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LOUISIANA COASTAL WETLANDS RESTORATION PLAN

BARATARIA BASIN

APPENDIX D

PREPARED BY:

LOUISIANA COASTAL WETLANDS CONSERVATION AND RESTORATION TASK FORCE

November 1993

LOUISIANA COASTAL WETLANDS RESTORATION PLAN

BARATARIA BASIN PLAN

APPENDIX D

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INTRODUCTION

STUDY AREA

The Barataria Basin (Figure 1) is located immediately south and west of New Orleans, Louisiana. The basin is approximately 120 miles long; the width of the central basin ranges from approximately 35 miles to approximately 24 miles. The basin is bounded on the north and east by the Mississippi River from Donaldsonville to Venice. The southern boundary is the Gulf of Mexico. The western boundary is Bayou Lafourche. The basin contains approximately 1,565,000 acres.

Portions of nine parishes are found in the basin: Assumption, Ascension, St. James, Lafourche, St. John the Baptist, St. Charles, Jefferson, Plaquemines, and Orleans. For the purposes of analysis, the basin was divided into nine regions: Fastlands, Des Allemands, Salvador, Central Marsh, Grande Cheniere, L'Ours, North Bay, Bay, and Empire (Figure 1).

The Fastlands Region contains 341,500 acres of leveed or developed areas. This region includes the developed corridors along the Mississippi River and Bayou Lafourche, as well as similar mid-basin areas of Des Allemands, Lafitte, Barataria, Crown Point, Gheens, and other municipalities and farmed areas. This region of the basin is not considered subject for restoration as described in this report.

Two wildlife management areas and one national park with a total of 65,000 acres (4 percent) are located within the basin. Most of the remaining land is privately owned.

EXISTING PROJECTS

Numerous existing projects have been identified that affect wetlands of Barataria Basin. The following is a list of the most consequential of those projects.

U.S. ARMY CORPS OF ENGINEERS

The Bayou Segnette Waterway was completed in August 1957. Its authorized dimensions are 8 feet deep and 80 feet wide, from the southern end of Company Canal at Westwego to the Gulf Intracoastal Waterway (GIWW) at Bayou Villars. This 12.2-mile long project provides a shorter and more direct route for large shrimping and fishing vessels to the packing and canning industries on Bayou Segnette.

The Barataria Bay Waterway was first dredged in 1925 and enlarged in 1963. Its original dimensions were 5 feet deep by 50 feet wide from Bayou Villars to Grand Isle, through Barataria Bay, a distance of 37 miles. Dimensions were increased to 12 feet deep by 125 feet wide. The route was altered to pass west of Barataria Bay. Navigation on the waterway includes traffic from oil industry cargo and liquid sulphur, as well as traffic from commercial and recreational fishing boats.

Barataria Bay Waterway maintenance material is used for wetland creation wherever possible and if funds are available. The Louisiana Department of Natural Resources cost shared reconstruction of Queen Bess Island in 1990. The purpose was to restore rookery habitat for the brown pelican. Several other sites along the waterway are used for placement of dredged material to create wetlands.

The GIWW, Raceland to Harvey Lock segment, was constructed by private concerns by the 1930's. Later, responsibility for the waterway was transferred to the U.S. Army Corps of

Engineers (USACE). The USACE enlarged the channel and maintains it at 12 feet deep by 125 feet wide.

The Empire to the Gulf Waterway was completed in 1950. The 9-foot deep by 80-foot wide authorized channel is approximately 9.7 miles long, connecting the Mississippi River at the Empire Locks to the Gulf of Mexico at Pelican Island.

Tiger Pass Waterway was completed in 1978. Dimensions are maintained at 14 feet deep by 150 feet wide in the channel and 16 feet deep by 250 feet wide in the entrance channel. Offshore oil operations, commercial and sport fishermen, and hunters utilize this route to the Gulf of Mexico from Venice, Louisiana. Along Tiger Pass, marsh is created using dredged material from maintenance dredging operations where feasible and when funding is available.

The Mississippi River and Tributaries project, the comprehensive flood control project for the lower Mississippi Valley below Cairo, Illinois, has had a significant impact on the water and land resources in the Mississippi River delta. Levees extend from above the Barataria Basin to Venice, Louisiana, on the west bank of the Mississippi River, providing protection from the standard project flood. These levees are essentially complete in south Louisiana except in several locations where additional work is required to bring them to project grade and cross-section.

The Belle Pass jetties were first constructed in 1939. By 1965, the jetties were extended and a groin and dike were constructed at the shoreline, east of the eastern jetty. By 1985, another jetty had been constructed to the west of the channel. This project disrupts the flow of sand into the channel, thereby reducing maintenance dredging costs. In doing so, it reduces east to west longshore sediment drift and sediment renourishment of beaches.

The Grand Isle jetty at Barataria Pass on the east end of Grand Isle was originally constructed in 1958 and extended in 1964 and 1989. The latest extension of 500 feet was to provide hurricane protection by trapping sand, thereby reducing beach erosion along Grand Isle (Penland and Boyd 1985).

The Grand Isle dune was constructed to +11.5 feet National Geodetic Vertical Datum (NGVD) in 1984 and has been maintained after storms or hurricanes.

The Empire jetties were first constructed in 1950 and were approximately 1,825 feet long and extended to the -6 foot depth contour. In 1970, the western jetty was extended 420 feet landward to reconnect that jetty to the shoreline, and a 475-foot-long groin and a tie dike were built. In 1978, the western channel jetty was extended another 325 feet landward to reconnect to the shore (Sargent and Bottin 1989).

The Davis Pond Freshwater Diversion was recommended in the "Louisiana Coastal Area, Freshwater Diversion to Barataria and Breton Sound Basins, Feasibility Study Report" prepared by the USACE in September 1984. The report also recommended that the project be implemented under the authorized Mississippi Delta Region Project, which is identical in purpose. The Davis Pond structure is currently in the detailed design phase. Construction of the diversion structure is scheduled to begin in late 1994, with completion estimated for late 2001.

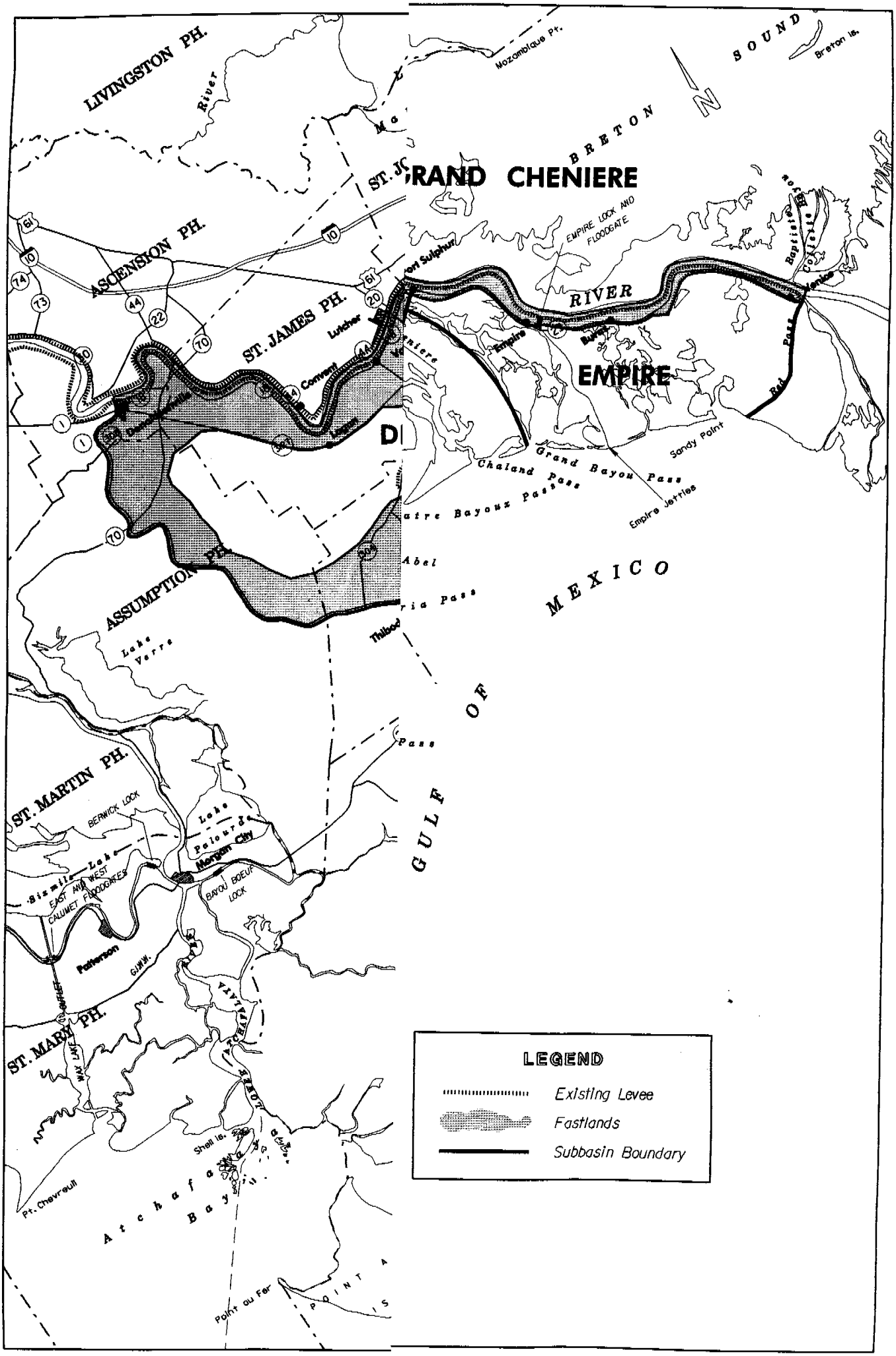

Figure 1. Barataria Basin, Basin

U.S. ENVIRONMENTAL PROTECTION AGENCY

A Comprehensive Conservation and Management Plan (CCMP) is being developed as part of the Barataria-Terrebonne National Estuary Program (BTNEP), a 5-year, multi-agency planning effort administered by the Environmental Protection Agency (EPA). Once a plan is developed, projects carried out in the area must be consistent with that plan.

Bayou Aux Carpes, a 3,000-acre area of wetlands north of Crown Point and adjoining Jean Lafitte National Historic Park, Barataria Unit, has been protected from the placement of dredged or fill material by action of the EPA since the mid-1980's under the authority of the federal Clean Water Act, Section 404(c).

U.S. FISH AND WILDLIFE SERVICE AND U.S. GEOLOGICAL SURVEY

Little Lake Marsh Management Study will compare effects of water level and salinity management to adjacent unmanaged marshes. Levees and water control structures have been installed in two areas totalling over 600 acres of marsh east of Bayou Rigolettes. Research began in 1991 and will continue through 1994.

U.S. NATIONAL PARK SERVICE

Jean Lafitte National Historic Park, Barataria Unit proposed a comprehensive surface water management plan in 1990 which is currently under review for possible modification. No target date for implementation has been set. Approximately 12,400 acres will be affected by the plan. The control of aquatic vegetation was implemented in 1986 along approximately 30 miles of waterways within the area. About 975 feet of the GIWW along Jones Point was stabilized in 1986.

STATE OF LOUISIANA

Department of Natural Resources.

The Louisiana Department of Natural Resources (LDNR), using the State Coastal Wetlands Conservation and Restoration Fund, implemented several projects in the Barataria Basin (State of Louisiana 1990, 1991, 1992, 1993). These projects are described below.

BA-3 Naomi (LaReussite) Diversion Siphon construction was completed in 1992. Operation began in February 1993. The siphons can divert a maximum of 2,400 cubic feet per second (cfs) of Mississippi River water and associated nutrients and sediment into an area of marsh southwest of Naomi that is rapidly deteriorating as a result of saltwater intrusion, sediment deprivation, and subsidence. This project was sponsored by Plaquemines Parish.

BA-4 West Point a la Hache Diversion Siphon construction was completed in 1992, and operation began in January 1993. The siphon can divert a maximum of 2,000 cfs of Mississippi River water and associated nutrients and sediment into an area of marsh that is rapidly deteriorating as a result of saltwater intrusion, sediment deprivation, and subsidence. This project was sponsored by Plaquemines Parish.

BA-5B Queen Bess Island shoreline protection involved the placement of 30,000 tons of crushed stone to armor the perimeter of the island in 1990. The Queen Bess Island project restored rookery habitat for brown pelicans.

Department of Wildlife and Fisheries.

BA-5C Baie de Chactas Shoreline Protection was completed in 1990. The purpose of this project was to restore wetlands using low-cost shore protection. Oyster shell was placed along the Lake Salvador shoreline to reduce erosion and tidal scour. Revegetation is proceeding. This project was cost shared by LDNR and St. Charles Parish.

The Salvador Wildlife Management Area, covering 31,000 acres, is owned and managed by the Louisiana Department of Wildlife and Fisheries.

The Edward Wisner Game Management area consists of 15,000 acres and is owned by the Edward Wisner Donation Advisory Committee and managed by the LDWF.

JEFFERSON PARISH

A breakwater is being built along the northwestern shoreline of the Pent to stop wave erosion which has caused the loss of at least 80 acres of marsh since 1961. As designed, the breakwater will collect sediment behind the breakwater to create marsh. Construction was begun in 1991.

A shoreline protection Christmas tree project was begun in 1990. For the first two years of the program, Goose Bayou (Bayou des Oies), Bayou La Tour, Bayou de Fleur, and Bayou Cypress shorelines were protected. This project was funded by the State Coastal Wetlands Conservation and Restoration Fund and carried out by the Parish.

A marsh creation project using Christmas trees was begun during 1991 when Jefferson Parish entered into a contract with EPA through the Barataria-Terrebonne National Estuary Program. A tree fence will be constructed across the entrance of each of four abandoned canals and the area behind the fence will be partially filled with bundles of Christmas trees. Water hyacinth will be introduced, if not already present, to encourage the creation of a floating mat of vegetation, which will eventually form flotant marsh.

LAFOURCHE PARISH

A Christmas tree wetland creation project was begun in 1990 to reclaim former wetlands in three areas by trapping sediment in shallow water areas through the use of discarded Christmas trees to construct brush fences. Two areas are located in Leeville and the third in the Flotation Canal at Port Fourchon. Fences are 1,500, 3,600 and 1,500 feet long respectively.

TOWN OF GRAND ISLE

The Grand Isle Rock Jetty was constructed in 1990 to slow erosion on the gulf beach at mid-island.

PRIVATE

Numerous large segments of marsh are under management in this basin. Seventeen USACE permits have been issued to manage over 215,000 acres of marsh. However, fewer than half of the permitted management plans have been implemented. Included are two areas, with a total of 100,000 acres, in Lafourche Parish which are part of this Restoration Plan (see project descriptions BA-2 and BA-6).

PROBLEM IDENTIFICATION

EXISTING CONDITIONS

GEOMORPHOLOGY AND HYDROLOGY

The physical characteristics of the Barataria Basin are influenced by several natural and man made physiographic features which, in turn, influence habitat distribution, hydrology, land use, and wetland restoration opportunities. Major features include natural and man made levees of the Mississippi River and Bayou Lafourche, the GIWW, U.S. Highway 90, the central marsh landmass, and a chain of barrier islands.

Sediments deposited by the Mississippi River filled the margins of the Gulf of Mexico and built these marshes over the last several thousand years (Frazier 1967). These marshes received periodic inputs of sediments and freshwater from the Mississippi River until the early 1900's but they are now isolated from the river. Even though there is no river discharge into these marshes, extensive non-saline marshes exist where water exchange with the gulf is restricted. This is because average rainfall (162 cm per year) is greater than average evapotranspiration (102 cm per year) in southeast Louisiana (Newton 1972). Currently, freshwater and sediment input to the Barataria Basin is limited by flood protection levees along the Mississippi River and the closure of Bayou Lafourche at Donaldsonville. A small amount of river water is introduced into the basin's wetlands through siphons at Naomi and West Point a la Hache and through the Algiers, Harvey, and Empire Locks.

The U.S. Highway 90 embankment, the GIWW banks, the central marsh landmass, and the chain of barrier islands are key features that regulate basin hydrology and significantly influence sediment distribution and the basin's salinity regime.

Water volume and levels in the Barataria Basin are strongly influenced by astronomical tides, winds, and precipitation. Tides of the northern gulf have a relatively small range between high and low, measuring 1 foot in the gulf and 0.1 foot in the upper basin. The volume of water exchanged between the bay and gulf at Barataria Pass by lunar and solar tides (the tidal prism) is approximately 328,230,000 cubic feet. Storm tides can account for more than half of the daily water-level fluctuations in the basin (Jarrett 1976; Levin 1990).

Water exchange within the basin is highly variable (Richie 1985; Richie and Penland 1989). The dominant water exchange route between the upper and lower basin is through Little Lake, Bayou Perot, and Lake Salvador. Secondary exchange is through Mud Lake, Barataria Bay Waterway, and the Pen. These two major routes converge in the vicinity of Mud Lake to Hackberry Bay in the North Bay Region.

A chain of barrier islands and barrier beaches separates the basin from the Gulf of Mexico. The island chain, except for Grand Isle, is eroding and will continue to deteriorate until restorative measures are implemented. The major passes between barrier islands are tide dominated and each has an ebb-tidal delta (Van Beek and Meyer-Arendt 1982; Penland and Suter 1988; Penland and Boyd 1985, Walton and Adams 1976; List et al. 1993). The Grand Isle Hurricane Protection project reduces the rate of beach erosion on that island.

VEGETATION AND SOILS

Plate 1 and Table 1 depict habitat data for the Barataria Basin and its major divisions. In the upper end of the basin, developed ridges and bottomland hardwoods along the natural levees of the Mississippi River, Bayou Lafourche, and other smaller distributaries drain into cypress-tupelo swamps. In the Lac Des Allemands vicinity, cypress-tupelo swamp gives way to fresh marsh. The fresh marsh zone extends down the basin to the Lake Salvador vicinity and is dominated by typical fresh marsh vegetation. South of Lake Cataouatche and Baie du Chactas lies a narrow band of intermediate marsh. This is a transition zone containing a mixture of brackish and fresh marsh plants. In the Central Marsh Region, intermediate marsh gives way to brackish vegetation. Saline marsh vegetation dominates the lower portion of the basin in the areas south of the Central Marsh Region (Chabreck and Linscombe 1988). Approximately 200 square miles of the basin converted to saltier marsh types between 1968 and 1978 (Chabreck and Linsombe 1982).

Marsh soils are generally high in organic content and contain varying amounts of mineral sediments. The location and distance from distributary streams, lakes, and other hydrologic features influence the mineral content of marsh soils. Wave energy and other erosional forces influence the natural deterioration of these soils.

FISH AND WILDLIFE RESOURCES

Barataria Basin wetlands consist of extensive marshes which are preferred habitat for most wildlife and waterfowl (Palmisano 1973). Freshwater finfishes, alligators, frogs, and turtles are abundant. Brackish marshes provide extensive nursery habitat for numerous economically important fish and shellfish, such as brown shrimp, white shrimp, blue crab, red drum, black drum, spotted seatrout, southern flounder, and gulf menhaden (Bahr et al. 1983).

Threatened and endangered species found in the Barataria Basin include the bald eagle, Arctic peregrine falcon, piping plover, brown pelican, green sea turtle, loggerhead sea turtle, and Kemp's ridley sea turtle. Wintering bald eagles utilize basin wetlands as foraging and nesting (five nests in 1991) habitat, usually constructing nests in cypress trees located near open water. Wintering Arctic peregrine falcons also utilize basin wetlands as foraging habitat. The piping plover commonly winters along Gulf of Mexico beaches. Brown pelicans forage along nearshore gulf waters and in the backbeach bays. In addition, Queen Bess Island supports a nesting colony of brown pelicans.

ECONOMIC RESOURCES

The economy of many communities in the basin is largely based upon oil and gas, and renewable biological resources. Oil and gas production and support industries in the basin are declining. Fishery harvests have increased, largely due to increased numbers of harvesters, each of which is harvesting less per man-hour than was harvested ten years ago. Fishery landings within the region of Bayou Lafourche and the Mississippi River were valued at $76,786,000 in 1989. Empire-Venice fishery landings were second in the nation for the years 1989 through 1991 and averaged 582 million pounds those years with a value of $46,300,000. Lafitte-Barataria and Grand Isle are in the top 50 locations in the nation for value of commercial fisheries, and Golden Meadow-Leeville for landings (National Marine

Table 1. Habitat Distribution in Barataria Basin[1]

Habitat	Fastlands (Acres)	Des Allemands (Acres)	Salvador (Acres)	Central (Acres)	L'Ours (Acres)	North Bay (Acres)	Grand Chenier (Acres)	Empire (Acres)	Bay (Acres)	Total (Acres)
Fresh marsh	9,600	38,830	104,330	19,760	40	100	130	520	10	173,320
Interm. marsh	50	0	5,530	36,430	0	14,970	0	2,510	0	59,490
Brackish marsh	720	0	0	14,740	5,470	62,640	11,310	5,580	2,260	102,720
Saline marsh	30	0	0	0	24,190	5,530	3,210	21,500	79,140	133,600
Subtotal marsh	10,400	38,830	109,860	70,930	29,700	83,240	14,650	30,110	81,410	469,130
Swamp	6,020	121,430	22,910	1,730	0	30	0	0	0	152,120
Other land	297,910	74,700	25,810	8,180	2,250	5,100	2,000	6,920	7,700	430,570
Aquatic vegetation[2]	770	2,010	6,540	4,890	0	670	70	1,680	250	16,880
Water	26,370	18,980	69,620	32,950	16,950	85,260	7,740	65,650	173,310	496,830
Total	341,470	255,950	234,740	118,680	48,900	174,300	24,460	104,360	262,670	1,565,530

[1] Data from USFWS GIS database (October 1993)
[2] Includes floating and submerged beds

Fisheries Service 1992). This region (Barataria through Breton Sound Basins) leads the state in harvest of mink fur and is second in raccoon production. Nutria, muskrat and otter are trapped also.

COASTAL WETLANDS PROBLEMS

Society's current methods for meeting navigation and flood control needs have artificially accelerated the delta lobe cycle of the Mississippi River. This basin was formerly in the maintenance phase but is now in the abandonment phase of the cycle (Coleman and Gagliano 1964). Rapid wetland loss likely will continue as long as these wetlands are deprived of the river sediments that built them and the spring floods that maintained them. Loss of riverine inputs is exacerbated by the shrinking of the barrier islands.

Within the Barataria Basin, annual wetland loss rates averaged nearly 5,700 acres per year between 1974 and 1990. During this period, the highest rates of loss occurred in the Grand Cheniere and Bay Regions. Table 2 provides a breakdown of the historic wetland losses in the Barataria Basin. The area of habitat loss in the basin since 1956 is delineated in Figure 2. Wetland loss within the Barataria Basin is attributed to a combination of natural and manmade causes, primarily due to the lack of sediments, subsidence, sea-level rise, erosion, herbivory, channelization, levee construction, and development.

Increasing tidal volume is a secondary effect contributing to the net cumulative wetland loss generated by these primary causes. As basin or subbasin tidal volume grows, related tidal exchange routes enlarge. When tidal pressure opens a new tidal route, erosional pressures on existing routes decrease and old channels may shallow where the flow has been captured.

Closing a tidal route will reduce erosion and may facilitate sedimentation in the blocked area, however, erosional pressures will increase elsewhere. Erosional pressures that were reduced by the opening of a new inlet will be re-exerted as tidal volume continues to grow. (O'Brien 1969; Walton and Adams 1976; Kaufman and Pilkey 1983; Howard 1985; Levin 1990; and Shamban and Moslow 1991).

"Relative sea-level rise" refers to changes in average water level relative to land surfaces as caused by both geologic subsidence and sea-level rise. Rates of relative sea-level rise range from 0.19 to 0.51 inches per year or 1.6 to 4.25 feet per century in the basin. This combined process results in increased flooding of wetlands and contributes to increased salinities (Ramsey and Penland 1989; Williams, Penland and Sallenger 1991, Hunt 1990).

If relative sea-level rise were not countered by the continual formation of new soil on the marsh surface, then these marshes would have deteriorated within decades of their creation by the river. Marsh soil formation in Louisiana is a vegetative growth process (Hatton et al. 1983, Nyman et al. 1993). Marsh plants put new roots just above the surface in response to flooding. Roots from one stem link up with roots from adjacent stems to form the new, more elevated marsh surface. Mineral sediments are not structurally important, but provide nutrients that promote healthy plant growth (DeLaune et al. 1981). Mineral sediments also appear essential in brackish and saline marsh soils to buffer sulfide toxicity (Nyman et al. 1990). Recent work suggests that 0.4 inches per year is the fastest that marshes can create new soil (Nyman et al. 1993).

Table 2. Historic Wetland Loss in Barataria Basin[1]

Subbasin	Time Period 1932-1958 Acres Lost	1932-1958 Percent per yr	1958-1974 Acres Lost	1958-1974 Percent per yr	1974-1983 Acres Lost	1974-1983 Percent per yr	1983-1990 Acres Lost	1983-1990 Percent per yr	Total Acres
DesAllemands	1,180[2]	0.02	1,180	0.04	4,270	0.16	1,850	0.09	8,480
Salvador	3,890[2]	0.08	8,450	0.25	4,580	0.25	2.190	0.16	19,110
Central	8,370[3]	0.40	11,920	0.73	3,070	0.38	3,940	0.65	27,300
L'Ours	1,870	0.16	6,620	0.93	3,530	1.04	2,530	1.05	14,550
North Bay	9,440	0.28	12,120	0.64	6,090	0.63	4,120	0.58	31,770
Grand Chenier	8,870	0.31	17,660	1.11	15,220	2.06	11,090	2.37	52,840
Empire	7,880	0.37	15,770	1.32	13,700	2.58	9,910	3.12	47,260
Bay	10,520	0.32	11,660	0.63	13,450	1.44	8,230	1.30	43,860
Total	52,020	0.32	85,380	0.81	63,910	1.2	43,860	1.15	245,170

[1] Data from USACE GIS Data Base (October 1993)
[2] Land Loss between 1935 and 1958
[3] Land Loss between 1939 and 1958

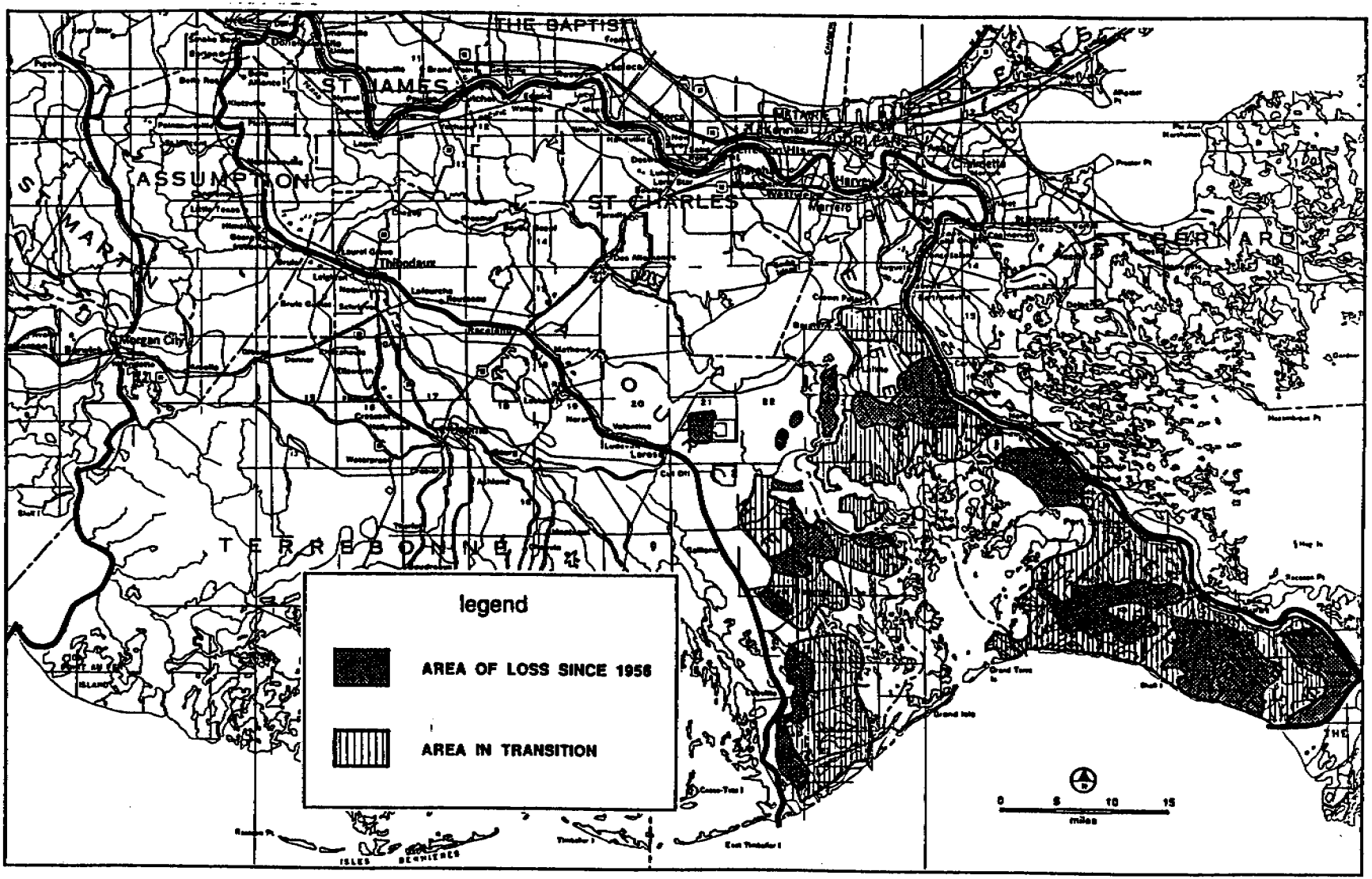

Figure 2. Primary areas of wetland habitat change in the Barataria Basin.

The barrier islands of the lower basin are an integral feature influencing hydrologic and wetland processes of the basin system. The islands, and their associated passes, affect the rate of tidal exchange, influencing freshwater retention and sediment transport. However, the barrier islands are deteriorating as a result of storm-caused erosion, subsidence, channel construction, and interruption of longshore sediment supply and drift (Kaufman and Pilkey 1983; Krawiec 1966; Levin 1990; McBride et al. 1991).

FUTURE WITHOUT-PROJECT CONDITIONS

WETLAND CHANGES

Predicted wetland loss over the next 20 and 50 years by subbasin is shown in Table 3. Without actions to correct the problems already discussed, another fifth of the basin's wetlands would be lost to open water by 2045. Losses would be concentrated in the North Bay, L'Ours, Bay and Empire Subbasins. Roughly 65 percent of the projected wetland loss--more than 100,000 acres--would occur in this portion of the basin. Barataria Bay would enlarge, absorbing adjacent waterbodies and its connection with the gulf would become substantially larger as barrier islands disappear. Marsh loss figures are based on extrapolation of historic losses provided by the USACE shown in Table 2 and from total acres of marsh shown in Table 1.

Table 3. Projected Marsh Loss in the Barataria Basin

Subbasin	Projected Loss at 20 Years		Projected Loss at 50 Years	
	Acres	Percent	Acres	Percent
DesAllemands	1,010	2.5	2,520	6.5
Salvador	4,610	4.2	11,540	10.5
Central	7,380	10.4	18,440	26.0
L'Ours	6,240	20.9	15,590	52.5
North Bay	10,160	12.2	25,390	30.5
Grande Cheniere	6,510	44.4	14,660	100.0
Empire	17,460	58.0	30,110	100.0
Bay	22,790	28.0	56,980	70.0
Total	76,160	16.6	175,230	38.0

As a result of the continued erosion of the barrier island chain, the tidal passes will enlarge and deepen, reducing the hydrologic benefits of the islands to the basin. Table 4 lists the central barrier islands of the basin and provides loss projections supplied by the USFWS and the USACE. An examination of a series of aerial photographs over the last 10 years indicates that Grand Pierre is accreting some land on the eastern side of the island; therefore, the projected date of disappearance may be delayed by more than a decade.

Table 4. Projected Size of Selected Barrier Islands

Island	Percent Loss 1956-1990	1990 Acres	2015 Acres	2045 Acres
West Grand Terre	34	567	431	247
East Grand Terre	36	670	246	0
Grand Pierre	75	137	0	0
Cheniere Ronquille	35	435	329	158

Moderate wetland losses would occur in the middle basin (Central Marsh and Salvador Subbasins), based on past wetland loss measurements. About 20 percent of the wetlands in this portion of the basin would be lost over the next 50 years. This is a very conservative estimate, because the intermediate to brackish marshes with low mineral matter content would be more likely to convert to open water than to saltier marsh types (Nyman et al. 1993) as they become exposed to advancing marine processes caused by marsh loss farther south.

Relatively minor wetland losses would occur in the upper basin (Des Allemands Subbasin) in the short term, as that region is most distant from tidal conditions and land masses are more stable. However, with continued sea-level rise and deterioration of land masses in the middle and lower regions of the basin, the upper basin will eventually be exposed to destructive conditions similar to those experienced in the basin's middle regions. About 8 percent of the wetlands in this portion of the basin would be lost over the next 50 years.

FISH AND WILDLIFE RESOURCES

The disappearance of wetlands throughout this basin means the loss of critical breeding, nesting, nursery, foraging, or overwintering habitat for economically important fish, shellfish, furbearers, migratory waterfowl, and alligators. Several endangered species would be further threatened. Loss of wetland habitat and the accompanying trend toward higher salinities typically leads to lower biodiversity and long-term productivity. The deterioration of the basin's wetlands causes an export of organic matter which in the near-term sustains a very productive estuarine fishery. However, as the wetlands increasingly change to open water, productivity of many fish and wildlife species will decline.

ECONOMIC RESOURCES

As fish and wildlife resources decline with the deterioration of wetlands, the commercial and recreational fishing industries in the basin would decline also. Concurrently, the supporting businesses (i.e., marinas, boat manufacturers, seafood processors, retailers, etc.) would suffer economic decline. The disappearance of the wetlands and the wildlife and fishery resources dependent on them would affect the economic structure of numerous communities in the lower and middle basin areas. In addition, the storm-buffering benefit the lower basin wetlands provide these communities would be reduced as wetland loss continues.

This loss would require the expansion of flood protection and drainage facilities for many basin communities, and maintenance costs would be increased for existing facilities.

PLAN FORMULATION

PLANNING OBJECTIVES FOR THE BASIN

Specific planning objectives were set for the Barataria Basin. These objectives were identified at public meetings and during the numerous plan formulation meetings. An objective was defined as the endpoint toward which efforts to address wetland problems are directed.

1) Restore fluvial (riverine) inputs of sediment and water to decrease salinities and preserve/create wetlands;
2) Maintain and restore central basin marshes;
3) Maintain and restore existing barrier islands to protect mainland marshes;
4) Maintain and restore fringe marshes; and
5) Reduce the tidal exchange between the upper and lower basin.

Because of the degree of wetland loss within this basin, it will not be sufficient just to "hold on to what we have" by reducing rates of wetland loss. The proximity of the Mississippi River provides on opportunity to create new wetlands to offset regional losses. Therefore, each of these objectives is considered a key objective.

STRATEGIES CONSIDERED

Strategies are general approaches toward achieving various basin objectives. The basic overall plan for this basin is to implement short-term strategies that will preserve the existing wetlands until long-term strategies can be implemented. Strategies 1 through 4, shown in Figure 3, are considered the most important or key strategies to reverse or offset wetland loss and consist of both short and long-term projects. The remaining short-term strategies address a specific problem or opportunity. Barataria Basin strategies are:

1) Introduce and manage fresh water and sediment to lower salinity and preserve/create marsh;
2) Improve hydrology in the central basin and fringing marshes to slow or reverse the trend of saltwater invasion;
3) Stabilize and restore those barrier islands which have the greatest impact on tidal prism;
4) Reduce tidal exchange by construction of an internal set of barrier islands between upper and lower basins;
5) Create marsh with dredged material;
6) Stabilize shorelines to preserve marsh;
7) Improve hydrology in areas of the basin not covered in strategy 2; and
8) Stabilize the other barrier islands to preserve mainland marshes and provide a storm barrier.

STRATEGY 1--INTRODUCE AND MANAGE FRESH WATER

This strategy supports Objective 1 and consists of projects that introduce and manage fresh water and sediments into the basin in both the long and short term. The major short-term freshwater diversion is from the Mississippi River into the Davis Pond area near the

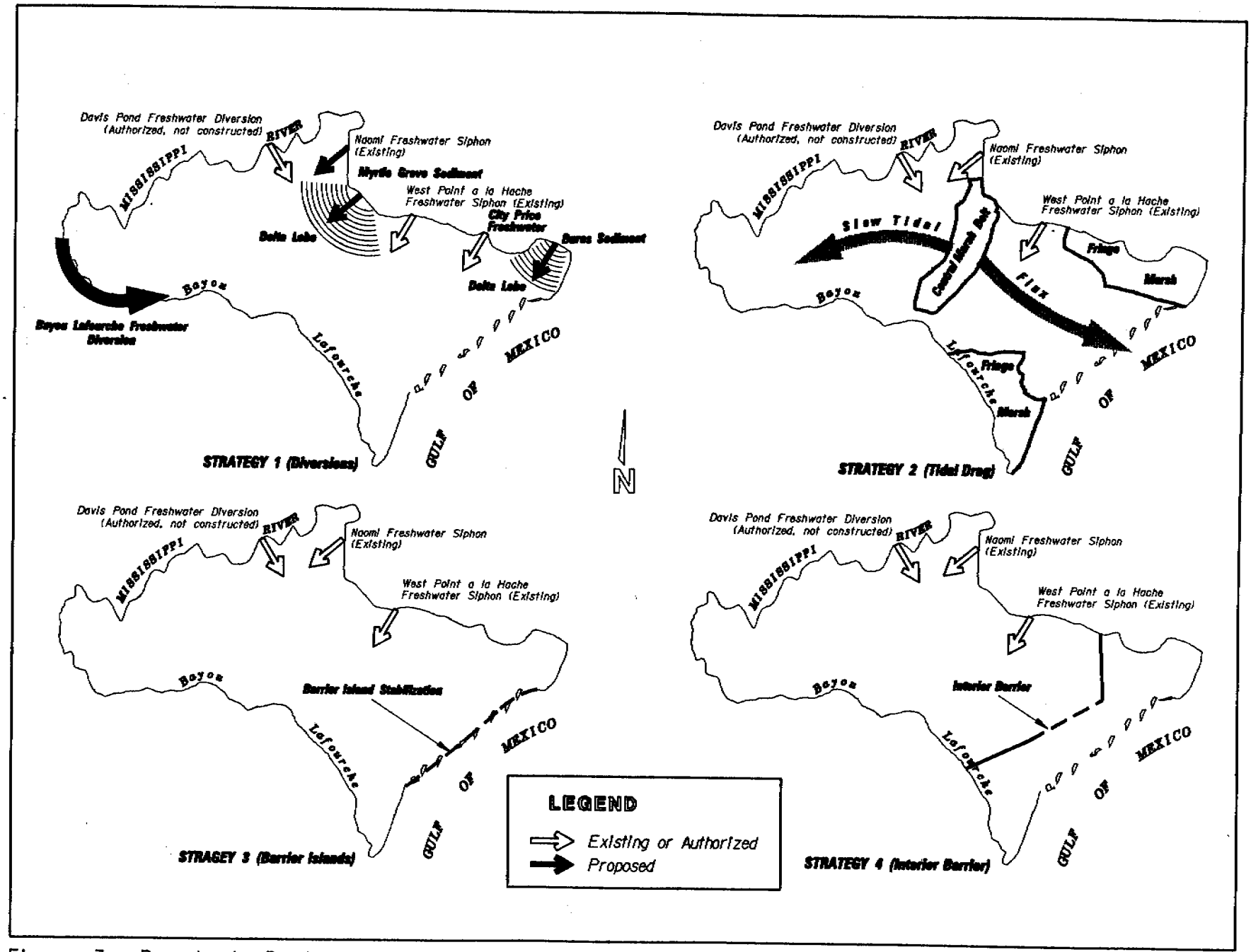

Figure 3. Barataria Basin, Key Strategies.

head of the basin. From there the water, nutrients and some sediments flow through most of the remainder of the basin. The plan calls for managing this freshwater to increase its retention time in the marshes. The possibility of enriching the fresh water flow with sediments dredged from the river will be considered in the long term. At least two sediment diversions, Buras and Myrtle Grove, are proposed in the future for the eastern side of the basin. Reconnecting Bayou Lafourche and constructing small diversions into both the Barataria and Terrebonne Basins would provide much needed fresh water and nutrients to the western side of the basin. Numerous small diversions from the Mississippi River are proposed with locations ranging from near the head of the basin into swamp areas to saline marshes near the southern boundary.

Management of the diversion outfalls would extend freshwater retention, aid in sediment deposition, and accelerate wetland creation. Principal areas for outfall management include the Salvador and Central Marsh Subbasins (Davis Pond Diversion), the fringe marshes along the Mississippi River (the existing Naomi and West Point a la Hache or other small diversions) and the L'Ours Subbasin (Bayou Lafourche Diversion).

