# NORTH FORK--ST. LUCIE RIVER
# AQUATIC PRESERVE MANAGEMENT PLAN

Adopted May 22, 1984



Department of Natural Resources

# NORTH FORK ST. LUCIE RIVER
# AQUATIC PRESERVE MANAGEMENT PLAN

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Division of Recreation and Parks

Bureau of Environmental Land Management

Preparation of this report 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 North Fork of the St. Lucie River is unique on the southeast coast of Florida. With the exception of the Northwest Fork of the Loxahatchee River, no other river in this region has so much of its floodplain preserved. The combination of subtropical climate, unusual vegetation mixture and wilderness qualities in the midst of major residential development make this preserve distinctive.

A wide variety of fish and wildlife are found in this preserve and contribute to its productivity. The preserve has provided critical habitat for water birds during past droughts and important habitat for many endangered species. The preserve is one of the last remaining freshwater/estuarine wilderness areas in this region of Florida.

The major objectives of the aquatic preserve management program are to manage the preserve to ensure maintenance of essentially natural conditions, 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 comments 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. These field personnel are critical to the realistic management of this aquatic preserve.

STATE OF FLORIDA

BOARD OF TRUSTEES OF THE INTERNAL IMPROVEMENT TRUST FUND

RESOLUTION

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 preserve; 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 North ForK-St. Lucie River area, and

NOW THEREFORE BE IT RESOLVED that the Board of Trustees of the Internal Improvement Trust Fund hereby adopts the North Fork-St. Lucie River Aquatic Preserve Management Plan; and

BE IT FURTHER RESOLVED that the Trustees designate the North Fork-St. Lucie River Aquatic Preserve as a "wilderness preserve", wherein the primary management objective will be the maintenance of these ecosystems in an essentially natural state; and

BE IT FURTHER RESOLVED that the North Fork-St. Lucie River Aquatic Preserve Management Plan shall serve as a fundamental policy guideline for the Trustees and other state and local agencies having jurisdiction relative to maintaining the North Fork-St. Lucie River Aquatic Preserve 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 North Fork-St. Lucie River Aquatic Preserve; 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 May, A.D., 1984.

Governor

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 management plan addresses the North Fork-St. Lucie Aquatic Preserve (Figure 1) in southeast Florida, approximately 40 miles northwest of West Palm Beach and two miles northwest of Stuart. The surface water area of the preserve is approximately 5,000 acres while the North Fork-St. Lucie River's drainage basin encompasses 333 square miles. The major portion of the preserve is within St. Lucie County, with a small portion in Martin County. A large section of the preserve lies within the city of Port St. Lucie.

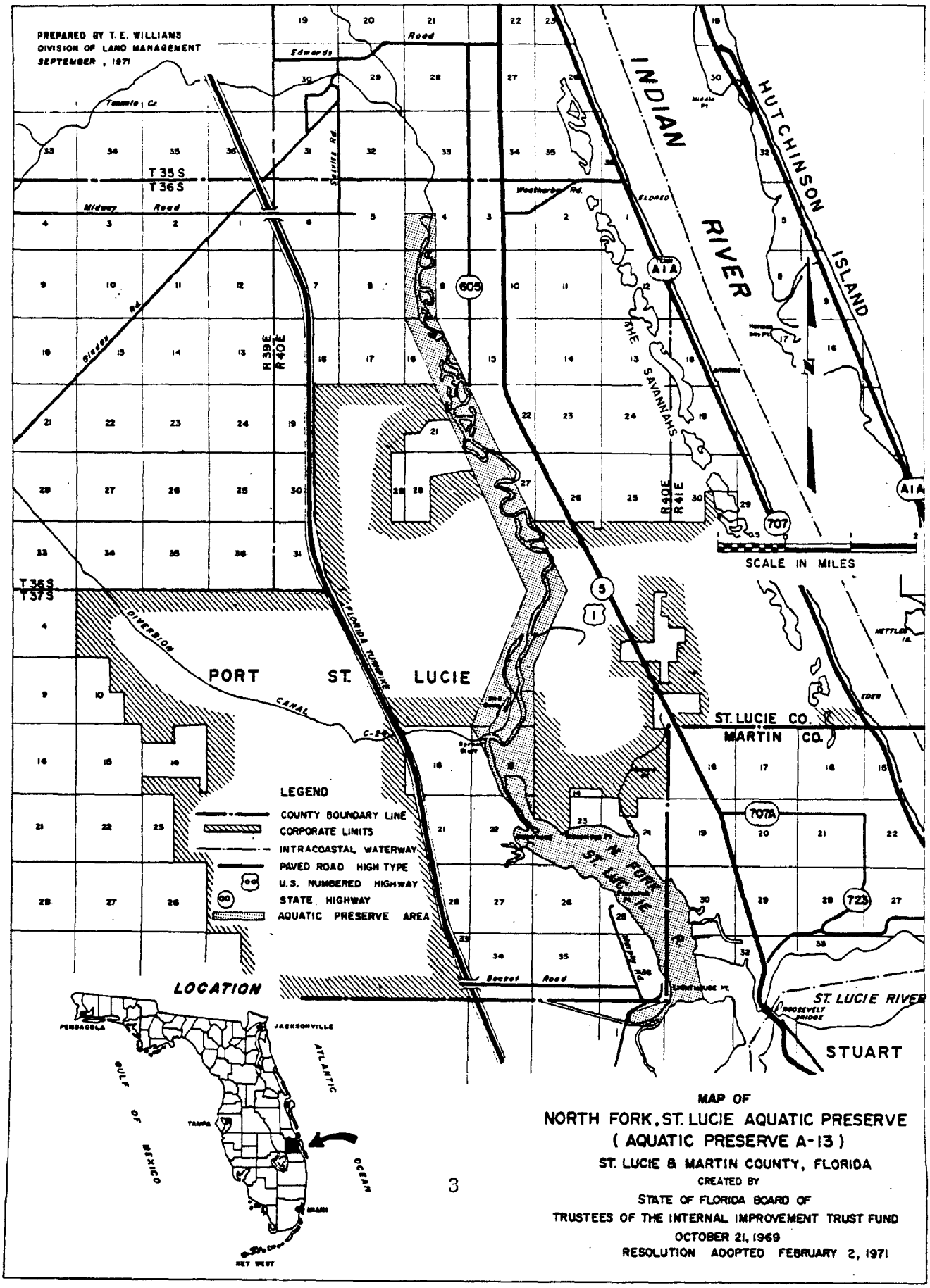
The preserve encompasses the majority the northern fork of the St. Lucie River which eventually flows into the Atlantic Ocean at the St. Lucie inlet. The preserve is generally in freshwater at the northern boundary and seasonally brackish to saline in the southern portion, with the majority of preserve in brackish water for most of the year. The vegetation in the preserve is equally varied in both fresh and salt water types, and also varied in temperate and tropical type vegetation. Red and white mangroves are dominant in the lower southern reaches of the preserve, while extensive hardwood swamps are found in the freshwater of the upper northern reaches.

