

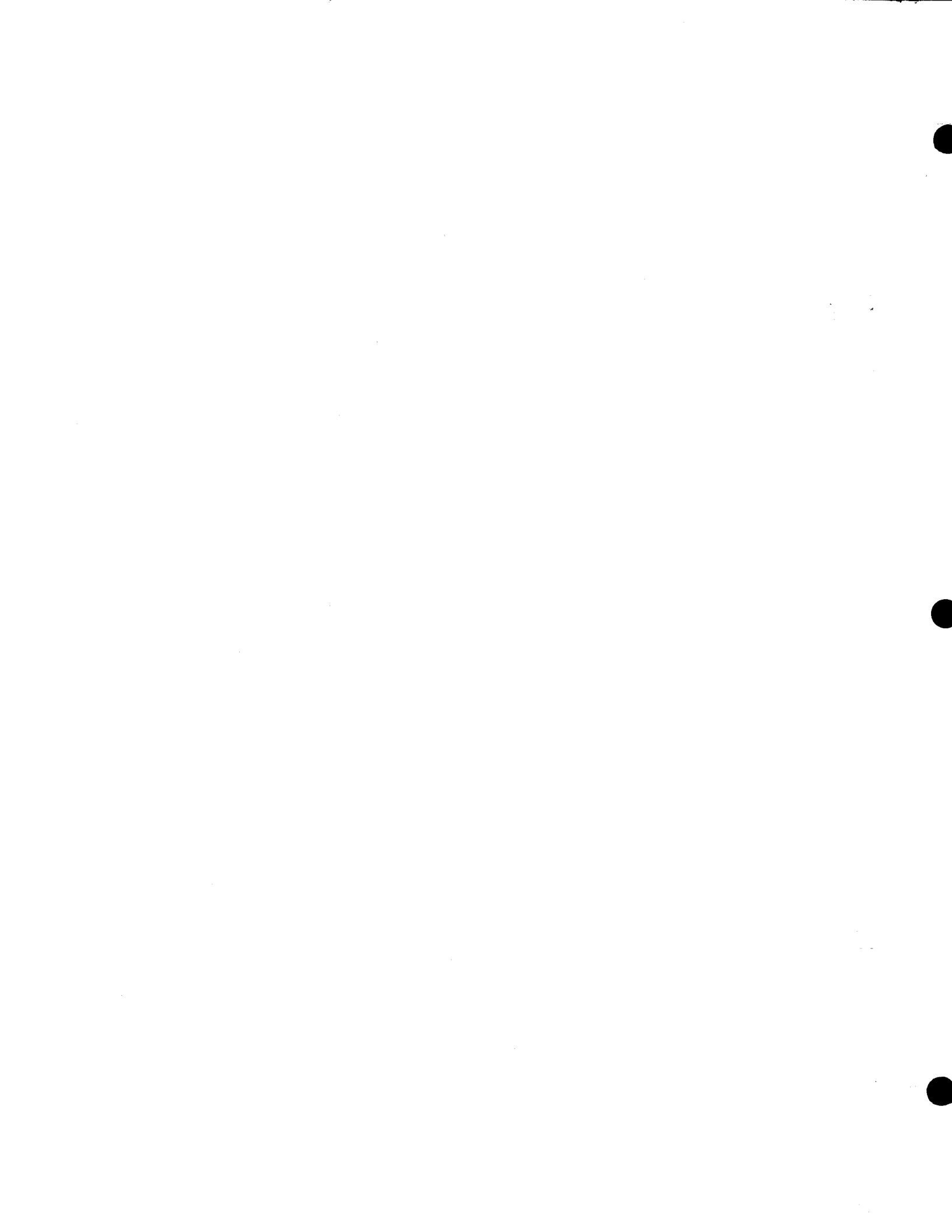


6th PRIORITY PROJECT LIST REPORT

PREPARED BY:

