

# **Environmental Assessment**

## **Marsh Restoration through Canal Backfilling**

### **Jean Lafitte National Historical Park and Preserve Barataria Preserve**

**February 2001**



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## Environmental Assessment

### **Marsh Restoration through Canal Backfilling at the Barataria Preserve Jean Lafitte National Historical Park and Preserve**

#### **I. Purpose and Need**

Past oil and gas activities within the Barataria Preserve of Jean Lafitte National Historical Park and Preserve have created several dead-end, "keyhole" canals that bisect the landscape. The canals and their adjacent spoil banks alter natural hydrological functions, disrupt sheet flow of fresh water and nutrients, amplify tidal volumes, and serve as conduits for saltwater intrusion and the introduction of exotic species. Furthermore, the canals allow wave energy to penetrate the interior marsh, increasing erosion of the soft substrates and contributing to marsh break up and conversion to open water. The presence of these keyhole canals exaggerate chronic stresses on coastal wetlands, which can result in declining plant viability and long term changes in species composition.

The Preserve is an 18,500-acre estuarine wetland complex located approximately 15 miles south of New Orleans in Jefferson Parish, Louisiana (Figure 1). Consistent with the park's legislative mandate and the General Management Plan, the Preserve is managed as a natural area containing significant natural and cultural resources. The canals impede natural functions and undermine the ability of the park to protect vegetative cover and to preserve the integrity of ecological and biological systems.

The National Park Service proposes to restore native freshwater marshes within two oil and gas canals using two different prototype treatments. The purpose of and need for this action is to alleviate the impacts of the dead-end canals on park wetlands and meet the policy requirements of Executive Order 11990 and Director's Order 77-1 for the protection of wetlands. This environmental assessment has been prepared by the National Park Service to examine the impacts of the proposed action to significant resources.

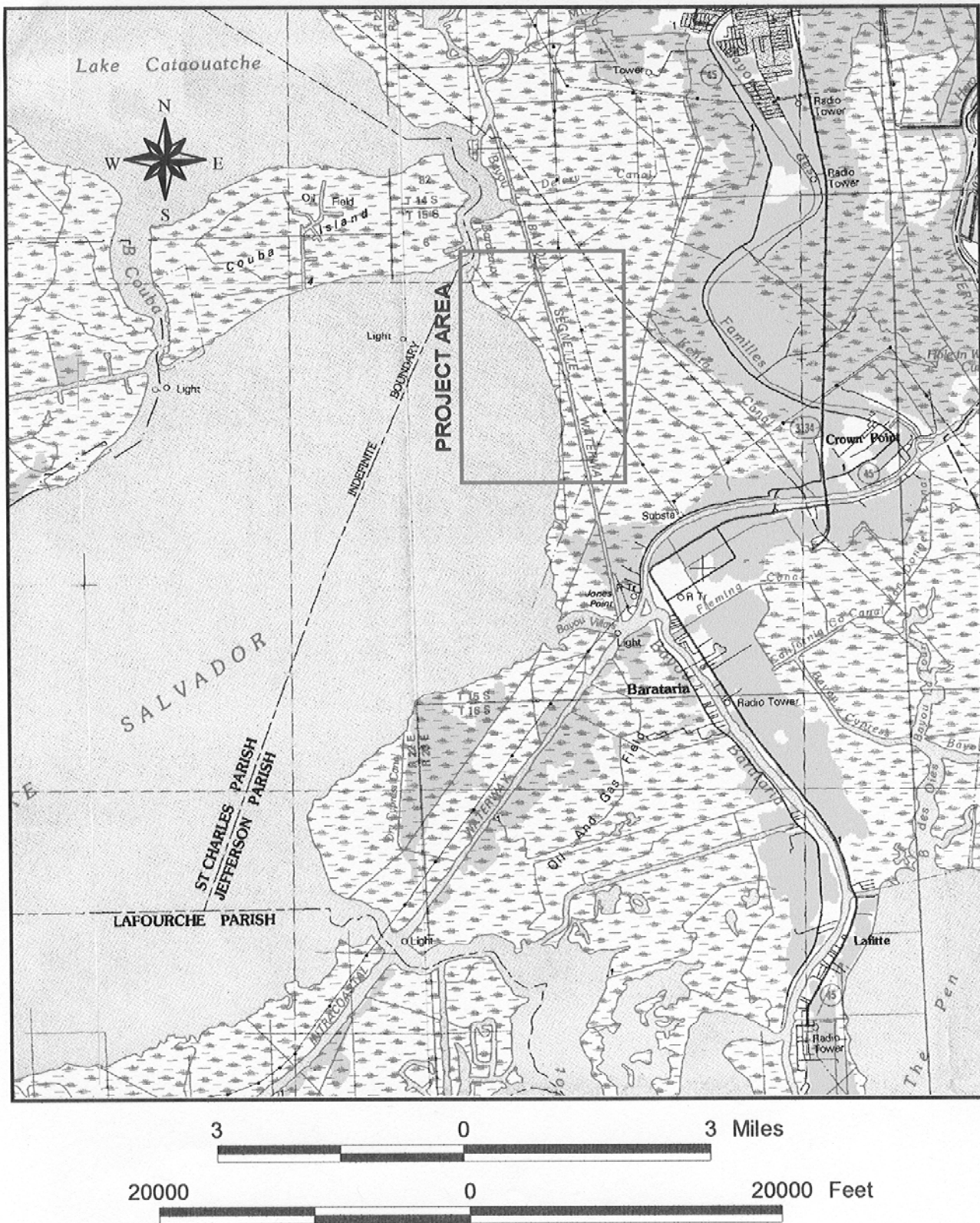


**Figure 1. Vicinity Map**  
**Marsh Restoration Through Canal Backfilling at the Barataria Preserve**  
**Jean Lafitte National Historical Park and Preserve**

