HOPEDALE HYDROLOGIC RESTORATION
CWPPRA PROJECT PPO-38/PO-24
ENVIRONMENTAL ASSESSMENT

St. Bernard Parish, Louisiana

U.S. Department of Commerce
National Oceanic and Atmospheric Administration
National Marine Fisheries Service

Prepared by: Tetra Tech EM Inc.

July 2003

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

1.0 INTRODUCTION

This Environmental Assessment (EA) was prepared in accordance with the requirements of the National Environmental Policy Act (NEPA) regarding the proposed implementation of the Hopedale Hydrologic Restoration Project (PPO-30/PO-24), in St. Bernard Parish. This EA complements an Environmental Impact Statement (EIS) for the Louisiana Coastal Wetlands Restoration Plan prepared by the Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA) Task Force (Louisiana Coastal Wetlands Conservation and Restoration Task Force [LCWCRTF] 1993).

1.1 PURPOSE AND NEED FOR ACTION

The combined effects of sea level rise, subsidence, altered hydrology, storms, erosion, herbivory, and dredge and fill activities have contributed to an alarming rate of wetland loss in coastal Louisiana. During the last 50 years, land loss rates in Louisiana have at times exceeded 40 square miles per year. In the 1990s, the rate was estimated at between 25 to 35 square miles each year (LCWCRTF and the Wetlands Conservation and Restoration Authority [WCRA] 1998). A healthy coastal marsh provides rearing, resting, and foraging habitat for shellfish and finfish, waterfowl, wading birds, small mammals, and numerous amphibians and reptiles. Coastal marshes also provide protection of interior lands from storm surges, water quality support functions, and other environmental services. Louisiana's coastal wetlands are the foundation of renewable fisheries resources that are integral to the local, state, and national economy. Of the 1.7 billion pounds of fisheries landing reported for the Gulf Coast in 2000, more than 75% were caught in Louisiana (National Marine Fisheries Service [NOAA Fisheries] 2001).

The LCWCRTF develops an annual list of restoration projects to address priority needs for coastal restoration. These projects are selected from a wide array of candidate projects, following substantial technical and public evaluation. The Hopedale Hydrologic Restoration project was selected by the CWPPRA Task Force as part of the 8th Priority Project List to address on-going wetland loss in a 4,500 acre area in the Breton Sound Basin.

1.2 PROJECT LOCATION, SETTING, AND GOALS

The Hopedale Hydrologic Restoration Project is located southeast of Yscloskey, Louisiana, in St. Bernard Parish (Figure 1). The project area is located in the Central Wetlands Mapping Unit of the Coast 2050 Restoration Plan (LCWCRTF and WCRA 1998, 1999). Since the 1930s, the Central Wetlands Mapping unit has undergone both significant wetland loss and conversion of swamp and intermediate habitats to brackish wetland habitats. Between 1932 and 1990, it is estimated that approximately 38% of the wetland acreage in the mapping unit was lost due to hydrologic alternations, deposition of dredged materials, impoundment, subsidence and storm impacts.

Altered hydrology has resulted in the conversion of swamps and intermediate marshes to shallow open water and brackish marsh. One major cause of direct and indirect wetland loss in the project area was the construction of the Mississippi River Gulf Outlet (MRGO) which increased tidal flooding and salinity levels throughout St. Bernard Parish. Increased tidal processes contributed to the conversion of wetlands to open water, and promoted the conversion of low-salinity marshes and swamps to brackish or even saline conditions. Subsidence also played a role in land loss in the vicinity of the proposed project – over the past century, the Hopedale area has subsided between 1.1 and 2 feet. Current elevations in the vicinity of the project area range from 1.0 to 2.5 feet above mean sea level; subsidence of 0.9 feet is expected by 2050 (LCWCRTF and WCRA 1999).

The project boundary encompasses about 4,570 acres, which includes approximately 3,805 acres of wetland habitats dominated by brackish marsh and shallow open water. The project area is generally bound by Bayou Yscloskey and Louisiana Highway (LA HWY) 46 to the west, Bayou La Loutre and LA HWY 624 to the south and east, and the MRGO to the north. The project area is located within a large and complex network of hydraulically connected marshes, channels, and lakes; however, project area marshes are substantially impounded by existing roads and the MRGO. Wetlands in the project area are characterized by minimal tidal influence, and extensive periods of ponding of water at or above average marsh elevation. The project area is divided by a remnant ridge which partitions the area into a major sub-area connected to, and influenced by, the S-1 structure, and a smaller section along LA HWY 46 which is predominantly influenced by the existing highway cross-drains at the S-2 through S-5 locations. Figure 2 depicts the general location of the ridge feature and two project sub-areas.

Like much of the surrounding areas in St. Bernard Parish, the project area has been heavily influenced by the construction of the MRGO. Indirect effects are similar to those experienced throughout the basin: increased tidal processes and saltwater intrusion. Construction of the MRGO also directly impacted project area resources by construction of a major borrow canal to provide material to construct retention dikes to contain large volumes of material generated during channel construction. This canal, locally known as the Retainer Canal, created a direct link from the MRGO to the project area. The impacts of this direct linkage were partially ameliorated by construction of a water control structure in the 1950s; however, due to lack of maintenance, the structure has deteriorated resulting in extensive impoundment of project area wetlands. This canal is the principle point of hydrologic exchange between the semi-impounded project area and surrounding waters; the canal also serves as the primary access route for economically-important fishery species into project area wetlands. Currently, project area wetlands are adversely impacted by reduced tidal exchange and prolonged inundation. Pre-construction hydrologic data and hydraulic modeling indicates that water levels in the project area are elevated for up to a month at a time (Brown, Cunningham and Gannuch [BCG] 2001a and 2001b, Sealy and Hymel 2001). Prolonged inundation of the marsh surface leads to deterioration of plant health, reducing the production of organic matter, and increasing marsh loss rates (Stutzenbaker 1999). Even flood-tolerant marsh plants, such as wiregrass (*Spartina patens*), cannot survive indefinitely if its stems are inundated, since plants require oxygen to produce energy (Middleton 1999). Increases in salinity, degraded vegetation, and restricted access to fisheries negatively impact the economically and biologically important functions of the project area wetlands.

The primary purposes of the Hopedale Hydrologic Restoration project are to reduce the adverse impacts to wetlands health and improve fisheries utilization of those wetlands resources. As evaluated during the planning process, the project is anticipated to reduce wetland loss rates in the project area, resulting in the conservation and protection of about 106 acres of existing brackish marsh over the project life. The primary project goals are:

* Reduce average water levels in the project area
* Reduce the duration of inundation in the project area
* Maintain or improve fisheries ingress and egress
* Reduce wetland loss rates

Secondary project goals include reducing average salinities and increasing the extent of submerged aquatic vegetation (SAV) coverage in shallow open water areas in the project area.

1.3 PROJECT AUTHORITY AND FUNDING

This project is authorized under the CWPPRA of 1990 (16 U.S.C. §777c, 3951-3956), which stipulates that Federal agencies and the State of Louisiana jointly develop and implement a plan to reduce the loss of coastal wetlands in Louisiana (16 U.S.C. §3952 (b) (2)). Participating Federal agencies include the Department of the Army, through the U.S. Army Corps of Engineers (COE), the Department of Commerce, through the National Marine Fisheries Service (NOAA Fisheries), the Department of Interior, through the U. S. Fish and Wildlife Service (FWS), the Department of Agriculture, through Natural Resources Conservation Service (NRCS) and the U.S. Environmental Protection Agency (EPA). The CWPPRA Task Force approved the Hopedale Hydrologic Restoration project (PPO-38/PO-24), in August, 1998 as part of the Eighth Priority Project List. The NOAA Fisheries is the Federal sponsor of the project, and the Louisiana Department of Natural Resources (LDNR) is the non-Federal local project sponsor. CWPPRA guidelines call for cost sharing between the Federal sponsor and LDNR, with the Federal sponsor providing 85% of the project cost and LDNR contributing the rest. Details of the cost sharing are documented in a cooperative agreement between LDNR and NOAA Fisheries.

The project-specific authorization under CWPPRA provides for construction of specific project features to meet the approved project goals. The authorized project features include the replacement of the existing water control structure in the Retainer Canal (S-1), and construction of small water control structures at the existing highway cross-drains at locations S-2 through S-5 (See Figure 2). For the purposes of this EA and accompanying analyses, the currently proposed project only includes replacement of the existing control structure at the S-1 location.

As evaluated by the CWPPRA Environmental Workgroup, the project area includes approximately 4,570 acres, of which about 3,086 acres are emergent wetlands and 719 acres are open water. The major project benefits are anticipated to result from reducing wetland loss rates by restoring hydrology in the project area. In February 2003, the CWPPRA Environmental Workgroup partitioned project benefits to two sub-areas: Sub-area 1 which includes about 79% of the project area and is hydrologically served primarily by the S-1 structure, and Sub-area 2 which includes about 21% of the project area served primarily by the S-2 through S-5 highway cross-drains.

2.0 ALTERNATIVES, INCLUDING PROPOSED ACTION

The no action and preferred alternatives are presented in this section. Details regarding the design, construction, and operations of the preferred alternative are described. As part of the evaluation and design process, topographic/bathymetric, geotechnical, water elevation and salinity data were obtained and evaluated. Hydraulic modeling was also conducted to allow evaluation of various feature configurations on project area hydrology. Other issues affecting project design include existing highway infrastructure and residential and light commercial development in the project area.

Water levels and flow rates at critical project area locations were predicted for the existing conditions/no-action scenario and several alternatives using a commercial version (XP-SWMM) of the Storm Water Management Model (SWMM), Version 4.3, developed by EPA. The model was verified using three hydrologic boundary conditions (tides, rainfall, and storm surges). Current topographic and bathymetric data and pre-construction hydrologic data supported development of the model. (BCG 2000, 2001a, b).

2.1 NO ACTION ALTERNATIVE

Under the no-action alternative, the existing structure at location S-1 (Figures 1 and 2) would be left in place. It is projected that this control structure would continue to deteriorate over time, further restricting hydrologic exchange. Existing highway cross-drains at locations S-2 through S-5 would not be modified.

2.2 ALTERNATIVES CONSIDERED BUT ELIMINATED

Several configurations of alternative structures were evaluated based on a range of hydrologic boundary conditions, tides, rainfall and storm surges (BCG 2001a, b). The alternatives considered but eliminated in favor of the preferred alternative include various combinations of structural elements in several locations. Culverts and fish access slots of various sizes were evaluated at location S-1 to optimize project performance. Several configurations of modifications to the existing cross drains were evaluated, however, due to landowner concerns and engineering issues, implementation of features to modify the cross-drains is not currently proposed. Features to address issues associated with the cross drains may be considered in the future and would be assessed through additional NEPA documentation. Details of the alternative configurations of the structures are in reports prepared by BCG (2001a, b, and c).

2.3 PREFERRED ALTERNATIVE

2.3.1 Structural Design

The preferred alternative would replace the existing control structure at the S-1 with three 84-inch diameter combination flap-sluice gates and two 2-foot by 7-foot fish access slots; the fish access slots will be fitted with sluice gates to allow for partial or complete closure in accordance with the operational criteria, described below and in Table 1 (Figures 3, 4 and 5).

At the S-1 structure location, cylinder piles will be placed within the Retainer Canal between the openings to support the sluice and flap gates. Steel plates will be installed to fill any gaps between the gates and the cylinder piles, and steel sheet piling will be driven along the edges of the gated structure to tie in to the bank slopes. Earthern levees will be constructed to prevent hydrologic by-passing of the structure (Figure 5). A secured walkway above the structure will allow access to authorized personnel for operations and maintenance. Geotextile fabric, crushed aggregate, and riprap will be installed on the banklines in the immediate vicinity of the structure (Figures 3 and 4). During installation of the gated structure, coffer dams (earthen plugs or temporary sheet piling) will be installed within the canal both upstream and downstream of the existing structure to allow for construction in a dry area (Figure 6). Bypass pumping will be used during the period of construction, which is expected to last about 60 – 90 days.

2.3.2 Operations

The structure would be operated to optimize project performance by maintaining tidal exchange during normal conditions, reducing hydrologic inputs during high water periods, and maximizing drainage when project area wetlands are inundated due to excessive flooding. Normal operations, storm closures, and special openings are described below and summarized in Table 1.

2.3.2.1 Normal Operation

Under normal operating conditions (i.e., Bayou La Loutre water levels ≤ 3.0 feet NAVD, and interior water levels are ≥ 0.44 feet NAVD), the flapgates on all structures will be in the flapping configuration. Fish slots on the S-1 structure will be open during normal operations. This configuration will allow tidal exchange through two, 2-foot x 7-foot fish access slots, and permit water to drain from the project area through the flapgates when adequate hydraulic head is available. Based on analysis of the daily gauge readings from January 1963 through December 2002 from the COE's "Mississippi River Gulf Outlet at Shell Beach" (Shell Beach) gauge (Station 8580004), it is anticipated that the structure would be configured for normal operation in excess of 90% of an 'average' year.

Table 1. Operations protocol for the S-1 structure.