**LOUISIANA COASTAL WETLANDS CONSERVATION AND RESTORATION
TASK FORCE**

April 1998



Coastal Wetlands Planning, Protection and Restoration Act

6th Priority Project List Report

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INTRODUCTION

The State of Louisiana contains about 40 percent of the Nation's coastal wetlands. Louisiana's coastal wetlands are experiencing losses at a rate of approximately 80 percent of the Nation's total coastal wetland loss rate. This is a disproportionately high level of loss, compared to nation-wide rates. In addition, the coastal wetland loss problem in Louisiana is extensive and complex in nature. Agencies of diverse purpose and mission that are involved with addressing the problem have proposed many alternative solutions. These proposals have had a wide spectrum of approach for diminishing, neutralizing, or reversing these losses. A global observation of these efforts by Federal, state, and local governments and the public has led to the conclusion that a comprehensive approach is needed to address this significant environmental problem. In response to this, the Coastal Wetlands Planning, Protection and Restoration Act (Public Law 101-646) was signed into law by President Bush on November 29, 1990. This report documents the implementation of Section 303(a) of the cited legislation.

STUDY AUTHORITY

Section 303(a) of the Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA, or the Breaux-Johnston Act), displayed in Appendix A, 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.

STUDY PURPOSE

The purpose of this study effort was to prepare the 6th Priority Project List (PPL) and transmit the list to Congress, as specified in Section 303(a)(3) of the CWPPRA. Section 303(b) of the act calls for preparation of a comprehensive restoration plan for coastal Louisiana; that effort was completed in November 1993, with the submission of the Louisiana Coastal Wetlands Restoration Plan.

PROJECT AREA

Plate 1 is a map that delineates the Louisiana coastal zone. The entire coastal area, which comprises all or part of 20 Louisiana parishes, is considered to be the CWPPRA project area. To facilitate the study process, the coastal zone was divided into nine hydrologic basins (refer to map).

STUDY PROCESS

The Interagency Planning Groups. Section 303(a)(1) of the CWPPRA directs the Secretary of the Army to convene the Louisiana Coastal Wetlands Conservation and Restoration Task Force, to consist of the following members:

- the Secretary of the Army (Chairman)
- the Administrator, Environmental Protection Agency
- the Governor, State of Louisiana
- the Secretary of the Interior
- the Secretary of Agriculture
- the 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 303(a)(2)], as stipulated in President Bush's November 29, 1990, signing statement (Appendix A). In addition, the State of Louisiana may not serve as a "lead" Task Force member for design and construction of wetlands projects of the priority project list.

In practice, the Task Force members named by the law have delegated their responsibilities to other members of their organizations. For instance, the Secretary of the Army authorized the commander of the Corps' New Orleans District to act in his place as chairman of the Task Force.

To assist it in putting the CWPPRA into action, the Task Force established the Technical Committee and the Planning and Evaluation Subcommittee. Each of these bodies contains the same representation as the Task Force -- one member from each of the five Federal agencies and one from the State. The Planning and Evaluation Subcommittee is responsible for the actual planning of projects and preparation of the November

1993 comprehensive restoration plan, as well as the other details involved in the CWPPRA process (such as development of schedules, budgets, etc.); the subcommittee makes recommendations to the Technical Committee and lays the groundwork for decisions which will ultimately be made by the Task Force. The Technical Committee reviews all materials prepared by the subcommittee, makes appropriate revisions, and provides recommendations to the Task Force. The Technical Committee operates at an intermediate level between the planning details considered by the subcommittee and the policy matters dealt with by the Task Force, and often formalizes procedures and formulates policy for the Task Force.

The Planning and Evaluation Subcommittee established several working groups to evaluate projects for priority project lists and the restoration plan. The Environmental Work Group was charged with estimating the benefits (in terms of wetlands created, protected, enhanced, or restored) associated with various projects. The Engineering Work Group reviewed project cost estimates for consistency. The Economic Work Group performed the economic analysis which permitted comparison of projects on the basis of their cost effectiveness. The Monitoring Work Group established a standard procedure for monitoring of CWPPRA projects and developed a monitoring cost estimating procedure based on project type.

