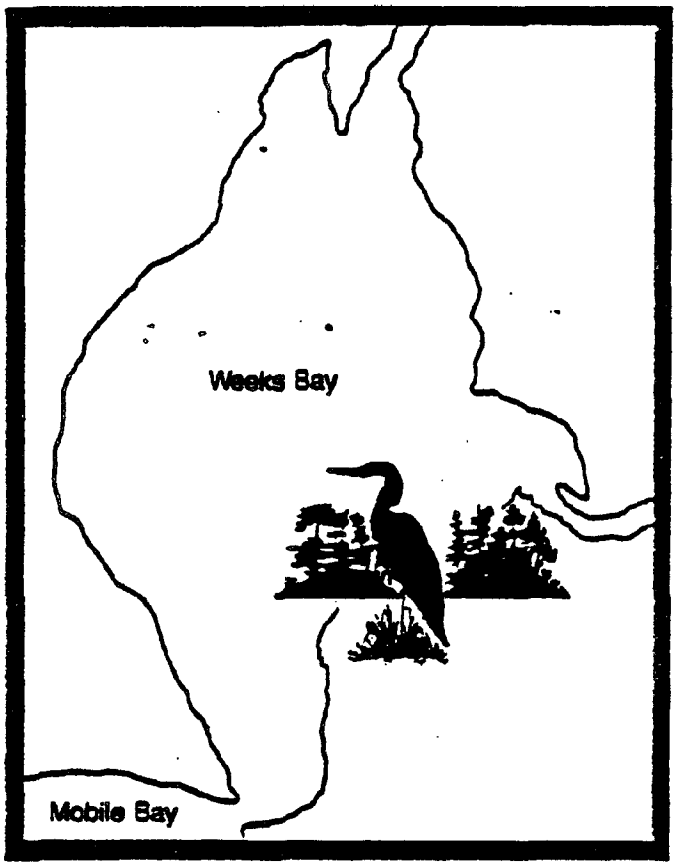
Final Environmental Impact Statement and Management Plan For the Proposed Weeks Bay National Estuarine Sanctuary



U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
State of Alabama
Department of Economic and Community Affairs and
Department of Conservation and Natural Resources

QH541.5
.E8
W434
1985

UNITED STATES DEPARTMENT OF COMMERCE

FINAL ENVIRONMENTAL IMPACT STATEMENT AND MANAGEMENT PLAN FOR THE PROPOSED WEEKS BAY NATIONAL ESTUARINE SANCTUARY

NOVEMBER 1985

Prepared by:

Sanctuary Programs Division
Office of Ocean and Coastal
Resource Management
National Ocean Service
National Oceanic and Atmospheric
Administration
3300 Whitehaven Street, N.W.
Washington, D.C. 20235

and

Alabama Department of Economic
and Community Affairs
Montgomery, Alabama 36105

and

Alabama Department of Conservation
and Natural Resources
Marine Resources Division
Gulf Shores, Alabama 36542

Property of CSC Library

US Department of Commerce
NOAA Coastal Services Center Library
2234 South Hobson Avenue
Charleston, SC 29405-2413

Designation: Final Environmental Impact Statement

Title: Final Environmental Impact Statement and Management Plan for the Proposed Weeks Bay National Estuarine Sanctuary

Abstract: The National Oceanic and Atmospheric Administration (NOAA) and the State of Alabama propose to designate approximately 950 acres of land and 1,718 acres (2.68 sq. mi.) of water in Weeks Bay, Alabama as a National Estuarine Sanctuary. Following its designation, and pending the availability of funding, it is also proposed that an additional 300 acres of land be added to the Sanctuary during the second year of operation. The designation will result in the implementation of a plan which will establish a comprehensive management framework for carrying out surveillance and enforcement, resource studies, and interpretive programs.

No new regulations have been proposed pursuant to this action; however, this does not preclude the State or Federal government, in the future, from promulgating regulations where deemed necessary to ensure the protection of the resources of the Weeks Bay ecosystem and the maintenance of the values the designation is intended to serve. The Interpretive Program provides a broad-based public education agenda that includes on-site and off-site activities geared to all visitors and users of the Sanctuary's resources. The Resource Studies Plan proposes to gather baseline data, monitor and assess water quality, and conduct comparative estuarine studies and wildlife research projects. Data from these studies will be used as the basis for improving coastal resource management decisions by the State and providing for the long-term protection of the Weeks Bay ecosystem. Alternatives to the Preferred Alternative have also been presented and include a discussion of the consequences of maintaining the status quo or pursuing other State and Federal options.

The responsible Federal official for this project is Paul M. Wolff, Assistant Administrator for Ocean Services and Coastal Zone Management, National Ocean Service, NOAA. Any written comments should be submitted to the contact identified below.

Lead Agency: U.S. Department of Commerce
National Oceanic and Atmospheric Administration
National Ocean Service
Office of Ocean and Coastal Resource Management

Contact: Dr. Nancy Foster
Chief, Sanctuary Programs Division
Office of Ocean and Coastal Resource Management
National Ocean Service
3300 Whitehaven Street, NW
Washington, D.C. 20235
202/634-4236

Final Environmental Impact Statement and Management Plan for the Proposed Weeks Bay National Estuarine Sanctuary

Table of Contents

		Page
	Executive Summary	1
I.	Introduction	3
	A. Purpose and Need for Action	5
	B. The Plan for Managing the Sanctuary	7
II.	Context for Planning and Management	9
	A. Regional Perspective	9
	B. Description of the Resources	11
	C. Uses	23
	D. Overall Management Issues	
	1. Goals and Objectives	23
	2. Management Issues	25
	3. Management Strategies	25
	4. Administrative Structure	26
	E. Resource Protection	
	1. Existing State Authorities	28
	2. Existing State Laws	29
	3. Federal Authorities	31
III.	Management Programs	34
	A. Resource Studies Plan	
	1. History of Research Activities	34
	2. Sanctuary Monitoring Program	35
	3. Facilities and Equipment	36
	4. Information Management	36
	5. Research Prospects	36
	B. Interpretive Plan	
	1. Facilities, Management and Personnel	38
	2. On-Site Interpretive Activities	39
	3. Off-Site Interpretive Activities	41

		Page
	C. Public Access Plan	41
	D. Construction Plan	42
	E. Land Acquisition Plan	43
IV.	Alternatives Including the Preferred Alternative	47
	A. Status Quo	47
	B. Preferred Alternative	48
	C. Alternative Boundaries	48
	D. Alternative Management Concepts	50
V.	Environmental Consequences	51
	A. Preferred Alternative	51
	B. Status Quo	52
	C. Boundary Alternatives	52
	D. Socio-Economic Impacts	53
	E. Unavoidable Adverse Environmental or Socio-Economic Effects	55
	F. Relationship Between the Short-term Uses of the Environment and the Maintenance and Enhancement of Long-term Productivity	55
	G. Irreversible or Irretrievable Commitment of Resources	56
VI.	List of Preparers	57
VII.	List of Agencies, Organizations, and Persons Receiving Copies	60
VIII.	Bibliography	63
IX.	Appendices	65
X.	Comments and Responses to the DEIS	

LIST OF FIGURES

Figure		Page
1	Location of Weeks Bay, Alabama	2
2	Interstate Access to Weeks Bay, Alabama	4
3	The Mobile Bay System	10
4	Physiographic Subdivisions of Coastal Alabama	12
5	Soil Associations	17
6	Flood Prone Areas in Mobile and Baldwin Counties ..	18
7	Ecological Habitats in the Weeks Bay Area	20
8	Generalized Map of Threatened Species Having Limited Range	22
9	Management Scheme for the Weeks Bay National Estuarine Sanctuary	27
10	Construction Plan for the Estuarine Sanctuary Science Center, Weeks Bay, Alabama	44
11	Land Acquisition Plan for the Proposed Weeks Bay National Estuarine Sanctuary	45

LIST OF TABLES

Table		Page
1	Stratigraphic Column of Coastal Alabama	14

Note to Readers:

This document serves as both a management plan and a final environmental impact statement for the proposed Weeks Bay National Estuarine Sanctuary; consequently, some of the section headings and the order of their arrangement may be different than that found in other environmental impact statements. To assist NEPA reviewers, the following table has been developed which identifies where the elements required for NEPA compliance can be found.

NEPA REQUIREMENT	MANAGEMENT PLAN	PAGE
Purpose and Need for Action	Part I, Introduction, Section A	5
Alternatives:		
Preferred Alternative	Part IV, Alternatives	48
Boundary Alternative	Part IV, Alternatives	48
Other Alternatives	Part IV, Alternatives	50
Affected Environment	Part II, Description of Resources, Section B	11
Environmental Consequences:		
General and Specific Impacts	Part V, Environmental Consequences	
Unavoidable Adverse Environmental Consequences, or Socioeconomic Effects	Part V, Environmental Consequences, Section D	55
Relationship between Short-term Uses of the Environment and the Maintenance and Enhancement of Long-term Productivity	Part V, Environmental Consequences, Section F	55
Possible Conflicts between the Proposed Action and the Objectives of Federal, State, Regional and Local Land Use Plans, Policies and Contacts for the Area Concerned	Part II, Management Issues, Section D	25
List of Preparers	Part VI	57
List of Agencies, Organizations, and Persons Receiving Copies of the DEIS	Part VI	60

EXECUTIVE SUMMARY

Proposed for designation as a national estuarine sanctuary, Weeks Bay is an embayment indenting the eastern shoreline of Mobile Bay midway between the major metropolitan areas of Mobile, Alabama and Pensacola, Florida (Figure 1). If designated, Weeks Bay will serve to protect an embayed estuarine ecosystem characteristic of the central Gulf Coast. Specifically, it will provide protection from the increasing pressures brought about by economic growth in coastal Alabama and the resultant movement of the population southward along the eastern shore of Mobile Bay. In response to possible threats to the relatively pristine ecosystem, the Alabama Department of Economic and Community Affairs, Office of State Planning and Federal Programs applied to the Office of Ocean and Coastal Resource Management (OCRM), NOAA, U.S. Department of Commerce in early 1983 for a financial assistance award to initiate the process for sanctuary designation.

As specified in Section 315 of the Coastal Zone Management Act of 1972 (P.L. 92-583), as amended, the purpose of the National Estuarine Sanctuary Program is for "...acquiring, developing, or operating estuarine sanctuaries to serve as natural field laboratories in which to study and gather data on the natural and human processes occurring within the estuaries of the coastal zone...". NOAA provides financial assistance to states on a fifty percent matching basis for land acquisition and development of research, education, and resource protection programs for the estuarine sanctuary.

Consistent with the intent of Section 315 of the Coastal Zone Management Act and sanctuary program regulations at 15 CFR Part 921, a Draft Environmental Impact Statement/Management Plan (DEIS/MP) was prepared and distributed to ensure the broadest possible review of the plan proposed to ensure the long-term protection and management of Weeks Bay. The DEIS/MP was distributed to Federal and State agencies and the general public for review in September 1984. During the comment period, a public hearing was held in Fairhope, Alabama, to receive input on the proposed designation by NOAA and/or the plan proposed by the State to manage the site. Based on the written comments received and testimony presented during the public hearing, NOAA has prepared this Final Environmental Impact Statement/Management Plan.

The proposed management plan, which will rely on the coordination of existing Federal and State authorities as a means for regulating activities within and affecting the resources of the Sanctuary, will be applied to all of the waters constituting Weeks Bay up to mean high water (mhw), including the tidal reaches of the rivers and tributaries which drain into the embayment. The boundaries of the proposed estuarine sanctuary also include 335 acres of fastland (property above mhw) within an "ecological core" between the mouths of the Fish and Magnolia rivers and a 615-acre parcel possessing nearly 3 miles of shoreline frontage lying immediately south of Weeks Bay. The boundary represents NOAA's Preferred Alternative; a result of recommendations received from the State of Alabama based upon its findings that the site best represented the estuarine environment characteristic of the greater Mobile Bay system and was deserving, given its relatively pristine quality, of the recognition and protection that would be accorded as a result of its designation as a National Estuarine Sanctuary.

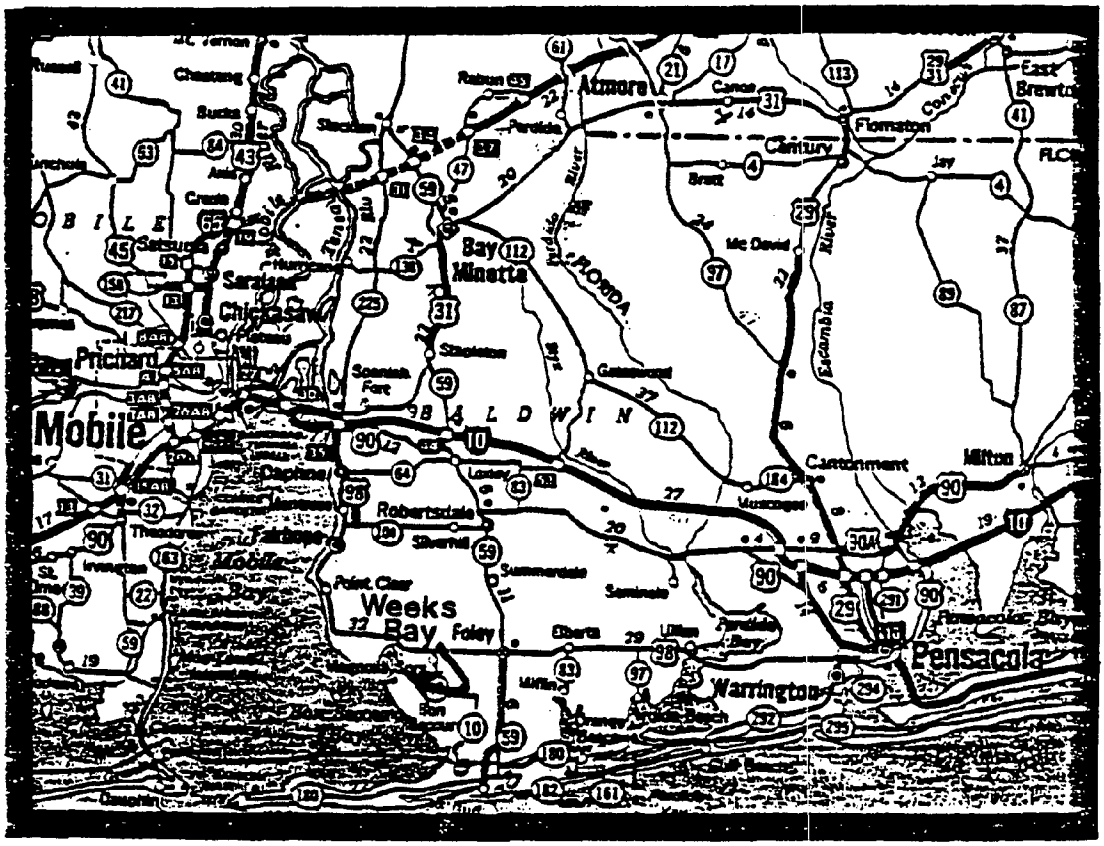


Figure 1. Location of Weeks Bay, Alabama

I. INTRODUCTION

In establishing the National Estuarine Sanctuary Program as a part of the Coastal Zone Management Act of 1972, Congress realized that certain areas, because of their vulnerability to expanding economic development and population pressures, should be set aside for the purpose of creating natural field laboratories in which to study estuarine processes--Weeks Bay represents just such an area. Representing a microcosm of the Mobile Bay system, which is under increasing stress from development pressures, Weeks Bay too may suffer from permanent changes if steps are not taken now to protect it.

Weeks Bay, a small estuarine embayment comprised of open, shallow waters and vegetated wetlands is geographically located approximately midway between the two major metropolitan areas of Mobile, Alabama and Pensacola, Florida, and is easily accessible to these areas by U.S. Highway 98 (Figure 2). It is representative of the Mississippi Delta subcategory of the Louisianian biogeographic region and receives waters from the Fish and Magnolia Rivers. The waters of the Bay connect with Mobile Bay through a narrow opening and cover approximately 1,718 acres averaging approximately 4.8 feet in depth. Given its natural value as a habitat for a diversity of commercially and recreationally important species of fish and crustaceans as well as its attractiveness and vulnerability to both development and water-dependent activities, the State has sought to have Weeks Bay designated as a National Estuarine Sanctuary by the Federal government and, subsequently, proposes to manage it in accordance with the Sanctuary Management Plan approved for the site.

The primary purpose of the plan proposed for managing the proposed estuarine sanctuary in Weeks Bay is to provide a framework for the comprenensive management of the living and non-living resources of the site. Through its establishment as a National Estuarine Sanctuary, the management of the Weeks Bay is intended to serve the following objectives:

- To gain a more thorough understanding of ecological relationships within the estuarine environment;
- To make baseline ecological measurements;
- To serve as a natural control in order to monitor changes and assess the impacts of human stresses on the ecosystem;
- To provide a vehicle for increasing public knowledge and awareness of the complex nature of estuarine ecosystems, their values and benefits to man and nature, and the problems confronting them; and
- To encourage multiple use of the estuarine sanctuaries to the extent that such usage is compatible with the primary sanctuary purposes of research and education.

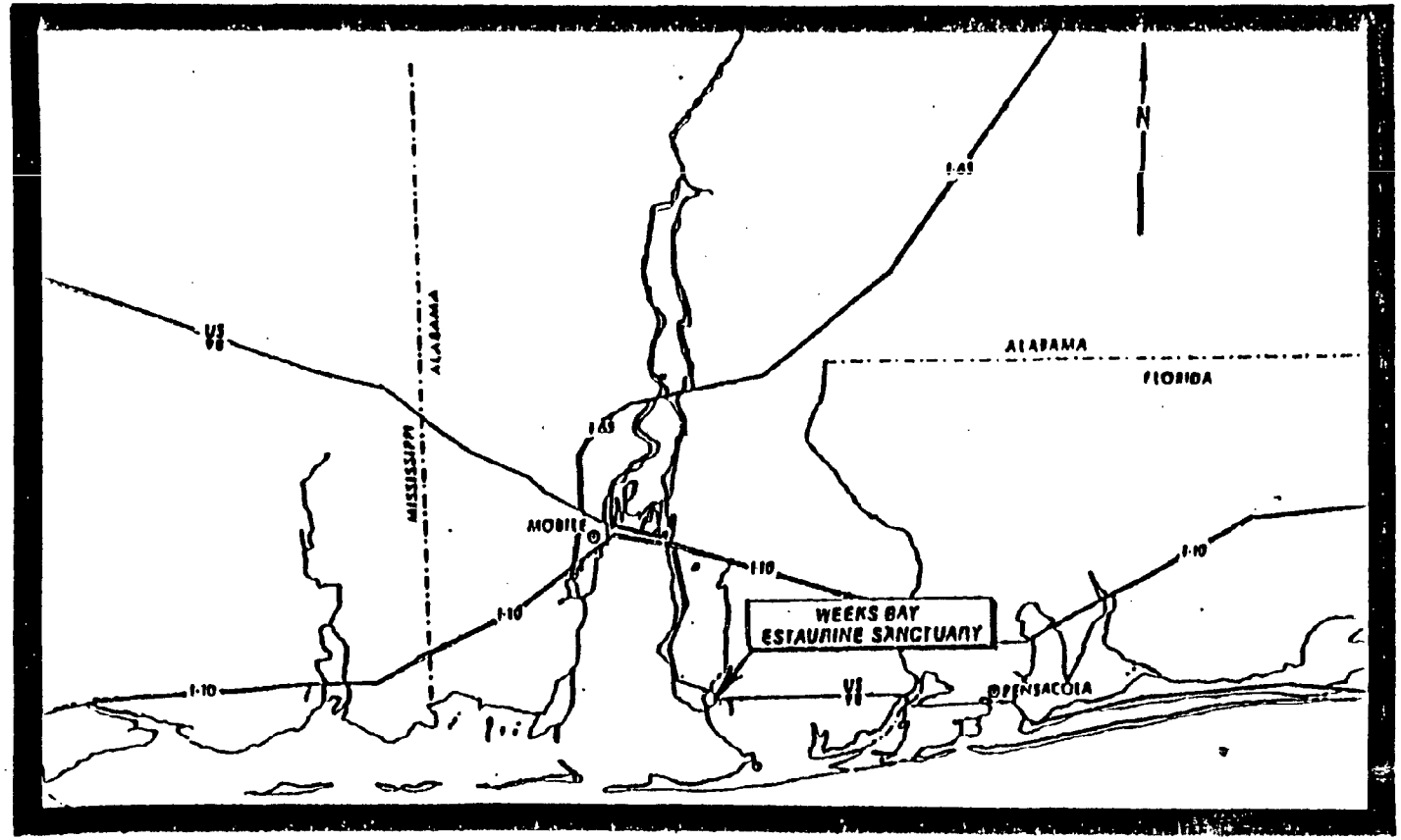


Figure 2. Interstate Access to proposed Weeks Bay National Estuarine Sanctuary

The action currently under consideration by OCRM is the proposed establishment and designation by NOAA of an estuarine sanctuary consisting of approximately 2,668 acres of lands and waters in and around Weeks Bay. The State of Alabama has submitted an application to NOAA seeking $500,000, a sum to be matched by the value of land donated to the State for the Sanctuary, in order to purchase two tracts of land totalling 335 acres. The proposed Sanctuary will be representative of the Mississippi Delta subcategory within the Louisianian biogeographic region.

The proposed Sanctuary is the result of the wide support received from many different organizations and the joint efforts of Federal, State, and local officials over several years. In 1981, the Alabama Coastal Area Board initiated an evaluation process to select a candidate for possible designation as an estuarine sanctuary; Weeks Bay was chosen in Spring 1982 as their nominee. In June 1982, the State of Alabama was awarded a $25,000 pre-acquisition award to develop a Draft Sanctuary Management Plan and an Environmental Assessment analyzing and describing the site.

A. Purpose and Need for Action

In response to the intense pressures upon the important coastal zone of the United States, Congress passed the Coastal Zone Management Act (CZMA) of 1972, as amended (CZMA), 16 U.S.C. 1451 *et seq*. The CZMA authorized a Federal grant-in-aid and assistance program to be administered by the Secretary of Commerce, who in turn delegated this responsibility to the Office of Ocean and Coastal Resource Management (OCRM) of the National Oceanic and Atmospheric Administration (NOAA).

The CZMA affirms a national interest in the effective protection and development of the Nation's coastal zone, and provides assistance and encouragement to coastal states (including those bordering the Atlantic and Pacific Oceans, the Gulf of Mexico, and the Great Lakes) and U.S. territories to develop and implement State programs for managing their coastal zone. The Act established a variety of grant-in-aid programs to such states for the purposes of:

- Developing coastal zone management programs (Sec. 305);
- Implementing and administering management programs that receive Federal approval (Sec. 306);
- Avoiding or minimizing adverse environmental, social, and economic impacts resulting from coastal energy activities (Sec. 308);
- Coordinating, studying, planning, and training programs to support both scientifically and technically the state coastal management programs (Sec. 310); and
- Acquiring estuarine sanctuaries, and land to provide for shorefront access and island preservation (Sec. 315).

The National Estuarine Sanctuary Program authorized by Section 315 of the CZMA establishes a program to provide matching grants to states to acquire, develop, and operate natural estuarine areas as sanctuaries so that scientists and students may be provided the opportunity to examine the ecological relationships within these areas over a period of time. Section 315 provides a maximum of $3,000,000 in Federal funds, to be matched by an equivalent amount from the state, for each sanctuary. Guidelines for implementing the estuarine sanctuary program were orignally published on June 4, 1974 (15 CFR Part 921, 39 FR 19922) and amended on September 9, 1977 (15 CFR Part 921, 42 FR 45522). Proposed regulations revising NOAA's procedures for selecting and designating national estuarine sanctuaries were published on August 3, 1983 (48 FR 35069). Final Estuarine Sanctuary Program Regulations were published June 27,1984 (49 FR 26502, to be codified at 15 CFR Part 921) and became effective on October 5, 1984 (Appendix A).

Sanctuaries established under this program have the dual purpose of: (1) providing relatively undisturbed areas so that a representative series of natural coastal ecological systems will always remain available for ecological research and education; and (2) ensuring the availability of natural areas as controls against which impacts of man's activities in other areas can be assessed. These sanctuaries are to be used primarily for long term scientific and educational purposes, especially to provide information essential to coastal zone management decision making. These purposes may include:

- Gaining a thorough understanding of the natural ecological relationships within the variety of estuarine environments of the United States;
- Making baseline ecological measurements;
- Serving as a natural control against which changes in other estuaries can be measured, and facilitating evaluation of the impacts of human activities on estuarine ecosystems; and
- Providing a vehicle for increasing public knowledge and awareness of the complex nature of estuarine systems, their values and benefits to man and nature, and problems they encounter.

While the primary purpose of estuarine sanctuaries is scientific and educational, multiple use of estuarine sanctuaries will be encouraged to the extent that such usage is compatible with the primary purpose served by their designation. Such uses may generally include activities such as low intensity recreation, fishing, hunting, and wildlife observation.

The CZMA and the regulations governing the administration of the National Estuarine Sanctuary Program envision that, if fully implemented, it will represent the variety of regional and ecological differences among the Nation's estuaries. The regulations indicate that "the purpose of the estuarine sanctuary program ... shall be accomplished by the establishment of a series of estuarine sanctuaries which will be designated so that at least one representative of each estuarine ecosystem will endure into the future for

scientific and educational purposes" [15 CFR 921.3(a)]. Appendix 1 to the regulations at 15 CFR Part 921, describe eleven (11) distinct biogeographic provinces or classifications based on geographic, hydrographic, and biologic characteristics. Subcategories of this basic system will be utilized as appropriate to distinguish major regions or subclasses of each province.

In north central Gulf of Mexico, very few estuarine systems exist outside of Louisiana. Weeks Bay, an estuarine system with an abundance of fish and wildlife, is one of the few estuaries in the south that remains relatively free from development. Activities such as fishing, boating, crabbing, hunting, and wildlife photography/observation take place in the Bay; however, the environmental effects of these are minimal. This situation may soon be changed, however, due to the increasing demand for waterfront footage generated by residential and recreational development. Continued reliance upon existing institutional arrangements may be inadequate to effectively monitor activities and prevent ecological harm to this unique estuarine ecosystem.

Preservation of Weeks Bay, a microcosm of the greater Mobile Bay system, will provide a system in which the effects of various land use pressures as well as natural and man-induced perturbations may be studied. Results of the studies could be applied to Mobile Bay and other areas to prevent further degradation of their ecosystem. Designating Weeks Bay as a national estuarine sanctuary will establish a mechanism for assessing the overall impact of activities in the area. Formal acknowledgement of the special resource values of the area will ensure that it is given special protection and will encourage particularly careful review of any proposals for future siting of potentially harmful activities. Finally, monitoring of the Sanctuary will provide the basis for a greater understanding of the area's need and ecological balance, and will provide the foundation for better management.

B. The Plan for Managing the Sanctuary

In order to ensure that the objectives of the CZMA regarding Weeks Bay are realized, this document presents the management scheme proposed for the site and an assessment evaluating the environmental impacts of the designation action. The management plan is oriented towards expanding research and educational opportunities in Weeks Bay. Land acquisitions of the "core" area of the estuarine complex will protect this valuable natural laboratory from the onward push of development along the eastern shore of Mobile Bay. No new laws or restrictions are being proposed as a result of this designation on the use of Weeks Bay; however, this is not to suggest that the State would not consider proposing such in the future if necessary.

Weeks Bay well represents that pristine microcosm of Mobile Bay to which we have referred. As such, it can be used in research on the effects of human and natural impacts on an estuarine system. It is an excellent site for such activities as it is close to both Mobile, Alabama and Pensacola, Florida and in near proximity to a satellite campus of Faulkner State Junior College, the students and faculty of which have been given prominent roles in the proposed research agenda.

On-site management of the Sanctuary will be provided by the Alabama Department of Conservation and Natural Resources (ADCNR) which, in consultation with the Alabama Department of Economic and Community Development (ADECA), will be responsible for the day-to-day operations of the site. ADECA will be the principal agency responsible for ensuring the satisfactory implementation of the Sanctuary's Federally-approved management plan. ADECA will also serve as the State's fiscal representative and principal contact in all discussions with NOAA regarding the Weeks Bay National Estuarine Sanctuary. The proposed management plan also calls for the establishment of a Sanctuary Advisory Committee (SAC) which will provide guidance to the ADECA/ADCNR in carrying out its provisions.

II. CONTEXT FOR PLANNING AND MANAGEMENT

A. Regional Perspective

Weeks Bay is located along the eastern shore of Mobile Bay in Baldwin County, Alabama, 30 miles southeast of Mobile (Figure 3). The Bon Secour National Wildlife Refuge, the best remaining undisturbed Gulf Coast Beach ecosystem between Pensacola, Florida and New Orleans, Louisiana lies to the south. The refuge includes Perdue and Little Point Clear, south of Weeks Bay; Little Dauphin Island, a barrier island at the mouth of Mobile Bay; and Skunk Bayou, which surrounds the property lying south of Weeks Bay and referred to in this document as the Swift tract. The habitat represented by the refuge is characteristic of barrier island ecosystems and boasts an extensive migratory bird population.

The Alabama coastal area has some 400,000 acres of bay and estuarine waters, 121,000 acres of vegetated wetlands, 130 identified species of birds, a commercial fishing catch with a final value estimated at $148 million, and a registration of over 23,300 recreational boats. It also has major industrial and municipal sources discharging 170 million gallons of various waste products each day into coastal waters; a booming second home construction business throughout the area's waterfront; a maintenance dredging requirement producing 7 million cubic yards of spoil materials annually; the prospect of increased energy-related development; and the possibility of additional growth related to the Tennessee-Tombigbee Waterway. Weeks Bay, is accessible via U.S. Highway 98 from Mobile, Alabama and Pensacola, Florida, as well as via Baldwin County Highway 1, which skirts the shoreline of Mobile Bay south to the mouth of the site.

Studies indicate that about 293 fish species live in Alabama's coastal waters. Most species are dependent upon coastal marshes, submerged grassbeds and estuarine waters for nursery areas before moving into deeper water at maturity. One hundred and thirty-two avian species are found associated with Alabama's saline and brackish areas. Turtles, snakes and alligators are the predominant reptiles and the coastal area includes a number of small mammals as well as whales and dolphins. The most common invertebrates are the commercially valuable shrimp, oyster and blue crabs.

The limited extent and uniqueness of the area's habitats, coupled with construction activities, has resulted in a significant reduction in the number of species of plants and animals once found in abundance. According to the Steering Committee on Endangered and Threatened Species in Alabama, the approximate number of species listed by the State as endangered, or threatened, or as species of special concern include: 30 species of plants; 9 fish species; 21 species of reptiles and amphibians; 22 species of birds; and 9 species of mammals.

The Port of Mobile plays a vital role in the health of the regional economy. In addition to providing approximately 800 jobs and an annual payroll exceeding $11 million, its facilities offer an additional impetus to industrial development by increasing access to national and international markets. In order to function properly, the port must maintain surface

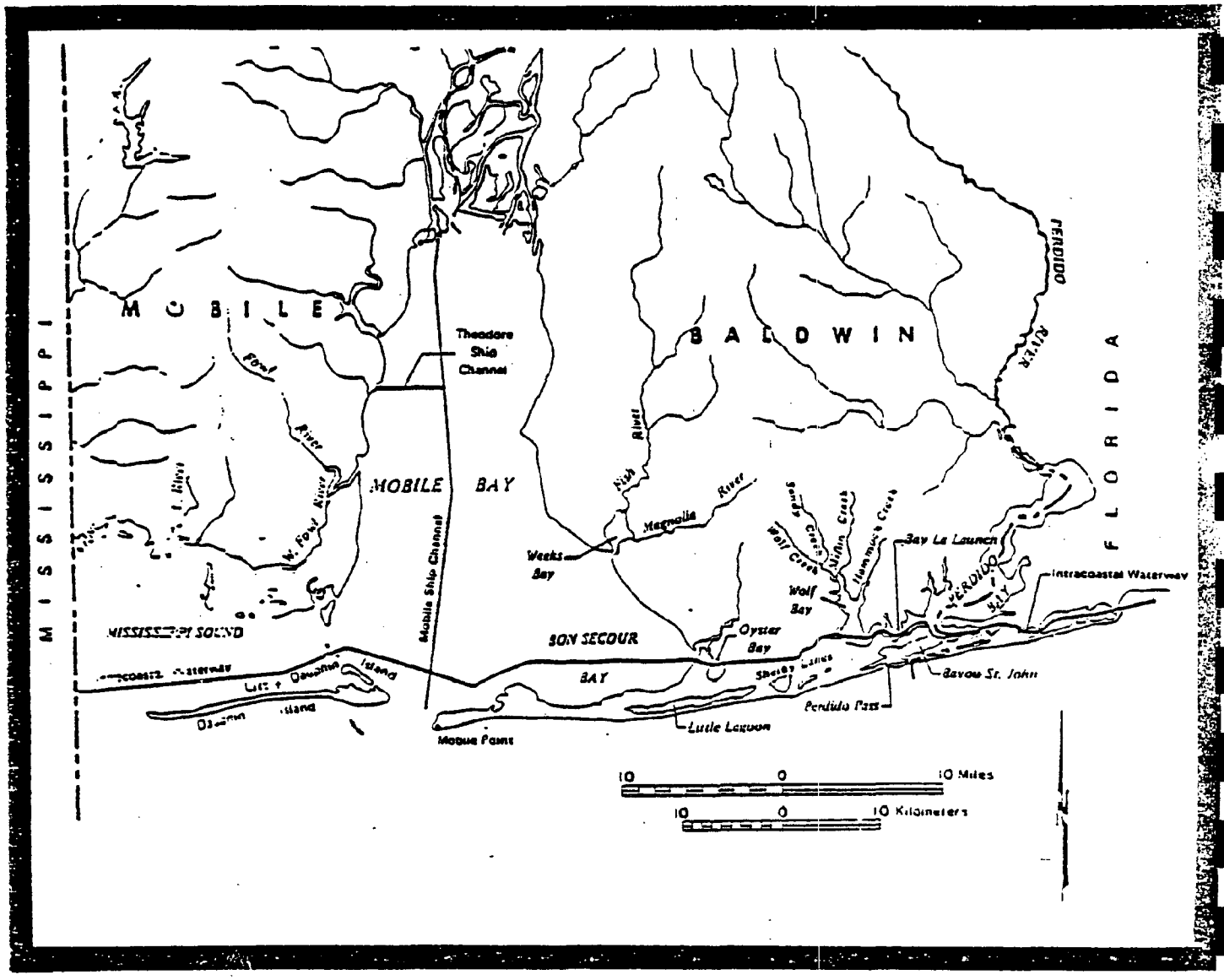


Figure 3. The Mobile Bay System

water transportation arteries in prime condition. Existing maintenance dredging operations in the Bay carried out by the Corps of Engineers produce an annual average of 7 million cubic yards of dredge spoil material. Several events are anticipated or have occurred which could provide for increased economic growth within the Mobile Bay area: (1) expanding chemical industrial base; (2) increased production of oil and natural gas; and (3) the completion of the TennesseeTombigbee Waterway. Studies prepared by the South Alabama Regional Planning Commission in 1975 indicate that approximately 4000 additional acres of industrial land will be required to satisfy the anticipated industrial requirements for the year 2000.