STRATEGY 2--IMPROVE HYDROLOGY IN THE CENTRAL BASIN AND FRINGING MARSHES

This strategy, a short-term strategy which supports Objective 5, reduces tidal exchange in the basin by reinforcing the existing band of marsh between the upper and lower basins. This area runs from the L'Ours Ridge across the Central Marsh Subbasin to connect with the eastern side of the basin above Myrtle Grove. Hydrology of the fringing marshes has been altered by man-made canals in the L'Ours and Grande Cheniere Subbasins. Restoration to conditions more like the historical flow pattern is needed to reduce tidal amplitude and slow saltwater intrusion.

STRATEGY 3--STABILIZE AND RESTORE CRITICAL BARRIER ISLANDS

Strategy 3, a short-term strategy which supports Objective 3, stabilizes and maintains the existing barrier islands by pumping material from the Gulf of Mexico to build marshes. These islands, located near the center of the barrier chain, protect marshes from gulf waves and storm-generated tides. In the future, the necessity of using breakwaters or jetties on the gulf side of the barrier islands will be considered. Restoration of the islands--East and West Grand Terre, Grand Pierre, and Cheniere Ronquille--that control the major tidal exchange points is considered critical.

STRATEGY 4--CONSTRUCTION OF AN INTERIOR SET OF BARRIER ISLANDS

Strategy 4 supports Objective 2. This strategy consists of an interior set of artificial barrier islands extending laterally into the basin from the natural ridge of Bayou Lafourche and the Mississippi River and flanking the existing marshes of the Central Marsh Subbasin. The western barrier would extend from Bayou Lafourche along the Bayou L'Ours Ridge to the Gulf of Mexico. The eastern barrier would follow the right descending bank of Bayou Grande Cheniere. Additional barriers or breakwaters may be necessary to partially close the gap between the two protected areas. Such barriers would protect interior marshes from storm surge, provide resistance to tidal exchange that would be lost as the outer natural barrier island chain deteriorates, slow saltwater intrusion to the upper reaches of the basin and

reduce sediment export. This is presently an expensive strategy, but is presented for possible future consideration. If construction costs decrease or benefits increase, creation of artificial barriers may become more feasible. A feasibility study on methods to reduce costs and to better evaluate benefits of barrier islands to interior marshes is among a number of studies the CWPPRA Task Force is considering for initiation in 1994.

STRATEGY 5--CREATE MARSH WITH DREDGED MATERIAL

This is a short-term strategy that takes advantage of sediments which accumulate and are periodically removed from navigation channels and material from dredging new canals. All material dredged from or near wetland areas should be used to create, restore or nourish marshes to help offset the high rate of marsh loss. To make this strategy more effective, techniques of dredging, pumping and disposal should be developed which maximize land building capabilities. This strategy is categorized as supporting even though specific projects relate to Objectives 2, 3, or 4.

STRATEGY 6--STABILIZE BANKS TO PRESERVE MARSH

Another short-term strategy, this supports objectives 2 through 4, and consists of defensive projects, such as shoreline protection, at sites where loss of the slightly elevated shoreline rim would subject the interior marsh to rapid erosion. Many of the flotant marshes in the Des Allemands and Salvador Subbasins, bordering the GIWW and lakes, need some type of shoreline protection. Also included in this strategy is the shoreline protection of the barrier islands by construction of breakwaters or jetties. This is considered a supporting strategy.

STRATEGY 7--IMPROVE HYDROLOGY IN AREAS NOT COVERED IN STRATEGY 2

Strategy 7 complements Strategy 2 and Objective 5 but deals with areas within the basin which are not covered by the former strategy. Hydrologic restoration in fresh/intermediate marshes in the Des Allemands and Salvador Subbasins and brackish and saline marshes in the North Bay and Bay Subbasins are included in this strategy. This is considered a supporting strategy.

STRATEGY 8--STABILIZE OTHER BARRIER ISLANDS

Strategy 8 supports Objective 3. This strategy extends barrier island restoration to the islands on either side of the basin which, though less critical to the management of tidal exchange, play an important role in the protection of marshes. This is considered a supporting strategy.

RATIONALE FOR SELECTED PLAN

In the strategies presented above, Strategies 3 and 4 are mutually exclusive. Restoration and maintenance of the existing barrier islands (Strategy 3) will preclude the necessity of constructing the internal set of barriers. The existing barrier islands serve as the key buffers for the central marshes by suppressing rates of storm-related erosion, slowing sediment export, and reducing water surges and saltwater intrusion. This strategy supports the natural system and efficiently employs short-term projects that address hydrodynamic modification by marsh restoration with dredged material on the bay side of barrier islands.

Strategy 4 provides a more defensive method of protection of the central marshes. This fallback strategy of creating interior barrier islands is an uncertain and higher risk option and abandons the natural system. Also, even though this strategy would provide increased protection to the marshes landward of the barrier, those seaward marshes would deteriorate more rapidly when exposed to the extreme forces of the open gulf after the disappearance of the existing barrier islands. This would be contrary to the overall objectives to create, restore, protect, and enhance wetlands. Therefore, Strategy 3 is selected for the plan for the Barataria Basin.

Figure 4 summarizes the basin strategies, which are dominated by freshwater and sediment diversion and outfall management (Strategy 1), hydrologic restoration (Strategies 2 and 7), barrier island restoration (Strategies 3 and 8) and supporting strategies of marsh creation (Strategy 5) and shoreline protection (Strategy 6).

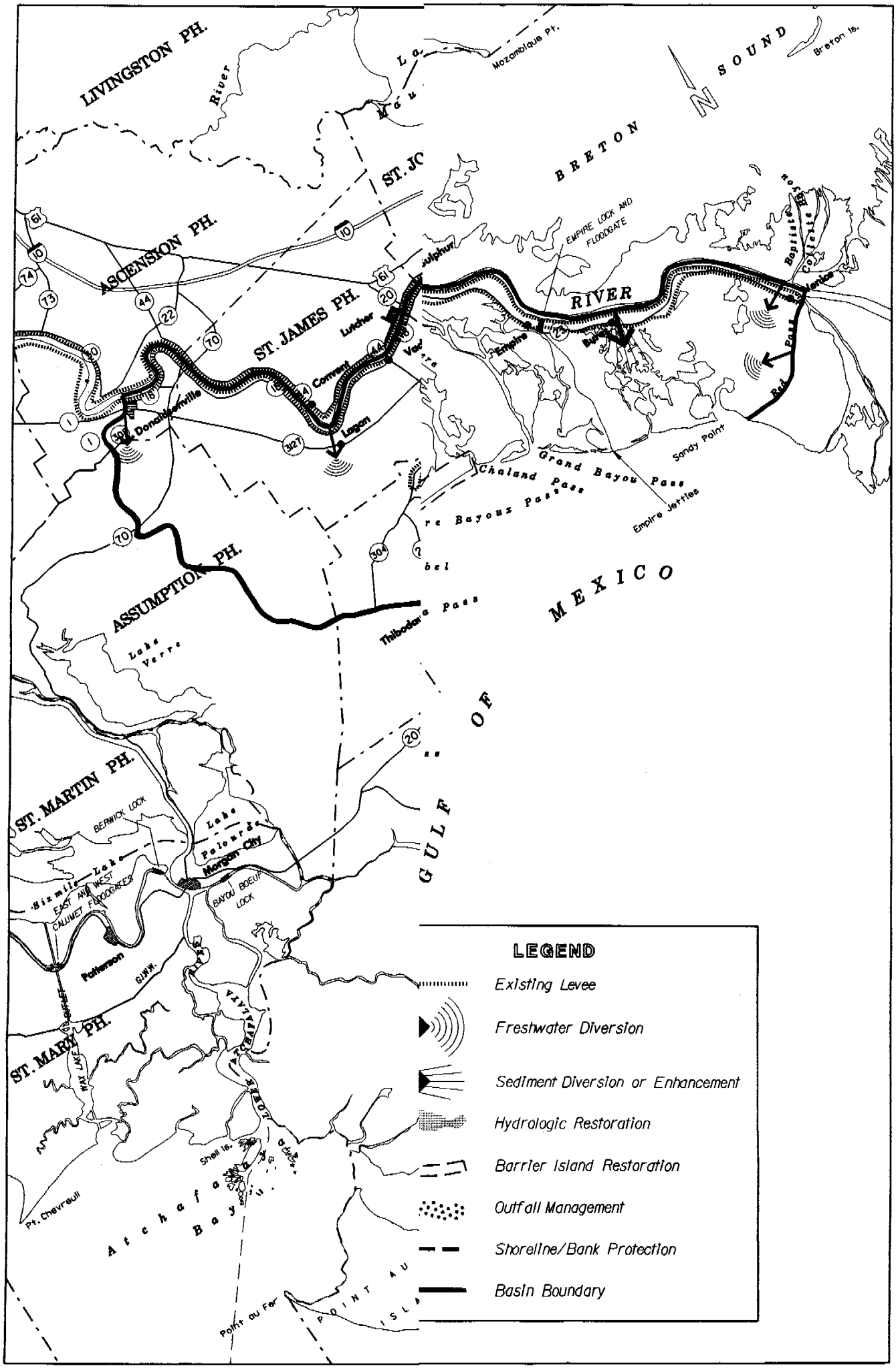

Figure 4. Barataria Basin, Strateg

IMPLEMENTATION OF THE SELECTED PLAN

COMPONENT PROJECTS

All project proposals for the Barataria Basin that were received by the CWPPRA Task Force are listed in Table 5. This table indicates project type, size, cost, and acres benefitted; it also shows which projects already have been selected as part of the restoration plan. The table classifies each project as critical or supporting according to the category of strategy it executes. Projects are further classified by time frame for implementation--short term or long term. Comments on the table show that 12 projects were not selected because they duplicate other projects, and nine projects are not included in the final plan because they are not appropriate for CWPPRA since creation or preservation of vegetated wetlands is not their main objective. Figure 5 shows the location of projects that are selected as part of the restoration plan, and the following chapter describes each selected project in detail.

Projects listed as part of the selected plan have been recommended by the public and participating agencies based on current knowledge of existing conditions, and within time constraints of the planning process. Additional projects can be recommended in the future for incorporation in the Barataria Basin Plan as additional information is developed and problems and needs change (see the Implementation section of the Main Report).

DEVELOPMENT OF BENEFITS AND COSTS

The benefits for most of the projects listed in Table 5 and described in the following chapter were estimated according to a modified rapid-assessment Wetland Value Assessment (WVA) protocol. The estimates are based, in part, on project-specific information which varied in quality and quantity among projects. The estimates are therefore rough approximations considered preliminary to a more in-depth assessment, and should be interpreted and used as such. Information for shoreline erosion and marsh creation projects tends to be site-specific, and is more likely to be accurate. Benefits for hydrologic restoration and marsh management projects often are more generic and thus less accurate. Projects that are on the first three Priority Project Lists have had complete WVA analysis.

Cost estimates for all projects were done according to a generic CWPPRA cost formula which includes the construction cost plus 12.5 percent for engineering and design; 11.5 percent for supervision and administration; and 25 percent for contingencies; plus monitoring, and operation and maintenance for 20 years.

Projects on the first three Priority Project Lists received a more rigorous and detailed cost estimate. In some cases, projects that are still largely conceptual or only preliminarily designed received gross cost estimates with no multipliers applied.

PRIORITY LIST PROJECTS

Four projects in Barataria Basin are included in the first (1991) Priority Project List. Fourchon Hydrologic Restoration (BA-18) in Lafourche Parish will restore approximately 44 acres and prevent the loss of 106 acres of saline marsh in a 2,000-acre impoundment. The Barataria Bay Waterway Wetland Creation project (BA-19) is located in Jefferson Parish and would create about 445 acres of marsh over 20 years using maintenance dredged material.

GIWW to Clovelly Hydrologic Restoration (BA-2), located in Lafourche Parish, covers 60,000 acres and involves the largest area of all projects in the three lists. In addition to the above three projects, U.S. Highway 90 Hydrologic Restoration (BA-6), which consists of 40,000 acres and is in Lafourche Parish, was placed on the deferred list. This means that construction funds, if not applied to other PPL1 projects, would be available for implementation of BA-6.

The Jonathan Davis Wetlands Protection project (PBA-35), located in Jefferson Parish, is the only project in Barataria Basin on PPL2. This project involves the stabilization and restoration of 46,000 feet of bank to protect 4,500 acres within a 7,200-acre area.

The most recent PPL includes a demonstration project in St. Charles Parish to test the effectiveness of a total of 22,200 feet of various types of wave breaks for Lake Salvador Shoreline Protection (BA-15). West Pointe a la Hache Outfall Management (BA-4C), located in Plaquemines Parish, will benefit 1,930 acres by directing the flow and managing retention time of the existing diversion. The Restoration of Bayou Perot/Rigolettes Peninsula (XBA-65A) in Jefferson Parish will prolong the life of about 3,800 acres of marsh. Completion of these projects (excluding the deferred project, BA-6) will create, restore, or protect 9,600 acres of wetlands and will benefit 10,830 acres at a fully funded cost of $18,735,000.

CRITICAL SHORT-TERM PROJECTS

Critical projects are those which implement key strategies of the plan and which are vital to basin protection and restoration, regardless of whether they can be implemented immediately or only in the long term. Critical short-term projects are those which need immediate action and for which sufficient information exists to support implementation. Critical short-term projects in the Barataria Basin Plan are listed below. An * indicates projects that have been funded.

*	BA-1A	Davis Pond Freshwater Diversion
	BA-3C	Naomi (La Reussite) Diversion Outfall Management
*	BA-4C	West Pointe a la Hache Diversion Outfall Management
	XBA-1A	West Grand Terre Sediment Replenishment
	XBA-1B	East Grand Terre Sediment Replenishment
	XBA-1C	Grand Pierre Island Sediment Replenishment
	XBA-1D	Cheniere Ronquille Sediment Replenishment
	XBA-54	Bayou Grande Cheniere Subbasin Hydrologic Restoration

CRITICAL LONG-TERM PROJECTS

Critical long-term projects are those which must be deferred until other projects are successfully implemented, or which require significant additional information or research and development before they can be implemented. Some of these long-term projects are only conceptual at this time, and, using currently available technologies, would be very expensive to implement. Their future feasibility will be determined, in part, by the outcome of feasibility studies and demonstrations which will be conducted in the short term to develop alternate methodologies and evaluate resource availability and distribution.

BA-1B	Davis Pond Outfall Management, Phase I
BA-3B	Naomi (La Reussite) Diversion Siphon Enlargement

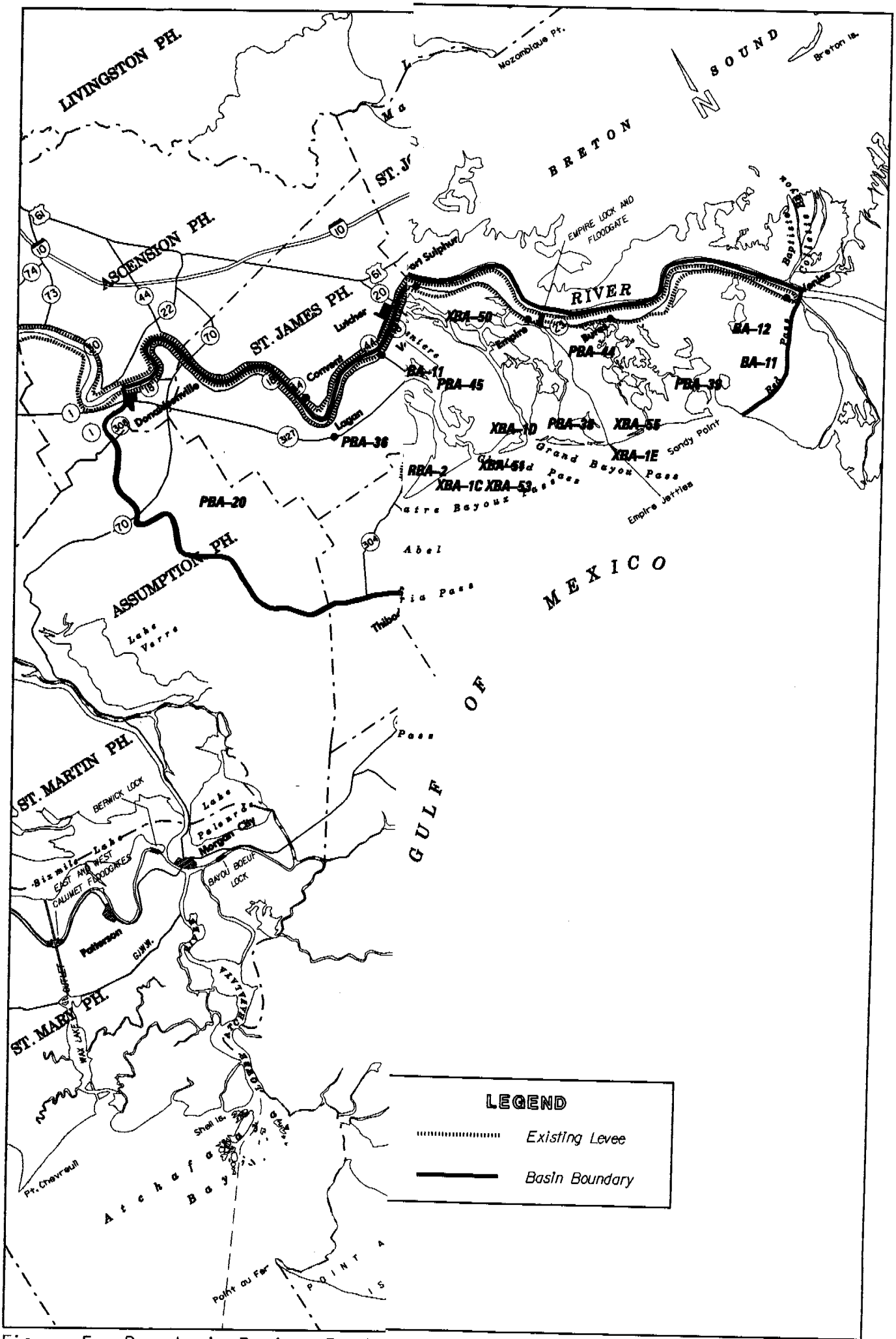

Figure 5. Barataria Basin, Proje

Table 5. Summary of the Barataria Bain Projects

Project No.	Project Name	Project Type	Priority List Project	Acres Created, Restored, or Protected	Net Benefited Acres	Estimated Cost ($)	Cost per Benefited Acre ($/Ac)	Comments
Critical Projects, Short-Term								
BA-1a	Davis Pond Freshwater Diversion	FD		* 32,220	32,220	26,696,000	800	Authorized USACE project (20 yr cost & Benefits)
BA-3c	Naomi (La Reussite) Diversion Outfall Management	OM		840	1,640	1,428,000	900	
BA-4c	West Pointe a la Hache Diversion Outfall Management	OM	PPL3	1,090	2,450	677,000	300	
XBA-1a	West Grand Terre Sediment Replenishment	BI		440	450	7,934,000	17,600	
XBA-1b	East Grand Terre Sediment Replenishment	BI		380	400	7,441,000	18,600	
XBA-1c	Grand Pierre Island Sediment Replenishment	BI		80	180	3,300,000	18,300	See XBA-53
XBA-1d	Cheniere Ronquille Sediment Replenishment	BI		180	190	2,368,000	12,500	
XBA-54	Bayou Grande Cheniere Subbasin Hydrological Restoration	HR		2,480	7,750	1,344,000	200	
Subtotal: Critical Projects, Short-Term				5,490	13,060	24,492,000		Costs & benefits do not include Davis Pond
Critical Projects, Long-Term								
BA-1b	Davis Pond Diversion Outfall Management, Phase 1	OM						Implement after diversion construction
BA-3b	Naomi (La Reussite) Diversion Siphon Enlargement	FD						On hold
BA-4b	West Pointe a la Hache Diversion Siphon Enlargement	FD						On hold
BA-10	Davis Pond Diversion Outfall Management, Phase II	OM		580	1,610	6,525,000	4,100	
BA-11	Tiger/Red Pass Diversion and Outfall Management	OM		800	1,360	5,321,000	3,900	
BA-12	Grand/Spanish Pass Diversion	FD						
BA-13	Hero Canal Freshwater Diversion	FD		350	350	9,510,000	27,200	
BA-17a	City Price Freshwater Diversion (Happy Jack)	FD		50	150	1,806,000	12,000	Probably will be two diversions
BA-17b	City Price Freshwater Diversion (Homeplace)	FD		1,130	1,270	3,094,000	2,400	Probably will be two diversions
PBA-18	Sediment Diversion at Hero Canal	SD						Supports BA-13
PBA-20	Freshwater Diversion to Bayou Lafourche	FD			300,000	1,500,000,000	5,000	
PBA-21	Route Diversion Outfalls to Area N. of The Pen	OM						
PBA-32	Hydrologic Restoration of Marshes Southeast of Leeville	HR						
PBA-36	Lagan Diversion	FD						
PBA-37	Bayou Des Allemands Diversion	FD						
PBA-44	Sediment Diversion at Buras	SD						
PBA-48a	Myrtle Grove Sediment Diversion Facility	SD						
PBA-48b	Myrtle Grove Outfall Management, Areas 1 thru 5	OM						
XBA-63	Central Basin Tidal Drag Enhancement	HR		24,130	74,470	16,782,000	200	
XBA-67b	Siphoned Sediment Enrichment of Davis Pond Diversion	SD						
XBA-67c	Siphoned Sediment Enrichment of Naomi Diversion	SD						
XBA-67d	Siphoned Sediment Enrichment of W Pointe a la Hache Diversion	SD						

Table 5. Summary of the Barataria Basin Projects (Continued)

Project No.	Project Name	Project Type	Priority List Project		Acres Created, Restored, or Protected	Net Benefited Acres	Estimated Cost ($)	Cost per Benefited Acre ($/Ac)	Comments
Supporting Projects, Short-Term									
BA-2	GIWW to Clovelly Hydrologic Restoration	HR	PPL 1		8,630	16,980	6,285,000	400	Permitted, active
BA-6	U.S. Highway 90 to GIWW Hydrologic Restoration	HR			1,620	6,360	4,583,000	700	Deferred from PPL 1
BA-7	Couba Island Shoreline Protection	SP			250	300	752,000	2,500	
BA-8	Lake Cataouatche Shoreline Protection	SP			20	70	376,000	5,400	
BA-9	Salvador WMA Gulf Canal Shoreline Protection	SP			40	60	844,000	12,060	
BA-14	Little Lake Marsh Management	MM			270	670	1,112,000	1,700	
BA-16	Bayou Segnette Wetland Protection	HR			90	90	1,106,000	12,300	
BA-18	Fourchon Wetland Restoration	HM	PPL 1		160	380	187,000	500	Partially completed by port
BA-19	Barataria Bay Waterway Marsh Building	MC	PPL 1		450	470	1,125,000	2,400	
PBA-11	Shoreline Protection on Grand Bayou with Tire Breakwater	SP			10	10	576,000	57,600	
PBA-12	BBW Shoreline Protection Below Bayou Rigolettes	SP			140	190	1,762,000	9,300	
PBA-16	The Pen Shoreline Protection	SP			60	110	2,324,000	21,100	
PBA-34	Hydrologic Restoration of Bayou L'Ours Ridge	HR			780	2,780	2,327,000	800	
PBA-35	Jonathan Davis Wetland Restoration	HR	PPL 2		510	1,580	2,796,000	1,800	
PBA-38	Shell Island Sediment Replenishment	BI		**	510	640	22,060,000	34,500	Included in XBA-1e, river sediments, not in total
PBA-39	Sandy Point Barrier Island Sediment Replenishment	BI			600	620	17,264,000	27,800	River sediments
PBA-58	Little Lake Oil and Gas Field Canal Closures	HR			580	1,130	1,193,000	1,100	
PBA-60	Barataria Drainage Pump Outfall Management	OM			20	90	97,000	1,100	Part of PBA-35 and XBA-63
PBA-61	Southeast Lake Salvador Hydrologic Restoration	HR			690	1,660	10,690,000	6,400	
PBA-66	Bara Bar Channel Maintenance Disposal on West Grand Terre	BI			160	160	3,027,000	18,900	
XBA-1e	Shell Island to Empire Jetties Sediment Replenishment	BI			510	530	15,296,000	28,900	Overlaps PBA-38, bay sediments
XBA-1f	Bay Champagne Gulf Shore Sediment Replenishment	SP			290	290	1,798,000	6,200	
XBA-51	Marsh Creation in Canals Between Passes La Mer and Chaland	MC			230	260	7,800,000	30,000	
XBA-65a	Restore Perot Peninsula Marsh, Spray Dredge	MC	PPL 3		1,070	1,480	1,658,000	1,100	
XBA-70	Dupre Cut & Bayou Dupont Shoreline Protection	SP			200	710	3,930,000	5,500	
Subtotal: Supporting Projects, Short-Term					17,380	36,980	88,908,000		

Table 5. Summary of the Barataria Basin Projects (Continued)

Project No.	Project Name	Project Type	Priority List Project	Acres Created, Restored, or Protected	Net Benefited Acres	Estimated Cost ($)	Cost per Benefited Acre ($/Ac)	Comments
Supporting Projects, Long-Term								
PBA-42	U.S. Highway 90 Drainage Improvements	HR						
PBA-45	Hydrologic Management of Grand Bayou	HR						
XBA-1a1	West Grand Terre Detached Breakwaters	SP			90	5,121,000	56,900	
XBA-1b1	East Grand Terre Detached Breakwaters	SP			600	4,481,000	7,500	
XBA-1c1	Grand Pierre Island Detached Breakwaters	SP			110	1,440,000	13,100	
XBA-1d1	Cheniere Ronquille Detached Breakwaters	SP			80	2,881,000	36,000	
XBA-1e1	Shell Island to Sandy Point Detached Breakwaters	SP			110	18,252,000	165,900	
XBA-49	Hydrologic Restoration of Marshes South of Clovelly	HR						
XBA-52	Grand Isle Jetty or Detached Breakwaters	BI						
XBA-53	Grand Pierre Jetty	BI		10	30	576,000	19,200	See XBA-1c
XBA-55	Jetty Modifications at Empire Waterway	SP		80	130	4,315,000	33,200	
XBA-56	Jetty Modifications at Belle Pass	SP		10	30	4,315,000	143,800	
XBA-62a	Northern Perot Peninsula Shoreline Protection	SP		480	480	9,367,000	19,500	
XBA-62b	Southern Perot Peninsula Shoreline Protection	SP		270	270	11,439,000	42,400	
Demonstration Projects								
BA-15	Lake Salvador Shoreline Protection	SP	PPL 3	180	1,190	1,258,000	1,100	
PBA-50	Oyster Reef Demonstration in Rambo Bay	SP		5	5	374,000	74,800	
XBA-50	Nairn Wetland Creation	MC		220	280	13,629,000	48,700	
XBA-67a	Dredged Sediment Enrichment of Davis Pond Diversion	SD						
Total Barataria Basin ***				23,050	51,230	114,658,000		
Total Barataria Basin with Davis Pond Freshwater Diversion ***				55,270	83,450	141,354,000		

Table 5. Summary of the Barataria Basin Projects (Continued)

Project No.	Project Name	Project Type	Priority List Project	Acres Created, Restored, or Protected	Net Benefited Acres	Estimated Cost ($)	Cost per Benefited Acre ($/Ac)	Comments
Projects not in Plan								
BA-5	Queen Bess Island Habitat Restoration	BI		20	40	175,100	4,400	Constructed
PBA-3	Marsh Creation With Material from Grand Isle Marina	MC						Not in plan
PBA-1	Barrier Island Nourishment, Belle Pass to Sandy Point	BI						Divided into smaller projects
PBA-2	West Grand Terre to Cheniere Ronquille Restoration	BI						Divided into smaller projects
PBA-4	Dredge Bayou Dupont to Create Marsh	MC						Increases tidal amplitude
PBA-5	Fort Livingston Dedicated Dredging	SP						Primary objective not wetlands
PBA-6	Baie du Cabanage to Bayou des Allemands Shoreline Protection	SP						Covered under BA-15 or BA-16
PBA-7	Shoreline Protection for Lake Salvador at Segnette WW	SP						Same as BA-16
PBA-8	Shoreline Protection of Bayou Lafourche at GIWW	SP						Primary objective not wetlands
PBA-9	Shoreline Protection Larose to Leeville	SP						Primary objective not wetlands
PBA-10	Shoreline Protection Baie du Cabanage	SP						Same as BA-15
PBA-13	Shoreline Protection GIWW at Crown Point	SP						Primary objective not wetlands
PBA-14	Shoreline Protection Wherever Marsh Destruction	SP						Subsumed by specific projects
PBA-15	Shoreline Protection of GIWW at Fleming Canal	SP						Primary objective not wetlands
PBA-17	Shoreline Protection, Barataria Bay Waterway at Lafitte	SP						Primary objective not wetlands
PBA-19	Cataouatche Pump Outfall Treatment	OM						Primary objective not wetlands
PBA-22	Hydrologic Management to Reduce Tidal Flushing	HR						Combined With PBA-46
PBA-23	Deepen & Widen B. Lafourche, Construct Locks	HR						Primary objective not wetlands
PBA-24	Outfall Management of Davis Pond	OM						Same As BA-10
PBA-25	Lake Salvador Watershed Management	HR						Same As BA-16
PBA-26	Lock on BBW, Gates at Caminada Pass	HR						Technology not developed
PBA-27	Replace Canal Plug off Scofield Bayou	HR						Included In XBA-1E
PBA-28	Construct Low Levees Along Canals	HR						Included In PBA-46
PBA-29	Manage Area Between The Pen and Hero Canal	MM						Supports BA-3C and BA-13
PBA-30	Manage Area North of B.Traverse Between BBW and MR	MM						Included In BA-3C
PBA-31	Bayous Oies & Dupont Shoreline Protection with dredged	SP						Covered under PBA-16 and XBA-70
PBA-33	Barrier Restoration Near Bayou L'Ours	HR						Same As PBA 34

Table 5. Summary of the Barataria Basin Projects (Continued)

Project No.	Project Name	Project Type	Priority List Project	Acres Created, Restored, or Protected	Net Benefited Acres	Estimated Cost ($)	Cost per Benefited Acre ($/Ac)	Comments
PBA-40	Fort Livingston Beach Nourishment	SP						Similar to PBA-5
PBA-41	Marsh Creation by Dredging Bayou Rigolettes	MC						Increases tidal amplitude
PBA-43	Hydrologic Management of Bayou Rigolettes	HR						Included in PBA-46
PBA-46	Central Marsh Interior Barriers	HR						Alternative B
PBA-47	Dedicated Dredging to Restore Marshes	MC						Increases tidal amplitude
PBA-49	Maintain Marshes South of Myrtle Grove	MM						Same area as PBA-48
XBA-65b	Marsh Restoration Between Bayou Perot and Bayou Rigolettes	MC			780	2689000	1,100	Same area as XBA-65a
XBA-68	Spoil Impoundment Restoration at Fourchon	HM						Same as BA-18
XBA-69	Stabilize or Refurbish Grand Pierre Island	BI						Same as XBA-1C

BI Barrier Island Restoration
FD Freshwater Divesion
HM Hydrologic Management of Impoundments
HR Hydrologic Restoration
MC Marsh Creation
MM Marsh Management
OM Outfall Management
SD Sediment Diversion
SP Shoreline or Bank Protection

* Cost and benefits for BA-1a, Davis Pond Freshwater Diversion, reflect a 20 year project life.

** Project PBA-38 overlaps with project XBA-1e, however, different construction techniques are used. PBA-38 is not included in the totals.

*** Total cost and benefits for the basin plan include only those for Critical Short-Term Projects and Supporting Short-Term Projects (BA-15 Demonstration included).

BA-4B	West Pointe a la Hache Diversion Siphon Enlargement
BA-10	Davis Pond Diversion Outfall Management, Phase II
BA-11	Tiger/Red Pass Diversion and Outfall Management
BA-12	Grand/Spanish Pass Diversion
BA-13	Hero Canal Freshwater Diversion
BA-17A	Happy Jack Freshwater Diversion
BA-17B	Homeplace Freshwater Diversion
PBA-18	Sediment Diversion at Hero Canal
PBA-20	Freshwater Diversion to Bayou Lafourche
PBA-21	Route Diversion Outfalls to Area North of the Pen
PBA-32	Marsh Management Southeast of Leeville
PBA-36	Lagan Freshwater Diversion
PBA-37	Bayou Des Allemands Freshwater Diversion
PBA-44	Buras Sediment Diversion
PBA-48A	Myrtle Grove Sediment Diversion
PBA-48B	Myrtle Grove Outfall Management
XBA-63	Central Basin Tidal Drag Enhancement
XBA-67B	Siphoned Sediment Enrichment of Davis Pond Diversion
XBA-67C	Siphoned Sediment Enrichment of Naomi Diversion
XBA-67D	Siphoned Sediment Enrichment of West Pointe a la Hache Diversion

SUPPORTING SHORT-TERM PROJECTS

Supporting projects are those that would contribute to wetland protection, but do not address key strategies. They usually address local situations, and are reviewed to assure that they are consistent with the overall strategies and do not conflict with critical projects. Short-term supporting projects have sufficient information and implementation potential to fulfill needs for immediate action, and they could be proposed for consideration on upcoming CWPPRA priority lists. Most short-term projects are associated with Strategies 2, 5, 6, and 7 and are listed below. An * indicates projects that have been funded.

*	BA-2	GIWW to Clovelly Hydrologic Restoration
	BA-6	U.S. Highway 90 to GIWW Hydrologic Restoration
	BA-7	Couba Island Shoreline Protection
	BA-8	Lake Cataouatche Shore Protection
	BA-9	Salvador Wildlife Management Area Gulf Canal Shoreline Protection
	BA-14	Little Lake Marsh Management
	BA-16	Bayou Segnette Wetland Protection
*	BA-18	Fourchon Hydrologic Restoration
*	BA-19	Barataria Bay Waterway Marsh Building
	PBA-11	Shoreline Protection on Grand Bayou with Tire Breakwater
	PBA-12	Barataria Bay Waterway Shoreline Protection Below Bayou Rigolettes
	PBA-16	The Pen Shoreline Protection
	PBA-34	Hydrologic Restoration of Bayou L'Ours Ridge
*	PBA-35	Jonathan Davis Wetland Restoration
	PBA-38	Shell Island Sediment Replenishment

	PBA-39	Sandy Point Barrier Island Sediment Replenishment
	PBA-58	Little Lake Oil and Gas Field Canal Closures
	PBA-60	Barataria Drainage Pump Outfall Management
	PBA-61	Southeast Lake Salvador Hydrologic Restoration
	PBA-66	Marsh Creation with BBW Dredged Material on West Grand Terre
	XBA-1E	Shell Island to Empire Jetties Sediment Replenishment
	XBA-1F	Bay Champagne Gulf Shore Sediment Replenishment
	XBA-51	Marsh Creation in Canals Between Passes La Mer and Chaland
*	XBA-65A	Restore and Maintain Perot Peninsula Marsh
	XBA-70	Dupre Cut and Bayou Dupont Shoreline Protection

SUPPORTING LONG-TERM PROJECTS

Long-term supporting projects are those which are not ready to be proposed for CWPPRA evaluation and possible funding at this time. Some projects require additional study and development and will not be ready for detailed evaluation for funding for several years. Others could not be considered in detail until 1) implementation of a project, e.g., outfall management after the diversion is operational; 2) decisions are made regarding other projects, e.g., construction of breakwaters may preclude the need for a jetty or 3) substantial additional information is available from major studies or demonstration projects. Projects in this category are listed below.

	PBA-42	U.S. Highway 90 Drainage Improvements
	PBA-45	Hydrologic Management of Grand Bayou
	XBA-1A1	West Grand Terre Detached Breakwaters
	XBA-1B1	East Grand Terre Detached Breakwaters
	XBA-1C1	Grand Pierre Island Detached Breakwaters
	XBA-1D1	Cheniere Ronquille Detached Breakwaters
	XBA-1E1	Shell Island to Sandy Point Detached Breakwaters
	XBA-49	Hydrologic Restoration of Marshes South of Clovelly
	XBA-52	Grand Isle Jetty or Detached Breakwaters
	XBA-53	Grand Pierre Jetty
	XBA-55	Jetty Modifications at Empire Waterway
	XBA-56	Jetty Modifications at Belle Pass
	XBA-62A	Northern Perot Peninsula Shoreline Protection
	XBA-62B	Southern Perot Peninsula Shoreline Protection

DEMONSTRATION PROJECTS

Demonstration projects especially proposed for the Barataria Basin, but applicable to other basins as well, are listed below. Additional demonstration and pilot projects will be developed in the future, especially to address techniques to carry out the critical strategies of sediment diversion and barrier island projects. Demonstration projects may be added to the basin plan and would be elegible for future project lists. An * indicates projects that have been funded.

*	BA-15	Lake Salvador Shoreline Protection
	PBA-50	Oyster Reef Demonstration in Rambo Bay

XBA-50 Nairn Wetland Creation
XBA-67A Dredged Sediment Enrichment of Davis Pond Diversion

Project BA-15 addresses the high priority problem of shoreline erosion in an area with unconsolidated or deep, soft mud bottoms. Typical bulkheads or riprap for protection usually fail or sink into the substrate. New types of structural measures or varied alignments of typical structures will be tested in this funded (PPL3) demonstration project. PBA-50 consists of wire mesh containers stocked with live oysters which provide protection for brackish shorelines and also contribute oyster shell to strengthen the marsh/water interface.

XBA-50 is a proposed method to transport sediments mined from the Mississippi River to a nearby subsided area. Sediments would be deposited to elevations that support marsh vegetation. If this technology proves feasible, it could be used wherever there is a sediment source and an area needing restoration. XBA-67A is another proposed method to distribute additional sediments via an existing freshwater diversion to marshes in the outfall area.

COSTS AND BENEFITS OF THE SELECTED PLAN

Table 6 summarizes the wetland benefits and costs over the next 20 years of the short-term projects proposed in the Barataria Basin Selected Plan and in the Davis Pond Freshwater Diversion. The Davis Pond Freshwater Diversion will preserve 83,000 acres over 50 years at a cost of $68.8 million. However, to be comparable to the CWPPRA projects, benefits and costs for 20 years (32,220 acres and $26,696,000) were used for the Davis Pond Freshwater Diversion.

The selected plan uses a combination of measures to achieve basin objectives. Hydrologic restoration (77 percent), outfall management (8 percent), and barrier island restoration (6 percent) account for the majority of acres preserved or created. Shoreline protection, marsh creation with dredged materials, and marsh management comprise only 6 percent of the acres saved in short-term projects.

In the Des Allemands Subbasin, no direct benefits are achieved because there are no selected plan short-term projects and Davis Pond Freshwater Diversion is located south of the subbasin. However, this area will indirectly benefit from plan implementation because significant portions of the seaward subbasins will be restored or maintained, thus providing a continued barrier to the inland progression of marine influence.

Implementation of the short term projects in the Salvador Subbasin would prevent 28 percent of the predicted loss. In the Central Marsh Subbasin, implementation of already-funded projects BA-2, PBA-35, and XBA-65A, plus the deferred project BA-6, would result in predicted marsh enhancement of 177 percent. When predicted Davis Pond Freshwater Diversion benefits are added to the Salvador and Central Marsh Subbasins, marsh enhancement increases to 337 and 281 percent, respectively. The CWPPRA costs are $39,889,000.

Plan implementation would prevent 12, 13 and 55 percent of the predicted loss in the L'Ours, North Bay and Grande Cheniere Subbasins. The projects located in this mid-basin area are designed to protect wetlands against tidal and erosive forces. Adding Davis Pond Freshwater Diversion benefits to the North Bay Subbasin prevents 75 percent of the predicted loss. The CWPPRA costs for this area are $8,344,000.

Table 6. Estimated Benefits and Costs of Barataria Basin Selected Plan Projects

Subbasin	CWPPRA			Davis Pond		Total	
	Net Acres Protected, Created, or Restored	Cost x 1000 ($)	Percent Loss Prevented	Net Acres Protected, Created, or Restored	Cost x 1000 ($)	Net Acres Protected, Created, or Restored	Percent Loss Prevented
Des Allemands	0	0	0	0		0	0
Salvador	1,270	15,026	28	14,280		15,550	337
Central Marshes	13,090	24,863	177	7,640		20,730	281
L'Ours	780	2,327	12	0		780	12
North Bay	1,300	3,430	13	6,310		7,610	75
Grande Cheniere	3,580	2,587	55	0		3,580	55
Empire	1,110	32,560	5	0		1,110	7
Bay	1,920	33,865	8	3,990		5,910	23
Total	23,050	114,658	30	32,220	26,696	55,270	73

The lower basin marshes and barrier islands which comprise the Empire and Bay Subbasins are projected to undergo the greatest losses. Plan implementation would only reduce the losses in these areas by 5 and 8 percent, respectively. Davis Pond Freshwater Diversion would prevent the loss of an additional 23 percent of wetlands in the Bay Subbasin. The CWPPRA costs are $66,425,000.

For a total expenditure on selected plan projects of $114,658,000 over the next 20 years, 30 percent of predicted loss in the entire Barataria Basin would be prevented. Benefits from Davis Pond Freshwater Diversion increases the predicted amount of marsh saved to 73 percent, including gains in two subbasins.

KEY ISSUES IN PLANNING

Traditional marsh-management projects which involve active water level management are likely to restrict access for estuarine-dependent organisms and interfere with re-establishment of natural pathways of water and sediment distribution. Habitat composition and functional characteristics may be different in managed marshes, and there is uncertainty as to their success in increasing marsh acreage. Some opposition to these projects exists on the grounds that they do not promote long-term sustainable marsh ecosystems as opposed to projects which achieve a more natural hydrologic environment. Others believe such projects are the only practical choice in many severely damaged areas; and that with proper design and implementation, marsh management can reduce saltwater intrusion and tidal scour, and partially restore natural hydrology and promote freshwater retention and sediment deposition. The USFWS is conducting an ongoing study of marsh management intended to address some of the issues identified above. In addition, the USACE is preparing a programmatic EIS on marsh management to evaluate the existing evidence on these issues.