The climate in this region is subtropical, with an annual rainfall of approximately 51 inches. The majority of this rainfall occurs from June to October (the wet season) as a result of convective thunderstorm events (Miller, 1978). The subtropical climate is an important factor in sustaining the great diversity of plant life within the preserve area.

The North Fork-St. Lucie River is supplied with freshwater from the Five-mile and Tenmile Creeks that flow through the central portion of St. Lucie County. The North Fork also serves as an outlet for two major drainage canals (C-23 and C-24). These canals drain the agricultural areas of western and southwestern St. Lucie County and northwestern Martin County.

The North Fork-St. Lucie Aquatic Preserve is designated and managed as a wilderness preserve. The overall emphasis of the management will be on maintaining and enhancing the existing wilderness condition. As more site specific information becomes available, essentially natural conditions shall be identified and resources in disturbed areas restored to that condition where possible. This plan advocates a multiple use approach to management due to the extensive and diverse uses within the North Fork-St. Lucie Aquatic Preserve. These uses include boating, fishing and swimming.

As there are currently no onsite staff resources, the management program in this aquatic preserve will be restricted in the scope of operations. Field support will be furnished on an interim basis by the Florida Park Service and other state agencies, when possible.




MAP OF

NORTH FORK, ST. LUCIE AQUATIC PRESERVE

( AQUATIC PRESERVE A-13 )

ST. LUCIE & MARTIN COUNTY, FLORIDA

CREATED BY

STATE OF FLORIDA BOARD OF

TRUSTEES OF THE INTERNAL IMPROVEMENT TRUST FUND

OCTOBER 21, 1969

RESOLUTION ADOPTED FEBRUARY 2, 1971

However, this limited 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 in Tallahassee, known as the "central office". On-site staff experience and additional resource information will likely lead to modifications (i.e., additions and deletions) of the program and plan, which are both designed to accommodate such changes or at least identify areas needing improvement.

Initially, the resource inventory will be heavily dependent on LANDSAT satellite imagery, and existing scientific and other literature. As the program proceeds and on-site managers are present, a better knowledge of the resources within the preserve and how man interacts and affects them will develop.

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 of 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 (Management Implementation Network) 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 resource 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, 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' National Oceanic and Atmospheric Administration, Office of Ocean and Coastal Resource Management, and the Florida Department of Environmental Regulation, Office of Coastal Management.

Chapter II

## MANAGEMENT AUTHORITY

Chapter 258, F.S., clearly establishes the proprietary management overview role of the Governor and Cabinet, sitting as the Trustees of the Internal Improvement Trust Fund 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, therefore, be presumed to potentially include staff and designated agents, in addition to the Governor and Cabinet.

In many respects, the authorities available supporting aquatic preserve planning and management are the cumulative result of the publics' 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.

The North Fork-St. Lucie Aquatic Preserve was adopted by the Trustees on March 30, 1972, by resolution. The boundary line of Figure 1 represents the gross boundary of the aquatic preserve. The actual preserve includes

those sovereignty submerged lands located waterward of the mean high water and ordinary high waterline within this boundary area.

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 Board of Trustees of the Internal Improvement Trust Fund (the Governor and Cabinet) 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 Governor and Cabinet imposing a moratorium 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 water bodies 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 of the Florida Statutes), 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 primary authorities available to staff in implementing management directives affecting aquatic preserves are found in Chapters 258 and 253, Florida Statutes. These authorities stipulate a lead responsibility for the Governor and Cabinet, sitting as the Board of Trustees of the Internal Improvement Trust Fund. Acting as "agents" for the Trustees, the staff of the Bureau of Environmental Land Management (BELM) 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 geared toward 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, Florida Statutes.

Formal review comments are provided to the Department of Natural resources, 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 Governor and Cabinet, sitting as owners of the land, to evaluate public interest and project merits within the context of environmental impact upon the preserve.

Chapters 16Q-21 and 16Q-20, Florida Administrative Code, are two administrative rules directly applicable to the Department of Natural Resources/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, 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 these 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 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."

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 Estero Bay Aquatic Preserve Management Plan was approved on September 6, 1983.

The State Lands Management Plan, adopted on March 17, 1981, by the Governor and Cabinet, sitting as the Board of Trustees of the Internal Improvement Trust Fund, 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.

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. Land acquisition programs conducted under the

Environmentally Endangered Lands authorities of Chapter 259, F.S., or the Conservation and Recreation Lands Program authorized by Chapter 253, F.S., will enhance the protection of the natural resources within the aquatic preserves.

Chapter 403, Florida Statutes, is an important adjunct to Chapter's 253 and 258, F.S. This governs, in part, the State's regulatory programs affecting water quality. The Department of Environmental Regulation, through a permitting and certification process, administers this program. Section 253.77, F.S. requires that all state regulatory agencies, such as the Department of Environmental Regulation, have evidence of approval of the requested use from the Trustees, prior to issuing permits for projects utilizing state-owned land. This statutory directive provides an avenue for staff comments on potential environmental impacts of projects in aquatic preserves through the Department of Environmental Regulation permitting process. Additionally, the Department of Environmental Regulation 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 Department of Environmental Regulation also provides a source of funding for data collection and planning in areas such as the North Fork-St. Lucie River, as well as being the state agency responsible for implementing the "federal consistency" provisions of the federal Coastal Zone Management Act.

The Department of Environmental Regulation's administrative rules of primary significance to the aquatic preserve management program include Chapters 17-3 and 17-4, Florida Administrative Code. 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 Department of Environmental Regulation, the Department of Natural Resources, and the U.S. Army Corps of Engineers 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 Department of Environmental Regulation/Corps of Engineers 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, and the Department of State, Division of Archives, History, and Records Management. The Executive Office of the Governor also provides a mechanism for public input into federal projects via the State clearinghouse process.

The Department of Community Affairs 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 Department of State, Division of Archives, History and Records Management, 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, administer 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.

(A) Prohibit the disturbance of archaeological and historical sites within the aquatic preserve, unless prior authorization has been obtained from the Board of Trustees and Division of Archives, History, and Records Management, and such disturbance is part of an approved research design or authorized project.

