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INDIAN RIVER LAGOON

AQUATIC PRESERVES MANAGEMENT PLAN

(VERO BEACH TO FORT PIERCE
and
JENSEN BEACH TO JUPITER INLET)

ADOPTED
JANUARY 22, 1985

DEPARTMENT OF NATURAL RESOURCES

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(VERO BEACH TO FORT PIERCE
and
JENSEN BEACH TO JUPITER INLET)

ADOPTED
JANUARY 22, 1985

Dr. Elton J. Gissendanner
Executive Director
Department of Natural Resources

This plan was prepared by
The Bureau of Environmental Land Management
Division of Recreation and Parks

Preparation of this management plan was primarily supported by a grant from the U.S. Office of Ocean and Coastal Resource Management, National Oceanic and Atmospheric Administration, and the Florida Department of Environmental Regulation, the Office of Coastal Management, through the Coastal Zone Management Act of 1972 as amended.

Executive Summary

The Indian River Lagoon area is a long, shallow lagoonal estuary important in this region for its value to recreational and commercial fishing, boating and prime residential development. The preserve is in a rapidly growing urban area affected by agriculture and residential drainage. The majority of the shore line is mangrove fringed, with scattered development in single family residences and a few condominiums. The lagoon is bounded on the west by the Florida mainland and on the east by barrier islands. The Intracoastal Waterway runs the length of the lagoon, which is designated as a wilderness preserve.

The estuary is an important home and nursery area for an extensive array of fish and wildlife. The major problems in the continued health of this area include the construction of major drainage networks that have increased the fresh water flow into the estuary, the loss of wetland areas and water quality degradation associated with agricultural drainage and urban runoff. Additionally, the Intracoastal Waterway and the maintained inlets have changed the historical flushing and circulation within the lagoon system.

The major objectives of the aquatic preserve management program are to manage the preserve to ensure the maintenance of an essentially natural condition, and to restore and enhance those conditions which are not in a natural condition. Management will also be directed to ensure public recreational opportunities while assuring the continued propagation of fish and wildlife. This task will be guided by the identification and mapping of natural resources and habitats necessary to meet these objectives. An additional management objective is the review and comment on applications for the use of state-owned submerged lands. This will require, in a fully implemented management program, the onsite investigation of these proposed uses by field personnel assigned to the aquatic preserve. The field personnel are critical to the realistic management of this aquatic preserve.

STATE OF FLORIDA

BOARD OF TRUSTEES OF THE INTERNAL IMPROVEMENT TRUST FUND

R E S O L U T I O N

WHEREAS, the Board of Trustees of the Internal Improvement Trust Fund is charged with the acquisition, administration, management, control, supervision conservation, protection, and disposition of all lands title to which is vested in the Trustees under Chapter 253, Florida Statutes; and

WHEREAS, Chapter 258, Florida Statutes, directs that state-owned submerged lands within aquatic preserves be set aside forever in their essentially natural or existing condition for the benefit of future generations; and

WHEREAS, the Trustees are charged with the adoption and enforcement of reasonable rules and regulations to carry out the provisions of Sections 258.35 through 258.46, Florida Statutes, regarding the regulation of human activity within the aquatic preserves so as not to unreasonably interfere with lawful and traditional public uses of the preserves;

WHEREAS; Section 16Q-20.13, Florida Administrative Code, mandates the development of management plans for aquatic preserves; and

WHEREAS, the Trustees desire to serve the public by effectively planning, managing and protecting aquatic preserves; and

WHEREAS, the Trustees recognize the importance and benefits of protecting the natural resources and preserving the natural ecosystem of the aquatic preserves in the Indian River Lagoon area, and

NOW THEREFORE BE IT RESOLVED that the Board of Trustees of the Internal Improvement Trust Fund hereby adopts the Indian River Lagoon Aquatic Preserves Management Plan; and

BE IT FURTHER RESOLVED that the Trustees designate the Vero Beach to Fort Pierce Aquatic Preserve and the Jensen Beach to Jupiter Inlet Aquatic Preserve as "wilderness preserves", wherein the primary management objective will be the maintenance of these ecosystems in an essentially natural state; and

BE IT FURTHER RESOLVED that the Indian River Lagoon Aquatic Preserves Management Plan shall serve as a fundamental policy guideline for the Trustees and other state and local agencies having jurisdiction relative to maintaining the Indian River Lagoon Aquatic Preserves system, and shall provide the overall policy direction for the development and implementation of all administrative rules and programs related to the management of state-owned submerged lands within the Vero Beach to Fort Pierce and Jensen Beach to Jupiter Inlet Aquatic Preserves; and

BE IT FURTHER RESOLVED THAT the Department of Natural Resources, Division of Recreation and Parks, is hereby designated as agent for the Trustees for purposes of aquatic preserve planning and management.

IN TESTIMONY WHEREOF THE Board of Trustees of the Internal Improvement

Trust Fund have hereunto subscribed their names and have caused the Official Seal of the Board of Trustees of the Internal Improvement Trust Fund to be hereunto affixed in the City of Tallahassee, The Capitol, on this the 22nd day of January, A.D., 1985.

APPROVED AS TO FORM AND LEGALITY

ATTORNEY - D.N.R

Governor

(Seal)

Secretary of State

Commissioner of Education

Attorney General

Commissioner of Agriculture

Comptroller

As and Constituting the State of Florida Board of Trustees of the Internal Improvement Trust Fund

Treasurer

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Chapter I

INTRODUCTION

This plan addresses the management of the Indian River Lagoon which encompasses two existing aquatic preserves (Vero Beach to Fort Pierce and Jensen Beach to Jupiter Inlet Aquatic Preserve) (Figures 1, 2, 3). The lagoon is located in southeast Florida, extending from southeastern Indian River County, through St. Lucie and Martin Counties, to the northeastern portion of Palm Beach County, and is bordered by three incorporated cities, Vero Beach, Ft. Pierce, and Stuart, north to south respectively. The Vero Beach to Fort Pierce Aquatic Preserve extends from the southern Vero Beach corporate limit (Indian River County) to the north A1A bridge (St. Lucie County) (Fig. 1). This preserve is 12 miles long and encompasses approximately 11,000 acres of surface water area. The larger Jensen Beach to Jupiter Inlet Aquatic Preserve extends from the southern corporate limits of Fort Pierce south to Jupiter Inlet, including the Peck Lake and Hobe Sound area (Figures 2 and 3). This preserve is 37 miles long and encompasses approximately 22,000 acres of surface water area.

The Indian River is a long, wide, shallow estuarine lagoon bounded on the west by the Florida mainland and on the east by bar-built barrier islands. The Fort Pierce, St. Lucie and Jupiter Inlets contribute to the estuarine environment by allowing mixing of saline Atlantic Ocean waters with fresh water from the St. Lucie and Loxahatchee Rivers. Additional input comes

Figure 1

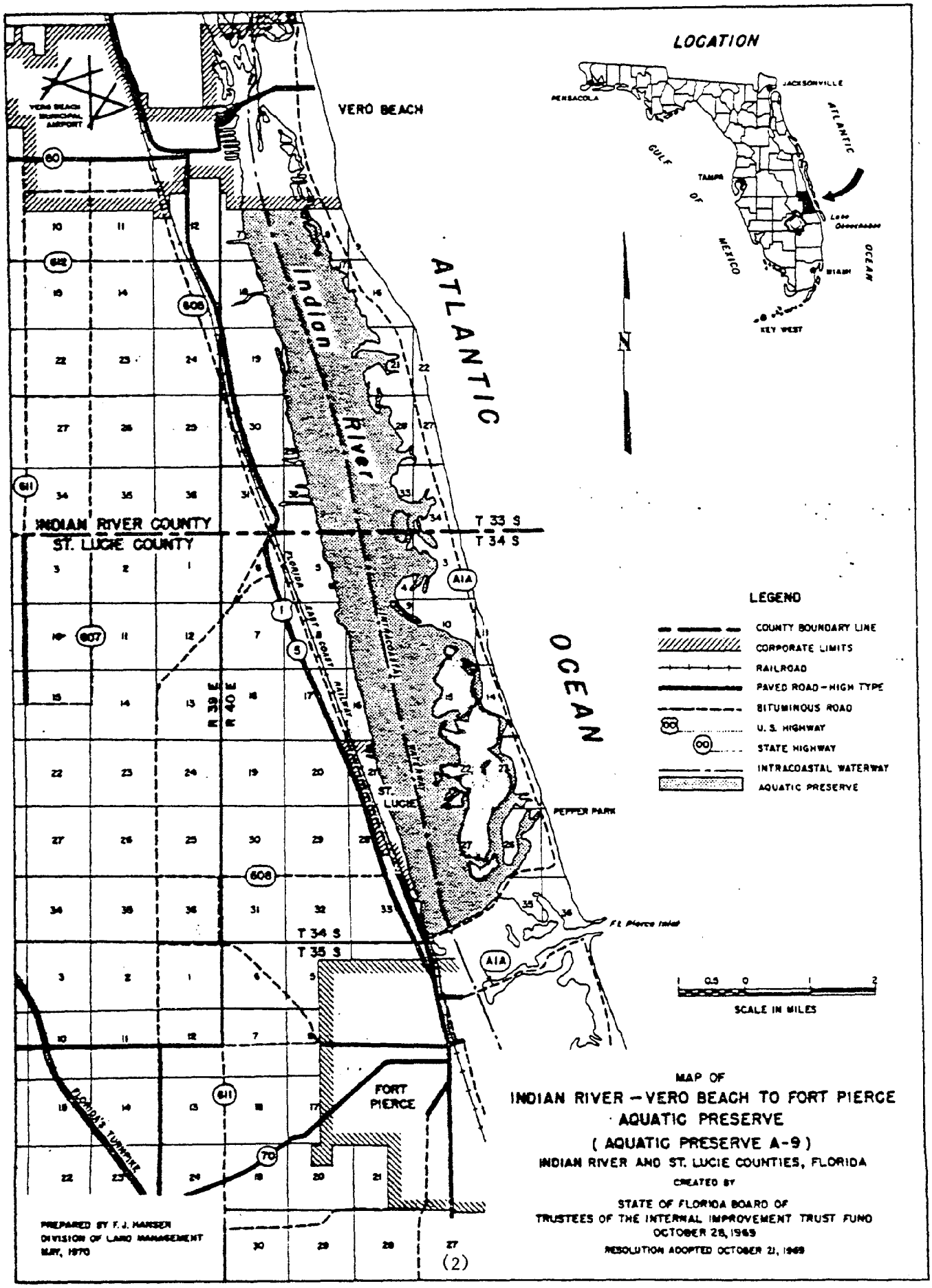

LOCATION
JACKSONVILLE
PENSACOLA
ATLANTIC
GULF
OF
MEXICO
TAMPA
MIAMI
OCEAN
KEY WEST
VERO BEACH
VERO BEACH MUNICIPAL AIRPORT
Indian River
ATLANTIC
OCEAN
INDIAN RIVER COUNTY
ST. LUCIE COUNTY
T 33 S
T 34 S
T 35 S
R 39 E
R 40 E
FLORIDA EAST COAST RAILWAY
INTRACOASTAL WATERWAY
ST. LUCIE
PEPPER PARK
Ft. Pierce Inlet
FORT PIERCE
FLORIDA'S TURNPIKE
LEGEND
COUNTY BOUNDARY LINE
CORPORATE LIMITS
RAILROAD
PAVED ROAD - HIGH TYPE
BITUMINOUS ROAD
U. S. HIGHWAY
STATE HIGHWAY
INTRACOASTAL WATERWAY
AQUATIC PRESERVE
SCALE IN MILES
MAP OF
INDIAN RIVER - VERO BEACH TO FORT PIERCE
AQUATIC PRESERVE
(AQUATIC PRESERVE A-9)
INDIAN RIVER AND ST. LUCIE COUNTIES, FLORIDA
CREATED BY
STATE OF FLORIDA BOARD OF
TRUSTEES OF THE INTERNAL IMPROVEMENT TRUST FUND
OCTOBER 28, 1969
RESOLUTION ADOPTED OCTOBER 21, 1969
PREPARED BY F. J. HARSER
DIVISION OF LAND MANAGEMENT
MAY, 1970

Figure 2

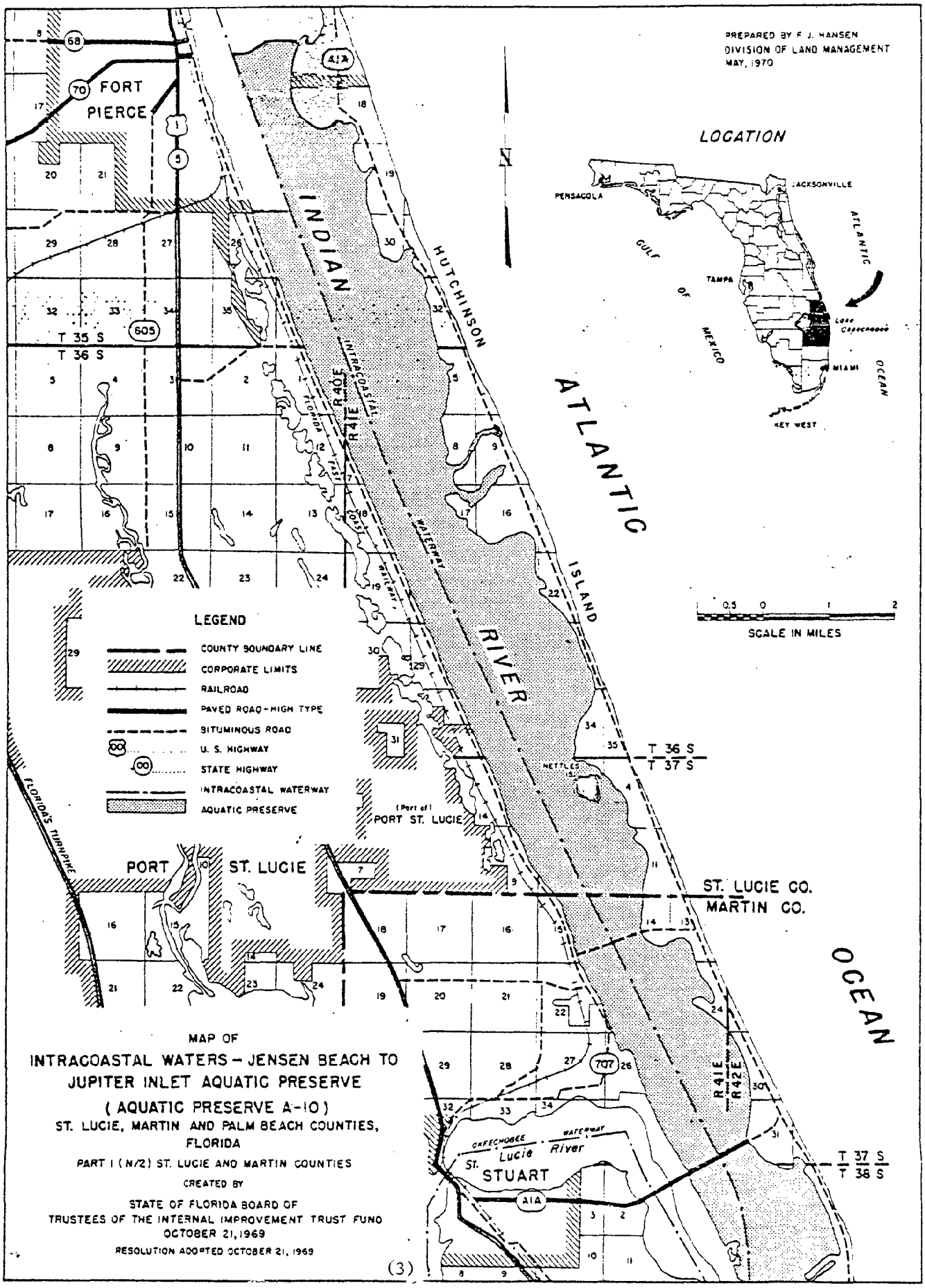
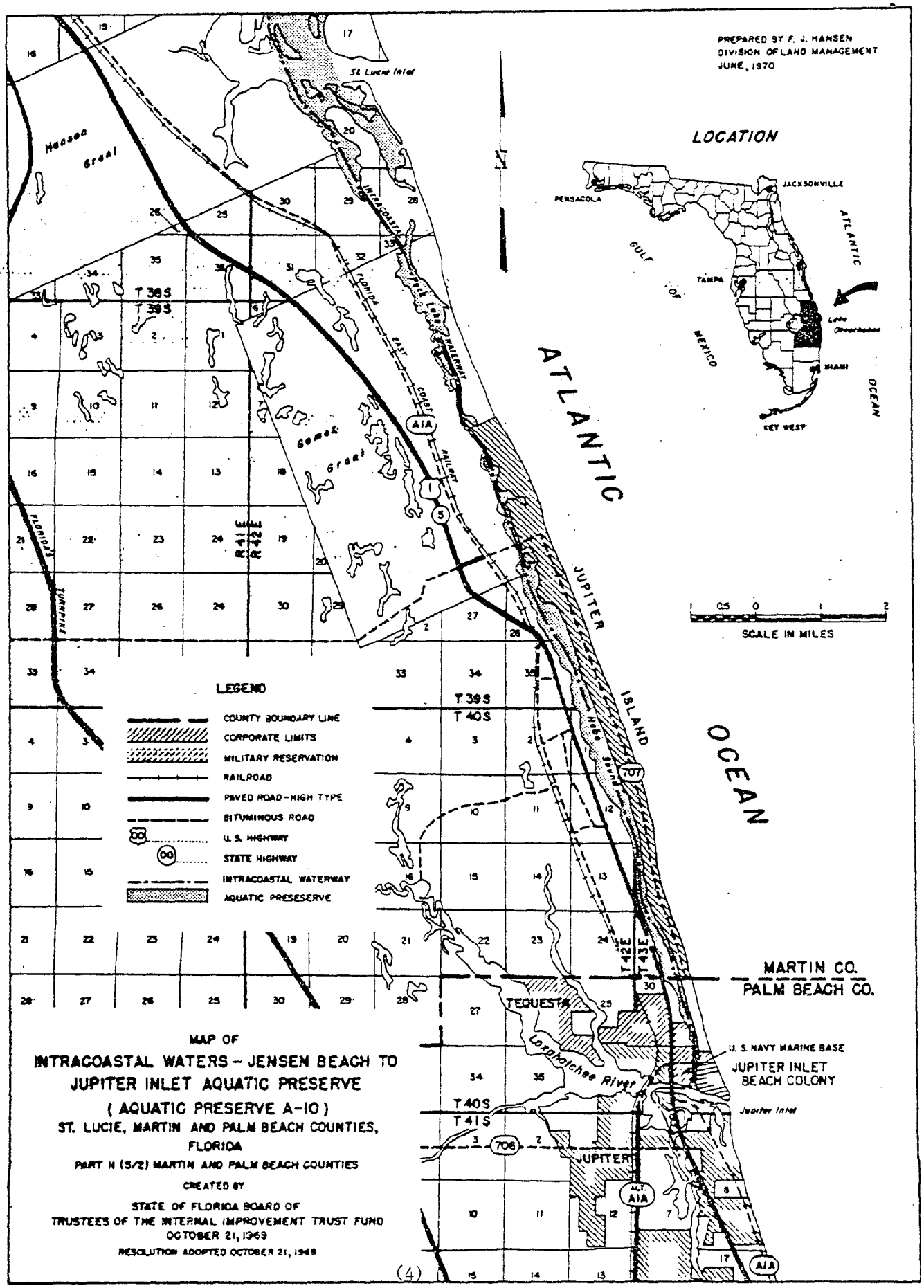

