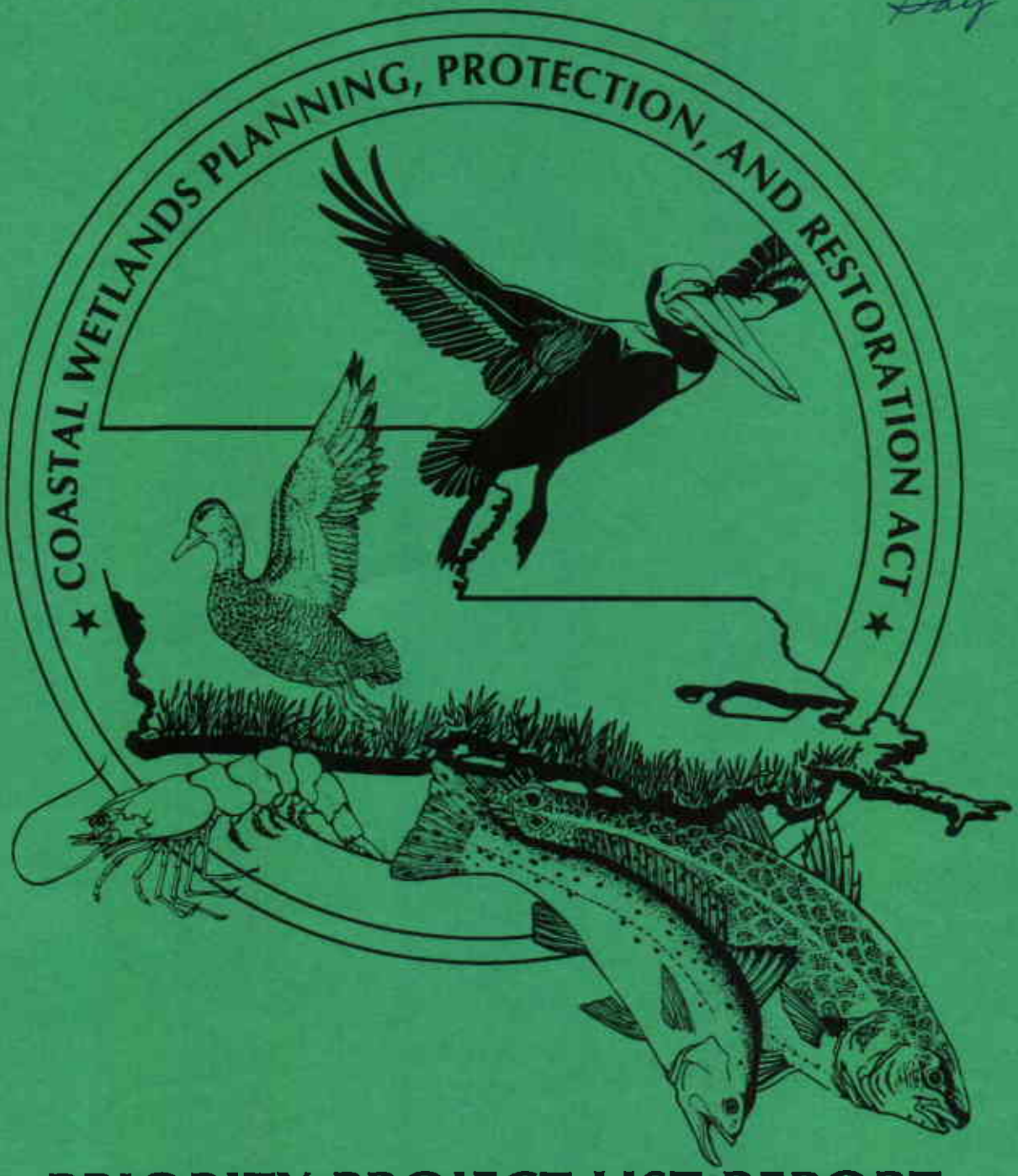

PRIORITY PROJECT LIST REPORT

PREPARED BY:

LOUISIANA COASTAL WETLANDS CONSERVATION AND RESTORATION TASK FORCE

November 18, 1991

COASTAL WETLAND PLANNING, PROTECTION, AND RESTORATION ACT

PRIORITY PROJECT LIST REPORT

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COASTAL WETLAND PLANNING, PROTECTION, AND RESTORATION ACT

PRIORITY PROJECT LIST REPORT

I. INTRODUCTION

The State of Louisiana contains 40 percent of the Nation's coastal wetlands, but is experiencing 80 percent of the Nation's coastal wetland loss. The widespread and complex nature of the coastal wetland loss problem, coupled with the diversity of agencies involved and numerous alternatives proposed, has led many in Federal, state, and local government, as well as, the general public to the conclusion that a comprehensive approach is needed. The Coastal Wetlands Planning, Protection, and Restoration Act (PL 101-646) was signed into law by President Bush on November 29, 1990, to address the need for a comprehensive approach to this significant environmental problem.

This report documents the implementation of Section 303(a) of the cited legislation.

II. STUDY AUTHORITY

Section 303(a) of the Coastal Wetlands Planning, Protection, and Restoration Act (CWPPRA), displayed in Appendix A, "Summary and the Complete Text of the CWPPRA", directs the Secretary of the Army to convene the Louisiana Coastal Wetlands Conservation and Restoration Task Force to:

> "....initiate a process to identify and prepare a list of coastal wetlands restoration projects in Louisiana to provide for the long-term conservation of such wetlands and dependent fish and wildlife populations in order of priority, based upon the cost-effectiveness of such projects in creating, restoring, protecting, and enhancing coastal wetlands, taking into account the quality of such coastal wetlands, with due allowance for small-scale projects necessary to demonstrate the use of new techniques or materials for coastal wetlands restoration."

III. STUDY PURPOSE

The purpose of this study effort was to prepare the Priority Project List and transmit the List to Congress by November 28, 1991, as specified in Section 303(a)(3) of the CWPPRA.

IV. PROJECT AREA

Figure 1, on the following page, is a map displaying the 20 Louisiana Parishes that are expected to contain coastal wetlands, as defined in Appendix B, "Definition of Coastal Wetlands." The CWPPRA does not define coastal wetlands, so the Task Force developed the definition in Appendix B.

V. STUDY PARTICIPANTS

Section 303(a)(1) directs the Secretary of the Army to convene a Task Force consisting of the following members (See Appendix C, "Task Force Members") :

- Secretary of the Army (Chairman)
- Administrator, Environmental Protection Agency
- Governor, State of Louisiana
- Secretary of the Interior
- Secretary of Agriculture
- Secretary of Commerce

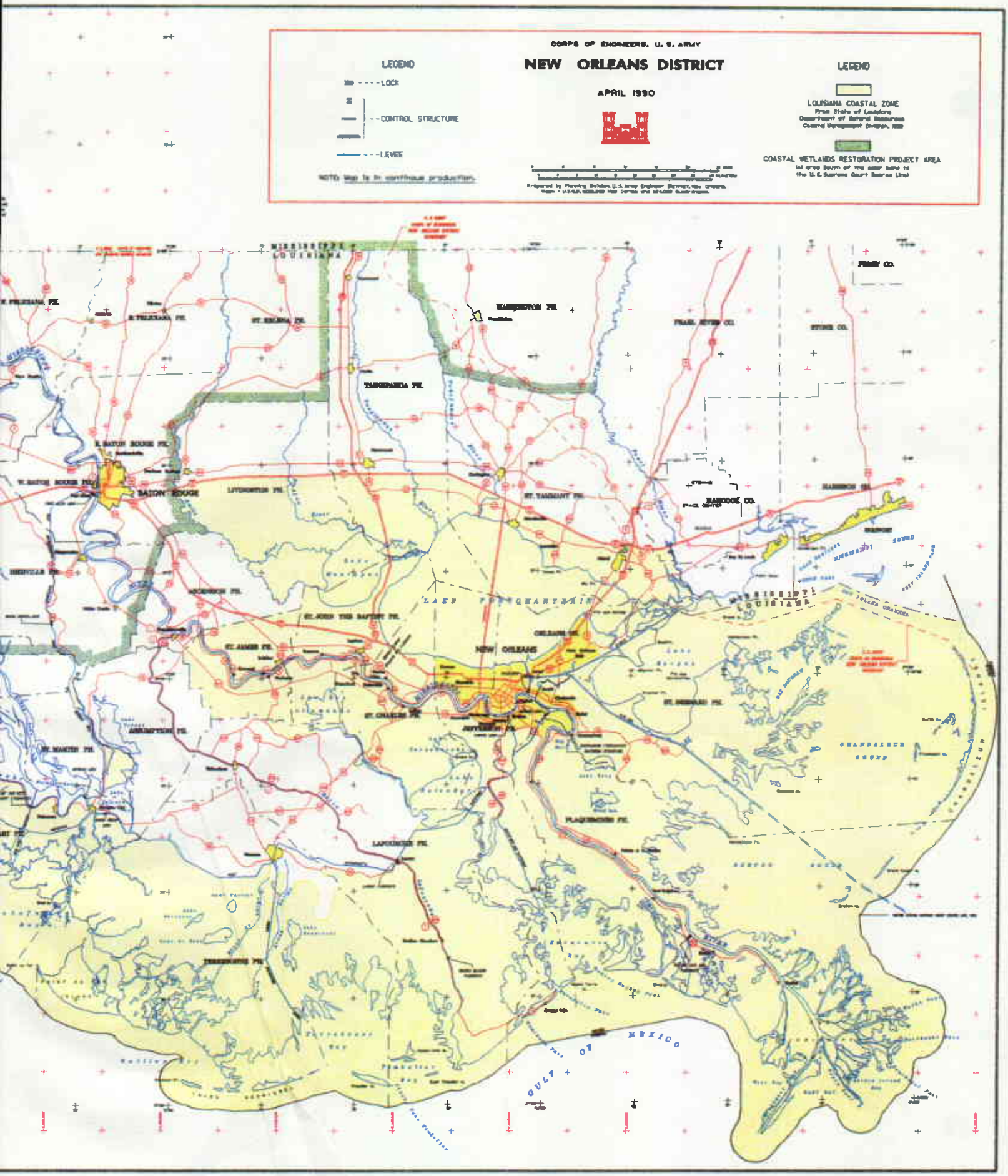
The State of Louisiana is a full voting member of the Task Force except for selection of the Priority Project List (Section 303a.2.), as stipulated in President Bush's November 29, 1990 signing statement, displayed on the last page of Appendix A. In addition, the State of Louisiana may not serve as a "lead" Task Force member for wetland projects of the Priority Project List.

VI. FORMULATION PROCESS FOR THE PRIORITY PROJECT LIST

A. Introduction

It is very important to distinguish between the more traditional, 3-year comprehensive plan formulation effort required by Section 303(b) and the short-term, accelerated project identification and evaluation process needed to satisfy the intent and time constraints associated with Section 303(a). The Task Force recognized, at the onset, that in order to prepare the first Priority Project List it would be necessary to inventory and identify existing projects in various stages of formulation, rather than conduct a traditional plan formulation process. The Task Force has begun a thorough, comprehensive planning effort as part of the preparation of the coastal wetlands Restoration Plan described in Section 303(b). This plan formulation process will also produce the future annual Priority Project Lists.


GULF OF MEXICO
CALCASIEU PR.
CAMERON PR.
VERMILION PR.
IBERIA PR.
ST. MARTIN PR.
LAFAYETTE PR.
ACADIA PR.
JEFFERSON DAVIS PR.
ALLEN PR.
EVANGELINE PR.
ST. LANDRY PR.
POINTE COUPEE PR.
GRANT PR.
LA SALLE PR.
CATAHOULA PR.
RAPIDES PR.
AVOYELLES PR.
WINN PR.
NATCHITOCHES PR.
SABINE PR.
VERNON PR.
BEAUREGARD PR.
LAKE CHARLES
FORT POLK MILITARY RESERVATION


CORPS OF ENGINEERS, U. S. ARMY
NEW ORLEANS DISTRICT
APRIL 1990
LEGEND
LOCK
CONTROL STRUCTURE
LEVEE
NOTE: Map is in continuous production.
LEGEND
LOUISIANA COASTAL ZONE
From State of Louisiana
Department of Natural Resources
Coastal Management Division, 1978
COASTAL WETLANDS RESTORATION PROJECT AREA
(all area South of the color band to
the U.S. Supreme Court Boundary Line)
Prepared by Planning Division, U.S. Army Engineer District, New Orleans
LOUISIANA
MISSISSIPPI
BATON ROUGE
NEW ORLEANS
HARRISON CO.
PERRY CO.
PEARL RIVER CO.
STONE CO.
LAKE PONTCHARTRAIN
LAKE BORGNE
MISSISSIPPI SOUND
GRANDE TERRE ISLANDS
GULF OF MEXICO

B. Identification of Candidate Wetland Projects

The CWPPRA defined a coastal wetlands restoration project in Section 302(6) and specified evaluation criteria for inclusion of these wetlands projects on the Priority Project List. These criteria are displayed in Appendix D, "Priority Project List Criteria". The five Federal Task Force members and the State of Louisiana each proposed candidate wetland projects and completed the fact sheets displayed in Appendix E, "Candidate Project Fact Sheets". Initially, 38 projects, totaling about $300 million in cost, were submitted for consideration for the Priority Project List. The Task Force reviewed each fact sheet to ensure that: 1.) the candidate wetland projects satisfied the criteria in Appendix D; 2.) there was no duplication among the candidate projects; 3.) the cost and wetland benefit data were of sufficient detail and reliability to allow a meaningful evaluation; and 4.) the total project cost was not disproportionately high relative to the funds expected to be available in FY 1992.

This first screening of candidate projects reduced the number of candidates to 27. The cost and wetland benefit data for these 27 projects were further refined based on comments made during the first screening process. The second screening put special emphasis on the: 1.) total project cost; 2.) number of similar types of candidate projects; and 3.) time available to conduct the detailed wetland benefit analysis on each project. This second screening resulted in the selection of 18 wetland projects for evaluation, with the other nine projects remanded to their respective lead Task Force members for further study/refinement and consideration for inclusion in the second Priority Project List or the Restoration Plan

C. Evaluation of Candidate Projects

The CWPPRA directed the Task Force to develop a prioritized list of wetland projects "....based on the cost-effectiveness of such projects in creating, restoring, protecting, and enhancing coastal wetlands, taking into account the quality of such coastal wetlands". The Task Force satisfied this requirement through the integration of a traditional time-value analysis of life-cycle project costs and other economic impacts and an evaluation of wetlands benefits using a community-based version of the U.S. Fish and Wildlife Services' "Habitat Evaluation Procedures". The product of these two analyses was a Cost/Habitat Unit figure for each project, which was used as the primary ranking criterion.

1. Cost Analysis

Cost analyses are displayed for each of the wetlands projects in Appendix E. Wetland project cost data were received from each lead Task Force member for their projects. These costs were then expressed as first costs, fully funded costs, present worth costs, and average annual costs. The Cost/Habitat Unit criterion was derived by dividing the average annual cost for each wetland project by the Average Annual Habitat Units (AAHU) for each wetland project. The average annual costs figures are based on 1991 price levels, a discount rate of 8-3/4 percent, and a project life of 20 years. The fully funded cost estimates developed for each project were used to determine how many projects could be supported by the funds expected to be available in FY 1992. The fully funded cost estimates include operation and maintenance and other compensated financial costs.

The cost component of the cost-effectiveness criterion was based on the following procedures and assumptions:

a. Average annual costs represent the sum of direct and known indirect construction and operating costs, discounted over time. Most cost estimates are based on planning or feasibility-level studies.

b. Construction or first costs include many different cost elements besides actual building of a project, such as engineering and design, inspection, contingencies, and, in some cases, planning, real estate (land, easements, rights-of-way, and relocations) and administration. Many of the costs are estimated using a uniform methodology, e.g. contingencies are the same percentage of construction costs for all projects.

c. Operating or ongoing costs for a project include many different cost elements besides direct operation and maintenance, including environmentally related costs. The cost elements include monitoring, replacement/closure, payment for oyster leases and induced dredging. Note that operating costs are not counted if they are part of an existing program which would not be expanded because of the project.

d. The discount rate used to account for the time value of money was 8.75% and the base year was 1995. For purposes of the calculation, first costs are scheduled to be fully experienced by mid-1995, which is when operating costs begin. Operating costs extend through 2014, 20 years from the base, which is also the time when first costs are considered fully amortized. Costs (and benefits) beyond 2014 are not considered.

e. The funding requirements for each project were based on the current dollar value of the construction and operating costs, except that costs paid for by sources other than the CWPPRA were not included. Whereas average annual costs assume no inflation over time, the calculation of funding requirements does include an inflation adjustment of 3.5% to 4.7% per year. Project benefits are not adjusted over time, i.e. they are not considered to inflate nor are they discounted to give extra value to near-term habitat gains.

2. Wetland Benefit Analysis

Appendix F, "Wetland Value Assessment Methodology", displays the wetland-quality-assessment method developed specifically for the CWPPRA by biologists from the U.S. Fish and Wildlife Service, with assistance from biologists from the other Task Force members. These biologists then applied this non-monetary assessment to each of the candidate wetland projects, after evaluating the with- and without-project wetland benefit projections for each project. In several cases, the wetland benefit projections were modified to gain a consensus among the biologists. The output of the Wetland Value Assessment was a series of with- and without-project Habitat Unit values, by target year, for each wetland project. These Habitat Unit values were then annualized and combined with the annualized cost data to produce the Cost/Habitat Unit criterion. The Habitat Unit values were annualized over a 20-year project life, using a zero percent discount rate.

3. Environmental Report

An "Environmental Report", contained in Appendix G, was prepared to address the wetland projects on the Priority Project List. This report, required by the National Environmental Policy Act, was prepared by a consultant under contract to the Environmental Protection Agency. The format and content of the report was determined by the Task Force.

D. Ranking of Candidate Projects

The Cost/Habitat Unit was the primary criterion used by the Task Force to prioritize the wetland projects in decreasing order of their cost effectiveness. This primary criterion, however, was supplemented by the secondary criteria displayed in Appendix D.

E. Public Involvement

The Task Force recognized the critical need to coordinate the preparation of the Priority Project List with the interested public. In response to this need, the Task Force established the Citizen Participation Group. Appendix H, "Citizen Participation Group", displays the list of Citizen Participation Group members and the Citizen Participation Group Charter. The 16 organizations that constitute the Citizen Participation Group represent the interests of the environmental community, oil and gas industry, agriculture, commercial fishing, recreational fishing, navigation, landowners, and public advocacy groups, all of which are active in Louisiana.

The Citizen Participation Group received detailed briefings concerning each project on the Priority Project List and on the evaluation methods used to rank the projects. Copies of the draft Priority Project List were provided to each member of the Citizen Participation Group for their review and comment. The Citizen Participation Group approved the draft Priority Project List and requested that appropriate consideration be given to their comments. The Task Force provided written responses to all Citizen Participation Group comments and revised the Priority Project List Report, as required.

VII. PRIORITY PROJECT LIST

The 18 wetland projects comprising the draft Priority Project List are displayed in Table 1, "Ranking of Projects by Cost/AAHU", on page 9. Figure 2, on page 10, displays the location of each of the 18 wetland projects. The Priority Project List consists of 14 wetland projects that fall within the funding limit for FY 1992 and 4 wetland projects that have been deferred to the Second Priority Project List unless these projects are pursued separately through the State of Louisiana's "Coastal Wetlands Conservation and Restoration Plan" or unless implementation of one or more of the 14 projects is delayed for some unforeseen reason. The implementation of these 18 projects will result in benefits to 153,000 acres of coastal wetlands, including the creation or preservation of 30,000 acres of marsh vegetation, as well as, benefits to the fish and wildlife populations these wetlands support.

The BA-6 project was deferred because significant wetland benefits are not expected to accrue until project year seven and because BA-6 is already part of the State of Louisiana's "Coastal Wetlands Conservation and Restoration Plan". The Tiger Pass project was deferred because of its relatively high fully funded cost and its location near the West Bay Sediment Diversion project, which will provide substantially greater wetland benefits to the Mississippi River Basin. The Falgout Canal South demonstration project was deferred in order to allow time to reformulate the project; for example to possibly obtain the sediments from the dredged material disposal islands in Atchafalaya Bay rather than from the Mississippi River. The mining of the disposal islands will provide a less expensive source of sediment and remove barriers to the distribution of sediments within the Atchafalaya Bay, thus benefiting a hydrologic basin not represented on the Priority Project List. Other sources of sediment and other deposition locations may be available to demonstrate the Falgout Canal South project. The Lake Salvador Shoreline project is part of the State of Louisiana's "Coastal Wetlands Conservation and Restoration Plan" and was deferred in favor of the Eastern Isle Dernieres project, which was included on the Priority Project List to demonstrate the effectiveness of barrier island restoration.

Table 2, "Ranking of Projects by Type", on page 11, displays how many types of wetland projects occur on the Priority Project List. Table 3, "Ranking of Projects by Hydrologic Basin", on page 12, displays how the wetland projects are distributed along the coast of Louisiana.

Table 1

Ranking of Projects by Cost ($) per AAHU

	Lead Task Force Member*	Cost ($) per AAHU**	Fully Funded Cost ($1,000)	Cumulative Fully Funded Cost ($1,000)	Wetland Percentage by Type *** F/I	B	S
Fourchon	CO	21	252	252	--	--	100
BA-2 (GIWW to Clovelly)	AG	68	8,142	8,394	83	17	--
Cameron Creole Watershed	IN	128	502	8,896	24	76	--
Bayou Sauvage Refuge	IN	180	1,105	10,001	100	--	--
Turtle Cove	IN/LA	194	386	10,387	100	--	--
Sabine Refuge	IN	253	4,844	15,231	100	--	--
Vegetative Plantings (Demonstration)	AG	282	848	16,079	3	11	86
West Bay Sediment Diversion	AR	305	8,517	24,596	100	--	--
Barataria Bay Waterway	AR	449	1,625	26,221	--	--	100
Lower Bayou La Cache	CO	837	1,254	27,475	--	15	85
Bayou La Branche	AR	2,369	4,327	31,802	100	--	--
Cameron Prairie Refuge	IN	3,171	1,111	32,913	100	--	--
Vermilion River Cutoff	AR/LA	6,196	1,523	34,436	--	100	--
Eastern Isle Dernieres (Demonstration)	EPA	13,949	6,345	40,781	--	--	100
Projects Deferred †							
BA-6 (GIWW to Hwy 90)	AG	323	4,583	4,583	100	--	--
Tiger Pass	AR	1,661	7,078	11,661	100	--	--
Falgout Canal South (Demonstration)	EPA	5,950	6,109	17,770	--	100	--
Lake Salvador Shoreline	AR	10,376	4,427	22,197	100	--	--

* The lead task force member (Federal sponsor) for the project, represented by the following acronoyms:
CO--U.S. Dept. of Commerce
AG--U.S. Dept. of Agriculture
IN--U.S. Dept. of the Interior
LA--State of Louisiana
AR--U.S. Dept. of the Army
EPA--Environmental Protection Agency

† Action on these projects will be deferred to the second Priority Project List unless they are pursued separately through the State of Louisiana's Wetland Restoration Plan or unless implementation of one of the above-listed projects is delayed for some unforeseen reason.

** Average Annual Habitat Units

*** Wetland Types:
F/I--Fresh/Intermediate Marsh
B---Brackish Marsh
S---Saline Marsh

Coastal Wetlands Planning, Protection, and Restoration Act

PRIORITY PROJECT LIST

STATE OF LOUISIANA (LA)

LA-A. Turtle Cove - Shoreline Protection
LA-B. Vermilion River Cutoff - Wetland Creation

ENVIRONMENTAL PROTECTION AGENCY (EPA)

EPA-A. Isle Dernieres - Barrier Island Restoration
EPA-B. Falgout Canal - Wetland Creation Demonstration

U. S. DEPARTMENT OF THE ARMY (AR)

AR-A. West Bay - Sediment Diversion for Marsh Creation
AR-B. Tiger Pass - Marsh Creation
AR-C. Bayou La Branche - Marsh Creation
AR-D. Bayou Segnette (Lake Salvador) - Bank Stabilization
AR-E. Barataria Bay Waterway - Marsh Creation

U. S. DEPARTMENT OF COMMERCE (CO)

CO-A. Fourchon - Hydrologic Restoration
CO-B. Lower Bayou La Cache Wetland - Hydrologic Restoration

U. S. DEPARTMENT OF AGRICULTURE (AG)

AG-A. G.I.W.W. to Clovelly - Hydrologic Restoration

Coastal Vegetative Programs

AG-B4. Timbalier Island
AG-B2. Falgout Canal
AG-B3. West Hackberry
AG-B4. Dewitt-Rollover Shore
AG-C. BA-6 (LA 90 to G.I.W.W.)

U. S. DEPARTMENT OF THE INT

IN-A. Bayou Sauvage NWR
IN-B. Cameron Prairie NW
IN-C. Sabine NWR - Erosio
IN-D. Cameron Creole Wat


CORPS OF ENGINEERS, U. S. ARMY
NEW ORLEANS DISTRICT
APRIL 1990
LEGEND
LOCK
CONTROL STRUCTURE
LEVEE
LEGEND
LOUISIANA COASTAL ZONE
COASTAL WETLANDS RESTORATION PROJECT AREA
NEW ORLEANS
BATON ROUGE
LA-A
AR-G
IN-A
AR-D
AG-C
AG-A
AG-B2
EPA-B
CO-B
AR-E
AR-A
AR-B
CO-A
EPA-A
AG-B1
GULF OF MEXICO
- Hydrologic Restoration
- Erosion Prevention
Prevention
Project - Borrow Canal Plug

Table 2

Ranking of Projects by Type

	Lead Task Force Member*	Cost ($) per AAHU**	Fully Funded Cost ($1,000)	Cumulative (by Type) Fully Funded Cost ($1,000)
Marsh Building with Sediment Diversion				
West Bay Sediment Diversion	AR	305	8,517	8,517
Water Management (Hydrologic Restoration)				
Fourchon	CO	21	252	252
BA-2 (GIWW to Clovelly)	AG	68	8,142	8,394
Cameron Creole Watershed	IN	128	502	8,896
Bayou Sauvage Refuge	IN	180	1,105	10,001
BA-6 (GIWW to Hwy 90)†	AG	323	4,583	14,584
Lower Bayou La Cache	CO	837	1,254	15,838
Marsh Building with Dredged Sediments				
Barataria Bay Waterway	AR	449	1,625	1,625
Tiger Pass†	AR	1,661	7,078	8,703
Bayou La Branche	AR	2,369	4,327	13,030
Falgout Canal South (Demonstration)†		5,950	6,109	19,139
Shoreline Erosion Control with Structures				
Turtle Cove	IN/LA	194	386	386
Sabine Refuge	IN	253	4,844	5,230
Cameron Prairie Refuge	IN	3,171	1,111	6,341
Vermilion River Cutoff	AR/LA	6,196	1,523	7,864
Lake Salvador Shoreline†	AR	10,376	4,427	12,291
Barrier Island Restoration with Dredged Sediments				
Eastern Isle Dernieres (Demonstration)	EPA	13,949	6,345	6345
Vegetative Plantings				
Falgout Canal, Isle Dernieres, Dewitt-Rollover, and West Hackberry (Demonstration Projects)	AG	282	848	848

* The lead task force member (Federal sponsor) for the project, represented by the following acronoyms:

CO–U.S. Dept. of Commerce
AG–U.S. Dept. of Agriculture
IN–U.S. Dept. of the Interior
LA–State of Louisiana
AR--U.S. Dept. of the Army
EPA–Environmental Protection Agency

† Action on these projects will be deferred to the second Priority Project List unless they are pursued separately through the State of Louisiana's Wetland Restoration Plan or unless implementation of one of the above-listed projects is delayed for some unforeseen reason.

** Average Annual Habitat Units

Table 3

Ranking of Projects by Hydrologic Basin

	Lead Task Force Member*	Cost ($) per AAHU ††	Fully Funded Cost ($1,000)	Cumulative (by Basin) Fully Funded Cost ($1,000)
Pontchartrain Basin				
Bayou Sauvage Refuge	IN	180	1,105	1,105
Turtle Cove	IN/LA	194	386	1,491
Bayou La Branche	AR	2,369	4,327	5,818
Breton Sound Basin				
None				
Mississippi River Basin				
West Bay Sediment Diversion	AR	305	8,517	8,517
Tiger Pass†	AR	1,661	7,078	15,595
Barataria Basin				
Fourchon	CO	21	252	252
BA-2 (GIWW to Clovelly)	AG	68	8,142	8,394
Barataria Bay Waterway	AR	449	1,625	10,019
BA-6 (GIWW to Hwy 90)†	AG	323	4,583	14,602
Lake Salvador Shoreline†	AR	10,376	4,427	19,029
Terrebonne Basin				
Falgout Canal (Vegetative Plantings)	AG	**		
Isle Dernieres (Vegetative Plantings)	AG	**		
Lower Bayou La Cache	CO	837	1,254	1,254
Eastern Isle Dernieres	EPA	13,949	6,345	7,599
Falgout Canal South†	EPA	5,950	6,109	13,708
Atchafalaya Basin				
None				
Teche/Vermilion Basin				
Vermilion River Cutoff	AR/LA	6,196	1,523	1,523
Mermentau Basin				
Dewitt-Rollover (Vegetative Plantings)	AG	**		
Cameron Prairie Refuge	IN	3,171	1,111	1,111
Calcasieu/Sabine Basin				
Cameron Creole Watershed	IN	128	502	502
Sabine Refuge	IN	253	4,844	5,346
West Hackberry (Vegetative Plantings)	AG	**		

* The lead task force member (Federal sponsor) for the project, represented by the following acronoyms:

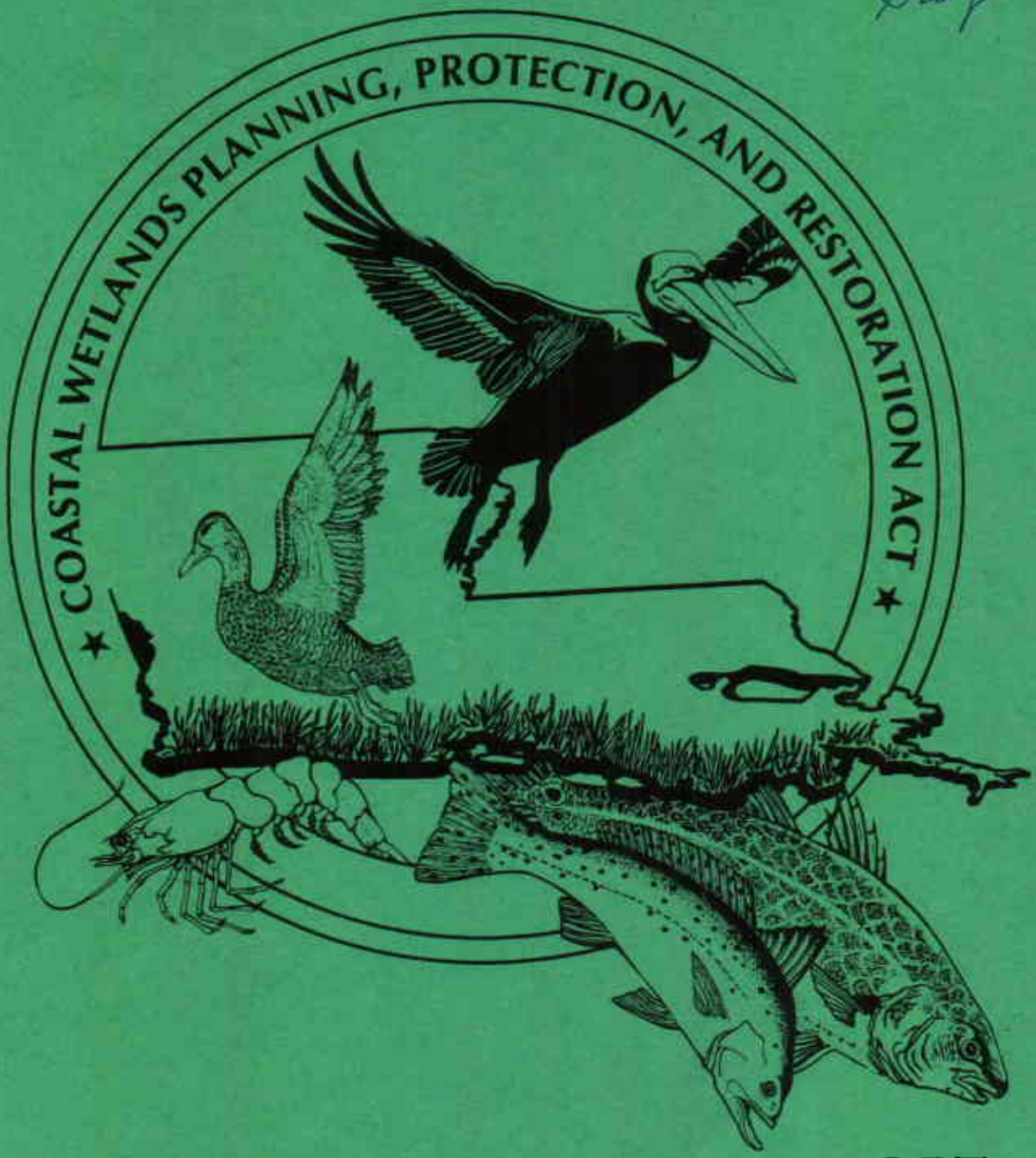
CO–U.S. Dept. of Commerce
AG–U.S. Dept. of Agriculture
IN–U.S. Dept. of the Interior
LA–State of Louisiana
AR–U.S. Dept. of the Army
EPA–Environmental Protection Agency

** The vegetative plantings demonstration project includes four sites in three basins. The overall cost of the project is $282/AAHU.

† Action on these projects will be deferred to the second Priority Project List unless they are pursued separately through the State of Louisiana's Wetland Restoration Plan or unless implementation of one of the above-listed projects is delayed for some unforeseen reason.

†† Average Annual Habitat Units

Gay



PRIORITY PROJECT LIST REPORT

(APPENDICES)

PREPARED BY:

LOUISIANA COASTAL WETLANDS CONSERVATION AND RESTORATION TASK FORCE

November 18, 1991

COASTAL WETLAND PLANNING, PROTECTION, AND RESTORATION ACT

PRIORITY PROJECT LIST REPORT
(Appendices)

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COASTAL WETLANDS PLANNING, PROTECTION, AND RESTORATION ACT

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November 18, 1991

APPENDIX A

SUMMARY OF THE CWPP&R ACT AND COMPLETE TEXT

COASTAL WETLANDS PLANNING, PROTECTION, & RESTORATION ACT
(Public Law 101-646, Title III)

SECTION 303. Priority Louisiana Coastal Wetlands Restoration Projects.

- Section 303a. Priority Project List.
  - NLT 13 Jan 91, Sec. of the Army (Secretary) will convene a Task Force.
    - •Secretary
    - •Administrator, EPA
    - •Governor, Louisiana
    - •Secretary, Interior
    - •Secretary, Agriculture
    - •Secretary, Commerce
  - NLT 28 Nov 91, Task Force will prepare and transmit to Congress a Priority List of wetland restoration projects based on cost effectiveness and wetland quality.
  - Priority List is revised and submitted annually as part of President's budget.
- Section 303b. Federal and State Project Planning.
  - NLT 28 Nov 93, Task Force will prepare a comprehensive coastal wetlands Restoration Plan for Louisiana.
  - Restoration Plan will consist of a list of wetland projects, ranked by cost effectiveness and wetland quality.
  - Completed Restoration Plan will become Priority List.
  - Secretary will ensure that navigation and flood control projects are consistent with the purpose of the Restoration Plan.
  - Upon submission of the Restoration Plan to Congress, the Task Force will conduct a scientific evaluation of the completed wetland restoration projects every 3 years and report the findings to Congress.

SECTION 304. Louisiana Coastal Wetlands Conservation Planning.

- Secretary; Administrator, EPA; and Director, USFWS will:
  - Sign an agreement with the Governor specifying how Louisiana will develop and implement the Conservation Plan.
  - Approve the Conservation Plan.
  - Provide Congress with periodic status reports on Plan implementation.
- NLT 3 years after agreement is signed, Louisiana will develop a Wetland Conservation Plan to achieve no net loss of wetlands resulting from development.

SECTION 305. National Coastal Wetlands Conservation Grants.

- Director, USFWS, will make matching grants to any coastal state to implement Wetland Conservation Projects (projects to acquire, restore, manage, and enhance real property interest in coastal lands and waters).
- Cost sharing is 50% Federal / 50% State *

SECTION 306. Distribution of Appropriations.

- 70% of annual appropriations not to exceed (NTE) $70 million used as follows:
  - NTE $5 million annually to fund Task Force preparation of Priority List and Restoration Plan -- Secretary disburses funds.
  - NTE $10 million to fund 75% of Louisiana's cost to complete Conservation Plan -- Administrator disburses funds.
  - Balance to fund wetland restoration projects at 75% Federal/ 25% Louisiana ** -- Secretary disburses funds.
- 15% of annual appropriations, NTE $15 million for Wetland Conservation Grants - Director, USFWS disburses funds.
- 15% of annual appropriations, NTE $15 million for projects authorized by the North American Wetlands Conservation Act - Secretary, Interior disburses funds.

SECTION 307. Additional Authority for the Corps of Engineers.

- Section 307a. Secretary authorized to:
  - Carry out projects to protect, restore, and enhance wetlands and aquatic/coastal ecosystems.
- Section 307b. Secretary authorized and directed to study feasibility of modifying the MR&T to increase flows and sediment to the Atchafalaya River for land building and wetland nourishment.

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* 25% if the state has dedicated trust fund from which principal is not spent.

* * 15% when Louisiana's Conservation Plan is approved.

activities, where appropriate, that would contribute to the restoration or improvement of one or more fish stocks of the Great Lakes Basin; and

"(2) activities undertaken to accomplish the goals stated in section 2006.

16 USC 941g.

"SEC. 2009. AUTHORIZATION OF APPROPRIATIONS.

"(a) There are authorized to be appropriated to the Director—

"(1) for conducting a study under section 2005 not more than $4,000,000 for each of fiscal years 1991 through 1994;

"(2) to establish and operate the Great Lakes Coordination Office under section 2008(a) and Upper Great Lakes Fishery Resources Offices under section 2008(c), not more than $4,000,000 for each of fiscal years 1991 through 1995; and

"(3) to establish and operate the Lower Great Lakes Fishery Resources Offices under section 2008(b), not more than $2,000,000 for each of fiscal years 1991 through 1995.

"(b) There are authorized to be appropriated to the Secretary to carry out this Act, not more than $1,500,000 for each of fiscal years 1991 through 1995.".

TITLE III—WETLANDS

Coastal Wetlands Planning, Protection and Restoration Act. 16 USC 3951 note.

SEC. 301. SHORT TITLE.

This title may be cited as the "Coastal Wetlands Planning, Protection and Restoration Act".

16 USC 3951.

SEC. 302. DEFINITIONS.

As used in this title, the term—

(1) "Secretary" means the Secretary of the Army;

(2) "Administrator" means the Administrator of the Environmental Protection Agency;

(3) "development activities" means any activity, including the discharge of dredged or fill material, which results directly in a more than de minimus change in the hydrologic regime, bottom contour, or the type, distribution or diversity of hydrophytic vegetation, or which impairs the flow, reach, or circulation of surface water within wetlands or other waters;

(4) "State" means the State of Louisiana;

(5) "coastal State" means a State of the United States in, or bordering on, the Atlantic, Pacific, or Arctic Ocean, the Gulf of Mexico, Long Island Sound, or one or more of the Great Lakes; for the purposes of this title, the term also includes Puerto Rico, the Virgin Islands, Guam, the Commonwealth of the Northern Mariana Islands, and the Trust Territories of the Pacific Islands, and American Samoa;

(6) "coastal wetlands restoration project" means any technically feasible activity to create, restore, protect, or enhance coastal wetlands through sediment and freshwater diversion, water management, or other measures that the Task Force finds will significantly contribute to the long-term restoration or protection of the physical, chemical and biological integrity of coastal wetlands in the State of Louisiana, and includes any such activity authorized under this title or under any other provision of law, including, but not limited to, new projects, completion or expansion of existing or on-going projects, individ-

ual phases, portions, or components of projects and operation, maintanence and rehabilitation of completed projects; the primary purpose of a "coastal wetlands restoration project" shall not be to provide navigation, irrigation or flood control benefits;

(7) "coastal wetlands conservation project" means—

(A) the obtaining of a real property interest in coastal lands or waters, if the obtaining of such interest is subject to terms and conditions that will ensure that the real property will be administered for the long-term conservation of such lands and waters and the hydrology, water quality and fish and wildlife dependent thereon; and

(B) the restoration, management, or enhancement of coastal wetlands ecosystems if such restoration, management, or enhancement is conducted on coastal lands and waters that are administered for the long-term conservation of such lands and waters and the hydrology, water quality and fish and wildlife dependent thereon;

(8) "Governor" means the Governor of Louisiana;

(9) "Task Force" means the Louisiana Coastal Wetlands Conservation and Restoration Task Force which shall consist of the Secretary, who shall serve as chairman, the Administrator, the Governor, the Secretary of the Interior, the Secretary of Agriculture and the Secretary of Commerce; and

(10) "Director" means the Director of the United States Fish and Wildlife Service.

SEC. 303. PRIORITY LOUISIANA COASTAL WETLANDS RESTORATION PROJECTS. 16 USC 3952.

(a) PRIORITY PROJECT LIST.—

(1) PREPARATION OF LIST.—Within forty-five days after the date of enactment of this title, the Secretary shall convene the Task Force to initiate a process to identify and prepare a list of coastal wetlands restoration projects in Louisiana to provide for the long-term conservation of such wetlands and dependent fish and wildlife populations in order of priority, based on the cost-effectiveness of such projects in creating, restoring, protecting, or enhancing coastal wetlands, taking into account the quality of such coastal wetlands, with due allowance for small-scale projects necessary to demonstrate the use of new techniques or materials for coastal wetlands restoration.

(2) TASK FORCE PROCEDURES.—The Secretary shall convene meetings of the Task Force as appropriate to ensure that the list is produced and transmitted annually to the Congress as required by this subsection. If necessary to ensure transmittal of the list on a timely basis, the Task Force shall produce the list by a majority vote of those Task Force members who are present and voting; except that no coastal wetlands restoration project shall be placed on the list without the concurrence of the lead Task Force member that the project is cost effective and sound from an engineering perspective. Those projects which potentially impact navigation or flood control on the lower Mississippi River System shall be constructed consistent with section 304 of this Act.

(3) TRANSMITTAL OF LIST.—No later than one year after the date of enactment of this title, the Secretary shall transmit to the Congress the list of priority coastal wetlands restoration projects required by paragraph (1) of this subsection. Thereafter,

Reports.

the list shall be updated annually by the Task Force members and transmitted by the Secretary to the Congress as part of the President's annual budget submission. Annual transmittals of the list to the Congress shall include a status report on each project and a statement from the Secretary of the Treasury indicating the amounts available for expenditure to carry out this title.

(4) LIST OF CONTENTS.—

(A) AREA IDENTIFICATION; PROJECT DESCRIPTION.—The list of priority coastal wetlands restoration projects shall include, but not be limited to—

(i) identification, by map or other means, of the coastal area to be covered by the coastal wetlands restoration project; and

(ii) a detailed description of each proposed coastal wetlands restoration project including a justification for including such project on the list, the proposed activities to be carried out pursuant to each coastal wetlands restoration project, the benefits to be realized by such project, the identification of the lead Task Force member to undertake each proposed coastal wetlands restoration project and the responsibilities of each other participating Task Force member, an estimated timetable for the completion of each coastal wetlands restoration project, and the estimated cost of each project.

(B) PRE-PLAN.—Prior to the date on which the plan required by subsection (b) of this section becomes effective, such list shall include only those coastal wetlands restoration projects that can be substantially completed during a five-year period commencing on the date the project is placed on the list.

(C) Subsequent to the date on which the plan required by subsection (b) of this section becomes effective, such list shall include only those coastal wetlands restoration projects that have been identified in such plan.

(5) FUNDING.—The Secretary shall, with the funds made available in accordance with section 306 of this title, allocate funds among the members of the Task Force based on the need for such funds and such other factors as the Task Force deems appropriate to carry out the purposes of this subsection.

(b) FEDERAL AND STATE PROJECT PLANNING.—

(1) PLAN PREPARATION.—The Task Force shall prepare a plan to identify coastal wetlands restoration projects, in order of priority, based on the cost-effectiveness of such projects in creating, restoring, protecting, or enhancing the long-term conservation of coastal wetlands, taking into account the quality of such coastal wetlands, with due allowance for small-scale projects necessary to demonstrate the use of new techniques or materials for coastal wetlands restoration. Such restoration plan shall be completed within three years from the date of enactment of this title.

(2) PURPOSE OF THE PLAN.—The purpose of the restoration plan is to develop a comprehensive approach to restore and prevent the loss of, coastal wetlands in Louisiana. Such plan shall coordinate and integrate coastal wetlands restoration

projects in a manner that will ensure the long-term conservation of the coastal wetlands of Louisiana.

(3) INTEGRATION OF EXISTING PLANS.—In developing the restoration plan, the Task Force shall seek to integrate the "Louisiana Comprehensive Coastal Wetlands Feasibility Study" conducted by the Secretary of the Army and the "Coastal Wetlands Conservation and Restoration Plan" prepared by the State of Louisiana's Wetlands Conservation and Restoration Task Force.

(4) ELEMENTS OF THE PLAN.—The restoration plan developed pursuant to this subsection shall include—

(A) identification of the entire area in the State that contains coastal wetlands;

(B) identification, by map or other means, of coastal areas in Louisiana in need of coastal wetlands restoration projects;

(C) identification of high priority coastal wetlands restoration projects in Louisiana needed to address the areas identified in subparagraph (B) and that would provide for the long-term conservation of restored wetlands and dependent fish and wildlife populations;

(D) a listing of such coastal wetlands restoration projects, in order of priority, to be submitted annually, incorporating any project identified previously in lists produced and submitted under subsection (a) of this section;

(E) a detailed description of each proposed coastal wetlands restoration project, including a justification for including such project on the list;

(F) the proposed activities to be carried out pursuant to each coastal wetlands restoration project;

(G) the benefits to be realized by each such project;

(H) an estimated timetable for completion of each coastal wetlands restoration project;

(I) an estimate of the cost of each coastal wetlands restoration project;

(J) identification of a lead Task Force member to undertake each proposed coastal wetlands restoration project listed in the plan;

(K) consultation with the public and provision for public review during development of the plan; and

(L) evaluation of the effectiveness of each coastal wetlands restoration project in achieving long-term solutions to arresting coastal wetlands loss in Louisiana.

(5) PLAN MODIFICATION.—The Task Force may modify the restoration plan from time to time as necessary to carry out the purposes of this section.

(6) PLAN SUBMISSION.—Upon completion of the restoration plan, the Secretary shall submit the plan to the Congress. The restoration plan shall become effective ninety days after the date of its submission to the Congress.

(7) PLAN EVALUATION.—Not less than three years after the completion and submission of the restoration plan required by this subsection and at least every three years thereafter, the Task Force shall provide a report to the Congress containing a scientific evaluation of the effectiveness of the coastal wetlands restoration projects carried out under the plan in crea- Reports.

ting, restoring, protecting and enhancing coastal wetlands in Louisiana.

(c) COASTAL WETLANDS RESTORATION PROJECT BENEFITS.—Where such a determination is required under applicable law, the net ecological, aesthetic, and cultural benefits, together with the economic benefits, shall be deemed to exceed the costs of any coastal wetlands restoration project within the State which the Task Force finds to contribute significantly to wetlands restoration.

(d) CONSISTENCY.—(1) In implementing, maintaining, modifying, or rehabilitating navigation, flood control or irrigation projects, other than emergency actions, under other authorities, the Secretary, in consultation with the Director and the Administrator, shall ensure that such actions are consistent with the purposes of the restoration plan submitted pursuant to this section.

(2) At the request of the Governor of the State of Louisiana, the Secretary of Commerce shall approve the plan as an amendment to the State's coastal zone management program approved under section 306 of the Coastal Zone Management Act of 1972 (16 U.S.C. 1455).

(e) FUNDING OF WETLANDS RESTORATION PROJECTS.—The Secretary shall, with the funds made available in accordance with this title, allocate such funds among the members of the Task Force to carry out coastal wetlands restoration projects in accordance with the priorities set forth in the list transmitted in accordance with this section. The Secretary shall not fund a coastal wetlands restoration project unless that project is subject to such terms and conditions as necessary to ensure that wetlands restored, enhanced or managed through that project will be administered for the long-term conservation of such lands and waters and dependent fish and wildlife populations.

(f) COST-SHARING.—

(1) FEDERAL SHARE.—Amounts made available in accordance with section 306 of this title to carry out coastal wetlands restoration projects under this title shall provide 75 percent of the cost of such projects.

(2) FEDERAL SHARE UPON CONSERVATION PLAN APPROVAL.—Notwithstanding the previous paragraph, if the State develops a Coastal Wetlands Conservation Plan pursuant to this title, and such conservation plan is approved pursuant to section 304 of this title, amounts made available in accordance with section 306 of this title for any coastal wetlands restoration project under this section shall be 85 percent of the cost of the project. In the event that the Secretary, the Director, and the Administrator jointly determine that the State is not taking reasonable steps to implement and administer a conservation plan developed and approved pursuant to this title, amounts made available in accordance with section 306 of this title for any coastal wetlands restoration project shall revert to 75 percent of the cost of the project: *Provided, however,* that such reversion to the lower cost share level shall not occur until the Governor has been provided notice of, and opportunity for hearing on, any such determination by the Secretary, the Director, and Administrator, and the State has been given ninety days from such notice or hearing to take corrective action.

(3) FORM OF STATE SHARE.—The share of the cost required of the State shall be from a non-Federal source. Such State share shall consist of a cash contribution of not less than 5 percent of

the cost of the project. The balance of such State share may take the form of lands, easements, or right-of-way, or any other form of in-kind contribution determined to be appropriate by the lead Task Force member.

(4) Paragraphs (1), (2), and (3) of this subsection shall not affect the existing cost-sharing agreements for the following projects: Caernarvon Freshwater Diversion, Davis Pond Freshwater Diversion, and Bonnet Carre Freshwater Diversion.

SEC. 304. LOUISIANA COASTAL WETLANDS CONSERVATION PLANNING. 16 USC 3953.

(a) DEVELOPMENT OF CONSERVATION PLAN.—

(1) AGREEMENT.—The Secretary, the Director, and the Administrator are directed to enter into an agreement with the Governor, as set forth in paragraph (2) of this subsection, upon notification of the Governor's willingness to enter into such agreement.

(2) TERMS OF AGREEMENT.—

(A) Upon receiving notification pursuant to paragraph (1) of this subsection, the Secretary, the Director, and the Administrator shall promptly enter into an agreement (hereafter in this section referred to as the "agreement") with the State under the terms set forth in subparagraph (B) of this paragraph.

(B) The agreement shall—

(i) set forth a process by which the State agrees to develop, in accordance with this section, a coastal wetlands conservation plan (hereafter in this section referred to as the "conservation plan");

(ii) designate a single agency of the State to develop the conservation plan;

(iii) assure an opportunity for participation in the development of the conservation plan, during the planning period, by the public and by Federal and State agencies;

(iv) obligate the State, not later than three years after the date of signing the agreement, unless extended by the parties thereto, to submit the conservation plan to the Secretary, the Director, and the Administrator for their approval; and

(v) upon approval of the conservation plan, obligate the State to implement the conservation plan.

(3) GRANTS AND ASSISTANCE.—Upon the date of signing the agreement—

(A) the Administrator shall, in consultation with the Director, with the funds made available in accordance with section 306 of this title, make grants during the development of the conservation plan to assist the designated State agency in developing such plan. Such grants shall not exceed 75 percent of the cost of developing the plan; and

(B) the Secretary, the Director, and the Administrator shall provide technical assistance to the State to assist it in the development of the plan.

(b) CONSERVATION PLAN GOAL.—If a conservation plan is developed pursuant to this section, it shall have a goal of achieving no net loss of wetlands in the coastal areas of Louisiana as a result of development activities initiated subsequent to approval of the plan,

exclusive of any wetlands gains achieved through implementation of the preceding section of this title.

(c) ELEMENTS OF CONSERVATION PLAN.—The conservation plan authorized by this section shall include—

(1) identification of the entire coastal area in the State that contains coastal wetlands;

(2) designation of a single State agency with the responsibility for implementing and enforcing the plan;

(3) identification of measures that the State shall take in addition to existing Federal authority to achieve a goal of no net loss of wetlands as a result of development activities, exclusive of any wetlands gains achieved through implementation of the preceding section of this title;

(4) a system that the State shall implement to account for gains and losses of coastal wetlands within coastal areas for purposes of evaluating the degree to which the goal of no net loss of wetlands as a result of development activities in such wetlands or other waters has been attained;

(5) satisfactory assurances that the State will have adequate personnel, funding, and authority to implement the plan;

(6) a program to be carried out by the State for the purpose of educating the public concerning the necessity to conserve wetlands;

(7) a program to encourage the use of technology by persons engaged in development activities that will result in negligible impact on wetlands; and

(8) a program for the review, evaluation, and identification of regulatory and nonregulatory options that will be adopted by the State to encourage and assist private owners of wetlands to continue to maintain those lands as wetlands.

(d) APPROVAL OF CONSERVATION PLAN.—

(1) IN GENERAL.—If the Governor submits a conservation plan to the Secretary, the Director, and the Administrator for their approval, the Secretary, the Director, and the Administrator shall, within one hundred and eighty days following receipt of such plan, approve or disapprove it.

(2) APPROVAL CRITERIA.—The Secretary, the Director, and the Administrator shall approve a conservation plan submitted by the Governor, if they determine that—

(A) the State has adequate authority to fully implement all provisions of such a plan;

(B) such a plan is adequate to attain the goal of no net loss of coastal wetlands as a result of development activities and complies with the other requirements of this section; and

(C) the plan was developed in accordance with terms of the agreement set forth in subsection (a) of this section.

(e) MODIFICATION OF CONSERVATION PLAN.—

(1) NONCOMPLIANCE.—If the Secretary, the Director, and the Administrator determine that a conservation plan submitted by the Governor does not comply with the requirements of subsection (d) of this section, they shall submit to the Governor a statement explaining why the plan is not in compliance and how the plan should be changed to be in compliance.

(2) RECONSIDERATION.—If the Governor submits a modified conservation plan to the Secretary, the Director, and the Administrator for their reconsideration, the Secretary, the

Director, and Administrator shall have ninety days to determine whether the modifications are sufficient to bring the plan into compliance with requirements of subsection (d) of this section.

(3) APPROVAL OF MODIFIED PLAN.—If the Secretary, the Director, and the Administrator fail to approve or disapprove the conservation plan, as modified, within the ninety-day period following the date on which it was submitted to them by the Governor, such plan, as modified, shall be deemed to be approved effective upon the expiration of such ninety-day period.

(f) AMENDMENTS TO CONSERVATION PLAN.—If the Governor amends the conservation plan approved under this section, any such amended plan shall be considered a new plan and shall be subject to the requirements of this section; except that minor changes to such plan shall not be subject to the requirements of this section.

(g) IMPLEMENTATION OF CONSERVATION PLAN.—A conservation plan approved under this section shall be implemented as provided therein.

(h) FEDERAL OVERSIGHT.—

(1) INITIAL REPORT TO CONGRESS.—Within one hundred and eighty days after entering into the agreement required under subsection (a) of this section, the Secretary, the Director, and the Administrator shall report to the Congress as to the status of a conservation plan approved under this section and the progress of the State in carrying out such a plan, including and accounting, as required under subsection (c) of this section, of the gains and losses of coastal wetlands as a result of development activities.

(2) REPORT TO CONGRESS.—Twenty-four months after the initial one hundred and eighty day period set forth in paragraph (1), and at the end of each twenty-four-month period thereafter, the Secretary, the Director, and the Administrator shall, report to the Congress on the status of the conservation plan and provide an evaluation of the effectiveness of the plan in meeting the goal of this section.

SEC. 305 NATIONAL COASTAL WETLANDS CONSERVATION GRANTS. 16 USC 3954.

(a) MATCHING GRANTS.—The Director shall, with the funds made available in accordance with the next following section of this title, make matching grants to any coastal State to carry out coastal wetlands conservation projects from funds made available for that purpose.

(b) PRIORITY.—Subject to the cost-sharing requirements of this section, the Director may grant or otherwise provide any matching moneys to any coastal State which submits a proposal substantial in character and design to carry out a coastal wetlands conservation project. In awarding such matching granta, the Director shall give priority to coastal wetlands conservation projects that are—

(1) consistent with the National Wetlands Priority Conservation Plan developed under section 301 of the Emergency Wetlands Resources Act (16 U.S.C. 3921); and

(2) in coastal States that have established dedicated funding for programs to acquire coastal wetlands, natural areas and open spaces. In addition, priority consideration shall be given to coastal wetlands conservation projects in maritime forests on coastal barrier islands.

(c) CONDITIONS.—The Director may only grant or otherwise provide matching moneys to a coastal State for purposes of carrying out a coastal wetlands conservation project if the grant or provision is subject to terms and conditions that will ensure that any real property interest acquired in whole or in part, or enhanced, managed, or restored with such moneys will be administered for the long-term conservation of such lands and waters and the fish and wildlife dependent thereon.

(d) COST-SHARING.—

(1) FEDERAL SHARE.—Grants to coastal States of matching moneys by the Director for any fiscal year to carry out coastal wetlands conservation projects shall be used for the payment of not to exceed 50 percent of the total costs of such projects: except that such matching moneys may be used for payment of not to exceed 75 percent of the costs of such projects if a coastal State has established a trust fund, from which the principal is not spent, for the purpose of acquiring coastal wetlands, other natural area or open spaces.

(2) FORM OF STATE SHARE.—The matching moneys required of a coastal State to carry out a coastal wetlands conservation project shall be derived from a non-Federal source.

(3) IN-KIND CONTRIBUTIONS.—In addition to cash outlays and payments, in-kind contributions of property or personnel services by non-Federal interests for activities under this section may be used for the non-Federal share of the cost of those activities.

(e) PARTIAL PAYMENTS.—

(1) The Director may from time to time make matching payments to carry out coastal wetlands conservation projects as such projects progress, but such payments, including previous payments, if any, shall not be more than the Federal pro rata share of any such project in conformity with subsection (d) of this section.

(2) The Director may enter into agreements to make matching payments on an initial portion of a coastal wetlands conservation project and to agree to make payments on the remaining Federal share of the costs of such project from subsequent moneys if and when they become available. The liability of the United States under such an agreement is contingent upon the continued availability of funds for the purpose of this section.

Texas.

(f) WETLANDS ASSESSMENT.—The Director shall, with the funds made available in accordance with the next following section of this title, direct the U.S. Fish and Wildlife Service's National Wetland Inventory to update and digitize wetlands maps in the State of Texas and to conduct an assessment of the status, condition, and trends of wetlands in that State.

16 USC 3955.

SEC. 306. DISTRIBUTION OF APPROPRIATIONS.

(a) PRIORITY PROJECT AND CONSERVATION PLANNING EXPENDITURES.—Of the total amount appropriated during a given fiscal year to carry out this title, 70 percent, not to exceed $70,000,000, shall be available, and shall remain available until expended, for the purposes of making expenditures—

(1) not to exceed the aggregate amount of $5,000,000 annually to assist the Task Force in the preparation of the list required under this title and the plan required under this title, including preparation of—

(A) preliminary assessments;
(B) general or site-specific inventories;
(C) reconnaissance, engineering or other studies;
(D) preliminary design work; and
(E) such other studies as may be necessary to identify and evaluate the feasibility of coastal wetland restoration projects;

(2) to carry out coastal wetlands restoration projects in accordance with the priorities set forth on the list prepared under this title;

(3) to carry out wetlands restoration projects in accordance with the priorities set forth in the restoration plan prepared under this title;

(4) to make grants not to exceed $2,500,000 annually or $10,000,000 in total, to assist the agency designated by the State in development of the Coastal Wetlands Conservation Plan pursuant to this title.

(b) COASTAL WETLANDS CONSERVATION GRANTS.—Of the total amount appropriated during a given fiscal year to carry out this title, 15 percent, not to exceed $15,000,000 shall be available, and shall remain available to the Director, for purposes of making grants—

(1) to any coastal State, except States eligible to receive funding under section 306(a), to carry out coastal wetlands conservation projects in accordance with section 305 of this title; and

(2) in the amount of $2,500,000 in total for an assessment of the status, condition, and trends of wetlands in the State of Texas.

(c) NORTH AMERICAN WETLANDS CONSERVATION.—Of the total amount appropriated during a given fiscal year to carry out this title, 15 percent, not to exceed $15,000,000, shall be available to, and shall remain available until expended by, the Secretary of the Interior for allocation to carry out wetlands conservation projects in any coastal State under section 8 of the North American Wetlands Conservation Act (Public Law 101-233, 103 Stat. 1968, December 13, 1989).

SEC. 307. GENERAL PROVISIONS.

16 USC 3956.

(a) ADDITIONAL AUTHORITY FOR THE CORPS OF ENGINEERS.—The Secretary is authorized to carry out projects for the protection, restoration, or enhancement of aquatic and associated ecosystems, including projects for the protection, restoration, or creation of wetlands and coastal ecosystems. In carrying out such projects, the Secretary shall give such projects equal consideration with projects relating to irrigation, navigation, or flood control.

Irrigation.
Navigation.
Flood control.

(b) STUDY.—The Secretary is hereby authorized and directed to study the feasibility of modifying the operation of existing navigation and flood control projects to allow for an increase in the share of the Mississippi River flows and sediment sent down the Atchafalaya River for purposes of land building and wetlands nourishment.

SEC. 308. CONFORMING AMENDMENT.

16 U.S.C. 777c is amended by adding the following after the first sentence: "The Secretary shall distribute 18 per centum of each annual appropriation made in accordance with the provisions of

section 777b of this title as provided in the Coastal Wetlands Planning, Protection and Restoration Act: *Provided*, That, notwithstanding the provisions of section 777b, such sums shall remain available to carry out such Act through fiscal year 1999.".

Great Lakes Oil Pollution Research and Development Act.

"TITLE IV—GREAT LAKES OIL POLLUTION RESEARCH AND DEVELOPMENT

33 USC 2701 note.

"SEC. 4001. SHORT TITLE.

"This title may be cited as the "Great Lakes Oil Pollution Research and Development Act".

"SEC. 4002. GREAT LAKES OIL POLLUTION RESEARCH AND DEVELOPMENT.

"Section 7001 of the Oil Pollution Act of 1990 (Public Law 101-380) is amended as follows:

Ante, p. 559.

"(1) GREAT LAKES DEMONSTRATION PROJECT.—In subsection (c)(6), strike "3" and insert "4", strike "and" after "California,", and insert "and (D) ports on the Great Lakes," after "Louisiana,".

"(2) FUNDING.—In subsection (f) strike "21,250,000" and insert "22,000,000" and in subsection (f)(2) strike "2,250,000" and insert "3,000,000".".

Approved November 29, 1990.

LEGISLATIVE HISTORY—H.R. 5390 (S. 2244):

SENATE REPORTS: No. 101-523 accompanying S. 2244 (Comm. on Environment and Public Works).

CONGRESSIONAL RECORD, Vol. 136 (1990):

Oct. 1, considered and passed House.

Oct. 26, considered and passed Senate, amended, in lieu of S. 2244.

Oct. 27, House concurred in Senate amendment.

WEEKLY COMPILATION OF PRESIDENTIAL DOCUMENTS, Vol. 26 (1990):

Nov. 29, Presidential statement.

COASTAL WETLANDS PLANNING, PROTECTION, AND RESTORATION ACT

PRIORITY PROJECT LIST REPORT
November 18, 1991

APPENDIX B

DEFINITION OF COASTAL WETLANDS

Definition of Coastal Wetlands as used in Section 303 of the Coastal Wetlands, Planning, Protection, and Restoration Act

Coastal wetlands are defined as vegetated wetlands, located within the "Coastal Wetlands Restoration Project Area" which are or were subject to tidal influence prior to human intervention. These include estuarine emergent wetlands, palustrine emergent wetlands, and palustrine forested wetlands and associated beds of aquatic vegetation. The vegetated wetland component of the definition is based on existing wetland definitions (Attachment 1) and inferences made in the Act (Attachment 2).

For purposes of administering the Section 303 of the Act, four wetland types were designated to categorize coastal wetlands. These include the following:

Saline Marsh. Saline marsh is described in the Fish and Wildlife Service's wetland classification system[1] as estuarine intertidal emergent vegetation narrow-leaved persistent regular tidal regime polyhaline. E2EM5N4 is the symbol used to designate saline marsh on wetland maps using the wetland classification system. Saline marsh is typically vegetated by oyster grass (*Spartina alterniflora*), black rush (*Juncus roemerianus*), saltwort (*Batis maritima*), and salt grass (*Distichlis spicata*). Other wetland types associated with saline marsh include scrub/shrub wetlands, shell reefs, flats, streams and ponds. Generally aquatic plants do not exist in saline marsh waters along the Louisiana coast. However, widgeongrass (*Ruppia maritima*) may occur in saline marsh waters bordering the brackish marsh zone where lower salinities exist. Also, seagrass beds occur in waters associated with saline marshes located on some barrier islands. Seagrass species include shoalgrass (*Diplanthera wrightii*), turtlegrass (*Thalassia testudinum*), and manateegrass (*Cymodocea manatorum*).

Brackish Marsh. Brackish marsh is described as estuarine intertidal emergent vegetation narrow-leaved persistent irregular tidal regime mesohaline. E2EM5P5 is the symbol used to designate brackish marsh on wetland maps using the Fish and Wildlife Service's wetland classification system. Brackish marsh is typically vegetated by wiregrass (*Spartina patens*), three-cornered grass (*Scirpus olneyi*), and leafy three-square (*Scirpus maritimus*). Other wetland types associated

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[1] Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deepwater habitats of the United States. U.S. Fish Wildl. Serv. FWS/OBS-79/31, Washington, D.C. 131 pp.

with brackish marsh include scrub/shrub wetlands, flats, streams and ponds. Aquatic plants that commonly occur in brackish marsh waters include widgeongrass, common duckweed (*Lemna minor*, Eurasian watermilfoil (*Myriophyllum spicatum*), muskgrass (*Chara vulgaris*), coontail (*Ceratophyllum demersum*), and dwarf spikerush (*Eleocharis parvula*).