SCENARIO	S-1 CONFIGURATION
Normal operations Bayou La Loutre below +3.0' NAVD 88.	Combination flap/sluice gates closed (i.e., flapping) Fish access slots open
Bayou La Loutre water levels (i.e., exterior) ≥ 3.0 feet NAVD for four consecutive hours or when Bayou La Loutre ≥ 3.5 feet NAVD. Resume normal operations when Bayou La Loutre water levels are below +2.0 for twelve consecutive hours	Close fish access slots Combination flap/sluice gates may be opened and resume normal (i. e. flapping) once water in Bayou La Loutre falls to +2.0' NAVD 88.
Perimeter overtopping Resume normal operation once interior gauge is ≤ 2.0 feet NAVD 88.	Open combination flap/sluice gates when Bayou La Loutre water levels are lower than interior water levels for twelve consecutive hours.
Interior water elevation below 0.44' NAVD 88 (Mean Low Water) for forty-eight consecutive hours. Resume normal operation once interior gauge is ≥ 0.75 feet NAVD 88 (average marsh elevation).	Lock combination gates closed (i. e., no flow) and close one of the two fish slots.

2.3.2.2 Prolonged High Tide

During prolonged high tide events the fish slots would be closed when Bayou La Loutre water levels (i.e., exterior) are higher than 3.0 feet NAVD for four consecutive hours, or when Bayou La Loutre stages are higher than 3.5 feet NAVD. This configuration is intended to prevent water levels in the project area from becoming excessively high during storm events or other extreme tidal events. The operational schedule requires resumption of "normal operations" (i.e., access slots will be opened) when Bayou La Loutre water levels are below 2.0 feet NAVD for twelve consecutive hours. Analysis of daily gauge readings from the Shell Beach gauge suggest that periods of such elevated water

levels, and closure of the access slots, would be expected to occur during an 'average' year approximately three to four days, or less than 1% of the time (see Appendix A). The historic record indicates that elevated stages occur most frequently in September and October. Based on the 38 year period of record, the trigger for closure during September was met during 23 of the 38 years. During September, stages which trigger slot closure would be expected to occur an average of less than 3 days per year, with an average closure duration of 3 days, and a maximum closure period of 12 days.

2.3.2.3 Perimeter Overtopping

The operational schedule provides that in the event of perimeter overtopping the sluice gates on the structure will be raised to assist in evacuating excess water from the project area. Fish access slots will be open. Such events are likely following a hurricane or prolonged period of heavy rain causing extremely elevated water levels in the interior of the project area. Raising the sluice gates when exterior water levels allow for drainage would increase the rate of flow out of the marsh, and accelerate a return to target water elevations in the project area.

2.3.2.4 Low Interior Water Levels

During periods of extremely low interior water levels (i.e., $\leq$ 0.44 feet NAVD), the operational schedule provides that the flap-gates will be locked closed to prevent excessive drainage of water from the project area. One of the two fish access slots will also be closed. Extremely low interior water levels are usually associated with winter weather patterns and associated north winds reducing Gulf water levels. This operational scenario is intended to prevent prolonged low water levels and associated dewatering of project area wetlands. Based on the Shell Beach gauge, the trigger for this operational configuration would have been met an average of 26 days per year over the 38-year record, or an average of 9% of the year (see Appendix A). The criteria was most frequently met in the month of February with an average duration of less than 8 days.

3.0 SIGNIFICANT RESOURCES IN AFFECTED ENVIRONMENT

Potential impacts from implementation of the project are evaluated in the context of existing environmental conditions. Baseline conditions focus on the immediate project area, as well as any off-site resources that may be affected.

3.1 PHYSICAL ENVIRONMENT

Components of the physical environment determined to be relevant to this project include geology, climate, air quality, and surface water resources.

3.1.1 Geology, Soils, and Topography

Soils in the project area are Lafitte-Clovelly muck, which is level, very poorly-drained soil with a thick mucky surface layer and clayey underlying material typical of coastal brackish marshes in Louisiana (USDA 1989). This soil has a very high potential for subsidence. Lafitte-Clovelly muck is a weak and fluid soil type which is not suitable for any load-bearing activity, such as livestock grazing or construction. The predominant use of this soil type is to support wetland functions (USDA 1989).

Preconstruction soil borings were collected at the main structure and the four side structure locations. Subsoils in the immediate construction area of S-1 consist of stiff brown clay to a depth of 3 feet below ground surface (bgs), underlain by soft gray clay and very soft gray silty clay to a depth of 18

feet bgs. Below this level, loose to medium dense gray silty fine sand occurs to a depth of at least 60 feet bgs. (Gore Engineering 2001).

A notable feature located in the project area is a remnant bayou ridge with elevations of 2.9 feet NAVD88 to 4.1 feet NAVD88, which ranges from 2.1 to 3.3 feet above average marsh elevation. This topographic feature effectively divides the project area into two distinct hydrologic units except during periods when water levels in the project area exceed the ridge elevation. Based on survey data, project design evaluations, and a review of recent aerial photographs, approximately 3,006 acres, or 79% of project area wetlands are within the hydrologic unit which is connected to, and served by, the S1 structure. The remaining 799 acres, or 21% the project area wetlands, are hydrologically connected to the existing highway cross-drains at locations S2 through S5.

3.1.2 Climate and Weather

The subtropical climate of coastal Louisiana is characterized by long, hot summers and short, mild winters, with high humidity year round. Over the past 40 years, air temperature ranged from 14 to 102 °F; average winter and summer temperatures are 55.3 and 82.4 °F, respectively (COE 1988). In a typical year, more than 60 inches of rain falls, mostly in the spring and summer months (COE 1988). In the fall and winter, winds tend to be from the north-northeast; in spring and summer, winds are generally from the south-southeast (COE 1988). The coast of Louisiana is threatened by hurricanes every several years; 12 major hurricanes (greater than Category 3) have hit the state since 1900, according to National Hurricane Center reports (http://www.nhc.noaa.gov/pastall.html). The Hopedale area was heavily damaged in 1965 by Hurricane Betsy and in 1969 by Hurricane Camille. Historical data on the intensity of hurricanes and storm surges were important inputs to the hydraulic and hydrographic model (BCG 2001a).

3.1.3 Air Quality

No significant point sources of air-borne pollutants occur in the vicinity of the proposed project, and air quality is generally good. The most prominent source of air-borne pollutants in the area is the diesel exhaust of boats, and very limited vehicular traffic. Offshore breezes mix and freshen the air, and frequent precipitation prevents the accumulation of particulates. St. Bernard Parish meets all of the national ambient air quality standards, according to the Louisiana Department of Environmental Quality Office of Environmental Assessment (Jennifer Walton, 2002, personal communication).

3.1.4 Surface Water Resources

The project area lies in a complex, hydraulically-connected network of marshes, channels, and lakes. In the immediate vicinity of the project area, small natural channels include Bayou La Loutre to the south and east, and Bayou Yscloskey to the west; the manmade MRGO dominates to the north. Surface water quality in the vicinity of the project area is generally good, with little industrial or agricultural discharge (COE 1988). The principal water quality parameter of concern in the project area is salinity, which increased dramatically after construction of the MRGO. Prior to the 1960s, the mean salinity ranged seasonally from approximately 4 parts per thousand (ppt) to 10 ppt. After construction of the MRGO saltwater intrusion from the Gulf of Mexico increased the upper limit of the salinity range to 22 ppt in the project vicinity (Gagliano 1973, as cited in Hartman et al. 1998). Salinity in Bayou La Loutre near location S-1 measured 30.5 ppt in July 2000 (Sealy and Hymel 2001).

The project area is substantially impounded, characterized by minimal tidal influence, extensive periods of elevated water levels, and ponding of water at or above average marsh elevation. Project

area wetlands are bound by adjacent roads and spoil containment areas and hydrologic exchange is limited by the existing control structure at location S-1. Pre-construction topographic and bathymetric survey data demonstrate that the S-1 structure is functioning at 33 to 50% of its original design capacity, providing approximately 19 to 28 square feet of opening. At least one of the existing culverts is non-functional (either completely collapsed or otherwise blocked), and survey and modeling data suggest that the remaining two culverts are significantly reduced (BCG, 2001a and BCG, 2001b). Pre-construction surveys and site inspections of the structures at locations S-2 through S-4 reveal that hydrologic exchange occurs through three 36-inch culverts under the highway; two 36-inch culverts are in place at the S-5 location.

Pre-construction hydraulic modeling indicates that no tidal signal is expected in the project area during normal, lunar tides. During significant "10-year" rainfall events (defined as 9.2 inches during a 24-hour period), the model predicts that water levels within the project area will increase to approximately 1.6 to 2.0 NAVD, which is approximately 0.8 to 1.2 feet higher than average marsh elevation (0.8 feet NGVD); water levels are not expected to return to marsh elevation for approximately ten days. Hydraulic modeling also indicates interior water levels will not return to marsh level for approximately 16 to 21 days following major storms that cause overtopping of the project perimeter.

3.2 BIOLOGICAL ENVIRONMENT

Principal biological resources of concern at the project site are those associated with coastal brackish marsh habitats. The following sections briefly describe the vegetative community, and associated wildlife and fisheries resources (including Essential Fish Habitat [EFH] and threatened and endangered species).

3.2.1 Vegetative Communities

The project area is located in the Central Wetlands Mapping Unit, in Region One of the Coast 2050 Restoration Plan (LCWCRTF and WCRA 1998). Historically, the dominant wetland habitats in this unit were classified as swamp and sawgrass marshes. Construction of the MRGO resulted in the direct conversion of substantial wetland areas to both open water and upland/spoil habitats. Recent analyses indicate that marshes in the Central Wetlands mapping unit are predominately brackish.

Wetlands located in the project area were evaluated through CWPPRA's Wetland Value Assessment (WVA) procedures. Vegetative maps from 1949 to 1988 show evidence of an increasing salinity trend in the area resulting in a shift from an optimal brackish marsh containing mainly three-cornered grass (*Scirpus americanus*) to a brackish marsh in its highest salinity regime (Hartman et al. 1998). Analyses of historical habitat classification data indicate that in 1956, there was approximately 594 acres of water, 1,285 acres of fresh marsh, 1,648 acres of "non-fresh" marsh, and minor amounts of forested and swamp habitats within the project area. Analysis of 1978 habitat classifications indicate that by 1978, there were approximately 670 acres of open water; 1,405 acres of intermediate marsh, 1,224 acres of brackish marsh, and minor amounts of forest and shrub-scrub habitats. The 1988/1990 habitat analysis demonstrates that the project area contained approximately 718 acres of open water; 2,970 acres of brackish marsh, and minor amounts of saline marsh, swamp, and shrub-scrub habitats. The WVA for the project estimated that 20% of the open water was dominated by SAV.

Site inspections of the project area noted wiregrass was the most common plant, occupying 90% of the vegetated marsh. Smooth cordgrass (*Spartina alterniflora*) covered 5% of the marsh, and small amounts of Gulf Coast waterhemp (*Amaranthus australis*) and camphorweed (*Pluchea camphorata*) made up the remainder of the marsh community. The majority of the SAV was widgeon grass

(*Ruppia maritima*). The vegetation within the COE MRGO spoil bank was 85% wiregrass, 10% salt grass (*Distichlus spicata*), and small areas of leafy three-square (*Scirpus robustus*) and black needle rush (*Juncus roemarianus*) (Hartman et al. 1998). This composition represents a marked change from pre-MRGO conditions, in which 28% of the project area was characterized as fresh marsh (Hartman et al. 1998).

3.2.2 Fish and Wildlife Resources

3.2.2.1 Fisheries Resources

The Breton Sound estuary supports a variety of estuarine invertebrate and fish species of ecological, commercial and recreational value. This area is considered to be typical of Louisiana coastal estuaries, which are characterized by extensive marshes representing a salinity continuum from saline to brackish to intermediate. Project area wetlands provide nursery and foraging habitats for a variety of economically-important marine fishery species, including red drum, white and brown shrimp, gulf menhaden, spotted and sand seatrout, striped mullet, southern flounder, black drum, Atlantic croaker, and blue crab . Other estuarine-dependent species expected to use the project area during some portion of their life history include the ecologically-important grass shrimp (Pattillo et al. 1997). Many other non-game species of finfish and shellfish are important links in the food chain to commercially harvested and recreationally caught species. Table 2.0 presents some of the most common estuarine dependent species in the Breton and Chandeleur Sounds; most of these species can be expected to occur in or near the project area during some portion of their life history. Some of these species serve as prey for species that are Federally-managed under the Magnuson-Stevens Fishery Conservation and Management Act, P.L. 104-297; 16 U.S.C. 1801 et seq. (Magnuson-Stevens Act) by the Gulf of Mexico Fishery Management Council (GMFMC) (e.g., red drum, mackerels, snappers, and groupers) and highly migratory species managed by NOAA Fisheries (e.g., billfish and sharks). Project area wetlands also produce nutrients and detritus, important components of the aquatic food web, which contribute to the overall productivity of the Breton Sound estuary.

Oyster spat may occur on hard structures within the project area, although the soft muck typical of the area is generally unsuitable for oyster growth. The nearest oyster lease is located north of the MRGO, outside the area of influence of the proposed project.