The Citizen Participation Group. The Task Force also established a Citizen Participation Group to provide general input from the diverse interests across the coastal zone: local officials, landowners, farmers, sportsmen, commercial fishermen, oil and gas developers, navigation interests, and environmental organizations. The Citizen Participation Group was formed to promote citizen participation and involvement in formulating priority project lists and the restoration plan. The group meets at its own discretion, but may at times meet in conjunction with other CWPPRA elements, such as the Technical Committee. The purpose of the Citizen Participation Group is to maintain consistent public review and input into the plans and projects being considered by the Task Force and to assist and participate in the public involvement program. The membership of the Citizen Participation Group is shown in Table 1.

Table 1
Membership of the Citizen Participation Group

Gulf Coast Conservation Association	Concerned Shrimpers of America
Coalition to Restore Coastal Louisiana	Gulf Intracoastal Canal Association
Lake Pontchartrain Basin Foundation	Louisiana Association of Soil and Water Conservation Districts
Louisiana Farm Bureau Federation, Inc.	Louisiana Landowners Association
Louisiana League of Women Voters	Louisiana Nature Conservancy
Louisiana Oyster Growers and Dealers Association	Louisiana Wildlife Federation, Inc.
Midcontinent Oil and Gas Association	New Orleans Steamship Association
Oil and Gas Task Force (Regional Economic Development Council)	Police Jury Association of Louisiana
Organization of Louisiana Fishermen	

Involvement of the Academic Community. While the agencies sitting on the Task Force possess considerable expertise regarding Louisiana's coastal wetlands problems, the Task Force recognized the need to incorporate another invaluable resource: the state's academic community. The Task Force therefore retained the services of the Louisiana Universities Marine Consortium (LUMCON) to provide scientific advisors to aid the Environmental Work Group in performing Wetland Value Assessments. This Academic Assistance Group also assists the Task Force in carrying out the two feasibility studies authorized by the Task Force in March 1995: the Louisiana Barrier Shoreline study (managed by the Louisiana Department of Natural Resources) and the Mississippi River Sediment, Nutrient, and Freshwater Redistribution study (managed by the Corps of Engineers).

Public Involvement. Even with its widespread membership, the Citizen Participation Group cannot represent all of the diverse interests affected by Louisiana's coastal wetlands. The CWPPRA public involvement program provides an opportunity for all interested parties to express their concerns and opinions and to submit their ideas concerning the problems facing Louisiana's wetlands. The Task Force has held at least six public meetings each of the last six years to obtain input from the public. In addition, the Task Force distributes a semiannual newsletter with information on the CWPPRA program and on individual projects.

PLAN FORMULATION PROCESS FOR THE 6th PRIORITY PROJECT LIST

BACKGROUND

The planning effort associated with the CWPPRA initially proceeded simultaneously along two tracks. Section 303(b) of the act calls for the development of a comprehensive restoration plan for Louisiana's coastal wetlands. This long term plan was developed over a three-year period, with the report (the *Louisiana Coastal Wetlands Restoration Plan*) completed in November 1993. Section 303(a), on the other hand, deals with projects which can be implemented within a short period of time. This section requires that any project selected for a priority project list be substantially complete within five years of its appearance on a list. The intent of this section is to provide a rapid response to the loss of coastal wetlands. The first Priority Project List was to be submitted within one year of enactment of the CWPPRA, with subsequent lists to be prepared annually.

Section 303(a) actually requires that priority project lists be submitted only until such time as the comprehensive restoration plan called for in section 303(b) has been prepared. Projects can then be drawn from the comprehensive plan. In practice, however, the Task Force has found the annual priority list process to be an effective means of developing projects and has continued to use that process -- without the five-year implementation limit.

The one-year time limit associated with developing a priority project list necessitated a deviation from the usual plan formulation process. Rather than beginning with a clean slate, it was preferable to begin with projects which were already developed to some degree. The emphasis was to develop where possible projects on which some planning had already been done. The projects on the First Priority Project List submitted in November 1991 fell into this category.

Preparation of subsequent lists involved somewhat more lead time than did the first list and employed a more traditional approach. This section describes the process by which the 6th Priority Project List was developed.

Development of the 6th list was a three-stage process: selection of candidate projects, evaluation of candidate projects, and selection of the priority project list.