## II. Alternatives

### **Marsh Restoration Alternative (Preferred Alternative)**

The area of the proposed action is located in Section 10, Township 15 South, Range 23 East within Jefferson Parish, Louisiana. Lakes Salvador and Cataouatche border the Preserve on the west, with the Bayou Barataria reach of the Gulf Intracoastal Waterway to the south and state highway 3134 to the east. Two canals adjacent to the Bayou Segnette Waterway have been selected for restoration. The North Segnette canal is 2900 feet in length and is located approximately 4.4 miles north of Jones Point. The South Segnette canal is located approximately 3.1 miles north of Jones Point and is 3015 feet in length (Figure 2). Restoring both the North and South Segnette canals would permanently fill 447,064 square feet (10.219 acres) and 513,590 square feet (11.739 acres) of open water, respectively, and re-create nearly 22 acres of freshwater wetlands.

The existing woody vegetation along the North and South Segnette canals will be cleared and the spoil banks will be degraded to a height not to exceed mean water level. This will involve excavating 3,941 cubic yards of material from the banks of the North Segnette canal, and 13,818 cubic yards of material from the banks of the South Segnette canal. The excavated soil and cut vegetation will be used as fill material for each canal. Both canals will be plugged with an earthen levee at their junction with the Bayou Segnette Waterway, using material from the adjacent spoil banks and/or material obtained from the bottom of the Bayou Segnette Waterway. Each plug will rise to the height of the existing spoil bank (approximately 2 feet above mean high water), and will contain a 25-ft wide cut that extends 2.5 feet below mean low water to allow for water and organism exchange. The face of each plug will be armored along the Segnette waterway for erosion resistance. A second earthen plug will be constructed at a point located 200 feet from the Segnette waterway, to divide each canal into two cells. The "outer" cell of each canal (closest to the Segnette waterway) will remain open water and serve as a catchment basin.

The "inner" cell of each canal will be used to test and evaluate the effectiveness of two different restoration treatments. The "inner" cell of the North Segnette canal will be filled *only* with the vegetation and material excavated from the adjacent spoil banks. The "inner" cell of the South Segnette canal will be filled with adjacent spoil bank material *and supplemented with* material hydraulically dredged from Lake Salvador to raise the subsurface elevation to mean low water. Approximately 50,000 cubic yards of dredge material will be required to fill the South Segnette canal to the desired level. The designated borrow area within Lake Salvador encompasses 84.477 acres and will be located at least 200 feet offshore from the northeastern shoreline. The dredge pipeline will be placed on the bottom of Bayou Segnette Waterway during construction so as not to obstruct or impede navigation.

Since no projects of this nature have been conducted in this type of floating marsh habitat, the park, in cooperation with the Coastal Ecology Institute of Louisiana State University, will monitor and document the effectiveness of the two prototype restoration methods. Through a Cooperative Agreement with the Louisiana State University Center for Wetland Resources - Coastal Ecology

Institute, the project design elements and the practicality of implementation will be documented and evaluated throughout the project.

A second agreement with the Water Resources Division of the United States Geological Survey (USGS) will provide for monitoring of contaminants that might potentially be released by the project as a result of sediment disturbance and transport. Baseline data is being gathered, and contaminant sampling will continue throughout the implementation phase and for two years post completion.

The marsh restoration alternative has been identified as the “Environmentally Preferred Alternative,” due to the inherent benefits associated with restoring 22 acres of wetland habitat.

### **No Action Alternative**

The only alternative considered to the proposed action is the "no action" alternative. Under the "no action" alternative, the park would fail to meet the requirements of National Park Service law and policy, specifically Executive Order 11990 and Director's Order 77-1 for the protection of wetlands.

Without implementation of the proposed action, the North and South Segnette canals would not be filled and would remain open water. The presence of oil and gas canals would continue to alter the historic hydrology of the Preserve by allowing rapid tidal exchanges, disrupting the flow of fresh water and nutrients, and providing a conduit for saltwater intrusion. Wave induced erosion would continue to scour the shoreline and promote the breakup of interior marshes. There would be an increased potential for exotic species to invade native habitats by colonization along canal spoil banks, and the existing peat marshes would continue to be lost or degraded.