PREPARED BY F. J. HANSEN
DIVISION OF LAND MANAGEMENT
MAY, 1970
LOCATION
PENSACOLA
JACKSONVILLE
GULF OF MEXICO
ATLANTIC OCEAN
TAMPA
MIAMI
KEY WEST
SCALE IN MILES
FORT PIERCE
INDIAN
HUTCHINSON
ISLAND
ATLANTIC
RIVER
OCEAN
INTRACOASTAL WATERWAY
FLORIDA EAST COAST
R40E
R41E
R42E
T 35 S
T 36 S
T 37 S
T 38 S
LEGEND
COUNTY BOUNDARY LINE
CORPORATE LIMITS
RAILROAD
PAVED ROAD-HIGH TYPE
BITUMINOUS ROAD
U. S. HIGHWAY
STATE HIGHWAY
INTRACOASTAL WATERWAY
AQUATIC PRESERVE
FLORIDA'S TURNPIKE
PORT ST. LUCIE
(Part of) PORT ST. LUCIE
NETTLES
ST. LUCIE CO.
MARTIN CO.
OKEECHOBEE WATERWAY
St. Lucie River
STUART
MAP OF
INTRACOASTAL WATERS - JENSEN BEACH TO
JUPITER INLET AQUATIC PRESERVE
(AQUATIC PRESERVE A-10)
ST. LUCIE, MARTIN AND PALM BEACH COUNTIES,
FLORIDA
PART I (N/2) ST. LUCIE AND MARTIN COUNTIES
CREATED BY
STATE OF FLORIDA BOARD OF
TRUSTEES OF THE INTERNAL IMPROVEMENT TRUST FUND
OCTOBER 21, 1969
RESOLUTION ADOPTED OCTOBER 21, 1969

Figure 3


PREPARED BY F. J. HANSEN
DIVISION OF LAND MANAGEMENT
JUNE, 1970
LOCATION
PENSACOLA
JACKSONVILLE
TAMPA
MIAMI
KEY WEST
GULF OF MEXICO
ATLANTIC OCEAN
SCALE IN MILES
ATLANTIC OCEAN
JUPITER ISLAND
St. Lucie Inlet
Hobe Sound
Loxahatchee River
Jupiter Inlet
TEQUESTA
JUPITER
JUPITER INLET BEACH COLONY
U. S. NAVY MARINE BASE
MARTIN CO.
PALM BEACH CO.
T 38 S
T 39 S
T 40 S
T 41 S
T 42 E
R 41 E
R 42 E
LEGEND
COUNTY BOUNDARY LINE
CORPORATE LIMITS
MILITARY RESERVATION
RAILROAD
PAVED ROAD-HIGH TYPE
BITUMINOUS ROAD
U. S. HIGHWAY
STATE HIGHWAY
INTRACOASTAL WATERWAY
AQUATIC PRESESERVE
MAP OF
INTRACOASTAL WATERS - JENSEN BEACH TO
JUPITER INLET AQUATIC PRESERVE
(AQUATIC PRESERVE A-10)
ST. LUCIE, MARTIN AND PALM BEACH COUNTIES,
FLORIDA
PART II (S/2) MARTIN AND PALM BEACH COUNTIES
CREATED BY
STATE OF FLORIDA BOARD OF
TRUSTEES OF THE INTERNAL IMPROVEMENT TRUST FUND
OCTOBER 21, 1969
RESOLUTION ADOPTED OCTOBER 21, 1969

from Taylor and Moores Creeks and artificial drainage canals. Salinity regimes in the lagoon range from 4.0 to 36.0 parts per thousand (ppt) with a mean of 26.5 ppt. The average depth of this shallow lagoon is five feet, with the deeper dredged artificial channel of the Intracoastal Waterway running through the length of the lagoon (von Zweck and Richardson, 1975). The climate in this region is subtropical with an average annual rainfall of approximately 56-60 inches.

The rainy season occurs from May to October (Treasure Coast Regional Planning Council, 1979). The shallow configuration of this system makes it particularly vulnerable to adverse impacts from urban runoff, chemical and heavy metal contamination and siltation.

These environmentally sensitive preserves harbor seagrass beds which stabilize bottom sediments and provide shelter and food to adult, juvenile and larval vertebrates and invertebrates. Mangrove trees fringe the shoreline of the barrier island and, to a lesser extent, the mainland and perimeters of the spoil islands. Saltmarsh grasses, oyster bars, drift algae, and tidal flats are also intricate parts of this dynamic lagoonal system.

These preserves are designated as wilderness preserves because of the presence of environmentally productive habitats and ecosystems within the preserves, and the lack of urban development, or shoreline modification. Figures 1, 2 and 3 represent the gross boundary of these aquatic preserves. The actual preserve includes those sovereignty submerged lands located waterward of the mean high waterline within this boundary area. Wilderness preserves will be

managed to emphasize maintenance and enhancement of existing wilderness conditions. As more site specific information becomes available, essentially natural conditions shall be identified and resources in disturbed areas restored to that condition where possible.

Due to the current limitation of onsite staff resources, the management program in these aquatic preserves will be restricted in the scope of operations. However, the program will fill the minimum need for active management in the preserve and should provide the framework for future program growth. The administrative support for this management program will be provided by the Division of Recreation and Parks' Bureau of Environmental Land Management (BELM) in Tallahassee, known as the "central office". Field personnel support will be through the Florida Park Service, Division of Marine Resources and the BELM staff, when available.

Initially, development of the resource inventory will be heavily dependent on LANDSAT satellite imagery, DOT aerial photography, and existing scientific and other literature. As the program proceeds and onsite managers are present, the experience and additional resource information will likely result in modifications to the program and plan, which are both designed to accommodate such changes or at least identify areas needing improvement.

This plan is divided into chapters according to their management application. Chapter II cites the authorities upon which this management program and plan are built. Chapter III (Major Program Policy Directives) highlights the major policy areas that are within this plan. Chapter IV presents a brief resource

description and references the appendices which contain more detailed information on the resources.

Chapter V presents the management objectives of both the on-site managers, who actually work in the preserve, and the administrative staff in Tallahassee.

Chapter VI addresses how this plan will interface with local, regional, state, and federal agencies and programs; as well as its relevance to non-government organizations, interest groups, and individuals.

Chapters VII through IX address the various uses, from public to private to commercial. Chapters X and XI address the use of the aquatic preserve for scientific research and environmental education, respectively.

Chapter XII is an internal management improvement section identifying problems and needs in the progressive improvement of this aquatic preserve management plan.

This plan was written by the Department of Natural Resources (DNR), Division of Recreation and Parks, Bureau of Environmental Land Management staff. Funding for the plan was by a coastal management grant (CM-78) through the U.S. Department of Commerce's National Oceanic and Atmospheric Administration, Office of Ocean and Coastal Resource Management, and the Florida Department of Environmental Regulation (DER), Office of Coastal Management.

Chapter II

MANAGEMENT AUTHORITY

The primary management authorities available to the staff for implementing management directives affecting aquatic preserves are found in Chapters 258 and 253, Florida Statutes (F.S.). These authorities clearly establish the proprietary management overview role of the Governor and Cabinet, sitting as the Board of Trustees of the Internal Improvement Trust Fund and are variously referred to as the "Trustees" or the "Board". Furthermore, all management responsibilities assigned to the Trustees by this plan may be fulfilled directly by the Governor and Cabinet or indirectly via staff or agents of the Trustees, pursuant to delegations of authority, management agreements, or other legal mechanisms. All subsequent references to the Board or Trustees should be presumed to potentially include staff and designated agents, in addition to the Governor and Cabinet. The staff of the Bureau of Environmental Land Management (BELM) (acting as "agents" for the Trustees) is able to review all requests for uses of, or directly affecting, state-owned sovereignty submerged lands within aquatic preserves. The review and subsequent staff comments are primarily designed to evaluate the environmental consequences of any proposed use of state-owned submerged land. The review is conducted within the confines of the criteria contained in the "maintenance" provisions for aquatic preserves in Chapter 258, F.S.

Formal review comments are provided to the Department of Natural Resources (DNR), Division of State Lands by the Bureau of Environmental Land Management for inclusion in the comments and recommendations accompanying agenda items for Trustees consideration. This mechanism allows the Trustees, sitting as owners of the land, to evaluate public interest and project merits within the context of environmental impact upon the preserve.

BACKGROUND

In many respects, the authorities supporting aquatic preserve planning and management are the cumulative result of the public's awareness of the importance of Florida's environment . The establishment of the present system of aquatic preserves is a direct outgrowth of public concern with dredge and fill activities rampant in the late 1960's.

In 1967, the Florida Legislature passed the Randall Act (Chapter 67-393, Laws of Florida), which set up procedures regulating previously unrestricted dredge and fill activities on state-owned submerged lands. That same year the legislature also provided statutory authority (Section 253.03, F.S.) for the Trustees to exercise proprietary control over state-owned lands. In 1967, this governmental focus on protecting Florida's productive estuaries from the impacts of development led to the establishment of a moratorium by the Governor and Cabinet on the sale of submerged lands to private interests. In that same year, this action was followed by the creation of an Interagency Advisory Committee on submerged lands management. In late 1968, that Committee issued a report recommending the establishment of a series of

aquatic preserves. Twenty-six separate waterbodies were addressed in the original recommendation.

Also in 1968, the Florida Constitution was revised, declaring in Article II, Section 7, the State's policy of conserving and protecting the natural resources and scenic beauty of the state. That constitutional provision also established the authority for the Legislature to enact measures for the abatement of air and water pollution.

It was not until October 21, 1969 that the Governor and Cabinet acted upon the recommendations of the Interagency Advisory Committee and adopted, by resolution, 18 of the waterbodies as aquatic preserves. Other preserves were similarly adopted at various times through 1971.

Prior to the October 1969 action by the Governor and Cabinet, the Legislature had created the Boca Ciega Aquatic Preserve. Subsequent Legislative action in 1972, 1973 and 1974, created the Pinellas County, Lake Jackson and Biscayne Bay Aquatic Preserves, respectively.

In 1975, the Legislature established a Florida Aquatic Preserve Act (Codified in Chapter 258, F.S.), thereby bringing all existing preserves under a standardized set of maintenance criteria. Additional acts were passed subsequent to the 1975 action, such as the addition of the Cockroach Bay Aquatic Preserve in 1976 and the Gasparilla Sound-Charlotte Harbor Aquatic Preserve to the system in 1978.

The Charlotte Harbor Aquatic Preserve Management Plan, approved by the Trustees on May 18, 1983 was the first management plan for an aquatic preserve. The following aquatic preserves have approved plans: Estero Bay - September 6, 1983; North Fork--St. Lucie - May 22, 1984; and Loxahatchee River--Lake Worth Creek - June 12, 1984.

The State Lands Management Plan, adopted on March 17, 1981, by the Trustees, contains specific policies. The Plan also establishes policies concerning spoil islands, submerged land leases, "Outstanding Native Florida Landscapes", unique natural features, submerged grassbeds, archaeological and historical resources, and endangered species. All of these issues provide management guidance to the aquatic preserve program.

ADMINISTRATIVE RULES

Chapters 16Q-21 and 16Q-20, Florida Administrative Code (F.A.C.), are two administrative rules directly applicable to the DNR's/Trustee's actions regarding allowable uses of submerged lands, in general, and aquatic preserves specifically. Chapter 16Q-21, F.A.C. controls activities conducted on sovereignty submerged lands, and is predicated upon the provisions of Sections 258.03 and 253.12, F.S. The stated intent of this administrative rule is:

"(1) To aid in fulfilling the trust and fiduciary responsibilities of the Board of Trustees of the Internal Improvement Trust Fund for the administration, management and disposition of sovereignty lands;

(2) To insure maximum benefit and use of sovereignty lands for all the citizens of Florida;

(3) To manage, protect, and enhance sovereignty lands so that the public may continue to enjoy traditional uses including, but not limited to, navigation, fishing, and swimming;

(4) To manage and provide maximum protection for all sovereignty lands, especially those important to public drinking water supply, shellfish harvesting, public recreation, and fish and wildlife propagation and management;

(5) To insure that all public and private activities on sovereignty lands which generate revenues or exclude traditional public uses provide just compensation for such privileges; and,

(6) To aid in the implementation of the State Lands Management Plan."

Chapter 16Q-20, F.A.C. addresses the aquatic preserves and derives its authority from Sections 258.35, 258.36, 258.37, and 258.38, F.S. The intent of this rule is contained in Section 16Q-20.01, F.A.C., which states:

"(1) All sovereignty lands within a preserve shall be managed primarily for the maintenance of essentially natural conditions, the propagation of fish and

wildlife, and public recreation, including hunting and fishing where deemed appropriate by the board and the managing agency.

(2) The aquatic preserves which are described in Section 258.39, 258.391, and 258.392, F.S., and in 16Q-20.02, F.A.C., were established for the purpose of being preserved in an essentially natural or existing condition so that their aesthetic, biological and scientific values may endure for the enjoyment of future generations.

(3) The preserves shall be administered and managed in accordance with the following goals:

(a) Preserve, protect, and enhance these exceptional areas of sovereignty submerged lands by reasonable regulation of human activity within the preserves through the development and implementation of a comprehensive management program;

(b) To protect and enhance the waters of the preserves so that the public may continue to enjoy the traditional recreational uses of those waters such as swimming, boating, and fishing;

(c) To coordinate with federal, state, and local management programs, which are compatible with the intent of the Legislature in creating the the preserves;

(d) To use applicable federal, state, and local management programs, which are compatible with the intent and provisions of the act and these rules, to assist in managing the preserves;

(e) To encourage the protection, enhancement or restoration of the biological, aesthetic, or scientific values of the preserves, including but not limited to the modification of existing manmade conditions toward their natural condition, and discourage activities which would degrade the aesthetic, biological, or scientific values, or the quality, or utility of a preserve, when reviewing applications, or when developing and implementing management plans for the preserve;

(f) To preserve, promote, and utilize indigenous life forms and habitats, including but not limited to: sponges, soft coral, hard corals, submerged grasses, mangroves, salt water marshes, fresh water marshes, mud flats, estuarine, aquatic and marine reptiles,

game and nongame fish species, estuarine, aquatic and marine invertebrates, estuarine, aquatic and marine mammals, birds, shellfish and mollusks;

(g) To acquire additional title interests in lands wherever such acquisitions would serve to protect or enhance the biological, aesthetic, or scientific values of the preserves.

(h) To maintain those beneficial hydrologic and biologic functions, the benefits of which accrue to the public at large."

OTHER MANAGEMENT AUTHORITIES

Other Department of Natural Resources management authorities applicable to aquatic preserves include fisheries and marine mammal management and protection, and beach and shore preservation programs outlined in Chapters 370 and 161, F.S., respectively. Land acquisition programs conducted under the Environmentally Endangered Lands authorities of Chapter 259, F.S. or the Conservation and Recreation Lands Program authorized by 253, F.S., will enhance the protection of the natural resources within the aquatic preserves.

Chapter 403, F.S., is an important adjunct to Chapter's 253 and 258, F.S. This governs, in part, the State's regulatory programs affecting water

quality and biological resources. The Department of Environmental Regulation (DER), through a permitting and certification process, administers this program. Section 253.77, F.S., as amended by the Warren S. Henderson Wetlands Protection Act of 1984, requires that any person requesting use of state-owned land shall have approval of the proposed use from the Trustees before commencing the activity. An interagency agreement between DNR and DER provides an avenue for staff comments on potential environmental impacts of projects in aquatic preserves through the DER permitting process. Additionally, the DER has designated, by administrative rule, a series of waterbodies with stringent use criteria called "Outstanding Florida Waters" (OFW). The inclusion of all aquatic preserve waters within this classification greatly enhances the protective provisions of Chapter 258, F.S. As the designated "306" Coastal Zone Management Agency, the DER also provides a source of funding for data collection and planning in areas such as the Indian River area, as well as being the state agency responsible for implementing the "federal consistency" provisions of the federal Coastal Zone Management Act.