Table 2. Relative Abundance of Finfish and Shellfish in Breton/Chandeleur Sound*

Common Name	Relative Abundance		
	Highly Abundant	Abundant	Common
American oyster		√	
Atlantic rangia			√
Hard clam			√
Bay squid			√
Brown shrimp		√	
Pink shrimp		√	
White shrimp			√
Grass shrimp	√		
Blue crab		√	
Gulf stone crab			√
Bull shark		√	
Gulf menhaden	√		
Gizzard shad			√
Bay anchovy		√	
Hardhead catfish		√	
Sheepshead minnow			√
Gulf killifish			√
Silversides			√
Crevalle jack			√
Florida pompano			√
Gray snapper			√
Sheepshead			√
Pinfish			√
Silver perch			√
Sand seatrout			√
Spotted seatrout		√	
Spot		√	
Atlantic croaker		√	
Black drum		√	
Red drum		√	
Striped mullet		√	
Spanish mackerel			√
Southern flounder		√	

* Based on Patillo et al. (1997). *Categories of relative abundance are defined in as follows: highly abundant species are "numerically dominant" over others; abundant species are "encountered in substantial numbers," and common species are "generally encountered but not in large numbers."*

3.2.2.2 Essential Fish Habitat

The project is located in an area identified as EFH by the GMFMC for species that are Federally-managed under the Magnuson-Stevens Act. Detailed information on Federally-managed species and their EFH is provided in the 1998 generic amendment of the Fishery Management Plans for the Gulf of Mexico prepared by the GMFMC, as required by the Magnuson-Stevens Act.

The Federally-managed fish species expected to occur in the project area are postlarval/juvenile and sub-adult white shrimp, brown shrimp and red drum. Categories of EFH in the project area include estuarine emergent wetlands, estuarine water column, and estuarine water bottoms. Table 3 lists the EFH requirements for each of the federally-managed species and life stages found in the project area.

In the project vicinity, red drum are expected to occur as juveniles year round, and as sub-adults during all but the winter months (December through February). Juvenile brown shrimp are highly abundant March through August, and common or abundant the rest of the year. Juvenile white shrimp are common during the low salinity periods of December through May, and abundant during the remainder of the year. Adult white shrimp are rare December through May and common to highly abundant during June through August.

Table 3. Essential Fish Habitat (EFH) for Managed Species in the Hopedale Marsh Area.

Species	Life Stage	EFH
Brown shrimp	postlarval/juvenile, subadults	Marsh edge, SAV, inner marsh, estuarine mud bottoms
White shrimp	postlarval/juvenile, subadults	Marsh edge, SAV, marsh ponds, inner marsh
Red drum	Subadults and adults	SAV, estuarine mud bottoms, marsh/water interface

3.2.2.3 Wildlife Resources

The brackish marsh of the project area provides habitat for numerous species of birds and mammals. Muskrat (*Ondatra zibethicus*) and nutria (*Myocaster coypus*) are the most important furbearers in St. Bernard Parish, but populations of both species have declined since the construction of the MRGO (Wicker et al. 1982.) Some white-tailed deer (*Odocoileus virginianus*) and rabbit (*Sylvilagus aquaticus*) occur on the spoil banks of the MRGO, but populations in the project area are small.

Although most ducks prefer fresh marsh, and rarely use saline marsh, the brackish marsh of the project area is home to the mottled duck (*Anas fulvigula*), the only duck that breeds in large numbers in the coastal marshes of Louisiana (Wicker et al. 1982). Despite the degradation of migratory waterfowl habitat that resulted from construction of MRGO, the position of the project area at the southern end of the Mississippi Flyway attracts many birds during winter months. The most frequently encountered (and harvested) dabbling ducks are gadwall (*Anas strepera*), blue-winged teal (*A. discors*) and green-winged teal (*A. crecca*) (Wicker et al. 1982). Open water in brackish marshes is favored by the lesser scaup (*Aythya affinis*), the most commonly harvested diving duck in the area. Yellow-crowned night herons (*Nyctanassa violacea*) are often observed roosting within the project area near the S-1 structure (Michael Sealy, personal communication). Other herons and egrets are also common in the area.

The American alligator (*Alligator mississippiensis*) occurs in low densities in the central Wetlands Mapping Unit, and populations are expected to decrease during the next 50 years (LCWCRTF and WCRA, 1999); the American alligator is the only reptile listed as a significant wildlife resource in the Coast 2050 planning documents (LCWCRTF and WCRA, 1998 and 1999). Turtles that may occur in the project area include the diamondback terrapin (*Malaclemys terrapin*), snapping turtle (*Chelydra serpentina*), and Eastern mud turtle (*Kinosternon subrubrum*) (Gosselink 1984; Dundee and Rossman 1989). Snakes common in brackish coastal marshes include the cottonmouth (*Agkistrodon piscivorous*) and brown snake (*Storeria dekayi*); many other species are likely to use the MRGO spoil bank to the north of the project area (Gosselink 1984; Dundee and Rossman 1989). Few amphibians occur in brackish habitats; one exception is the Eastern narrowmouth toad (*Gastrophryne carolinensis*), which is expected to be found in the project area (Dundee and Rossman 1989).

3.2.2.4 Threatened and Endangered Species

According to the U.S. Fish and Wildlife Service's Louisiana Field Office, there are 10 Federally listed threatened or endangered species that occur in St. Bernard Parish. Table 4 below provides the Latin name, legal status (both Federal and State), and likelihood of occurrence in the project area for each of these species.

Federally listed avian species include the brown pelican, piping plover, and bald eagle. Of these species, the brown pelican is the only threatened or endangered bird likely to occur in the project area. Brown pelicans are often seen foraging and resting in the water on both sides of the existing structure at S-1.

Five species of sea turtles occur in the Gulf of Mexico off the Louisiana coast. All are considered either threatened or endangered, but none are likely to occur in the project area. The loggerhead and the green turtle are somewhat common in nearshore waters. The Kemp's ridley is an uncommon visitor, and the hawksbill and leatherback turtles are rarely encountered in Louisiana (Dundee and Rossman 1989). Two Federally listed fish that occur in St. Bernard Parish are Gulf sturgeon and pallid sturgeon. The Gulf sturgeon spawns and rears in large rivers, but adults can be found throughout the Gulf of Mexico and more interior bays, such as Chef Menteur Pass and Lake Catherine. The pallid sturgeon occurs in major rivers. It is unlikely that the either the Gulf sturgeon or pallid sturgeon occurs in the project area (David Walther, personal communication). Impacts to these species are addressed in Section 4.2.2.4.

Table 4. Threatened and Endangered Species of St. Bernard Parish

COMMON NAME	LATIN NAME	FEDERAL STATUS	NOTES
Brown Pelican	*Pelecanus occidentalis*	Threatened	• Likely to occur in project area • Observed foraging at S-1
Bald Eagle	*Haliaeetus leucocephalus*	Threatened	• Unlikely to occur in project area • Winter visitor to coastal areas • No nests known in area
Piping Plover	*Charadrius melodus*	Threatened	• Unlikely to occur in project area • Migrant on barrier islands
Kemp's Ridley Sea Turtle	*Lepidochelys kempii*	Endangered	• Unlikely to occur at project site • Nest on coastal beaches or barrier islands
Loggerhead Sea Turtle	*Caretta caretta*	Threatened	
Green Sea Turtle	*Chelonia mydas*	Threatened	
Hawksbill Sea Turtle	*Eretmochelys imbricata*	Endangered	
Leatherback Sea Turtle	*Dermochelys coriacea*	Endangered	
West Indian Manatee	*Trichecus manatus*	Endangered	• Unlikely to occur in project area
Pallid sturgeon	*Scaphirhynchus albus*	Endangered	• Unlikely to occur in project area • Occurs in major rivers (i.e., main channels of the Mississippi and Atchafalaya Rivers)
Gulf sturgeon	*Acipenser oxyrhynchus desotoi*	Endangered	• Unlikely to occur in project area • Occurs in large rivers and Gulf of Mexico

3.3 CULTURAL ENVIRONMENT

More than 67,000 people were reported living in St. Bernard Parish in the 2000 census, with a mean population density of 144 people per square mile of land area (U. S. Census 2000). However, only about 25 percent of the 1,793 square miles that make up the parish are considered land, with the rest characterized as "water area" (U. S. Census 2000). Although no population or density data are available for the unincorporated area of Hopedale, 10 percent of the parish population lives in the area defined as "Poydras and below" (Gary Huettmenn, 2002, personal communication). According to the Coast 2050 restoration plan (LCWCRTF and WCRA, 1998), about 325 people live in the Yscloskey area, which includes Hopedale. Housing and population density are significantly less than the parish average. The population of St. Bernard Parish is skewed toward adults, with a median age of 37 years. Only 25 percent of the residents are under age 17. The median household size is 3 individuals (U. S. Census 2000).

The large majority of residents of St. Bernard Parish (88.3 percent) identify as white; 7.6 percent identify as African-American and 5.1 percent as Hispanic. Small numbers of Asian Pacific Islanders also reside in the parish (U. S. Census 2000). Percentages add to more than 100 because individuals may report identity with more than one racial category. In the Yscloskey-Hopedale area, a significant portion of the population is of Canary Island origin, known as "Islenos." The Islenos arrived in lower Louisiana in the 1770s, and still retain a distinct genealogical and cultural identity today. Many Islenos speak Spanish in the home and participate in cultural events coordinated through the Canary Islands Descendants Association (http://canaryislandersislenos.com/index.html). The Islenos tend to be engaged in the fishing and trapping industries, and are known as skilled boat builders. Islenos use the shallow-draft Delacroix Skiff outfitted with butterfly nets to harvest finfish and shellfish from the coastal marshes (http://www.sec.state.la.us/archives/canary/canary-11-97.htm).

In addition to the people and living culture of the area, the cultural environment may include sites of historic, prehistoric, or Native American significance. Consultation with the State Historic Preservation Officer (SHPO) has been initiated in compliance with Section 106 of the National Historic Preservation Act (Appendix C).

3.3.1 Historic, Prehistoric, and Native American Resources

Prehistoric and historic archeological sites are common along the coast of Louisiana, reflecting the long history of human habitation. A survey of the natural ridges and levees near the Hopedale project area conducted for a recent EA for the MRGO revealed several prehistoric shell middens. Studies of the middens indicate that Native Americans collected and ate freshwater and estuarine in the area. Evidence suggests that both permanent and temporary residences existed along the natural levees, which also served as major routes of travel and transport.

In addition to prehistoric Native American domiciles, archeological sites in the general area include boat landings, camps, shipwrecks, and military fortifications. No survey of cultural resources has been conducted in the project area. However, because the preferred alternative is a refurbishment of an existing control structure and does not involve significant disturbance of any levee or ridge area likely to contain archeological sites. However, a review of the project area revealed no known or recorded sites.

3.3.2 Land Use / Recreation

The primary uses of land in the vicinity of the project are light commercial uses typically associated with various commercial fisheries and small residential communities. The primary land use in the

wetlands of the project area are recreational hunting and fishing. No commercial, industrial or agricultural sites occur within the project area.

3.3.3 Infrastructure

The project area is bounded by LA HWYs 46 and 624, which provide principal hurricane evacuation routes for the residents of this area. In the Central Wetlands Mapping Unit overall, there are 24.8 miles of tertiary roads, 1.9 miles of railroads, 22.6 miles of natural gas pipeline, and 17 oil and/or natural gas wells (LCWCRTF and WCRA 1999).

Navigable waterways, which are discussed in Section 4.1.4 as surface water resources, also provide major transportation routes to residents and workers in the Hopedale Area. The MRGO is the most significant water development project in the area, and its future operation is under active review at this time. The nearest port to the project area is the Port of New Orleans, which services river traffic in St. Bernard, Orleans, and Jefferson Parishes.

Residences and businesses in the Hopedale area are provided with potable water from a treatment plant in Chalmette, Louisiana, via a 6-inch pipe out of Yscloskey (CEI 1982; Logan Martin, 2002, personal communication 2002). Groundwater in the area is not potable due to high salinity. Natural gas, electricity, telephone and cable service are available throughout the area from private firms. Sewage treatment, which is regulated and inspected by the state Department of Health and Hospitals, is by individual septic or treatment plants. The project area is outside the system of hurricane protection levees, and no active drainage infrastructure is in place. Drainage is largely under the influence of tides and gravity (Logan Martin, personal communication). A 16-inch diameter natural gas pipeline originates at the One Petroleum plant on LA HWY 46 and runs south to Eloi Bay (Art Rainwater, personal communication) . The line is located well outside all construction areas, and no impacts are anticipated.

3.3.4 Socioeconomics

The principal employers in St. Bernard Parish overall are the petroleum and sugar refining industries and Chalmette Medical Center (Louisiana Department of Economic Development, 1998 profile, as cited on St. Bernard Parish web site http://www.st-bernard.la.us/ecodev.htm). Mean per capita income of St. Bernard Parish residents was $20,900 in 1998 (http://www.st-bernard.la.us/ecodev.htm).

Within the immediate project area, commercial and recreational fishing are important economic activities (LCWCRTF and WCRA 1998). Commercial fisheries on the Louisiana coast are dominated by estuarine dependent species, such as blue crabs, oysters, brown shrimp and white shrimp. Total landings of fish and shellfish in the parish in 2000 were about 14.1 million pounds, with a dockside value of about $19.5 million. The oyster harvest in 2000 was worth more than $8.0 million (3.5 million pounds), and the blue crab harvest was valued at $3.9 million (5.7 million pounds) (John Poffenberger, personal communication). Because the landing statistics show only a single dealer for brown and white shrimp in St. Bernard Parish, landings data for 2000 are confidential. More than 2 million pounds of shrimp were harvested in St. Bernard Parish in 1978 (Wicker et al. 1982). Landings of all commercial fisheries in the Delacroix-Yscloskey area were 15.5 million pounds in 2000, at a value of $20 million; the port was ranked 36th in the nation based on pounds of catch (http://www.st.nmfs.gov/webplcomm/plsql/webst1.MF_LPORT_HIST.RESULTS).