Fresh/Intermediate Marsh. This type includes fresh and low salinity coastal marshes. Fresh marsh is described as palustrine emergent vegetation. PEM is the symbol used to designate fresh marsh on wetland maps using the Fish and Wildlife Service's wetland classification system. Vegetative species composition in fresh marshes is diverse but generally includes maidencane (*Panicum hemitomon*), pennywort (*Hydrocotyle sp.*), pickerelweed (*Pontederia cordata*), alligatorweed (*Alternanthera philoxeroides*), and bulltongue (*Sagittaria sp.*). Aquatic plants that commonly occur in fresh marsh waters include common duckweed, coontail, Eurasian watermilfoil, spikerush, and muskgrass. Intermediate marsh is described as estuarine intertidal emergent vegetation narrow-leaved persistent irregular tidal regime oligohaline. Intermediate marsh has been combined with fresh marsh because its habitat values are similar and it generally lies between fresh and brackish marshes in the form of a relatively narrow band. E2EM5P6 is the symbol used to designate intermediate marsh on wetland maps. Vegetative composition is usually a mixture of fresh marsh and brackish marsh species and typically includes wiregrass, bulltongue, roseau (*Phragmites australis*), bullwhip (*Scirpus californicus*), sawgrass *Cladium jamaicense*), Walter's millet (*Echinochloa walteri*), and cow pea (*Vigna luteola*). Aquatic plants that commonly occur in intermediate marsh waters include widgeongrass, dwarf spikerush, muskgrass, coastal waterhyssop (*Bacopa monnieri*, Eurasian watermilfoil, and southern naiad (*Najas guadalupensis*). Other wetland types associated with this marsh type include scrub/shrub wetlands, small "islands" of cypress swamp, flats, streams and ponds.

Cypress-tupelo Swamp. Cypress-tupelo swamp is described as palustrine forested broad-leaved deciduous/needle-leaved deciduous. PFO1/2 is the symbol used to designate cypress-tupelo swamp on wetland maps using the Fish and Wildlife Service's wetland classification system. Tree species typically include baldcypress (*Taxodium distichum*), tupelogum (*Nyssa aquatica*), and red maple (*Acer rubrum*). Other wetland types associated with cypress swamp include relatively small areas of scrub/shrub wetlands fresh marsh, streams and ponds. Aquatic beds and emergents may characterize the

understory. Aquatic beds usually consist of floating vegetation, water hyacinth (*Eichornia crassipes*) and duckweed (*Lemna sp.*). The understory may include saplings of the overstory species and buttonbush (*Cephalanthus occidentalis*).

Attachment 1.

Wetland Definitions (Source-Federal Wetlands Delineation Manual):

Section 404 of the Clean Water Act (CE & EPA)

> Areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

Food Security Act of 1985 (SCS) and Section 301 of the Emergency Wetlands Resources Act of 1986 (FWS)

> Areas that have a predominance of hydric soils and that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of hydrophytic vegetation typically adapted for life in saturated soil conditions.*

Classification of Wetlands and Deepwater Habitats of the U.S. (FWS)

> Lands that are transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water. Wetlands must have one or more of the following three attributes: (1) at least periodically, the land supports predominantly hydrophytes, (2) the substrate is predominantly undrained hydric soil, and (3) the substrate is nonsoil and is saturated with water or covered by shallow water at some time during the growing season of each year.

* The Food Security Act wetland definition excludes lands in Alaska identified as having a high potential for agricultural development and a predominance of permafrost soils.

The Coastal Wetlands Planning, Protection, and Restoration (Act) does not specifically define coastal wetlands. However, in Section 303.(b)(3), the Task Force is directed to integrate the Corps' Louisiana Comprehensive Coastal Wetlands Feasibility Study and the State's Coastal Wetlands Conservation and Restoration Plan in developing a restoration plan to address coastal wetland loss in Louisiana. The State's plan concentrates on vegetated wetlands and incorporates measures to arrest the loss of vegetated wetlands.

The report prepared for the Corps' study addressed vegetated wetland loss, described major wetland types as marsh and forested wetlands, noted the conversion of wetlands to open water, and noted the national significance of the amount and loss of coastal wetlands in Louisiana. In the Fish and Wildlife Service's 1984 wetland status and trend report, Louisiana's coastal marsh was identified as a national problem area because of the high rate of loss experienced there. The report noted that the problem primarily resulted from the increasing submergence of coastal marshes.

Section 304. of the Act provides for the development of a conservation plan for Louisiana coastal wetlands that has as its goal the achievement of no net loss of coastal wetlands as a result of development activities. As referred to previously, the concern over wetland loss in coastal Louisiana stems from the loss of vegetated wetlands.

Section 305. of the Act provides for granting funds to coastal states for implementing coastal wetlands conservation projects. The Act encourages projects that are consistent, with the National Wetlands Priority Conservation Plan (Plan) prepared by Fish and Wildlife Service for the Department of Interior in 1989. The purpose of the Plan is priority planning for wetland acquisition. Coastal vegetated wetlands would rank high under the criteria used for prioritizing acquisition sites whereas open water areas would rank much lower. The assessment criteria consider wetland losses, threats, functions and values..

Section 307. of the Act authorizes the Corps of Engineers to study the feasibility of utilizing existing projects to increase the transport of sediment for building land and nourishing wetlands. As referred to previously, the concern expressed over Louisiana coastal wetland loss has been the loss of vegetated wetlands, not open water. Land building would occur at the expense of open water. Nourishing wetlands with sediment implies offsetting the effects of processes resulting in the submergence of marshes. By succeeding in wetland nourishment, vegetated wetland loss would be reduced with reductions in open water gains.

COASTAL WETLANDS PLANNING, PROTECTION, AND RESTORATION ACT

PRIORITY PROJECT LIST REPORT
November 18, 1991

APPENDIX C

TASK FORCE MEMBERS

COASTAL WETLANDS PLANNING, PROTECTION, AND RESTORATION ACT

TASK FORCE MEMBERS

Task Force Member	Member's Representative
Governor, State of Louisiana	Mr. David Chambers Executive Assistant for Coastal Activities Office of the Governor P. O. Box 94004 Baton Rouge, LA 70804-9004 (504) 342-6493 ; FAX: (504) 342-3522
Administrator, EPA	Mr. Russell F. Rhoades Division Director Environmental Services Division Region VI Environmental Protection Agency 1445 Ross Ave. Dallas, Texas 75202 (214) 655-2210 ; FAX: (214) 655-7446
Secretary, Department of the Interior	Mr. S. Scott Sewell Director Minerals Management Service U.S. Department of the Interior Mail Stop: 4230 M.I.B. 1849 C Street, NW, Office #4210 Washington, D.C. 20240 (202) 208-3500 ; FAX: (202) 208-7248

TASK FORCE MEMBERS (cont.)

Task Force Member	Member's Representative
Secretary, Department of Agriculture	Mr. Horace J. Austin State Conservationist Soil Conservation Service 3737 Government Street Alexandria, Louisiana 71302 (318) 473-7751 ; FAX: (318) 473-7771
Secretary, Department of Commerce	Dr. Clement Lewsey Gulf Regional Manager Coastal Programs Division Office of Ocean and Coastal Resource Management U.S. Department of Commerce Room 721; Universal Bldg. 1825 Connecticut Avenue, N.W. Washington, D.C. 20235 (202) 606-4138 ; FAX: (202) 606-4329
Secretary of the Army (Chairman)	Col. Michael Diffley District Engineer U.S. Army Engineer District, N.O. P.O. Box 60267 New Orleans, LA 70160-0267 (504) 862-2204 ; FAX: (504) 862-2492

COASTAL WETLANDS PLANNING, PROTECTION, AND RESTORATION ACT

PRIORITY PROJECT LIST REPORT
November 18, 1991

APPENDIX D

PRIORITY PROJECT LIST CRITERIA

CRITERIA
for the
PRIORITY PROJECT LIST

I. Criteria for Candidate Projects :

A. Coastal wetland restoration project (as defined in Section 302) :

> "any technically feasible activity to create, restore, protect, or enhance coastal wetlands through sediment and freshwater diversion, water management, or other measures that the Task Force finds will significantly contribute to the long-term restoration or protection of the physical, chemical, and biological integrity of coastal wetlands in the State of Louisiana, includes any provision of law, including, but not limited to, new projects, completion or expansion of existing or on-going projects, individual phases, portions, or components of projects, and operation, maintenance and rehabilitation of completed projects; the primary purpose of a "coastal wetlands restoration project" shall <u>not</u> be to provide navigation, irrigation, or flood control benefits;"

B. Project substantially complete in 5 years.

C. Project results in the long-term (>10 years) conservation of wetlands.

D. Project meets desirable planning objectives established by the Task Force and does not appear to conflict with other projects within the same basin.

II. Criteria for Listed Projects :

A. Criteria for candidate projects satisfied.

B. Project meets desirable planning objectives established by the Task Force and does not conflict with other proposed projects within the same basin.

C. The Task Force agrees that the lead Task Force member for the project will likely be able to obtain full environmental compliance :
1. NEPA
2. Sections 10/404
3. State Coastal Management Program
4. State Water Quality Certification
5. Endangered Species Act

III. **Primary criterion for Prioritizing Candidate and Listed Projects :**

- Average Annual Cost/Habitat Unit

IV. **Secondary criteria for Prioritizing Candidate and Listed Projects :**

A. Letter of Interest to cost share from the State of Louisiana or other non-Federal Sponsor.

B. Letter of Interest from landowner to satisfy the necessary "terms and conditions", to be established by the Secretary of the Army, under Section 303(e).

C. A specific recommendation from the State of Louisiana concerning whether or not to include the project on the Priority List.

D. Average Annual Acres of wetlands and other habitats created/benefited by the project.

E. Average Annual Acres of wetlands and other habitats lost/degraded by the project.

F. Current and/or projected rates of vegetated wetland loss and their causes within the project area, hydrologic basin, and throughout the coastal area.

G. Freshwater or sediment diversion/introduction project or feature of a project.

H. Relative abundance of marsh types in the project area, hydrologic basin, and throughout the coastal area.

I Level of public support.

J. Part of major interagency environmental program that has a scientifically based methodology.

K. Provides direct benefits to Federal and State endangered or threatened species.

L. Speed of implementation.

M. Technologies used are applicable to other coastal wetlands.

COASTAL WETLANDS PLANNING, PROTECTION, AND RESTORATION ACT

PRIORITY PROJECT LIST REPORT
November 18, 1991

APPENDIX E

CANDIDATE PROJECT FACT SHEETS

COASTAL WETLANDS PLANNING, PROTECTION, AND RESTORATION ACT

APPENDIX E
NOVEMBER 18, 1991

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COASTAL WETLANDS PLANNING, PROTECTION, AND RESTORATION ACT

APPENDIX E

November 18, 1991

TAB A

FOURCHON HYDROLOGIC RESTORATION

SPOIL IMPOUNDMENT RESTORATION - FOURCHON

Candidate Project
for the
Priority Project List
of the
Coastal Wetlands Planning, Protection, and Restoration Act

PROPOSED BY

U.S. Department of Commerce
with the support of the
U.S. Environmental Protection Agency

August 1, 1991

POINT OF CONTACT: Ric Ruebsamen
PHONE: (504) 389-0508

PROJECT DESCRIPTION

Location

The proposed project area is located in lower Lafourche Parish, between State Road 3090 and Bayou Lafourche, and adjacent to the Port Fourchon facilities. The area encompasses a 2400 acre impoundment centered at latitude 29° 00′ 08" and longitude 90° 11′ 30". The impoundment was created for spoil containment but has not been filled entirely. Elevated spoil deposits extend over about one fourth of the area and have converted to saline marsh and shrub cover. Retention of local rainfall because of poor drainage maintains a shallow water body in most of the remaining area. Habitat data of 1984 (DNR) showed the following habitat composition:

Open Water	- 1440 acres	Shrub Cover	- 315 acres
Saline Marsh	- 580 acres	Other	- 30 acres
Wetlands	- 2020 acres	Non-wetlands	- 345 acres

Justification

The area is a dredge spoil disposal site which is impounded above normal tide levels because of limited water exchange through a single 36 in culvert. Due to the high water level inside the impoundment and the absence of further spoil deposition, conversion to open water continues and averaged about 13 acres per year between 1978 and 1984. Without water exchange with adjacent estuarine water bodies, the area contributes only minimally as habitat for estuarine-dependent fish populations. Migratory fish species, and especially juveniles of commercially important species, are largely excluded.

Placement of culverts beneath the shell road at the north perimeter of the area would open it to regular tidal exchange and enhance ingress and egress of marine organisms. Fisheries would be enhanced, and the overall reduction in water levels would afford improved conditions for the natural establishment of saline marsh vegetation in the shallowest portion of the area, further improving habitat quality. Because the area is utilized by wintering waterfowl and wading birds, the project will be designed and operated to ensure the conservation of those resource values.

Objectives

The objective is to reestablish saline marsh habitat within the shallowest portion of the impoundment as an integral part of the estuarine environment. This is to be accomplished by returning this non-circulating area to a regular tidal regime and a lower mean water level with resultant improvements in water quality, natural revegetation, and greater support of wildlife and fisheries populations.

Project Features

The project involves the placement of double 48" dia. culverts beneath the shell road along the northern perimeter. Culvert length will be approximately 75 feet. Shell armoring of levee faces adjacent to the culverts will be required to prevent scouring.

ANTICIPATED BENEFITS

Type and acres restored

The project is expected to restore approximately 44 acres of saline marsh and prevent the loss of 106 acres of existing saline marsh. Restoration would result primarily as a result of revegetation on emerging water bottom in the shallowest part of the impoundment adjacent to the existing saline marsh.

Type and acres enhanced and the nature of the enhancement

Quality of remaining shallow water bodies would be enhanced as a result of water exchange. Improved circulation would benefit oxygen concentrations.

Type and acres protected

None

Duration of coastal wetland benefits

Benefits from this project are expected tolast approximately 20 years. Deposition, if any, of dredged material from the Bayou Lafourche Waterway is not expected to conflict with the proposed project.

Benefits to coastal wetland dependent fish and wildlife populations

The project would make available an additional 2020 acres of sheltered saline habitat to fish and wildlife.

Other significant benefits

None

Type and acres of coastal wetlands and other habitats adversely affected by the project

No significant adverse environmental effects are anticipated.

Conflicts with other projects and programs

Feasibility analysis will be required to identify definite sources of conflict with current user functions. The area continues to be a dedicated spoil disposal area for maintenance dredging of Bayou Lafourche Waterway. A permit for disposal of dredged material in the project area has been applied for, and a Coastal Use Permit has been granted. The Section 10/404 permit remains under review. The US Army Corps of Engineers is presently studying the feasibility to assume maintenance of Bayou Lafourche Waterway in 1995. The area is privately owned by the Wisner Foundation and the Louisiana Land and Exploration Company, and the proposed project could also conflict with land-owner objectives.

COSTS

Estimated costs and source of the estimates are as follows:

Feasibility Analysis, Planning and Permitting	$ 2,250
Engineering and Design	$ 4,950
Supervision and administration of engineering and design	$ 675
Project Construction	$ 45,000
Supervision and Inspection of construction (x2)	$ 9,900
Contingencies	$ 9,000
Replacement costs @ 10 yrs	$ 45,000
Operation and Maintenance for 20 years @ $ 500/yr	$ 10,000
Project monitoring for 20 years @ $ 3,000/yr	$ 60,000
The total project cost over 20 years would be approximately	$ 186,775

Construction cost estimates were derived from:

Clark, D. and R. Hartman. 1990. Engineering and Construction Techniques of Marsh Management Structures. p 87-163 in Cahoon, D.R. and C.G. Groat, eds. A Study of Marsh Management Practice in Coastal Louisiana, Volume II, Technical Description. Final report to Minerals Management Service, New Orleans, LA. Contract No. 14-12-0001-30410. OCS Study/MMS 90-0075. 309p.

STATUS OF ENVIRONMENTAL COMPLIANCE

NEPA

No specific environmental evaluation of the project has taken place at this time.

Sections 10/404

A section 10/404 permit will be needed because of required construction activities in wetlands but has not been applied for.

Louisiana Coastal Management Program

The project is located with the Louisiana Coastal Zone and requires a Coastal Use Permit. This permit has not been applied for.

Louisiana Water Quality Certification

Certification will be required but has not been applied for.

Endangered Species Act

The project is not believed to adversely affect endangered or threatened species; verification is required.

PROJECT IMPLEMENTATION SCHEDULE

The following schedule expresses anticipated time period in terms of month after initiation of the project:

Authorization	0
Planning and detailed feasibility analysis starting date	2
Planning and detailed feasibility analysis finish date	3
Submittal of permit applications	3
Completion permit process	6
Engineering and design start date (pending permit approval)	8
Engineering and design finish date	9
Construction start date	9
Construction finish date	10

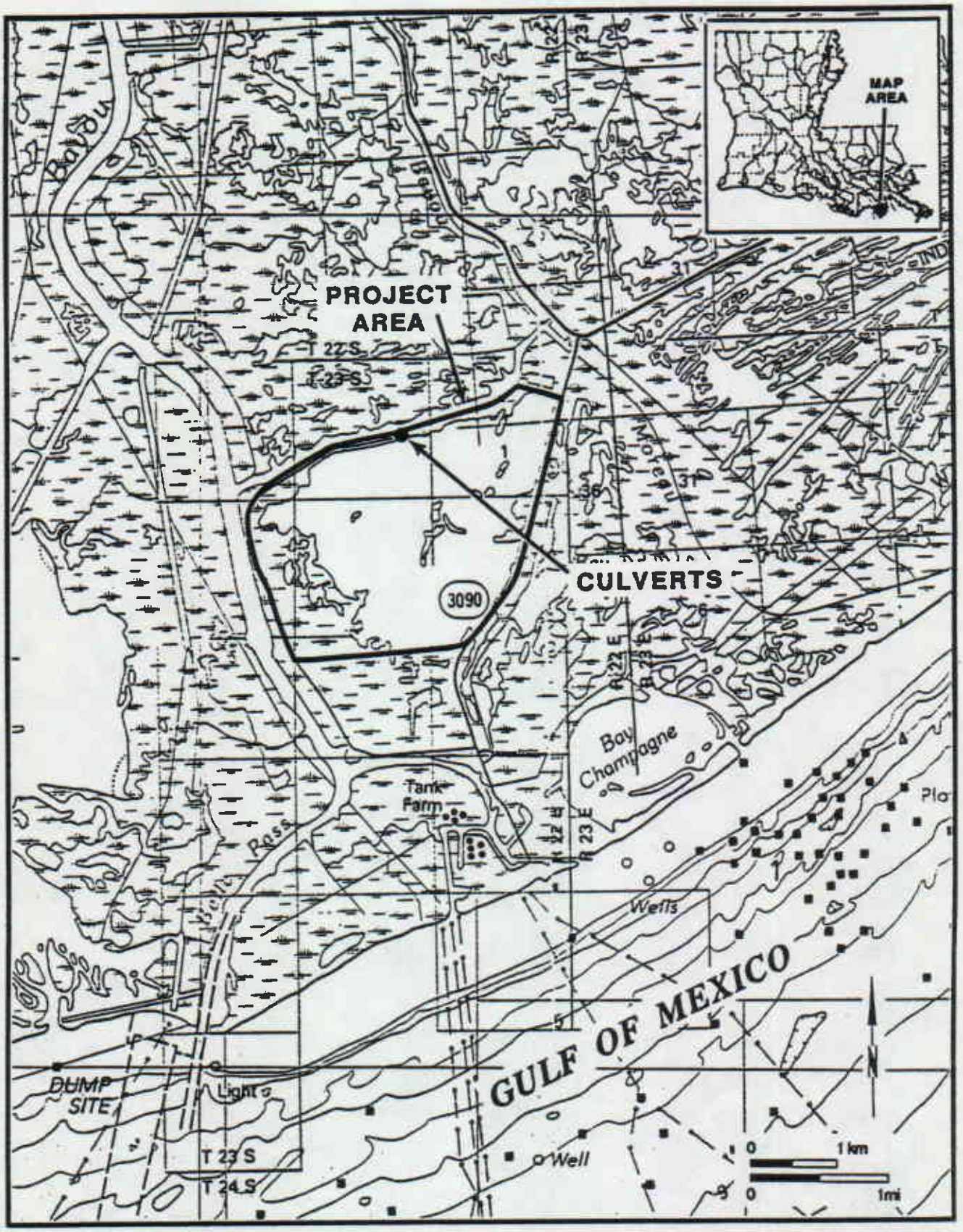
POTENTIAL FUNDING SOURCES

Federal Funding Sources

No federal funding sources other than the Coastal Wetlands Planning, Protection, and Restoration Act have been identified.

Non-federal Funding Sources

State funding could be available to share in the project cost should the project be submitted and approved under the 1992-93 State Coastal Wetland Restoration and Protection Plan, and be determined to be feasible.


MAP AREA
PROJECT AREA
T 22 S
T 23 S
CULVERTS
3090
R 22 E
R 23 E
Bay Champagne
Tank Farm
Ross
Wells
GULF OF MEXICO
DUMP SITE
Light
T 23 S
T 24 S
Well
0 1 km
0 1mi

PROJECT: FOURCHON

TOTAL FIRST COSTS	$67,000
TOTAL FULLY FUNDED COSTS	$252,000

ANNUAL CHARGES	PRESENT WORTH	AVERAGE ANNUAL
INTEREST & AMORTIZATION	$69,687	$7,498
MONITORING	$29,075	$3,128
IMPACT TO WATER SUPPLY		$0
ACCESS OIL & GAS		$0
INDUCED DREDGING		$0
IMPACT TO SHIPPING		$0
EMERGENCY CLOSURE		$0
OYSTER LEASES		$0
O & M COSTS	$4,846	$521
REPLACEMENT COSTS	$22,311	$2,401
OTHER COSTS		$0
TOTAL	$125,919	$13,549

AVERAGE ANNUAL HABITAT UNITS	643.89
COST PER HABITAT UNIT	$21
AVERAGE ANNUAL ACRES OF EMERGENT MARSH	146

COASTAL WETLANDS PLANNING, PROTECTION, AND RESTORATION ACT

APPENDIX E

November 18, 1991

TAB B

GULF INTRACOASTAL WATERWAY TO CLOVELLY HYDROLOGIC RESTORATION

REVISED

November 13, 1991

BA-2 GULF INTRACOASTAL WATERWAY TO CLOVELLY WETLAND

Candidate Project
for the
Priority Project List
of the
Coastal Wetlands Planning, Protection, and Restoration Act

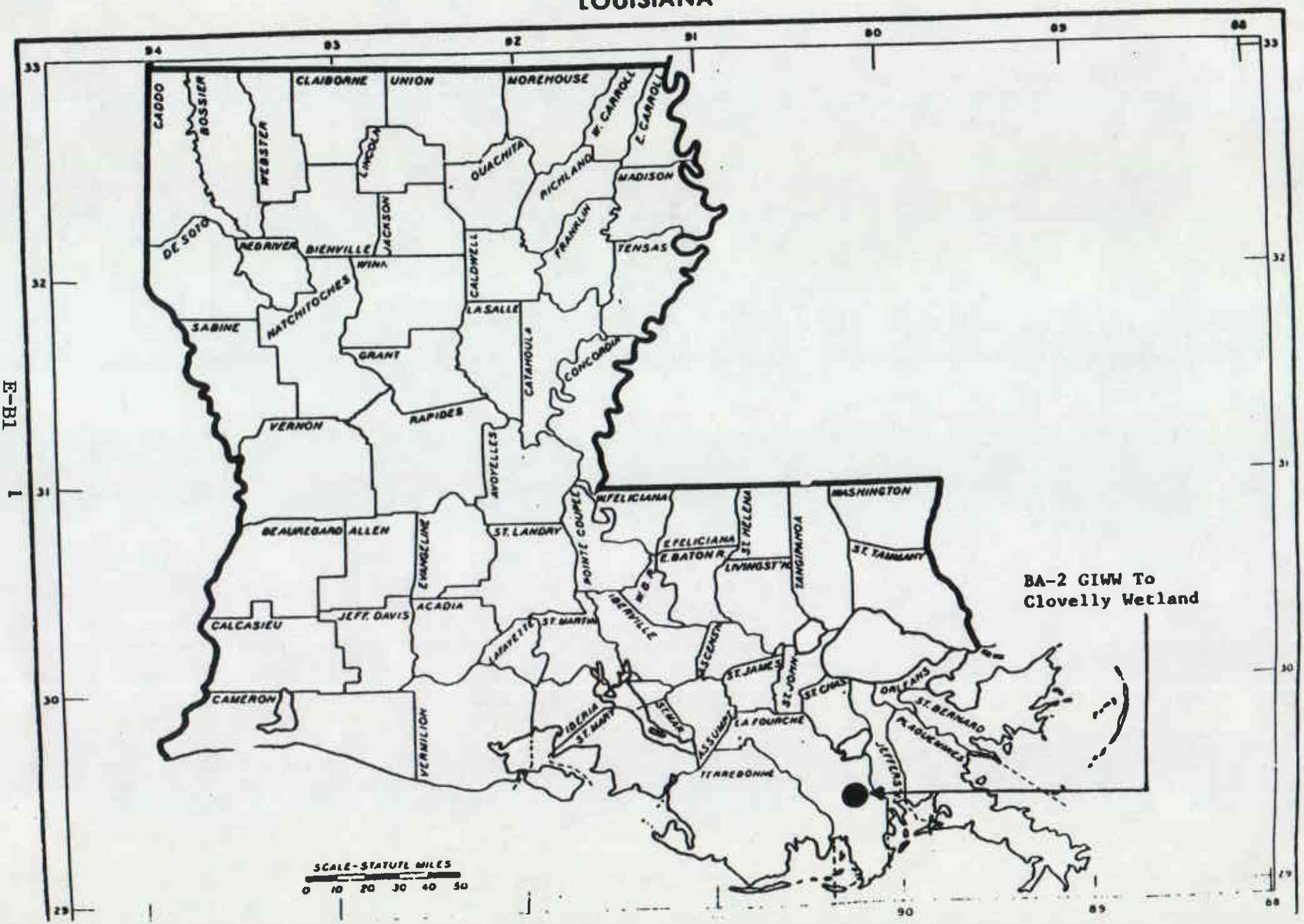
PROPOSED BY

U.S. Department of Agriculture - Soil Conservation Service

July 24, 1991

POINT OF CONTACT: Bennett C. Landreneau
PHONE: (318) 473-7756
or
Ed Hickey
(318) 473-7816

LOUISIANA



BA-2 GIWW To
Clovelly Wetland

BA-2. GIWW TO CLOVELLY WETLAND

Location:

This wetland protection and enhancement project encompasses the marshes of Lafourche Parish southeast of the GIWW, east of Bayou Lafourche, and north of the Superior Canal. The area encompasses approximately 60,000 acres of primarily fresh and low-salinity wetlands and is one of the last contiguous coastal wetland tracts within the Barataria estuary.

Center of Project Area: Latitude 29 33′ N
Longitude 90 15′ E

Justification:

General

The identified soil and water problems in the area are from damages to 60,000 acres of fresh/intermediate, and brackish coastal wetlands caused by erosion. The revenue in 1957 from commercial fishery resources, commercial trapping resources, and recreational opportunities was $31,370,600. The revenue in 1985 from the same sources was $24,365,700.

Marsh Losses

This wetland area is losing approximately 564 acres per year from coastal wetland deterioration and erosion.

Erosion in these wetlands is primarily due to saltwater intrusion and extreme water level fluctuation. Saltwater intrusion is especially detrimental in fresh/intermediate wetlands. The plants in these wetlands are not salt-tolerant and rapid introduction of saltwater will kill them. Before salt-tolerant species can become established, the area has gone from a mud-flat to open water, and every tidal movement erodes more soil material. Once the water reaches the point where it is too deep for plant growth, it is quite difficult to reverse the erosion process.

Construction of navigation and mineral exploration canals has contributed to increased water movement changing the hydrology and allowing saltwater to enter areas where natural conditions once blocked intrusion. Spoil placement on these canals has also altered the hydrology in many areas by causing water impoundment. Within these impounded areas, plants are drowned and water depth becomes favorable to less

desirable species, such as bulltongue, or prohibits the growth of emergent plants completely.

Other natural causes of coastal wetland erosion are sea level fluctuation and subsidence. The average rate of apparent sea level rise is about 0.003 to 0.005 feet per year during the twentieth century.

Coastal wetlands erosion can be reduced by installing structures to deter saltwater intrusion and provide a more stable water level. Conservation practices, such as revegetation of mud-flats, can be installed in portions of the watershed area.

Objectives:

The objectives of this project are to protect and maintain approximately 60,000 ac of primarily fresh and low-salinity wetlands through the restoration of historical hydrologic conditions. Restoring these hydrologic conditions will promote: (1) greater freshwater retention and utilization to prevent rapid salinity increases, and (2) water exchange through sheet flow as opposed to an expanding network of tidal channels. These are the hydrologic conditions that prevailed historically in the area. Most of the wetlands in the project area are fragile and susceptible to rapid breakup. The process of wetland breakup has been progressive from south to north and has already become noticeable in the southern part of the project area. This is most alarming in view of the limited possibilities for freshwater and sediment introduction into the area from the Mississippi River. Restoration is less feasible and almost always more expensive once losses have occurred.

Project Features:

The recommended project includes:

(1) Twelve acres of critical area plantings. The plantings will consist of vegetation native to the project area and will establish vegetation on mud-flat areas. Sediment fences will be used in conjunction with plantings in certain areas of the Delta Farms pond (Mgt. Unit 10) and in the broken marsh area adjacent to Bayou L'Ours (Mgt. Unit 7).

(2) Twelve structures for water control (weirs). Three of these weirs (No.'s 2, 4, and 7) near the mouth of natural bayous that flow into Bay L'Ours and Little Lake will be rock weirs. These rock weirs will limit

bottom flow to some extent and provide marine organisms easier access to the interior marsh. One weir, site No. 35, will be a variable crest. The remainder of the weirs will be fixed crest with a minimum boat bay 10 feet wide and about 4 feet deep. Maximum boat bay dimensions will depend upon the size of the canal or bayou. These weirs will help hold water in the wetlands during low water or drought conditions and allow water to flow into the wetland interior during high tide while helping to hold the water with high salinities out of the marsh.

(3) Twenty-six earthen channel dams or plugs. These dams will be installed in abandoned oil field canals to help maintain water levels in the management unit. They are designed to redirect fresh water to a more vital area, reduce tidal fluctuations, and reduce saltwater intrusion. These dams are necessary to maintain the integrity of water management in each management unit. Five of these plugs on the south side of the Intracoastal Waterway, numbers 70, 71, 80, 81, and 82, will have culverts with flapgates and screw gates for introduction of fresh water, and sediment when available, from the Intracoastal Waterway.

(4) Thirty-four miles of low level dikes or overflow banks. These planned dikes, or overflow banks are for the re-establishment of the natural high banks that have deteriorated because of saltwater intrusion and wave action. The low dikes or overflow banks should have a settled height of about eight inches.

(5) Fifty miles of shoreline-erosion-protection-vegetative plantings. These plantings will consist of native plants to the water shed area. The plantings will be designed and placed in such a manner as to reduce erosion caused by wave action in the watershed. These plantings will be installed according to Louisiana specification S-580, Streambank and Erosion Protection (Vegetative) issued in December 1989.

(6) Outfall from four pumping plants (project map) will be utilized to the most feasible extent to route pumped water away from open canals and into coastal wetlands. This will be accomplished by strategically locating weirs and channel plugs and using levees and cuts in levees to direct water into the marsh to encourage sheet flow.

Anticipated Benefits:

Approximately 37,800 acres of fresh/intermediate marsh and 22,200 acres of brackish marsh including interspersed open water, will be significantly enhanced by the greater utilization of freshwater and a reduction of tidal exchange.

The total 60,000 acres of the project area will be protected by installation of this project.

The project structural measures have a 20 year life expectancy.

Because of the relationship between total wetland acreage and fishery production, any cessation of wetland loss will benefit the menhaden, shrimp, oyster, Atlantic croaker, blue crab, spotted seatrout, spot, and red drum found in the watershed. The erosion reductions and revegetation resulting from project installation will reduce the decline in the harvests of fish resources in the watershed.

Installation of the project will significantly reduce the direct loss or conversion of wildlife habitat, which will preserve the wildlife productive capability of the project area wetlands. As a result, continued existence of habitats for nutria, muskrat, mink, otter, raccoon, and the American alligator and others will be assured.

Preserving fish and wildlife habitat for production of menhaden, shrimp, oyster, Atlantic croaker, blue crab, spotted seatrout, spot, red drum, nutria, muskrat, mink, otter, raccoon, American alligator, and waterfowls will be beneficial to both recreational and commercial interests.

The reduction of the physical losses discussed above translates into reduced social and economic losses. Reduction of these losses will result in; (1) increased use of the wetland environment for recreational purposes; (2) increased employment in the fishing industry and related processing and service facilities, and the beneficial effects on those whose incomes depend on these enterprises; (3) preservation of a unique and rewarding way of life in coastal fishing communities; (4) prevention of some of the business and tax revenue losses related to the greater rate of fishing industry decline under without-project conditions; and (5) preservation of a portion of a vital link in an important human food chain.

Anticipated Adverse Benefits:

Coastal wetland habitats will not be adversely affected by this project.

Most of the conflicts concerning this project have been resolved. There is at least one remaining with an oil company which is being worked on.

Costs:

Engineering and Design	$ 301,900
E & D Supervision and Administration	60,380
Project Construction	3,019,000
Supervision and Inspection of Construction	301,900
Operation and Maintenance	57,200
Project Monitoring (Annual)	42,000

Source of Cost Estimates: SCS and DNR Engineer's experience and actual cost data for similar construction in coastal Louisiana.

Status of Environmental Compliance:

(a) NEPA - Process complete; full compliance
(b) Section 10/404 - Applied for and approved; Expected to be issued soon.
(c) LA CZMP - Applied for and received
(d) Water Quality Certification - Applied for and received
(e) Endangered Species Act - Compliance, the American alligator will benefit from project measures, and no other threatened or endangered species will be adversely affected.

Project Implementation Schedule:

(a)	Start Engineering and Design	October 1, 1991
(b)	End Engineering and Design	February 1, 1992
(c)	Start Construction	April 15, 1992
(d)	End Construction	September 30, 1993

Potential Funding Sources:

(a) Federal: CWPPR Act
Public Law-566, No Construction Start Authorized
No Funds Budgeted

(b) Non-Federal: State of Louisiana, Act 6 Funds

PROJECT MAP

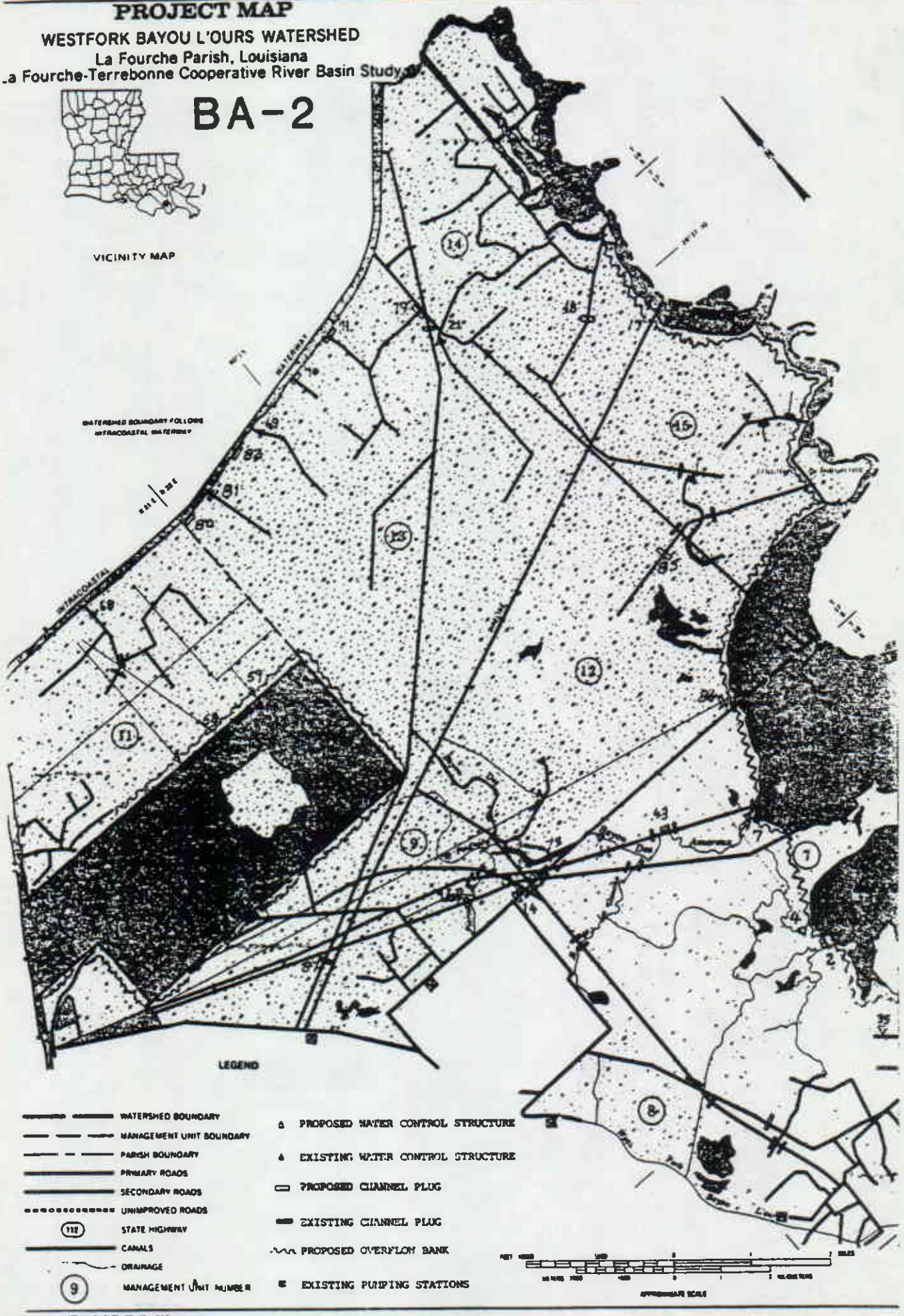
WESTFORK BAYOU L'OURS WATERSHED

La Fourche Parish, Louisiana

La Fourche-Terrebonne Cooperative River Basin Study

BA-2

VICINITY MAP



LEGEND

- WATERSHED BOUNDARY
- MANAGEMENT UNIT BOUNDARY
- PARISH BOUNDARY
- PRIMARY ROADS
- SECONDARY ROADS
- UNIMPROVED ROADS
- (112) STATE HIGHWAY
- CANALS
- DRAINAGE
- (9) MANAGEMENT UNIT NUMBER
- PROPOSED WATER CONTROL STRUCTURE
- EXISTING WATER CONTROL STRUCTURE
- PROPOSED CHANNEL PLUG
- EXISTING CHANNEL PLUG
- PROPOSED OVERFLOW BANK
- EXISTING PUMPING STATIONS

PROJECT: BA-2 GIWW TO CLOVELLY

TOTAL FIRST COSTS	$4,301,000
TOTAL FULLY FUNDED COSTS	$8,142,000

ANNUAL CHARGES	PRESENT WORTH	AVERAGE ANNUAL
INTEREST & AMORTIZATION	$5,087,541	$547,419
MONITORING	$407,047	$43,798
IMPACT TO WATER SUPPLY		$0
ACCESS OIL & GAS		$0
INDUCED DREDGING		$0
IMPACT TO SHIPPING		$0
EMERGENCY CLOSURE		$0
OYSTER LEASES		$0
O & M COSTS	$554,359	$59,649
REPLACEMENT COSTS		$0
OTHER COSTS		$0
TOTAL	$6,048,947	$650,867

AVERAGE ANNUAL HABITAT UNITS	9,510.18
COST PER HABITAT UNIT	$68
AVERAGE ANNUAL ACRES OF EMERGENT MARSH	3,102

COASTAL WETLANDS PLANNING, PROTECTION, AND RESTORATION ACT

APPENDIX E

November 18, 1991

TAB C

CAMERON CREOLE WATERSHED HYDROLOGIC RESTORATION

CAMERON-CREOLE WATERSHED
BORROW CANAL PLUG PROJECT

Candidate Project
for the
Priority Project List
of the
Coastal Wetlands Planning, Protection, and Restoration Act

Proposed By
U.S. Fish & Wildlife Service - Sabine National Wildlife Refuge
July 2, 1991
Revised November 13, 1991

POINT OF CONTACT: Will Nidecker, Refuge Manager
Sabine National Wildlife Refuge
Hwy. 27, 3000 Main St.
Hackberry, LA 70645

PHONE: 318/762-3816

I. Project Description

The proposed project is located in the coastal marshes of southwest Louisiana (Figure 1). The site lies within the Cameron-Creole Watershed Project (CCWP) which includes Sabine National Wildlife Refuge, East Cove Unit and adjoining private lands. The project location is situated at latitude 29 51′ and longitude 93 11′. The CCWP consists of 64,000 acres of brackish, intermediate, and freshwater marshes with water management and salt water intrusion being controlled by five large lakeshore water control structures.

Louisiana has been losing wetlands to coastal erosion at a rapid rate for many years. Much of this loss can be attributed to channelization and water diversion of existing watershed systems. Changes in water movement patterns on the CCWP have resulted in the excessive pooling of saline water at the watershed's south end. This excessive pooling slows marsh recovery.

The proposed project would help establish even water distribution and a favorable salinity regime in the CCWP. It consists of the installation of two sheet metal plugs in the lakeshore borrow canal. One of the plugs would be placed in the borrow canal just south of Mangrove Bayou Water Control Structure and the other would be installed south of the Grand Bayou Water Control Structure (Figure 2). The plugs would be set at normal marsh level, allowing water to flow over the plugs during high water or flood conditions. Each plug would include a 6-8 ft. boat bay/water control structure to allow for boat access and to provide added flexibility in the control of water flows through the marsh system.

The proposed project would reduce rapid movement of saline water through the borrow canal, lowering marsh salinities in the north area and would facilitate the fulfillment of the basic objective of the Cameron-Creole Watershed Management Plan which is to restore the project area to approximate the 1972 vegetative communities and salinity regimes. The project would also help reduce excessive pooling in southern areas of the watershed.

II. Anticipated Benefits

The proposed project would promote the diversification of plant communities and would increase marsh restoration gains above those predicted to occur under the CCWP alone. The proposed work would also increase submergent vegetation over 4600 acres of shallow fresh and estuarine open water.

The proposed project would promote preservation, restoration and diversification of wetland plant communities; enhance brood-rearing habitat for mottled ducks; improve wintering and migration habitat for up to 250,000 migratory waterfowl; benefit a wide variety of other marsh-associated wildlife species such as furbearers, reptiles, amphibians, shorebirds, and raptors; and help to conserve and restore habitat for estuarine-dependent fish

and shellfish. Coastal wetland benefits of the project would last for the life of the plugs (approximately 20 years).

III. Anticipated Adverse Effects

The installation of the two plugs would destroy or degrade approximately 2 acres of brackish marsh. The proposed project will not create any conflicts with other projects and programs.

IV. Costs

Development, supervision, and administration of the engineering and design of the plugs would cost $44,000. These costs may be reduced by utilizing plans of similar existing projects that have been developed by other federal agencies. Cost of construction of the two plugs is $290,000 as estimated by Crain Bros. Construction Co., Grand Chenier, LA. Supervision and inspection of construction contracts and monitoring of the project can be handled in-house by Service personnel. The plugs would have a life expectancy of 20 years and would require little or no maintenance during that time period, if anodes are installed on the plugs ($3,000 per year).

V. Status of Environmental Compliance

NEPA documentation of the proposed project would not be needed. The project is covered under the original Cameron-Creole Watershed Project construction permit issued by the Army Corps of Engineers. Permits through Sections 10/404 (the Clean Water Act), Louisiana Coastal Management Program, and Louisiana Water Quality Certification would have to be obtained prior to construction. The project site does not support any endangered or threatened species so no Section 7 evaluation would be required.

VI. Project Implementation Schedule

Development of the engineering and design of the plugs could begin shortly after the approval date of November 28, 1991 with design specifications being completed by February 1992. Bid selection could be made by June 1992 and construction could commence shortly thereafter. Installation of the two plugs should take approximately 30 days.

VII. Potential Funding Sources

Federal funding would be limited to money provided through the Coastal Wetlands Planning, Protection, and Restoration Act. Other funds may be obtained from Louisiana Department of Natural Resources, Coastal Restoration Program.

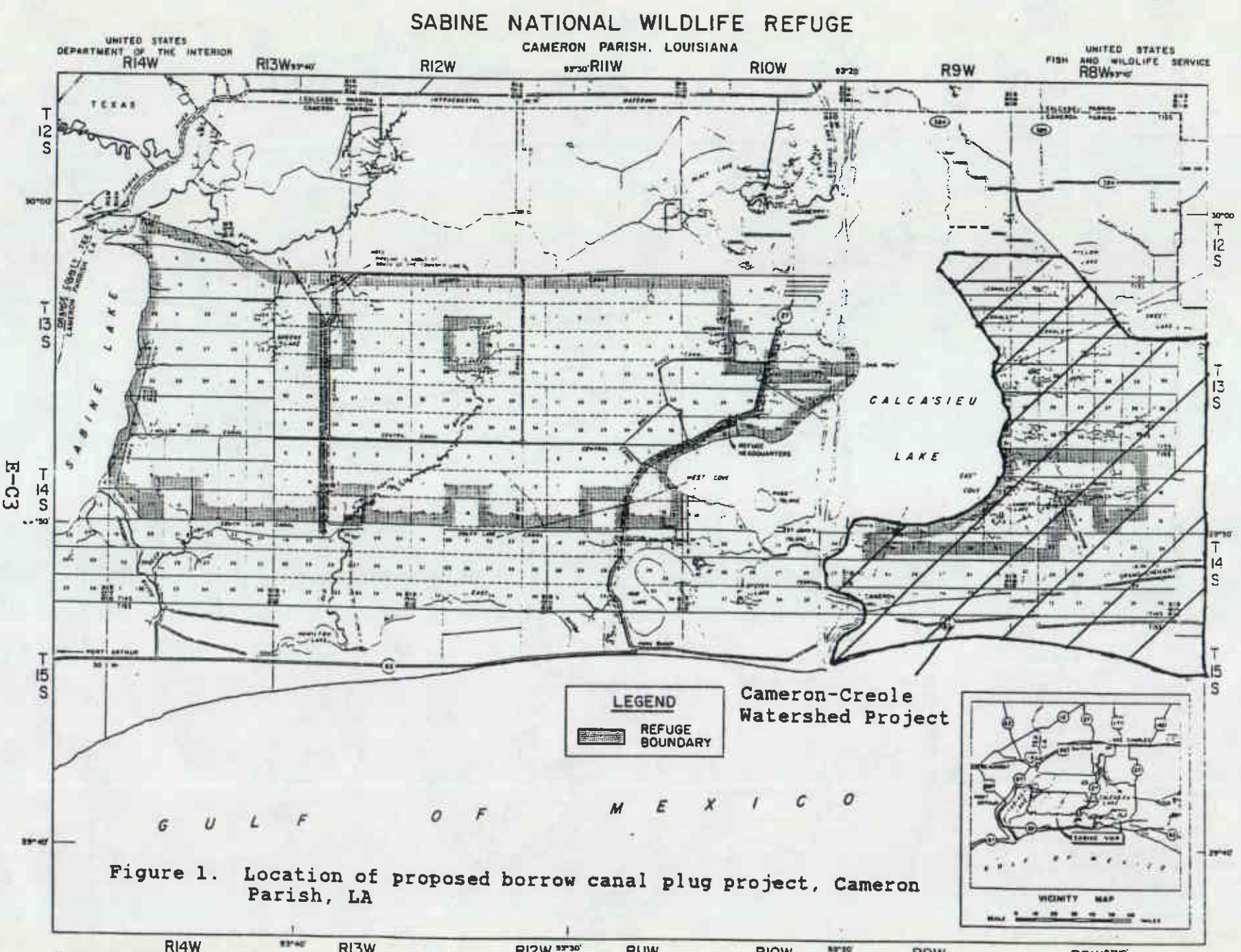


Figure 1. Location of proposed borrow canal plug project, Cameron Parish, LA

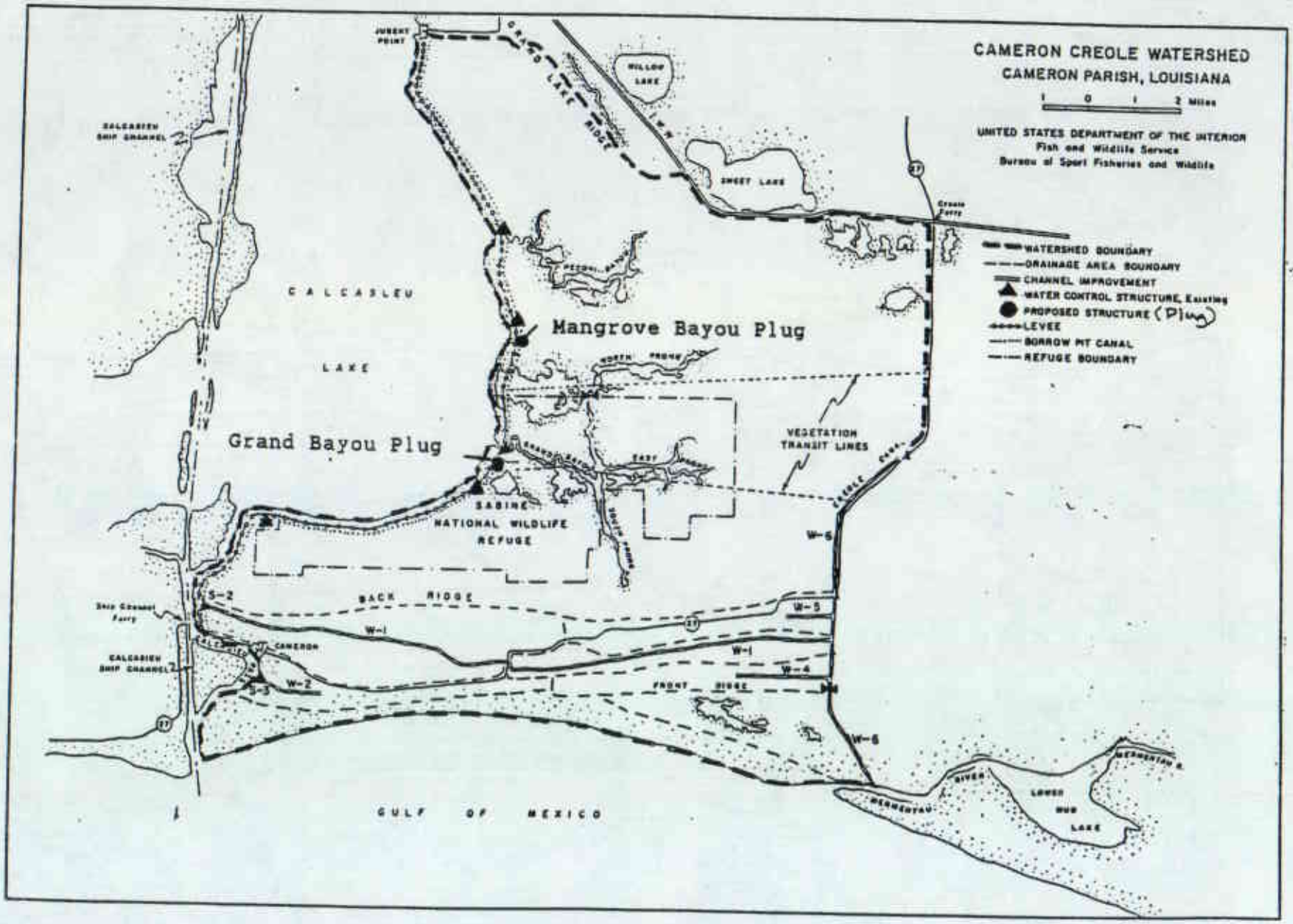


Figure 2. Location of proposed plugs, Cameron-Creole Watershed Project, Cameron Parish, LA

PROJECT: CAMERON-CREOLE WATERSHED BORROW CANAL

TOTAL FIRST COSTS	$334,000
TOTAL FULLY FUNDED COSTS	$502,000

ANNUAL CHARGES	PRESENT WORTH	AVERAGE ANNUAL
INTEREST & AMORTIZATION	$347,785	$37,422
MONITORING	$19,383	$2,086
IMPACT TO WATER SUPPLY		$0
ACCESS OIL & GAS		$0
INDUCED DREDGING		$0
IMPACT TO SHIPPING		$0
EMERGENCY CLOSURE		$0
OYSTER LEASES		$0
O & M COSTS	$29,075	$3,128
REPLACEMENT COSTS		$0
OTHER COSTS		$0
TOTAL	$396,243	$42,636

AVERAGE ANNUAL HABITAT UNITS	332.96
COST PER HABITAT UNIT	$128
AVERAGE ANNUAL ACRES OF EMERGENT MARSH	440

COASTAL WETLANDS PLANNING, PROTECTION, AND RESTORATION ACT

APPENDIX E

November 18, 1991

TAB D

BAYOU SAUVAGE WILDLIFE REFUGE HYDROLOGIC RESTORATION

BAYOU SAUVAGE NATIONAL WILDLIFE REFUGE WETLAND RESTORATION --

UNITS 3 & 4

CANDIDATE PROJECT
FOR THE
PRIORITY PROJECT LIST
OF THE
COASTAL WETLANDS PLANNING, PROTECTION, AND RESTORATION ACT

PROPOSED BY

U.S. FISH AND WILDLIFE SERVICE

November 14, 1991

POINTS OF CONTACT:	HOWARD POITEVINT	QUIN J. KINLER
PHONE:	(504) 646-7555	(318) 264-6630

PROJECT DESCRIPTION

Location. The proposed project would be located in Units 3 and 4 of the Bayou Sauvage National Wildlife Refuge, Orleans Parish, Louisiana (see attached map). These units are completely enclosed by the Lake Pontchartrain Hurricane Protection levee. Geographically, the project area is located south of U.S. Highway 90, west of the Corps of Engineers' hurricane protection levee, north of the Gulf Intracoastal Waterway, and east of the Maxent Canal Levee. The project occupies parts of Section 1, T11S, R13E; Section 37, T11S, R14E; Sections 37 and 38, T12S, R13E; and Section 13, T12S, R14E. The center of the project area is located approximately at latitude 30° 3′ 8″, longitude 80° 51′ 15″.

Justification. The Lake Pontchartrain Hurricane Protection levee has isolated Units 3 and 4 from the surrounding marsh complex and has established a large freshwater impoundment. The water control structures installed at the time of levee construction are not capable of removing rainfall in a timely manner. As a result, the artificially elevated water levels have caused significant deterioration of the impounded marsh.

Bayou Sauvage National Wildlife Refuge was established to provide wintering and nesting habitat for migratory waterfowl. The maintenance of a large wading bird rookery is also a high priority for the Refuge. These objectives, and that of restoring or maintaining vegetated wetlands, can not be accomplished unless a mechanism to remove excess water and partially and temporarily expose the marsh surface is established.

Objectives. The objectives of this project are to establish a means for removing excess water throughout the year in order to lower water levels during spring and summer to promote the re-establishment of emergent marsh vegetation throughout much of Units 3 and 4, and reduce the mortality of rookery-supporting black willow.

Project Features. The proposed project includes the purchase, installation, operation, and maintenance of two 48-inch pumps located on the east boundary of the units as illustrated on the attached map.

ANTICIPATED BENEFITS

Without the proposed project, approximately 3,800 acres of impounded fresh marsh would remain in a badly deteriorated state. At present about 1,800 acres (47 percent) of Units 3 and 4 support persistent emergent vegetation. With a reliable and consistent means of lowering water levels, annual plant production would be achieved on a regular basis over an additional 1,050 acres (28 percent). Additionally, existing

rookery-supporting black willow would be maintained, and the accumulation of organic matter should promote the establishment of perennial vegetation in the future.

During 1990, about 52,000 ducks were observed on the Refuge; with proper water management, it is anticipated that 80,000 to 90,000 ducks could be wintered. During the past two nesting seasons, wading bird nests declined in number from about 7,000 to about 5,000; without the capability to lower water levels, the decline of nesting habitat and bird usage is expected to continue. Shorebirds, small mammals, resident freshwater fish, and other wildlife would benefit from the increased production of emergent vegetation.

ANTICIPATED ADVERSE EFFECTS

There are no anticipated adverse effects of placing two pump stations along the Corps of Engineers hurricane protection levee.

COSTS

Engineering and Design	$36,000
Supervision and Administration of E&D	none[1]
Project Construction	$715,000
Supervision and Inspection of Construction Contracts	none[1]
Operation and Maintenance	$179,000[2]
Project Monitoring	none[1]

[1] These tasks will be accomplished within the Refuge's normal work activities.
[2] Total costs for the 20-year project life.

STATUS OF ENVIRONMENTAL COMPLIANCE

NEPA. An Environmental Assessment will be prepared by the Fish and Wildlife Service, Southeast Louisiana National Wildlife Refuge Complex.

Section 10/404. The proposed project would not require a Section 10/Section 404 permit unless minor deposition of fill would be necessary to secure pump intakes and outfalls; in that event, permission for the work would be sought under General Permit NOD-25.

Louisiana Coastal Management Program. The Louisiana Department of Natural Resources - Coastal Management Division will be notified of the proposed work. Preliminary discussion has indicated no objection to the project.

Louisiana Water Quality Certification. Activities authorized under General Permit NOD-25 do not require a specific water quality certification.

Endangered Species Act. No threatened or endangered species would be affected by the proposed project. A formal Section 7 Evaluation will be prepared.

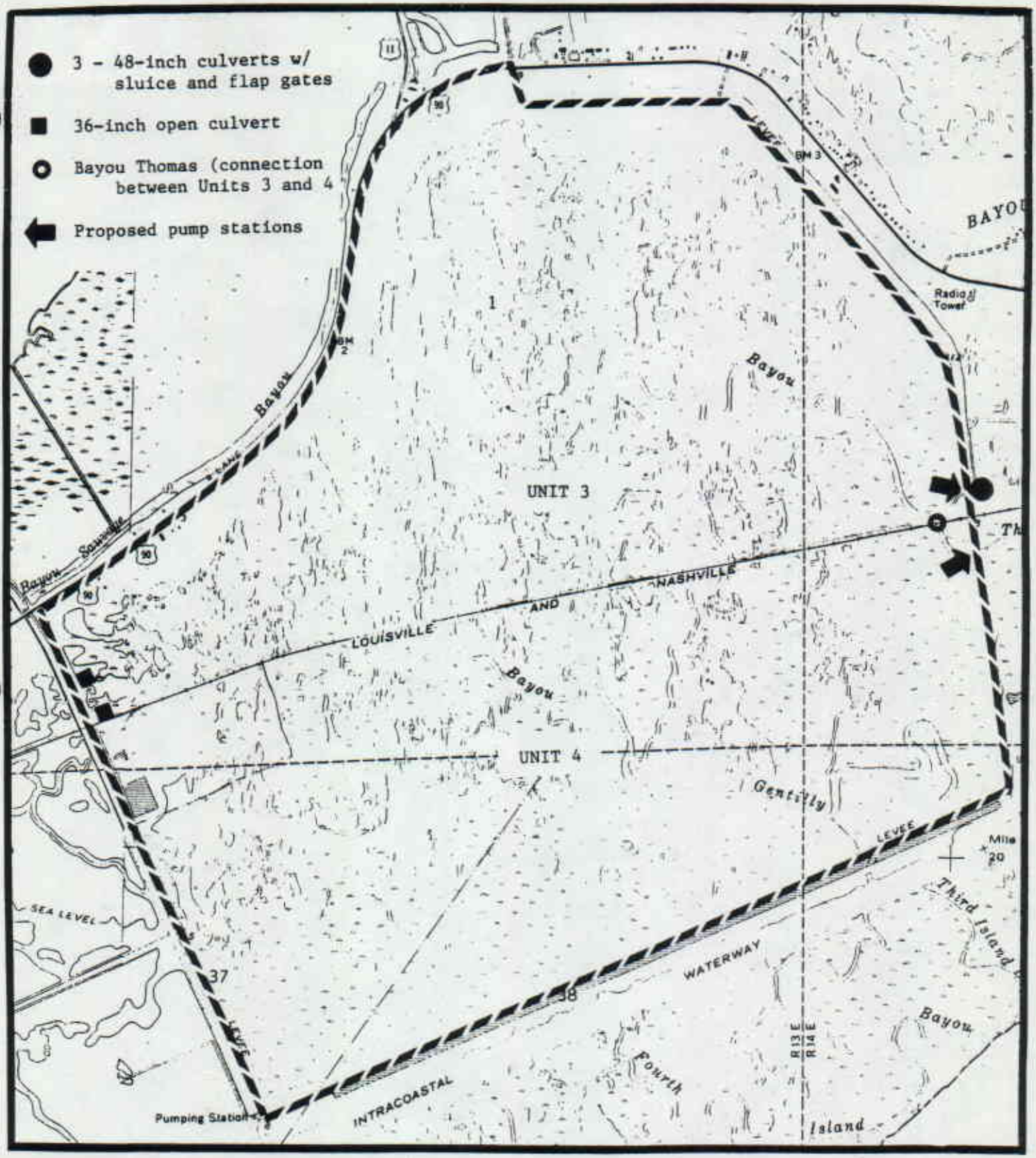
PROJECT IMPLEMENTATION SCHEDULE

Item	Date
Engineering & Design Start	12/1/91
Engineering & Design Finish	12/1/92
Construction Start	5/1/93
Construction Finish	5/1/94

POTENTIAL FUNDING SOURCES

Federal: Coastal Wetlands Planning, Protection, and Restoration Act.

Non-Federal: State of Louisiana (anticipated).



BAYOU SAUVAGE NATIONAL WILDLIFE REFUGE WETLAND RESTORATION -- UNITS 3 and 4.

PROJECT: BAYOU SAUVAGE NWR

TOTAL FIRST COSTS	$751,000
TOTAL FULLY FUNDED COSTS	$1,105,000

ANNUAL CHARGES	PRESENT WORTH	AVERAGE ANNUAL
INTEREST & AMORTIZATION	$784,810	$84,446
MONITORING		$0
IMPACT TO WATER SUPPLY		$0
ACCESS OIL & GAS		$0
INDUCED DREDGING		$0
IMPACT TO SHIPPING		$0
EMERGENCY CLOSURE		$0
OYSTER LEASES		$0
O & M COSTS	$83,987	$9,037
REPLACEMENT COSTS		$0
OTHER COSTS		$0
TOTAL	$868,797	$93,483

AVERAGE ANNUAL HABITAT UNITS	519.75
COST PER HABITAT UNIT	$180
AVERAGE ANNUAL ACRES OF EMERGENT MARSH	1,313

COASTAL WETLANDS PLANNING, PROTECTION, AND RESTORATION ACT

APPENDIX E

November 18, 1991

TAB E

TURTLE COVE SHORELINE EROSION CONTROL

TURTLE COVE SHORELINE PROTECTION

Candidate Project
for the
Priority Project List
of the
Coastal Wetlands Planning, Protection, and Restoration Act

PROPOSED BY

State of Louisiana

September 27, 1991

Revised

POINT OF CONTACT: Bill Savant
PHONE: (504)342-7308

PROJECT DESCRIPTION

Location

The 8300 ac Manchac Wildlife Management Area (WMA) is located in the northern portion of St. John the Baptist Parish between Lake Maurepas and Lake Pontchartrain, and south of Pass Manchac. The area faces the northwest portion of Lake Pontchartrain along about 6.2 miles of shoreline. Approximately 4.2 miles south of Pass Manchac is a shallow embayment known as Turtle Cove, the site of this project. The center of the project is located at approximately latitude 30^0 15' north, and longitude 90^0 20' west. The proposed project is expected to directly benefit approximately 1044 acres of the Manchac WMA.

Justification

The management area is a freshwater wetland that is in a state of transition from freshwater swamp to marsh. It is protected from the low salinity brackish waters and waves of Lake Pontchartrain by a natural storm berm along the Lake shore. Along the central portion of the Pontchartrain shore only 200 ft of protective shore remain between an 800 ac area of broken, floating fresh marsh, known as the Prairie, and Lake Pontchartrain. Since 1970, the shoreline at this location has eroded at a rate of about 18 feet per year. If shoreline erosion continues unchecked, the Prairie will become part of the Lake in approximately 3 to 5 years based on current erosion rates. Once the shoreline is breached, the entire Prairie area will be rapidly converted to open water and expand as a result of wave erosion and water exchange with Lake Pontchartrain. Increased salinity and increased rates of water movement will jeopardize the physical integrity of much of the WMA.

The project area is part of the wetland buffer between Lake Maurepas and Lake Pontchartrain into the broken marsh area of the Prairie and the resultant loss of these and adjacent wetland habitats through wave erosion and tidally induced water exchange.

Currently the U.S. Army Corps of Engineers (USACOE), New Orleans District has proposed to undertake shoreline protection along 4.5 miles of the area as mitigation for construction of the New Orleans Hurricane Protection Levee. The project proposed here is to protect immediately the most vulnerable segment of the shore where breaching is imminent.

Project Features

The project features include a breakwater consisting of two 500 feet long Longard Tubes filled with sand. The breakwater will be installed away from the shoreline and vegetation will be planted in the protected area to induce sediment accumulation and marsh restoration.

ANTICIPATED BENEFITS

Type and acres restored

Approximately 0.5 ac of marsh will be restored by vegetation plantings and sediment accumulation behind the breakwater.

Type and acres enhanced and the nature of the enhancement

None

Type and acres protected

Construction of the breakwater will directly protect 1044 ac of broken fresh marsh and associated shallow water habitat that would be subject to saltwater intrusion and accelerated erosion should the Prairie area be replaced by brackish open water and become part of Lake Pontchartrain.

Duration of coastal wetland benefits

The project is designed to temporarily protect the most critical section of shoreline protecting a large marsh area until a segmented offshore breakwater is constructed by the USACOE to mitigate for the Lake Pontchartrain and Vicinity Hurricane Protection Project. Since there is no assurance that the mitigation structure will be built, this project was evaluated on its own merits. If the mitigation structure is not built, the shoreline would break through in another place in 10 to 15 years and the interior marsh would then begin to deteriorate. Even though the project would function for 10 to 15 years, the project benefits were evaluated over a 20 year period.

Benefits to coastal wetland dependent fish and wildlife populations

Benefits to migratory waterfowl and freshwater fish species and the continued existence of fresh to intermediate wetland habitat.

Other significant benefits

Benefits to public recreation for hunting, fishing, and other uses result from the continued existence of fresh to intermediate wetland habitat.

ANTICIPATED ADVERSE EFFECTS

Type and acres of coastal wetlands and other habitats adversely affected by the project

There are no anticipated adverse effects to coastal wetlands from the projects.

Conflicts with other projects and programs

The project does not conflict with other projects. The project is designed as an interim measure until such time that the COE mitigation plan is constructed.

COSTS

Estimated costs and source of the estimates are as follows:

Engineering and design	$19,340
Supervision and administration of engineering and design	3,868
Project construction	193,400
Supervision and inspection of construction	19,340
Operation and maintenance	25,000
Project monitoring for 20 years	41,500

Construction costs estimates were derived from: U.S. Army Corps of Engineers. 1981. Low Cost Shore Protection-A Report of the Shoreline Erosion Control Demonstration Program. Office of The Chief, USACOE, Washington. 830 p. It is assumed that the USACOE mitigation project would be completed within the next 10 years.