The DER's administrative rules of primary significance to the aquatic preserve management program include Chapters 17-3 and 17-4, F.A.C. Both rules are based upon the authorities contained in Chapter 403, F.S. Chapter 17-3, F.A.C. addresses water quality standards and establishes the category of "Outstanding Florida Waters", while Chapter 17-4, F.A.C. addresses permit requirements.

In December, 1982 a Memorandum of Understanding (MOU) between the DER, DNR, and the U.S. Army Corps of Engineers (COE) was executed. This MOU clearly

establishes a process whereby the proprietary concerns of the Trustees, stated in Chapter 253, F.S. can be integrated into the DER/COE joint permit processing system.

Other opportunities for environmental review and input into activities potentially affecting aquatic preserves are afforded by the Department of Community Affairs (DCA), and the Department of State, Division of Archives, History, and Records Management (DAHRM). The Executive Office of the Governor also provides a mechanism for public input into federal projects via the State clearinghouse process.

The DCA is statutorily responsible for administering the "Development of Regional Impact" (DRI). The DRI program, authorized by Section 380.06, F.S. was established by the Legislature to provide a review and monitoring procedure for those development projects potentially affecting more than one county.

Chapter 267, F.S. establishes the state policy regarding preservation and management of Florida's archaeological and historical resources. This responsibility is legislatively assigned to the DAHRM, which holds title to those cultural resources located on state-owned lands. This also applies to sovereignty submerged lands, including aquatic preserves.

The Department of Health and Rehabilitative Services, under their public mandate, administers two programs directly affecting the aquatic preserve management program. These programs are (1) septic tank regulation, usually

administered by county health departments and (2) arthropod (mosquito) control programs, usually implemented through local mosquito control districts. Each of these programs holds the potential for creating significant impacts upon the aquatic preserves. Establishment of close working relationships between the aquatic preserve staff and the Department of Health and Rehabilitative Services will be a necessary element of the aquatic preserves management program.

Each of the above referenced programs may provide an effective means of protecting aquatic preserves and their ecologically sensitive resources. Appendix A contains a compendium of the appropriate statutes and administrative rules.

Chapter III

MAJOR PROGRAM POLICY DIRECTIVES

This plan contains a number of management policy issues that are discussed either generally or definitively. This section highlights those major policy areas that comprise the basic thrust of this management effort. Adoption of these policies will provide specific staff direction for implementing the day-to-day aquatic preserve management program. Major program policy directives are:

(A) Manage all submerged lands within the aquatic preserve to ensure the maintenance of essentially natural conditions to ensure the propagation of fish and wildlife, and public recreation opportunities.

(B) Prohibit the disturbance of archaeological and historical sites within the aquatic preserve, unless prior authorization has been obtained from the Trustees and DAHRM, and such disturbance is part of an approved research design or authorized project.

(C) Develop a resource inventory and map natural habitat types within the aquatic preserve, with an emphasis on those habitat types utilized by threatened and/or endangered species.

(D) Protect and, where possible, enhance threatened and endangered species habitat within the aquatic preserve.

(E) Prohibit development activities within the aquatic preserve that adversely impact upon grassbeds and other valuable submerged habitat, unless a prior determination has been made by the Board of overriding public importance with no reasonable alternatives, and adequate mitigation measures are included.

(F) Prohibit the trimming and/or removal of mangroves and other natural shoreline vegetation within the aquatic preserve, except when necessitated by the pursuit of legally authorized projects and local Mangrove Protection Ordinances.

(G) Provide research and educational opportunities for scientists and other interested researchers within the framework of a planned research program in the aquatic preserve.

(H) Acquire, where feasible, privately owned submerged lands located within the boundaries of the aquatic preserve pursuant to the authorities contained in Section 253.02(4), F.S.

(I) Prohibit the drilling of oil and gas wells, the mining of minerals, and dredging for the primary purpose of obtaining upland fill within the aquatic preserve.

(J) Prohibit non-water dependent uses of submerged lands within the aquatic preserve except in those cases where the Board has determined that the project is overwhelmingly in the public interest and no reasonable alternatives exist. This prohibition shall include floating residential units, as defined in Section 125.0106(2), F.S.

(K) Prohibit storage of toxic, radioactive, or other hazardous materials within the aquatic preserve.

(L) Prohibit mosquito control practices within the aquatic preserve that require habitat modification or manipulation (i.e. diking, ditching) unless failure to conduct such practices would result in a threat to public health.

(M) Limit pesticide and biocide use within the aquatic preserve to those that are approved by the Environmental Protection Agency (EPA) for wetland and aquatic application.

(N) Prohibit the construction of new deep water ports within the aquatic preserve boundaries.

(O) Insure that artificial reef construction does not adversely impact environmentally fragile areas within the aquatic preserve and that the construction will maintain the essentially natural condition while enhancing the quality and utility of the preserve.

(P) Manage state-owned spoil islands within the aquatic preserve as bird rookeries and wildlife habitat areas.

(Q) Encourage public utilization of the aquatic preserve, consistent with the continued maintenance of its natural values and functions.

(R) Develop a well coordinated aquatic preserve management mechanism that recognizes and utilizes local government programs and authorities.

(S) Require, through the efforts of DER and the water management districts, the maintenance of the naturally high water quality of the estuary and ensure the natural seasonal flow fluctuations of freshwater into the estuary.

(T) Formally recognize and designate the Indian River Lagoon Aquatic Preserves (Vero Beach to Fort Pierce and Jensen Beach to Jupiter Inlet) as wilderness preserves as delineated in Figure 1, 2 and 3 in accordance with the provisions of Section 16Q-20.13(d), F.A.C.

(U) Apply the management criteria contained in the adopted Indian River Lagoon Aquatic Preserves Management Plan to all subsequent legislative additions of land to the aquatic preserve.

(V) Encourage the assistance of federal, state, and local government agencies in implementing the aquatic preserve management plans, especially in the areas of protection of natural and cultural resources and the enforcement of applicable resource laws and ordinances.

(W) Marinas shall not be located in Class 1 or 2 Resource Protection Areas.

(X) Identify and document any problems caused by fishing activities and report them to the Marine Fisheries Commission. Enforce any rule adopted by the Marine Fisheries Commission and approved by the Trustees.

Chapter IV

RESOURCE DESCRIPTION

The Indian River Lagoon is a long, dynamic, lagoonal estuary important in this region for its value to recreational and commercial fishing, boating and prime residential development. It is located in a rapidly growing urban area affected by agriculture and residential drainage. The majority of the shore line is mangrove fringed, with scattered development in single family residences and a few condominiums. The southern portion of the preserve (figure 3) is much narrower than the homogenous northern portions. South of the St. Lucie Inlet, this section of the Indian River in Martin County has minimal disruption of the natural shoreline and much of the adjoining land is under the protection of the Department of Natural Resources and the U.S. Fish and Wildlife Service. The grassbeds in this area are an important feeding ground for the endangered manatee. The area adjacent to the Jupiter Inlet in Palm Beach County is noted for its high water clarity and rich, tropical marine life.

The estuary is an important shelter and nursery ground for an extensive array of fish and wildlife (Appendix C). The major problems in the continued health of this area are the massive amounts of fresh water released by the extensive manmade drainage systems, mosquito impoundments restricting nutrient flow and the ingress and egress of fishes, circulation problems due to causeways, and

water quality problems associated with agriculture and urban drainage, and sewage treatment plants surrounding the lagoon.

Detailed information on the resources (e.g., species lists, water quality information, archaeological and historical site information, life histories, geological background, supporting maps, and cultural resource information) is located in Appendices C and D. The resource information presented in this chapter is intended to be generally descriptive of the major management functions and resources of the area surrounding the riverine and estuarine complex.

A. Geological Features and Landforms.

In the late Pleistocene (125,000 years before present (B.P.)) sea level was higher than today, covering the present barrier island as an offshore sand bar formed on the shallow shelf. The present mainland acted as a barrier island which protected a shallow lagoon (Eastern Valley) behind a ridge (Atlantic Coastal Ridge) creating a situation analogous to the present day barrier island lagoon system.

Sea levels dropped at the beginning of the glacial age and exposed the present lagoon and bar-built barrier island which partially lithified. As sea level rose during the deglaciation of the continent (30-35,000 years B.P.), the Indian River Lagoon became partially inundated and created a brackish water environment.

Between 6,000 and 30,000 years B.P. the present lagoon was once again exposed to the air as the sea level retreated. Deposition of sediments through wind and fresh water transport partially filled the lagoon until the last great ice sheets melted and a rising sea level inundated the Indian River Lagoon. The lagoonal environment, as exists today, formed 5,000-6,000 years ago.

The long narrow chain of barrier islands act as the first line of defense of the Mainland against storm surges. Inlets have historically broken through the islands during storms forming temporary shallow inlets which later closed due to siltation. Man's intervention through dredging and stabilization of the existing inlets allowed saline water to mix with fresh water, creating the estuarine environment that now exists (after Almasi, 1983 and Florida Oceanographic Society, 1982).

B. Community Associations.

The plant communities of the Indian River basin are a major factor in the continued health and productivity of the natural systems in the preserves. This section will also reference some of the major animal species associated with these plant communities. The major community associations recognized in the preserves are mangrove forests, marine grassbeds, drift algae, saltmarsh, oyster bars, tidal flats and spoil islands. Each community is presented separately although in reality these communities are sometimes mixed or overlap. Final subsections address the animal life and endangered species within the aquatic preserves.

1. Mangroves. The four species of mangrove trees in the Indian River Lagoon represent the dominant vegetational association. The mangroves range from twelve to fifty feet in height and generally inhabit the low energy shorelines of the estuary system.

The four species of mangroves occurring here are the red mangrove (Rhizophora mangle) which is dominant, both in and near the water at low tide level; black mangrove (Avicennia germinans) generally inland of, but sometimes mixed with reds; white mangrove (Laguncularia racemosa) generally upland of, but also mixed with blacks; and buttonwood (Conocarpus erectus) upland of and mixed with whites. These mangrove association species generally indicate areas of frequent (red mangrove) to infrequent (white mangrove) saline inundation.

There are many variations of the mangrove community within the area. The major variation is the fringe mangrove which occurs along the shorelines of the embankments, river, creeks and other waterways. All four species can appear in this variation, both in zones and mixed as described above. There are also areas of overwash where the mangroves are standing in water with little or no associated uplands. This variation is generally dominated by red mangroves (Odum et al., 1982). The mangrove species have various root structures, i.e., prop roots and pneumatophores (the aerating root spikes of the black mangroves) and extensive underground root mats which capture and stabilize sediments in the estuarine waters and function as an erosion control buffer in other areas. These root networks recycle nutrients and minerals from the anaerobic soil substrate by returning them to the estuary as detritus from the mangrove leaves. This is the primary basis of the estuary's food

chain and productivity (Heald and Odum, 1970). The mangrove canopy and root tangle also provide valuable habitat for many marine and estuarine organisms (Savage, 1972). The entire community also functions to buffer the uplands from storm tides and winds, and acts as a storage area for those waters.

The mangrove community types and various locations indicate that they can adapt to many situations, but they are susceptible to both natural and man-induced disturbances. The natural disturbances can come from freezing temperatures, hurricanes, new pass formations or changes in sea level. Hurricane damage, although not experienced in the recent past, is a potential threat to these communities. Man induced disturbances in the Lagoon area include the large areas of mosquito impoundments that changed the mangrove diversity, dredge and fill activities that destroyed mangrove areas, and erosion and other forces that may be attributed to man.

Man's more subtle influence on the mangrove communities is not as fully understood as the natural forces that cause the direct removal or killing of the trees. The effects of changing the upland drainage pattern, both by bulkhead placement and drainage canals, need much more study. The placement of extensive bulkheading along waterways has preempted mangrove growth in many areas.

Protection of the extensive mangrove communities in the preserve will be a major task of this plan's management activities. The policies and practices of this management are addressed in Chapter V, Section B.

Other vegetation associated with the mangrove communities include: salt grass (Distichlis spicata); bull rush (Scirpus americanus); spike rush (Eleocharis cellulosa); smooth cordgrass (Spartina alterniflora); glasswort (Salicornia spp.); sea purslane (Sesuvium portulacastrum); saltwort (Batis maritima); sea ox-eye (Borrichia frutescens), and sea lavender (Limonium cardinianum).

The tree canopies and root tangles provide habitat for various animals. These community types are utilized by a wide variety of invertebrates, fishes, amphibians, reptiles, mammals and birds (Table I).

2. Marine Grassbeds. Marine grasses are submerged flowering plants which stabilize sediments, entrap silt, recycle nutrients, provide shelter, habitat and substrate for animals and other plant forms, provide important nursery grounds, and are important direct food sources (Odum, 1974; Wood et al., 1969). The grassbeds are very productive, possibly the most productive habitat within the estuary. These beds serve as a food source for the endangered manatee (Trichechus manatus), important nursery areas for juvenile forms of shellfish, and as substrate for many epiphytic algae species eaten by invertebrates which are in turn eaten by the fishes. Many commercially important fishes spend at least part of their lives in these grassbeds (Zieman, 1982) (Table II).

The most common marine grass found in the Indian River Lagoon is manatee grass (Syringodium filiforme). The next dominant is Cuban shoal grass (Halodule wrightii). Other marine grasses found in the lagoon include turtle grass (Thallassia testudinum), widgeon grass (Ruppia maritima), Halophila johnsonii,

Table I

ANIMAL LIFE COMMONLY ASSOCIATED WITH THE MANGROVE COMMUNITY

Mammals
- marsh rabbit
- rice rat
- raccoon
- bobcat
- otter

Birds
- yellow-crowned night heron
- green-backed heron (formerly green heron)
- black crowned night heron
- little blue heron
- great blue heron
- snowy egret
- American egret
- cattle egret
- roseate spoonbill
- osprey
- brown pelican
- white ibis
- clapper rail
- belted kingfisher
- fish crow
- northern parula warbler
- yellow-rumped warbler
- yellow-throated warbler
- red-winged blackbird

Reptiles
- diamondback terrapin

Fishes
- tarpon
- bay anchovy
- rainwater killifish
- sheepshead minnow
- mosquitofish
- sailfin molly
- tarpon snook
- gray snapper

Invertebrates
- mangrove tree crab
- fiddler crab
- blue crab
- oysters
- shrimp
- snails

Source: Fernald, et al. The Sebastian Inlet-Ft. Pierce Inlet Barrier Islands. A Profile of Natural Communities, Development Trends, and Resource Management Guidelines. 1982.

As modified by: Barnett, et al. Fish and Wildlife Resources of the Charlotte Harbor Area. 1980.

Mike Nagy, Per. Comm.

Table II

ANIMAL LIFE FOUND IN MARINE GRASSBED AREAS OR

GENERALLY ASSOCIATED WITH THIS COMMUNITY

Mammals
- Atlantic bottle-nosed dolphin
- manatee

Birds
- common loon
- horned grebe
- brown pelican
- double-crested cormorant
- magnificent frigatebird
- pintail
- green-winged teal
- blue-winged teal
- American widgeon
- northern shoveler
- lesser scaup
- ruddy duck
- red-breasted merganser
- osprey
- American coot
- herring gull
- Forster's tern
- least tern
- royal tern
- Caspian tern
- black skimmer
- belted kingfisher

Reptiles
- diamondback terrapin

Fishes
- bullshark
- ladyfish

Fishes (continued)
- tarpon
- scaled sardine
- striped anchovy
- sea catfish
- gafftopsail catfish
- rainwater killifish
- gulf killifish
- longnose killifsh
- sheepshead minnow
- sailfin molly
- gulf pipefish
- crevalle jack
- snook
- gray snapper
- pigfish
- spotfin mojarra
- silver jenny
- silver perch
- spotted seatrout
- spot
- southern kingfish
- red drum
- sheepshead
- pinfish
- striped mullet
- white mullet
- tidewater silverside
- lined sole

Invertabrates
- Northern quahog
- Southern quahog

Source: Fernald, et al. The Sebastian Inlet-Ft. Pierce Inlet Barrier Island. A Profile of Natural Communities, Development Trends, and Resource Management Guidelines. 1982.

As modified by: Barnett, et al. Fish and Wildlife Resources of the Charlotte Harbor Area. 1980.

and H. engelmanii (Thompson, 1976, Eiseman and McMillan, 1980). Detailed mapping of marine grassbeds are in Appendix D (Resource Protection Area Mapping). The more dense areas of grassbeds in the estuarine complex are usually in shallow water with a fairly constant salinity. These shallow areas are prime fish habitat and are vulnerable to damage by boating activities. The marine grassbeds are sensitive to turbidity and, as a result, are vulnerable to dredging activities.

Within the Indian River Lagoon, grassbeds are denser near inlets, in bands along the western shoreline, and in scattered patches on the eastern shoreline (Thompson, 1976). Seagrass coverage and diversity appear to vary seasonally, yearly and possibly in longer cycles.

Marine grassbeds are a primary vegetation community and will be used as a key indicator in measuring the natural condition of the aquatic preserve. Protection of marine grassbeds will be a major consideration in the field and administrative review of use proposals (See Appendix D).

The invertebrate fauna and algal flora associated with these grassbeds can be rich and diverse, depending on the specific area. There is a need for more data on the animal life associated with marine grassbeds.