Freshwater and sediment diversions from the Mississippi River are major proposals for several basins and must be coordinated so these vital resources are used in the most effective manner. The Feasibility Study scheduled to start in 1994 addresses this coordination. The Comprehensive Coastal Management Plan for the Barataria-Terrebonne National Estuary Program is in progress and also must be coordinated in the long-term planning for the basin.

All projects in the selected plan must be consistent with flood protection for the residential, commercial and industrial developments in the basin. The components of the selected plan also must support vital economic activities in this basin such as navigation, ports, oil and gas activities, and fisheries. Relocations of people and property must be minimized. Real estate concerns about ownership of project sites and public access to these sites once CWPPRA projects are built must be addressed.

The cost of short term critical projects in the selected plan, not including the Davis Pond Freshwater Diversion, is over $24 million. Supporting short term projects cost nearly $90 million. Additional authorization and funding other than CWPPRA will be required to implement all the projects, especially the long term critical projects.

PROJECT DESCRIPTIONS

CRITICAL SHORT-TERM PROJECTS

BA-1A DAVIS POND FRESHWATER DIVERSION

Location.

The Davis Pond Freshwater Diversion Structure will be located on the west bank of the Mississippi River west of New Orleans at river mile 118 above head of passes (AHP). The diversion is located in St Charles Parish (Figures 4, 5 and 6).

Problems and Opportunities.

Leveeing the Mississippi River and damming Bayou Lafourche virtually eliminated all significant flow of freshwater to the basin (other than precipitation runoff). One of the major requirements for maintaining and enhancing the existing ecological framework of the basin is the reintroduction of adequate volumes of freshwater, nutrients, and sediment to counter saltwater intrusion, sediment export, and subsidence. This project is one of the major offensive strategies designed to reverse the land loss rates in the Barataria Basin. Project XBA-67A describes methods to enrich the sediment load transported into the basin by this diversion. Projects BA-10 and BA-1B describe management of the diversion outfall.

Description.

The Davis Pond Freshwater Diversion Structure would route water from the Mississippi River near Luling through an outflow channel, into a ponding area (Davis Pond), over a shoreline ridge into Lake Cataouatche, and then into the lower Barataria Basin. Approximately 10,600 cfs would be diverted during normal high water stages in the river. The water will be discharged through an outfall channel into a 10,000-acre marsh area where much of the sediment load is expected to be retained. From the marsh, the water will flow across a low weir into Lake Cataouatche and subsequently into Lake Salvador and the lower Barataria Basin.

Benefits and Costs.

This diversion will indirectly benefit approximately 65 percent of the basin. Over 83,000 acres of marsh are expected to be preserved by the diversion over a 50-year period. This project, a portion of the Mississippi Delta Region Project, will cost $68,800,000 which is authorized by the Flood Control Act of 1965, Public Law 89-298 (House Document Number 308, 88th Congress, 1st Session).

Effects and Issues.

The project will optimize salinity conditions for fish and wildlife, particularly fur bearers, waterfowl, and oysters, and will maintain and enhance the existing ecological framework of the basin by providing nutrients and sediments to help offset subsidence in the

vegetated wetlands. By reversing the trend of increasing salinities in the lower Barataria Basin, some oyster leases will be displaced southerly into historical oyster producing areas.

Status.

Funding will be shared 70/30 percent between the Federal government and the State of Louisiana. Planning of the project is nearly complete and operation is scheduled for 2001.

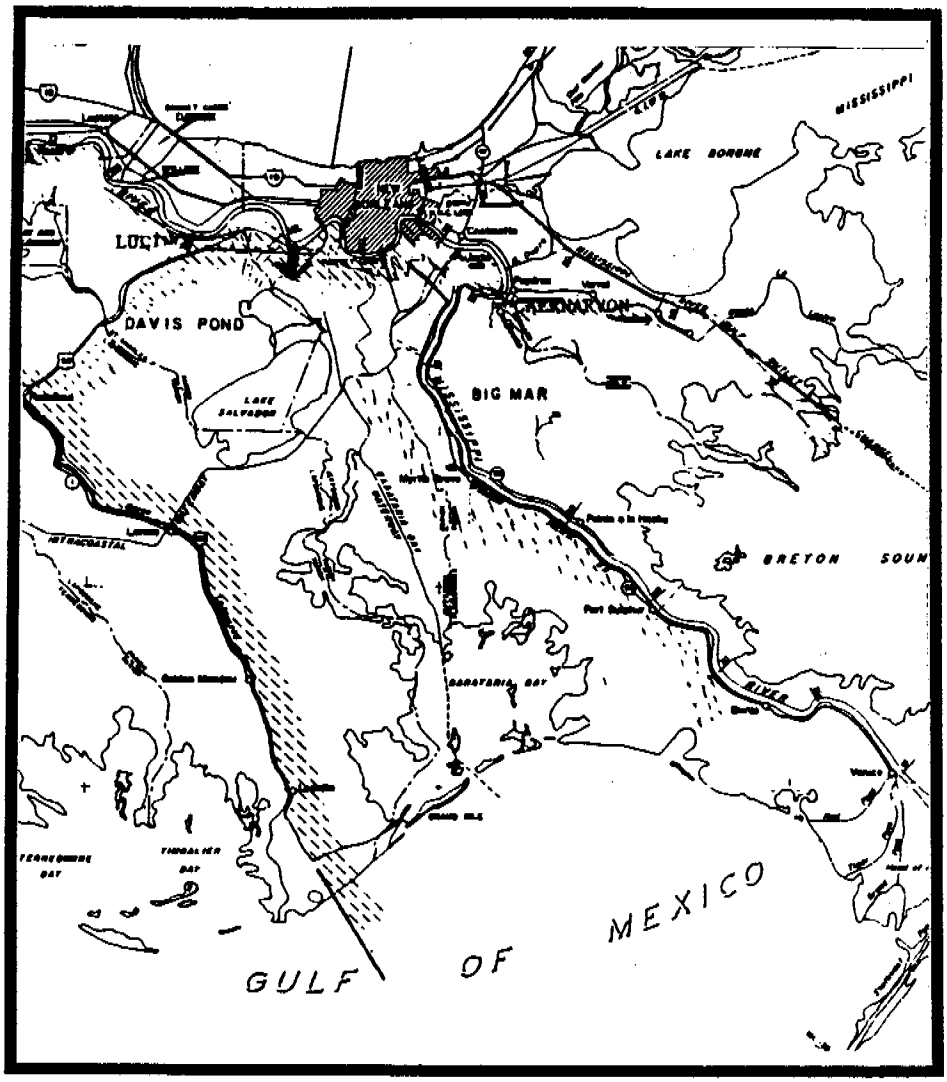

Figure 6. BA-1A Davis Pond Freshwater Diversion

BA-3C NAOMI (LA REUSSITE) DIVERSION OUTFALL MANAGEMENT

Location.

The existing freshwater diversion siphons are near the community of Naomi in Plaquemines Parish (Figure 7). The outfall area encompasses approximately 8,200 acres.

Problems and Opportunities.

The objective of the existing diversion is to provide supplemental freshwater, nutrients, and mineral sediments from the Mississippi River to marshes near the siphon. Marshes in the area have become increasingly subject to deterioration, and many shallow ponds have developed. Outfall management will increase the benefits of the project by increasing freshwater and sediment retention in project area marshes.

Description of Features.

As proposed, the outfall management area will be designed to receive a diversion of about 2,400 cfs during spring-flood flow of the Mississippi River. The plan calls for maintenance of a continuous bank line along the Pen and Bayou Dupont to force discharges southward where wetland deterioration is most severe, and the gaping of other spoil banks to facilitate dispersion and movement of the diverted water through the marsh.

Benefits and Costs.

Site-specific WVA analyses were not undertaken for this project. However, it is estimated that approximately 840 acres of marsh would be protected and 420 acres enhanced by project implementation. In addition, coverage by submerged aquatic vegetation is estimated to increase on approximately 380 acres. The total area estimated to be benefitted by this project is 1,640 acres. The gross cost estimate for this project is $1,428,000.

Effects and Issues.

Management would slow dispersion of diverted water through a number of canals to the Barataria Bay Waterway and would enhance freshwater and sediment retention.

Maintaining small boat access will be an issue.

Status.

The project is being designed for the existing flow capacity. A feasibility study must be done to finalize the plan and determine methods to increase benefits and reduce costs.

BA-4C WEST POINT A LA HACHE DIVERSION OUTFALL MANAGEMENT

Location.

The existing freshwater diversion siphon is located in Plaquemines Parish immediately upstream from the ferry landing in the town of West Pointe a la Hache (Figure 8). The outfall area encompasses approximately 9,200 acres.

Problems and Opportunities.

The diversion siphon at this site was constructed in 1992 and is operational. However, there is no management of the fresh water diverted into the project area. Diverted water and sediment from the diversion rapidly flows from the project area via Grand Bayou. Strategic placement of canal plugs and water control structures would retain fresh water and sediments within the project area for a longer period of time.

Description of Features.

Two rock weirs with boat bays, one water control structure with four 48-inch flapgated culverts,and one earthen plug would be installed across project area channels to slow and divert water into marshes. In addition, a 3.5-mile long area would be planted with California bulrush. The plan calls for controlling normal water exchange across the Bayou Grande Cheniere ridge.

Benefits and Costs.

Site-specific WVA analyses undertaken for this project estimate that project implementation will protect 1,090 acres of marsh and benefit coverage of aquatic vegetation on 1,360 acres. The total area estimated to be benefitted by this project is 2,450 acres. The fully funded cost for this project is $677,000.

Effects and Issues.

Implementation will slow dispersion of diverted water through a number of canals to the Barataria Bay Waterway and would enhance freshwater and sediment retention.

Small boat access to project area wetlands must be maintained.

Status.

This project was selected for funding on PPL 3. Detailed feasibility analyses are being done to finalize plan components.

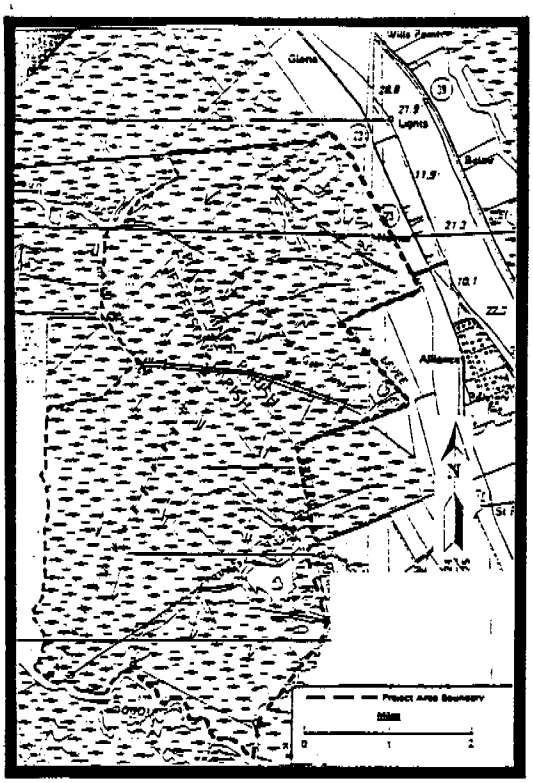

Figure 7. BA-3C Naomi (La Reussite) Diversion Outfall Management

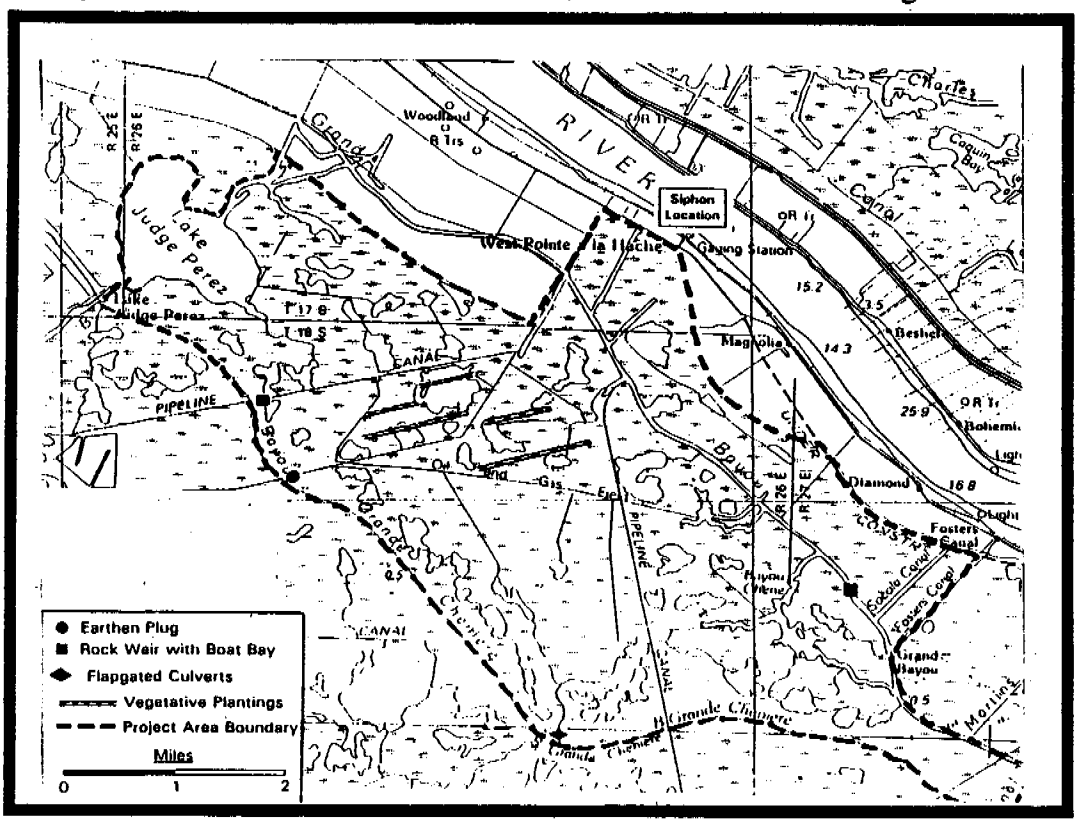

Figure 8. BA-4C West Point a La Hache Diversion Outfall Management

XBA-1A WEST GRAND TERRE SEDIMENT REPLENISHMENT

Location.

West Grand Terre (Figure 9) is the first island immediately east of the Barataria Bay Waterway and Grand Isle. This island is located at approximately 29° 16' latitude and 89° 56' longitude.

Problems and Opportunities.

Data from the USACE and the USFWS indicate that the acreage of the island has decreased steadily between 1932 and 1990. It has been projected that the island will disappear around the year 2087, assuming continuation of the historical marsh loss rate of 6.2 acres per year.

Description of Features.

Approximately 350 acres of shallow water habitat in the bay on the northeastern shore of the island would be filled with dredged material to an initial height of +3 to +4 ft NGVD. This area is expected to subside to marsh surface elevations within a few months after deposition.

Benefits and Costs.

Site-specific WVA analyses were not undertaken for this project. However, it is estimated that approximately 350 acres of marsh would be created, 90 acres protected from wave erosion, and an additional 10 acres enhanced by project implementation. The gross cost estimate for this project is $7,934,000.

Effects and Issues.

The island will be stabilized against wash over, breaching, and bay-side erosion, thereby increasing island longevity. The effects of hydrodynamic drag on tidal exchange will be increased for a short term and maintained for a longer period, thereby helping to reduce interior-basin saltwater intrusion, erosion, and sediment export.

The project will temporarily increase turbidity and suspended sediment loads in waters adjacent to the project area. This may result in temporary impacts to oyster leases near West Grand Terre Island.

The location of the borrow site must be chosen carefully to avoid interrupting longshore sediment drift or increasing wave erosion on beaches north of the borrow pit.

Projects involving Barataria Bay barrier islands should be designed in conjunction of each other and, if possible, constructed concurrently to reduce costs. These islands also should be considered for periodic replenishment as dredged material becomes available.

If monitoring indicates that the marsh built on this island erodes quickly, a future project to construct an artificial dune on the island should be considered.

Status.

This project is a candidate for future priority lists. A feasibility study must be done to finalize the plan and determine methods to reduce costs and increase benefits.

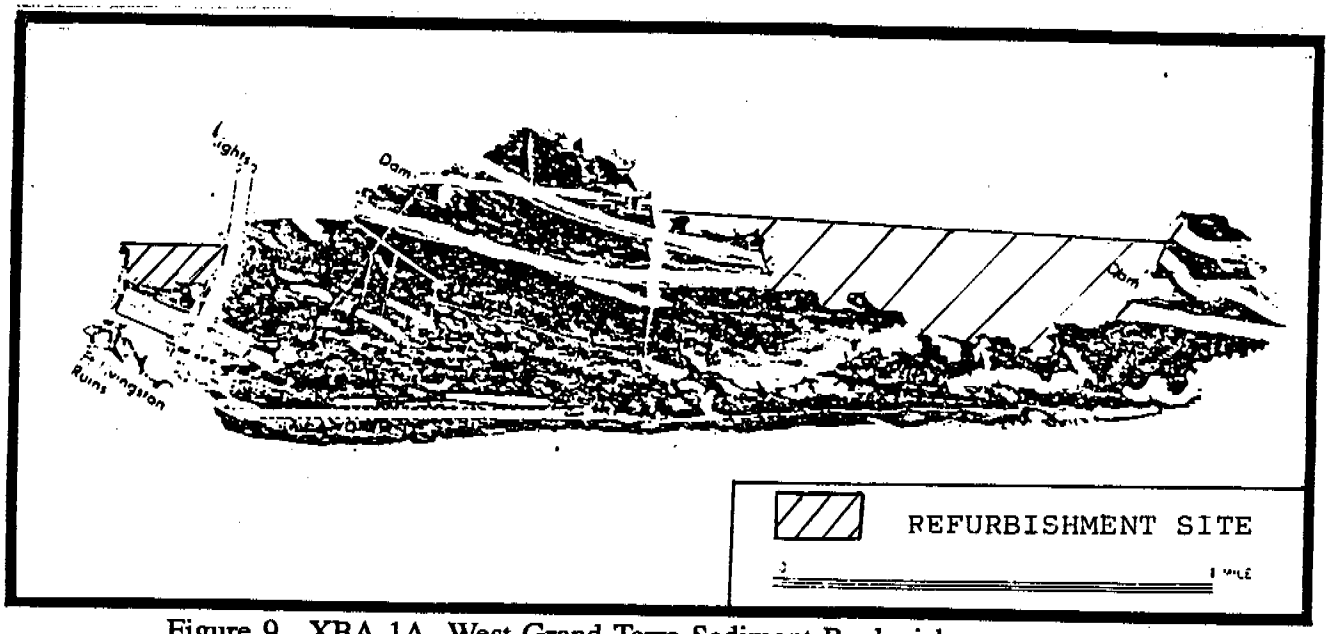

Figure 9. XBA-1A West Grand Terre Sediment Replenishment

XBA-1B EAST GRAND TERRE SEDIMENT REPLENISHMENT

Location.

The island of East Grand Terre (Figure 10) is located approximately 6 miles northeast of Grand Isle and 2 miles west of Cheniere Ronquille in Plaquemines Parish. The island is located at approximately 29° 18' latitude, 89° 52' longitude.

Problems and Opportunities.

Data from the USACE and the USFWS show that the sub-aerial acreage of the island has decreased steadily between 1932 and 1990. It has been projected that the island will disappear in the year 2031, assuming continuation of the same historical land loss rate of 15.3 acres per year.

Description of Features.

Approximately 320 acres of shallow water in Bay Melville and Bay Dispute will be filled with dredged material to an initial elevation of +3 to +4 ft NGVD. Spoil is expected to subside to marsh elevation within a few months after deposition.

Benefits and Costs.

Site-specific WVA analyses were not undertaken for this project. However, it is estimated that approximately 320 acres of marsh will be created, 60 acres of marsh protected from wave erosion, and 20 acres will be enhanced, by project implementation. The gross cost estimate for this project is $7,441,000.

Effects and Issues.

Similar to XBA-1A above.

Status.

This project is part of the Restoration Plan and a candidate for future priority lists. A feasibility study must be done to finalize the plan.

XBA-1C GRAND PIERRE ISLAND SEDIMENT REPLENISHMENT

Location.

Grand Pierre Island (Figure 11) is located between Quatre Bayoux Pass and Pass Ronquille at approximately 29° 19' latitude and 89° 50' longitude.

Problems and Opportunities.

Data from aerial photographs show that the island has fluctuated in acreage between 1978 and 1990 and now appears relatively stable. Every year, an unknown quantity of sand passes southwesterly off the ends of Cheniere Ronquille and Grand Pierre Island via longshore transport. Due to increasing ebbtide flow through Quatre Bayoux Pass, some of this sand is flushed offshore and out of the longshore drift, away from Grand Pierre. The best use of the sediment would be to retain the sediment on Grand Pierre, rather than allowing it to be deflected into the deeper gulf waters by the ebb tides from Quatre Bayoux Pass.

Description of Features.

Fill dredged from open water areas adjacent to the island would be used to raise the elevations of the island crest to +6 ft NGVD. Dredged material also would be used to create marsh surface elevations in a shallow bay on the east side of Grand Pierre Island and in a shallow water area north of the island.

Benefits and Costs.

Detailed WVA analyses on this project estimate that 80 acres of marsh would be created with dredged material and an additional 100 acres of marsh would benefit from spoil deposition. The estimated cost for the project is $3,300,000.

Effects and Issues.

Similar to XBA-1A above.

Status.

This project was a candidate for the PPL3. Although not selected for funding, it is a candidate for future priority project lists. A feasibility study must be done to finalize the plan and determine methods to reduce costs and increase benefits.

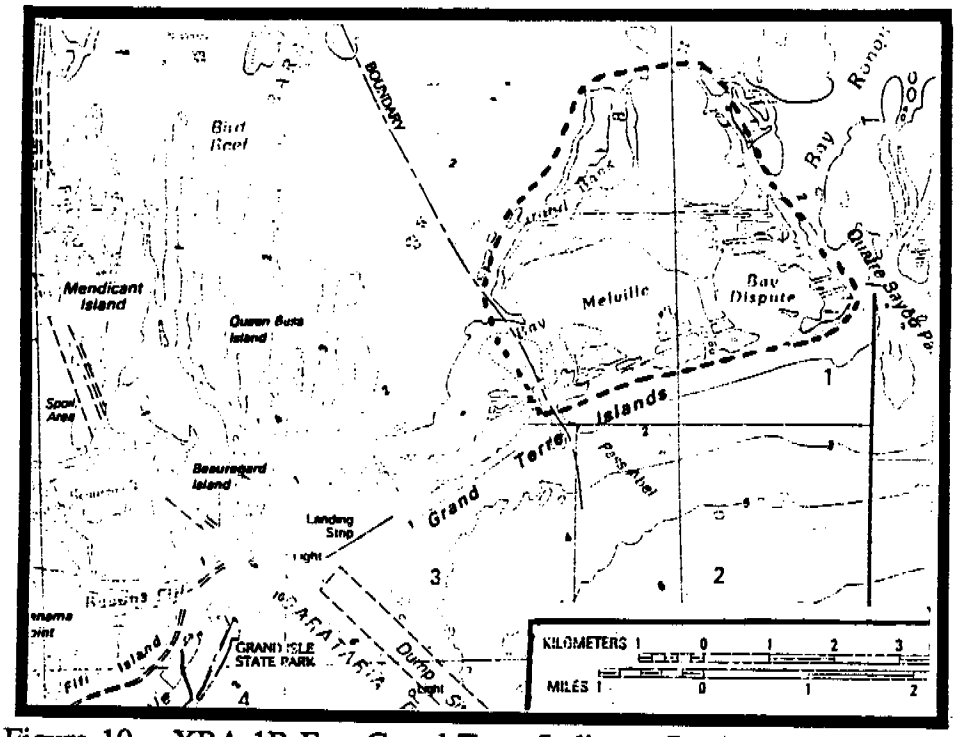

Figure 10. XBA-1B East Grand Terre Sediment Replenishment

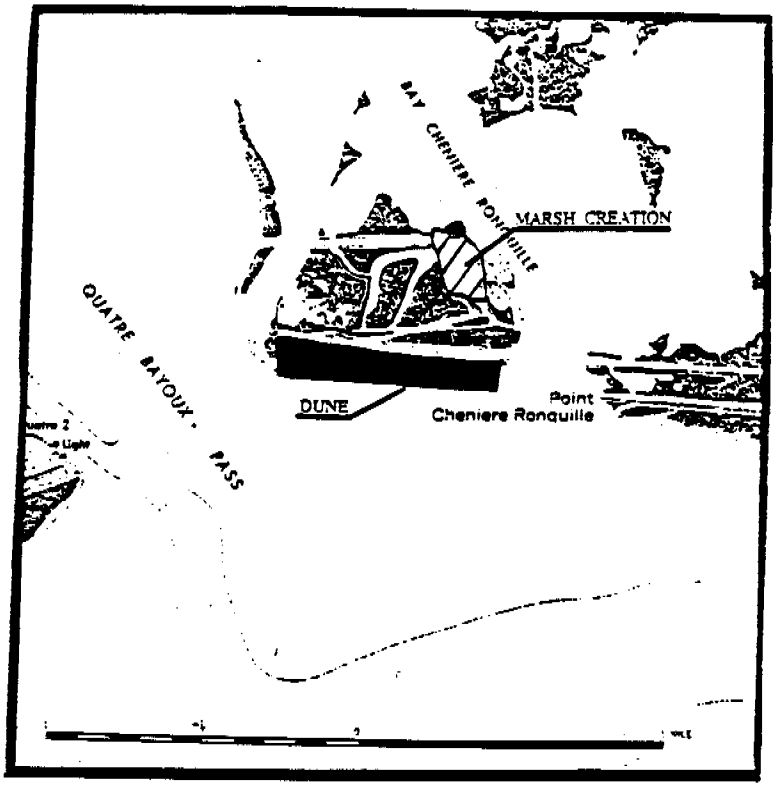

Figure 11. XBA-1C Grand Pierre Island Sediment Replenishment

XBA-1D CHENIERE RONQUILLE SEDIMENT REPLENISHMENT

Location.

Cheniere Ronquille (Figure 12) is located between Pass Ronquille and Pass la Mer, at approximately 29° 19' latitude and 89° 49' longitude.

Problems and Opportunities.

Data from the USACE and the USFWS show that the acreage of the island has decreased between 1932 and 1990. It has been projected that the island will disappear near the year 2073, assuming the island continues to disappear at the historical loss rate of 5.7 acres per year.

Description of Features.

Approximately 100 acres of shallow water in the bay north of Cheniere Ronquille will be filled with dredged material to an initial elevation of +3 to +4 ft NGVD. Spoil is expected to subside to marsh elevation within a few months after deposition.

Benefits and Costs.

Site-specific WVA analyses were not undertaken for this project. However, it is estimated that approximately 100 acres of marsh will be created, 80 acres protected and 10 acres enhanced by project implementation. The total area benefitted by this project is 190 acres. The gross cost estimate for this project is $2,368,000.

Effects and Issues.

Similar to XBA-1A above.

Status.

This project is a candidate for future priority lists. A feasibility study must be done to finalize the plan and determine methods to reduce costs and increase benefits.

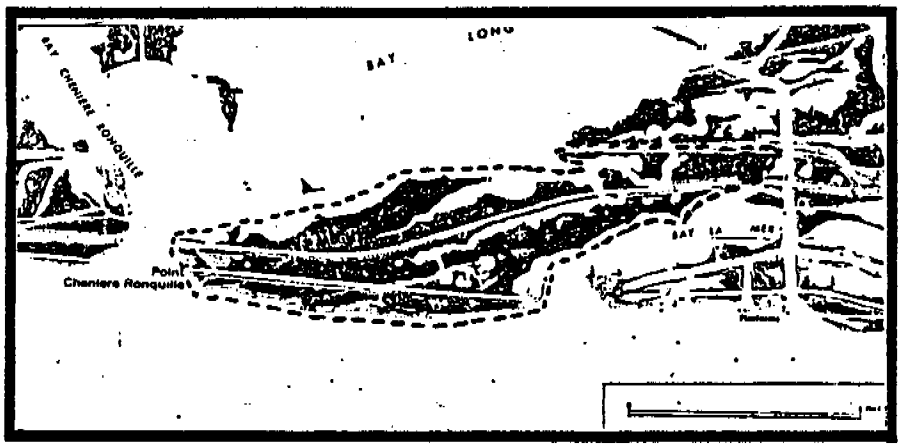

Figure 12. XBA-1D Cheniere Ronquille Sediment Replenishment

XBA-54 BAYOU GRANDE CHENIERE SUBBASIN HYDROLOGIC RESTORATION

Location.

The project area (Figure 13) is located between the Mississippi River and Bayou Grande Cheniere and between Fosters Canal and the Freeport Sulphur Canal. This 39,000-acre area is the Grand Cheniere Subbasin in Plaquemines Parish.

Problems and Opportunities.

Bayou Grand Cheniere was historically a distributary of the Mississippi River. The natural levees of this bayou created the Bayou Grande Cheniere Subbasin which lies between the Mississippi River and Bayou Grande Cheniere. In the upper end of the subbasin, navigation and pipeline canals have been dredged through the natural levees, thus altering the hydrology. Consequently, marshes within the upper subbasin now experience increased tidal exchange and saltwater intrusion, and reduced freshwater retention.

Freshwater currently being introduced via the West Pointe a la Hache Siphon will be managed under BA-4C. In this area south of BA-4C, tidal exchange associated with the Socala Canal Number 2 and other cuts though the bayou ridge will disperse introduced freshwater. Similarly, it is anticipated that the larger Freeport Sulphur Company Canal will completely disperse any introduced freshwater. The purpose of this project is to direct freshwater flow southeasterly between the two natural levees, to benefit a larger area of marsh.

Description of Features.

The Grand Cheniere Bayou Ridge will be built up to an elevation of 1.5 to 2 feet NGVD. To maximize benefits in those areas, constrictions should be placed in the Socala Canal Number 2 and the Freeport Sulphur Canal where they intersect the Bayou Grande Cheniere natural levee. At least two boat-bay dams will be constructed to accommodate small boat traffic through navigation canals that pass through the ridge. Approximately 12 solid plugs, or leaky rock plugs would be strategically placed in adjacent pipeline canals and access canals to promote maximum distribution and benefits of introduced freshwater before being dispersed by tidal exchange. The northeastern bank of the Freeport Sulphur Canal would be re-established.

Benefits and Costs.

Approximately 2,480 acres will be protected, and 1,640 acres enhanced. Aquatic vegetation will increase in 3,640 acres for a total of 7,750 acres. The gross cost estimate for this project is $1,344,000.

Effects and Issues.

The project would partially restore runoff hydrology and provide outfall management of the existing West Pointe a la Hache siphon, and any other Mississippi River diversion into

this subbasin. Restoration of the ridge will be greatly reduce tidal influence, thus maximizing benefits of any fresh water introduced into the subbasin.

Small boat access through more heavily used canals proposed for closure or constriction should be maintained.

There is a potential for impacts to oyster leases inside this basin as well as impairment to fish access.

A critical first step toward achieving this project is establishing the outfall management plan for XBA-4C West Pointe a la Hache freshwater diversion.

Status.

This project is conceptual but is part of the Restoration Plan and will be a candidate for future priority lists. A short feasibility study must be completed prior to construction.

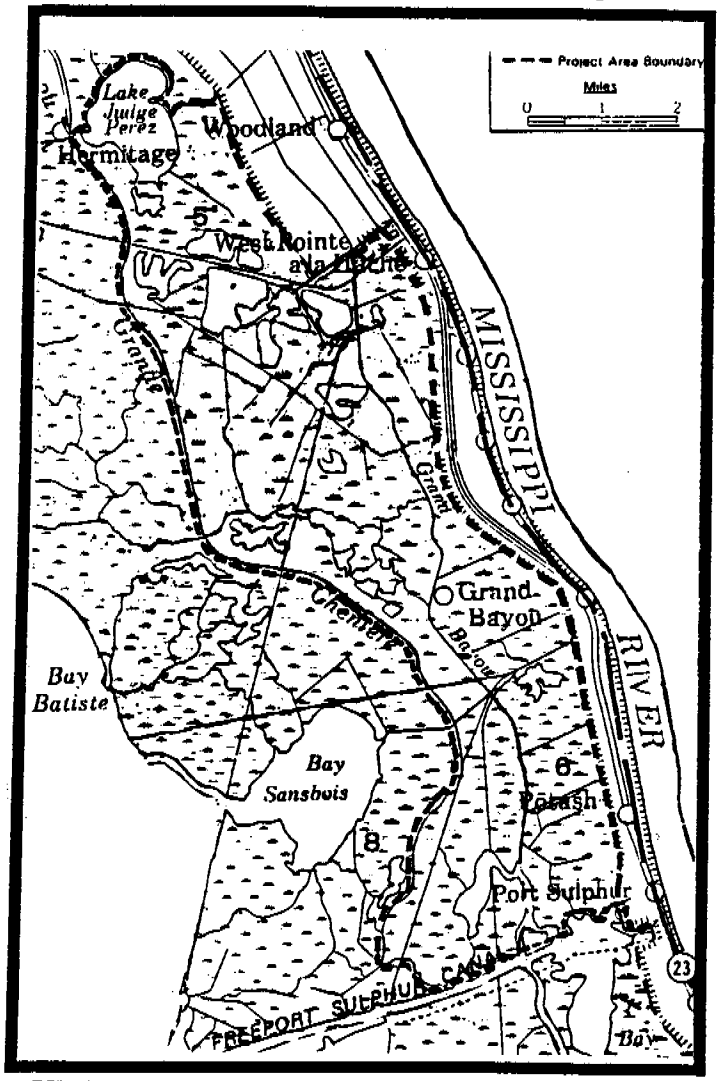

Figure 13. XBA-54 Bayou Grande Cheniere Subbasin Hydrologic Restoration

CRITICAL LONG-TERM PROJECTS

BA-1B DAVIS POND DIVERSION OUTFALL MANAGEMENT NORTH OF LAKE CATAOUATCHE

Location.

The Davis Pond Freshwater Diversion structure will be located on the west bank of the Mississippi River west of New Orleans at river mile 118 AHP. The diversion is located in St. Charles Parish (Figure 14).

Problems and Opportunities.

The outfall area north of Lake Cataouatche is designated to receive a maximum of 10,600 cfs of river water during peak river flow periods. Outfall management will slow the runoff of diverted water and increase the acreage receiving river water. Sediment retention will be optimized.

Description of Features.

Project features have not been developed.

Benefits and Costs.

An estimate of the area to be benefitted by this proposed project will be determined after Davis Pond diversion is operational and the flow patterns are established. Structures to direct the flow and facilitate fine sediment deposition then would be designed. Costs cannot be determined at this time.

Effects and Issues.

The effects of this proposed project have not been segregated from those that would be attributed to the Davis Pond Freshwater Diversion.

Status.

This project cannot be initiated until Davis Pond Freshwater Diversion is a reality. BA-10 would be phase II of outfall management.

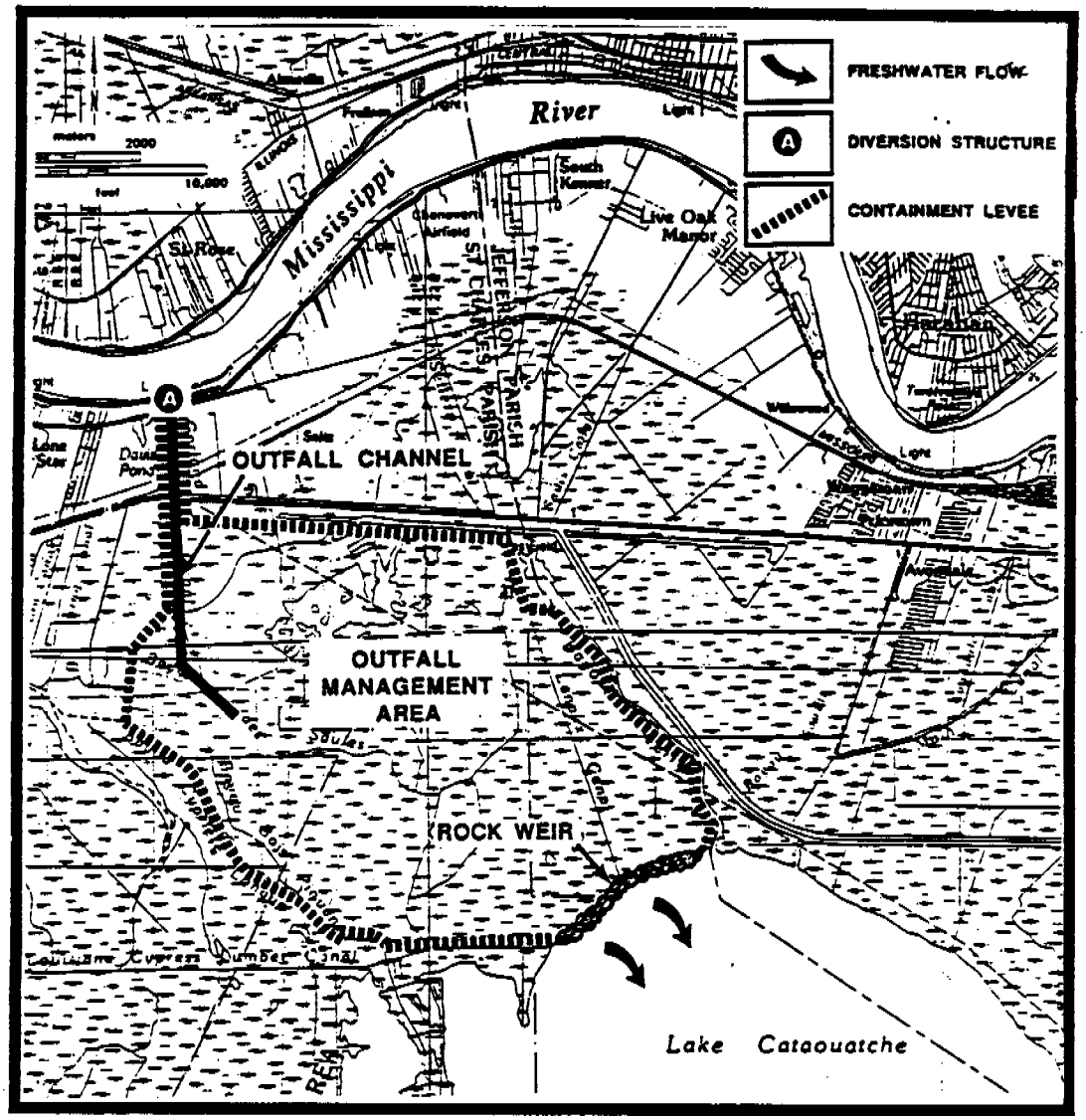

Figure 14. BA-1B Davis Pond Diversion Outfall Management North of Lake Cataouatche

BA-3B NAOMI (LA REUSSITE) DIVERSION SIPHON ENLARGEMENT

Location.

The site of the proposed siphon enlargement is near the community of Naomi in Plaquemines Parish (Figure 7).

Problems and Opportunities.

The originally designed siphon was installed and placed in operation in 1992. The objective of the siphon enlargement project is to maintain and restore marsh by providing additional freshwater, nutrients, and mineral sediments from the Mississippi River. Because the area may be separated from future benefits of the proposed Davis Pond Freshwater Diversion by the Bayou Barataria ridge, it is proposed that the siphon capacity be enlarged by adding additional siphons within the existing right of way.

The concept of enlargement may also include sediment enrichment. (See XBA-67B.)

Description of Features.

The existing siphons deliver a discharge of about 2,400 cfs during spring-flood flow of the Mississippi River. Earlier analysis has established a need of about 6,000 cfs. The number of siphons would be increased to handle the greater capacity.

Benefits and Costs.

Due to the long term nature of this project and the dependance of its design upon impacts of other projects, the benefits and costs of this project cannot be analyzed at present.

Effects and Issues.

The need for enlargement must be determined.

Status.

The flow and effects of the existing diversion must be studied to determine the need for additional water prior to a decision to enlarge the structure.

BA-4B WEST POINTE A LA HACHE DIVERSION SIPHON ENLARGEMENT

Location.

The site of the freshwater diversion siphon is immediately upstream from the ferry landing at West Pointe-a-la-Hache in Plaquemines Parish (see Figure 8).

Problems and Opportunities.

The objective of siphon enlargement is to maintain and restore marsh by providing supplemental freshwater, nutrients, and mineral sediments from the Mississippi River. Because the area is too far removed and sheltered from the proposed Davis Pond Freshwater Diversion to receive sedimentation benefits, it is proposed that the siphon capacity be enlarged by adding additional siphons within the existing right of way.

The concept of enlargement may also include sediment enrichment. (See XBA-67C.)

Description of Features.

Additional siphons would be added within the existing right of way. Earlier analysis has established a need of about 6,000 cfs.

Benefits and Costs.

Due to the long term nature of this project, and the dependance of its design upon impacts of other projects, the benefits and costs of this project cannot be analyzed at present.

Effects and Issues.

The need for enlargement must be determined.

Status.

The flow and effects of the existing diversion must be studied to determine the need for additional water prior to a decision to enlarge the structure.