IDENTIFICATION OF PROJECTS

Projects considered for the 6th list were derived from the *Louisiana Coastal Wetlands Restoration Plan*. In the restoration plan, an identification number was assigned to each project to help keep track through the screening and evaluation process. Each project received a two-letter code to identify its basin; these codes are shown below.

PO	Pontchartrain	AT	Atchafalaya
BS	Breton Sound	TV	Teche/Vermilion
MR	Mississippi River Delta	ME	Mermentau
BA	Barataria	CS	Calcasieu/Sabine
TE	Terrebonne		

Projects which were originally part of the State's Coastal Wetlands Conservation and Restoration Plan use these two letters followed by a number. Projects which were derived from the scoping meetings held in the fall of 1991 are identified by a "P" ("public") preceding the two-letter code (e.g., PPO-52, PTV-18).

Plan formulation meetings held from February through May 1992 were an additional source of projects for consideration for priority project lists. Projects which were proposed during and after these meetings are identified with an "X" (e.g., XTE-41).

The CWPPRA provides for revision of the comprehensive restoration plan as appropriate, and the Task Force considers such revisions on an annual basis. Some projects which have been added to the plan are not specific to one project area, but rather may be applied at any appropriate site on a coastwide basis. These projects are designated "CW," followed by a numerical identifier.

SELECTION OF CANDIDATE PROJECTS

Candidate projects are those which the Task Force will evaluate in some detail in order to choose a priority project list. The Planning and Evaluation Subcommittee selects a number of candidate projects as the first step in priority project list development.

In May 1996 the Planning and Evaluation Subcommittee held a series of meetings for project nominations and the selection of candidate projects. The meetings were held according to the schedule shown in Table 2.

Table 2
Meetings for Project Nominations
and Selection of Candidate Projects

Purpose and Location	Date	Hydrologic Basins
Nominations -- New Orleans, Louisiana	July 9, 1996	Pontchartrain Mississippi River Delta Breton Sound Barataria Terrebonne
Nominations -- Abbeville, Louisiana	July 11, 1996	Atchafalaya Teche-Vermilion Mermentau Calcasieu/Sabine
Candidate Selection -- Baton Rouge, Louisiana	July 23, 1996	All basins

The public was invited to participate in these meetings, not only by commenting on projects nominated by the CWPRA agencies, but also by nominating projects of their own. The sole requirement for nomination was that a project must be listed in the *Louisiana Coastal Wetlands Restoration Plan*. The subcommittee selected the candidate projects from among the nominees at the July 23rd meeting.

The Planning and Evaluation Subcommittee established in advance that the nominee projects to be selected as candidates were to be the top ten by closed-ballot agency popular vote. The subcommittee considered the qualitative benefits of each nominee project to establish project value to the ecosystem and respective popular vote. In the voting process, the projects having highest- to lowest-value to the ecosystem respectively received the highest- to lowest-numerical vote. The popular vote for the nominees are displayed in table 3.

Of the nominees, 26 projects were chosen as candidate to be evaluated in detail; these were the projects from which the 6th Priority Project List would be selected. In addition, the Planning and Evaluation Subcommittee decided 3 demonstration projects (some proposed by the agencies, some proposed by the public) merited consideration for the 6th Priority Project List. By Task Force decision, the total cost of demonstration projects for any list is generally limited to about \$2 million.

A lead federal agency was then assigned to each candidate project. The lead agency was responsible for developing the project more fully and producing designs and cost estimates. The Engineering Work Group met and reviewed each agency's design and cost estimate for the projects. After finalization of the designs and cost estimates, the lead agencies furnished