STATUS OF ENVIRONMENTAL COMPLIANCE

NEPA

All NEPA requirements have been fulfilled.

Sections 10/404

The Section 10/404 permit has been received for this project.

Louisiana Coastal Management Program

The Coastal Use permit has been received for this project.

Louisiana Water Quality Certification

The Louisiana Department of Environmental Quality has granted a Water Quality Certification for this project.

Endangered Species Act

The U.S. Fish and Wildlife Service has reviewed the project and has not objected on the grounds of impacts to endangered species.

PROJECT IMPLEMENTATION SCHEDULE

A USACOE permit required for the project at the Prairie has been obtained. As soon as funding is provided, construction can begin. Once the breakwater is complete the vegetative plantings can be implanted during the first growing season in Spring of 1992. The status of the USACOE mitigation plan for the remainder of the program is unknown.

The estimated schedule for project implementation in months after authorization is:

Planning and detailed feasibility analysis starting date	0
Planning and detailed feasibility analysis finish date	0
Submittal of permit applications	0
Completion permit process	0
Engineering and design start date	0
Engineering and design finish date	3
Construction start date	4
Construction finish date	9

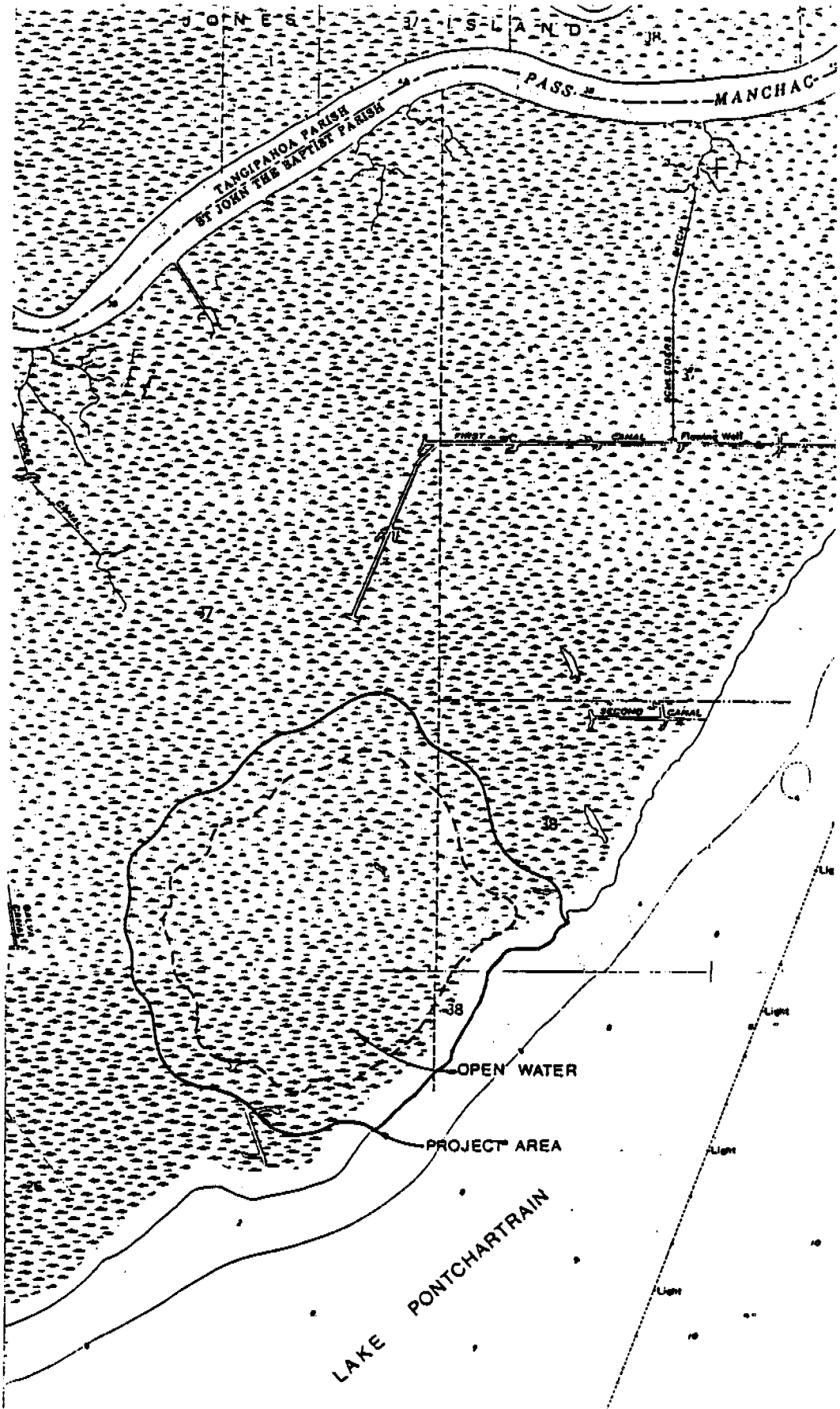
POTENTIAL FUNDING SOURCES

Federal Funding Sources

No federal funding sources other than the Coastal Wetlands Planning, Protection, and Restoration Act have been identified.

Non-federal Funding Sources

The project has been approved for funding under the 1992-93 State Coastal Wetland Restoration and Protection Plan as project PO-10 (Turtle Cove Shore Protection).



TURTLE COVE PROJECT AREA

NOT TO SCALE

PROJECT: TURTLE COVE

TOTAL FIRST COSTS	$279,000
TOTAL FULLY FUNDED COSTS	$386,000

ANNUAL CHARGES	PRESENT WORTH	AVERAGE ANNUAL
INTEREST & AMORTIZATION	$291,433	$31,358
MONITORING	$20,822	$2,240
IMPACT TO WATER SUPPLY		$0
ACCESS OIL & GAS		$0
INDUCED DREDGING		$0
IMPACT TO SHIPPING		$0
EMERGENCY CLOSURE		$0
OYSTER LEASES		$0
O & M COSTS	$17,140	$1,844
REPLACEMENT COSTS		$0
OTHER COSTS		$0
TOTAL	$329,395	$35,443

AVERAGE ANNUAL HABITAT UNITS	182.69
COST PER HABITAT UNIT	$194
AVERAGE ANNUAL ACRES OF EMERGENT MARSH	45

COASTAL WETLANDS PLANNING, PROTECTION, AND RESTORATION ACT

APPENDIX E

November 18, 1991

TAB F

SABINE WILDLIFE REFUGE SHORELINE EROSION CONTROL

RECONSTRUCTION OF THE IMPOUNDMENT 3 WEST LEVEE
SABINE NATIONAL WILDLIFE REFUGE

Candidate Project
for the
Priority Project List
of the
Coastal Wetlands Planning, Protection, and Restoration Act

PROPOSED BY

U.S. Fish and Wildlife Service, Sabine National Wildlife Refuge

November 14, 1991

POINT OF CONTACT: Ronny Paille, Sabine National Wildlife Refuge
PHONE: (318) 762-3816

PROJECT DESCRIPTION

A. Location

The proposed project would be located on Sabine National Wildlife Refuge in western Cameron Parish, Louisiana (see Figure 1). Five and one-half miles of the existing Burton Canal levee would be cleared, rip-rapped, and planted with Spartina alterniflora. Eroded portions of the levee would also be reconstructed . The center of the project area would be located at latitude 29° 55′ north, and longitude 93° 37′40" west.

B. Justification

The existing Impoundment 3 levee was constructed in 1951. Although sections of eroded levee have been repaired in the past, many portions of the existing levee have deteriorated due to boat wake erosion and subsequent sloughing of levee material into the adjacent Burton Canal. Continued erosion will soon result in multiple breaches of the existing levee. Subsequent saltwater intrusion and increased tidal exchange would adversely affect approximately 13,000 acres of existing fresh marsh and shallow open water habitat. Because much of the affected fresh marsh existing within Impoundment 3 is highly organic and floating, multiple breaches in the west impoundment levee would likely result in the conversion of those marshes to shallow open water. Existing beds of submerged and floating-leaved aquatic vegetation within Impoundment 3 would also suffer extensive losses due to increased salinity, turbidity, and water exchange. Loss of that aquatic vegetation would also result in greater wind-induced wave erosion of remaining marsh within the impoundment.

Reconstruction and armoring of the existing levee would be the most effective project alternative for the conservation of project-area marshes.

C. Objectives

The objective of the proposed project is to maintain and protect existing fresh marsh within Impoundment 3.

D. Project Features

The existing west levee is 5.5 miles long. Where eroded, the levee would be restored to 6-foot-high, 8-foot-wide crown, and 1 on 3 side slopes. A 25-foot-wide strip of man-size rip-rap would be placed along the Burton Canal side of the levee. Material for reconstruction of eroded portions of the levee would be taken from either Burton Canal or the marsh immediately east of the levee. One-gallon containers of Spartina alterniflora will be planted every 5 feet along the Burton Canal side of the levee for erosion control.

ANTICIPATED BENEFITS

The proposed project would protect approximately 13,000 acres of existing Impoundment 3 fresh marsh from deterioration associated with the anticipated failure of the existing west levee. The above-mentioned project benefits are expected to last at least 20 years.

Fresh marshes currently existing within Impoundment 3 are the last major remnant of a once vast coastal fresh marsh located in western Cameron Parish. Impoundment 3 fresh marshes provide habitat for American alligator, alligator snapping turtle, bullfrog, and numerous other species of reptiles and amphibians. Those marshes also provide habitat for ibis, herons, egrets, bitterns, gallinules, rails, migratory and resident waterfowl, raptors, nutria, muskrat, raccoon, mink, river otter, swamp rabbit, and white-tailed deer. Impoundment 3 marshes may also support the endangered red wolf; however, no recent reports have been verified. Additionally, Impoundment 3 provides habitat for largemouth bass, crappie, sunfishes, blue catfish, channel catfish, alligator gar, and spotted gar.

ANTICIPATED ADVERSE EFFECTS

Dredging for levee reconstruction would adversely impact approximately 10 acres of project-area emergent, floating-leaved, and submergent vegetation.

COSTS

Engineering and design: $276,000 (12% of total construction costs)

Supervision and administration of engineering and design: Refuge personnel will supervise and administer; No Cost

Project construction: $3,000,000

Supervision and inspection of construction contract(s): Refuge personnel will supervise and administer; No Cost

Operation and maintenance: $690,000 (30% of total construction cost)

Project monitoring: Refuge-conducted GIS monitoring - $10,000

STATUS OF ENVIRONMENTAL COMPLIANCE

A. NEPA
A NEPA review of the proposed project has not been conducted.

B. Section 10/404
The proposed project is authorized under the refuge's General Permit NOD-25, therefore, a Section 10/404 review would not be required.

C. Louisiana Coastal Management/Consistency Program
The proposed project has not been reviewed by the state's consistency program.

D. Louisiana Water Quality Certification
Since the proposed project is authorized under the refuge's General Permit NOD-25, a separate Louisiana Water Quality Certification is not required.

E. Endangered Species Act
The proposed project is not expected to affect any threatened or endangered species.

PROJECT IMPLEMENTATION SCHEDULE

Engineering and design start date: 28 November 1991

Engineering and design finish date: 28 November 1992

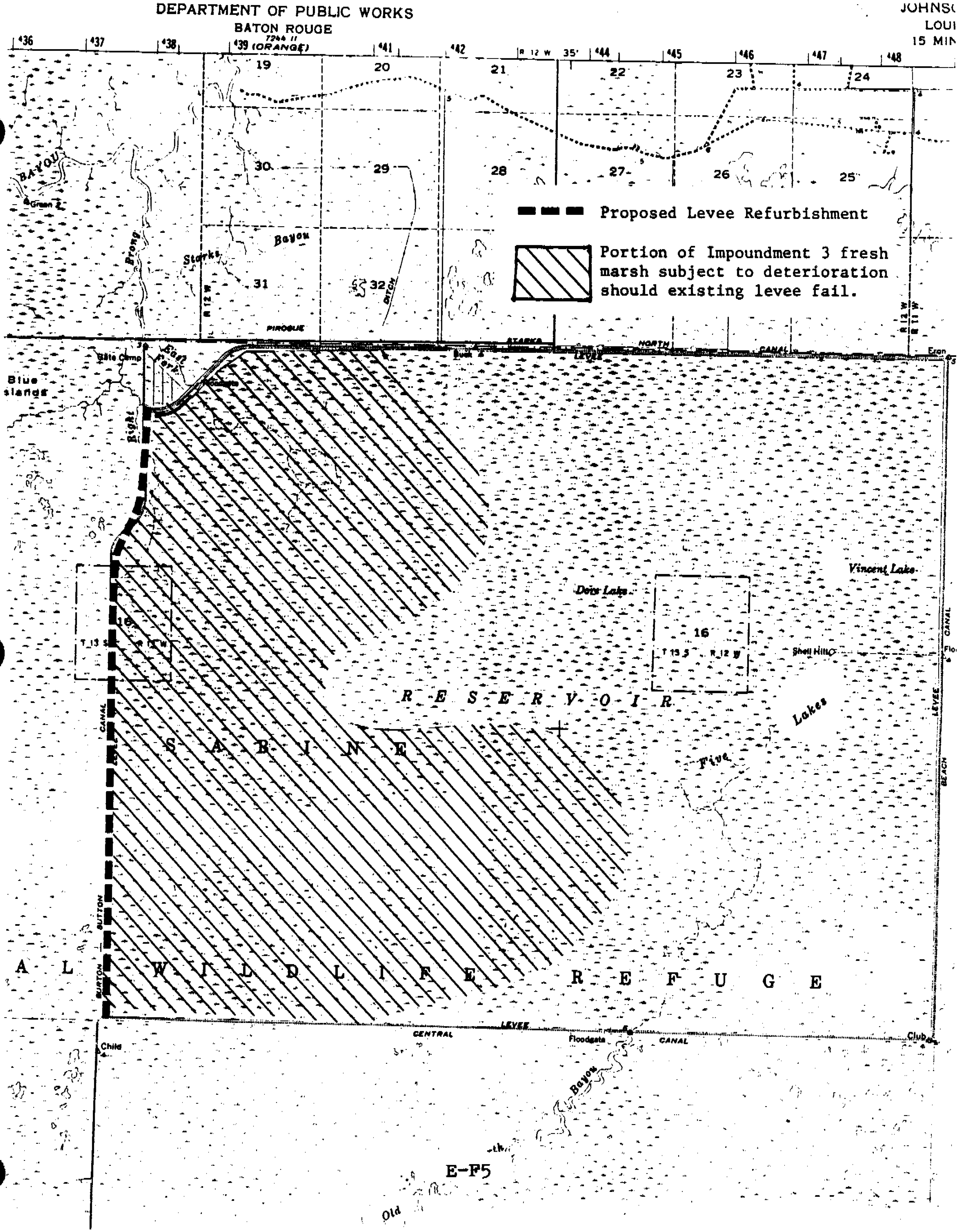
Construction start date: 1 May 1993

Construction finish date: 1 May 1994

POTENTIAL FUNDING SOURCES

Federal funding source: Coastal Wetlands Planning, Protection, and Restoration Act

Non-Federal funding source: State of Louisiana - Coastal Restoration Division Trust Fund


DEPARTMENT OF PUBLIC WORKS
BATON ROUGE
JOHNS
LOUI
15 MIN
Proposed Levee Refurbishment
Portion of Impoundment 3 fresh marsh subject to deterioration should existing levee fail.
BAYOU
Starks
Bayou
DITCH
Blue Islands
Right
East Fork
NORTH
CANAL
LEVEE
Doix Lake
Vincent Lake
Shell Hill
R E S E R V O I R
S A B I N E
Five
Lakes
A L
W I L D L I F E
R E F U G E
SUTTON
BURTON
CANAL
CENTRAL
LEVEE
Floodgate
CANAL
BEACH
Bayou
Old

PROJECT: SABINE NWR

TOTAL FIRST COSTS	$3,276,000
TOTAL FULLY FUNDED COSTS	$4,844,000

ANNUAL CHARGES	PRESENT WORTH	AVERAGE ANNUAL
INTEREST & AMORTIZATION	$3,605,764	$387,980
MONITORING	$5,782	$622
IMPACT TO WATER SUPPLY		$0
ACCESS OIL & GAS		$0
INDUCED DREDGING		$0
IMPACT TO SHIPPING		$0
EMERGENCY CLOSURE		$0
OYSTER LEASES		$0
O & M COSTS	$271,450	$29,208
REPLACEMENT COSTS		$0
OTHER COSTS		$0
TOTAL	$3,882,996	$417,810

AVERAGE ANNUAL HABITAT UNITS	1,654.61
COST PER HABITAT UNIT	$253
AVERAGE ANNUAL ACRES OF EMERGENT MARSH	2,207

COASTAL WETLANDS PLANNING, PROTECTION, AND RESTORATION ACT

APPENDIX E

November 18, 1991

TAB G

VEGETATIVE PLANTINGS DEMONSTRATION PROJECT

REVISED

November 13, 1991

VEGETATIVE PLANTINGS
CHENIER PLAIN, DELTAIC PLAIN AND BARRIER ISLAND

Candidate Project
for the
Priority Project List
of the
Coastal Wetlands Planning, Protection and Restoration Act

PROPOSED BY

U.S. Department of Agriculture - Soil Conservation Service

July 31, 1991

POINT OF CONTACT: Bennett C. Landreneau
PHONE: (318) 473-7756
or
Ed Hickey
(318) 473-7816

Project Description:

Location:

See attached copy maps with project locations identified.

Coordinant locations are as follows:

West Hackberry - Latitude 29° 59'N, Longitude 93° 27'E
Dewitt-Rollover Gulf Shoreline - Latitude 29° 35'N, Longitude 92° 30'E
Falgout Canal - Latitude 29° 26'N, Longitude 90° 45'E
Timbalier Island - Latitude 29° 03'N, Longitude 90° 28'E

Justification:

This project consists of several components designed to minimize coastal wetland erosion and provide restoration through the use of vegetative plantings. Vegetation in many areas has died as a result of rapid water level fluctuations, ponding and saltwater intrusion. This loss of vegetation combined with natural and boat induced wave action increases the erosion rate of shorelines, canal banks, and natural levees.

Healthy vegetation is essential to the soil building process for the predominantly organic soils found in the project area. Without the regenerative effects of vegetation, fragile organic soils are soon lost to erosive forces. Formerly vegetated areas soon become open water with resultant loss of wetland values.

Objectives:

1. To restore wetland productivity through planning, designing and implementing vegetative projects that protect and enhance coastal and inland wetlands.

2. To establish a vegetative buffer between the Gulf and coastal wetlands to reduce wave energy and trap sediments.

3. To pursue new and innovative vegetative techniques.

4. To maintain the integrity of the barrier islands as a first line of defense in protecting coastal wetlands from tidal surges caused by hurricanes.

5. To incorporate vegetative planting projects in all coastal restorative work when applicable.

Project Features:

See attached maps for project features: This project is composed of three elements:

1. Chenier Plain - West Hackberry and Dewitt-Rollover Gulf Shoreline
2. Deltaic Plain - Falgout Canal
3. Barrier Island - Timbalier Island

These projects consist of vegetative plantings suited to the particular habitat. In areas where high wave energies might preclude plant colonization, wave stilling devices will be used in conjunction with vegetation.

Anticipated Benefits:

Over 77,000 feet of plantings will be used to control erosion on shorelines and canal banks. Approximately 489 acres of saline, 96 acres of brackish, and 50 acres of fresh marsh will be protected by this project.

Coastal wetland dependent populations of fish and wildlife are expected to benefit from this project. Any reduction in loss of coastal wetland will have a positive effect on menhaden, shrimp, oyster, blue crab, sea trout, and red drum production.

Installation of this project will measurably reduce the direct loss or conversion of wildlife habitat which will preserve the wildlife productive capability of areas affected by this project.

Social and economic benefits will accrue as coastal wetland losses are stabilized. An increase in commercial and recreational fishing and related support industries will provide employment and tax revenues. Additionally a unique and rewarding way of life will be preserved.

Anticipated Adverse Effects:

No adverse effects or conflicts are anticipated with this project.

Costs:

Project Installation	$430,000
Planning & Design	43,000
P & D	8,600
Supervision & Inspection of Planting	43,000
Maintenance & Replacement	97,500
Project Monitoring (Annual)	45,000

Status of Environmental Compliance:

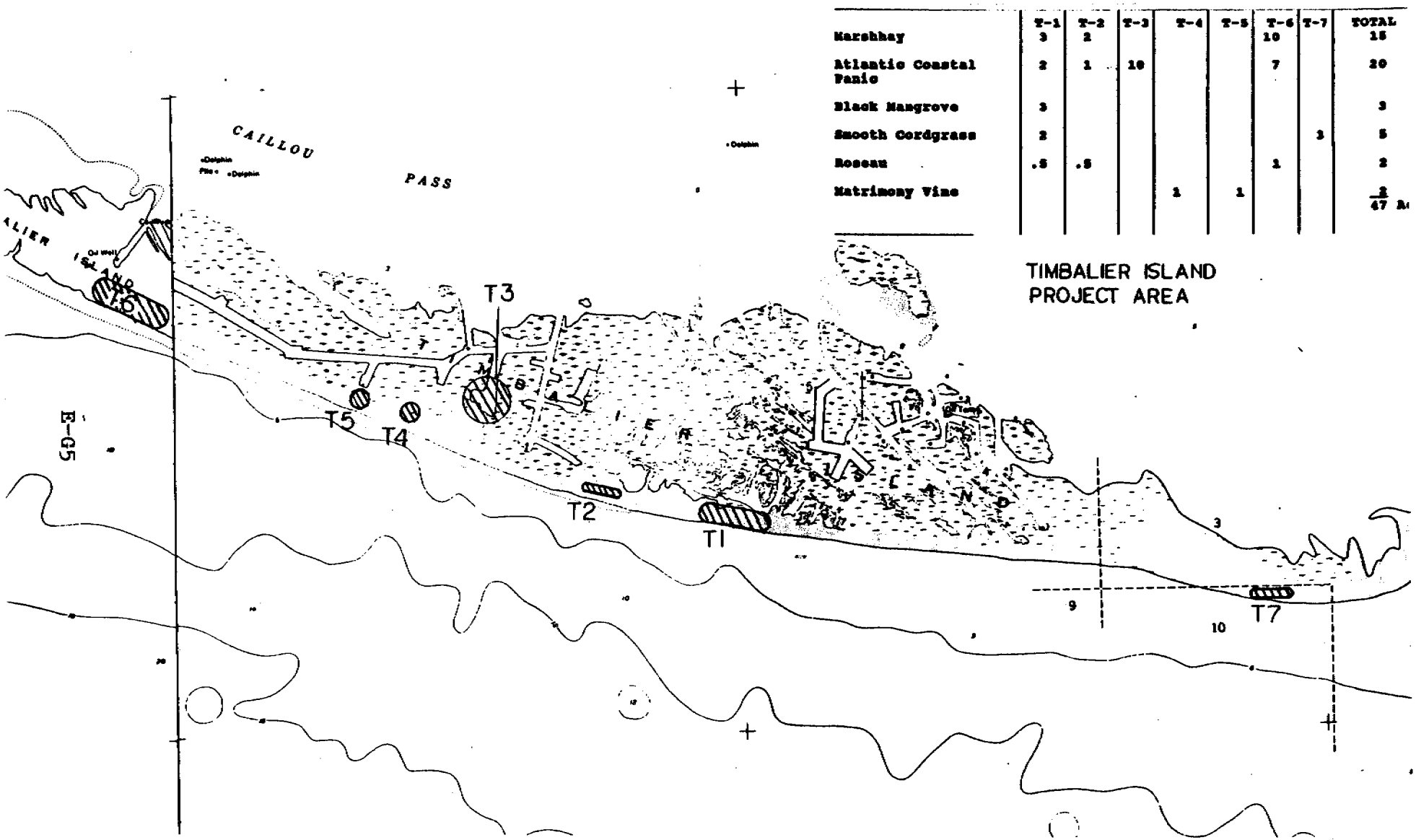
(a) NEPA - Environmental Assessment will be prepared.
(b) Section 10/404 - Permit will be applied for where wave stilling devices are required.
(c) LA-CZMP - Permit will be applied for where wave stilling devices are required.
(d) Water Quality Certification - N/A
(e) Endangered Species Act - N/A

Project Implementation Schedule:

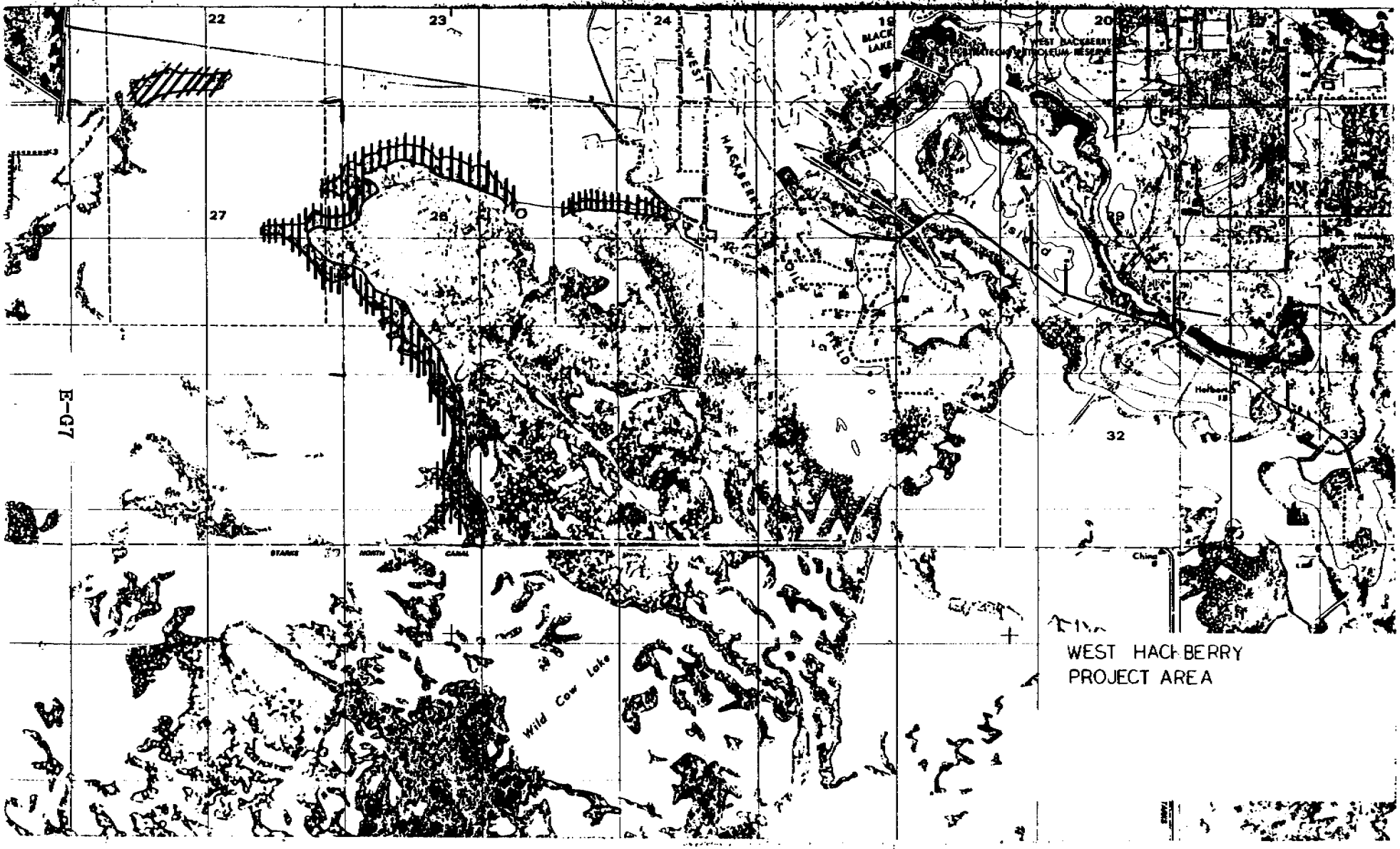
(a)	Start Design	October 1, 1991
(b)	End Design	October 1, 1992
(c)	Start Plantings	March 30, 1992 ~~3~~ ?
(d)	End Plantings	June 30, 1994

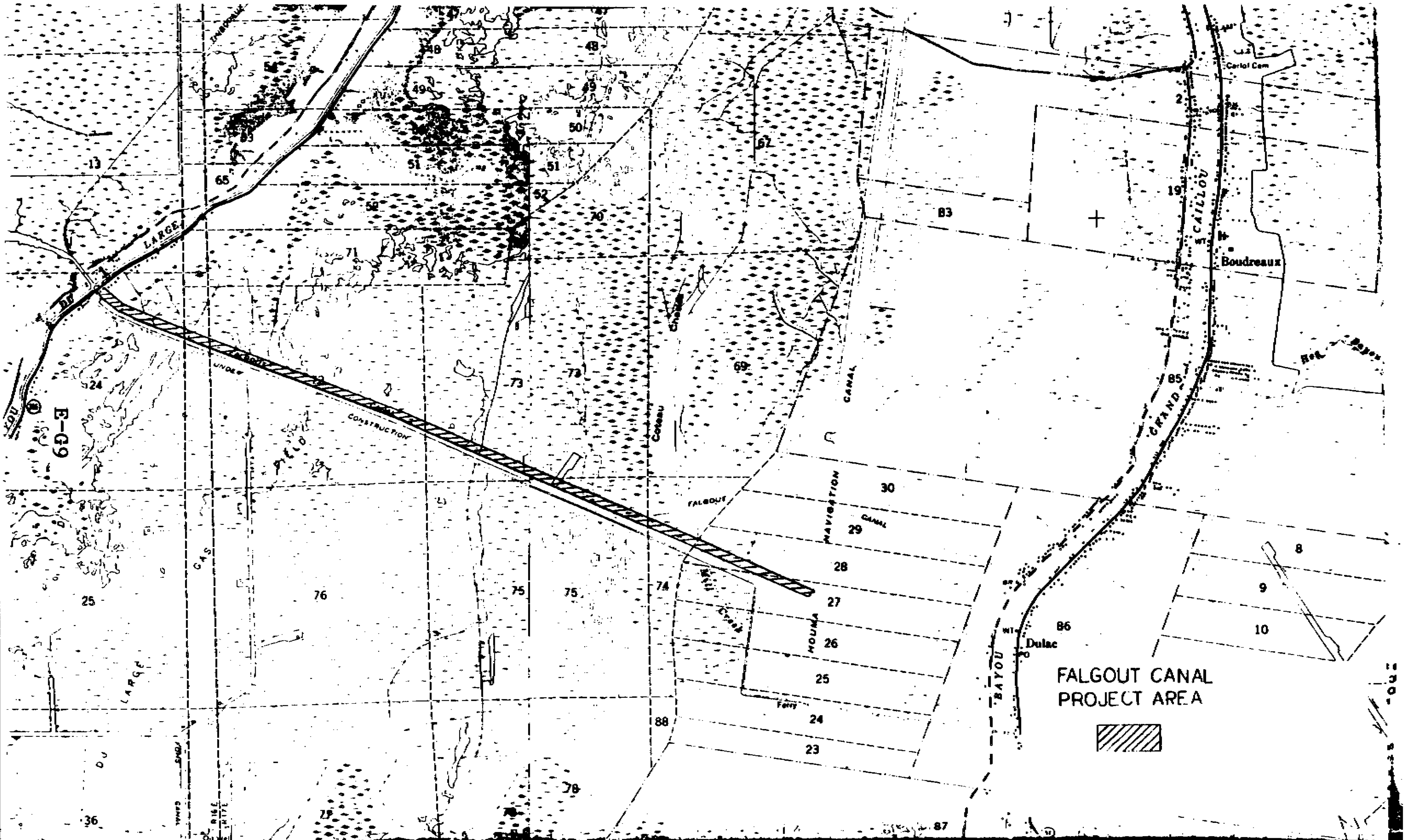
Potential Funding Sources:

(a) Federal: CWPPR Act
(b) Non Federal: State of Louisiana - Act 6



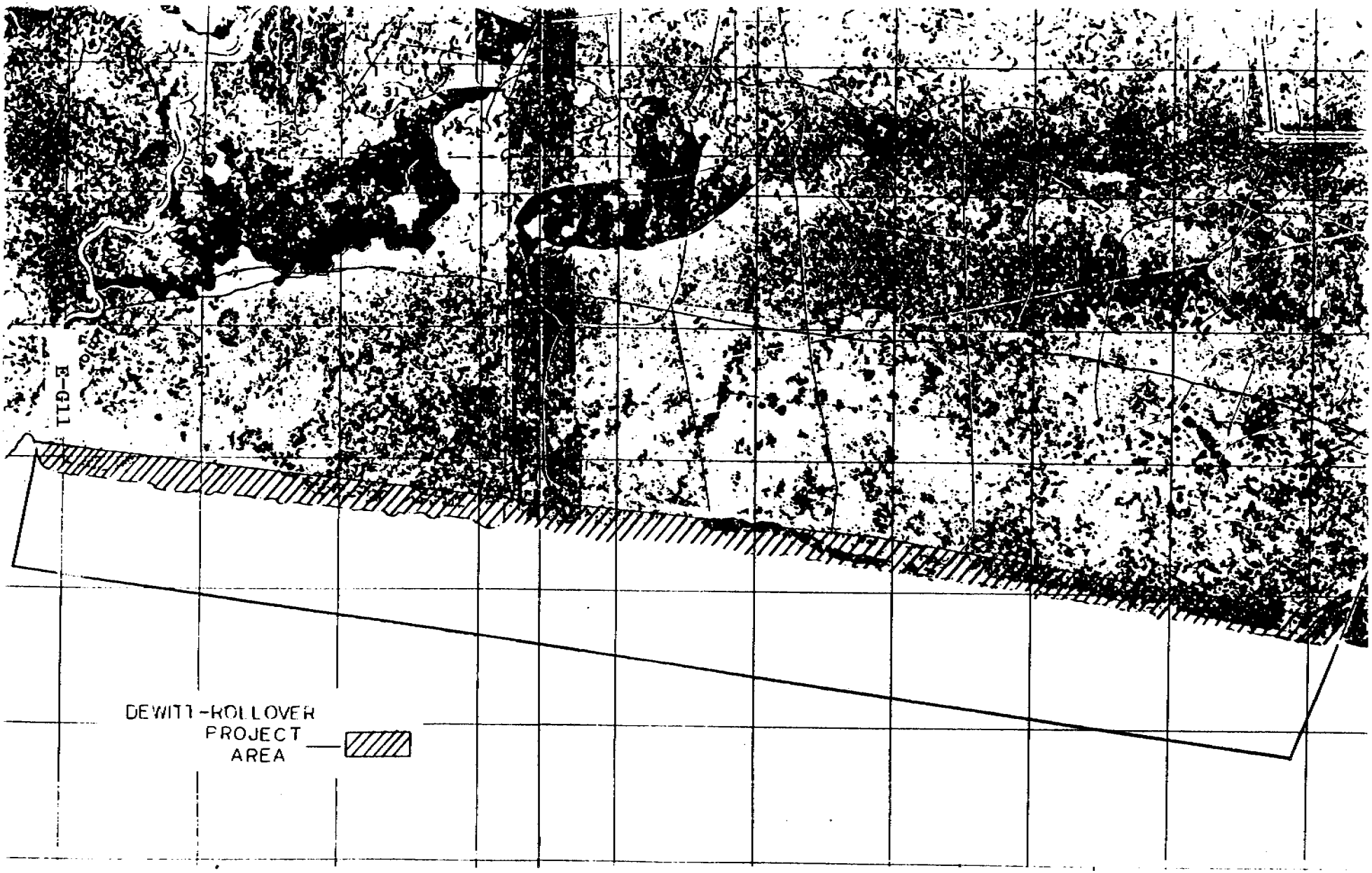
	T-1	T-2	T-3	T-4	T-5	T-6	T-7	TOTAL
Marshhay	3	2				10		15
Atlantic Coastal Panic	2	1	10			7		20
Black Mangrove	3							3
Smooth Cordgrass	2						3	5
Roseau	.5	.5				1		2
Matrimony Vine				1	1			2
								47 Ac


22
23
24
19
20
27
28
29
32
33
BLACK LAKE
WEST HACKBERRY
HACKBERRY
OIL FIELD
Wild Cow Lake
WEST HACKBERRY
PROJECT AREA



FALGOUT CANAL
PROJECT AREA
GRAND CAILLOU
BAYOU
Boudreaux
Dulac
HOUMA NAVIGATION CANAL
FALGOUT CANAL
UNDER CONSTRUCTION

E-G9



E-611

PROJECT: VEGETATIVE PLANTINGS

TOTAL FIRST COSTS	$625,000
TOTAL FULLY FUNDED COSTS	$848,000

ANNUAL CHARGES	PRESENT WORTH	AVERAGE ANNUAL
INTEREST & AMORTIZATION	$695,595	$74,846
MONITORING	$27,034	$2,909
IMPACT TO WATER SUPPLY		$0
ACCESS OIL & GAS		$0
INDUCED DREDGING		$0
IMPACT TO SHIPPING		$0
EMERGENCY CLOSURE		$0
OYSTER LEASES		$0
O & M COSTS	$70,638	$7,601
REPLACEMENT COSTS		$0
OTHER COSTS		$0
TOTAL	$793,267	$85,356

AVERAGE ANNUAL HABITAT UNITS	302.16
COST PER HABITAT UNIT	$282
AVERAGE ANNUAL ACRES OF EMERGENT MARSH	385

COASTAL WETLANDS PLANNING, PROTECTION, AND RESTORATION ACT

APPENDIX E

November 18, 1991

TAB H

WEST BAY SEDIMENT DIVERSION

MARSH CREATION

SEDIMENT DIVERSION FROM THE MISSISSIPPI RIVER PLAQUEMINES PARISH, LOUISIANA

Candidate Project
for the
Priority Project List
of the
Coastal Wetlands Planning, Protection, and Restoration Act

PROPOSED BY

U. S. Army Engineer District, New Orleans

October 1991

POINT OF CONTACT: David Carney
PHONE: (504) 862-2528

COASTAL WETLANDS PLANNING, PROTECTION, AND RESTORATION ACT

CANDIDATE PROJECT FACT SHEET

MARSH CREATION WITH UNCONTROLLED SEDIMENT DIVERSION FROM THE MISSISSIPPI RIVER

PLAQUEMINES PARISH, LOUISIANA

PROJECT DESCRIPTION

a. Location:

The proposed project is located in Plaquemines Parish Louisiana and would consist of large-scale uncontrolled sediment diversion to the west bank (right descending bank) of the Mississippi River at mile 4.7 Above Head of Passes (AHP). The proposed sediment diversion would be located at about latitude 29° 12' 30", longitude 89° 17' 30". A map of the project area is attached.

b. Justification:

Much of the land building capacity of the Mississippi River is being lost due to the discharge of sediments to the deep waters of the Gulf. The proposed project would recapture a small portion of the River's land building capacity that is currently being lost. Sediment diversion is an effective measure that can be implemented to create, nourish, and maintain wetlands.

c. Objective:

The project objective is to create vegetated wetland by diversion of sediments from the Mississippi River.

d. Project Features:

This project consists of construction of a conveyance channel and earthen "broad-crested" weir at mile 4.7 AHP for large-scaled uncontrolled diversion of sediments from the Mississippi River. The sediment diversion channel and weir would be constructed in two phases: (1) Initial construction of an interim diversion channel to accommodate a discharge of 20,000 cubic feet per second (cfs) at the 50% duration stages in the Mississippi River and marsh development areas, and (2) Modification of the interim diversion channel design to accommodate full-scale diversions of 50,000 cfs at the 50% duration stage on the Mississippi River immediately upon completion of a period of intensive monitoring of diversion operations.

The following features are included in the proposed project :

- Facility Relocations. A 10-inch diameter crude oil pipeline owned by Chevron Oil Company is located on the west bank and runs parallel to the the river at mile 4.7 AHP . About 1500 linear feet of the pipeline would have to be relocated.

PROJECT DESCRIPTION (Continued)

• Construction of a Sediment Diversion Channel and Weir. The initial sediment diversion channel will be dredged to a depth of -45 feet NGVD[1/], have a bottom width of 30 feet and side slopes of 1-foot vertical on 3-feet horizontal. Construction of the diversion channel and weir will be accomplished by hydraulic pipeline dredge. Excavation of approximately 650,000 cubic yards of material will be required for the initial 20,000 cfs design diversion. Phase two of the construction will consist of excavating approximately 1,450,000 cubic yards of material to achieve the final 50,000 cfs design section. The excavated material will be hydraulically transported and placed along the marsh side of the existing river banks and pumped to an elevation, of +4.0 feet to +4.5 feet NGVD, conducive to marsh creation.

• Construction of Sediment Retention Dikes. In order to further enhance the development of marsh within the receiving waters, earthen dikes would be constructed within these waters to assist in retaining discharged sediments.

• Project Monitoring. An intensive monitoring program will be implemented. This program will be operational for a period of one (or more) high water seasons to observe diversion operations at the 20,000 cfs design level. The monitoring program will provide for hydrographic surveys, discharge measurements for developing and verifying diversion rating curves, aerial photography, sediment concentration measurements, sediment plume studies, etc, as necessary, to assess the efficacy of diversion operations and indicated desired design modifications for full-scale diversions. A long-term monitoring program will become operational after full-scale diversions are implemented.

• Bifurcation Dredging. Additional bifurcations would be dredged in the new delta that would be formed, as required, to help maintain optimal performance of the large-scale sediment diversion and assist in extending the growth of the delta.

• Contingency Closure. It is possible that during sediment diversion operations the theoretical cross section of the diversion channel could increase due to scour caused by diverted flows from the Mississippi River. In the event that during the project life the original diversion channel cross-sectional area were to enlarge by approximately 50 percent contingency plans for closing off the diversion would be initiated.

ANTICIPATED BENEFITS

Project implementation would create approximately 9,831 acres of fresh to intermediate marsh over the 20-year life of the proposed project.

ANTICIPATED ADVERSE EFFECTS

The work would entail clearing approximately 5.5 acres of overbank area adjacent to the Mississippi River at the site of the diversion channel. No other coastal wetlands would be adversely affected by the proposed project. Approximately 9,831 acres of shallow open water would be converted to emergent marsh. The proposed project would not conflict with other known wetland creation or protection projects or programs in coastal Louisiana.

Approximately 277,000 linear feet of canals and slips are located within the proposed marsh development area. Diverted sediment would fill these canals if not maintained.

1/ National Geodetic Vertical Datum of 1929 (formerly referred to as mean sea level, msl)

COSTS

a. Engineering and design.	$115,000
b. Supervision and administration of engineering and design.	(included in E&D)
c. Project construction.	$2,375,000
d. Supervision and inspection of construction contract(s).	$154,000
e. Operation and maintenance (average annual costs and duration in years).	$36,000/y (20 years)
f. Project monitoring	$54,300/y

g. Source(s) of the cost estimates: Land Loss and Marsh Creation Feasibility Study

STATUS OF ENVIRONMENTAL COMPLIANCE

a. NEPA.	Incomplete
b. Sections 10/404.	Complete
c. Louisiana Coastal Management Program.	Incomplete
d. Louisiana Water Quality Certification.	Incomplete
e. Endangered Species Act.	Incomplete

The impacts of the proposed project have been addressed in a Draft Environmental Impact Statement that is awaiting approval for release for public review.

PROJECT IMPLEMENTATION SCHEDULE

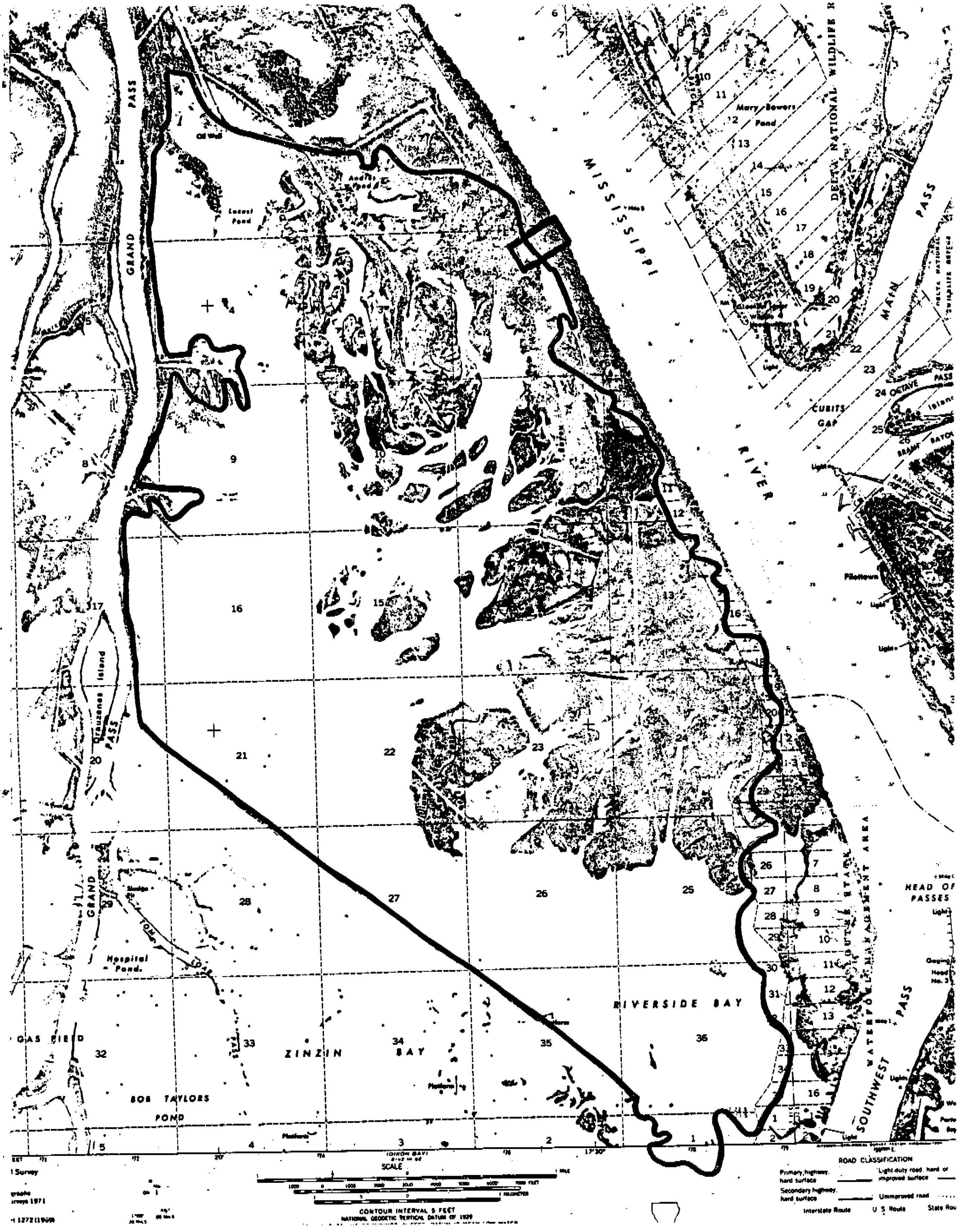
a. Engineering and design start date.	August 1992
b. Engineering and design finish date.	February 1994[2/]
c. Construction start date.	August 1994
d. Construction finish date.	November 1994

POTENTIAL FUNDING SOURCES

a. Federal funding source(s): Coastal Wetlands Planning, Protection, and Restoration Act.

b. Non-federal funding source(s). State of Louisiana.

2/ Considers estimated time requirements for obtaining Right of Entry permits, completing surveys, hydraulic design, foundations investigations, etc., and assumes accelerated schedule of design reviews by the Lower Mississippi Valley Division.


GRAND PASS
MISSISSIPPI RIVER
Mary Bowers Pond
DELTA NATIONAL WILDLIFE R
MAIN PASS
CUBITS GAP
OCTAVE PASS
Grand Pass
Riverside Bay
ZINZIN BAY
BOB TAYLORS POND
Hospital Pond
GAS FIELD
HEAD OF PASSES
SOUTHWEST PASS
Pilottown
CONTOUR INTERVAL 5 FEET
ROAD CLASSIFICATION
SCALE

PROJECT: WEST BAY SEDIMENT DIVERSION

TOTAL FIRST COSTS	$2,644,000
TOTAL FULLY FUNDED COSTS	$8,517,000

ANNUAL CHARGES	PRESENT WORTH	AVERAGE ANNUAL
INTEREST & AMORTIZATION	$2,767,826	$297,818
MONITORING	$504,625	$54,298
IMPACT TO WATER SUPPLY	$2,868,712	$308,673
ACCESS OIL & GAS	$275,454	$29,639
INDUCED DREDGING	$5,970,023	$642,374
IMPACT TO SHIPPING	$251,981	$27,113
EMERGENCY CLOSURE	$975,843	$105,001
OYSTER LEASES		$0
O & M COSTS	$330,011	$35,509
REPLACEMENT COSTS		$0
OTHER COSTS		$0
TOTAL	$13,944,475	$1,500,426

AVERAGE ANNUAL HABITAT UNITS	4,912.27
COST PER HABITAT UNIT	$305
AVERAGE ANNUAL ACRES OF EMERGENT MARSH	5,329

COASTAL WETLANDS PLANNING, PROTECTION, AND RESTORATION ACT

APPENDIX E

November 18, 1991

TAB I

BARATARIA BAY WATERWAY MARSH BUILDING WITH DREDGED SEDIMENTS

MARSH CREATION

BARATARIA BAY WATERWAY MAINTENANCE DREDGING
JEFFERSON PARISH, LOUISIANA

Candidate Project
for the
Priority Project List
of the
Coastal Wetlands Planning, Protection, and Restoration Act

PROPOSED BY

U. S. Army Engineer District, New Orleans

October 1991

POINT OF CONTACT: David Carney
PHONE: (504) 862-2528

COASTAL WETLANDS PLANNING, PROTECTION, AND RESTORATION ACT

CANDIDATE PROJECT FACT SHEET

MARSH CREATION

BARATARIA BAY WATERWAY MAINTENANCE DREDGING JEFFERSON PARISH, LOUISIANA

PROJECT DESCRIPTION

a. Location:

The proposed project is located in Jefferson Parish Louisiana. The planned work consists of using sediments dredged for maintenance of the Barataria Bay Waterway between mile 0 at Barataria Pass, and mile 16, near Bayou St. Denis. The proposed project would consist of creating marshes at several individual sites along some 16 miles of the waterway. Maps showing the locations of the proposed marsh creation sites are attached.

b. Justification:

The reach of the Barataria Bay Waterway which traverses the open waters of Barataria Bay must be dredged for maintenance at about four-year intervals. Currently, sediments dredged from the waterway are placed in designated disposal areas adjacent to the waterway. With implementation of the current proposal, this material would be used beneficially to create new marsh and nourish existing marsh near the waterway.

c. Objective:

The project objective is to create vegetated wetland using sediments dredged for normal maintenance of the Barataria Bay Waterway.

d. Project Features:

This alternative would involve using sediments dredged for maintenance of the Barataria Bay Waterway to create marsh in shallow water areas adjacent to the channel. Eighteen marsh development areas, ranging in size from about 15 to about 133 acres, are proposed between Mile 0 (at Barataria Pass) and Mile 16 of the waterway (near Bayou St. Denis).

Full implementation of the proposal is contingent upon the State of Louisiana not renewing a number leases on State-owned water bottoms where there is no oyster production. Selected non-producing leased areas would be removed from potential production and made available for marsh development at the discretion of the State.

The channel is dredged for maintenance at about four-year intervals; consequently, over the 20-year life of the project, channel dredging would be performed about five times. On average, approximately 1,740,000 cubic yards of dredged material are excavated and placed in disposal areas within the project reach during each dredging cycle. Hydraulic cutter-head dredges and bucket dredges are currently used to excavate the material. Bucket dredges place material in designated disposal areas on both sides of the channel. The hydraulic cutter-head dredges place material in three designated confined disposal areas on the east side of the channel.

PROJECT DESCRIPTION (Continued)

With this proposal, hydraulic cutter-head dredges would be used, exclusively, for maintenance of the waterway. Dredged material from maintenance of the waterway would be placed in shallow water areas on both sides of the channel at an elevation conducive to marsh development. The marsh development areas would be confined to minimize damage to producing oyster beds located in Barataria Bay. Typical confinement would consist of three to five-foot high soil dikes.

Dredged sediments would be placed to an elevation of +4.0 feet NGVD[1/]. After consolidation, a final design elevation of +2.0 feet NGVD would be obtained. Approximately six months of pumping time would be required for the dredged material placement. An additional twelve months would be required for consolidation of the dredged material to about elevation +2.0 feet NGVD.

To create marsh, dredged material must be pumped greater distances than would be the case for normal maintenance of the waterway. Consequently, additional costs over present maintenance costs would be incurred.

ANTICIPATED BENEFITS

Project implementation would create approximately 445 acres of saline marsh over the 20-year life of the proposed project.

ANTICIPATED ADVERSE EFFECTS

Approximately 510 acres of open water habitat would be impacted by construction of low-level dikes and dredged material placement. Some designated oyster lease areas could be removed from potential production by converting shallow open water to vegetated wetland.

No other coastal wetlands or wetland habitats would be adversely affected. The proposed project would not conflict with other known wetland creation or protection projects or programs in coastal Louisiana.

COSTS

a. Engineering and design.	$5,000
b. Supervision and administration of engineering and design.	(included in E&D)
c. Project construction.	$184,000
d. Supervision and inspection of construction contract(s).	$19,000
e. Operation and maintenance (average annual costs and duration in years).	$44,000 (20 years)
f. Project monitoring.	
g. Source(s) of the cost estimates.	Land Loss and Marsh Creation Feasibility Study

1/ National Geodetic Vertical Datum of 1929 (formerly referred to as mean sea level, msl)

STATUS OF ENVIRONMENTAL COMPLIANCE

a. NEPA.	Incomplete
b. Sections 10/404.	Incomplete
c. Louisiana Coastal Management Program.	Incomplete
d. Louisiana Water Quality Certification.	Incomplete
e. Endangered Species Act.	Incomplete

The impacts of the proposed project have been addressed in a Draft Environmental Impact Statement that is awaiting approval for release for public review.

PROJECT IMPLEMENTATION SCHEDULE

a. Engineering and design start date:	November 1993
b. Engineering and design finish date:	July 1994
c. Construction start date:	August 1994
d. Construction finish date:	November 1994

POTENTIAL FUNDING SOURCES

a. Federal funding source(s): Coastal Wetlands Planning, Protection, and Restoration Act.

b. Non-federal funding source(s): State of Louisiana.


41 AC.
WATERWAY
51 AC.
131 AC.
LOUISIANA COASTAL AREA, LA.
LAND LOSS AND MARSH CREATION
BARATARIA BAY WATERWAY
MARSH BUILDING WITH
SEDIMENTS FROM
MAINTENANCE DREDGING

PLATE 6

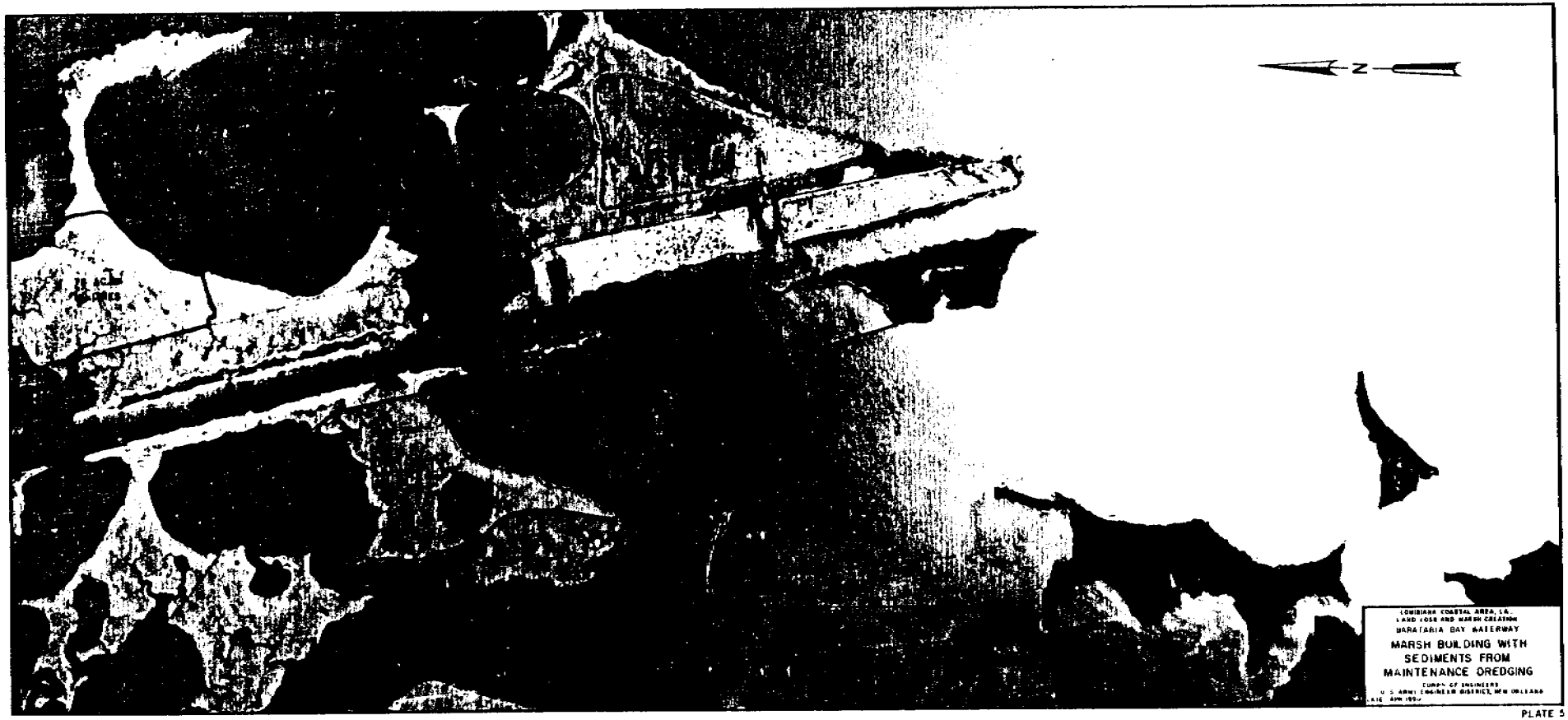

LOUISIANA COASTAL AREA, LA.
LAND LOSS AND MARSH CREATION
BARATARIA BAY WATERWAY
MARSH BUILDING WITH
SEDIMENTS FROM
MAINTENANCE DREDGING
CORPS OF ENGINEERS
U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS

PLATE 5

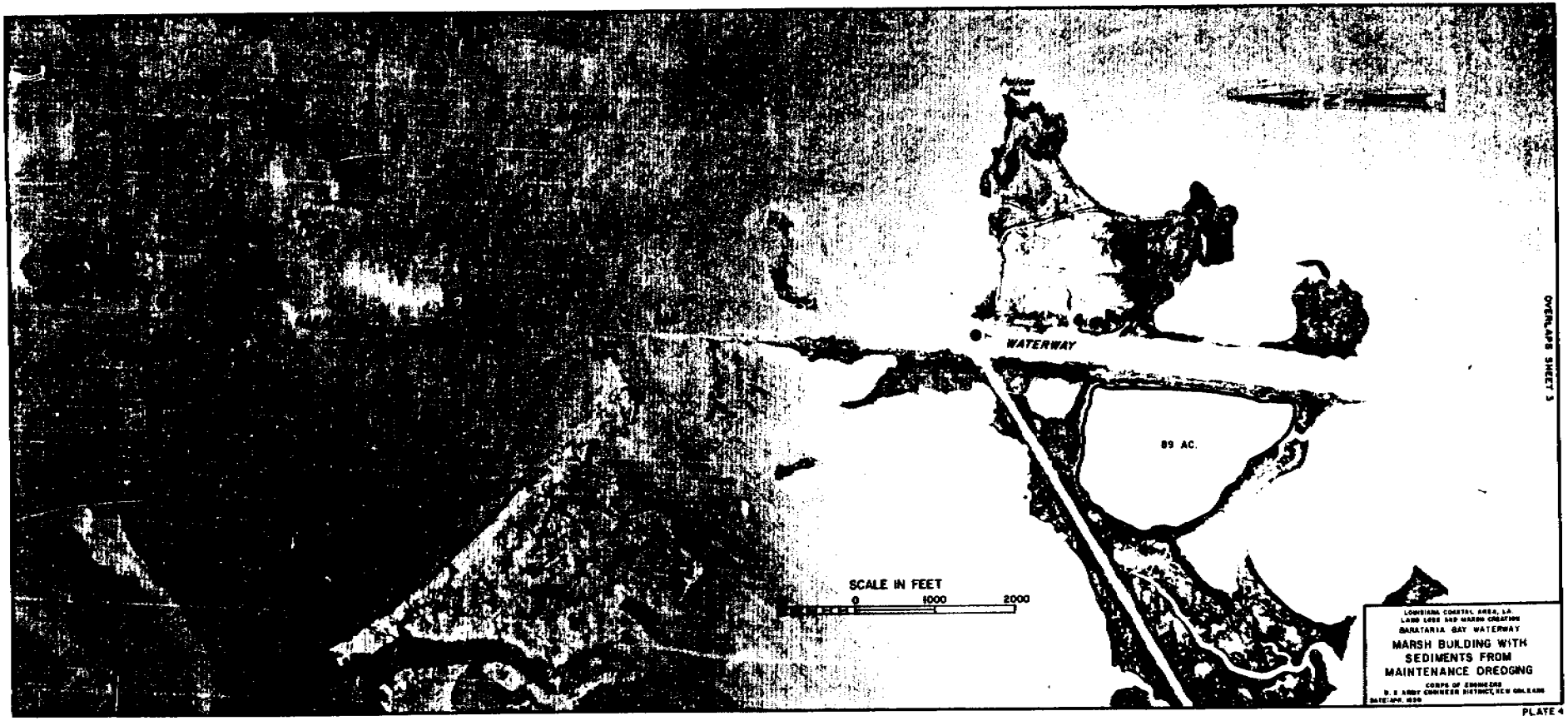

WATERWAY
89 AC.
SCALE IN FEET
0
1000
2000
OVERLAPS SHEET 3
LOUISIANA COASTAL AREA, LA
LAND LOSS AND MARSH CREATION
BARATARIA BAY WATERWAY
MARSH BUILDING WITH
SEDIMENTS FROM
MAINTENANCE DREDGING
CORPS OF ENGINEERS

PLATE 4

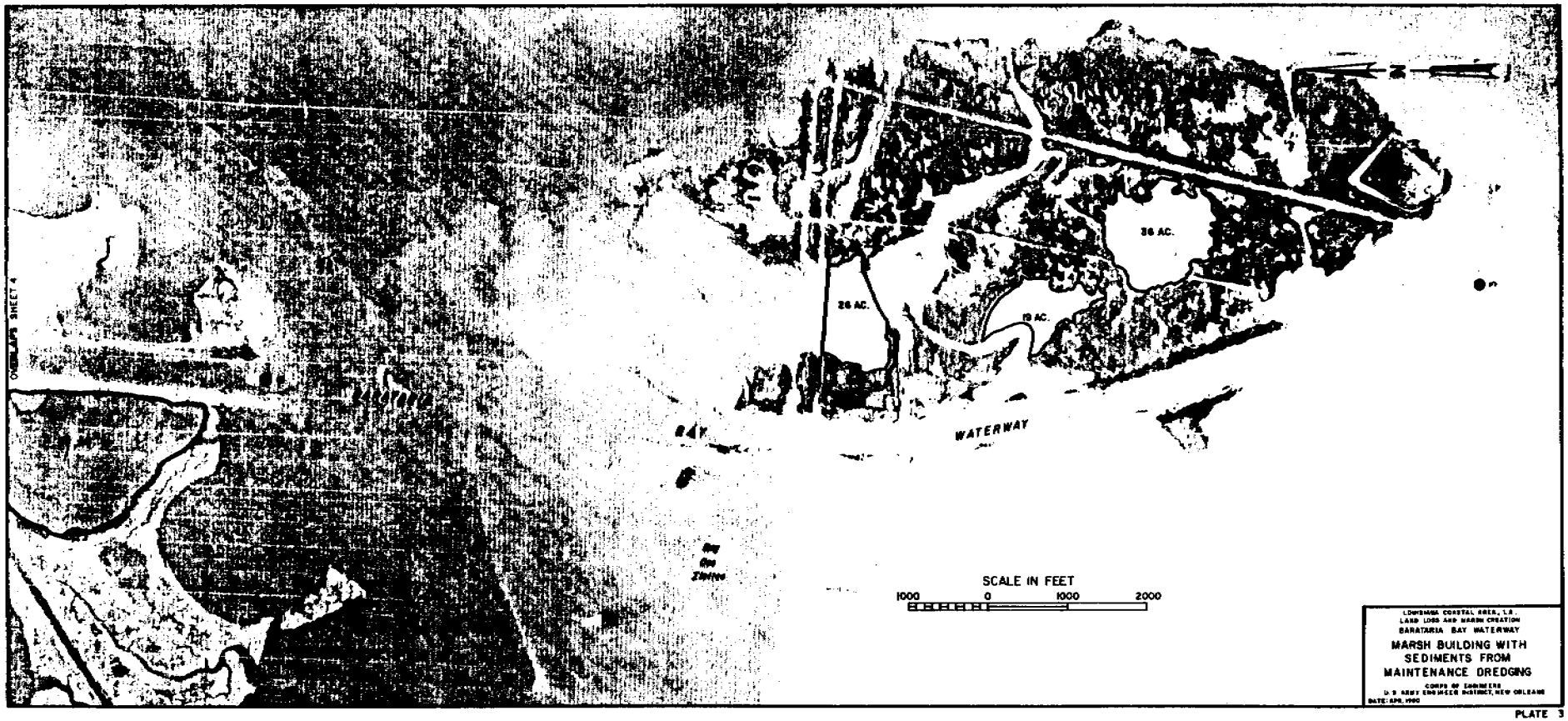

SHEET 4
26 AC.
26 AC.
19 AC.
BAY
WATERWAY
SCALE IN FEET
1000 0 1000 2000
LOUISIANA COASTAL AREA, LA.
LAND LOSS AND MARSH CREATION
BARATARIA BAY WATERWAY
MARSH BUILDING WITH
SEDIMENTS FROM
MAINTENANCE DREDGING
CORPS OF ENGINEERS
U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
DATE: APR. 1990

PLATE 3


GRAND TERRE ISLAND
PASS
GRAND ISLE
SCALE IN FEET
1000 0 1000 2000
LOUISIANA COASTAL AREA, LA.
LAND LOSS AND MARSH CREATION
BARATARIA BAY WATERWAY
MARSH BUILDING WITH SEDIMENTS FROM MAINTENANCE DREDGING
CORPS OF ENGINEERS
U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
DATE APR 1990

PLATE

PROJECT: BARATARIA BAY WATERWAY

TOTAL FIRST COSTS	$208,000
TOTAL FULLY FUNDED COSTS	$1,625,000

ANNUAL CHARGES	PRESENT WORTH	AVERAGE ANNUAL
INTEREST & AMORTIZATION	$217,365	$23,388
MONITORING		$0
IMPACT TO WATER SUPPLY		$0
ACCESS OIL & GAS		$0
INDUCED DREDGING		$0
IMPACT TO SHIPPING		$0
EMERGENCY CLOSURE		$0
OYSTER LEASES	$41,659	$4,483
O & M COSTS		$0
REPLACEMENT COSTS	$368,506	$39,651
OTHER COSTS		$0
TOTAL	$627,530	$67,522

AVERAGE ANNUAL HABITAT UNITS	150.53
COST PER HABITAT UNIT	$449
AVERAGE ANNUAL ACRES OF EMERGENT MARSH	219

COASTAL WETLANDS PLANNING, PROTECTION, AND RESTORATION ACT

APPENDIX E

November 18, 1991

TAB J

LOWER BAYOU La CACHE HYDROLOGIC RESTORATION

HYDROLOGIC RESTORATION - LOWER BAYOU LA CACHE WETLAND

Candidate Project
for the
Priority Project List
of the
Coastal Wetlands Planning, Protection, and Restoration Act

PROPOSED BY

U.S. Department of Commerce
with the support of the
U.S. Environmental Protection Agency

August 1, 1991

POINT OF CONTACT: Ric Ruebsamen
PHONE: (504) 389-0508

PROJECT DESCRIPTION

Location

The proposed project area surrounds Lower Bayou La Cache in southern Terrebonne Parish. It is bounded by Bayou Petit Caillou to the west, Bayou Terrebonne to the east, Bush Canal to the north, and Sevin Canal/Bay Lucien to the south. The project area encompasses 4,200 acres of wetlands. The center of the project area is located at latitude 29° 19′, and longitude 90° 38′.