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

(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 significant grass beds, 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 (freshwater swamp) within the aquatic preserve, except when necessitated by the pursuit of legally authorized projects.

(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 E.P.A. 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 North Fork-St. Lucie Aquatic Preserve as a wilderness preserve in accordance with the provisions of Section 16Q-20.13(d), F.A.C. This designation recognizes that the floodplain of the North Fork-St. Lucie River has been disturbed in the past by channel dredging, and extensive hydroperiod alteration, and that future development activities in that floodplain may be permissible, but only to the extent that the river system and floodplain vegetation are not further degraded.

(U) Apply the management criteria contained in the adopted North Fork-St. Lucie Aquatic Preserve 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.

## Chapter IV

## RESOURCE DESCRIPTION

The North Fork-St. Lucie River is unique on the southeast coast of Florida. With the exception of the Northwest Fork of the Loxahatchee River, no other river in this region has so much of its floodplain preserved. The combination of the subtropical climate, unique vegetation mixture and wilderness qualities combined in the midst of major residential development make this preserve distinctive. The wilderness designation of the North Fork-St. Lucie River Aquatic Preserve is based primarily on the outstanding characteristics of the floodplain vegetation, associated species habitat, and the presently existing natural appearance and functions of the river in relation to adjacent east coast rivers.

A wide variety of fish and wildlife are found in this preserve and contribute to its productivity. The preserve has provided critical habitat for water birds during past droughts (Dan Cary, personal communication). The preserve is also an important habitat for many endangered species. The preserve serves as one of the last remaining freshwater/estuarine wilderness areas in this region of Florida.

Detailed information on the resources, such as species lists, water quality data, archaeological and historical site information, life histories, geological background, supporting maps, plus cultural resource information are 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 of the area surrounding the riverine and estuarine complex.

## A. Geological Features and Landforms.

The North Fork-St. Lucie River separates the Atlantic Coastal Plain to the east from the Eastern Flatwoods to the west. A major portion of the freshwater drainage flows from the extensive agricultural areas within the Eastern Flatwoods. The Eastern Flatwoods is a monotonously flat region with drainage mainly underground, through fine surface sands. The improved drainage system for agricultural purposes allows runoff to reach the St. Lucie River faster than was historically possible. The Atlantic Coastal Ridge to the east of the preserve, is a low ridge of relatively permeable fine to medium sand. These areas have historically flooded less frequently than inland areas (Lichtler, 1960). The St. Lucie River is the major breach in this area of the Atlantic Coastal Ridge which allows freshwater to flow to the Indian River and eventually to the Atlantic Ocean.

## B. Community Associations.

The plant communities of the North Fork-St. Lucie are a major factor in the continued health and productivity of the natural systems of the preserve. Five major community associations are recognized in the Preserve: mangrove, freshwater swamp, marine grassbeds, tidal flats and deep water areas. Each community is described separately although in reality these communities are sometimes mixed or overlap. The predominate animal species associated with these plant communities and endangered species with in this preserve are subsequently identified.

Mangroves. The four species of mangrove trees in the lower North Fork-St. Lucie River area represent the dominant vegetational association. The mangroves range from twelve to forty feet in height and generally inhabit the low energy shorelines of the St. Lucie River estuary system.

The four species of mangroves occurring here are the red mangrove (Rhizophora mangle) both in and near the water at low tide level; black mangrove (Avicennia germinans) generally inland of, but some-times 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 embayments, rivers, streams 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 mangrove areas, 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). There are a few other variations that appear in more inland areas both along natural drainage channels and sometimes isolated from the normal tides. These communities have a wide variety of mangrove species mixture and also might include scrub or dwarfed forms of the mangroves. Communities that become completely isolated from tidal influence often lead to the death of the more saline tolerant species as the waters and soils become less saline. The mangrove species have

various root structures, (i.e., prop roots and pneumatophores - the aerating root spikes of the blacks) 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 anerobic 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 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 a rise in sea level. Hurricane damage, although not experienced in the recent past, is a potential threat to these communities.

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.

Protection of the mangrove communities in the preserve will be a major task of this plan's management activities. The majority of the mangrove communities

in the preserve are already in public ownership by their location on sovereign lands. 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); black needlerush (Juncus roemerianus); spike rush (Eleocharis cellulosa); cordgrasses (Spartina spp); glass wort (Salicornia spp.); sea purslane (Sesuvium portulacastrum); salt wort (Batis maritima); and sea ox-eye (Borrichia frutescens).

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.

2. Freshwater Swamp Forest. The floodplain of the upper reaches of the preserve, including the creeks and sloughs flowing into the preserve, is vegetated by freshwater swamp plant species. These areas, also known as swamp hammocks, are formed on the natural levees and dikes that form the shoreline of the river. The soils in these areas are deep organic muck which are saturated and often flooded. This generally forested swamp is made up of dense stands of maple, water ash, sabal palm, sweet bay and laurel oak. The tree limbs and understory in these areas are heavily vegetated in ferns, vines, orchids, and bromeliads (Teas, 1971). These freshwater swamp forests are the best examples of the plant mixtures of temperate and tropical type vegetation (Table I). These areas are also the major reason for the wilderness classification of the preserve.

TABLE I

PLANT LIST FOR THE FRESHWATER SWAMP

| | |
|---|---|
| *Psilotum nudum* | whisk fern |
| *Ophioglossum palmatum* | hand fern |
| *Osmunda regalis* | royal fern |
| *Vittaria lineata* | shoestring fern |
| *Polypodium polypodioides* | resurrection fern |
| *Phlebodium aureum* | golden polybody |
| *Nephrolepsis exaltata* | Boston fern |
| *Acrostichum danaeaefolium* | leather fern |
| *Blechnum serrulatum* | swamp fern |
| *Woodwardia virginica* | chain fern |
| *Thelypteris palustris* | wood fern |
| *Thelypteris interrupta* | wood fern |
| *Campyloneuron phyllitides* | strap fern |
| *Osmunda cinnomomea* | cinnamon fern |
| *Panicum joorii* | |
| *Cladium jamaicensis* | sawgrass |
| *Serenoa repens* | saw palmetto |
| *Sabal palmetto* | sabal palm |
| *Peltandra virginica* | arrow arum |
| *Colocasia esculentum* | taro |
| *Tillandsia usneoides* | Spanish moss |
| *Tillandsia recurvata* | ball moss |
| *Tillandsia fasciculata* | air pine |
| *Tillandsia setacea* | needle leaf air pine |
| *Tillandsia utriculata* | giant air pine |
| *Tillandsia balbisiana* | reflexed wild pine |
| *Smilax bona-nox* | greenbrier |
| *Smilax laurifolia* | bamboo vine |
| *Crinum americanum* | string lily |
| *Encyclia tampensis* | butterfly orchid |
| *Saururus cernuus* | lizard's tail |
| *Salix caroliniana* | willow |
| *Myrica cerifera* | wax myrtle |
| *Carya aquatica* | water hickory |
| *Quercus laurifolia* | laurel oak |
| *Quercus nigra* | water oak |
| *Ficus aurea* | strangler fig |
| *Morus rubra* | mulberry |
| *Magnolia virginiana* | sweet bay |
| *Annona glabra* | pond apple |
| *Dioscorea bulbifera* | yam vine |
| *Eyrthrina herbacea* | coral bean |
| *Bursera simaruba* | gumbo limbo |
| *Schinus terebinthifoliusa* | Brazilian pepper |