Secondary economic activities related to support of commercial and recreational fishing include a small boat launch and general store near the project area, which provides manual or mechanized

4.1.3 Surface Water Resources

No Action
It is anticipated that the remaining fully-open culvert in the S-1 location will collapse within the next 10 years, greatly reducing the flow of water into and out of the area. Historically, local residents have opened the damaged culverts with heavy equipment after major storms; this will likely occur again if the project is not built.

Under existing conditions, hydraulic modeling indicates that water levels in the project area generally experience little or no tidal signal, providing little or no daily oscillation between "flooded" and "exposed" conditions. Following significant rainfall events, extremely high tides, and storm events, the model predicts that water levels in the project area will remain elevated for extensive periods of time. For example, following a 10-year rainfall event (defined as 9.2 inches of rain in 24 hours), water levels would not return to marsh elevation for more than 10 days. Impoundment resulting from a 10-year rainfall combined with a 10- to 20-year hurricane and spring tides is expected to take 16 to 21 days to drain from the area (BCG 2001a).

Preferred Alternative
The preferred alternative is expected to restore healthy wetland hydrology with a normal tidal signal to the project area. Hydraulic modeling results suggest that interior water levels would reflect daily tidal signals similar to water levels outside the project area. Construction of the preferred alternative at location S-1 is anticipated to halve the time required to return water levels to marsh elevation following a 10-year rainfall to less than 5 days (BCG 2001a). The drainage time following a 10-year rainfall combined with a 10-year hurricane and spring tides is expected to be reduced by more than 11 days (to 5 days) under the preferred alternative. Similar reductions in period of impoundment are expected following more severe storm events (BCG 2001a).

4.2 SIGNIFICANT BIOLOGICAL RESOURCES

Significant biological resources were described in section 3.2. Changes in the quality or character of biological resources in the project area are evaluated under the No Action and Preferred Alternatives.

4.2.1 Vegetative Communities

No Action Alternative
No major shifts in composition of plant species is expected under the no action scenario. However, repeated prolonged inundation of the project area is expected to reduce the acreage and vigor of less tolerant plant species, and favor an increase in smooth cordgrass (Hartman et al. 1998). Based on CWPPRA's Environmental Workgroup's partitioning of benefits across the two project sub-areas, it is anticipated that over the 20-year project life, about 135 acres of emergent wetlands would be converted to shallow open water without the project. SAVs are predicted to decline from 20% to 15% under the No Action alternative. The WVA also projected that without the proposed project, wetland loss rates in the project area would increase from the estimated current rate of 0.12% per year to a high of 0.48% per year over the 20-year period.

Preferred Alternative
The current wiregrass-dominated marsh would be maintained by construction and operation of the preferred alternative. The WVA estimated that the current wetland loss rate would be reduced by 50% to approximately 0.06% per year. It is anticipated that under the preferred alternative, only about 29 acres of emergent vegetation would be lost over the 20-year project (Hartman et al. 1998). SAVs are

predicted to increase from 20% to 25% within one year of the construction of the preferred alternative, and to further increase to 30% by target year 20.

4.2.2 Fish and Wildlife Resources

4.2.2.1 Fisheries Resources

No Action Alternative
Trends in fisheries resources for the Central Wetlands Mapping Unit were predicted as part of the Coast 2050 restoration plan, based on professional judgment and limited data (LCWCRTF and WCRA 1998); these estimates are considered to represent conditions that would prevail under the No Action Alternative. Most common fisheries resources in the lower St. Bernard marshes, including blue crab, white and brown shrimp, red and black drum, spotted seatrout, and southern flounder, are expected to maintain steady populations through 2050; Gulf menhaden are predicted to increase (LCWCRTF and WCRA 1999 – App C). Oyster harvests are expected to decrease in the immediate area.

Within the broader context of fisheries resources in lower St. Bernard Parish, fisheries habitat in the project area is expected to decline as wetlands loss continues under the No Action Alternative. Additionally, fisheries access to the project area is substantially impeded by the existing water control structure at location S-1, and it is anticipated that access will be further reduced as the structure continues to collapse. Recent topographic and bathymetric survey data and field inspections suggest that approximately 19.6 square feet of cross-sectional area are open for marine organism and fishery ingress and egress at location S-1 (See Table 5). It is anticipated that without the project the access area will further decrease as the existing culverts continue to collapse.

Table 5. Effective Area of Fisheries Access Through S-1

SCENARIO	AREA OF FISHERIES ACCESS	ANTICIPATED % OF TIME
No Action Alternative	± 19.6 sq. ft., decreasing in future	100%
Preferred Alternative, normal operations	28 sq. ft.	90%
Preferred Alternative, prolonged high tide operations	0 sq. ft.	1%
Preferred Alternative, low interior water levels	14 sq. ft.	9%
Preferred Alternative, "annual (weighted) average"	26.4 sq. ft.	N/A

Preferred Alternative
The refurbished control structures will provide for enhanced estuarine organism access to the 3006 acres of wetlands and open water in the project area which are influenced by the S-1 structure. During normal operations, fish access slots will remain open, allowing actively swimming organisms and passively drifting eggs and larvae of many species to enter the marsh on incoming tides. Gates

will open on outgoing tides, allowing drifting organisms to exit the marsh and active swimmers to enter or exit. The large fish access slots (2 feet high by 7 feet wide) at the S-1 structure were designed to provide higher quality, more reliable access for marine organisms, compared to the partially collapsed culverts that currently exist. The area available for fisheries access at the S-1 structure location will increase from approximately 19.6 square feet to 28 square feet under the preferred alternative. Under normal operating conditions, the fish access slots will be open, and the flap gates will be in the flapping position. Based on analysis of the historic record from the Shell Beach gauge, it is anticipated that the structure would be configured for normal operation in excess of 90% of an 'average' year. Closures of both fish access slots are anticipated to occur less than 1% of an average year, and closure of one of the two fish access slots are expected to occur about 9% of an average year. Table 5 summarizes the extent of fisheries access to project area marshes under the no action and preferred alternatives, and Appendices A and B include supporting analyses. The preferred alternative would provide more cross-sectional area for fish access, as demonstrated in Table 5. The fish access slots provide higher quality access than the no action alternative by providing access throughout the water column to a depth of – 7 feet NAVD. Finally, the configuration of slots in the center of the Retainer Canal as well as toward the bankline will provide access for organisms which prefer mid-stream and bankline transits.

During construction, coffer dams will block all fisheries ingress and egress; water flow will be maintained via pumping. Construction is anticipated to take 60-90 days, and no population-level effects on fisheries resources is expected to result from this temporary interruption in fisheries access.

4.2.2.2 Essential Fish Habitat Assessment

No Action

The No Action Alternative is likely to increasingly limit the accessibility of managed species to EFH within the project area. Primary access from offshore waters through Bayou La Loutre to the project area is via the deteriorating control structure at location S-1. As the existing structure continues to deteriorate, access to EFH associated with project area wetlands will continue to decrease.

Preferred Alternative

Preliminary evaluation of the EFH issues suggests that any adverse effects to the sub-categories of EFH described in Section 3.2.2.2 would be temporary and minor results of construction. Post-construction access for Federally-managed species to the project area would improve, as shown in Table 5. Although details of habitat use are not well documented within the project area specifically, it is reasonable to expect that establishment of a normal tidal signal and healthy wetland hydrology will favor the abundance and growth of a variety of native finfish and shellfish species. Federally-managed estuarine-dependent species for which EFH has been identified in project area rely on complex diurnal and seasonal patterns of water movement throughout the marshes. Coupled with the increase in effective fisheries access area, the restoration of more natural salinities and water elevations, are anticipated to positively affect populations of brown and white shrimp, and red drum in the area. While access to EFH in the project area will be temporary impacted by project construction, there will be an overall benefit to EFH as marsh habitat quality is restored, and overall increase to Federally-managed species access to EFH in the project area is increased and enhanced.

4.2.2.3 Wildlife Resources

No Action

Populations of wading birds, seabirds, and raptors have been stable in brackish marshes of the Central Wetlands since the 1980s, and no change is expected except for a decline in seabirds (LCWCRTF and

WCRA 1999). Declines are predicted for dabbling ducks, diving ducks, rails, coots, and gallinules under the no action scenario of Coast 2050. Brown pelican populations have been increasing along the Louisiana coast since the nationwide ban on use of DDT and subsequent recovery efforts by wildlife agencies; this trend is expected to continue.

The overall decline of most furbearer populations in the Central Wetlands Mapping Unit since the 1980s is expected to continue. The No Action Alternative may allow the project area to become ever more saline, favoring oystergrass and salt grass, which generally results in a decline in both nutria and muskrat populations (Wicker et al. 1982). Populations of all small game species are expected to decrease as the brackish marsh habitat deteriorates (LCWCRTF and WCRA 1999).

Preferred Alternative
Preliminary evaluation indicates that the preferred alternative will have a net beneficial effect on wildlife resources in the project area. Local temporary adverse effects on wildlife, especially birds, are expected to be limited to noise and other human activity during construction. Post-construction conditions would be favorable to the wildlife species described in Section 3.2.3.3, such as ducks, wading birds, and reptiles, by restoring the natural hydrology of this area.

4.2.2.4 Threatened and Endangered Species

No Action
No Federally listed threatened or endangered species are expected to be significantly affected by the No Action Alternative, although brown pelicans may be displaced under the No Action Alternative. Brown pelicans forage near the existing control structure at location S-1, probably because prey congregate on both sides of the control structure while waiting for conditions to favor passage through the culverts. If the passage were to collapse completely, prey density in the area may decline. The pelicans would likely relocate, but are not expected to be directly harmed by this outcome.

It is possible that Gulf sturgeon occur in the vicinity of the proposed project, although the limited area of access through the existing S-1 structure makes occurrence in the project area unlikely. If Gulf sturgeon do occur in the project area, the continued decrease in the effective access will make it more difficult for them to leave the project area in the future. Gulf sturgeon could possibly enter the project area from Bayou La Loutre through the existing culverts beneath LA HWY 624, although the shallow waters and small area of access is not their favored habitat.

Preferred Alternative
Construction of the Preferred Alternative would favor the regular movement of a wide variety of shellfish and finfish through the S-1 structure, which would likely maintain the current foraging activities of brown pelicans at this location. Increasing the flow and effective area of access through the S-1 structure would allow Gulf sturgeon to enter and exit the project area more easily than the current conditions allow. Any sturgeon that currently exist within the project area will be able to exit the area through the fish slots and flap gates once the new structure is in place. During construction, however, no ingress or egress will be possible.

On a broader scale, restoration of the normal wetland hydrology would support the Gulf sturgeon as well as a variety of estuarine-dependent species that provide important trophic links to the brown pelican, which is a top predator in the estuarine food web. It is anticipated that implementation of the preferred alternative is unlikely to adversely affect any threatened or endangered species.

4.3 CULTURAL ENVIRONMENT

The cultural environment includes elements of significant historic, prehistoric, or Native American resources, land use, recreation, infrastructure, and socioeconomic factors.

4.3.1 Historic, Prehistoric, and Native American Resources

No Action
No adverse effects are expected to historic, prehistoric or Native American resources under the No Action Alternative.

Preferred Alternative
No adverse effects are expected to historic, prehistoric or Native American resources within the project area because none of these resources are located near the construction areas. The State Historical Preservation Officer will be consulted before the project is constructed.

4.3.2 Land Use / Recreation

Neither land use nor recreation is expected to be affected by the no action alternative or by the proposed project.

4.3.3 Infrastructure

No Action
The no action alternative would fail to protect the existing marsh in the project area, and allow acreage to convert to saline marsh or open water. Loss of coastal wetlands is implicated in the increased vulnerability of coastal communities to damage by severe storms, including hurricanes. The Coast 2050 restoration plan estimates that replacement of lost or damaged infrastructure in the Yscloskey-Hopedale area following a hurricane would cost as much as $13 million (LCWCRTF and WCRA 1999).

Preferred Alternative
Restoration of the normal wetland hydrology to the project area will contribute to the protection of existing brackish marsh, and reduce loss rates. Because this project is relatively small, the overall positive effect of the preferred alternative in protecting infrastructure is best viewed in the context of cumulative effects, discussed in Section 5.1.

Reduction in the elevation and duration of inundation in the project area may directly affect the integrity of Highway 624 by reducing the saturation of surrounding soils. During construction, short-term localized obstruction of minor waterways, such as the side channels at locations S-2 through S-5, will occur.

4.3.4 Socioeconomics

No Action Alternative
If no action is taken to restore the healthy wetland hydrology of the project area, its value as a nursery ground for commercial and recreational fisheries will be compromised. Businesses that earn direct or indirect income from fisheries would suffer a loss of renewable resources, as the brackish marshes of the project area are further degraded.

Preferred Alternative
The proposed project is not expected to have an adverse effect on economic resources. Improvements to wetland function is anticipated to positively affect fisheries resources, and indirectly support nearby businesses that provide services to recreational and commercial fishing parties. A few people may obtain temporary jobs during the construction phase of the project.

4.3.5 Noise

No Action Alternative
The no action alternative is not expected to affect noise.