Justification

The area currently opens to large waterways at numerous locations on the north, east, and west perimeters. Three canals cross the area, connecting Bayous Petit Caillou and Terrebonne. Ten additional access canals have been dredged into the area; nine of which are open to flow between one of these two bayous and the interior of the area. Numerous open water areas have developed or expanded in the last 20 years, particularly in the areas surrounding canals. Between 1956 and 1984, 483 acres converted to open water, while only 24 acres changed from open water to land (largely from spoil deposition). Loss of vegetated marsh can be expected to continue if modification of hydrologic regimes is not affected. Consequently, degradation of fish and wildlife habitats will continue, and prime nursery areas for estuarine-dependent fish/shellfish species will be lost.

Objectives

The project intends to reduce marsh loss rate and improve fish and wildlife habitat quality by restoring natural north-south water exchange with the estuarine water bodies and by reducing flow through the numerous canals dredged in the area. Preventing flow directly to and from the major waterways flanking the area will improve utilization of local freshwater, and will reduce rapid saltwater ingress and tidal scour. The reach of short-duration high salinity events will be reduced, while ingress and egress of aquatic species can occur through the numerous interior channels and ponds connecting ultimately to Bayou de l'Ouest and Bay Lucien to the south. Likewise, the introduction of sediments from the estuarine waters to the south during storm events will be maintained.

Project Features

The project includes the reconstruction of the south bank levee of Bush Canal from Bayou Petit Caillou to Bayou Terrebonne. This levee has been completely washed out over much of its length and about 65% of the reconstruction must be done in open-water areas of some depth. Additionally, and pending remaining access requirements, a shell-reinforced plug will be placed in the mouth of each of nine access canals along Bayou Petit Caillou; and six shell-reinforced canal plugs placed along Bayou Terrebonne. Canal

plugs would range from approximately 80-175 linear feet each. Access canals to active mineral exploration/extraction sites may have to be ringed, rather than plugged, and provided with water control structures where the canal boundary would induce ponding of water.

Levee construction along Bush Canal involves subaerial base, shell-reinforced construction over approximately 2,647 linear feet, and subaqueous base, shell-reinforced construction over approximately 4,853 linear feet.

At this time the project is not integrated with State Project TE-3, Bayou La Cache Wetland, which addresses the area north of the Bush Canal. The current project could greatly benefit if fresh-water flow from Project TE-3 were routed across the Bush Canal into the proposed project area.

ANTICIPATED BENEFITS

Type and acres restored

Some saline marsh will be created where spoil banks along plugged access canals can be degraded.

Type and acres enhanced and the nature of the enhancement

The proposed project is anticipated to benefit approximately 4200 acres of wetland habitats, including about 1200 acres of shallow water bodies. Approximately 3000 acres of vegetated wetlands, mostly saline with some brackish marsh, will be enhanced by reducing salt related stress on vegetation and by promoting wetland overflow relative to channelized flow. Enhancement would extend to the entire 4200 acres of nursery habitat for estuarine-dependent aquatic species by shifting toward more even, lowered energy levels throughout the area, and by reducing extreme salinity fluctuations.

Type and acres protected

Both the reduced salinity stress and the reduced flow velocities are anticipated to result in a reduction of the wetland loss rate which currently is estimated to be 12.8 acres/year (based on loss rates for 1978-1984 in the project area) or 256 acres over the life of the project. We estimated that the rate of loss would be reduced to 8.5 acres/year or 170 acres over the 20 year project life. This would result in preservation of 85 acres of wetlands.

Duration of coastal wetland benefits

At the current rate of wetland loss, the area could remain a viable wetland habitat for several decades. The duration of the benefits, provided that regular maintenance of canal plugs is performed, would therefore be in excess of 20 years.

Benefits to coastal wetland dependent fish and wildlife populations.

Fish populations would benefit from the restoration of lower hydraulic energy levels that facilitate use of the area as a nursery area and as juvenile habitat. Both fish and wildlife populations would be enhanced by healthier vegetation as salinity stresses are reduced.

Other significant benefits

ANTICIPATED ADVERSE EFFECTS

Type and acres of coastal wetlands and other habitats adversely affected by the project

No significant adverse environmental effects are anticipated.

Conflicts with other projects and programs.

The project would reduce but not eliminate current small boat access to the area for recreational and commercial fisheries use. No conflicts with other projects or programs are presently apparent provided that access to active oil and gas wells is maintained.

COSTS

Estimated costs and source of the estimates are as follows:

Feasibility analysis, Planning and Permitting	$ 30,500
Engineering and Design	$ 67,100
Supervision and administration of engineering and design	$ 9,150
Project Construction	$ 610,000
Supervision and Inspection of construction	$ 67,100
Contingencies	$ 122,000
Operation and Maintenance for 20 years @ $6,000/yr	$ 120,000
Project monitoring for 20 years @ $4,000/yr	$ 80,000
The total project cost over 20 years would be approximately	$1,105,850

Some variation in initial construction cost will occur, depending upon easements. Ringing an active mineral site having long, branching access canals could cost over $26,000 more than plugging the canal at the mouth. Some expense could be reduced by augmenting spoil banks in good condition surrounding short access canals, which would remove the canal from benefits of inclusion in the project area, but could save up to $8,000/site.

All construction cost estimates have been derived from:

Clark, D. and R. Hartman. 1990. Engineering and Construction Techniques of Marsh Management Structures. p 87-163 in Cahoon, D.R. and C.G. Groat, eds. A Study of Marsh Management Practice in Coastal Louisiana, Volume II, Technical Description. Final report to Minerals Management Service, New Orleans, LA. Contract No. 14-12-0001-30410. OCS Study/MMS 90-0075. 309p.

STATUS OF ENVIRONMENTAL COMPLIANCE

NEPA

No specific environmental evaluation of the project has taken place at this time and no permits have been applied for.

Sections 10/404

No specific environmental evaluation of the project has taken place at this time and no permits have been applied for. A section 10/404 permit will be needed because of required construction activities in wetlands.

Louisiana Coastal Management Program

The project is located with the Louisiana Coastal Zone and requires a Coastal Use Permit. This permit has not yet been applied for.

Louisiana Water Quality Certification

This permit has not yet been applied for.

Endangered Species Act

The project is not believed to adversely affect endangered or threatened species.

PROJECT IMPLEMENTATION SCHEDULE

The following schedule expresses anticipated time period in terms of month after initiation of the project:

Authorization	0
Planning and detailed feasibility analysis starting date	2
Planning and detailed feasibility analysis finish date	4
Submittal of permit applications	4
Completion permit process	7
Engineering and design start date (pending permit approval)	7
Engineering and design finish date	9
Construction start date	11
Construction finish date	15

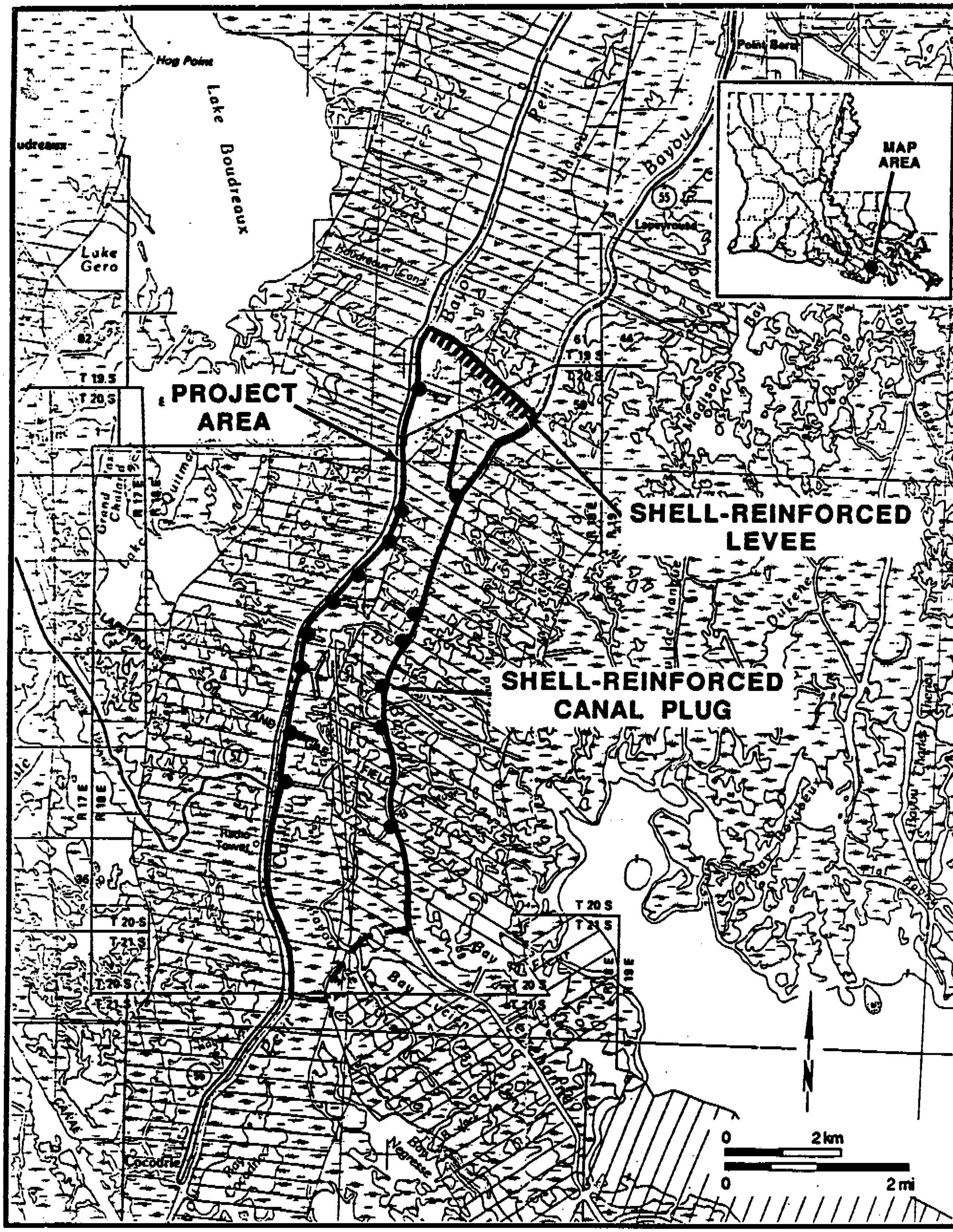
POTENTIAL FUNDING SOURCES

Federal Funding Sources

No federal funding sources other than the Coastal Wetlands Planning, Protection, and Restoration Act have been identified.

Non-federal Funding Sources

State funding is available to share in the project cost if the project were to be submitted and approved under the State's 1992-93 Coastal Wetland Restoration and Protection Plan, and subsequently found to be feasible. Local cost sharing may be available from the South Terrebonne Tidewater District.


PROJECT AREA
SHELL-REINFORCED LEVEE
SHELL-REINFORCED CANAL PLUG
MAP AREA
Lake Boudreaux
Hog Point
Lake Gero
Point Barre
Cocodrie
N
0
2 km
0
2 mi

PROJECT: LOWER BAYOU LA CACHE HYDRO. REST.

TOTAL FIRST COSTS	$906,000
TOTAL FULLY FUNDED COSTS	$1,254,000

ANNUAL CHARGES	PRESENT WORTH	AVERAGE ANNUAL
INTEREST & AMORTIZATION	$944,650	$101,644
MONITORING	$38,766	$4,171
IMPACT TO WATER SUPPLY		$0
ACCESS OIL & GAS		$0
INDUCED DREDGING		$0
IMPACT TO SHIPPING		$0
EMERGENCY CLOSURE		$0
OYSTER LEASES	$58,150	$6,257
O & M COSTS		$0
REPLACEMENT COSTS		$0
OTHER COSTS		$0
TOTAL	$1,041,566	$112,073

AVERAGE ANNUAL HABITAT UNITS	133.82
COST PER HABITAT UNIT	$837
AVERAGE ANNUAL ACRES OF EMERGENT MARSH	45

COASTAL WETLANDS PLANNING, PROTECTION, AND RESTORATION ACT

APPENDIX E

November 18, 1991

TAB K

BAYOU La BRANCHE MARSH BUILDING WITH DREDGED SEDIMENTS

MARSH CREATION

LA BRANCHE WETLANDS
ST. CHARLES PARISH, LOUISIANA

Candidate Project
for the
Priority Project List
of the
Coastal Wetlands Planning, Protection, and Restoration Act

PROPOSED BY

U. S. Army Engineer District, New Orleans

October 1991

POINT OF CONTACT: David Carney
PHONE: (504) 862-2528

COASTAL WETLANDS PLANNING, PROTECTION, AND RESTORATION ACT

CANDIDATE PROJECT FACT SHEET

MARSH CREATION

LA BRANCHE WETLANDS
ST. CHARLES PARISH, LOUISIANA

PROJECT DESCRIPTION

a. Location:

The proposed project is located in the Bayou La Branche Wetlands in St. Charles Parish. The area is adjacent to the Lower Guide Levee of the Bonnet Carre' Floodway. The approximate center of the proposed marsh creation and nourishment site is at latitude 30° 03' 00", longitude 90° 22' 00". A map of the project area is attached.

b. Justification:

The Bayou La Branche Wetlands consist of fresh and intermediate marshes on the south shore of Lake Pontchartrain. The close proximity of an abundant sediment source affords an ideal opportunity to restore these deteriorated areas of marsh.

c. Objective:

The project objective is to create new vegetated wetlands and restore and nourish deteriorated marshes in the Bayou La Branche area.

d. Project Features:

The proposed project involves dedicated dredging of sediments from Lake Pontchartrain to create vegetated wetlands in the area indicated on the attached map. The work would consist of pumping sediments from a bar located at the mouth of the Bonnet Carre' Floodway adjacent to the proposed marsh development site. The marsh development area would be confined with retention dikes. Dredge material would be pumped to a height conducive to marsh development after a period of settlement and compaction.

ANTICIPATED BENEFITS

The proposed project would create approximately 254 acres of intermediate marsh and would nourish an additional 87 existing acres. By the end of the 20-year project life, approximately 296 acres of marsh would remain in the project area. Additionally, the proposed project could provide significant public outreach benefits in that the project site is visible from U. S. Interstate Highway 10. The area is ideally situated for a demonstration project for marsh creation and restoration.

ANTICIPATED ADVERSE EFFECTS

Sediments would be dredged from a small submerged delta in Lake Pontchartrain at the mouth of the Bonnet Carre' Floodway. This benthic habitat would be modified by the proposed project. Approximately 254 acres of open water habitat would be converted to emergent marsh. No other coastal wetlands or wetland habitats would be adversely affected. The proposed project would not conflict with other known wetland creation or protection projects or programs in coastal Louisiana.

COSTS

a. Engineering and design.	$360,000
b. Supervision and administration of engineering and design.	(included in E&D)
c. Project construction.	$3,280,000[1/]
d. Supervision and inspection of construction contract(s).	$360,000
e. Operation and maintenance	$0
f. Project monitoring.	

g. Source(s) of the cost estimates: Corps of Engineers (updated 7/91)

STATUS OF ENVIRONMENTAL COMPLIANCE

a. NEPA.	Not initiated
b. Sections 10/404.	Not initiated
c. Louisiana Coastal Management Program.	Not initiated
d. Louisiana Water Quality Certification.	Not initiated
e. Endangered Species Act.	Not initiated

PROJECT IMPLEMENTATION SCHEDULE

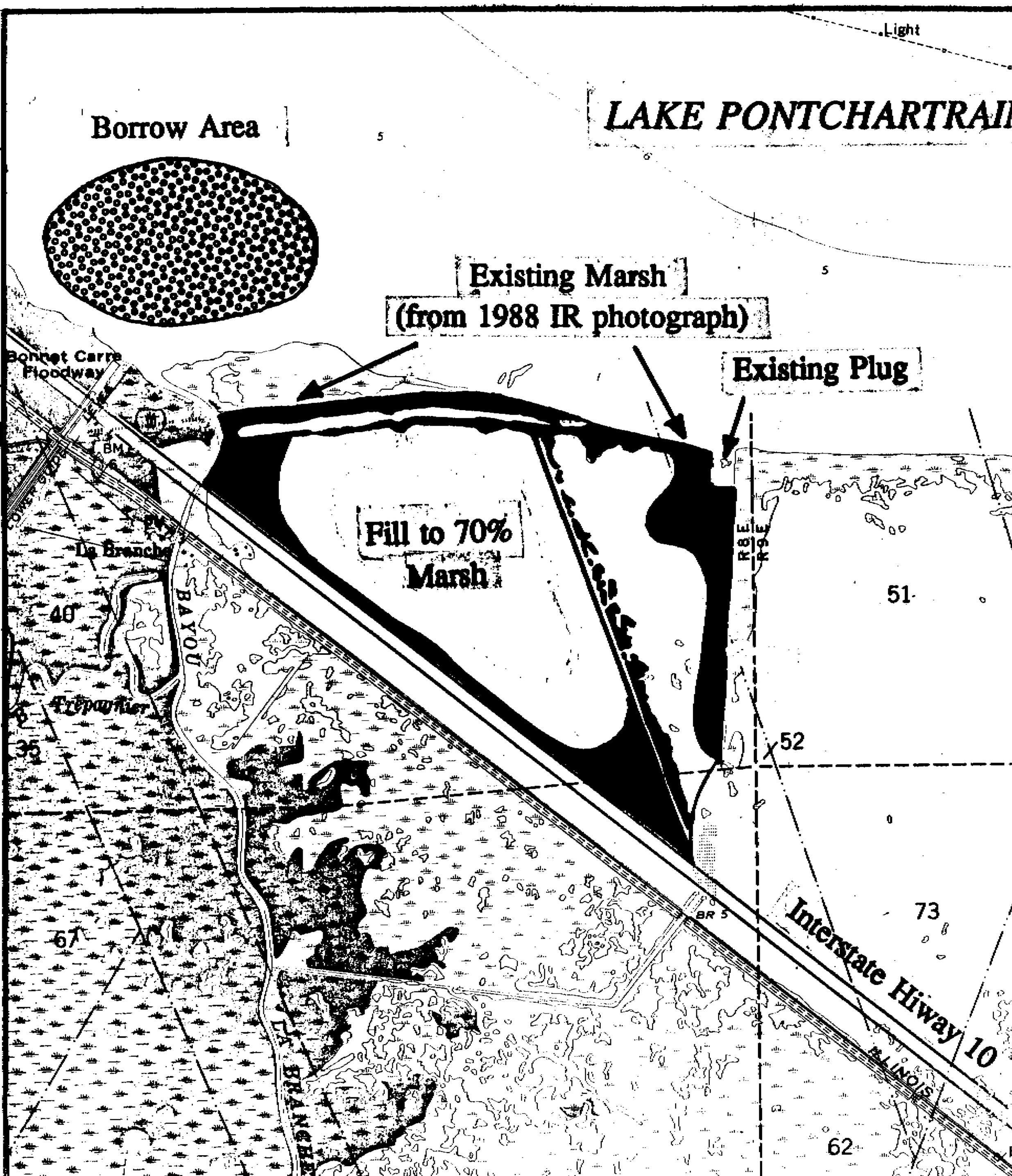
a. Engineering and design start date.	March 1992
b. Engineering and design finish date.	November 1992
c. Construction start date.	December 1992
d. Construction finish date.	March 1993

POTENTIAL FUNDING SOURCES

a. Federal funding source(s). Coastal Wetlands Planning, Protection, and Restoration Act.

b. Non-federal funding source(s). State of Louisiana.

1/ Does not include real estate costs.



MARSH CREATION
LABRANCHE WETLANDS
St. Charles Parish, LA

PROJECT: LA BRANCHE WETLANDS

TOTAL FIRST COSTS	$4,000,000
TOTAL FULLY FUNDED COSTS	$4,327,000

ANNUAL CHARGES	PRESENT WORTH	AVERAGE ANNUAL
INTEREST & AMORTIZATION	$4,204,180	$452,370
MONITORING		$0
IMPACT TO WATER SUPPLY		$0
ACCESS OIL & GAS		$0
INDUCED DREDGING		$0
IMPACT TO SHIPPING		$0
EMERGENCY CLOSURE		$0
OYSTER LEASES		$0
O & M COSTS		$0
REPLACEMENT COSTS		$0
OTHER COSTS		$0
TOTAL	$4,204,180	$452,370

AVERAGE ANNUAL HABITAT UNITS	190.98
COST PER HABITAT UNIT	$2,369
AVERAGE ANNUAL ACRES OF EMERGENT MARSH	205

COASTAL WETLANDS PLANNING, PROTECTION, AND RESTORATION ACT

APPENDIX E

November 18, 1991

TAB L

CAMERON PRAIRIE WILDLIFE REFUGE SHORELINE EROSION CONTROL

CAMERON PRAIRIE NATIONAL WILDLIFE REFUGE

EROSION PROTECTION AND MARSH ENHANCEMENT

Candidate Project
for the
Priority Project List
of the
Coastal Wetlands Planning, Protection, and Restoration Act

PROPOSED BY

U.S. Fish and Wildlife Service

November 13, 1991

POINT OF CONTACT: Paul Yakupzack
PHONE: (318) 598-2216

1. PROJECT DESCRIPTION

a. Location

1. The proposed project is located in the Cameron Prairie National Wildlife Refuge (NWR) which is approximately 25 miles southeast of Lake Charles, LA in north central Cameron Parish. The attached general refuge map identifies the project area.

2. The latitude of the project is 29° 56′, the longitude is 93° 04′.

b. Justification

1. The Cameron Prairie NWR is bounded on the south by the Gulf Intracoastal Waterway (GIWW). Over the years the north bank of this waterway has eroded. This erosion has largely eliminated the original spoil bank that protected the fresh water wetlands located north of the waterway. Without a spoil bank or levee to protect these wetlands, continued land loss from erosion will occur. The waterway will become wider and wider. Valuable emergent wetlands will be lost as they erode and revert to turbid shallow areas adjacent to an ever-widening waterway.

c. Objectives

1. Protection of emergent wetlands of the Cameron Prairie NWR adjacent to the GIWW.

2. Enhancement of the emergent wetlands protected by the proposed levee.

3. Terminate the encroachment of the GIWW into a NWR.

d. Project Features

1. The area to be affected by the project consists of 640 acres of fresh marsh in the southern portion of the Refuge's 1600-acre Unit 8.

2. We propose to protect the project area marshes by constructing a rock dike (breakwater) adjacent and parallel to the remaining spoil bank to protect it from further erosion. The project area will be managed as an emergent freshwater marsh that will be utilized by all fish and wildlife species common to the area.

2. ANTICIPATED BENEFITS

a. The Cameron Prairie NWR is composed of 9,621 acres of fresh marsh, active rice fields and old rice fields. Unit 8 is a 1600 acre emergent marsh that was formerly maintained as a fresh water reservoir for rice culture. It is vegetated with maidencane and bulltongue. There are several large ponds scattered throughout this unit. These ponds are vegetated with bladderwort, watershield, white waterlily and other aquatic vegetation.

Unit 8, including the project area, is a valuable wintering area for migratory ducks and geese. As many as 5,000 ducks and 500 geese have been observed utilizing this area during the peak wintering period.

Although no turbidity is currently entering the project area from the GIWW, it is expected to enter in the very near future. Approximately 6,000 feet of the spoilbank on the west side of the southern boundary of the project area is almost totally washed away by erosion from the GIWW. Highly turbid water from the GIWW will cause rapid deterioration of the aquatic plants that vegetate the ponds found in the project area. This deterioration will lead to diminished use by all fish and wildlife species that depend on this aquatic growth for food and shelter. By implementation of the project as proposed, this water quality deterioration will be prevented.

b. No marsh will be created by this project.

c. Approximately 640 acres of emergent fresh marsh with its associated shallow ponds will be protected by the construction of this project.

d. It is anticipated that about 30 acres of coastal wetlands may be restored by this project between the proposed breakwater and the edge of the existing shoreline. However, given the uncertainty of the estimate, no benefits were claimed for that restoration. The area is presently a shallow water zone between the channel of the GIWW and the edge of the emergent marsh. By timely implementation of this project no additional areas will require restoration.

e. It is expected that the duration of this project will be in excess of 20 years.

f. Coastal fish and wildlife populations are expected to be enhanced by the completion of this project. Alligators, fresh water sport fish, migratory birds, waterfowl, resident birds, furbearers and other aquatic life will benefit from the water level control measures designed into this project. Intrusion of extremely turbid water and erosive wave action from the barge traffic in the GIWW will be prevented by the rock breakwater.

g. By constructing this project as proposed, maintenance dredging will not be required as often along this 2 mile reach of the GIWW. Maintenance of existing wetland values for all fish and wildlife resources will be maintained.

3. ANTICIPATED ADVERSE EFFECTS

a. No adverse effects are anticipated or foreseen to coastal wetlands or other habitats as a result of implementation of this project.

b. No conflicts with other projects and programs are foreseen or anticipated.

4. COSTS

a. Engineering and design costs are expected to be about 10% of the total project construction cost or about $96,900.00.

b. Supervision and administration of engineering and design costs will be provided in the future.

c. Construction of the rock breakwater parallel to the Gulf-Intracoastal Waterway will be approximately $969,000.00.

d. Supervision and inspection of construction contract(s) cost's will be absorbed by the Fish and Wildlife Service through its annual budget for the Cameron Prairie NWR.

e. Operation and maintenance costs are expected to be absorbed by the Fish and Wildlife Service in its annual budget for the Cameron Prairie NWR.

f. Project monitoring costs will be absorbed by the Fish and Wildlife Service through its annual budget for the Cameron Prairie NWR.

g. Crain Brothers, Inc. of Grand Chenier, LA provided these construction cost estimate. Contact Mr. Charles Perry or Paula Mudd at 318-538-2411.

5. STATUS OF ENVIRONMENTAL COMPLIANCE

a. NEPA documents have not been prepared but all necessary documents will be prepared by the Service in a timely manner should this project be funded.

b. Section 10/404 permit will be required, and an application for that permit has been submitted. Cameron Prairie is covered by General Permit (NOD-25) which covers all work on National Wildlife Refuges except that adjacent to the GIWW.

c. Louisiana Coastal Management Program permits are not required because Cameron Prairie is not located in the Louisiana Coastal Zone.

d. Louisiana Water Quality Certification will be obtained shortly after the time of application for the Section 10/404 permit from the Corps of Engineers.

e. Endangered Species Act: The project is not expected to have adverse impacts to any species covered by this act.

6. PROJECT IMPLEMENTATION SCHEDULE

a. Engineering and design start date is November 28, 1991.
b. Engineering and design finish date is February 1, 1992.
c. Construction start date is April 1, 1992.
d. Construction finish date is August 31, 1992.

7. POTENTIAL FUNDING SOURCES

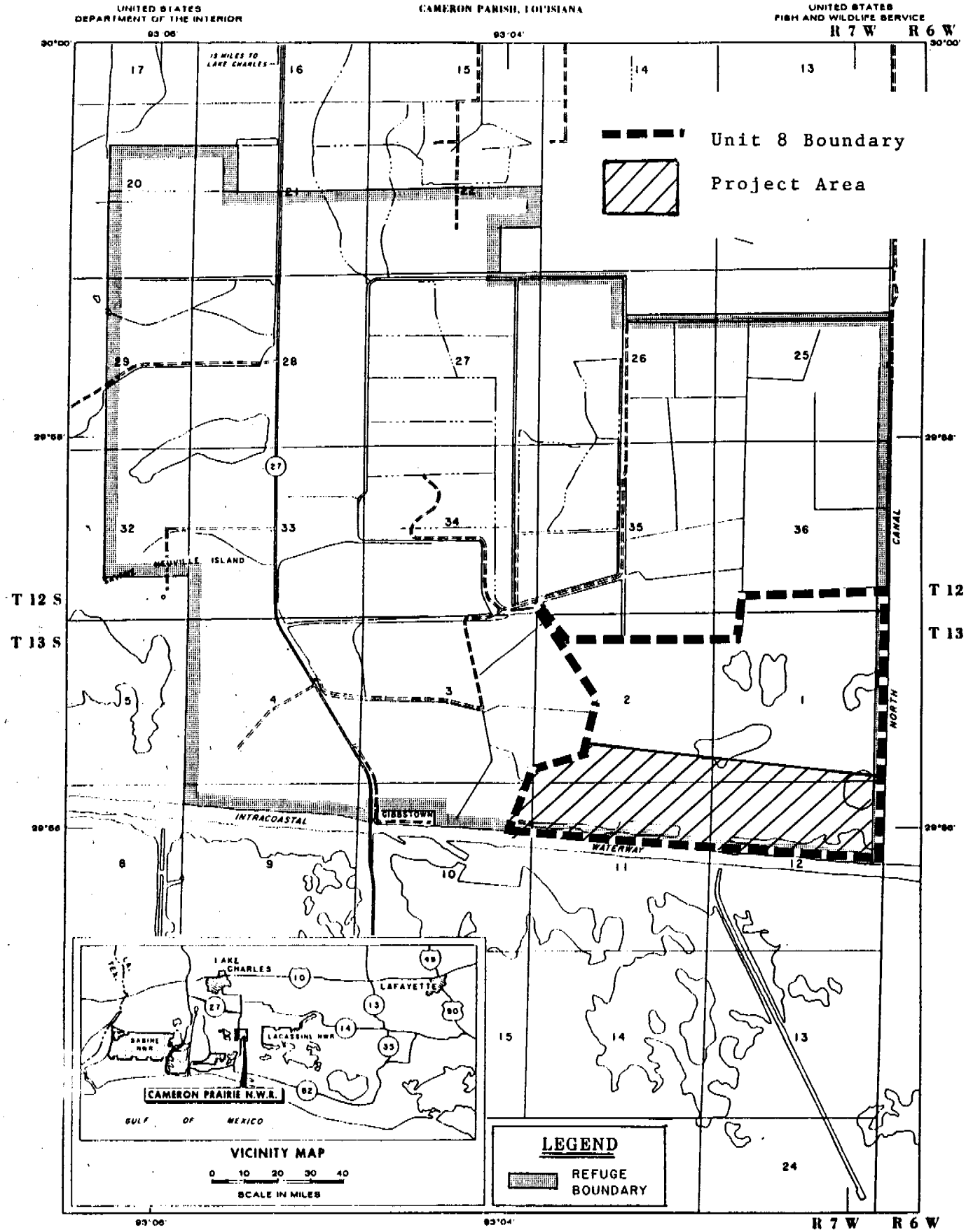
a. Federal Funding Source(s).

1. Coastal Wetland Planning, Protection and Restoration Act.
2. Annual Budget of the Cameron Prairie NWR for monitoring, operations and maintenance.

b. Non-federal Funding Source(s).

1. State of Louisiana-Coastal Restoration Program.

CAMERON PRAIRIE NATIONAL WILDLIFE REFUGE



E-L5

4RLA1084 404

PROJECT: CAMERON-PRAIRIE NWR

TOTAL FIRST COSTS	$1,066,000
TOTAL FULLY FUNDED COSTS	$1,111,000

ANNUAL CHARGES	PRESENT WORTH	AVERAGE ANNUAL
INTEREST & AMORTIZATION	$1,111,555	$119,603
MONITORING		$0
IMPACT TO WATER SUPPLY		$0
ACCESS OIL & GAS		$0
INDUCED DREDGING		$0
IMPACT TO SHIPPING		$0
EMERGENCY CLOSURE		$0
OYSTER LEASES		$0
O & M COSTS		$0
REPLACEMENT COSTS		$0
OTHER COSTS		$0
TOTAL	$1,111,555	$119,603

AVERAGE ANNUAL HABITAT UNITS	37.72
COST PER HABITAT UNIT	$3,171
AVERAGE ANNUAL ACRES OF EMERGENT MARSH	131

COASTAL WETLANDS PLANNING, PROTECTION, AND RESTORATION ACT

APPENDIX E

November 18, 1991

TAB M

VERMILION RIVER CUTOFF SHORELINE EROSION CONTROL

Vermilion River Cutoff

Candidate Project
for the
Priority Project List
of the
Coastal Wetlands Planning, Protection, and Restoration Act

PROPOSED BY

State of Louisiana

September 27, 1991

Revised

POINT OF CONTACT: Bill Savant
PHONE: (504)342-7308

PROJECT DESCRIPTION

Location and size

The Vermilion River Cutoff, near Intracoastal City in Vermilion Parish, connects the Vermilion River and the GIWW with Vermilion Bay for navigational purposes. The project impact area is approximately 200 acres. The center of the project site is located at latitude 29°45'08" and longitude 92°07'17".

Justification

A barrier between the Vermilion River Cutoff and Vermilion Bay is needed to protect the marsh area behind the navigational waterway and provide the opportunity to restore at least 11 acres of vegetated wetlands and protection of 54 acres of brackish marsh. The project would use dredge material, sediment traps, and vegetation to restore the barrier.

Objectives

The objective of the project is to reestablish a section of marsh bank along the west side of the Vermilion River Cutoff through the use of structural measures which provide shoreline protection and allow for sediment accretion.

Project features

A large section of the west bank of the Vermilion River Cutoff has eroded away as a result of both bay-side wave action and boat wakes within the channel. A wide, shallow area through which flow is diverted from the navigation channel has developed and may also contribute to increased future dredged needs.

A rock armored structure will be constructed in the critical section of the west channel bank and sediment trapping devices and vegetative plantings will be utilized to restore a vegetated wetland area between Vermilion Bay and Vermilion River Cutoff. The rock armor will have a Gravelite base and will be 6200 feet long with a 100 foot opening retained in the area of a historic natural channel. The opening will allow for ingress and egress of marine organisms and will maintain a natural waterway which provided access to Onion Lake prior to construction of the Vermilion River Cutoff.

A wave dampening brush fence will be constructed 350 feet behind the armor structure to reduce wave energy and collect suspended sediments. Plantings will be done as needed to increase capture of suspended sediment that passes through the brush fence and stabilize the newly formed marsh. The length of the brush fence is estimated to be about 4300 feet with a 100 foot break for the natural waterway.

An original natural channel existed that was estimated to be 100 feet in width. However, due to erosion it is approximately 1200 feet at present. The armor will be placed to leave the natural channel (100 ft) in tact for marine organism ingress and egress, and navigation. The rock armor will line the natural channel and allow for intersection with the brush fence. This will add another 700 feet of rock armor to the project site.

ANTICIPATED BENEFITS

Type(s) and acres of coastal wetlands enhanced, and the degree and nature of the enhancement

None.

Type(s) and acres of coastal wetlands created

None.

Type(s) and acres of coastal wetlands protected

The rock armor and brush fence will protect approximately 54 acres of brackish marsh on the eastern side of the channel from waves generated in Vermilion Bay. However, boat wakes generated in the GIWW will still impact the eastern side of the Vermilion River Cutoff.

Type(s) and acres of coastal wetlands restored

The deposition of sediments will restore eleven acres of open water to brackish marsh between the rock structure and brush fence.

Duration (life expectancy) of coastal wetland benefits

The project has an expected life of twenty years.

Benefits to coastal wetland dependent fish and wildlife populations

Eleven acres of vegetated wetlands will be created for use by fish and wildlife.

Other significant benefits

The brush fence and rock armor will protect and maintain the newly created marsh and reduce the erosion from wind generated wave action on the Onion Lake (eastern) side of the Vermilion River Cutoff. The project may also reduce future dredging required for channel maintenance.

ANTICIPATED ADVERSE EFFECTS

Types and acres of coastal wetlands and other habitats adversely affected by the project

There are no anticipated adverse affects.

Conflicts with other project and programs

The project site has had no previously recorded or proposed Coastal Use Permits.

COSTS

Estimated costs and sources of the estimates are as follows:

Engineering and design	$79,500
Supervision and administration of engineering and design	15,900
Project construction & contingency	954,000
Supervision and inspection of construction	79,500
Operation and maintenance	50,000
Project Monitoring for 20 years	41,500
Replacement	80,000

Source(s) of the cost estimate

The source of cost estimates are from Coastal Restoration Staff engineers and biologists. The estimates are based on previous projects with similar features, maintenance, and monitoring requirements.

STATUS OF ENVIRONMENTAL COMPLIANCE

NEPA

The project proposal has been subject to public review as part of the Louisiana Coastal Wetlands Conservation and Restoration Plan. No permit application has been filed.

Section 10/404

A section 10/404 permit will be required. No application has been filed.

Louisiana Coastal Management Program

CRD has a general use permit for any brush fences they build in the coastal zone. No other permits have been filed. The other project features will require a Coastal Use Permit, since the project site is in the Louisiana Coastal Zone. The permit has not yet been filed for these features.

Louisiana Water Quality Certification

The permit has not been filed.

Endangered Species Act

The project is not believed to adversely affect endangered or threatened species. Further evaluation is required before project implementation.

PROJECT IMPLEMENTATION SCHEDULE

	Months
Authorization	0
Planning/Feasibility start date	2
Planning/Feasibility finish date	8
Permit application submittal	8
Complete permit process	14
Engineering and design start date	14
Engineering and design finish date	16
Construction start date	18
Construction finish date	22

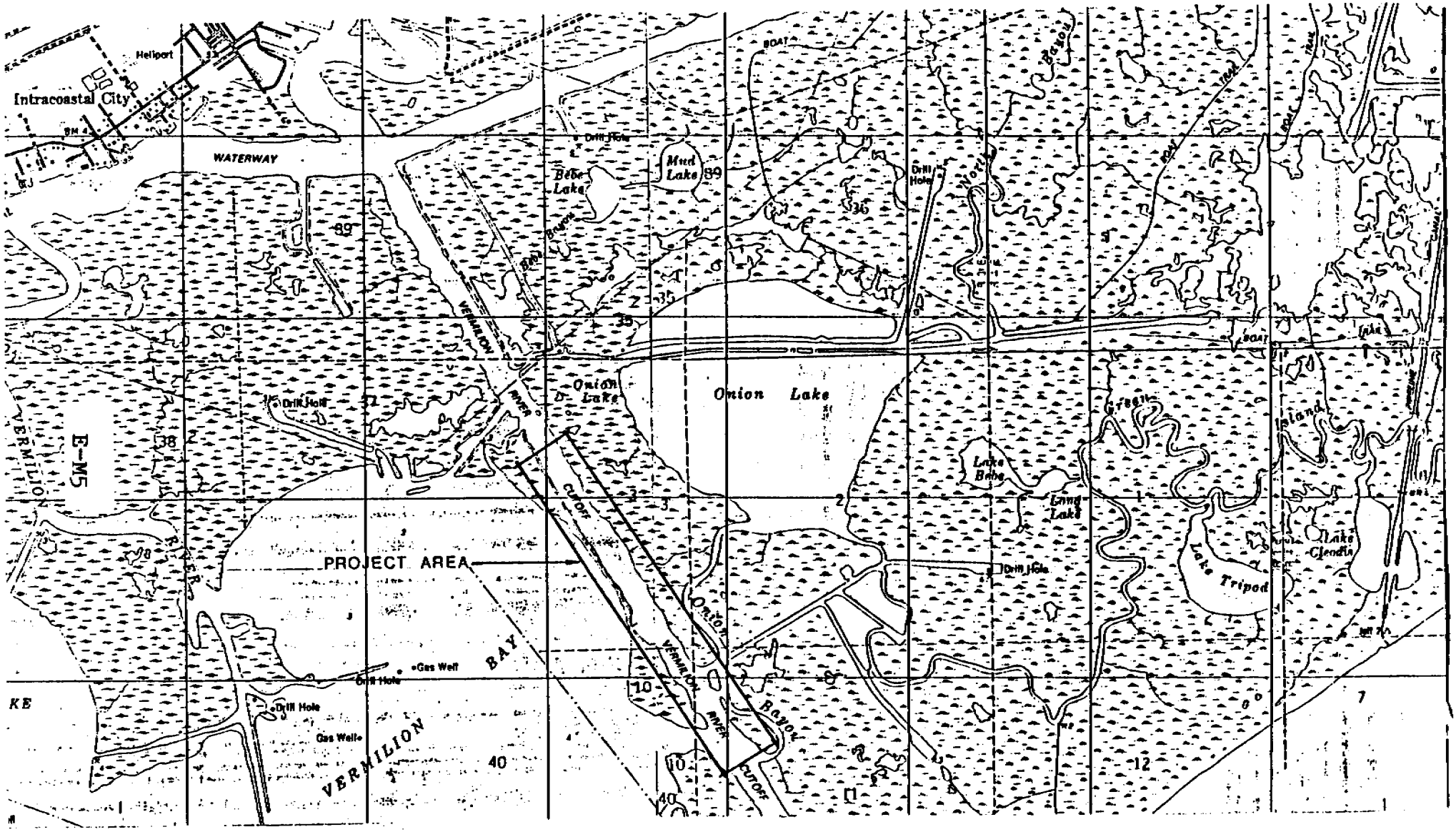
POTENTIAL FUNDING SOURCES

Federal funding source(s)

Potential federal funding sources are the Coastal Wetlands Planning, Protection, and Restoration Act and section 150/1135 as part of maintenance dredging. The entire project could be done in association with maintenance dredging which would also increase project benefits by allowing for immediate creation of a larger marsh area between the rock structure and brush fence. However, the COE has indicated that maintenance dredging is not likely to be required in the near future.

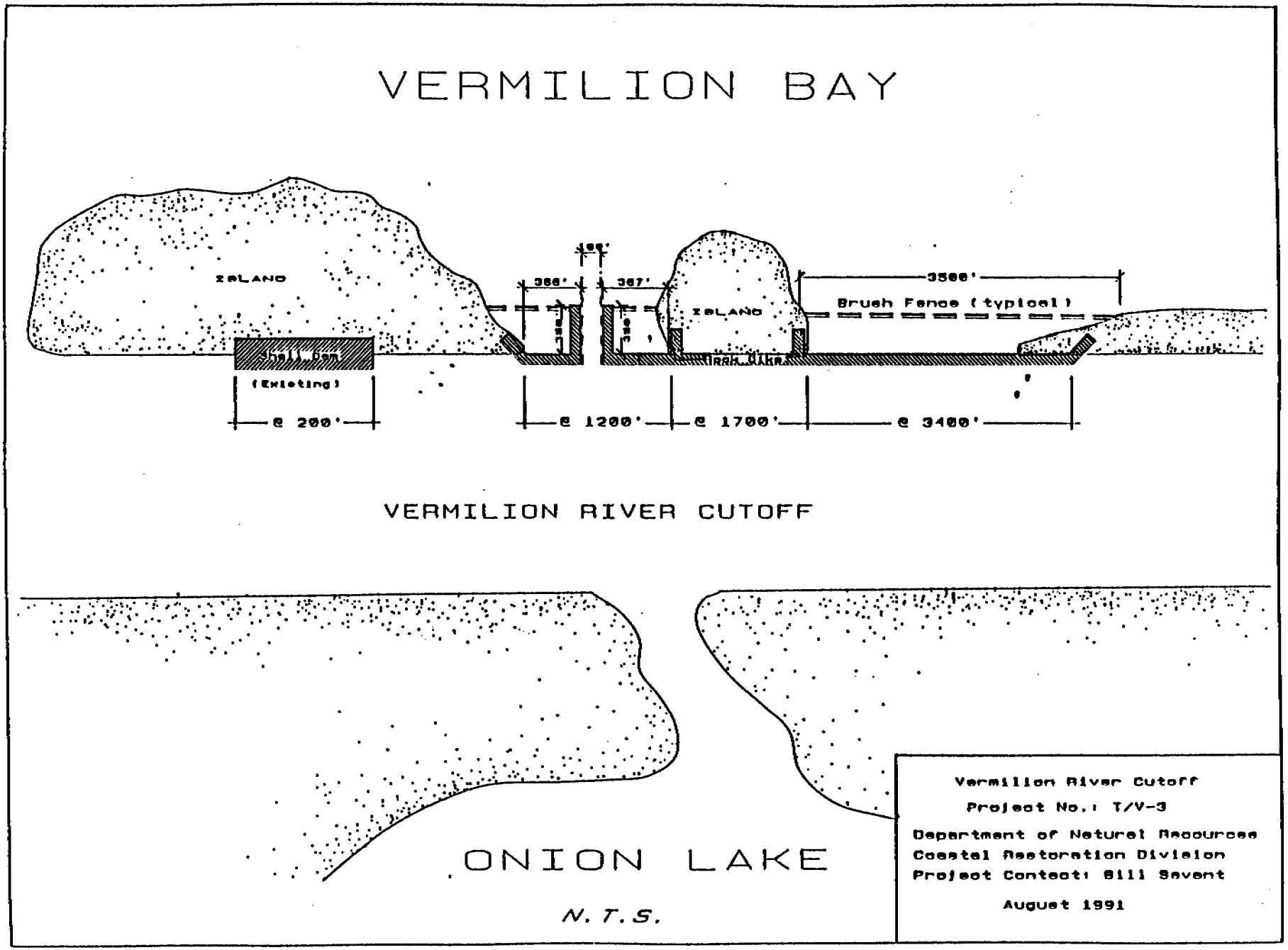
Non-federal funding source(s)

State funding has been authorized in the 1991/92 State Coastal Wetland Conservation and Restoration Plan (Project T/V-3).



VERMILION RIVER CUTOFF PROJECT AREA

NOT TO SCALE


VERMILION BAY
ISLAND
Shell Dam
(Existing)
388'
387'
ISLAND
3500'
Brush Fence (typical)
Shell Dike
@ 200'
@ 1200'
@ 1700'
@ 3400'
VERMILION RIVER CUTOFF
ONION LAKE
N.T.S.
Vermilion River Cutoff
Project No.: T/V-3
Department of Natural Resources
Coastal Restoration Division
Project Contact: Bill Savent
August 1991

E-M7

FIGURE 1

PROJECT: VERMILION RIVER CUTOFF SHORELINE PROTECTION

TOTAL FIRST COSTS	$1,169,000
TOTAL FULLY FUNDED COSTS	$1,523,000

ANNUAL CHARGES	PRESENT WORTH	AVERAGE ANNUAL
INTEREST & AMORTIZATION	$1,252,801	$134,801
MONITORING	$20,822	$2,240
IMPACT TO WATER SUPPLY		$0
ACCESS OIL & GAS		$0
INDUCED DREDGING		$0
IMPACT TO SHIPPING		$0
EMERGENCY CLOSURE		$0
OYSTER LEASES		$0
O & M COSTS	$23,873	$2,569
REPLACEMENT COSTS	$36,059	$3,880
OTHER COSTS		$0
TOTAL	$1,333,555	$143,491

AVERAGE ANNUAL HABITAT UNITS	23.16
COST PER HABITAT UNIT	$6,196
AVERAGE ANNUAL ACRES OF EMERGENT MARSH	37

COASTAL WETLANDS PLANNING, PROTECTION, AND RESTORATION ACT

APPENDIX E

November 18, 1991

TAB N

EASTERN ISLE DERNIERES BARRIER ISLAND RESTORATION

EASTERN ISLES DERNIERES BARRIER ISLAND RESTORATION/COASTAL WETLAND CREATION

Candidate Project
for the
Priority Project List
of the
Coastal Wetlands Planning, Protection and Restoration Act

Local Sponsor
Terrebonne Parish Consolidated Government

PROPOSED BY
U.S. Environmental Protection Agency, Region 6

Point of Contact: Jeanene Peckham
Phone: (214) 655-2263

COASTAL WETLANDS PLANNING, PROTECTION AND RESTORATION ACT
PROPOSED PROJECT
EASTERN ISLES DERNIERES BARRIER ISLAND RESTORATION, COASTAL WETLAND CREATION

PROJECT DESCRIPTION

LOCATION:

The project involves restoration of Eastern Isles Dernieres in Terrebonne Parish and includes marsh creation. The project is centered at Longitude 90* 42' west and latitude 29* 03'north. (FIGURE 1)

JUSTIFICATION:

The U.S. Geological Survey Circular 1075, 1990, features the Isles Dernieres in its publication entitled COASTS IN CRISIS and states that due to natural and human forces, the island has one of the most rapidly deteriorating shorelines in the world. The entire chain may be submerged by 2020, with Eastern Isle Dernieres predicted to be submerged much earlier. Using the Louisiana Geological Survey shoreline erosion rates, Eastern Isles Dernieres except for approximately 30 acres will be lost in 20 years.

The rapid erosion, breaching, and disappearance of the island will expose the wetlands and estuaries adjacent to greater wave and current action. Bay areas will be open to direct wave attack from the Gulf of Mexico, and increase the frequency and residence time of saline water incursions and the impact of tidal cycles. The result is accelerated conversion of estuarine areas to a less productive open Gulf of Mexico habitat.

Without the protection of barrier islands, the estuaries in the lower deltaic plain are susceptible to a dramatic increase in erosion rates, and, consequently, further land loss.

Restoration of barrier islands is considered a vital component in any comprehensive plan for wetlands protection in Louisiana and was addressed in the State's application for the Terrebonne-Barataria Estuary to be included in the National Estuary Program.

Experience has demonstrated that the most cost-effective method of restoration is to use only sediment and vegetation to nourish beaches and to build back-island marshes. Extensive information is included in Penland et al (1990), McBride et. al., (1989) and a number of other reports listed as references.

OBJECTIVES

The objectives of the project are to restore the coastal dunes and wetlands of the Eastern Isles Dernieres, enhance the physical integrity of the islands, and protect the lower

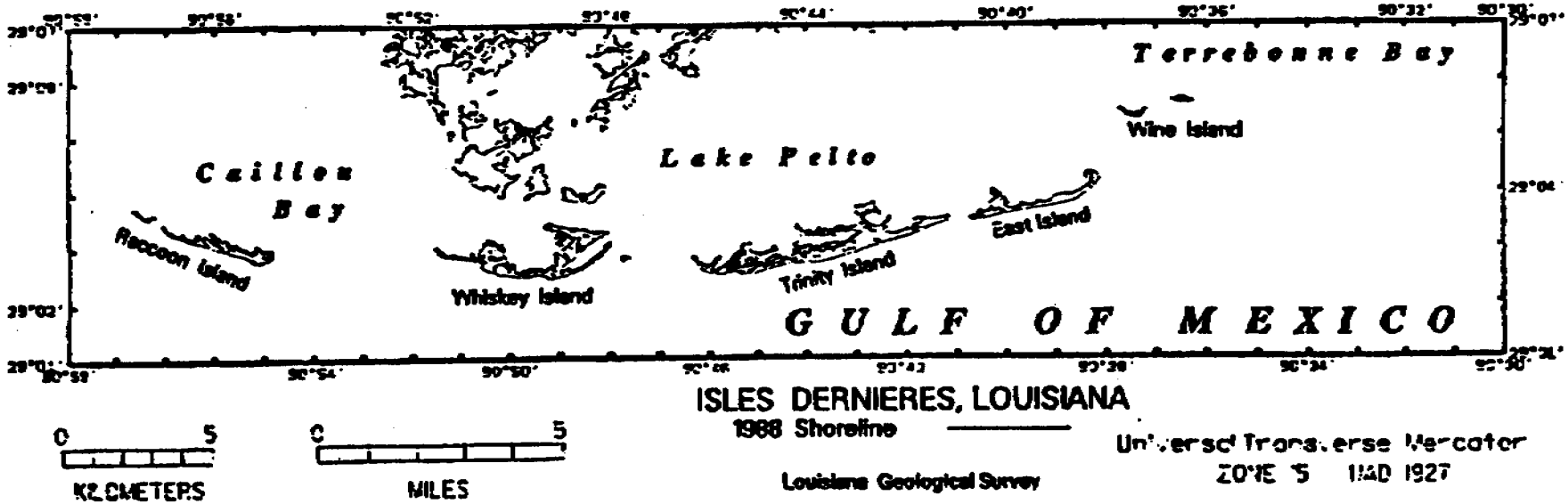

Terrebonne Bay
Wine Island
Lake Pelto
Caillou Bay
Raccoon Island
Whiskey Island
Trinity Island
East Island
GULF OF MEXICO
ISLES DERNIERES, LOUISIANA
1988 Shoreline
Louisiana Geological Survey
Universal Transverse Mercator
ZONE 15 NAD 1927
0 5
KILOMETERS
0 5
MILES

FIGURE 1

Terrebonne estuary and associated vegetated wetlands against direct exposure to the Gulf of Mexico.

Specific objectives are to increase the height and width of the barrier island, and close breaches, using sediment and vegetation. The overwash will be prevented and will lessen loss of back marsh. Habitat will be provided for fish and wildlife, including migratory birds.

PROJECT FEATURES

The proposed two-mile restoration and marsh creation is based on experience gained in a successful pilot project implemented by Terrebonne Parish in 1985. As illustrated in Figure 2, overwash sediments will be used to build up dunes; dune height will be approximately 8 feet and dunes will be seeded.Emergent sands will be used to close breaches and build retaining structure behind and over which dredged material will be pumped. (Figure 2)

Sediment will be suction dredged from bay areas behind the island and used to hydraulically fill the area between dunes and earthen retaining structure. An elevated platform up to 3 feet NGVD will be planted with species appropriate to brackish marsh. This project will create wetlands and provide wildlife and fisheries habitat.

The project will be additive to the existing restoration at the eastern most end and will extend two miles to the west. At least 105 acres of saline marsh will be directly created by the project.

WETLANDS PROTECTED

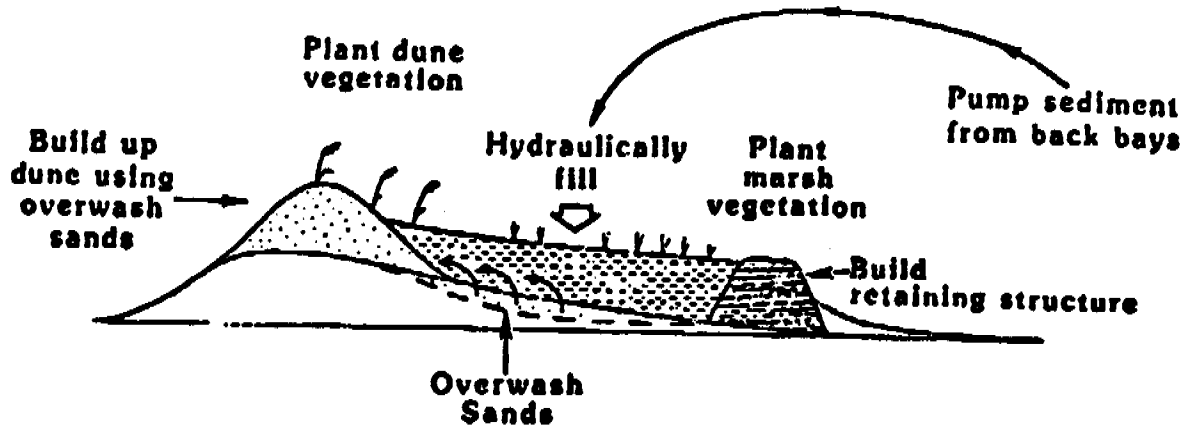
Construction of a barrier island system which is continuous, high and wide will provide greater protection to back-barrier bays, estuaries and marshes, compared to the existing system. The protection comes from a combination of island features, including: reduction of overwash erosion and island breaching; reduction of fetch for local wind-induced waves; greater energy dissipation of storm surges; fewer tidal inlets and less saline intrusion. Direct benefits have been estimated beyond those retaining the integrity of the island itself, to a reduction in land loss at least 100 acres per mile of restoration, however, these benefits are not included in the approach to evaluation of benefits.

LIFE EXPECTANCY OF BENEFITS

The lifetime of the islands will be extended to possibly some 30-40 years in to the future. See diagram for remaining project area after 20 years. (Map, Future with Project)

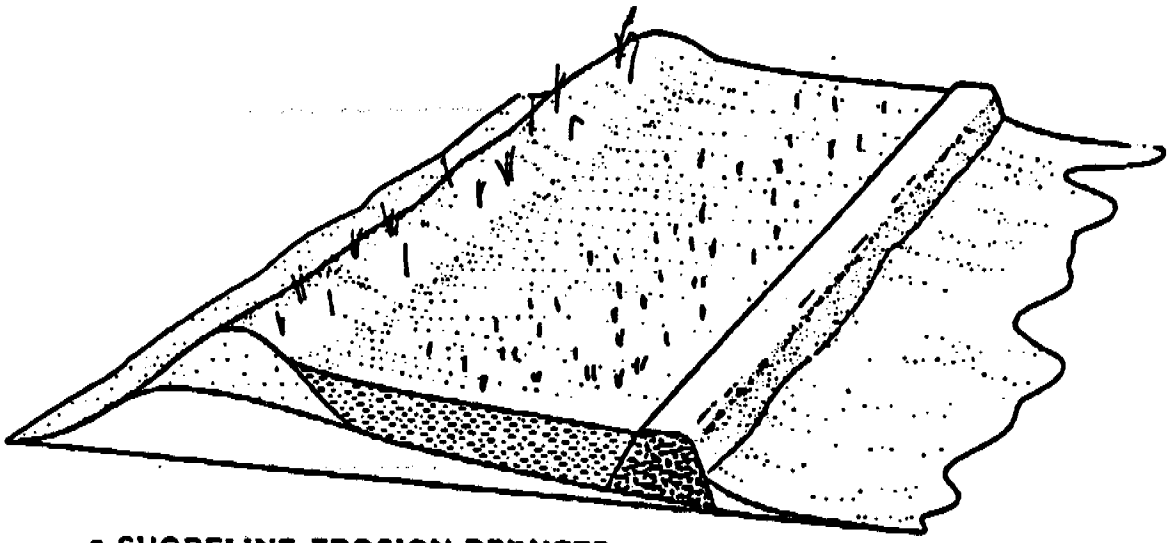
A

SHORELINE AND BARRIER ISLAND RESTORATION



B

SHORELINE AND BARRIER ISLAND RESTORED



- SHORELINE EROSION REDUCED
- DUNES RESTORED
- ISLAND WIDTH AND HEIGHT INCREASED
- BACK BARRIER RETAINING STRUCTURE COMPLETED
- BREACHES SEALED
- MANMADE CANALS FILLED

FIGURE 2

SECTION 10/404

Section 10/404 permits will be needed for the proposed dredging and for discharge into waters of the United States. No aspects of the project are known to pose a significant permitting problem. The dredging area for Eastern Isles Dernieres previously has been permitted by the New Orleans District Corps of Engineers.

LOUISIANA COASTAL MANAGEMENT PROGRAM

The project is located in the Louisiana Coastal zone and requires a Coastal Use Permit. There are no aspects of the project which are known to pose a significant permitting problem. The dredging area for Eastern Isle Dernieres previously has been permitted by the State of Louisiana Department of Natural Resources, Coastal Management Division.

LOUISIANA WATER QUALITY CERTIFICATION

No request for certification has been filed. There are no aspects of this project which are known to pose a significant certification problem.

ENDANGERED SPECIES ACT

This project is not believed to adversely affect endangered or threatened species, but the project will be coordinated with the U.S. Fish and Wildlife Service.

PROJECT IMPLEMENTATION SCHEDULE

Construction is proposed to be completed in approximately 14 months after listing.

POTENTIAL FUNDING SOURCES

FEDERAL FUNDING SOURCE(S)

No present Federal funding sources have been identified other than the Coastal Wetlands Planning, Protection and Restoration Act.

NON-FEDERAL FUNDING SOURCE(S)

Only known non-Federal funding sources are from the State of Louisiana and the Terrebonne Parish Consolidated Government.

BENEFITS TO WETLAND DEPENDENT FISH AND WILDLIFE POPULATIONS

Creation of marsh on the islands will provide direct habitat for fish and wildlife, including nesting area for shore birds, such as brown pelicans. (A usage by birds for nesting and for use of fresh water retained from precipitation on the flattened area adjacent to dunes, which did not exist previous to the restoration, has been observed at the small restoration site of 1985.

OTHER SIGNIFICANT BENEFITS

This project builds upon the previous success of the Terrebonne Parish demonstration project and is supportive of local initiatives for coastal zone protection and restoration. For example, by reducing storm surge impacts, the project will enhance local flood protection programs.

ANTICIPATED ADVERSE EFFECTS

ADVERSE EFFECTS ON WETLANDS AND OTHER HABITATS

Dredging has adverse impacts on bottom habitat; previous studies indicate effects in the project area should be minimal. The filling of wetland between dunes and the sand retention may encroach on some existing saltwater marsh but is minimal.

CONFLICTS WITH OTHER PROJECTS AND PROGRAMS

No conflicts with other programs are apparent. The project is expected to be beneficial for the National Estuarine Program for the Terrebonne-Barataria Estuary.

PUBLIC SUPPORT

IT SHOULD BE NOTED THAT A HIGH LEVEL OF PUBLIC SUPPORT IS INDICATED BY THE PARISH. ATTACHED IS A LETTER OF INTEREST BY PRESIDENT DUHE', TERREBONNE PARISH CONSOLIDATED GOVERNMENT.

STATUS OF ENVIRONMENTAL COMPLIANCE

NEPA

EPA anticipates an Environmental Assessment and Finding would be completed in early 1992. A draft Environmental Assessment has been prepared for a previously proposed restoration project, this information will be helpful in preparing NEPA documents for this project.

OFFICE OF THE PRESIDENT
TERREBONNE PARISH CONSOLIDATED GOVERNMENT
P. O. BOX 6097
HOUMA, LOUISIANA 70361

T. L. "TEDDY" DUHE'
PARISH PRESIDENT

(504) 873-6401

July 31, 1991

Mr. Russell S. Rhoades, 6E
Director of Environmental Services Division
1445 Ross Avenue
Dallas, TX 75202

**RE: EPA Barrier Island Pilot Project
Terrebonne Parish**

Dear Mr. Rhoades:

In 1978, Terrebonne Parish established and maintains through today, the restoration of its Barrier Island as a major priority of the Parish. As evidence of this priority and its commitment to it, the Parish has spent over $1 million of local funds to date toward Barrier Island restoration projects. In addition, the Parish has worked closely with State and Federal agencies to produce the same end results.

EPA's current interest in Terrebonne's Islands, as expressed by Ms. Jeanene Peckham of your office is gratifying.

At this time, Terrebonne Parish is interested in further pursuing the development of an EPA/local sponsored project.

If my office can be of any assistance in this matter, please do not hesitate to call.