Table I (continued)

| | |
|---|---|
| *Toxicodendron radicans* | poison ivy |
| *Ilex cassine* | dahoon holly |
| *Acer rubrum* | maple |
| *Vitis rotundifolia* | grape |
| *Vitis shuttleworthii* | calusa grape |
| *Urena lobata* | caesar weed |
| *Psidium guajava* | guava |
| *Ludwigia peruviana* | primrose willow |
| *Cornus foemina* | stiff cornel dogwood |
| *Myrsine guianensis* | myrsine |
| *Fraxinus caroliniana* | water ash |
| *Callicarpa americana* | beauty berry |
| *Bacopa monnieri* | water hyssop |
| *Cephalanthus occidentalis* | button bush |
| *Psychotria undata* | wild coffee |
| *Psychotria sulzneri* | wild coffee |
| *Sambucus simpsonii* | elderberry |
| *Amorpha fruticosa* | bastard indigo |
| *Diospyros Virginiana* | persimmon |

Source: General Development Corporation, 1980, and Maggy Hurchalla, pers. comm.

3. 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), as vital nursery areas for juvenile forms of shellfish, and as substrate for many algal species fed on by invertebrates which are in turn eaten by the fishes. Many commercially important fishes spend at least part of their life in these grassbeds (Zieman, 1982).

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 existing and restoration of historic marine grassbeds will be a major consideration in the field and administrative review of use proposals (See Appendix D).

Widgeon grass (Ruppia maritima) is the only significant marine grass in the North Fork-St. Lucie River area (Phillips, et al., 1960). This is due to the low salinities in this area due to its location at the mouth of the freshwater river. Another major factor for the lack of other marine grass types might be the heavy sediment loading of the system which has been indicated in the literature (Van Os, et al., 1980).

4. Tidal Flats. These areas in the estuarine system describe a wide variety of habitats that may have sporadic vegetation from the previous three

communities or no vegetation (vascular) 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 habitat for invertebrates, including crabs, oysters, and worms. The role of these various tidal flat areas is not fully understood but it is known that they are important habitats.

These areas, consisting of estuarine beaches, areas waterward of the mangroves, spoil areas, shoal areas, and mud flats, are important to the estuary in as much as they contribute 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 their nesting sites.

5. Deep Water Areas. These areas within the preserve include: channels, rivers, creeks, and other deep water areas. These areas are important to the estuary's tidal exchange. These deeper waters also allow predator fish access to the river. The bottle-nosed dolphin and manatee are important mammals potentially found in these areas.

6. Animal Life. The animal life in and associated with the North Fork-St. Lucie Aquatic Preserve is as diverse as the vegetation of the area. The animal life of the lower areas of the preserve area are estuarine related and those of the upper areas freshwater and hammock related. There are also species visiting this area during migrations, daily feeding and times of environmental stress (i.e. drought, storms, development activities).

Table 2 represents those animal species that are found within the preserve's boundary during usual circumstances. Additional species lists can be found in Appendix C.

7. Endangered Species. The combination of the subtropical climate, diverse vegetation and habitats, and waterbodies in the North Fork-St. Lucie River area has resulted in a high incidence of endangered animals and vegetation species. The plant species found in Table 3 are from the official State of Florida Plant List (Section 581.185, F. S.). The animal species in Table 4 are from the official lists as designated by the Florida Game and Fresh Water Fish Commission. Critical habitat and food sources such as the Acrostichum danageifolium giant leather fern which the manatee sometimes feed on, will be protected.

## C. Archaeological and Historical Resources

There are many sites along the North Fork that offer the environmental characteristics necessary for prehistoric or Indian settlements. That is assuming that the present conditions, also occurred in that time period. The drainage activities in the region may have altered this area producing those characteristics. There have also been many activities, such as agriculture and timbering, that have disturbed these areas.

The North Fork was used by the Seminole Indians as a transportation route linking the St. Lucie River area with the lower St. Johns River marshes to the

TABLE 2

ANIMAL SPECIES FOUND WITHIN THE NORTH FORK-ST.LUCIE AQUATIC PRESERVE

## AMPHIBIANS

| | |
|---|---|
| *Siren lacertina* | Greater siren |
| *Pseudobranchus striatus* | Narrow-striped dwarf siren |
| *Amphiuma means* | Two-toed amphiuma |
| *Notopthalmus viridescens* | Peninsula newt |
| *Eurycea quadridigitata* | Dwarf salamander |
| *Gastrophryne carolinensis* | Eastern narrow-mouthed toad |
| *Bufo terrestris* | Southern toad |
| *Bufo quercicus* | Oak toad |
| *Hyla cinerea* | Green treefrog |
| *Hyla squirella* | Squirrel treefrog |
| *Limnaoedus ocularis* | Little grass frog |
| *Acris gryllus* | Florida cricket frog |
| *Eleuthrodactylus plantrostris* | Greenhouse frog |
| *Rana grylio* | Pig frog |
| *Rana utricularia* | Southern leopard frog |