3. Drift Algae. Drift algae are important associated components of the marine grassbed system in the Indian River Lagoon. There are some 60 species of red, brown and green algae that are either interspersed or grow on marine grasses. These algae begin as attached forms on the grass blades and

eventually break loose to drift. These floating algal mats become substrata for numerous invertebrates, associated algae and fish. The drift algae communities may provide better refuge for many organisms than marine grasses. These communities occur throughout the lagoon (Benz et al., 1979, Eiseman and Benz, 1975; Gore et al., 1981; Kulczycki et al., 1981; Virnstein and Howard [in press]).

4. Saltmarsh. Historically, this habitat was commonly converted to mosquito impoundments and only a small percentage of the original acreage remains open today. These communities in this region are generally forced out by the more dominant mangroves. The saltmarsh grasses grow in transitional areas between mangroves, freshwater marshes and saltbarren areas. Some of these transitional areas are also at elevations (i.e., landward of the mean high water line) that technically may put them outside the aquatic preserve boundary (unless the uplands are state-owned).

The species within this community are smooth cordgrass (*Spartina alterniflora*), saltwort (*Batis maritima*), glasswort (*Salicornia virginica*), salt grass (*Distichlis spicata*) and sea ox-eye (*Borrichia frutescens*).

This community can also have mangroves, cabbage palms, and exotics mixed in with the vegetation. The type of vegetation present varies with the degree of tidal inundation, the influence of other vegetation, the amount of disturbance by ditching and diking, and the amount of freshwater drainage from the uplands. The saltmarsh grass community recycles nutrients, contributes to the estuarine productivity, and provides shelter and habitat to a variety of animal life (see Table III).

Table III

ANIMAL LIFE COMMONLY ASSOCIATED WITH SALTMARSH GRASS COMMUNITIES

WITHIN THE INDIAN RIVER LAGOON AREA

Mammals

marsh rabbit
rice rat
hispid cotton rat
raccoon

Reptiles

diamondback terrapin
common garter snake

Fishes

bay anchovy
rainwater killifish
gulf killifish
sheepshead minnow
mosquitofish
striped mullet

Birds

great blue heron
great egret
snowy egret
tricolored heron
clapper rail
least sandpiper
black-necked stilt
ring-billed gull
laughing gull
Forster's tern
least tern
black tern
tree swallow
barn swallow
common yellowthroat
red-winged blackbird
sharp-tailed sparrow

Source: Fernald, et al. The Sebastian Inlet-Ft. Pierce Inlet Barrier Island. A Profile of Natural Communities, Development Trends, and Resource Management Guidelines. 1982.

As modified: Barnett, et al. Fish and Wildlife Resources of the Charlotte Harbor Area. 1980.

5. Tidal Flats. A tidal flat in the estuarine complex describes a wide variety of habitats that may have sporadic vegetation from the previous three communities, or no vascular vegetation at all. There is extensive algal growth in these areas. The tidal flats are used primarily by shore and wading birds as feeding and loafing areas (Barnett et al., 1980). These areas are also valuable for invertebrates, including crabs, oysters, and worms.

Tidal flats, consisting of estuarine beaches, areas waterward of the mangroves, spoil areas, shoal areas, and mud flats, are important to the estuary through their contribution to the algal production. The mollusk, crustacean, and worm communities feed on both the algae and materials from the other plant communities of the estuary. The bird life is dependent on these areas for feeding and some of these flat areas surround colonial nesting sites in the estuarine complex. The ecological role of these various tidal flat areas is not fully understood, but it is known that they are important habitats (Table IV).

6. Oyster Bars. The oyster performs a valuable function in the food web by converting plankton, detritus and possibly dissolved organics into animal protein, which is then available to higher predators (Tabb et al., 1974). The substrate formed by the oyster colonies occurs in areas where there are no other hard substrates. These oyster bars create habitat space that is unique to the estuary. The oysters and the associated animals are utilized by other animals which feed on or around the oyster bars. Oyster bars are common in the lagoon and once were commercially fished (Wilcox, 1897). Due to pollution from residential and agricultural sources there is only a relatively small

Table IV

ANIMAL LIFE COMMONLY ASSOCIATED WITH TIDAL FLATS

OF THE INDIAN RIVER LAGOON AREA

Mammals

raccoon

Birds

brown pelican
great blue heron
yellow-crowned night heron
white ibis
roseate spoonbill
semipalmated plover
Wilson's plover
ruddy turnstone
spotted sandpiper
greater yellowlegs
lesser yellowlegs
willet
red knot
least sandpiper
dunlin
western sandpiper
sanderling
shore-billed dowitcher
black-necked stilt
herring gull
ring-billed gull
laughing gull
Forster's tern
least tern
Royal tern
sandwich tern
Caspian tern
black skimmer
fish crow

Source: Fernald, et al. The Sebastian Inlet-Ft. Pierce Inlet Barrier Island. A Profile of Natural Communities, Development Trends, and Resource Management Guidelines. 1982.

As modified by: Barnett, et al. Fish and Wildlife Resources of the Charlotte Harbor Area. 1980.

area north of Fort Pierce and east of the Intracoastal Waterway that presently has approved, open shellfish waters. This approved area may also be affected by squatters as addressed under Spoil Islands (Section 8.). The continued health of this remaining open shellfish water will depend on its protection from existing or potential pollution sources from the spoil islands and other shoreline developments.

7. Deep Water Areas. These areas within the Indian River Lagoon area include natural and artificial inlets, channels, rivers, creeks, and other deep water areas. These areas are important to the estuary's tidal exchange. They are critical to tidal flushing and are necessary for a healthy estuary. The deeper waters also allow predator fish access to the lagoon. The bottle-nosed dolphin and manatee are important mammals potentially found in these areas.

8. Spoil Islands. The construction and maintenance of the Intracoastal Waterway channel and barrier island inlets resulted in the formation of a chain of spoil islands within the Indian River Lagoon. These islands, formed by the deposition of the dredged material (spoil), usually parallel the channel alignment. These islands vary in size from 1 to 75 acres within the Indian River Lagoon. They have been subjected to erosion and accretion from winds, currents and boat wakes which have modified the original shape and placement of many of the islands. In many cases, the original spoil placement destroyed valuable marine grassbeds and shallow water habitats.

Vegetation on these islands is generally dominated by exotics, such as Australian Pine and Brazilian pepper. However, the shoreline fringe is

generally vegetated with mangroves and other native wetland vegetation, and provides valuable habitat to fish and wildlife, especially bird life.

There are some 10 spoil islands within the Indian River County, 14 within the St. Lucie County and 10 within the Martin County portions of the preserves. The Palm Beach County portion does not have these same spoil areas but has more upland disposal. The Indian River County spoil islands have been dedicated to recreation and waterbird roosting and nesting habitat. Some of the spoil islands within St. Lucie County have undergone minor development by "squatters". These islands are within areas conveyed to the Florida Inland Navigation District (FIND) by the Trustees for the sole purpose of navigational improvement and are not owned by these individual squatters.

9. Mosquito Impoundments. Numerous mosquito impoundments have been developed by diking and impounding high marsh habitats adjacent to the Indian River Lagoon (Bidlingmayer and McCoy, 1978). By manipulating water levels within these impoundments, prime mosquito habitat can be flooded to prevent mosquitoes from depositing eggs in tidal areas.

The impounding and flooding have changed the vegetation, wildlife types and diversity. The impoundments also restrict and, in some cases, prohibit the flow of nutrients and fishery interaction within the Indian River lagoon. These impacts can be mitigated by opening the impoundments to tidal access during months when mosquito control is not needed (Clements and Rogers 1964; Provost 1967, 1974b, 1976). There is now a wide variation in management practices for mosquito impoundments. A Subcommittee on Mosquito Impoundments

was established under the Governor's Working Group for Mosquito Control to help foster improved management techniques, to benefit environmental and mosquito control concerns.

10. Animal Life. The animal life associated with the Indian River Lagoon area is historically as diverse as the vegetation. However, with the encroachment of human activities such as mosquito impoundments, intracoastal waterway, maintained inlets, spoil islands and other dredge and fill areas, artificial drainage, bridges, and roads, much of the original habitat has been modified. These modifications have caused a variety of changes to the animal life of the Lagoon.

The fisheries of the Indian River Lagoon are a major reason for its designation as an aquatic preserve. The estuary is a valuable recreational fishing and nursery area for fish commercially caught in the Atlantic Ocean. Other species not directly important to commercial fishing, but necessary to its ultimate food chain, also depend on this estuary. The islands, tidal flats, mangrove forests and spoil islands provide a refuge for species visiting this area during migrations, for daily feeding purposes and during times of environmental stress (i.e., drought, storms, development activities). These visiting species include the manatee and many bird species. Fresh and saltwater fish species and other animal species lists and information can be found in Appendix C.

11. Endangered Species. The combination of the subtropical climate, diverse vegetation and habitats, and waterbodies in the Indian River Lagoon Aquatic

Preserves has resulted in the survival of many species of endangered animals. Portions of the Indian River Lagoon area have also been established as a sanctuary for the endangered manatee. Chapter 16N-22 of the Florida Manatee Sanctury Act establishes a slow speed zone (from November 15 to March 31) that extends from the St. Lucie Inlet south to Jupiter Inlet. Exceptions to this include the Intracoastal Waterway and portions of the river regulated under Section 371.522, F.S. The northern section of the Vero Beach to Ft. Pierce Aquatic Preserve is similarly designated. Table V provides a list of endangered animals known to occur within this lagoon.

C. Archaeological and Historical Sites.

The Indian River Lagoon area has a long history of Indian activity. The main Indian occupants were the Ais tribes. The Jeaga Indians, considered to be "cousins" of the Ais, occupied a few scattered villages in the area. These Indians were primarily hunter-gatherers, taking advantage of the rich fishery resources of the Indian River and Atlantic Ocean.

The demise of these early tribes in the 1700's led to speculation that they had been replaced by Spanish civilization and the migration from the north of Seminole Indians into the area. From the 1880's on, early settlers used many of the Ais Indian shell mounds for road construction. Today, few artifacts are left in the area (Rights, 1982).

Ft. Pierce, Ft. Jupiter (near Pennock Point) and Ft. Capron (north of Ft.

Table V

SPECIES OF THE INDIAN RIVER LAGOON AREA

WHICH ARE CLASSIFIED AS ENDANGERED, THREATENED, OR OF SPECIAL CONCERN

ENDANGERED

Reptiles

Atlantic green turtle	(*Chelonia mydas mydas*)
Atlantic hawksbill turtle	(*Eretmochelys imbricata imbricata*)
Atlantic Ridley turtle	(*Lepidochelys kempii*)
Leatherback turtle	(*Dermochelys coriacea*)
Atlantic salt marsh snake	(*Nerodia fasciata taeniata*)

Birds

Wood stork	(*Mycteria americana*)
Peregrine falcon	(*Falco peregrinus*)

Mammals

West Indian manatee	(*Trichechus manatus*)

THREATENED

Reptiles

Atlantic loggerhead turtle	(*Caretta caretta caretta*)

Birds

Eastern brown pelican	(*Pelecanus occidentalis carolinensis*)
Bald eagle	(*Haliaeetus leucocephalus*)
American kestrel	(*Falco sparverius paulus*)
Roseate tern	(*Sterna dougallii*)
Least tern	(*Sterna albifrons*)

Table V (continued)

SPECIES OF SPECIAL CONCERN

Fishes	
Common snook	(*Centropomus undecimalis*)
Rivulus	(*Rivulus marmoratus*)
Reptiles	
American alligator	(*Alligator mississippiensis*)
Birds	
Little blue heron	(*Florida caerulea*)
Snowy egret	(*Egretta thula*)
Louisiana heron	(*Hydranassa tricolor*)
Reddish egret	(*Dichromanassa rufescens*)
Roseate spoonbill	(*Ajaia ajaja*)
American oystercatcher	(*Haematopus palliatus*)

Adapted from: Fernald, et al. *The Sebastian Inlet-Ft. Pierce Inlet Barrier Island: A Profile of Natural Communities, Development Trends, and Resource Management Guidelines*, 1982.

Florida Game and Fresh Water Fish Commission, *Offical lists of Endangered and Potentially Endangered Fauna in Florida*, October 1984.

Pierce) are just a few in a chain of forts established by the U. S. Army during the Seminole wars. General Thomas Jessup and Lt. Benjamin Pierce battled the Seminole Indians in the area, eventually forcing many of them to take refuge in the Everglades (Tebeau, 1972).

D. Water Resources.

Water is the one resource whose characteristics most directly affect the habitability and healthiness of the Indian River Lagoon for the plants and animals naturally adapted to living there. The drainage basin of the majority of the Indian River Lagoon has been modified by agricultural drainage and residential development. The agricultural areas west of the river represent the first stage of man's alterations. These alterations included the construction of major drainage networks that allowed large amounts of fresh water to flow into the lagoon much quicker than natural drainage would have permitted. Added to the fresh water impacts are the potential biocides and nutrients within these waters that drain off agricultural, residential and urban lands.

The Intracoastal Waterway (completed in 1941) and the maintained inlets have changed the historical flushing and circulation within the lagoon system. The mosquito impoundments have removed large acreages of wetlands from the free exchange with the lagoon. Finger canals and lands created by dredge and fill have destroyed wetland areas and created water quality problems.

Two major sewage treatment plants are located within close proximity of the Indian River Lagoon Aquatic Preserves. The Fort Pierce Utility Authority facility is located within the city limits of Fort Pierce, on the east side of the Indian River, approximately 0.9 miles north of Aquatic Preserve A-10. This plant has recently been expanded to a design capacity of 9.0 million gallons per day. The average daily flow of 4.0 million gallons per day discharges into Class III waters of the Indian River Lagoon southwest of the Causeway Island plant site and Fort Pierce Inlet.

The Vero Beach treatment plant is located within the city limits along the western shore of the Indian River Lagoon, approximately 1.5 miles north of the aquatic preserve boundary. This facility has a design capacity of 4.5 million gallons per day with an average flow of 3.0 million gallons per day discharging into Class III waters of the Indian River Lagoon.

Both sewage treatment plants have secondary treatment of sewage effluent. An engineering study indicated no significant water quality impact (i.e., oxygen depression) should occur from these discharges.

The City of Stuart also has a sewage treatment plant in close proximity to the Indian River, but uses deep well injection for effluent disposal.

In addition to these major sewage treatment facilities, there are approximately 25 smaller plants located on the mainland, discharging into the Lagoon, and at least 60 package plants on the barrier islands.

With all of the aforementioned problems, the Indian River Lagoon is still a relatively productive system, when compared to more populated areas to the south and on the west coast of Florida. The growth experienced in past decades is beginning to take its toll on the resources, but has not yet reached a critical level. The magnitude of development is now reaching a level where water quality considerations will become critical.

E. Cultural.

The U. S. Census population for Indian River, Martin and St. Lucie Counties for 1970 and 1980, with percent increase, was 35,992 to 59,896 - 66.4%, 28,035 to 64,014 - 128.3% and 50,836 to 87,182 - 71.5%, respectively. The majority of these counties' population is along the coastline. The Palm Beach County population was 348,993 in 1970 and 576,812 in 1980. However, population growth in that portion of the preserve within northern Palm Beach County is insignificant compared to the dense population residing in the lower end of that county.

The U. S. Census populations for the cities along these preserves and their growth and percent increase between 1970 and 1980 are: Vero Beach 11,908 to 16,176 - 35.8%; Fort Pierce 29,721 to 33,802 - 13.7%; Seawalls Point 298 to 1,187 - 298.3%; Stuart 4,820 to 9,467 - 96.4%; Tequesta 2,642 to 3,685 - 39.5%. This graphically indicates that the population increases, which also indicate an increase in associated residential development, are quite significant. These growth pressures effect water resources and wildlife, and

generally increase the potential for environmental degradation. Growth impacts on the Indian River Lagoon are generally covered under the issues identified by the Hutchinson Island Resource Planning and Management Plan:

* elimination of mangrove areas and other marine or freshwater habitat for the purpose of development;

* the elimination and/or isolation of mangrove and marsh areas from the estuary/lagoon by diking and impounding for the purpose of mosquito and sand fly control;

* extensive bulkheading of the Indian River;

* adverse impacts on water quality due to reduced flushing and increased waste load, bulkheading, dredging of channels and storm water runoff.

Chapter V

RESOURCE MANAGEMENT

A. Introduction

The main objective of the resource management plan in the aquatic preserve is to protect the resources of the aquatic preserves for the benefit of future generations (Section 258.35, F.S.). The Indian River Lagoon Aquatic Preserves are designated as wilderness preserves and the management will be directed toward the maintenance of the existing or essential natural conditions. This part of the management plan addresses the policies and procedures which both onsite and administrative personnel will pursue. The onsite management will involve DNR's field personnel assigned to the aquatic preserve. The administrative management will involve Division of Recreation and Parks' personnel (both in the field and in Tallahassee) and Division of State Lands' personnel, cooperating in the review of applications for use of state-owned lands and related activities surrounding the preserve. These personnel will be interacting with various government and non-government entities, interest groups, and individuals.

B. Onsite Management Objectives

The onsite management objectives are reflected in the activities that the field personnel become involved in (i.e., observation, research, public

interaction, emergency responses, etc.) to protect and enhance the resources within the aquatic preserve. Other activities, such as the interaction with other government and non-government entities, are covered in more detail in Chapter VI (Management Implementation Network). The field personnel's duties are, with respect to management of the various uses of the aquatic preserve, addressed in more detail in Chapters VII through XI. The field personnel will generally be involved in all management activities concerning the Indian River System.