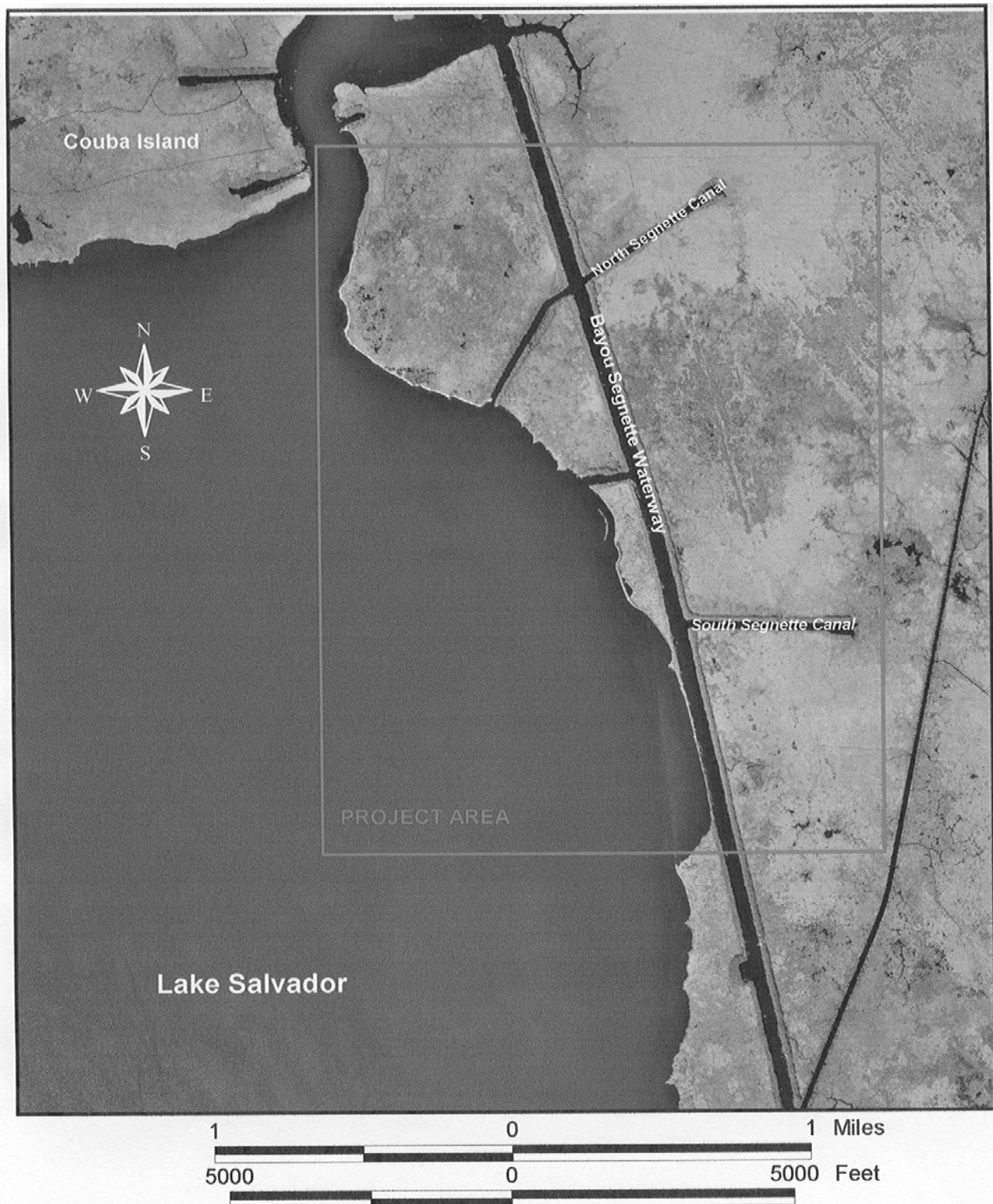
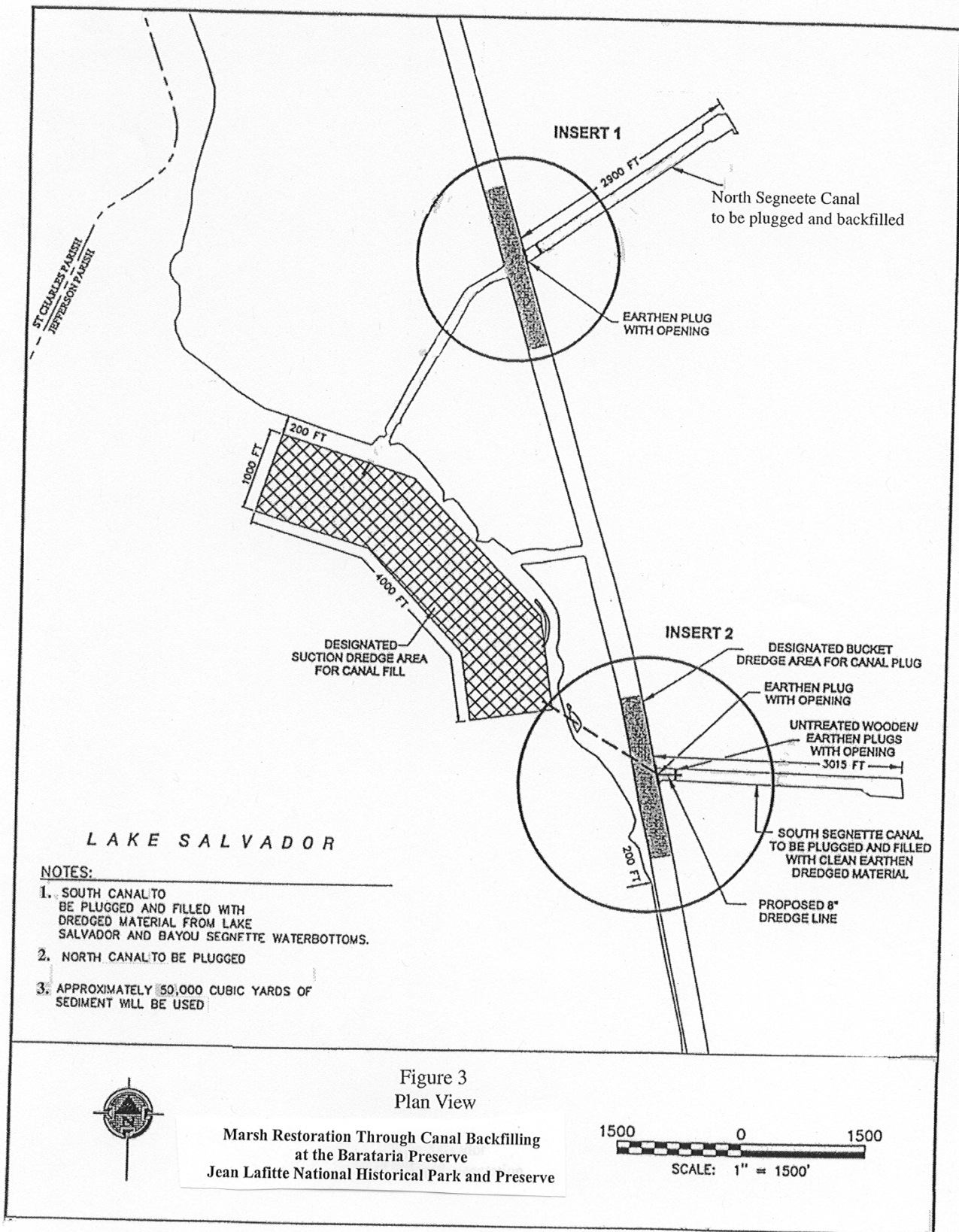