## REPTILES

| | |
|---|---|
| *Alligator mississippiensis* | American alligator |
| *Chelydra serpentina* | Snapping turtle |
| *Sternotherus odoratus* | Musk turtle |
| *Kinosternon bauri* | Striped mud turtle |
| *Chrysemys nelsoni* | Florida red-bellied turtle |
| *Terrapene carolina bauri* | Florida box turtle |
| *Trionyx ferox* | Florida softshell |
| *Anolis carolinensis* | Green anole |
| *Cnemidophorus sexlineatus* | Six-lined racerunner |
| *Sciencella lateralis* | Ground skink |
| *Eumeces inexpectatus* | Southeastern five-lined skink |
| *Nerodia fasciata* | Florida water snake |
| *Thamnophis sirtalis* | Eastern garter snake |
| *Thamnophis sauritus* | Peninsula ribbon snake |
| *Storeria dekayi* | Florida brown snake |
| *Diadophis punctatus* | Southern ringneck snake |
| *Opheodrys aestivus* | Rough green snake |
| *Coluber constrictor* | Southern black racer |
| *Drymarchon corais* | Eastern indigo snake |
| *Elaphe* spp. | Rat snakes |
| *Lompropeltis* spp. | King snakes |
| *Micrurus fulvius* | Eastern coral snake |
| *Agkistrodon piscivorus* | Florida cottonmouth |
| *Sistrurus miliarius* | Dusky pygmy rattlesnake |

Table 2 (continued)

BIRDS

| | |
|---|---|
| Anhinga anhinga | Anhinga |
| Ardea Herodias | Great blue heron |
| Casmerodius albus | Great egret |
| Bulbuleus ibis | Cattle egret |
| Egretta tricolor | Louisiana heron |
| Egretta coerulea | Little blue heron |
| Butorides striatus | Green heron |
| Eudocimus albus | White ibis |
| Anatidae | Ducks |
| Cathartes aura | Turkey vulture |
| Coragyps atratus | Black vulture |
| Butco jamaicensis | Red-tailed hawk |
| Butco lineatus | Red-shouldered hawk |
| Butco platypterus | Borad-winged hawk |
| Circus cyaneus | Marsh hawk |
| Pandion hahetus | Osprey |
| Falco sparverius | American kestrel |
| Gallinola chloropus | Common gallinule |
| Fulica americana | American coot |
| Coccyzus americanus | Yellow-billed cuckoo |
| Otus asio | Screech owl |
| Asio flammeus | Short-eared owl |
| Strix varia | Barred owl |
| Megaceryle alcyon | Belted kingfisher |
| Dryocopus pileatus | Pileated woodpecker |
| Centorus carolinusi | Red-bellied woodpecker |
| Sphyrapicus varius | Yellow-bellied sapsucker |
| Iridoprocne bicolor | Tree swallow |
| Hirundo rustica | Barn swallow |
| Cynocitta cristata | Blue jay |
| Coryus brachyrhchynos | Common crow |
| Thryothorus ludovicianus | Carolina wren |
| Mimus polyglottus | Mockingbird |
| Dumetella carolinensis | Catbird |
| Turdus migratorius | Robin |
| Polioptila caerulea | Blue-gray gnatcatcher |
| Bombycilla cedrorum | Cedar waxwing |
| Virco griseus | White-eyed vireo |
| Mniotilta varia | Black-and-white warbler |
| Dendroica coronata | Yellow-rumped warbler |
| Dendroica palmarum | Palm warbler |
| Geothlypis trichas | Common yellowthroat |
| Parulidae (many spp.) | Warblers |
| Sturnella magna | Eastern meadowlark |
| Agelaius phoeniceus | Red-winged blackbird |
| Quiscalus major | Boat-tailed grackle |
| Cardinalis cardinalis | Cardinal |

Table 2 (continued)

MAMMALS

| | |
|---|---|
| *Didelphis marsupialis* | Opossum |
| *Cryptotis parva* | Least shrew |
| *Scalopis aquaticus* | Eastern mole |
| *Vespertilionidae* | Bats |
| *Dasypus novemcinctus* | Armadillo |
| *Sylvilagus palustris* | Marsh rabbit |
| *Sylvilagus floridanus* | Cottontail rabbit |
| *Sciurus carolinensis* | Gray squirrel |
| *Oryzomys pafustris* | Rice rat |
| *Procyon lotor* | Raccoon |
| *Lutra canadensis* | River otter |
| *Mephitis mephitis* | Striped skunk |
| *Urocyon cineroargenteus* | Gray fox |
| *Lynx rufus* | Bobcat |
| *Sus scrofa* | Feral pig |
| *Odocoileus virginianus* | Whitetail deer |

Source: General Development Corporation, 1980 - modified.

TABLE 3

THREATENED AND ENDANGERED PLANT SPECIES FOUND IN THE NORTH FORK-ST. LUCIE AQUATIC PRESERVE

ENDANGERED

| | |
|---|---|
| *Ophioglossum palmitum* | Hand fern |

THREATENED

| | |
|---|---|
| *Psilotum nudum* | Wisk fern |
| *Vittaria lineata* | Shoestring fern |
| *Phlebodium aureum* | Golden polypody |
| *Nephrolepis exaltata* | Boston fern |
| *Acrostichum danaeaefolium* | Leather fern |
| *Thelypteris palustris* | Shield fern |
| *Thelypteris interrupta* | Shield fern |
| *Salvinia rotundifolia* | Water fern |
| *Tillandsia fasciculata* | Air pine |
| *Tillandsia utriculata* | Giant air pine |
| *Tillandsia setacea* | Needle leaved air pine |
| *Enyclia tampensis* | Butterfly orchid |
| *Annona glabra* | Pond apple |

Classification from the Preservation of Native Flora of Florida Act (Section 581.185, Florida Statutes)

TABLE 4

THREATENED AND ENDANGERED ANIMAL SPECIES
EXPECTED IN THE NORTH FORK-ST. LUCIE
AQUATIC PRESERVE

| | |
|---|---|
| **ENDANGERED** | |
| *Falco peregrinus* | Peregrine falcon |
| *Mycteria americana* | Wood stork |
| *Trichechus manatus latirostris* | Carribbean manatee |
| **THREATENED** | |
| *Caracara cherway auduboni* | Audubon's caracara |
| *Drymarchon corais couperi* | Eastern indigo snake |
| *Falco sparverius paulus* | Southeastern kestrel |
| *Haliaectus leucocephalus* | Bald eagle |
| **SPECIES OF SPECIAL CONCERN** | |
| *Alligator mississippiensis* | American alligator |
| *Aramus guarauna pictus* | Limpkin |
| *Florida caerulea* | Little blue heron |
| *Hydranassa tricolor* | Louisiana heron |
| *Leucophoyx thula* | Snowy egret |

Classifications from the Florida Game and Fresh Water Fish Commission
Section 39-27.02-.05, Florida Administrative Code, July 15, 1983.

northwest. The Seminoles were believed to use these routes in seasonal hunting excursions from the St. Johns Marshes to Hutchinson Island. There they would hunt bear and manatee. The North Fork was also used in the Seminole Wars of the 1800's. Large military forces are believed to have traveled through this area during the 1838 winter campaign of General Jesup during the Second Seminole War (Clausen et al., 1979).