Sincerely,

T.L. "Teddy" Duhe'
Parish President

TLD/eja

xc: Mr. Jim Edmonson

EASTERN ISLE DERNIERES RESTORATION

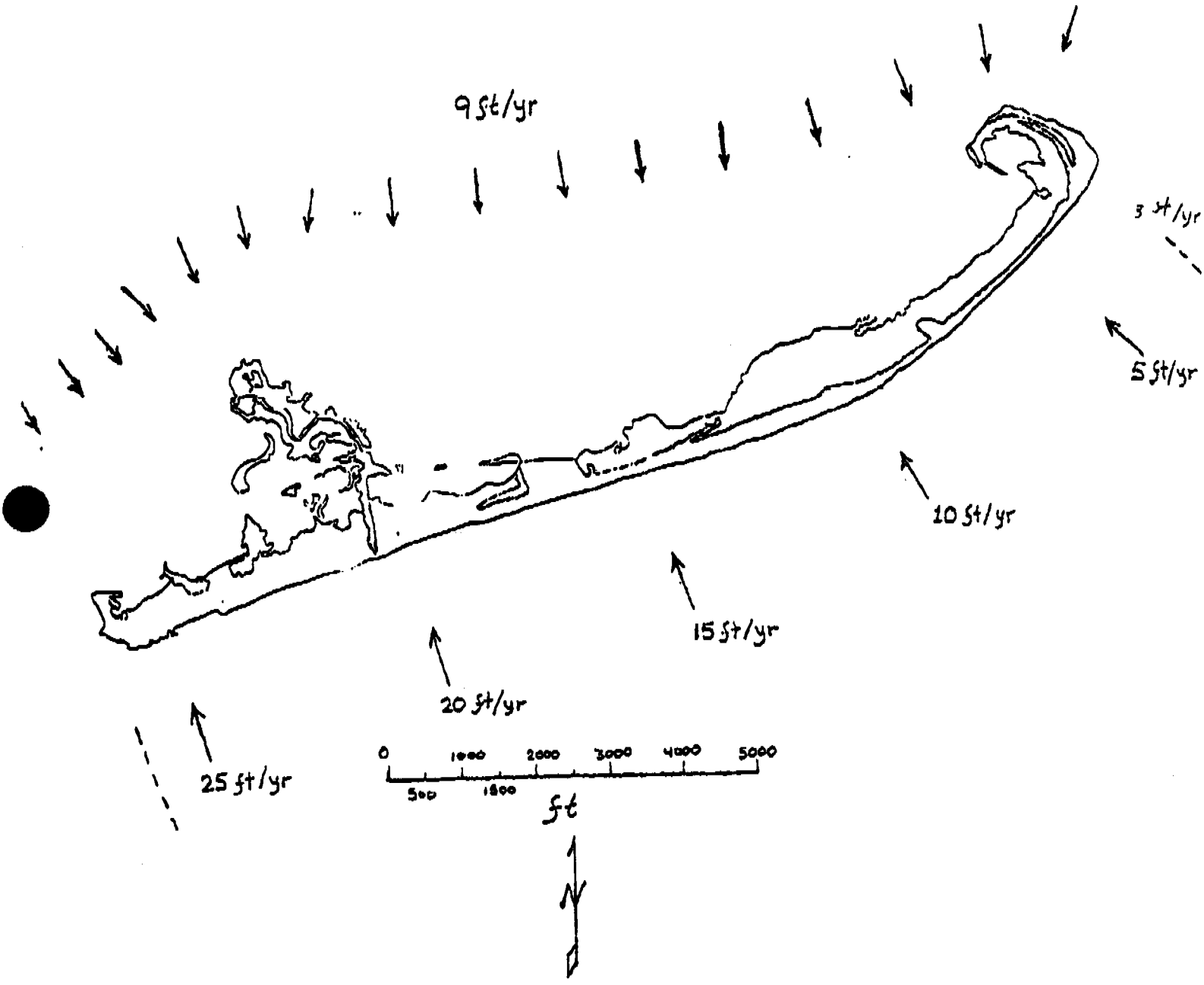
Wetland Value Assessment

Methodology

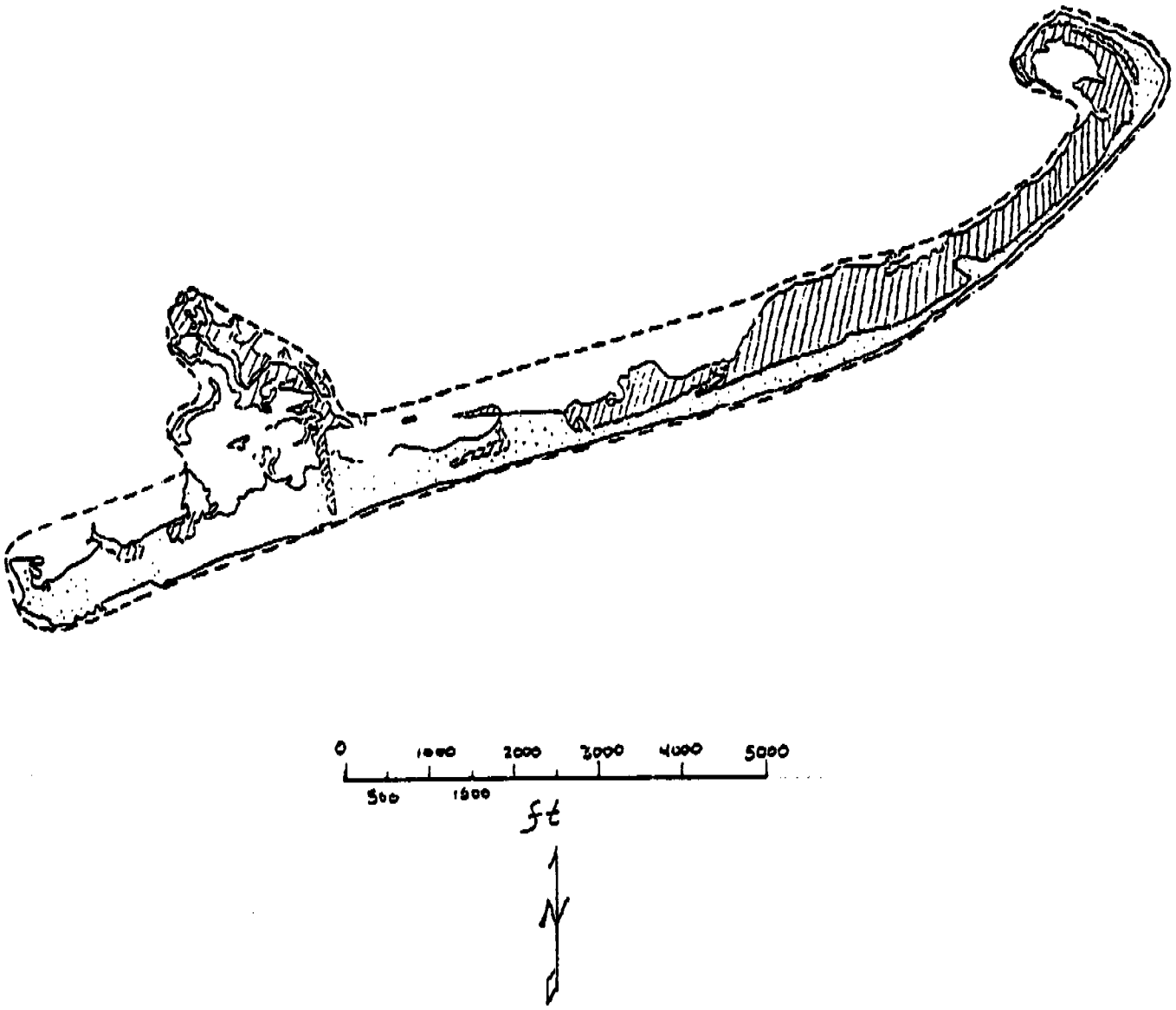
The study site was delineated from 1989 color infrared (CIR) aerial photography. The Island was then surrounded by a study site boundary which remained constant throughout the project life and each habitat type was indicated on the study site map. Louisiana Geologic Survey shoreline erosion rates on the beach side of the east, west, and backside of the island were 3 ft/yr, 25 ft/yr, and 9ft/yr, respectively. Erosion rates on the beach side were pro-rated from east to west into 3, 5, 10, 15, 20, and 25 ft/yr. Erosion rates were then used to determine island habitat acreage over 5-yr periods, both with and without the project. Erosion rates were assumed not to change with the project.

From the baseline data, maps for years 5, 10, 15, and 20 were drawn both with and without project, based on the above shoreline erosion rates. Acreage were planimetered for each (Table 1). It was assumed that the unvegetated beach and foredune of the island remained fairly constant and moved back as the shoreline eroded with and without the project. Also, it was assumed that the saline marsh, which received only irregular tidal flooding comprised 10 percent of the total saline marsh at baseline. This area moved back as the unvegetated dune moved.

Once areas were obtained for each year, they were used to formulate the HSI for each variable (Table 2). Average Annual Salinity (Variable 6) was assumed to be 22 ppt and was not expected to chance with the project. Also, no modifiers were present both before or after the project for Aquatic Organism Access (Variable 7). For both Water Duration (Variable 4) and Open Water Depth (Variable 5), a weighted average was used to indicate the HSI, Acreage from each category were multiplied by their SI, added together and divided by the total amount of acreage available in that category.

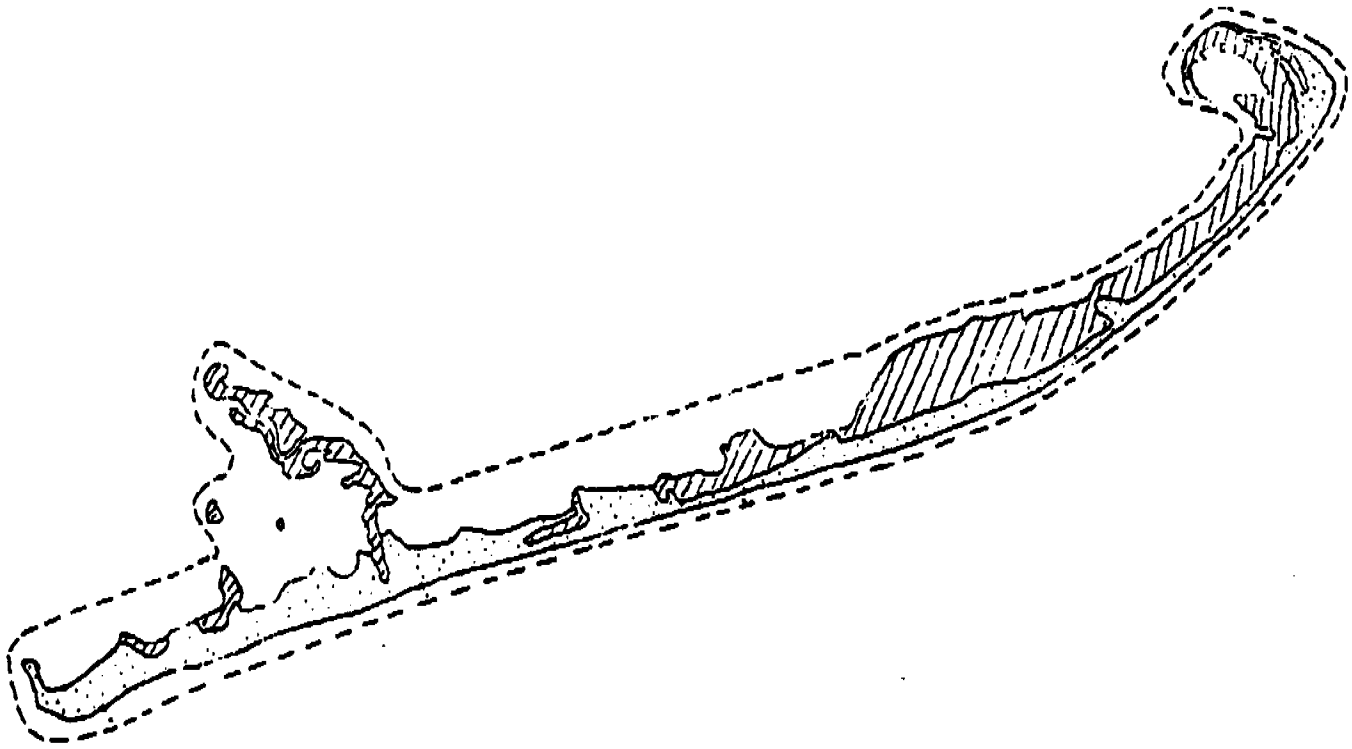


MAP
EROSION RATES
E-N11



MAP
BASELINE

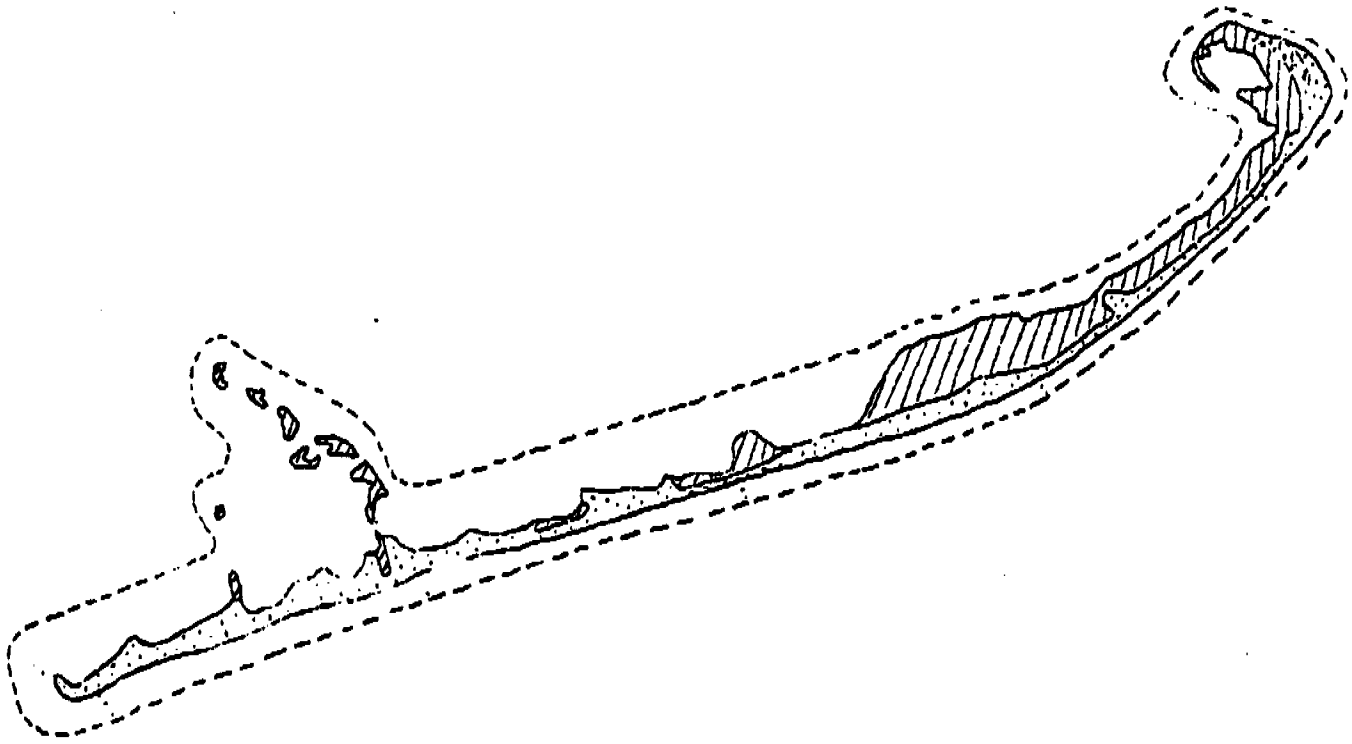
E-N13



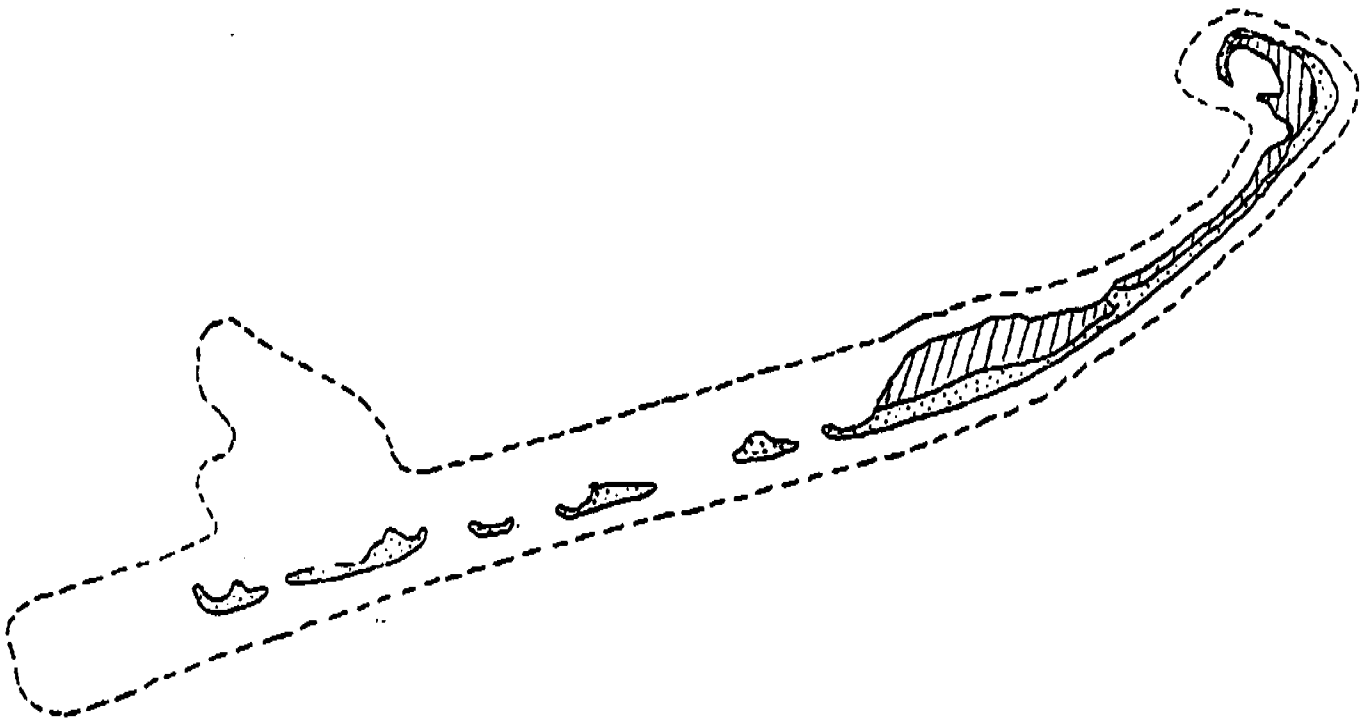
MAP

5 YEARS WITHOUT PROJECT

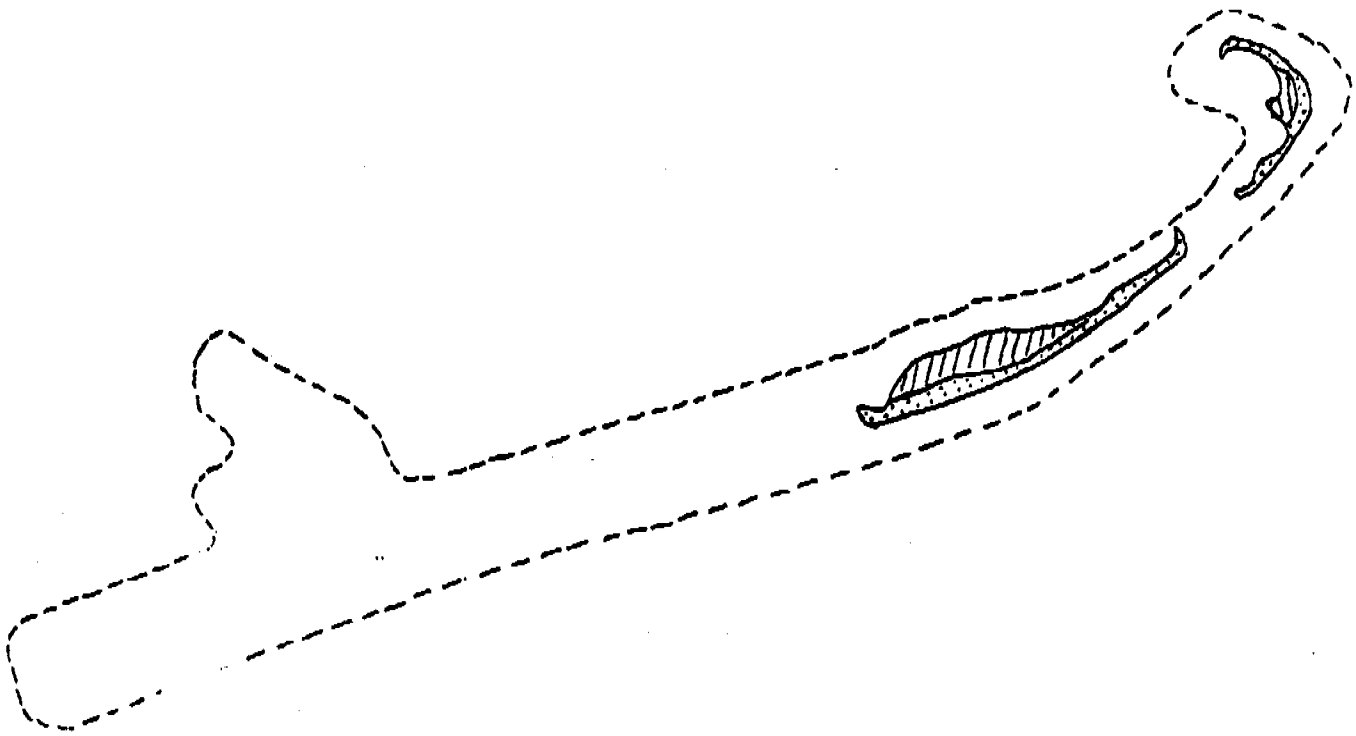
E-N15



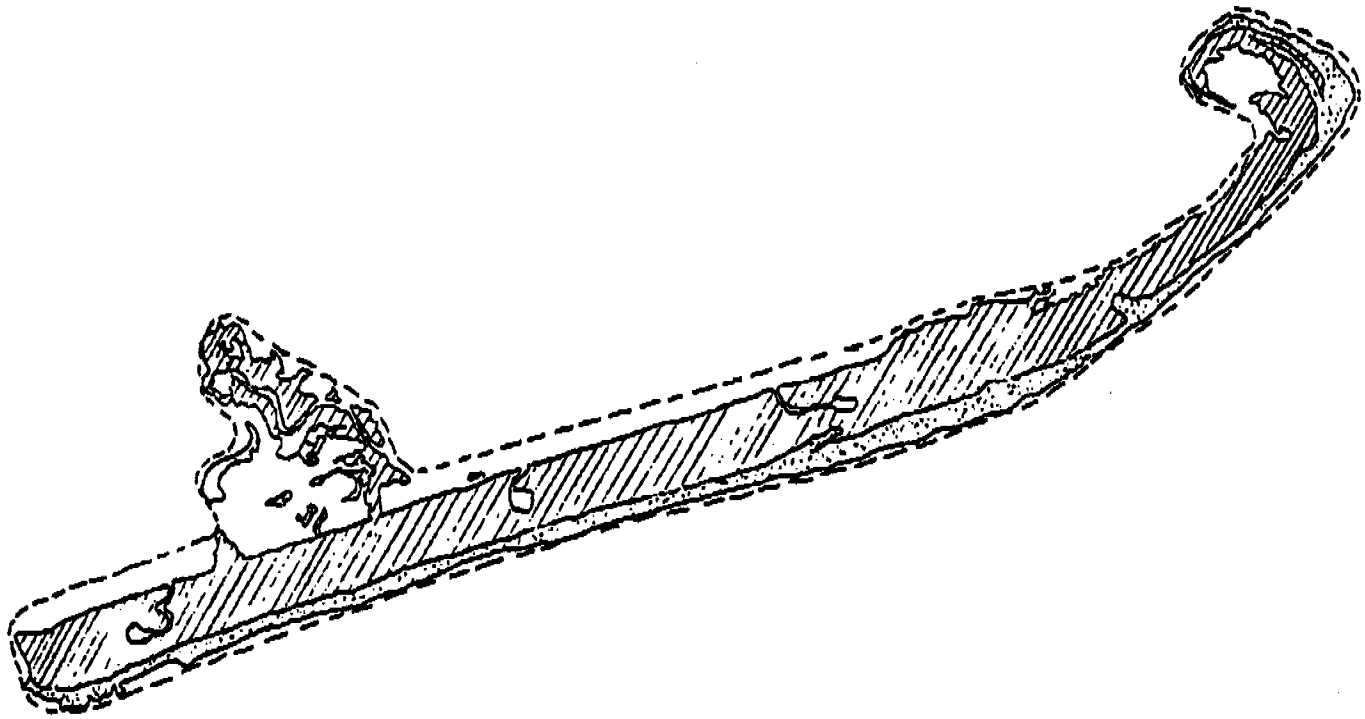
MAP
10 YEARS WITHOUT PROJECT
E-N17



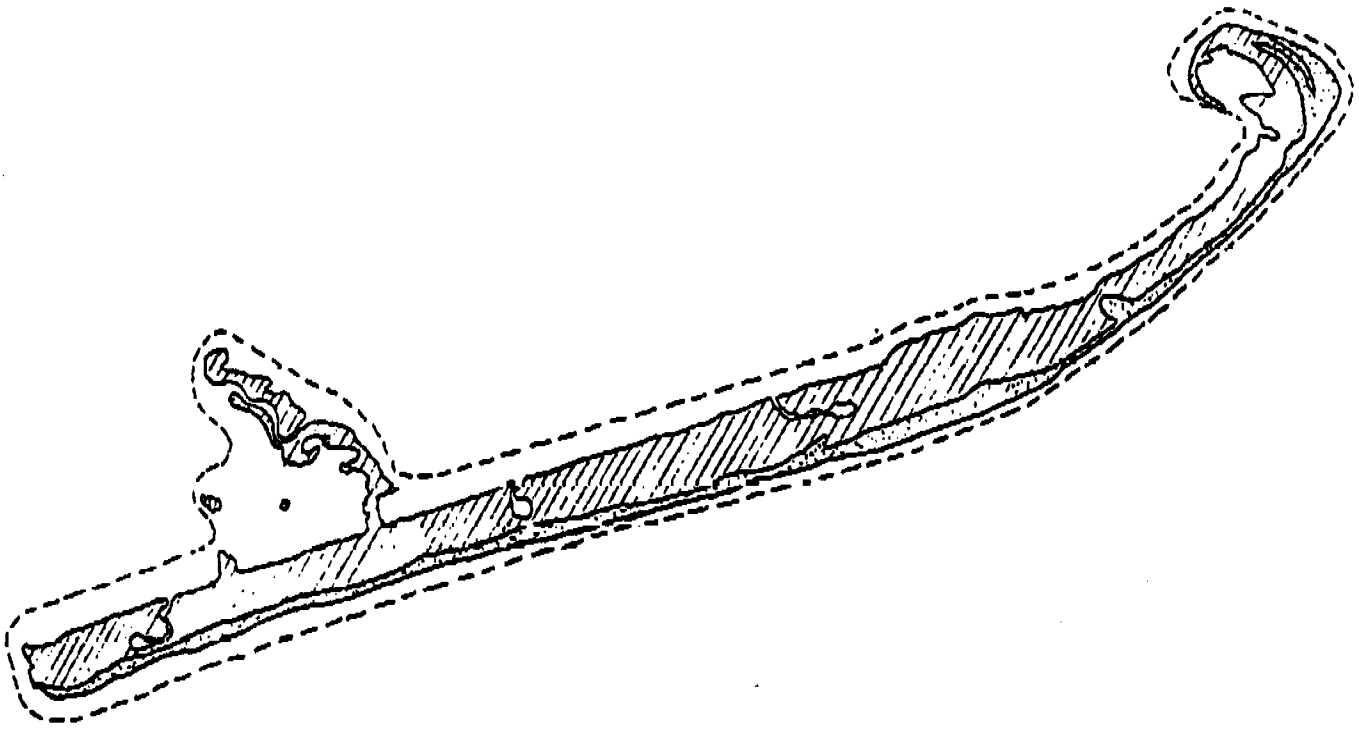
MAP
15 YEARS WITHOUT PROJECT
E-N19



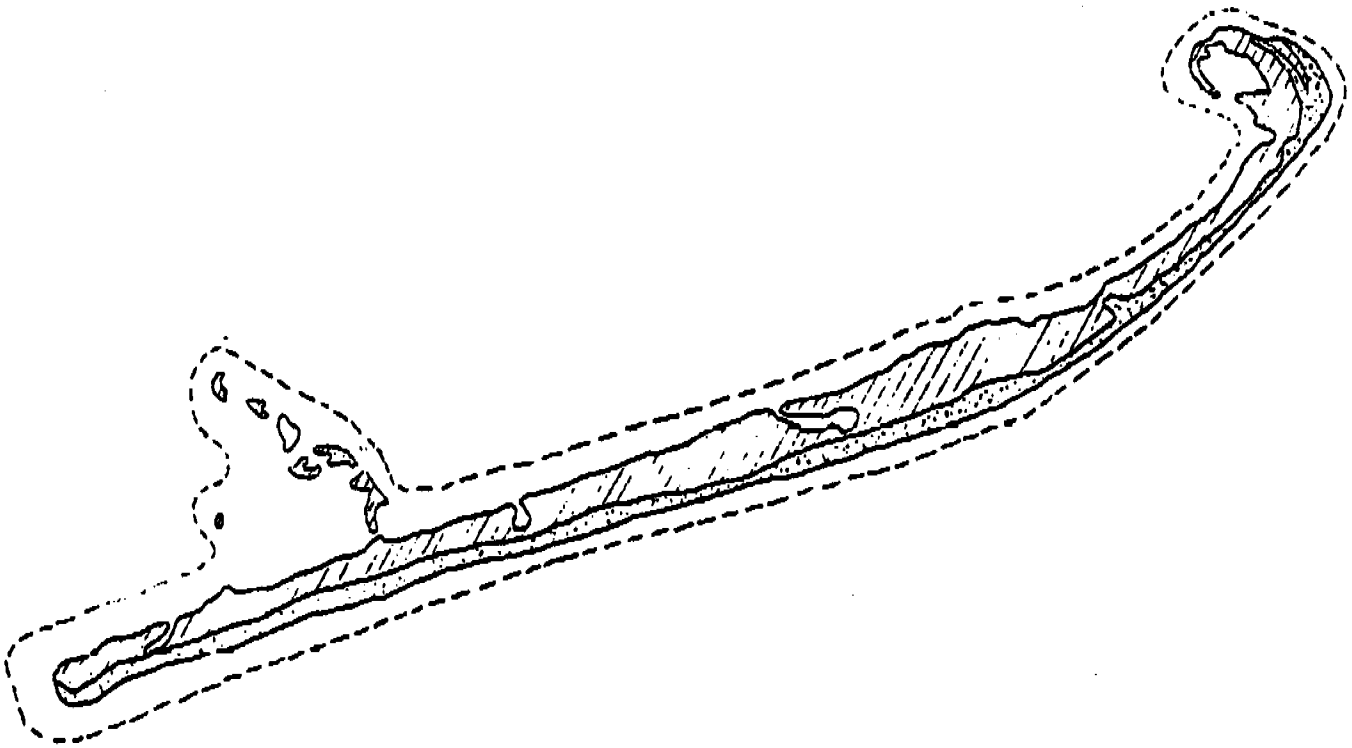
MAP
20 YEARS WITHOUT PROJECT
E-N21



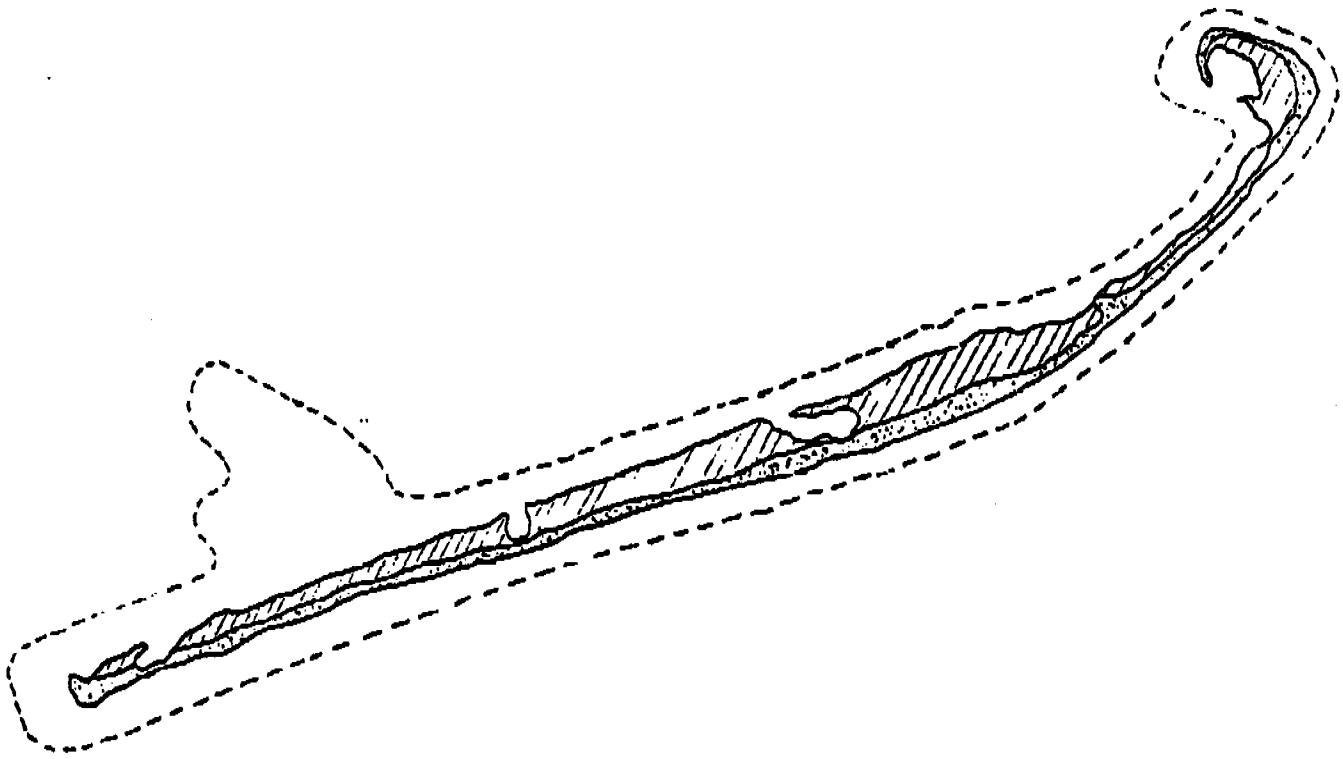
MAP
1 YEAR WITH PROJECT
E-N23



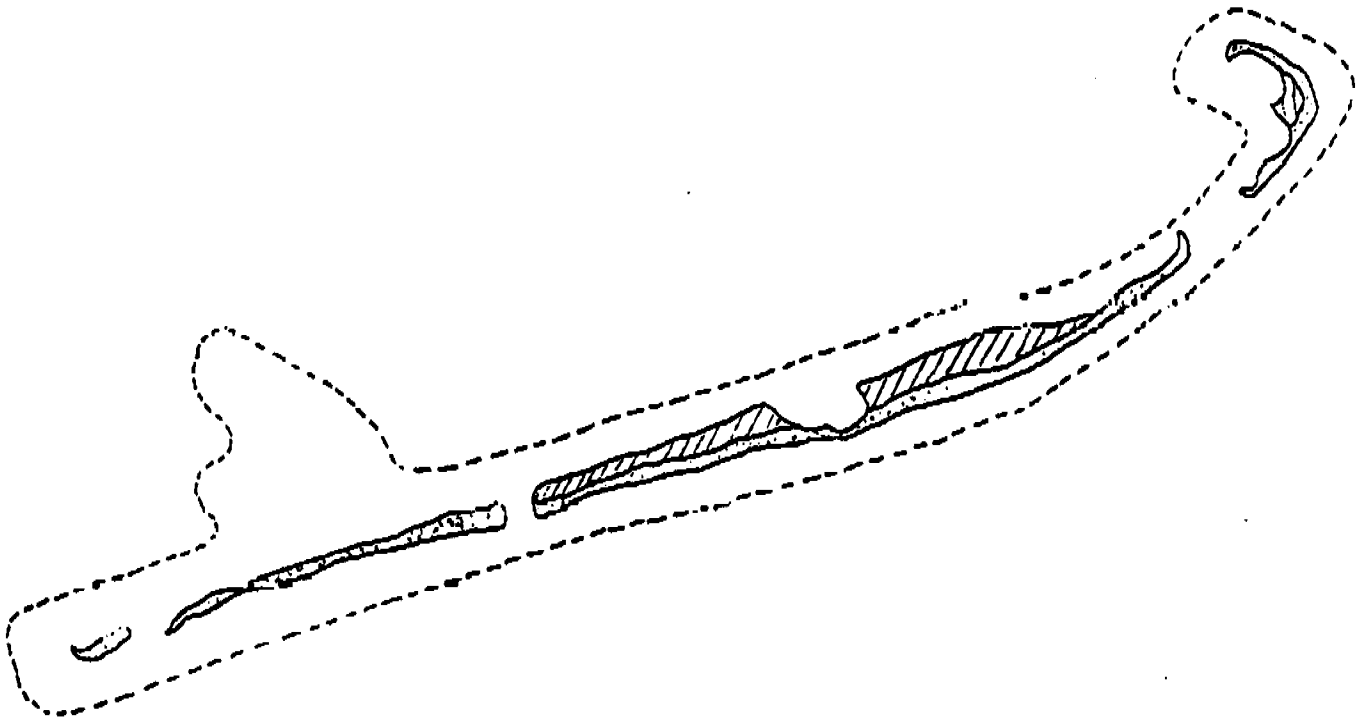
MAP
5 YEARS WITH PROJECT
E-N25



MAP
10 YEARS WITH PROJECT
E-N27



MAP
15 YEARS WITH PROJECT
E-N29



MAP
20 YEARS WITH PROJECT
E-N31

PROJECT: EASTERN ISLES DERNIERS

TOTAL FIRST COSTS	$5,414,000
TOTAL FULLY FUNDED COSTS	$6,345,000

ANNUAL CHARGES	PRESENT WORTH	AVERAGE ANNUAL
INTEREST & AMORTIZATION	$5,674,039	$610,527
MONITORING	$145,374	$15,642
IMPACT TO WATER SUPPLY		$0
ACCESS OIL & GAS		$0
INDUCED DREDGING		$0
IMPACT TO SHIPPING		$0
EMERGENCY CLOSURE		$0
OYSTER LEASES		$0
O & M COSTS		$0
REPLACEMENT COSTS		$0
OTHER COSTS		$0
TOTAL	$5,819,413	$626,169

AVERAGE ANNUAL HABITAT UNITS	44.89
COST PER HABITAT UNIT	$13,949
AVERAGE ANNUAL ACRES OF EMERGENT MARSH	61

COASTAL WETLANDS PLANNING, PROTECTION, AND RESTORATION ACT

APPENDIX E

November 18, 1991

TAB O

GULF INTRACOASTAL WATERWAY TO U. S. HIGHWAY 90 HYDROLOGIC RESTORATION

REVISED

November 13, 1991

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

Candidate Project
for the
Priority Project List
of the
Coastal Wetlands Planning, Protection, and Restoration Act

PROPOSED BY

U.S. Department of Agriculture - Soil Conservation Service

July 29, 1991

POINT OF CONTACT: Bennett C. Landreneau
PHONE: (318) 473-7756
or
Ed Hickey
(318) 473-7816

BA-6 U.S. HIGHWAY 90 to GIWW WETLAND

Location:

This wetland protection and enhancement project is located in Lafourche Parish on the east side of Bayou Lafourche between U.S. Highway 90 and the Gulf Intracoastal Waterway, bounded on the east by Bayou des Allemands.

Center of Project Area: 29° 45' N Latitude
90° 25' E Longitude

Justification:

This area was recognized in the identification of management needs for the Barataria Basin by the Barataria Basin Technical Working Group (Hartman and Cahoon, 1988) and by the Coastal Restoration Technical Committee, 1988. The need for implementation of protective measures stems from several considerations which include: (1) status and trend of wetland loss within this part of Lafourche Parish and the Barataria estuary; (2) importance of this area from both a biological and a social economic perspective; (3) present integrity of this 40,000 acre area of fresh/intermediate coastal wetlands; (4) imminence of wetland loss; and (5) potential for future restoration if major losses were to occur. Each of these considerations points to the urgency for undertaking measures that will protect and help maintain the area between U.S. Highway 90 and the Gulf Intracoastal Waterway.

In the absence of supplemental freshwater and sediment from the Mississippi River, maintenance of this area against the processes of subsidence, sea-level rise, erosion by waves and currents, and saltwater intrusion is entirely dependent on providing a hydrologic regime that (1) minimizes the physiological stress to the wetland vegetation from excessive salt concentrations or adverse flooding conditions, and (2) is conductive to the retention and accumulation of locally provided sediments.

Objectives:

The objectives of the project are to protect and maintain approximately 40,000 acres of primarily fresh/intermediate coastal wetlands through the restoration of historical hydrologic conditions. Reestablishing these conditions will promote: (1) greater freshwater retention to prevent rapid salinity increases and resultant loss of vegetation and (2) water exchange through sheet-flow as opposed to an expanding network of tidal channels.

Project Features:

The recommended project includes:

(1) Approximately 19 miles of shoreline and critical area vegetative plantings. The plantings which will consist of vegetation native to the watershed area will reduce erosion caused by wave action and help restore vegetative cover to critical areas.

(2) Five structures for water control (weirs). These structures will be rock weirs located near the mouth of natural bayous and will limit bottom flow to some extent and provide marine organisms an easy access to the interior marsh.

(3) Five earthen channel dams or plugs. These dams will be installed in abandoned oil field canals to help maintain water levels in the marsh. They will help redirect fresh water to a more vital area, reduce tidal fluctuations, and reduce saltwater intrusion. These plugs are necessary to maintain the integrity in each area.

(4) Approximately 20 miles of overflow banks or low level dikes are planned for the reestablishment of the old natural bayou or lake banks.

(5) Outfall from existing pumping plants will be utilized to the most feasible extent to route pumped water away from open canals and into the wetland.

Anticipated Benefits:

Approximately 40,000 acres of fresh/intermediate coastal wetlands will be significantly enhanced by more stable water levels and by less saltwater intrusion.

The entire 40,000 acres of fresh/intermediate coastal wetlands will be protected by the project.

This project structural measures have a 20 year life expectancy.

Installation of the project will help to protect and maintain this coastal wetland as it is today, thus maintaining the valuable habitat for fish and wildlife populations within the area.

Reduction of physical losses in these coastal wetlands would translate into reduced social and economic losses from recreational and commercial enterprises. Maintaining the coastal wetlands will also help preserve a unique way of life in coastal communities in the area.

Anticipated Adverse Effects:

No adverse effects to coastal wetlands are anticipated by installation of this project and there are no known conflicts with other programs.

Costs:

Engineering and Design	$ 151,400
E & D Supervision and Administration	30,280
Project Construction	1,514,000
Supervision and Inspection of Construction	151,400
Operation and Maintenance	42,300
Project Monitoring (Annual)	22,000

Source of Cost Estimates: SCS and DNR experience and actual cost data for similar installations in coastal Louisiana.

Status of Environmental Compliance:

(a) NEPA - An environmental assessment will be made.
(b) Section 10/404 - Applied for and approved;
(c) LA CZMP - Applied for and received.
(d) Water Quality Certification - Applied for and received.
(e) Endangered Species Act - None in the area that would be affected by the project.
(f) Scenic Stream - Permit applied for and received.

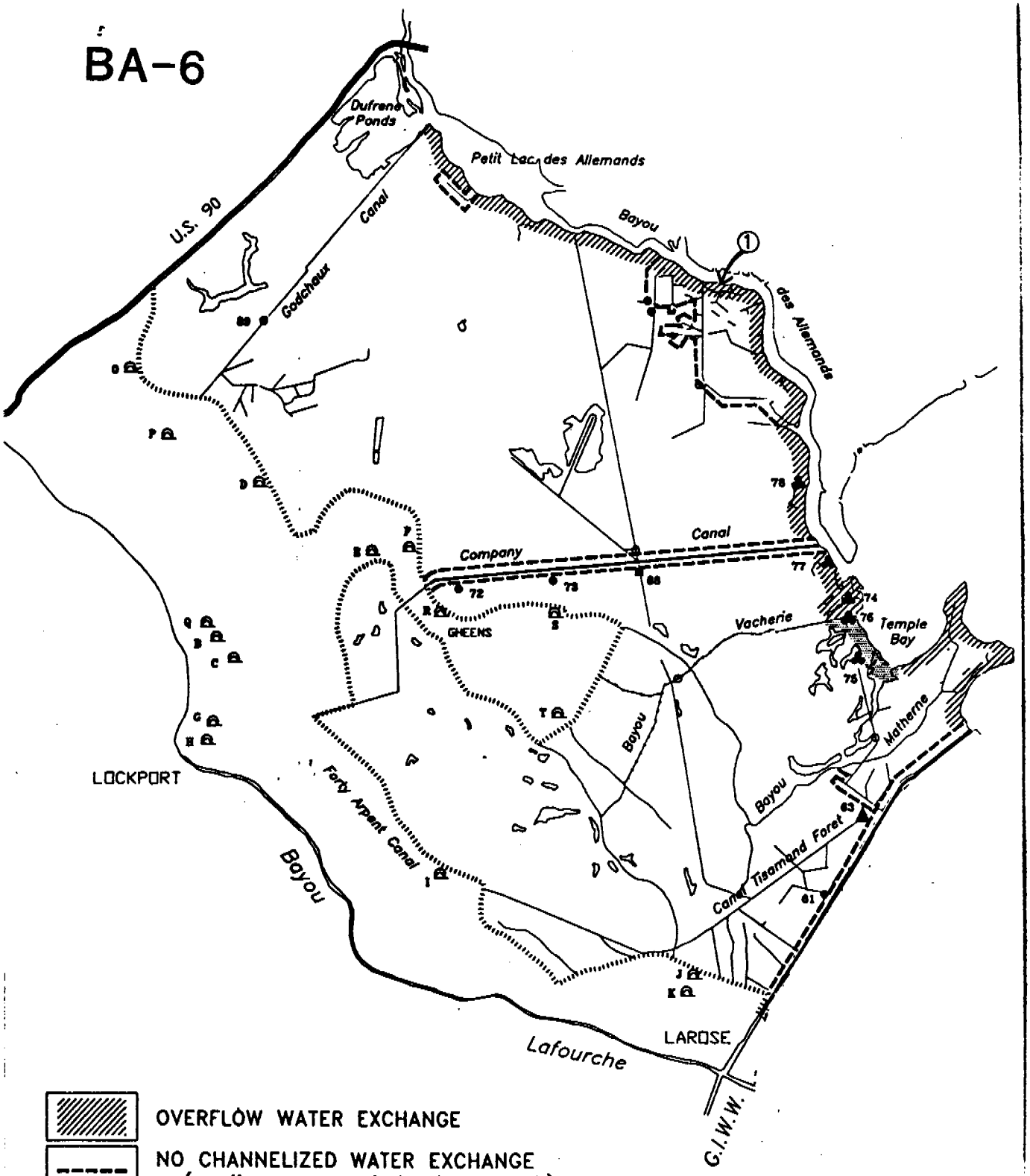
Project Implementation Schedule:

(a)	Start Engineering and Design	February 1992
(b)	End Engineering and Design	June 1992
(c)	Start Construction	September 1992
(d)	End Construction	July 1993

Potential Funding Sources:

(a) Federal: CWPPR Act
(b) Non Federal: State of Louisiana - Act 6

BA-6



OVERFLOW WATER EXCHANGE

NO CHANNELIZED WATER EXCHANGE (continuous marsh bank or spoil)

MARSH RESTORATION

CHANNELIZED WATER EXCHANGE

MAJOR SALTWATER AVENUES

PLUG

FLAPGATE

ROCK WEIR

FIXED-CREST WEIR W/BOAT BAY

0 5

miles

Existing

PUMP

CLOSURE

DEVELOPMENT BOUNDARY

PROJECT: BA-6 US HIGHWAY 90 TO GIWW

TOTAL FIRST COSTS	$2,231,000
TOTAL FULLY FUNDED COSTS	$4,583,000

ANNUAL CHARGES	PRESENT WORTH	AVERAGE ANNUAL
INTEREST & AMORTIZATION	$2,475,729	$266,388
MONITORING	$213,215	$22,942
IMPACT TO WATER SUPPLY		$0
ACCESS OIL & GAS		$0
INDUCED DREDGING		$0
IMPACT TO SHIPPING		$0
EMERGENCY CLOSURE		$0
OYSTER LEASES		$0
O & M COSTS	$409,954	$44,111
REPLACEMENT COSTS		$0
OTHER COSTS		$0
TOTAL	$3,098,898	$333,441

AVERAGE ANNUAL HABITAT UNITS	1,031.16
COST PER HABITAT UNIT	$323
AVERAGE ANNUAL ACRES OF EMERGENT MARSH	1,725

COASTAL WETLANDS PLANNING, PROTECTION, AND RESTORATION ACT

APPENDIX E

November 18, 1991

TAB P

TIGER PASS MARSH BUILDING WITH DREDGED SEDIMENTS

MARSH CREATION

TIGER PASS MAINTENANCE DREDGING
PLAQUEMINES PARISH, LOUISIANA

Candidate Project
for the
Priority Project List
of the
Coastal Wetlands Planning, Protection, and Restoration Act

PROPOSED BY

U. S. Army Engineer District, New Orleans

October 1991

POINT OF CONTACT: David Carney
PHONE: (504) 862-2528

COASTAL WETLANDS PLANNING, PROTECTION, AND RESTORATION ACT

CANDIDATE PROJECT FACT SHEET

MARSH CREATION

TIGER PASS MAINTENANCE DREDGING

PROJECT DESCRIPTION

a. Location:

The proposed project is located in Plaquemines Parish Louisiana. The planned work consists of using sediments dredged for maintenance of Tiger Pass to create marsh. The proposed marsh development area would be located at latitude 29° 09', longitude 89° 25'. A map is attached.

b. Justification:

The bar at the gulf entrance to Tiger Pass must be dredged for normal maintenance at approximately two and one-half to three year intervals. Normally, the dredged sediments would be used to create bird breeding islands near the bar area. Unfortunately, creation and maintenance of bird breeding islands has been difficult due to high wave energy in the unsheltered waters at the entrance to the channel. Transporting the material inland would allow marsh to be created in areas less subject to harsh wave attack, and allow better beneficial use of the available dredged material.

c. Objective:

The objective of the project is to create vegetated wetland using sediments dredged for normal maintenance of Tiger Pass.

d. Project Features:

Tiger Pass is dredged from mile 11.9 to mile 14.0 once every two and one-half to three years. On average, approximately 1,097,000 cubic yards of sediment is removed from within the jetty and bar areas during each dredging cycle. Dredged sediments will be transported inland and deposited within shallow open water areas at an elevation conducive to marsh development. Sediments will be used to reestablish marsh lost to subsidence and erosion.

Dredging will be performed by hydraulic cutter-head pipeline dredge. The marsh development sites will be unconfined with the dredged material placed on both sides of Tiger Pass at an elevation of +4.0 feet NGVD[1/]. The dredged sediments will consolidate to a final design elevation of +1.5 feet NGVD to +2.5 feet NGVD. During the project life, dredged material will also be periodically used to nourish marsh previously created but lost to subsidence and erosion. On average, an additional 85 acres of marsh will be created every two and one-half to three years.

1/ National Geodetic Vertical Datum of 1929 (formerly referred to as mean sea level, msl)

PROJECT DESCRIPTION (Continued)

Approximately three months of pumping time would be required for the dredged material placement. An additional nine months would be required for consolidation of the dredged material to the final design elevation.

To create marsh, dredged material must be pumped greater distances than would be the case for normal maintenance of the waterway and bar. Consequently, additional costs over present maintenance costs would be incurred.

ANTICIPATED BENEFITS

Project implementation would create approximately 415 acres (net) of brackish and intermediate marsh by the end of the 20-year life of the proposed project.

ANTICIPATED ADVERSE EFFECTS

Approximately 415 acres of open water habitat would be converted to emergent wetland. No other coastal wetlands or wetland habitats would be adversely affected. The proposed project would not conflict with other known wetland creation or protection projects or programs in coastal Louisiana.

COSTS

a.	Engineering and design.	$5,000
b.	Supervision and administration of engineering and design.	(included in E&D)
c.	Project construction.	$560,000
d.	Supervision and inspection of construction contract(s).	$56,000
e.	Operation and maintenance (average annual costs and duration in years).	$175,000 (20 years)
f.	Project monitoring.	
g.	Source of the cost estimates: Land Loss and Marsh Creation Feasibility Study	

STATUS OF ENVIRONMENTAL COMPLIANCE

a.	NEPA.	Incomplete
b.	Sections 10/404.	Complete
c.	Louisiana Coastal Management Program.	Incomplete
d.	Louisiana Water Quality Certification.	Complete
e.	Endangered Species Act.	Incomplete

The impacts of the proposed project have been addressed in a Draft Environmental Impact Statement that is awaiting approval for release for public review.

PROJECT IMPLEMENTATION SCHEDULE

a. Engineering and design start date: November 1993

b. Engineering and design finish date: July 1994

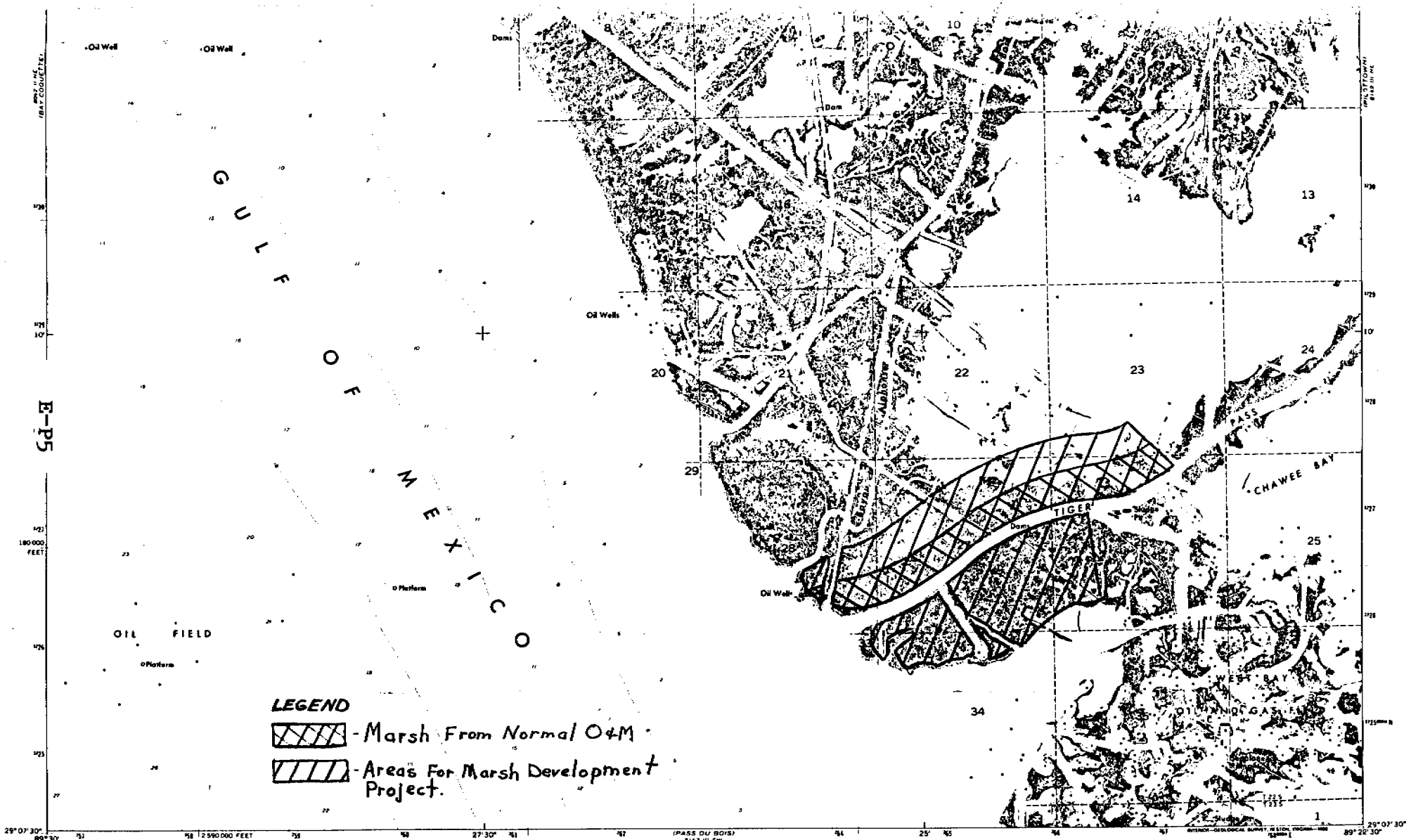
c. Construction start date: August 1994

d. Construction finish date: November 1994

POTENTIAL FUNDING SOURCES

a. Federal funding source(s): Coastal Wetlands Planning, Protection, and Restoration Act.

b. Non-federal funding source(s). State of Louisiana.



Mapped, edited, and published by the Geological Survey

Control by USGS and USC&GS

Orthophotomap prepared from high-altitude aerial photographs taken October 21, 1971. Topography by planetable surveys 1971

Supersedes planimetric map dated 1935

Selected hydrographic data compiled from USC&GS Chart 1272 (1969)
This information is not intended for navigational purposes

Polyconic projection. 1927 North American datum
10,000-foot grid based on Louisiana coordinate system, south zone
1000-meter Universal Transverse Mercator grid ticks, zone 16, shown in blue

All or part of this quadrangle lies within a subsidence area
Where omitted, land lines have not been established

UTM GRID AND 1971 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

To place on the predicted North American Datum 1983, move the projection lines 21 meters south and 6 meters east as shown by dashed corner ticks

SCALE
1 MILE
1000 0 1000 2000 3000 4000 5000 6000 7000 FEET
1 0 1 KILOMETER

CONTOUR INTERVAL 5 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929
DEPTH CURVES AND SOUNDINGS IN FEET—DATUM IS MEAN LOW WATER
THE MEAN RANGE OF TIDE IS APPROXIMATELY 1½ FOOT

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U.S. GEOLOGICAL SURVEY, DENVER, COLORADO 80225, OR RESTON, VIRGINIA 22092
AND BY THE STATE OF LOUISIANA, DEPARTMENT OF PUBLIC WORKS, BATON ROUGE, LOUISIANA 70804
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

LOUISIANA
QUADRANGLE LOCATION

ROAD CLASSIFICATION
Primary highway, hard surface
Light duty road, hard or improved surface
Secondary highway, hard surface
Unimproved road
Interstate Route U.S. Route State Route

PASS TANTE PHINE, LA.
NW/4 WEST DELTA 15 QUADRANGLE
29089-84-TF-024
1971
DMA 8162 III NW—SERIES V8850

PROJECT: TIGER PASS

TOTAL FIRST COSTS	$621,000
TOTAL FULLY FUNDED COSTS	$7,078,000

ANNUAL CHARGES	PRESENT WORTH	AVERAGE ANNUAL
INTEREST & AMORTIZATION	$648,055	$69,731
MONITORING		$0
IMPACT TO WATER SUPPLY		$0
ACCESS OIL & GAS		$0
INDUCED DREDGING		$0
IMPACT TO SHIPPING		$0
EMERGENCY CLOSURE		$0
OYSTER LEASES		$0
O & M COSTS	$1,621,331	$174,455
REPLACEMENT COSTS		$0
OTHER COSTS		$0
TOTAL	$2,269,386	$244,186

AVERAGE ANNUAL HABITAT UNITS	146.97
COST PER HABITAT UNIT	$1,661
AVERAGE ANNUAL ACRES OF EMERGENT MARSH	197

COASTAL WETLANDS PLANNING, PROTECTION, AND RESTORATION ACT

APPENDIX E

November 18, 1991

TAB Q

FALGOUT CANAL SOUTH MARSH BUILDING WITH DREDGED SEDIMENTS

FALGOUT CANAL SOUTH WETLAND CREATION DEMONSTRATION

Candidate Project
for the
Priority Project List
of the
Coastal Wetlands Planning, Protection, and Restoration Act

PROPOSED BY

U.S. Environmental Protection Agency, Region 6
Dallas, Texas

POINTS OF CONTACT: EPA - **Ms. Jeanene Peckham, (214) 655-2263**

COASTAL WETLANDS PLANNING, PROTECTION, AND RESTORATION ACT
CANDIDATE PROJECT FACT SHEET
FALGOUT CANAL SOUTH WETLAND CREATION PROJECT

1.0 Project Description

This project is designed to test the effectiveness of direct river sediment application by pipeline/spray application as a marsh restoration technique, which has potential for widespread use in restoration of coastal wetlands in Louisiana.

The Falgout Canal South Wetland (FCSW) Creation Project is proposed to create 120 acres of new brackish marsh from an area presently lost to open water. On an additional 100 acres a hard bottom colonized by aquatic vegetation will be created. The total area to be directly treated is 220 acres of open water. This will be carried out through addition of net 600,000 cubic yards (cy) of mineral sediment harvested from the Mississippi River.

1.1 Location (LAT 29 25'; LONG 90 45')

The FCSW area to be treated is generally south of Falgout Canal, and between the natural levee ridge of Bayou Dularge and the new marsh creation area along Houma Navigation Canal (HNC) utilized in 1991. (Figure 1) The FCSW is outside of any existing management scheme.

1.2 Justification

The justification for this project has two major elements. First, it is clear that a long-term need exists to demonstrate and improve existing technological capabilities to cost effectively build and restore wetlands and wetland habitat in coastal Louisiana using dredged sediments. Such need is particularly acute in Terrebonne Parish which is beyond the reach of proposed open-channel diversions and experiences subsidence rates in areas in excess of 1 cm/yr.

The second aspect is local, in that the FCSW area needs sediment and is a suitable site for this project. The area now consists of shallow open water resulting from loss of fresh marsh and swamp (affected by salt water entering via the HNC) that was not replace by more salt tolerant vegetation, as a result of rapid subsidence rates (see Figure 2).

The utilization of Mississippi River sediment is important as it represents a continual supply of mineral sediment. Calculations were made of the existing material that would be available if the existing Bayous (such as Bayou Terrebonne, Bayou Grand Caillou) were dredged; such areas provide for creation of possibly a total of 6,000 acres over many years, before material would be available again.

1.3 Objectives

It is anticipated that this project will - in a 6-month period build 120 acres of land suitable for marsh colonization and create an additional 100 acres of hard bottom very shallow aquatic vegetated area.

Specific objectives are:

* **Build 120 acres of new brackish marsh;**
* **Build 100 acres of hard bottomed area of diverse aquatic vegetation;**
* **Test scientific engineering and economic assumptions about using dredged sand to build and to restore degraded coastal wetlands;**
* **Evaluate habitat value of wetlands created using spray application of sediment;**
* **Utilize pipelines to distribute sediment into areas not easily accessible. A long term goal would be to utilize abandoned oil/gas pipelines to transport sediment back into degraded areas. Potential for establishment of new approaches for mitigation measures for the oil/gas industry is significant.**
* **Test effectiveness of various application methods at a scale similar to that which will actually be needed for viability of this option in the context of regional coastal restoration.**
* **Evaluate economics of restoring degraded wetlands using dredged materials "harvested" specifically for this purpose.**
* **Develop new methods and opportunities for enhancing beneficial use of dredged materials.**

1.4 Project Features

Basic project features are shown under the listing "Scenario II" in Figure 3.

1.4.1 Facilities and Equipment

* **Large hydraulic dredge (24" to 30") operating in Mississippi River near Belle Chasse for four months;**

* Batture impoundment and spillways to hold, dewater and reload sand onto hopper barges for five months;

* Two 2,500 cy hopper barges and tugs to tow 70 miles to FCW for five months;

* Pilings for mooring barges adjacent to FCSW on west bank of the HNC;

* Mobile barge-mounted unloader/booster facility to operate for five months;

* 23,000 feet of HDPE pipe and telescoping nozzle sections. One time purchase to be used for life of project;

* Two marsh buggies with pipe handling and fusing equipment to be used for six months.

1.4.2 Project Operation

This project purposes to use conventional equipment and practices to hydraulically dredge approximately 900,000 cy of fine sand from the bed of the Mississippi River near Belle Chasse, pump it to a batture impoundment, reload 660,000 cy onto 2,500 cy hopper barges in a dry condition and transport it 75 miles to a Mobile Marsh Base Station (MMBS) docked on the west bank of the HNC adjacent to the open water area south of the Falgout Canal. A schematic of the MMBS is shown in Figure 4. The MMBS will then slurry the sand in the hopper barges and pump 600,000 cy into the marsh via a straight high density polyethylene (HPDE) 16-inch pipe up to 4,000 feet in length. Make-up water for the slurry will be obtained from the HNC. Attached to this pipe will be a 1,000-foot telescoping section with regularly spaced opposed nozzle apertures for spraying the slurry up to 150 feet. Schematics of the proposed marsh pipeline are attached as Figures 5 and 6. The pipe would be cut and shortened or moved laterally or radially to create an even platform for marsh colonization. Nutrients and seeds could be introduced to the slurry to speed marsh establishment. The MMBS is designed to pump 5,000 cy of sand in a slurry (15 percent by weight) a mile into the marsh each day on a 12-hour daylight operating schedule.

It should be pointed out that use of the MMBS is the only unique part of this scenario, as the method of supplying the sand from the Mississippi is quite commonly used for large construction projects throughout south Louisiana. As a result, engineering and design will be primarily limited to the MMBS and marsh pipe network.

2.0 ANTICIPATED BENEFITS

2.1 Total Wetland Enhancement

It is anticipated that introducting 600,000 cy of mineral sediments into the FCSW will enhance the productivity of the brackish marsh and pond habitat. Enhancement will take many forms, including:

* Creation of a new 120 acre platform of sufficient elevation for establishment of salt-tolerant marsh vegetation; create 100 acres hard bottomed aquatic vegetated area;
* Introduction of mineral sediments and nutrients to existing marsh;
* Reduction of fetch and wave energy in open water areas;
* Potential for creation of grass beds on pond bottoms;
* Potential for creation of new wildlife habitat for species requiring sandy or more solid marshes;
* Development, testing and improvement of new wetlands restoration methodology with potential for large-scale application.

2.1.1 Coastal Wetlands Created

An estimated 120 acres of brackish marsh will be created from open water; 100 acres of very shallow hard bottomed aquatic vegetated area of fisheries habitat.

2.1.2 Coastal Wetlands Protected

An estimated 220 acres will be protected from land loss due to subsidence.

2.1.3. Coastal Wetlands Restored

An estimated 120 acres of open-water will be resorted to productive brackish wetlands. Additional 100 acres restored for submerged vegetative habitat.

2.2 Life Expectancy of Coastal Wetland Benefits

Creation of new salt-tolerant marshes in the FCSW will, following colonization, enable that area to begin generating organic sediments to maintain marsh elevation relative to sea level. Plants will be able to draw upon the stockpile of mineral nutrients introduced for decades. Perhaps more importantly, once the means has been worked out (through projects like this one) to regularly resupply subsiding marshes with the small annual supplement of mineral nutrients they require, then the life expectancy of all coastal

marshes will increase dramatically.

2.3 Benefits to Fish and Wildlife

Introduction of fine sand into this historically muddy system will introduce considerable substrate diversity which will probably increase utilization by some species of fish and wildlife. It is expected that hard bottomed pond habitat will be created that will result in development of grass beds and the appearance of species that utilize this habitat.

3.0 ANTICIPATED ADVERSE EFFECTS

3.1 Environmental Impacts

Anticipated adverse effects will be related to the following factors:

* Quality of Mississippi River sand introducted.

  Minimize concerns by testing borrow source material. Unlike the water itself, most Mississippi River bedload material is not significantly affected by industrial or municipal discharges.

* Effects on shallow pond soft-bottom benthic habitat destroyed.

  An unavoidable impact that must be weighed against the habitat values of new wetland and hard-bottom pond habitat created.

* Effects of pipe-handling operations.

  Operations can be designed such that effects of vehicle tracks and drag-marks are covered by subsequent slurry overlay, therefore any effects will be limited. Operations will disturb wildlife and may need to be restricted to protect certain species.

* Turbidity/chemical effects.

* The slurrying operation will result in some escape of sand into the HNC. In the FWC, the fine sand that will be introduced will be coarser-grained than any existing sediments and will not travel far from the point of introduction. The spray application method is designed to result in less disturbance of in-place materials, but turbidity will still result from suspension of clays and organic sediments. Dissolved oxygen may be affected through disturbance of low oxygen pore waters.

3.2 Programmatic Conflicts

None are known.

4.0 COSTS

Current estimates of the cost to place 600,000 cy of Mississippi River sand into the FCW as described were recently made by Woodward-Clyde consultants (WCC) as part of preliminary engineering feasibility study conducted for Terrebonne Parish. WCC estimated that engineering, construction, operation and monitoring of such a project would cost approximately $5,755,000, resulting in an average cost per cubic yard placed of $9.59. It is likely that opportunities to reduce these estimates will be identified during advanced engineering and design. Some uncertainty exists, however, with regard to costing out the marsh base station. WCC used an estimated lease rate.

Outside of the marsh site itself, this operation is quite conventional and can be bid competitively. Because other costs have been estimated conservatively, it is believed that $5.755 million will be sufficient to cover all year one costs associated with this project, including advanced engineering and design of the MMBS and development of the experimental sediment placement project and monitoring effort. A breakdown of estimated costs is shown in Table F-1.

5.0 STATUS OF ENVIRONMENTAL COMPLIANCE

a. NEPA

EPA anticipates that an Environmental Assessment and Finding of No Significant Impact could possibly be accomplished within four months from determination by the Task Force to place the project on the priority list.

b. Section 10/Section 404

Application has not yet been made for a Section 10 permit, however, it is expected to be obtained without controversy.