**Figure 2. Project Area Aerial Photograph**  
**Marsh Restoration Through Canal Backfilling at the Barataria Preserve**  
**Jean Lafitte National Historical Park and Preserve**



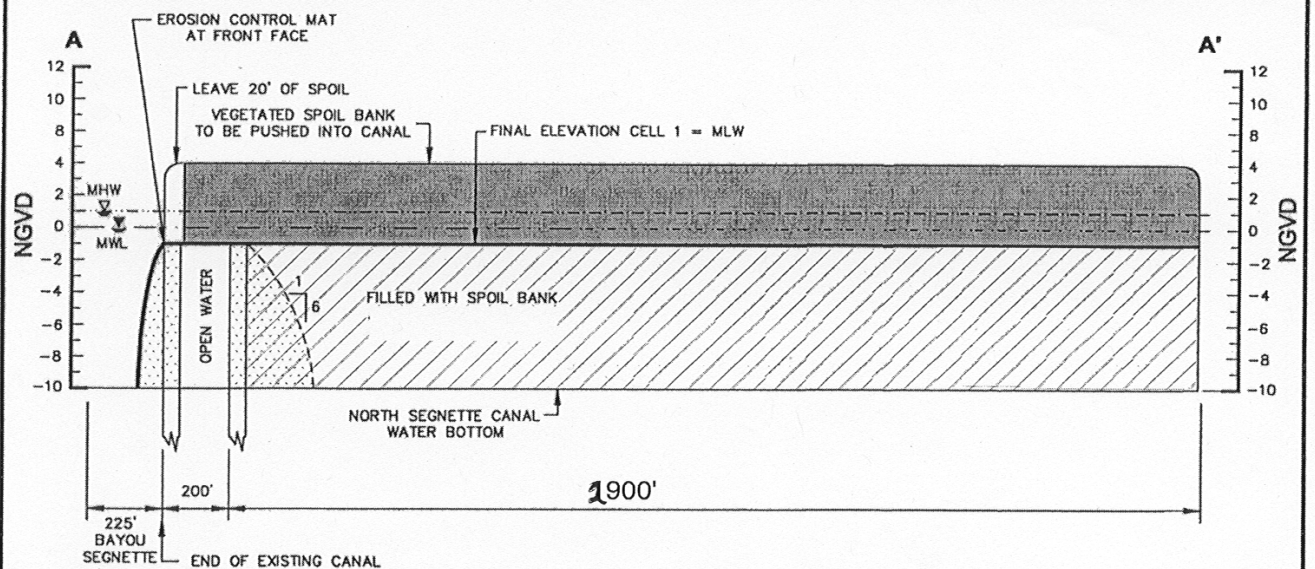
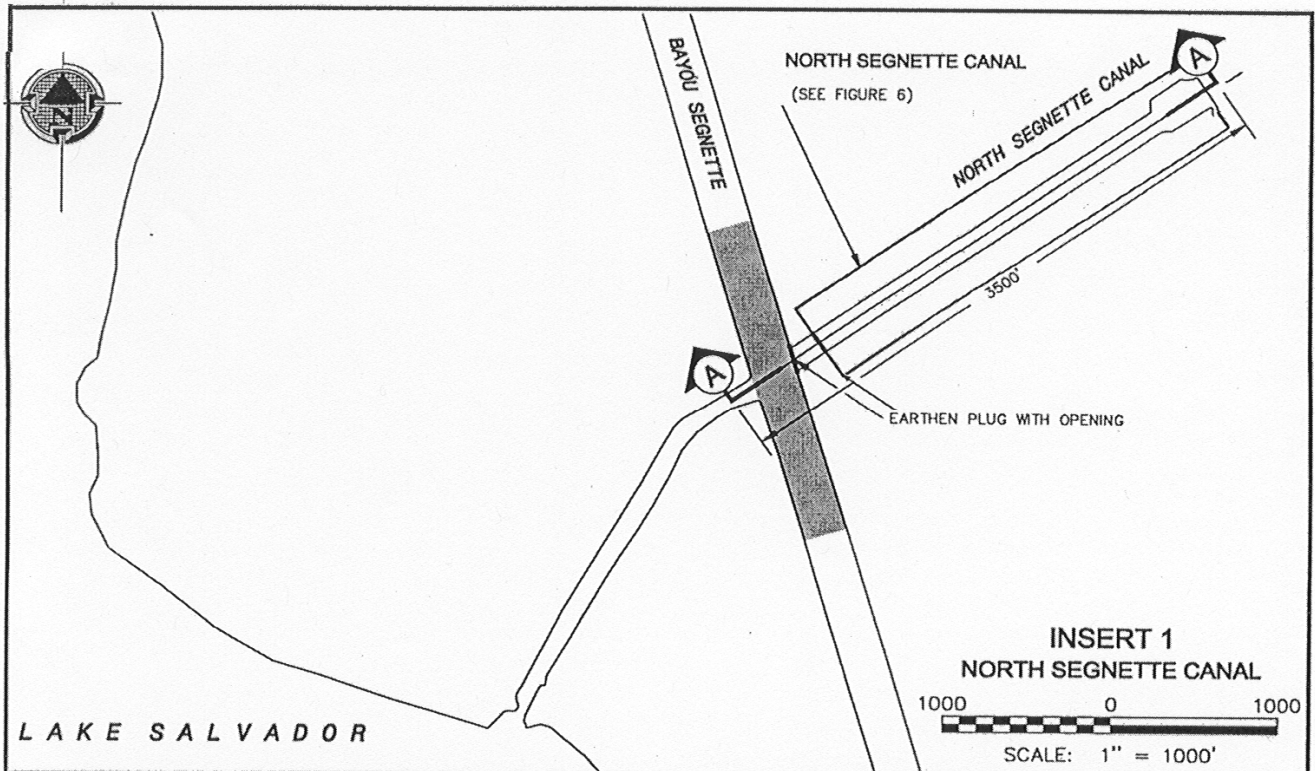