1. Plant Communities

The communities of aquatic and wetland plants within the Preserve perform five major functions vital to the health and productivity of the estuarine system:

a. they tend to stabilize geologic features in the face of dynamic forces (i.e., currents, tides, winds, and waves), which often act in concert to both erode and deposit;

b. they create, from recycled nutrients and solar energy, the organic material that fuels the estuarine food web which supports the area's fisheries, endangered species, migratory waterfowl, colonial waterbird nesting colonies, raptors, marine mammals, and marine and estuarine invertebrates;

c. they provide protected fisheries habitat for spawning and juvenile development;

d. they provide roosting and nesting habitat for water birds; and,

e. they physically buffer estuarine and riverine waters from contaminated and channelized runoff from uplands within the estuarine watershed and, in some cases, buffer the uplands from storm waves and winds.

The management objectives for plant communities will be to maintain and enhance these functions. Because these plant communities are critically important to the well-being of the Preserve, a program to work toward the protection and restoration of those communities now damaged or destroyed by human activities should be developed.

Management Policy

a. Field Familiarization and Documentation. Field personnel will become familiar with the plant species and communities present in the aquatic preserve, and locations of their occurrences.

b. Literature Familiarization. Field personnel will assemble a working library of existing pertinent literature concerning the species and communities present in the aquatic preserve. Staff will become familiar with the ranges, life histories, ecological requirements, productivity, importance to water quality, contribution to landform stabilization, wildlife habitat provision, fisheries habitat provision, and fisheries food production of the plant communities within the aquatic preserves.

c. Preparation of Guidelines for Management of Endangered Species. Field personnel, based on their field observations and literature reviews, will develop maps (using 7.5 minute quadrangles) showing the locations of threatened and endangered plant species within the aquatic preserve. A set of management guidelines for each species, outlining the habitat requirements and the methods to sustain and/or restore these habitats will be developed. Field personnel, in the course of documenting the occurrence of threatened and endangered animals, will develop maps showing the locations and types of plant communities used by these animals for nesting, roosting, feeding, resting, spawning, etc. Literature information and personal observations will then be used to develop guidelines for maintaining (or restoring if necessary) the "critical habitat" required by each species.

d. Monitoring of Plant Communities for Natural Changes. Field personnel will become familiar with the use of aerial photography and LANDSAT imagery, for the study and monitoring of plant communities (historically and at the present time) and will use this remote sensing in conjunction with field observations to monitor and document natural changes such as:

1. freeze damage to, and recovery of, mangrove communities:
2. wind and wave damage to mangrove communities from storms and hurricanes;
3. accretion-related seaward extension of mangrove communities;
4. erosion-related landward retraction of mangrove communities;
5. depositional burying of marine grassbeds communities;
6. invasions of exotic plant species and revegetation by native species after exotic plant removal projects;

7. pathogen damage to and recovery of plant communities.

e. Identification of Areas and Communities in Need of Restoration. Field personnel will, as time permits, systematically survey the aquatic preserve to determine the location, nature, and extent of environmental damages from human activities and assess the possibility of restoring each of the sites according to whether the site is publicly or privately owned, and the cost and effort required.

f. Protection of Plant Communities. Field personnel shall protect the plant communities from the various uses of sovereign lands within the aquatic preserve according to the following guidelines.

1. Field personnel in their biological reports shall not recommend for approval any proposed use of sovereignty submerged lands when the plant communities in the proposed use area appear to be jeopardized.

   i. Pruning of mangroves shall only be permitted for access from the mean high-water line to a dock or pier. The destructive clearing of mangroves in sovereignty lands shall be strictly prohibited.

   ii. Marine grassbeds communities shall not be removed or shaded to such an extent as to cause the death of a significant area of the community. They shall not be subjected to unacceptable turbidity, decreased light penetration, propeller or net damage.

2. Field personnel shall be notified of applications for uses of submerged lands within the aquatic preserve by the Bureau of Environmental Land Management central office. No applications will be approved within Class 1 and 2 Resource Protection areas (see section B(6) of this chapter) without a thorough review by the field personnel. The field personnel will inspect the site, assess the potential impacts to the plant communities, and then convey their recommendations to the central office as required.

3. Field personnel will initiate various educational programs and supplement existing educational programs designed to increase public awareness of the damage that recreational, private and commercial uses (i.e., propeller damage) can inflict on marine grassbed communities.

4. Field personnel will develop an exotic plant control and removal plan after monitoring the rate and extent of invasion by exotic species, such as Brazilian pepper, Australian pine, and melaleuca.

5. In cooperation with the Treasure Coast Regional Planning Council, field personnel will familiarize themselves with the results of a study under the Coastal Energy Impact Program, in assessing the potential impacts of an oil tanker spill or drilling rig accident on the natural resources of the Indian River Lagoon.

g. Restoration of Plant Communities. Field personnel will consult with professionals in the wetlands restoration/revegetation field to determine the advisability of using healthy beds of marine grasses as a stock source to restore damaged grassbeds. They will develop guidelines for restoring marine grassbeds in the aquatic preserve.

Field personnel will identify easily accessible mangrove communities within the aquatic preserve where a high density of mangrove seedlings could serve as a nursery stock source for transplanting to restoration sites. Field personnel will consult with professionals in the wetlands restoration/revegetation field concerning proven procedures for transplanting and nurturing mangroves, and will develop guidelines for restoring mangrove communities in the aquatic preserve.

In the event that plant restoration is required as the result of a permit application with DER, or as a result of any other process, the field personnel will be responsible for monitoring the restoration activity. This might include advising the individuals involved in the actual restoration work on the best techniques under the available restoration guidelines. The field personnel will monitor the success of the restoration project after the work is completed.

h. Identification of Research Needs. Field personnel will identify research needs concerning plant communities within the aquatic preserve with special emphasis given to data needs that would increase the capability of field personnel to manage plant communities under environmental stress, and to

determine threshold tolerances for plant community health and diversity in relation to degraded environmental conditions.

i. Coordination with Other Researchers. Field personnel will become familiar with research projects being conducted within the aquatic preserve by state and federal agency biologists and non-government researchers. Water quality research issues, as they affect plant communities, should also be closely followed. .This familiarization should lead to a better understanding of both agencies' personnel and a better awareness of the data findings and uses. The research liaison will also be addressed in Chapter X (Scientific Research).

2. ANIMAL LIFE

The richness of the animal life of the Indian River Lagoon area is important to the designation of the aquatic preserve. The fish, shrimp, and crabs within the aquatic preserve, both in the estuary and offshore, are valuable resources on which recreational and commercial fisheries depend. Large areas of undisturbed wetlands are excellent habitat for many types of wildlife. These wildlife include an extensive list of endangered species, migratory waterfowl, colonial waterbirds, invertebrates and vertebrates.

The management objective for animal life within the aquatic preserve will be the protection through preservation of habitats and living conditions in the most natural condition possible.

MANAGEMENT POLICY

a. Field Familiarization and Documentation. Field personnel will become familiar with the major animal species in each habitat in the aquatic preserve. This identification process will include the location, number, season of sighting, weather conditions and any other factors which may be necessary to build a working knowledge of the species, and their interaction and occurrence in the aquatic preserve.

b. Literature Familiarization. The field personnel will assemble a working library of existing literature concerning the major animal species and communities within the aquatic preserve. The field personnel will become familiar with life histories, ecological requirements, position in the community, habitat and other factors necessary for sound management.

c. Preparation of Guidelines for the Management of the Endangered Species Within the Aquatic Preserve. The field personnel will become familiar with the guidelines of the Florida Game and Fresh Water Fish Commission, U. S. Fish and Wildlife Service, Department of Natural Resources' Division of Marine Resources, National Marine Fisheries Service and any other applicable agencies and non-government organizations involved in the management of endangered species. These guidelines will be used in conjunction with the field familiarization, documentation, and mapping to develop management guidelines for each endangered species within the aquatic preserve. Special guidelines shall be developed and implemented for the management of areas within the aquatic preserve that are identified as critical habitat for endangered species.

d. Manatee Management. When applications for use of submerged lands within the preserves are within a manatee sanctuary or manatees are known to use the area, field personnel will notify the State Manatee Coordinator. These applications will require his authorization and approval before those applications are recommended by BELM. Field personnel will also work with the manatee coordinator in gathering manatee siting data within the preserves and establishing new sanctuaries, if necessary.

e. Monitoring Changes in Animal Populations. Field personnel will study and monitor changes in animal species that are caused by natural phenomena, such as:

i. freezes;
ii. storms and hurricanes;
iii. changes in habitat due to changes in plant types;
iv. changes in habitat due to water quality changes; and
v. geologic or hydrologic changes including erosion, estuarine current flow changes, and any other physical changes.

f. Protection of Animal Life From Human Uses of the Aquatic Preserve. Field personnel, during the process of resource impact analysis in the review of use applications in or affecting the preserve, shall consider the protection of animal species. The review shall also consider the potential effects of the proposed use on the plant communities as they function as habitat for the animal life and uses that may cause a disturbance in the

natural activities and functions of the animal life (e.g., air pollution, excessive noise or bright lights affecting a bird rookery). The field personnel should be notified of any proposed activities (e.g., seismic testing, mammal capture by permit) within the aquatic preserve that might affect the well-being of animal life and should be involved in planning the activity so as to cause the least amount of stress on animal life.

g. Identification of Research Needs. The field personnel in the course of their duties shall identify research needs required to improve the management of animal life in the aquatic preserve. This identification process is more fully described in Chapter XII (Identified Program Needs).

h. Coordination with Other Researcher. Field Personnel will become familiar with research projects conducted within the aquatic preserve by state and federal agency biologists and non-government researchers. This familiarization should lead to a better understanding of both agencies' personnel and a better awareness of the data findings and uses. The research liaison will also be addressed in Chapter X (Scientific Research).

3. GEOLOGIC FEATURES

The management of geologic features will require that the field personnel become aware of the natural geologic features and the changes, both human and natural, which affect these features within the aquatic preserve to better enable a review of applications for state-owned land uses that might affect

these features. These geologic features will include inlets, islands, shoals, shorelines, embayments, and channels. The overall objective of the management of these features is to allow the naturally dynamic system to operate without man's influence or interference. Active management in this area shall include the review of proposed uses that might affect the geologic features within the aquatic preserve. The majority of these reviews will probably concern bulkheads, bridges and channels as they might affect state-owned lands. The objective in the placement of bulkheads on lands upland of the aquatic preserve shall be that the natural contour and drainage be altered to the least amount practicable. The use of rip rap with mangrove or other suitable native plantings would be preferable to bulkheads within the preserve. Bulkheads are not allowed within the preserve, except as stated in Sections 258.42(2), and 258.44 F.S. and in accordance with the management objectives of the preserve.

Existing bridges and causeways within the Indian River Lagoon have resulted in losses of grassbeds and mangroves. Future proposed bridge locations will be reviewed in light of these potential impacts. Causeways restrict natural flushing and create unnatural circulation patterns.

Maintenance dredging of existing channels should also be carefully studied to remove conditions that require perennial maintenance and environmental disturbances. New channels also have the potential to adversely impact the aquatic preserves, with varying influences in each preserve, depending on channel location.

The field personnel shall also be involved in the review of project proposals

submitted to other agencies, such as the U.S. Army Corps of Engineers, the Department of Environmental Regulation, the Department of Transportation or the Water Management Districts, and shall formally review and comment on any permit application that impacts the aquatic preserve. These projects shall be reviewed jointly with those agencies' personnel whenever possible. The field personnel will review these projects on behalf of the aquatic preserve and its resources.

4. ARCHAEOLOGICAL AND HISTORICAL SITES

Archaeological and historical sites have several characteristics which must be recognized in a resource management program.

i. They are a finite and non-renewable resource.

ii. Each site is unique because individually it represents the tangible remains of events which occurred at a specific time and place.

iii. While these sites uniquely reflect localized events, these events and the origin of particular sites are related to conditions and events in other times and places. They also preserve traces of past biotic communities, climate, and other elements of the environment that may be of interest to other scientific disciplines.

iv. These sites, particularly archaeological sites, are very fragile because their significance is derived not only from the individual artifacts within them, but especially from the spatial arrangement of those artifacts in both horizontal and vertical planes.

Administering Agency.

The management of the archaeological and historical sites is authorized and administered by the Division of Archives, History and Records Management (DAHRM) in the Florida Department of State. The management authority for this area of management is presented in Chapter II (Management Authority).

Management Policy.

The management policy presented here is one of conservation, as recommended by the DAHRM and subject to that agency's changes. Their policy is as follows:

1. The field personnel and all other agencies planning activities within the aquatic preserve shall coordinate closely with DAHRM in order to prevent any unauthorized disturbance of archaeological and historical sites that may exist on the affected tract. DAHRM is vested with the title to archaeological and historical resources abandoned on state lands and is responsible for administration and protection of such resources (Section 267.061(1)(b), F.S.). It is illegal to destroy or otherwise alter sites on state lands without a

permit from DAHRM (Section 267.13, F.S.). Therefore, agencies planning activities should coordinate their plans with DAHRM at a sufficiently early stage to preclude inadvertent damage or destruction to these resources.

2. The nature of these sites' fragility and vulnerability to looting and other destructive forces requires that the location of these sites not be widely known, if the location is known at all. In many instances DAHRM will have knowledge of the known and expected site distribution in an area. Special field surveys for unknown areas may be required by DAHRM to identify potential endangerment of a proposed activity to these archaeological and historical sites. This will be especially necessary in the case of activities contemplating ground disturbance over large areas.

3. In the case of known sites, activities that are expected to alter or damage these sites shall alter their management or development plans as necessary, or make special provisions so as not to disturb or damage such sites prior to professionally acceptable and authorized mitigation.

4. If in the course of a management activity, or as a result of development or the permitting of dredge/fill activities, it is determined that valuable historic or archaeological sites will be damaged or destroyed, DAHRM reserves the right to require salvage measures to mitigate the destructive impact of such activities on

such sites (Section 267.061(1)(b), F.S.). Such salvage measures shall be accomplished before DAHRM would grant permission for site destruction.

5. Excavation of archaeological sites in the near future is discouraged. Archaeological sites within the aquatic preserve should be left undisturbed for the present, with particular attention devoted to preventing site looting by "treasure hunters".

6. Field personnel will note suspected sites for future surveys by DAHRM. Cooperation with other agencies in this activity is also encouraged by DAHRM. The DAHRM will help inform the field personnel about the characteristics and appearance of these sites.

7. Any discovery of instances of looting or unauthorized destruction of these sites will be reported to the DAHRM so that appropriate action may be initiated. The Florida Marine Patrol and other enforcement personnel of DNR shall provide enforcement assistance to DAHRM and make arrests or investigate cases of looting or other unauthorized destruction of archaeological sites. The field personnel will follow the above management policy and become familiar with the personnel involved with this task in DAHRM and their procedures for identifying suspected sites.

5. WATER RESOURCES

Responsible management of water resources for the protection of human health and recreational enjoyment of aquatic preserve waters, as well as for the protection and enhancement of the preserves' plant and animal communities is, without a doubt, the most critical aspect of aquatic preserve management. Research to understand how human activity can alter or detrimentally affect the dynamic characteristics of the preserves' various habitats can be approached confidently after monitoring data has been used to model the effects of naturally occurring variations on the same habitat. Only a single toxic substance may be necessary to initiate irreparable ecological damage and change in the water resources of the aquatic preserve estuarine ecosystem.

Management Policy

The successful management of the water resources of the aquatic preserve depends heavily on other government agencies (i.e., DER and the Water Management District) charged with regulating water quality and quantity. The objective of the water resources management shall be to maintain the naturally high water quality and to ensure the natural seasonal fluctuations of fresh water into the estuary. Sources of water resources data from non-government agencies, are dependent on or may be found among colleges, universities, scientific foundations and private consultants working in the Indian River Lagoon area. These various entities have interests at many different levels and areas within the riverine and estuarine system. The aquatic preserve management program will manage the water resources through coordination with

these various entities. The field personnel will not conduct water sampling, but through the review of these data from other entities and from their own field observations, they will be able to identify water resource problems in the aquatic preserve.

a. Familiarization with the Jurisdiction, Personnel, and Monitoring Programs of Government Agencies and Other Entities. Field personnel will become thoroughly familiar with the jurisdiction, personnel and monitoring programs of other agencies, institutions and corporations involved in studying, monitoring, regulating and managing water resources within the aquatic preserve and the drainage basins which provide fresh water to this preserve. Those agencies known to be working or having potential activities affecting the preserve are listed below; others may be added as they are identified.

1. Florida Department of Environmental Regulation
2. Palm Beach County Health Department
3. South Florida Water Management District
4. St. Johns Water Management District
5. U. S. Geological Survey
6. U. S. Fish and Wildlife Service
7. Treasure Coast Regional Planning Council
8. Florida Game and Fresh Water Fish Commission
9. Florida Department of Natural Resources Marine Research Laboratory
10. University of Florida
11. Florida Institute of Technology
12. Florida Medical Entomology Laboratory

13. Jupiter Inlet District

14 Fort Pierce Inlet District

15. U. S. Environmental Protection Agency

16. Florida Power and Light Company

17. Florida Inland Navigation District

18. Harbor Branch Foundation

19. Florida Oceanographic Society

20. National Marine Fisheries Service

21. Applied Biology, Inc./St. Lucie Power Plant

b. Monitoring of Water Resources by Cooperative Data Collection and Review. Field personnel will: 1. promote coordination among involved agencies in planning monitoring programs and in evaluating monitoring data; and 2. monitor water resources within the preserve by reviewing the data collected and compiled by those agencies as it applies to the aquatic preserve and its resources.

c. Review of Permit and Lease Application for Aquatic Preserve Uses and Watershed Activities that would affect the Preserve Water Resources. Field personnel will review sovereign land lease applications, development of regional impact reviews, and DER/COE permit applications in cooperation with other agencies as necessary, and as outlined in Chapter V (C) for their potential impact on the water resources of the aquatic preserve.

d. Familiarization with and Monitoring of Activities and Users which Regularly Contribute Pollutants to Preserve Waters. Field personnel will

become familiar with the activities and users which regularly or potentially contribute pollutants to the waters of the aquatic preserve. This monitoring will be accomplished directly by field observations and indirectly by review of other entities' water resources data. Field personnel will encourage and coordinate with other agencies involved with water resources monitoring to consider more detailed field monitoring in areas of the preserve where the incidence of polluting activities is found to be high. These monitoring activities will also include the monitoring of freshwater releases into the preserves and their effect on the environment.