BA-10 DAVIS POND DIVERSION OUTFALL MANAGEMENT, PHASE II

Location.

The 21,950-acre site is located in St. Charles Parish southeast of the community of Boutte, flanking the northwest shore of Lake Salvador and the western shore of Lake Cataouatche in St. Charles Parish (Figure 15). The site is part of the Salvador WMA.

Problems and Opportunities.

The objective of this project is to provide for introduction of Mississippi River water and sediment into the Salvador WMA through management of the outfall from the proposed Davis Pond Freshwater Diversion. A secondary objective of this project is to reduce shoreline erosion along the northern Lake Salvador shoreline.

Description of Features.

Hydrological analyses will determine the feasibility of routing diverted freshwater and sediments through shallow, open-water ponds, ditches, and other drainage pathways to numerous exit points at Lake Salvador. Presently anticipated physical features include 6.3 miles of shoreline stabilization using sturdy timber bulkhead placed 100 feet from the existing shoreline and backfilled with dredged material from Lake Salvador; cutting 50-foot wide gaps every 500 feet along 17.7 miles of spoil bank; installing 4 miles of Christmas-tree sediment fence; planting approximately 79 acres of vegetation along the Lake Salvador shoreline; and constructing a rock weir at Baie du Cabanage leaving a gap 10 feet wide by 3 feet deep in the center for small boats.

Benefits and Costs.

Outfall management will enhance water quality and sediment retention from the diverted water and will benefit public resources on the management area by increasing productivity and expansion of the existing marsh. Land loss is assumed to be reduced by 70 percent from 1.264 to 0.379 percent per year. The net wetland increase resulting from the project is anticipated to be 580 acres, principally by avoiding loss. Aquatic vegetation can be expected to increase from 20 percent to 60 percent on 690 acres of open water. It is estimated that 620 acres of wetland could be enhanced by the project. The total benefitted acres are 1,610. The total cost estimate for this project is $6,525,000.

Effects and Issues.

The specific issues of hydrologic analysis that need to be addressed are 1) containment of flows in the general area of the Netherlands; 2) availability of drainage routes in the contiguous wetlands to the south; and 3) the extent to which distributary ridges present natural flow barriers. Resolution of these issues will determine specific measures to be taken for enhancement of outfall distribution.

Status.

The State has developed some preliminary plans, however, final plans cannot be developed until the diversion is operating. This project would follow BA-1B.

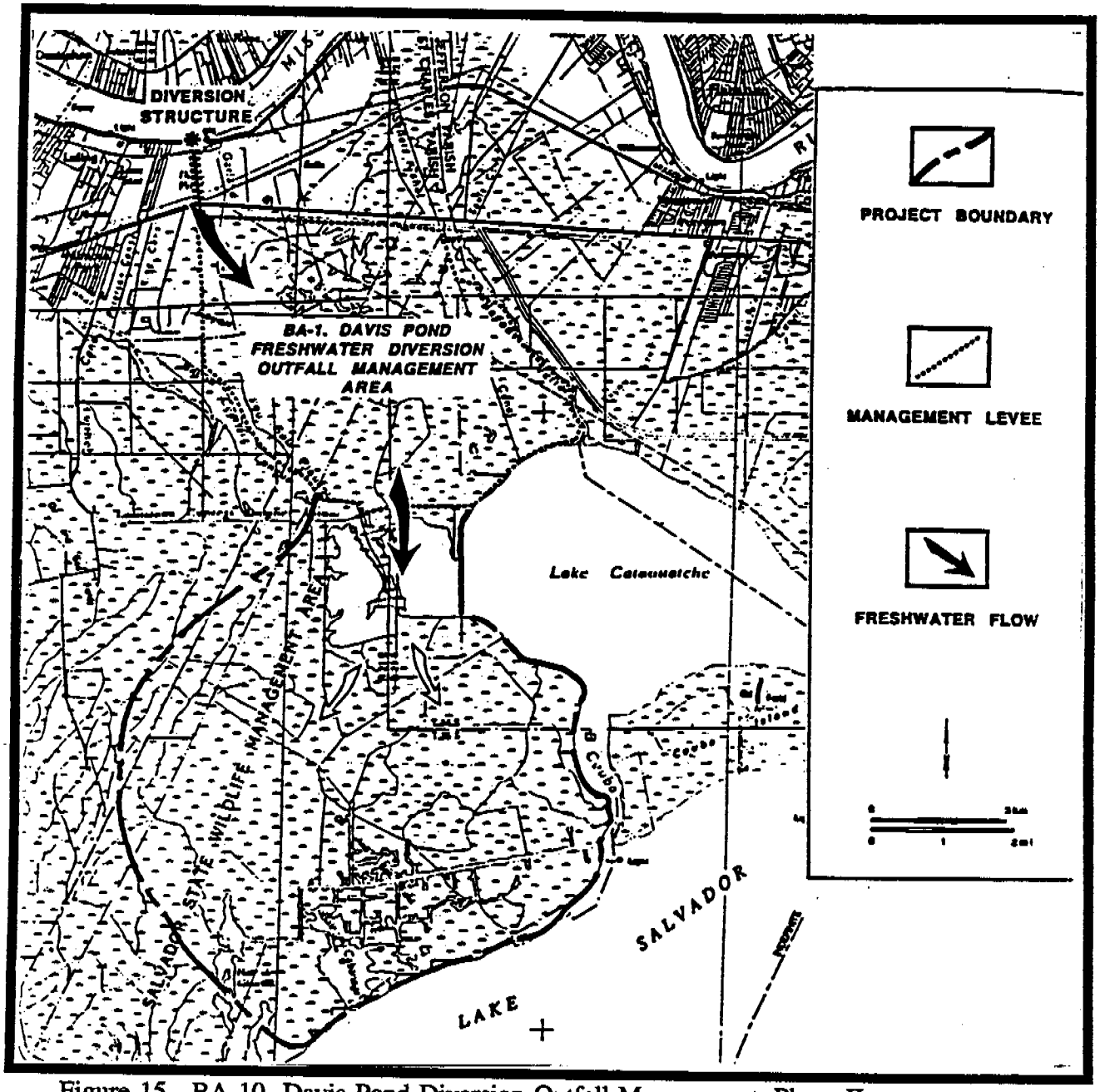

Figure 15. BA-10 Davis Pond Diversion Outfall Management, Phase II

BA-11 TIGER/RED PASS DIVERSION AND OUTFALL MANAGEMENT

Location.

The proposed project is located near Venice in Plaquemines Parish between Spanish Pass and the roadway adjacent to Red Pass (Figure 16). The outer edge of the Venice Dome oil field borders the area to the southwest enclosing an estimated 1,600 acres of shallow, open water with limited emergent marsh.

Problems and Opportunities.

The objective of this project is to maintain and restore marsh in this area by providing supplemental freshwater, nutrients, and mineral sediment from the Mississippi River and by managing the diversion outfall.

Description of Features.

Freshwater diversion alone would be of limited value because of the absence of emergent or aquatic vegetation to trap suspended sediments and the hydrologic connection with the Venice Dome Oil Field. The marsh management plan is to introduce sediment and freshwater through the oil field in combination with water level draw-down. These ideas are limited because of the very high subsidence rates in the area. Therefore, a combination of the two concepts is proposed. The project will include a gated gravity-diversion structure from Tiger Pass into Red Pass. Culverts would be approximately 400 ft long beginning at McDermott's Dock in Tiger Pass, going underneath Tidewater Road, and discharging into the project area. The size and number of pipes will be based on the retention time necessary for sediment deposition, as dictated by the sizes and locations of outfall structures.

Benefits and Costs.

Due to the long term nature of this project, and the dependance of its design upon impacts of other projects, this project cannot be analyzed at present.

Effects and Issues.

None have been identified.

Status.

This project may be combined with BA-12. Detailed plan evaluation and a feasibility analysis need to be conducted, however, this project is a candidate for future priority lists.

BA-12 GRAND/SPANISH PASS DIVERSION

Location.

The proposed project is a freshwater diversion located at Venice in Plaquemines Parish at the former confluence of Grand Pass and Spanish Pass (Figure 17).

Problems and Opportunities.

The objective of this project is to maintain and restore marsh in this area by providing supplemental freshwater, nutrients, and mineral sediment from the Mississippi River. The outfall zone of the proposed diversion structure is primarily shallow, open water with clusters of small marsh islands.

Description.

The project would be a gated, gravity-flow structure consisting of nine 72-inch diameter pipes diverting approximately 1,400 cfs. The diversion structure will begin at a dock area in Grand Pass, go under the Tidewater Road which serves the industrial facilities along Red Pass, and reconnect the latter with Spanish Pass.

Benefits and Costs.

This project will enhance 4,000 acres of marsh and shallow water in the Yellow Cotton Bay area. Cost estimates were not developed for this project.

Effects and Issues.

Status.

This project may be combined with BA-11. Detailed plan evaluation and a feasibility analysis need to be conducted. This project is a candidate for future priority lists.

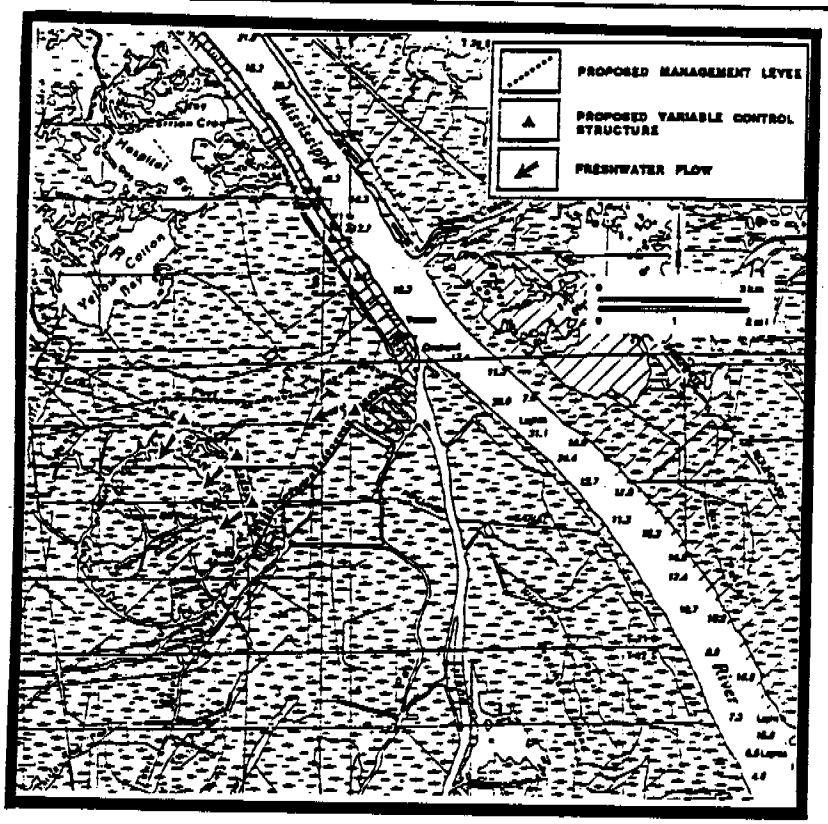

Figure 16. BA-11 Tiger/Red Pass Diversion and Outfall Management

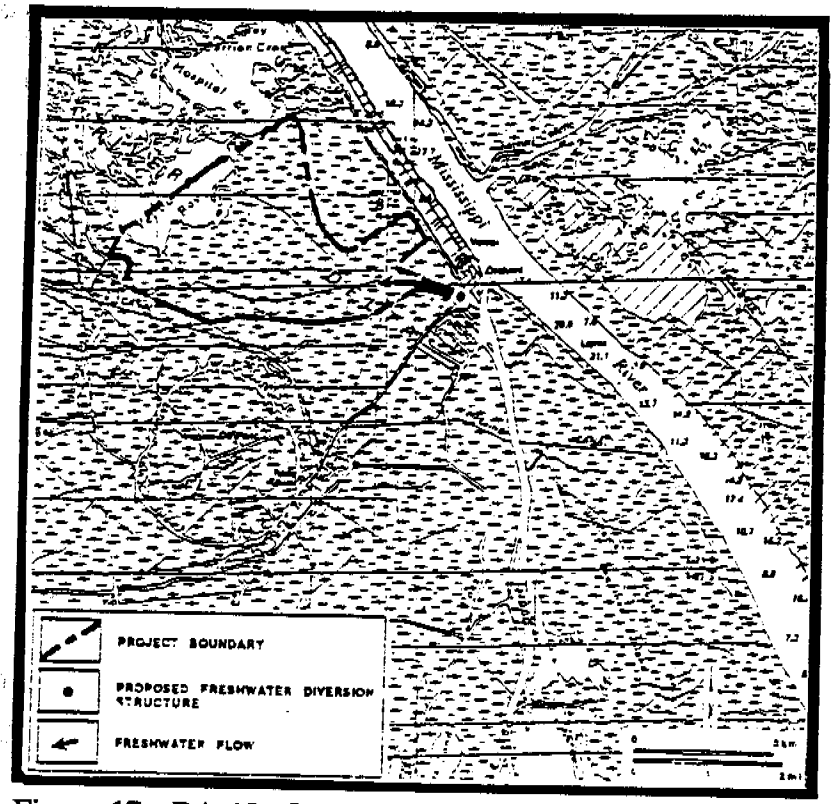

Figure 17. BA-12 Grand/Spanish Pass Diversion

BA-13 HERO CANAL FRESHWATER DIVERSION

Location.

The proposed project is a freshwater diversion siphon at Hero Canal at Belle Chasse, just south of Alvin Calendar Naval Air Base (Figure 18).

Problems and Opportunities.

The objective of the siphon project is to maintain emergent wetlands in this area by providing supplemental fresh water, nutrients, and mineral sediment from the Mississippi River. Other measures will ensure that the diverted water passes through existing marshes for maximum sediment retention and nutrient uptake.

Description of Features.

Preliminary plans include construction of three 72-inch diameter pipes that will siphon approximately 1,100 cfs during high stages of the Mississippi River into the marshes bounded by Hero Canal to the north, Bayou Barataria to the west, and levees to the east. The siphons would be approximately 1,500 feet long, beginning in the Mississippi River, crossing over the river levee, going underneath the existing railroad and Louisiana Highway 23, and into the head of the Hero Canal. A new diversion channel would be constructed to direct the water to the appropriate marsh area. An outfall control structure would be placed in the canal to force the diverted water through the wetland area. After the project is operating, water movement will be evaluated and outfall managed, where necessary, to produce optimum results.

Benefits and Costs.

WVA analyses undertaken for this project preliminarily estimate that project implementation will protect approximately 350 acres of fresh marsh and benefit 60 acres of submerged aquatic vegetation. However, project implementation also will destroy 50 acres of cypress swamp. The gross cost estimate for this project is $9,510,000.

Effects and Issues.

Commitment to undertake a sediment diversion and impacts of freshwater diversions at Davis Pond and Naomi should be analyzed prior to undertaking this project.

Dredging of the outfall canal will destroy a large cypress swamp. Consideration should be given to methods to use the existing Hero Canal as an outfall site.

Status.

This project is a candidate for future priority project lists. Detailed plan evaluation and a feasibility analysis needs to be done.

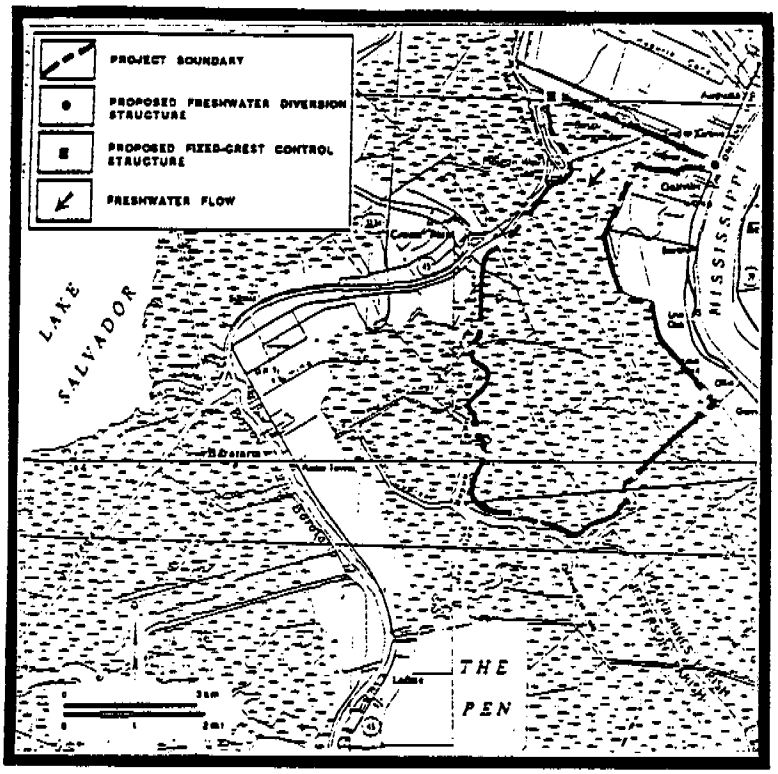

Figure 18. BA-13 Hero Canal Freshwater Diversion

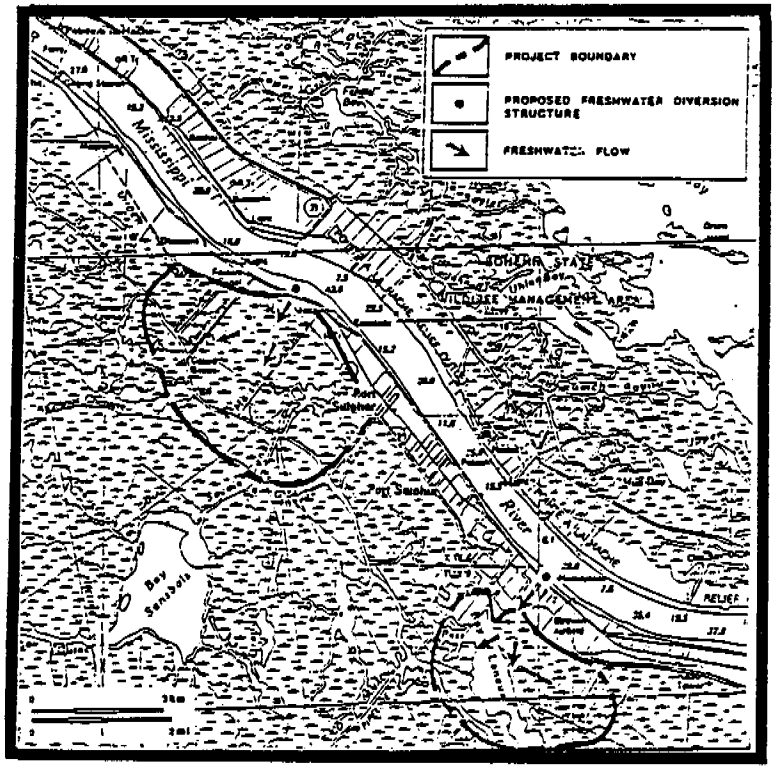

Figure 19. BA-17 City Price Freshwater Diversion

BA-17A CITY PRICE FRESHWATER DIVERSION AT HAPPY JACK

Location.

The proposed diversion site (Figure 19) is located on the right descending bank of the Mississippi River, at a point 2 miles upstream of the Port Sulphur.

Problems and Opportunities.

The diversion would serve the Bayou Long to Bayou Grand Lizard sub-basin of the Barataria Basin which encompasses a 40,000 acre wetland area.

Description of Features.

The diversion would amount to a constant release of Mississippi water and sediments at 1,000 cfs. The discharge will directly feed Bay Sanbois and its associated waterways and would directly influence 8,000 acres in the eastern half of the Bayou Long/Bayou Grand subbasin. Deep siphons would be used to select for heavier sediments and divert a constant flow of 1,000 cfs from the Mississippi River. This will simulate part of what Bayou Long or Bayou Grand could have carried before levees were constructed. At a future date the discharge would be increased via additional siphons or sluice gates and channels.

Benefits and Costs.

Preliminary plans indicate that the proposed City Price diversion would be more efficient if divided into two smaller diversions (see BA-17B). Site-specific WVA analyses were not undertaken for this project. However, it was estimated that 52 acres would be created and a total of 152 acres benefitted if a diversion, estimated to cost $1,806,000 were located at Happy Jack.

Effects and Issues.

There may be significant impacts upon oyster and shrimp industries in the region. Maintenance dredging of the Sulphur Canal will increase.

Status.

A feasibility study must be done to determine the location and finalize plans.

BA-17B CITY PRICE FRESHWATER DIVERSION AT HOMEPLACE

Location.

The proposed diversion site (Figure 19) is located on the right descending bank of the Mississippi River, at a point 2 miles downstream of Port Sulphur.

Problems and Opportunities.

The diversion would serve the Bayou Long to Bayou Grand Lizard sub-basin of the Barataria Basin which encompasses a 40,000 acre wetland area.

Description of Features.

The diversion would amount to a constant release of Mississippi water and sediments at 1,000 cfs. The discharge will directly feed Bay Lanaux and its associated waterways and would directly influence 8,000 acres in the eastern half of the Bayou Long/Bayou Grand subbasin. Deep siphons would be used to select for heavier sediments and divert a constant flow of 1,000 cfs from the Mississippi River. This will simulate part of what Bayou Long or Bayou Grand could have carried before levees were constructed. At a future date the discharge would be increased via additional siphons or sluice gates and channels.

Benefits and Costs.

Preliminary plans indicate that this project could be divided into two smaller diversions (see BA-17A). Site-specific WVA analyses were not undertaken for this project. However, it was estimated that a diversion near Homeplace would create or protect 1,130 acres and benefit a total of 1,270 acres at an estimated cost of $3,094,000.

Effects and Issues.

There may be significant impacts upon oyster and shrimp industries in the region.

Maintenance dredging of the Sulphur Canal will increase.

Status.

A feasibility study must be done to determine the location and finalize plans.

PBA-18 HERO CANAL SEDIMENT DIVERSION

Location.

The proposed project is located at the site of the proposed freshwater diversion siphon at Hero Canal at Belle Chase, just south of Alvin Calendar Naval Air Base (Figure 18). See BA-13 for additional information.

Problems and Opportunities.

The objective of the sediment diversion project is to maintain emergent wetlands in this area by providing supplemental sediments from the Mississippi River.

Description of Features.

Two methods have been suggested for sediment enrichment: deep siphons and dredging upstream of the diversion.

Benefits and Costs.

An estimate of benefits and costs is premature.

Effects and Issues.

A sediment diversion should be planned at an existing freshwater diversion prior to undertaking this project.

Resolution of the problems concerning the route of the Hero Canal Freshwater Diversion should be resolved prior to or in conjunction with planning for a sediment diversion.

Status.

This project is conceptual. Detailed plan evaluation and a feasibility analysis need to be done after the Hero Canal Freshwater Diversion is in place.

PBA-20 FRESHWATER DIVERSION TO BAYOU LAFOURCHE

Location.

Bayou Lafourche branches off the Mississippi River at Donaldsonville in Ascension Parish (Figure 20). The bayou extends about 110 miles in a southeasterly direction to the Gulf of Mexico. The location of a reconnection or diversion has not been determined but probably would not be in the historic channel.

Problems and Opportunities.

Prior to 1904 and the sealing of Bayou Lafourche for flood protection, the bayou carried approximately 12 percent of the Mississippi River's discharge. A lock was planned to allow waterborne traffic to continue, but funding was never made available for construction. Isolation from fresh water and sediment from the Mississippi River has contributed to the high marsh loss rates, as well as to impacts on the fresh (drinking) water supply. Since 1904, Bayou Lafourche is fed only by rainwater drainage.

Description of Features.

A potential location for a 55,000 cfs diversion would be 2 miles east of Donaldsonville. The channel would follow the toe of the natural levees along the east bank of Bayou Lafourche and would feed into the Bayou immediately south of Plattenville, eliminating the route through the heavily developed area. A weir in Bayou Lafourche upstream of the channel connection would eliminate the chances of backflooding in Donaldsonville. A spillway will be constructed 2 miles downstream of the diversion in the left descending bank to divert some of the discharge (not to exceed 5,000 cfs) into Bayou Verret, from which it would flow slowly to Lac Des Allemands. Some channel enlargement would be necessary, however the dredged material could be used to create and restore wetlands. Approximately nine diversions would be constructed along both sides of the bayou to ensure that fresh water, sediments and nutrients are spread over as large an area as possible.

Benefits and Costs.

The net gain in marsh acres created and prevention of loss of existing marsh , representing net acres of benefit, have not been estimated. However, it is anticipated that diversion of approximately 27,500 cfs of fresh water and sediment into the Barataria Basin at multiple points could be used to restore and protect a substantial proportion of marsh. Potential total benefits would reach 600,000 acres in the Barataria and Terrebonne Basins (approximately 300,000 acres in each basin). The costs have been estimated at $1.5 billion over an 8-year construction period.

Effects and Issues.

Major impacts of construction will occur in the upper portion of the Barataria Basin, however, most of the flow (and benefits) would be directed into the lower portions of Barataria and Terrebonne Basins.

The banks of Bayou Lafourche are highly populated, therefore additional water will pose flooding problems which must be solved prior to a diversion.

Many of the 27 bridges over Bayou Lafourche may have to be relocated or rebuilt.

Status.

This proposed project is conceptual but supported by the lower Lafourche Parish water districts and industrial concerns. A feasibility study must be conducted to determine the amount of freshwater and sediment available for diversions from the Mississippi River and the optimum number and location for those diversions. Smaller diversions from Bayou Lafourche into Barataria Basin require feasibility analysis also.

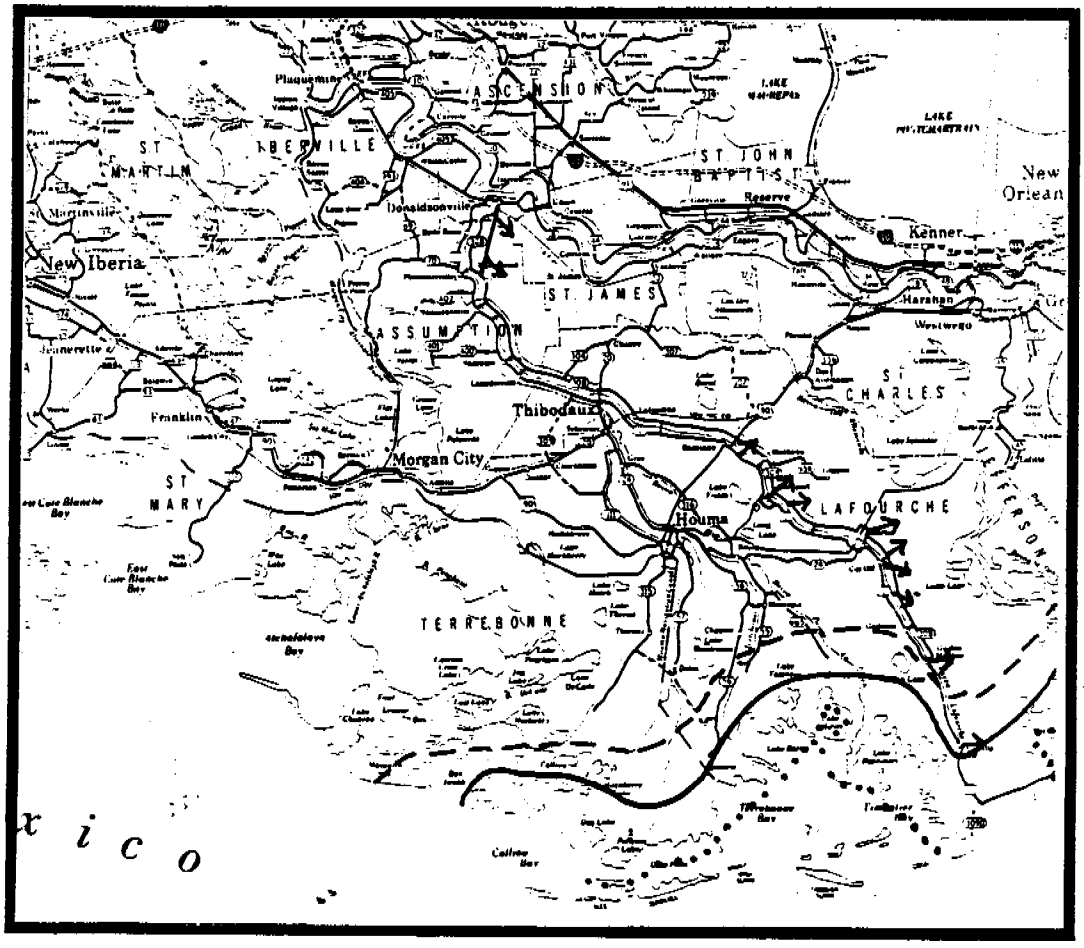

Figure 20. PBA-20 Freshwater Diversion to Bayou Lafourche

PBA-21 ROUTE DIVERSION OUTFALLS TO AREA NORTH OF THE PEN

Location.

The project area is located between the Hero Canal, The Pen, Bayou Barataria ridge, and the leveed corridor on the Mississippi River between Hero Canal and Naomi (Figure 21).

Problems and Opportunities.

Higher salinities have steadily intruded into the area north of The Pen. Water diversions into this subbasin via the Naomi Siphon and Algiers Locks should be managed to maximize their beneficial impacts. Diversion outfalls from the Naomi, Algiers Lock, and Davis Pond sites are expected to interactively freshen this area significantly. Management of those outfalls can strengthen their influence in this area.

Description of Features.

Features cannot be developed until Davis Pond Freshwater Diversion is operational.

Benefits and Costs.

An estimate of the acreage benefitted by this project will require final definition of the project area, and the amount of water and sediment to be delivered from the various diversions. Project costs cannot be determined.

Effects and Issues.

Diversion outfalls from the Naomi, Algiers Lock, and Davis Pond sites are expected to interactively freshen this area significantly. Until their impacts are understood, pursuit of this independent project should be delayed.

The Naomi outfall management plan can extend additional influence upon this area.

Status.

The project would need to be correlated with diversions near the area.

PBA-32 HYDROLOGIC RESTORATION IN MARSHES SOUTHEAST OF LEEVILLE

Location.

The project area is located between Louisiana Highway 1, Louisiana Canal, and Caminada Bay (Figure 22).

Problems and Opportunities.

The fringing marsh of project area is experiencing significant subsidence and sediment export which contributes to marsh loss. Pipelines have interrupted natural hydrology and facilitate saltwater intrusion. Protection of these fringing marshes is critical to the stability of more interior marshes along Bayou Lafourche.

Description of Features.

Canals would be plugged or backfilled to marsh elevation with material mined offshore. Natural beach rims along the Gulf of Mexico and Caminada Bay would be maintained to reduce tidal inundation.

Benefits and Costs.

An estimate of the acreage benefitted by this project will require final definition of the project area. Project costs cannot be determined at this time.

Effects and Issues.

Specific effects cannot be delineated until project components are defined.

Status.

Details of this project must be developed and coordinated with the landowners. A feasibility study must be conducted, however it is a candidate for future priority lists.

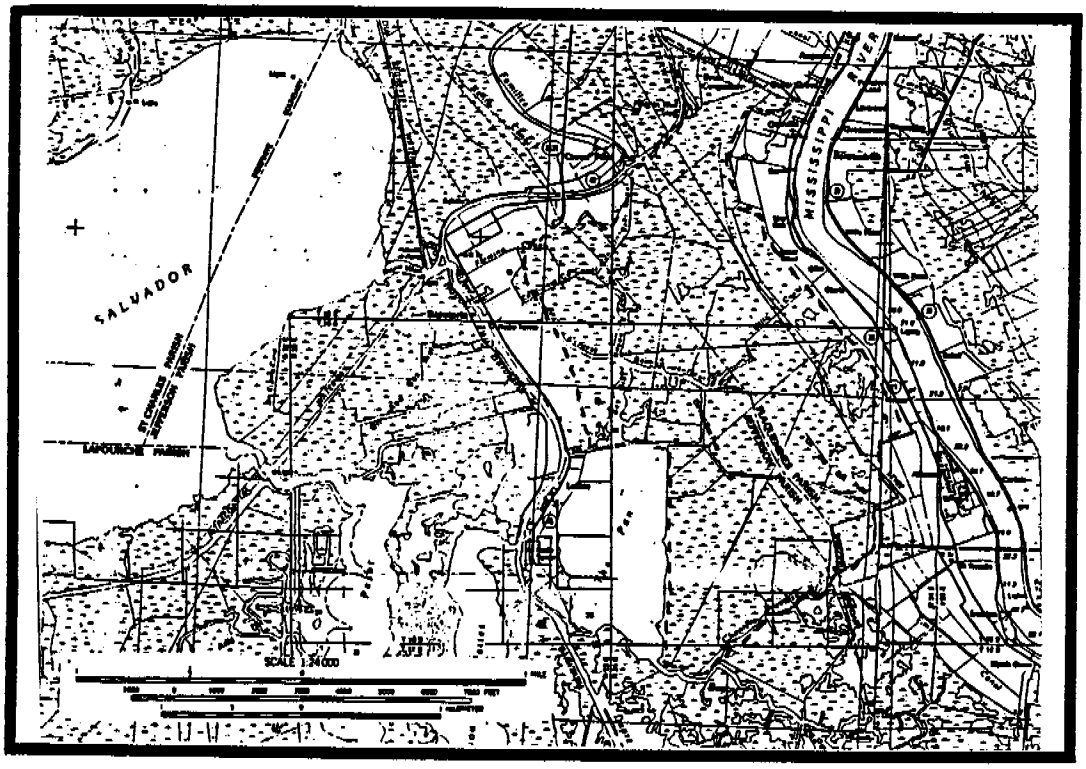

Figure 21. PBA-21 Route Diversion Outfalls to Area North of the Pen

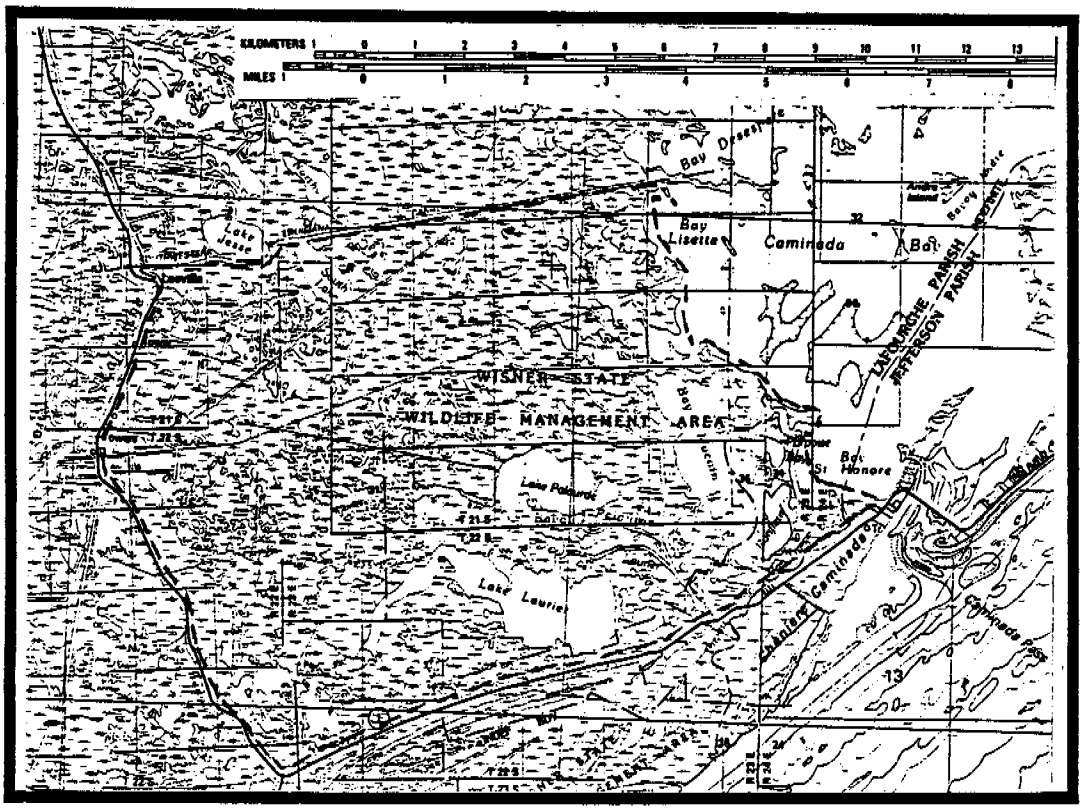

Figure 22. PBA-32 Hydrologic Restoration in Marshes Southeast of Leeville

PBA-36 LAGAN FRESHWATER DIVERSION

Location.

The project would be located in the vicinity of Lagan in St James Parish (Figure 23).

Problems and Opportunities.

Studies will need to be made to determine possible hydroperiod problems in the swamps in this area. If a problem exists, a hydrologic restoration project should be developed. Cypress regeneration would be a goal of this project.

Description of Features.

Introduction of Mississippi River water, sediments and nutrients into his area has been suggested. Until the impacts of the Davis Pond Freshwater Diversion are known, water from this diversion into the Des Allemands subbasin, may not be appropriate.

Benefits and Costs.

The costs of such a study and project are not known at this time.

Effects and Issues.

The benefits and costs cannot be developed until a feasibility study is completed to show the needs of the area.

Status.

This is a conceptual plan, at present, which needs further study.

PBA-37 BAYOU DES ALLEMANDS FRESHWATER DIVERSION

Location.

The project area is located in the vicinity of Edgard and Wallace in St. John the Baptist Parish (Figure 24)

Problems and Opportunities.

See PBA-36.

Description of Features.

Similar to PBA-36.

Benefits and Costs.

The costs of such a study and project are not known at this time.

Effects and Issues.

Similar to PBA-36. A diversion in this area was proposed in 1984 under the Louisiana Coastal Area, Freshwater Diversion to Barataria and Breton Sound Basins study. Opposition due to the fear of increased flooding to the area residents caused the USACE to relocate the proposed diversion to the Davis Pond area.

Status.

This is a conceptual plan which needs further study.

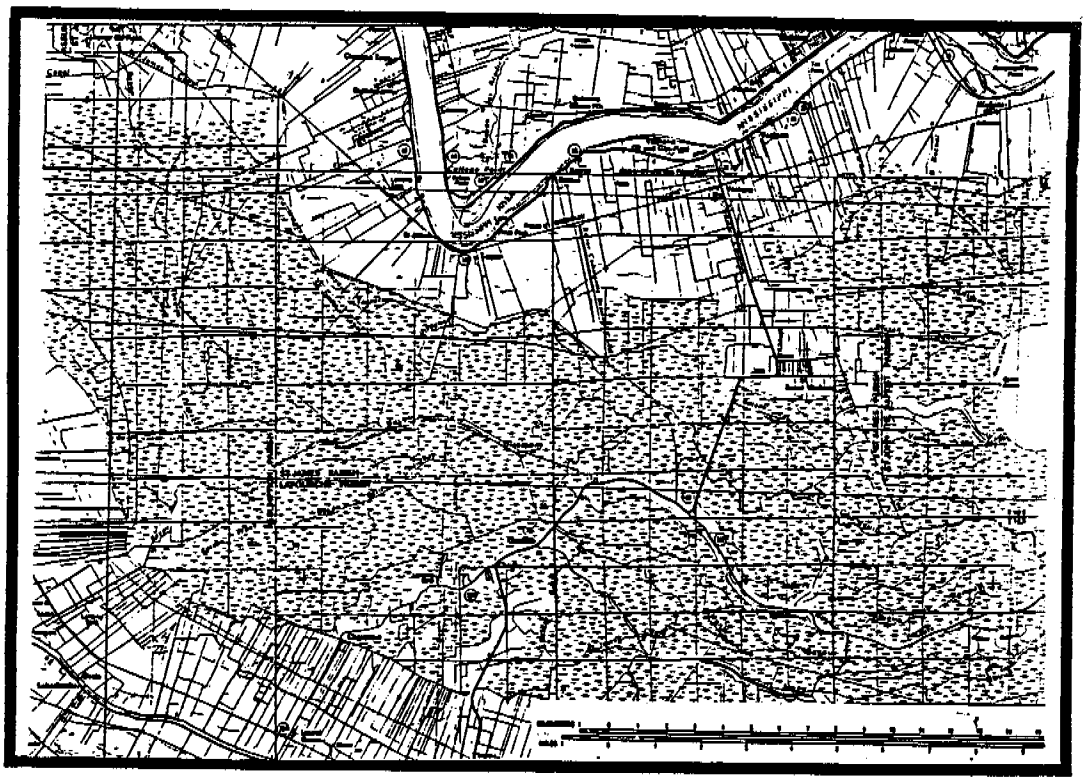

Figure 23. PBA-36 Lagan Freshwater Diversion

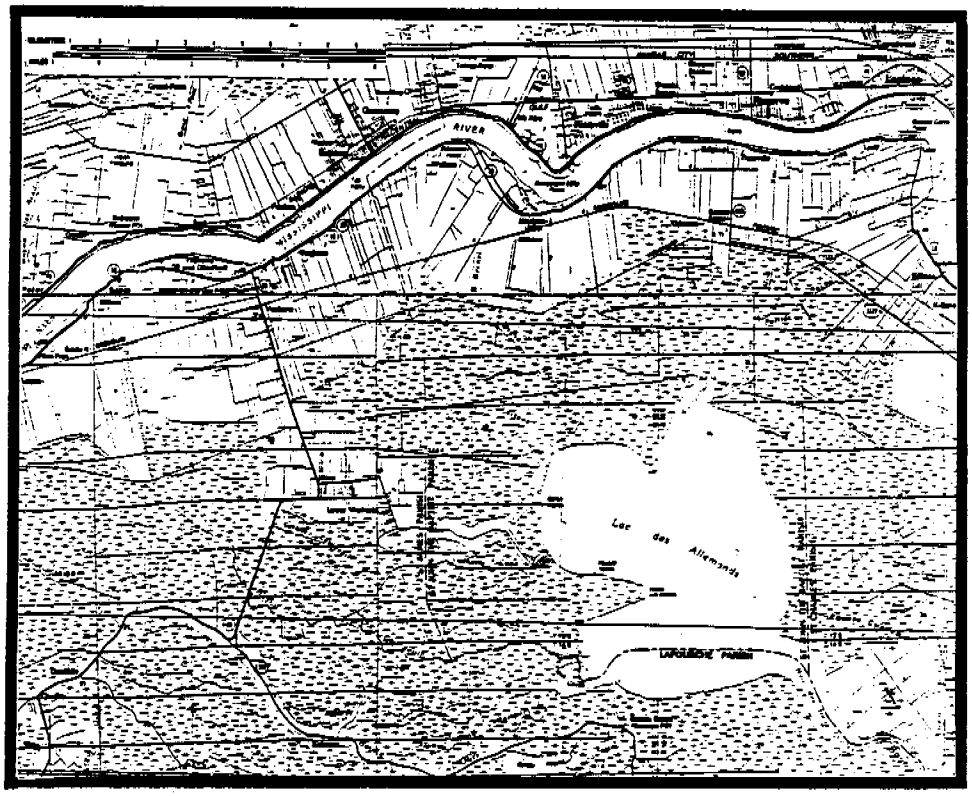

Figure 24. PBA-37 Bayou Des Allemands Freshwater Diversion

PBA-44 SEDIMENT DIVERSION AT BURAS

Location.