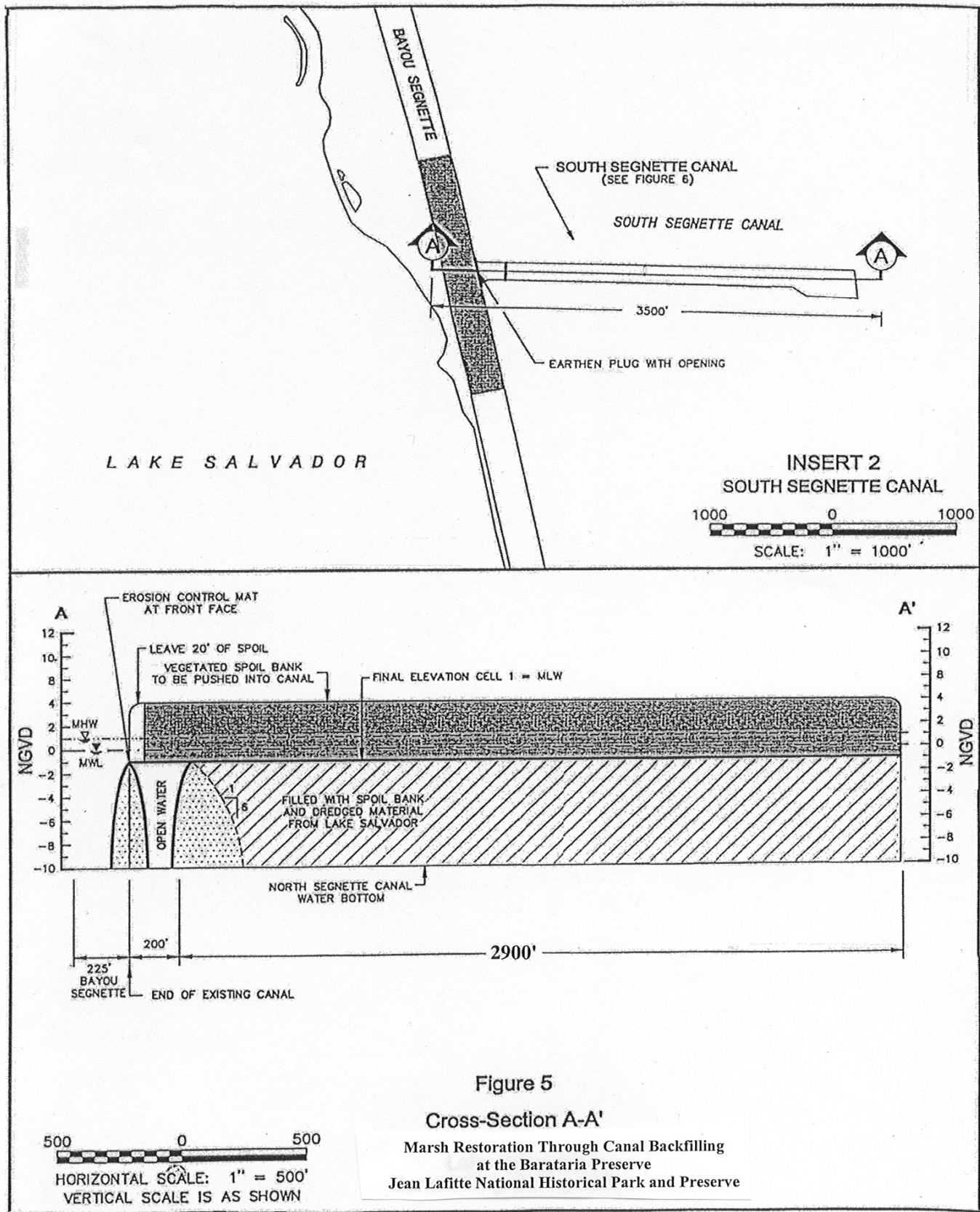
Figure 4  
Cross-Section A-A'

Marsh Restoration Through Canal Backfilling  
at the Barataria Preserve  
Jean Lafitte National Historical Park and Preserve

500 0 500

HORIZONTAL SCALE: 1" = 500'

VERTICAL SCALE IS AS SHOWN



### III. Affected Environment and Environmental Consequences

Affected elements associated with project compliance are listed below. Only those elements marked "yes" are discussed further.