Mobile and Baldwin Counties are both experiencing rapid population increases as well as urban growth. Balwin County's overall population increased 17 percent during the period 1970-1976; Mobile County's growth was 9.9 percent. A significant portion of this growth occurred within the coastal area.

The fishing industry is the major economic factor in several Mobile and Baldwin County communities. From 1950 to 1977, the dollar amount of Alabama's commercial marine fishery increased from $12.1 million to $37 million at the dock. Shrimping is by far the major commercial fishery, accounting for almost 91 percent of the retail value of all commercial fishing in the State. The abundance of shrimp is dependent on many factors, the most significant of which is the presence of extensive wetland areas for nursery grounds and food. It is estimated that 95 percent of all commercial species of shrimp found in the Gulf of Mexico spend at least a portion of their life cycle in estuaries such as Weeks Bay.

The coastal area of Alabama also offers a wide variety of recreational opportunities to residents and tourists. Most recreational activities are centered around the area's water resources. A total of 10,963 acres of publicly-owned or maintained shorefront and recreation areas are available in the two counties. Public access in Baldwin County is provided by 9248 acres of State, County and municipal parks, boat ramps and other properties. Access to coastal recreational opportunities is further provided by numerous privately owned and operated fish camps, boat ramps, and marinas.

B. Description of the Resources

The Weeks Bay area can be characterized as being representative of the greater Mobile Bay system. An estuarine environment of great importance to the eastern Mobile Bay-Bon Secour Bay system, it possesses numerous species of plants and animals, including many threatened and endangered species. It is a highly-productive area that serves as a nursery for commercially important shellfish and finfish and, moreover, exhibits a diverse array of other flora and fauna.

1. General Physiography

Coastal Alabama lies within two major physiographical provinces: the East Gulf Coastal Plain section of the Coastal Plain province and the Mississippi-Alabama shelf section of the Continental Shelf province. Land areas in coastal Alabama are within the Southern Pine Hills and the Coastal Lowlands subdivisions of the East Gulf Coastal Plain section (Figure 4).

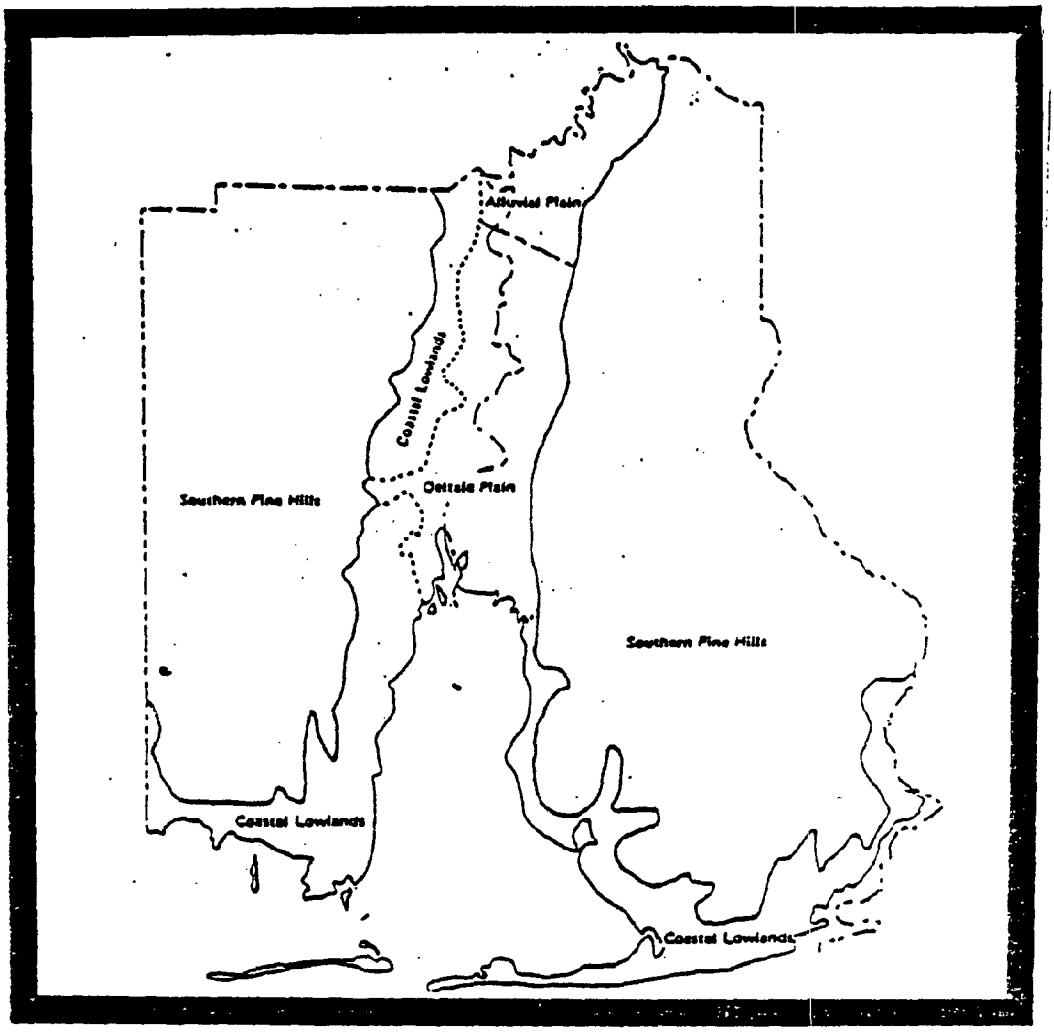


Figure 4. Physiographic Subdivisions of Coastal Alabama (O'Neil and Mettee, 1982)

Alabama's Coastal Lowlands are essentially flat to gently undulating plains extending along the coast adjacent to the Mississippi Sound and the margins of Mobile, Bon Secour, and Perido Bays (Cooke 1939). The lowlands are indented by many tidal creeks, rivers, and estuarines and are fringed by tidal marshes, all of which are subject to inundation at high tide.

2. Stratigraphy and Soils

a. Subsurface Stratigraphy: Coastal and offshore regions of Alabama are underlain by sediments that range from pre-Jurassic to Holocene in age and may reach 25,000 feet in thickness at the coast (Table 1). This thick section of sedimentary rocks lies unconformably upon metamorphic and igneous rocks of unknown age.

1) Pre-Coastal Plain Basement Complex

The lithologic character and relative age of rocks comprising the igneous and metamorphic basement complex are indefinite. The complex has been penetrated to 18,850 feet.

2) Jurassic System

Rocks of Jurassic age in coastal Alabama are about 5,000 feet thick. Lower Jurassic rocks are mainly salt, sandstone, dolomite, limestone, and interbedded evaporite deposits of salt and anhydrite. The upper part of the Jurassic consists primarily of terrigenous clastic deposits of shale and sandstone.

3) Cretaceous System-Lower Cretaceous Series

Lower Cretaceous sediments in coastal Alabama are mainly terrigenous clastics and consist mostly of interbedded sandstone and shale with some anhydite, limestone, and shales. These sediments are about 4,000-5,000 feet thick.

4) Cretaceous System - Upper Cretaceous Series

Upper Cretaceous formations include beds of chalk, clay, sand, gravel, and mixtures of these. The strata are 3,000 feet thick.

5) Tertiary System

Tertiary formations consist predominantly of marine, estuarine, and fluvial terrigenous clastic rocks and interbedded marine carbonates. The section is about 5,000 feet thick and is composed of the Paleocene Series, Oligocene Series, Miocene Series, and the Pliocene-Pleistocene Series, including the Citronelle Formation.

5) Tertiary System - Pliocene and Pleistocene Series

The Citronelle Formation crops out in the central and southern parts of the coastal area. In the northern part of Mobile and Baldwin Counties it caps hills and ridges. The formation ranges in thickness from

Table 1. Stratigraphic Column of Coastal Alabama
(Alabama Coastal Area Board, 1978)

ERATHEM	SYSTEM	SERIES	ROCK UNITS
CENOZOIC	QUATERNARY	HOLOCENE	UNDIFFERENTIATED ALLUVIAL DELTAIC, ESTUARINE AND COASTAL SEDIMENTS
		PLEISTOCENE	ALLUVIAL TERRACE DEPOSITS
	TERTIARY	PLIOCENE	CITRONELLE FORMATION
		MIOCENE	MIOCENE UNDIFFERENTIATED
		OLIGOCENE	CHICKASAWHAY LIMESTONE
			VICKSBURG GROUP
		EOCENE	JACKSON GROUP
			CLARIBORNE GROUP
			WILCOX GROUP
		PALEOCENE	MIDWAY GROUP
MESOZOIC	CRETACEOUS	UPPER	SELMA GROUP
			EUTAW FORMATION
			TUSCALOOSA GROUP
		LOWER	LOWER CRETACEOUS UNDIFFERENTIATED
	JURASSIC	UPPER	COTTON VALLEY GROUP
			HAYNESVILLE FORMATION
			SMACKOVER FORMATION
		MIDDLE	NORPHLET FORMATION
			LOUANN SALT
	TRIASSIC		UNDIFFERENTIATED SEDIMENTS
PRE-MESOZOIC			BASEMENT COMPLEX

about 100-200 feet and consists chiefly of gravelly sand, sand with clay-balls and partings, sandy clay, and gravel.

b. Surface Stratigraphy: Surface geologic units of the coastal and offshore areas consist of unconsolidated sand, gravel, salt, and clay of Miocene through Holocene age. The Miocene Series and Citronelle Formation crop out in bands that strike northwest and dip southwest. Terrace deposits generally parallel the Mobile River system and Mobile Bay and slope gently toward the Gulf of Mexico.

1) Tertiary System - Miocene Undifferentiated

The Miocene Series overlies the Oligocene Series in the subsurface and crops out in the central and northern parts of Mobile and Baldwin Counties, ranging in thickness from 400 feet in the northern part of the counties to about 3,000 feet at the coast. In the outcrop, the Miocene Series, undifferentiated, consists of laminated to massive, marine and estuarine, fine and coarse clastic deposits. These deposits include very fine to coarse grained sands, sandstones, and sandy, silty clay. Locally, the sand contains very fine to medium quartz pebble gravels and silicified and carbonized plant material. Carbonized leaf remains occur in the clay beds.

2) Quaternary System - Pleistocene Series

Terrace deposits in this series are generally 20 to 30 feet thick, but locally reach a thickness of 50 feet. Deposits consist of fine to coarse grained, gravelly sand, and sandy clay. Location and elevation of these deposits is related to beds of ancestral rivers in the Mobile River system.

3) Quaternary System - Pleistocene and Holocene Series

Low terrace and alluvial deposits occur as a belt from 7 to 10 miles wide in the delta complex at the head of Mobile Bay and extend northward beyond the confluence of the Tombigbee and Alabama Rivers. Sediments in the Mobile River basin are of fluvial, estuarine, and marine origin and are as much as 150 feet thick. Sediments deposited in upper Mobile Bay are of fluvial origin and include delta-front and pro-delta sand, silt, and clay; interstratified fine-grained sand and silt; and interstratified silt and clay. Other flood plain deposits occur in the smaller tributary and river systems that drain into the coastal area and contain gravelly sand, silt, and clay derived from the weathering of older interior deposits.

The Coastal Lowlands, at altitudes ranging from sea level to 30 feet, are underlain by low terrace and alluvial deposits. These deposits bordering lower and central portions of Mobile Bay and southern Mobile and Baldwin Counties include sediments of marine origin with shells, shell debris, and layers of peat formed in pre-existing swamps and marshes.

4) Quaternary System - Inshore and Nearshore Sediments

Sediment types in Alabama's 394,000 acres of inshore water bottoms are comprised of (1) delta-front and prodelta deposits, (2) estuarine fine-grained deposits, and (3) bay margin quartzose sand, shell, and heavy materials.

Delta-form and prodelta deposits are found at the heads of Alabama's coastal bays, near the active sediment source. These deposits are comprised of sand, silty sand, silt, and clay-like silt. Estuarine fine-grained deposits are found over most of the inner bay and estuarine bottoms. Estuarine deposits are comprised of silty clay and clay. Bay margin deposits are comprised of fine to medium grained quartzose sands with local concentrations of shell material, clay casts or heavy minerals. Oyster shell is a feature of the inshore water bottoms of Mobile Bay.

Nearshore deposits off the Alabama coast include a conspicuous tidal delta extending seaward from the mouth of Mobile Bay and comprised of well-sorted quartzose sand similar to those occurring locally in the beach and dune deposits. Related to this tidal delta is a line further seaward comprised of estuarine fine-grained deposits that have settled to the bottom after passing through the mouth of Mobile Bay (Alabama Coastal Area Board, 1978).

c. Soils: According to the Alabama Coastal Area Board (1978) tne proposed Weeks Bay Estuarine Sanctuary site is characterized by two types of surface soils: Malbis-Orangeburg-Pansey Association and Dorovan-Plummer-Tidal March Association. These have the following properties and their boundaries are given in Figure 5.

1) Malbis-Orangeburg-Pansey Association

Deep, moderate to well-drained, level to gently sloping, sandy clay loams; normally good for agriculture, especially where drainage is poor; building limitations are normally severe and are only sometimes slight to moderate.

2) Dorovan-Plummer-Tidal Marsh Association

Variable depending on location, normally level, poorly drained, organic soils with severe limitations for construction; in Mobile Delta, only capable of limited hardwood production; tidal marshes unsuitable for agriculture.

3. Drainage

The proposed Sanctuary receives runoff from the Fish and Magnolia Rivers and is considered to be in a flood-prone area. Base elevations of the 100-year event (the common name for a flood which has a 1% chance of occurring annually) are shown in Figure 6.

4. Biological Characteristics

a. Forested Wetlands and Swamp Habitats: Much of the land around Weeks Bay is forested wetlands and swamps. Much of the Foley and Ogburn Tracts and part of the Swift Tract are comprised of a forested wetland type known as moist pine forest. The moist pine line is prevalent in areas of low relief and poor drainage between streams. It forms a more or less extensive strip between flood plain swamps and upland pine-oak forest. Despite its apparent monotony, the vegetation of moist pinelands is diverse and rich in species. The most common tree is the slash pine (Pinus elliotti),

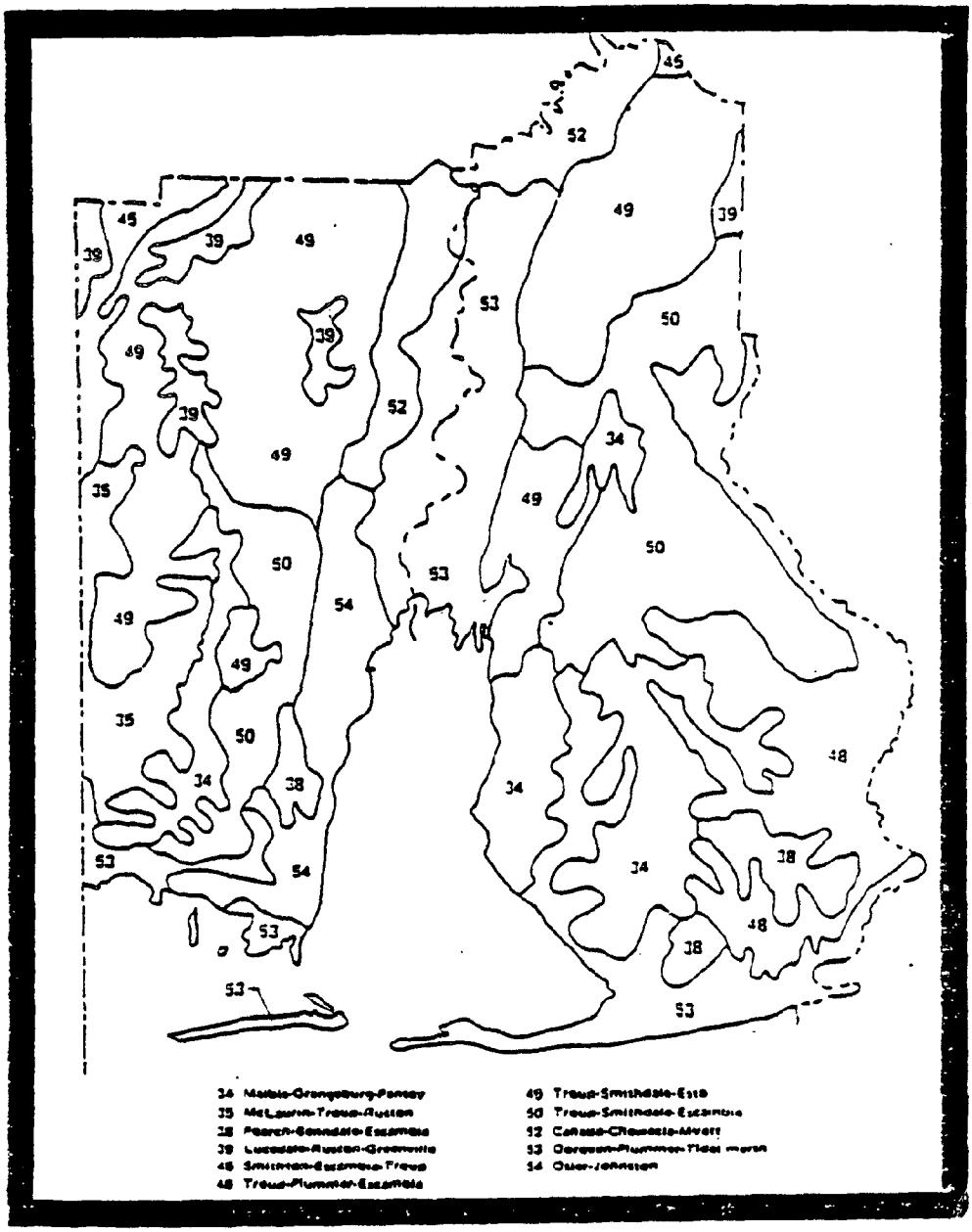


Figure 5. Soil Associations
(Modified from Soil Conservation Service, 1974)

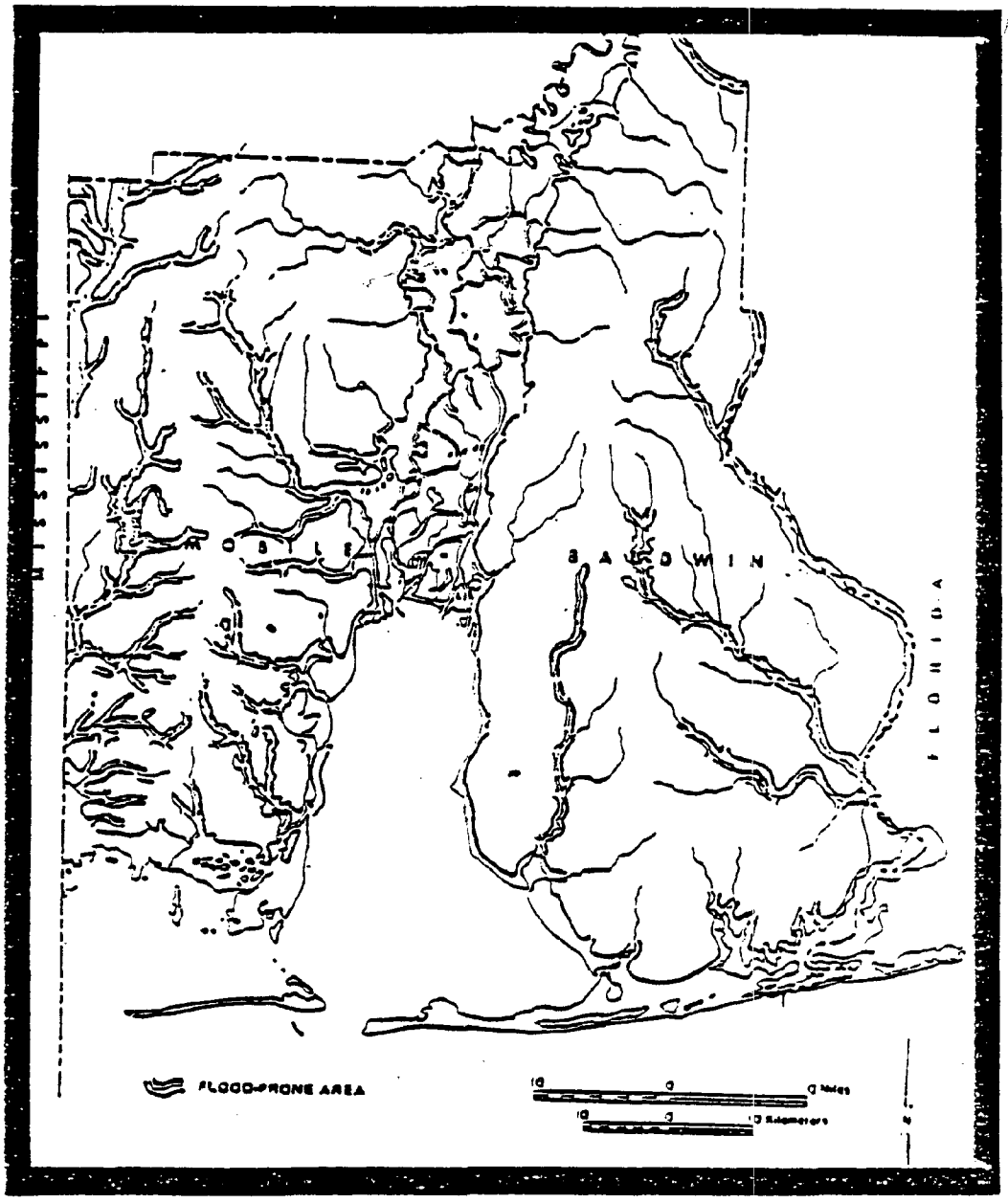


Figure 6. Flood Prone Areas in Mobile and Baldwin Counties (Riccio, et al., 1973)

although longleaf pine (Pinus palustris) can also grow there. The understory may be very dense and consists largely of gallberry (Ilex glabra), wax myrtle (Myrica cerifera), saw palmetto (Serenoa repens), St. John's worts (Hypericum fasciculatum), and occasional sweet bay (Magnolia virginiana), swamp bay (Persea palsutris) and swamp tupelo (Nyssa sylvatica var. biflora). The moist forests are designated by the Roman numeral IV in Figure 7.

Fish River, Magnolia River, and several small tidal streams in the Weeks Bay area are bordered by a forested wetland type known as bay, tupelo, cypress swamp. The vegetation of these swamps varies depending partly on the amount and duration of flooding. If flooding is extensive, pond cypress (Taxodium distichum var. nutans) and swamp tupelo may dominate the canopy. Usually under moderate flooding the dominant trees are sweet bay. Red maple (Acer rubrum), swamp tupelo, swamp bay and tulip tree (Liriodendron tulipifera) may also occur there. White cedar (Chamaecyparis thyoides) becomes increasingly more common in swamps along upper reaches of streams, especially along the Fish and Magnolia Rivers.

Few plants grow under the dense shade of these trees; among these are such shrubs as Virginia willow (Itea virginica), star anis (Illicium floridanum), and fetterbush (Leucothoe axillaris). Netted chain fern (Woodwardia areolata) and cinnamon fern (Osmuda cinnamomea) are among the few tolerant herbs growing there.

The more open borders of these swampy woods may be covered by dense thickets of swamp cyrilla (Cyrilla racemifora), black titi (Cliftonia monophylla), and large gallberry (Ilex coriacea). Wax myrtle (Myrica cerifera) and yaupon (Ilex vomitoria) also grow in this habitat and are especially common along the brackish waters of Weeks Bay and on the Swift tract.

The transition zone between these forested wetlands and upland pine-oak forests supports plants adapted to somewhat better drainage conditions such as water oak (Quercus nigra), laurel oak (Q. laurifolia), sweetgum (Liquidambar styraciflua), southern magnolia (Magnolia grandiflora), and devilwood (Osmanthus americana). The bay, tupelo, cypress swamp is designated by the Roman numeral VI in Figure 7.

b. Marshes: The shoreline of Weeks Bay supports marshes dominated by salt-tolerant herbs and grass-like plants. These marshes occur as narrow shoreline fringes and extend up the tidal mouths of the Fish and Magnolia Rivers. The black needlerush (Juncus roemerianus) is an abundant species and dominates portions of marsh in the area.

Two species of cordgrass (Spartina alterniflora and S. cynosuroides) are locally abundant in the intertidal zone. Other frequent species are salt grass (Distichlis spicata), saltmeadow cordgrass (Spartina patens), salt marsh aster (Aster tenuifolius), marsh gerardia (Agalinis maritima) and sea lavender (Limonium nashii).

Within the less saline, brackish marshes, a greater diversity of species occurs. Of the saline marsh species only needlerush and saltmeadow cordgrass are found frequently in the brackish environment. Common brackish

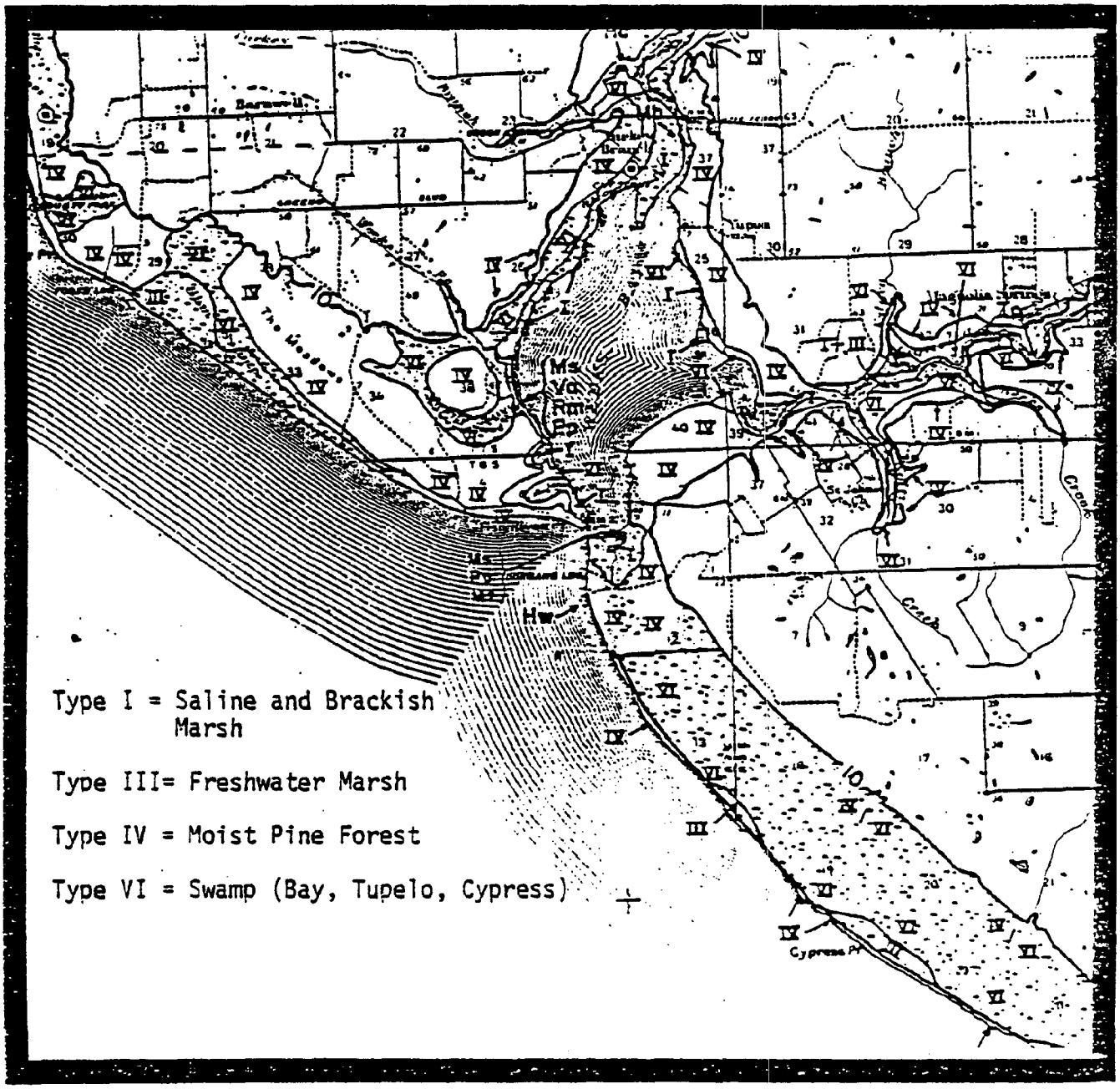


Figure 7. Ecological Habitats in the Weeks Bay Area (Stout and Lelong, 1981)

species include cattails (Typha spp.), spike rush (Eleocharis spp.), reed (Phragmites australis), bull rushes (Scirpus spp.), and sawgrass (Cladium jamaicense). The marshes are designated by Roman numeral I in Figure 7.

c. Submerged Grassbeds: Four species of plants dominate the submerged grassbeds in Weeks Bay. The most abundant species is widgeon grass (Ruppia maritima). The other species are Eurasian watermilfoil (Myriophyllum spicatum), tapegrass (Vallisneria americana), and slender pondweed (Potamogeton pusillus). The occurrence of these grassbeds is restricted to relatively quiet waters along shorelines. Due to high turbidity conditions and subsequent reduction of available light, beds occur only in shallow waters less than two meters deep, primarily in 50 cm or less. A species list of major plants in the vicinity of the proposed Weeks Bay Estuarine Sanctuary is given in Appendix C.

d. Animal Populations: Because of the diversity of habitats found in the Weeks Bay system, a wide variety of animal species is present in the area. Many of these animals have special status because of threats to their habitat (Appendix D). According to the South Alabama Regional Planning commission (1979), Weeks Bay is part of an area that provides habitat for as many as 19 threatened species (Figure 8).

The fish populations in this area include freshwater species in the Fish and Magnolia Rivers and marine species in the lower portions of the rivers and bays. This area also serves as nursery grounds for numerous marine species. Many of the marine species such as spotted sea trout, red drum, croaker, flounder, mullet, and menhaden are important commercial species. The fish populations of this area also support a popular sport fishery.

The Weeks Bay-Bon Secour Bay area is abundant with bird life having approximately 95 residents, plus 37 nesting, 125 wintering, and 82 additional spring and fall migrants. A number of accidental or occasional species have also been observed in the area (John Borom, et al.). At least 339 species of birds occur in this area at some time during the year. This area is of special importance to the large number of trans-Gulf migrants as a resting and feeding area. The dominant migrants are from the Mississippi flyway, a generous number from the Atlantic flyway, and some from the west (Appendix E)

Holliman (1979) reported that there are 54 forms of mammals that live within the 10-foot contour in the coastal zone of Alabama, with most of these found in the Weeks Bay area.

The freshwater and brackish swamp and marsh areas of Weeks Bay provide habitat for many species of amphibians and reptiles. The most prominent of these is the American alligator which is commonly reported in this area. Mount (1975) reported that there are 115 species of herpetofaunal forms in the Lower Coastal Plain of Alabama. In addition, endangered, rare, and vertebrate species (the status of which is undetermined) that are most likely to appear in the vicinity are given in Appendix F.