The proposed diversion site is located on the right descending bank of the Mississippi river, at a point 2 miles upstream of the village of Buras at latitude 29°22'00" and longitude 89°34'00" (Figure 25).

Problems and Opportunities.

Severe marsh loss has occurred throughout this region. Evidence suggests that movements of geologic faults were a significant cause of the accelerated loss rate between 1956 and 1978. Sudden fault movement may have caused significant marsh submergence and loss in the narrow east to west strip between Adams Bay and Lake Washington during 1973.

Sudden marsh loss caused an increase in tidal volume, which in turn accelerated erosion rates in remaining marshes between the subsided area and the gulf. Increased tidal influence made the region significantly more saline. Since then, the area has been heavily leased for oyster production.

Description of Features.

The diversion would amount to a constant release of Mississippi water and sediments at 5,000 cfs. The discharge would nourish Bay Pomme d'Or and its associated waterways. Deep siphons would be used to divert a constant flow of 1,000 cfs from the Mississippi River. This will simulate what Bayou Long or Bayou Grand Lizard would have carried before levees were constructed. By combining sluice gates and deep siphons, the amounts of suspended sediment could be controlled, reducing channel maintenance costs.

Benefits and Costs.

The diversion would serve the Bayou Long to Bayou Grand Lizard subbasin of the Barataria Basin which encompasses an area of 40,000 acres of wetlands and shallow open water.

Effects and Issues.

There will be significant impacts upon oyster and shrimp industries in the region. Maintenance dredging of the Empire canal will greatly increase.

Status.

This project is conceptual. An initial feasibility study must be conducted to determine potential benefits and wetlands to reduce costs and increase benefits.

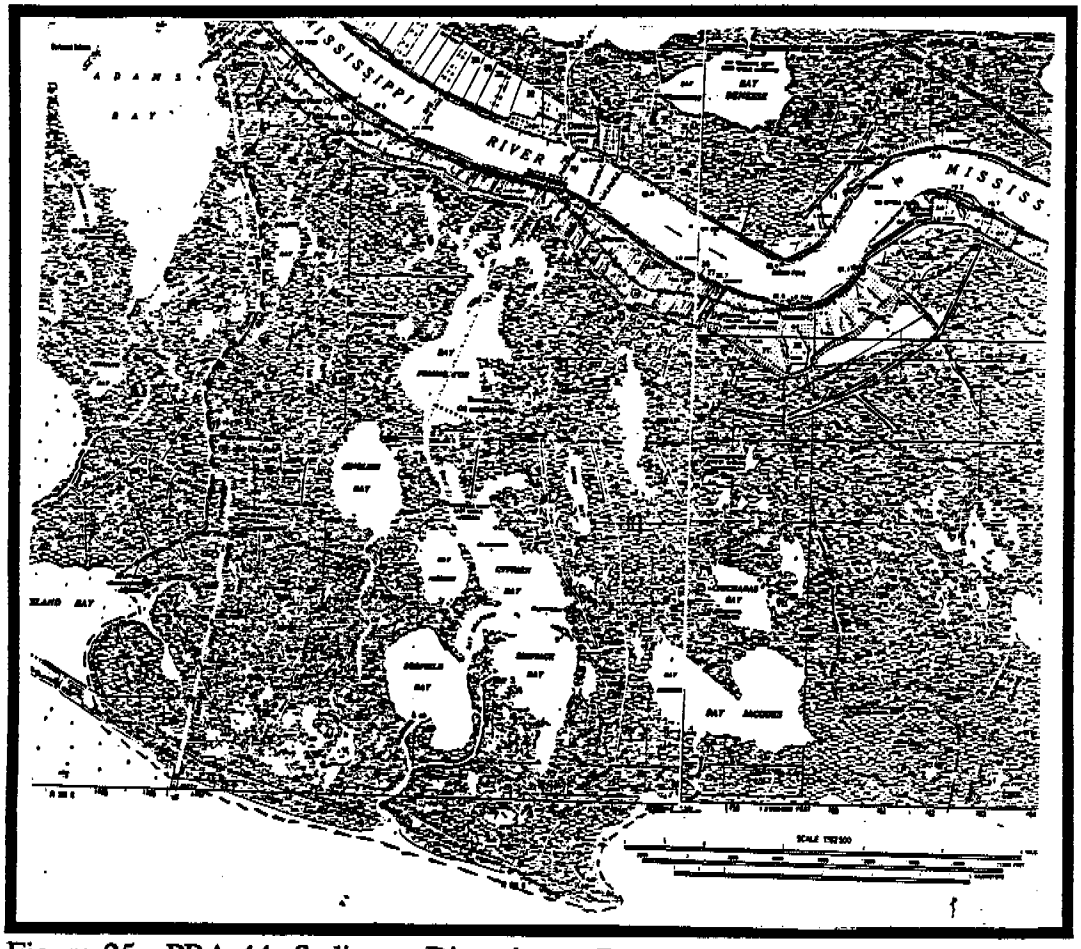

Figure 25. PBA-44 Sediment Diversion at Buras

PBA-48A MYRTLE GROVE SEDIMENT DIVERSION

Location.

The proposed diversion site is located on the right descending bank of the Mississippi River, immediately upstream of the city of Myrtle Grove (Figure 26). Specific alternative sites have been identified just below Ironton and at the Wilkinson Canal, each with benefits and disadvantages that need detailed analysis. The diverted sediment would primarily service the area described above. Secondarily, the supplied sediment will be dispersed more broadly into the Central Marsh Subbasin to the north and to North Bay Subbasin to the south.

Problems and Opportunities.

One of the most significant problems of the basin is the elimination of river flooding and associated sediments from the basin. Re-establishing the flow of river sediments into the basin is critical to achieve the plan objective of reversing land loss. Rapid subsidence is occurring in the large area located west of Bayou Grand Cheniere, north of lakes Round and Laurier, east of the Barataria Bay Waterway, and south of The Pen and Cheniere Traverse Bayou. This possible outfall site is approximately 25,235 acres, of which approximately 11,024 acres is land.

Description of Features.

The diversion would amount to a constant release of water of 15,000 cfs with associated sediments. This flow will simulate what Bayou Grand Cheniere, 2 miles downstream, used to carry before levees were built.

The outfall management plan is described as long-term supporting project PBA-48B.

Benefits and Costs.

The area estimated to be benefitted by this project has not been estimated. The gross cost estimate for this project is $67,415,520.

Effects and Issues.

The project will supply significant volumes of water and sediment into the basin in a region that is rapidly subsiding and exporting sediment. The sediment will serve to reduce residual and tidal water volumes in the outfall area and beyond as is evidenced by the Algiers Lock Diversion. By doing so, significant acreage of marsh will be created over the project life. Over-all, wildlife and fishery resources will greatly benefit from the created marsh and the freshwater.

Engineering feasibility of the project will be an early issue to be resolved. Consequently, additional authorization and funding must be sought to pursue this project. As long as the Lafitte Oil and Gas Field and other production sites are active, they will not be included as part of the outfall site to receive sediment. Even so, increased maintenance dredging of well-access canals may become necessary.

The project will cause gulfward displacement of some oyster leases and brown shrimp harvesting.

Ownership of newly emergent land may become an issue.

Increased maintenance dredging costs of the Barataria Bay Waterway must be included.

Implementation of this project will require close administrative and technical coordination of flows through each of the diversions into the basin.

Construction of this project will take longer than 5 years and the cost may be too high to be considered under the CWPPRA.

Status.

A detailed feasibility study will be necessary prior to construction.

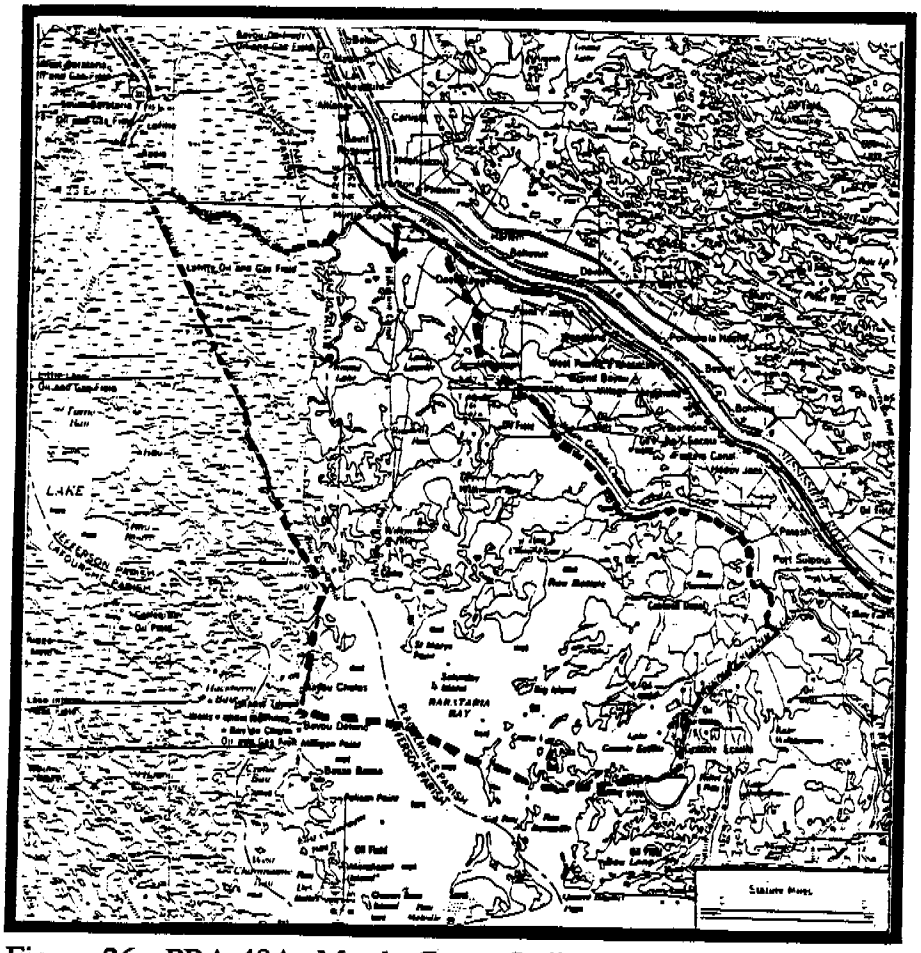

Figure 26. PBA-48A Myrtle Grove Sediment Diversion

PBA-48B MYRTLE GROVE OUTFALL MANAGEMENT

Location.

The project area is located from the outfall of the Myrtle Grove sediment diversion (PBA-48A) and between Bayou Dupont and Bayou Cheniere Traverse (Figure 26).

Problems and Opportunities.

The potential area of outfall for a Myrtle Grove freshwater diversion can be divided into five hydrologic units which cover 21,435 acres. Between 1932 and 1990, this area lost about 207 acres of wetlands per year. As of 1990, they contained approximately 9,800 acres of wetland.

Description of Features.

Project area will be managed after construction of the Myrtle Grove Sediment Diversion.

Benefits and Costs.

An estimate of benefits and costs is premature.

Effects and Issues.

This project is dependant upon construction of the Myrtle Grove diversion (PBA-48A).

Status.

Flows from a diversion must be studied prior to initiation of any outfall management planning.

XBA-63 CENTRAL BASIN TIDAL DRAG ENHANCEMENT

Location.

The project is located in the central portion of Barataria Basin (Figure 27). The northern- most alignment is the spoil bank on the southern bank of the GIWW, between Larose and Hero Canal. The southern alignment follows a line between the northwest corner of Clovelly Farms, along the northern shore of Little Lake, across Bayou Perot to the Little Lake Hunting Club Canal, Old Barataria Ridge, along the northern spoil banks of the Lafitte Oil and Gas Field, to Bayou Dupont to the Myrtle Grove Levee. The approximate center of the project area is latitude 29°35'00" and longitude 90°05'00".

Problems and Opportunities.

Major alterations of the hydrodynamic circumstances of the basin have cumulatively caused significant increases in basin tidal volume and penetration of tidal influence into the basin. Correspondingly, there has been a reduction in freshwater retention in the upper and central basin, significant saltwater intrusion and increases in erosion and export of sediment. There is a synergistic effect among these processes.

Inducement of additional tidal drag, to the extent practical, will slow the effects of tidal exchange and increase freshwater retention. Once installed, this project is flexible to allow modifications with regard to placement of structural measures if circumstances warrant.

Description of Features.

Between the two barrier alignments running from the fastlands of Lafourche to Plaquemines Parishes are found a total of 127,847 acres of which 85,354 acres are wetlands. Construction activities along the northern alignment will include but are not limited to: 1) re-establishment of the GIWW spoil bank and some adjoining access canal spoil banks to an elevation of 0.5 to 1 ft NGVD; 2) re-establishment of the spoil bank around a small system of access canals that is through the GIWW spoil bank and north of Bayou Perot; 3) appropriate rip-rap constrictions and scour aprons at Bayou Perot, Bayou Barataria, Van Donne Canal, canal entrance to the West Barataria Oil and Gas Field, and the north-south canal to the West Delta Farms Oil and Gas Field; 4) the construction of five dams at three small canals or cuts through the GIWW spoil bank, and the pipeline canal at Hole-in-the-Wall in Plaquemines Parish.

Construction activities along the southern alignment will include but are not limited to: 1) re-establishment and creation of spoil banks to create a low berm with an elevation of 0.5 to 1 foot NGVD; 2) appropriate rip-rap constrictions and scour aprons at north-south canal at Little Lake, the entrance to the Little Temple Oil and Gas Field, Bayou Perot, Harvey Cut, Barataria Bay Waterway at old Bayou Barataria Ridge, and Bayou Dupont; 3) rip-rap shore protection and canal closures on Bayou Perot at the Little Temple Oil and Gas Field; and 4) seven access canal dams (two in Little Temple and five in Lafitte oil and gas fields).

Appropriate constrictions and scour aprons should be considered for Bayou Rigolettes, Goose Bayou, and possibly Bayou Dupont near their confluences with the Barataria Bay Waterway.

Benefits and Costs.

Site-specific WVA analyses were not undertaken for this project. However, it is preliminarily estimated that the project will protect approximately 24,130 acres from erosion, benefit 28,790 acres of submerged aquatic vegetation, and enhance an additional 21,550 wetland acres. The total area estimated to be benefitted by this project is 74,470 acres. The gross cost estimate for this project is $16,782,060.

Effects and Issues.

The project is expected to reduce marsh loss and sediment export throughout the Barataria Basin. The 85,354 acres of wetlands located between the two alignments and another 20,000 acres south of the alignments will most directly benefit. Project will function as additional outfall management for BA-1 and BA-3 further slowing and perhaps reversing saltwater intrusion into upper and central basin areas. Additionally, erosion will be lessened because of increased tidal drag created by appropriate constriction or armoring of tidal waterways. Undesirable water movements in the lower basin will be ameliorated due to the slower exchange of water.

Consideration and inclusion of land owners should be made early in the planning process.

Rip-rap constrictions in tidal channels may simply cause localized hydrologic jumps, and may have little effect in diminishing the volume of water moving through the channels.

The construction of constrictions and scour aprons, etc. may help counter losses from erosion, but might exacerbate subsidence and sediment deprivation.

Small boat navigational routes possibly may be displaced due to closure of a few well-access canals. No major routes will be displaced.

Elevation of the berms to be raised and maintained should be determined. Each alignment should be constructed as a single unit, otherwise, erosion and saltwater intrusion will be induced or accelerated in regions where the alignment remains unconstricted.

Increased flooding of developed property at low elevations may be possible if inadequate attention to gradual constrictions is applied.

The location of flow and stage monitoring stations should be established. Inclusion of the Lafitte Oil and Gas Field within the southern alignment may become an issue. The perception is that as long as the field remains active, tidal flushing of the field should be impaired as little as possible and sedimentation in the access canals caused by either Myrtle Grove or Naomi diversions must be kept to a minimum. Placing the southern drag alignment to the north of the field seems in best consideration of these needs.

Modeling should be run to better determine impacts and design.

The alignment serves as an additional outfall management of BA-1, BA-3, and PBA-60 and the basin in general.

Status.

Conceptual. Extensive studies must be completed to validate the feasibility of this concept and to determine the location of structures.

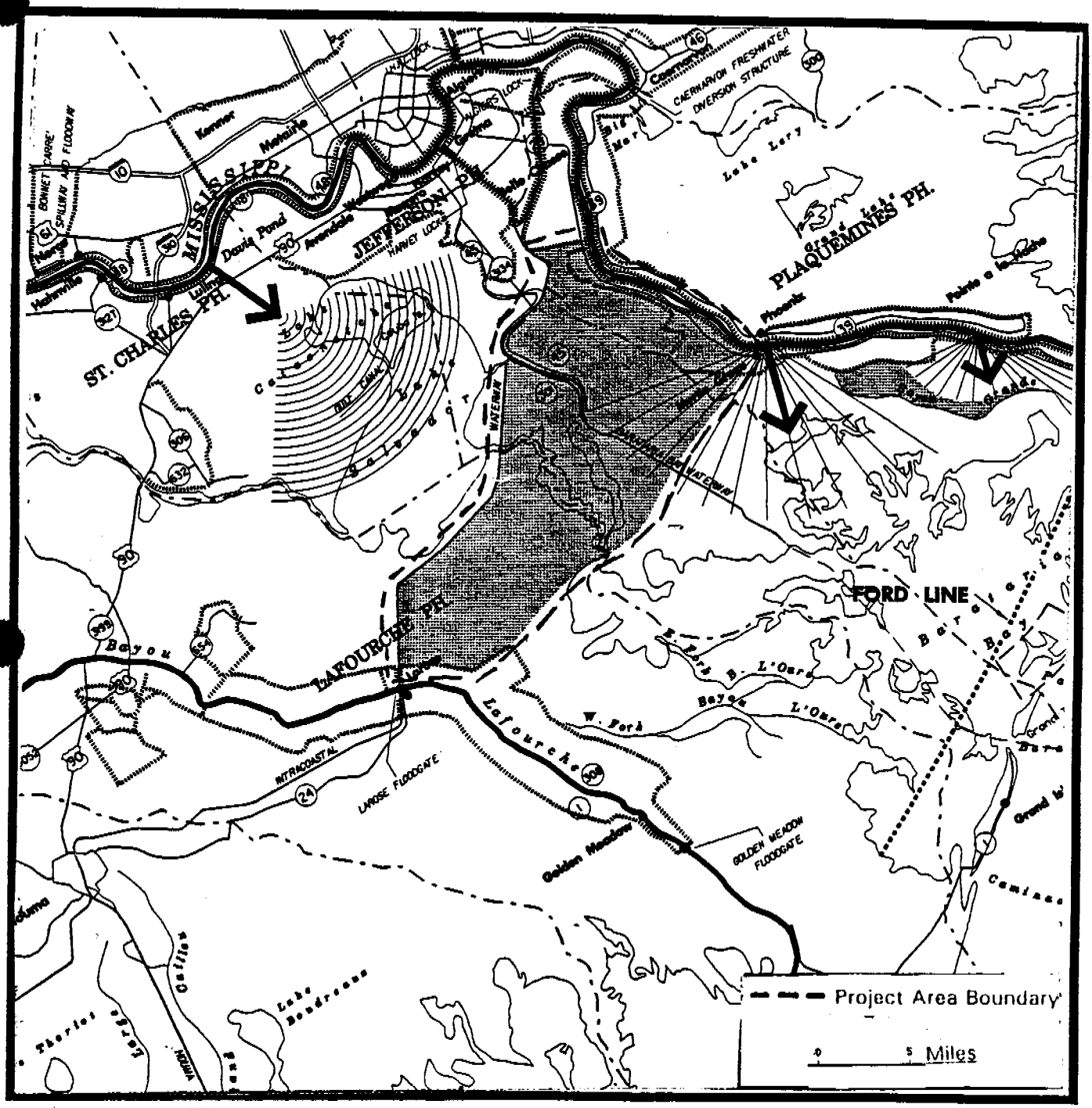

Figure 27. XBA-63 Central Basin Tidal Drag Enhancement

XBA-67B DEEP SIPHON SEDIMENT ENRICHMENT OF THE DAVIS POND FRESHWATER DIVERSION

Location.

The Davis Pond Freshwater Diversion has been planned for construction at a site near Luling, Louisiana, approximately at river mile 119 AHP (See Figure 14).

Problems and Opportunities.

Similar to XBA-67A which is in the Demonstration section.

Description of Features.

Similar to XBA-67A above, except siphons would be used to divert sediment into the basin. Constructing one or more deep river siphons adjacent to the proposed sluice-gates will increase sediment loads delivered into the basin through Davis Pond Freshwater Diversion. The mouth of the siphon could be turned into the river flow for additional lift. By combining the already planned sluice gates and these deep siphons, the amount and dispersion of suspended sediment could be controlled, thereby reducing maintenance costs.

Benefits and Costs.

The area benefitted by the project would be similar to that for XBA-76A. Cost estimates for this project have not yet been developed.

Effects and Issues.

The proposed project will more than double the sediment load carried by the Davis Pond diversion. By doing so, the project will accelerate wetland creation, increase habitat diversity, and broaden dispersion of sediments through the basin. This would significantly increase the beneficial impacts of the diversion by providing more sediment over a greater area and in a shorter period of time than has been described for Davis Pond.

More information is needed to determine if a siphon or dredge provides the most cost - effective sediment enrichment.

Status.

This project is conceptual. Further consideration must await construction of a freshwater diversion.

XBA-67C DEEP SIPHON SEDIMENT ENRICHMENT OF THE NAOMI FRESHWATER DIVERSION

Location.

The existing freshwater diversion siphons are located near the community of Naomi in Plaquemines Parish (See Figure 7).

Problems and Opportunities.

Similar to sediment enrichment for Davis Pond (XBA-67B).

Description of Features.

Similar to XBA-67B.

Benefits and Costs.

Similar to those for XBA-67B, but not quantified.

Effects and Issues.

See XBA-67B.

Status.

This project is conceptual. Further consideration must await construction of a freshwater diversion.

XBA-67D DEEP SIPHON SEDIMENT ENRICHMENT OF WEST POINTE A LA HACHE FRESHWATER DIVERSION

Location.

The site of the proposed freshwater diversion siphons is near the community of West Pointe a la Hache in Plaquemines Parish (Figure 8).

Problems and Opportunities.

Similar to sediment enrichment for Davis Pond (XBA-67A).

Description of Features.

See XBA-67A.

Benefits and Costs.

Unknown.

Effects and Issues.

See XBA-67A.

Status.

This project is conceptual. Further consideration must await construction of a freshwater diversion.

SUPPORTING SHORT-TERM PROJECTS

BA-2 GIWW TO CLOVELLY HYDROLOGIC RESTORATION

Location.

This project encompasses the marshes of Lafourche Parish southeast of the GIWW, east of Bayou Lafourche, and north of the Superior Canal (Figure 28). The area encompasses approximately 60,000 acres of marsh.

Problems and Opportunities.

This area is losing approximately 530 acres of marsh per year due to salt water intrusion, subsidence, and tidal erosion. Construction of navigation and mineral access canals has increase water movement and salt water intrusion. Spoil placement on these canals has altered the hydrology in many areas by causing water impoundment.

The purpose of this project is to restore to the maximum extent possible, the historical hydrologic conditions by 1) increasing freshwater retention, 2) promoting water exchange through sheetflow rather than tidal channels, and 3) reducing the cross-sectional area of, or plugging canals allowing salt water intrusion.

Description of Features.

The project includes: 1) 12 acres of critical area plantings; 2) 12 water control structures; 3) 26 plugs or dams; 4) 43 miles of low level dikes or overflow banks; 5)50 miles of shoreline erosion protection vegetative plantings; and 6) outfall management of 4 pumping plants to encourage sheetflow.

Benefits and Costs.

Site-specific WVA were performed on this project for PPL 1. This analysis estimated that project implementation would save approximately 8,630 acres from erosion. The total benefitted area is 8,630 acres. The total cost for this project is $6,285,000.

Effects and Issues.

Salt water intrusion will be reduced by plugging or placing water control structures in various canals. In addition, these plugs and structures will increase freshwater retention. The vegetative plantings and overflow banks will reduce shoreline erosion in critically eroding areas. The pump outfall management structures will also increase freshwater retention.

The pump outfall management program will improve water quality in the basin by forcing water high in nutrients and pollutants to flow through swamps and marshes rather than being directed immediately into waterbodies. This should enhance plant growth while reducing eutrophication.

Boat access to many areas must be maintained.

Status.

The project was selected for funding on PPL 1. Project engineering and design is completed. Project construction should begin within the next year.

BA-6 U.S. HIGHWAY 90 TO GULF INTRACOASTAL WATERWAY HYDROLOGIC RESTORATION

Location.

BA-6 is a 40,000-acre wetland protection and enhancement project located in Lafourche Parish east of Bayou Lafourche, between U.S. Highway 90 and the GIWW, and west of Bayou des Allemands (Figure 29).

Problems and Opportunities.

The project area consists of fresh to intermediate marshes that have been deprived of freshwater and sediments from the Mississippi River. Wetland losses are due to subsidence, sea-level rise, erosion by waves and currents and saltwater intrusion. Hydrologic modifications to minimize physiological stress to wetland vegetation caused by prolonged flooding and increased salinities, and retain sediments have been recommended. Fresh water from the outfall of forced drainage pumps is currently being discharged into canals that quickly funnel the water off-site. Instead of wasting this readily available supply of freshwater, this resource will be incorporated in the management plan.

Description of Features.

Specific project features include: 1) thirteen miles of vegetative plantings; 2) five rock weirs; 3) five earthen dams; 4) twenty miles of overflow banks; and, 5) outfall management of existing forced drainage pumps. Oil fields along with some of the larger canals will be hydrologically isolated from their associated wetlands. Abandoned canals will be closed. Restoration of a more desirable hydrologic regime will be accomplished by employing both structural and nonstructural measures.

Benefits and Costs.

Site-specific WVA analyses run on this project estimate that approximately 1,620 acres will be protected from loss, the coverage of aquatic vegetation will be increased on 1,920 acres, and an additional 2,820 wetland acres would be enhanced. The total area estimated to be benefitted by this project is 6,360 acres. The fully funded cost for this project is $4,583,000.

Effects and Issues.

This project is expected to substantially reduce land loss rates of project area wetlands and significantly expand the coverage of aquatic vegetation. By directing forced drainage outfalls through area wetlands, water quality in adjacent waterbodies is expected to improve.

Maintaining small boat access will be an issue.

Status.

Preliminary designs are completed and a permit has been issued to Lafourche Parish for construction. The project was deferred from the first priority list and is a candidate for future priority lists.

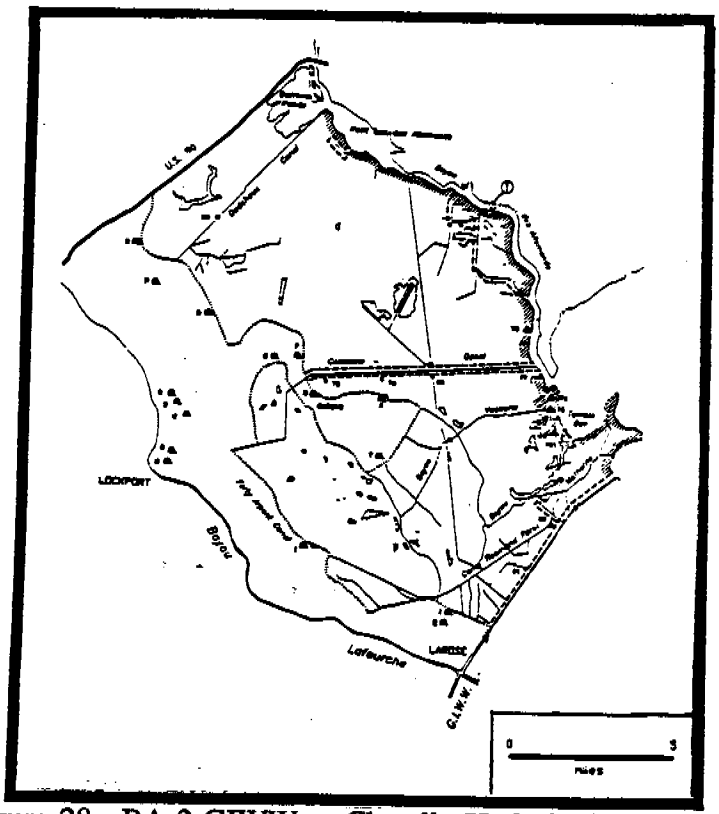

Figure 28. BA-2 GIWW to Clovelly Hydrologic Restoration

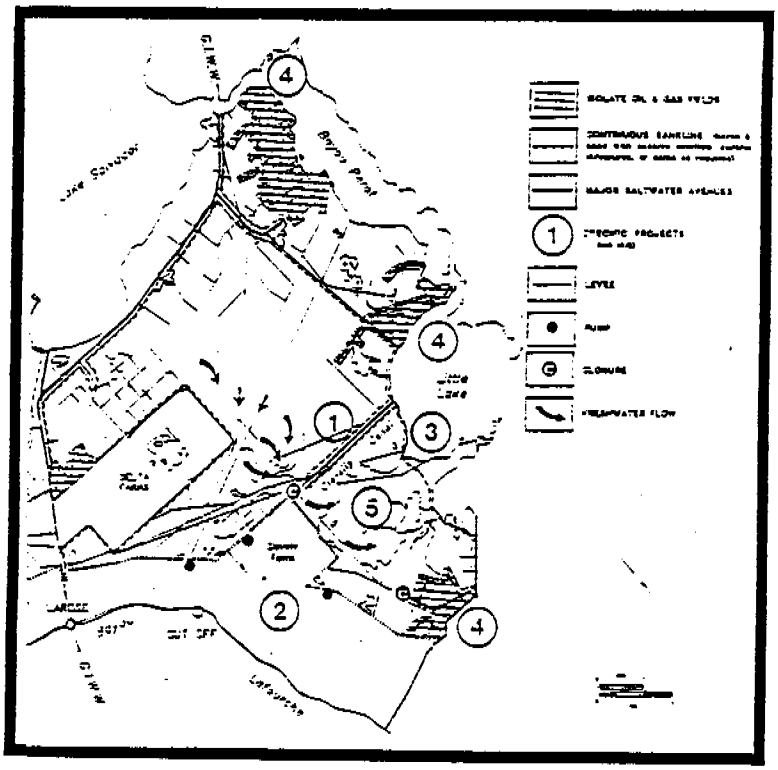

Figure 29. BA-6 U.S. Highway 90 to Gulf Intracoastal Waterway Hydrologic Restoration

BA-7 COUBA ISLAND SHORELINE PROTECTION

Location.

The 350-acre project site is located on Couba Island in St. Charles Parish, between Lake Cataouatche and Lake Salvador (Figure 30).

Problems and Opportunities.

Couba Island is important as a hydrologic barrier between Lake Salvador and Lake Cataouatche. Shoreline erosion from wind-generated waves is causing severe shoreline erosion along the southern shore of Couba Island. Furthermore, water movement through an inactive access canal is causing erosion of fresh marsh wetlands hydrologically connected to the canal through breached spoil banks.

Description of Features.

Approximately 4 miles of shoreline protection are needed along the southern shoreline.

Benefits and Costs.

Site specific WVA analyses were not undertaken for this project. However, it is preliminarily estimated that project implementation will protect approximately 250 acres of marsh from loss and will benefit 50 acres of submerged aquatic vegetation. The cost estimate for this project is $752,000.

Effects and Issues.

This project will reduce shoreline erosion along the southern shore of Couba Island and will reduce interior marsh loss by prohibiting water flow through an abandoned access canal.

Protection of the shoreline will help stop the breaching of Lake Salvador into the more fragile marshes presently only protected by a narrow strip of higher marsh.

Status.

The feasibility study has been completed. The state is undergoing detailed project design due to be completed in November 1993.

BA-8 LAKE CATAOUATCHE SHORELINE PROTECTION

Location.

This 350-acre project is located on the western shore of Lake Cataouatche at the boundary of the Salvador Wildlife Management Area (Figure 31).

Problems and Opportunities.

The objective of the project is to preserve valuable wetlands and submerged aquatic vegetation on public lands of the "Netherlands" area by prolonging existence of the marsh that separates this area from Lake Cataouatche.

Description of Features.

An approximately 2,000-foot long tire and piling breakwater is proposed to supplement the 3,500-foot long tire and piling breakwater installed by the USACE as mitigation for the West Bank hurricane protection levee.

Benefits and Costs.

Site-specific WVA analyses were not undertaken for this project. However, it is preliminarily estimated that project implementation will reduce wetland loss by approximately 20 acres and increase the coverage of submerged aquatic vegetation by 50 acres. The total area estimated to be benefitted by this project is 70 acres. The gross cost estimate for this project is $376,000.

Effects and Issues.

There will be a reduction of fetch and wave energy in the Netherlands, thereby reducing land loss and enhancing aquatic vegetation.

Status.

Preliminary designs are completed. The project is a candidate for future priority lists. Detailed plan evaluation and a feasibility analysis needs to be done.

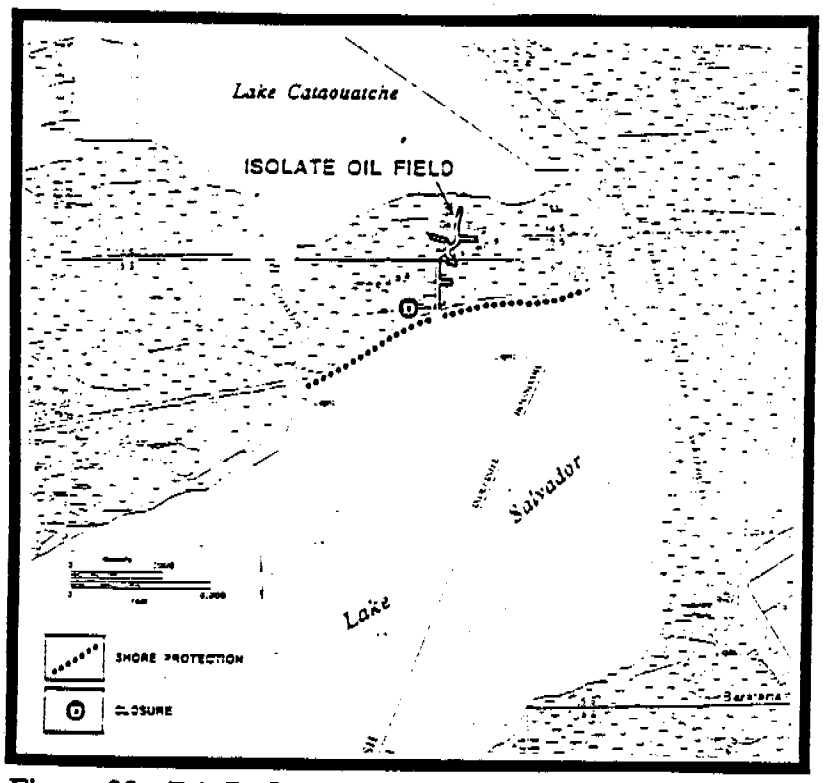

Figure 30. BA-7 Couba Island Shoreline Protection

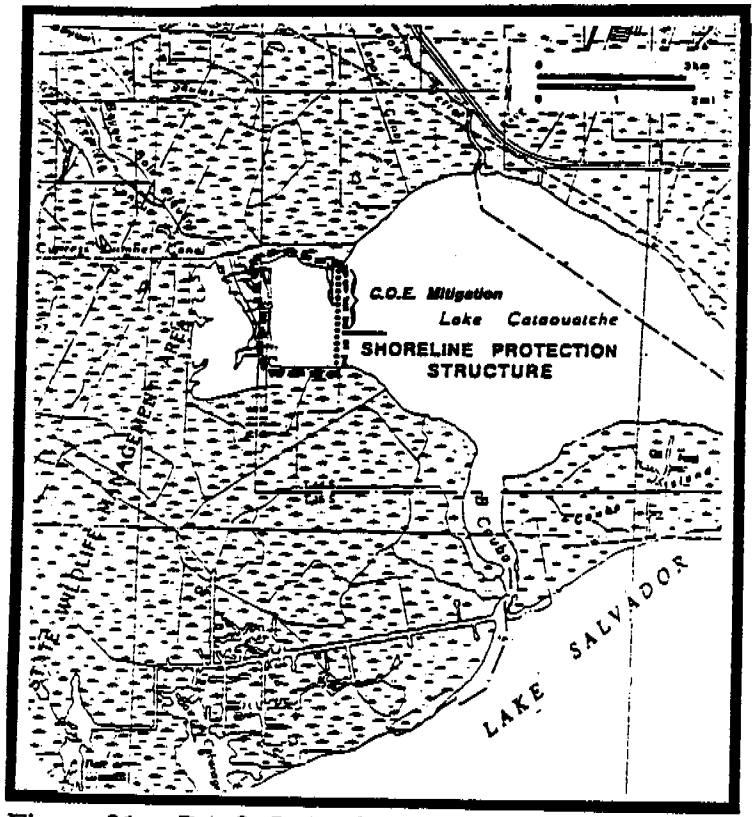

Figure 31. BA-8 Lake Cataouatche Shoreline Protection

BA-9 SALVADOR WILDLIFE MANAGEMENT AREA GULF CANAL SHORELINE PROTECTION

Location.

This project is located in St. Charles Parish along the main oil field canal west of Bayou Couba in the Salvador WMA (Figure 32).

Problems and Opportunities.

The Gulf Canal serves as the major artery for oil and gas activity in the Salvador WMA. When constructed, the canal was 70 feet wide. By 1965 and 1985 the average width was 312 feet and 414 feet respectively along the initial 2.5 mile stretch. There is an average annual shoreline erosion rate of 5.1 feet per year. The objective of the project is to reduce marsh erosion caused by boat wakes.

Description of Features.

The project would involve construction of 5 miles of wave dampening fences in conjunction with vegetative plantings in the shallow areas along the canal banks.

Benefits and Costs.

Site-specific WVA analyses were not undertaken for this project. However, it is preliminarily estimated that project implementation will protect approximately 40 acres of marsh from erosion, enhance 10 wetland acres, and benefit 10 acres of aquatic vegetation. The total area estimated to be benefitted by this project is 60 acres. The gross cost estimate for this project is $844,000.

Effects and Issues.

The project would reduce shoreline erosion along 2.5 miles of canal shoreline.

Status.

Preliminary designs are completed and this project is a candidate for future priority project lists. Detailed plan evaluation and a feasibility analysis needs to be done.

BA-14 LITTLE LAKE MARSH MANAGEMENT

Location.

The 2,000-acre brackish marsh project area is located along the east shoreline of Bayou Rigolettes, approximately 8 miles southwest of Lafitte in Jefferson Parish (Figure 33).

Problems and Opportunities.

The project area is experiencing shoreline erosion and interior marsh breakup as a result of saltwater intrusion, subsidence, and excessive tidal exchange. The project area forms an important component of the upper Barataria estuary, as it is part of the hydrologic barrier between Little Lake and Lake Salvador. The area has been under management for several decades; however, recently, it has been experiencing high shoreline erosion rates along Bayou Rigolettes. The eastern management levee has eroded, and saltwater intrusion and subsidence threaten the interior marshes.

Description of Features.

Several types of measures are under consideration at this time including 1) erosion control measures, 2) bank restoration along Bayou Rigolettes, using dredged material and vegetation planting, and 3) management of water exchange using water control structures after restoration of management levees.

Benefits and Costs.

Site-specific WVA analyses were not undertaken for this project. However, it was estimated that this project will protect approximately 270 acres from loss, enhance 180 acres, and benefit aquatic vegetation on 220 acres. The total area estimated to be benefitted by this project is 670 acres. The gross cost estimate for this project is $1,112,000.

Effects and Issues.