| <u>Elements</u>                  | <u>Affected</u> |
|----------------------------------|-----------------|
| Air Quality                      | no              |
| American Indian Religious Use    | no              |
| Cultural/Historical Resources    | no              |
| Farmlands, Prime/Unique          | no              |
| Floodplains                      | yes             |
| Scenic Values                    | yes             |
| Threatened/Endangered Species    | no              |
| Water Quality                    | yes             |
| Water Bottoms                    | yes             |
| Wetland Resources/Riparian Zones | yes             |
| Wilderness                       | no              |

### Environmental Consequences and Impacts

#### Floodplains

##### Marsh Restoration Alternative

The entire Barataria Preserve is within the geomorphic 100-year floodplain of the Mississippi River and its distributaries. The proposed action does not involve the placement or creation of any permanent structure within the floodplain. Successful execution of the project would restore the historical wetland hydrology at a localized scale and re-create up to 22 acres of fresh marsh. Natural floodplain values (vegetation, wildlife habitat and dissipation of flood energy) would be enhanced and contribute to the overall quality of the ecosystem.

##### No Action Alternative

The presence of oil and gas canals within the Preserve would continue to alter the natural wetland hydrology and allow rapid tidal exchanges with the interior marshes. These processes diminish natural floodplain values and threaten the viability, composition and extent of the existing emergent marsh vegetation.

## **Scenic Values**

### Marsh Restoration Alternative

The elevated spoil banks adjacent to each canal support a plant community that would not typically be sustained within the surrounding marsh landscape. This vegetation creates a visual screen to the surrounding marsh. The dominant vegetation along the spoil banks is the exotic Chinese tallow tree (*Sapium sebiferum*) with a small percentage of wax myrtle (*Myrica cerifera*), black willow (*Salix nigra*), hackberry (*Celtis laevigata*) and red maple (*Acer rubrum*). There are no national/state registered tree specimens or rare species located in the project area. The existing vegetation would be removed from the spoil banks and placed on the bottom of the canal as fill material during the construction phase of the project. The lack of an elevated substrate will prevent future growth of the vegetation used as fill material. Removing the spoil banks and associated vegetation will restore the traditional open landscape and reestablish the character of the surrounding marsh.

### No Action Alternative

Vegetation along the elevated canal banks would continue to obstruct the natural viewscape of the project area. Exotic plant species would continue to thrive along the canal banks, dispersing seeds into the open water and facilitating transport and invasion of new wetland areas.

## **Water Quality**

### Marsh Restoration Alternative

Turbidity levels and quantities of suspended particulates within the water column would temporarily increase during the dredging operations within Lake Salvador and the Bayou Segnette Waterway. These impacts would be of short duration and on a localized scale, primarily only during the actual dredging, construction and backfilling operations. Material deposited within each canal will be permanently contained in the canals by the earthen levee plugs. The "outer" cell (catchment basin) of each canal has been designed to trap additional sediments to minimize the impacts on local water quality. Turbidity levels and suspended particulates would return to ambient conditions following completion of dredging and construction activities.

Bottom sediments from nearby sites within Lake Salvador and the Bayou Segnette Waterway have been examined for heavy metals and other contaminants during previous research. The park has consulted with contaminant experts at the Louisiana Department of Environmental Quality (LDEQ) and at the Water Resources Division of the USGS, as well as informally with other government and university researchers. After examining all available data, the project partners have concluded that 1) the evidence is that contaminant levels in Lake Salvador are within acceptable limits; 2) the risk of contamination of biota as a result of this project is remote; and 3) the project as designed, will ultimately lead to greater containment of any contamination that might be trapped in the sediments, resulting in a net reduction in long-term exposure to biota.

No sampling has ever taken place from the immediate area of Lake Salvador from which sediment will be dredged for this project. Several available data sets of fish tissue, water, and sediment samples taken from other areas of the lake and adjacent Preserve in the last ten years show no cause for concern. These studies and results show that there is no comprehensive, quantifiable data to indicate that the sediments pose a threat to aquatic life or exceed any regulatory standards. There is one anomalous set of fish tissue samples taken from the lake in 1997, from an area about 1.5 miles from the dredge site that show elevated mercury levels in some fish. Because these samples are higher than previous samples, and because subsequent samples in 1998 did not show a recurrence of the elevated levels, a high probability exists that the 1997 samples were contaminated during handling and gave a false result. Nevertheless, in light of the above, our partner agency, USGS, has agreed to conduct mercury monitoring, as outlined in the Preferred Alternative.

#### No Action Alternative

Without implementing the proposed action, ambient water quality conditions within Lake Salvador and the Bayou Segnette Waterway would likely remain the same. No additional contaminant sampling or monitoring would be conducted.

### **Water Bottoms**

#### Marsh Restoration Alternative

Dredging operations will change the topography of the water bottom and redistribute bottom sediments on a localized scale. These impacts would be moderated to some extent by wave action and natural hydrological processes. Approximately 50,000 cubic yards of bottom material would be dredged from Lake Salvador to fill the South Segnette Canal. Soil borings near the shoreline of Lake Salvador show mostly brown, silty (muck) sediments with a high organic content extending to a depth of -11 feet, below which clay soils predominate. The sediments within the spoil banks along each canal represent this soil type, but have been de-watered, oxidized and are now primarily clay material. A limited portion of the Bayou Segnette Waterway, immediately adjacent to the North and South Segnette canals, will also be dredged to obtain material for the construction of the earthen levees across the mouth of each canal. Soils along the bottom of the Bayou Segnette waterway are expected to have characteristics similar to the lower clay sediments of Lake Salvador.