Preferred Alternative
Short term impacts, limited to the construction phase, are expected to include increased noise associated with construction machinery. No long term or significant adverse effects are expected.

5.0 OTHER CONSIDERATIONS REQUIRED BY NATIONAL ENVIRONMENTAL POLICY ACT

This section addresses specific topics that NEPA requires, including cumulative impacts, environmental justice, and the protection of children from environmental health risks. Issues related to environmental justice and protection of children are in accordance with Executive Orders (EO) 12898 and 13045, respectively.

5.1 CUMULATIVE IMPACTS

The Council on Environmental Quality (CEQ) regulations (40 Code of Federal Regulations [CFR] § 1500-1508) implementing the procedural provisions of NEPA, as amended (42 U.S. Code § 4321 and following sections) define cumulative effects as follows: "The impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions" (40 CFR § 1508.7).

A proposed action must be considered in the context of cumulative impacts of all projects undertaken in a region. Although the impacts of a single project may be minimal, additive effects of many projects could be substantial. Cumulative impacts include those resulting from the currently proposed action, other recently completed projects in the area, and actions being considered within the near future.

Both the No Action Alternative and the Preferred Alternative are best considered in the context of cumulative effects in space and time. The proposed project was conceived under CWPPRA to meet the immediate needs of the project area. However, the value of Louisiana's coastal wetland ecosystem is derived in part from the physical expanse of interconnected habitats. Although CWPPRA projects are nominated and implemented one at a time, and must have individual merit, the cumulative value of all of the wetland restoration and protection projects in an area can be far greater than the sum of the individual projects. Other projects in the vicinity that will add to the ultimate value of the Hopedale Hydrologic Restoration include the closing of the MRGO to deep draft ships, which will reduce the influx of highly saline waters into the project area (LCWCRTF and WCRA 1999).

The negative effects of the No Action Alternative are also appropriately considered in the context of cumulative impacts. The CWPPRA overview of the Pontchartrain Basin, of which the Hopedale site

is a part, predicts that without intervention, if marsh loss continues at the current rate, another 62,400 acres (or 23% of the existing marshes in the basin), would be converted to open water by the year 2040. As the lower marshes disintegrate, commercial and recreational fishing will decline. Habitat for wintering ducks would become scarce, the ecotourism industry would founder, and storms would easily overtake coastal communities http://www.LAcoast.gov/cwppra/projects/pontchartrain/pontsum.htm). The preferred alternative is expected to produce significant wetlands benefits as well as benefits to fisheries resources. Also, the preferred alternative is anticipated to have indirect benefits to the protection of existing infrastructure by protecting and restoring coastal wetlands which can decrease storm impacts to roads, hurricane protection levees, and other facilities.

5.2 ENVIRONMENTAL JUSTICE

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, provides that "each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies and activities on minority populations and low income populations."

In general, residents of St. Bernard Parish are among the more affluent in the state. As described in Section 3.3.4, average per capita income in St. Bernard Parish was around $20,000, which is higher than the statewide per capita income of $17,131 in the year 2000 (http://www.census.gov/census2000/states/la.html). Income levels of residents of the incorporated section of St. Bernard Parish may reflect employment in professional and technical jobs associated with an urban environment. However, residents in the Hopedale area are more likely to be engaged in fisheries-related work, and mean income may be less than the parish average.

Although the project area is predominantly marsh and open water, local residents are affected by hydrologic conditions in the area. The proposed project would restore wetland function, reduce the impacts of impoundment, and favor growth of the brackish marsh that sustains commercial and recreational fisheries in the area. Project implementation will reduce the incidence of flooding in the surrounding residential and business areas; thus, the restoration project is expected to have a net positive effect on the Hopedale community. No adverse impacts to minorities are anticipated.

5.3 PROTECTION OF CHILDREN

EO 13045 requires that each Federal agency evaluating the impacts of a proposed action identify and assess environmental health and safety risks that may disproportionately affect children and ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health or safety risks. All of the adverse effects of the proposed project are short-term, temporary and local results of construction activities. No negative effect on children is anticipated.

5.4 COORDINATION AMONG AGENCIES

Coordination concerning the proposed project has been maintained with each of the CWPPRA Task Force agencies and LDNR. Contents of this draft EA and the draft Finding of No Significant Impact (FONSI) were discussed with appropriate congressional, Federal, State and local agencies and other interested parties. Comments from all reviewers on the proposed action are in Appendix C. The final EA and the draft FONSI will be made available to the following agencies:

U. S. Department of the Interior, FWS
U.S. Environmental Protection Agency, Water Quality Protection Division, Region VI
U. S. Department of Commerce, NOAA Fisheries
U.S. Natural Resources Conservation Service
U.S. Army Corps of Engineers
Louisiana State Historic Preservation Officer
Louisiana Department of Natural Resources
Louisiana Department of Wildlife and Fisheries

5.5 PUBLIC PARTICIPATION

The proposed project was nominated by St. Bernard Parish in an April, 1998 public meeting held in New Orleans, Louisiana. These meetings are part of the standard Priority Project List development procedure used to nominate, evaluate, and select projects for CWPPRA implementation. The Hopedale Hydrologic Restoration project was evaluated during several working meeting in 1998 and 1999. All meetings are open to the public, and meeting announcements are circulated through a standard mailing list. Additionally, the St. Bernard Parish Council's Coastal Advisory Committee has been briefed on the proposed project, and numerous on-site meetings have been held with land owners, members of the Coastal Advisory Committee and personnel from St. Bernard Parish Government.

5.6 COMPLIANCE

The status of compliance of the proposed restoration project with applicable laws and regulations is presented in Table 6. Regulations require coordination of the EA and draft FONSI with appropriate agencies, organizations and individuals for their review and comments. The proposed project is not expected to cause adverse environmental impacts requiring compensatory mitigation.

Table 6. Compliance with Environmental Statutes

Federal Statutes	***Status***
Archaeological and Historic Preservation Act of 1974	Complete
Clean Water Act of 1977, as amended	In Progress
Coastal Zone Management Act of 1972, as amended	Complete
Endangered Species Act of 1973, as amended	Complete
Estuary Protection Act	Complete
Fish and Wildlife Coordination Act of 1958, as amended	Complete
Magnuson-Stevens Fishery Conservation and Management Act of 1976, as amended	Complete
National Environmental Policy Act of 1969, as amended	In Progress
National Historic Preservation Act of 1966, as amended	Complete
State Statutes	
Archaeological Treasury Act of 1974, as revised	Complete
Louisiana State and Local Coastal Resources Management Act of 1978	Complete

6.0 CONCLUSIONS

The proposed hydrologic restoration of the Hopedale project area would reduce the period of inundation of the marsh, and restore normal hydrology to the wetlands in the project area. The plan

for normal and special operations of the control structures will protect the marsh from the damaging effects of prolonged inundation, while maintaining or improving fisheries access.

Without the project, both ponding and marsh salinities are expected to increase, resulting in the loss of brackish marsh habitat in the area. The temporary and reversible local impacts resulting from construction of the project are greatly outweighed by the benefits to the coastal environment.

7.0 PREPARERS

This EA was prepared by Tetra Tech EM, Inc. under contract to the Central Administrative Support Center of NOAA. It was written by June Mire, Ph.D., under the guidance of Rachel Sweeney of NOAA Fisheries. Reference materials, listed in Section 9.0, were obtained from Federal, state, and municipal agencies, non-government organizations, published literature, and information provided by Federal agencies on the worldwide web.

8.0 FINDING OF NO SIGNIFICANT IMPACT

This EA finds that no significant adverse environmental impacts are expected to results from the Hopedale Hydrological Restoration Project. Furthermore, the National Environmental Policy Act or its implementingregulations do not require preparation of an Environmental Impact Statement for this project. Regional and site-specific data, including results of the hydrologic and hydrographic modeling conducted in 2001 (BCG 2001), suggest that restoration of the normal wetland hydrology will decrease salinities and reduce the period of inundation in the marsh, thereby favoring the growth of desirable brackish marsh vegetation.

This finding is consistent with recommendations of the sponsoring agency (NOAA Fisheries) and the CWPPRA Task Force. The State of Louisiana supports the project in principle and with allocations of state resources. As representatives of the local population, St. Bernard Parish officials have voiced strong support for the project.

_____ _____

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

9.0 LITERATURE CITED

BCG. 2000. *Hydrologic Investigation Plan*. October.

BCG. 2001a. *Report on Final Results of Hopedale Hydrologic Restoration Modeling*. June.

BCG. 2001b. *Report on Supplemental Results of Hopedale Hydrologic Restoration Modeling.* September.

BCG. 2001c. *Report on Preliminary Design Concept of Hopedale Hydrologic Restoration Modeling.* December.

Coastal Environments, Inc. 1982. *St. Bernard Parish Coastal Management Program Document.* Prepared for St. Bernard Parish Police Jury, Chalmette, Louisiana.

Dundee, H. A. and D. A. Rossman. 1989. *The Amphibians and Reptiles of Louisiana.* Louisiana University Press. Baton rouge. 300 pp.

Gore Engineering, Inc. 2001. *Subsoil Investigation: Water Control Structures, Hopedale Hydrologic Restoration.* August.

Gosselink, J. G. 1984. *The Ecology Of Delta Marshes Of Coastal Louisiana: A Community Profile.* U.S. Fish and Wildlife Service.

Hartman, R., C. Baker, and D. Clark. 1998. *Hopedale Hydrologic Restoration (PPO-38). Candidate Project for the Eighth Priority List of the Coastal Wetlands Planning, Protection, and Restoration Act. Candidate Project Information Sheet for Wetland Value Assessment.* National Marine Fisheries Service, and Louisiana Department of Natural Resources.

Louisiana Coastal Wetlands Conservation and Restoration Task Force. 1993. *Louisiana Coastal Wetlands Restoration Plan: Main Report and Environmental Impact Statement*. 163 p.

Louisiana Coastal Wetlands Conservation and Restoration Task Force and the Wetlands Conservation and Restoration Authority. 1998. *Coast 2050: Towards a Sustainable Coastal Louisiana*. Louisiana Department of Natural Resources. Baton Rouge, LA. 161 p.

Louisiana Coastal Wetlands Conservation and Restoration Task Force and the Wetlands Conservation and Restoration Authority. 1999. *Coast 2050: Towards a Sustainable Coastal Louisiana, The Appendices. Appendix C – Region 1 Supplemental Information.* Louisiana Department of Natural Resources. Baton Rouge, LA. 161 p.

Middleton, B. 1999. *Wetland Restoration: Flood Pulsing and Disturbance Dynamics.* John Wiley & Sons. New York. 388 pages.

NOAA Fisheries. 2001. *Fisheries of the United States: 2000.* B. K. O'Bannon, editor. Office of Science and Technology, Fisheries Statistics and Economics Division. Silver Spring, MD. August.

Patillo, M., T. E. Czapla, D.M. Nelson, and M.E. Monaco. (1997). *Distribution and Abundance of Fishes and Invertebrates in Gulf of Mexico Estuaries.* Rockville, MD., NOAA/NOS Strategic Environmental Assessments Division,. II. Species Life History Summaries: 377.

Sealy, M. T. and M. K. Hymel 2001. Preliminary data analysis for Hopedale Hydrologic Restoration (PO-24) Project. LA Dept. Natural Resources, Coastal Restoration Division. Baton Rouge, LA.

Stutzenbaker C.D. 1999. *Aquatic and Wetland Plants of the Western Gulf Coast.* Texas Parks and Wildlife, Wildlife Division. 465 pages.

United States Census 2000. As cited on http://www.census.gov/census2000/states/la.html

United States Army Corps of Engineers (COE). 1988. *Mississippi River-Gulf Outlet, St. Bernard Parish, Louisiana, Reconaissance Report on Channel Bank Erosion.* 1988.

United States Department of Agriculture. 1989. *Soil Survey of St. Bernard Parish, Louisiana.* Soil Conservation Service. 96 pages, plus maps.

WaterMarks can be accessed at http://www.LAcoast.gov

Wicker, K.M., G.C. Castille, D.J. Davis, S.M. Gagliano, D.W. Roberts, D.S. Sabins, and R.A. Weinstein. 1982. *St. Bernard Parish: A Study in Wetland Management.* Prepared for St. Bernard Parish Police Jury, Chalmette, Louisiana. 132 pages.

Personal communications:

Huettmann, Gary. St. Bernard Parish Economic Development Commission. Chalmette, LA. Phone: 504/278-4200. February 19, 2002.

Martin, Logan. St. Bernard Parish Department of Public Works. Phone: 504-278-4316

Poffenberger, John. NMFS, Office of Science and Technology, Fisheries Statistics and Economics Division, Miami, FL. Phone: 305/361-4263. February 26, 2002.

Rainwater, Art. Operations Supervisor, Louisiana Intrastate Gas Corporation. Phone: 985/575-8311. March 21, 2002.

Sealy, Michael. Louisiana Department of Natural Resources. New Orleans, LA. Phone: 504/280-4016. December 3, 2001.

Walther, David. U.S. Fish and Wildlife Service. Lafayette, LA. Phone: 337/291-2133. March 21, 2002.

Walton, Jennifer. Louisiana Department of Environmental Quality, Office of Environmental Assessment. Baton Rouge, LA. Phone: 225/765-0169. March 1, 2002.