The soils at this site are very unstable with poor load bearing capacity. Traditional structures used to reduce shoreline erosion may not be suitable under these circumstances.

Management design must consider future availability of water from the proposed Davis Pond Diversion.

Installation of water control structures for hydrologic management purposes will adversely impact marine fisheries production and vertical accretion of sediments on management area wetlands.

Status.

Preliminary designs are completed and this project is a candidate for future priority lists. A feasibility study must be done to finalize the plan and determine methods to improve benefits and reduce costs.

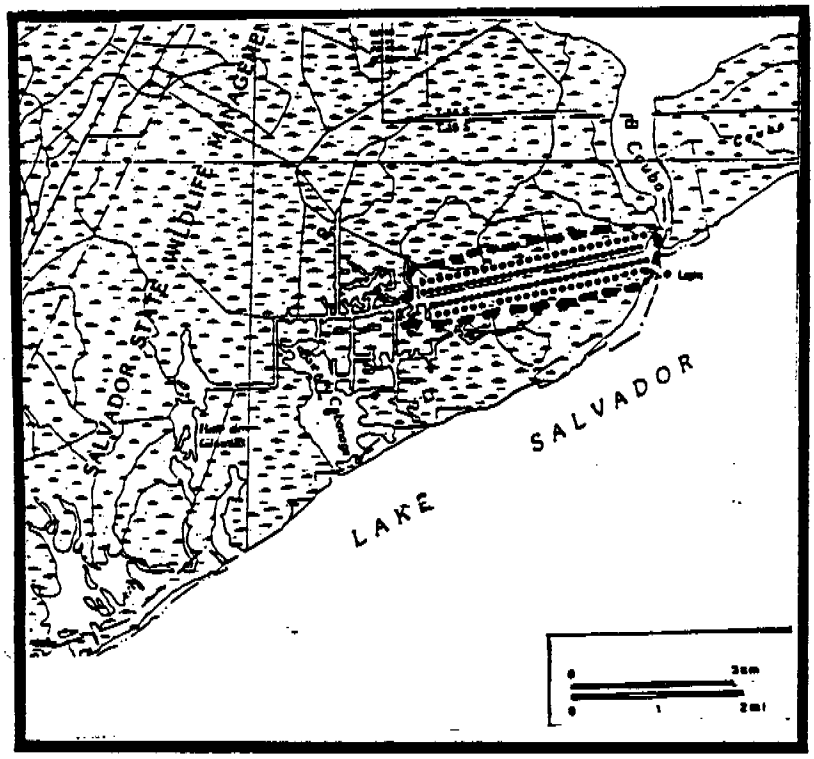

Figure 32. BA-9 Salvador Wildlife Management Area Gulf Canal Shoreline Protection

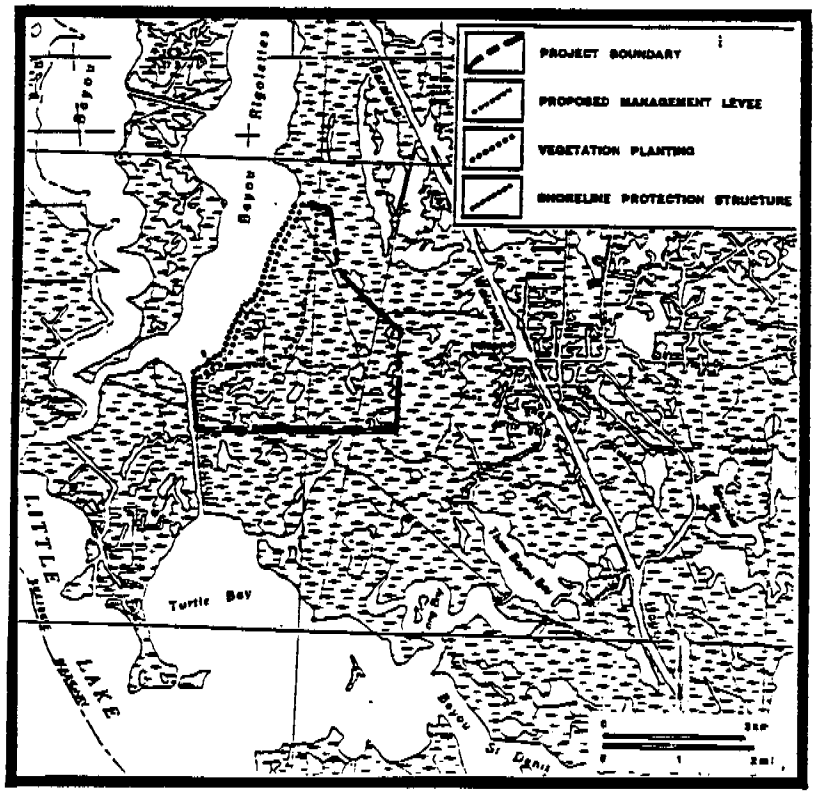

Figure 33. BA-14 Little Lake Marsh Management

BA-16 LAKE SALVADOR SHORELINE PROTECTION AT THE BAYOU SEGNETTE WATERWAY

Location.

This project is located on the eastern shore of Lake Salvador in Jefferson Parish (Figure 34).

Problems and Opportunities.

The Jean Lafitte National Historical Park is located east of Lake Salvador. The Bayou Segnette Waterway and a narrow isthmus of land separate the Park from Lake Salvador. Wind generated waves on Lake Salvador are eroding the eastern shore of the lake adjacent to the Bayou Segnette Waterway. At the most critical location, only a 10-foot wide, tree lined bank separates the lake from Bayou Segnette. Without shoreline protection, the eastern shore of Lake Salvador will erode and breach into the Bayou Segnette Waterway. This would allow wind-driven waves to erode the marshes of the Park.

Description of Features.

The project consists of construction a 5,000-foot long breakwater parallel to the eastern bank of Lake Salvador. The area between the breakwater and the existing shore would trap sediments from Lake Salvador. An abandoned oil well access canal just north of the proposed breakwater is allowing water exchange between Lake Salvador and Bayou Segnette. Closure of this canal is also a project feature.

Benefits and Costs.

WVA analyses undertaken for this project have estimated that project implementation will protect approximately 90 acres of marsh. The cost estimate for this project is $1,106,000.

Effects and Issues.

This project will prevent the eastern shoreline of Lake Salvador from breaching into the Bayou Segnette Waterway. In turn, this will prevent loss of marshes on the Jean Lafitte National Historical Park from accelerated erosion caused by wind generated waves.

Status.

This project has been funded by the State and Jefferson Parish. Construction of this project is scheduled for 1993.

BA-18 FOURCHON HYDROLOGIC RESTORATION

Location.

The project area is located in lower Lafourche Parish, between State Road 3090 and Bayou Lafourche, and adjacent to the Port Fourchon facilities (Figure 35). The area encompasses a 2,500-acre impoundment created for spoil containment but little utilized.

Problems and Opportunities.

The area is a dredge spoil disposal site which is impounded above normal tide levels because of limited water exchange capability. Without water exchange with adjacent estuarine water bodies, the area contributes only minimally as habitat for wildlife and resident fish populations. Placement of culverts in the perimeter levee surrounding the area would open it to regular tidal exchange and enhance marine fishery production. The overall reduction in water levels would encourage the encroachment of smooth cordgrass into formerly shallow-water areas.

Description of Features.

The project involves the installation of two 48-inch diameter culverts beneath the shell road along the northern perimeter of the project area. Culvert length will be approximately 75 feet long.

Benefits and Costs.

WVA analyses undertaken for this project estimate that project implementation will create approximately 160 acres of marsh and benefit 220 acres for a total of 380 acres benefited. The cost estimate for the project is $187,000.

Effects and Issues.

The project would enhance fishery production on project area wetlands by increasing fishery access to the site.

The project will improve the coverage of emergent marsh vegetation by reducing overall water elevations.

Status.

The project was selected for funding on PPL1. The landowners have installed some features of the project and are not supportive of additional work. Project status is uncertain at this time.

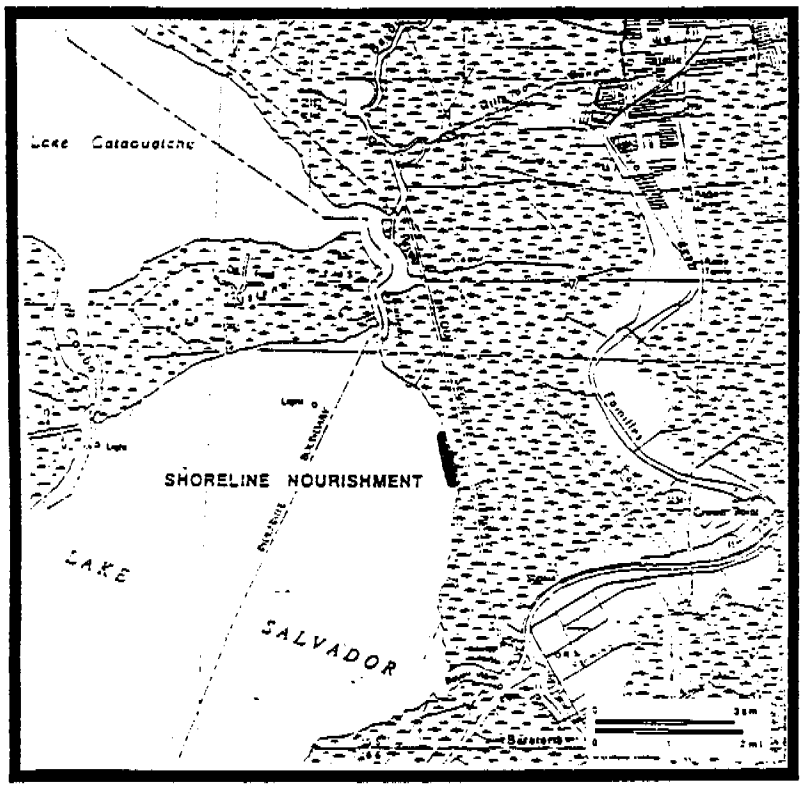

Figure 34. BA-16 Lake Salvador Shoreline Protection at the Bayou Segnette Waterway

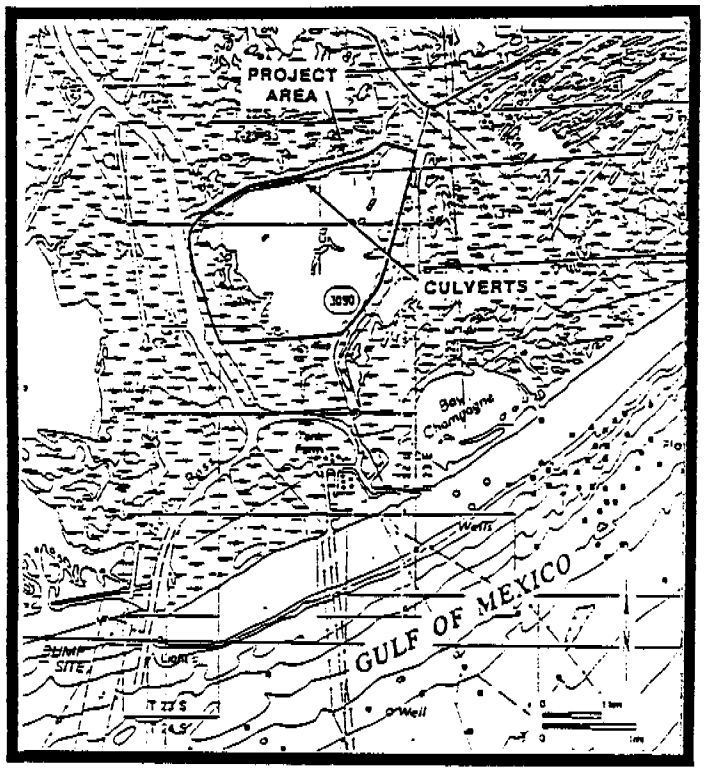

Figure 35. BA-18 Fourchon Hydrologic Restoration

BA-19 BARATARIA BAY WATERWAY MARSH BUILDING WITH DREDGED SEDIMENTS

Location.

The project area is in Jefferson Parish adjacent to the Barataria Bay Waterway between mile 0 and mile 16 (Figure 36).

Problems and Opportunities.

Marsh areas adjacent to the Barataria Bay Waterway have eroded rapidly due to boat wakes, salt water intrusion, and tidal scour. This reach of the Barataria Bay Waterway is maintenance dredged at 4-year intervals and dredged sediments are placed in designated disposal areas adjacent to the waterway. This project will allow this material to be used beneficially to create new marsh and nourish existing marsh.

Description of Features.

Over the 20-year project life, channel dredging would be performed about five times, averaging approximately 1,740,000 cubic yards of spoil per dredging event. With this project, hydraulic cutter-head dredges would be used to dredge the waterway and pump the material into 18 marsh development areas. Small dikes would be constructed around the disposal areas to ensure the material stacks to marsh elevations and to avoid affecting producing oyster beds. Spoil would be pumped to elevations appropriate for marsh creation.

Benefits and Costs.

WVA analyses undertaken for this project estimate that project implementation will create approximately 450 acres of marsh. The cost of the project is $1,125,000, which is only the cost of pumping the dredged material for beneficial disposal.

Effects and Issues.

The project will re-create a large wetland area destroyed by channel dredging, salt water intrusion, boat wakes, and tidal scour.

Spoil containment dikes should be breached after consolidation and vegetative establishment to restore tidal circulation and fisheries access to created marsh areas.

Status.

The project was selected for funding under PPL 1. Project implementation awaits the next dredging of the waterway.

PBA-11 SHORELINE PROTECTION ON GRAND BAYOU WITH A TIRE BREAKWATER

Location.

The project is located on Grand Bayou between West Pointe a la Hache and Port Sulphur in Plaquemines Parish, approximately 7 miles northwest of Port Sulphur (Figure 37).

Problems and Opportunities.

The banks of Grand Bayou are rapidly eroding due to a number of factors, especially boat wakes. This project will stabilize the bayou banks in selected critical areas and thus protect the marshes from continued erosion. This project also will use discarded automobile tires for erosion protection.

Description of Features.

The project involves the installation of a pile supported tire structure along approximately 3,000 feet of critical shoreline.

Benefits and Costs.

Site-specific WVA analysis were not undertaken for this project. However, it was estimated that this project will protect approximately 10 acres from loss. The gross cost estimate for this project is $576,000.

Effects and Issues.

The USACE has investigated the use of tires as breakwaters.

Binding the tires together securely is difficult and usually leaves a variety of moving joints and parts that wear out, causing the structure to fail. In areas such as this where water energies can be very high during storms, tires from a failed structure could be scattered broadly across the coastal region.

Status.

Details of the project design need to be developed and a decision made concerning the use of tires in a breakwater before the project is considered a candidate for a priority list.

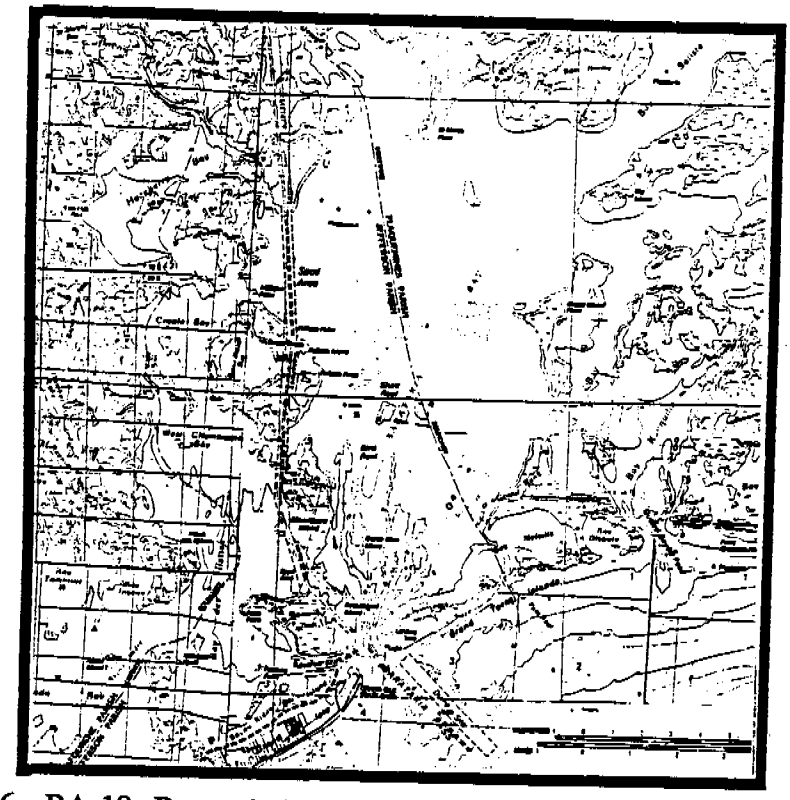

Figure 36. BA-19 Barataria Bay Waterway Marsh Building with Dredged Material

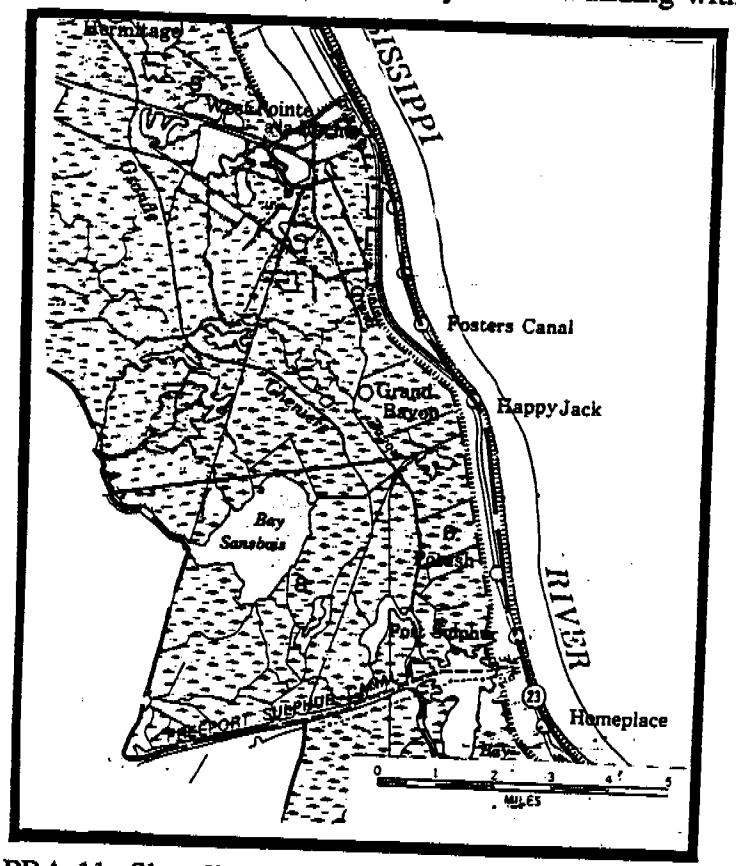

Figure 37. PBA-11 Shoreline Protection on Grand Bayou with a Tire Breakwater

PBA-12 BARATARIA BAY WATERWAY SHORELINE PROTECTION BELOW BAYOU RIGOLETTES

Location.

The project site is located in Jefferson Parish on the east and west banks of the Dupre Cut portion of the Barataria Bay Waterway, north of the Lafitte Oil and Gas Field and southeast of Lafitte (Figure 38).

Problems and Opportunities.

Breaches have occurred in the banks of the Barataria Bay Waterway in the area of the Dupre Cut due to erosion from vessel wakes. This has resulted in increased water exchange rates and marsh losses.

Description of Features.

Material from maintenance dredging of Dupre Cut and other transported fill would be used to stabilize the banks of the Barataria Bay Waterway adjacent to Dupre Cut.

Benefits and Costs.

Site-specific WVA analyses were not undertaken for this project. However, it is preliminarily estimated that project implementation will protect approximately 140 acres of marsh from loss, benefit 30 acres of submerged aquatic vegetation, and enhance an additional 20 acres of wetlands. The total area estimated to be benefitted by this project is 190 acres. The gross cost estimate for the project is $1,762,000.

Effects and Issues.

This project will reconstruct stable banks and protect marshes currently threatened from saltwater intrusion and tidal scour.

Irregular maintenance dredging would not provide an adequate source of material for construction. It is unlikely that this waterway can be stabilized with only dredged material.

Several pipelines on the eastern margin of Dupre Cut pose additional problems.

Status.

This project is a candidate for future priority lists. Detailed plan evaluation and a feasibility analysis needs to be done.

PBA-16 THE PEN SHORELINE PROTECTION

Location.

The project is located on the northern shoreline of a large, rectangular open water area called The Pen in Jefferson Parish east of the city of Lafitte (Figure 39).

Problems and Opportunities.

The northeast corner of The Pen, including portions of Goose Bayou and Bayou Plat is eroding rapidly. The resulting loss of bank integrity results in increased water exchange rates between The Pen and the adjacent marsh.

Description of Features.

Lightweight shoreline protection materials would be installed in shallow water adjacent to the eroding shoreline.

Benefits and Costs.

Site-specific WVA analyses have not been undertaken for this project. However, it is estimated that project implementation will protect approximately 60 acres of marsh from loss and enhance an additional 50 wetland acres. The total area estimated to be benefitted by this project is 110 acres. The gross cost estimate for this project is $2,324,000.

Effects and Issues.

The project will reduce marsh erosion, slow water exchange, and maintain the hydrologic integrity of these wetlands.

Status.

This project is a candidate for future priority lists. Detailed plan evaluation and feasibility analyses need to be undertaken.

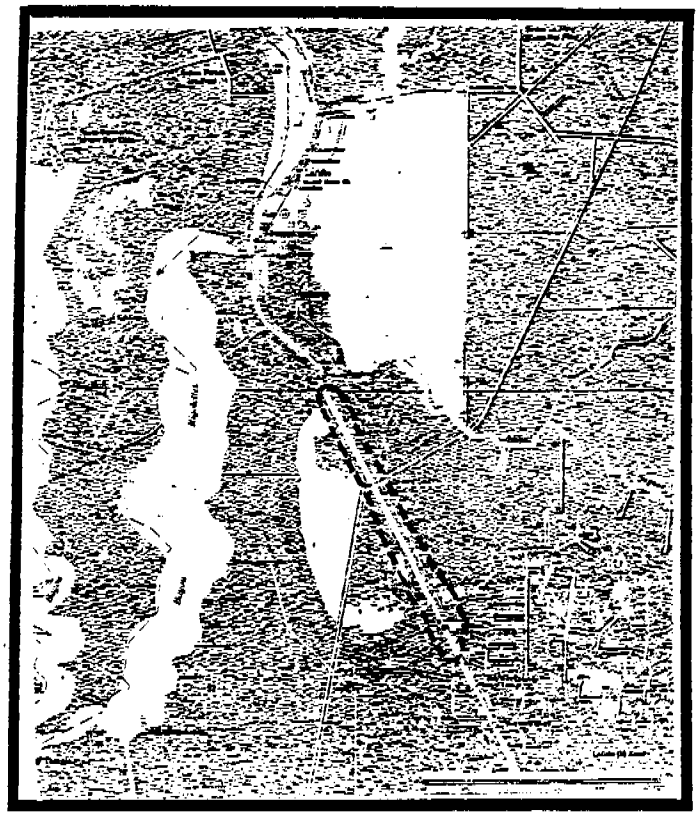

Figure 38. PBA-12 Barataria Bay Waterway Shoreline Protection Below Bayou Rigolettes

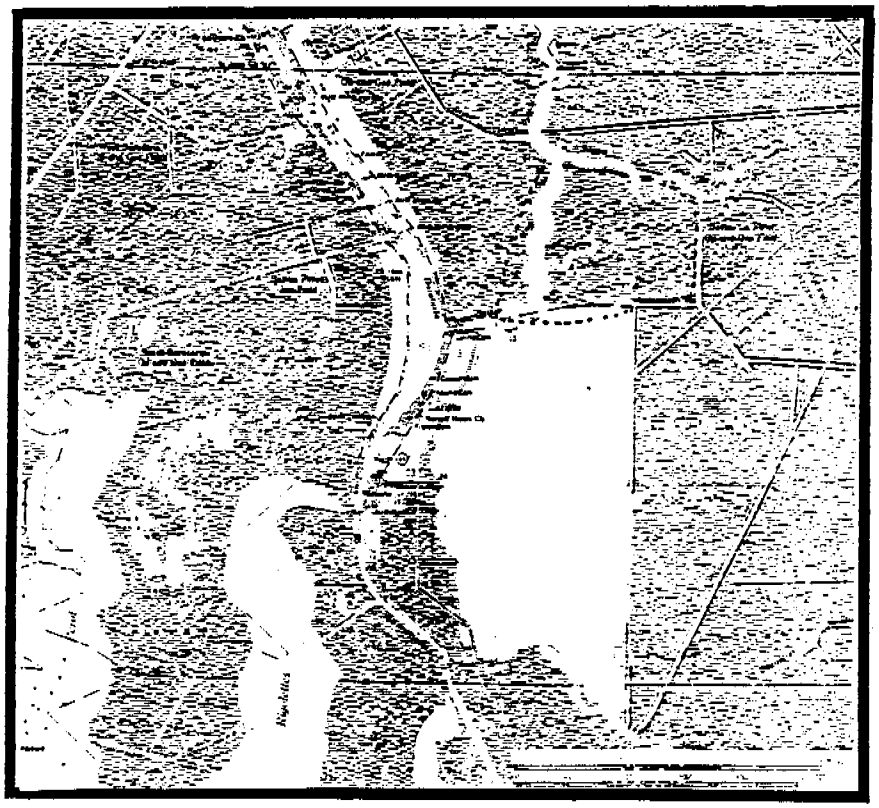

Figure 39. PBA-16 The Pen Shoreline Protection

PBA-34 HYDROLOGIC RESTORATION OF BAYOU L'OURS RIDGE

Location.

The Bayou L'Ours Ridge is located in Lafourche Parish east of La. Highway 1, south of Golden Meadow and north of Leeville (Figure 40).

Problems and Opportunities.

Bayou L'Ours was historically a distributary of Bayou Lafourche. The natural levees of this bayou created the L'Ours subbasin which lies between Bayous Lafourche and L'Ours. Access and pipeline canals have been dredged through the natural levees, altering the subbasin's hydrology. Consequently, marshes within the upper subbasin now experience increased tidal exchange, reduced freshwater retention, and higher salinities.

Freshwater currently being introduced via drainage pumps from forced drainage areas near Golden Meadow and Cutoff will not be effectively retained in the subbasin without repairing this ridge. The purpose of this project is to significantly reduce tidal flow through the L'Ours Ridge, thereby directing fresh water from forced drainage areas to flow southeasterly between the two natural levees.

Description of Features.

Approximately 10 canal closures or constrictions will be installed to restore the hydrologic integrity of the Bayou L'Ours Ridge. Two of the closures will contain boat bays to accommodate small boat traffic.

Benefits and Costs.

Site-specific WVA analyses have not been undertaken for this project. However, it is preliminarily estimated that project implementation will protect approximately 780 acres of marsh from loss, benefit 1,330 acres of submerged aquatic vegetation, and enhance an additional 680 wetland acres. The total area estimated to be benefitted by this project is 2,780 acres. The gross cost estimate for this project is $2,327,000.

Effects and Issues.

The project would serve to increase freshwater and sediment retention. The re-established ridge would help retain fresh water from the existing forced drainage outfalls.

Small boat access through more heavily used canals proposed for closure or constriction should be maintained.

Impacts to oyster leases must be considered.

Eliminating tidal flow across this ridge will increase erosional pressure in tidal routes that are forced to accommodate the additional flow.

Status.

This project is a candidate for future priority project lists. Detailed plan evaluation and feasibility studies must be undertaken to finalize the plan design.

PBA-35 JONATHAN DAVIS WETLAND RESTORATION

Location.

The project encompasses 6,450 acres of wetlands within the South Barataria and Bayou Perot Oil and Gas Fields in Jefferson Parish. The area is bounded by Louisiana Highway 301 on the east, Bayou Rigolettes and Bayou Perot on the south, the GIWW on the west, and Pailet Canal on the north (Figure 41).

Problems and Opportunities.

A series of canals dredged in the project area have caused marsh loss due to salt water intrusion, boat wakes, and tidal scour. In addition, canal spoil banks block overland flow and locally impound water. Wind-generated waves from Bayou Perot and Bayou Rigolettes are causing high rates of shoreline erosion in marshes adjacent to those waterbodies.

The purpose of this project is to reduce tidal scour and salt water intrusion by installing plugs and water control structures at critical locations.

Description of Features.

Project components include 13 rock weirs, 20 plugs or canal closures, spoil bank maintenance at critical locations, and the use of dredged material to stabilize and re-create wetlands in marshes adjacent to Bayou Perot and Bayou Rigolettes (Figure).

Benefits and Costs.

WVA analyses undertaken for this project estimate that project implementation will protect approximately 510 acres of marsh, benefit 360 acres of submerged aquatic vegetation and enhance 710 acres. The total area estimated to be benefited by this project is 1580 acres. The fully funded cost of this project is $2,796,000.

Effects and Issues.

This project should reduce marsh loss rates by reducing shoreline erosion, tidal scour, and saltwater intrusion. The area's value to fish and wildlife will be enhanced by maintaining a healthy marsh environment.

Boat access through numerous access canals must be maintained.

Status.

This project was selected for funding on PPL 2. Detailed plan evaluation and feasibility analyses are being undertaken.

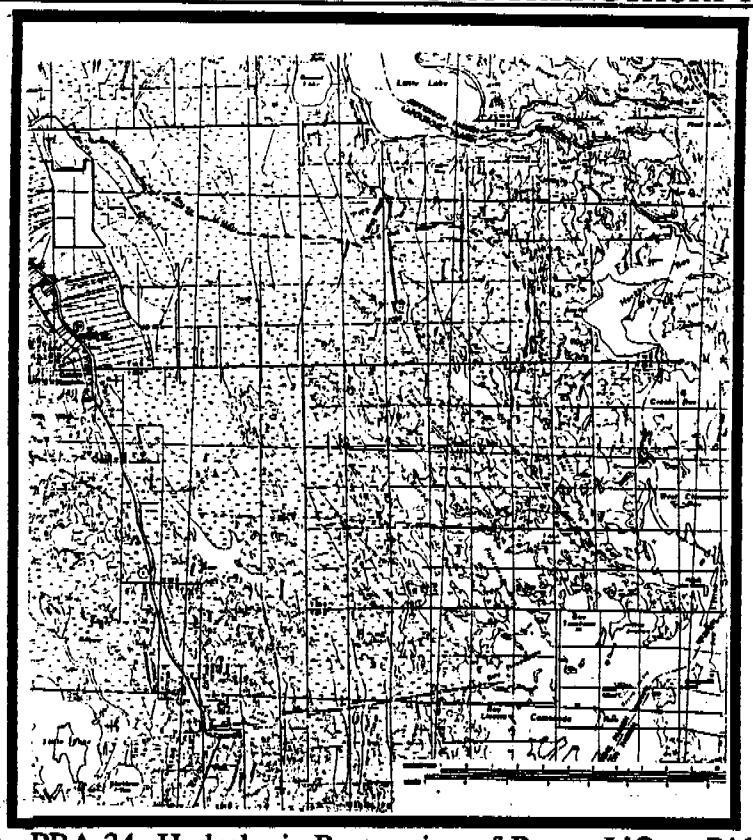

Figure 40. PBA-34 Hydrologic Restoration of Bayou L'Ours Ridge

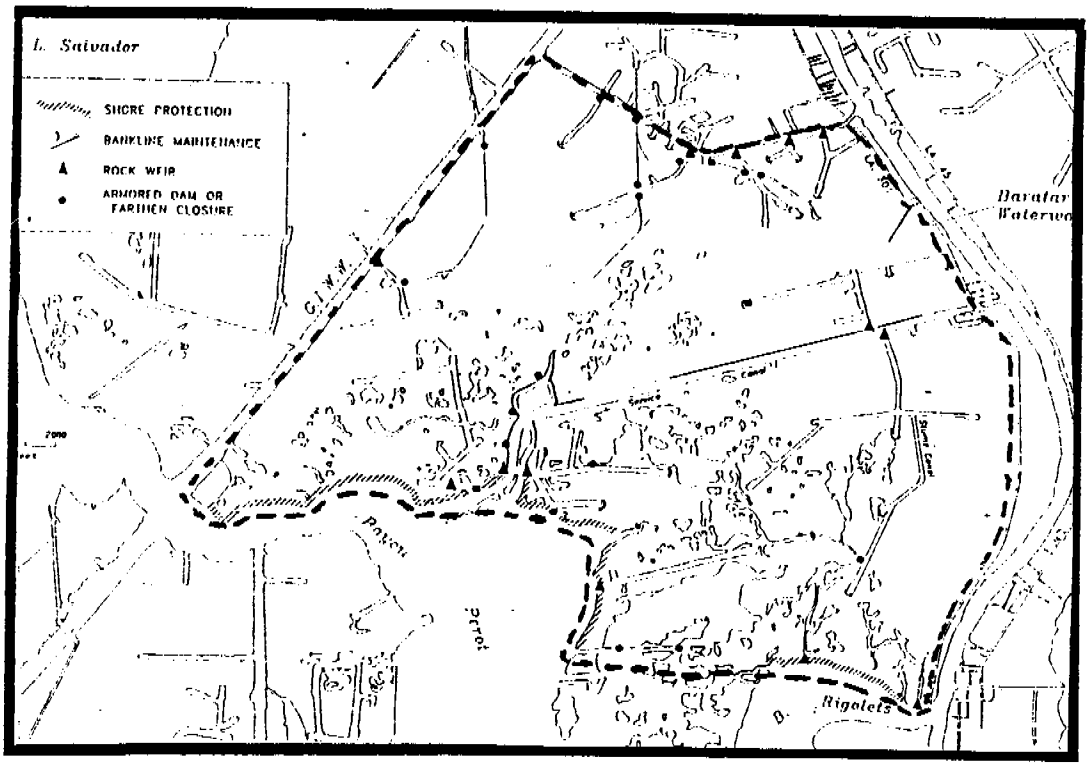

Figure 41. PBA-35 Jonathan Davis Wetland Restoration

PBA-38 SHELL ISLAND SEDIMENT REPLENISHMENT

Location.

The project area consists of a 2-mile stretch of the Gulf of Mexico shoreline in Plaquemines Parish immediately west of the Empire Waterway jetties (Figure 42).

Problems and Opportunities.

The shoreline west of the Empire Waterway jetties is eroding rapidly as a result of inadequate sediment supply, pipeline canals, interruption of the longshore sediment drift by the jetties, and perhaps sub-surface fault movements.

Description of Features.

This project involves pumping approximately 3 million cy of sand from Sixty-Mile Point in the Mississippi River onto 2 miles of shoreline west of the jetties. The island will be expanded by approximately 400 acres. This project differs from XBA-1E in the length of shoreline filled and in the source of the fill material.

Benefits and Costs.

Site-specific WVA analyses were not undertaken for this project. However, it is estimated that approximately 400 acres of marsh would be created, 110 acres protected, and 20 acres enhanced by project implementation. In addition, it is estimated that maintenance of this barrier system will protect approximately 110 acres of shallow habitat containing submerged aquatic vegetation. The total area estimated to be benefitted by this project is 640 acres. The gross cost estimate for this project is $22,060,000.

Effects and Issues.

This stretch of shoreline will be stabilized against wash over, breaching, and bay-side erosion, thereby increasing island longevity. Hydrodynamic drag upon tidal exchange will be increased for a short term and maintained for a longer period, thereby helping to reduce interior-basin saltwater intrusion, erosion, and sediment export.

The project will temporarily increase turbidity and suspended sediment loads in waters adjacent to the project area. This may result in temporary impacts to oyster leases near Shell Island Bay.

Projects involving Barataria Bay barrier islands should be designed in conjunction with each other and, if possible, constructed concurrently to reduce costs. These islands also should be considered for periodic replenishment as dredged material becomes available.

If monitoring indicates that the marsh built on this island erodes quickly, a future project to construct an artificial dune on the island should be considered.

Status.

An initial phase of this project was evaluated on PPL2 but was not selected for funding. This project is a candidate for future priority lists. A feasibility study must be done to finalize the plan and determine methods to reduce costs and increase benefits.

PBA-39 SANDY POINT BARRIER ISLAND SEDIMENT REPLENISHMENT

Location.

Sandy Point barrier island is a 4 mile segment of the Gulf of Mexico shoreline between Sandy Point Bay and Scofield Pass in Plaquemines Parish (Figure 43).

Problems and Opportunities.

This stretch of barrier shoreline is rapidly eroding due to an inadequate sediment supply, pipeline canals, and perhaps sub-surface fault movements.

Description of Features.

This project consists of the pumping of approximately 3 million cy of sand from a borrow area located 3 miles southeast of Sandy Point into shallow water areas behind the remnant beach rim. Approximately 400 acres of shallow water habitat will be filled to marsh elevations.

Benefits and Costs.

Site-specific WVA analyses were not undertaken for this project. However, it is estimated that approximately 400 acres of marsh would be created, 200 acres protected, and 20 acres enhanced by project implementation. The total area estimated to be benefitted by this project is 620 acres. The gross cost estimate for this project is $17,264,000.

Effects and Issues.

This stretch of shoreline will be stabilized against wash over, breaching, and bay-side erosion, thereby increasing island longevity. Hydrodynamic drag upon tidal exchange will be increased for a short term and maintained for a longer period, thereby helping to reduce interior-basin saltwater intrusion, erosion, and sediment export.

The project will temporarily increase turbidity and suspended sediment loads in waters adjacent to the project area. This may result in temporary impacts to nearby oyster leases.

Projects involving Barataria Bay barrier islands should be designed in conjunction with each other and, if possible, constructed concurrently to reduce costs. These islands also should be considered for periodic replenishment as dredged material becomes available.

The high cost of the project may necessitate implementation in several stages or require separate funding.

If monitoring indicates that the marsh built on this island erodes quickly, a future project to construct an artificial dune on the island should be considered.

Status.

This project presently is in a conceptual phase only. An initial feasibility study must be done to determine potential benefits and methods to reduce costs and increase benefits.

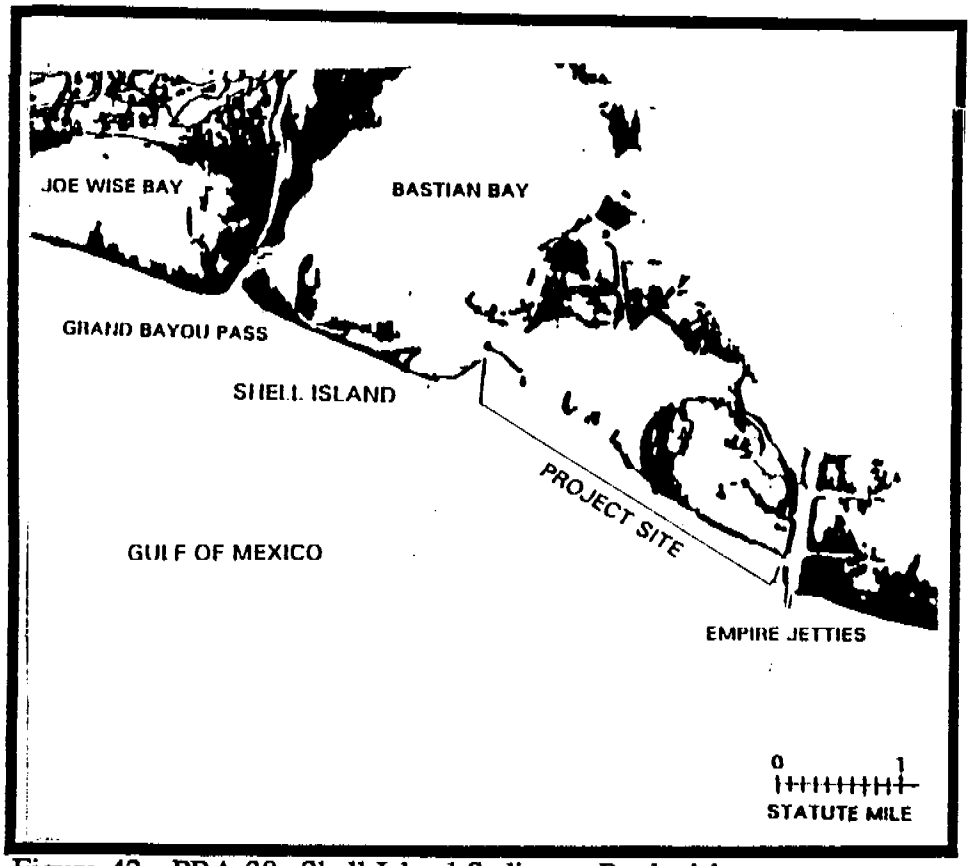

Figure 42. PBA-38 Shell Island Sediment Replenishment

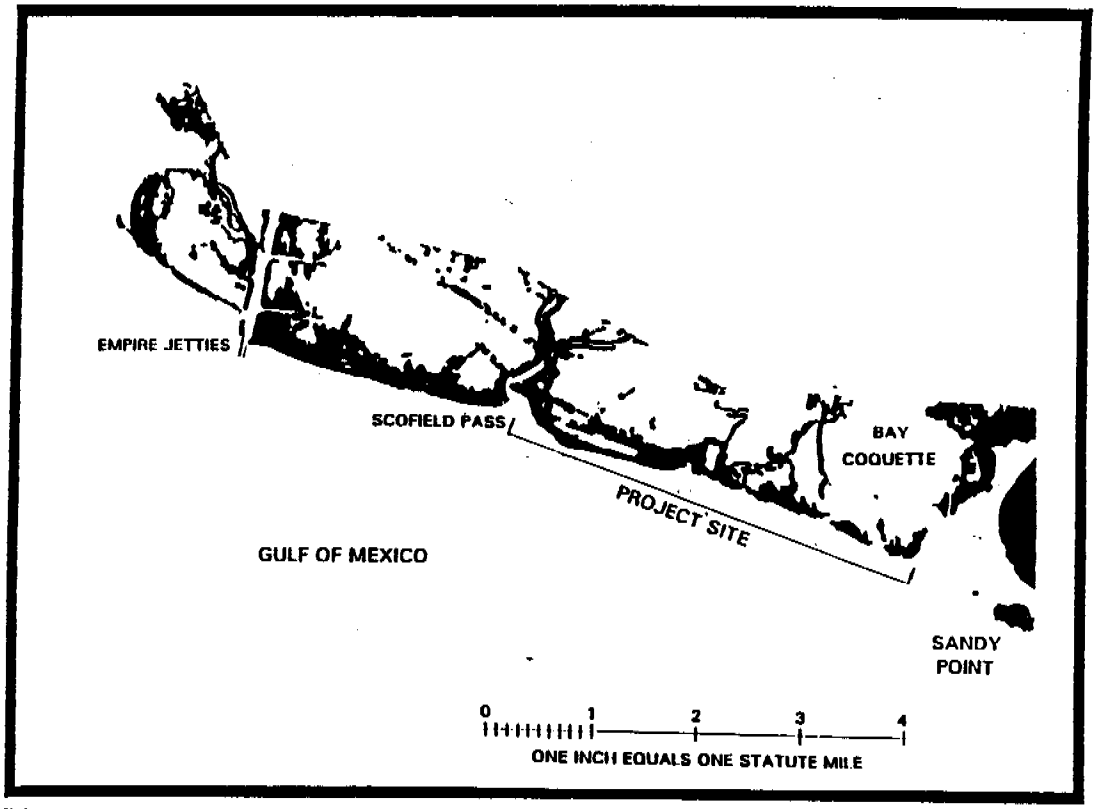

Figure 43. PBA-39 Sandy Point Barrier Island Sediment Replenishment

PBA-58 LITTLE LAKE OIL AND GAS FIELD CANAL CLOSURES

Location.