Table 3

Agency Vote for Screening of Nominee Projects on the 6th Priority Project List^a

Project No.	Project Name	Project Rank	LA Vote	NRCS Vote	NMFS Vote	EPA Vote	USFWS Vote	COE Vote	Total Project Vote
XTE-32	Bayou Boeuf Pump Station ^b	1	12	10	13	25	11	18	89
PTE-26	Penchant Basin Plan ^b	2		24	17	14	22	11	88
PBA-44	Sediment Diversion at Boothville ^b	3	8		25	15	14	24	86
TE-7f	Lake Boudreaux Basin Freshwater Introduction and Hydrologic Management ^b	4		16	18	9	25	17	85
CW-5	Long-term Marsh Creation at 60-mile Point (West Point a la Hache) ^b	5	24		15	21		23	83
CW-6	Long-term Marsh Creation East of Atchafalaya Bay ^b	6	23		23	22		15	83
PBA-12b	Barataria Bay Waterway Bank Protection East ^b	7	1	22	21		23	7	74
CW-1	Dedicated Dredging in the Mississippi River ^b	8	15			19	13	25	72
TV-5/7	Marsh Island Hydrologic Restoration ^b	9	9	17	4	6	17	19	72
CW-7	Bayou Lafourche Dedicated Dredging (in Oilfield Canals) ^b	10	18	3	8	20		22	71
XCS-48	Black Bayou Hydrologic Restoration ^b	11		14	20	7	19	6	66
PMR-10	Delta-wide Crevasses ^b	12	7		22	13		21	63
PME-2	Breakwaters at Rockefeller Refuge ^b	13	16	15	11			20	62
PBA-48	Myrtle Grove Siphon Enlargement ^b	14			24	12	24		60
XMR-10b	Channel Armor Gaps West ^b	15	4		10	23	21		58
XTV-25/ FTV-10	Oaks/Avery Canals Hydrologic Restoration ^b	16	25	23		4	1		53
FTV-19b	Sediment Trapping at the Jaws ^b	17	19	2		17		14	52
BA-3/4	Assume OM&M of the Siphons at Naomi, Violet, and West Pointe a la Hache	18	14	7	6		18		45
CS-2	Rycade Canal Assumption of OM&M	19	20	9			15		44
PBA-11	Tiger/Red (Spanish) Pass Diversion ^b	20			19		20		39
XBA-63	Land Bridge in the Barataria Basin	21	3	8	16		6	1	34
CS-1a	Holly Beach Breakwaters Assumption of Maintenance	22	22	11					33
XTE-62	Wine Island Eastward Extension	23	21		5	5			31
XME-22	Pecan Island Terracing	24			14		4	12	30
PTV-20	Little White Lake Terracing	26			12		5	13	30
PO-1a	LaBranche Wetland South of I-10	28		20			10		30
XBA-51	Shoreline Replenishment at Pass Chaland and East	29	2		7	16		4	29
TV-2a	Hammock Lake Shoreline Protection	30		19			7		26
XPO-64	Bayou Sauvage NWR Rstrtn, I-10 to L Pontchartrain	31			9		16		25
TE-2	Falgout Canal Assumption of Maintenance	32	13	4			8		25
PME-14	South Mermentau Hydrologic Restoration	33		25					25
etc.									
PTE-									
15b(iv)	Isles Dernieres Restoration, Eastern Trinity Island	34				24			24
BA-16	Assume OM&M of the L Salvadore/Jean Lafitte Proj	35	5	6			12		23
PCS-12/18	Oyster Bayou Hydrologic Restoration	36		21					21
PBA-58b	Little Lake Oil and Gas Field Shore Protection	37	17				2		19
PPO-7	LaBranche Marsh Creation East	38				8		10	18
XTV-27	Freshwater Bayou Bank Stabilization East	39		18					18
XTE-64	Avoca Island Diversion	40				18			18
PME-7	Pecan Island Pump Station	41				1		16	17
XTE-70	Terrebonne Ridge Hydrologic Restoration	42		12	1			3	16
XBA-1d	Cheniere Ronquille Segmented Breakwaters	43	6					9	15
XTE-45	Timbalier Island Restoration	44			3	11			14
XTE-59	Fina Laterre Freshwater Introduction	45		5			9		14
CS-55	Sabine Terracing Assumption of OM&M	46	11				3		14
CW-4	Highway 1 Marsh Creation ^c	47	10	1		3			14
PPO-2a									
etc.	Lakes Pontchartrain/Borgne Land Bridge Phase 1	48		13					13
XBA-55	Jetty Modification at Empire	49			2	10			12
XBA-73a	Ft. Jackson Marsh Creation	50						8	8
CW-3	Big Mar Marsh Restoration	51						5	5
PPO-2h	Lake Borgne Shore Protection West of Shell Beach	52				2		2	4
CW-2	Big Mar Marsh Restoration	53							0
XTE-66	Sediment Conveyance	54							0
XBA-75	Jetty Modification at Tiger Pass	55							0
XBA-76	Mississippi River Diversion at Port Sulphur	56							0
Cumulative Project Votes of Each Agency =			325	325	325	325	325	325	0

^a Nominee votes were compiled on July 24, 1996.