D. Water Resources.

Water is the one resource whose characteristics most directly affect this estuary's habitability and healthiness for the plants and animals naturally adapted to living there. The drainage basin of the entire St. Lucie River has been modified by agricultural drainage and residential development. The North Fork-St. Lucie River receives the outfall of two major drainage canals (C-23 and C-24) and many other drainage sources in the upper headwaters. The freshwater flow from the St. Lucie Canal on the South Fork may also affect the North Fork indirectly. The uplands surrounding the preserve area are also modified by the extensive Port St. Lucie residential development and the other residential developments along the river. The North Fork was also modified by the U. S. Army during World War II. Those modifications involved the straightening and channelization of the upper section of the river (Environmental Quality Laboratory, 1980). The result of all of these modifications to the river and its basin is that rainfall that may have taken months to get to the river by natural drainage now takes only hours. The river that once meandered through a broad floodplain now flows down a deep channel. Water quality is generally fairly good for the preserve. The

preserve does act as a treatment system for the water quality problems both upstream and from upland discharges (Davis, 1982).

The basic characteristics of the water in the North Fork vary in response to daily, seasonal, and long term forces which are related to the area's climate. Added to this are the artificial conditions of large releases of freshwater from the canals and the water quality problems associated with agricultural and urban development. The Fivemile and Tenmile Creeks in the upper reaches of the North Fork are now being developed as the city of Fort Pierce grows. The River appears to have an abnormally high sedimentation level (Van Os, 1980). Other water quality problems have been noted.

The combination of the extensive Department of Environmental Regulation monitoring and water management studies by the South Florida Water Management District have the potential for the development of a comprehensive water quality plan for the North Fork. The Treasure Coast Regional Planning Council has also developed wetlands protection policies that will be helpful in protecting the floodplain of the North Fork. More and more data is being gathered on this system, filling data gaps and developing knowledge of how the system works, and how best to protect this system. The North Fork has been described as a system that is "holding its own" (Davis, 1982). With the pressures of increased development in the basin this condition may not continue without careful management.

E. Cultural.

This section addresses the human influence and development of this area, as it affects the aquatic preserve. The 1980 U.S. Census population for Martin County was 64,014 and St. Lucie County was 87,182. The 1982 populations for those counties respectively were 71,635 and 100,984. This represents a 11.9 and 15.8 percent increase, respectively (Terhune, 1983). The increase in population for Port St. Lucie is 55.8 percent, from 14,690 in 1980 to 22,887 in 1982. This graphically indicates that the population increases with increased residential development in the immediate area are quite significant. The pressures on the St. Lucie River system from this growth increase the potential for water quality degradation.

The section of the North Fork that flows through the City of Port St. Lucie has remained generally intact with the exception of the effects of the canals projecting off the river. There are a few areas in this middle section which still may receive development. That part of the preserve north of Port St. Lucie extending to the preserve's northern boundary has received only minor residential development, but has been modified for agriculture. The southern section of the preserve, below C-23, has the majority of the eastern shoreline developed. The western shoreline is presently receiving extensive development pressure.

There are two major Developments of Regional Impact (DRI's) along the river corridor: Sharrett on the northwest boundary and Harbor Ridge on the southwest

boundary. Both developments have received approvals. The Sharrett development has a projected population of over 22,000 people. The Harbor Ridge projected population is over 1,700.

The North Fork-St. Lucie Aquatic Preserve area is presently undergoing a great deal of development. The corridor along the preserve will probably be fully developed in the next ten years if the present growth trends are maintained. The North Fork river basin is also receiving extensive growth pressure west of Fort Pierce. The river is presently indicating a tendency toward increased water quality degradation and the projected growth will further stress the river's viability in the future.

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 North Fork-St. Lucie Aquatic Preserve is designated as a wilderness preserve and the management will be directed toward the maintenance and enhancement of that condition. This part of the management plan addresses the policies and procedures that the onsite and administrative personnel will pursue. The onsite personnel in this respect are described as the field personnel. The full realization of the field personnel's duties and responsibilities will not be realized until the Bureau of Environmental Land Management has established onsite personnel in this area. During the interim period the Florida Park Service and other state agencies will fill the minimum field needs for the review of applications for use of state owned lands and related activities. Section B will fully apply only as onsite personnel are assigned to this preserve. The administrative management will involve Bureau of Environmental Lands Management 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. The field 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 by the activities that the staff 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, with respect to management of the various uses of the aquatic preserve, are addressed in more detail in Chapters VII through XI. The field personnel will generally be involved in all management activities concerning the North Fork-St. Lucie Aquatic Preserve.

### 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 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, the field personnel will develop a program to work toward the restoration of plant communities now damaged or destroyed by human activities and to prevent such damage in the future.

Management Policy

a. Field Familiarization and Documentation. Aquatic preserve 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 preserve.

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 guide-lines to 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 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 sea grass communities;
6. invasions of exotic plant species and revegetation by native species after exotic removal projects; and
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 for 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. Sea grass communities shall not be removed or shaded to such an extent as to cause the death of a significant area of the community or 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 recreational, private and commercial uses (i.e., propeller damage) can inflict on seagrass 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 St. Lucie estuary.

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 in 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, and will offer logistical and professional assistance with data collection in the field, as time permits. This familiarization and assistance should lead to a better understanding of both other 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 North Fork-St. Lucie is a major reason for the designation of the aquatic preserve. The fish, shrimp, and crabs

within the the aquatic preserve are valuable resources on which recreational and commercial fisheries depend. The large area of undisturbed wetlands is excellent habitat for many types of wildlife. These wildlife include extensive list of endangered species, migratory waterfowl, colonial waterbird nesting invertebrates and vertebrates.

Management objective for animal life within the aquatic preserve will be that of protection through preservation of their 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 to their 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. Monitoring of Animal Species for Changes Due to Natural Causes.

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; and

iv. geologic or hydrologic changes including erosion, estuarine current flow changes, and any other physical changes.

e. 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 as they might relate to the well being of animal life and be involved in planning the activity so as to cause the least amount of stress on animal life.

f. 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 Need). Data/Information Needs.

3. GEOLOGIC FEATURES

The management of geologic features will require the field personnel being 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 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 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.

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 or water management district, 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. Channel maintenance and drainage canal placement and operation are examples of such projects. 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.

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

B. Management Policy. The management policy presented here is one of conservation, recommended by the Division of Archives, History and Records Management, 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, D.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 destruction 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 preserve's various habitat 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 ecologically damaging changes in the water resources of the aquatic preserve since they function as one hydrologic system supporting a biologically interdependent estuarine ecosystem.