A Clean Water Act, Section 404 has been issued for the site just to the north described as Falgout Canal-2, which provides for placement of dredged material. A permit for this site, just south of Falgout Canal on the west side of Houma Navigation Canal is believed to be obtainable.

c. **Louisiana Coastal Management Program**

The Falgout Canal-2 area has been addressed by the CZM program previously; other areas in the vicinity of HNC have received consistency, therefore we expect this project to receive consistency.

d. Clean Water Act, Section 401 Water Quality Certification by the Louisiana Department on Environmental Quality has not yet been applied for, but is believed obtainable.

e. **Endangered Species Act**

Contact has been made with U.S. Fish and Wildlife Service regarding occurrence of species in the areas addressed. The nearest bald eagle nest is more than one mile away; adverse impacts are not anticipated.

6.0 PROJECT IMPLEMENTATION

The initial 600,000 cy project is designed to be engineered bid, contracted and constructed within 14 months of authorization. Planting and monitoring will be conducted for a minimum of an additional six months. Much preliminary engineering work has been completed by WCC for Terrebonne Parish. Actual placement of material can occur after about a month of preparation both on the Mississippi River batture impoundment and at the marsh location. Mobilization activities will include construction of the batture impoundment, fabrication of the MMBS and its deployment to the FCSW and construction of the marsh pipe network. Final design work and environmental assessments will require surveys and geotechnical testing on the front end. A proposed schedule is provided as Table F-2.

7.0 POTENTIAL FUNDING SOURCES

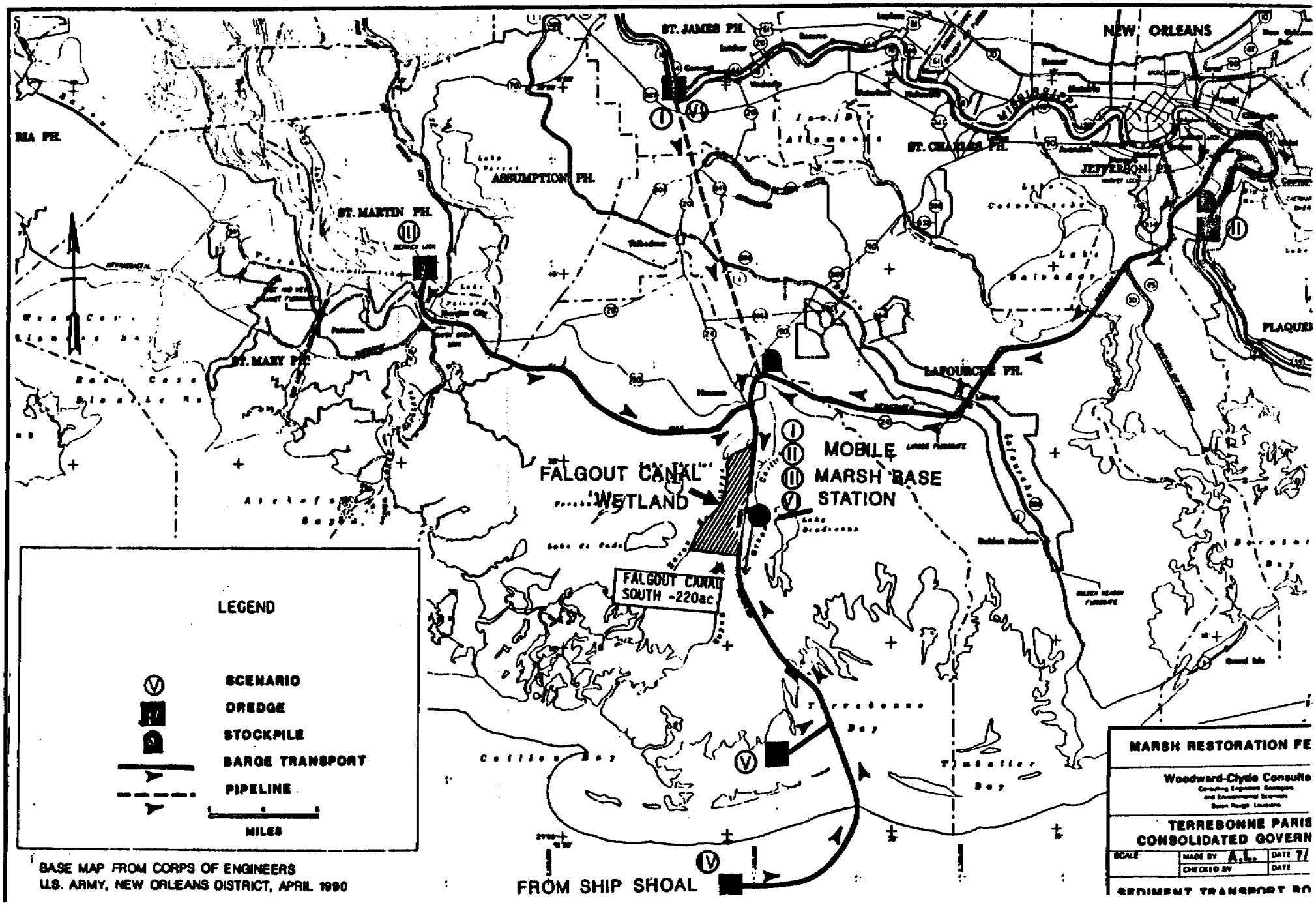
FEDERAL

The Coastal Wetlands Planning, Protection and Restoration Act is the only presently known source of Federal funds which could be used to fully initiate a demonstration project of this nature which could have very far reaching effects for furthering wetland creation in sediment starved areas.

The Environmental Projection Agency has committed $150,000.00 of Clean Water Act, Section 404 Extramural Funds to a grant for Terrebonne Parish Consolidated Government to be applied to a demonstration utilizing pipelines to transport sediment into remote degraded areas needing restoration. This small effort would be incorporated into the larger system for marsh building now proposed for CWPPRA funding.

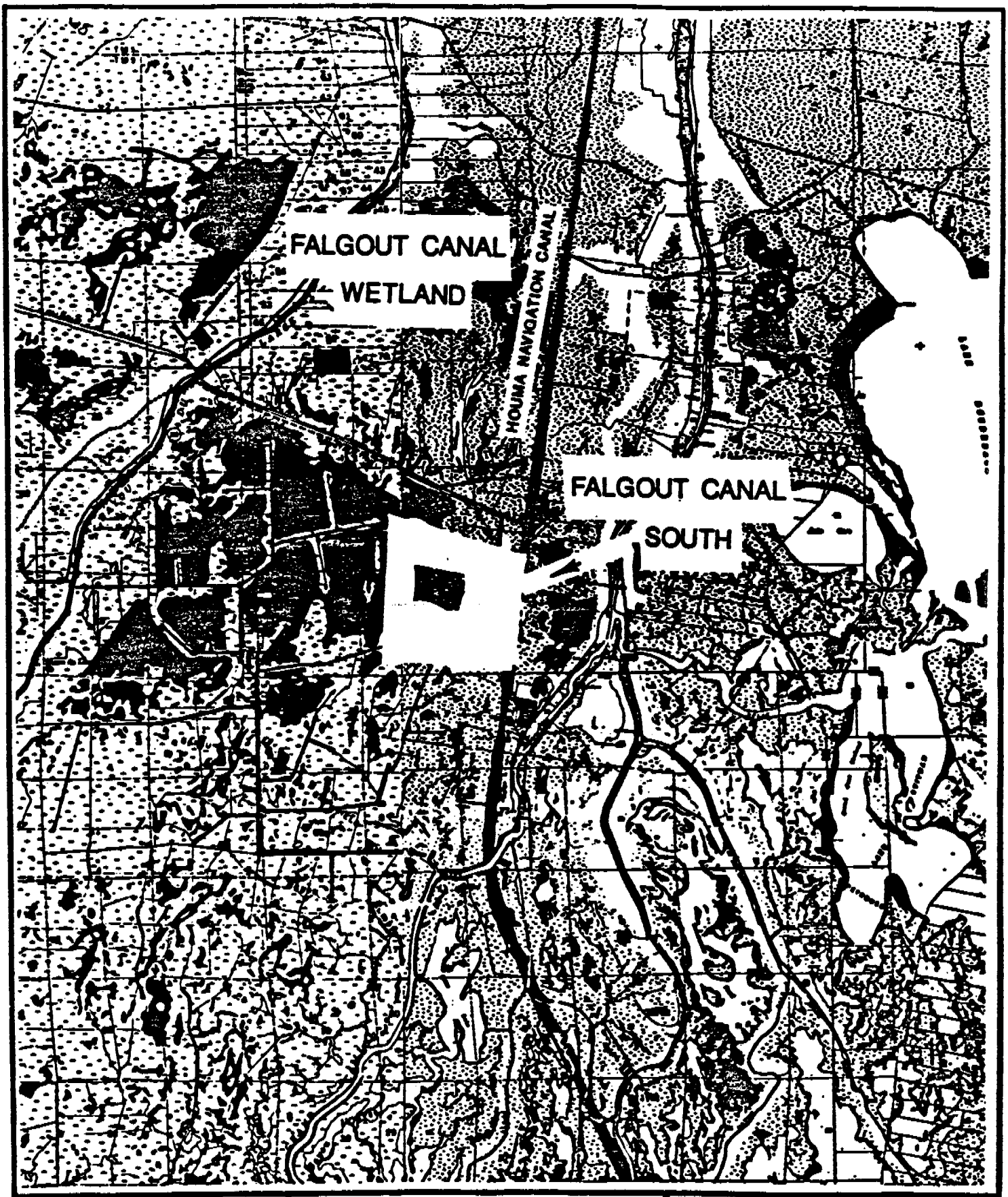
NON-FEDERAL SOURCES

The Terrebonne Parish Consolidated Government is considering the extent to which they may be involved in this prototype project to transport Mississippi River sediment to the Parish and into creation/restoration areas.


ST. JAMES PH.
NEW ORLEANS
ASSUMPTION PH.
ST. MARTIN PH.
ST. MARY PH.
LAFOURCHE PH.
JEFFERSON PH.
FALGOUT CANAL
WETLAND
MOBILE
MARSH BASE
STATION
FALGOUT CANAL
SOUTH ~220ac
FROM SHIP SHOAL
LEGEND
SCENARIO
DREDGE
STOCKPILE
BARGE TRANSPORT
PIPELINE
MILES
BASE MAP FROM CORPS OF ENGINEERS
U.S. ARMY, NEW ORLEANS DISTRICT, APRIL 1990
MARSH RESTORATION FE
Woodward-Clyde Consulta
TERREBONNE PARIS
CONSOLIDATED GOVERN
SCALE
MADE BY
CHECKED BY
DATE

E-09

FIGURE 1



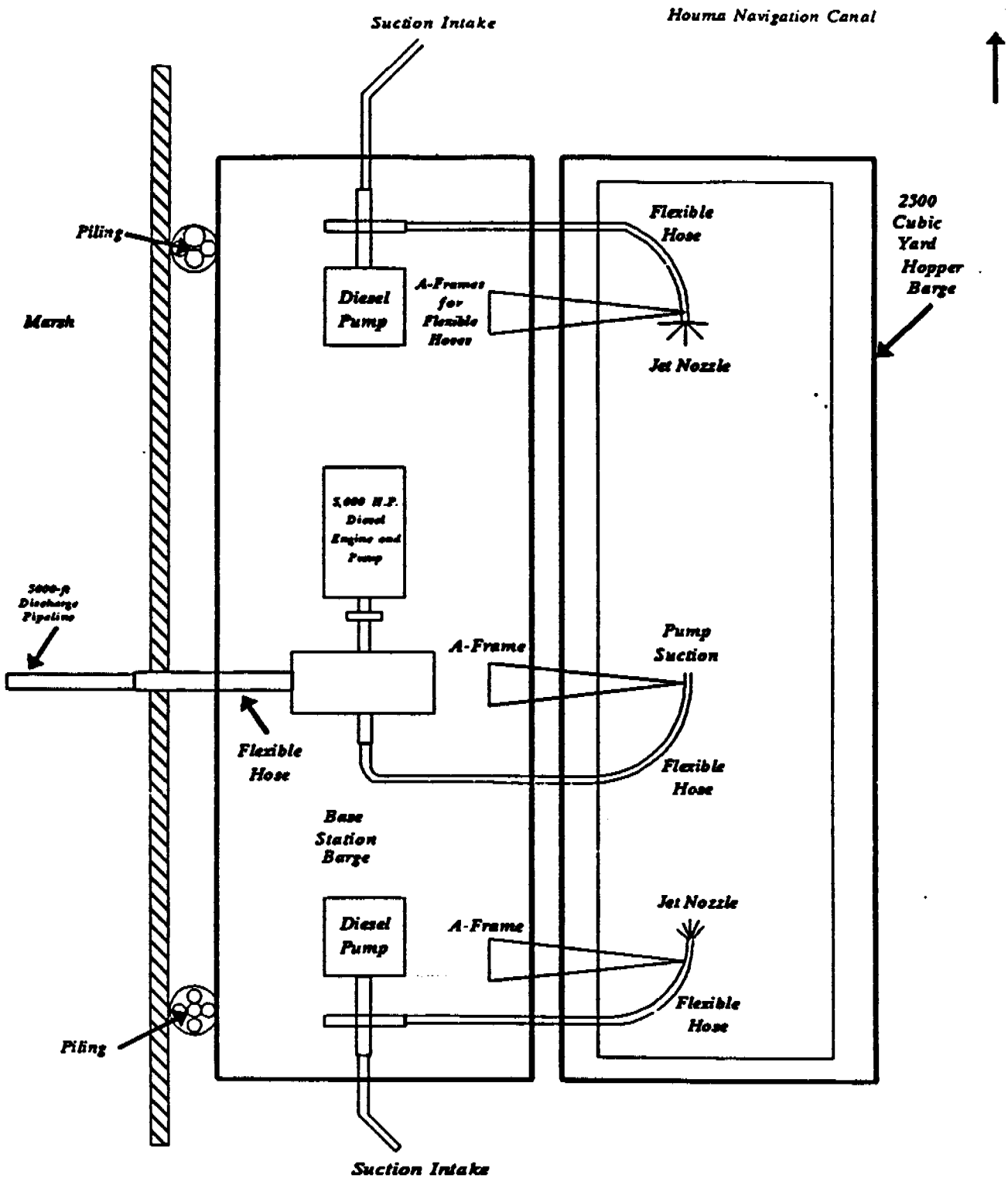
0 1 2
Miles

E-Q11

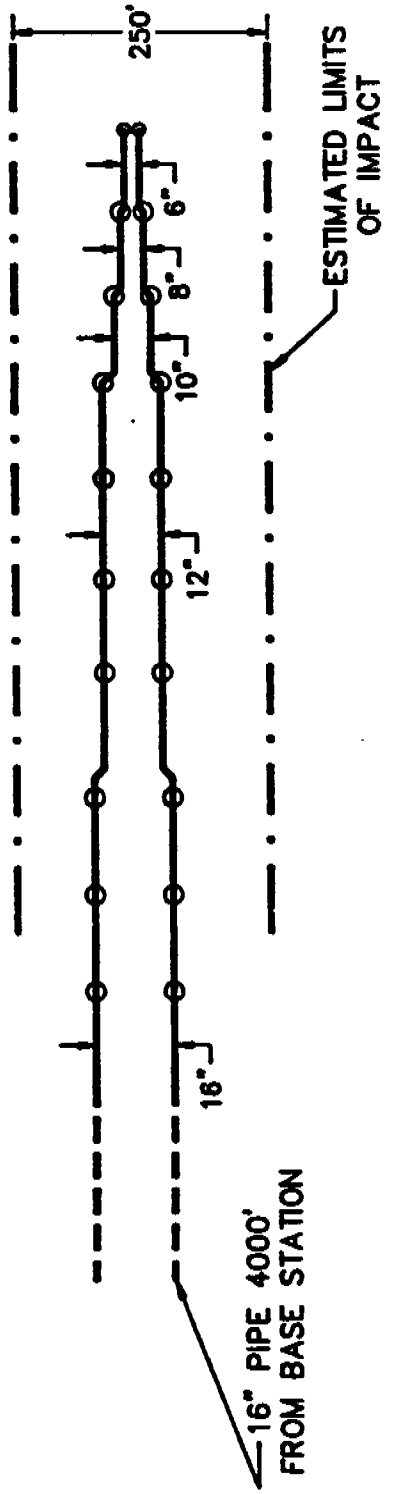
FALGOUT CANAL SOUTH
WETLAND CREATION

FILE NO.
2

MARSH RESTORATION FEASIBILITY TERREBONNE PARISH, LOUISIANA	**Woodward-Clyde Consultants** Consulting Engineers, Geologists and Environmental Scientists Baton Rouge, Louisiana	SEDIMENT TRANSPORT SCENARIOS	FILE NO. 908670C FIG. NO. 3
SCALE: N.T.S.	DRAWN BY: L. RAWLS DATE: 7/31/91 CHKD. BY: DATE:		



MARSH RESTORATION FEASIBILITY TERREBONNE PARISH, LOUISIANA	**Woodward-Clyde Consultants** Consulting Engineers, Geologists and Environmental Scientists Baton Rouge, Louisiana	BARGE BASE STATION SCHEMATIC	FILE NO. 908670C FIG. NO. 4
SCALE:	DRAWN BY: J. BICKFORD DATE: 7/24/91 CHKD. BY: DATE:		



LEGEND

O – NOZZLE LOCATION

MARSH RESTORATION FEASIBILITY TERREBONNE PARISH, LOUISIANA	Woodward-Clyde Consultants Consulting Engineers, Geologists and Environmental Scientists Baton Rouge, Louisiana SCALE: N.T.S. DRAWN BY: J. BICKFORD DATE: 7/24/91 CHKD. BY: DATE:	TELESCOPING MAINLINE SCHEMATIC	FILE NO. 908670C FIG. NO. 5

MARSH RESTORATION FEASIBILITY TERREBONNE PARISH, LOUISIANA	**Woodward-Clyde Consultants** Consulting Engineers, Geologists and Environmental Scientists Baton Rouge, Louisiana SCALE: N.T.S. | DRAWN BY: J. BICKFORD | DATE: 7/24/91 CHKD. BY: | DATE:	NOZZLE SCHEMATIC	FILE NO. 90B670C FIG. NO. 6

TABLE F-1

COST ESTIMATE TO BUILD MARSH BY PLACING 600,000 CY OF MISSISSIPPI RIVER SAND IN THE FALGOUT CANAL SOUTH WETLAND TERREBONNE PARISH, LOUISIANA

Cost Element	Cost (thousands)*
Advanced Eng./Design	$ 80
Supervision/Administration of Eng./Design	15
Project Construction	765
Supervision/Inspection of Construction/Operations	110
Operations/Maintenance	4,735
Project Monitoring	50
Total	$5,755

* Costs estimated by Woodward-Clyde Consultants as part of Engineering Feasibility Study for Terrebonne Parish was completed in September 1991.

TABLE F-2

PROPOSED SCHEDULE
FALGOUT CANAL SOUTH WETLAND CREATION PROJECT

Activities	Months 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Adv. Eng./Des.	**********																			
Env. Assess.	**********																			
Exp. Design		**********																		
Acq. Batture Rights		**********																		
Const. Batture Imp.								***												
MMBS Fabric./Mob							******													
Marsh Pipe/Nozzle Fab.								***												
Dredge Mob/Ops									**********											
MMBS Operations									**********	**********	**********	**********	**********	**********						
Planting																		**********		
Const. Insp.								**********	**********	**********	**********	**********	**********	**********	**********	**********	**********	**********	**********	**********
Monitoring	**********	**********	**********	**********	**********	**********	**********	**********	**********	**********	**********	**********	**********	**********	**********	**********	**********	**********	**********	**********

PROJECT: FALGOUT CANAL SOUTH

TOTAL FIRST COSTS	$5,705,000
TOTAL FULLY FUNDED COSTS	$6,109,000

ANNUAL CHARGES	PRESENT WORTH	AVERAGE ANNUAL
INTEREST & AMORTIZATION	$6,294,612	$677,300
MONITORING	$24,229	$2,607
IMPACT TO WATER SUPPLY		$0
ACCESS OIL & GAS		$0
INDUCED DREDGING		$0
IMPACT TO SHIPPING		$0
EMERGENCY CLOSURE		$0
OYSTER LEASES		$0
O & M COSTS		$0
REPLACEMENT COSTS		$0
OTHER COSTS		$0
TOTAL	$6,318,841	$679,907

AVERAGE ANNUAL HABITAT UNITS	114.27
COST PER HABITAT UNIT	$5,950
AVERAGE ANNUAL ACRES OF EMERGENT MARSH	108

COASTAL WETLANDS PLANNING, PROTECTION, AND RESTORATION ACT

APPENDIX E

November 18, 1991

TAB R

LAKE SALVADOR SHORELINE EROSION CONTROL

MARSH PROTECTION

LAKE SALVADOR SHORELINE PROTECTION
JEFFERSON PARISH, LOUISIANA

Candidate Project
for the
Priority Project List
of the
Coastal Wetlands Planning, Protection, and Restoration Act

PROPOSED BY

U. S. Army Engineer District, New Orleans

October 1991

POINT OF CONTACT: David Carney
PHONE: (504) 862-2528

COASTAL WETLANDS PLANNING, PROTECTION, AND RESTORATION ACT

CANDIDATE PROJECT FACT SHEET

MARSH PROTECTION

LAKE SALVADOR SHORELINE PROTECTION
JEFFERSON PARISH, LOUISIANA

PROJECT DESCRIPTION

a. Location:

The proposed project is located on the eastern shore of Lake Salvador in Jefferson Parish Louisiana. The coordinates of the proposed project are approximately latitude 29° 46' 15", longitude 90° 09' 00". A map is attached.

b. Justification:

The Jean Lafitte National and Historical Park and Preserve is located east of Lake Salvador. The park consists mostly of fresh and intermediate marshes, cypress swamps, and ridges of hardwood trees. The Bayou Segnette Waterway and a narrow isthmus of land separate the park and Lake Salvador (see attached map). Wind generated waves from Lake Salvador are eroding the eastern shore of the lake and the western (right-descending) bank of the Bayou Segnette Waterway. At the most critical location, only a one-foot wide, tree-lined bank separates Lake Salvador and the Bayou Segnette Waterway. Without shoreline protection the eastern shore of Lake Salvador will continue to erode. The eventual breaching of the narrow point of land separating the Lake and the Bayou Segnette Waterway could allow wind-driven waves to erode the marshes of the park.

c. Objective:

The project objective is to protect vegetated wetlands in the Jean Lafitte National and Historical Park and Preserve. Providing erosion protection for the eastern shore of Lake Salvador (the most critical section) will insure that the narrow isthmus separating Lake Salvador and Bayou Segnette is not breached exposing the wetlands of the park to wind generated wave erosion.

d. Project Features:

The proposed project consist of constructing a 5,000-foot long multi-celled sand-filled fabric bag breakwater parallel to the eastern bank of Lake Salvador. The area between the breakwater and the existing shore would trap sediments from Lake Salvador; over time, emergent wetland vegetation could establish. An abandoned oil well access canal, just north of the proposed breakwater, is allowing water exchange between Lake Salvador and the Bayou Segnette Waterway. It is expected that this abandoned canal will grow progressively larger over time; consequently, closure (earthen closure) of the access canal is also a proposed project feature.

ANTICIPATED BENEFITS

Stopping further erosion of the eastern bank of Lake Salvador would protect about 77 acres of fresh to intermediate marsh in the Jean Lafitte National and Historical Park and Preserve from being lost to wave erosion. Approximately 11 acres of new wetlands may develop between the proposed breakwater and the existing eastern bank of the lake.

During tours of the park, U. S. Park Service employees could include discussions of the project, its function, and the beneficial impact on maintaining the freshwater marshes.

ANTICIPATED ADVERSE EFFECTS

Approximately 11 acres of open water habitat could be converted to emergent wetland. The footprint area of the breakwater would cause the loss of some small amount of benthic habitat in Lake Salvador.

No other coastal wetlands or wetland habitats would be adversely affected. The proposed project would not conflict with other known wetland creation or protection projects or programs in coastal Louisiana.

COSTS

a. Engineering and design.	$150,000
b. Supervision and administration of engineering and design	(included in E&D)
c. Project construction	$1,500,000
d. Supervision and inspection of construction contract(s)	$150,000
e. Replacement Cost (in project year 10)	$676,000
f. Project monitoring	
g. Source of the cost estimates: Corps of Engineers	

STATUS OF ENVIRONMENTAL COMPLIANCE

a. NEPA.	Not Initiated
b. Sections 10/404.	Not Initiated
c. Louisiana Coastal Management Program.	Not Initiated
d. Louisiana Water Quality Certification.	Not Initiated
e. Endangered Species Act.	Not Initiated

PROJECT IMPLEMENTATION SCHEDULE

a. Engineering and design start date: March 1992

b. Engineering and design finish date: October 1992

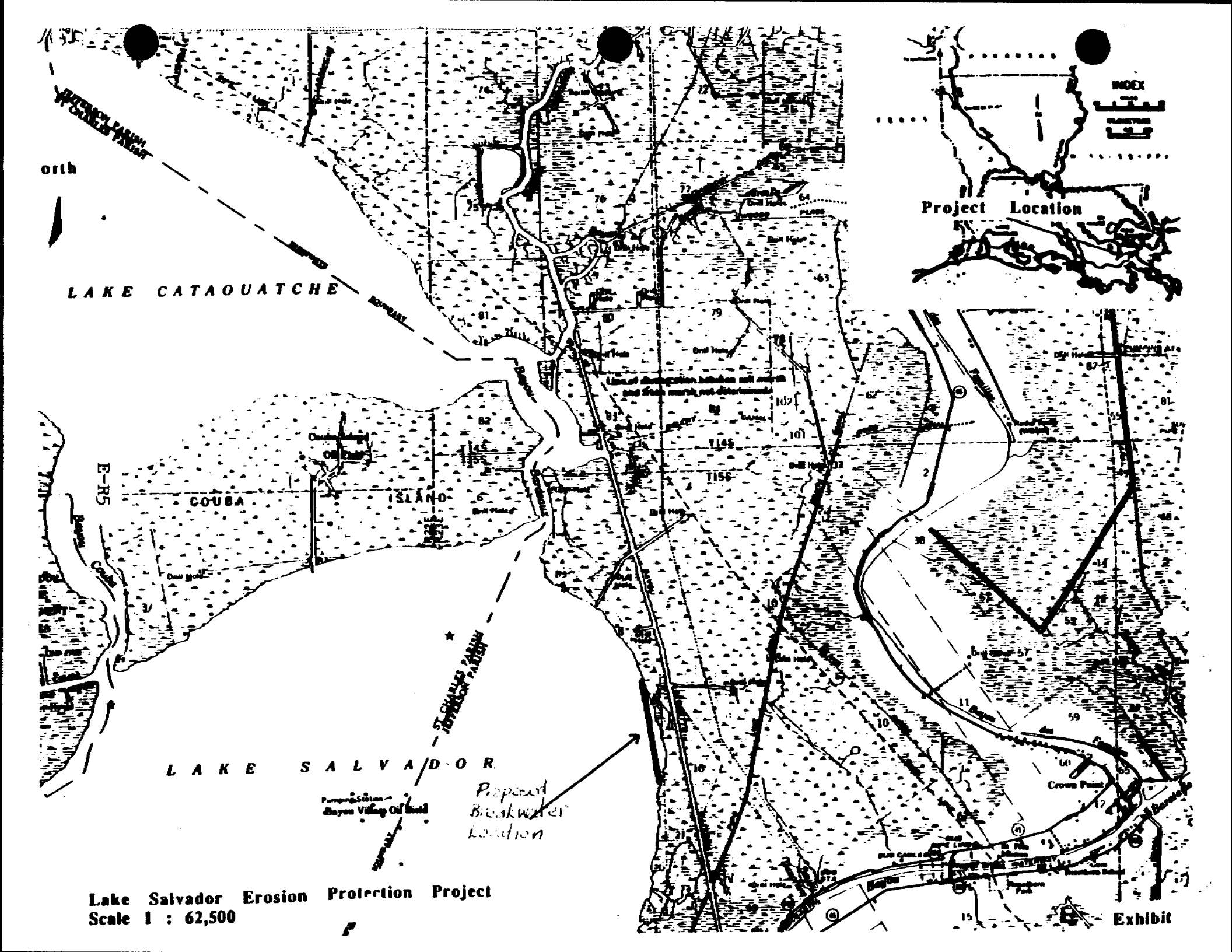
c. Construction start date: November 1992

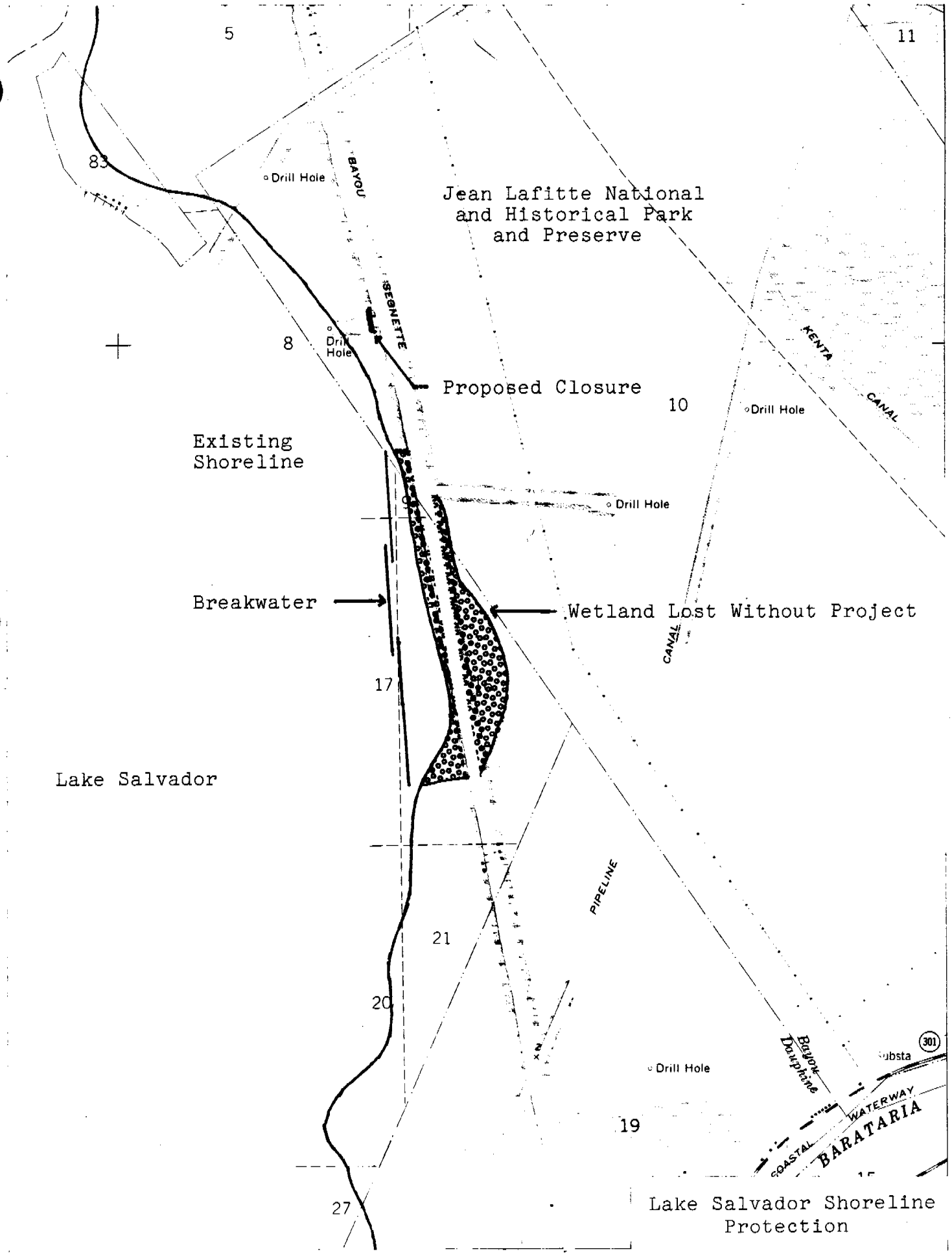
d. Construction finish date: February 1993

POTENTIAL FUNDING SOURCES

a. Federal funding source(s): Coastal Wetlands Planning, Protection, and Restoration Act.

b. Non-federal funding source(s). State of Louisiana.


LAKE CATAOUATCHE
LAKE SALVADOR
COUBA
ISLAND
E-R5
Project Location
Proposed Breakwater Location
Lake Salvador Erosion Protection Project
Scale 1 : 62,500
Exhibit



Lake Salvador Shoreline
Protection

PROJECT: LAKE SALVADOR SHORELINE

TOTAL FIRST COSTS	$1,800,000
TOTAL FULLY FUNDED COSTS	$4,427,000

ANNUAL CHARGES	PRESENT WORTH	AVERAGE ANNUAL
INTEREST & AMORTIZATION	$1,890,786	$203,449
MONITORING		$0
IMPACT TO WATER SUPPLY		$0
ACCESS OIL & GAS		$0
INDUCED DREDGING		$0
IMPACT TO SHIPPING		$0
EMERGENCY CLOSURE		$0
OYSTER LEASES		$0
O & M COSTS		$0
REPLACEMENT COSTS	$676,104	$72,749
OTHER COSTS		$0
TOTAL	$2,566,890	$276,197

AVERAGE ANNUAL HABITAT UNITS	26.62
COST PER HABITAT UNIT	$10,376
AVERAGE ANNUAL ACRES OF EMERGENT MARSH	52

COASTAL WETLANDS PLANNING, PROTECTION, AND RESTORATION ACT

PRIORITY PROJECT LIST REPORT
November 18, 1991

APPENDIX F

WETLAND VALUE ASSESSMENT METHODOLOGY

COASTAL WETLAND PLANNING, PROTECTION, AND RESTORATION ACT

WETLAND VALUE ASSESSMENT METHODOLOGY AND COMMUNITY MODELS

Developed by the Environmental Work Group,
Coastal Wetland Planning, Protection, and Restoration Act
Technical Committee

Point of Contact: Loyd Mitchell
Fish and Wildlife Biologist
U.S. Fish and Wildlife Service
825 Kaliste Saloom
Building II, Suite 102
Lafayette, LA 70895
(318) 264-6630

Revised: October 8,1991

COASTAL WETLAND PLANNING, PROTECTION AND RESTORATION ACT

Wetland Value Assessment Methodology and Community Models

I. INTRODUCTION

The Wetland Value Assessment (WVA) methodology has been developed as a uniform and quantitative habitat-based assessment methodology for use in prioritizing project proposals submitted for funding under the Coastal Wetlands Planning, Protection, and Restoration Act (CWPPRA). The WVA quantifies changes in wetland quality and quantity that are projected to be brought about as a result of a proposed project. The results of the WVA, measured in Average Annual Habitat Units (AAHU's), can be combined with economic data to provide a measure of the effectiveness of a proposed project in terms of annualized cost per AAHU gained.

The WVA has been developed by the Environmental Work Group (Group) assembled under the Planning and Evaluation Subcommittee of the CWPPRA Technical Committee, and included members from each agency represented on the CWPPRA Task Force. The Group recognized early in the CWPPRA implementation process that the time frame under which projects proposed for 1991 were to be identified, evaluated, ranked, and submitted to Congress would be the primary factor dictating the design of a suitable evaluation methodology. Thus, the WVA was assembled under the guidelines that the methodology had to be developed quickly and had to be easily applied to proposed projects using only existing or readily obtainable data to the greatest extent possible.

The WVA has been developed strictly for use in ranking proposed CWPPRA projects; it is not intended to provide a detailed, comprehensive methodology for establishing baseline conditions within a project area.

The WVA is a modification of the Habitat Evaluation Procedures (HEP) developed by the U.S. Fish and Wildlife Service. HEP is widely used by the Fish and Wildlife Service and other Federal

and State agencies in evaluating the impacts of development projects on fish and wildlife resources. A notable difference exists between the two methodologies, however, in that HEP uses a species-oriented approach, whereas the WVA utilizes a community approach.

The WVA has been developed for application to the following coastal Louisiana wetland types: fresh marsh (including intermediate marsh), brackish marsh, saline marsh, and cypress-tupelo swamp. Future reference in this document to "wetland" or "wetland type" refers to one or more of those four communities.

II. WVA CONCEPT

The WVA operates under the assumption that optimal conditions for a coastal wetland can be characterized, and that any existing or predicted condition can be compared to that optimum to provide an index of wetland quality. The quality component of a wetland is estimated or expressed through the use of a mathematical model developed specifically for each wetland type. Each model consists of 1) a list of variables that are considered important in characterizing the particular wetland type, 2) a Suitability Index graph for each variable, which defines the assumed relationship between wetland quality and the variable, and 3) a mathematical formula that combines the quality value (Suitability Index) for each variable into a single, overall value for wetland quality; that single value is referred to as the Habitat Suitability Index, or HSI.

The Wetland Value Assessment models (Attachment 1) have been developed for determining the suitability of Louisiana coastal wetlands in performing or providing a diverse array of functions and values including, but not limited to, providing resting, foraging, breeding, and nursery habitat to a diverse assemblage of fish and wildlife species; providing storm-surge protection, flood water storage, and water quality functions; and serving in nutrient import/export. Those functions are loosely equated to wetland "quality" in that a wetland that provides or performs those functions and values better or to a greater degree than

another may be considered to be of higher "quality".

The WVA models have been designed to function at a community level. As such, the models attempt to define an optimum combination of all functions and values provided or performed by those systems.

The output of each model (the HSI) is assumed to have a linear relationship with the suitability of a coastal wetland system in providing the above-mentioned functions and values.

III. COMMUNITY MODEL VARIABLE SELECTION

The initial task in WVA community model development was to select the environmental variables considered appropriate for describing quality in each wetland type. Prior to initiating that task, the following criteria were developed by which to judge the overall appropriateness of any potential variable:

1) the condition described by the variable had to be important in defining or characterizing the particular wetland type under consideration;

2) values had to be easily estimated and predicted based on existing data (e.g., aerial photography, LANDSAT, GIS systems, water quality monitoring stations, and interviews with knowledgeable individuals); and

3) the variable had to be sensitive to the types of changes expected to be brought about by typical wetland projects proposed under the CWPPRA.

Variables for each model were selected through a two part procedure. The first involved a listing of environmental variables thought to be important in characterizing a coastal marsh or swamp system, considering the full range of functions and values provided or performed by the wetland type.

The second part of the selection procedure involved scanning variables used in various species HSI models published by the U.S. Fish and Wildlife Service. Models considered were limited to those of fish and wildlife species known to inhabit the various coastal wetland types being considered. The initial list of HSI models surveyed included models for 10 estuarine fish and shellfish, 4 freshwater fish, 12 birds, 3 reptiles and amphibians, and 2 mammals (Attachment 2). The number of models included from each species group was a reflection of model availability.

Selected HSI models were then grouped according to the wetland types used by each species. Because most species for which models were considered are not restricted to one wetland type, most models were included in more than one wetland type group. Within each wetland type group, variables from all models were then grouped according to overall similarity (e.g., water quality, vegetation, etc.). Each variable was evaluated based on 1) whether it met the overall variable selection criteria; 2) whether another, more easily measured/predicted variable in the same or a different similarity group functioned as a surrogate; and 3) whether it was deemed suitable for the WVA application (e.g., some freshwater fish model variables dealt with riverine or lacustrine environments). Variables that did not satisfy those conditions were eliminated from further consideration. The remaining variables, still in their similarity groups, were then further eliminated or refined by combining similar variables and/or culling those that were functionally duplicated by variables from other models (i.e., some variables were used frequently in different models in only slightly different format, such as percent marsh coverage, salinity, etc.).

Variables selected from the HSI models were then compared to those identified in the first part of the selection procedure to arrive at a final list of variables to describe wetland quality. That list includes seven variables for each of the marsh types and three for the cypress-tupelo swamp (Attachment 1).

IV. SUITABILITY INDEX GRAPHS

The next task in model development consisted of constructing Suitability Index graphs for each variable selected within a wetland type. A Suitability Index (SI) graph is a graphical representation of how the overall quality or "suitability" of a given wetland type is predicted to change as values of the given variable change, and allows the model user to numerically describe, through a Suitability Index, the "quality" of a wetland area for any value measured for the variable in question. Each Suitability Index ranges from 0.0 to 1.0, with 1.0 representing the optimum condition for the variable in question.

A variety of resources were utilized to construct each Suitability Index graph, including personal knowledge of Group members, the species HSI models from which the final list of variables was partially derived, consultation with other professionals and researchers outside the Group, and published and unpublished data and studies. The process of graph development was one of constant evolution, feedback, and refinement; the final form of each Suitability Index graph was decided upon through consensus among Group members.

V. SUITABILITY INDEX GRAPH ASSUMPTIONS

Individual Suitability Index graphs were developed according to the following assumptions:

1. Fresh/Intermediate Marsh Model

Variable V_1- Percent of wetland covered by persistent emergent vegetation (≥ 10% canopy cover). Persistent emergent vegetation plays an important role in coastal wetlands by providing foraging, resting, and breeding habitat for a wide variety of fish and wildlife species; providing a source of detritus and energy for the marsh itself and adjacent systems; and functioning in water purification and storm-surge reduction. An area with no marsh (i.e., shallow open water) is assumed to have minimal suitability or "quality" in terms of this

variable, and is assigned an SI of near zero. Optimum conditions in a fresh/intermediate marsh are assumed to occur between 50% and 70% coverage of persistent emergent vegetation (SI=1.0). Suitability is assumed to decline as percent marsh coverage exceeds 70%, due to reductions in the amount of open water and marsh/water interface. However, even a fresh/intermediate marsh with 100% marsh coverage (0% open water) is considered relatively high quality, especially in terms of wildlife habitat for certain species, water quality maintenance, and storm-surge reduction, and is therefore given an SI=0.6.

Variable V_2- Percent of open water area dominated (> 50% canopy cover) by aquatic vegetation. Fresh and intermediate marshes often support diverse communities of floating-leaved and submerged aquatic plants that provide important food and cover to a wide variety of fish and wildlife species, and function in water quality maintenance. A fresh/intermediate open water area with no aquatics is assumed to have low suitability (SI=0.1). It is assumed that optimum conditions occur between 50% and 70% open water coverage by aquatic vegetation (SI=1.0). Wetland suitability or quality is assumed to decrease sharply with aquatic plant coverage exceeding 70% due to the potential for mats of aquatic vegetation to hinder fish and wildlife utilization; to adversely affect water quality by reducing photosynthesis by phytoplankton and other plant forms due to shading; and contribute to oxygen depletion spurred by warm-season decay of large quantities of aquatic vegetation.

Variable V_3- Marsh edge and interspersion. This variable takes into account the relative juxtaposition of marsh and open water for a given marsh:open water ratio, and is measured by comparing the project area to sample illustrations depicting various degrees of interspersion. Interspersion is assumed to be especially important when considering the value of an area as foraging and nursery habitat for freshwater and estuarine fish and shellfish; the marsh/open water interface represents an ecotone where prey species often concentrate, and where post-larval and juvenile organisms can find cover. Isolated marsh ponds are often more productive in terms of aquatic vegetation

than are larger ponds due to decreased turbidities, and, thus, may provide more suitable waterfowl habitat. A high degree of interspersion is assumed to be optimal (SI=1.0), and the lowest expression of interspersion (e.g., all open water, all marsh, or all marsh clumped together) is assumed to be least desirable in terms of expressing marsh quality, and is thus assigned an SI=0.2.

Variable V_4- Water duration in relation to marsh surface. Excessive water levels in a fresh/intermediate marsh can stress and eliminate certain types of marsh vegetation, particularly annuals and less flood-tolerant perennial grasses, resulting in a less diverse plant and animal community. Infrequent flooding can result in shrub encroachment into an emergent marsh; shrub vegetation is assumed to be less desirable than herbaceous marsh vegetation. Seasonal flooding is assumed to be important in establishing a diverse plant community in a fresh/intermediate marsh, including an mix of annual and perennial plants important to wildlife, and thus is considered the optimum water duration condition. Infrequent flooding is considered least desirable, and is assigned an SI=0.1.

Variable V_5- Open water depth in relation to marsh surface. Shallow water areas are assumed to be more important in terms of biological productivity than deeper water due to a general reduction in sunlight, oxygen, and temperature as water depth increases. Also, shallower water depths provide greater bottom accessibility for certain species of waterfowl, better foraging habitat for wading birds, and more favorable conditions for aquatic plant growth. Optimum open water depths in a fresh/intermediate marsh are assumed to be less than 0.5 foot deep (SI=1.0), while water deeper than 1.5 feet deep is assigned an SI=0.2.

Variable V_6- Mean high salinity during the growing season. It is assumed that periods of high salinity are most detrimental in a fresh/intermediate marsh when they occur during the growing season (defined as March through November, based on dates of first and last frost contained in Soil Conservation Service soil surveys for coastal Louisiana parishes). Mean high salinity is defined as the

average of the upper 33 percent of salinity readings taken during a specified period of record. Optimum conditions are assumed to occur when mean high salinity during the growing season is less than 3 parts per thousand (ppt). The suitability of fresh/intermediate marsh is assumed to decrease as mean high salinity exceeds 3 ppt.

Variable V_7- Aquatic organism access. Access by aquatic organisms, particularly estuarine fishes and shellfishes, is considered to be a critical component in assessing the "quality" or suitability of a given marsh system to provide habitat to those species. Additionally, a marsh with a relatively high degree of access by default also exhibits a relatively high degree of hydrologic connectivity with adjacent systems, and therefore may be considered to contribute more to nutrient exchange than would a marsh exhibiting a lesser degree of access. The Suitability Index for V_7 is determined by calculating an "Access Value" based on an interaction between the percentage of the project area wetlands considered accessible by estuarine organisms during normal tidal fluctuations, and the type of man-made structures (if any) across identified points of ingress/egress (bayous, canals, etc.). Standardized procedures for calculating the Access Value were established (Attachment 1). Optimum conditions are assumed to exist when all of the study area is accessible and the access points are entirely open and unobstructed. A fresh/intermediate marsh with no access is assigned an SI=0.3, reflecting the assumption that, while fresh/intermediate marshes are important to some species of estuarine fishes and shellfish, such a marsh lacking access continues to provide benefits to a wide variety of other wildlife and fish species, and is not without value or suitability.

2. Brackish Marsh Model

Variable V_1- Percent of wetland covered by persistent emergent vegetation ($\geq$ 10% canopy cover). Refer to the V_1 discussion under the fresh/intermediate marsh model for a discussion of the importance of persistent emergent vegetation in coastal marshes. The V_1 Suitability Index

graph for the brackish marsh model is similar to that for the fresh/intermediate model, with the exception that a brackish marsh exhibiting 100% cover of persistent emergent vegetation is assigned an SI=0.5. Because brackish marshes are assumed to be more important to estuarine fish and shellfish relative to fresh marshes, marsh coverage in excess of 70% is assumed to reduce habitat suitability for estuarine fish and shellfish proportionately more in a brackish marsh than in a fresh/intermediate marsh.

Variable V_2- Percent of open water area dominated (> 50% canopy cover) by aquatic vegetation. Like fresh/intermediate marshes, brackish marshes have the potential to support aquatic plants that serve as important sources of food and cover for a wide variety of wildlife. However, brackish marshes generally do not support the amounts and kinds of aquatic plants that occur in fresh/intermediate marshes (although certain species, such as widgeon-grass, can occur abundantly under certain conditions). Therefore, a brackish marsh entirely lacking aquatic plants is assigned an SI=0.3. It is assumed that optimum open water coverage of aquatic plants in a brackish marsh occurs at between 50% and 70% cover, and that suitability decreases slightly as coverage exceeds 70%, to an SI=0.7 at 100% aquatic cover.

Variable V_3- Marsh edge and interspersion. The Suitability Index graph for edge and interspersion in the brackish marsh model is the same as that in the fresh/intermediate marsh model.

Variable V_4- Water duration in relation to marsh surface. Three classes of water duration are used for the V_4 Suitability Index graph in the brackish marsh model. Extreme long- and long-duration flooding in a brackish marsh can stress marsh hay cordgrass (Spartina patens), eventually contributing to a reduction in dominance of that plant and an increase in more flood-tolerant plants such as smooth cordgrass (S. alterniflora), Scirpus spp., and Eleocharis spp. Because marsh hay cordgrass is an important biomass producer and contributor to the detrital food chain in brackish marshes, prolonged flooding is

assumed to be an undesirable condition (SI=0.5) in comparison to a more regular flooding regime involving regular tidal exchange with almost daily surface exposure (SI=1.0). The least desirable regime is assumed to be infrequent flooding (SI=0.1), a condition that encourages shrub encroachment at the expense of herbaceous marsh vegetation.

Variable V_5- Open water depth in relation to marsh surface. As in the fresh/intermediate model, shallow water areas are assumed to be more important in terms of brackish marsh habitat suitability or quality than deeper areas. Four water depth categories are established for the brackish marsh model, with optimum water depths occurring between 0.5 foot and 1.5 feet deep (SI=1.0). That SI reflects the importance of that depth category as a foraging stratum for post-larval and juvenile stages of estuarine fish and shellfish, as well as for waterfowl and wading birds; most aquatic plants are also expected to occur in that depth category. Open water less than 0.5 foot deep is assumed to be only slightly less important, and is assigned an SI=0.8. Deeper water, while important as a refuge for fish and alligators during summer and winter, receives lower Suitability Indices.

Variable V_6- Average annual salinity. The suitability index graph is constructed to represent optimum salinity conditions at between 6 ppt and 10 ppt. Average annual salinities below 4 ppt are not considered on the graph because salinities below that level effectively define an intermediate marsh. Similarly, average annual salinities greater than 18 ppt are assumed to be representative of those found in a saline marsh, and thus are not considered in the brackish marsh model.

Variable V_7- Aquatic organism access. The general rational and procedure behind the V_7 Suitability Index graph for the brackish marsh model is identical to that established for the fresh/intermediate model. However, brackish marshes are assumed to be more important as providers of habitat to estuarine fish and shellfish than fresh/intermediate marshes. Therefore, the Suitability

Index for aquatic organism access in the brackish marsh model is assumed to be equivalent to the Access Value. For the purposes of the WVA, an Access Value of zero is assigned an SI of 0.0001, because the structure of the HSI formula is such that an SI of zero yields an HSI of zero, thus implying that a brackish marsh has no community value if it is not accessible by aquatic organisms. By substituting the value 0.0001 for zero, the problems associated with a zero HSI are avoided.

3. **Saline Marsh Model**

Variable V_1- Percent of wetland covered by persistent emergent vegetation (≥ 10% canopy cover). The V_1 Suitability Index graph for the saline marsh model is similar to that of the brackish marsh, except that suitability decreases more rapidly as marsh coverage exceeds 70%. Also, 100% coverage is assigned an SI=0.4 rather than 0.5 as in the brackish marsh model. That difference is due to the assumption that saline marshes are utilized heavily by estuarine fish and shellfish, and thus a higher percentage of marsh would decrease suitability in saline marsh proportionately more than in the brackish marsh.

Variable V_2- Percent of open water area dominated (> 50% canopy cover) by aquatic vegetation. Aquatic vegetation is generally not considered an important habitat component in the saline marshes of coastal Louisiana; those saline marshes are usually strongly influenced by tides, and the resulting hydraulic energy and turbidity usually limits growth of aquatic vegetation, with the possible exception of seagrass beds occupying certain locations in bays and other shallow water areas. Thus, the V_2 Suitability Index graph for the saline marsh model is relatively flat, illustrating an SI=0.6 for no aquatic vegetation and an optimum of 50% to 70% aquatic vegetation coverage.

Variable V_3- Marsh edge and interspersion. The Suitability Index graph for edge and interspersion in the saline marsh model is the same as that for the fresh/intermediate and brackish marsh models.

Variable V_4- Water duration in relation to marsh surface. Three water duration categories are described for the saline marsh model. The optimum condition is assumed to be one of regular (daily) tidal exchange typical of coastal saline marshes dominated by smooth cordgrass. The remaining two water duration categories represent decreased inundation frequency, which are assumed to be less desirable and are thus assigned lower suitability indices.

Variable V_5- Open water depth in relation to marsh surface. The Suitability Index graph for water depth in the saline marsh model is the same as that for the brackish marsh model.

Variable V_6- Average annual salinity. The Suitability Index graph is constructed to represent optimum salinity conditions at between 14 ppt and 18 ppt. Average annual salinities below 9 ppt are not considered on the graph because average annual salinities below that level would essentially define a brackish marsh.

Variable V_7- Aquatic organism access. The Suitability Index graph for aquatic organism access in the saline marsh model is the same as that for the brackish marsh model.

4. **Cypress-Tupelo Swamp Model**

Variable V_1- Water regime. Four water regime categories are described for the cypress-tupelo swamp model. The optimum water regime for a cypress-tupelo swamp is assumed to be seasonal flooding (SI=1.0); seasonal flooding with periodic drying cycles is assumed to contribute to increased nutrient cycling (primarily through oxidation and decomposition of accumulated detritus), increased vertical structure complexity (due to growth of other plants on the swamp floor), and increased recruitment of dominant overstory trees. Semipermanent flooding is also assumed to be desirable, as reflected in the SI=0.8 for that water regime category. Permanent flooding is assumed to be the least desirable (SI=0.2).

Variable V_2- Water flow/exchange. This variable attempts to take into consideration the amounts and types of water inputs into a cypress-tupelo swamp. The Suitability Index graph is constructed under the assumption that abundant and consistent riverine input and water flow-through is optimum (SI=1.0), because under that regime the full functions and values of a cypress-tupelo swamp are assumed to be maximized. Suitability is assumed to decrease as water exchange between the swamp and adjacent systems is reduced. A swamp system with no water exchange (e.g., an impounded swamp where the only water input is through rainfall and the only water loss is through evapotranspiration and ground seepage) is assumed to be least desirable, and is assigned an SI= 0.2.

Variable V_3- Average high salinity. Average high salinity is defined as the average of the upper 33 percent of salinity measurements taken during a specified period of record. Because baldcypress is salinity-sensitive, optimum conditions for baldcypress survival are assumed to occur at average high salinities less than 1 ppt. Suitability is assumed to decrease rapidly at average high salinities in excess of 1 ppt.

VI. HABITAT SUITABILITY INDEX FORMULA

The final step in WVA model development was to construct a mathematical formula that combines all Suitability Indices for each wetland type into a single Habitat Suitability Index (HSI) value (Attachment 1). Because the Suitability Indices range in value from 0.0 to 1.0, the HSI also ranges in from 0.0 to 1.0, and is a numerical representation of the overall or "composite" quality of the particular wetland study area being evaluated.

The HSI formula defines the aggregation of Suitability Indices in a manner unique to each wetland type depending on how the formula is constructed. The formulas developed for the WVA use a geometric mean to aggregate Suitability Indices within a wetland type, as per model construction guidelines contained in HEP support documents. According to those guidelines, a geometric

mean is appropriate for use when the relationship between model variables is such that some compensations exist (i.e., a low Suitability Index for one variable will be partially compensated for by a high Suitability Index of another variable); however, optimum conditions can exist only if all Suitability Indices are equal to 1.0. A geometric mean is computed by multiplying the Suitability Indices together and raising the resulting product by the reciprocal of the sum of all Suitability Index exponents.

Any Suitability Index can be weighted by raising its exponent to the degree deemed appropriate. Weighting increases the power or "importance" of a given variable relative to the other variables in the HSI formula. A larger exponent will increase the influence of that variable's Suitability Index in determining the HSI. Because the primary focus of the CWPPRA is interpreted as being on vegetated wetlands, variables V_1 and V_2 have been weighted to the third and second power, respectively, to increase the importance of vegetation condition in determining HSI's. An exception in this regard has been made in the HSI formula for the saline marsh model, where variable V_2 is not weighted, due to the natural lack of aquatic vegetation in tidal saline marshes. Finally, variable V_7 (aquatic organism access) has been weighted to the second power in the brackish and saline marsh models, to reflect the critical role of those marsh types in providing habitat to estuarine fish and shellfish.

As with the Suitability Index graphs, the Habitat Suitability Index formulas were developed by consensus among the Group members.

VI. BENEFIT ASSESSMENT

The net benefits of a proposed project are estimated by predicting habitat conditions into the future for two scenarios: with the proposed project in place and without the proposed project. Specifically, predictions are made as to how the model variables will change through time under the two scenarios. Through that process, Habitat Suitability Indices are established for baseline (pre-project) conditions and for both future-with

and future-without project conditions for various years throughout the expected life of the project. Those Habitat Suitability Indices are then multiplied by the acreage of wetland type known or expected to be present in the various target years to arrive at Habitat Units (HU's).

HU's represent a numerical combination of quality (HSI) and quantity (acres) existing at any given point in time. The "benefit" of a project over future-without conditions can be quantified by comparing HU's between the two scenarios. The difference in HU's between the two conditions represents the net benefit attributable to the project in terms of habitat quantity and quality.

The HU's resulting from the future-with and future-without project conditions are annualized, averaged out over the project life, and compared to determine the net gain in average annual HU's (AAHU's) attributable to the project. Net gain in AAHU's is then combined with annualized cost data to arrive at a cost per AAHU for the evaluated project. That figure is compared to the same figure from other projects in order to rank all proposed projects in order of cost per AAHU.

WETLAND VALUE ASSESSMENT COMMUNITY MODEL

Fresh/Intermediate Marsh

Vegetation:

Variable V_1 Percent of wetland area covered by emergent vegetation (≥ 10% canopy cover).

Variable V_2 Percent of open water area dominated (> 50% canopy cover) by aquatic vegetation.

Interspersion:

Variable V_3 Marsh edge and interspersion.

Water Depth and Duration:

Variable V_4 Water duration in relation to marsh surface.

Variable V_5 Open water depth in relation to marsh surface.

Water Quality:

Variable V_6 Mean high salinity during the growing season (March through November).

Aquatic Organism Access:

Variable V_7 Aquatic organism access.

HSI Calculation:

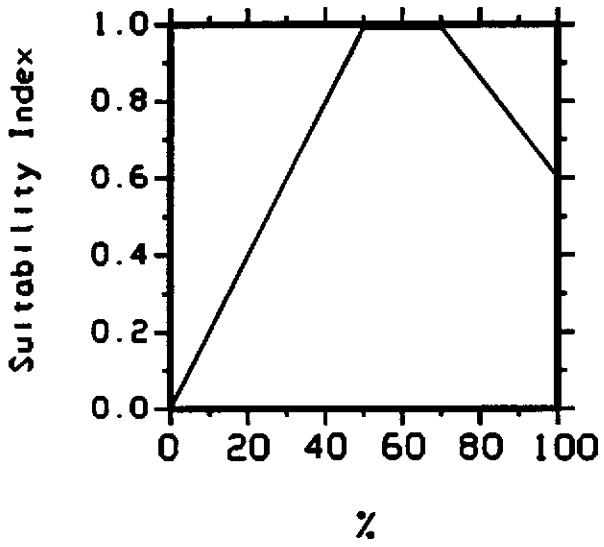
$$HSI = \left(SI_{V_1}{}^3 \times SI_{V_2}{}^2 \times SI_{V_3} \times SI_{V_4} \times SI_{V_5} \times SI_{V_6} \times SI_{V_7}\right)^{1/10}$$

Attachment 1

FRESH MARSH

Variable V_1 Percent of wetland area covered by emergent vegetation (≥ 10% canopy cover).

Suitability Graph



Line Formulas

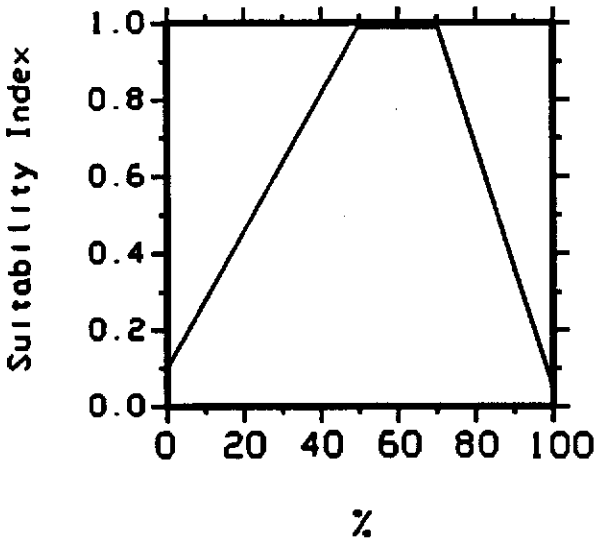
If 0 ≤ % < 50, then SI = 0.02x

If 50 ≤ % < 70, then SI = 1.0

If % ≥ 70, then SI = -0.0133x + 1.93

Variable V_2 Percent of open water area dominated (> 50% canopy cover) by aquatic vegetation.

Suitability Graph



Line Formulas

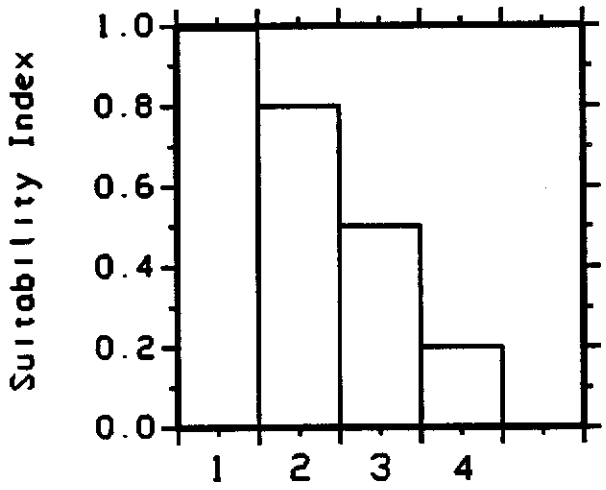
If $0 \leq \% < 50$, then $SI = 0.018x + 0.1$

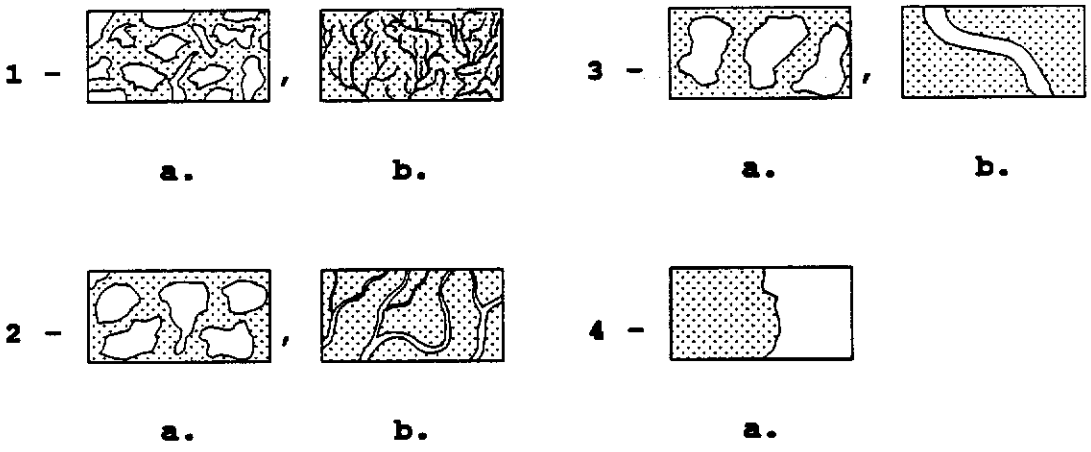
If $50 \leq \% < 70$, then $SI = 1.0$

If $\% \geq 70$, then $SI = -0.0317x + 3.217$

Variable V_3 Marsh edge and interspersion.

Suitability Graph



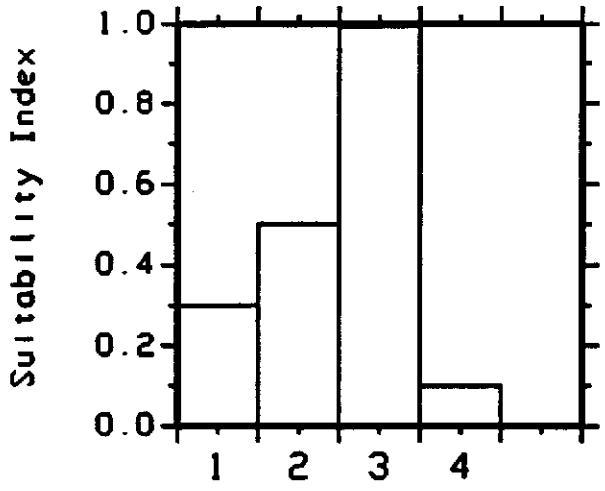


Note: Percent marsh is the same in each pond illustration (45%); only the relative arrangement of marsh and open water differ. Marsh/water areas in the pond illustrations can be conceptually reversed to represent 45% water.

FRESH MARSH

Variable V_4 Water duration in relation to marsh surface.

Suitability Graph



1 - Area subject to extreme long-duration flooding (surface is flooded throughout the year in almost all years). Wetland vegetation typically characterized by *Scirpus* spp., *Typha* spp., *Zizaniopsis miliacea*, etc.

2 - Area subject to long-duration flooding (surface is flooded throughout the growing season in most years). Wetland vegetation typically characterized by bulltongue (*Sagittaria* spp.)

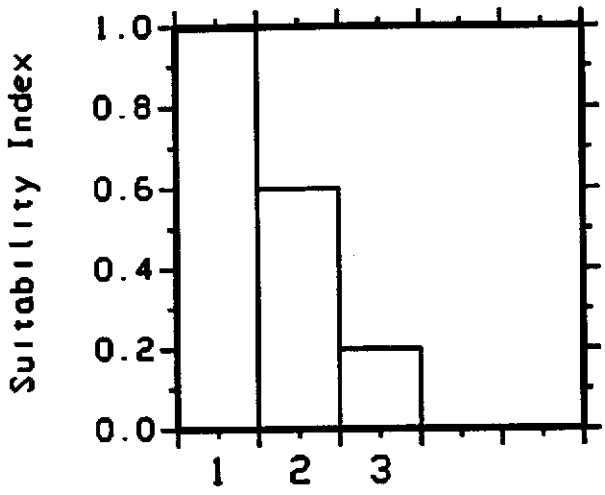
3 - Area subject to seasonal flooding (surface is flooded for extended periods, especially during the growing season, but is exposed by the end of the growing season in most years). Wetland vegetation typically characterized by *Panicum hemitomon*, *Hydocotyle* spp., *Bacopa* spp., *Polygonum* spp., etc.

4 - Area subject to infrequent flooding (surface water is present for only brief periods during the growing season). Wetland vegetation characterized by shrubs (*Baccharis*, *Myrica*, etc.)

Estimate acreage in each category and compute a weighted average to arrive at SIV_4.

Variable V_5 Open water depth in relation to marsh surface.

Suitability Graph



1 - Water less than 0.5 foot deep.