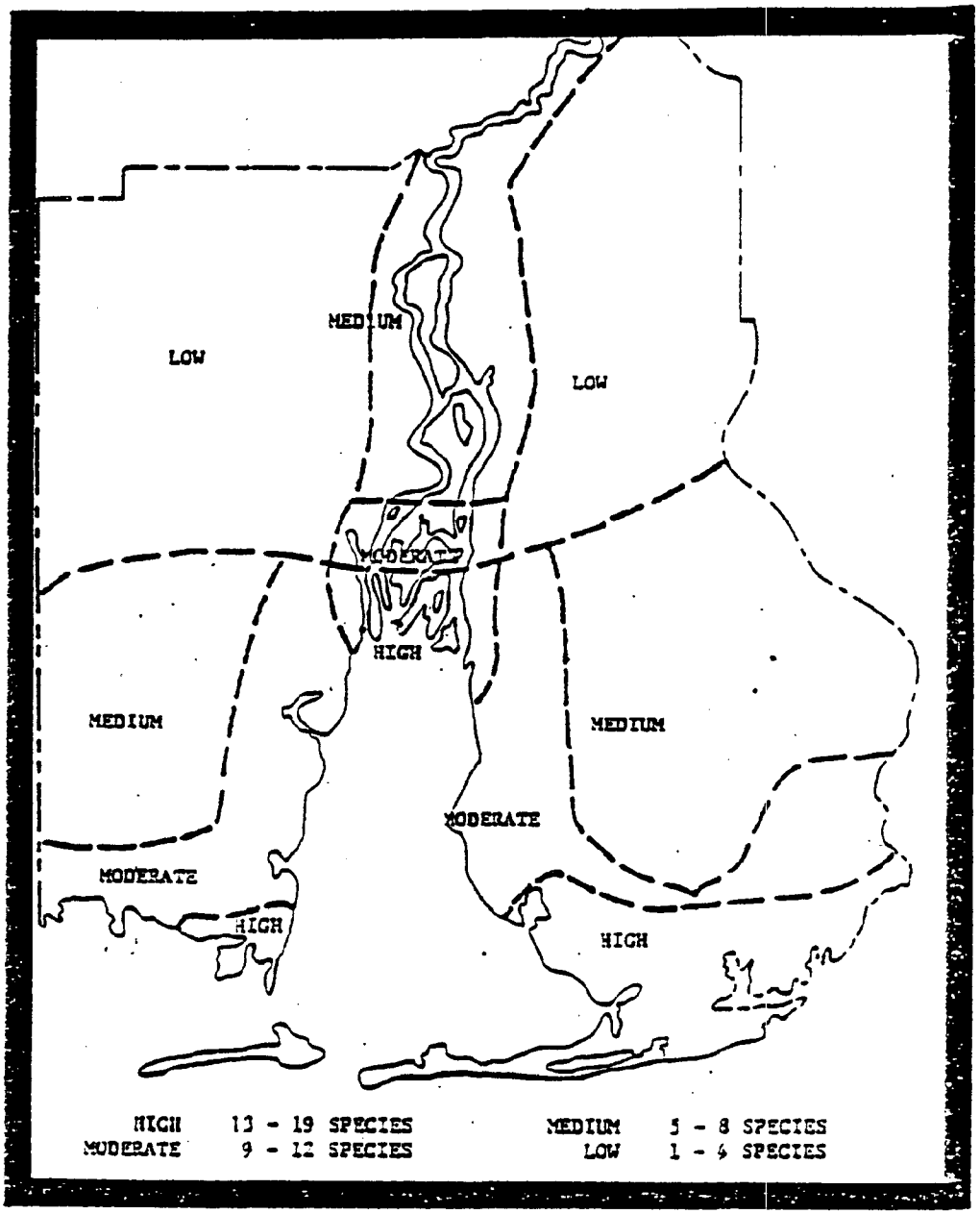


Figure 8. Generalized Map of Threatened Species Having Limited Range
(South Alabama Regional Planning Commission, 1979)

C. Uses

Weeks Bay has been closed to shrimping for several years, as it is an important nursing and staging area for shrimp, and is extremely important to the viability of the shrimp fishery in Bon Secour and Mobile Bays. Many of the other marine species which nurse in the estuary, including the spotted sea trout, red drum, croaker, flounder and mullet, are also important commercial and sport species. Weeks Bay contains large stands of productive habitats that are critical to the life cycles of numerous aquatic and terrestrial animal species, emphasizing the importance of preserving this important ecosystem.

The industrialization and rising population of Mobile Bay threaten the vitality of the estuaries on Mobile Bay. Weeks Bay represents a nursery and staging area for Mobile Bay and the Gulf of Mexico, and very likely represents a microcosm of the entire Mobile Bay system in a more pristine state. However, as the demand for available waterfront property continues to rise with the ever-increasing migration of people to eastern Mobile Bay, more pressure will be brought to bear upon the limited quantity of land in desireable areas such as Weeks Bay. As such its value as a teaching and research tool will be immeasureable.

The Weeks Bay area also provides recreational opportunities for numerous Alabama residents; e.g., boating, waterskiing, fishing, and photography are among the most popular activities. Access for the recreationist is provided by a state-owned boat ramp located on the west side of the mouth of the bay. This not only provides access to Weeks Bay, but also to other areas along the eastern shore of Mobile Bay including Bon Secour Bay and the Bon Secour National Wildlife Refuge that adjoins the 615 acre Swift tract.

The majority of land use in this area is largely undeveloped with some agricultural usage and small pockets of residential usage along Fish River, Magnolia River and Weeks Bay. There does not appear to be any pattern to the development of the area as large, attractive, expensive dwellings can be found located next to smaller modest cottages. There are a number of substandard "camp" type structures along the Bay and on the west bank of the Fish River. Developed areas include the Magnolia Springs community situated on the north side of the Magnolia River approximately a mile and a half from the Bay, the River Bluff subdivision, and the community of Marlow on Fish River just north of the Bay. Along Weeks Bay itself, there has been community development in the southeast and southwest areas and limited buildup of single family residential housing in these areas in close proximity to U.S. Highway 98 and Baldwin County Road No. 12.

D. Overall Management Issues

1. Goals and Objectives

The proposed Weeks Bay National Estuarine Sanctuary will be established primarily for research and educational purposes. To the extent consistent with these principles, the Sanctuary will also provide for long-term resource protection and recreational activities.

Research: The principal research objectives of the plan proposed for managing the Weeks Bay National Estuarine Sanctuary include:

- To gain a more thorough understanding of ecological relationships within the estuarine environment;
- To make baseline ecological measurements; and
- To serve as a natural control in order to monitor changes and assess the impacts of human stresses on the ecosystem.

Since the Weeks Bay area represents a microcosm of the entire Mobile Bay system, establishment of the area as an estuarine sanctuary may provide research opportunities for the Marine Environmental Sciences Consortium, State of Alabama, local governments, and other entities. These institutions will be afforded expanded research opportunities to: (1) monitor and survey programs; (2) research and analyze the impacts of various pollutants on development of estuarine life; and (3) develop programs that fill information gaps in the knowledge of the Mobile Bay system.

The addition of the Swift tract to the Sanctuary (and its location relative to both Weeks Bay and the Bon Secour National Wildlife Refuge) will open up the possibility for combined State and Federal research projects. The tract, which fronts Bon Secour Bay, may be used in comparative studies of greater Mobile Bay and the Weeks Bay estuarine system.

Education: The Weeks Bay management plan also provides as one of its objectives:

- A means for increasing public knowledge and awareness of the complex nature of estuarine ecosystems, their values and benefits to man and nature, and the problems confronting them.

The proposed Sanctuary area is well-suited for educational programs because the area contains a variety of fauna, flora and estuarine habitat representative of the Mobile Bay system. It is convenient to Faulkner State Junior College, the only institution of higher learning in Baldwin County, as well as to the County's primary and secondary schools. Specific educational programs may include: (1) instruction in estuarine natural history; (2) interpretative nature trails; (3) guided field trips for secondary school students; and (4) extension programs that reach out to adults and other students in the region. It is anticipated that facilities necessary to support these educational and research activities will be constructed in the Sanctuary.

Recreation: Another objective envisaged as a result of the designation of the estuarine sanctuary in Weeks Bay is:

- The multiple use of the estuarine sanctuary to the extent that such use is compatible with the primary sanctuary purposes of research and education.

While a major objective of the proposed Weeks Bay National Estuarine Sanctuary is to provide long-term resource protection so that selected sites may be used for scientific and educational purposes, other existing water and related land use activities, such as fishing, hunting, boating, and wildlife observation will be allowed to continue, subject to current State and Federal laws and regulations.

2. Management Concerns

Support for an estuarine sanctuary in the Weeks Bay area has come from a broad group of State, Federal and local governmental entities; primary, secondary, and higher institutions of learning; special interest groups; and numerous individuals in the area. During conversations with adjacent landowners and at the public meeting held at Weeks Bay to discuss the estuarine sanctuary concept, the major concern centered around the issue of additional restrictions.

While favoring the idea of protecting the area in the long-term from development disturbances or pressures, citizens and residents were concerned that restrictions in the Sanctuary would be so prohibitive as to preempt those activities, such as hunting, fishing, wildlife observing, that have been engaged in for generations.

Establishment of the estuarine sanctuary does not involve creating any new Federal or State laws or regulations for the area. Rather, Federal, State, and local regulations, laws, and policies that regulate fishing, shell fishing, hunting, boating, and water quality management in the area will continue to be employed. As in the past, such rules and regulations will continue to be promulgated and enforced by State and local authorities.

3. Management Strategies

Actions necessary to accomplish the purposes set forth by the designation of the site as a National Estuarine Sanctuary will involve the implementation of the following:

- Continued enforcement of existing State and Federal laws and regulations by State and Federal law enforcement personnel;
- A research strategy involving monitor and inventory surveillance programs, educational research programs, ecological relationship studies, baseline geological measurement studies, and other projects described in Section III(A) of this plan;
- An interpretive educational and recreational program described in Section III(B);
- A plan for public access described under Section III(C) including nature trails, boat ramps;
- A facilities construction program described in Section III(D) including, but not necessarily limited to, a visitor and education research center;

- A land acquisition plan for ecologically key land and water areas described in Section III (E) of this plan; and

- A Memorandum of Understanding between the State of Alabama and NOAA concerning Federal-State coordination in the long-term operation and management of the proposed Weeks Bay National Estuarine Sanctuary (Appendix B).

4. Administrative Structure

Four key elements in the sanctuary management structure will be: (1) the Alabama Department of Economic and Community Affairs (ADECA) in charge of overall Sanctuary management; (2) the Alabama Department of Conservation and Natural Resources (ADCNR) responsible for on-site administration; (3) a Weeks Bay Estuarine Sanctuary Advisory Committee: and (4) the role that Faulkner State Junior College will play in the implementation of the research agenda (Figure 9).

Although ADECA has been given principal oversight authority for ensuring the effective implementation of the plan for managing the site, ADCNR has been assigned the primary responsibility for the on-site administration of the Weeks Bay National Estuarine Sanctuary. This arrangement was made in response to a range of needs requiring Federal coordination on the one hand and the effective on-the-ground implementation of the goals and objectives of the Sanctuary on the other. ADECA will serve as the State's liaison with the Federal government; ADCNR, with its proven expertise in natural resource management and regulatory enforcement responsibilities, will manage the site.

The proposed Sanctuary Advisory Committee (SAC) will serve in an advisory capacity in the implementation of the management plan. The committee is expected to include, but not be limited to: (1) a representative from the Marine Resources Division of ADCNR; (2) a representative from the Game and Fish Division of ADCNR; (3) a representative from FSJC; (4) a designee from the Baldwin County Commission; (5) a designee from the Baldwin County School Board; (6) a designee from the Department of Environmental Management, (7) a designee from The Nature Conservancy; (8) a designee from Sea Grant; (9) a designee from the University of South Alabama College of Arts and Sciences; (10) a designee from the Marine Environmental Sciences Consortium; and (11) a designee from ADECA's State Planning Division. The Committee will be chaired by the Sanctuary Manager. Members will serve for one-year appointments, with no limit on reappointment. At its discretion, the ADCNR may establish subcommittees or ad hoc committees to address specific questions related to the Sanctuary. The committee will meet on a regular schedule to be determined by ADCNR. Some of the SAC's activities might include the following:

- Advise the ADCNR on matters relating to planning for operation of the Sanctuary;

- Assist in seeking support for the research and educational programs and other financial matters;

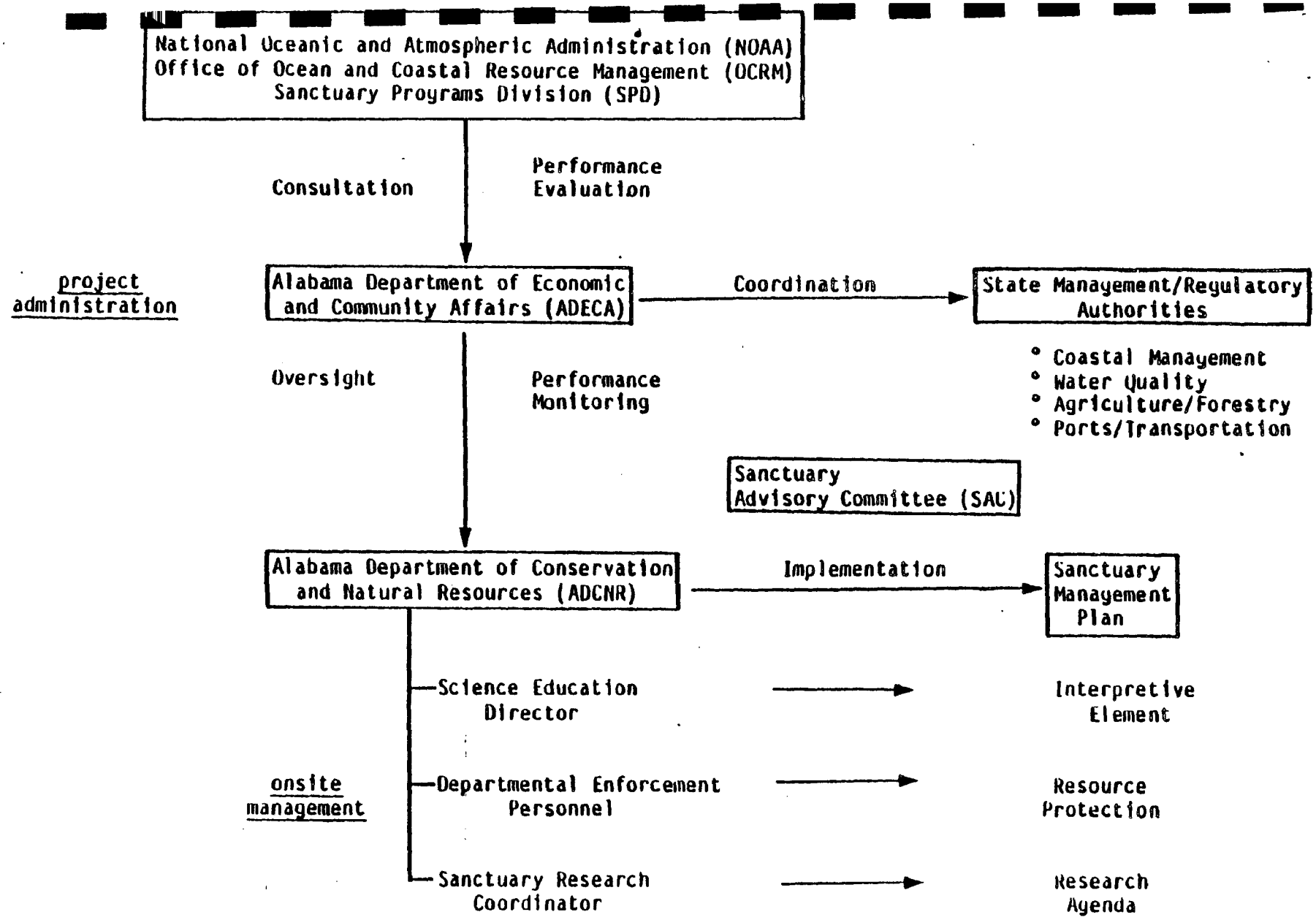


Figure 9. Proposed Management Scheme for the Weeks Bay National Estuarine Sanctuary

- Assist in the preparation of any periodic summary or annual reports on the operations of the Sanctuary; and

- Represent the interests of the users of the Sanctuary and the information and educational materials generated by the Sanctuary.

E. Resource Protection

The State of Alabama proposes to use its existing legal authorities and regulatory enforcement programs to provide for the protection of the Sanctuary's resources. Where necessary, agencies will enter into formal agreements specifying how their respective roles and responsibilities will be coordinated.

1. Existing State Authorities

a. Alabama Department of Environmental Management (ADEM): Alabama Law (Action No. 82-612) established the ADEM to provide for a comprehensive and coordinated program of environmental management. The ADEM is a group of State agencies whose primary responsibility is to administer environmental legislation into one department. It reviews permitting activities in coastal areas to ensure consistency with the Alabama Coastal Area Management Program.

Acting through the Environmental Management Commission, the ADEM adopts and promulgates rules, regulations and standards for the Department, and develops environmental policy for the State. It also serves as the State's clearinghouse for environmental data and as the State agency responsible for administering Federally-designated environmental projects.

The Department, the Attorney General, a district attorney or an assistant district attorney having jurisdiction, may initiate an action against any entity if in the judgement of the Office of State Planning and Federal Programs such party is determined to be in violation of the management program of the Commission.

b. Coastal Resources Advisory Committee (CRAC): The CRAC was created to advise the ADEM and the Office of State Planning and Federal Programs on all matters concerning the coastal area. Members of this board are primarily from Mobile and Baldwin Counties.

c. The Alabama Department of Conservation and Natural Resources (ADCNR): The ADCNR has direct control over natural resources, parks and historical sites of the State as well as all State lands other than those specifically committed to the use or control of some other department. The Department, which is composed of the Game and Fish Division, State Lands Division, State Parks Division and Marine Police and Marine Resources Division is charged with: (a) administering all laws pertaining to wildlife protection and conservation including game and fish laws, boat registration, and the management and protection of marine resources; (b) carrying out cooperative research and educational programs with Federal agencies; (c) acquiring land by donation, purchase, condemnation or lease with regards to State parks and parkways, and supplying the appropriate administration.

The Department exercises complete authority over all seafoods harvested in Alabama waters including all public and natural oyster reefs and oyster bottoms. Its rules and regulations prescribe the time and manner by which all classes of seafoods may be taken. Through the State Lands Division, it also manages and controls submarginal lands and river and bay bottoms.

The ADCNR has the power to levy fines for violations of its regulations. The game and fish wardens of the Division of Game and Fish are empowered to serve subpoenas, carry firearms and to confiscate all game, birds, animals or fish that have been caught, taken or killed in violation of ADCNR regulations. Employees of the Division of Marine Resources (Marine Police) are empowered to carry firearms, with the power to arrest, with or without warrant, any person who violates any of the laws of the State of Alabama or any rule or regulation of the ADCNR.

2. Existing State Laws

a. Water Quality Control: The Code of Alabama 1975, Sections 22-21-1 through 22-22-14, as amended, describe the ADEM as the State Water Quality Control Authority. The ADEM is charged with responsibility for conservation of ground and surface waters within the coastal area, propagation of wildlife, fish and aquatic life, and for water supplies. Specifically, ADEM has the authority to provide for the prevention, abatement and control of new or existing water pollution. It supervises the enforcement of all laws relating to water pollution in the state and establishes criteria for acceptable limits of pollution.

The agency issues permits for the discharge of sewage, industrial waste entering directly or through municipal or private treatment facilities, and other waste into the waters of the State. The ADEM is given wide latitude through its rulemaking authority which is reflected by the fact that each permit stipulates the conditions under which waste discharge may be permitted. A permit must first be obtained from the ADEM before construction of any water works or water system supplying water for domestic purposes to the public.

In addition to the ADEM, the State Oil and Gas Board, by provision of the Code of Alabama 1975, Sections 9-17-1 through 9-17-32, is charged with the prevention of the pollution of fresh water supplies by oil, gas or saltwater and to prevent wells from being drilled, operated or produced in a manner which would cause injury to neighboring property.

b. Fish, Game and Wildlife: The ADCNR is empowered in §9-2-7 of the Code of Alabama, 1975, with formulating a state wildlife policy, fixing open season during which game animals and birds may be taken, fixing daily and seasonal bag limits on game birds and animals and setting daily creel limits on game fish. The ADCNR also has the authority to regulate the catching and taking of game birds, animals and fish and to close the season of any species in any county or area when, upon a survey by the department, it is found necessary for the conservation and perpetuation of such species. It may also designate by name what animals shall be classed as game or fur-bearing animals, and what species of fish shall be game fish.

c. Marine Resources: The ADCNR assumes responsibility for regulating the cultivation and removal of oysters and the taking, processing and distribution of turtles, shrimp, crabs and other marine resources. It also assumes responsibility for the establishment of reefs in offshore waters.

d. Registration and Operation of Vessels: The provisions of the Code of Alabama, 1975, Sections 35-5-1 through 35-5-36, require the registration of all vessels in Alabama. The ADCNR, through its Division of Marine Police, promulgates and enforces water safety regulations.

e. State Docks: The Alabama State Docks Department supervises, promotes, controls, manages and directs the State docks associated with State lands. The Department requires construction permits for structures in water on navigable streams. Such structures include piers, boat basins, overhead power lines and underwater pipelines.

f. Obstructions to Navigations: Sections 33-7-1 through 33-7-53, of the Code of Alabama, 1975, consist of several diverse provisions aimed at maintaining the navigability of waters in the State. Fines are imposed for any intentional or willful obstruction of a navigable water course by any means including floating timber to market. Other provisions of the act specify the conditions upon which one may gain an easement and the right to construct dams across navigable rivers.

An additional important provision codified at Section 33-7-53 relates to acquisition of tidelands by riparian owners. This section specifically states that "the owner of any lands in the State of Alabama abutting on tidelands (controlled or owned by the State), which shall not have been approved by or under valid public authority and shall not be otherwise devoted to public use, shall be authorized to acquire such tidelands and to fill, reclaim or otherwise improve same and to fill in, reclaim or otherwise improve the abutting submerged land and to own, use, mortgage and convey the lands so reclaimed, filled, or improved, any improvements thereon" subject to the following conditions and approval: (1) conformance to any stipulated or established harbor line, (2) if the land is to be used for a bridge, road or causeway over navigable waters; for a bridgehead or approach; or for terminal facilities abutting on the bridge, road or causeway plans for the bridge, road or causeway must be approved by appropriate Federal authorities, the Director of the State Docks Department, and the Governor. When appropriate approvals are obtained and construction of the improvement pursuant to the plans is completed, title to the subject lands and the entire improvement thereon vests in the riparian owner, (3) if the proposed or constructed improvement on the land is different from those enumerated above, the riparian owner may gain title to the land only by obtaining county commission approval of the county in which the land is situated, and approval of both the Director of the State Docks Department and the Governor, provided that notice of application for the required approvals is given by publication in the county newspaper at least 10 days before the request. Following the required approvals, title passes to the riparian owner upon filing, for record, a certificate of the appropriate approvals.

g. Discharge of Litter and Sewage from Watercraft: Alabama law (Code of Alabama, 1975, Sections 33-6-1 through 33-6-12) strictly prohibits the discharge of litter, sewage, and other materials from watercraft. Under its provisions, the DEM is authorized to adopt regulations or promulgate orders designed to control the discharge of waste from watercraft into State waters. Authority is given to impose marine toilet specifications upon vessel manufacturers and makes it unlawful for any manufacturer to deliver a marine toilet or other sewage disposal device within the state without having received certification and approval by the ADEM.

h. Wild Sea Oats Act - Baldwin County

The provisions of the Wild Sea Oats Act, Acts of Alabama, 1973, Act No. 971, make it a misdemeanor to pick wild sea oats on the beaches of Baldwin County. The DCNR is made responsible for posting signs to that effect near the beaches.

3. Federal Authorities

Like state authorities, Federal programs vary greatly in approach and scope, ranging from broad-based legislation providing for resource management such as the Coastal Zone Management Act to controls that address specific threats and the needs of a particular resource. The following Federal laws and regulations are known to be enforceable in the coastal area of Alabama:

a. Coastal Zone Management Act of 1972: In 1972, Congress passed the Coastal Zone Management Act (CZMA), 16 U.S.C. 1451 et seq., in response to public concern about balancing needs for preservation and development in coastal areas. The Act authorized a Federal grant-in-aid program administered by the Secretary of Commerce, who in turn delegated this responsibility to NOAA's Assistant Administrator for Ocean Services and Coastal Zone Management. Amended on July 16, 1976 (P.L. 94-370) and on October 1, 1980 (P.L. 96-464), the Act affirms a national interest in the effective protection and careful development of the coastal zone by providing assistance and encouragement to coastal states and territories for developing and implementing programs for achieving these objectives.

Broad guidelines and the basic requirements of the CZMA provide the necessary direction to states for developing their coastal management programs. Program development and approval regulations are contained in 15 CFR Part 923, revised and published March 28, 1979, in the Federal Register.

The Alabama Coastal Management Program (ASCMP) was approved September 25, 1979 and announced in the Federal Register on October 12, 1979 (FR 58938). The ASCMP provides a comprehensive management program for coastal lands and waters as well as uses of these areas.

b. Clean Water Act (CWA): The Clean Water Act (CWA), 33 U.S.C. 1251 et seq., establishes the basic scheme for restoring and maintaining the chemical, physical, and biological integrity of the nation's waters. It contains two basic mechanisms for preventing water pollution: (1) the regulation of discharges from known sources; and (2) the regulation of oil and hazardous substances discharges. Its major provisions are:

(1) Discharges

The CWA's chief mechanism for preventing and reducing water pollution is the National Pollutant Discharge Elimination System (NPDES), administered by EPA. Under the NPDES program, a permit is required for the discharge of any pollutant from a point-source into navigable waters (which include State waters, the contiguous zone, and the ocean). EPA can delegate NPDES permitting to the State for State waters.

(2) Oil Pollution

Discharges of oil and hazardous substances in harmful quantities are prohibited by the CWA. When such discharges do occur, the National Contingency Plan (NCP) for the removal of oil and hazardous substance discharges, will take effect. The Coast Guard, in cooperation with EPA, administers the Plan, which applies to all discharges of oil in the contiguous zone and to activities under the Outer Continental Shelf Lands Act. The NCP establishes the organizational framework whereby oil spills are to be cleaned up.

(3) Recreational Vessels

The CWA (33 U.S.C. §1322) requires recreational vessels with toilet facilities to contain operable marine sanitation devices. The regulations state that boats, 65 feet in length and under, may use either Type I, II, or III MSD's which must be certified by the Coast Guard. Types I and II are chemical treatment devices and Type III is a holding tank. The CWA requires noncommercial crafts to comply with marine sanitation device regulations issued by EPA and enforced by the U.S. Coast Guard.

(4) Dredging and Discharging Dredged Materials

Section 404 permits, from the Army Corps of Engineers (based on EPA developed guidelines), are required prior to filling and/or discharging dredged materials within three miles of shore (including wetloads), or the transportation of dredged material for the purpose of dumping it into ocean waters.

c. Marine Mammal Protection Act of 1972 (MMPA): The MMPA, 16 U.S.C. 1361 et seq., applies to U.S. citizens and foreign nationals subject to U.S. jurisdiction and is designed to protect all species of marine mammals. The MMPA is jointly implemented by the National Marine Fisheries Service (NMFS), which is responsible for whales, porpoises, and pinnipeds other than the walrus, and the Department of the Interior's Fish and Wildlife Service (FWS), which is responsible for all other marine mammals. The Marine Mammal Commission advises these implementing agencies and sponsors relevant scientific research. The primary management features of the Act include: (1) a moratorium on the "taking" of marine mammals; (2) the development of a management approach designed to achieve an "optimum sustainable population" for all species of population stocks of marine mammals; and (3) protection of populations determined to be "depleted."

d. The Rivers and Harbors Act: Section 10 of the Act, 33 U.S.C. 403 prohibits the unauthorized obstruction of navigable waters of the United States. The construction of any structure in the territorial sea or on the outer continental shelf is prohibited without a permit from the U.S. Army Corps of Engineers (COE). The COE will not issue a Section 10 permit unless construction or obstruction has been found to be consistent with the Alabama Coastal Zone Management Program.

Section 13 of the Act, 33 U.S.C. 407 (referred to as the Refuse Act), prohibits the discharge of refuse and other substances into navigable waters, but has been largely superceded by the CWA. In effect, such discharges are regulated under this section only insofar as they affect navigation or anchoring.

e. Endangered Species Act of 1973 (ESA): The Endangered Species Act of 1973 (ESA), 16 U.S.C. 1531-1541 et seq., provides protection for listed species of marine mammals, birds, fish, invertebrates, and plants. The USFWS and NMFS determine which species need protection and maintain a list of endangered and threatened species. The most significant protection provided by the ESA is the prohibition on taking of listed species. The term "take" is defined broadly to mean "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or to attempt to engage such conduct" [16 U.S.C. 1532 (14)]. The FWS regulations interpret the term "harm" to include significant environmental modification or degradation and acts which annoy listed species to such an extent as to significantly disrupt essential behavior patterns (50 CFR 17.3).

The ESA also protects endangered species and their habitats. This is accomplished through a consultation process designed to insure that projects authorized, funded, or carried out by the Federal agencies do not jeopardize the continued existence of endangered or threatened species or "result in the destruction or modification of habitat of such species which are determined by the secretary (of the Interior or Commerce) to be critical" (16 U.S.C. 1536). Critical habitat for endangered species is designated by the FWS or NMFS depending on the species.

f. Migratory Bird Treaty Act: The essential provision of the Act, 16 U.S.C. 1536, which implements conventions with Great Britain and Japan, makes it unlawful, except as permitted by regulations "to hunt, take, capture ... any migratory bird, any part, nest or egg" of any protected bird (16 U.S.C 703). The Secretary of the Interior is charged with determining when, to what extent, if at all, and by what means to permit these activities. Each convention established a "closed season" during which no hunting is permitted. Of the birds found in the study area, only certain species of ducks, geese, gallinules, and doves are considered game birds under the MBTA.

III. Management Programs

A. Resource Studies Plan

The establishment of the proposed Weeks Bay National Estuarine Sanctuary presents an opportunity to develop a comprehensive body of knowledge regarding the physical and biological characteristics and interrelationships of a relatively pristine tidal estuary and its adjacent uplands, tributaries and waters. .Research on estuaries has demonstrated the importance of undeveloped wetlands in providing detrital-based nutrients, water purification, wildlife habitat and cultural benefits for commercial and sport fisheries interests.

The research program for this Sanctuary has not been designed to accomplish specific projects on an established schedule. It does not specify individual project design because flexibility in project design is critical and must ultimately be based on limiting factors such as funding, manpower and equipment. These factors are not known at this time. Therefore, this plan provides opportunity and direction within a framework of flexibility, and provides a basis for indepth research into a wide range of specific baseline surveys of flora, fauna and various physical and chemical parameters. Additionally, an ongoing monitoring program providing trends in water quality, biological parameters and in faunal changes is essential to the well-being of this Sanctuary. The basic purpose of research in the Sanctuary will be to provide fundamental data, opportunity, and direction to the scientific community, thereby permitting the cumulative results of various projects to form a body of information necessary for increased understanding of the Weeks Bay estuarine system. The security from encroaching development coupled with the availability of a data base will provide a tool for the testing of various ecological theories and will be some of the most important scientific work that will emerge from this program. The main objective of research conducted under the sanctuary framework will be to produce information useful in coastal management.

History of Research Activities

Scientific research in the Weeks Bay estuary, although limited, has been included in research projects covering larger geographic areas. The Alabama Marine Resources Division (AMRD) of the Alabama Department of Conservation and Natural Resources (ADCNR) in 1977 began a monitoring program of the Weeks Bay area. The program initially consisted of monthly sampling at three 16-foot otter trawl stations and two beam plankton trawl (BPL) stations. Later during that year, otter trawl samples were reduced to two locations; in 1980, otter trawl and BPL samples were reduced to one location each in Weeks Bay. Hydrographic data including dissolved oxygen, salinity and temperature measurements have been taken at each station since 1977. Data collected in the monitoring program provided sufficient understanding of shrimp population dynamics to warrant the permanent closing of Weeks Bay to all shrimping.

The AMRD stocked striped bass (Morone saxatilis) in the tributaries of Weeks Bay in 1974 and at the head of Weeks Bay since 1975. Generally, a portion of the stocked fish are tagged and movement of these fish in the

estuarine system is monitored as part of a research project funded by the National Marine Fisheries Service, the AMRD, and the U.S. Fish and Wildlife Service. The AMRD is conducting intensive research on the life history and stock assessment of the spotted trout (Cynoscion nebulosus). Tagged spotted sea trout fingerlings reared by the AMRD were stocked in Weeks Bay in the winter of 1984. The AMRD plans to continue the monitoring effort and fish stocking program in the future provided funding is available.

A study of birds and mammals in coastal Alabama for the Alabama Coastal Area Board resulted in the publication "Present Levels of Birds and Mammals in the Coastal Zone", which included the proposed Sanctuary area. In another study of coastal wetlands vegetation, Judy Stout of the Marine Environmental Sciences Consortium prepared an atlas of coastal Alabama which included the wetlands vegetation in the Weeks Bay estuary. The atlas entitled, "Wetland Habitats of the Alabama Coastal Zone", was prepared for the Alabama Coastal Board in 1981 and represents the best inventory of aquatic plants available for the proposed Sanctuary. A complete inventory of the estuarine flora and fauna in Weeks Bay has not been attempted. Hugh Swingle included a seine station near the mouth of the bay in his study, "Biology of Alabama Estuarine Areas-Cooperative Gulf of Mexico Estuarine Inventory", conducted in 1968 and 1969.

Sanctuary Monitoring Program

A monitoring program should ultimately document trends in biological, physical, and chemical parameters and provide data for needed future research. Currently, monitoring of the Weeks Bay area is being conducted monthly by the AMRD for shrimp and finfish at two stations. Water samples are analyzed for dissolved oxygen, salinity and temperature at each station. This monitoring program may be expanded if the sanctuary managers decide that an expanded program is needed to stay abreast of changes in the Weeks Bay estuary. A minimal baseline monitoring program will be part of an on-going research effort in the estuary. Other areas to be monitored may include, but not necessarily be limited to:

- Changes in habitat and community structure;
- Detailed water chemistry analysis;
- Water currents and circulation patterns;
- Meterological and climatic parameters
- Historical land use/archaeological studies;
- Phytoplankton and zooplankton populations;
- Benthic macroinvertebrate communities; and
- Expanded fish and crustacean population monitoring.