#### No Action Alternative

Without implementing the proposed action, approximately 85 acres of water bottom and approximately 50,000 cubic yards of sediments would not be dredged for use as fill material. Consequently, the quality and topography of water bottom habitats would likely remain similar to present conditions.

## **Wetlands**

### Marsh Restoration Alternative

Due to the nature of the proposed action, it is impossible to avoid wetland habitats. Virtually all of the land comprising the Barataria Preserve is classified as wetlands. A significant portion of the Preserve consists of an ecologically unique floating marsh habitat, dominated by maidencane (*Panicum hemitomon*) and bull tongue (*Sagittaria lancifolia*). The land surrounding the North and South Segnette canals has been classified according to the 1998 Wetlands Inventory and the Cowardin classification system as "estuarine intertidal emergent" wetlands with persistent vegetation that is irregularly flooded (denoted by code E2EM1P). The extensive estuarine intertidal emergent wetlands of the Barataria and Terrebonne estuaries in the Mississippi River delta region are one of only two such systems in the world, the other located in the delta of the Danube River. The portion within the Preserve is the only such area protected by the National Park system. The proposed action would result in a net increase of as much as 22 acres of this unique wetland type.

Cut vegetation, soil and dredged material would be placed in the canals to provide a submerged substrate and seed source for the establishment of native emergent and/or submergent vegetation. Plugging each canal with an earthen levee will restore the historical hydrology of the project area and restore wetland functions by facilitating a slower and more natural tidal exchange between the Bayou Segnette waterway and the interior marsh. The integrity of the interior marshes will also be preserved by a reduction in the tidal prism as well as the wave energy that contributes to erosion.

Best management practices will be followed during the construction phase of the project in order to minimize temporary impacts to the surrounding wetlands. A barge mounted amphibious excavator and bucket dredge will be utilized to degrade the existing canal spoil banks and to obtain material needed for the construction of the earthen plugs.

Ubiquitous wildlife species that inhabit the spoil banks (primarily mammals, amphibians, reptiles, and birds) would be displaced a minimum of 225 feet into adjacent habitats by the proposed action. Fish species within the canals would likely vacate the area during back filling and sediment placement operations. The existing benthic communities and submerged aquatic vegetation within the South Segnette canal would be destroyed due to the deposition of material into the canal. However, each canal plug will be designed with an opening at the intersection of the Segnette waterway to facilitate organism exchange. Benthic invertebrates and submerged aquatic vegetation communities are expected to re-establish in the impacted areas after the work is completed. There are no known threatened or endangered species, or species of special concern in the project vicinity (US Fish and Wildlife Service, 2000).

## No Action Alternative

Without a restoration project, continued marsh degradation is expected in the project area due to saltwater intrusion and erosional processes. The integrity of the existing interior floating marshes and associated vegetation communities would continue to be threatened, resulting in the possible break-up and eventual conversion to open water. Common wetland wildlife species would continue to utilize the canal banks at the present level. Important fisheries habitat within interior wetlands would continue to decline over time.

## **Cumulative Impacts**

The cumulative impacts of the marsh restoration alternative are likely to be increased preservation of the estuarine intertidal emergent wetlands of the Barataria Preserve, resulting in long term benefits for wildlife, fisheries, water quality, floodplains and the human population. The proposed action would restore the natural hydrology and protect the core interior marshes of the Preserve from saltwater intrusion, amplified tidal volumes, increased wave energy, and exotic species invasion. Without implementing the proposed action, erosional processes would continue, resulting in the continuing loss and degradation of wetland habitats.

## **IV. Compliance**

### **National Environmental Policy Act of 1969**

[42 USC §§ 4332 (1982)]

This environmental assessment and resultant decision document provide disclosure of the decision-making process and potential environmental consequences of the alternatives. This environmental assessment and draft Finding of No Significant Impact will be available for a 30-day public review and comment period, after which the National Park Service will decide if the proposed action is significant enough to prepare an environmental impact statement. If an environmental impact statement is not required, the NPS Regional Director may sign a finding of no significant impact (FONSI). Together, this environmental assessment and FONSI will conclude the National Environmental Policy Act compliance for this project.

### **Endangered Species Act of 1973**

[16 USC §§ 1531 et seq (1982)]

Section 7 of the Endangered Species Act directs all federal agencies to use their authorities in furtherance of the purposes of the Act by carrying out programs for the conservation of endangered or threatened species. Federal agencies are required to consult with the U.S. Fish and Wildlife Service to ensure that any action authorized, funded, or carried out by the agency does not jeopardize the continued existence of listed species or critical habitat. Informal consultation under Section 7 of the Endangered Species Act was completed in September 2000 with a finding by the U.S. Fish and Wildlife Service that the proposed activities would not affect listed or proposed threatened or endangered species.

### **Clean Water Act of 1972**

[33 USC §§ 1251-1376 (1982)]

This act seeks to restore and maintain the chemical, physical, and biological integrity of the nation's water by a variety of means. Section 404 of the Act provides direct wetlands protection by authorizing the Army Corps of Engineers to prohibit or regulate, through a permit process, discharge of dredged or fill material into the waters of the United States, including wetlands.

Actions described within this document comply with the requirements of section 404 of the Clean Water Act and other applicable federal, state, and local regulations. Applications have been submitted to the Army Corps of Engineers and Louisiana Department of Environmental to obtain permits for dredging portions of the Bayou Segnette Waterway and Lake Salvador and for placing fill material into two canals to restore wetland habitat.