The project is located in Jefferson Parish, in the peninsula between Little Lake and Turtle Bay, west of the Harvey Cutoff and south of Bayou Rigolettes (Figure 44).

Problems and Opportunities.

The project area is eroding from saltwater intrusion and elevated water exchange rates which resulted from the channelization of the area with oil-field canals. Plugging canals would reduce erosion rates by limiting avenues for saltwater intrusion and by reducing tidal scour.

Description of Features.

The project entails the construction of 14 plugs in various canals.

Benefits and Costs.

Site-specific WVA analyses were not undertaken for this project. However, it is preliminarily estimated that project implementation would protect approximately 580 marsh acres from loss, would benefit 300 acres of submerged aquatic vegetation, and would enhance an additional 250 wetland acres. The total area estimated to be benefitted by this project is 1,130 acres. The gross cost estimate for this project is $1,193,000.

Effects and Issues.

The project will reduce flow through access canals, thereby reducing erosion and possibly resulting in lower salinities.

Small boat access may be decreased.

Access to active wells in this site must be maintained.

Status.

This project is a candidate for future priority lists. A feasibility study must be done to determine which canals can and should be closed, and to determine methods to reduce costs and increase benefits.

PBA-60 BARATARIA DRAINAGE PUMP OUTFALL MANAGEMENT

Location.

The project area is located west of Bayou Barataria, east of the Intracoastal Waterway, and north of the PBA-35 Jonathan Davis Wetland Protection project area.

Problems and Opportunities.

Tidal flow through the Pailet Canal introduces saline water into the Jonathan Davis wetland area. By controlling storm water run-off discharged from an area west of Bayou Barataria into the Jonathan Davis Wetland Protection area and by constructing a dam between the drainage pump outfall and Bayou Barataria, freshwater will be retained in the area and saltwater intrusion will be reduced.

Description of Features.

The drainage pump station discharges into the Pailet Canal, which defines the northwestern boundary of the Jonathan Davis Wetland Protection area. An armored, earthen plug would be constructed on the Pailet Canal between the pump outfall and Bayou Barataria.

Benefits and Costs.

Site-specific WVA analyses were not undertaken for this project. However, it is preliminarily estimated that project implementation will protect approximately 20 marsh acres, benefit 40 acres of submerged aquatic vegetation, and enhance an additional 30 wetland acres. The total area estimated to be benefitted by this project is 90 acres. The gross cost estimate for this project is $97,000.

Effects and Issues.

Greater freshwater retention will occur in the region, increasing the effectiveness of PBA-35 and XBA-63. Reduced tidal flow through Pailet Canal will reduce erosion and reduce sediment export.

This project could be combined with PBA-35 and XBA-63.

Status.

This project is a candidate for future priority project lists. Detailed plan evaluation and a feasibility study needs to be done.

PBA-61 SOUTHEAST LAKE SALVADOR HYDROLOGIC RESTORATION

Location.

The project area is located in Jefferson Parish on the southeast side of Lake Salvador (Figure 45). The project area is bounded by Bayou Perot, Lake Salvador, Bayou Villars, and the GIWW.

Problems and Opportunities.

The project area is eroding as a result of a number of factors including wind driven waves, tidal flow, and vessel wakes. The project will provide shoreline protection for high energy zones. Canal closures will reduce water exchange rates.

Description of Features.

Shoreline protection is proposed for the GIWW and Lake Salvador shorelines of the project site. Additionally, three canals are proposed to be plugged.

Benefits and Costs.

Site-specific WVA analyses were not undertaken for this project. However, it is preliminarily estimated that project implementation will protect approximately 700 acres of marsh, benefit 760 acres of submerged aquatic vegetation, and enhance an additional 200 wetland acres. The total area estimated to be benefitted by this project is 1,660 acres. The gross cost estimate for this project is $10,690,000.

Effects and Issues.

Shoreline retreat, sediment export, and water flow through the site will be reduced.

Small boat access may be reduced.

Status.

This project is a candidate for future priority project lists. Detailed plan evaluation and feasibility analyses need to be done to finalize the plan design.

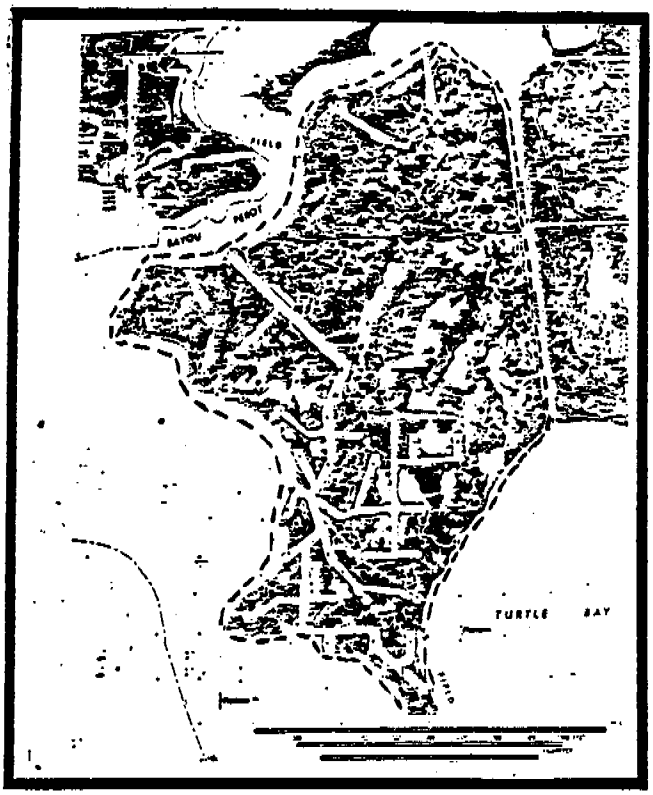

Figure 44. PBA-58 Little Lake Oil and Gas Field Canal Closures

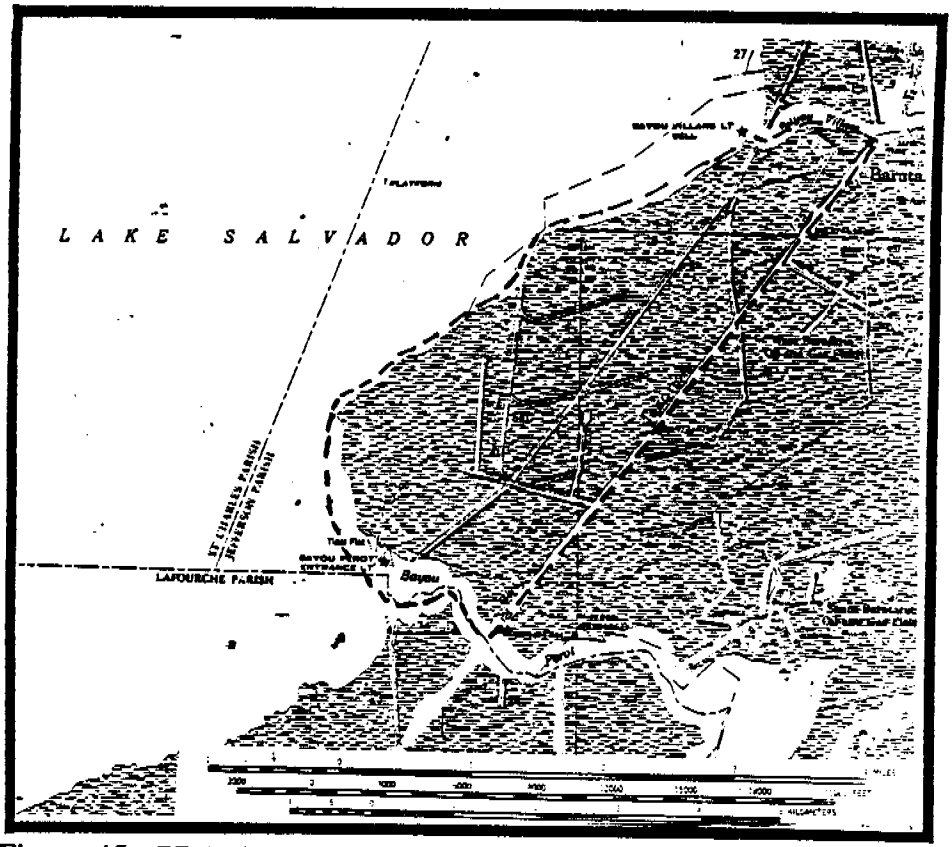

Figure 45. PBA-61 Southeast Lake Salvador Hydrologic Restoration

PBA-66 BARATARIA PASS BAR CHANNEL MAINTENANCE DISPOSAL ON WEST GRAND TERRE

Location.

The project is located in Jefferson Parish, on the northeastern quadrant of West Grand Terre Island (Figure 9).

Problems and Opportunities.

The island contained 567 acres in 1990. During the period between 1956 and 1990, the island lost approximately 8.5 acres per year. West Grand Terre Island is a barrier island which is subject to erosion from tidal currents, wave conditions, and channelization. This project will stabilize bay-side shorelines, close canal openings to reduce water exchange, increase the width of the island and provide a silt screen barrier on the northern side of the island to improve sediment deposition and reduce tidal erosion.

Description of Features.

Five canals will be closed. A silt screen barrier will be stretched across the Bight on the bay side of the island. Spoil generated during maintenance dredging of the Barataria Bay Waterway will be hydraulically transported to and dispersed in the bay and pipeline channels.

Benefits and Costs.

Site-specific WVA analyses were not undertaken for the project. However, it is preliminary estimated that implementation of this project would create 160 acres of marsh. A gross cost estimate for this project is $3,027,000.

Effects and Issues.

The USACE and LDNR will be sharing the cost of creating marsh on the island with material dredged from the bar channel. This project must be designed to complement that disposal.

Placement of spoil in pipeline canals having active pipelines must be done carefully to avoid impacting the pipeline. Easements in these areas may be difficult to get and pipeline companies will probably hold the contractor liable for damage to the pipeline.

Status.

The USACE and LDNR project will be implemented in 1994, and will consist of sediment deposition along the beach rim on the south side of the island and in the bay on the northeast side of the island. Spoil disposal will not be undertaken in the pipeline canals because of easement problems.

XBA-1E SHELL ISLAND TO EMPIRE JETTIES SEDIMENT REPLENISHMENT

Location.

The project area consists of a stretch of eroding shoreline between Shell Island and the Empire Waterway jetties The approximate center of the project is located at 29° 14' latitude and 89° 32' longitude (Figure 46).

Problems and Opportunities.

Data from the USACE and the USFWS show that the acreage of the island has decreased steadily between 1932 and 1990. It has been projected that this system of islands will disappear in or near the year 2002, assuming the project area continues to disappear at the same historical loss rate of 73.3 acres per year.

Description of Features.

This project involves pumping sand from a borrow source 3 miles southeast of Sandy Point and placing it on the shore between Sandy Point Bay and Scofield Pass. Nourishing these 4 miles of shoreline would require approximately 3 million cubic yards of fill and would result in the creation of approximately 400 acres of marsh. This project differs from PBA-38 in the length of shoreline filled and the source of the fill material.

Benefits and Costs.

Site-specific WVA analyses were not undertaken for this project. However, it is estimated that approximately 400 acres of marsh would be created, 110 acres protected, and 20 acres enhanced by project implementation. The total area estimated to be benefitted by this project is 530 acres. The gross cost estimate for this project is $15,296,000.

Effects and Issues.

Similar to XBA-1A.

Status.

This project is a candidate for future priority lists. A feasibility study must be done to finalize the plan and determine methods to reduce costs and increase benefits.

XBA-1F BAY CHAMPAGNE GULF SHORE SEDIMENT REPLENISHMENT

Location.

Bay Champagne is located southeast of Fourchon in Lafourche Parish at approximately 29° 6' latitude and 90° 10' longitude (Figure 47).

Problems and Opportunities.

Data published by Williams et al. (1992) indicate that this shoreline retreated at a rate of approximately 51 feet per year between 1978 and 1988. This low sand spit is subject to frequent washover and landward movement largely due to the export of its sediment and the fine nature of the sediment. Project objectives are to build and strengthen the narrow sand spit that separates Bay Champagne from the gulf for the purposes of slowing shoreline retreat, reducing washover, and creating wetlands in the bay. However, much of the sediment deposited along the Gulf shoreline will rapidly be transported to the west.

Description of Features.

Fill would be applied to the narrow spit between the bay and the Gulf to raise the elevations of the spit to +6 NGVD. Appropriate areas of shallow water north of the spit would be filled with dredged material to create marsh surface elevations.

Benefits and Costs.

Site-specific WVA analyses were not undertaken for this project. However, it is estimated that approximately 90 acres of saline marsh would be created and an additional 200 acres protected by project implementation. The total area estimated to be benefitted by this project is 290 acres. The gross estimated cost for this project is $1,798,000.

Effects and Issues.

Similar to XBA-1A.

Status.

This project is a candidate for future priority lists. A feasibility study must be done to finalize the plan and determine methods to reduce costs and increase benefits.

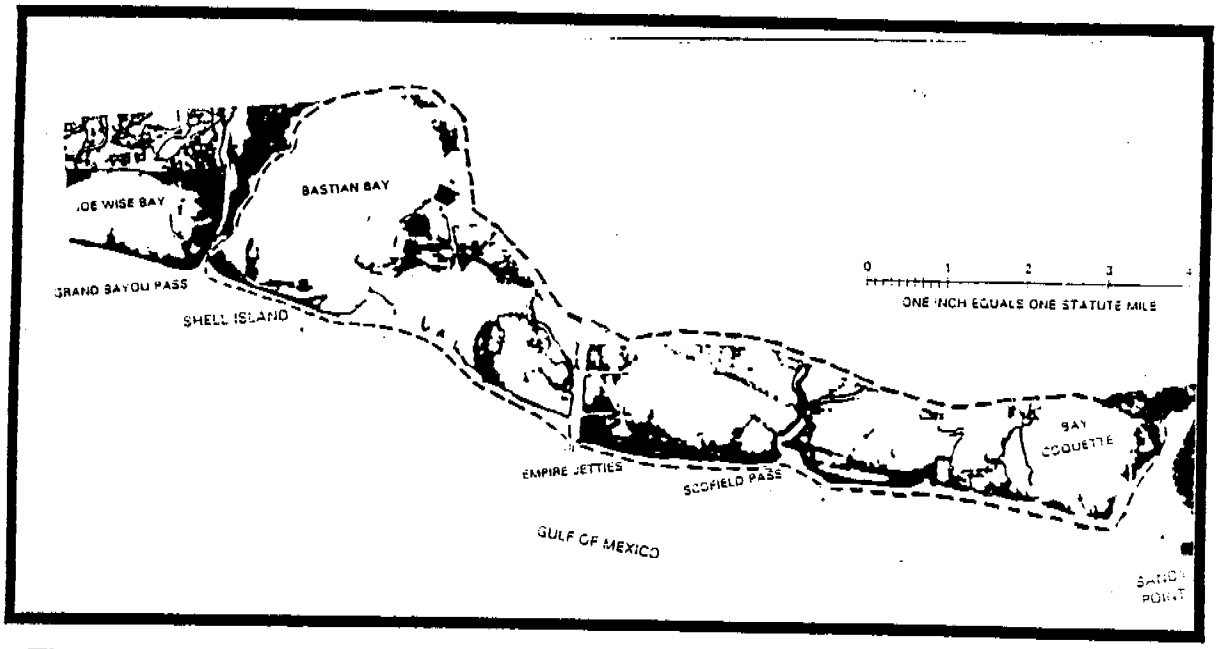

Figure 46. XBA-1E Shell Island to Empire Jetties Sediment Replenishment

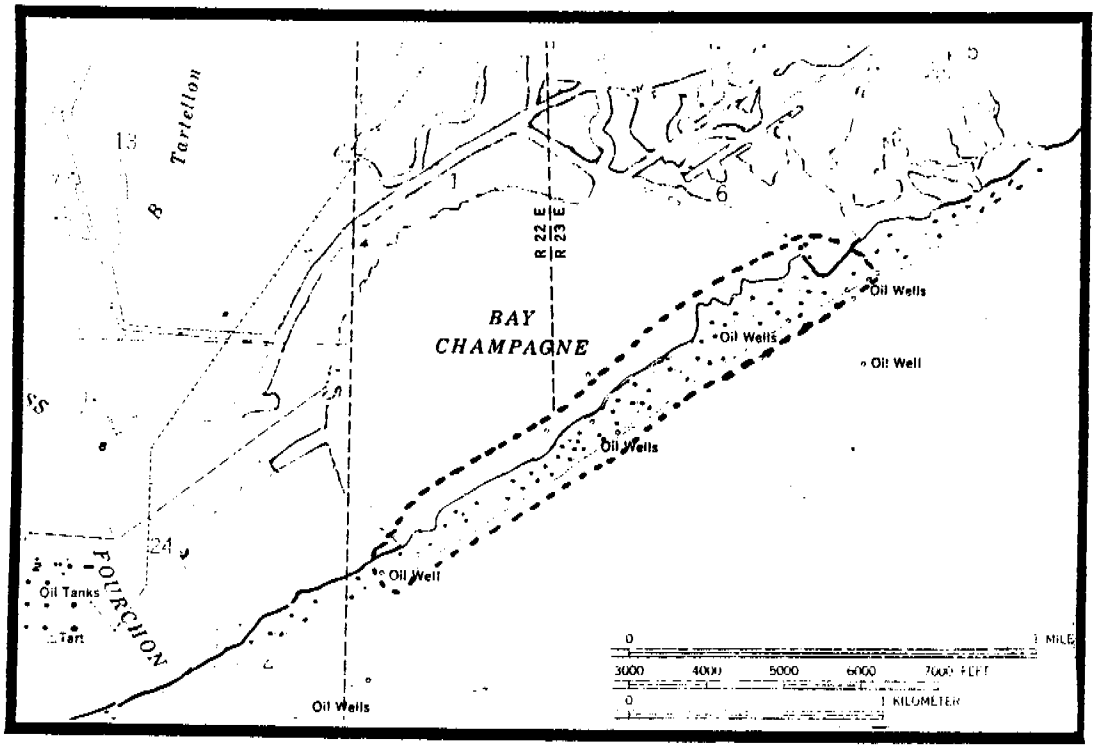

Figure 47. XBA-1F Bay Champagne Gulf Shore Sediment Replenishment

XBA-51 MARSH CREATION IN CANALS BETWEEN PASSES LA MER AND CHALAND

Location.

This project involves canals located in the Lake Washington Oil and Gas Field in Plaquemines Parish, to the east and west of Pass la Mer (Figure 48).

Problems and Opportunities.

Pipeline and access canals that were dredged landward of, and parallel to, the low dune system of the barrier beaches in the Barataria Basin serve as sediment sinks that trap sediments during overwash events. This situation accelerates narrowing and breaching of the island which is anticipated to occur in the near future in the vicinity of the Lake Washington Oil and Gas Field to the east and west of Pass la Mer. The result will be accelerated shoreline retreat for a shoreline that already has one of the highest retreat rates in Louisiana.

Description of Features.

Sediment will be hydraulically dredged and deposited to marsh elevation in 90 acres of canals. If the filled canals do not vegetate naturally, they will be planted with the appropriate vegetative species.

Benefits and Costs.

Site-specific WVA analyses were not undertaken for this project. However, it is preliminarily estimated that approximately 90 acres of marsh would be created, 140 acres would be protected, and 30 wetland acres would be enhanced by project implementation. The total area estimated to be benefitted by this project is 260 acres. The gross cost estimate for this project is $7,800,000.

Effects and Issues.

The project will prevent an acceleration of shoreline retreat, protect an inland oil and gas field, infuse heavier sediments into a sediment-starved barrier system, and create marsh.

Active or closed-in wells must remain accessible.

The high cost of this project is a concern. This project should be coordinated with other barrier island sediment replenishment projects in the vicinity to help reduce start-up costs.

Status.

This project is a candidate for future priority lists. Detailed planning and feasibility studies must be undertaken to finalize the plan design.

XBA-65A MARSH RESTORATION BETWEEN BAYOUS PEROT AND RIGOLETTES

Location.

The project area is the peninsula between Bayou Rigolettes in Jefferson Parish and Bayou Perot in Lafourche Parish (Figure 49). The peninsula covers and area of approximately 4,255 acres.

Problems and Opportunities.

Shoreline erosion rates ranging from 20 to 30 feet per year are rapidly destroying this marsh peninsula. This shoreline erosion is caused by wind and boat generated waves. In addition, the lack of sediment input from the Mississippi River has resulted in increased subsidence rates. This marsh area is presently losing 82 acres per year and is expected to be completely gone in 20 years.

Description of Features.

Approximately 600,000 cubic yards of material would be mined from Bayous Rigolettes and Perot and deposited along the shoreline on the peninsula. A shallow-draft barge fitted with a spray nozzle would be used to spread the sediments in a 250-foot wide strip along the shoreline. The elevation of the deposited sediments would approximate 1 foot above the adjacent marsh vegetation.

Benefits and Costs.

WVA analyses undertaken for this project estimate that project implementation will protect approximately 1,060 acres of marsh and will benefit 310 acres of submerged aquatic vegetation. The total area estimated to be benefitted by the project is 1,370 acres. The cost estimate for this project is $1,835,000.

Effects and Issues.

This project will drastically reduce the shoreline erosion rate by increasing and fortifying the elevation of the shoreline. As the shoreline erodes over time, much of the dredged material would be moved inward, increasing the life of the peninsula.

Borrow pits must be carefully located and dredged to ensure that deep sumps are not created that would tend to contain water low in dissolved oxygen. These pits must be located such that they also do not increase shoreline erosion on shorelines adjacent to the pits.

Status.

This project was approved for funding on PPL3. Detailed engineering and feasibility analyses are being undertaken to finalize plan designs.

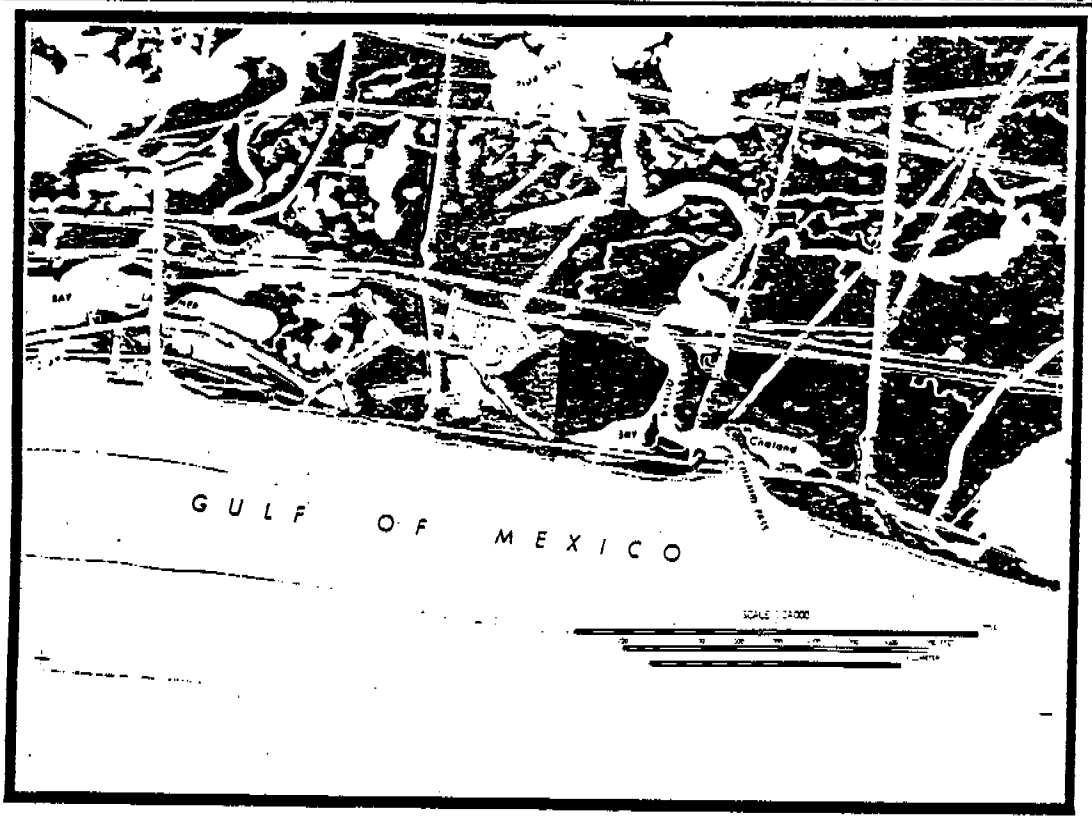

Figure 48. XBA-51 Marsh Creation in Canals Between Passes La Mer and Chaland

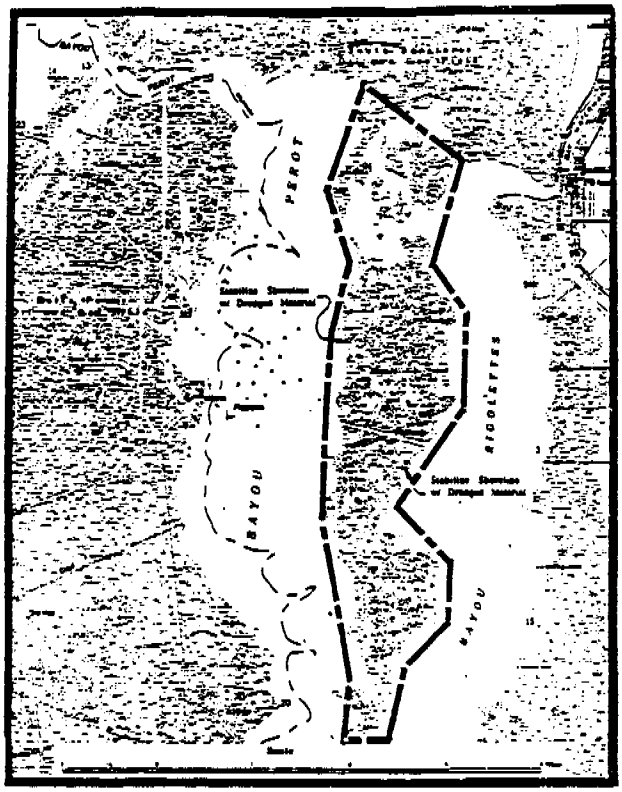

Figure 49. XBA-65A Marsh Restoration Between Bayous Perot and Rigolettes

XBA-70 DUPRE CUT AND BAYOU DUPONT SHORELINE PROTECTION

Location.

The project area encompasses 3,904 acres bounded on the west by Dupre Cut of the Barataria Bay Waterway, on the north and east by Bayou Dupont and on the south by the Lafitte Oil and Gas Field (Figure 50).

Problems and Opportunities.

The levees separating the project area from Dupre Cut have been breached in several locations, allowing saltwater intrusion into the formerly low salinity wetlands of the project area. Breaches between the Dupre Cut and the project area also have caused tidal scour. This
has resulted in large areas of marsh converting to open water.

Description of Features.

The project entails the creation of a continuous spoil embankment along the shore of the project area fronting the Barataria Bay Waterway. Four water control structures and two plugs would be installed at openings between the project area and Bayou Dupont. Low elevation shorelines between the project area and Bayou Dupont and the Lafitte Oil and Gas Field would be filled to reduce tidal flow and shoreline erosion at those sites.

Benefits and Costs.

WVA analyses undertaken for this project estimate that project implementation would protect approximately 200 acres of marsh and would benefit an additional 510 acres of submerged aquatic vegetation. The total area estimated to be benefitted by this project is 710 acres. The cost for this project is $3,930,000.

Effects and Issues.

This project would reduce the impact of salt water intrusion and tidal scour on project area wetlands and would result in a large increase in coverage of submerged aquatic vegetation. In addition, project implementation would prevent the large-scale export of sediments.

Boat access to project area wetlands must be maintained.

The proposed installation and operation of water control structures would adversely impact marine fishery production on project area wetlands.

Status.

The project was a candidate for funding on PPL 3, but was not selected. The project is a candidate for future priority lists. Detailed plan evaluation must be undertaken to determine methods to maintain the present level of fisheries production on project area wetlands while incorporating necessary project features.

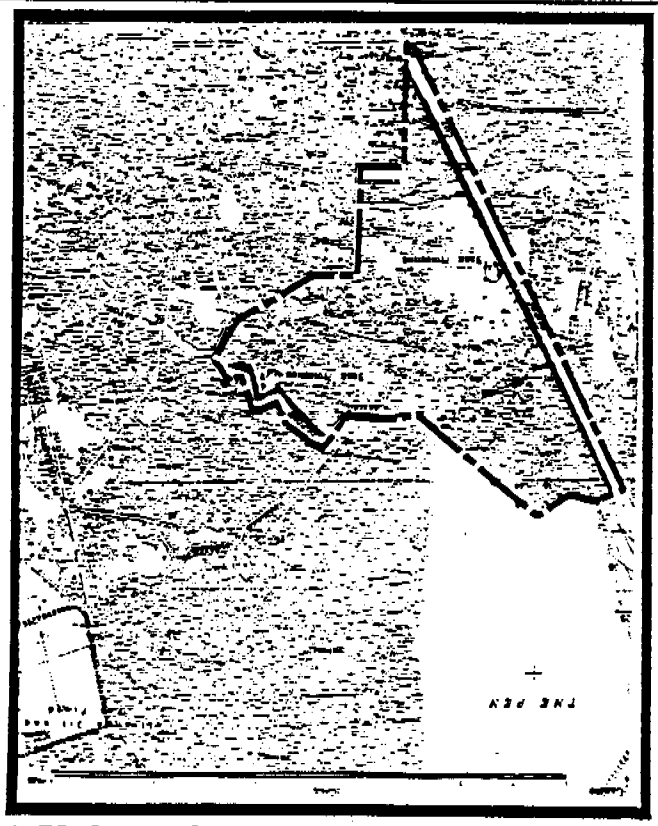

Figure 50. XBA-70 Dupre Cut and Bayou Dupont Shoreline Protection

SUPPORTING LONG-TERM PROJECTS

PBA-42 U.S. HIGHWAY 90 DRAINAGE IMPROVEMENTS

Location.

U.S. Highway 90 and the Southern Pacific Railroad are situated between Boutte, des Allemands and Raceland (Figure 51).

Problems and Opportunities.

Roughly parallel to each other, U.S. Highway 90 and the Southern Pacific Railroad stretch across the basin between the leveed corridors of the Mississippi River and Bayou Lafourche such that their alignment may be useful for water management of wetlands to their northwest.

Description of Features.

Water control structures are to be applied to the existing waterways that have been consolidated to pass under or through the bridges and culverts of the two rights-of-way.

Benefits and Costs.

Benefit and cost estimates are premature until the plan is developed. Ponding should be relieved north of the highway and the wetlands south of the area would be nourished by additional freshwater.

Effects and Issues.

Construction must be conducted to minimize interruption of traffic on both the highway and railroad.

Status.

This project is a concept only. An initial feasibility study must be done to determine potential benefits and methods to reduce costs and increase benefits.

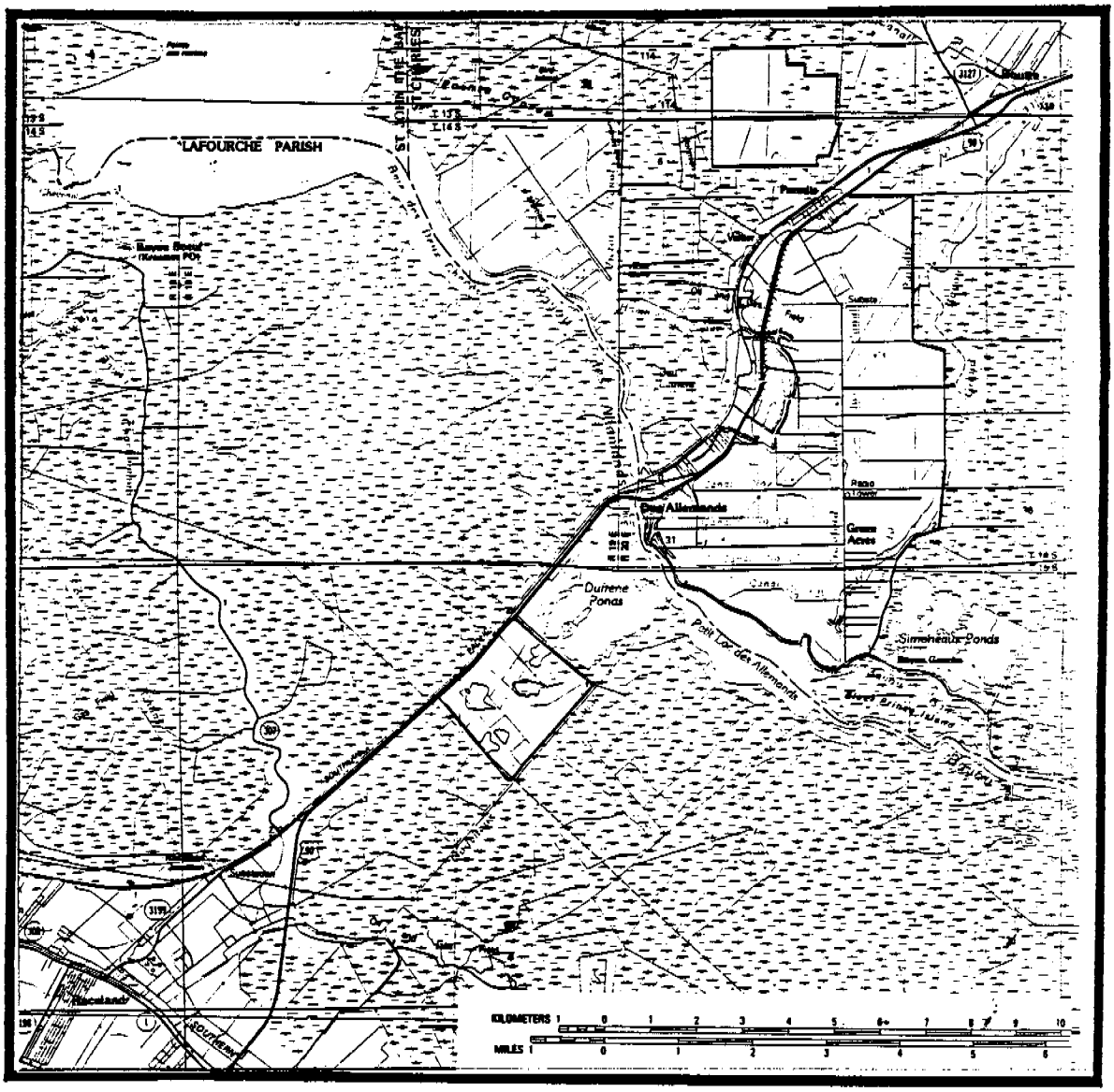

Figure 51. PBA-42 U.S. Highway 90 Drainage Improvements

PBA-45 HYDROLOGIC MANAGEMENT OF GRAND BAYOU MARSHES

Location.

The project site is located in Plaquemines Parish along Grand Bayou, extending from the Socola Canal to the Gulf of Mexico (Figure 13).

Problems and Opportunities.

Pipeline and petroleum access canals intersecting Grand Bayou increase wetland loss from saltwater intrusion and tidal scour. This problem is exacerbated by high subsidence rates.

Description of Features.

Earthen plugs would be constructed across all pipeline canals leading from the Gulf of Mexico and intersecting Grand Bayou. Rock weirs or plugs would be constructed across major access canals intersecting Grand Bayou. A low elevation sill would be constructed at the mouth of Grand Bayou to reduce salt water intrusion.

Benefits and Costs.

A determination of the benefits and costs of this project has not yet been undertaken.

Effects and Issues.

The project will reduce the flow of salt water and tidal flux from open petroleum access canals or pipeline canals into Grand Bayou. The project also would reduce the flow of salt water up Grand Bayou from the Gulf of Mexico.

Installing plugs across pipelines must be undertaken carefully. Liability issues will be a problem.

Boat access to active oil wells must be maintained.

Status.

This project is conceptual. Detailed plan evaluation and a feasibility analysis needs to be conducted.

XBA-1A1 WEST GRAND TERRE DETACHED BREAKWATERS

Location.

See XBA-1A and Figure 9.

Problems and Opportunities.

See XBA-1A.

Description of Features.

Segmented, detached breakwaters will be constructed in shallow water along the entire southern shore of the island parallel to the shoreline.

Benefits and Costs.

Site-specific WVA analyses were not undertaken for this project. However, it is estimated that the proposed installation of breakwaters will protect approximately 90 acres of marsh on the island from erosion over the 20-year project life. The gross cost estimate for this project is $5,121,000.

Effects and Issues.

The breakwaters will extend the longevity of the island by reducing shoreline erosion along the south shore of Grand Terre.

There is some concern that construction of segmented breakwaters may result in decreased sediment deposition downcurrent of the structures and accelerated erosion of shallow waterbottoms between the breakwaters. The heavy breakwaters will settle and thus have a high maintenance cost. Consideration should be given to construction of a foundation.

The project can be implemented in stages. Breakwaters can be constructed as funds become available.

Status.

The project is a candidate for future priority lists. A feasibility study must be done to finalize the plan and determine methods to reduce costs and increase benefits.

XBA-1B1 EAST GRAND TERRE DETACHED BREAKWATERS

Location.

See XBA-1B and Figure 10.

Problems and Opportunities.

See XBA-1B.

Description of Features.

Segmented, detached breakwaters will be constructed in shallow water along the entire southern shore of the island parallel to the shoreline.

Benefits and Costs.

Site-specific WVA analyses were not undertaken for this project. However, it is estimated that the proposed installation of breakwaters will protect approximately 60 acres of marsh on the island from erosion over the 20-year project life. The gross cost estimate for this project is $4,481,000.

Effects and Issues.

Similar to XBA-1A1.

Status.

The project is a candidate for future priority lists. A feasibility study must be done to finalize the plan and determine methods to reduce costs and increase benefits.

XBA-1C1 GRAND PIERRE DETACHED BREAKWATERS

Location.

See XBA-1C and Figure 11.

Problems and Opportunities.

See XBA-1C.

Description of Features.

Segmented, detached breakwaters will be constructed in shallow water along the entire southern shore of the island parallel to the shoreline.

Benefits and Costs.

Site-specific WVA analyses were not undertaken for this project. However, it is estimated that the proposed installation of breakwaters will protect approximately 110 acres of marsh on the island from erosion over the 20-year project life. The gross cost estimate for this project is $1,440,000.

Effects and Issues.

Similar to XBA-1A1.

Status.

The project is a candidate for future priority lists. A feasibility study must be done to finalize the plan and determine methods to reduce costs and increase benefits.

XBA-1D1 CHENIERE RONQUILLE DETACHED BREAKWATERS

Location.

Same as XBA-1D and Figure 12.

Problems and Opportunities.

Same as XBA-1D.

Description of Features.

Segmented, detached breakwaters will be constructed in shallow water along the entire southern shore of the island parallel to the shoreline.

Benefits and Costs.

Site-specific WVA analyses were not undertaken for this project. However, it is estimated that the proposed installation of breakwaters will protect approximately 80 acres of marsh on the island from erosion over the 20-year project life. The gross cost estimate for this project is $2,881,000.

Effects and Issues.

Similar to XBA-1A1.

Status.

The project is a candidate for future priority lists. A feasibility study must be done to finalize the plan and determine methods to reduce costs and increase benefits.