These activities will also be applicable to Chapter X (Scientific Research), and the coordination through Chapter VI (Management Implementation Network). The field personnel's onsite presence will be complemented by their reliance on other agencies and entities for data and regulation. The field personnel will have the ability to visually monitor water resource crises and phenomena as they occur and when they affect other resources.

6. CUMULATIVE IMPACT ANALYSIS

Cumulative Impacts are the sum total of major and minor changes or effects upon a natural system. Taken singularly these effects may not constitute a notable change in the condition of the natural system, but as these single changes or uses accumulate, their combined impact may result in a substantive environmental disturbance or degradation of the natural system.

The review of proposed uses in the aquatic preserve from the perspective of cumulative impact analysis requires a thorough knowledge of the natural system and the various interactions and dynamics within that system. This aquatic preserve management program will initiate development of a cumulative impact analysis program. The evaluation of cumulative impacts shall include the following criteria from Chapter 160-20 F.A.C.:

"(1) The number and extent of similar human actions within the preserve which have previously affected or are likely to affect the preserve, whether considered by the Department under its current authority or which existed prior to or since the enactment of the Act; and,

(2) The similar activities within the preserve which are currently under consideration by the department; and

(3) Direct and indirect effects upon the preserve and adjacent preserve, if applicable, which may reasonably be expected to result from the activity; and

(4) The extent to which the activity is consistent with management plans for the preserve, when developed; and

(5) The extent to which the activity is permissible within the preserve in accordance with comprehensive plans adopted by affected local governments, pursuant to Section 163.3161, F.S., and other applicable plans adopted by local, state and federal governmental agencies.

(6) The extent to which the loss of beneficial hydrologic and biologic functions would adversely impact the quality or utility of the preserve; and

(7) The extent to which mitigation measures may compensate for adverse impacts."

The availability of onsite reserve staff who are familiar with the distinctive characteristics of this system, coupled with their ability to access LANDSAT imagery and mapping, and other data sources, is the key to development of a successful cumulative impact analysis program. As cumulative impacts are identified for specific areas and/or resources, they will become an integral part of the project analysis and decision-making process.

7. MANAGEMENT OF ENCROACHMENTS

The management of encroachments in the preserve will concern the unauthorized placement of structures or other illegal uses in the aquatic preserve. These encroachments might also include illegal activities associated with an approved use (e.g., extension of a dock, construction of boat houses, extension of an approved channel).

The management policy for the field personnel, after identification of a suspected illegal encroachment, will involve a reporting procedure and the monitoring of the remedial action. After a field identification of suspected encroachments, field personnel will notify the central office to verify the

title of the property and research the possibility of the use being an approved activity. Due to the extensive areas involved in the aquatic preserve, this will be a progressive activity depending on the field personnel's eventual familiarization with the preserve and the approved uses. The potential for unauthorized activities in such an extensive area may possibly require some type of mapping and recording system to assist the field personnel in their monitoring.

The management action for verified illegal encroachment will be developed by the agencies specifically involved (i.e., DNR, DER). The field personnel will assist, as necessary, with field evaluations or other support activities. The final action will be monitored by the field personnel, at the direction of the Trustees to the central office. The procedures followed in these applications will be decided on a case by case basis.

The issue of squatters living on spoil islands is the major initial encroachment issue. The major points of this issue are concerned with private individuals living on public lands and the potential degradation of water quality in surrounding waters. The surrounding waters are not only in the aquatic preserve but also in open shellfishing waters.

These private individuals will be given a specific period of time to prove ownership. If they can not deliver proof of ownership, a method of removal will be developed, given the conditions of each site.

C. RESOURCE MAPPING AND RESOURCE PROTECTION AREAS

The efficient description and location of resources within such a large area requires the use of remote sensing techniques. This work will be done in conjunction with DNR's Marine Research Laboratory's Assessment of Fishery Habitat Loss Study in the Indian River Lagoon. Marine Research Laboratory personnel have developed resource and habitat indentification mapping through the use of LANDSAT (satellite) imagery and aerial photography.

The vegetation and land use mapping done in this study will become the basis for the development of a Resource Protection Area management system in the aquatic preserves. This mapping system will identify and classify various resources within the aquatic preserves that require protection by the management program. This mapping system will also give acreage totals for each land use and vegetation classification in the preserves. The vegetation portion of the mapping will be augmented over time by wildlife and fisheries information (endangered species, bird rookeries, etc.), archaeological and historical site information and other resource factors deemed crucial to the continued health and viability of the aquatic preserves.

The onsite managers will supplement this mapping with the above information to develop and update a Resource Protection Area (RPA) mapping program. The RPA mapping system is based on three levels of resource classification. The Class 1 level will contain resources of the highest quality. Uses proposed for these areas will receive the most rigorous review. The Class 1 level will include one or more of the following: marine grassbeds; mangrove swamp;

saltwater marsh; oyster bars; archaeological and historical sites (upland and submerged); endangered species habitat; colonial waterbird nesting sites; and other appropriate factors.

The Class 2 areas will be defined as those areas containing the resources of Class 1, but in a transitional condition compared to Class 1. These resources will either be building toward Class 1 status or declining to Class 3 status. Class 2 areas will require careful field review as to the specific area's sensitivity to each proposed use. In some respects, these areas may be as sensitive or more sensitive to disturbances as Class 1 areas. The resources of Class 2 will include: marine grassbeds; mangroves in scrub condition or colonizing new lands; saltwater marsh colonizing new lands; and other resources of Class 1 type that fit in the Class 2 condition.

Class 3 areas will be characterized by the general absence of the attributes of the above two classes. Class 3 areas may have small localized Class 1 or 2 areas within them. Class 3 will generally have deep water areas or areas with no significant vegetation or wildlife attributes. Nearshore and bottom areas significantly modified by man will be designated Class 3.

These RPA maps will require periodic revisions as the onsite managers learn more about the resource's reactions to man's uses. Scientific research and other data additions may also require modification of this system. Natural changes will also require modification of this classification system. Periodic checking by LANDSAT satellite imagery will become useful for remote sensing monitoring as its use is more fully developed.

The RPA maps will become a planning tool for both onsite and central office staff. More detailed field review will still be required to supplement this information on a case by case basis, as necessary.

The initial development, as well as periodic review, will require the support and assistance of the many other resource regulating and managing agencies, as well as local and regional government entities. Support will also be requested from the colleges, universities, foundations and other interest groups and individuals.

The RPA mapping will use the USGS 7.5 minute quadrangle map format for vegetation and these maps, after public notice and opportunity for public review and comment, will be placed in Appendix D of the aquatic preserve management plan. It is recognized that mapping at this scale may not adequately define small areas which do not qualify for the RPA class level assigned to a general area.

D. ADMINISTRATIVE MANAGEMENT OBJECTIVES

This section of the chapter addresses the role of the central office, in the aquatic preserve management planning and implementation process. The central office's role is generally interpreted within the context of coordinating activities with the field personnel. This coordination linkage is important to many program aspects, including project review and evaluation, local contact initiation, administrative rule development, contractual services and conflict resolution, not to mention the routine support (payroll, operating

expenses, etc.) usually extended by the central office to the onsite managers. All program activities identified within this context are designed to protect and enhance the environmental, educational, scientific, and aesthetic qualities of the natural systems of the aquatic preserve.

1. Objectives

Specifically, the following administrative objectives are an essential part of the aquatic preserve management program.

a. To ensure a comprehensive, coordinated review and evaluation of proposed activities potentially affecting the environmental integrity of the aquatic preserve.
b. To serve as the link between aquatic preserve field personnel and state agencies and programs which originate in Tallahassee.
c. To serve as the primary staff in the development of administrative rule additions, deletions, and revisions.
d. To serve as the administrative staff for contractual agreements and services.
e. To establish and maintain a conflict resolution process.
f. To review all existing and past activities as to their affect on the environmental integrity of the aquatic preserve.

2. Project Review and Evaluation

A major element in the administration of an aquatic preserve management system is the establishment of a thorough project review process. It is the program intent that the central office staff review all proposed activities requiring the use of state-owned lands within the preserve.

Sections 258.42 through 258.44, F.S., establish the legal context within which all proposed uses of the aquatic preserve must be evaluated.

Essentially, these sections require that projects be basically water dependent or water-enhanced, not contrary to the lawful and traditional uses of the preserve, and not infringing upon the traditional riparian rights of the upland property owner.

The primary mechanism through which proposed uses are reviewed is accomplished by participation in the state lands management process as established by Chapter 253, F.S., and modified by Chapter 258, F.S. The central office was administratively designated, on October 4, 1982, as an agent of the Trustees, for the purposes of evaluating the environmental consequences of proposed uses of state-owned lands within aquatic preserves.

In conducting the environmental evaluations, the central office staff will rely heavily upon the most current, readily available data such as Department of Transportation (DOT) aerial photography, LANDSAT imagery, DER biological reports, and other data resources (see Appendices C and D). If a proposed

activity is legally consistent with the maintenance criteria outlined in Section 258.42 F.S. and Chapter 16Q-20, F.A.C., and is generally of negligible environmental concern, then the project review will likely be conducted in its entirety by the central office staff, utilizing the generalized environmental data.

The field personnel will be requested to conduct a more detailed environmental assessment of the project if the central office staff, during the course of the preliminary application review; determines that the requested use of state-owned lands may have a significant effect upon the environmental integrity of the preserve. Copies of all applications received will be provided to the field personnel for project monitoring and assessment of the possible cumulative impacts.

Field personnel will be encouraged to establish direct communication links with the various regulatory and management agencies for purposes of obtaining advance notification of projects potentially affecting the preserve. All environmental review and assessments, however, will be channeled through the central office unless other arrangements have been previously cleared with the central office.

While the State Lands Management Program authorized by Chapters 253 and 258, F.S. and Chapters 16Q-20 and 16Q-21, F.A.C. is expected to be the primary management implementation vehicle for the aquatic preserve, it is by no means the only vehicle. Section 253.77, F.S., as amended, and the December, 1982

Memorandum of Understanding between the COE, DER and DNR provide direct access to DER's permitting process for DNR. The Development of Regional Impact (DRI) and other regional or state level review processes represent other implementation mechanisms. The basic review approach and the evaluation relationship between the field personnel and the central office staff will be the same as the case involving the State Lands Management program.

One aspect of the aquatic preserve review and evaluation program is the identification of proposed activities that are either generally or specifically prohibited. Immediately upon review of such project applications, the central office staff will notify the Division of State Lands (or other program managers) that the proposed activity is legally unapprovable for the stated reasons. For those proposals which are subject to denial due to their adverse environmental impacts, even though the activity may be permissible, Section 258.42, F.S., specifically provides that:

"(1) No further sale, lease, or transfer of sovereignty submerged lands shall be approved or consummated by the trustees except when such sale, lease, or transfer is in the public interest.

(2) The trustees shall not approve the waterward relocation or setting of bulkhead lines waterward of the line of mean high water within the preserve except when public road and bridge construction projects have no reasonable alternative and it is shown to be not contrary to the public interest.

(3) (a) No further dredging or filling of submerged lands shall be approved by the trustees except the following activities may be authorized pursuant to a permit:

1. Such minimum dredging and spoiling as may be authorized for public navigation projects.

2. Such minimum dredging and spoiling as may be authorized for creation and maintenance of marinas, piers, and docks and their attendant navigation channels.

3. Such other alteration of physical conditions as may, in the opinion of the trustees, be necessary to enhance the quality or utility of the preserve or the public health generally.

4. Such other maintenance dredging as may be required for existing navigation channels.

5. Such restoration of land as authorized by s. 253.124(8).

6. Such reasonable improvements as may be necessary for public utility installation or expansion.

7. Installation and maintenance of oil and gas transportation facilities, provided such facilities are properly marked

with marine aids to navigation as prescribed by federal law.

(b) There shall, in no case, be any dredging seaward of a bulkhead line for the sole or primary purpose of providing fill for any area landward of a bulkhead line.

(c) There shall be no drilling of gas or oil wells. However, this will not prohibit the state from leasing the oil and gas rights and permitting drilling from outside the preserve to explore for oil and gas if approved by the board.

(d) There shall be no excavation of minerals, except the dredging of dead oyster shells as approved by the Department of Natural Resources.

(e) There shall be no erection of structures within the preserve, except:

1. Private docks for reasonable ingress or egress of riparian owners;
2. Commercial docking facilities shown to be consistent with the use or management criteria of the preserve; and
3. Structures for shore protection, approved navigational aids, or public utility crossings authorized under subsection (3)(a).

(f) No wastes or effluents shall be discharged into the preserve which substantially inhibit the accomplishment of the purposes of this act.

(g) No nonpermitted wastes or effluents shall be directly discharged into the preserve which substantially inhibit the accomplishment of the purposes of this act."

Generally, applicants desirous of appealing staff recommendations will have to follow those appellate procedures outlined in the appropriate authorizing statutes. In the case where applications requesting the use of state-owned lands are denied, three appellate procedures are available to the applicant. Depending upon the type of application submitted, an applicant may:

a. Ask the Governor and Cabinet to overturn an application decision rendered by the Executive Director of Department of the Natural Resources (or his designee) under a delegation of authority;
b. Request an Administrative Hearing under the procedures outlined in Chapter 120, F.S.; or
c. Appeal the action of the Board of Trustees of the Internal Improvement Trust Fund to the District Court of Appeals.

3. Liaison Between Field Personnel and Other Interested Parties

One of the most important aspects of the field personnel's job is to establish a mutually beneficial communication link with pertinent interest groups. The central office staff will assist in initially identifying and contacting governmental bodies, special interest groups and interested individuals requiring aquatic preserve program coordination.

When requested by the onsite managers, the central office staff will assist in arranging for specialized management expertise not generally available locally. This may include, for example, such things as arranging for DAHRM to conduct a detailed cultural resource assessment for certain areas of the the preserve.

CHAPTER VI

MANAGEMENT IMPLEMENTATION NETWORK

This chapter of the management plan will address the various relationships of aquatic preserve management to the different government agencies and programs, non-government entities, interest groups, and individuals within the aquatic preserve area. The activities of both field personnel and central office staff as they relate to these other organizations will be presented.

A. FEDERAL

Many federal agencies have property interests, land and wildlife management programs, research activities, construction activities, and regulation programs existing or potentially existing within the aquatic preserves. The objective of the aquatic preserve management program will be to complement the various activities wherever possible. The field personnel will assist those federal agencies in areas where they have common goals. The field personnel and central office staff will also review the federal activities as to their effect on the objectives of the aquatic preserve management. This review shall be coordinated through the DER's Office of Coastal Management for the purposes of enforcing the provisions of the Federal Coastal Zone Management Act of 1972, as amended.

1. United States Fish and Wildlife Service. The aquatic preserve program will be involved in the review of proposed preserve uses in conjunction with the Fish and Wildlife's Division of Ecological Services in Vero Beach. This division reviews dredge and fill requests and other federal level permitting under the Fish and Wildlife Coordination Act.

Another management program in which the field personnel could possibly interact with the Fish and Wildlife Service is the protection and recovery of endangered species and bird rookeries within the aquatic preserve. Field personnel will become involved in using available recovery techniques for this purpose, as necessary.

2. U.S. Army Corps of Engineers. The U.S. Corps of Engineers (COE) is charged with providing technical guidance and planning assistance for the Nation's water resources development. The COE also provides supervision and direction to many engineering works such as harbors, waterways and many other types of structures. Their major responsibility, as it applies to the aquatic preserve, is the protection of navigable waters, pollution abatement and maintaining water quality and the enhancement of fish and wildlife.

The COE activities in the Indian River Lagoon include their involvement with the DER in the dredge and fill permitting process, technical oversight of channel, inlet and canal maintenance, and evaluating requests for new channels, canals and other such public works projects. The field personnel will become familiar with the various programs, policies and procedures as they apply to the aquatic preserve.

The field personnel and central office staff will also review activities proposed by the COE for conformance to the objectives of the aquatic preserves' management plan. This involvement should begin in the early stages of project planning in order to facilitate the best protection of the aquatic preserve possible.

3. U.S. Geological Survey. The U.S. Geological Survey (USGS) under the Department of the Interior has the responsibility to perform surveys, investigations, and research pertaining to topography, geology, and the mineral and water resources of the United States. USGS also publishes and disseminates data relative to those preceding activities. In the past the USGS has conducted many studies on various resources in the region.

The field personnel and central office staff will become familiar with these studies and the data results as they apply to their management activities.

4. U.S. Environmental Protection Agency. The U.S. Environmental Protection Agency (EPA), in cooperation with state and local governments, is the federal agency responsible for the control and abatement of environmental pollution. The six areas of pollution within which the EPA is concerned are air, water, solid waste, noise, radiation and toxic substances. The DER is the state agency responsible for handling most of these programs on a state level in lieu of a federal program. Within the aquatic preserve, the field personnel will assist the EPA in planning field activities where there are common goals.