As the research program expands, the monitoring program may address ecological and physiological parameters not currently under investigation. The continuous collection of data will result in an expanded data base which will be useful in identifying changes in the environmental quality of the estuary. It will be important to coordinate all research in the Sanctuary and to collect information with standardized methods so that meaningful comparisons can be made between different data sets. As the data base expands organized systems of data storage and retrieval may be necessary.

Facilities and Equipment

The proposed estuarine science center will serve as an on-site research facility in the Sanctuary. The facility will include two laboratories, a small reference library and a small auditorium for presentations. Operating the facility will require a part-time science education director (Faulkner State Junior College faculty) as well as other staff described in Section III(B). Students wishing to receive college credit will make use of the association of the Sanctuary with Faulkner State Junior College.

Important to the dissemination of research information are publications that will be jointly developed by the Alabama Department of Conservation and Natural Resources and Faulkner State Junior College.

Information Management

Although information concerning estuarine systems along the northern Gulf of Mexico is numerous and varied, it has not been readily available or systematically archived, making literature searches a time-consuming task. One of the goals of sanctuary management will be to compile and continuously update this information into a central repository where it will be available to potential users. The repository will confirm information on scientific research projects, public information materials, voucher specimens, reprints from scientific and popular journals as well as unpublished reports, and more. Also included will be pertinent management and scientific information from other estuarine areas, general information about the National Estuarine Sanctuary Program, and information regarding other resource management programs.

Available information on Weeks Bay and other estuaries will be analyzed to determine the types and amount of data that is pertinent to the area. This information will be compiled, synthesized, annotated, and updated as part of an historical bibliography of published and unpublished information on Weeks Bay and other similar systems.

A comprehensive summary document on the research history and opportunities in estuarine research applicable to Weeks Bay will be developed to create a central data bank of various topics associated with estuarine resource management.

Research Prospects

The diversity of land, water, and biotic resources of the proposed Sanctuary will offer the opportunity to conduct a variety of research projects limited only by funding and the imagination of the research community. The sanctuary research program will seek the participation of students, interested individuals and organizations whose research contributions will expand the body of knowledge relative to the understanding of the functions, values and ecological relationships of the Weeks Bay estuary.

Several research opportunities have been identified, and are presented in the following not as a comprehensive list but as an initial framework for future research:

- Baseline data gathering and interpretation - Virtually all aspects of biological composition of the sanctuary need further documentation. Archaeological, climatological, geological, hydrological and cultural resources of the Sanctuary need documentation. The collection and synthesis of these data can provide critical information for specific studies;

- Ecological studies - The possibilities for ecological research cover a wide range of subjects from studies of individual species' relationships with their environment to studies of various biological communities and their relationships to each other and their environment;

- Comparative studies - Comparative studies incorporating other coastal estuaries along the Alabama coastline can be undertaken after sufficient data have been compiled on the proposed Sanctuary. These studies may concern general interest questions or theories but more frequently will address specific questions. With the inclusion of the Swift tract, the Sanctuary will have a continuous border with the Bon Secour National Wildlife Refuge, thereby facilitating comparative studies on Mobile Bay that can be undertaken jointly by State and Federal agencies;

- Estuary model study - The Marine Environmental Sciences Consortium has spent much of the last five years working on methods to quantatively evaluate the natural resources and environmental characteristics of Mobile Bay and adjacent waters. The physical size of the project constitutes a major obstacle as does the lack of adequate experimental controls. It appears quite likely that Weeks Bay could constitute an acceptably similar and yet more logistically manageable study area. It is relatively pristine and the argument can be made that it has many of the characteristics once found in Mobile Bay. The Marine Environmental Sciences Consortium proposes to initiate a series of hydrographic and biological studies in Weeks Bay with the initial objective of comparing the existing data base for Mobile Bay with Weeks Bay in an effort to identify similarities and differences; and

- Wildlife research projects suggested include:

  - Determination of the use of the coastal woodlands by wood ducks;
  - Evaluation of the present day use of colonial bird nesting sites;
  - Determination of fur-bearer abundance, species and trapping opportunities;
  - Determination of the suitability of areas for marsh, swamp and cottontail rabbits;
  - Determine the use of created tree cavities in living trees for various species that require nest cavities;
  - Test use of nesting platforms for young bald eagles;
  - Test habitat manipulation for selected cover to encourage use by special desired wildlife species; and
  - Evaluate effects of human activity on area wildlife.

B. Interpretive Plan

Alabama possesses a special resource in its Mobile Bay estuarine system of which Weeks Bay is an important part. With its conflicting uses of industry, real estate development, recreation, and commercial fishing, the estuarine system offers a fascinating study area in not only the biological sense but also in the construction of a solid ecological balance among these uses. Although most people want to cooperate in maintaining this beautiful setting, few understand man's role or the complexities of this environment. The objective of the interpretive element is to increase the understanding of the ecological importance of these biologically productive areas among Alabama residents.

Facilities, Management and Personnel

Other states have proven that one method proven effective in informing the public of environmental systems is a science education center where visitors can see, touch, sell, hear, and taste various aspects of the outdoors and thus, come away with a new awareness and appreciation of the area. A major purpose of an estuarine sanctuary is to provide a vehicle for increasing public knowledge and awareness of the complex nature of estuarine systems, their values and benefits to man and nature, and the problems which confront them. An estuarine science center is planned at Weeks Bay for this purpose.

It is anticipated that the completed estuarine science center will contain approximately 5,000 square feet. Facility size and construction schedule is dependent upon availability of funds. It will serve as an example to developers of the design and construction practices that create minimal adverse environmental impacts. The facility will include a small auditorium for presentations, a museum, two laboratories, a small reference library, offices, and restrooms. A small pier with docking facilities will also be constructed should funding become available. As currently envisaged by the State of Alabama, the facility will be tied to the following operational concepts:

° Operations philosophy: The establishment of the center will ensure ready access to the proposed Weeks Bay Estuarine Sanctuary by scientists, students, and the general public and would facilitate coordination between research and education. In addition, the center will ensure public availability and reasonable distribution of research results for timely use in coastal management decisionmaking;

° Admission: All on-site interpretive activities will be free and open to the general public. Students interested in college credit would register through Faulkner State Junior College. Fees covering costs for materials, etc., may be charged for organized instructional activities;

° Season: The estuarine science center will be open year-round with hours to be determined by its operators;

° Operations: All operational procedures will be determined by the ADCNR with the advice of the Weeks Bay Sanctuary Advisory Committee;

° Management: Management procedures and manpower will be supplied by the ADCNR, Faulkner State Junior College, and other cooperating agencies and institutions. It is anticipated that several groups will utilize the science center on a regular basis. Coordination of center activities will be handled by ADCNR. Maintenance and utilities will be shared on a pro rata basis among users of the facility; and

° Personnel:

(1) One estuarine sanctuary manager (ADCNR);
(2) One part-time secretary (ADCNR);
(3) One part-time custodian (ADCNR);
(4) One part-time science education director (FSJC); and
(5) One part-time secretary (FSJC).

Other part-time workers will be supplied on agreement by the ADCNR and Faulkner State Junior College.

On-site Interpretive Activities:

In addition to the preceding, the proposed Sanctuary will provide opportunities for the following:

° Publications - The ADCNR and Faulkner State Junior College may jointly develop publications as necessary to promote the goals and objectives of the Sanctuary. An estuary brochure is essential to the public education program and will be developed as soon as possible. Other publications pertaining to various aspects of the Sanctuary will also be developed. All publications will be carefully screened to assure that they serve the stated objectives of the National Estuarine Sanctuary program.

° Organized Activities - Programs should stimulate public educational involvement in the objectives of the Sanctuary. The Sanctuary manager and the science education director will jointly coordinate all such programs to assure that they serve the objectives of the Sanctuary such as:

- Statewide events - The ADCNR and Faulkner State Junior College will jointly sponsor specific meetings, tours, workshops, etc., on topics relating to the estuarine sanctuary. These events will be publicized statewide and will be directed to the interested general public. These events will use the expertise of Sanctuary staff as well as volunteer experts;

- Specialized group workshops - The Sanctuary staff will provide workshops and other organized educational activities for specialized groups and organizations such as science teachers and college classes. These activities will concentrate on topics directly related to the Sanctuary and its management;

- Seminars - The Sanctuary staff will operate a lecture series at the proposed estuarine science center. Guest speakers and Sanctuary staff will present evening or weekend programs. These presentations will be on an irregular schedule with programs held both indoors and outdoors as conditions and subject matter warrant. The seminars should promote public education and yet entertain and stimulate interest in people with only casual concern about the estuary;

- Interpretive programs - The science education director will coordinate and provide a variety of interpretive programs for the public and special groups. A "nature walk" along well marked nature trails is an effective means of stimulating two-way communication with an audience while providing close contact with the physical setting of the Sanctuary. The proposed Sanctuary provides a variety of habitats which can be used for interpretive programs. Interpretive tours may be led by Sanctuary staff or by skilled volunteers with prior approval from the science education director;

- Research facility tours - Tours of the research facilities at the proposed Sanctuary should be made available to interested groups such as college classes and the public at regular intervals. Care will be taken to avoid upsetting the schedules of staff and guest researchers. A "hands on" learning experience will be provided wherever possible;

- Auditorium - The auditorium will be used for Sanctuary-sponsored and approved functions. Use of this room as a public meeting facility for the local community will be evaluated and a policy will be established prior to its availability;

- Teaching laboratory - The teaching laboratory will be used for Sanctuary-sponsored functions such as classroom activities. The facility will primarily be used by Faulkner State Junior College and other cooperating agencies, such as the Sea Grant Advisory Service, in cooperation with the Baldwin County Board of Education. All freshman and sophomore college level credit courses will be regulated by Faulkner State Junior College. Related activities will be non-credit for the general public. The science education director will coordinate all educational activities;

- Area tours - Special "good neighbor" tours of the Sanctuary will be offered to the adjacent landowners and local community. Sanctuary staff will encourage a full understanding of the estuary and Sanctuary objectives within the local community; and

° Visitor orientation - Many, if not most, of the public visiting the Sanctuary will be casual visitors with little or no knowledge of the purpose of the sanctuary. Since it is not feasible for Sanctuary staff to greet each visitor and explain the history, purpose, and activities of the Sanctuary, a visitor orientation system is essential to the operation of the Sanctuary. This system will include the following:

- Trails - A nature trail system will be developed to provide a variety of experiences for both the casual and serious visitor;

- Museum - The museum will serve many of the needs of the various Sanctuary visitors as time and resources permit. Passive displays, designed to explain the sanctuary to the casual visitor, will be incorporated into a secure facility. Displays, aquaria, and other interpretive aids will be designed by professionals to fulfill the objectives of this aspect of the education program; Active displays will be developed for classes interested in more detailed education. Microscopes, water chemistry equipment, and similar devices will be used to provide greater opportunities to special groups and individuals; and

- Trail-side devices - Various devices, including signs, bulletin boards, observation platforms, benches, maps, brochures, etc., will be used to convey information to the public. A self-guided tour of that portion of the sanctuary which is open to the public will provide an enjoyable and educational experience through the use of trail-side devices.

Off-site Interpretive Activities:

In addition to the activities that would be conducted on-site at Weeks Bay, the following are proposed as part of an ongoing outreach program:

° Mobile displays - Faulkner State Junior College will acquire or construct mobile displays for use throughout the state at conferences, workshops, and schools;

° Lectures - The Sanctuary manager and the science education director will be available for speaking engagements to such groups as service organizations, youth groups, school groups, conservation clubs, and radio and television programs; and

° News media - The Sanctuary staff will actively promote media coverage of the site. Such coverage will include special newspaper articles and editorials, magazine articles, and electronic media coverage.

C. Public Access Plan

Public access to the proposed Weeks Bay National Estuarine Sanctuary is one of the more desirable features for nomination of this site. Weeks Bay is geographically located approximately midway between the two major metropolitan areas of Mobile, Alabama and Pensacola, Florida and is easily accessible to these areas by U.S. Highway 98. Interstate 10 traverses Baldwin County approximately 18 miles north of Weeks Bay and three major interchanges provide easy access via State of Alabama Highway 59, Baldwin County Highway 27, and U.S. Highway 98.

The major tributary rivers to Weeks Bay, the Fish and the Magnolia, provide easy water access to the proposed National Estuarine Sanctuary from the north and east, and the contiguous waters of Mobile Bay facilitate water access from the Mobile metropolitan area to the northwest, the rapidly growing Eastern Shore of Baldwin county (Point Clear, Fairhope, Montrose, Daphne, and Spanish Fort) to the north, Bayou La Batre and Coden to the west, and Dauphin Island and Fort Morgan from the south. Water access is further facilitated by an existing state-owned boat launching ramp and paved parking area at the mouth of Weeks Bay (Viewpoint), a county public boat launch, parking, and picnicking area at Mullet Point (Mobile Bay), public launching facilities at two locations along the Mobile Bay Causeway (U.S. Highway 90), two public boat launching and parking areas along the Fort Morgan Peninsula, one commercially operated boat launching facility on Weeks Bay, and approximately 19 commercially operated boat launching facilities, liveries or marinas, which are located within a 45-minute boat ride of Weeks Bay.

Some nature trails will be constructed in the Sanctuary to accommodate access by handicapped children and adults. All trails will be constructed and maintained with appropriate safety features that will minimize risks to patrons and maximize enjoyment. Access to the proposed Weeks Bay National Estuarine Sanctuary by organized groups will be encouraged by the inclusion of lecturer/guide services through the facilities.

Access to the proposed Sanctuary for hunting and fishing will vary only nominally from traditional access in the former and none at all in the latter. Some consideration will be required for hunting prohibition within a safety zone around nature trails and organized day-use access, but other areas within the Sanctuary can be open to hunting in compliance with State and Federal law. Traditional fishing, both commercial and recreational, will be permitted in the Sanctuary providing fishermen are in compliance with State and Federal laws and regulations.

Permission for overnight camping will be considered by the Sanctuary manager on the basis of the following: (a) Camping will be allowed only if part of an organized estuarine education or research project or in support of an activity such as clearing nature trails; and (b) Camping will be allowed only in areas designated by the Sanctuary manager. It is not intended that the Sanctuary become a public camping area.

D. Construction Plan

Requisite to the construction of the proposed estuarine science center will be the State's submittal, and NOAA's approval, of a detailed plan laying out the proposed cost and construction schedule, architectural drawings, and a preliminary engineering report for the proposed site. The following briefly describes the major components of the construction package to be submitted by the State as a precondition for acquiring Federal financial assistance in the construction of the facility in Weeks Bay:

° Physical Design: The following items should be incorporated somewhere into the center complex (Figure 10).

- Entrance signs
- Parking lot with lighting
- Water and sewer connections
- Electrical and telephone connections
- Reception area
- Restrooms
- Reference library
- Office facilities
- Small auditorium
- Museum
- Workroom (for preparation of exhibits)
- Storage for maintenance supplies
- Teaching laboratory
- Research laboratory
- Nature trails
- Pier with docking facilities

° Site: North of the Fish River Bridge on the east side of Fish River.

° Proposed Construction Schedule: The facility may be constructed in two or more phases. However, an exact construction schedule has not been determined. All plans and schedules are contingent upon funding. It is expected that the first phase will be constructed during the first five (5) years and the remaining construction will be completed during the next ten (10) years.

E. Land Acquisition Plan

Priorities for land acquisition are based on physical and biological factors, making the Sanctuary a manageable unit displaying the diversity of habitats characteristic of the area. In order to establish the Sanctuary as a ecological unit and to provide for a site upon which to base support activities, several areas were targeted for acquisition. These included: (1) land adjacent to major areas of marsh; (2) land near the mouths of the rivers; and (3) land on Bon Secour Bay or Mobile Bay near the mouth of Weeks Bay.

Since Alabama claims title to all tidal land up to the mean high tide line, all of the Bay's subaqueous bottoms and intertidal fringe is already under State jurisdiction and; consequently, has been included within Sanctuary boundaries. Also included within the Sanctuary will be the public boat ramp located on the north end of the Bay which is maintained by the Alabama Department of Conservation and Natural Resources.

The proposed management plan's land acquisition element will involve two phases (Figure 11), the first of which concentrates on acquiring the land along the east side of Weeks Bay, near the mouths of the Fish and Magnolia Rivers, and northeast Bon Secour Bay, just south of Weeks Bay. These 950 acres, involving three (3) separate land tracts currently owned by The Nature Conservancy (TNC), represent a large portion of the proposed Sanctuary's "core" area.

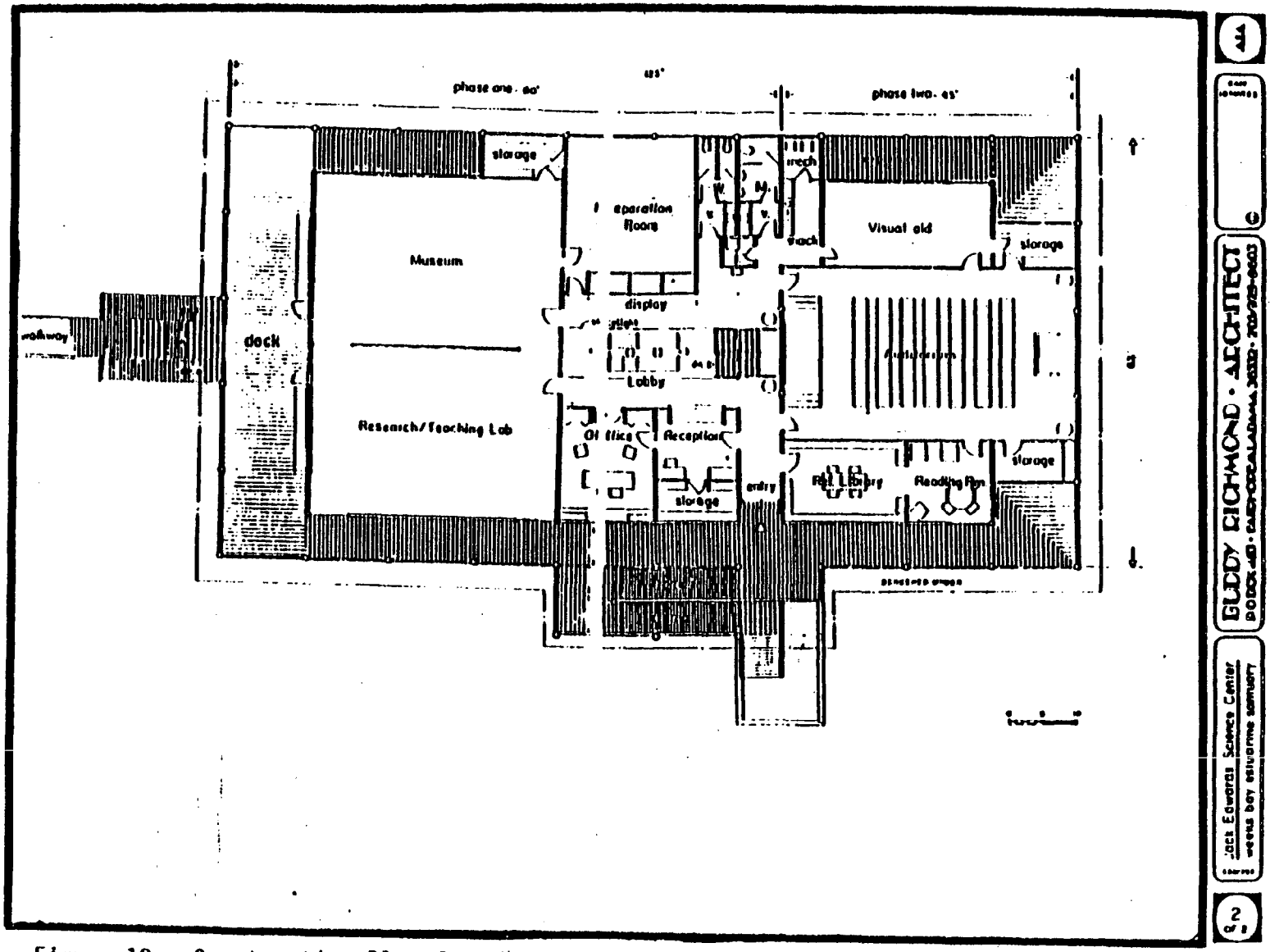


Figure 10. Construction Plan for the Sanctuary Science Center

As part of its proposed second-phase acquisition plans, the State will focus on land along the western portion of Weeks Bay. The plan presently calls for Phase II acquisitions to begin during the first year of Sanctuary operations, pending availability of funds. The following traces the planned trajectory for State land acquisition activities:

° Phase I: The first priority for land acquisition is to protect a significant portion of the ecological "core" of the Weeks Bay estuarine system; i.e., the discrete area representative of resources typical to the site and biogeographic regime including those areas which serve as transitional boundaries between geopolitical and distinct ecological units. Consequently, the proposed plan calls for the acquisition of 335 acres of freshwater marsh and moist pine habitats which are contiguous to the waters of the Bay, in near proximity to the mouths of the Fish and Magnolia Rivers. The plan also seeks to acquire another 615 acres fronting Bon Secour Bay, southeast of the mouth of Weeks Bay, which is contiguous to the Bon Secour Wildlife Refuge administered by the U.S. Fish and Wildlife Service. These three (3) parcels; referred to in this document as the Foley, Ogburn, and Swift tracts, are currently owned by The Nature Conservancy (TNC). It is proposed that TNC donate the 615-acre Swift tract to the State, the appraised value of which then would be used to acquire the necessary Federal funding for acquiring the Ogburn and Foley tracts.

Site Description: The Foley tract, approximately 178 acres, is located on the northeast side of Weeks Bay on the eastern shore of the Fish River. The tract has approximately 3,000 feet of frontage on the extreme southern portion of the Fish River where it empties into Weeks Bay. Contiguous to and lying directly south of the Foley parcel along Weeks Bay, the 157-acre Ogburn tract extends TNC's ownership of the proposed Sanctuary's shoreline almost to the mouth of the Magnolia River. The Swift tract lies approximately 1 and 1/2 miles south of where Weeks Bay empties into greater Mobile Bay. It consists of approximately 615 acres along the shore of Bon Secour Bay with nearly three miles of frontage.

In consideration of the preceding and of the appraisals submitted by the State on the three tracts, NOAA has tentatively approved the following land valuations: Swift, $500,000; Foley, $275,188; and Ogburn, $214,305.

° Phase II: Following initial acquisition, and after the Sanctuary has been designated (i.e., NOAA's approval of the management plan), the State will be eligible to receive supplemental Federal financial assistance for construction and acquisition of land along the west side of Weeks Bay. The proposed acquisition of the approximately 300-acre site would contribute to the research value of the Sanctuary and provide still further protection of its waters. Again, as in Phase I, the State will be negotiating the planned purchase with The Nature Conservancy. Currently, no value has been established for the property; however, it is expected that the State will be able to negotiate, when additional Federal funds become available, a favorable purchase agreement with TNC, a willing seller. The State has proposed to pursue this acquisition during the first year of Sanctuary operations; however, such activity will be contingent upon its receiving additional Federal financial assistance.

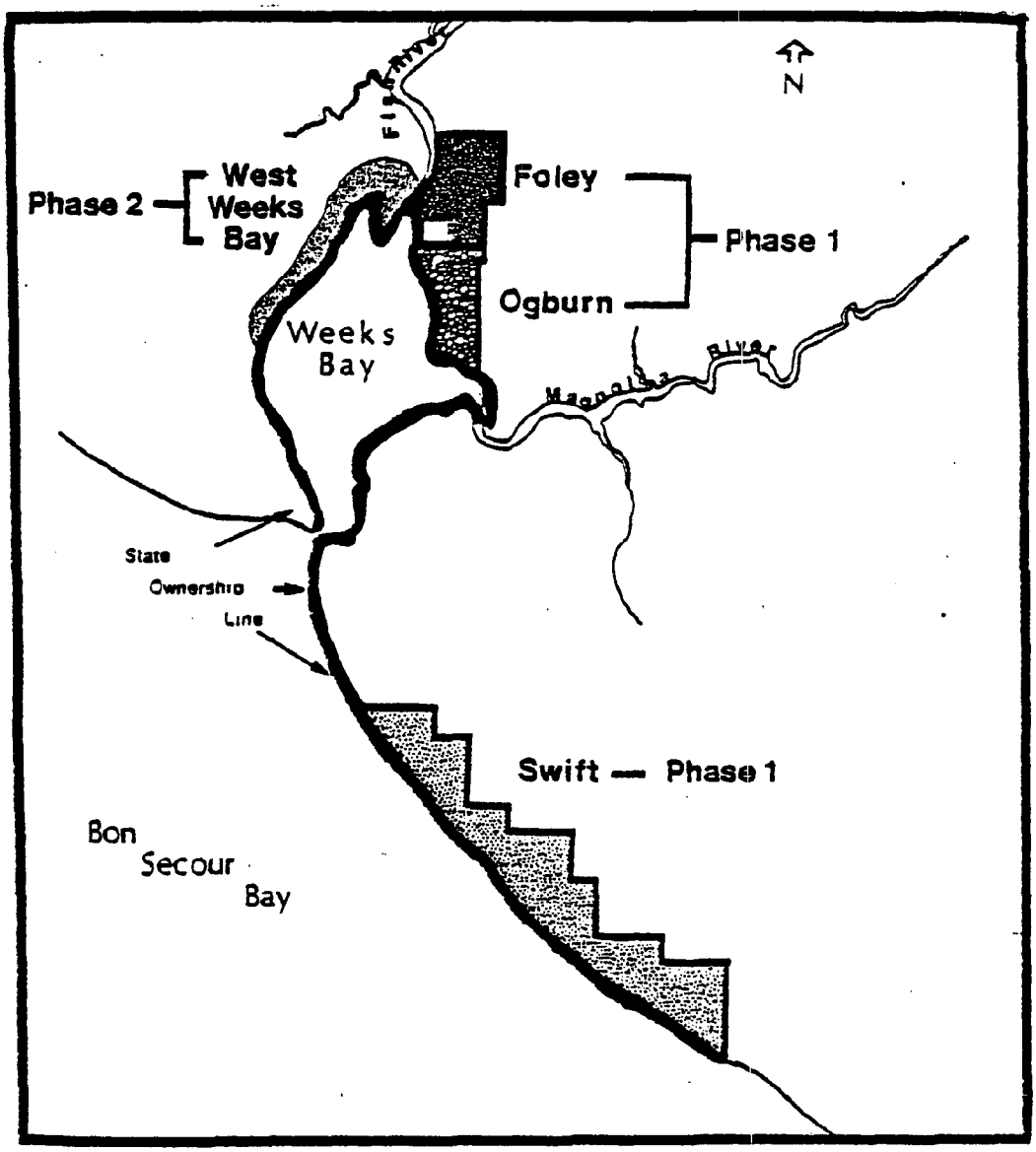


Figure 11. Land Acquisition Plan for the Proposed Weeks Bay National Estuarine Sanctuary

IV. ALTERNATIVES INCLUDING THE PREFERRED ALTERNATIVE

The evaluation of the estuarine sanctuary proposal in Alabama has involved principally an examination of a range of alternatives within three (3) major categories: (a) the need or desirability of using the provisions of Section 315 of the Coastal Zone Management Act as a means to protect the Weeks Bays estuarine system; (b) the boundaries of the area necessary to define and protect the "core" of the ecosystem; and (c) the most appropriate management arrangement for meeting the intended purposes of the proposed designation and carrying-out the goals and objectives of the plan for managing the Sanctuary. In addition to these key elements, the following were also evaluated: (a) the ecological, recreational, research, and educational significance of the resources of the proposed area; (b) existing and potential threats to these resources; (c) protection afforded by existing State and Federal regulatory mechanisms; (d) the aesthetic quality of the area's resources; and (e) the economic value of natural resources and human uses in the area which may be foregone as a result of sanctuary designation.

After completing the site selection process, the Alabama Coastal Area Board nominated Weeks Bay for possible estuarine sanctuary designation. In evaluating the recommendation, NOAA examined two primary alternatives before deciding to proceed with the project: (a) to forgo sanctuary designation in favor of the status quo; and (2) to proceed with the estuarine sanctuary designation process. A thorough examination of the information, the findings of which are discussed in the following, resulted in NOAA's decision to proceed with the nomination.

A. Status Quo

If no estuarine sanctuary were designated, the protection of Weeks Bay's diverse habitats and resources would continue to rely solely upon existing programs. Maintenance of the status quo simply means that existing State and Federal regulatory and nonregulatory programs and the levels of effort related to protection of Weeks Bay would remain unchanged. Considering the rapid increase in, and high demand for, condominium development in coastal Baldwin County since Hurricane Frederic (1979), without the moderating influence of a systematic plan to protect the integrity of the estuarine ecosystem, the Weeks Bay area most likely would be subjected to intense development pressures in the future.

The role of public education in wildlife and habitat protection is very important as it provides users and the general public with the background needed to formulate sound conservation values. However, though the expertise may be present, the support necessary to produce a coordinated interpretive effort in this area has yet to be provided. Of equal importance to education is the research agenda, which provides the data necessary to form a sound interpretive program. Maintenance of the status quo will not provide the coordination necessary to establish quality research and interpretive programs in this area.

The proposed Sanctuary Management Plan recognizes the need for the State of Alabama's active involvement in the administration and protection of the Weeks Bay estuarine system. In order for this to occur, the roles of the various agencies involved must be coordinated to provide for the most efficient management system possible; however, the status quo does not provide the level of coordination needed to formulate responsible management policies for this area.

B. Preferred Alternative

The idea of designating Weeks Bay as a National Estuarine Sanctuary was conceived by the Coastal Area Advisory Committee established by the Coastal Area Board (now part of Department of Environmental Management). The Committee was composed of fourteen members, seven each appointed by Baldwin and Mobile Counties, who represented a broad range of coastal interests. After a careful analysis of ecological and economic realities of Alabama's very limited coastal area, they agreed that the Weeks Bay area was an excellent site for an estuarine sanctuary, if approved by the local landowners and citizenry. This area was considered to be the best possible site because of the suitability for estuarine research and education, the availability of lands owned by willing sellers, and the fact that this area is representative of the coastal geographical region. Other key factors considered in the site selection process included the relative lack of disturbance, the compatibility of sanctuary designation with adjacent area land uses, the diversity of the habitat, and the impacts that would result if the sanctuary was not established.

In establishing the estuarine sanctuary, the State of Alabama will rely mainly on sales from willing sellers and donations of fees or other property interests. Use of conservation easements and less-than-fee acquisition will be considered where feasible.

NOAA's Preferred Alternative, calls upon the provisions of Section 315 of the Coastal Zone Management Act of 1972, as amended (P.L. 92-583) to designate Weeks Bay as a National Estuarine Sanctuary. Part I of this document describes in greater detail the national program's authorizing statute, the purposes and current status of the National Estuarine Sanctuary Program, the goals and objectives of the plan for managing the Sanctuary, and the terms proposed in its designation. This alternative will provide a means for addressing all of the deficiencies described for the status quo option and relies on the effective coordination and participation of Federal, State, and local agencies and their respective authorities.

C. Alternative Boundaries

Alternative boundaries examined by the Coastal Area Board, Alabama Office of State Planning and Federal Programs, and Baldwin County included:

- A line following and conforming with the 10-foot contour (above mean sea level) around Weeks Bay;
- The State ownership line up to the mean high tide line around Weeks Bay;

- The State ownership line up to the mean high tide line around Weeks Bay, the Swift tract, and the land in between the Swift tract and the mouth of Weeks Bay; and

- The State ownership line plus the Foley, Ogburn, and Swift tracts (Preferred Alternative).

The first alternative would present administrative problems extremely difficult to deal with and very time consuming. It would involve lengthy negotiations with private land owners whose acreage is currently used as farmland and private residences. It would also involve excess lands outside the "core" area, presenting sanctuary management with the problem of managing areas that are of marginal importance in maintaining the integrity and quality of Weeks Bay. The additional lands and costs for negotiation and possible litigation by current land owners make this option impractical.

Alternative 2 provides the simplest administrative approach in that very little land negotiation is needed; the State's ownership line corresponding with the mean high tide line. However, this option does not provide a complete representation of the Weeks Bay estuarine complex, as there would be minimal representation of the freshwater marsh or moist pine habitats which constitute a large portion of the core area of the proposed Sanctuary. Although simple in approach, it would not contribute to the overall protection of the proposed Sanctuary.

The third alternative would involve additional costs encumbered by negotiations with the private land owners of the area between the northern boundary of the Swift tract and the mouth of Weeks Bay. The additional time required for negotiations and the added costs of purchase as well as possible relocation of displaced residents make this option prohibitive. Although similar in topography and elevation to the Swift tract, this area does not possess the same natural resources; i.e., its timber, marshes, and numerous habitats for various species of birds, mammals, reptiles, amphibians, and plants.

Alternative 4, NOAA's Preferred Alternative, is proposed as a mechanism to ensure adequate protection of the Bay's resources yet maintain traditional uses of the area. This alternative represents an area that includes all the land and water areas necessary to sustain a viable estuary and offers management opportunities for scientific and educational use as well as public education. Selection of this alternative satisfied a number of needs. First, it recognized the uniqueness and value of the bay's natural resources. Second, it will help maintain the ecological integrity of this productive estuary. Third, it will provide discrete areas where managers and researchers may conduct activities that will aid in providing long-term management for this and other similar areas. Fourth, it will provide opportunities for conducting education programs in natural areas that provide first-hand information and "hands-on" training to its students.

D. Alternative Management Concepts

A number of strategies were discussed and considered by NOAA and the State during the evaluation of the site as a potential estuarine sanctuary and in the development of the plan for its management. Of these the following received the most attention:

- Management by a Federal agency using Federal employees;
- Management by Baldwin County using County employees, subject to State agency and Advisory Committee supervision; and
- Management and operation by a State agency using State employees.