### Management Policy

The successful management of the water resources of the aquatic preserve depends heavily on other government agencies (i.e., Department of Environmental Regulation 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 data on water resources, other than from government agencies, are dependent on or may be found among colleges, universities, scientific foundations and private consultants working in the North Fork-St. Lucie 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 entitites. The field personnel will not have the ability to do water sampling, but through the analysis of the data from these other entities and 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. Aquatic preserve 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. The drainage basin in this case is the North Fork-St. Lucie Drainage Basin which flows directly into aquatic preserve waters. Those agencies known to be working or have potential activities affecting the preserve are listed below; others may be added as they are identified.

1. Florida Department of Environmental Regulation
2. St. Lucie County
3. Martin County

4. South Florida Water Management District
5. Treasure Coast Regional Planning Council
6. Florida Department of Natural Resources Marine Research Laboratory
7. North St. Lucie Water Control District
8. U. S. Geological Survey
9. U. S. Environmental Protection Agency
10. Florida Power and Light Company
11. Florida Institute of Technology

b. Monitoring of Water Resources by Cooperative Data Collection and Review. Field personnel will: 1. lend cooperative assistance to other agencies monitoring water resources within the aquatic preserve and its basin; 2. promote coordination among involved agencies in planning monitoring programs and in evaluating monitoring data; and 3. themselves 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 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 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, with staffing, initiate development of a cumulative impact analysis program. The evaluation of cumulative impacts shall include the following criteria (Chapter 16Q-20 F.A.C.):

"a. 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,

b. the similar activities within the preserve which are currently under consideration by the Department; and

c. direct and indirect effects upon the preserve and adjacent preserve, if applicable, which may reasonably be expected to result from the activity; and

d. the extent to which the activity is consistent with management plans for the preserve, when developed; and

e. 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 government agencies.

f. the extent to which the loss of beneficial hydrologic and biologic functions could adversely impact the quality or utility of the preserve; and

g. 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, extending 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., Department of Natural Resources, Department of Environmental Regulation, etc) the field personnel will assist in this process, as necessary, with the field evaluation 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.

## 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 and resource mapping. Both standard aerial photography and LANDSAT imagery will be used in this preserve in the mapping of critical resources. LANDSAT imagery will be developed in conjunction with DNR's Marine Research Laboratory.

The vegetation and land use mapping done in this study will become the basis for developing a Resource Protection Area management system for the North

Fork-St. Lucie Aquatic Preserve. This mapping system will identify and classify various resources within the aquatic preserve that require protection by the management program. 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 preserve.

The LANDSAT generated mapping will be the basis for the development of 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 the following: marine grassbeds; mangrove swamp; freshwater 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 so to disturbances as Class 1 areas. The resources of Class 2 will include: marine grassbeds; mangroves in scrub condition or colonizing new lands; freshwater swamp; salwater 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. These areas will generally be more suitable traditional aquatic preserve uses.

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 on site 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 management agencies, as well as local and regional government entities. Support will also be required of 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 will be attached to the aquatic preserve management plan in Appendix D.

## D. ADMINISTRATIVE MANAGEMENT OBJECTIVES

This section of the chapter addresses the role of the Division of Recreation and Parks, Bureau of Environmental Land Management's 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 preserve's 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 basicly water dependent or water-enhanced, not contrary to the lawful and traditional uses of the preserve, and not infringe 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 has

been administratively designated, on October 4, 1982, as an agent of the Governor and Cabinet, sitting as the Board of Trustees of the Internal Improvement Trust Fund, for the purposes of evaluating the environmental consequences of all proposed uses of state-owned lands within aquatic preserves. These proposed uses range from private single-family docks and navigation buoys to large commercial marinas.

In conducting the environmental evaluations, the central office staff will rely heavily upon the most current, readily available data such as LANDSAT imagery, Department of Environmental Regulation 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 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. and the December, 1982 Memorandum of Understanding between the U.S. Army Corps of Engineers, Department of Environmental Regulation and Department of Natural Resources provide direct access to the permitting process of the Department of Environmental Regulation for the Department of Natural Resources. The D.R.I. 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 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, Chapter 258,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 of applications requesting the use of state-owned lands, 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 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 the onsite personnel 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 Archives, History and Records Management to conduct a detailed cultural resource assessment for certain areas of the the preserve.

4. Administrative Rule Responsibilities.

The central office will provide the staff for any required administrative rule additions, deletions or revisions arising from the aquatic preserve program. In all likelihood, the adoption of the individual aquatic preserve management plans will require amendments to Chapter 16Q-20, F.A.C. to reflect the preserve management as presented in this plan. Rule revisions will also be required if the Governor and Cabinet issue changes or additions to existing Cabinet policy concerning aquatic preserve management or if the Legislature authorizes substantive amendments to the existing statutory authorities. All rule development will follow the procedures outlined in Chapter 120, F.S.

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, and 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 Department of Environmental Regulation, 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. 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 techniques for this purpose.

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 North Fork-St. Lucie Aquatic Preserve include their involvement with the Florida Department of Environmental Regulation in the dredge and fill permitting process, technical oversight of channel 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 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 Florida Department of Environmental Regulation (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 in which they may be involved and 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 St. Lucie 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 resource or regulate activities within the aquatic preserve. There are also other programs within the Department of Natural Resources (DNR) that are within or affect the North Fork-St. Lucie area aquatic preserve. 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 North Fork-St. Lucie Aquatic Preserve. 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 is responsible for reviewing Developments of Regional Impact (DRI). 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.

3. Department of Natural Resources. The aquatic preserve management program is associated with several other land management programs in the Department of Natural Resources (DNR) in the North Fork-St. Lucie River area.

The Florida Park Service, under the Division of Recreation and Parks, has several State parks in the two county area surrounding this preserve. The initial management of this preserve will depend on personnel from the Florida Park Service on an interim basis until onsite personnel can be provided. The Bureau of Environmental Land Management has management responsibility of the Savannas State Reserve in southeast St. Lucie County and northeast Martin County. The Savannas are not presently staffed, but as they receive staff in the future these personnel will also be working in the North Fork-St. Lucie Aquatic Preserve.