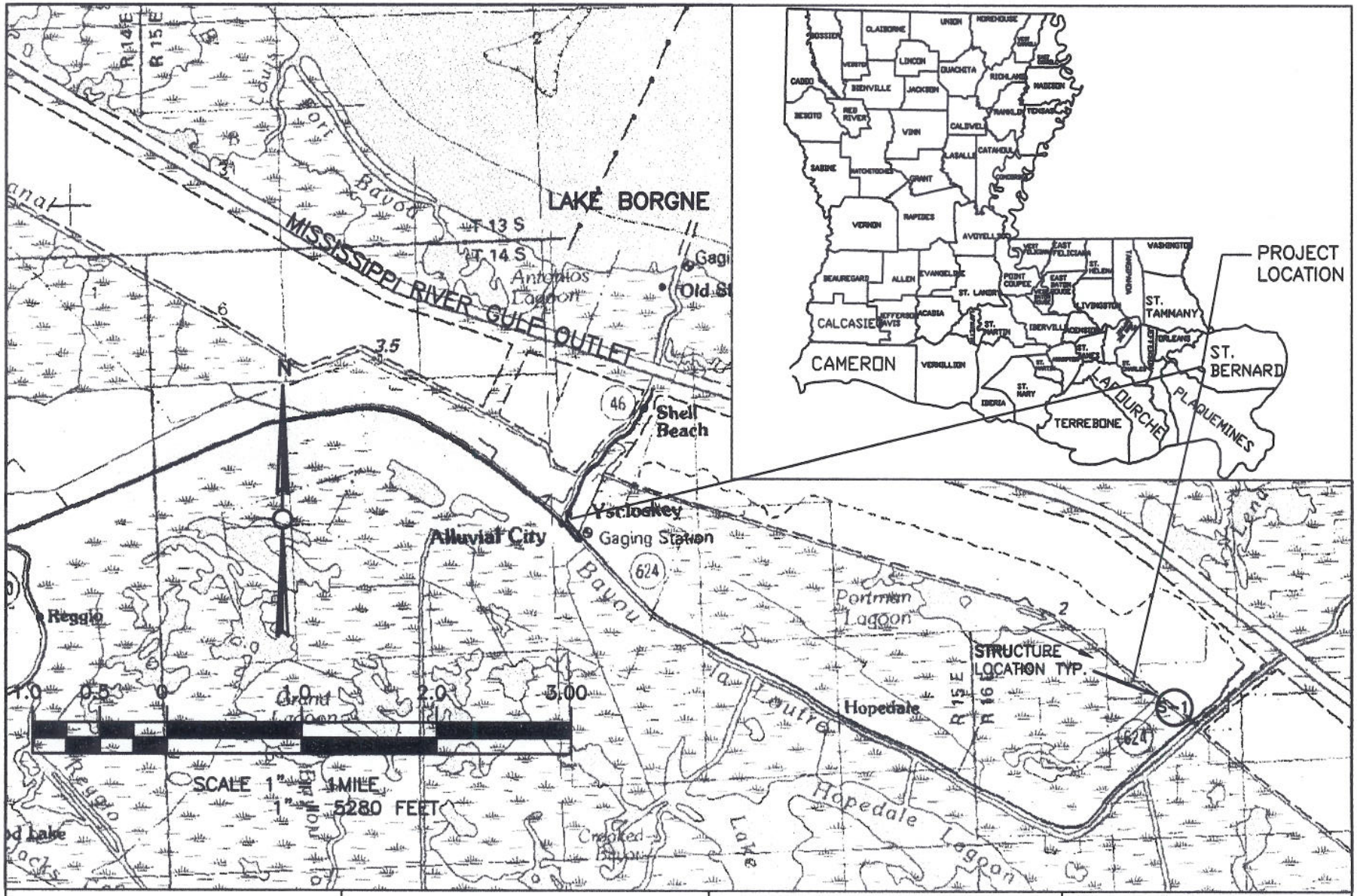
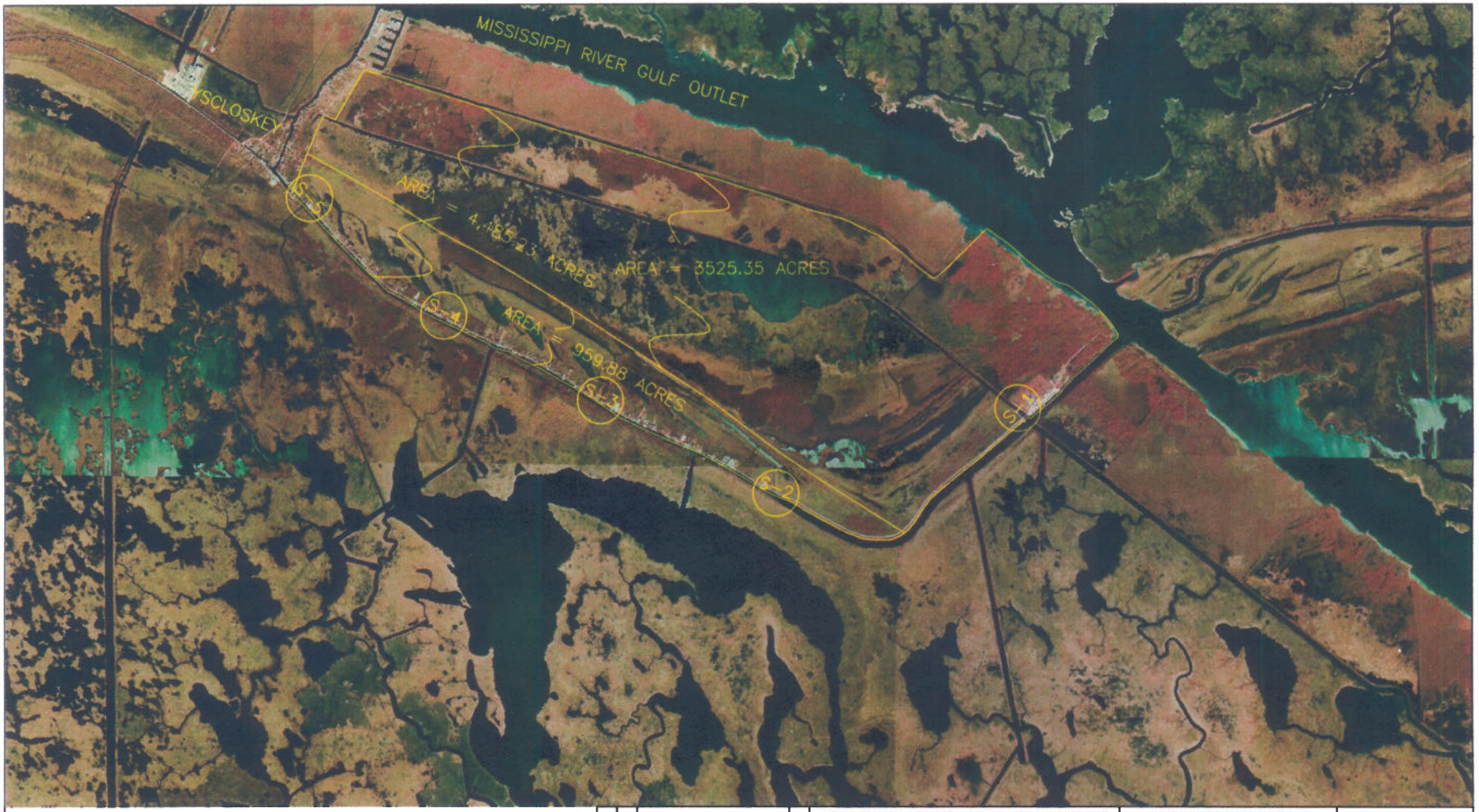
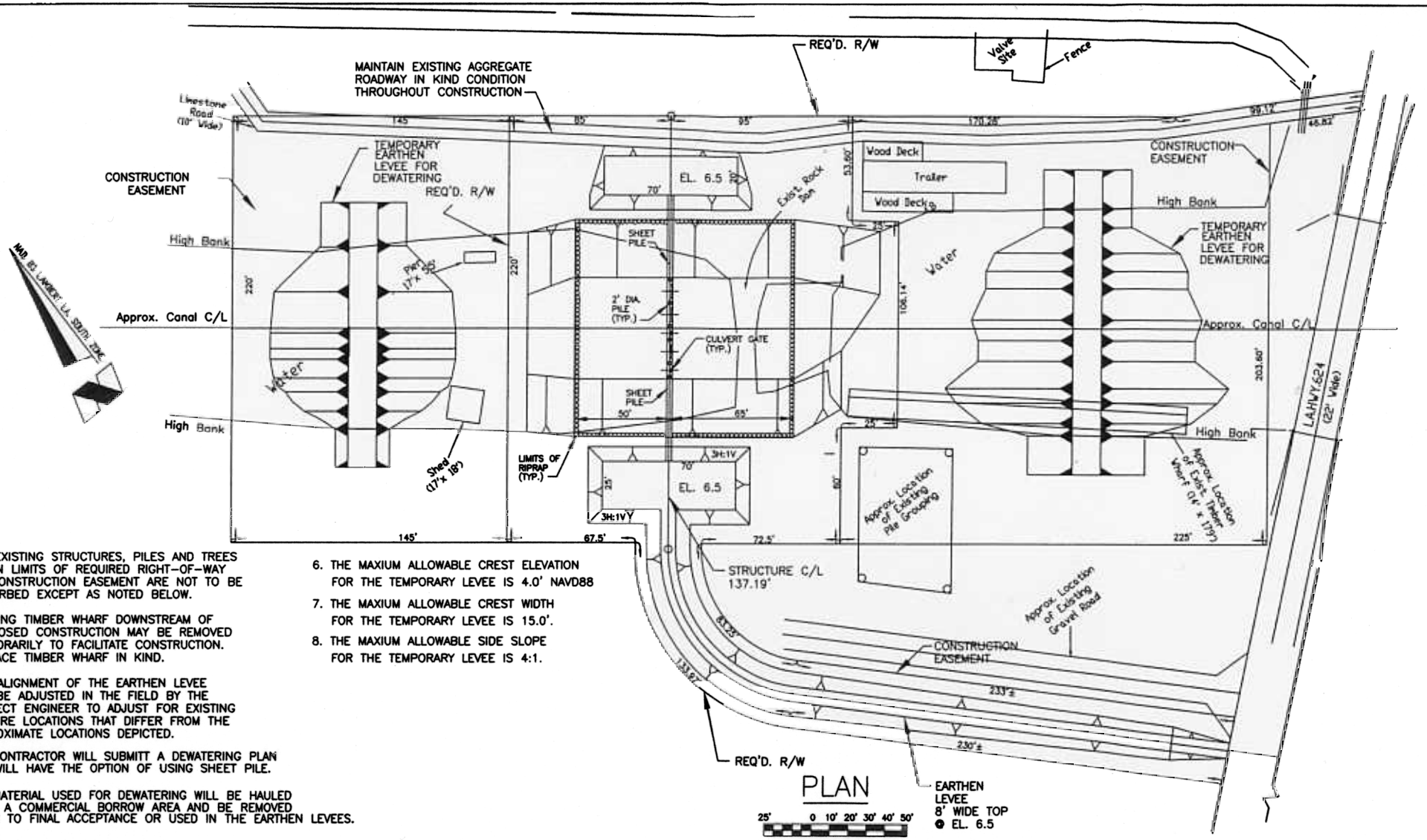


Figure 1

LOUISIANA DEPARTMENT OF NATURAL RESOURCES COASTAL RESTORATION DIVISION 625 N 4th STREET BATON ROUGE, LA 70802	HOPEDALE HYDROLOGIC RESTORATION PO-24 ST. BERNARD PARISH	Project Location
		SCALE: 1" =1 MILE
APPROVED BY: CHRIS KNOTTS, P. E.	STATE PROJECT NO.: PPO-38	DATE: 02/21/03
DESIGNED BY: Brown Cunningham Gannuch ENGINEERS • ARCHITECTS • CONSULTANTS	FEDERAL PROJECT NO.: PO-24	SHEET



				LOUISIANA DEPARTMENT OF NATURAL RESOURCES COASTAL RESTORATION DIVISION 625 NORTH 4TH STREET BATON ROUGE, LOUISIANA 70804	HOPEDALE HYDROLOGIC RESTORATION PO-24 ST. BERNARD PARISH	CROSS SECTION
SCALE	Figure 2.						
1" = 3,000	File Loc: F:\Users\Autocad\Basins\PO\PO-24 HOPEDALE\PROJECT LAYOUT	REV.	DATE	DESCRIPTION BY	DRAWN BY: CLARK ALLEN, P.E. APPROVED BY: CHRIS KNOTTS, P.E.	STATE PROJECT NO.: PPO-38	DATE: 07/19/02
						FEDERAL PROJECT NO.: PO-24	SHEET 1 OF 1