Alternative 1 was rejected because the only Federal agency considered capable of providing management for the proposed Sanctuary, the U.S. Fish and Wildlife Service, lacked the legal authority to assume the role of manager for a National Estuarine Sanctuary. This limitation also would have been applicable to other Federal agencies as well; i.e., program regulations at 15 CFR Part 921 specifically provide for state involvement (with the assistance of NOAA) in the selection and, subsequent, management of a site as a National Estuarine Sanctuary.

Management by Baldwin County (Alternative 2), under State supervision, was rejected because the County lacks the professional expertise and personnel to provide for full-time management of the area.

Alternative 3, NOAA's Preferred Alternative, was chosen because of the existing expertise and management capabilities of the State. The Alabama Department of Economic and Community Affairs currently plays a significant role in the implementation of the State's coastal management program, providing a convenient opportunity for coordinating programs authorized under Sections 306 and 315 of the Federal Coastal Zone Management Act of 1972, as amended. The Department of Conservation and Natural Resources, additionally, has the staff capability as well as the necessary enforcement and regulatory authority to deal with the management of coastal resources, thus, making them the agency most capable of handling the on-site management responsibilities for the proposed Sanctuary.

V. Environmental Consequences

The overall environmental effects of the proposed Weeks Bay National Estuarine Sanctuary will be beneficial. The purpose of this action is to designate this area as an outdoor laboratory which will be used primarily for the purposes of research and education. By preventing environmentally harmful development activities on property acquired for the Sanctuary, the ecological integrity of many acres of sensitive terrestrial and aquatic habitat will be sustained. Sanctuary status will also ensure the long-term natural productivity and continued biological integrity of the Weeks Bay system through the comprehensive management of its resources and values.

Sanctuary designation will not change existing activities or uses in Weeks Bay or on property adjoining the proposed Sanctuary. Existing laws and regulations will protect the environmental quality of the estuarine sanctuary from degradation due to activities on private property in adjacent or surrounding areas. Since the current property owners are willing sellers, there will be no relocation impacts associated with purchase of the land. Establishing sanctuary status will help ensure long-term protection to State and Federally-listed endangered, threatened, or special concern species.

A. Preferred Alternative

Although no new laws and regulations will be promulgated as the result of designation of Weeks Bay as a National Estuarine Sanctuary, designation will enhance resource protection. The establishment of a sanctuary will help maintain the environmental integrity of the eastern shore of Mobile Bay by focusing the public's attention on the system's natural values and vulnerabilities to human activities. The interpretive program will increase public awareness of the integral part estuaries play in the economic and ecological viability of the Gulf of Mexico. The sanctuary will also enhance resource protection through development of a data/information base from which sound management decisions can be made.

The interpretive program will provide a variety of experiences through an enriched appreciation and awareness of the fragility and importance of the natural environment. The off-site activities will promote a greater understanding of the importance of estuarine areas throughout the State. On-site activities such as museums, trails, and interpretive displays will provide the opportunity for vital "hands-on" learning experiences.

The resource studies program will provide a central repository of the numerous and varied literature of estuarine systems along the northern Gulf of Mexico. This information will then be available to potential users to help not only in protecting the resources at Weeks Bay, but also in managing other estuarine systems along the northern Gulf Coast. Publications developed by the ADCNR or Faulkner State Junior College will help disseminate this information.

The Preferred Alternative will provide a coordinated and comprehensive management scheme that will result in the most effective means of maintaining the Weeks Bay estuary for research and education activities and for future generations.

The preferred boundary alternative will provide the protection necessary to preserve the health of the "core" area of the Weeks Bay estuary. It will offer discrete areas conducive to educational and scientific activities as well as optimal management and enforcement efforts.

B. Status Quo

Under the status quo, Weeks Bay will not be provided the degree of management or protection warranted by the significance of its resources. Population pressures to develop more tracts along eastern Mobile Bay may lead to the degradation of areas vital to the health of Weeks Bay and its surrounding areas. Acquisition of "core" land will help maintain the biological integrity of the Weeks Bay area.

No coordinated interpretative program is offered by this alternative. Public awareness of the importance of estuaries in the ecological and economic life of Mobile Bay and the Gulf of Mexico will continue to be neglected, thus negating an important aspect in overall resource management.

Resource studies will be funded at a low level by this alternative. Collection of data needed to fill the gaps in the information available for management of the Mobile Bay system will continue to exist, necessitating management decisions based on inadequate data. With no monitoring or assessment program, adverse impacts due to natural or man-induced perturbations may occur before the problem can be addressed.

C. Boundary Alternatives

All of the alternatives considered would afford Weeks Bay certain levels of protection. Additionally, most of them would, through the coordinated activities of the State, also conserve some of the Bay's key resources. Thus, the evaluation of the boundary alternatives needed to respond to the questions of size (how large or small should it be to protect the area?) and ease of management (which would allow for the best possible management of the area given a certain set of constraints?).

Criteria reflecting the desired operational attributes of the alternatives was considered with an additional set of factors which examined the significance of certain areas in terms of operational efficiency, ease of physical discrimination, and biological significance. The following discusses these with reference to the boundary alternatives:

° The operational efficiency of a sanctuary is a measure made in terms of matching the needs prescribed by the size of the area subject to management with the availability of resources to carry-out the plan. In these terms, both Alternative 2 and the Preferred Alternative meet this description. Given the current level of funding the other two are too large.

° The ease in physical discrimination is a condition which describes the relative ease or difficulty in delineating, on the basis of ground features and benchmarks identified on maps, the boundary of the area subject to the provisions of the Sanctuary Management Plan, and its consistency with existing State and Federal programs. Again, the Preferred Alternative meets these

requirements better than the other options. Although all options may be identified on topographic maps, the physical presence of easily identified roads, paths, benchmarks, residences, and farmlands surrounding the three properties involved make them more easily delineated without the aid of a map than do the other alternatives.

° The biological significance of an area refers to its value in terms of its contribution to the overall maintenance and integrity of a larger system. Although all of the alternatives presented contribute to a certain extent, Alternative 3 and the Preferred Alternative provide this attribute to a greater extent than the other two. The areas encumbered by both Alternatives 3 and 4 possess a diversity of important ecological habitats and resources that contribute to the high productivity and ecological importance of the Weeks Bay area.

This evaluation represents a qualitative estimate of how and to what extent each boundary alternative meets the need for balancing resource management needs with the realities imposed by management constraints. For instance, a broad boundary would provide the geographic coverage necessary in managing the area. However, it would also sacrifice the ability to concentrate its available resources on discrete management issues within specific areas of unique biological significance. Thus, the Preferred Alternative represents the best compromise between the alternatives presented and is the only one that satisfies all the criteria presented in the evaluation.

D. Socio-Economic Impacts

A number of socioeconomic benefits will result from the establishment of the proposed estuarine sanctuary. The proposed sanctuary is located approximately halfway between the towns of Fairhope and Foley. These communities are important art and cultural centers. The relatively unspoiled nature of the eastern shore of Mobile Bay attracts many people to the area to live. Sanctuary status will enhance this aspect of the eastern shore of Mobile Bay and will provide a buffer zone in an area of growing population. Additionally, the portion of the proposed estuarine sanctuary located on Bon Secour Bay will provide almost a direct and continuous link with the recently established Bon Secour National Wildlife Refuge.

The effectiveness of science education centers in illustrating and communicating ecological systems and environmental problems has been demonstrated in other areas. Such a facility is planned for the Weeks Bay area. Faulkner State Junior College, the only institute of higher learning in Baldwin County, will provide a science education director who will direct an educational program for students and the public. The educational program will include publications, displays, demonstrations, workshops, field trips, seminars, etc. The purpose of this facility and its programs will be to provide a vehicle for increasing public knowledge and awareness of the complex nature of estuarine systems, their values and benefits to man and nature, and the problems which confront them.

There is a great deal of interest among Baldwin County residents concerning environmental issues, especially those involving Mobile Bay. Designation of Weeks Bay as a National Estuarine Sanctuary will help focus

the surrounding community's attention on the value of research and education in estuarine management. Scientific findings and the experience of educators using the proposed Sanctuary will aid in the development of sound coastal management policy and practice. Improved management capabilities for the surrounding estuarine areas resulting from research within the proposed Sanctuary will help ensure that the aesthetic and highly productive values of these systems, which underpin the area's tourist and seafood industry, continue to exist.

In addition to the benefits that might be derived from the proposed action, its attendant plan for land acquisition may engender socioeconomic costs such as those discussed in the following:

° Loss of private-sector development opportunities. The lands which have been targeted for acquisition in Phases I and II of the Sanctuary's proposed management plan will be dedicated exclusively to accommodating those uses set forth in its provisions and which are consistent with the purposes for which the designation was made (see Section I, "Purpose and Need for Action"). It is not currently envisaged that the real property acquired using Section 315 funds or dedicated by the State for Sanctuary purposes will be made available to private-sector development. Neither is it intended by this designation that these lands or real property be leased or rented by the State for commercial purposes.

Some loss in revenue to Baldwin County may be experienced as a result of the removal of the acquired lands from the active tax roles and the foreclosure of future development opportunities (i.e., revenue loss from residential and commercial construction, including permit fees, and personal income and property taxes); however, several factors ameliorate these costs. First, of the lands proposed for acquisition, only a small percentage can be considered developable; the remaining requires prohibitive capital investment simply to provide access or meet minimum construction standards and local building codes. Second, the Sanctuary will serve to attract visitors and researchers to the area resulting in increased visitor spending for food, transportation, lodging, and recreational activities.

° Tighter enforcement of existing restrictions imposed on land development. Although no new restrictions have been proposed, the designation of the Sanctuary will place increased emphasis on the State's enforcement of existing regulations and oversight responsibility for ensuring the protection of the Bay's waters from non-point sources of pollution. Such sources, which result principally from land disturbing activities associated with construction practices, and from residential and commercial waste discharges, are for the most part subject to local control, requiring that the State exercise its broad powers to ensure local compliance with State and Federal water quality standards.

In view of the reduced development potential represented by the proposed acquisition, and the enhanced levels of enforcement brought on by the designation, the following may result:

(a) A rise in the cost of new development, and appreciation in the values of existing development and/or remaining developable lands;

(b) A depression in the values of vacant lands rendered "undevelopable" as a result of increased enforcement activities; and

(c) Displacement effects which implicitly promote development activities in locations less subject to use constraints (i.e., economic costs and regulatory restrictions).

The downstream effects associated with the management plan's land acquisition element may be positive or negative, depending on one's perspective; however, all environmental and socioeconomic factors considered, the proposed action ought to have a net positive impact on the Bay and the surrounding community.

E. Unavoidable Adverse Environmental or Socioeconomic Effects

Implementation of the Sanctuary Management Plan may result in minor disturbances to the environment through construction or improvement of a visitor center, boat ramp, parking lot or trails. Except for minor site disturbances, there are no significant adverse environmental effects. Adverse socioeconomic effects will be limited to the foregone development opportunities of the lands acquired for Sanctuary purposes. This is necessary in order to maintain the integrity of the Weeks Bay estuarine complex.

F. Relationship between Short-term Uses of the Environment and the Maintenance and Enhancement of Long-term Productivity

Sanctuary designation will provide long-term assurance that the natural resources and resulting benefits of the area are available for future use and enjoyment. Without sanctuary designation, intensive uses, such as residential development, would most likely occur within some parts of the proposed Sanctuary. This would result in a loss of ecological and economic benefits due to disruption and degradation of natural resources.

Research information collected from the proposed Sanctuary over the long-term will assist Federal, State, and local governments in making better coastal management decisions. Better management will, in turn, help resolve use conflicts and mitigate adverse impacts of human activities in the coastal zone, thus saving both money and resources. Research in the proposed Sanctuary might well allow more efficient and safer use of resources in the coastal zone, which may also result in the discovery of previously unknown resources (medical, nutritional, esthetic, recreational) for human use. A public education program will provide a grassroots foundation for wise public use of estuarine resources.

G. Irreversible or Irretrievable Commitment of Resources

Within the proposed Sanctuary, there are no resources that will be irreversibly committed or irretrievably lost as a result of the designation of the Sanctuary. The intent of the proposed action is to protect, enhance, and manage the natural resources for research, education, and recreation. If these resources are protected and managed, the option to which is consumption and alteration, they will be available for future use. It is also believed that, through the plan developed for its management, establishment of the proposed Sanctuary will ensure the future vitality of living resources and their continued availability to commercial and sport fishermen as well as provide expanded opportunities for non-consumptive recreational endeavors.

VI. LIST OF PREPARERS

Dr. Nancy Foster - U.S. Department of Commerce/NOAA

Dr. Foster is the Chief of the Sanctuary Programs Division, Office of Ocean and Coastal Resource Management, National Ocean Service. Her responsibilities included the overall direction for the development of this project. Dr. Foster is a graduate of Texas Christian University (M.A. in Marine Biology) and George Washington University (PhD in Marine Biology).

Kelvin Char - U.S. Department of Commerce/NOAA

Mr. Char is a Sanctuary Projects Manager with the Sanctuary Programs Division. His responsibilities in the preparation of this document included providing guidance to assigned staff in the project's development and organization. He attended the Universities of Illinois and Hawai'i, graduating from the latter with a Bachelor of Arts degree in zoology. He also holds a Masters degree in Urban-Regional Planning (MURP) from the University of Hawaii and has broad experience in the professional planning/engineering field.

William J. Thomas - U.S. Department of Commerce/NOAA

Mr. Thomas is an Assistant Sanctuary Projects Manager with the Sanctuary Programs Division. Assigned the primary responsibility for this project, his roles included coordinating the gathering of information, synthesis of information, writing, editing, graphics, and overall preparation of the DEIS/MP document. He possesses both undergraduate and graduate degrees in zoology (B.A. and M.S.) from the University of Hawai'i and formerly served as a marine advisory agent with the institution's Sea Grant Program.

Thomas Gindling Jr. - U.S. Department of Commerce/NOAA

Mr. Gindling was a program assistant serving on an internship with the Sanctuary Programs Division. His responsibilities included information gathering and synthesis, writing, editing and preparing this document for publication. He received his Bachelor of Arts degree in Latin American Studies from Denison University and is currently a doctoral candidate in Economics at Cornell University.

Colleen M. Quinn - U.S. Department of Commerce/NOAA

Ms. Quinn was a program assistant serving as an intern with the Sanctuary Programs Division. Her responsibilities included final proofing and editing of this document for formal publication. She received her Bachelor of Arts degree in English and Philosophy from the College of William and Mary and is currently attending law school at the University of Virginia.

Others whose valuable contribution made this document possible:

Ms. Lois Mills - Clerk/typist, Sanctuary Programs Division, OCRM

Dr. John Borom - Biologist and Director of the Fairhope Center, Faulkner State Junior College; Fairhope, Alabama.

Mr. Walter Tatum - Chief Marine Biologist with the Marine Resources Division of the Alabama Department of Conservation and Natural Resources.

Mr. William Tucker - District Fisheries Supervisor with the Game and Fish Division of the Alabama Department of Conservation and Natural Resources.

Mr. C. William Wade - Biologist III for the Mobile County District, Alabama Department of Conservation and Natural Resources (Retired from DCNR in August 1983).

The following individuals provided input on behalf of the State of Alabama during the planning process for the proposed Weeks Bay National Estuarine Sanctuary:

Mr. David Barley
Dr. Gary Branch
Mr. Brad Gane
Mr. John W. Hodnett
Dr. Bill Hosking
Dr. James Jones
Mr. Charles D. Kelley
Mr. Neil Lauder
Rep. Steve McMillan
Mr. George Merlini
Dr. Philip Norris
Hon. Tom Norton
Ms. Marie Patrick
Mr. Bill Rushton
Dr. William Schroeder
Mr. Sherman Shores
Dr. Judy Stout
Mr. Hugh Swingle
Mr. Arthur Tonsmeire
Mr. Bill Wallace
Dr. Rick Wallace

VII. LIST OF AGENCIES, ORGANIZATIONS, AND PERSONS RECEIVING COPIES

Congressional Representatives

Senator Howell Thomas Heflin
Senator Jeremiah A. Denton
Representative Sonny Callahan
Representative William Louis Dickenson
Representative William Nichols
Representative Tom Bevill
Representative Ronnie G. Flippo
Representative Ben Erdreich
Representative Richard B. Shelby

State Government

Water Improvement Commission
State Oil and Gas Board
Department of Conservation and Natural Resources
State Forestry Commission
State Highway Department
Public Service Commission
State Docks Commission
Historic Commission
Liquefied Petroleum Gas Board
Water Well Standards Board
State Board of Health
Department of Agriculture and Industries
Water Conservation and Irrigation Agency
Department of Economic and Community Affairs
Office of the Attorney General
Water Improvement Commission

Local Groups

Magnolia Land Company
Foreman and Weller, Inc.
Baldwin County Wildlife Federation
Board of School Commissioners of Mobile County
South Baldwin Chamber of Commerce
Bon Secour Fisheries, Inc.
Mobile Bay Audubon Society

Individuals

David Ball
Clarence Bishop
Barry Booth
Ben Borom
John Borom
Rod Brettel

Individuals (continued)

William Bridger
Jerry Boyington
Mrs. E.C. Brueggeman
Charles Burnett
Randy Butler
M. M. Chavis
Denise Clanton
Ernest Clark
Sam Damson
Linda Ennis
Mike Ford
Jack Friend
John R. Greggs
Sam Hardman
Elizabeth Havard
Thomas Horne
Dan Hughes
Myrt Jones
Oswalt Lipscomb
Sheldon Lipscomb
Tom Lott
Steve Masters
Alton McClantoc
Larry McDuff
Steve McMillan
Lynn Meador
David Nelson
Albert Nonkes
Edward Parker
John Parker
Mark Paul
Walter Penry
Ken Regan
Robert Renz
Brent Richerson
Art Rigas
R. B. Ryder
David L. Scott
Maud Skeba
Hattie L. Smith
Edward Steele
Arthur Tonsmeire
Ellen Weller
A. W. Williams

VIII. BIBLIOGRAPHY

Alabama Coastal Area Board Management Program. 1978. Workshop Draft. Alabama Coastal Area Board, Daphne, Alabama. 284 pp.

Alabama Department of Conservation and Natural Resources. 1975. Fishes, Birds and Mammals at the Coastal Area of Alabama. Montgomery, Alabama.

Bland, P.G. and W.M. Tatum. 1976 Survey of the 16-foot trawl fishery of Alabama. Alabama Mar. Resour. Bull. 11:51-57.

Boschung, H.T., ed. 1976. Endangered and threatened plants and animals of Alabama. Bull. Alabama Mus. Natu. Hist. No. 2. 92 pp.

Chermock, R.K. 1974. The environment of offshore and estuarine Alabama. Alabama Geol. Survey Inf. Ser. 51. 135 pp.

Cooke, C.W. 1939. Scenery of Florida. Florida Dept. of Conservation Geol. Bull. 17. 118 pp.

Crance, J.J. 1971. Description of Alabama estuarine areas - cooperative Gulf of Mexico estuarine inventory. Alabama Mar. Resour. Bull. G: 85 pp.

Heath, S.R. 1979 - Shrimp assessment and management in the Mobile estuary: pages 201-207 in H.A. Loyacano and J.P. Smith, eds. Symposium on the Natural Resources of the Mobile Estuary, Alabama, U.S. Army Corps of Engineers, Mobile District.

Holliman, Dan C. 1979. The status of mammals in the Alabama coastal zone and a proposed resource plan for their management. Pages 263-276 in H.A. Loyacano and J.P. Smith, eds. Symposium on the Natural Resources of the Mobile Estuary, Alabama. U.S. Army Corps of Engineers, Mobile District.

1981 & 1982. Present levels of birds and mammals in the coastal zone. Alabama Coastal Area Board Technical Reports CAB 81-84 and CAB 82-06

Gulf Universities Research Consortium. 1979. Final Report on the Alabama coastal zone ecology and water quality data information source, existing benthic data evaluation. Marine Sciences Consortium. Dauphin Island, AL.

Mount, R.H. 1975. The reptiles and amphibians of Alabama. Auburn Agric. Exp. Station. Auburn, Alabama. 347 pp.

Office of Coastal Zone Management. 1974. Alabama Coastal Area Management Plan and Final Environmental Impact Statement. U.S. Department of Commerce. National Oceanographic and Atmospheric Admn. OCZM. Washington, D.C. 411 pp.

O'Neal, P.E. and M.F. Mettee. 1982. Alabama coastal region ecological characterization. Volume 2. A synthesis of environmental data. U.S. Fish and Wildlife Service, Office of Biological Services, Washington, D.C. FWS/OBS-82/42 346 pp.

Riccio, J.F., J.D. Hardin, and G.M. Lamb. 1973. Development of a hydrologic concept for the greater Mobile metropolitan-urban environment. Alabama Geol. Survey Open-file Rep. 226 pp.

Soil Conservation Service. 1974. General soil map State of Alabama. Auburn, Alabama.

South Alabama Regional Planning Commission. 1979. Water quality management plant, Mobile and Baldwin couunties, Alabama. South Alabama Reyional Planning Comm., Mobile, Alabama. 669 pp.

Stout, J.P. and M.G. Lelong. 1981. Wetland habitats of the Alabama coastal area. Alabama Coastal Area Board Tech. Publ. CAB-81-01. 27 pp.

Swigle, H.A. 1971. Biology of Alabama estuarine areas - cooperative Gulf of Mexico estuarine inventory. Alabama Mar. Resour. Bull. 5:1123

Tucker, W.H. 1979. Freshwater fish and fisheries resources of the Mobile Delta. Pages 157-166 in H.A. Loyacano and J.P. Smith, eds. Symposium on the National Resources of the Mobile Estuarine, Alabama. U.S. Army Corps of Engineers, Mobile District.

Wade, C.W. 1977. Survey of the Alabama Marine recreational fishery. Alabama Mar. Resour. Bull. 22 pp.

IX. APPENDICES

A. Program Regulations Highlighting Biogeographic Classifications

B. Memorandum of Understanding between the State of Alabama and the National Oceanic and Atmospheric Administration

C. Checklist of the Dominant Plants of the Weeks Bay Estuarine Sanctuary Project

D. Checklist of Animals in the Vicinity of the Weeks Bay Estuarine Sanctuary Project

E. List of Birds Which Possibly Occur in the Weeks Bay Area

F. Animals With Endangered, Threatened, or Special Concern Status With Collection Records or Likely to Occur in the Weeks Bay, Alabama Area

APPENDIX A - MEMORANDUM OF UNDERSTANDING BETWEEN THE STATE OF ALABAMA AND THE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

MEMORANDUM OF UNDERSTANDING
BETWEEN
THE STATE OF ALABAMA
AND
THE NATIONAL OCEANIC AND ATMOSPHERIC AUMINISTRATION
CONCERNING THE
ESTABLISHMENT AND ADMINISTRATION OF
THE WEEKS BAY NATIONAL ESTUARINE SANCTUARY

WHEREAS, the State of Alabama has determined that the waters and related coastal habitats of Weeks Bay provide unique opportunities to study natural and human processes occurring within an embayed estuarine ecosystem of Mobile Bay; and

WHEREAS, it is the finding of the State of Alabama that the resources of Weeks Bay and the values they represent to the citizens of Alabama and the United States are susceptible to degradation through man's activities and natural phenomena, and would benefit from the management of Weeks Bay as a National Estuarine Sanctuary; and

WHEREAS, the National Oceanic and Atmospheric Administration (NUAA), U.S. Department of Commerce has concurred with that finding and pursuant to its authority under Section 315 of the Coastal Zone Management Act of 1972, as amended (CZMA), P.L. 92-583, 16 U.S.C. 1461, and in accordance with implementing regulations at 15 CFR 921.30, may designate Weeks Bay as a National Estuarine Sanctuary; and

WHEREAS, the Governor, State of Alabama, has designated the Alabama Department of Economic and Community Affairs (ADECA) to act on behalf of the State in matters concerning the Weeks Bay National Estuarine Sanctuary (WBNES), the boundaries of which are delineated in the proposed Sanctuary Management Plan (Plan); and

WHEREAS, ADECA, as the agency designated in the Plan and by the State of Alabama responsible for managing the WBNES, acknowledges the need and requirement for continuing State-Federal cooperation in the long-term management of the site in a manner consistent with the purposes sought through its designation.

NOW, THEREFORE, in consideration of the mutual covenants contained herein it is agreed by and between the ADECA and NUAA, effective on the date of the designation of the Weeks Bay National Estuarine Sanctuary, as follows:

ARTICLE I: State-Federal Roles in Sanctuary Management

A. ADECA, as the principal contact for the State of Alabama in all matters concerning the WBNES, will serve to ensure that the Sanctuary is managed in a manner consistent with the goals of the National Estuarine Sanctuary Program and the management objectives of the Plan. Its responsibilities for Plan implementation will include the following:

(1) Effect and maintain a process for coordinating the roles and responsibilities of all State agencies involved in the management of the Sanctuary, including but not limited to:

(a) Enforcement programs regulating water quality, fish and wildlife habitat protection, sport and commercial fisheries, and non-consumptive recreational activites;

(b) The on-site administration of facilities, programs, and tasks related to Sanctuary management;

(c) Activities and programs conducted pursuant to the State's Federally-approved coastal management program authorized under Section 306 of the CZMA; and

(d) Research agenda developed and implemented in accordance with corresponding elements of the proposed Plan;

(2) As the Governor's designee under 15 CFR 921.50 and recipient State entity in matters concerning all financial assistance awards authorized under Section 315 of the CZMA, apply for, budget, and allocate such funds received for supplemental acquisition and development, operation and management, and research;

(3) Prepare and submit to NOAA for its approval an operational strategy which in coordination with the Plan describes how the State of Alabama intends to meet its long-term commitment to the management of the Sanctuary. The strategy, at a minimum, will describe the following:

(a) Specific mediation procedures and resolution mechanisms, developed jointly with the SPO, for reaching mutually acceptable solutions for correcting or avoiding conflicts requiring action under 15 CFR 921.35;

(b) The procedures developed in accordance with SPO guidelines and proposed by the State as a means for prescribing contingency responses to emergency conditions that exceed routine Plan implementation; and

(c) The Plan's continuing function, after Federal financial assistance for operations and management ends, as a vehicle for carrying out the mission of the national program; i.e., (i) how the State intends to coordinate Sanctuary management with its coastal resource management decisionmaking process; (ii) the anticipated work program, priorities, and sources of funding for ensuring the continued maintenance of the Sanctuary; and, (iii) the means relied upon by the State to assure NOAA that real property acquired with Federal funds for the purposes of the Sanctuary will continue to be used in a manner consistent with 15 CFR 921.21(e);

(4) Serve as principal negotiator on issues involving proposed boundary changes and/or amendments to the Plan;

(5) Submit annual reports to NOAA on the Sanctuary describing, in accordance with 15 CFR 921.34, program performance in Plan implementation and a detailed work program for the following year of Sanctuary operations, including budget projections and research efforts;

(6) Respond to NOAA's requests for information and to evaluation findings made pursuant to Section 312 of the CZMA; and

(7) In the event that it should become necessary, based on findings of deficiency, serve as the point-of-contact for the State of Alabama in actions involving the possible withdrawal of sanctuary designation, as provided at 15 CFR 921.35.

B. Within NOAA, the Sanctuary Programs Division (SPD), Office of Ocean and Coastal Resource Management (OCRM), will serve to administer the provisions of Section 315 of the CZMA to ensure that the WBNES is managed in accordance with the goals of the National Estuarine Sanctuary Program and the Plan. In carrying out its responsibilities, the SPD will:

(1) Subject to appropriation, provide financial assistance to the State, consistent with 15 CFR 921 Subparts D, E, and F, for managing and operating the Sanctuary;

(2) Serve as the point-of-contact for NOAA in discussions regarding applications for and any financial assistance received by the State under Section 315 of the CZMA, including any and all performance standards, compliance schedules, or Special Award Conditions deemed appropriate by NOAA to ensure the timely and proper execution of the proposed work program;

(3) Participate in periodic evaluations scheduled by OCRM in accordance with Section 312 of the CZMA to measure the State's performance in Plan implementation and its compliance with the terms and conditions prescribed in financial assistance awards granted by NOAA for the purposes of the Sanctuary and advise appropriate OCRM staff of existing or emerging issues which might affect the State's coastal management program; and

(4) Establish an information transfer/exchange network cataloging all available research data and educational material developed on each site included within the national system of estuarine sanctuaries.

ARTICLE II: Real Property Acquired for the Purposes of the Sanctuary

A. The ADECA agrees to the conditions set forth at 15 CFR 921.21(e) which specify the legal documentation requirements concerning the use and disposition of real property acquired for Sanctuary purposes with Federal funds under Section 315 of the CZMA.

ARTICLE III: Program Evaluation

A. During the period that Federal financial assistance is available for Sanctuary operations and management, OCRM will schedule, pursuant to 15 CFR 921.34, periodic evaluations of the State's performance in meeting the conditions of such awards and progress in implementing the Plan and the provisions of this MOU. Where findings of deficiency occur, NOAA may initiate action in accordance with the procedures established at 15 CFR 921.35.

B. After Federal financial assistance under Section 315 of the CZMA is no longer available for the operation and management of the Sanctuary, OCRM will continue to evaluate, pursuant to Section 312 of the CZMA and the corresponding provisions of 15 CFR 921, ADECA's performance in implementing the Plan and strategy committing the State to the long-term management of the WBNES. Where findings of deficiency occur, NOAA may initiate action in accordance with the procedures established at 15 CFR 921.35.

IN WITNESS THEREOF, the parties hereto have caused this Memorandum to be executed.

Peter L. Tweedt
Director
Office of Ocean and Coastal Resource Management
National Oceanic and Atmospheric Administration
U.S. Department of Commerce

AUG 6 1985
Date

William M. Rushton
Director
Alabama Department of Economic and Community Affairs
State of Alabama

7/31/85
Date

Dr. Nancy Foster
Chief
Sanctuary Programs Division
Office of Ocean and Coastal Resource Management
National Oceanic and Atmospheric Administration
U.S. Department of Commerce

8/6/85
Date

Witness

7/31/85
Date

APPENDIX B - NATIONAL ESTUARINE SANCTUARY PROGRAM REGULATIONS

required for this notice of final rulemaking. The regulations set forth procedures for identifying and designating national estuarine sanctuaries, and managing sites once designated.

These rules do not directly affect "small government jurisidictions" as defined by Pub. L. 96-354, the Regulatory Flexibility Act, and the rules will have no effect on small businesses.

(C) Paper Work Reduction Act of 1980 (Pub. L. 96-511)

These regulations do not impose any information requirements of the type covered by Pub. L. 96-511 other than those already approved by the Office of Management and Budget (approval number 0648-0121) for use through September 30, 1986.

(D) National Environmental Policy Act

NOAA has concluded that publication of these rules does not constitute a major Federal action significantly affecting the quality of the human environment. Therefore, an environmental impact statement is not required.

List of Subjects in 15 CFR Part 921

Administrative practice and procedure, Coastal zone, Environmental protection, Natural resources, Wetlands.

(Federal Domestic Assistance Catalog Number 11.420 Estuarine Sanctuary Program)

Dated: February 29, 1984.

Paul M. Wolff,

Assistant Administrator for Ocean Services and Coastal Zone Management.

Accordingly, 15 CFR Part 921 is revised as follows:

PART 921—NATIONAL ESTUARINE SANCTUARY PROGRAM REGULATIONS

Subpart A—General

Sec.
921.1 Mission and goals.
921.2 Definitions.
921.3 National Estuarine Sanctuary Biogeographic Classification Scheme and Estuarine Typologies.
921.4 Relationship to other provisions of the Coastal Zone Management Act and to the National Marine Sanctuary Program.

Subpart B—Preacquisition: Site Selection and Management Plan Development

921.10 General.
921.11 Site selection.
921.12 Management Plan development.

Subpart C—Acquisition, Development, and Preparation of the Final Management Plan

921.20 General.
921.21 Initial acquisition and development awards.

Subpart D—Sanctuary Designation and Subsequent Operation

Sec.
921.30 Designation of National Estuarine Sanctuaries.
921.31 Supplemental acquisition and development awards.
921.32 Operation and management: Implementation of the Management Plan.
921.33 Boundary changes, Amendments to the Management Plan, and addition of multiple-site components.
921.34 Program evaluation.
921.35 Withdrawal of designation.

Subpart E—Research Funds

921.40 General.
921.41 Categories of potential research projects: evaluation criteria.

Subpart F—General Financial Assistance Provisions

921.50 Application information.
921.51 Allowable costs.
921.52 Amendments to financial assistance awards.

Appendix 1—Biogeographic Classification Scheme
Appendix 2—Typology of National Estuarine Areas

Authority: Sec. 315(1), Pub. L. 92-583, as amended; 86 Stat. 1280 (16 U.S.C. 1461(1)).

Subpart A—General

§ 921.1 Mission and goals.

(a) The mission of the National Estuarine Sanctuary Program is the establishment and management, through Federal-state cooperation, of a national system of estuarine sanctuaries representative of the various regions and estuarine types in the United States. Estuarine sanctuaries will be established to provide opportunities for long-term research, education, and interpretation.

(b) The goals of the Program for carrying out this mission are:

(1) Enhance resource protection by implementing a long-term management plan tailored to the site's specific resources;

(2) Provide opportunities for long-term scientific and educational programs in estuarine areas to develop information for improved coastal decisionmaking;

(3) Enhance public awareness and understanding of the estuarine environment through resource interpretive programs; and

(4) Promote Federal-state cooperative efforts in managing estuarine areas.