^b Selected for evaluation as a Candidate project on the 6th Priority Project List.

CWPPRA Agencies:

LA = State of Louisiana
 COE = US Army Corps of Engineers
 EPA = Environmental Protection Agency
 NMFS = National Marine Fisheries Service
 NRCS = Natural Resources Conservation Service
 USFWS = US Fish and Wildlife Service

Basin Project Identification Codes:

PO = Pontchartrain
 BS = Breton Sound
 MR = Mississippi River Delta
 BA = Barataria
 TE = Terrebonne
 AT = Atchafalaya
 TV = Teche/Vermilion
 ME = Mermentau
 CS = Calcasieu/Sabine

this information to the Environmental Work Group. The Environmental Work Group performed a Wetland Value Assessment (WVA) for each candidate project. The section entitled "Evaluation of Candidate Projects" summarizes the information developed by the lead agencies in this process.

EVALUATION OF CANDIDATE PROJECTS

Benefit Analysis (WVA). The WVA is a quantitative, habitat-based assessment methodology developed for use in prioritizing project proposals submitted for funding under the Breaux-Johnston Act. The WVA quantifies changes in fish and wildlife habitat quality and quantity that are projected to emerge or develop as a result of a proposed wetland enhancement 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 was developed by the Environmental Work Group. The Environmental Work Group is assembled under the Planning and Evaluation Subcommittee of the CWPPRA Technical Committee. The Environmental Work Group includes members from each agency represented on the CWPPRA Task Force. The WVA was designed to be applied, to the greatest extent possible, using only existing or readily obtainable data.

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. Some aspects of the WVA have been defined by policy and functional considerations of the CWPPRA; therefore, user-specific modifications may be necessary if the WVA is used for other purposes.

The WVA is a modification of the Habitat Evaluation Procedures (HEP) developed by the U.S. Fish and Wildlife Service (U.S. Fish and Wildlife Service, 1980). 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. The HEP generally uses a species-oriented approach, whereas the WVA uses a community approach.

The WVA was 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.

The WVA operates under the assumption that optimal conditions for fish and wildlife habitat within a given coastal wetland type can be characterized, and that existing or predicted conditions can be compared to that optimum to provide an index of habitat quality. Habitat quality is estimated or expressed through the use of a mathematical model

developed specifically for each wetland type. Each model consists of the following components:

1. a list of variables that are considered important in characterizing fish and wildlife habitat:
 - a. V_1 --percent of wetland covered by emergent vegetation,
 - b. V_2 --percent open water dominated by submerged aquatic vegetation,
 - c. V_3 --marsh edge and interspersions,
 - d. V_4 --percent open water less than or equal to 1.5 feet deep,
 - e. V_5 --salinity, and
 - f. V_6 --aquatic organism access.
2. a Suitability Index graph for each variable, which defines the assumed relationship between habitat quality (Suitability Index) and different variable values; and
3. a mathematical formula that combines the Suitability Index for each variable into a single value for wetland habitat quality; that single value is referred to as the Habitat Suitability Index, or HSI.

The Wetland Value Assessment models have been developed for determining the suitability of Louisiana coastal wetlands for providing resting, foraging, breeding, and nursery habitat to a diverse assemblage of fish and wildlife species. Models have been designed to function at a community level and therefore attempt to define an optimum combination of habitat conditions for all fish and wildlife species utilizing a given marsh type over a year or longer.

The output of each model (the HSI) is assumed to have a linear relationship with the suitability of a coastal wetland system in providing fish and wildlife habitat.

A comprehensive discussion of the WVA methodology is presented in Appendix E.