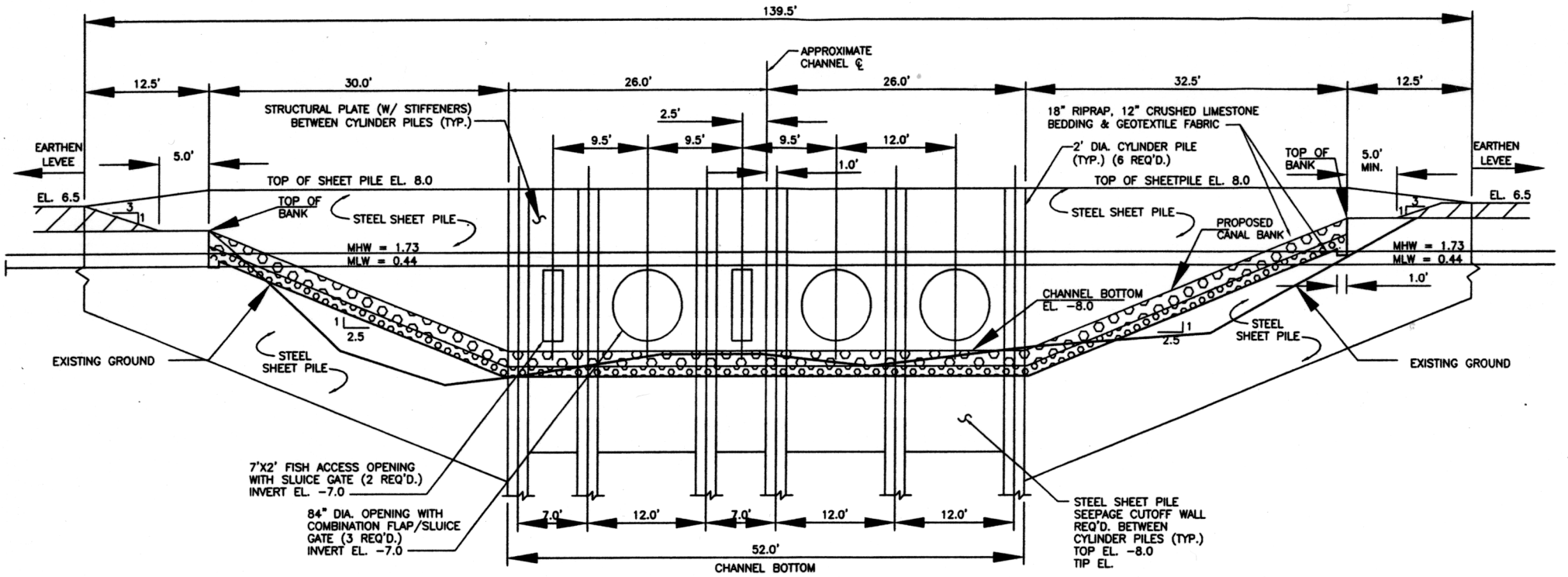


NOTES:

1. ALL EXISTING STRUCTURES, PILES AND TREES WITHIN LIMITS OF REQUIRED RIGHT-OF-WAY OR CONSTRUCTION EASEMENT ARE NOT TO BE DISTURBED EXCEPT AS NOTED BELOW.
2. EXISTING TIMBER WHARF DOWNSTREAM OF PROPOSED CONSTRUCTION MAY BE REMOVED TEMPORARILY TO FACILITATE CONSTRUCTION. REPLACE TIMBER WHARF IN KIND.
3. THE ALIGNMENT OF THE EARTHEN LEVEE MAY BE ADJUSTED IN THE FIELD BY THE PROJECT ENGINEER TO ADJUST FOR EXISTING FEATURE LOCATIONS THAT DIFFER FROM THE APPROXIMATE LOCATIONS DEPICTED.
4. THE CONTRACTOR WILL SUBMITT A DEWATERING PLAN AND WILL HAVE THE OPTION OF USING SHEET PILE.
5. ALL MATERIAL USED FOR DEWATERING WILL BE HAULED FROM A COMMERCIAL BORROW AREA AND BE REMOVED PRIOR TO FINAL ACCEPTANCE OR USED IN THE EARTHEN LEVEES.
6. THE MAXIUM ALLOWABLE CREST ELEVATION FOR THE TEMPORARY LEVEE IS 4.0' NAVD88
7. THE MAXIUM ALLOWABLE CREST WIDTH FOR THE TEMPORARY LEVEE IS 15.0'.
8. THE MAXIUM ALLOWABLE SIDE SLOPE FOR THE TEMPORARY LEVEE IS 4:1.

Figure 3: Plan View of the S-1 Structure

LOUISIANA DEPARTMENT OF NATURAL RESOURCES COASTAL RESTORATION DIVISION 625 N 4th STREET BATON ROUGE, LA 70802	HOPEDALE HYDROLOGIC RESTORATION PO-24 ST. BERNARD PARISH	S-1 SITE PLAN
APPROVED BY: CHRIS KNOTTS, P. E.	STATE PROJECT NO.: PPO-38	SCALE: 1" = 50'
DESIGNED BY: Brown Cunningham Gannuch ENGINEERS • ARCHITECTS • CONSULTANTS	FEDERAL PROJECT NO.: PO-24	DATE: 02/21/03



ELEVATION

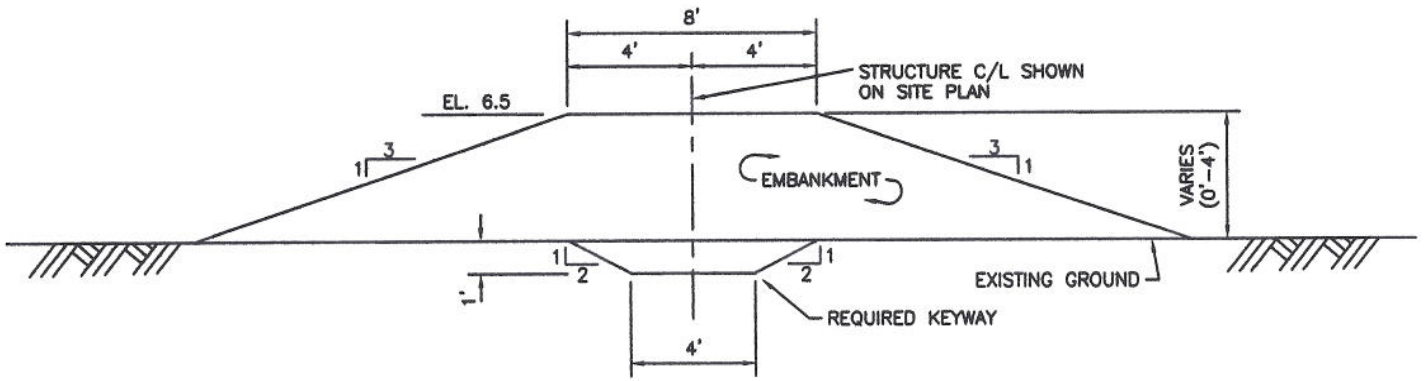
5' 0 5' 10' 15'

NOTES:

1. MANWALK ALONG TOP OF STRUTURE AND DRAINAGE GATES NOT SHOWN FOR CLARITY.
2. MEAN HIGH WATER AND MEAN LOW WATER ON THE COE SHELL BEACH GAGE AND NOAA TIDAL BENCH MARK AT SHELL BEACH.
3. ALL EXISTING MATERIAL ABOVE GEOTEXTILE FABRIC WILL BE REMOVED.

Figure 4: Cross-Section of the S-1 Structure

LOUISIANA DEPARTMENT OF NATURAL RESOURCES COASTAL RESTORATION DIVISION 625 N 4th STREET BATON ROUGE, LA 70802	HOPEDALE HYDROLOGIC RESTORATION PO-24 ST. BERNARD PARISH	S-1 Elevation
		SCALE: 1" = 10'
APPROVED BY: CHRIS KNOTTS, P. E.	STATE PROJECT NO.: PPO-38	DATE: 10/09/02
DESIGNED BY: Brown Cunningham Gannuch ENGINEERS • ARCHITECTS • CONSULTANTS	FEDERAL PROJECT NO.: PO-24	



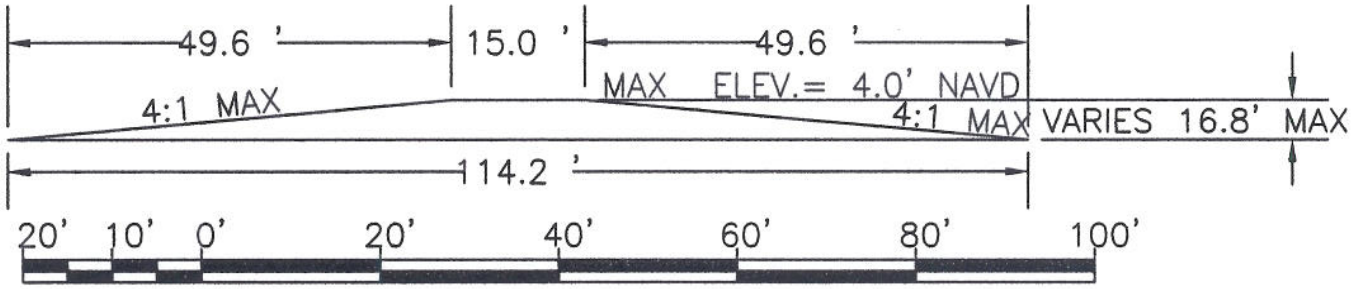
TYPICAL SECTION
EARTHEN LEVEE (S-1 SITE)

Figure 5: Typyical Section of Earthen Levee at the S-1 Structure Location

LOUISIANA DEPARTMENT OF NATURAL RESOURCES COASTAL RESTORATION DIVISION 625 N 4th STREET BATON ROUGE, LA 70802	HOPEDALE HYDROLOGIC RESTORATION PO-24 ST. BERNARD PARISH	TYPICAL SECTIONS
		SCALE: AS SHOWN
APPROVED BY: CHRIS KNOTTS, P. E.	STATE PROJECT NO.: PPO-38	DATE: 02/21/03
DESIGNED BY: Brown Cunningham Gannuch	FEDERAL PROJECT NO.: PO-24	

G:\users\Autocad\BASINS\PO\po-24 hopedale\permit\S-1 only\NMFS EA\figure 5.dwg

TEMPERARY DEWATERING LEVEE AT S-1 TYPICAL SECTION



NOTES:

1. THE CONTRACTOR WILL SUBMITT A DEWATERING PLAN AND WILL HAVE THE OPTION OF USING SHEET PILE.
2. ALL MATERIAL USED FOR DEWATERING WILL BE HAULED FROM A COMMERCIAL BORROW AREA AND BE REMOVED PRIOR TO FINAL ACCEPTANCE OR USED IN THE EARTHEN LEVEES.

Figure 6: Temporary Dewatering Levee

LOUISIANA DEPARTMENT OF NATURAL RESOURCES COASTAL RESTORATION DIVISION 625 N 4th STREET BATON ROUGE, LA 70802	HOPEDALE HYDROLOGIC RESTORATION PO-24 ST. BERNARD PARISH	DEWATERING PLAN
		SCALE: 1" = 80'
APPROVED BY: CHRIS KNOTTS, P. E.	STATE PROJECT NO.: PPO-38	DATE: 02/21/02
DESIGNED BY: Brown Cunningham Gannuch ENGINEERS • ARCHITECTS • CONSULTANTS	FEDERAL PROJECT NO.: PO-24	

APPENDIX A

Analysis of daily gauge data from the Shell Beach Gauge which evaluates historic frequency and duration of events which met the "Prolonged High Tide" operational criteria

APPENDIX A -- Analysis of daily gauge data from the Shell Beach Gauge which evaluates historic frequency and duration of events which met the "Prolonged High Tide" operational criteria (i.e., Bayou La Loutre stages at 3.0 feet NAVD for four consecutive hours or Bayou La Loutre > 3.5 feet NAVD)

	Number of days criteria met or exceeded											
YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1962	0	0	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	3	0	0	0
1964	0	0	0	0	0	0	0	0	0	1	0	0
1965	0	0	0	0	0	0	0	0	1	N/A	N/A	N/A
1966	N/A	N/A	N/A	0	2	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	1	0	0	0	N/A
1969	0	1	0	0	0	0	0	1	N/A	4	0	0
1970	0	0	0	0	0	0	0	0	1	5	0	0
1971	0	N/A	0	0	0	0	0	0	2	0	N/A	N/A
1972	0	0	0	0	1	1	1	0	0	4	0	0
1973	0	0	1	4	0	0	0	0	8	3	0	0
1974	0	0	0	0	2	0	0	0	9	1	0	0
1975	0	0	0	0	0	1	0	0	5	0	0	0
1976	0	0	0	0	0	1	0	0	1	1	0	0
1977	0	N/A	0	0	0	0	0	3	6	0	1	0
1978	0	0	0	0	1	0	N/A	0	0	0	0	0
1979	0	0	0	0	0	0	0	0	2	0	0	0
1980	N/A	0	N/A	0	0	0	0	0	1	N/A	0	0
1981	0	0	0	0	0	0	0	0	0	0	0	0
1982	0	0	0	N/A	0	0	0	0	0	0	0	0
1983	1	1	0	0	0	0	0	0	0	1	0	0
1984	0	0	0	N/A	N/A	N/A	0	0	4	0	0	N/A
1985	N/A	0	0	0	0	0	0	2	0	N/A	0	0
1986	0	0	0	0	0	0	0	0	0	0	0	1
1987	0	0	0	0	0	0	0	0	0	0	0	0
1988	0	0	0	0	0	0	0	0	1	0	0	0
1989	0	0	0	0	0	0	0	0	N/A	N/A	0	0
1990	N/A	0	0	0	0	0	0	0	N/A	N/A	0	0
1991	0	0	N/A	N/A	0	4	0	0	1	1	0	0
1992	0	0	N/A	0	0	0	0	2	1	4	0	0
1993	0	0	0	0	0	0	0	0	0	0	N/A	N/A
1994	N/A	N/A	0	0	0	0	0	0	2	2	0	0
1995	0	0	0	0	0	0	1	0	1	2	0	0
1996	0	0	N/A	0	0	N/A	N/A	0	N/A	N/A	2	0
1997	0	1	0	0	0	0	1	0	0	0	0	0
1998	0	1	N/A	N/A	N/A	N/A	0	0	12	N/A	N/A	0
1999	0	0	0	0	0	0	0	0	1	0	0	0
2000	0	0	0	0	0	0	0	0	4	0	N/A	N/A
Total days	1	4	1	4	6	7	3	1	66	29	3	1
Average days/month	0.0	0.1	0.0	0.1	0.2	0.2	0.1	0.0	1.9	0.9	0.1	0.0
Average % of month	0.09%	0.41%	0.10%	0.38%	0.52%	0.65%	0.26%	0.10%	6.29%	2.92%	0.29%	0.10%
Number of events	1	4	1	1	4	4	2	1	20	12	2	1
Average duration (days)	1	1	1	4	2	2	2	1	3	2	2	1