(c) To assist the states in carrying out the Program's goals in an effective manner, the National Oceanic and Atmospheric Administration (NOAA) will coordinate a research and education information exchange throughout the national estuarine sanctuary system. As part of this role, NOAA will ensure that information and ideas from one sanctuary are made available to others in the system. The network that will be established will enable sanctuaries to exchange information and research data with each other, with universities engaged in estuarine research, and with Federal and state agencies. NOAA's objective is a system-wide program of research and monitoring capable of addressing the management issues that affect long-term productivity of our Nation's estuaries.

(d) Multiple uses are encouraged to the degree compatible with the sanctuary's overall purpose as provided in the management plan and consistent with subsections (a) and (b), above. Use levels are set by the individual state and analyzed in the management plan. The sanctuary management plan (see § 921.12) will describe the uses and establishes priorities among these uses. The plan shall identify uses requiring a state permit, as well as areas where uses are encouraged or prohibited. In general, sanctuaries are intended to be open to the public; low-intensity recreational and interpretive activities are generally encouraged.

(e) Certain manipulative research activities may be allowed on a limited basis, but only if specified in the management plan and only if the activity is consistent with overall sanctuary purposes and the sanctuary resources are protected. Manipulative research activities require the prior approval of the state and NOAA. Habitat manipulation for resource management purposes is not permitted within national estuarine sanctuaries.

(f) While the Program is aimed at protecting natural, pristine sites, NOAA recognizes that many estuarine areas have undergone ecological change as a result of human activities. Although restoration of degraded areas is not a primary purpose of the Program, some restorative activities may be permitted in an estuarine sanctuary as specified in the management plan.

(g) NOAA may provide financial assistance to coastal states, not to exceed 50 percent of all actual costs, to assist in the designation and operation of national estuarine sanctuaries (see section 921.51(e)). Three types of awards are available under the National Estuarine Sanctuary Program. The *preacquisition award* is for site selection and draft management plan preparation. The *acquisition and development award* is intended primarily for land acquisition and construction purposes. The *operation and management award* provides funds to assist in implementing the research, educational, and administrative

programs detailed in the sanctuary management plan. Under the Act, the Federal share of funding for a national estuarine sanctuary shall not exceed $3,000,000. At the conclusion of Federal financial assistance, funding for the long-term operation of the sanctuary becomes the responsibility of the state.

(h) Lands already in protected status by another Federal, state, local government or private organization can be included within national estuarine sanctuaries only if the managing entity commits to long-term non-manipulative management. Federal lands already in protected status cannot comprise the key land and water areas of a sanctuary (see § 921.11(c)(3)).

§ 921.2 Definitions.

(a) "Act" means the Coastal Zone Management Act, as amended, 16 U.S.C. 1451 *et seq.* Section 315(1) of the Act, 16 U.S.C. 1461(1), establishes the National Estuarine Sanctuary Program.

(b) "Assistant Administrator" (AA) means the Assistant Administrator for Ocean Services and Coastal Zone Management, National Ocean Service, National Oceanic and Atmospheric Administration, U.S. Department of Commerce, or his/her successor or designee.

(c) "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 Marianas, and the Trust Territories of the Pacific Islands, and American Samoa (see 16 U.S.C. 1454(4)).

(d) "Estuary" means that part of a river or stream or body of water having unimpaired connection with the open sea, where the sea water is measurably diluted with fresh water derived from land drainage. The term also includes estuary-type areas of the Great Lakes. see 16 U.S.C. 1454(7).

(e) "National Estuarine Sanctuary" means and area, which may include all or the key land and water portion of an estuary, and adjacent transitional areas and uplands, constituting to the extent feasible a natural unit, set asides as a natural field laboratory to provide long-term opportunities for research, educational, and interpretation on the ecological relationships within the area (see 16 U.S.C. 1454(8)).

§ 921.3 National Estuarine Sanctuary Biogeographic Classification Scheme and Estuarine Typologies.

(a) National estuarine sanctuaries are chosen to reflect regional differences and to include a variety of ecosystem types. A biogeographic classification scheme based on regional variations in the nation's coastal zone has been developed. The biogeographic classification scheme is used to ensure that the National Estuarine Sanctuary System includes at least one site from each region. The estuarine typology system is utilized to ensure that sites in the Program reflect the wide range of estuarine types within the United States.

(b) The biogeographic classification scheme, presented in Appendix 1, contains 27 regions. Figure 2 graphically depicts the biogeographic regions of the United States.

(c) The typology system is presented in Appendix 2.

§ 921.4 Relationship to other provisions of the Coastal Zone Management Act and to the National Marine Sanctuary Program.

(a) The National Estuarine Sanctuary Program is intended to provide information to state agencies and other entities involved in coastal zone management decisionmaking pursuant to the Coastal Zone Management Act, 16 U.S.C. 1451 *et seq.* Any coastal state, including those that do not have approved coastal zone management programs under section 306 of the Act, is eligible for an award under the National Estuarine Sanctuary Program (see § 921.2(e)).

(b) Where feasible, the National Estuarine Sanctuary Program will be conducted in close coordination with the National Marine Sanctuary Program (Title III of the Marine Protection, Research and Sanctuaries Act, as amended, 16 U.S.C. 1431–1434), also administered by NOAA. Title III authorizes the Secretary of Commerce to designate ocean waters as marine sanctuaries to protect or restore such areas for their conservation, recreational, ecological, or esthetic values. National marine and estuarine sanctuaries will not overlap, though they may be adjacent.

Subpart B—Preacquisition: Site Selection and Management Plan Development

§ 921.10 General.

(a) A state may apply for a preacquisition award for the purpose of site selection and preparation of documents specified in § 921.12 (draft management plan and environmental impact statement (EIS)). The total Federal share of the preacquisition award may not exceed $50,000, of which up to $10,000 may be used for site selection as described in § 921.11. Financial assistance application procedures are specified in Subpart F.

(b) In selecting a site, a state may choose to develop a multiple-site sanctuary reflecting a diversity of habitats in a single biogeographic region. A multiple-site sanctuary also allows the state to develop complementary research and educational programs within the multiple components of its sanctuary. Multiple-site sanctuaries are treated as one sanctuary in terms of financial assistance and development of an overall management framework and plan. Each individual component of a proposed multiple-site sanctuary shall be evaluated separately under § 921.11(c) as part of the site selection process. A state may propose to establish a multiple-site sanctuary at the time of the initial site selection, or at any point in the development or operation of the estuarine sanctuary, even after Federal funding for the single component sanctuary has expired. If the state decides to develop a multiple-site national estuarine sanctuary after the initial acquisition and development award is made on a single site, the proposal is subject to the requirements set forth in § 921.33. It should be noted, however, that the total funding for a multiple-site sanctuary remains at the $3,000,000 limit; the funding for operation of a multiple-site sanctuary is also limited to the $250,000 standard (see § 921.32(b)).

§ 921.11 Site selection.

(a) A state may use up to $10,000 in Federal preacquisition funds to establish and implement a site selection process which is approved by NOAA.

(b) In Addition to the requirements set forth in Subpart F, a request for Federal funds for site selection must contain the following programmatic information:

(1) A description of the proposed site selection process and how it will be implemented in conformance with the biogeographic classification scheme and typology (§ 921.3);

(2) An identification of the site selection agency and the potential management agency; and

(3) A description of how public participation will be incorporated into the process (see § 921.11(d)).

(c) As part of the site selection process, the state and NOAA shall evaluate and select the final site(s). NOAA has final authority in approving such sites. Site selection shall be guided by the following principles:

(1) The site's benefit to the National Estuarine Sanctuary Program relative to the biogeographic classification scheme

and typology set forth in § 921.3 and Appendices 1 and 2;

(2) The site's ecological characteristics, including its biological productivity, diversity of flora and fauna, and capacity to attract a broad range of research and educational interests. The proposed site should, to the maximum extent possible, be a natural system;

(3) Assurance that the site's boundaries encompass an adequate portion of the key land and water areas of the natural system to approximate an ecological unit and to ensure effective conservation. Boundary size will vary greatly depending on the nature of the ecosystem. National estuarine sanctuaries may include existing Federal or state lands already in a protected status where mutual benefit can be enhanced, see § 921.51(e)(2). Importantly, however, NOAA will not approve a site for potential sanctuary status that is dependent upon the inclusion of currently protected Federal lands in order to meet the requirements for sanctuary status (such as key land and water areas). Such lands may only be included within a sanctuary to serve as a buffer or for other ancillary purposes;

(4) The site's importance for research, including proximity to existing research facilities and educational institutions; *(Comment:* NOAA is developing more detailed criteria for selecting potential national estuarine sanctuaries based upon research characteristics. Once these criteria are developed, a notice of their availability will be published in the **Federal Register**).

(5) The site's compatibility with existing and potential land and water uses in contiguous areas; and

(6) The site's importance to education and interpretive efforts, consistent with the need for continued protection of the natural system.

(d) Early in the site selection process, the state must seek the views of affected landowners, local governments, other state and Federal agencies, and other parties who are interested in the area(s) being considered for selection as a potential national estuarine sanctuary. After the local government and affected landowners have been contacted, at least one public meeting shall be held in the area of the proposed site. Notice of such a meeting, including the time, place, and relevant subject matter, shall be announced by the state through the area's principal news media at least 15 days prior to the date of the meeting and by NOAA in the **Federal Register**.

§ 921.12 Management Plan development.

(a) After the selected site is approved by NOAA and the state, the state may request the remainder of the preacquisition funds to develop the draft management plan and environmental impact statement. The request must be accompanied by the information specified in Subpart F and the following programmatic information:

(1) An analysis of the site based on the biogeographic scheme/typology discussed in § 921.3 and set forth in Appendices 1 and 2;

(2) A description of the site and its major resources, including location, proposed boundaries, and adjacent land uses. Maps, including aerial photographs, are required;

(3) A description of the public participation process used by the state to solicit the views of interested parties, a summary of comments, and, if interstate issues are involved, documentation that the Governor(s) of the other affected state(s) has been contacted;

(4) A list of all sites considered and a brief statement of the basis for not selecting the non-preferred sites; and

(5) A draft management plan outline (see subsection (b) below) and an outline of a draft memorandum of understanding (MOU) between the state and NOAA detailing the Federal-state roles in sanctuary management during the period of federal funding and expressing the state's long-term commitment to operate and manage the sancturay.

(b) After NOAA approves the state's request to use the remaining preacquisition funds, the state shall begin developing a draft management plan. The plan will set out in detail:

(1) Sanctuary goals and objectives, management issues, and strategies or actions for meeting the goals and objectives;

(2) An administrative section including staff roles in administration, research, education/interpretation, and surveillance and enforcement.

(3) A research plan, including a monitoring design;

(4) An interpretive plan (including interpretive, educational and recreational activities);

(5) A plan for public access to the sanctuary;

(6) A construction plan, including a proposed construction schedule, and drawings of proposed developments. If a visitor center, research center or any other facilities are proposed for construction or renovation at the site, a preliminary engineering report must be prepared;

Note.—Information on preparing a preliminary engineering report (PER) is provided in "Engineering and Construction Guidelines for Coastal Energy Impact Program Applicants" (42 FR 64630 (1977)), which is supplied to award recipients.

(7) An acquisition plan identifying the ecologically key land and water areas of the sanctuary, priority acquisitions, and strategies for acquiring these areas. This plan should identify ownership patterns within the proposed sanctuary boundaries; land already in the public domain; an estimate of the fair market value of land to be acquired; the method of acquisition, or the feasible alternatives (including less-than-fee techniques) for the protection of the estuarine area; a schedule for acquisition with an estimate of the time required to complete the proposed sanctuary; and a discussion of any anticipated problems;

Note.—As discussed in § 921.11(c)(3), if protected lands are to be included within the proposed sanctuary, the state must demonstrate to NOAA that the site meets the criteria for national estuarine sanctuary status independent of the inclusion of such protected lands.

(8) A resource protection plan detailing applicable authorities, including allowable uses, uses requiring a permit and permit requirements, any restrictions on use of the sanctuary, and a strategy for sanctuary surveillance and enforcement of such use restrictions, including appropriate government enforcement agencies;

(9) If applicable, a restoration plan describing those portions of the site that may require habitat modification to restore natural conditions; and

(10) A proposed memorandum of understanding (MOU) between the state and NOAA regarding the Federal-state relationship during the establishment and development of the national estuarine sanctuary, and expressing the long-term commitment by the state to maintain effectively the sanctuary after Federal financial assistance ends. In conjunction with the MOU and where possible under state law, the state will consider taking appropriate administrative or legislative action to ensure the long-term protection of the sanctuary. The MOU shall be signed prior to sanctuary designation. If other MOUs are necessary (such as with a federal agency or another state agency), drafts of such MOUs also must be included in the plan.

(c) Regarding the preparation of an environmental impact statement (EIS) under the National Environmental Polic Act on a national estuarine sanctuary proposal, the state shall provide all

necessary information to NOAA concerning the socioeconomic and environmental impacts associated with implementing the draft management plan and feasible alternatives to the plan. Based on this information, NOAA will prepare the draft EIS.

(d) Early in the development of the draft management plan and the draft EIS, the state shall hold a meeting in the area or areas most affected to solicit public and government comments on the significant issues related to the proposed action. NOAA will publish a notice of the meeting in the Federal Register and in local media.

(e) NOAA will publish a Federal Register notice of intent to prepare a DEIS. After the draft EIS is prepared and filed with the Environmental Protection Agency (EPA), a Notice of Availability of the DEIS will appear in the Federal Register. Not less than 30 days after publication of the notice, NOAA will hold at least one public hearing in the area or areas most affected by the proposed sanctuary. The hearing will be held no sooner than 15 days after appropriate notice by NOAA of the meeting has been given in the principal news media and in the Federal Register. After a 45-day comment period, a final EIS is prepared by NOAA.

Subpart C—Acquisition, Development, and Preparation of the Final Management Plan

§ 921.20 General.

After NOAA approval of the site, the draft management plan and the draft MOU, and completion of the final EIS, a state is eligible for an acquisition and development award to acquire land and water areas for inclusion in the sanctuary and to construct research and educational facilities in accordance with the draft management plan. The acquisition and development award has two phases. In the initial phase, state performance should work to meet the criteria required for formal sanctuary designation, i.e., acquiring the key land and water areas as specified in the draft management plan and preparing the final plan. These requirements are specified in § 921.30. The initial acquisition and development phase is expected to last no longer than two years after the start of the award. If necessary, a longer time period may be negotiated between the state and NOAA. After the sanctuary is designated, funds may be used to acquire any remaining land and for construction purposes.

§ 921.21 Initial acquisition and development awards.

(a) Assistance is provided to aid the recipient in: (1) Acquiring land and water areas to be included in the sanctuary boundaries; (2) minor construction, as provided in paragraphs (b) and (c) of this section; (3) preparing the final management plan; and (4) up to the point of sanctuary designation, for initial management costs, e.g., implementing the NOAA approved draft management plan, preparing the final management plan, hiring a sanctuary manager and other staff as necessary, and for other management-related activities. Application procedures are specified in Subpart F.

(b) The expenditure of Federal and state funds on major construction activities is not allowed during the initial acquisition and development phase. The preparation of architectural and engineering plans, including specifications, for any proposed construction is permitted. In addition, minor construction activities, consistent with paragraph (c) of this section also are allowed. The NOAA-approved draft management plan must, however, include a construction plan and a public access plan before any award funds can be spent on construction activities.

(c) Only minor construction activities that aid in implementing portions of the management plan (such as boat ramps and nature trails) are permitted under the initial acquisition and development award. No more than five (5) percent of the initial acquisition and development award may be expended on such facilities. NOAA must make a specific determination, based on the final EIS, that the construction activity will not be detrimental to the environment.

(d) Except as specifically provided in paragraphs (a)–(c) of this section, construction projects, to be funded in whole or in part under the acquisition and development award, may not be initiated until the sanctuary receives formal designation, see § 921.30.

Note.—The intent of these requirements and the phasing of the acquisition and development award is to ensure that substantial progress in acquiring the key land and waters areas has been made and that a final management plan is completed before major sums are spent on construction. Once substantial progress in acquisition has been made, as defined by the state in the management plan, other activities guided by the final management plan may begin with NOAA's approval.

(e) Deeds for real property acquired for the sanctuary under acquisition funding shall contain substantially the following provision:

Title to the property conveyed by this deed shall vest in the [recipient of the CZMA Section 315 award or other Federally-approved entity] subject to the condition that the property shall remain part of the Federally-designated [name of National Estuarine Sanctuary]. In the event that the property is no longer included as part of the sanctuary, or if the sanctuary designation of which it is part is withdrawn, then the National Oceanic and Atmospheric Administration or its successor agency, in conjunction with the State, may exercise any of the following rights regarding the disposition of the property:

(i) The recipient may be required to transfer title to the Federal Government. In such cases, the recipient shall be entitled to compensation computed by applying the recipient's percentage of participation in the cost of the program or project to the current fair market value of the property; or

(ii) At the discretion of the Federal Government, (a) the recipient may either be directed to sell the property and pay the Federal Government an amount computed by applying the Federal percentage of participation in the cost of the original project to the proceeds from the sale (minus actual and reasonable selling and fix-up expenses, if any, from the sale proceeds); or (b) the recipient may be permitted to retain title after paying the Federal Government an amount computed by applying the Federal percentage of participation in the cost of the original project to the current fair market value of the property.

Note.—Fair market value of the property must be determined by an independent appraiser and certified by a responsible official of the state, as provided by OMB Circular A-102 Revised, Attachment F.

(f) Prior to submitting the final management plan to NOAA for review and approval, the state should hold a public meeting in the area affected by the estuarine sanctuary. NOAA will publish a notice of the meeting in the Federal Register and in the local media.

Subpart D—Sanctuary Designation and Subsequent Operation

§ 921.30 Designation of National Estuarine Sanctuaries.

(a) The AA shall designate an area as a national estuarine sanctuary pursuant to Section 315 of the Act, based upon written findings that the state has met the following conditions:

(1) A final management plan has been approved by NOAA;

(2) Sanctuary construction and access policies, § 921.21(b)–(d), have been followed;

(3) Key land and water areas of the proposed sanctuary, as identified in the management plan, are under state control; and

(4) An MOU between the state and NOAA ensuring a long-term commitment by the state to the

sanctuary's effective operation and implementation has been signed.

(b) A notice of designation of a national estuarine sanctuary will be placed in the Federal Register and in the local media.

(c) The term "state control" in § 921.30(a)(3) does not necessarily require that the land be owned by the state in fee simple. Less-than-fee interests and regulatory measures may suffice where the state makes a showing that the lands are adequately controlled consistent with the purposes of the sanctuary.

§ 921.31 Supplemental acquisition and development awards.

After sanctuary designation, and as specified in the approved management plan, the state may request a supplemental acquisition and development award for construction and acquiring any remaining land. Application procedures are specified in Subpart F. Land acquisition must follow the procedures specified in § 921.21(e).

§ 921.32 Operation and management: Implementation of the Management plan.

(a) After the sanctuary is formally designated, the state may apply for assistance to provide for operation and management. The purpose of this phase in the national estuarine sanctuary process is to implement the approved final management plan and to take the necessary steps to ensure the continued effective operation of the sanctuary after direct Federal support is concluded.

(b) Federal funds of up to $250,000, to be matched by the state, are available for the operation and management of the national estuarine sanctuary. Operation and management awards are subject to the following limitations:

(1) No more than $50,000 in Federal funds per annual award; and

(2) No more than ten percent of the total amount (state and Federal shares) of each operation and management award may be used for construction-type activities (i.e., $10,000 maximum per year).

§ 921.33 Boundary changes, amendments to the Management Plan, and addition of multiple-site components.

(a) Changes in sanctuary boundaries and major changes to the final management plan, including state laws or regulations promulgated specifically for the sanctuary, may be made only after written approval by NOAA. If determined to be necessary, NOAA may require public notice including notice in the Federal Register and an opportunity for comment. Changes in the boundary involving the acquisition of properties not listed in the management plan or final EIS require public notice and the opportunity for comment in certain cases, an environmental assessment may be required. Where public notice is required, NOAA will place a notice in the Federal Register of any proposed changes in sanctuary boundaries or proposed major changes to the final management plan and ensure that a notice is published in the local media.

(b) As discussed in § 921.10(b), a state may choose to develop a multiple-site national estuarine sanctuary after the initial acquisition and development award for a single site has been made. Public notice of the proposed addition in the Federal Register and local media, and the opportunity for comment, in addition to the preparation of either an environmental assessment or environment impact statement on the proposal will be required. An environmental impact statement, if required, will be prepared in accordance with section 921.12 and will also include an administrative framework for the multiple-site sanctuary that describes the complementary research and educational programs within the sanctuary. If NOAA determines, based on the scope of the project and the issues associated with the additional site, that an environmental assessment is sufficient to establish a multiple-site sanctuary, then the state shall develop a revised management plan as described in § 921.12(b). The revised management plan will address the sanctuary-wide goals and objectives and the additional component's relationship to the original site.

§ 921.34 Program evaluation.

(a) Performance during the term of the operation and management award (or under the initial acquisition and development award, if the sanctuary is not designated within two years) will be evaluated annually by the Program Office and periodically in accordance with the provisions of Section 312 of the Act to determine compliance with the conditions of the award and overall progress in implementing the management plan.

(b) To ensure effective sanctuary oversight after the major federal funding expires, the state is required to submit an annual report on the sanctuary. The report should detail program successes and accomplishments in meeting the policies and activities described in the sanctuary management plan. A work plan, detailing the projects to be undertaken the next year to meet the Program goals and the state's role in ongoing sanctuary programs, should also be included. Inadequate annual reports will trigger a full-scale management audit with a site-visit. On a periodic basis, NOAA will also conduct a full-scale Section 312 evaluation with a site visit and public meeting.

§ 921.35 Withdrawal of designation.

(a) Upon a finding by the Program Office through its programmatic evaluation (§ 921.34) that a national estuarine sanctuary is not meeting the mandate of Section 315 of the Act, the national Program goals or the policies established in the management plan, NOAA will provide the state with a written notice of the deficiency. Such a notice will explain the deficiencies in the state's approach, propose a solution or solutions to the deficiency and provide a schedule by which the state should remedy the deficiency. The state shall also be advised in writing that it may comment on the Program Office's finding of a deficiency and meet with Program officials to discuss the finding and seek to remedy the deficiency.

(b) If the issues cannot be resolved within a reasonable time, the Program Office will make recommendation regarding withdrawal of designation to the AA. A notice of intent to withdraw designation, with an opportunity for comment, will be placed in the Federal Register.

(c) The state shall be provided the opportunity for an informal hearing before the AA to consider the Program Office's recommendation and finding of deficiency, as well as the state's comments on and response to the recommendation and finding.

(d) Within 30 day after the informal hearing, the AA shall issue a written decision regarding the sanctuary. If a decision is made to withdraw sanctuary designation, the procedures specified in § 921.21(e) regarding the disposition of real property acquired with federal funds shall be followed.

Subpart E—Research Funds

§ 921.40 General.

(a) To stimulate high quality research within designated national estuarine sanctuaries, NOAA may find research on a competitive basis to sanctuaries having an approval final management plan. Research funds are intended to support significant research projects that will lead to enhanced scientific understanding of the sanctuary environment, improved coastal decisionmaking, improved sanctuary management, or enhanced public appreciation and understanding of the sanctuary ecosystem. Research opportunities will be identified in final

management plans for national estuarine sanctuaries. Research funds will be used to fill obvious voids in available data, as well as to support creative or innovative projects.

(b) Research funds are provided in addition to any funds available to the state under the operation and management or acquisition and development awards. Research funds must be matched by the state, consistent with § 921.51(e)(iii) ("allowable costs"). Individual states may apply for funding for more than one research project per sanctuary.

§ 921.41 Categories of potential research project; evaluation criteria.

(a) While research funds may be used to start-up long-term projects, they are not intended as a source of continuing funding for a particular project over time. Emphasis will be placed on projects that are also of benefit to other sanctuaries in the system. Proposals for research under the following categories will be considered:

(1) Establishing a Data Base and Monitoring Program (e.g., studies related to gathering and interpreting baseline information on the estuary. Funds are available to establish a data base and monitoring system; however, the long-term support for such a system must be carried out as part of overall sanctuary implementation);

(2) Estuarine Ecology (e.g., studies of the relationships between estuarine species and their environment, studies of biological populations community relationships, studies on factors and processes that govern the biological productivity of the estuary);

(3) Estuarine Processes (e.g., studies on dynamic physical processes that influence and give the estuary its particular physical characteristics, including studies related to climate, patterns of watershed drainage and freshwater inflow, patterns of water circulation within the estuary, and studies on oceanic or terrestrial factors that influence the condition of estuarine waters and bottoms);

(4) Applied Research (e.g., studies designed to answer specific management questions); and

(5) Socioeconomic Research (e.g., studies on patterns of land use, sanctuary visitation, archaeological research).

(b) Proposals for research in national estuarine sanctuaries will be evaluated in accordance with criteria listed below:

(1) Scientific merits;

(2) Relevance or importance to sanctuary management or coastal decisionmaking;

(3) Research quality (i.e., soundness of approach, environmental consequences, experience related to methodologies);

(4) Importance to the National Estuarine Sanctuary Program;

(5) Budget and Institutional Capabilities (i.e., reasonableness of budget, sufficiency of logistical support); and

(6) In addition, in the case of long-term monitoring projects, the ability of the state or the research grant recipient to support the grant beyond this initial funding.

Subpart F—General Financial Assistance Provisions

§ 921.50 Application information.

(a) The maximum total Federal funding per sanctuary is $3,000,000 for the preacquisition, acquisition and development, and operation and management awards. The research funding under § 921.40 is excluded from this total.

(b) Only a state Governor, or his/her designated state agency, may apply for national estuarine sanctuary financial assistance awards. If a state is participating in the national Coastal Zone Management Progam, the recipient of an award under Section 315 of the Act shall consult with the state coastal management agency regarding the application.

(c) No acquisition and development award may be made by NOAA without the approval of the Governor of the state, or his/her designated agency, in which the land to be acquired is located.

(d) All applications are to be submitted to: Management and Budget Group, Office of Ocean and Coastal Resource Management, National Ocean Service, National Oceanic and Atmospheric Administration, 3300 Whitehaven St., NW., Washington, D.C. 20235.

(e) An original and two copies of the complete application must be submitted at least 120 working days prior to the proposed beginning of the project. The Application for Federal Assistance Standard Form 424 (Non-construction Program) constitutes the formal application for preacquisition, operation and management, and research awards. The Application for Federal Assistance Standard Form 424 (Construction Program) constitutes the formal application for land acquisition and development awards. The application must be accompanied by the information required in Subpart B (preacquisition), Subpart C and Section 921.31 (acquisition and development), and § 921.32 (operation and management), as applicable. All applications must contain back up data for budget estimates (Federal and non-Federal shares), and evidence that the application complies with the Executive Order 12372, "Intergovernmental Review of Federal Programs." In addition, applications for acquisition and development awards must contain:

(1) State Historic Preservation Office comments;

(2) Appraisals and title information;

(3) Governor's letter approving the sanctuary proposal; and

(4) Written approval from NOAA of the draft or final management plan.

The Standard Form 424 has been approved by the Office of Management and Budget (Approval number 0648-0121) for use through September 30, 1988.

§ 921.51 Allowable costs.

(a) Allowable costs will be determined in accordance with OMB Circulars A-102, "Uniform Administrative Requirements for Grants-in-Aid to State and Local Governments", and A-87, "Principles for Determining Costs Applicable to Grants and Contracts with State, Local, and Federally Recognized Indian Tribal Governments"; the financial assistance agreement; these regulations; and other Department of Commerce and NOAA directives. The term "costs" applies to both the Federal and non-Federal shares.

(b) Costs claimed as charges to the award must be reasonable, beneficial and necessary for the proper and efficient administration of the financial assistance award and must be incurred during the awards period, except as provided under preagreement costs, subsection (d).

(c) Costs must not be allocable to or included as a cost of any other Federally-financed program in either the current or a prior award period.

(d) Costs incurred prior to the effective date of the award (preagreement costs) are allowable only when specifically approved in the financial assistance agreement. For non-construction awards, costs incurred more than three months before the award beginning date will not be approved. For construction and land acquisition awards, NOAA will evaluate preagreement costs on a case-by-case basis.

(e) General guidelines for the non-Federal share are contained in OMB Circular A-102, Attachment F. The following may be used by the state in satisfying the matching requirement:

(1) *Preacquisition Awards.* Cash and in-kind contributions (value of goods

and services directly benefiting and specifically identifiable to this part of the project) are allowable. Land may not be used as match.

(2) *Acquisition and Development Awards.* Cash and in-kind contributions are allowable. In general, the fair market value of lands to be included within the sanctuary boundaries and acquired pursuant to the Act, with other than Federal funds, may be used as match. The fair market value of privately donated land, at the time of donation, as establishment by an independent appraiser and certified by a responsible official of the State (pursuant to OMB Circular A-102 Revised, Attachment F) may also be used as match. Appraisals must be performed according to Federal appraisal standards as detailed in NOAA regulations and the "Uniform Appraisal Standards for Federal Land Acquisitions." Costs related to land acquisition, such as appraisals, legal fees and surveys, may also be used as match. Land, including submerged lands, already in the state's possession, in a fully-protected status consistent with the purposes of the National Estuarine Sanctuary Program, may be used as match only if it was acquired within a one-year period prior to the award of preacquisition or acquisition funds and with the intent to establish a national estuarine sanctuary. For state lands not in a fully-protected status (e.g., a state park containing an easement for subsurface mineral rights), the value of the development right or foregone value may be used as match if acquired by or donated to the state for inclusion within the sanctuary.

A state may initially use as match land valued at greater than the Federal share of the acquisition and development award. The value in excess of the amount required as match for the initial award may be used to match subsequent supplemental acquisition and development awards for the estuarine sanctuary.

(3) *Operations and Management Awards; Research Funds.* Cash and in-kind contributions (directly benefiting and specifically identifiable to this phase of the project), except land, are allowable.

§ 921.52 Amendments to financial assistance awards.

Actions requiring an amendment to the financial assistance award, such as a request for additional Federal funds, revisions of the approved project budget, or extension of the performance period must be submitted to NOAA on Standard Form 424 (OMB approved number 0748-0121 for use through September 30, 1986) and approved in writing.

Appendix 1—Biographic Classification Scheme

Acadian

1. Northern Gulf of Maine (Eastport to the Sheepscot River).
2. Southern Gulf of Maine (Sheepscot River to Cape Cod).

Virginian

3. Southern New England (Cape Cod to Sandy Hook).
4. Middle Atlantic (Sandy Hook to Cape Hatteras).
5. Chesapeake Bay.

Carolinian

6. Northern Carolinas (Cape Hatteras to Santee River).
7. South Atlantic (Santee River to St. John's River).
8. East Florida (St. John's River to Cape Canaveral).

West Indian

9. Caribbean (Cape Canaveral to Ft. Jefferson and south).
10. West Florida (Ft. Jefferson to Cedar Key).

Louisianian

11. Panhandle Coast (Cedar Key to Mobile Bay).
12. Mississippi Delta (Mobile Bay to Galveston).
13. Western Gulf (Galveston to Mexican border).

Californian

14. Southern California (Mexican border to Point Concepcion).
15. Central California (Point Concepcion to Cape Mendocino).
16. San Francisco Bay.

Columbian

17. Middle Pacific (Cape Mendocino to the Columbia River).
18. Washington Coast (Columbia River to Vancouver Island).
19. Puget Sound.

Great Lakes

20. Western Lakes (Superior, Michigan, Huron).
21. Eastern Lakes (Ontario, Erie).

Fjord

22. Southern Alaska (Prince of Wales Island to Cook Inlet).
23. Aleutian Islands (Cook Inlet to Bristol Bay).

Sub-Arctic

24. Northern Alaska (Bristol Bay to Demarcation Point).

Insular

25. Hawaiian Islands.
26. Western Pacific Island.
27. Eastern Pacific Island.

BILLING CODE 3510-08-M

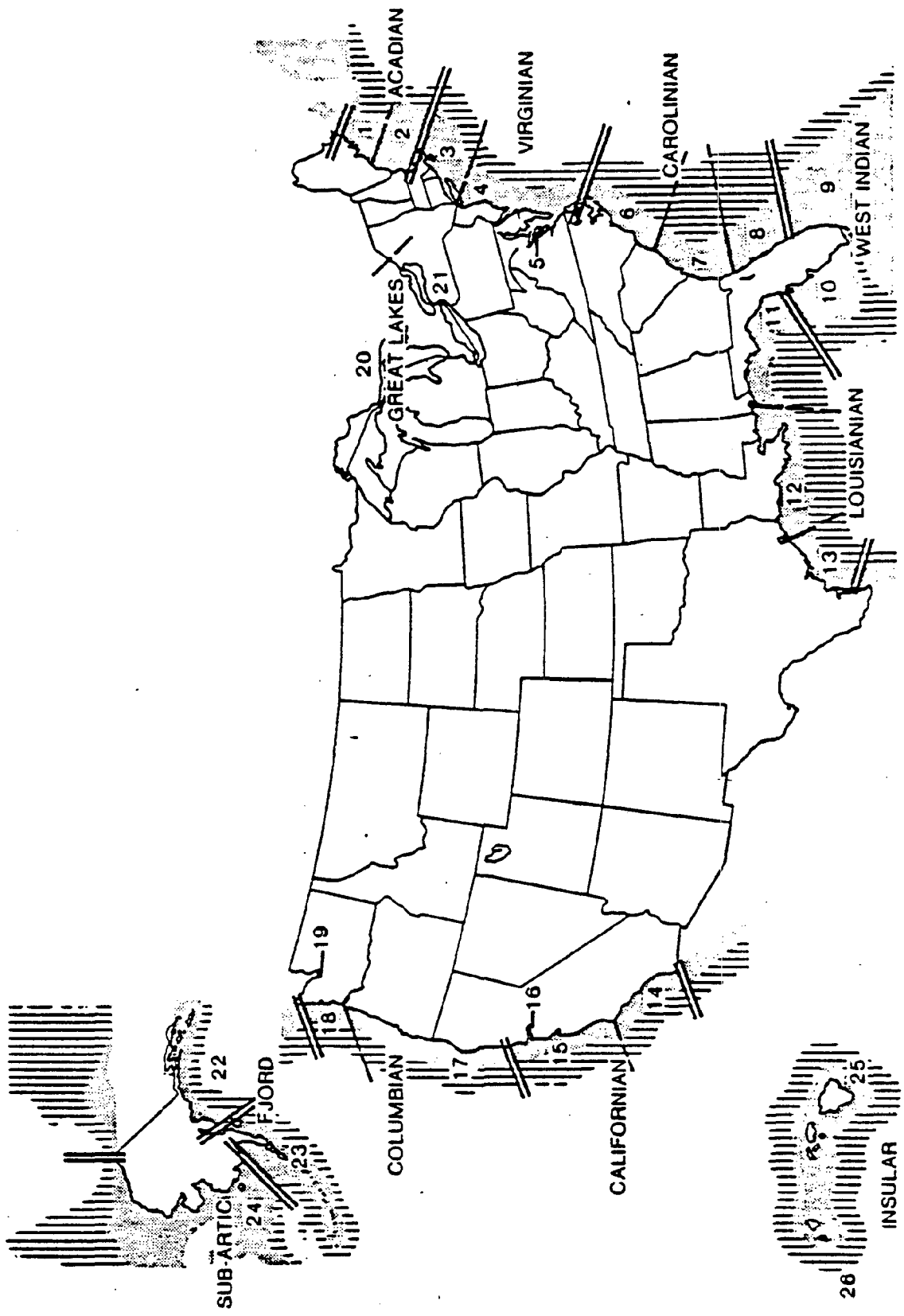


Figure 1. Blogeographic Regions of the United States.