5. U.S. Coast Guard. The U.S. Coast Guard is the federal agency involved in boating safety, including search and rescue when necessary. The Coast Guard is also charged with the permitting of structures which affect navigation and boating safety. These structures include bridges, causeways, aerial utilities and other structures which may be in conflict with navigational uses. The field personnel, in conjunction with the central office staff, will also review projects which the Coast Guard may be evaluating for permits.

6. National Marine Fisheries Service. The National Marine Fisheries Service (NMFS) under the U.S. Department of Commerce is active in the Indian River area in recording commercial fish landings. The NMFS also has enforcement officers in the area checking for illegal fishery activities. The field personnel will work with these personnel whenever they have common goals within the aquatic preserve.

B. STATE

Many state agencies have programs which affect the resources or regulate activities within the aquatic preserve. There are also other DNR programs that are within or affect the Indian River Lagoon Aquatic Preserves. This section will describe the interactions and relationships of these various agency programs and how they relate to aquatic preserve management.

1. Department of Environmental Regulation. The Department of Environmental Regulation (DER) is responsible for regulating air and water quality and, in some cases, water quantity (through the water management district) within the

Indian River Lagoon. The DER is also the local contact for the initiation of dredge and fill applications in conjunction with the COE and DNR. With respect to water quality and dredge and fill regulation, the DER is possibly one of the most important agencies to the management of the aquatic preserve. The water quality of the preserve is the most important factor to the health of the estuarine complex, and dredge and fill activities are one of the most potentially destructive activities within the preserve. The DER also regulates other forms of pollution, such as air, noise, wastewater and hazardous waste, which may be important in the future to the preserve.

The field personnel will become familiar with the water quality, dredge and fill, and other regulatory programs that are important to the aquatic preserve. The field personnel should develop a close working relationship with DER staff and become familiar with DER field activities and programs that are in common with the objectives of the aquatic preserve management program. The field personnel should open the most efficient line of communication with the local offices to receive the permit applications from DER as soon as possible to improve the response time within the review process.

The DER, Office of Coastal Management is charged with coordinating activities related to coastal management in the state and reviewing federal actions for consistency with the State Coastal Management Program, Section 380.20, F.S. The central office staff will maintain a close relationship with the Office of Coastal Management for assistance in the review of federal actions, data and research needs, and other program support.

2. Department of Community Affairs. The Department of Community Affairs (DCA) is responsible for reviewing Developments of Regional Impact (DRI) and for designating Areas of Critical State Concern (ACSC). DRI's are major developments that have impacts on a scale which is greater than county level and require a regional review from neighboring local governments and state agencies. Both the central office staff and field personnel of the aquatic preserve program will be involved in reviewing DRI's. The field personnel should receive notice of a DRI through the central office staff and will proceed with the field review. The central office staff will coordinate the field review findings and work with the other state agencies in Tallahassee in the review of the DRI.

Hutchinson Island, the barrier islands between Sebastian Inlet south to Jupiter Inlet, is presently under review by the DCA. The ACSC staff of DCA has completed the Hutchinson Island Resource Planning and Management Plan and it was enacted by the Governor in 1983. This region was identified as a possible ACSC and a Resource Planning and Management Program (RPMP) was established as a preliminary review for this designation.

The ACSC program is intended to protect the areas of the state where unsuitable land development has endangered or may potentially endanger resources of regional or statewide significance. The RPMP evaluates the resources, and the local government's land development practices. After this evaluation is complete, the RPMP committee makes recommendations to the local governments on how their land development practices could be improved to ensure an orderly and well-planned growth that would protect the critical

resources. The local governments, counties and cities, are now in the process of making these land development modifications, based on the RPMP recommendations. If these modifications are not made to the RPMP Committee's approval, those areas of local government that are not in conformance could be designated an ACSC or the entire area may be designated an ACSC by the Legislature. Under an ACSC designation, the local governments are required to notify DCA of any application for a development permit. The entire land development process will require the state's oversight until that local government modifies its land development practices to conform to the ACSC requirements. The recommendations of the Hutchinson Island Resource Planning and Management Committee as they apply to the aquatic preserves have been included into this plan.

3. Department of Natural Resources. The aquatic preserve management program is associated with several other Department of Natural Resource (DNR) programs in the Indian River area.

DNR's Marine Research Laboratory in St. Petersburg, under the Division of Marine Resources, has several programs and projects within the Indian River Lagoon which will benefit the aquatic preserve program. The Marine Lab is presently studying fishery habitat losses in the Indian River Lagoon. The Resource Protection Area mapping, which will be used in the management of these aquatic preserves, was created as a product of that fishery habitat loss study. The data from this project, when it is completed, will be incorporated into this management plan. The Marine Lab staff is also involved in manatee protection programs and is the headquarters of the State Manatee Coordinator.

The marine laboratory also operates a field station in Jensen Beach, active in research on marine turtles.

The field personnel will become familiar with these studies and programs, and will consult the Marine Lab for their data needs whenever possible.

The Division of Marine Resources also handles the permitting for the collection of certain marine species and use of certain chemicals. The field and central office staff will become familiar with this permitting process and request notification of these permits within the aquatic preserve.

The Marine Patrol, under DNR's Division of Law Enforcement, also operates in the Indian River Lagoon. The field personnel will become familiar with their programs and operation, and will call on the Marine Patrol for law enforcement support as required.

The Division of State Lands within the DNR is charged with overseeing uses, sales, leases or transfers of state-owned lands. The aquatic preserve staff will interact with State Lands in all transactions concerning submerged lands within the aquatic preserve. These would include the potential acquisition of privately titled submerged lands or contiguous uplands important to the integrity of the preserve. This relationship is more fully described in Chapter V(C).

The Division of Resource Management, through the Bureau of Geology and Aquatic Plant Research and Development, is responsible for various programs potentially affecting the aquatic preserve. Staff will establish communication

links with this Division to ensure that adequate consideration is given to potential impacts upon the preserve that may result from the conduct of their various programs.

The Division of Recreation and Parks, in addition to the work related to aquatic preserves by BELM and The Florida Park Service, is also involved in the management of State parks and recreation areas nearby. The aquatic preserve program will work closely with these programs as they relate to aquatic preserve management objectives.

4. Marine Fisheries Commission (MFC).

The MFC was established as a rulemaking authority pursuant to Section 370.027, F.S. The seven members are appointed by the governor and are delegated full rulemaking authority over marine life (subject to approval by the Trustees), with the exception of endangered species. This authority covers the following areas: a) gear specifications, b) prohibited gear, c) bag limits, d) size limits, e) species that may not be sold, f) protected species, g) closed areas, h) quality control codes, i) seasons, and j) special considerations related to eggbearing females and oyster and clam relaying. The field personnel and central office staff will become familiar with and enforce the rules of the MFC.

The MFC is also instructed to make annual recommendations to the Trustees regarding Marine fisheries research priorities. The field and central office staff will use these recommendations to direct research efforts within the aquatic preserve.

5. Florida Game and Fresh Water Fish Commission. (GFWFC) The GFWFC's Environmental Services office in Vero Beach sends biologists into the Indian River Lagoon area to review projects which may have potential impacts on local fish and wildlife habitat as necessary. The central office will use the GFWFC's assistance in their review process, when possible, and in developing fish and wildlife management for the aquatic preserve.

The GFWFC has enforcement officers working in this area. The field personnel will interact with these officers where there are common goals.

The GFWFC is also the state coordinator of the Endangered Species in Florida. The field personnel and central office staff will work with GFWFC personnel in developing program needs in this area.

6. Department of Transportation. (DOT) The DOT has an office in Fort Pierce and the field personnel and the central office will work with the resident engineer on anticipated projects having possible impacts on the aquatic preserve. The field personnel and administrative staff will review any major highway or bridge projects that may be proposed in the future.

7. Department of State. The Division of Archives, History and Records Management (DAHRM) in the Department of State will have a close working relationship with the field personnel and central office staff in the protection of archaeological and historical sites. The field personnel will be directed by DAHRM, through the central office, in any activities or management policy needs for these sites.

8. Health and Rehabilitative Services. (HRS) Both the central office staff and field personnel will establish communication and coordination linkages with HRS and their locally conducted programs of septic tank regulation and mosquito control. Although mosquito control serves a useful public function, the effects of pesticides (adulticides and larvacides) in the waters of the preserve are a primary concern. Additionally, the central office staff will become involved in future meetings and management programs developed by the Governor's Working Group on mosquito control. Subsequent policy recommendations coming out of this group will be evaluated for applicability to the ongoing aquatic preserve management program.

C. REGIONAL

The regional level of the management implementation network as it applies to the Indian River Lagoon Aquatic Preserves will include the South Florida Water Management District, St. Johns River Water Management District, the Treasure Coast Regional Planning Council, and the Florida Inland Navigation District. These organizations have activities that are broader than the local government, but are on a smaller scale than the state level.

1. Water Management District. The district boundaries of the South Florida Water Management District (SFWMD) contain the Martin, Palm Beach and St. Lucie Counties' area of the aquatic preserves. The St. Johns River Water Management District includes the Indian River County portion of the preserves. The water management district administers permitting programs for the local consumable use of water, storm water discharges, and dredge and fill type activities.

This includes the withdrawal and use of water from rivers, streams, and wells. The types of water uses they permit in the Indian River Lagoon area include irrigation and public water supply. The field personnel will become familiar with the review and permitting procedures as they might apply to water supply in this basin. The water management district is also involved in various studies on water supply and management, and other related research that may be of use to aquatic preserve management.

2. Treasure Coast Regional Planning Council. The Treasure Coast Regional Planning Council (TCRPC) serves as a regional planning body for the local governments of Indian River, Martin, Palm Beach and St. Lucie Counties, as well as two cities within these counties and other southeast Florida counties. Among its duties, the TCRPC:

a. aids local governments with planning expertise;

b. is the regional representative for the Development of Regional Impact (DRI) review process;

c. serves as a regional clearinghouse for state and federal projects and programs; and

d. conveys information from the local governments to the state and federal levels.

The field personnel will become familiar with the various projects, programs,

and data sources that the TCRPC has within its administration that may effect or prove useful to the aquatic preserve program.

The DRI review of projects which affect the aquatic preserves will be reviewed by the central office staff, with the field personnel's field review, when necessary. DRI's for large marinas, large subdivisions on the uplands above the preserve, and commercial or industrial developments will require a field review by the field personnel as to their effect on the aquatic preserve.

3. Florida Inland Navigation District (FIND). The FIND is a multi-county district sponsor of the Intracoastal Waterway from Duval County south to Dade county. FIND is also responsible for providing and maintaining spoil areas (spoil islands) to the Corps of Engineers for the dredging and maintenance of the Waterway. FIND presently holds title to channel and spoil easements throughout the Indian River Lagoon. Field personnel and the central office will work closely with the FIND in the removal of squatters on spoil islands and future dredging proposals.

D. Local Governments and Special Districts.

This section will address the relationship of the aquatic preserve management program to the various local government agencies, special districts and their programs. The local governments are the incorporated cities and counties that surround the aquatic preserve. The Indian River Lagoon Aquatic Preserves span four counties which include, from north to south, Indian River, St. Lucie, Martin and Palm Beach Counties. The following cities border this lagoon area; Vero Beach, Fort Pierce, Stuart, St. Lucie Village, Ocean Breeze Park,

Sewall's Point, Hobe Sound, Jupiter Inlet Colony and the unincorporated Jensen Beach community. The various special districts (drainage, inlet and mosquito control) and their relationship to aquatic preserve management, are also presented.

The field personnel will be the local liaison for the aquatic preserve to these local government entities to assist them in modifying their policies and practices to conform to the objectives of the aquatic preserve's management plan, and to exchange information and expertise for mutual benefits.

1. Relationship to local management plans. The local governments are required by the Local Government Comprehensive Planning Act of 1975 (LGCPA), (Section 163.3161, F.S.) to have a comprehensive management plan with elements relating to the different governmental functions (i.e. housing, physical facilities, conservation, land use, and coastal zone protection). These plans, in effect, are long-range plans for the orderly and balanced development of the city or county. The comprehensive plans guide local zoning policies and practices toward a future as set out in the plan. No development is permitted that does not conform to the local government's comprehensive plan.

The aim of the aquatic preserve, with respect to these local government comprehensive plans, is to have their plans be consistent with the aquatic preserve management plans. The field personnel will become familiar with the above plans and how they support or are in conflict with the objectives of aquatic preserve management. The field personnel will assist local planning

officials in having their plans meet these objectives. The field personnel and central office staff will assist these officials in the preparation of their Marina Element, as required in Chapter IX. It is hoped that local governments will join in the spirit of aquatic preserve management and be willing to work for these changes.

2. Relation to local development codes. The local zoning and development codes (e.g., building codes) provide the major local regulation that defines what an owner can do on a particular parcel of property. The zoning prescribes the allowable uses and the intensity of those uses. Certain uses along an aquatic preserve can potentially have a profound effect on a preserve.

This section will operate in conjunction with the preceding section on local management plans. The field personnel will become familiar with the local zoning, development codes and their potential effects on the nearby aquatic preserve. The field personnel will assist local planning and zoning officials in identifying areas where changes in zoning would better conform to the objectives of the aquatic preserve management. The field personnel might also offer to assist local planning and zoning officials in the review of proposed subdivisions upland of the preserve.

3. Suggested policies and practices in support of Aquatic Preserve Management. This section will address any other policy or practice not covered in the two preceding sections. These policies and practices might include local government mangrove ordinances; recreation problems where a park

is in or near an aquatic preserve, or any other problem as it might relate to local governments. The field personnel will offer assistance or information to local officials or will coordinate with other agencies to help solve these problems as they occur. The field personnel will work with county personnel on enforcement of ordinances such as the Palm Beach Mangrove Protection Ordinance. The field personnel will also comment, through the central office, on any local practice that is identified as endangering the well-being of the aquatic preserve.

4. Special Districts (Drainage, Inlet and Mosquito Control). The special districts are taxing districts established to correct drainage and mosquito control problems. There are 3 drainage districts that directly affect these preserves; Indian River Farms Drainage District in Indian River County, Fort Pierce Farms Water Management District in St. Lucie County, and Hobe-St. Lucie Conservancy District in Martin County. Several other interior districts indirectly affect these preserves and are addressed in the North Fork-St. Lucie River and Loxahatchee River-Lake Worth Creek Aquatic Preserve Management Plans. Each of the three counties has a mosquito control district. The Jupiter Inlet District is responsible for maintaining that inlet.

These districts may not have an official comprehensive management plan, but they do have management policies and program statements that are similar to such a plan. The field personnel will become familiar with these policies and the activities of these districts and will monitor their effect on the aquatic preserve. For example, the field personnel might recommend identifying areas that should not receive mosquito spraying or other alternative management

because of remoteness to inhabited areas and possible, but unnecessary damage to the resources of the aquatic preserve; or drainage districts might be asked not to use certain types of herbicides or to use them only at certain times of the year.

E. Other Entities

This section will apply to the numerous entities that have an interest in the aquatic preserve but are non-governmental agencies. This will include, but not be limited to, the environmental interest groups (i.e., Audubon Society, Sierra Club and Conservation Alliances), the scientific organizations, the fishing and sports interest groups (i.e., Florida League of Anglers, Organized Fishermen of Florida), the universities that may have research activities in the preserve (i.e., Florida Institute of Technology, University of Miami, University of Florida,) and any other interest groups or individuals. The relationship of these entities to aquatic preserve management might include the coordination of activities, such as scientific research, environmental education, management of rookeries or
other natural areas, or numerous other possible activities. A worthwhile aquatic preserve management process will depend on the continued support and help of these interest groups in all of the aquatic preserves. The field personnel will be active in communicating the aquatic preserve management process and activities to the various groups and consulting with them for their help in their areas of expertise.

Chapter VII

PUBLIC USES

This chapter addresses the public use of the aquatic preserve. The public in this case shall refer to the general public or those persons without riparian rights. The "Florida Aquatic Preserve Act of 1975" (Section 258.35, F.S.) allows for the lawful and traditional public uses of the aquatic preserve, such as sport fishing, boating and swimming (as adapted from Section 258.43(1), F.S.). These and other traditional uses that do not involve a commercial intent or the use of a riparian right to place a structure in the preserve, and do not degrade or otherwise destroy the preserve will be considered public uses. This section will be further divided into consumptive and non-consumptive uses as applicable to each resource.

A. Consumptive Uses.

Consumptive uses involve the removal of resources from the preserve. These uses include fishing, hunting, shellfishing, and other related activities. They also include the unintentional removal of resources such as propeller damage to grassbeds. The management of these uses (see Chapter V. Resource Management, Section B: Onsite Management Objectives) will include the observation and monitoring of the effects of these uses on the resources. The field personnel will periodically assess the impacts through the use of the Marine Research Laboratory's LANDSAT capabilities for habitat losses or disturbance in the Indian

River Lagoon area plus any other studies or data sources that might become available. This management will also include the protection of the resources from unlawful or excess practices of these uses. The legality of these uses will be controlled by existing applicable state laws and local ordinances. Field personnel will, for example, become familiar with and will enforce rules adopted by the Marine Fisheries Commission. These will include regulations on fishing gear, bag and size limits, closed areas, seasons, etc.

Consumptive uses will also be monitored for their effect on other resources (e.g., bird rookeries, marine grassbeds, oyster bars, archaeological and historical sites). The field personnel will also be sensitive to additional enforcement needs (i.e., the need for additional enforcement staff during nesting seasons).