XBA-1E1 SHELL ISLAND TO SANDY POINT DETACHED BREAKWATER

Location.

Same as XBA-1E and Figure 46.

Problems and Opportunities.

Same as XBA-1E.

Description of Features.

Segmented, detached breakwaters will be constructed in shallow water along the entire southern shore of the island parallel to the shoreline.

Benefits and Costs.

Site-specific WVA analyses were not undertaken for this project. However, it is estimated that the proposed installation of breakwaters will protect approximately 110 acres of marsh on the island from erosion over the 20-year project life. The gross cost estimate for this project is $18,252,000.

Effects and Issues.

Similar to XBA-1A1.

Status.

The project is a candidate for future priority lists. A feasibility study must be done to finalize the plan and determine methods to reduce costs and increase benefits.

XBA-49 HYDROLOGIC RESTORATION OF MARSHES SOUTH OF CLOVELLY

Location.

The project area is located in Lafourche Parish south of Clovelly Farms; east of Bayou Lafourche and Louisiana Highway 1; west of Little Lake, Hackberry Bay and Caminada Bay; and north of Louisiana Highway 1. The approximate center of the project is latitude 29°20' and longitude 90°10' (Figure 52).

Problems and Opportunities.

The western fringe marshes of Barataria Basin have undergone and continue to undergo drastic changes from fresher marshes to more saline marshes. Since the 1930's an estimated 40,745 acres wetland have been lost from this area. Channel dredging, submergence, and containment of the Mississippi River and Bayou Lafourche have been identified as primary causes of these changes which have created efficient avenues for saltwater intrusion and sediment export.

Description of Features.

Shoreline protection measures will be constructed to protect critically eroding shorelines. Vegetative plantings will trap sediments and stabilize shorelines and interior marshes. Diversion of additional freshwater from Bayou Lafourche through the western fringe marshes will be important.

Benefits and Costs. - Project area benefits and costs cannot be estimated at this time, however, rates of wetland loss, shoreline erosion and sediment export will be slowed.

Effects and Issues.

Because of the development along the banks of Bayou Lafourche, a diversion from that bayou to provide freshwater to nourish the marshes south of Clovelly, yet not increase flooding of residential areas, will be expensive to implement.

Coordination with landowners and user groups will be difficult.

Status.

This project is in the Restoration Plan and a candidate for future priority lists. Detailed planning and feasibility studies must be undertaken.

XBA-52 GRAND ISLE JETTY OR DETACHED BREAKWATERS

Location.

This project is located on the southern shoreline of Grand Isle in Jefferson Parish (Figure 53).

Problems and Opportunities.

Up until 1971, it was estimated that approximately 300,840 cy of sand collected on the eastern end of Grand Isle with longshore transport each year. After the jetty was constructed, that volume of sand is transported into Barataria Pass. Due to the ebbtide flow through Barataria Pass, the vast majority of this sand is believed to be flushed offshore into the Gulf and out of the longshore drift. The best use of the sand would be to retain the sediment on the island.

Description of Features.

Sediment retention can be accomplished by the following techniques independently or in conjunction with each other. The jetty at the eastern end of Grand Isle could be modified to enhance sediment retention, or a second jetty could be placed further east of the existing jetty, at the new end of the island. Detached segmented breakwaters could be placed parallel to the Grand Isle beach to protect against shoreline erosion and help retain sediment.

Benefits and Costs.

Because of the incompleteness of the project description, estimates of project benefits and costs were not possible.

Effects and Issues.

Sediment retention would increase the size of Grand Isle, reduce shoreline retreat, and reduce washover probability and severity.

This project may not be appropriate for CWPPRA funding since it would do little to protect or create vegetated wetlands.

Determining the pathway, destination and flow rate of longshore sediment drift off the eastern end of Grand Isle is important to the success of this project.

This project should only be attempted if it is determined that longshore sediment transport delivers an insignificant volume of sediment from Grand Isle to the Grand Terre Islands.

The aesthetic impact of parallel detached breakwaters may be of importance.

Status.

A feasibility study must be undertaken to determine the need for, and design of, specific project components, and to develop cost estimates.

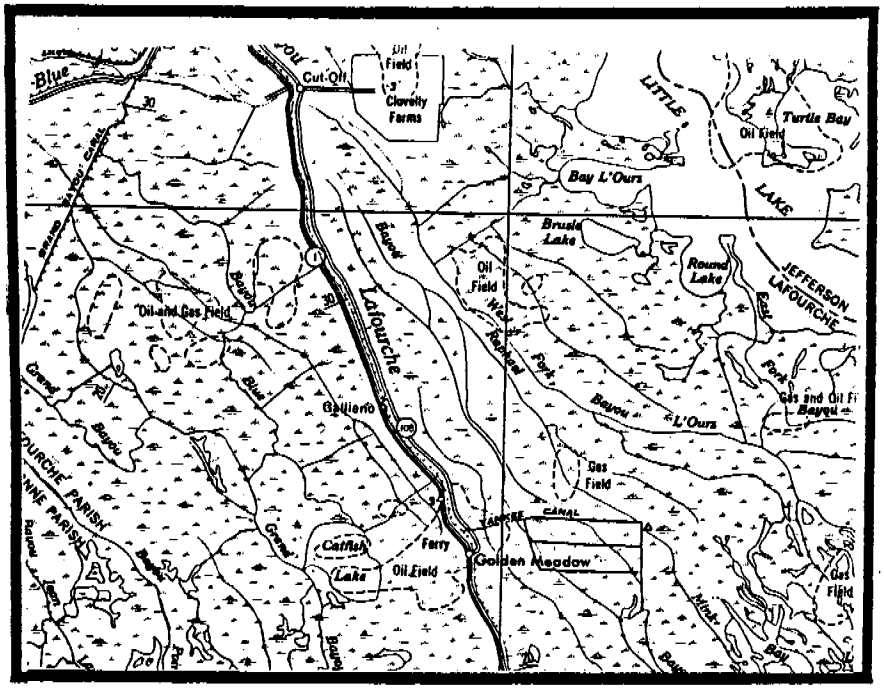

Figure 52. XBA-49 Hydrologic Restoration of Marshes South of Clovelly

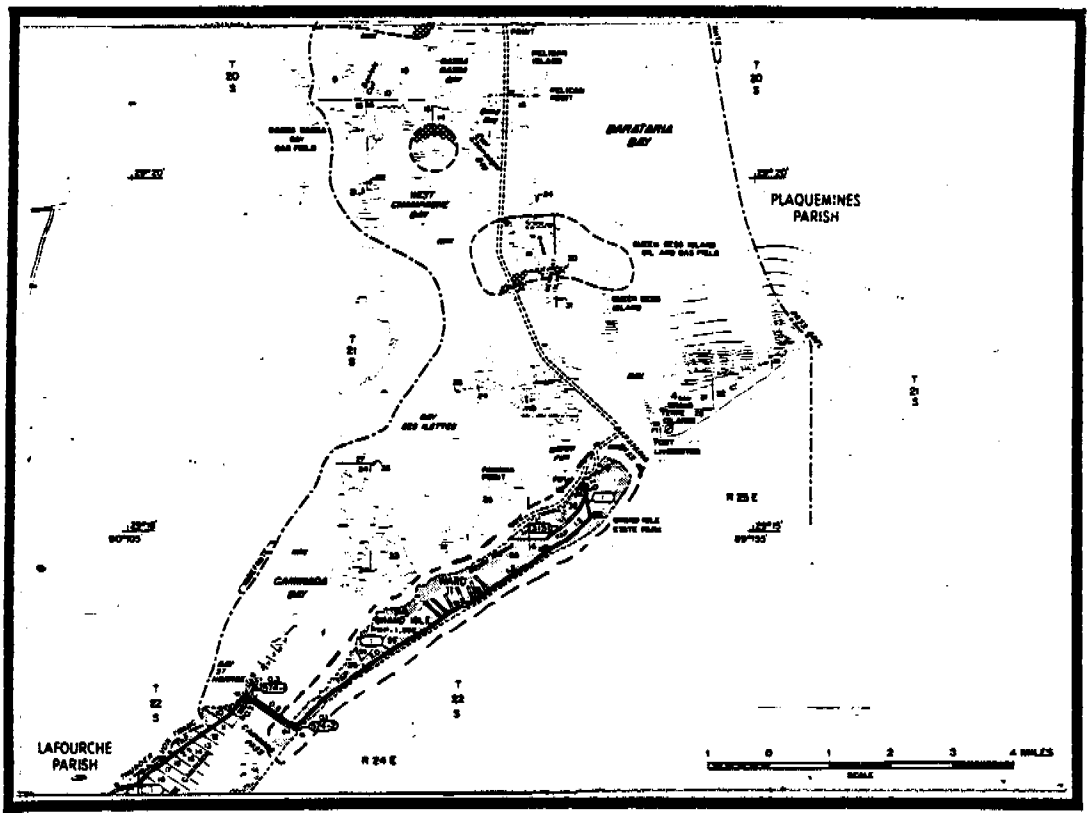

Figure 53. XBA-52 Grand Isle Jetty or Detached Breakwaters

XBA-53 GRAND PIERRE JETTY

Location.

See XBA-1C and Figure 11.

Problems and Opportunities.

See XBA-1C.

Description of Features.

An 800-ft jetty on the western end of Grand Pierre would be constructed to trap sediments prior to their loss from the island to the longshore or offshore drift.

Benefits and Costs.

Site-specific WVA analyses were not undertaken for this project. However, it was estimated that the proposed jetty construction would trap enough sediment to create 10 acres of marsh and would protect an additional 20 acres from erosion. The total area benefitted by this project is 30 acres. The gross cost estimate for this project is $576,000.

Effects and Issues.

By retaining sediment, this project will create marsh and slow shoreline retreat. This in turn will reduce shoreline erosion and enlarge the island as a barrier against storms. The impacts of hydrodynamic drag on tidal exchange will be increased as the island enlarges and maintained for a longer period, thereby helping to reduce interior-basin saltwater intrusion, erosion, and sediment export.

Projects involving jetties may divert, slow down, or trap moving sediment at the expense of the regional coastal sediment supply and down-current barrier islands. The pathway, destination and flow rate of longshore sediment drift west of Cheniere Ronquille should be determined prior to deciding whether the jetty should be constructed. The project should be attempted only if it is determined that longshore sediment transport delivers an insignificant volume of sediment to the Grand Terre Islands for their maintenance or if those islands are nourished via other means.

Status.

This project is in the conceptual phase. Further consideration of the project must await the results of a longshore sediment transport study.

XBA-55 JETTY MODIFICATIONS AT EMPIRE WATERWAY

Location.

The Empire Waterway jetties are located in Plaquemines Parish on the east and west sides of the Empire Waterway, extending from the gulf shoreline (Figure 54.)

Problems and Opportunities

Jetties interrupt longshore sediment drift, causing accelerated shoreline retreat down drift of the jetty. Barrier island shorelines west of the Empire Waterway jetties are experiencing accelerated loss from sediment deprivation.

Description of Features.

The proposed project would reduce Empire Waterway jetties in length. After jetty modification, if sediment transport continues to be significantly reduced, sand transfer pumps should be considered to route sediment from the up-drift side of jetties to feed the beach down drift of the channel.

Benefits and Costs.

Neither the approximate acreage of marsh that would be created by this project nor the costs have been estimated.

Effects and Issues.

Re-establishment of sand drift around the channel would be more natural.

Shell Island would be stabilized.

Bar channel maintenance costs may increase.

Status.

A feasibility study must be undertaken to determine the need for, and design of, specific project components and to develop cost estimates.

XBA-56 JETTY MODIFICATIONS AT BELLE PASS

Location.

This project is located at the existing jetties at Belle Pass on the Gulf shoreline, in Lafourche Parish west of Fourchon (Figure 55).

Problems and Opportunities.

Jetties interrupt longshore sediment drift, causing accelerated shoreline retreat down drift of the jetty. Barrier islands west of the jetties in particular are experiencing accelerated rates of erosion.

Description of Features.

This project would reduce the length of the Belle Pass jetties. After jetty modification, if it is determined that their presence continues to significantly interrupt sediment transport, sand transfer pumps should be considered to route sediment from the up-drift sides of jetties to feed the beach down drift of the channel.

Benefits and Costs.

Neither the approximate acreage of marsh that would be created by this project nor the costs have been estimated.

Effects and Issues.

Re-establishment of sand drift around the channel would be more natural and would help nourish and stabilize East Timbalier and Timbalier Islands.

Bar channel maintenance costs may increase.

Status.

A feasibility study must be undertaken to determine the need for, and design of, specific project components, and to develop cost estimates.

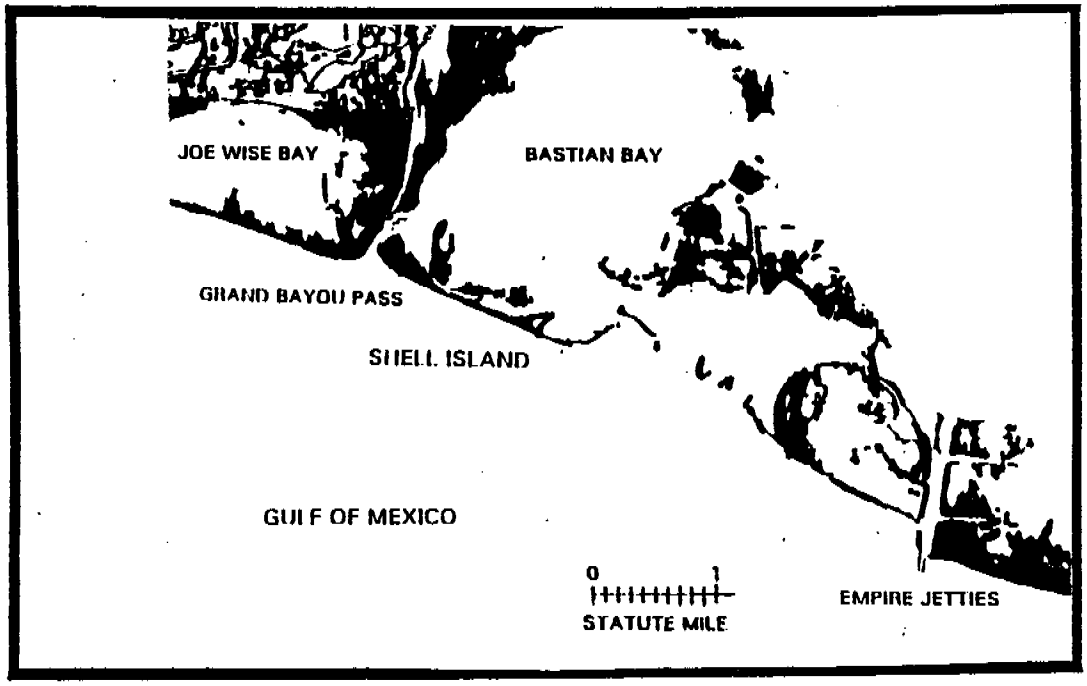

Figure 54. XBA-55 Jetty Modifications at Empire Waterway

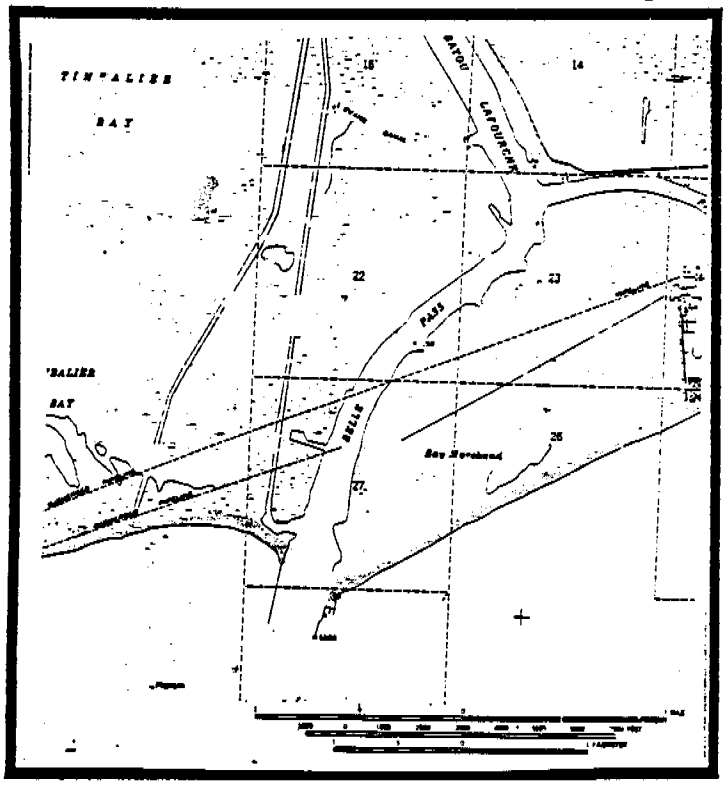

Figure 55. XBA-56 Jetty Modifications at Belle Pass

XBA-62A NORTHERN PEROT PENINSULA SHORELINE PROTECTION

Location.

The project area is the northern part of the peninsula between Bayou Rigolettes in Jefferson Parish and Bayou Perot in Lafourche Parish (Figure 56). The peninsula covers and area of approximately 4,255 acres and is divided roughly in half by a navigation canal.

Problems and Opportunities.

Shoreline erosion rates ranging from 20 to 30 feet per year are rapidly destroying this marsh peninsula. This shoreline erosion is caused by wind and boat generated waves. In addition, the lack of sediment input from the Mississippi River has resulted in increased subsidence rates. This marsh area is presently losing 82 acres per year and is expected to be completely gone in 20 years. This project attacks the problem of shoreline erosion in the northern half of the peninsula.

Description of Features.

Lightweight shoreline protection material is recommended for this area because the unconsolidated bottom does not provide structural integrity for typical hard structures.

Benefits and Costs.

Site-specific WVA analyses were not undertaken for this project. However, preliminary estimates are that project implementation will protect approximately 380 acres of marsh and will benefit 100 acres of submerged aquatic vegetation. The total area estimated to be benefitted by the project is 480 acres. The gross cost estimate for this project is $9,367,000.

Effects and Issues.

The soils at this site are very unstable with poor load bearing capacity. Traditional structures used to reduce shoreline erosion may not be suitable under these circumstances.

Status.

Marsh nourishment of the entire peninsula by spray dredging material from Bayous Perot and Rigolettes (XBA-65A) was approved for funding on PPL3. The effects of the approved project should be studied prior to consideration of implementing shoreline protection.

XBA-62B SOUTHERN PEROT PENINSULA SHORELINE PROTECTION

Location.

The project area is the southern part of the peninsula between Bayou Rigolettes in Jefferson Parish and Bayou Perot in Lafourche Parish (Figure 56). The peninsula covers and area of approximately 4,255 acres and is divided roughly in half by a navigation canal. This project attacks the problem of shoreline erosion of the southern half of the peninsula.

Problems and Opportunities.

Shoreline erosion rates ranging from 20 to 30 feet per year are rapidly destroying this marsh peninsula. This shoreline erosion is caused by wind and boat generated waves. In addition, the lack of sediment input from the Mississippi River has resulted in increased subsidence rates. This marsh area is presently losing 82 acres per year and is expected to be completely gone in 20 years. This project attacks the problem of shoreline erosion in the northern half of the peninsula.

Description of Features.

Lightweight shoreline protection material is recommended for this area because the unconsolidated bottom does not provide structural integrity for typical hard structures.

Benefits and Costs.

Site-specific WVA analyses were not undertaken for this project, however preliminary estimates are that project implementation will protect approximately 230 acres of marsh and will benefit 40 acres of submerged aquatic vegetation. The total area estimated to be benefitted by the project is 270 acres. The gross cost estimate for this project is $11,439,000.

Effects and Issues.

The soils at this site are very unstable with poor load bearing capacity. Traditional structures used to reduce shoreline erosion may not be suitable under these circumstances.

Status.

Marsh nourishment of the entire peninsula by spray dredging material from Bayous Perot and Rigolettes (XBA-65A) was approved for funding on PPL3. The effects of the approved project should be studied prior to consideration of implementing shoreline protection.

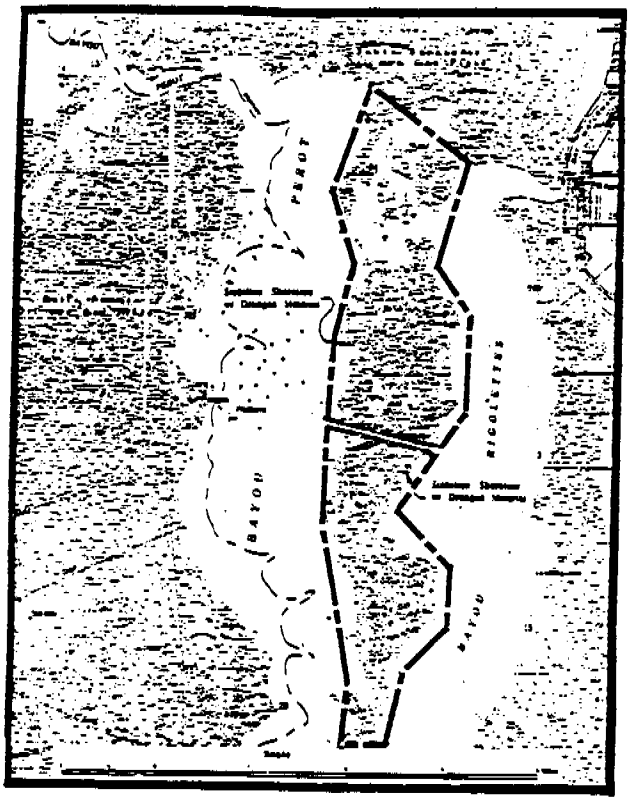

Figure 56. XBA-62 Bayou Perot and Rigolettes Shoreline Protection

DEMONSTRATION PROJECTS

BA-15 LAKE SALVADOR SHORELINE PROTECTION

Location.

The project is located in St. Charles Parish at the southwest end of Lake Salvador between Baie du Chactas and Bayou des Allemands (Figure 57).

Problems and Opportunities.

This area has suffered from high rates of land loss caused by a shoreline retreat rate averaging 13 feet per year. Erosion has breached the lake rim at several locations allowing tidal and wave energy to erode the highly organic marsh surface, resulting in pond formation in the interior marsh. Since 1956, the project area has lost more than 1,000 acres of marsh.

Description of Features.

Breaches in the shoreline will be plugged with a shell-armored berm, and timber pylon breakwaters will be placed in shallow water approximately 300 to 400 feet offshore.

Benefits and Costs.

Detailed WVA analyses developed on this project estimate that implementation will protect approximately 180 acres of marsh, benefit 130 acres of submerged aquatic vegetation and enhance 880 acres. The total area estimated to be benefitted by this project is 1,190 acres. The fully funded cost of the project is $1,258,000.

Effects and Issues.

This project will recreate and maintain the shoreline along this section of the lake and reduce tidal scour and land loss.

The soils at this site are very unstable with poor load bearing capacity. Traditional structures used to reduce shoreline erosion may not be suitable under these circumstances.

Status.

Preliminary designs are complete and the project was selected for funding as a demonstration project on PPL 3. A detailed feasibility study must be completed on the project to finalize the plan design.

PBA-50 OYSTER REEF DEMONSTRATION IN RAMBO BAY

Location.

A proposed location for the oyster reef demonstration project is in Rambo Bay in Lafourche Parish (Figure 58).

Problems and Opportunities.

Shoreline erosion is a prevalent problem throughout the basin. Establishing oyster reefs adjacent to marsh shorelines in areas with appropriate salinities may be an excellent method for reducing wave energies on those shorelines while increasing fisheries habitat.

Description of Features.

Wire cages will be anchored along and at an appropriate distance from the marsh shoreline. The cages will be used as clutch material upon which oysters will grow and eventually form a reef. When big enough, the reef will act as a wave barrier.

Benefits and Costs.

Site-specific WVA analyses were not undertaken for this project. However, it is preliminarily estimated that project implementation will protect approximately 5 acres of marsh from loss. The fully funded cost for this project is $374,000.

Effects and Issues.

Shoreline will be protected and oyster-reef habitat will be developed, benefitting a very large and diverse community of organisms.

This is a small demonstration project, designed to test a new concept. This demonstration project has been proposed for other basins. Only one area will be necessary for the initial demonstration.

Harvesting of oysters from the cages would be a major concern.

Status.

Preliminary designs are complete. The project was a candidate for PPL 2 and 3 and is eligible for future lists.

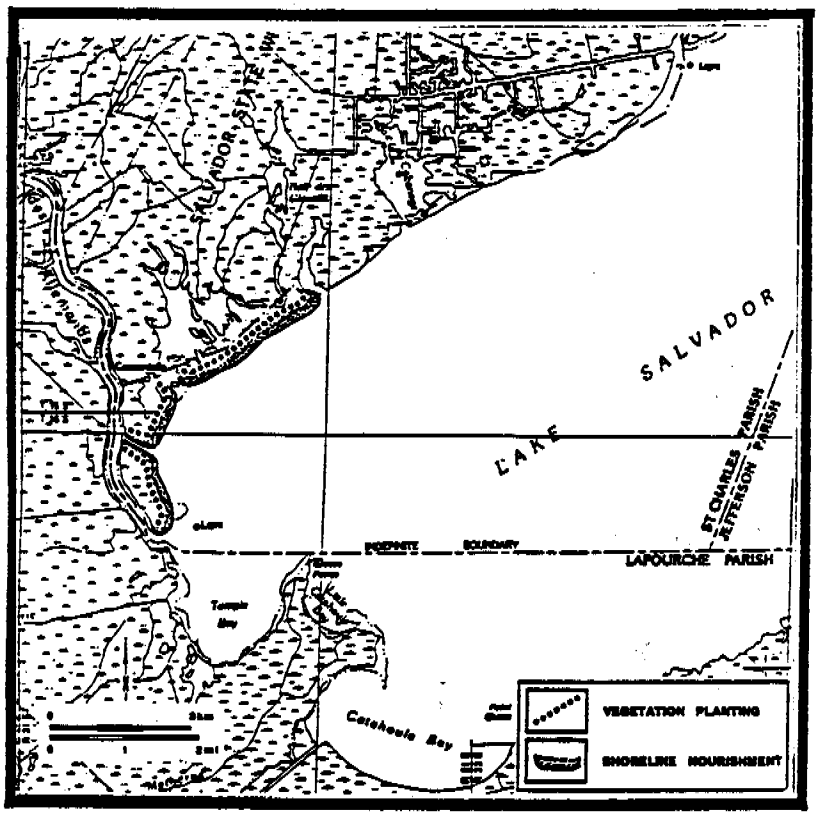

Figure 57. BA-15 Lake Salvador Shoreline Protection

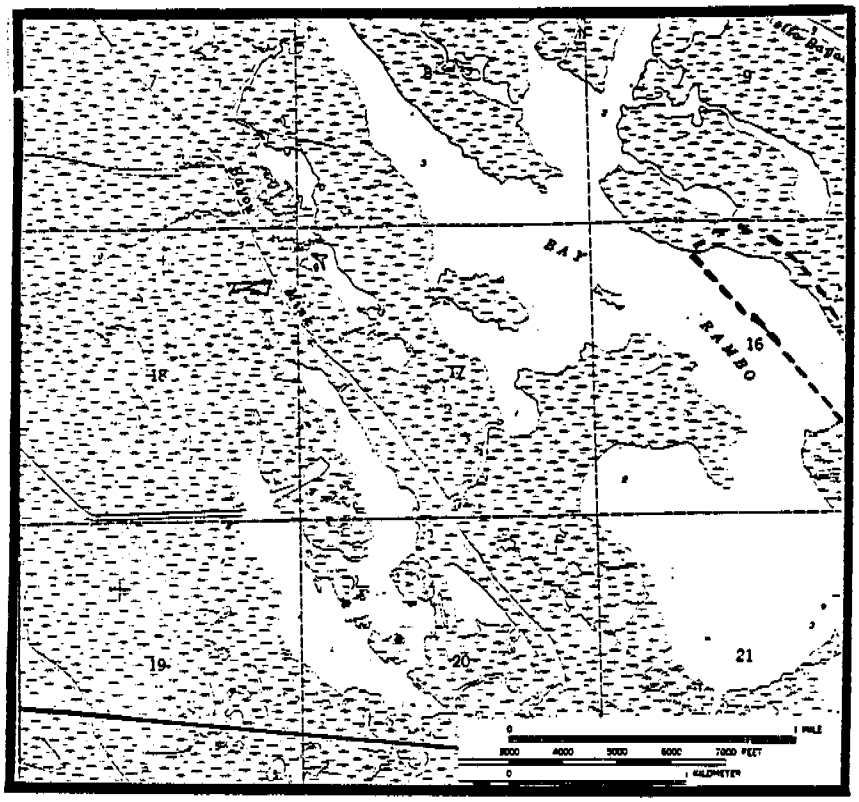

Figure 58. PBA-50 Oyster Reef Demonstration in Rambo Bay

XBA-50 NAIRN WETLAND CREATION

Location.

The 675-acre project area is located in Plaquemines Parish northeast of Bay Delta Cheniere and Bay Chicot (Figure 59). The dredging location is in the Mississippi River in the vicinity of Sixty Mile Point.

Problems and Opportunities.

The western half of the project area contains large shallow open water ponds surrounded by areas of stressed marsh; the remaining area is primarily broken marsh.

The objective is to 1) harvest material for wetland restoration, 2) use existing technologies to increase slurry densities and reduce costs of sediment transport, 3) develop new methods for making the best use of transported sediment to create wetlands, and 4) determine the feasibility and cost-effectiveness of high-technology sediment diversion projects by actually conducting a project at the scale needed to use the technology.

Description of Features.

A hydrologic dredge will be used to mine sediments from the Mississippi River selecting, to the extent possible, materials ideal for marsh creation. A pipeline will deliver the sediment/water slurry to the project area for dispersal. Conveyance of sediment in a concentrated slurry, of varying densities, through up to 28,000 feet of pipeline, will be evaluated. Jet-spray technologies will be used to distribute sediment in open water, broken marsh and interior marsh sites. The project may include filling and restoring some canals to marsh elevation.

Benefits and Costs.

Site-specific WVA analyses were not undertaken for this project. However, it is preliminarily estimated that project implementation would result in the creation of 220 acres of marsh and the enhancement of 60 wetland acres. The total area estimated to be benefitted by this project is 280 acres. The gross cost estimate for this project is $13,629,000.

Effects and Issues.

Residual and tidal water volume will be reduced in the area, thereby reducing tidal influence and perhaps reversing saltwater intrusion. Marsh acreage in the project site will be increased.

Dispersing sediment over broken marsh without damaging emergent vegetation is a technique that needs further development.

The high cost of this project means that it may require funding under a separate authority.

Boat access to project area wetlands and canals must be maintained.

Status.

This project was a candidate for PPL 2. Detailed planning and feasibility studies must be undertaken prior to further consideration of funding this project.

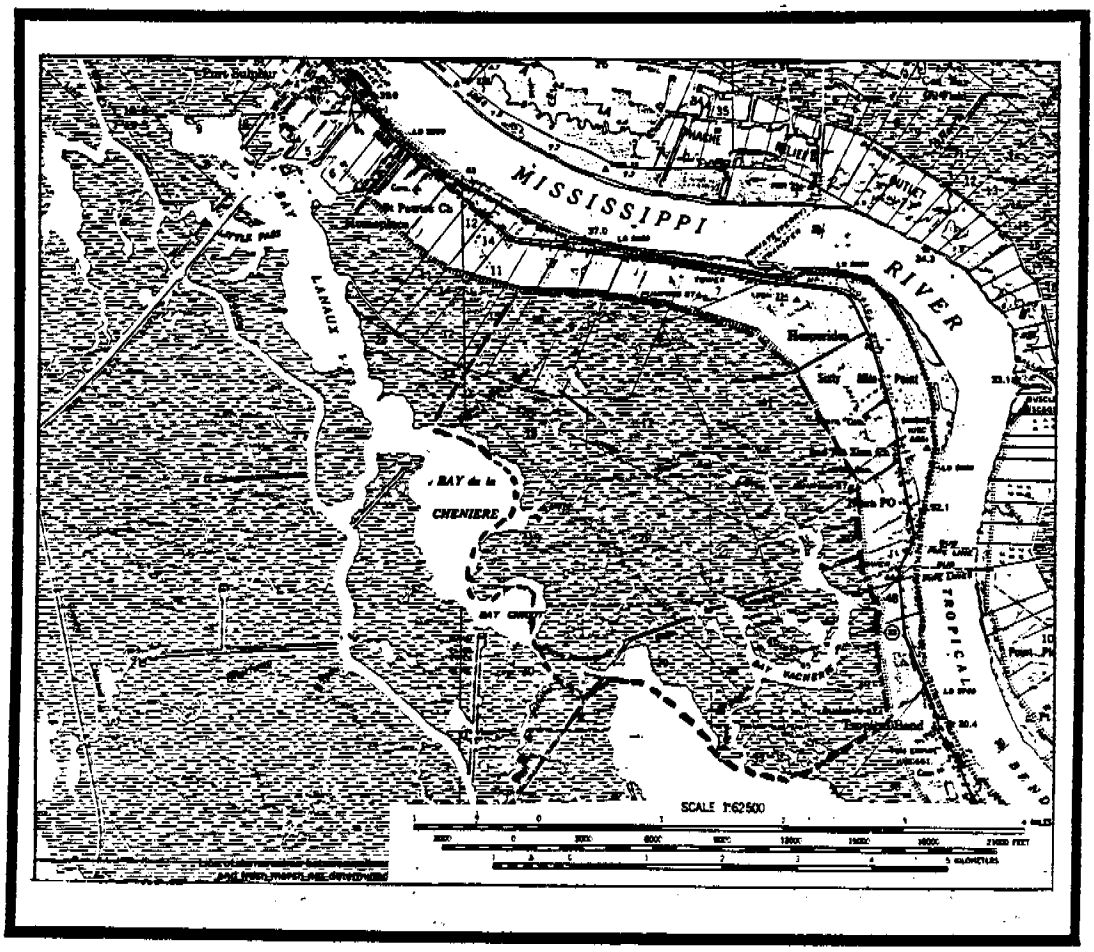

Figure 59. XBA-50 Nairn Wetland Creation

XBA-67A DREDGED SEDIMENT ENRICHMENT OF DAVIS POND FRESHWATER DIVERSION

Location.

The Davis Pond freshwater diversion structure is planned at a site near Luling, in St Charles Parish, approximately at Mississippi River mile 119 (Figure 15).

Problems and Opportunities.

The Mississippi River sediment load in the vicinity of the Davis Pond intake is composed of approximately 30 percent silt and very fine sand, which is easily transportable through the presently designed diversion channel. A load of coarser sediments could be transported during peak flows if a method could be devised to enrich the water near the intake structure.

Description of Features.

Because of its status as a demonstration project, the following would be applied during two nonconsecutive operation years of the Davis Pond Water Diversion Facility. Increased sediment loads would be delivered into the basin by stationing a 24-inch cutterhead hydraulic dredge in the river upstream of the diversion intake such that its discharge would be drawn into and through the intake. To capture the maximum 1,400,000 cy of fine sand and silt per year, approximately 4,100,000 cy of sediment would be dredged during 137 days from January through May. Initial calculations indicate that the described maximum enrichment with dredged material can be captured by the intake and transported without significant sedimentation in the main diversion channel. The present specifications of the diversion channel of Davis Pond will not need to be changed. Intake of coarser sediments should be considered for early project operation and during peak flows to accelerate delta formation. Finer materials should be selected when turbulence through the diversion channel is below a certain energy level.

If the demonstration is successful and dredged sediment enrichment is continued, the natural channels will fill with sediment and become too expensive to maintain for the purposes of delta expansion. Then the diversion discharge can be routed into a single channel to increase its velocity and to direct the outfall past the developing delta for further development to the south or southeast (See BA-10). As the delta develops, the need for dredged material delivered into the diversion structure will gradually diminish so that the expense of operating the dredge may not be justified except during maximum flows.

Benefits and Costs.

This project will accelerate creation of vegetated wetlands; increase habitat diversity; cause broader dispersion of sediments through the basin with significantly greater beneficial impacts over a larger area than anticipated.

Site-specific WVA analyses were not undertaken for this project. However, it is preliminarily estimated that project implementation will create approximately 1,020 acres of marsh, benefit 1,500 acres of submerged aquatic vegetation, and enhance an additional 4,250 wetland acres. The total area estimated to be benefitted by this project is 6,775 acres.

Because the project description has not been fully determined and the number of years that the dredge would be operational not decided, costs estimates for this project have not been developed.

Effects and Issues.

The freshwater diversion structure is already authorized and the construction costs will occur with or without sediment enhancement. Targeted operational date for the diversion is in 2001.

Due to the increased silt load with this demonstration project, canals and shallow waterways will silt in sooner than originally anticipated, limiting boat access in the Salvador Wildlife Management Area. The cost of the Davis Pond Freshwater Diversion (BA-1A) maintenance dredging will increase.

Directing delta formation will be a major and continuing consideration if the sediment enrichment project is extended beyond two years. After the presently proposed outfall management plan areas (BA-1B and BA-10) are filled with sediment, the appropriateness of building a delta into the NW region of shallow Lake Cataouatche must be considered.

Status.

The project is conceptual.

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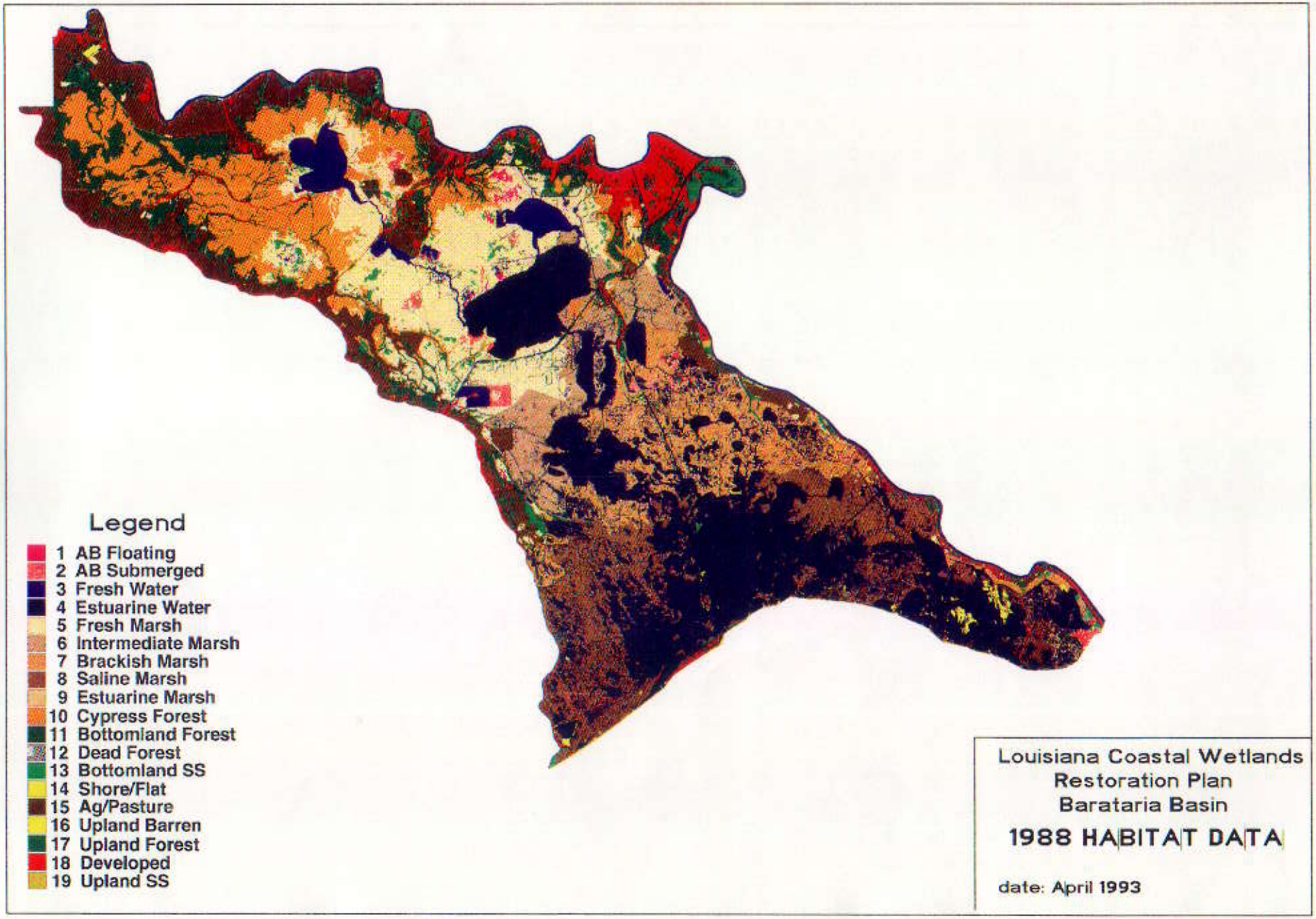
Legend
1 AB Floating
2 AB Submerged
3 Fresh Water
4 Estuarine Water
5 Fresh Marsh
6 Intermediate Marsh
7 Brackish Marsh
8 Saline Marsh
9 Estuarine Marsh
10 Cypress Forest
11 Bottomland Forest
12 Dead Forest
13 Bottomland SS
14 Shore/Flat
15 Ag/Pasture
16 Upland Barren
17 Upland Forest
18 Developed
19 Upland SS
Louisiana Coastal Wetlands
Restoration Plan
Barataria Basin
1988 HABITAT DATA
date: April 1993

PLATE 1