Designs and Cost Analysis. During the plan formulation process, each of the Task Force agencies assumed responsibility for developing designs, and estimates of costs and benefits for a number of candidate projects. The cost estimates for the projects were to be itemized as follows:

1. Construction Cost
2. Contingencies Cost
3. Engineering and Design
4. Environmental Compliance
5. Supervision and Administration (Corps and LADNR Project Management)
6. Supervision and Inspection (Construction Contract)
7. Real Estate
8. Operation and Maintenance
9. Monitoring

In addition, each lead agency provided a detailed itemized construction cost estimate for each project. These estimates are shown in Appendix C.

An Engineering Work Group was established by the Planning and Evaluation Subcommittee, with each Federal agency and the State of Louisiana represented. The work group reviewed each estimate for accuracy and consistency.

When reviewing the construction cost estimates, the work group verified that each project feature had an associated cost and that the quantity and unit price for those items were reasonable. In addition, the work group reviewed the design of the projects to determine whether the method of construction was appropriate and the design feasible.

All of the projects were assigned a contingency cost of 25 percent because detailed information such as soil borings, surveys, and -- to a major extent -- hydrologic data were not available, in addition to allowing for variations in unit prices.

Engineering and design, environmental compliance, supervision and administration, and supervision and inspection costs were reviewed for consistency, but ordinarily were not changed from what was presented by the lead agency.

Economic Analysis. The Breaux Act 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 Procedure. The product of these two analyses was an Average Annual Cost per Average Annual Habitat Unit figure for each project, which was used as the primary ranking criterion. The method permits incremental analysis of varying scales of investment and also accommodates the varying salinity types and habitat quality characteristics of project wetland outputs.

The major inputs to the cost effectiveness analysis are the products of the lead Task Force agencies and the Engineering and Environmental Work Groups. The various plans were refined into estimates of annual implementation costs and annual Habitat Units (HU).

Implementation costs were used to calculate the economic and financial costs of each wetland project. Financial costs chiefly consist of the resources needed to plan, design, construct, operate, and maintain the project. These are the costs, when adjusted for inflation, that the Task Force uses in budgeting decisions. The economic costs include, in addition to the financial cost, monetary indirect impacts of the plans not accounted for in the implementation costs. Examples would include impacts on dredging in nearby commercial navigation channels, effects on water supplies, and