B. Non-consumptive Uses.

These uses are those which do not generally remove resources from the preserve. Examples of these uses include swimming, diving, boating, bird-watching, and other related activities. The management practices involved with these uses will be the same as those previously described under Section A., except that these uses are not generally controlled by law. The guiding principle in these cases will be whether or not the activity causes a disruption of the preserves' resources (e.g., destroys marine grassbeds, disturbs rookeries). Only in the event of these disruptions will the field personnel become involved. Some of these uses may possibly be involved in environmental educational (Chapter XI) programs.

Chapter VIII

PRIVATE NON-COMMERCIAL USES

This section will apply to those private, non-commercial, uses which are derived from riparian rights (e.g., docks, piers). The management of the aquatic preserve recognizes the rightful and traditional uses of those near-shore sovereignty lands lying adjacent to upland property. This right of ingress, egress, boating, swimming, fishing, and other incidental uses of sovereignty lands normally allows for the placement of certain structures, such as docks, within the preserve. This right, however, can only be exercised with the prior consent of the Board, and does not include approval of activities that destroy or damage areas of environmental significance. The review of these will require the interaction of the Resource Protection Area mapping with administrative and possible field review and later monitoring by field personnel as projected by Chapter V., Section B.

Private non-commercial uses shall be designed to avoid critical Resource Protection Area (Class 1 and 2) and shall be designed to reduce the use's impact to the preserve in general. Individual applications for these private non-commercial uses shall be reviewed by the applicable Resource

Protection Area Map and criteria. In addition, private dock proposals will be reviewed by the following criteria as to specific design and location:

a. private dock structures shall have a maximum width of 4 feet,

b. the dock decking design and construction will insure maximum light penetration, with full consideration of safety and practicality,

c. the dock will extend out from the shoreline to a maximum depth of 4 feet (mean low water),

d. when the water depth is 4 feet at an existing bulkhead the maximum dock length from the bulkhead shall be 25 feet, subject to modifications accommodating shoreline vegetation overhang,

e. wave break devices, when necessary, shall be designed to allow for maximum water circulation and shall be built in such a manner as to be part of the dock structure.

f. maximum terminal platform size shall be 160 square feet, not exceeding 8 feet in width.

g. maximum dock length of 500 feet or 20% of the subject waterbody, whichever is less.

h. Dredging to obtain navigable water depths is not normally approved in conjunction with private dock applications.

i. Exceptions to these guidelines may be considered, but only upon demonstration by the applicant that such exceptions are necessary to ensure reasonable riparian ingress and egress.

j. The above criteria shall be modified by local zoning requirements if found to be more restrictive.

Bulkheads should be placed, when allowed, in such a way as to be the least destructive and disruptive to the vegetation and other resource factors in

each area. Approved uses which do disrupt or destroy resources on state-owned lands will require mitigation. This mitigation will include restoration by the applicant or other remedy which will compensate for the loss of the affected resource to the aquatic preserve.

Dredging within the aquatic preserve shall be held to a minimum. Dredging proposals shall be reviewed according to the procedures in Chapter V depending on the proposed activities location within the RPA. Proposals within Class 1 areas (Chapter V (B)[6]) will be scrutinized to the maximum extent in order to find the best practicable method of development and location if that use is acceptable in that particular area of the preserve. The mitigation of lost or disturbed resources shall be required. There shall be no dredging allowed in Class 1 or 2 areas or in nearby areas if it will adversely impact these areas.

The location of proposed multiple docking facilities, such as for condominium developments, shall be based on the marina siting criteria described in Chapter IX, because their impact is generally the same as marinas. No multiple docking facilities shall be located in Class 1 or 2 resource protection areas; provision for reasonable riparian ingress and egress shall be specifically allowable. The multiple docking facility designation will include any multiple docking facility for multiple unit developments, subdivision facilities or other non-profit operation. In evaluating applications for such facilities, the following criteria shall be utilized:

a. The preempted area of sovereignty submerged land shall not exceed square footage amounting to ten times the waterfront footage of the

applicant, or the square footage attendant to providing a single dock in accordance with the criteria for private single family residential docks, whichever is greater;

b. Water depths adjacent to and within the facility shall insure that a minimum of one foot of clearance is provided between the deepest draft of a vessel and the bottom;

c. Dredging and/or filling in conjunction with the construction of the docking facility and access channel shall be prohibited in Class 1 or 2 resource protection areas, except as allowed pursuant to Sections 258.42-44, F.S.

d. No dock shall extend waterward more than 500 feet or 20 percent of the subject waterbody, whichever is less;

e. Main access docks and connecting or cross walks shall not exceed six feet in width;

f. Terminal platforms shall not exceed eight feet in width;

g. Finger piers shall not exceed three feet in width, and 25 feet in length;

h. Pilings may be utilized as required to provide adequate mooring capabilities.

i. The Trustees may also stipulate the number, lengths, drafts and types of vessels allowed to utilize the proposed facility.

j. Exceptions to these guidelines may be considered, but only upon demonstration by the applicant that such exceptions are necessary to ensure reasonable riparian ingress and egress.

Authorization of such facilities will be conditioned upon receipt of documentation evidencing the subordination of the riparian rights of ingress

and egress for the remainder of the applicant's shoreline for the life of the proposed docking facility. Boat ramps and travel lift platforms or other similar launching facilities, with associated temporary mooring facilities, will be encouraged over permanent wet storage facilities. Non-residential docking facilities (commercial) are addressed in Chapter IX.

The use of seaplanes within this preserve is seen as a non-traditional use. Applications for seaplane use within the preserve will be reviewed on a case by case basis. These uses will only be recommended where such use will not affect resource protection areas or natural values of the preserve, not effect endangered species habitat, can be utilized in a safe manner, and will not preempt traditional uses within the proposed use area.

CHAPTER IX

COMMERCIAL USES

This section addresses the variety of traditional and non-traditional (i.e., new uses to this area) commercial uses which might occur within the aquatic preserve. Among the traditional uses in the Indian River area are utility crossings, power plants, marinas and yacht clubs, commercial fishing, and other types of boats (i.e., sportfishing, diving) for hire. Non-traditional uses in this area which have also occurred in other areas of this or other states include oil and gas transportation facilities, and other such commercial uses.

A. TRADITIONAL COMMERCIAL USES.

1. Utility Crossings. There are at present time both aerial and underwater utility crossings in the aquatic preserve. Future proposals should be designed so the preserve is crossed by the least destructive method in the least vulnerable areas according to the RPA maps (see Chapter V[B]). Increased or additional use of any existing utility crossings is preferable, if their condition at the time of the proposal is acceptable. The field personnel should eventually develop a utility crossing plan for all areas with anticipated utility crossing needs to allow for clear and advance planning, for placement of these crossings in the best environmental location possible. The utility crossing plans, when completed, will become a part of this plan.

Crossings should be limited to open water areas to minimize disturbance to marine grassbeds, mangroves or other critical habitat areas.

2. Commercial Fishing. The management of the aquatic preserve shall not include the direct management of commercial fishing activities. Field personnel will monitor these activities and assess their affects on the preserve only in conjunction with the Division of Marine Resources and as part of a cooperative effort with that division. The field personnel will also notify the requisite authority in the event of illegal activities (Chapter 370, F. S. or by special act). The field personnel, along with other agencies and divisions' programs and studies, will monitor fishing activities within the aquatic preserve with respect to the need to manage access of boats in certain areas, prevention of marine grassbed destruction and other needs of the aquatic preserve as they are associated with commercial fishing activities. After problems associated with commercial fishing activities are identified and documented, the findings will be presented to the Marine Fisheries Commission. It is the authority of the Commission and the Florida Legislature to regulate commercial fishing within the aquatic preserve.

3. Marinas. The locating of marinas and their related uses will be a major concern of the Indian River Aquatic Preserves management. Marinas represent a use with many potential impacts on the preserve's resources. The siting policy of the Blue Ribbon Marina Committee (Final Report-January, 1983), as adopted by the Governor and Cabinet, is modified and shall be used for siting marinas in the aquatic preserve. This policy will be that:

a. marinas shall only be located in or near well flushed, deep water areas,

b. the design of the marina should not rely on dredge or fill activities in Class 1 or 2 resource protection areas, except as allowed pursuant to Sections 258.42-44, F.S.,

c. the marina shall not be located in Class 1 or 2 resource protection areas, except for provision of required riparian ingress and egress through shoreline vegetation,

d. the site location shall also take into account the access of the boat traffic to avoid marine grassbeds in the surrounding areas,

e. the location of new facilities within the preserve shall be secondary to the expansion of existing facilities within the preserve,

f. the location of new facilities and expansion of existing facilities shall consider the use of upland dry storage as an alternative to multiple wet slip docking,

g. new facilities shall be discouraged in any previously undisturbed location within the boundaries of the preserve and shall be allowed only in Class 3 resource areas, and then only where the local governments have a marina element and after careful review and approval by the Board,

h. marinas should be specifically sited outside state designated manatee sanctuaries and ingress and egress channels shall be posted with appropriate speed limits,

i. field personnel will work with local governments (see Chapter

VI) on location of marinas close to demand areas and in areas with sufficient uplands to support activity needs, and

j. field personnel will work with local government in finding marina sites that meet the above policies and that are protected from hurricanes,

4. Deep Water Port Facilities. The only port of this type within the Indian River Lagoon is the Port of Fort Pierce which is not within either aquatic preserve. Although activities within this port facility are outside the preserves, they will effect the preserves. New activities and maintenance work will be reviewed as to their effect on the preserves. New port facilities within the preserve boundary shall be prohibited.

5. Other Docking. Any other type of commercial docking, not mentioned in the preceding sections, will follow the marina siting policy as stated in Section A(3) of this Chapter.

6. Power Plants. The St. Lucie Power Plant is located on Hutchinson Island halfway between Fort Pierce and Stuart. The primary intake and discharge for the plant cooling system is to the Atlantic Ocean. However, there is an emergency cooling canal connected to Big Mud Creek and the Indian River. Normal operating activities do not apparently effect the Indian River Lagoon. Emergency situations have major impact potentials.

Power plants have the potential for causing major changes in the air quality, water quality, and plant and animal life of the aquatic preserve. For these reasons, additional power plants are incompatible with the purposes of this

aquatic preserve. The location of proposed power plants upstream of a preserve should also be evaluated as to the effects on the downstream preserve.

B. Non-traditional Commercial Uses

1. Other Uses. Any other use that qualifies as a commercial use of state-owned submerged lands not mentioned above will require a review for its anticipated impact on the aquatic preserve and the best location for the activity compatible to the resource protection areas within the preserve.

2. Aquaculture The Indian River area could potentially have proposals for aquacultural development in the future. These uses may include floating structures or other new techniques now being used in aquaculture. The location and type of impacts to the resources will require careful examination. If there is not sufficient data available for a valid evaluation, a small scale test of the use might be possible in a selected area.

CHAPTER X

SCIENTIFIC RESEARCH

The field personnel attached to the Indian River Aquatic Preserve should serve as the area coordinators of scientific research in the preserves. Scientific research, and any other type of research or testing within the aquatic preserve, should require the clearance of both the field personnel and the central office staff before these activities can proceed. Certain activities could be detrimental to the resources of the preserve and should be carefully reviewed before allowing them to occur. Factors including location, species procedures, and time of year, should be carefully reviewed for the possible disturbance or effect of the research on the other resources of the aquatic preserve. The field personnel will be aware of the possibility of working with other government agencies, colleges, universities, research foundations and government programs to fill the data needs of the aquatic preserve (see Chapter V and XII). The field personnel will assist in the selection of possible test sites and other research needs within the preserve.

CHAPTER XI

ENVIRONMENTAL EDUCATION

The aquatic preserve should be used to enhance environmental educational programs at every opportunity. The goal of maintaining the aquatic preserve for the benefit of future generations can begin to be realized through the use of aquatic preserves for environmental education. Through education, the youth of Indian River, Martin, Palm Beach and St. Lucie Counties can acquire a knowledge of the natural systems and an appreciation for the aquatic preserve program. Such appreciation helps to ensure the future protection and support of the aquatic preserves.

The field personnel will, through their normal activities in the aquatic preserve, select good examples of habitats and resources within these aquatic environments for use during educational group tours. This might include the development of environmental educational boat or canoe tours through the preserves. Other educational activities might also include prepared presentations for specific interest or user groups such as sport (boating, diving, fishing, etc.), civic and conservation groups and the development of a brochure outlining the major points of management within the preserve. These brochures could then be circulated to the various user groups.

The field personnel should also prepare programs on the value of management activities of the aquatic preserve for presentation to interested groups of all ages. Educating the public about aquatic preserve management is the key to the success and future of the preserve.

CHAPTER XII

IDENTIFIED PROGRAM NEEDS

This chapter of the management plan will address the various internal program needs that are expected to be identified during management activities. Meeting these needs will correct or generally relieve some stress on the preserve or the personnel involved in the management of the aquatic preserve. These needs may, in some cases, require legislative or administrative rule changes or acquisition of critical areas by the state. The need to identify problem areas and adjust the management plan in a manner that will positively address these problems and management needs is an essential element of any good management program. Both field personnel and central office staff will continually monitor the management plan implementation process and specifically identify observed program needs and problems. The areas to be considered include, but are not limited to:

A. acquisition of additional property,

B. boundary problems,

C. legislative needs,

D. administrative rule changes,

E. data needs,

F. resource protection capabilities, and

G. funding and staffing needs.

Staff will annually develop an implementation status report that will contain a summary of identified management needs and suggested measures to be taken in meeting these needs.

A. Acquisition of Additional Property

There are areas both within and upland of the aquatic preserve that are in public ownership under the jurisdiction of various local, state and federal agencies. Many of these lands contain important resources, such as bird rookeries, archaeological or historical sites, endangered species habitat, and freshwater source wetlands. The protection of these areas is necessary to the wilderness preserve designation areas. Formal management agreements, memoranda of understanding, etc., that will ensure the compatible management of these areas will be developed. Other areas within or adjacent to the preserve that are in private ownership should be closely examined to determine the advisability of bringing them into public ownership. The acquisition of these lands might act as a buffer to critical resources, prevent development of sensitive areas, allow the restoration of areas adversely affected by previous development or allow removal of disrupting uses within a preserve. The field personnel, during normal management activities, should be aware of significant upland areas and sovereign land conveyances which, if developed, would compromise the integrity of the aquatic preserve. The field personnel will keep a running record of these areas and will prioritize these areas for possible public acquisition.

B. Boundary Problems and Systems Insufficiencies

The boundaries of the aquatic preserve are often artificial delineations of the natural systems within and surrounding the preserves. A variety of scientific studies are presently being conducted both within and outside of the preserve boundaries, and their results could conceivably suggest a change in these boundaries. These changes may include the extension of the present boundaries in some areas or the exclusion of other areas. The field personnel, in their normal management activities, will be sensitive to the possible need for boundary modifications. Potential boundary changes and acquisition projects might include areas upstream of the present boundary in the streams flowing into the preserves, previously conveyed sovereign lands, or other areas not presently within the preserve. Any boundary change will require legislative approval.

An initial consideration for boundary modification is to extend the southern boundary of the Vero Beach to Fort Pierce Aquatic Preserve to include productive grassbeds north of Fort Pierce Inlet and east of the Intracoastal Waterway. Another consideration would be the possible future addition of the inlets to the aquatic preserve boundary area.

C. Legislative Needs

Management needs could conceivably involve changes in the legislation pertaining to aquatic preserve or changes in the other statutes upon which

aquatic preserve management is based. These changes may include boundary realignments or the strengthening of certain management authorities.

D. Administrative Rule Changes

Administrative rules are statements addressing the organization, procedures and practices used in the implementation of aquatic preserve management plans and policies. This process includes identifying problems within the Department of Natural Resources, as well as other agencies, that affect the management of the preserve.

E. Data (Information) Needs

The field personnel and central office staff will note data needs and promote research or other means to fulfill them. Data needs in the near future could possibly be supplied by such ongoing projects as the U.S. Geological Survey's and South Florida Water Management District's studies, Department of Environmental Regulation water quality monitoring or by the research of other agencies. The field personnel will be aware of data needs as they interact with the various levels of government and with other entities. These data needs might include additional mapping, ownership information, water quality data or any other data. The major suppliers of data will probably be other public agencies that are conducting programs in and around the preserve. Other potential sources of data are the colleges and universities that have, in the past, conducted research projects in the area.

F. Resource Protection and Enforcement Capabilities

The protection of the preserve's resources depends on the Florida Marine Patrol, in addition to field personnel. These protection needs might also require additional enforcement support from local government or other state agencies. The need for additional manpower, authority, equipment or vehicles for this task will be identified.

The field personnel will become familiar with the staff capabilities of both the Department of Natural Resources and the other agencies with enforcement responsibilities in the preserve. Annually, staff should fully assess the effectiveness of the protective and enforcement capabilities of these combined agencies.

G. Funding and Staffing Needs

The present aquatic preserve management program has been minimally implemented with funds from a variety of sources and programs. The writing of this management plan was funded through a grant from the U. S. Office of Coastal Zone Management, National Oceanic and Atmospheric Administration, and through the "Coastal Zone Management Act of 1972", as amended. This grant will end in 1984.

In order for the management program proposed in this plan to function and succeed, the program must have its own funding and staffing. The workload required by this program is too much for an interim staff from other agencies

to handle in addition to their other obligations. Funding and staffing needs are critically important to the success of the aquatic preserve program.

The management of Indian River Lagoon Aquatic Preserves would be integrated into the management program and needs of other BELM management programs in the area. This preserve's management would be combined with two other aquatic preserves (North Fork-St. Lucie and assistance to Loxahatchee River-Lake Worth Creek). A proposed budget given these needs has been estimated at $150,000 for staff, equipment, office and expenses for the first year. The proposed staff would include two biologists and one ranger.

INDIAN RIVER LAGOON AQUATIC PRESERVE

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