DNR's St. Petersburg Marine Research Laboratory, under the Division of Marine Resources, has several programs and projects within the North Fork-St. Lucie River area which will benefit the aquatic preserve program. The Marine

Lab is studying fishery habitat losses along the coast of Florida. The mapping, developed from LANDSAT which will be used in the management of this aquatic preserve, 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. The field personnel will become familiar with these studies and programs, and will consult the Marine Lab for their data needs within the North Fork-St. Lucie River area 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 North Fork-St. Lucie River area. 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 aquatic preserve program will work closely with the Division of State Lands in the review of applications for the use of sovereignty lands and other related issues. 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.

4. Florida Game and Fresh Water Fish Commission. (GFWFC) The GFWFC's Environmental Services office in Vero Beach sends biologists to the North Fork-St. Lucie River area to review projects which may have potential impacts on local fish and wildlife habitat as necessary. These personnel will also be assisting in field management activities on an interim basis. The field personnel 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 the St. Lucie River 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.

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

6. 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.

7. 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. Additionally, the central office staff will become involved in future meetings of 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 aquatic preserve on the North Fork-St. Lucie River will include the South Florida Water Management District and the Treasure Coast Regional Planning Council. These organizations have activities that are broader than the local government, but are on a smaller scale than the state level.

1. South Florida Water Management District. The district boundaries of the South Florida Water Management District (SFWMD) contain the entire North Fork-ST. Lucie River drainage basin. The water management district administers permitting programs for the local consumptive 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 North Fork-St. Lucie River Basin 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 the local governments of Martin and St. Lucie Counties, as well as two cities within these counties and other southeast Florida counties as a regional planning body. 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 affects the aquatic preserve will be reviewed by the central office staff, with the field personnel's field review, when

necessary. DRIs 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.

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 only incorporated cities within the North Fork-St. Lucie basin are Port St. Lucie, bisected by the preserve and Ft. Pierce, to the North. The Special districts include each county's mosquito control, the North St. Lucie Water Control District, and any other special districts that might affect the aquatic preserve. The field personnel will be the local liaison for the aquatic preserve to these local government entities. The field personnel will be available to these local 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.

The special districts may not have an official comprehensive management plan equivalent to the LGCPA plans, but they do have management policies and program statements that may be similar to such a plan. The field personnel will become familiar with these policies and the activities of these districts and 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 use them only at certain times of the year. The operations of drainage districts have a considerable effect on this preserve.

2. Relation to local development codes. The local zoning and development codes (e.g., building codes) provide the major local regulation as to 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 and its 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 proceeding 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 apply to local governments to offer assistance or information to local officials or in coordinating with other agencies to help solve these problems as they occur. 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.

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), the scientific organizations, the fishing ans 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., University of Miami, University of Florida, Florida Institute of Technology), 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 involves the removal of resources from the preserve. These uses include fishing, hunting, shellfishing, and other related activities. 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 North Fork-St. Lucie 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. These 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 preserve resource (e.g., destruction of 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 must recognize 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 the administrative and possible field review with later monitoring by field personnel as projected by Chapter V., Section B.

Private non-commercial uses shall be designed to avoid Critical Resource Protection Areas (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 four (4) feet,

b. the dock decking design and construction will insure maximum light penetration,

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

d. when the water depth is at four (4) feet at an existing bulkhead the maximum dock length from the bulkhead shall be twenty five (25) feet, and

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

When allowed, Bulkheads should be placed in such a way as to be the least destructive and disruptive to the vegetation and other resource factors in each area. 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 critical habitat areas or in nearby areas if it will adversely impact critical habitat 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. Docks and piers need to be located so that they cause the least amount of destruction or displacement of resources within the preserve. These resources should include all the factors used in the designation of RPA's (mangroves, marine grassbeds, etc.).

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 North Fork-St. Lucie River area are utility crossings, marinas and yacht clubs, commercial fishing, and other types of fishing or boating for hire. Non-traditional uses in this area which have also occurred in other areas of this or other states include power plants, oil and gas transportation facilities, aquaculture, seaplane facilities, ferry services in or over the water, 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 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 division's 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.

3. Marina. The locating of marinas and their related uses will be a major concern of the North Fork-St. Lucie Aquatic Preserve 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,

c. the marina shall not be located in Class 1 or 2 resource protection areas,

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 shall be secondary to the expansion of existing facilities,

f. new facilities shall be discouraged in any location 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,

g. marinas should be specifically sited away from critical manatee habitat.

h. 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

i. field personnel will work with those agencies in finding marina sites that meet the above policies and are protected from hurricanes.

4. Deep Water Port Facilities. There are no facilities of this type within the North Fork-St. Lucie Aquatic Preserve at the present time and new port facilities 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 A93) of this Chapter.

B. Non-traditional Commercial Uses

1. Power Plants. Power plants have the potential for causing major changes in the air quality, water quality, plant and animal life of the aquatic preserve. For these reasons they are incompatible with the purpose 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.

2. Seaplane Areas. Uses of this sort, which cause high noise levels, high speed disturbances or constant activity over a standard route or landing area, will require careful placement in areas that will not disturb wildlife, affect marine grassbeds, or otherwise degrade the natural condition of the aquatic preserve. The field personnel should be involved in the planning, time of operation scheduling and the later monitoring of this type of activity in conjunction with the central office staff.

3. 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 each preserve.

CHAPTER X

# SCIENTIFIC RESEARCH

The field personnel attached to the North Fork-St. Lucie Aquatic Preserve should serve as the area coordinator 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 affect 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 preserve for environmental education. The education of the youth of Martin and St. Lucie Counties is a very good way of enhancing the knowledge of the natural systems and future support of the aquatic preserve program. Knowledge of the resources in the preserve and their values are a major factor in the continued protection of the aquatic preserve in the future.

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 preserve. These activities may also include the eventual 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 aquatic preserve for presentation to interested groups of all ages on the values of management activities of the aquatic preserve to government units and private interest groups. The education of the public on 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. Formal management agreements, memoranda of understanding, etc., that will ensure the compatible management of these areas shall 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 exclude 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.

## C. Legislative Needs

Management needs could conceivably involve changes in the legislation pertaining to aquatic preserve or 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 South Florida Water Management Districts studies, Department of Environmental Regulation water quality monitoring or other agencies. The field personnel will be aware of data needs as they interact with the various levels of government and 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 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 depend on the Florida Park Service, the Florida Marine Patrol and Florida Game and Fresh Water Fish Commission, 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 capabilities of both Department of Natural Resources' staff 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. 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, 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 North Fork-St. Lucie Aquatic Preserve 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 (Indian River-Vero Beach to Fort Pierce and Jensen Beach to Jupiter Inlet). A proposed budget given these needs has been estimated at $82,000 for staff, equipment, office and expenses for the first year. The proposed staff would include a biologist and one ranger.

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