### **Coastal Zone Management Act**

[16 USC §§ 1451 to 1464 (1982)]

Federal consistency is the Coastal Zone Management Act requirement that federal actions that are reasonably likely to affect any land or water use or natural resource of the coastal zone be consistent with the enforceable policies of a coastal state's federally approved coastal management program. The Louisiana Coastal Zone Management Program is administered by the Louisiana Department of Natural Resources, Coastal Management Division. A Consistency Determination was issued in December 2000, indicating the project is in full compliance with applicable provisions to protect the values of the coastal zone.

### **National Historic Preservation Act of 1966**

[16 USC 470 et. Seq.]

This act requires federal agencies to establish programs for evaluating and nominating properties to the National Register of Historic Places and to consider the effects of their undertaking on listed or eligible properties. Section 106 mandates that federal agencies take into account the effects of their actions on properties listed or eligible for listing in the National Register and give the Advisory Council on Historic Preservation a reasonable opportunity to comment, if appropriate. The goal of the National Historic Preservation Act of 1966, as amended and Section 106 is to make sure that preservation is fully considered in federal actions, thereby protecting our shared heritage (National Park Service, 1994, p. 53).

The National Park Service "Assessment of Actions Having an Effect on Cultural Resources" has rendered a determination of "no effect" for the proposed project. Therefore, no known archeological, ethnographic or historic resources in the project vicinity will be threatened. Ground disturbance will be restricted to the spoil banks surrounding each canal. Vegetation will be cleared and the elevated spoil banks will be degraded into the existing canal. If any archeological resources are inadvertently discovered, work would be halted until the resources could be identified and documented, and a new strategy would be decided upon, if necessary. Consultation with the State Historic Preservation Officer (SHPO) would then take place.

### **American Indian Religious Freedom Act and Executive Order 13007**

[P.L. 94-541; 90 Stat. 2505]

Federal policy as established the American Indian Religious Freedom Act (AIRFA, 1978) seeks "to protect and preserve" American Indian religious freedom rights and provides "access to sites" and "the freedom to worship through ceremonies and traditional rites." Executive Order 13007, Indian Sacred Sites (1996) provides "access to and ceremonial use of Indian sacred sites."

There is no impact to American Indian Religious Uses in the proposed marsh restoration area. To our knowledge there are no known sacred sites in this area, nor have any requests for access to this particular area been made.

### **Executive Orders 11988 and 11990**

#### **Floodplain Management and Protection of Wetlands**

[42 USC 4321 (1982)]

These two executive orders direct federal agencies to enhance floodplain and wetland values, to avoid development in floodplains and wetlands whenever there is a practical alternative, and to avoid to the extent possible adverse impacts associated with the occupation or modification of floodplains and wetlands.

This project has been reviewed in accordance with “Special Directive 93-4: Revised Guidelines for National Park Service Floodplain Compliance” (National Park Service, 1993), for compliance with EO 11988. It has been determined to be an "excepted action" based on the fact that the project is "functionally dependent upon locations in proximity to water and for which floodplain sites are never a practicable alternative". Although the proposed activity does comply with NPS policy to restore and preserve natural floodplain values, the Floodplain Management Guidelines do not apply, and therefore a Statement of Findings for EO11988 will not be prepared.

This project has also been reviewed in accordance with “Directors Order #77-1: Wetland Protection,” for compliance with EO 11990. It has been determined that this project qualifies as an "excepted action" under section 4.2, since it is "a water dependent action designed specifically for the purpose of restoring degraded (or completely lost) natural wetland, stream, riparian or other aquatic habitats or ecological processes." Therefore, a Statement of Findings for EO 11990 is not required.

### **Executive Order 12898**

#### **Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations**

This order requires all federal agencies to address disproportionately high and adverse human health or environmental effects of their programs and policies on minorities and low-income populations and communities.

This project will have no effect on minority or low-income populations or communities.

## **V. Coordination**

The preparation of this Environmental Assessment has been coordinated with appropriate Federal, state and local interests, as well as environmental groups and other interested parties. The following agencies and other interested parties have been notified of the proposed action:

Barataria-Terrebonne National Estuary Program  
Coalition to Restore Coastal Louisiana  
US Fish and Wildlife Service  
US Army Corps of Engineers  
Louisiana Department of Environmental Quality  
Louisiana Department of Natural Resources  
Louisiana Department of Wildlife and Fisheries  
Jefferson Parish Environmental Department  
Wisner Donation Advisory Committee  
Sierra Club  
Orleans Audubon Society  
Ms. Vickie Duffourc  
Dr. Fritz Wagner  
Mr. Frank Ehret  
Mr. John Uhl  
Mr. Edgar Veillon  
Dr. Barry Kohl

## **VI. Preparers**

This Environmental Assessment was prepared by William J. Hulslander, Jr., Natural Resource Management Specialist, with relevant sections prepared by David P. Muth, Chief of Resource Management at Jean Lafitte National Historical Park and Preserve. Project illustrations were provided by Louisiana State University's Coastal Ecology Institute. The mailing address of the preparers is:

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Natural Resources Management  
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Suite 2400  
New Orleans, Louisiana 70130

## **V. References**

- Coastal Monitoring Inc. 1998. Dead-end Canal Quantification. Technical Report for Jean Lafitte National Historical Park and Preserve. 9 pp.
- Cowardin, L. M, V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of Wetlands and Deepwater Habitats of the United States. U.S. Fish and Wildlife Service. FWS/OBS-79/31.
- Louisiana Department of Natural Resources, Baton Rouge, Louisiana. December 2000. Correspondence from Mr. Terry Hovey.
- National Park Service. 1998. Director's Order #77-1: Wetland Protection. Approved October 22, 1998.
- National Park Service. 1994. Director's Order #28: Cultural Resource Management Guideline.
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