APPENDIX B

Analysis of daily gauge data from the Shell Beach Gauge which evaluates historic frequency and duration of events which met the "Low Water" operational criteria

APPENDIX B -- Analysis of daily gauge data from the Shell Beach Gauge which evaluates historic frequency and duration of events which met the "Low Interior Water Levels" operational criteria (i.e., Interior water elevation below 0.44' NAVD for 48 consecutiuve hours)

	Number of days criteria met or exceeded											
YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1962	2	7	2	1	5	0	0	0	0	0	1	8
1963	2	7	9	2	11	6	0	2	0	0	2	8
1964	9	8	3	0	0	0	1	0	0	1	0	0
1965	5	2	10	4	0	0	0	0	0	N/A	N/A	N/A
1966	N/A	N/A	N/A	3	0	0	0	0	0	0	0	6
1967	5	4	9	0	1	0	0	0	0	0	0	0
1968	4	6	9	4	3	2	0	0	0	0	1	N/A
1969	0	0	4	0	0	0	0	0	N/A	0	4	5
1970	8	13	3	0	0	0	0	0	0	0	0	0
1971	4	N/A	0	0	0	2	0	0	0	0	N/A	N/A
1972	0	6	0	0	0	0	0	0	0	0	0	0
1973	3	0	0	1	0	0	0	0	0	0	0	1
1974	0	0	1	0	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0	0	0	0	0
1976	1	10	0	0	0	0	0	0	0	0	0	4
1977	2	N/A	0	0	0	0	0	0	0	0	0	1
1978	0	3	2	2	0	0	N/A	0	0	0	0	5
1979	9	9	10	0	1	0	0	0	0	0	2	7
1980	N/A	7	N/A	1	0	0	3	0	0	N/A	6	12
1981	22	16	23	9	3	3	5	0	0	0	4	13
1982	16	12	13	N/A	2	9	12	0	0	0	0	0
1983	9	0	4	0	2	0	0	0	0	0	0	0
1984	13	19	11	N/A	N/A	N/A	0	0	0	0	4	N/A
1985	N/A	12	5	3	8	5	0	0	0	N/A	0	7
1986	17	12	11	4	2	0	0	0	0	0	0	0
1987	11	5	0	16	1	0	0	1	0	0	0	5
1988	9	8	16	13	7	0	1	0	0	0	2	9
1989	5	13	13	6	3	0	0	0	N/A	N/A	2	11
1990	N/A	4	4	1	0	0	0	0	N/A	N/A	0	12
1991	0	14	N/A	N/A	0	0	0	0	0	0	2	4
1992	7	0	N/A	0	2	0	0	0	0	0	0	1
1993	1	2	7	3	0	0	0	0	0	0	N/A	N/A
1994	N/A	N/A	8	3	0	0	0	0	0	0	0	2
1995	22	21	1	0	0	0	0	0	0	0	0	3
1996	12	11	N/A	1	2	N/A	N/A	0	N/A	N/A	0	0
1997	3	1	0	0	0	0	0	0	0	0	0	7
1998	0	2	N/A	N/A	N/A	N/A	3	0	0	N/A	N/A	0
1999	2	8	1	2	0	0	1	0	0	0	0	0
2000	4	16	2	0	0	0	0	0	0	0	N/A	N/A
Total days	207	258	181	79	53	27	26	3	0	1	30	131
Average days/month	6.1	7.4	5.5	2.3	1.4	0.8	0.7	0.1	4.0	0.0	0.9	4.0
Average % of month	19.6%	26.3%	17.7%	7.5%	4.6%	2.5%	2.3%	0.2%	13.2%	0.1%	2.9%	12.8%
Number of events	27	29	25	19	15	6	7	3	0	1	11	21
Average duration (days)	7	8	6	3	2	1	1	1	4	0	1	4

APPENDIX C

Agency Consultation Letters

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1445 ROSS AVENUE, SUITE 1200
DALLAS, TX 75202-2733

April 18, 2003

Mr. Richard Hartman
Chief, Baton Rouge Office
U.S. Department of Commerce
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Habitat Conservation Division
c/o Louisiana State University
Baton Rouge, Louisiana 70803-7535

Dear Mr. Hartman:

We appreciate the opportunity to review the draft Environmental Assessment concerning the Hopedale Hydrologic Restoration Project (PPO-38/PO-24). We have only one comment. Section 5.4 depicts coordination with the U.S. Environmental Protection Agency, Water Quality Protection Division, Region IV. This should be Region VI.

We concur with your findings of no significant adverse environmental impacts are expected from the Hopedale Hydrological Restoration Project. We appreciate the opportunity to review this document.

Sincerely,

Troy Hill, P.E.
Chief
Marine and Wetlands Section

United States Department of the Interior

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

April 10, 2003

Mr. Richard Hartman
National Marine Fisheries Service
Habitat Conservation Division
c/o Louisiana State University
Baton Rouge, Louisiana 70803-7535

Dear Mr. Hartman:

The U.S. Fish and Wildlife Service has reviewed the draft Environmental Assessment (EA) for the Hopedale Hydrologic Restoration Project (PPO-38, PO-24), funded under the Coastal Wetlands Planning, Protection, and Restoration Act. The Service submits the following comments in accordance with the National Environmental Policy Act (NEPA) of 1969 (83 Stat.852, as amended; 42 U.S.C. 4321 et seq.) and the Endangered Species Act (ESA) of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.).

General Comments

In general, this EA is well written and adequately describes the environmental impacts of the project. Because the proposed project restores normal wetland hydrology, enhances the ingress and egress of shellfish and fin fish in the project area, thereby maintaining the current foraging activities of brown pelicans, we concur that the project is not likely to adversely affect the brown pelican, the only Federally listed endangered species that is likely to occur within the project area. Therefore, no further consultation will be required for threatened or endangered species unless there are changes in the scope or location of the project, or project construction has not been initiated within one year. If the project has not been initiated within 1 year, follow-up consultation should be accomplished with this office prior to making expenditures for construction. If the scope or location of the proposed work is changed, consultation should occur as soon as such changes are proposed. The National Marine Fisheries Service is responsible for the Federally listed sea turtles and the Gulf sturgeon in estuarine waters. Please contact Stephania Bolden (727/570-5312) in St. Petersburg, Florida, for information concerning those species.

Specific Comments

Section 3.2.2.4, General - This section describes a variety of species which may be Federally or State listed as threatened or endangered which occur at least occasionally in St. Bernard Parish. Although the likelihood of each of these species being found in the project area is presented in

Table 4, text within this section should clearly state which of these species are likely to occur in the project area.

Page 15, Paragraph 1 - It is stated that there are "ten vertebrate species listed as Federally or State threatened or endangered...in St. Bernard Parish" and that those species and their legal status are presented in Table 4. Table 4, however, contains eleven species and does not include the legal status of any of those species. This inconsistency should be corrected.

Page 15, Paragraph 2, Sentence 1 - The peregrine falcon is included in the list of threatened or endangered avian species. That species is no longer listed under the ESA and, with no further explanation, its inclusion in the list is misleading. A clear distinction should be made here between which species are Federally listed under the ESA and which are listed by the State.

Page 16, Table 4 - As noted above, the peregrine falcon, which is included in the table, is no longer listed under the ESA. The legal status of each species should be included in the table. The table is described as containing all vertebrate species that are Federally or State listed threatened or endangered which occur at least occasionally in St. Bernard Parish. This Parish list should then include the pallid sturgeon (Federally listed as endangered) which may be found in St. Bernard Parish. Because it occurs in the Mississippi River, we recognize that the pallid sturgeon is unlikely to be found in the project area. The piping plover is described as being an "uncommon migrant on barrier islands." This statement is erroneous, since piping plovers are known to winter on Louisiana barrier islands, which were designated as portions of critical habitat for that species on July 10, 2001. We recommend removing "uncommon" from the description in the table, however, we agree that this species is unlikely to occur at the project site.

Thank you for the opportunity to provide comments on this draft EA. If you have any questions regarding our comments, please contact Martha Segura of this office at (337) 291-3110.

Sincerely,

Russell C. Watson
Acting Supervisor
Louisiana Field Office

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

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

MAY 7 2003

F/SER3:DK

MEMORANDUM FOR: Richard Hartman
Chief, Baton Rouge Office

FROM: Roy E. Crabtree, Ph.D.
Regional Administrator

SUBJECT: Hopedale Hydrologic Restoration in St. Bernard Parish, Louisiana

This correspondence is in reply to the March 17, 2003, letter and accompanying information from the Habitat Conservation Division (HCD) of the National Marine Fisheries Service (NOAA Fisheries). HCD has requested section 7 consultation from NOAA Fisheries' Protected Resources Division (PRD), pursuant to the Endangered Species Act of 1973 (ESA). The project is the Hopedale Hydrologic Restoration in St. Bernard Parish, Louisiana. NOAA Fisheries is the Federal sponsor of this project proposed by the Louisiana Coastal Wetlands Conservation and Restoration Task Force. The NOAA Fisheries' consultation number for this project is I/SER/2003/00449; please refer to this number in future correspondence on this project.

The purpose of the project is to reduce wetland losses which result from prolonged and elevated water levels, and to improve fisheries utilization of those wetland resources. The combined effects of sea level rise, subsidence, altered hydrology, storms, erosion, herbivory, and dredge-and-fill activities have contributed to substantial wetland losses in coastal Louisiana. Within the mapping unit encompassing the project area, it is estimated that 38 percent of the wetland acreage was lost between 1932 and 1990. The project boundary encompasses about 4,570 acres, including 3,805 acres of wetland habitats dominated by brackish marsh and shallow open water. The project area is approximately bounded by Bayou Yscloskey and Louisiana Highway (LA HWY) 46 to the west, Bayou La Loutre and LA HWY 624 to the south and east, and the Mississippi River Gulf Outlet (MRGO) to the north.

The engineering and operation of the project are designed to meet the primary goals of reducing average water levels and duration of inundation in the project area, maintain or improve fisheries ingress and egress, and reduce wetland loss rates. Secondarily, the design is expected to reduce average salinities and increase the extent of submerged vegetation coverage in the shallow open water areas in the project area. The project would replace the existing water control structure (S-1) with three 84-inch diameter combination flap-sluice gates and two 2-foot by 7-foot fish access slots. The fish access slots will also be fitted with sluice gates to allow for partial or complete closure in accordance with operational criteria. Other structures such as cylinder piles, steel plates and sheet piling, earthen levees, riprap, and temporary cofferdams will be placed in the area as part of the construction process. The structure would be operated to optimize project performance by maintaining tidal exchange during normal conditions, reducing hydrologic inputs during high water periods, and maximizing drainage when project area wetlands are inundated due to excessive flooding.

ESA-listed species under the purview of NOAA Fisheries which potentially occur in the project area include the green (*Chelonia mydas*), loggerhead (*Caretta caretta*), Kemp's ridley (*Lepidochelys kempii*), leatherback (*Dermochelys coriacea*), and hawksbill (*Eretmochelys imbricata*) sea turtles, as well as the Gulf sturgeon (*Acipenser oxyrhincus desotoi*). No critical habitat has been designated or proposed for listed species within the project area.

The location of the project (an inundated wetland margin of the MRGO well north of the opening to the Gulf of Mexico) limits the likelihood of the presence of any sea turtle species. It is possible that the Gulf sturgeon occurs in the project area, though the limited area of access through the existing S-1 structure makes it unlikely. Construction of the new S-1 structure would allow for increased movement through the area by fishes. NOAA Fisheries, therefore, believes that the proposed action is not likely to adversely affect any listed species under our purview. Essential fish habitat considerations fall under the purview of HCD, which was the originator of the request for this section 7 consultation.

This memorandum concludes NOAA Fisheries' consultation responsibilities under section 7 of the ESA for the proposed actions for federally-listed species, and their critical habitat, under NOAA Fisheries' purview. A new consultation should be initiated if there is a take, new information reveals impacts of the proposed actions that may affect listed species or their critical habitat, a new species is listed, the identified action is subsequently modified, or critical habitat is designated that may be affected by the proposed activity.

If you have any questions about this ESA consultation, please contact Dennis Klemm, fishery biologist, at the number above or by e-mail at Dennis.Klemm@noaa.gov.

cc: F/PR3

File: 1514-22 E. NOAA
O:\section 7\informal\Hopedale Hydrologic Restoration.wpd