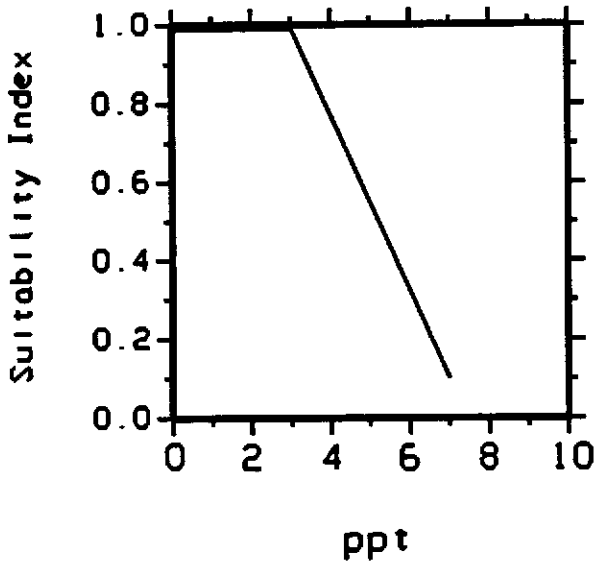
2 - Water between 0.5 and 1.5 feet deep.

3 - Water more than 1.5 feet deep.

Estimate acreage in each category and compute a weighted average to arrive at SIV_5.

Variable V_6 Mean high salinity during the growing season (March through November).

Suitability Graph



Line Formulas

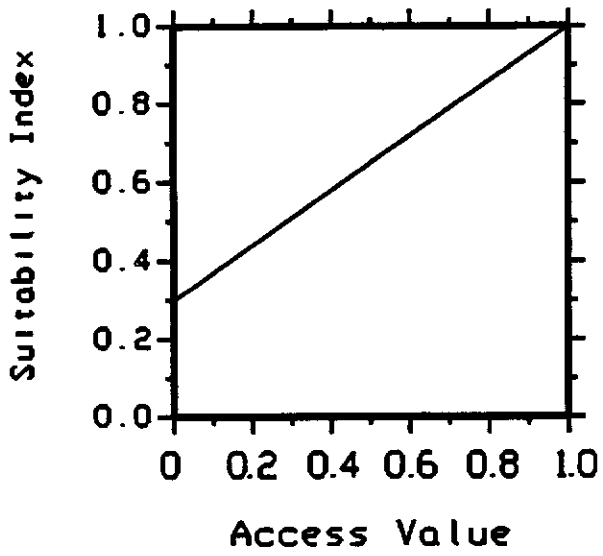
If $0 \leq ppt < 3$, then $SI = 1.0$

If $3 \leq ppt \leq 7$, then $SI = -0.225x + 1.675$

Note: Mean high salinity is defined as the average of the upper 33 percent of salinity readings taken during the period of record.

Variable V_7 Aquatic organism access.

Suitability Graph



Line Formula

$SI = 0.7x + 0.3$

Note: Access Value = P * R, where P = percentage of wetland area considered accessible by estuarine organisms during normal tidal fluctuations, and R = Structure Rating.

Refer to "Procedure For Calculating Access Value" for complete information on calculation of Structure Rating.

WETLAND VALUE ASSESSMENT COMMUNITY MODEL

Brackish Marsh

Vegetation:

Variable V_1 Percent of wetland area covered by emergent vegetation (≥ 10% canopy cover).

Variable V_2 Percent of open water area dominated (> 50% canopy cover) by aquatic vegetation.

Interspersion:

Variable V_3 Marsh edge and interspersion.

Water Depth and Duration:

Variable V_4 Water duration in relation to marsh surface.

Variable V_5 Open water depth in relation to marsh surface.

Water Quality:

Variable V_6 Average annual salinity.

Aquatic Organism Access:

Variable V_7 Aquatic organism access.

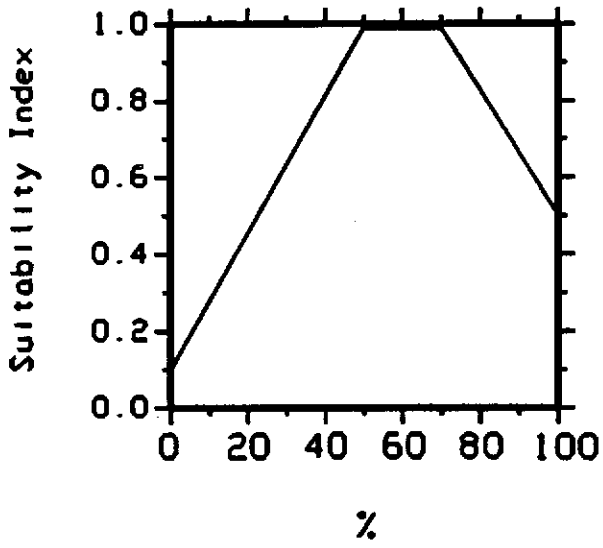
HSI Calculation:

$$HSI = \left(SI_{V_1}{}^3 \times SI_{V_2}{}^2 \times SI_{V_3} \times SI_{V_4} \times SI_{V_5} \times SI_{V_6} \times SI_{V_7}{}^2\right)^{1/11}$$

BRACKISH MARSH

Variable V_1 Percent of wetland area covered by emergent vegetation (≥ 10% canopy cover).

Suitability Graph



Line Formulas

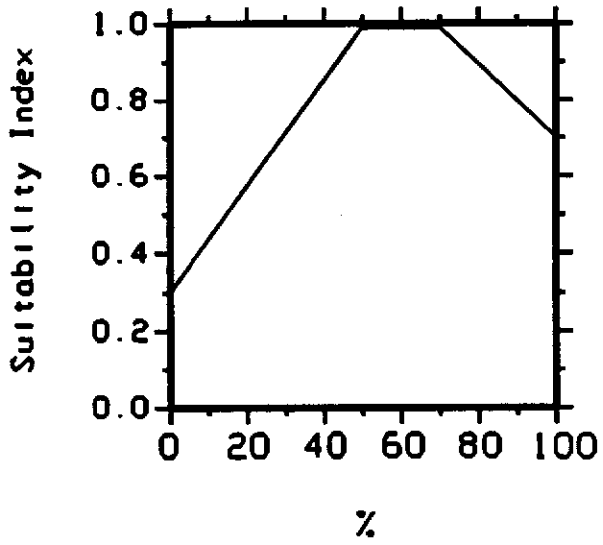
If $0 \leq \% < 50$, then $SI = 0.018x + 0.1$

If $50 \leq \% < 70$, then $SI = 1.0$

If $\% \geq 70$, then $SI = -0.0167x + 2.17$

Variable V_2 Percent of open water area dominated (> 50% canopy cover) by aquatic vegetation.

Suitability Graph



Line Formulas

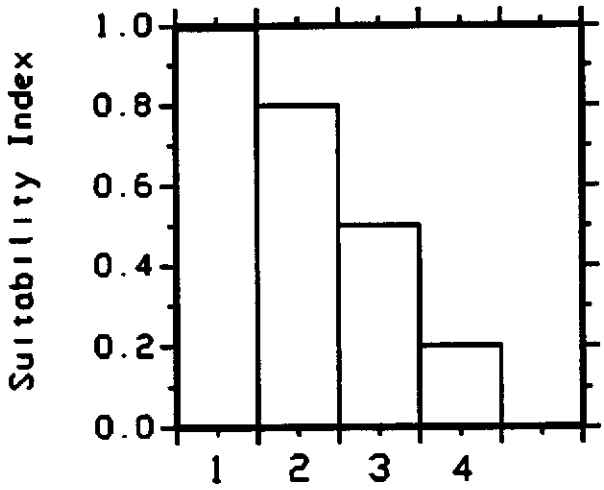
If $0 \leq \% < 50$, then $SI = 0.014x + 0.3$

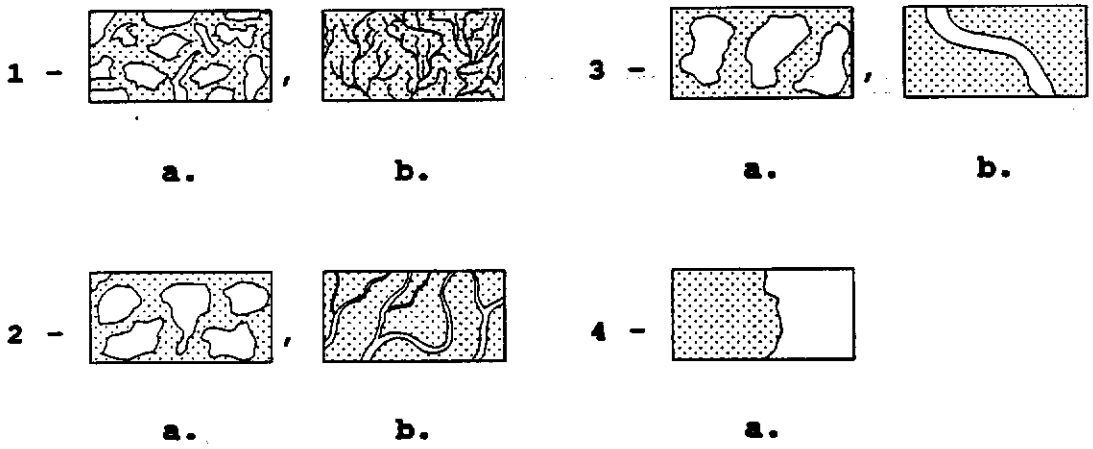
If $50 \leq \% < 70$, then $SI = 1.0$

If $\% \geq 70$, then $SI = -0.01x + 1.7$

Variable V_3 Marsh edge and interspersion.

Suitability Graph



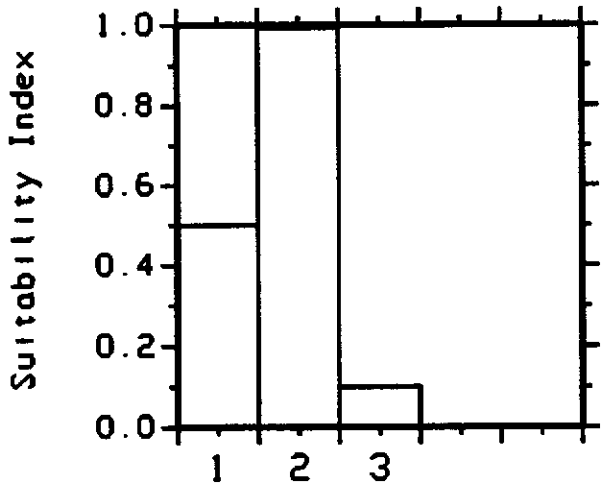


Note: Percent marsh is the same in each pond illustration (45%); only the relative arrangement of marsh and open water differ. Marsh/water areas in the pond illustrations can be conceptually reversed to represent 45% water.

BRACKISH MARSH

Variable V_4 Water duration in relation to marsh surface.

Suitability Graph



1 - Area subject to extreme long- to long-duration flooding (surface is flooded at least throughout the growing season in most years); tidal exchange and/or surface exposure is minimal. Wetland vegetation typically characterized by a community of *Spartina patens*, with *S. alterniflora*, *Scirpus* spp., and/or *Eleocharis* spp. associated and comprising ≥ 25% of canopy cover; or evidence to suggest that prolonged flooding is reducing *Spartina patens*

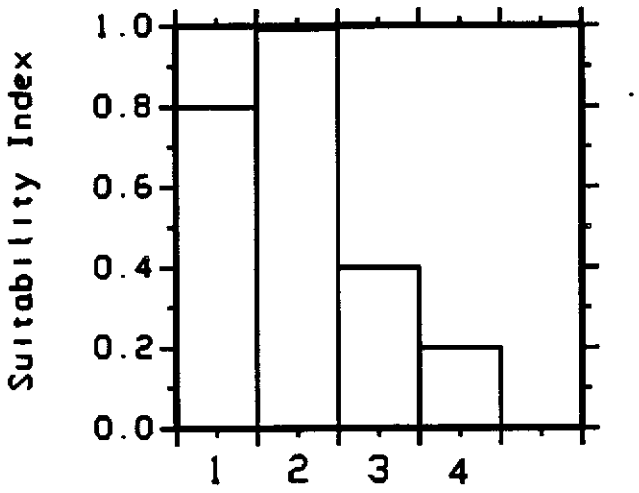
2 - Area subject to regular tidal exchange, normally with daily surface exposure. Wetland vegetation characterized by *Spartina patens*

3 - Area subject to infrequent flooding (tidal or otherwise). Wetland vegetation characterized by shrubs (*Baccharis*, *Iva*, etc.)

Estimate acreage in each category and compute a weighted average to arrive at SIV_4.

Variable V_5 Open water depth in relation to marsh surface.

Suitability Graph



1 - Water less than 0.5 foot deep.

2 - Water between 0.5 and 1.5 feet deep.

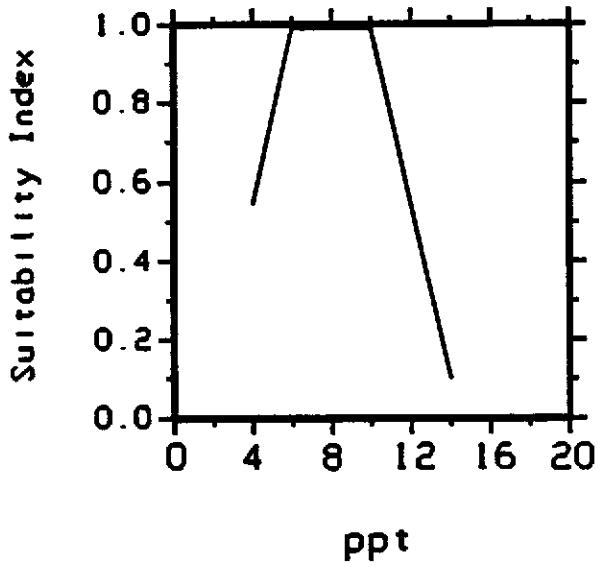
3 - Water between 1.5 and 4.0 feet deep.

4 - Water more than 4.0 feet deep.

Estimate acreage in each category and compute a weighted average to arrive at SIV_5.

Variable V_6 Average annual salinity.

Suitability Graph



Line Formulas

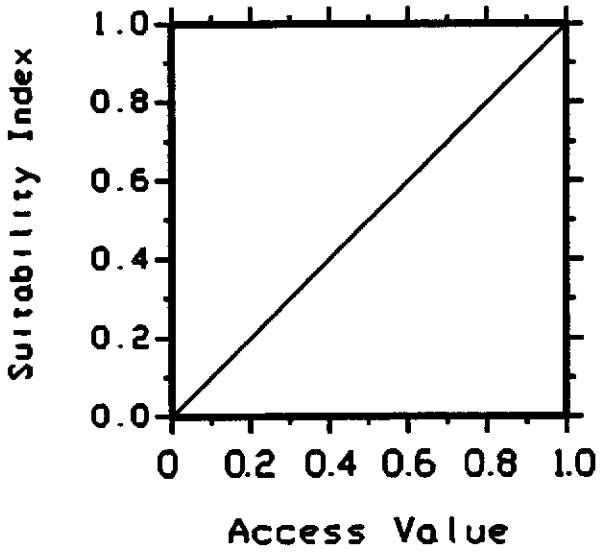
If $4 \leq ppt < 6$, then $SI = 0.225x - 0.35$

If $6 \leq ppt < 10$, then $SI = 1.0$

If $ppt \geq 10$, then $SI = -0.225x + 3.25$

Variable V_7 Aquatic organism access.

Suitability Graph



Line Formula

SI = Access Value

Note: Access Value = P * R, where P = percentage of wetland area considered accessible by estuarine organisms during normal tidal fluctuations, and R = Structure Rating.

Refer to "Procedure for Calculating Access Value" for complete information on calculation of Structure Rating.

WETLAND VALUE ASSESSMENT COMMUNITY MODEL

Saline Marsh

Vegetation:

Variable V_1 Percent of wetland area covered by emergent vegetation (≥ 10% canopy cover).

Variable V_2 Percent of open water area dominated (> 50% canopy cover) by aquatic vegetation.

Interspersion:

Variable V_3 Marsh edge and interspersion.

Water Depth and Duration:

Variable V_4 Water duration in relation to marsh surface.

Variable V_5 Open water depth in relation to marsh surface.

Water Quality:

Variable V_6 Average annual salinity.

Aquatic Organism Access:

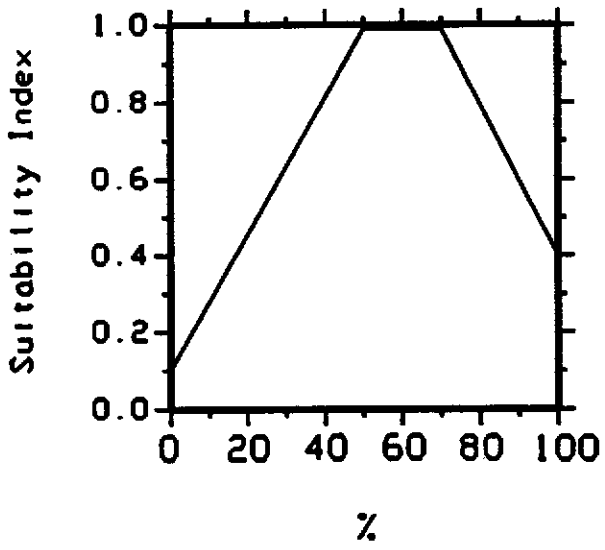
Variable V_7 Aquatic organism access.

HSI Calculation:

$$HSI = \left(SI_{V_1}{}^3 \times SI_{V_2} \times SI_{V_3} \times SI_{V_4} \times SI_{V_5} \times SI_{V_6} \times SI_{V_7}{}^2 \right)^{1/10}$$

Variable V_1 Percent of wetland area covered by emergent vegetation (≥ 10% canopy cover).

Suitability Graph



Line Formulas

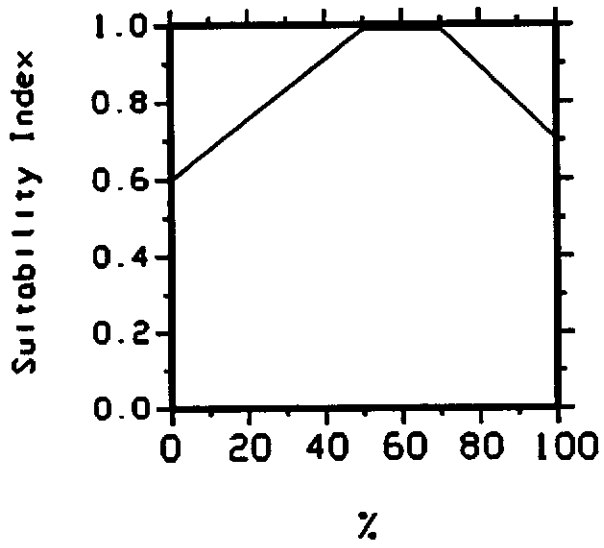
If $0 \leq \% < 50$, then $SI = 0.018x + 0.1$

If $50 \leq \% < 70$, then $SI = 1.0$

If $\% \geq 70$, then $SI = -0.02x + 2.4$

Variable V_2 Percent of open water area dominated (> 50% canopy cover) by aquatic vegetation.

Suitability Graph



Line Formulas

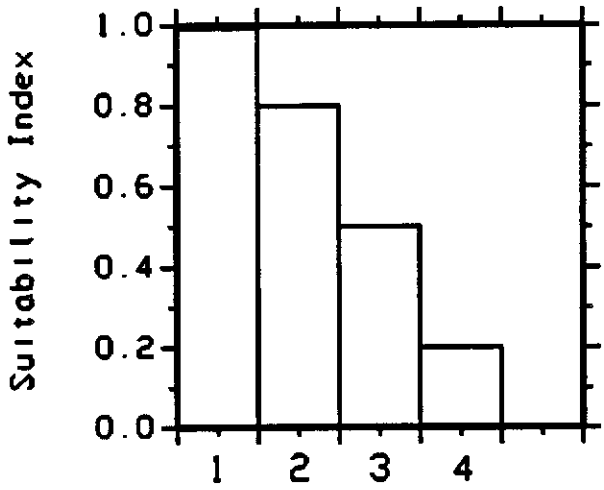
If $0 \leq \% < 50$, then $SI = 0.008x + 0.6$

If $50 \leq \% < 70$, then $SI = 1.0$

If $\% \geq 70$, then $SI = -0.01x + 1.7$

Variable V_3 Marsh edge and interspersion.

Suitability Graph



1 - 

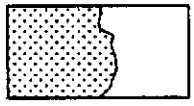
a. b.

3 - 

a. b.

2 - 

a. b.

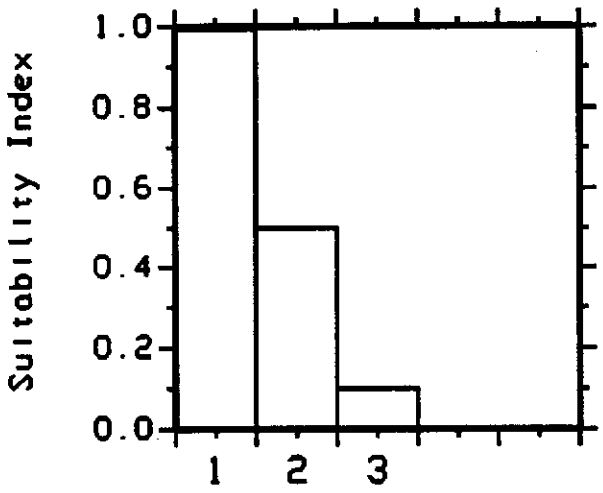
4 - 

a.

Note: Percent marsh is the same in each pond illustration (45%); only the relative arrangement of marsh and open water differ. Marsh/water areas in the pond illustrations can be conceptually reversed to represent 45% water.

Variable V_4 Water duration in relation to marsh surface.

Suitability Graph



1 - Area subject to regular (daily) tidal exchange. Wetland vegetation dominated (> 70% canopy cover) by *Spartina alterniflora*

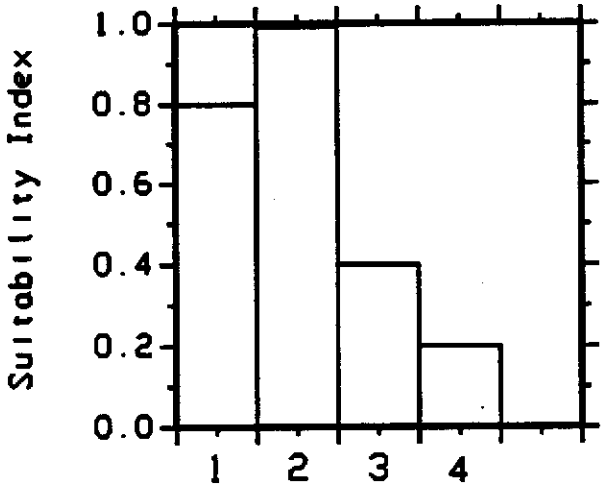
2 - Area subject to irregular tidal flooding. Wetland vegetation dominated by *Juncus roemerianus* and *Distichlis spicata*

3 - Area subject to infrequent tidal flooding. Wetland vegetation dominated by shrubs (*Baccharis*, etc.) and *Salicornia*

Estimate acreage in each category and compute a weighted average to arrive at SIV_4.

Variable V_5 Open water depth in relation to marsh surface.

Suitability Graph



1 - Water less than 1 foot deep.

2 - Water between 1 and 1.5 feet deep.

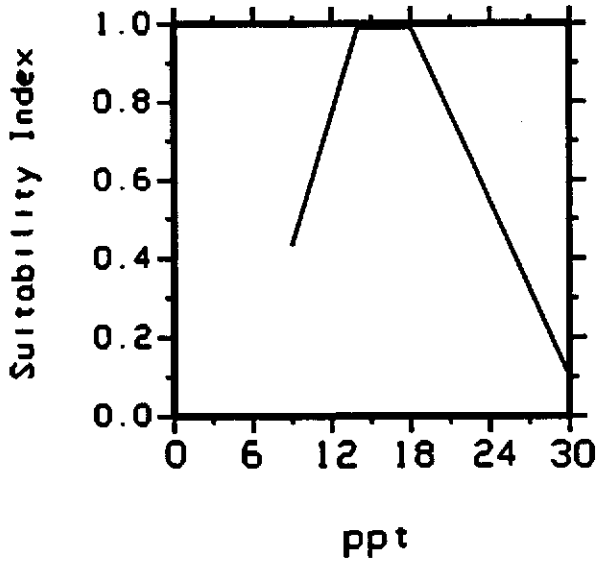
3 - Water between 1.5 and 4 feet deep.

4 - Water greater than 4 feet deep.

Estimate acreage in each category and compute a weighted average to arrive at SIV_5.

Variable V_6 Average annual salinity.

Suitability Graph



Line Formulas

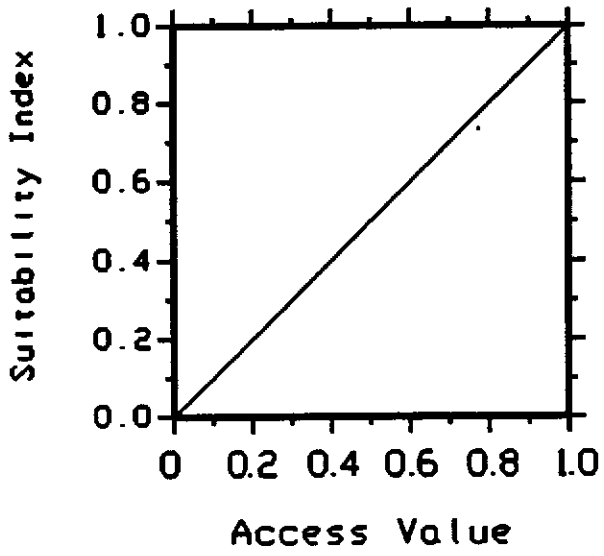
If $9 \leq ppt < 14$, then $SI = 0.112x - 0.575$

If $14 \leq ppt < 18$, then $SI = 1.0$

If $ppt \geq 18$, then $SI = -0.075x + 2.35$

Variable V_7 Aquatic organism access.

Suitability Graph



Line Formula

SI = Access Value

Note: Access Value = P * R, where P = percentage of wetland area considered accessible by estuarine organisms during normal tidal fluctuations, and R = Structure Rating.

Refer to "Procedure for Calculating Access Value" for complete information on calculation of Structure Rating.

WETLAND VALUE ASSESSMENT COMMUNITY MODEL

Cypress-Tupelo Swamp

Water Depth and Duration:

Variable V_1 Water regime.

Water Quality:

Variable V_2 Water flow/exchange.

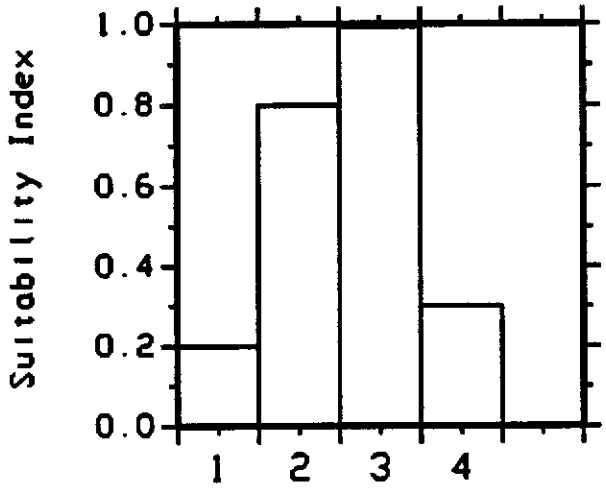
Variable V_3 Average high salinity.

HSI Calculation:

$$HSI = (SI_{V_1} \times SI_{V_2} \times SI_{V_3})^{1/3}$$

Variable V_1 Water regime.

Suitability Graph



1 - Permanently Flooded: water covers the substrate throughout the year in all years.

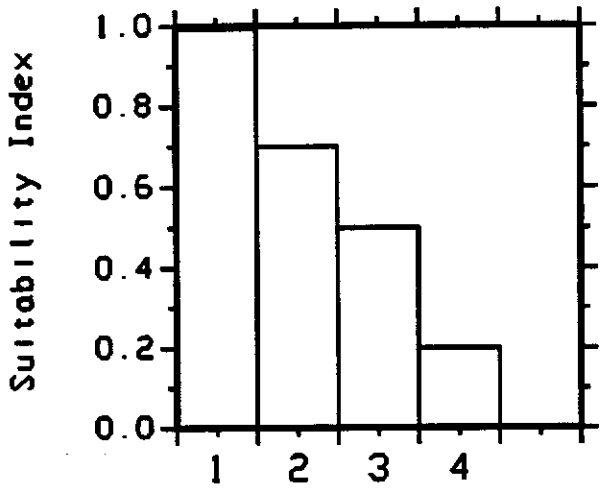
2 - Semipermanently Flooded: surface water is present throughout the growing season in most years.

3 - Seasonally Flooded: surface water is present for extended periods, especially in the growing season, but is absent by the end of the growing season in most years.

4 - Temporarily Flooded: surface water is present for brief periods during the growing season, but the water table usually lies well below the surface for most of the season.

Variable V_2 Water flow/exchange.

Suitability Graph



1 - Receives abundant and consistent riverine input and through-flow.

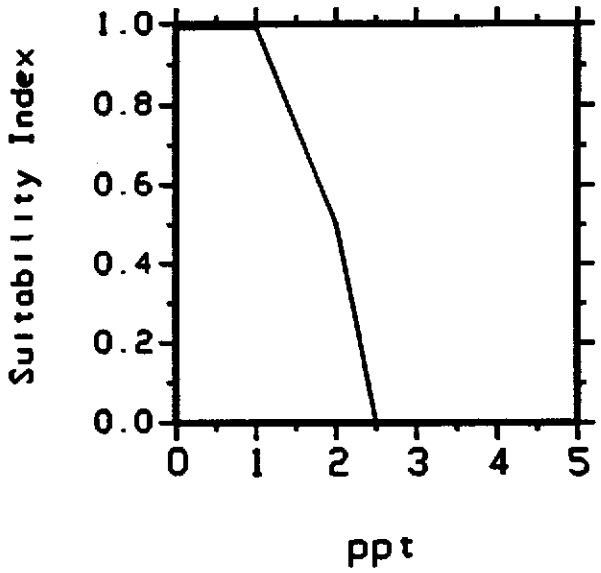
2 - Moderate water exchange, through riverine and/or tidal input.

3 - Limited water exchange, through riverine and/or tidal input.

4 - No water exchange (stagnant, impounded).

Variable V_3 Average high salinity.

Suitability Graph



Line Formulas

If $0 \leq ppt < 1$, then $SI = 1.0$

If $1 \leq ppt < 2$, then $SI = -0.5x + 1.5$

If $2 \leq ppt < 2.5$, then $SI = -1.0x + 2.5$

If $ppt \geq 2.5$, then $SI = 0$

Average high salinity is defined as the average of the upper 33 percent of salinity readings taken during the period of record.

PROCEDURE FOR CALCULATING ACCESS VALUE

1. Determine the percent of wetland area accessible by estuarine organisms during normal tidal fluctuations (P) for baseline (TY0) conditions. P may be determined by examination of aerial photography, knowledge of field conditions, or other appropriate methods.

2. Determine the Structure Rating (R) for each project structure as follows:

Structure Type	Rating
open system	1.0
slotted weir	0.8
open culverts	0.7
flapgated culvert with slotted weir	0.6
variable crest weir	0.4
flapgated culvert	0.3
rock weir	0.2
fixed crest weir	0.1
solid plug	0.0001

For each structure type, the rating listed above pertains only to the standard structure configuration and assumes that the structure is operated according to common operating schedules consistent with the purpose for which that structure is designed. In the case of a "hybrid" structure or a unique application of one of the above-listed types (including unique or "non-standard" operational schemes), the WVA analyst(s) may assign an appropriate Structure Rating between 0.0001 and 1.0 that most closely approximates the relative degree to which the structure in question would allow ingress/egress of estuarine organisms. In those cases, the rational used in developing the new Structure Rating shall be documented.

3. Determine the Access Value. Where multiple openings <u>equally</u> affect a common "accessible unit", the Structure Rating (R) of the structure proposed for the "major" access point for the unit will be used to calculate Access Value. The designation of "major" will be made by the Environmental Work Group. An "accessible unit" is a defined as a portion of the <u>total</u> accessible area that is served by one or more access routes (canals, bayous, etc.), yet is isolated in terms of estuarine organism access to or from other units of the project area. Isolation factors include physical barriers that prohibit further movement of estuarine organisms, such as natural levee ridges, and spoil banks; and dense marsh that lacks channels, trenasses, and similar small connections that would, if present, provide access and intertidal refugia for estuarine organisms.

Access Value should be calculated according to the following examples (Note: for all examples, P for TY0 = 90%. That designation is arbitrary and is used only for illustrative purposes; P could be any percentage from 0% to 100%):

a. One opening into area; no structure.

Access Value = P
= .90

b. One opening into area that provides access to the entire 90% of the project area deemed accessible. A flapgated culvert with slotted weir is placed across the opening.

Access Value = P * R
= .90 * .6
= .54

c. Two openings into area, each capable by itself of providing full access to the 90% of the project area deemed accessible in TY0. Opening #2 is determined to be the major access route relative to opening #1. A flapgated culvert with slotted weir is placed across opening #1. Opening #2 is left unaltered.

Access Value = P
= .90

Note: Structure #1 had no bearing on the Access Value calculation because its presence did not reduce access (opening #2 was determined to be the major access route, and access through that route was not altered).

d. Two openings into area. Opening #1 provides access to an accessible unit comprising 30% of the area. Opening #2 provides access to an accessible unit comprising the remaining 60% of the project area. A flapgated culvert with slotted weir is placed across #1. Opening #2 is left open.

Access Value = weighted avg. of Access Values of the two accessible units

$= ([P_1*R_1] + [P_2*R_2])/(P_1+P_2)$
$= ([.30*0.6] + [.60*1.0])/(.30+.60)$
$= (.18 + .60)/.90$
$= .78/.90$
$= .87$

Note: $P_1 + P_2 = .90$, because only 90 percent of the study

area was determined to be accessible at TY0.

e. Three openings into area, each capable of providing full access to the entire area independent of the others. Opening #3 is determined to be the major access route relative to openings #1 and #2. Opening #1 is blocked with a solid plug. Opening #2 is fitted with a flapgated culvert with slotted weir, and opening #3 is left open.

Access Value = P
= .90

Note: Structures #1 and #2 had no bearing on the Access Value calculation because their presence did not reduce access (opening #3 was determined to be the major access route, and access through that route was not altered).

f. Three openings into area, each capable of providing full access to the entire area independent of the others. Opening #2 is determined to be the major access route relative to openings #1 and #3. Opening #1 is blocked with a solid plug. Opening #2 is fitted with a flapgated culvert with slotted weir, and opening #3 is fitted with a fixed crest weir.

Access Value = $P * R_2$
= .90 * .6
= .54

Note: Structures #1 and #3 had no bearing on the Access Value calculation because their presence did not reduce access. Opening #2 was determined beforehand to be the major acccess route; thus, it was the flapgated culvert with slotted weir across that opeing that actually served to limit access.

g. Three openings into area. Opening #1 provides access to an accessible unit comprising 20% of the area. Openings #2 and #3 provide access to an accessible unit comprising the remaining 70% of the area, and within that area, each is capable by itself of providing full access. However, opening #3 is determined to be the major access route relative to opening #2. Opening #1 is fitted with an open culvert, #2 with a flapgated culvert with slotted weir, and #3 with a fixed crest weir.

Access Value = $([P_1*R_1] + [P_2*R_3])/(P_1+P_2)$

= ([.20*.7]+[.70*.6])/(.20+.70)
= (.14 + .42)/.90
= .56/.90
= .62

h. Three openings into area. Opening #1 provides access to an accessible unit comprising 20% of the area. Opening #2 provides access to an accessible unit comprising 40% of the area, and opening #3 provides access to the remaining 30% of the area. Opening #1 is fitted with an open culvert, #2 a flapgated culvert with slotted weir, and #3 a fixed crest weir.

Access Value = $([P_1*R_1]+[P_2*R_2]+[P_3*R_3])/(P_1+P_2+P_3)$

= ([.20*.7]+[.40*.6]+[.30*.1])/(.20+.40+.30)
= (.14+.24+.03)/.90
= .41/.90
= .46

Published Habitat Suitability Index (HSI) Models Consulted for Variables for Possible Use in the Wetland Value Assessment Models

Estuarine Fish and Shellfish

pink shrimp
white shrimp
brown shrimp
spotted seatrout
Gulf flounder
southern flounder
Gulf menhaden
juvenile spot
juvenile Atlantic croaker
red drum

Reptiles and Amphibians

American alligator
slider turtle
bullfrog

Mammals

mink
muskrat

Freshwater Fish

channel catfish
largemouth bass
red ear sunfish
bluegill

Birds

clapper rail
great egret
northern pintail
mottled duck
coot
marsh wren
great blue heron
laughing gull
snow goose
red-winged blackbird
roseate spoonbill
white-fronted goose

Attachment 2

COASTAL WETLANDS PLANNING, PROTECTION, AND RESTORATION ACT

PRIORITY PROJECT LIST REPORT
November 18, 1991

APPENDIX G

ENVIRONMENTAL REPORT

ENVIRONMENTAL REPORT

CWPPRA PRIORITY PROJECT LIST

October 30, 1991

CONTENTS

1. CWPPRA

Title III of Public Law 101-646 is the "Coastal Wetlands Planning, Protection and Restoration Act", or CWPPRA. CWPPRA establishes the Louisiana Coastal Wetlands Conservation and Restoration Task Force. The six Task Force members are representatives of the Secretary of the Army (chair), the Administrator of EPA, the Secretaries of Interior, Agriculture and Commerce, and the Governor of Louisiana.

The Task Force is supported by a Technical Committee and by subcommittees whose members are professional staff from the New Orleans District Corps of Engineers, EPA Region VI, Fish and Wildlife Service, Soil Conservation Service, National Marine Fisheries Service and the State of Louisiana.

CWPPRA requires the preparation of an annual priority project list which will identify coastal wetlands restoration projects in Louisiana according to their "cost-effectiveness" and other factors. The first such list is to be developed by the Task Force and submitted to Congress by the Secretary of the Army no later than 29 November 1991. The initial priority list is to be a basis for allocation of CWPPRA funds in 1991-1992.

This environmental report summarizes the environmental factors which were considered by the Task Force agencies in the development of the priority project list. The report is in addition to the Environmental Assessment or Environmental Impact Statement and Findings that will be required before any specific project can be funded for detailed plans/and specification, and construction.

2. CANDIDATE PROJECTS

Candidate projects for the priority project list were identified through written proposals which were submitted by the Task Force agencies on August 6, 1991. The proposals, termed "Fact Sheets", provide a basic description of each project, including estimated benefits, financial costs and status of environmental compliance. A total of 28 project fact sheets were submitted.

Projects were reviewed by the Planning and Evaluation Subcommittee of the Task Force Technical Committee. After preliminary analysis, 10 projects were deferred pending further study and are not candidates for the 1991 priority project list. The remaining 18 projects were subjected to detailed analysis, including the submittal of additional information and revised fact sheets.

Table 1 identifies and provides location information for the 18 projects which are candidates for the CWPPRA priority project list. Based on information provided in the Fact Sheets and in supplemental information submittals, the projects have been classified into the following categories.

- Marsh building with sediment diversion: West Bay.

- Marsh creation with dredged sediments: Tiger Pass; Bayou La Branche; Barataria Bay; Falgout Canal.
- Barrier island restoration with dredged sediments: Isles Dernieres.
- Shoreline erosion control with structures: Vermilion River; Turtle Cove; Cameron Prairie; Sabine Refuge; Lake Salvador.
- Shoreline erosion control with vegetative plantings: Timbalier Island et al.
- Water management/hydrologic restoration: BA-2, BA-6, Cameron Creole, Lake Salvador, Fourchon, Bayou La Cache; Bayou Sauvage.

3. COST-EFFECTIVENESS INDEX

The CWPPRA at §303(a)(1) states that the priority project list is to be developed based on project "cost-effectiveness", with consideration given to factors such as wetlands quality and demonstration value. The term cost-effectiveness is not defined in the act, but as commonly used in the evaluation of federal projects it is intended to encompass the full range of project costs and benefits, including those which are not normally or readily subject to quantification or reduction to monetary terms.

To help implement this directive, the Task Force and its supporting committees calculated a cost-effectiveness index for each project. The methodology for calculating the index captures numerous factors which are commonly considered in environmental evaluations; the methodology is summarized below.

Project costs. The cost component of the cost-effectiveness index was expressed in annual average dollars and was based on the following procedures and assumptions.

- Average annual costs represent the sum of direct and known indirect construction and operating costs, discounted over time. Most cost estimates are based on planning or feasibility level studies.
- Construction or first costs include many different cost elements besides actual building of a project, such as engineering and design, inspection, contingencies and, in some cases, planning, real estate (land, easements, rights-of-way, relocations) and administration. Many of the costs are estimated using a uniform methodology, e.g. contingencies are the same percentage of construction costs for all projects.
- Operating or ongoing costs for a project include many different cost elements besides direct operation and maintenance, including environmentally-related costs. The cost elements include monitoring,

replacement/closure, payment for oyster leases and induced dredging. Note that operating costs are not counted if they are part of an existing program which would not be expanded because of the project; and there is no contingency included.

- The discount rate used to account for the time value of money was 8.75%; the base year was 1995. For purposes of the calculation, first costs are scheduled to be fully experienced by mid-1995, which is when operating costs begin. Operating costs extend through 2014, 20 years from the base, which is also the time when first costs are considered fully amortized. Costs (and benefits) beyond 2014 are not considered.

- The funding requirements for each project were based on current dollar value of the construction and operating costs, except that costs paid for by sources other than CWPPRA were not included. Whereas average annual costs assume no inflation over time, the calculation of funding requirements does include an inflation adjustment of 3.5 to 4.7% per year.

- Project benefits are not adjusted over time, i.e. they are not considered to inflate nor are they discounted to give extra value to near-term habitat gains.

- Some projects include more than one component. Typically, the cost-effectiveness index is based on the costs and benefits of all the components combined.

Habitat benefits. The effectiveness component of the cost-effectiveness index was expressed in average annual habitat units (AAHU); the effectiveness component quantifies the difference between AAHU's with and without a project. Habitat units were calculated using a methodology which is designed to provide quick, uniform, numeric estimates of habitat benefits, with an emphasis on habitat quality along with quantity. The methodology is not a tool for detailed evaluation of projects, but a tool for comparing projects.

Habitat units are defined as the product of habitat acres - basically the size of the benefited area - times a habitat suitability index (HSI). The HSI ranges from a value of 1 (optimum habitat) to 0 (useless habitat). The variables used to calculate HSI are ones which are: important in characterizing particular wetland types; sensitive to habitat change; and capable of being quantified rather easily based on existing data or judgments. Each variable is quantified using the 0 to 1 range and the individual values are manipulated in equations to give the HSI. The equations allow for extra weighting on selected variables.

The projects listed in Table 1 involve three primary habitat types: fresh/intermediate marsh, brackish marsh and saline marsh. For these habitats, HSI calculations are based on seven input variables, enumerated as V_1 through V_7, as follows.

- V_1 = percent wetland area covered by emergent vegetation. This variable is given the heaviest weight for all three marsh types. Optimum conditions occur at 50 to 70% cover. That is, broken marsh provides more optimum habitat than intact marsh.

- V_2 = percent open water area dominated by aquatic vegetation. This variable receives extra weight in the evaluation of fresh/intermediate marsh habitats. Optimum conditions occur at 50 to 70% dominance.

- V_3 = marsh edge/interspersion. This variable indicates optimum conditions where, for a given land to water ratio, there is the greatest edge and interspersion between marsh and open water.

- V_4 = water duration in relation to marsh surface. Optimum conditions reflect regular (seasonal or tidal) flooding, rather than long-duration or infrequent flooding.

- V_5 = open water depth in relation to marsh surface. Optimums are <0.5 feet for fresh/intermediate marshes; 0.5 to 1.5 feet for brackish marshes; and 1 to 1.5 feet for saline marshes.

- V_6 = mean high salinity in growing season. For fresh/intermediate marsh, optimum conditions are less than 3 ppt (parts per thousand) salinity; for brackish marsh, 6 to 10 ppt; and for saline marsh, 14 to 18 ppt.

- V_7 = aquatic organism access. This variable receives extra weight in the evaluation of brackish and saline marsh habitats. Optimum conditions occur when access is effectively unlimited.

Results. The cost-effectiveness index is the result of dividing annual average costs by average annual habitat units. Table 2 lists the cost-effectiveness index for each of the 18 projects, ranked in order from lowest to highest. Because environmental considerations are included in the index, the table can be considered as a measure of relative environmental impact of the projects.

4. ENVIRONMENTAL COMPLIANCE

The fact sheets reported on the compliance status of each candidate project with respect to five regulatory arenas, as follows.

- NEPA. Meaning completion of an Environmental Assessment (EA) and Finding of No Significant Impact (FNSI) or an Environmental Impact Statement (EIS).

- Sections 10/404. Meaning a Department of the Army permit demonstrating compliance with Section 404 of the Clean Water Act and/or Section 10 of the River and Harbor Act.

- Louisiana Coastal Management Program. Meaning, for those within the Coastal Management Zone, a permit from the State of Louisiana demonstrating compliance with the Coastal Management Program (CMP).

- Louisiana Water Quality Certification. Meaning certification from the State of Louisiana (as provided for in Section 401 of the Clean Water Act) that proposed actions will not violate Louisiana water quality standards.

- Endangered Species Act. Meaning compliance with the Fish and Wildlife Coordination Act and, as appropriate, the Endangered Species Act, which respectively require coordination with state and federal fish and wildlife agencies, and reporting on any endangered species or habitat to be affected.

Table 3 summarizes the compliance status of the projects, as reported by the agencies. The table uses a numerical system to indicate project status.

1 - complete, or virtually complete
2 - in progress, or compliance has been obtained for projects at the same site, or reported by agency as "incomplete"
3 - process not yet initiated, or reported by agency as "no problems anticipated".

5. SECONDARY CRITERIA

The Task Force identified factors other than the cost-effectiveness index which would bear on cost-effectiveness and ultimate project rankings. These factors are termed secondary criteria, include several factors with environmental attributes. Information relating to some criteria is available from the project fact sheets or supplemental submittals. Table 4 presents the information as follows.

- ACRES measures the criteria "average annual acres of wetlands and other habitats created/benefited by the project" by reporting the total acreage benefited by the project (numeric value). This is the project area value used in the HU calculation.

- CREAT is based on the same criteria and measures the total acreage built by a project through 2014, including both emergent marsh and open water aquatic vegetation. It does not consider losses to the acreage once it has been created.

- DESTR measures the criteria "average annual acres of wetlands and other habitats lost/degraded by the project". It is the agency's estimate as to the amount of wetland acreage excavated or otherwise lost through project construction or development.

- LOSS measures the criteria "current and/or projected rates of vegetated wetland loss and their causes within the project area, hydrologic basin, and throughout the coastal area" by reporting the agency's estimate as to wetlands loss without the project in acres per year.

- DIVRT reports with respect to the criteria "freshwater or sediment diversion/introduction feature of a project", by using a yes where the agency did report that there are such features and a no where such features were not reported.

- SCARC relates to the criteria "relative abundance of marsh types in the project area, hydrologic basin, and throughout the coastal area", by using the words "project", "basin" or "coast", as appropriate, where the agency did report that the wetlands being protected are relatively scarce and a no where such features were not reported.

- E & S relates to the criteria "provides direct benefits to Federal and State endangered or threatened species", by using a yes where the agency did report that there are such benefits and a no where such benefits were not reported.

- TIME addresses the criteria "speed of implementation" by indicating the year in which the first project benefits will be experienced.

- DEMO identifies projects which the agencies report as having demonstration values beyond those of conventional projects. Note that §303(a)(1) of CWPPRA states that the project prioritization should give consideration to small-scale projects which demonstrate the use of new techniques or materials for coastal wetlands restoration.

So far as is known, all projects meet the secondary criteria "level of public support" and "part of major interagency environmental program that has a scientifically based methodology".

6. OTHER CONSIDERATIONS

For some projects, the fact sheets contained environmental information which is in addition to that discussed previously. Table 5 summarizes such information.

TABLE 1. LOCATION OF ALTERNATIVES

Project	Parish	1:100,000 a/ map	Latitude b/ Longitude	Basin
Turtle Cove	St. John	Ponchatoula	30-15 90-20	Pontchartrain
Vermilion River Cutoff	Vermilion	White Lake	29-45 92-07	Teche/Vermilion
Isles Dernieres	Terrebonne	Terrebonne Bay	29-03 90-48	Terrebonne
Falgout Canal South	Terrebonne	Terrebonne Bay	29-25 90-45	Terrebonne
West Bay	Plaquemines	Miss. Delta	29-12 89-17	Miss. River
Tiger Pass	Plaquemines	Miss. Delta	29-09 89-25	Miss. River
Bayou La Branche	St. Charles	Ponchatoula	30-03 90-22	Pontchartrain
Lake Salvador	Jefferson	New Orleans	29-46 90-09	Barataria
Barataria Bay Waterway	Jefferson	Miss. Delta	29-20 89-58	Barataria
BA-2 GIWW to Clovelly	LaFourche	New Orleans and Terrebonne Bay	29-33 90-15	Barataria
BA 6 US 90 to GIWW	LaFourche	New Orleans	29-45 90-27	Barataria
Coastal vegetative program:				
Timbalier Island	Terrebonne	Terrebonne Bay	29-04 90-30	Terrebonne
Falgout Canal	Terrebonne	Terrebonne Bay	29-24 90-45	Terrebonne
Dewitt-Rollover	Vermilion	White Lake	29°34 92-29	Mermentau
West Hackberry	Cameron	Port Arthur	29-59 93-28	Calcasieu/Sabine
Fourchon Restoration	LaFourche	Terrebonne Bay	29-00 90-11	Barataria
Lower Bayou La Cache Wetland	Terrebonne	Terrebonne Bay	29-19 90-38	Terrebonne
Bayou Sauvage NWR	Orleans	Gulfport	30-03 90-51	Pontchartrain
Cameron Prairie NWR	Cameron	Port Arthur	29-56 93-04	Mermentau
Sabine NWR	Cameron	Port Arthur	29-55 93-37	Calcasieu/Sabine
Cameron Creole Watershed	Cameron	Port Arthur	29-51 93-11	Calcasieu/Sabine

a. These are the names of topographic maps published by U.S. Geological Survey showing the area where a given project is located. b. "30-15 90-20" means 30 degrees 15 minutes north latitude, 90 degrees 20 minutes west longitude.

TABLE 2. COST-EFFECTIVENESS INDEX

PROJECT	INDEX $ per habitat unit
Fourchon Restoration	21
BA-2 GIWW to Clovelly	68
Cameron Creole	128
Bayou Sauvage NWR	180
Turtle Cove	194
Sabine NWR	253
Coastal vegetative pgm	282
West Bay Diversion	305
BA-6 US 90 to GIWW	323
Barataria Bay	449
Lower Bayou La Cache	837
Tiger Pass	1,661
Bayou La Branche	2,369
Cameron Prairie NWR	3,171
Falgout Canal South	5,950
Vermilion River Cutoff	6,196
Lake Salvador	10,376
Isle Dernieres	13,949

TABLE 3. STATUS OF ENVIRONMENTAL COMPLIANCE

1 = Complete; 2 = In progress; 3 = Not initiated

Agency and Project	NEPA (EA/EIS)	DOA (10/404)	LA CMP	LA 401	FWCA/ ESA
Turtle Cove	1	1	1	1	2
Vermilion River Cutoff	2	3	2	3	3
Isles Dernieres	2	2	2	3	3
Falgout Canal South	3	2	2	3	2
West Bay Diversion	2	1	2	2	2
Tiger Pass	2	1	2	1	2
Bayou La Branche	3	3	3	3	3
Lake Salvador	3	3	3	3	3
Barataria Bay Waterway	2	2	2	2	2
BA-2 GIWW to Clovelly	1	1	1	1	1
BA-6 US 90 to GIWW	3	1	1	1	2
Coastal vegetative pgm	3	3	3	N/A[a/]	N/A[a/]
Fourchon Restoration	3	3	3	3	3
Lower Bayou La Cache	3	3	3	3	3
Bayou Sauvage NWR	3	2	2	2	2
Cameron Prairie NWR	3	2	N/A[b/]	3	2
Sabine NWR	3	N/A[c/]	3	N/A[c/]	2
Cameron Creole Watershed	N/A[d/]	2	3	3	2

a/ Not explained.
b/ Not in Coastal Zone.
c/ Authorized under General Permit NOD-25.
d/ "Covered under the original Cameron-Creole Watershed Project construction permit issued by the Army Corps of Engineers."

TABLE 4. SECONDARY CRITERIA

PROJECT	ACRES	CREAT	DESTR	LOSS	DIVRT	SCARC	E & S	TIME	DEMO
Turtle Cove	1044	0.5	0	28	No	No	No	1	No
Vermilion River Cutoff	202	11	0	3	No	No	No	2	No
Isles Dernieres	449	105	minor	9	No	Yes	No	3	Yes[a/]
Falgout Canal South	220	220	minor	gone	No	No	No	2	Yes[b/]
West Bay Diversion	12910	9662	5.5	small	Yes	No	No	3	No[c/]
Tiger Pass	595	415	0	18	No	No	No	1	No
Bayou La Branche	487	290	minor	0	No	No	No	1	No
Lake Salvador	170	11	0	77	No	No	No	1	No
Barataria Bay	510	450	0	0	No	No	No	1	No
BA-2 GIWW to Clovelly	60,000	0	0	450	Yes	Yes	Yes	2	No
BA-6 US 90 to GIWW	40,000	0	0	250	Yes	Yes	Yes	3	No
Coastal vegetative pgm	2,643	0	0	33	No	Yes	Yes	2	Yes[d/]
Fourchon Restoration	2020	146	0	6	No	No	No	1	No
Lower Bayou La Cache	4200	85	0	12.8	No	No	No	1	No
Bayou Sauvage NWR	1313	1050	0	25	No	No	No	3	No
Cameron Prairie NWR	131	30	0	12	No	No	No	1	No
Sabine NWR	2207	0	10	445	No	No	No	3	No
Cameron Creole Watershed	440	843	2	None[e/]	Yes	No	No	1	No

a/ Will provide up-to-date information for large-scale restoration of barrier islands, an approach likely to be used under the long-term plan.
b/ Will use a mobile marsh base station and pipelines to distribute sediments dredged specifically for marsh-building purposes to areas beyond the reach of proposed open-channel diversions.
c/ However, will demonstrate large-scale uncontrolled sediment diversion/intensive monitoring.
d/ Will pursue new and innovative vegetative techniques at four different coastal environments.
e/ Project enhances wetland in an existing watershed project area.

TABLE 5. OTHER CONSIDERATIONS

Project	Information from fact sheets & supplemental submittals
Turtle Cove	Benefits to public recreation.
Vermilion River Cutoff	May reduce future dredging requirements.
Isles Dernieres	Possible flood control benefits; minimal impacts to benthic habitat from dredging.
Falgout Canal South	Minor impacts from harvested sediment, lost benthic habitat, construction, turbidity.
West Bay Diversion	Minor clearing; pipeline relocation; induced dredging; minor salt water intrusion.
Tiger Pass	Beneficial use of sediments dredged for navigation channel maintenance.
Bayou La Branche	High public visibility; minor benthic habitat loss.
Lake Salvador	High public visibility; protection of National Historical Park area.
Barataria Bay	Lost oyster leases; beneficial use of dredged sediments.
BA-2 GIWW to Clovelly	Reduction of physical losses in this area will translate into reduced social and economic losses.
BA-6 US 90 to GIWW	Reduction of physical losses in this area will translate into reduced social and economic losses.
Coastal vegetative pgm	Opportunity to closely compare vegetative planting in different hydrologic basins.
Fourchon Restoration	Area will remain for future beneficial use of dredge material.
Lower Bayou La Cache	Project may require maintenance of oil and gas access and navigation channels.
Bayou Sauvage NWR	High public visibility on urban wildlife refuge; would help preserve wading bird rookery.
Cameron Prairie NWR	High public visibility on wildlife refuge; benefits wetlands accessible to public.
Sabine NWR	High public visibility on wildlife refuge; benefits wetlands accessible to public.
Cameron Creole Watershed	High public visibility on wildlife refuge; enhances wetlands in an existing federal watershed project area.

COASTAL WETLANDS PLANNING, PROTECTION, AND RESTORATION ACT

PRIORITY PROJECT LIST REPORT
November 18, 1991

APPENDIX H

CITIZEN PARTICIPATION GROUP

COASTAL WETLANDS PLANNING, PROTECTION, AND RESTORATION ACT

CITIZEN PARTICIPATION GROUP MEMBERS

Citizen Participation Group Member	Member's Representative
Chairman :	
Coalition to Restore Coastal Louisiana	Mr. Michael Mielke Executive Director Coalition to Restore Coastal Louisiana 1 Ashland Drive Destrehan, Louisiana 70047 (504) 764-8394; FAX: (504) 764-8294
Concerned Shrimpers of America	Mr. Tee John Mialjevich President Concerned Shrimpers of America P. O. Box 637 Belle Chasse, Louisiana 70037 (504) 391-1177; FAX: (504) 391-1911
Gulf Coast Conservation Association	Mr. Maumus Claverie Gulf Coast Conservation Association 830 Union St., Third Floor New Orleans, Louisiana 70112 (504) 524-5416; FAX: (504) 522-9208
Gulf Intracoastal Canal Association	Mr. Vernon Behrhorst Executive Director Gulf Intracoastal Canal Association P. O. Box 44050 Lafayette, Louisiana 70504 (318) 235-1634 ; FAX: (318) 235-1634 Mr. Carl B. Hakenjos **(Alternate)** Senior Consultant, Marine Projects Waldemar S. Nelson and Company 1200 St. Charles Avenue New Orleans, Louisiana 70130-4334 (504) 523-5281 ; FAX: (504) 593-5261

COASTAL WETLANDS PLANNING, PROTECTION, AND RESTORATION ACT

CITIZEN PARTICIPATION GROUP MEMBERS (cont.)

Citizen Participation Group Member	Member's Representative
Lake Pontchartrain Basin Foundation	Mr. Mark S. Davis General Counsel Lakeway 1 P.0. Box 6965 3900 N. Causeway Boulevard Suite 821 Metairie, Louisiana 70009-6965 (504) 836-2215; FAX: (504) 836-7283
Louisiana Association of Soil and Water Conservation Districts	Mr. Allan Ensminger Supervisor, Crescent Soil and Water Conservation District Louisiana Association of Soil and Water Conservation Districts P. O. Box 158 Belle Chasse, Louisiana 70037 (504) 394-2463; FAX: (504) 367-1514
Louisiana Farm Bureau Federation, Inc.	Mr. Martin Cancienne Second Vice President Louisiana Farm Bureau Federation, Inc. P. O. Box 95004 Baton Rouge, Louisiana 70895-9004 (504) 922-6200; FAX: (504) 922-6229
Louisiana Landowners Association	Mr. Newman Trowbridge, Jr. General Counsel Louisiana Landowners Association P. O. Box 565 Franklin, Louisiana 70538 (318) 828-5480; FAX: (318) 828-1160 Mr. John W. Woodard (Alternate) Manager, Laterre Operations Fina Laterre, Inc. 1256 Bayou LaCarpe Road Houma, Louisiana 70363 (504) 879-3528; FAX: (504) 876-5267

COASTAL WETLANDS PLANNING, PROTECTION, AND RESTORATION ACT

CITIZEN PARTICIPATION GROUP MEMBERS (cont.)

Citizen Participation Group Member	Member's Representative
Louisiana League of Women Voters	Ms. Charlotte Fremaux Louisiana League of Women Voters 305 Cuddihy Drive Metairie, Louisiana 70005 (504) 833-0816; FAX:
Vice Chairman:	
Louisiana Nature Conservancy	Ms. Nancy Jo Craig Executive Director Louisiana Nature Conservancy P. O. Box 4125 Baton Rouge, Louisiana 70821 (504) 338-1040; FAX: (504) 338-0103
Louisiana Oyster Growers and Dealers Association	Mr. Mark Chatry Executive Director Louisiana Oyster Growers and Dealers Association P. O. Box 537 Covington, Louisiana 70434 (504) 893-0774; FAX: (504) 893-0774
Louisiana Wildlife Federation, Inc.	Mr. Randy P. Lanctot Executive Director Louisiana Wildlife Federation, Inc. P. O. Box 16089, LSU Station Baton Rouge, Louisiana 70893 (504) 344-6707; FAX: (504) 338-0103

CITIZEN PARTICIPATION GROUP MEMBERS (cont.)

Citizen Participation Group Member	Member's Representative
Midcontinent Oil and Gas Association	Mr. B. Jim Porter President Midcontinent Oil and Gas Association 801 N. Boulevard, Suite 201 Baton Rouge, Louisiana 70802 (504) 387-3205; FAX: (504) 344-5502
New Orleans Steamship Association	Mr. Channing F. Hayden, Jr. Vice President New Orleans Steamship Association 2240 World Trade Center 2 Canal Street New Orleans, Louisiana 70130-1407 (504) 522-9392; FAX: (504) 523-2140
Oil and Gas Task Force (Regional Economic Development Council)	Mr. W. L. (Bill) Berry Director, Wetlands Management Louisiana Land and Exploration 909 Poydras Street P.0. Box 60350 New Orleans, Louisiana 70160 (504) 566-6425; FAX: (504) 566-6805
	Mr. Mike Parker (Alternate) Exxon Company, USA P.0. Box 60626 New Orleans, Louisiana 70160 (504) 561-4766; FAX: (504) 561-4222

CITIZEN PARTICIPATION GROUP MEMBERS (cont.)

Citizen Participation Group Member	Member's Representative
Police Jury Association of Louisiana	Mr. Walter Comeaux President Police Jury Association of Louisiana 707 North 7th Street Baton Rouge, Louisiana 70802 (504) 343-2835; FAX: (504) 343-0050
Ex Officio Member:	Mr. J. Martin Walke Executive Assistant to Sen. Breaux Hale Boggs Federal Building 501 Magazine Street, Suite 1005 New Orleans, Louisiana 70130 (504) 589-2531; FAX: (504) 589-2533
Advisor:	Mr. David F. Carney Attn: CELMN-PD-FC U.S. Army Engineer District, New Orleans P.O. Box 60267 New Orleans, Louisiana 70160-0267 (504) 862-2528; FAX: (504) 862-2572

COASTAL WETLANDS PLANNING, PROTECTION, AND RESTORATION ACT
(PL 101-646)

CHARTER
for the
CITIZEN PARTICIPATION GROUP

I. NAME:

The name of the group shall be the Coastal Wetlands Planning, Protection, and Restoration Act Citizen Participation Group (CPG). The CPG's area of interest includes the coastal wetlands of Louisiana as identified by the Task Force.

II. GOALS AND OBJECTIVES:

The CPG has the following goals and objectives:

a. Promote the development of Coastal Wetlands Planning, Protection and Restoration Activities.
b. Promote citizen participation and involvement in the formulation of the Priority Project List (Section 303a) and the Restoration Plan (Section 303b).
c. Assist and participate in a public involvement program to insure public involvement in the restoration planning process.

III. AUTHORITY:

The CPG is a standing work group established by the Louisiana Coastal Wetlands Conservation and Restoration Task Force. The CPG reports to the Task Force and will, from time to time, meet on its own or with the various committees and work groups of the Task Force, particularly the Technical Committee.

IV. ADMINISTRATIVE:

The principal mailing address shall be that of the Chairman. Clerical assistance shall be provided by the U.S. Army Corps of Engineers. A representative from the U.S. Army Corps of Engineers will act as an advisor to the CPG and will attend their meetings upon request. The CPG may request other Task Force members to attend CPG meetings and make presentations, as needed.

V. PURPOSE:

The purpose of the CPG will be to:

a. Maintain consistent public review and input into the plans and projects being considered by the Task Force.
b. Assist and participate in the public involvement program.
c. Perform additional tasks at the request of the Task Force or at the suggestion of members of the CPG, upon approval of the Task Force.

VI. MEMBERSHIP:

The membership of the CPG will be as follows:

a. Coalition to Restore Coastal Louisiana. **(Chairman)**
b. Concerned Shrimpers of America.
c. Gulf Coast Conservation Association.
d. Gulf Intracoastal Canal Association.
e. Lake Pontchartrain Basin Foundation.
f. Louisiana Association of Soil and Water Conservation Districts.
g. Louisiana Farm Bureau Federation, Inc.
h. Louisiana Landowners Association.
i. Louisiana League of Women Voters.
j. Louisiana Nature Conservancy. **(Vice Chairman)**
k. Louisiana Oyster Growers and Dealers Association.
l. Louisiana Wildlife Federation, Inc.
m. Midcontinent Oil and Gas Association.
n. New Orleans Steamship Association.
0. Oil and Gas Task Force of the Regional Economic Development Council.
p. Police Jury Association of Louisiana.
q. U.S. Senator John Breaux. **(Ex Officio Member)**

Each organization will designate a representative to the CPG. Whenever the designated CPG representative is unable to attend a meeting, he or she or the member organization, may identify an alternate representative and notify the CPG Chairman. Each alternate representative must be announced by the Chairman before that alternate representative can participate in the meeting. Changes to the CPG membership will approved by a 2/3 majority vote of the CPG. Potential members are required to make a brief presentation describing the purpose of their organization and why they desire to join the CPG.

VII. DUTIES OF THE CPG CHAIRMAN:

At their first meeting, the CPG will select a temporary Chairman and Vice Chairman to serve as such through the first CPG meeting of calender year 1992. Each calender thereafter, a Chairman and Vice Chairman will be selected by the CPG members at the first CPG meeting of that calender year. The Vice Chairman will preside over CPG meetings and perform other duties, as required, in the absence of the Chairman. The duties of the Chairman are to:

a. Coordinate the activities of the CPG to insure that the overall goals and objectives of the CPG are accomplished.
b. Preside over meetings of the CPG, attend extra meetings as necessary to achieve the CPG goals, call meetings as necessary, and sign correspondence and documents when authorized to do so on the behalf of the CPG.
c. Represent the CPG at Task Force meetings.
d. Make presentations to Task Force on behalf of the CPG.

VIII. CONDUCT OF MEETINGS

Meetings will be conducted in accordance with Robert's Rules of Order, latest edition. In the event of a vote on a major issue, a 2/3 majority of the membership is required for passage. Minority reports will be allowed.