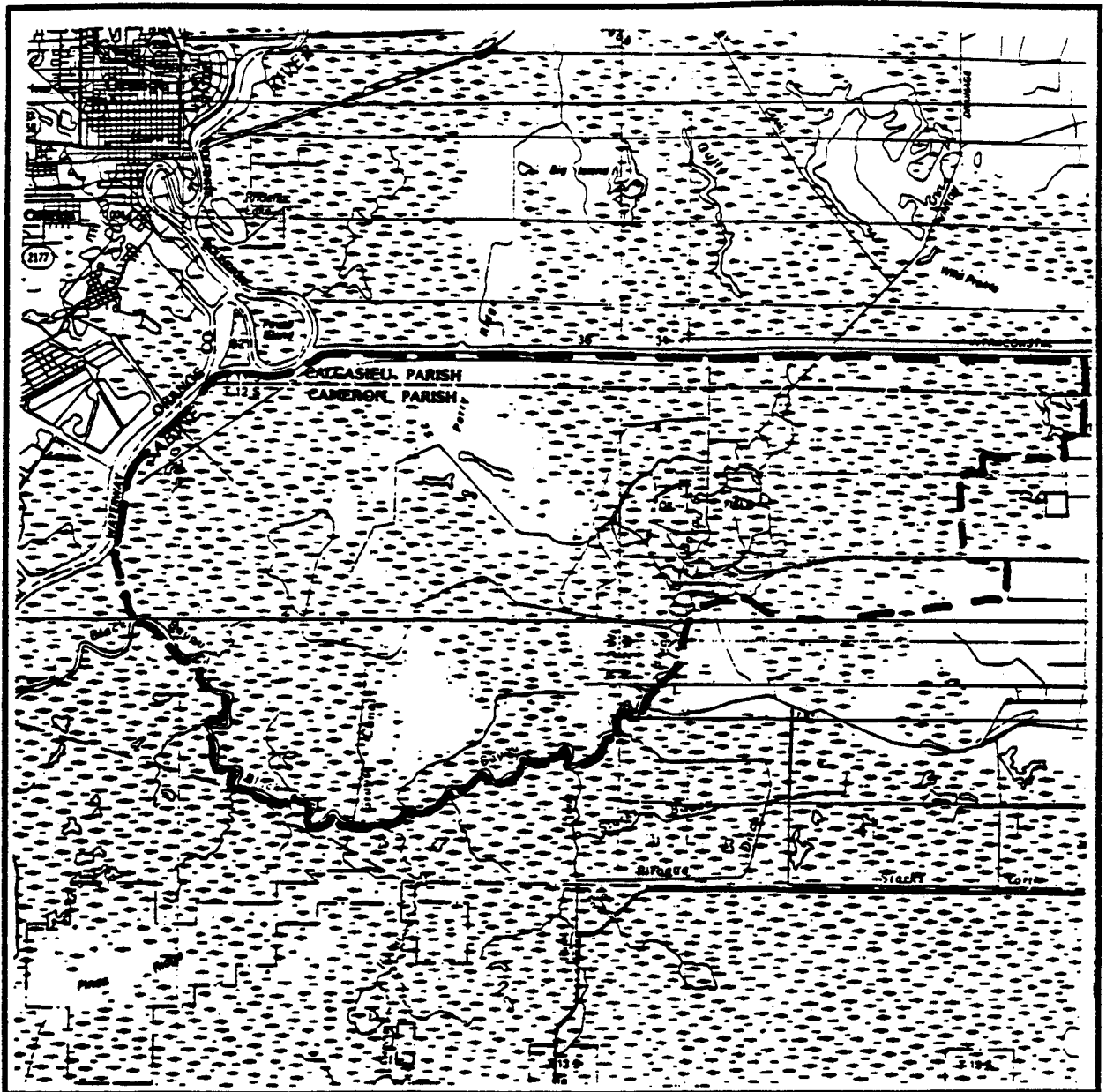
effects on nearby facilities and structures not reflected in right-of-way and acquisition costs.

The stream of economic costs for each project was brought to present value and annualized at the current discount rate, based on a 20-year project life. Beneficial environmental outputs were annualized at a zero discount rate and expressed as average annual habitat units (AAHU). These data were then used to rank each plan based on cost per AAHU produced. Annual economic costs were also calculated on a per acre basis. Financial costs were adjusted to account for projected levels of inflation and used to monitor overall budgeting and any future cost escalations in accordance with rules established by the Task Force.

Following the review by the Engineering Work Group, costs were expressed as first costs, fully funded costs, present worth costs, and average annual costs. The Cost per 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 1997 price levels, a discount rate of 7.375 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 fiscal year 1997. The fully funded cost estimates include operation and maintenance and other compensated financial costs.

DESCRIPTION OF CANDIDATE PROJECTS

This section provides a brief description of each candidate project. The descriptions include the project location, features, anticipated benefits, and a map identifying the project area and project features.



Black Bayou Hydrologic Restoration (XCS-48)

The project is located in Cameron Parish in the northwestern quadrant of the Calcasieu-Sabine Basin about 5 miles SE from Orange, TX. The project consists of: 1) shoreline restoration of 9,000 ft of GIWW shoreline west of the Gum Cove Ridge; 2) a weir with a barge bay in the canal leading from the GIWW to the Black Bayou Oil Field; 3) replacement of the collapsed culverts in the shell road on the southern boundary of Unit NO-13; 4) a plug with flapgated culverts in the Vinton Drainage ditch; 5) a rock liner in Black Bayou near its intersection with the GIWW; 6) 24,000 linear ft of bullwhip (*Scirpus californicus*) vegetative plantings in certain areas of Units NO-17, NO-18 and NO-19; and 7) 20,000 linear ft of shallow water straight line terraces in Unit NO-13 with 8,000 linear ft of wiregrass (*Spartina patens*) plantings on the terraces. The project area is 25,529 acres and will restore/protect 3,594 acres of marsh in 20 years.