Appendix 2—Typology of National Estuarine Areas

This typology system reflects significant differences in estuarine characteristics that are not necessarily related to regional location. The purpose of this type of classification is to maximize ecosystem variety in the selection of national estuarine sanctuaries. Priority will be given to important ecosystem type as yet unrepresented in the sanctuary system. It should be noted that any one site may represent several ecosystem types or physical characteristics.

Class I—Ecosystem Types

Group I—Shorelands

A. *Maritime Forest-Woodland:* This type of ecosystem consists of single-stemmed species that have developed under the influence of salt spray. It can be found on coastal uplands or recent features, such as barrier islands and beaches, and may be divided into the following biomes:

1. *Northern Coniferous Forest Biome:* This is an area of predominantly evergreens such as the sitka spruce (*Picea*), grand fir (*Abies*), and white cedar (*Thuja*), with poor development of the shrub and herb layers, but high annual productivity and pronounced seasonal periodicity.

2. *Moist Temperate (Mesothermal) Coniferous Forest Biome:* Found along the west coast of North America from California to Alaska, this area is dominated by conifers, has a relatively small seasonal range, high humidity with rainfall ranging from 30 to 150 inches, and a well-developed understory of vegetation with an abundance of mosses and other moisture-tolerant plants.

3. *Temperate Deciduous Forest Biome:* This biome is characterized by abundant, evenly distributed rainfall, moderate temperatures which exhibit a distinct seasonal pattern, well-developed soil biota and herb and shrub layers, and numerous plants which produce pulpy fruits and nuts. A distant subdivision of this biome is the *pine edaphic forest* of the southeastern coastal plain, in which only a small portion of the area is occupied by climax vegetation, although it has large areas covered by edaphic climax pines.

4. *Broad-leaved Evergreen Subtropical Forest Biomes:* The main characteristic of this biome is high moisture with less pronounced differences between winter and summer. Examples are the hammocks of Florida and the live oak forests of the Gulf and South Atlantic coasts. Floral dominants include pines, magnolias, bays, hollies, wild tamarind, strangler fig, gumbo limbo, and palms.

B. *Coast Shrublands:* This is a transitional area between the coastal grasslands and woodlands and is characterized by woody species with multiple stems a few centimeters to several meters above the ground developing under the influence of salt spray and occasional sand burial. This includes thickets, scrub, scrub savanna, heathlands, and coastal chaparral. There is a great variety of shrubland vegetation exhibiting regional specificity:

1. *Northern Areas:* Characterized by *Hudsonia*, various ericaceous species, and thickets of *Myrica*, *Prunus*, and *Rosa*.

2. *Southeast Areas:* Floral dominants include *Myrica*, *Baccharis*, and *Ilex*.

3. *Western Areas: Adenostoma*, *Arcotyphylos*, and *Eucalyptus* are the dominant floral species.

C. *Coastal Grasslands:* This area, which possesses sand dunes and coastal flats, has low rainfall (10 to 30 inches per year) and large amounts of humus in the soil. Ecological succession is slow, resulting in the presence of a number of seral stages of community development. Dominant vegetation includes mid-grasses (2 to 4 feet tall), such as *Ammophila*, *Agropyron*, and *Calamovilfa*, tall grasses (5 to 8 feet tall), such as *Spartina*, and trees such as the willow (*Salix* sp.), cherry (*Prunus* sp.), and cottonwood (*Populus deltoides*). This area is divided into four regions with the following typical strand vegetation:

1. Arctic/Boreal: *Elymus;*
2. Northeast/West: *Ammophila;*
3. Southeast/Gulf: *Uniola;* and
4. Mid-Atlantic/Gulf: *Spartina patens.*

D. *Coastal Tundra:* This ecosystem, which is found along the Arctic and Boreal coasts of North America, is characterized by low temperatures, a short growing season, and some permafrost, producing a low, treeless mat community made up of mosses, lichens, heath, shrubs, grasses, sedges, rushes, and herbaceous and dwarf woody plants. Common species include arctic/alpine plants such as *Empetrum nigrum* and *Betula nana*, the lichens *Cetraria* and *Cladonia*, and herbaceous plants such as *Potentilla tridentata* and *Rubus chamaemorus*. Common species on the coastal beach ridges of the high arctic desert include *Dryas intergrifolia* and *Saxifrage oppositifolia*.

This area can be divided into two main subdivisions:

1. *Low Tundra:* characterized by a thick, spongy mat of living and undecayed vegetation, often with water and dotted with ponds when not frozen; and

2. *High Tundra:* a bare area except for a scanty growth of lichens and grasses, with underlying ice wedges forming raised polygonal areas.

E. *Coastal Cliffs:* This ecosystem is an important nesting site for many sea and shore birds. It consists of communities of herbaceous, graminoid, or low woody plants (shrubs, heath, etc.) on the top or along rocky faces exposed to salt spray. There is a diversity of plant species including mosses, lichens, liverworts, and "higher" plant representatives.

Group II—Transition Areas

A. *Coastal Marshes:* These are wetland areas dominated by grasses (Poaceae), sedges (Cyperaceae), rushes (Juncaceae), cattails (Typhaceae), and other graminoid species and is subject to periodic flooding by either salt or freshwater. This ecosystem may be subdivided into: (a) tidal, which is periodically flooded by either salt or brackish water; (b) non-tidal (freshwater); or (c) tidal freshwater. These are essential habitats for many important estuarine species of fish and invertebrates as well as shorebirds and waterfowl and serves important roles in shore stabilization, flood control, water purification, and nutrient transport and storage.

B. *Coastal Swamps:* These are wet lowland areas that support mosses and shrubs together with large trees such as cypress or gum.

C. *Coastal Mangroves:* This ecosystem experiences regular flooding on either a daily, monthly, or seasonal basis, has low wave action, and is dominated by variety of salt-tolerant trees, such as the red mangrove (*Rhizophora mangle*), black mangrove (*Avicennia nitida*), and the white mangrove (*Laguncularia racemosa*). It is also an important habitat for large populations of fish, invertebrates, and birds. This type of ecosystem can be found from central Florida to extreme south Texas to the islands of the Western Pacific.

D. *Intertidal Beaches:* This ecosystem has a distinct biota of microscopic animals, bacteria, and unicellular algae along with macroscopic crustaceans, molluska, and worms with a detritus-based nutrient cycle. This area also includes the driftline communities found at high tide levels on the beach. The dominant organisms in this ecosystem include crustaceans such as the mole crab (*Emerita*), amphipods (Gammaridae), ghost crabs (*Ocypode*), and bivalve molluscs such as the coquina (*Donax*) and surf clams (*Spisula* and *Mactra*).

E. *Intertidal Mud and Sand Flats.* These areas are composed of unconsolidated, non-organic content sediments that function as a short-term storage area for nutrients and organic carbons. Macrophytes are nearly absent in this ecosystem, although it may be heavily colonized by benthic diatoms, dino-flagellates, filamentous blue-green and green algae, and chaemosynthetic purple sulfur bacteria. This system may support a considerable population of gastropods, bivalves, and polychaetes, and may serve as a feeding area for a variety of fish and wading birds. In sand, the dominant fauna include the wedge shell *Donax*, the scallop *Pecten*, tellin shells *Tellina*, the heart urchin *Echinocardium*, the lug worm *Arenicola*, sand dollar *Dendraster*, and the sea pansy *Renilla*. In mud, faunal dominants adapted to low oxygen levels include the terebellid *Amphitrite*, the boring clam *Playdon*, the deep sea scallop *Placopecten*, the quahog *Mercenaria*, the echiurid worm *Urechis*, the mud snail *Nassarius*, and the sea cucumber *Thyone*.

F. *Intertidal Algal Beds:* These are hard substrates along the marine edge that are dominated by macroscopic algae, usually thalloid, but also filamentous or unicellular in growth form. This also includes the rocky coast tidepools that fall within the intertidal zone. Dominant fauna of these areas are barnacles, mussels, periwinkles, anemones, and chitons. Three regions are apparent:

1. *Northern Latitude Rocky Shores:* It is in this region that the community structure is best developed. The dominant algal species include *Chondrus* at the low tide level, *Fucus* and *Ascophyllum* at the mid-tidal level, and *Laminaria* and other kelp-like algae just beyond the intertidal, although they can be exposed at extremely low tides or found in very deep tidepools.

2. *Southern Latitudes:* The communities in this region are reduced in comparison to

those of the northern latitudes and possesses algae consisting mostly of single-celled or filamentous green, blue-green, and red algae, and small thalloid brown algae.

3. *Tropical and Subtropical Latitudes:* The intertidal in this region is very reduced and contains numerous calcareous algae such as *Porolithon* and *Lithothamnion*, as well as green algae with calcareous particles such as *Halimeda*, and numerous other green, red, and brown algae.

Group III—Submerged Bottoms

A. *Subtidal Hardbottoms:* This system is characterized by a consolidated layer of solid rock or large pieces of rock (neither of biotic origin) and is found in association with geomorphological features such as submarine canyons and fjords and is usually covered with assemblages of sponges, sea fans, bivalves, hard corals, tunicates, and other attached organisms. A significant feature of estuaries in many parts of the world is the oyster reef, a type of subtidal hardbottom. Composed of assemblages of organisms (usually bivalves), it is usually found near an estuary's mouth in a zone of moderate wave action, salt content, and turbidity. If light levels are sufficient, a covering of microscopic and attached macroscopic algae, such as kelp, may also be found.

B. *Subtidal Softbottoms:* Major characteristics of this ecosystem are an unconsolidated layer of fine particles of silt, sand, clay, and gravel, high hydrogen sulfide levels, and anaerobic conditions often existing below the surface. Macrophytes are either sparse or absent, although a layer of benthic microalgae may be present if light levels are sufficient. The faunal community is dominated by a diverse population of deposit feeders including polychaetes, bivalves, and burrowing crustaceans.

C. *Subtidal Plants:* This system is found in relatively shallow water (less than 8 to 10 meters) below mean low tide. It is an area of extremely high primary production that provides food and refuge for a diversity of faunal groups, especially juvenile and adult fish, and in some regions, manatees and sea turtles. Along the North Atlantic and Pacific coasts, the seagrass *Zostera marina* predominates. In the South Atlantic and Gulf coast areas, *Thalassia* and *Diplanthera* predominate. The grasses in both areas support a number of epiphytic organisms.

Class II—Physical Characteristics

Group I—Geologic

A. *Basin Type:* Coastal water basins occur in a variety of shapes, sizes, depths, and appearances. The eight basic types discussed below will cover most of the cases:

1. *Exposed Coast:* Solid rock formations or heavy sand deposits characterize exposed ocean shore fronts, which are subject to the full force of ocean storms. The sand beaches are very resilient, although the dunes lying just behind the beaches are fragile and easily damaged. The dunes serve as a sand storage area, making them chief stabilizers of the ocean shorefront.

2. *Sheltered Coast:* Sand or coral barriers, built up by natural forces, provide sheltered areas inside a bar or reef where the ecosystem takes on many characteristics of confined waters—abundant marine grasses, shellfish, and juvenile fish. Water movement is reduced, with the consequent effects of pollution being more severe in this area than in exposed coastal areas.

3. *Bay:* Bays are larger confined bodies of water that are open to the sea and receive strong tidal flow. When stratification is pronounced, the flushing action is augmented by river discharge. Bays vary in size and in type of shorefront.

4. *Embayment:* A confined coastal water body with narrow, restricted inlets and with a significant freshwater inflow can be classified as an embayment. These areas have more restricted inlets than bays, are usually smaller and shallower, have low tidal action, and are subject to sedimentation.

5. *Tidal River:* The lower reach of a coastal river is referred to as a tidal river. The coastal water segment extends from the sea or estuary into which the river discharges to a point as far upstream as there is significant salt content in the water, forming a salt front. A combination of tidal action and freshwater outflow makes tidal rivers well-flushed. The tidal river basin may be a simple channel or a complex of tributaries, small associated embayments, marshfronts, tidal flats, and a variety of others.

6. *Lagoon:* Lagoons are confined coastal bodies of water with restricted inlets to the sea and without significant freshwater inflow. Water circulation is limited, resulting in a poorly flushed, relatively stagnant body of water. Sedimentation is rapid with a great potential for basin shoaling. Shores are often gently sloping and marshy.

7. *Perched Coastal Wetlands:* Unique to Pacific islands, this wetland type, found above sea level in volcanic crater remnants, forms as a result of poor drainage characteristics of the crater rather than from sedimentation. Floral assemblages exhibit distinct zonation while the faunal constituents may include freshwater, brackish, and/or marine species. Example: Aunu'u Island, American Samoa.

8. *Anchialine Systems:* These small coastal exposures of brackish water form in lava depressions or elevated fossil reefs, have only a subsurface connection to the ocean, but show tidal fluctuations. Differing from true estuaries in having no surface continuity with streams or ocean, this system is characterized by a distinct biotic community dominated by benthic algae such as *Rhizoclonium*, the mineral encrusting *Schizothrix*, and the vascular plant *Ruppia maritima*. Characteristic fauna, which exhibit a high degree of endemicity, include the mollusks *Theodoxus neglectus* and *T. cariosus*, the small red shrimp *Metabetaeus lohena* and *Halocaridina rubra*, and the fish *Eleotris sandwicensis* and *Kuhlia sandvicensus*. Although found throughout the world, the high islands of the Pacific are the only areas within the U.S. where this system can be found.

B. *Basin Structure:* Estuary basins may result from the drowning of a river valley (coastal plains estuary), the drowning of a glacial valley (fjord), the occurrence of an offshore barrier (bar-bounded estuary), some tectonic process (tectonic estuary), or volcanic activity (volcanic estuary).

1. *Coastal plains estuary:* Where a drowned valley consists mainly of a single channel, the form of the basin is fairly regular, forming a simple coastal plains estuary. When a channel is flooded with numerous tributaries, an irregular estuary results. Many estuaries of the eastern United States are of this type.

2. *Fjord:* Estuaries that form in elongated, steep headlands that alternate with deep U-shaped valleys resulting from glacial scouring are called fjords. They generally possess rocky floors or very thin veneers of sediment, with deposition generally being restricted to the head where the main river enters. Compared to total fjord volume, river discharge is small. But many fjords have restricted tidal ranges at their mouths, due to sills, or upreaching sections of the bottom which limit free movement of water, often making river flow large with respect to the tidal prism. The deepest portions are in the upstream reaches, where maximum depths can range from 800 m to 1200 m, while sill depths usually range from 40 m to 150 m.

3. *Bar-bounded Estuary:* These result from the development of an offshore barrier, such as a beach strand, a line of barrier islands, reef formations, a line of moraine debris, or the subsiding remnants of a deltaic lobe. The basin is often partially exposed at low tide and is enclosed by a chain of offshore bars or barrier islands, broken at intervals by inlets. These bars may be either deposited offshore or may be coastal dunes that have become isolated by recent sea level rises.

4. *Tectonic Estuary:* These are coastal indentures that have formed through tectonic processes such as slippage along a fault line (San Francisco Bay), folding, or movement of the earth's bedrock, often with a large inflow of freshwater.

5. *Volcanic Estuary:* These coastal bodies of open water, a result of volcanic processes, are depressions or craters that have direct and/or subsurface connections with the ocean and may or may not have surface continuity with streams. These formations are unique to island areas of volcanic origin.

C. *Inlet Type:* Inlets in various forms are an integral part of the estuarine environment, as they regulate, to a certain extent, the velocity and magnitude of tidal exchange, the degree of mixing, and volume of discharge to the sea. There are four major types of inlets:

1. *Unrestricted:* An estuary with a wide, unrestricted inlet typically has slow currents, no significant turbulence, and receive the full effect of ocean waves and local disturbances which serve to modify the shoreline. These estuaries are partially mixed, as the open mouth permits the incursion of marine waters to considerable distances upstream, depending on the tidal amplitude and stream gradient.

2. *Restricted:* Restrictions of estuaries can exist in many forms: bars, barrier islands, spits, sills, and more. Restricted inlets result in decreased circulation, more pronounced longitudinal and vertical salinity gradients, and more rapid sedimentation. However, if the estuary mouth is restricted by depositional features or land closures, the incoming tide may be held back until it suddenly breaks forth into the basin as a

tidal wave, or *bore*. Such currents exert profound effects on the nature of the substrate, turbidity, and biota of the estuary.

3. *Permanent:* Permanent inlets are usually opposite the mouths of major rivers and permit river water to flow into the sea. Sedimentation and deposition are minimal.

4. *Temporary (Intermittent):* Temporary inlets are formed by storms and frequently shift position, depending on tidal flow, the depth of the sea and sound waters, the frequency of storms, and the amount of littoral transport.

D. *Bottom Composition:* The bottom composition of estuaries attests to the vigorous, rapid, and complex sedimentation processes characteristic of most coastal regions with low relief. Sediments are derived through the hydrologic processes of erosion, transport, and deposition carried on by the sea and the stream.

1. *Sand:* Near estuary mouths, where the predominating forces of the sea build spits or other depositional features, the shores and substrates of the estuary are sandy. The bottom sediments in this area are usually coarse, with a graduation toward finer particles in the head of the estuary. In the head region and other zones of reduced flow, fine silty sands are deposited. Sand deposition occurs only in wider or deeper regions where velocity is reduced.

2. *Mud:* At the base level of a stream near its mouth, the bottom is typically composed of loose muds, silt, and organic detritus as a result of erosion and transport from the upper stream reaches and organic decomposition. Just inside the estuary entrance, the bottom contains considerable quantities of sand and mud, which support a rich fauna. Mud flats, commonly built up in estuarine basins, are composed of loose, coarse, and fine mud and sand, often dividing the original channel.

3. *Rock:* Rocks usually occur in areas where the stream runs rapidly over a steep gradient with its coarse materials being derived from the higher elevations where the stream slope is greater. The larger fragments are usually found in shallow areas near the stream mouth.

4. *Oyster shell:* Throughout a major portion of the world, the oyster reef is one of the most significant features of estuaries, usually being found near the mouth of the estuary in a zone of moderate wave action, salt content, and turbidity. It is often a major factor in modifying estuarine current systems and sedimentation, and may occur as an elongated island or peninsula oriented across the main current, or may develop parallel to the direction of the current.

Group II—Hydrographic

A. *Circulation:* Circulation patterns are the result of the combined influences of freshwater flow, tidal action, wind and oceanic forces, and serve many functions: nutrient transport, plankton dispersal, ecosystem flushing, salinity control, water mixing, and more.

1. *Stratified:* This is typical of estuaries with a strong freshwater influx and is commonly found in bays formed from "drowned" river valleys, fjords, and other deep basins. There is a net movement of freshwater outward at the top layer and saltwater at the bottom layer, resulting in a net outward transport of surface organisms and net inward transport of bottom organisms.

2. *Non-stratified:* Estuaries of this type are found where water movement is sluggish and flushing rate is low, although there may be sufficient circulation to provide the basis for a high carrying capacity. This is common to shallow embayments and bays lacking a good supply of freshwater from land drainage.

3. *Lagoonal:* An estuary of this type is characterized by low rates of water movement resulting from a lack of significant freshwater influx and a lack of strong tidal exchange because of the typically narrow inlet connecting the lagoon to the sea. Circulation, whose major driving force is wind, is the major limiting factor in biological productivity within lagoons.

B. *Tides:* This is the most important ecological factor in an estuary, as it affects water exchange and its vertical range determines the extent of tidal flats which may be exposed and submerged with each tidal cycle. Tidal action against the volume of river water discharged into an estuary results in a complex system whose properties vary according to estuary structure as well as the magnitude of river flow and tidal range. Tides are usually described in terms of their cycle and their relative heights. In the United States, tide height is reckoned on the basis of average low tide, which is referred to as *datum*. The tides, although complex, falls into three main categories:

1. *Diurnal:* This refers to a daily change in water level that can be observed along the shoreline. There is one high tide and one low tide per day.

2. *Semidiurnal:* This refers to a twice daily rise and fall in water that can be observed along the shoreline.

3. *Wind/Storm Tides:* This refers to fluctuations in water elevation to wind and storm events, where influence of lunar tides is less.

C. *Freshwater:* According to nearly all the definitions advanced, it is inherent that all estuaries need freshwater, which is drained from the land and measurably dilutes seawater to create a brackish condition. Freshwater enters an estuary as runoff from the land either from a surface and/or subsurface source.

1. *Surface water:* This is water flowing over the ground in the form of streams. Local variation in runoff is dependent upon the nature of the soil (porosity and solubility), degree of surface slope, vegetational type and development, local climatic conditions, and volume and intensity of precipitation.

2. *Subsurface water:* This refers to the precipitation that has been absorbed by the soil and stored below the surface. The distribution of subsurface water depends on local climate, topography, and the porosity and permeability of the underlying soils and rocks. There are two main subtypes of surface water.

a. *Vadose water:* This is water in the soil above the water table. Its volume with respect to the soil, is subject to considerable fluctuation.

b. *Groundwater:* This is water contained in the rocks below the water table, is usually of more uniform volume than vadose water, and generally follows the topographic relief of the land, being high below hills and sloping into valleys.

Group III—Chemical

A. *Salinity:* This reflects a complex mixture of salts, the most abundant being sodium chloride, and is a very critical factor in the distribution and maintenance of many estuarine organisms. Based on salinity, there are two basic estuarine types and eight different salinity zones (expressed in parts per thousand—ppt).

1. *Positive estuary:* This is an estuary in which the freshwater influx is sufficient to maintain mixing, resulting in a pattern of increasing salinity toward the estuary mouth. It is characterized by low oxygen concentration in the deeper waters and considerable organic content in bottom sediments.

2. *Negative estuary:* This is found in particularly arid regions, where estuary evaporation may exceed freshwater inflow, resulting in increased salinity in the upper part of the basin, especially if the estuary mouth is restricted so that tidal flow is inhibited. These are typically very salty (hyperhaline), moderately oxygenated at depth, and possess bottom sediments that are poor in organic content.

3. *Salinity zones (expressed in ppt):*

a. *Hyperhaline*—greater than 40 ppt.

b. *Euhaline*—40 ppt to 30 ppt.

c. *Mixohaline:* 30 ppt to 0.5 ppt.

(1) Mixoeuhaline—greater than 30 ppt but less than the adjacent euhaline sea.

(2) Polyhaline—30 ppt to 18 ppt.

(3) Mesohaline—18 ppt to 5 ppt.

(4) Oligohaline—5 ppt to 0.5 ppt.

d. *Limnetic:* Less than 0.5 ppt.

B. *pH Regime:* This is indicative of the mineral richness of estuarine waters and fall into three main categories:

1. *Acid:* Waters with a pH of less than 5.5.

2. *Circumneutral:* A condition where the pH ranges from 5.5 to 7.4.

3. *Alkaline:* Waters with a pH greater than 7.4.

[FR Doc. 84-16901 Filed 6-25-84; 8:45 am]

BILLING CODE 3510-08-M

APPENDIX C - CHECKLIST OF THE DOMINANT PLANTS OF THE WEEKS BAY ESTUARINE SANCTUARY PROJECT

Checklist of the Dominant Plants in the Vicinity of the Weeks Bay Estuarine Sanctuary Project (from Stout and Lelong 1981 and unpublished sources).

Submerged Plants

Myriophyllum spicatum (Eurasian Watermilfoil)
Potamogeton pusillus (Slender Pondweed)
Ruppia maritima (Widgeongrass)
Vallisneria americana (Tapegrass)

Type IV Pine Savannah (Pocosin, Low Pineland, Bog)

Woody Plants (Trees, Shrubs and Vines)

Aronia arbutifolia (Red Chokeberry)
Arundinaria gigantea (Cane)
Clethra alnifolia (Pepperbush)
Cliftonia monophylla (Black Titi)
Cyrilla racemiflora (Swamp Cyrilla)
Hypericum cistifolium; H. brathyphyllum (St. John's Wort)
H. fasciculatum; H. myrtifolia
Ilex coriacea (Large Gallberry)
Ilex glabra (Gallberry)
Ilex cassine (Dahoon)
Lyonia lucida (Fetterbush)
Magnolia virginiana (Sweey Bay)
Myrica cerifera (Wax Myrtle)
Nyssa sylvatica var. biflora (Swamp Tupelo)
Persea palustris (Swamp Bay)
Pinus elliottii (Slash Pine)
Pinus palustris (Longleaf Pine)
Rhododendron viscosum var. serrulatum (Swamp Azalea)
Rhus vernix (Poison Sumac)
Smilax laurifolia (Green Briar)
Serenoa repens (Saw Palmetto)
Taxodium distichum var. nutans (Pond Cypress)
Vaccinium elliottii; V. fuscatum (Blueberry)

Herbaceous Plants (Except Grasses and Grass-Like Plants)

Aletris aurea; A. farinosa (Colic Root)
Asclepias lanceolata; A. longifolia (Milkweed)
Balduina uniflora
Calopogon pulchellus (Grass Pink Orchid)

Chondrophora nudata (Rayless Goldenrod)
Cleistes divaricata (Rosebud Orchid)
Drosera brevifolia; D. filiformis (Sundew)
Eriocaulon decangulare (Pipewort)
Habenaria blephariglottis (White Fringe Orchid)
Lachnanthes caroliniana (Red-Root)
Lobelia glandulosa; L. puberula (Lobelia)
Lophiola americana (Golden Crest)
Lycopodium alopecuroides; L. carolinianum (Clubmoss)
Pinguicula lutea; P. planifolia (Butterwort)
Pogonia ophioglossoides (Rose-Crested Orchid)
Polygala brevifolia; P. cruciata (Milkwort)
Polygala cymosa; P. ramosa (Yellow Milkwort)
Rhexia alifanus; R. lutea (Meadow Beauty)
Sabatia brevifolia; S. macrophylla (Rose Gentian)
Sarracenia alata; S. flava (Yellow Pitcher Plant)
S. leucophylla (Purple Pitcher Plant)
S. psittacina (Parrot Pitcher Plant)
S. purpurea; S. rubra (Red Pitcher Plant)
Scutellaria integrifolia (Rough Skullcap)
Spiranthes praecox; S. vernalis (Ladies Tresses Orchid)
Tofieldia racemosa (False Asphodel)
Utricularia cornuta; U. juncea (Bladderwort)
Xyris caroliniana; X. difformis (Yellow Eyed Grass)

Grasses and Grass-Like Plants

Andropogon virginicus (Broom Sedge)
Anthaenantia rufa
Aristida affinis; A. virgata (Three-Awn Grass)
Ctenium aromaticum (Toothache Grass)
Dichromena latifolia (White-Top Sedge)
Eleocharis microcarpa; E. tuberculosa (Spike Rush)
Erianthus giganteus (Plume Grass)
Fuirena squarrosa; F. scirpoidea (Umbrella Grass)
Muhlenbergia expansa (Muhly Grass)
Panicum consanguineum; P. ensifolium (Panic Grass)
P. spretum; P. scabriusculm
Rhynchospora chapmanii; R. ciliaris (Beak Rush)
R. glomerata; R. plumosa; R. pusilla
Scleria ciliata; S. reticularis (Nut Rush)

Type VI. Bay Forest and Adjacent Mesic Wood

Trees

Acer rubrum (Red Maple)
Chamaecyparis thyoides (White Cedar)
Gordonia lasianthus (Loblolly Bay)
Liriodendron tulipifera (Tulip Tree)

Magnolia grandiflora (Southern Magnolia)
Nyssa sylvatica var. biflora (Swamp Tupelo)
Osmanthus americana (Devilwood)
Persea palustris (Swamp Bay)
Pinus elliottii (Slash Pine)
Quercus hemisphaerica (Laurel Oak)
Q. nigra (Water Oak)
Salix nigra (Black Willow)
Taxodium distichum var nutans (Pond Cypress)

Shrubs and Vines

Alnus serrulata (Hazel Alder)
Arundinaria gigantea (Cane)
Clethra alnifolia (Pepper Bush)
Cliftonia monophylla (Black Titi)
Decumaria barbara (Climbing Hydrangea)
Ilex coriacea (Large Gallberry)
Ilex vomitoria (Yaupon)
Illicium floridanum (Star Anise)
Itea virginica (Virginia Willow)
Leucothoe axillaris (Fetterbush)
Lyonia lucida (Fetterbush)
Myrica cerifera (Wax Myrtle)
Smilax glauca (Green Briar)
S. laurifolia (Green Briar)
Viburnum nudum (Possum-Haw Viburnum)
Vitis rotundifolia (Muscadine)

Herbaceous Plants

Carex glaucescens (Sedge)
Eleocharis flavescens (Spike Rush)
Gratiola virginiana (Hedge Hyssop)
Hypericum mutilum (St. John's Wort)
H. virginicum
Juncus debilis; J. diffusissimus (Rush)
Leersia virginica (Rice Cutgrass)
Lindernia dubia (False Pimpernel)
Lycopus rubellus (Water Horehound)
Orontium aquaticum (Golden Club)
Osmunda cinnamomea (Cinnamon Fern)
O. regalis (Royal Fern)
Peltandra virginica (Arrow-Arum)
Polygonum punctatum (Smartweed)
Rhynchospora miliacea (Beak Rush)
Thelypteris normalis (Widespread Maiden Fern)
Woodwardia areolata (Netvein Chain Fern)
Xyris iridifolia (Yellow-Eyed Grass)

Type I. Saline and Brackish Marsh

Herbaceous Plants (Except Grasses & Grass-Like Plants)

Acnida cuspidata (Water Hemp)
Agalinis maritima (Marsh Gerardia)
Alternanthera philoxeroides (Alligator Weed)
Aster tenuifolius (Salt Marsh Aster)
Bacopa monnieri (Coastal Water-Hyssop)
Boltonia asteroides
Cynanchum palustre
Hibiscus moscheutos (Marsh Mallow)
Ipomoea sagittata (Marsh Morning Glory)
Kosteletzkya virginica (Salt Marsh Mallow)
Lilaeopsis chinensis
Limonium nashii (Sea Lavender)
Lythrum lineare (Salt Marsh Loosetrife)
Pluchea camphorata, P. purpurascens (Marsh Fleabane)
Sabatia stellaris (Rose-Gentian)
Sagittaria falcata
Salicornia bigelovii; S. virginica (Glasswort)
Sesuvium maritimum (Marsh Purslane)
Solidago sempervirens (Seaside Goldenrod)
Suaeda linearis (Sea-Bite)
Typha domingensis; T. latifolia (Cattail)
Vigna luteola (Cow pea)

Grasses, Sedges and Rushes

Cladium jamaicense (Saw Grass)
Cyperus odoratus; C. virens (Umbrella Sedge)
Distichlis spicata (Salt Grass)
Echinochloa walteri
Eleocharis cellulosa; E. parvula (Spike Rush)
Fibristylis castanea (Saltmarsh Fimbristylis)
Fuirena scirpoidea
Juncus roemerianus (Needle Rush)
Panicum repens (Torpedo Grass)
P. virgatum (Switch Grass)
Paspalum distichum
Phragmites australis (Reed)
Scirpus americanus (American Bulrush)
S. californicus (Giant Bulrush)
S. olneyi (Olney Bulrush)
S. robustus (Saltmarsh Bulrush)
S. validus (Soft Stem Bulrush)
Setaria geniculata (Foxtail Grass)
Spartina alterniflora (Smooth Cordgrass)
S. cynosuroides (Big Cordgrass)
S. patens (Marsh-Hay Cordgrass)
S. spartinae (Gulf Cordgrass)

APPENDIX D - CHECKLIST OF ANIMALS IN THE VICINITY OF THE WEEKS BAY ESTUARINE SANCTUARY PROJECT

Checklist of Animals in the Vicinity of the Weeks Bay Estuarine Sanctuary Project (from Chermock 1974 and unpublished sources).