Gay

PRIORITY PROJECT LIST REPORT

EXECUTIVE SUMMARY

PREPARED BY:

LOUISIANA COASTAL WETLANDS CONSERVATION AND RESTORATION TASK FORCE

November 18, 1991

COASTAL WETLANDS PLANNING, PROTECTION AND RESTORATION ACT

1st Priority Project List

G U L F O F M E X I C O

STATE OF LOUISIANA (LA)

LA-A. Turtle Cove - Shoreline Protection
LA-B. Vermilion River Cutoff - Wetland Creation

ENVIRONMENTAL PROTECTION AGENCY (EPA)

EPA-A. Isle Dernieres - Barrier Island Restoration
EPA-B. Falgout Canal - Wetland Creation Demonstration

U. S. DEPARTMENT OF THE ARMY (AR)

AR-A. West Bay - Sediment Diversion for Marsh Creation
AR-B. Tiger Pass - Marsh Creation
AR-C. Bayou La Branche - Marsh Creation
AR-D. Bayou Segnette (Lake Salvador) - Bank Stabilization
AR-E. Barataria Bay Waterway - Marsh Creation

U. S. DEPARTMENT OF COMMERCE (CO)

CO-A. Fourchon - Hydrologic Restoration
CO-B. Lower Bayou La Cache Wetland - Hydrologic Restoration

U. S. DEPARTMENT OF AGRICULTURE (AG)

AG-A. G.I.W.W. to Clovelly - Hydrologic Restoration

Coastal Vegetative Program:

AG-B1. Timbalier Island
AG-B2. Falgout Canal
AG-B3. West Hackberry
AG-B4. Dewit-Rollover Shore
AG-C. BA-6 (US 90 to G.I.W.W.)

U. S. DEPARTMENT OF THE INT

IN-A. Bayou Sauvage NWR
IN-B. Cameron Prairie NW
IN-C. Sabine NWR - Ere
IN-D. Cameron Creole Wa

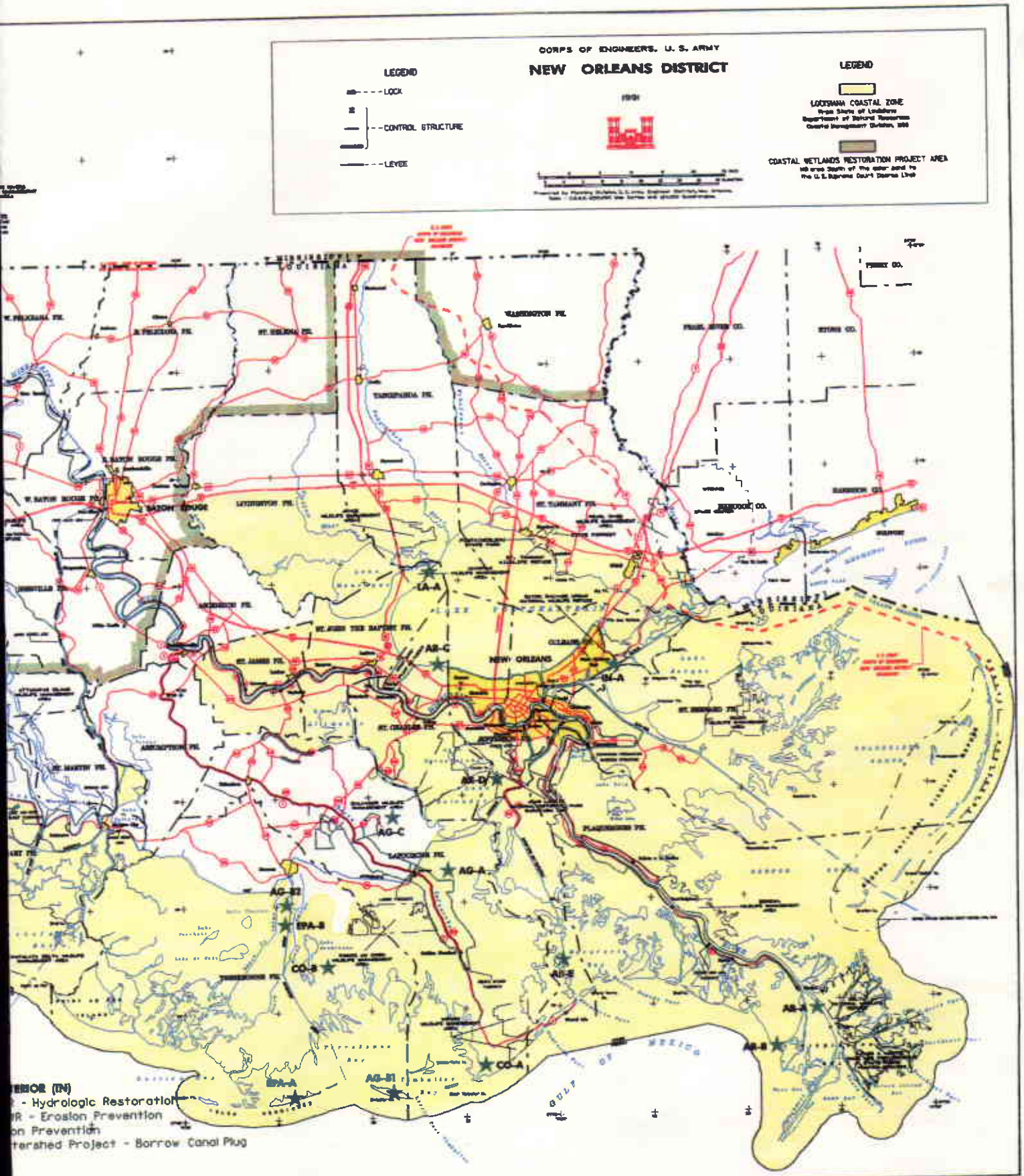

CORPS OF ENGINEERS, U. S. ARMY
NEW ORLEANS DISTRICT
LEGEND
LOCK
CONTROL STRUCTURE
LEVEE
LEGEND
LOUISIANA COASTAL ZONE
COASTAL WETLANDS RESTORATION PROJECT AREA
NEW ORLEANS
BATON ROUGE
LA-A
AB-C
IN-A
AB-D
AG-C
AG-A
AG-B2
EPA-B
CO-B
AB-E
AB-A
AB-B
CO-A
EPA-A
AG-B1
ERIOR (IN)
- Hydrologic Restoration
R - Erosion Prevention
on Prevention
tershed Project - Borrow Canal Plug

Plate 1

COASTAL WETLAND PLANNING, PROTECTION, AND RESTORATION ACT

PRIORITY PROJECT LIST REPORT
(Executive Summary)

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COASTAL WETLAND PLANNING, PROTECTION, AND RESTORATION ACT

PRIORITY PROJECT LIST REPORT
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COASTAL WETLAND PLANNING, PROTECTION, AND RESTORATION ACT

PRIORITY PROJECT LIST REPORT
(Executive Summary)

I. INTRODUCTION

The State of Louisiana contains 40 percent of the Nation's coastal wetlands, but is experiencing 80 percent of the Nation's coastal wetland loss. The widespread and complex nature of the coastal wetland loss problem, coupled with the diversity of agencies involved and numerous alternatives proposed, has led many in Federal, state, and local government, as well as, the general public to conclude that a comprehensive approach is needed. The Coastal Wetlands Planning, Protection, and Restoration Act (PL 101-646) was signed into law by President Bush on November 29, 1990, to address the need for a comprehensive approach to this significant environmental problem.

This report documents the implementation of Section 303(a) of the cited legislation.

II. STUDY AUTHORITY

Section 303(a) of the Coastal Wetlands Planning, Protection, and Restoration Act (CWPPRA), directs the Secretary of the Army to convene the Louisiana Coastal Wetlands Conservation and Restoration Task Force to:

> . . . initiate a process to identify and prepare a list of coastal wetlands restoration projects in Louisiana to provide for the long-term conservation of such wetlands and dependent fish and wildlife populations in order of priority, based upon the cost-effectiveness of such projects in creating, restoring, protecting, or enhancing coastal wetlands, taking into account the quality of such coastal wetlands, with due allowance for small-scale projects necessary to demonstrate the use of new techniques or materials for coastal wetlands restoration.

III. STUDY PURPOSE

The purpose of this study effort was to prepare the Priority Project List and transmit the List to Congress by November 28, 1991, as specified in Section 303(a)(3) of the CWPPRA.

IV. PROJECT AREA

The map on the following page displays the 20 Louisiana parishes that are expected to contain coastal wetlands. The CWPPRA does not define coastal wetlands; therefore, the Task Force developed the following definition:

> Coastal wetlands are vegetated wetlands located within coastal Louisiana which are subject to tidal influence or were subject to tidal influence prior to human intervention. These wetlands include estuarine emergent wetlands (brackish and saline marsh), palustrine emergent wetlands (fresh/intermediate marsh), palustrine forested wetlands (cypress-tupelo swamp), and associated beds of aquatic vegetation.

V. STUDY PARTICIPANTS

Section 303(a)(1) directs the Secretary of the Army to convene a Task Force consisting of the following members:

- Secretary of the Army (Chairman)
- Administrator, Environmental Protection Agency
- Governor, State of Louisiana
- Secretary of the Interior
- Secretary of Agriculture
- Secretary of Commerce

The State of Louisiana will serve as the non-Federal sponsor of all projects constructed under the CWPPRA. The State of Louisiana is a full voting member of the Task Force except for final selection of the Priority Project List. In addition, the State of Louisiana may not serve as a lead Task Force member for wetland projects on the Priority Project List.

VI. FORMULATION PROCESS FOR THE PRIORITY PROJECT LIST

A. Introduction

It is very important to distinguish between the more traditional, 3-year comprehensive plan formulation effort required by Section 303(b) and the short-term, accelerated project identification and evaluation process needed to satisfy the intent and time constraints associated with Section 303(a). The Task Force recognized, at the onset, that in order to prepare the first Priority Project List it would be necessary to inventory and identify existing projects in various stages of formulation, rather than conduct a traditional plan formulation process. The Task Force has begun a thorough, comprehensive planning effort as part of the preparation of the coastal wetlands Restoration Plan described in Section 303(b). This plan formulation process will also produce the future annual Priority Project Lists.

B. Identification of Candidate Wetland Projects

The CWPPRA defined a coastal wetlands restoration project as follows:

> Any technically feasible activity to create, restore, protect, or enhance coastal wetlands through sediment and freshwater diversion, water management, or other measures that the Task Force finds will significantly contribute to the long-term restoration or protection of the physical, chemical, and biological integrity of coastal wetlands in the State of Louisiana, and includes any such activity authorized under this title or under any other provision of law, including, but not limited to, new projects, completion or expansion of existing or on-going projects, individual phases, portions, or components of projects and operation, maintenance and rehabilitation of completed projects; the primary purpose of a "coastal wetlands restoration project" shall not be to provide navigation, irrigation, or flood control benefits . . . .

The five Federal Task Force members and the State of Louisiana each proposed candidate wetland projects and completed fact sheets for each project. Initially, 38 projects, totaling about $300 million in cost, were submitted for consideration for inclusion on the Priority Project List. The Task Force reviewed each fact sheet to ensure that: 1) the candidate wetland projects satisfied the criteria specified in the CWPPRA;

Coastal Wetlands Planning, Protection, and Restoration Act
PRIORITY PROJECT LIST

STATE OF LOUISIANA (LA)
- LA-A. Turtle Cove - Shoreline Protection
- LA-B. Vermilion River Cutoff - Wetland Creation

ENVIRONMENTAL PROTECTION AGENCY (EPA)
- EPA-A. Isle Dernieres - Barrier Island Restoration
- EPA-B. Falgout Canal - Wetland Creation Demonstration

U. S. DEPARTMENT OF THE ARMY (AR)
- AR-A. West Bay - Sediment Diversion for Marsh Creation
- AR-B. Tiger Pass - Marsh Creation
- AR-C. Bayou La Branche - Marsh Creation
- AR-D. Bayou Segnette (Lake Salvador) - Bank Stabilization
- AR-E. Barataria Bay Waterway - Marsh Creation

U. S. DEPARTMENT OF COMMERCE (CO)
- CO-A. Fourchon - Hydrologic Restoration
- CO-B. Lower Bayou La Cache Wetland - Hydrologic Restoration

U. S. DEPARTMENT OF AGRICULTURE (AG)
- AG-A. G.I.W.W. to Clovelly - Hydrologic Restoration
- Coastal Vegetative Programs
- AG-B1. Timbalier Island
- AG-B2. Falgout Canal
- AG-B3. West Hackberry
- AG-B4. Dewitt-Rollover Shore
- AG-C. BA-6 (US 90 to G.I.W.W.)

U. S. DEPARTMENT OF THE INTERIO
- IN-A. Bayou Sauvage NWR - H
- IN-B. Cameron Prairie NWR -
- IN-C. Sabine NWR - Erosion P
- IN-D. Cameron Creole Waters

OR (IN)
Hydrologic Restoration
- Erosion Prevention
Prevention
shed Project - Borrow Canal Plug

2) there was no duplication among the candidate projects; 3) the cost and wetland benefit data were of sufficient detail and reliability to allow a meaningful evaluation; and 4) the total project cost was not disproportionately high relative to the funds expected to be available in FY 1992. This first screening of candidate projects reduced the number of candidates to 27. The cost and wetland benefit data for these 27 projects were further refined based on comments made during the first screening process. The second screening placed special emphasis on the: 1) total project cost; 2) number of similar types of candidate projects; and 3) time available to conduct the detailed wetland benefit analysis for each project. This second screening resulted in the selection of 18 wetland projects for evaluation, with the other nine projects remanded to their respective lead Task Force members for further study and refinement. These nine projects will be considered for inclusion in the second Priority Project List or the Restoration Plan.

C. Evaluation of Candidate Projects

The CWPPRA directed the Task Force to develop a prioritized list of wetland projects ". . . based on the cost-effectiveness of such projects in creating, restoring, protecting, or enhancing coastal wetlands, taking into account the quality of such coastal wetlands . . . ." The Task Force satisfied this requirement through the integration of a traditional time-value analysis of life-cycle project costs and other economic impacts and an evaluation of wetlands benefits using a community-based version of the U.S. Fish and Wildlife Service's "Habitat Evaluation Procedures." The product of these two analyses was a Cost/Habitat Unit figure for each project, which was used as the primary ranking criterion.

1. Cost Analysis

Wetland project cost data were received from each lead Task Force member for their projects. These costs were then expressed as first costs, fully funded costs, present worth costs, and average annual costs. The Cost/Habitat Unit criterion was derived by dividing the average annual cost for each wetland project by the Average Annual Habitat Units (AAHU) for each wetland project. The average annual cost figures are based on 1991 price levels, a discount rate of 8 3/4 percent, and a project life of 20 years. The fully funded cost estimates developed for each project were used to determine how many projects could be supported by the funds expected to be available in FY 1992. The fully funded cost estimates include operation and maintenance and other compensated financial costs.

2. Wetland Benefit Analysis

A wetland-quality-assessment method, entitled the "Wetland Value Assessment," was developed specifically for the CWPPRA by biologists from the U.S. Fish and Wildlife Service, with the assistance of biologists from the other Task Force members. These biologists then applied this non-monetary assessment to each of the candidate wetland projects, after predicting future with- and without-project wetland conditions for each project. In several cases, the wetland benefit projections were modified to gain a consensus among the biologists. The output of the Wetland Value Assessment was a series of with- and without-project Habitat Unit values, by target year, for each wetland project. These Habitat Unit values were then annualized and combined with the annualized cost data to produce the Cost/Habitat Unit criterion. The Habitat Unit values were annualized over a 20-year project life, using a zero percent discount rate.

3. Environmental Report

An Environmental Report was prepared to address the wetland projects on the Priority Project List. This report, required by the National Environmental Policy Act, was prepared by a consultant under contract to the Environmental Protection Agency. The format and content of the report were determined by the Task Force.

D. Ranking of Candidate Projects

The Cost/Habitat Unit was the primary criterion used by the Task Force to prioritize the wetland projects in decreasing order of their cost effectiveness. This primary criterion, however, was supplemented by the considerations subsequently described in paragraph VII. C.

E. Public Involvement

The Task Force recognized the critical need to coordinate the preparation of the Priority Project List with the interested public. In response to this need, the Task Force established the Citizen Participation Group. The 16 organizations that constitute the Citizen Participation Group represent the interests of the environmental community, oil and gas industry, agriculture, commercial fishing, recreational fishing, navigation, landowners, and public advocacy groups, all of which are active in Louisiana.

The Citizen Participation Group received detailed briefings concerning each project on the Priority Project List and on the evaluation methods used to rank the projects. Copies of the draft Priority Project List were provided to each member of the Citizen Participation Group for their review and comment. The Citizen Participation Group approved the draft Priority Project List and requested that appropriate consideration be given to their comments. The Task Force provided written responses to all Citizen Participation Group comments.

VII. PRIORITY PROJECT LIST

A. Introduction

The 18 wetland projects composing the draft Priority Project List are displayed in Table 1, "Ranking of Projects by Cost/AAHU," on page 8. The map on page 3 displays the location of each of the 18 wetland projects. Table 2, "Ranking of Projects by Type," on page 9, displays the types of wetland projects on the Priority Project List. Table 3, "Ranking of Projects by Hydrologic Basin," on page 10, displays how the wetland projects are distributed along the coast of Louisiana.

The Priority Project List consists of 14 wetland projects that fall within the funding limit for FY 1992 and 4 wetland projects that have been deferred to the Second Priority Project List unless these projects are pursued separately through the State of Louisiana's "Coastal Wetlands Conservation and Restoration Plan" or unless implementation of one or more of the 14 wetland projects is delayed for some unforeseen reason. The implementation of these 18 projects will result in benefits to 153,000 acres of coastal wetlands, including the creation or preservation of 30,000 acres of marsh vegetation, as well as benefits to the fish and wildlife populations that these wetlands support.

Table 1

Ranking of Projects by Cost ($) per AAHU

	Lead Task Force Member*	Cost ($) per AAHU**	Fully Funded Cost ($1,000)	Cumulative Fully Funded Cost ($1,000)	Wetland Percentage by Type *** F/I	B	S
Fourchon	CO	21	252	252	--	--	100
BA-2 (GIWW to Clovelly)	AG	68	8,142	8,394	83	17	--
Cameron Creole Watershed	IN	128	502	8,896	24	76	--
Bayou Sauvage Refuge	IN	180	1,105	10,001	100	--	--
Turtle Cove	IN/LA	194	386	10,387	100	--	--
Sabine Refuge	IN	253	4,844	15,231	100	--	--
Vegetative Plantings (Demonstration)	AG	282	848	16,079	3	11	86
West Bay Sediment Diversion	AR	305	8,517	24,596	100	--	--
Barataria Bay Waterway	AR	449	1,625	26,221	--	--	100
Lower Bayou La Cache	CO	837	1,254	27,475	--	15	85
Bayou La Branche	AR	2,369	4,327	31,802	100	--	--
Cameron Prairie Refuge	IN	3,171	1,111	32,913	100	--	--
Vermilion River Cutoff	AR/LA	6,196	1,523	34,436	--	100	--
Eastern Isle Dernieres (Demonstration)	EPA	13,949	6,345	40,781	--	--	100
Projects Deferred †							
BA-6 (GIWW to Hwy 90)	AG	323	4,583	4,583	100	--	--
Tiger Pass	AR	1,661	7,078	11,661	100	--	--
Falgout Canal South (Demonstration)	EPA	5,950	6,109	17,770	--	100	--
Lake Salvador Shoreline	AR	10,376	4,427	22,197	100	--	--

* The lead task force member (Federal sponsor) for the project, represented by the following acronoyms:
CO--U.S. Dept. of Commerce
AG--U.S. Dept. of Agriculture
IN--U.S. Dept. of the Interior
LA--State of Louisiana
AR--U.S. Dept. of the Army
EPA--Environmental Protection Agency

† Action on these projects will be deferred to the second Priority Project List unless they are pursued separately through the State of Louisiana's Wetland Restoration Plan or unless implementation of one of the above-listed projects is delayed for some unforeseen reason.

** Average Annual Habitat Units

*** Wetland Types:
F/I--Fresh/Intermediate Marsh
B----Brackish Marsh
S----Saline Marsh

Table 2

Ranking of Projects by Type

	Lead Task Force Member*	Cost ($) per AAHU**	Fully Funded Cost ($1,000)	Cumulative (by Type) Fully Funded Cost ($1,000)
Marsh Building with Sediment Diversion				
West Bay Sediment Diversion	AR	305	8,517	8,517
Water Management (Hydrologic Restoration)				
Fourchon	CO	21	252	252
BA-2 (GIWW to Clovelly)	AG	68	8,142	8,394
Cameron Creole Watershed	IN	128	502	8,896
Bayou Sauvage Refuge	IN	180	1,105	10,001
BA-6 (GIWW to Hwy 90)†	AG	323	4,583	14,584
Lower Bayou La Cache	CO	837	1,254	15,838
Marsh Building with Dredged Sediments				
Barataria Bay Waterway	AR	449	1,625	1,625
Tiger Pass†	AR	1,661	7,078	8,703
Bayou La Branche	AR	2,369	4,327	13,030
Falgout Canal South (Demonstration)†		5,950	6,109	19,139
Shoreline Erosion Control with Structures				
Turtle Cove	IN/LA	194	386	386
Sabine Refuge	IN	253	4,844	5,230
Cameron Prairie Refuge	IN	3,171	1,111	6,341
Vermilion River Cutoff	AR/LA	6,196	1,523	7,864
Lake Salvador Shoreline†	AR	10,376	4,427	12,291
Barrier Island Restoration with Dredged Sediments				
Eastern Isle Dernieres (Demonstration)	EPA	13,949	6,345	6345
Vegetative Plantings				
Falgout Canal, Isle Dernieres, Dewitt-Rollover, and West Hackberry (Demonstration Projects)	AG	282	848	848

* The lead task force member (Federal sponsor) for the project, represented by the following acronoyms:

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LA–State of Louisiana
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EPA–Environmental Protection Agency

† Action on these projects will be deferred to the second Priority Project List unless they are pursued separately through the State of Louisiana's Wetland Restoration Plan or unless implementation of one of the above-listed projects is delayed for some unforeseen reason.

** Average Annual Habitat Units

Table 3

Ranking of Projects by Hydrologic Basin

	Lead Task Force Member*	Cost ($) per AAHU ††	Fully Funded Cost ($1,000)	Cumulative (by Basin) Fully Funded Cost ($1,000)
Pontchartrain Basin				
Bayou Sauvage Refuge	IN	180	1,105	1,105
Turtle Cove	IN/LA	194	386	1,491
Bayou La Branche	AR	2,369	4,327	5,818
Breton Sound Basin				
None				
Mississippi River Basin				
West Bay Sediment Diversion	AR	305	8,517	8,517
Tiger Pass†	AR	1,661	7,078	15,595
Barataria Basin				
Fourchon	CO	21	252	252
BA-2 (GIWW to Clovelly)	AG	68	8,142	8,394
Barataria Bay Waterway	AR	449	1,625	10,019
BA-6 (GIWW to Hwy 90)†	AG	323	4,583	14,602
Lake Salvador Shoreline†	AR	10,376	4,427	19,029
Terrebonne Basin				
Falgout Canal (Vegetative Plantings)	AG	**		
Isle Dernieres (Vegetative Plantings)	AG	**		
Lower Bayou La Cache	CO	837	1,254	1,254
Eastern Isle Dernieres	EPA	13,949	6,345	7,599
Falgout Canal South†	EPA	5,950	6,109	13,708
Atchafalaya Basin				
None				
Teche/Vermilion Basin				
Vermilion River Cutoff	AR/LA	6,196	1,523	1,523
Mermentau Basin				
Dewitt-Rollover (Vegetative Plantings)	AG	**		
Cameron Prairie Refuge	IN	3,171	1,111	1,111
Calcasieu/Sabine Basin				
Cameron Creole Watershed	IN	128	502	502
Sabine Refuge	IN	253	4,844	5,346
West Hackberry (Vegetative Plantings)	AG	**		

* The lead task force member (Federal sponsor) for the project, represented by the following acronoyms:

CO--U.S. Dept. of Commerce	LA--State of Louisiana
AG--U.S. Dept. of Agriculture	AR--U.S. Dept. of the Army
IN--U.S. Dept. of the Interior	EPA--Environmental Protection Agency

** The vegetative plantings demonstration project includes four sites in three basins. The overall cost of the project is $282/AAHU.

† Action on these projects will be deferred to the second Priority Project List unless they are pursued separately through the State of Louisiana's Wetland Restoration Plan or unless implementation of one of the above-listed projects is delayed for some unforeseen reason.

†† Average Annual Habitat Units

B. Description of Listed Projects

Fourchon, Hydrologic Restoration (CO-A)

The project area, located in lower Lafourche Parish, just north of the Port Fourchon facilities, contains about 580 acres of emergent saline marsh interspersed with 1,440 acres of shallow water (See Figure 2). Water levels are held above normal tidal elevations because of limited water exchange through a single culvert. The area functions only minimally as habitat for estuarine dependent fish and shellfish. Placement of two additional culverts would open the area to regular tidal exchange, improve water quality, reestablish the area as an estuarine nursery, prevent the loss of 106 acres of marsh, and restore an additional 44 acres. The fully funded cost is $252,000, and the cost-effectiveness criterion is $21/AAHU.

BA-2 - GIWW to Clovelly, Hydrologic Restoration (AG-A)

This project, encompassing about 41,000 acres of emergent fresh to brackish marsh and 19,000 acres of open water, is located in central Lafourche Parish southeast of the GIWW (See Figure 2). Over the next 20 years, this area would lose about 10,550 acres of marsh, mainly due to saltwater intrusion and extreme water-level fluctuation. The project would restore historic hydrologic conditions by the construction of plugs in abandoned oil-field canals, weirs (with boat-bays at major access points), low-level dikes, and vegetative plantings to reduce shoreline erosion. These features will reduce the wetland loss by 6,150 acres over 20 years. The fully funded cost is $8,142,000, and the cost-effectiveness criterion is $68/AAHU.

Cameron Creole Watershed, Hydrologic Restoration (IN-D)

This project area in Cameron Parish includes 5,900 acres of intermediate and brackish emergent marsh and 4,600 acres of interspersed open water (See Figure 2). In the next 20 years, 1,625 acres of marsh will be restored via operation of the existing Cameron Creole Watershed Project. Two plugs with boatbays would be placed in the lakeshore borrow canal on the east side of Calcasieu Lake to slow the rapid movement of saline waters and reduce ponding. These plugs will restore an additional 850 acres of marsh over the next 20 years. The fully funded cost is $502,000, and the cost-effectiveness criterion is $128/AAHU.

Bayou Sauvage Refuge, Hydrologic Restoration (IN-A)

This project is located on the Bayou Sauvage National Wildlife Refuge, in Orleans Parish, in a refuge unit where hurricane protection levees impound 1,800 acres of emergent marsh interspersed with 2,000 acres of shallow open water (See Figure 2). Rainfall cannot be removed in a timely manner, and the elevated water levels have caused significant deterioration of the marsh. Installation and operation of two 48-inch pumps would prevent the loss of 500 acres of marsh and restore an additional 1,050 acres. The fully funded cost is $1,105,000, and the cost-effectiveness criterion is $180/AAHU.

Turtle Cove, Erosion Prevention (LA-A)

This project would protect pond and marsh habitat on the Manchac Wildlife Management Area, in St. John the Baptist Parish (See Figure 3). Lake Pontchartrain is threatening to break into a 1,044-acre area known as the Prairie. The Prairie consists of 180 acres of emergent fresh marsh interspersed with 864 acres of open water containing submerged aquatic vegetation. Construction of a temporary breakwater, consisting of two 500-foot-long Langard Tubes filled with sand, would prevent the loss of both the marsh and vegetated pond until the mitigation plan for the Lake Pontchartrain and Vicinity Hurricane Protection Project can be implemented. The fully funded cost is $386,000, and the cost-effectiveness criterion is $194/AAHU.

Sabine Refuge, Erosion Prevention (IN-C)

This project on the Sabine National Wildlife Refuge, in Cameron Parish, encompasses 8,450 acres of emergent fresh marsh interspersed with 4,550 acres of shallow open water containing aquatic vegetation (See Figure 3). Reconstruction of 5.5 miles of eroded levee would prevent saline waters from entering this impoundment and thus prevent the loss of 5,540 acres of fresh marsh. The fully funded cost is $4,844,000, and the cost-effectiveness criterion is $253/AAHU.

Vegetative Planting - Demonstration Projects (AG-B1 through AG-B4)

These four projects are in Terrebonne, Vermilion, and Cameron Parishes and encompass about 1,540 acres of marsh, interspersed with about 1,100 acres of shallow water (See Figure 3). By planting approximately 77,000 feet of appropriate vegetation, with necessary wave-stilling devices, marsh loss would be reduced by 635 acres. Plantings would be done in a variety of habitats including fresh marsh near Falgout Canal, a brackish marsh near Hackberry, a saline Gulf shoreline from Dewitt Canal to Rollover Bayou, and on Timbalier Island. The fully funded cost is $848,000, and the cost-effectiveness criterion is $282/AAHU.

West Bay, Sediment Diversion (AR-A)

The project consists of a large-scale sediment diversion through the west bank of the Mississippi River, at mile 4.7 above Head of Passes, in Plaquemines Parish (See Figure 4). The diversion, consisting of a broad-crested earthen weir, would build 9,831 acres of marsh in what is now a 12,800-acre shallow bay system. The fully funded cost is $8,517,000, and the cost-effectiveness criterion is $305/(AAHU).

Barataria Bay Waterway, Marsh Building with Dredged Sediments (AR-E)

This project involves the use of material dredged during maintenance of the Barataria Bay Waterway, to create 445 acres of marsh in what is now shallow open water along the waterway, south of Bayou St. Denis in Jefferson Parish (See Figure 4). The fully funded cost, over and above that required for the traditional disposal of the material, is $1,625,000, and the cost-effectiveness criterion is $449/AAHU.

Lower Bayou La Cache, Hydrologic Restoration (CO-B)

The project area is located in Terrebonne Parish, south of Houma, and consists of 3,000 acres of marsh interspersed with 1,200 acres of shallow water (See Figure 4). Fifteen oil-field canals cross this one-mile-wide by seven-mile-long area, which is bounded by Bayou Petit Caillou to the west and Bayou Terrebonne to the east. Historic hydrology will be reestablished by reconstructing the south bank levee of Bush Canal and placing shell-reinforced plugs, or continuous levees around active canals, at all 15 points where canals intersect the major bayous. The southern-most portion of the project area will continue to provide tidal exchange and fishery access. Wetland loss would be reduced and there would be a net gain of 86 acres over the next 20 years. Fully funded costs are $1,254,000, and the cost-effectiveness criterion is $837/AAHU.

Bayou La Branche, Marsh Building with Dredged Sediments (AR-C)

The project consists of creating 209 acres of emergent marsh with sediment dredged from where the Bonnet Carre Spillway enters Lake Pontchartrain by placing it in shallow water within the La Branche wetlands, just north of Interstate Highway 10, in St. Charles Parish (See Figure 4). The fully funded cost is $4,327,000, and the cost-effectiveness criterion is $2,369/AAHU.

Cameron Prairie Refuge Erosion Prevention (IN-B)

The project consists of constructing a rock dike adjacent and parallel to the north shoreline of the GIWW, in Cameron Parish (See Figure 5). The project would prevent the loss of 247 acres of marsh within an impoundment on the Cameron Prairie National Wildlife Refuge. The impoundment presently consists of 350 acres of emergent fresh marsh interspersed with 290 acres of shallow open water containing submerged aquatic vegetation. The fully funded cost is $1,111,000, and the cost-effectiveness criterion is $3,171/AAHU.

Vermilion River Cutoff Erosion Prevention (LA-B)

The project would reestablish 6,200 feet of the rapidly eroding west bank of the Vermilion River Cutoff, by the installation of a rock-armored structure, construction of sediment-trapping devices, and establishment of vegetative plantings (See Figure 5). These measures would prevent the loss of 54 acres of marsh and create 11 acres within an area which presently consists of 54 acres of marsh interspersed with 148 acres of open water, in Vermilion Parish. The fully funded cost is $1,523,000, and the cost-effectiveness criterion is $6,196/AAHU.

Eastern Isle Dernieres - Demonstration (EPA-A)

The project consists of the restoration of two miles of this barrier island in Terrebonne Parish (See Figure 5). Barrier islands serve as a first line of defense for the coastal wetlands behind them. Material dredged from nearby open water would be used to create an additional 105 acres of saline marsh on the north side of the island. All but 30 acres of the existing island would be lost over the next 20 years without the project. Additionally this demonstration project will provide data to better estimate dredging and disposal costs associated with barrier island restoration. The fully funded cost is $6,345,000, and the cost-effectiveness criterion is $13,949/AAHU.

BA-6 - GIWW to U.S. Highway 90, Hydrologic Restoration (AG-C)

This project, encompassing about 36,000 acres of fresh marsh interspersed with 4,000 acres of open water, is located in central Lafourche Parish north of the GIWW (See Figure 5). Over the next 20 years, this area would lose about 5,000 acres of marsh, mainly due to the absence of sediment and saltwater intrusion caused by man-made waterways. The project would restore historic hydrologic conditions by the construction of plugs in abandoned oil field canals, rock weirs, low-level dikes, and the establishment of vegetative plantings to reduce shoreline erosion. These features will reduce the wetland loss by 3,200 acres over 20 years. The fully funded cost is $4,583,000, and the cost-effectiveness criterion is $323/AAHU.

Tiger Pass, Marsh Building with Dredged Sediments (AR-B)

The project consists of using dredged material from the Tiger Pass navigation project to create 385 acres of marsh in what is now shallow open water, in Plaquemines Parish (See Figure 6). The fully funded incremental cost, over and above that required for traditional disposal of the material, is $7,078,000, and the cost-effectiveness criterion is $1,661/AAHU.

Falgout Canal South, Marsh Building with Dredged Sediments - Demonstration (EPA-B)

This demonstration project consists of marsh creation using fine sand dredged from an offsite source and barged to an area that degraded to open water in Terrebonne Parish, south of Houma (See Figure 6). In a test of new technology, the dredged material would then be slurried and pumped into a telescoping pipeline equipped with nozzles to spray the slurry into 220 acres of open water to create 104 acres of emergent marsh, and to establish a platform for the growth of submerged vegetation in the remaining 116 acres of open water. The fully funded cost is $6,109,000, and the cost-effectiveness criterion is $5,950 /AAHU.

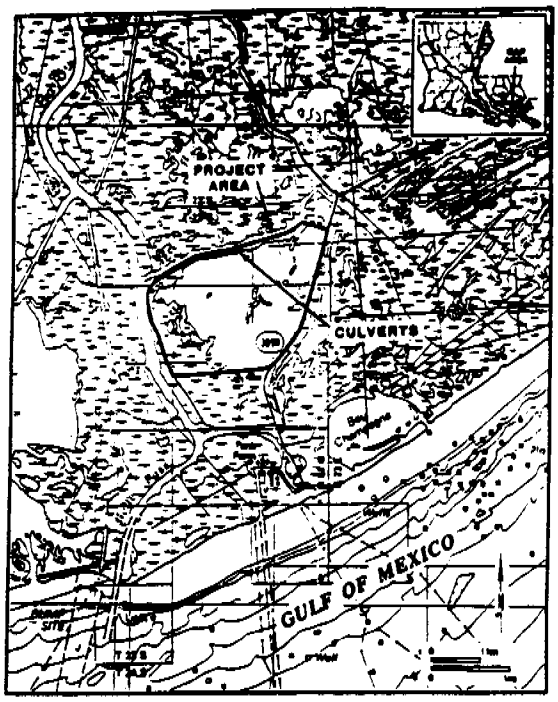
Lake Salvador, Erosion Prevention (AR-D)

The project consists of the construction of a breakwater using a 5,000-foot-long, multi-celled, sand-filled fabric bag, placed parallel to the eastern bank of Lake Salvador in Jefferson Parish (See Figure 6). This breakwater would prevent the lake from breaching the narrow isthmus between the lake and the Bayou Segnette Waterway. Wind-driven waves would attack the wetlands of Jean Lafitte National Historical Park if this breach were to occur. Closure of an abandoned oil-well access canal is also a project feature. The project would prevent the loss of 77 acres of marsh and create an additional 11 acres. The fully funded cost is $4,427,000, and the cost-effectiveness criterion is $10,376/AAHU.

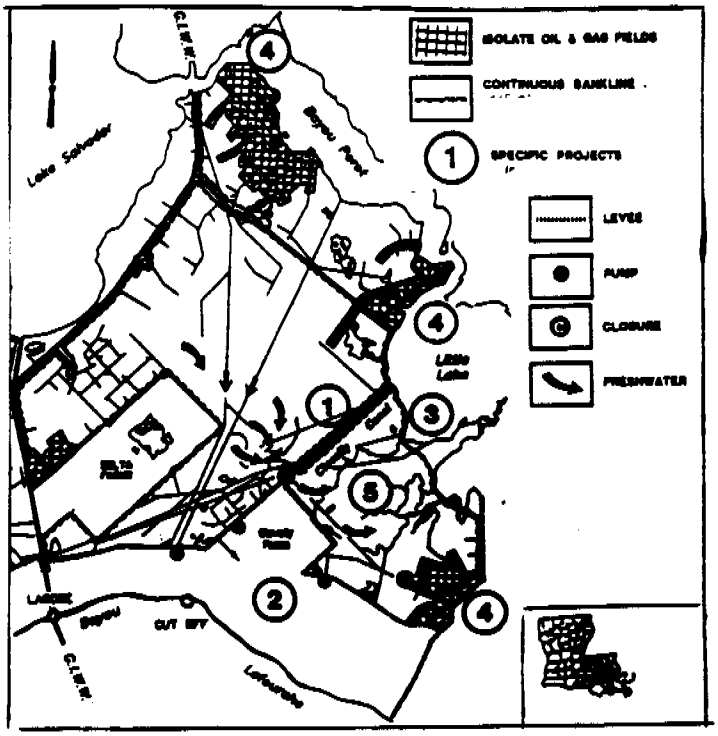
C. Rationale for Deferred Projects

The BA-6 - GIWW to U.S. Highway 90 project (AG-A) was deferred because significant wetland benefits are not expected to accrue until project year seven and because this project is already part of the State of Louisiana's "Coastal Wetlands Conservation and Restoration Plan." The Tiger Pass project (AR-B) was deferred because of its relatively high fully funded cost and its location near the West Bay Sediment Diversion project (AR-A), which will provide substantially greater wetland benefits to the Mississippi River Basin. The Falgout Canal South demonstration project (EPA-B) was deferred in order to allow time to reformulate the project - for example, to possibly obtain the sediments from the dredged material disposal islands in Atchafalaya Bay rather than from the Mississippi River. The mining of the disposal islands will provide a less expensive source of sediment and remove barriers to the distribution of sediments within the Atchafalaya Bay, thus benefiting a hydrologic basin not represented on the Priority Project List. Other sources of sediment and other deposition locations may be identified to demonstrate the Falgout Canal South project (EPA-B). The Lake Salvador Shoreline project (AR-D)is part of the State of Louisiana's "Coastal Wetlands Conservation and Restoration Plan" and was deferred in favor of the Eastern Isle Dernieres project (EPA-A).

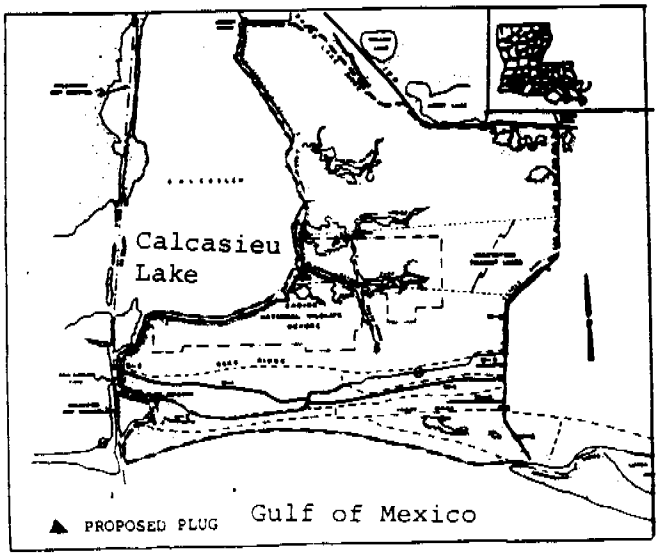
Figure 2



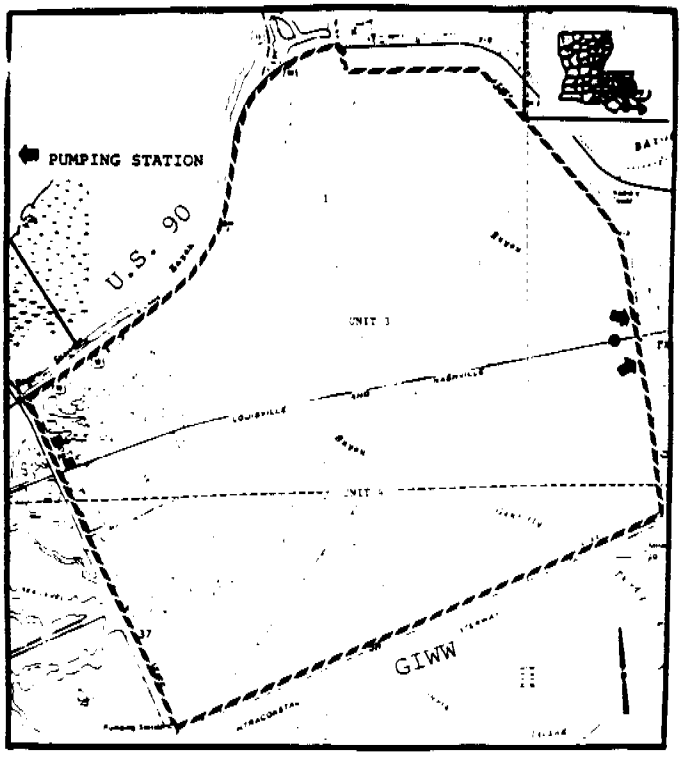
FOURCHON HYDROLOGIC RESTORATION
(CO-A)



BA-2 GIWW TO CLOVELLY HYDROLOGIC RESTORATION
(AG-A)

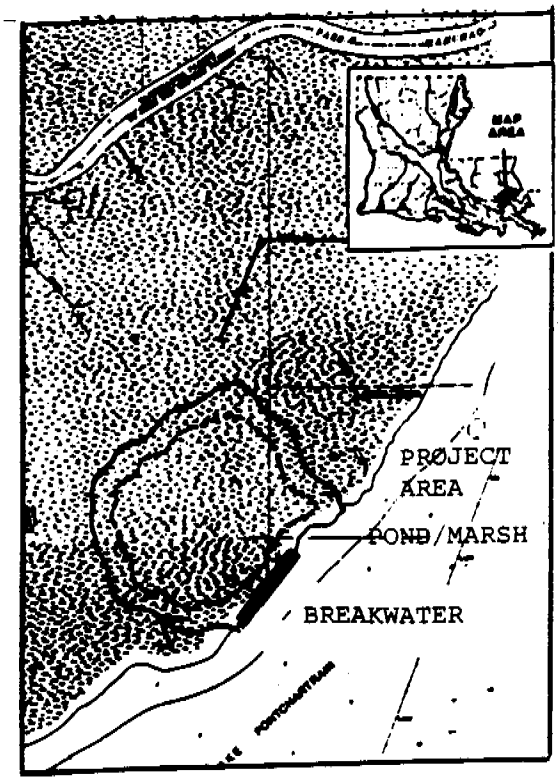


CAMERON CREOLE WATERSHED HYDROLOGIC
RESTORATION (IN-D)

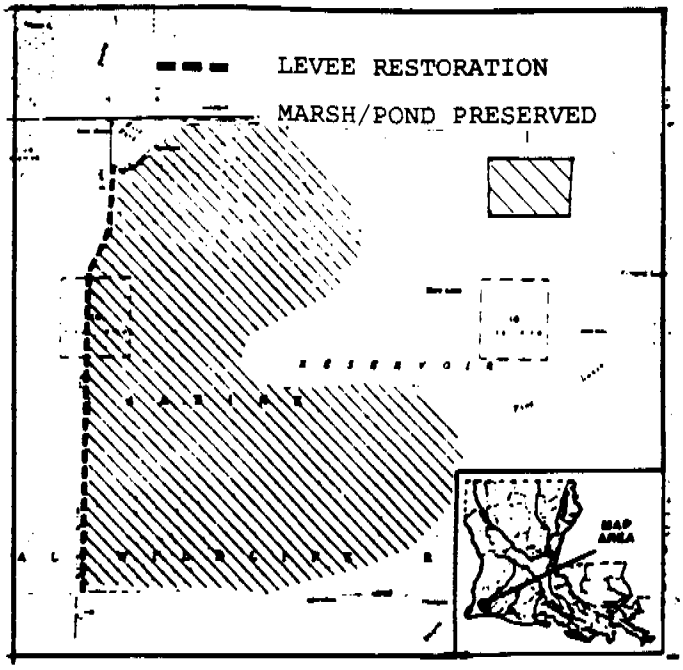


BAYOU SAUVAGE REFUGE HYDROLOGIC RESTORATION
(IN-A)

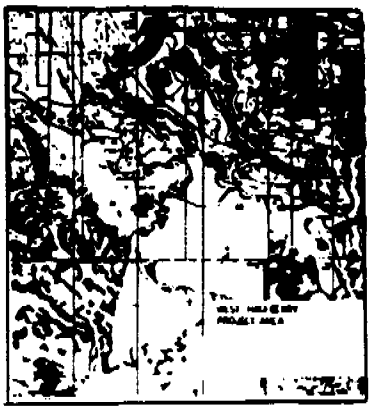
Figure 3



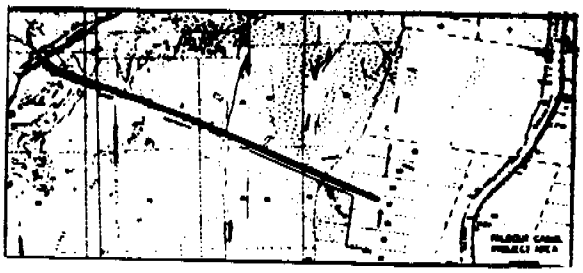
TURTLE COVE EROSION CONTROL
(LA-A)



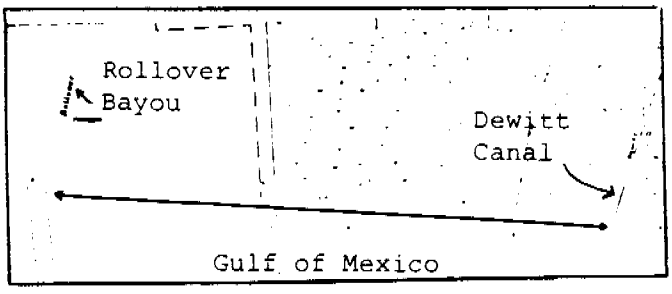
SABINE REFUGE EROSION CONTROL
(IN-C)



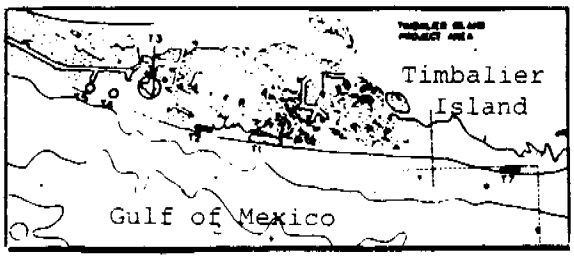
HACKBERRY VEGETATIVE PLANTING
(AG-B3)



FALGOUT CANAL VEGETATIVE PLANTING
(AG-B2)

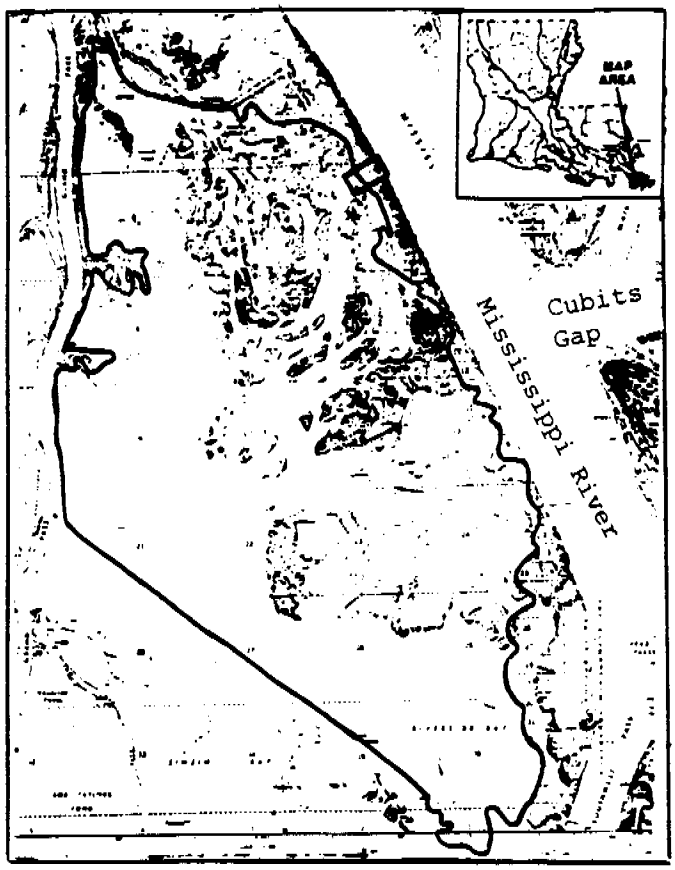


DEWITT-ROLLOVER VEGETATIVE PLANTING
(AG-B4)

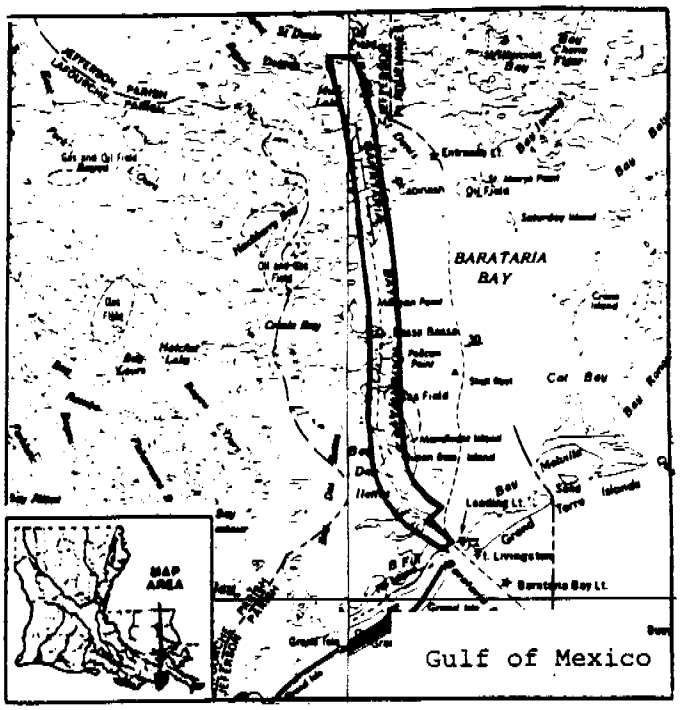


TIMBALIER VEGETATIVE PLANTING
(AG-B1)

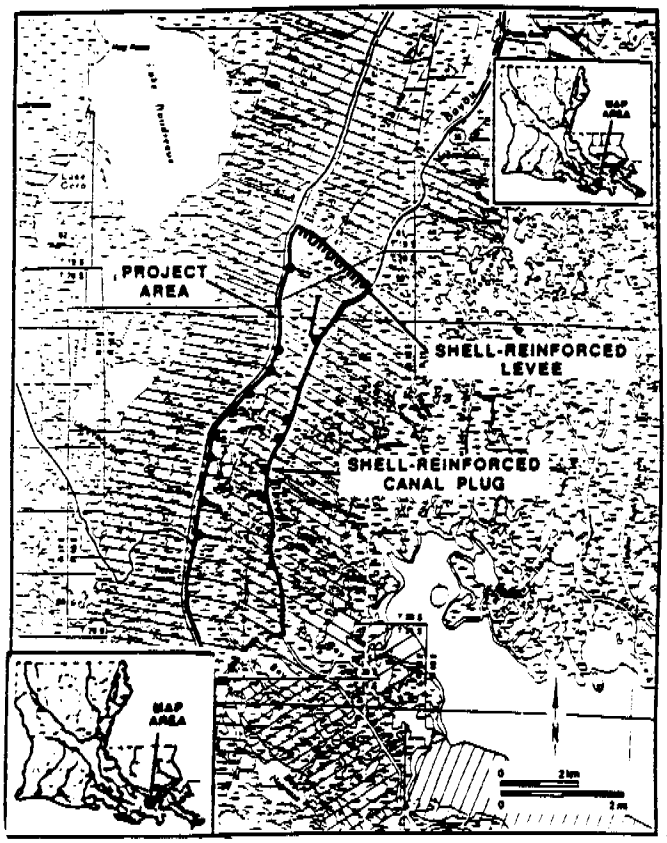
Figure 4



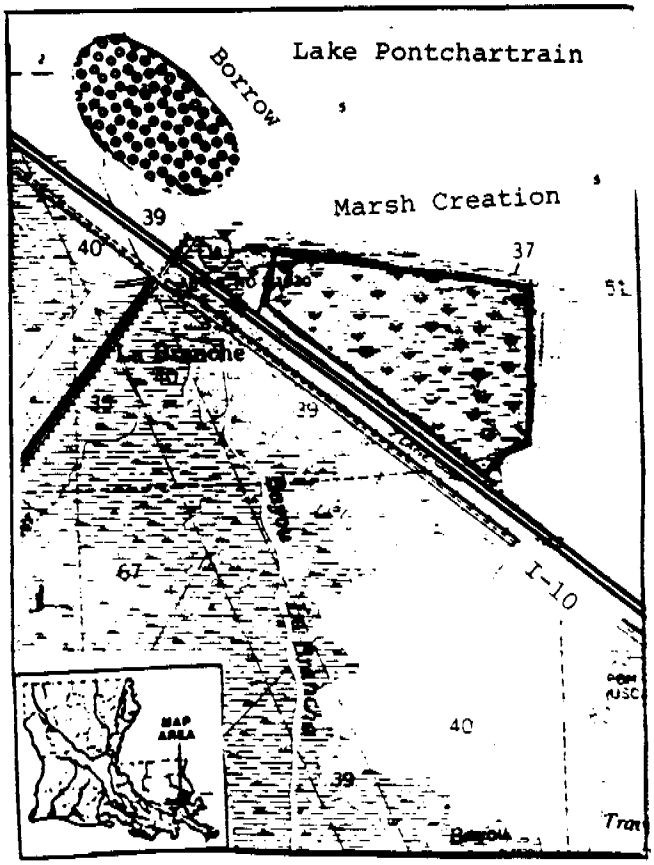
WEST BAY SEDIMENT DIVERSION
(AR-A)



BARATARIA BAY WATERWAY MARSH BUILDING
WITH DREDGED SEDIMENTS
(AR-E)

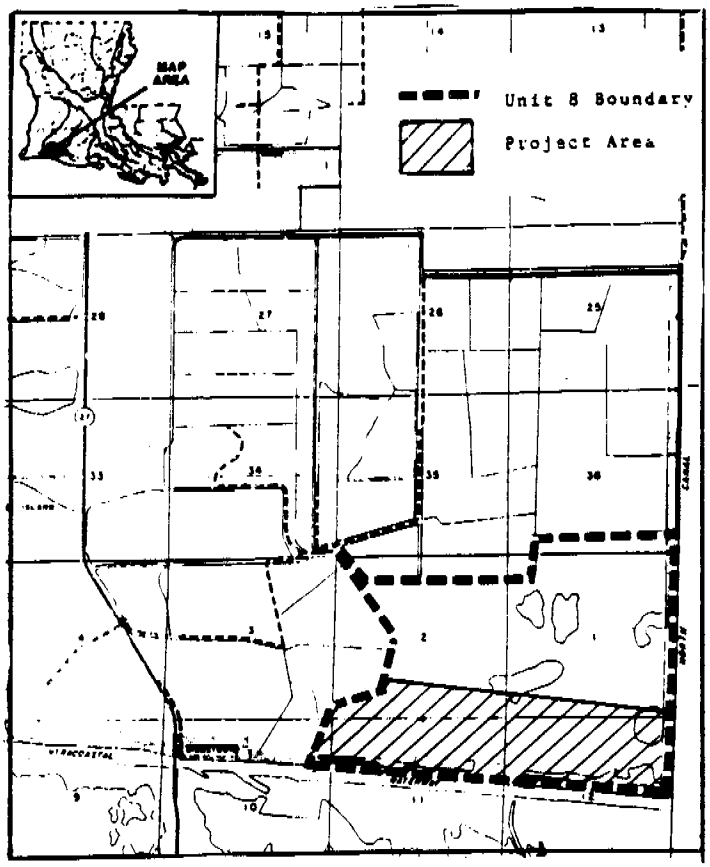


LOWER BAYOU LA CACHE HYDROLOGIC RESTORATION
(CO-B)

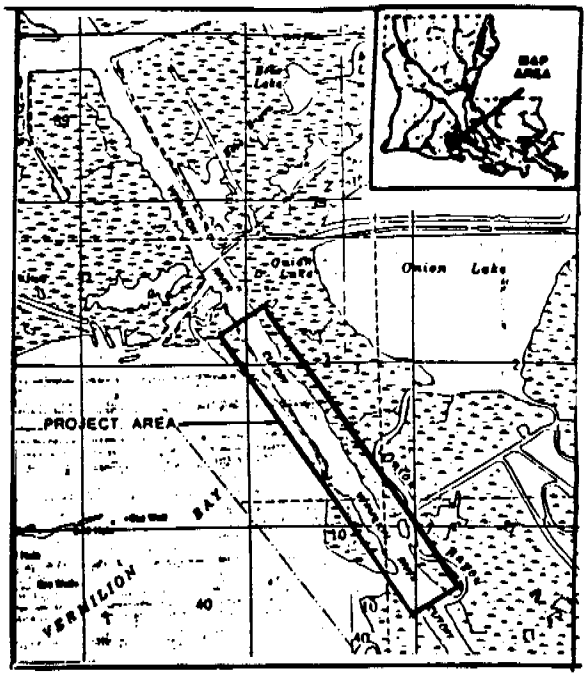


BAYOU LA BRANCHE MARSH BUILDING
WITH DREDGED SEDIMENTS
(AR-C)

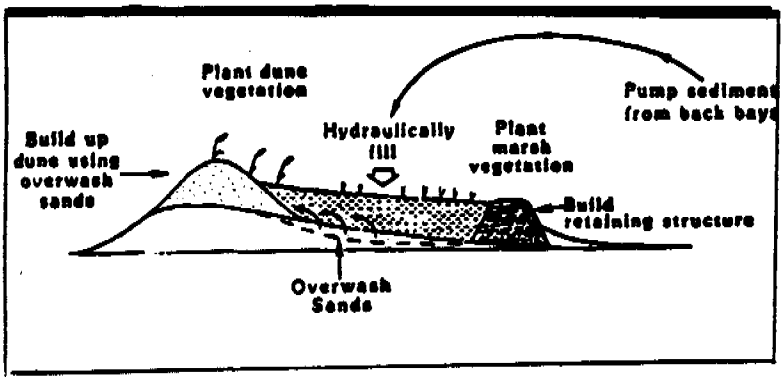
Figure 5



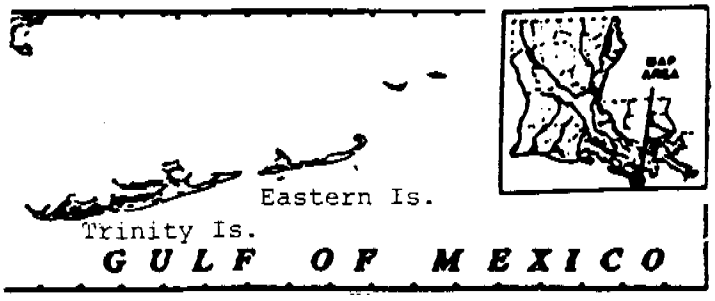
CAMERON PRAIRIE REFUGE EROSION CONTROL
(IN-B)

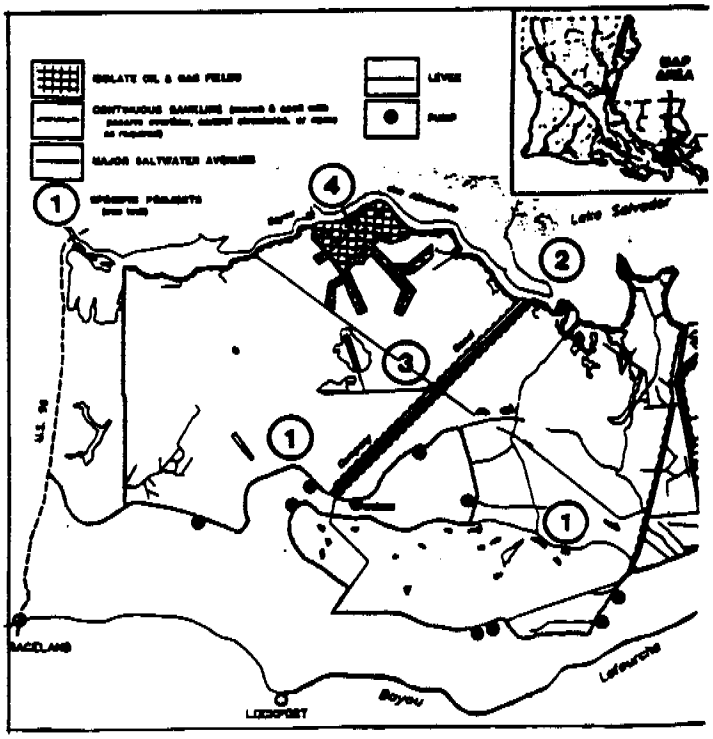


VERMILION RIVER CUTOFF EROSION CONTROL
(LA-B)



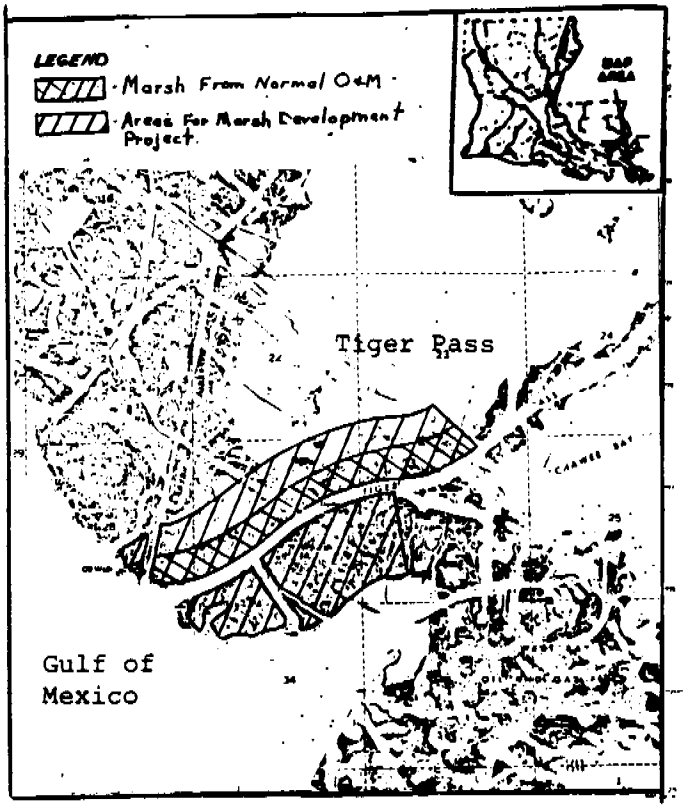
EASTERN ISLES DERNIERES DEMONSTRATION
(EPA-A)



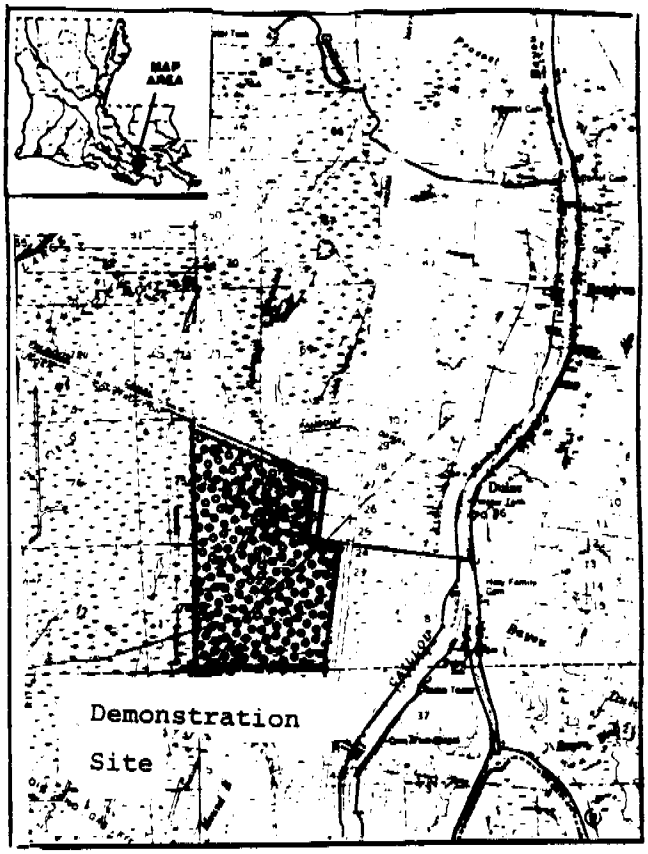


BA-6 GIWW TO U.S. HIGHWAY 90
HYDROLOGIC RESTORATION
(AG-C)

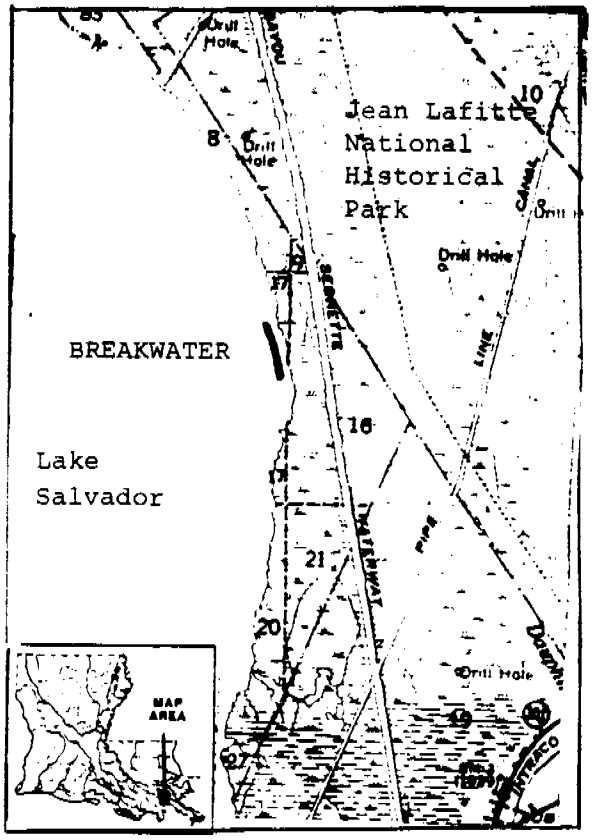
Figure 6



TIGER PASS MARSH BUILDING WITH DREDGED SEDIMENTS
(AR-B)



FALGOUT CANAL SOUTH MARSH BUILDING WITH DREDGED SEDIMENTS DEMONSTRATION
(EPA-B)



LAKE SALVADOR SHORELINE EROSION CONTROL
(AR-D)