Marine Invertebrate Animals

Acetes americanus (Sergistid Shrimp)
Amphicteis gunneri (Polychaeta)
Callinectes sapidus (Blue Crab)
Clibanarius vittatus (Striped Hermit Crab)
Cyathura polita (Isopoda)
Crassostrea virginica (Oyster)
Gammarid amphipods
Laeonereis culveri (Polychaeta)
Libinia emarginata (Spider Crab)
Lolliguncula brevis (Squid)
Menippe mercenaria (Stone Crab)
Neanthes succinea (Polychaeta)
Neritina reclivata (Green Nerite, Gastropod)
Ovalipes guadalupensis (Portunid Crab)
Palaemonetes pugio (Grass Shrimp)
Palaemonetes vulgaris (Grass Shrimp)
Penaeus aztecus (Brown Shrimp)
Penaeus setiferous (White Shrimp)
Portunus gibbesii (Portunid Crab)
Rangia cuneata (Marsh clam)
Sesarma cinereum (Square-Backed Fiddler Crab)
Squilla empusa (Mantis Shrimp)
Trachypenaeus sp. (Hardback Shrimp)
Uca pugilator (Fiddler Crab)
Uca pugnax (Fiddler Crab)

Marine Vertebrate Animals

Anchoa mitchilli (Bay Anchovy)
Arius felis (Sea Catfish)
Achirus lineatus (Lined Sole)
Archosargus probatocephalus (Sheepshead)
Anguilla rostrata (American Eel)
Bagre marinus (Gafftopsail Catfish)
Brevoortia patronus (Gulf Menhaden)
Bairdella chrysura (Silver Perch)
Cynoscion arenarius (Sand Seatrout)
Cynoscion nebulosus (Spotted Seatrout)
Caranx hippos (Crevalle Jack)
Citharichthys spilopterus (Bay Whiff)
Dorosoma petenense (Threadfin Shad)

Eutropus crossotus (Fringed Flounder)
Esox americanus (Redfin Pickerel)
Esox niger (Chain Pickerel)
Fundulus grandis (Gulf Killifish)
Fundulus jenkensi (Saltmarsh Topminnow)
Gambusia affinis (Mosquitofish)
Gobionellus boleosoma (Darter Goby)
Gobiosoma bosci (Naked Goby)
Lagodon rhomboides (Pinfish)
Leiostomus xanthurus (Spot)
Lepisosteus spatula (Alligator Gar)
Lepomis macrochirus (Bluegill)
Lepomis punctatus (Spotted Sunfish)
Micropogon undulatus (Atlantic Croaker)
Micropterus salmoides (Largemouth Bass)
Mugil cephalus (Striped Mullet)
Notropis petersoni (Coastal Shiner)
Notropis shumardi (Silverband Shiner)
Oligoplites saurus (Leatherjacket)
Paralichthys lethostigma (Southern Flounder)
Pogonias cromis (Black Drum)
Sciaenops ocellata (Red Drum)
Symphurus plagiusa (Blackcheek Tonguefish)
Trinectes maculatus (Hogchoker)
Tursiops truncatus (Bottlenose Dolphin)

Terrestrial Vertebrate Animals

Acris gryllus gryllus (Southern Cricket Frog)
Agkistrodon piscivorus (Cottonmouth)
Anolis carolinensis (Green Anole)
Ardea herodias (Great Blue Heron)
Bufo terrestris (Southern Toad)
Casmerodius albus (American Egret)
Didelphis marsupialus (Opossum)
Dasypus novemcinctus (Nine-Banded Armadillo)
Fulica americana (Coot)
Hyla femoralis (Pinewoods Treefrog)
Megaceryle alcyon (Belted Kingfisher)
Lutra canadensis (River Otter)
Lynx rufus (Bobcat)
Myocastor coypus (Nutria)
Mephitis mephitis (Striped Skunk)
Natrix sipedon fasciata (Banded Water Snake)
Neotoma floridana (Eastern Woodrat)
Ondatra zibethica (Muskrat)
Oryzomys palustris (Marsh Rice Rat)
Procyon lotor (Raccoon)
Peromyscus gossypinus (Cotton Mouse)
Rynchops nigra (Black Skimmer)
Sciurus carolinensis (Eastern Grey Squirrel)
Sigmodon hispidus (Hispid Cotton Rat)
Sylvilagus palustris (Marsh Rabbit)

Sylvilagus floridanus (Eastern Cottontail)
Terrapene carolina (Box Turtle)
Urocyon cinereoargenteus (Gray Fox)
Vulpes fulva (Red Fox)

APPENDIX E - LIST OF BIRDS WHICH OCCUR OR POSSIBLY OCCUR IN THE WEEKS BAY AREA

List of Birds Which Occur or Possibly Occur in the Weeks Bay Area

(from unpublished sources).

Common loon
Red-throated loon
Pied-billed grebe
Horned grebe
Eared grebe
Red-necked grebe
Greater shearwater
Sooty shearwater
Wilson's petrel
White-tailed tropicbird
White pelican
Brown pelican
Gannet
Booby
Double-crested cormorant
Anhinga
Frigate-bird
Great Blue heron
Green heron
Little blue heron
Cattle egret
Reddish egret
Great egret
Snowy egret
Louisiana heron
Black-crowned night heron
Yellow-crowned night heron
Least bittern
American bittern
Stork ibis
Wood ibis
White ibis
White faced ibis
Glossy ibix
Whistling swan
Canada goose
White-fronted goose
Snow goose
Blue goose
Fulvous Tree duck
Mallard duck
Black duck
Mottled duck
Gadwall duck
Pintail duck
Green-winged teal
Blue-winged teal
European widgeon
American widgeon
Northern shoveler
Wood duck
Redhead
Ring-necked duck
Canvasback
Greater scaup
Lesser scaup
Common goldeneye
Bufflehead
Oldsquaw
White-winged scoter
Surf scoter
Common scoter
Ruddy duck
Hooded merganser
Common merganser
Red-breasted merganser
Turkey vulture
Black vulture
Swallow-tailed kite
Mississippi kite
White-tailed kite
Sharp-shinned hawk
Cooper's hawk
Red-tailed hawk
Red-shouldered hawk
Broad-winged hawk
Rough-legged hawk
Bald eagle
Golden eagle
Marsh hawk
Osprey
Peregrine falcon
Pigeon hawk
Sparrow hawk
Bobwhite
Turkey
Sandhill crane
King rail
Clapper rail
Virginia rail
Sora rail
Yellow rail
Black rail
Purple gallinule

Common gallinule
American coot
American oystercatcher
Semipalmated plover
Piping plover
Snowy plover
Wilson's plover
Killdeer plover
American Golden plover
Black-bellied plover
Surf-bird
Ruddy turnstone
American woodcock
Common snipe
Long-billed curlew
Whimbrel
Upland plover
Spotted sandpiper
Solitary sandpiper
Willet
Greater yellowlegs
Lesser yellowlegs
Red knot
Pectoral sandpiper
White-rumped sandpiper
Baird's sandpiper
Least sandpiper
Dunlin sandpiper
Short-billed dowitcher
Long-billed dowitcher
Stilt sandpiper
Semipalmated sandpiper
Western sandpiper
Buff-breasted sandpiper
Marbled godwit
Sanderling
American avocet
Black-necked stilt
Red phalarope
Wilson's phalarope
Northern phalarope
Pomarine jaeger
Parasitic jaeger
Great black-backed gull
Herring gull
Ring-billed gull
Laughing gull
Bonaparte's gull
Sabine gull
Gull-billed tern
Forster's tern

Commontern
Roseate tern
Sooty tern
Bridled tern
Least tern
Royal tern
Sandwich tern
Caspian tern
Black tern
Black skimmer
Rock dove
White-winged dove
Mourning dove
Ground dove
Yellow-billed cuckoo
Black-billed cuckoo
Barn owl
Screech owl
Great horned owl
Burrowing owl
Barred owl
Long-eared owl
Short-eared owl
Chick-Wills-Widow
Whip-poor-will
Common nighthawk
Chimney swift
Ruby-throated hummingbird
Rufous hummingbird
Belted kingfisher
Yellow-shafted flicker
Pileated woodpecker
Red-bellied woodpecker
Red-headed woodpecker
Yellow-bellied sapsucker
Hairy woodpecker
Downy woodpecker
Red-cockaded woodpecker
Eastern kingbird
Gray kingbird
Western kingbird
Scissor-tailed flycatcher
Great crested flycatcher
Ash-throated flycatcher
Eastern phoebe
Say's Phoebe
Yellow-bellied flycatcher
Acadian flycatcher
Traill's flycatcher
Least flycatcher
Eastern wood pewee

Olive-sided flycatcher
Vermillion flycatcher
Horned lark
Tree swallow
Bank swallow
Rough-winged swallow
Barn swallow
Cliff swallow
Purple martin
Blue jay
Common crow
Fish crow
Carolina chickadee
Tufted titmouse
White-breasted nuthatch
Red-breasted nuthatch
Brown-headed nuthatch
Brown creeper
House wren
Winter wren
Bewick's wren
Carolina wren
Long-billed marsh wren
Short-biled marsh wren
Rock wren
Mockingbird
Gray catbird
Brown thrasher
Sage thrasher
Robin
Wood thrush
Hermit thrush
Swainson's thrush
Gray-cheeked thrush
Veery thrush
Eastern bluebird
Blue-gray gnatcatcher
Golden-crowned kinglet
Ruby-crowned kinglet
Water pipit
Sprague's pipit
Cedar waxwing
Loggerhead shrike
Starling
White-eyed vireo
Bell's vireo
Yellow-throated vireo
Solitary vireo
Black-whiskered vireo
Red-eyed vireo
Philadelphia vireo
Warbling vireo
Black-and-white warbler
Prothonotary warbler
Swainson's warbler
Worm-eating warbler
Golden-winged warbler
Blue-winged warbler
Lawrence's warbler
Brewster's warbler
Backman's warbler
Tennessee warbler
Orange-crowned warbler
Nashville warbler
Northern parula warbler
Yellow warbler
Magnolia warbler
Cape May warbler
Black-throated blue warbler
Yellow-rumped warbler
Audubon's warbler
Black-throated green warbler
Black-throated gray warbler
Cerulean warbler
Blackburnian warbler
Yellow-throated warbler
Chestnut-sided warbler
Bay-breasted warbler
Black-poll warbler
Pine warbler
Prairie warbler
Palm warbler
Ovenbird
Northern water thrush
Louisiana water thrush
Kentucky warbler
Connecticut warbler
Mourning warbler
Common yellow throat
Yellow-breasted chat
Hooded warbler
Wilsons warbler
Canada warbler
American redstart
House sparrow
Bobolink
Meadowlark
Western Meadowlark
Red-winged blackbird
Orchard oriole
Northern oriole
Bullock's oriole

Rusty blackbird
Brewer's blackbird
Yellow-headed blackbird
Boat-tailed grackle
Common grackle
Brown-headed cowbird
Western tanager
Summer tanager
Scarlet tanager
Cardinal
Rose-breasted grosbeak
Black-headed grosbeak
Blue grosbeak
Indigo bunting
Painted bunting
Lark bunting
Dickcissel
Evening grosbeak
Purple finch
Common redpoll
Pine siskin
American goldfinch
Red crossbill
Rufus-sided towhee
Green-tailed towhee
Savannah sparrow
Grasshopper sparrow
LeConte's sparrow
Henslow's sparrow
Sharp-tailed sparrow
Seaside sparrow
Vesper sparrow
Lark sparrow
Bachman's sparrow
Dark-eyed junco
Chipping sparrow
Clay-colored sparrow
Field sparrow
Harris' sparrow
White-crowned sparrow
White-throated sparrow
Fox sparrow
Lincoln's sparrow
Swamp sparrow
Song sparrow
Lapland longspur

APPENDIX F - ANIMALS WITH ENDANGERED, THREATENED, OR SPECIAL CONCERN STATUS WITH COLLECTION RECORDS OR LIKELY TO OCCUR IN THE WEEKS BAY, ALABAMA AREA

Animals with Endangered, Threatened, or Special Concern status with collection records or likely to occur in the Weeks Bay, Alabama area (E - Endangered, T - Threatened, S - Special Concern).*

FISHES	E	T	S
Alabama shovelnose sturgeon *Schaphirphynchus sp.*	X		
Atlantic sturgeon *Acipenser oxyrhynchus*		X	
Pygmy killifish *Leptolucania ommata*			X
AMPHIBIANS AND REPTILES			
Eastern indigo snake *Drymarchon corais couperi*	X		
Black pine snake *Pituophis melanoleucus lodingi*	X		
Florida pine snake *Pituophis melanoleucus mugitus*	X		
Dusky gopher frog *Rana areolata sevosa*		X	
American alligator *Alligator mississippiensis*		X	
Alabama red bellied turtle *Pseudemys alabamensis*		X	
Gopher tortoise *Gopherus polyphemus*		X	
River frog *Rana heckscheri*			X
Greater siren *Siren lacertina*			X
Pine woods snake *Rhadinaea flavilata*			X
Florida green water snake *Natrix cyclopion floridana*			X

BIRDS (cont.)	E	T	S
Merlin *Falco columbarius*			X
Sandhill crane *Grus canadensis*			X
Black rail *Laterallus jamaicensis*			X
American oystercatcher *Haematopus palliatus*			X
Swainson's warbler *Limnothlypis swainsonii*			X
Bachman's sparrow *Aimophila aestivalis*			X
MAMMALS			
Florida black bear *Ursus americanus floridanus*	X		
Marsh rabbit *Sylvilagus palustris palustris*			X
Bayou gray squirrel *Sciurus carolinensis fuliginosus*			X

*Boschung, H. B. 1976. Editor. Endangered and threatened plants and animals of Alabama. Alabama Museum of Natural History. Bulletin 2. Tuscaloosa, Alabama.

AMPHIBIANS AND REPTILES (Cont.)	E	T	S
Eastern diamondback rattlesnake *Crotalus adamanteus*			X
Florida softshell turtle *Trionyx ferox*			X
BIRDS			
Brown pelican *Pelecanus occidentalis*		X	
Bald eagle *Haliaeetus leucocephalus*		X	
Osprey *Pandion haliaetus*		X	
Peregrine falcon *Falco peregrinus*		X	
Snowy plover *Charadrius alexandrinus*		X	
Red-cocaded woodpecker *Dendrocopus borealis*	X		
Reddish egret *Dichromanassa rufescens*		X	
Mottled duck *Anas fulvigula*		X	
Little blue heron *Florida caerulea*		X	
Black-crowned night heron *Nycticorax nycticorax*			X
Wood stork *Mycteria americana*			X
Swallow-tailed kite *Elanoides forficatus*			X
Sharp-shinned hawk *Accipiter striatus*			X
Cooper's hawk *Accipiter cooperii*			X
Red-shouldered hawk *Buteo lineatus*			X

X. Responses to Comments Received on the Proposed Weeks Bay National Estuarine Sanctuary Draft Environmental Impact Statement and Sanctuary Management Plan

This section summarizes the written and verbal comments received by NOAA from all sources on the Draft Environmental Impact Statement and Sanctuary Management Plan (DEIS/MP) during the document's review period which closed on November 19, 1984. In compliance with NEPA regulations, NOAA has responded to each comment through either:

- The revision of the EIS/MP, where necessary to expand, clarify, and/or correct content;
- Responses to specific comments made by individual reviewers; and/or,
- Generic responses, in instances where similar concerns were expressed by a number of independent reviewers.

The following summarizes the most common issues and concerns raised by reviewers of the DEIS/MP and NOAA's corresponding response:

Generic Comment A

Designation of a national estuarine sanctuary may interfere with the traditional hunting and fishing activities of South Alabama residents. NOAA should consider the lifestyle of the local population when evaluating the proposed Sanctuary.

Generic Response A

NOAA recognizes that since the National Estuarine Sanctuary Program is an instrument established by Federal statute and administered in accordance with Federal regulations, there might be some concern raised regarding the possibility of future Federal actions and/or expanded regulatory controls restricting or prohibiting traditional uses of the proposed Sanctuary's resources. With respect to future Federal involvement, neither enabling legislation (Section 315 of the Coastal Zone Management Act, 16 U.S.C. 1461) nor program regulations at 15 CFR Part 921 [FR 49(125): 26510-26520, June 27, 1984] provide explicit site-specific rulemaking authority to NOAA. On the other hand, the regulations at 15 CFR §921.1(d), concerning uses of a sanctuary's resources, provide the State with the authority to establish preferential use levels" in its plan for managing the Sanctuary, identify uses requiring a state permit, and determine where certain uses will be encouraged or prohibited.

No additional regulations are being proposed by the State of Alabama pursuant to this designation; however, the State is authorized to act and indeed will be responsible for acting should conditions in the Sanctuary warrant additional controls. Even provided this authority, the State must act in compliance

with the regulations at 15 CFR§921.33 requiring that any change, to either the Sanctuary's boundaries and/or management plan, including amendments to the regulatory framework relied upon for plan implementation or the promulgation of new rules affecting resource use, be permitted only after opportunities for public review and comment. These provisions to safeguard the public's continuing involvement in the decisionmaking process, plus the establishment of a Sanctuary Advisory Committee, whose membership will include local citizens and interest groups, will ensure that future management decisions will consider the lifestyle of the local population.

In any event, what the State does or does not do in the future with respect to exercising its regulatory authority in Weeks Bay will not preclude any action proposed by other Federal agencies, acting under their respective authorities. This includes NOAA's exercise of its regulatory authority to withdraw sanctuary designation in accordance with 15 CFR §921.35. In the future, if NOAA finds that the Weeks Bay site is no longer being managed for the purposes originally intended in its designation as a National Estuarine Sanctuary, then such sanctuary designation may be withdrawn.

Generic Comment B

Designation of an estuarine sanctuary will mean increased access, thereby leading to degradation of the Bay's pristine ecosystem.

Generic Response B

Although Federal designation of the site as a National Estuarine Sanctuary might lead to increased interest in, and consequently, access to, the area, the plan for managing Weeks Bay is intended to provide the necessary controls for protecting the natural values of the site. Public access, for example, will be provided only in accordance with the management plan, and then carefully monitored to ensure that such provisions do not adversely impact the qualities which make the Weeks Bay ecosystem unique.

Interpretive programs also will be instituted to provide information to both local residents and visitors regarding the values of estuarine systems to coastal habitats and their vulnerability to both natural and man-induced perturbations. In this way, the implementation of the management plan seeks to combine the State's regulatory activities with a comprehensive education-public awareness program; the ultimate result of this will ensure the long-term protection of Weeks Bay as a National Estuarine Sanctuary.

Generic Comment C

There does not appear to be any provision that would allow the State to take action in the event that the waters of the proposed Sanctuary were degraded or threatened by the effects engendered by non-point sources of pollution occurring upstream from the site or by land runoff from lands contiguous to the Bay.

PART X

Responses to Comments on the Draft Environmental Impact Statement and Management Plan for the Proposed Weeks Bay National Estuarine Sanctuary

Generic Response C

The National Estuarine Sanctuary Program was never intended to duplicate the purposes served through the implementation of coastal programs authorized under Section 306 of the Coastal Zone Management Act of 1972, as amended, which provide for the wise use and protection of the nation's coastal resources. The sanctuary program, rather, was established specifically to create a national system of estuarine sanctuaries and was intended more to complement the efforts of state coastal programs by emphasizing the protection of special areas whose lands and waters constitute a natural ecological unit, such as those found in National Parks and Wildlife Refuges. Accordingly, the program concentrates its resources on the management of the lands and waters found within the boundaries of a sanctuary; however, to the extent provided by other state and/or Federal authorities and relied upon states in the management of a site, plans for managing a sanctuary may also include within their "regulatory" purview the control of certain activities occurring outside of the sanctuary.

The State of Alabama has proposed to protect the Weeks Bay ecosystem from impacts resulting from the uses of lands and waters lying outside of the proposed Sanctuary's boundaries through the exercise of its existing authorities. To ensure that the integration of these authorities will result in the effective control of off-site activities vis-a-vis any situation that might impact the Sanctuary's resource values, the State also proposes to execute Memorandas of Agreement among and between its agencies responsible for the management of the National Estuarine Sanctuary in Weeks Bay.

Generic Comment D

The property lying south of the proposed estuarine sanctuary known as the Swift tract is not contiguous to the waters or lands within the Bay and, more logically, should be included as part of the Bon Secour National Wildlife Refuge.

Generic Response D

Program regulations require that an estuarine sanctuary, to the best extent possible, represent a natural ecological unit; one in which all of the biotic and abiotic components which interact to form a distinct ecosystem or habitat can be found. This requirement, and not simply its physical location with respect to a proposed sanctuary's ecological core, is the principal test used in determining the appropriateness of incorporating areas within the boundaries of an area subject to designation.

In its past consideration of other sanctuaries, NOAA has not allowed states to include as part of their proposals, lands which did not constitute an integral part of a proposed site; consequently, the value that such may have represented to the state as match for acquiring Federal funds for acquisition. In this instance, however, NOAA has found that the resource represented by the Swift tract is not only integral to the values of the Weeks Bay estuarine system but also provides a direct and continuous link between the proposed Sanctuary and the Bon Secour National Wildlife Refuge.

For example, the area within Weeks Bay as well as the Swift tract is considered vitally important to the shrimping industry; a major contributor to the economy of Baldwin County. The waters in and around the Bay, in close association with the unspoiled wetlands which extend well beyond its opening to Mobile Bay, serve as an important habitat in the life-cycle of this commercially valuable resource. Additionally, the Swift tract, the management of which the U.S. Fish and Wildlife Service feels would be better served through sanctuary designation, will provide opportunities for: (a) examining the differences and similarities between "open-water" and enclosed estuarine systems represented by the Swift tract and Weeks Bay, respectively; and (b) establishing a management continuum that will extend State and Federal protection southeast along the shoreline of Bon Secour Bay from Weeks Bay to the southern extent of the National Wildlife Refuge.

Individual Written Comments

Charting and Geodetic Services (John D. Bossler): The subject statement has been reviewed within the areas of Charting and Geodetic Services' (C&GS) responsibility and expertise, and in terms of the impact of the proposed action on C&GS activities and projects.

Geodetic control survey monuments may be located in the proposed project area. If there is any planned activity which will disturb or destroy these monuments, C&GS requires not less than a 90 day notification in advance of such activity in order to plan for their relocation. C&GS recommends that funding for this project include any cost of relocation required for C&GS monuments. For further information about these monuments, please contact Mr. John Spencer, Chief, National Geodetic Information Branch (N/CG17), or Mr. Charles Novak, Chief, Network Maintenance Section (N/CG162), at 6001 Executive Boulevard, Rockville, Maryland 20852.

Response: Comment accepted. Recent surveys conducted for The Nature Conservancy on the property to be included in the Sanctuary have not indicated the presence of any C&GS monuments. However, should any be found in the areas of planned activities, the proper contacts will be made in accordance with the above.

United States Coast Guard (Lt. T.A. Tansey, Environmental Manager): Thank you for the opportunity to review the draft EIS on the Weeks Bay national estuarine sanctuary. The Eigth Coast Guard District highly supports your proposed action to preserve this important wildlife area.

Response: Comment accepted.

Department of the Air Force (Thomas D. Sims, Chief, Environmental Planning Division): As the designated Air Force single point of contact in the eastern region, we have been asked by Headquarters Air Force to respond to your agency's request for comment on the subject DEIS. Development of the proposed sanctuary will not adversely affect current Air Force operations

in Alabama, Florida and Mississippi. Thank you for the opportunity to review this DEIS. Our point of contact is Mr. Winfred G. Dodson, FTS number 242-6821/6776.

Response: Comment accepted.

U.S. Department of Agriculture (Ernest V. Todd, State Conservationist):

Comment: While certain concerns regarding the maintenance and protection of Weeks Bay are addressed the very important impact of sediment from the watersheds of Fish River and Magnolia River has not been considered. This subject should be addressed in the management plan. The problems associated with soil erosion are of national concern. All of the projections and plans for Weeks Bay are fine within themselves but if the base resource is destroyed the rest becomes academic.

Response: NOAA agrees that sediment entering the Fish and Magnolia Rivers, and ultimately transported to Weeks Bay, represents a serious potential threat to the resource values and continued maintenance of the proposed estuarine sanctuary. NOAA also recognizes, and the State has agreed, that sanctuary designation carries with it certain shared responsibilities for ensuring that the water quality and resources of the Bay will be effectively managed, including exercising whatever means available for controlling point and non-point sources of pollution; e.g., urban-industrial wastes and sediment resulting from land-use practices. Consequently, the plan proposed for managing the Sanctuary relies heavily on the State's ability to manage land-uses in the Fish and Magnolia River basins. If, through this approach, the State is unable to protect the resources of the Sanctuary, additional regulatory authority might be sought and/or Federal action initiated, including the possible withdrawal of the designation. See Part II.E. of the EIS for a description of State agencies and authorities. See also generic responses A and C.

Comment: The use of "Type I", etc. to denote ecological habitats in Figure 7, page 20, and in the body of the DEIS could be confused with wetland types listed in Circular 39, Wetlands of the United States published by the U.S. Department of the Interior, Fish and Wildlife Service, in 1971. Such confusion would result in error since the types listed in the DEIS do not meet the descriptions in Circular 39. We suggest that you consider using the descriptions found in Classification of Wetlands and Deepwater Habitats of the United States by L.M. Cowardian, Virginia Carter, Francis C. Golet, and Edward T. LaRoe. This is also a publication by the U.S. Department of the Interior, Fish and Wildlife Service issued in 1979. We believe that you will find the descriptions of habitats in this issue to be more accurate.

Response: Circular 39, as reported by Lynn A. Greenwalt, in Cowardian, et al. (1979) is no longer officially used by the U.S. Fish and Wildlife Service, rendering moot the possible confusion between it and the classification system used in this EIS to describe wetland types in Weeks Bay. The U.S. Fish and Wildlife Service's 1979 version (Cowardian, et al.) was also considered: however, a classification scheme developed by the Alabama Marine Environmental Sciences Consortium, following an extensive survey of the Weeks Bay area, was thought to provide greater detail and site-specificity.

Department of the Army (Lawrence R. Green, Chief Planning Division, Mobile District, Corps of Engineers):

Comment: The overall organization of the DEIS and management plan should be improved upon in order that a better flow of subject matter may be achieved. Through this reorganization effort, the reader will have a better understanding of the scope of the proposed action.

Response: Comment accepted. Since the close of the comment period, NOAA has worked with the State of Alabama to improve the content and organization of the document. Modifications have been made where necessary to clarify the intent and scope of the proposed action.

Comment: The document presents no data which substantiates the claim that Weeks Bay represents a "microcosm" of Mobile Bay in a more pristine state.

Response: The term microcosm is used often to describe a system, the quality of which is similar to a larger unit but on a smaller scale. Used in this context to describe the Weeks Bay estuary, it is not intended to argue that the proposed Sanctuary is identical, ecologically, to the greater Mobile Bay system; but, more as a true, albeit smaller and less disturbed, representative of the biogeographic region and ecosystem type represented in the Mobile Bay "macroenvironment." Appendix 1 and 2 of the National Estuarine Sanctuary Program Regulations (15 CFR Part 921), included as Appendix __ of this FEIS, describe the schema used by NOAA to classify estuarine systems by biogeographic regions and typological parameters such as: temperature regime; basin depth and configuration; surface hydrology and circulation, including vertical and horizontal mixing; and dominant ecological communities.

U.S. Environmental Protection Agency (Sheppard N. Moore, Chief, NEPA Review, Environmental Assessment Branch):

Comment: Since isolated areas of undisturbed pristine habitat of this type are needed for research and education, designating the area a National Estuarine Sanctuary would be the best method of preserving it.

Response: Comment accepted.

Comment: We believe the overall impact will be beneficial to the environment. However, the environmental evaluation is too brief and could be improved by including a more detailed discussion of the effects of the various phases on the environment.

Response: Comment accepted. Although the overall impact of the contemplated action on the natural environment will be positive, the proposed land acquisition plan may involve: (a) the loss of private sector development opportunities and tax revenue on lands acquired by the State for Sanctuary purposes; (b) tighter enforcement of existing restrictions controlling the use of private lands included within the Sanctuary boundary; and (c) other possible economic dislocations such as windfalls accruing to owners of remaining developable lands in areas contiguous to or in near-proximity to the Bay. These factors have been discussed further in Section IV, "Environmental Consequences."

U.S. Department of the Interior (Mr. Bruce Blanchard, Director, Environmental Project Review):

Comment: We are pleased with the proposal to establish a National Estuarine Sanctuary in Weeks Bay. Conservation of the area is particularly important because of its proximity to the Fish and Wildlife Service's Bon Secour National Wildlife Refuge.

Response: Comment accepted. NOAA and the State of Alabama agree that the proposed Sanctuary will provide opportunities currently not available for coordinating State and Federal activities aimed at protecting an extensive reach of coastal habitat representative of southeast Mobile Bay.

Comment: While the DEIS recognizes that Federal permits may be required for certain actions relating to the Sanctuary, it doesn't evaluate the specific actions that may require permits (e.g., docking facilities) or their impacts to fish and wildlife resources.

Response: The discussion in the management plan describing support activities and plant facilities simply establishes, at this point, an intent by the State to pursue certain objectives in support of Sanctuary operations. It should not be viewed as an architectural/engineering report or detailed construction plan, the preparation of which will be required by NOAA as a condition for its approval (see Section V, "Construction Plan"). NOAA's action would not relieve the State of its responsibility for acquiring the necessary permits from appropriate Federal authorities, thereby ensuring that any action proposed within the Sanctuary would be given the necessary project review, including an evaluation of impacts to fish and wildlife resources.

U.S. Department of Health and Human Services (Dr. Stephen Margolis, Ph.D., Center for Environmental Health, Atlanta, GA): Sanctuary designation should provide long-term assurance that the natural resources and resulting benefits of the area are available for future use and enjoyment. Except for minor site disturbances associated with construction of a visitor center, boat ramp, parking lot, and trails, we foresee no significant adverse effects resulting from the proposed plan.

Response: Comment accepted.

The Weller Co., Inc. (Mr. David B. Ball): I heartily recommend and approve the proposed action.

Response: Comment accepted.

The Mobile Bay Audubon Society (Mrs. Myrt Jones, President): The Mobile Bay Audubon Society continues support for the designation and acquisition of lands within the Weeks Bay area for the proposed Weeks Bay National Estuarine Sanctuary. Please continue to forward documents pertinent towards this goal. Thank you.

Response: Comment accepted.

Responses to Comments Received at the Public Hearing

A Public Hearing was held on November 8, 1984 at the Fairhope Municipal Complex in Fairhope, Alabama. Printed below is the testimony received and NOAA's response.

First National Bank and Mobile County Wildlife and Conservation Association (Mr. Arthur Dyas): I don't know about testimony, but I would just like to make a statement if that is what this is supposed to be all about. My name is Art Dyas. I'm actually here wearing three hats tonight: one hat in the form of First National Bank as trustee for the Robert S. Bacon Trust. And I will speak briefly for that one and just say that First National Bank as trustee for the Robert S. Bacon Trust is very much in favor of the proposal. We support it and we hope you will carry forth with it. The other two hats that I'm wearing are for the Mobile County Wildlife and Conservation Association. We have an organization over in Mobile County that represents about seven hundred people, primarily businessmen and sportsmen throughout the county. The third hat is myself as a Baldwin County resident. So the last two hats sort of go hand in hand together. And I would like to say that on behalf of the Mobile County Wildlife Association and for myself that we are very much in favor of your proposal. We feel like this is a very necessary first step for the conservation of resources that we have available to us. We feel that it is very important to the quality of life that we have come to experience and to expect from the Mobile-Baldwin County area. And we hope that it will continue that way. And thank you very much for your effort. That is it.

Response: Comment accepted.

Montrose, Baldwin County Resident (Mr. Jack Friend): My name is Jack Friend. I live in Montrose here in Baldwin County and I would like to testify in support of the sanctuary. In recent years every time I think of Mobile Bay, I think of Chesapeake Bay. I don't know whether you all are familiar with what is happening up there or not, but Chesapeake Bay is just about ruined. It is polluted. It's fishery stocks are being depleted. It's recreational facilities are diminishing. And it has just about reached a point where it is doubtful that it can ever be retrieved. People, however, in that area have realized what is happening. And they banded together now and they are going to launch a massive effort to try and revitalize the Chesapeake Bay and its tributaries. I have just come from that part of the country and I read in one of the newspapers where the Secretary of the Interior had made a speech to some citizens in the Virginia portion of the Chesapeake area. And he said that they were going to try to do everything possible to restore the bay, but he was very doubtful that it could be done over a short period of time, and it would take years and years. And that is probably true. In the meantime, a couple of generations of kids may not be able to experience what their parents and grandparents have experienced up there. I support this sanctuary idea because I think it is a means whereby we can prevent the same kind of thing from happening to Mobile Bay that happened to the Chesapeake Bay. I'm a firm believer in growth and development, but I think that growth and development and environmental quality are really two sides of the same coin. Both equal what I call the

prosperity equation. If you have only got growth and development but no quality of life, no environmental quality, you don't have a very good life. If you just have the quality of life but no growth and development, then you are also lacking. This kind of project represents one of those kinds that I think will preserve the quality of life, yet at the same time will not infringe upon growth and development. And overall, I think that our community and our area will be much better off because of it, so I personally would like to support it. And I hope you will proceed with it and I think it is a wonderful thing. I congratulate The Nature Conservancy, the State and Federal government and everyone involved that is in the process of making this come true. Thank you.

Response: Comment accepted.

NOAA COASTAL SERVICES CENTER LIBRARY
3 6668 00004 9546