WEKIVA RIVER

AQUATIC PRESERVE

MANAGEMENT PLAN

ADOPTED AUGUST 1987

DEPARTMENT OF NATURAL RESOURCES

WEKIVA RIVER AQUATIC PRESERVE

MANAGEMENT PLAN

August 25, 1987

Tom Gardner

Executive Director

Department of Natural Resources

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

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EXECUTIVE SUMMARY

The Wekiva River Aquatic Preserve is located in Lake, Orange, Seminole and Volusia Counties of Central Florida, totalling approximately 19,000 acres of sovereignty submerged lands. This riverine system is one of the most pristine in the state.

Wekiva River, three miles of the Little Wekiva River, one mile of Rock Springs Run and the lower portion of Blackwater Creek was designated the Wekiva River Aquatic Preserve in June 1975; it was expanded in June 1985 to include a portion of the St. Johns River from State Road 44 to Interstate 4. The primary purpose of the designation is to preserve the biological resources of this riverine system. This area consists predominately of a variety of freshwater plant species, and provides critical habitat to an extensive array of fish, birds and other wildlife. Maintaining the continued health of the preserve will involve minimizing water pollution and losses of wetlands resulting from urban, residential and industrial development in the region.

The major objective of the aquatic preserve management program is to ensure the maintenance of essentially natural conditions. Management will also be directed to ensure public recreational opportunities while assuring the continued propagation of fish, birds and other wildlife resources. 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 to review and comment on applications for the use of state-owned submerged lands. Meeting these objectives will require a fully implemented management program with the continuation of the on-site Environmental Specialist for the aquatic preserve who has an office in the city of Sanford.

STATE OF FLORIDA

BOARD OF TRUSTEES OF THE INTERNAL IMPROVEMENT TRUST FUND

R E S O L U T I O N

WHEREAS, the Board of Trustees of the Internal Improvement Trust Fund is charged with the acquisition, administration, management, control, super-vision, 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; and

WHEREAS; Section 18-20.13, Florida Administrative Code, mandates the development of management plans for aquatic preserves; and

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

WHEREAS, the Trustees have recognized the Wekiva River Aquatic Preserve as a biological/scientific preserve in formal action on June 22, 1975; and

WHEREAS, the Trustees recognize the importance and benefits of protecting the natural resources and preserving the natural ecosystem and aesthetics in the Wekiva River Aquatic Preserve area; and

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

BE IT FURTHER RESOLVED that the Wekiva 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 natural resources and environmental quality of this aquatic preserve, 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 Wekiva 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

Governor

(Seal)

Secretary of State

Commissioner of Education

Attorney General

Commissioner of Agriculture

Comptroller

Treasurer

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

Approved as to form and legality

DNR Attorney

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Chapter I INTRODUCTION

This plan addresses the management of the Wekiva River Aquatic Preserve. The Preserve is located in central Florida, and includes parts of Lake, Orange, Seminole and Volusia Counties. This Aquatic Preserve is one of the 40 officially designated preserves in the statewide system (Figure 1).

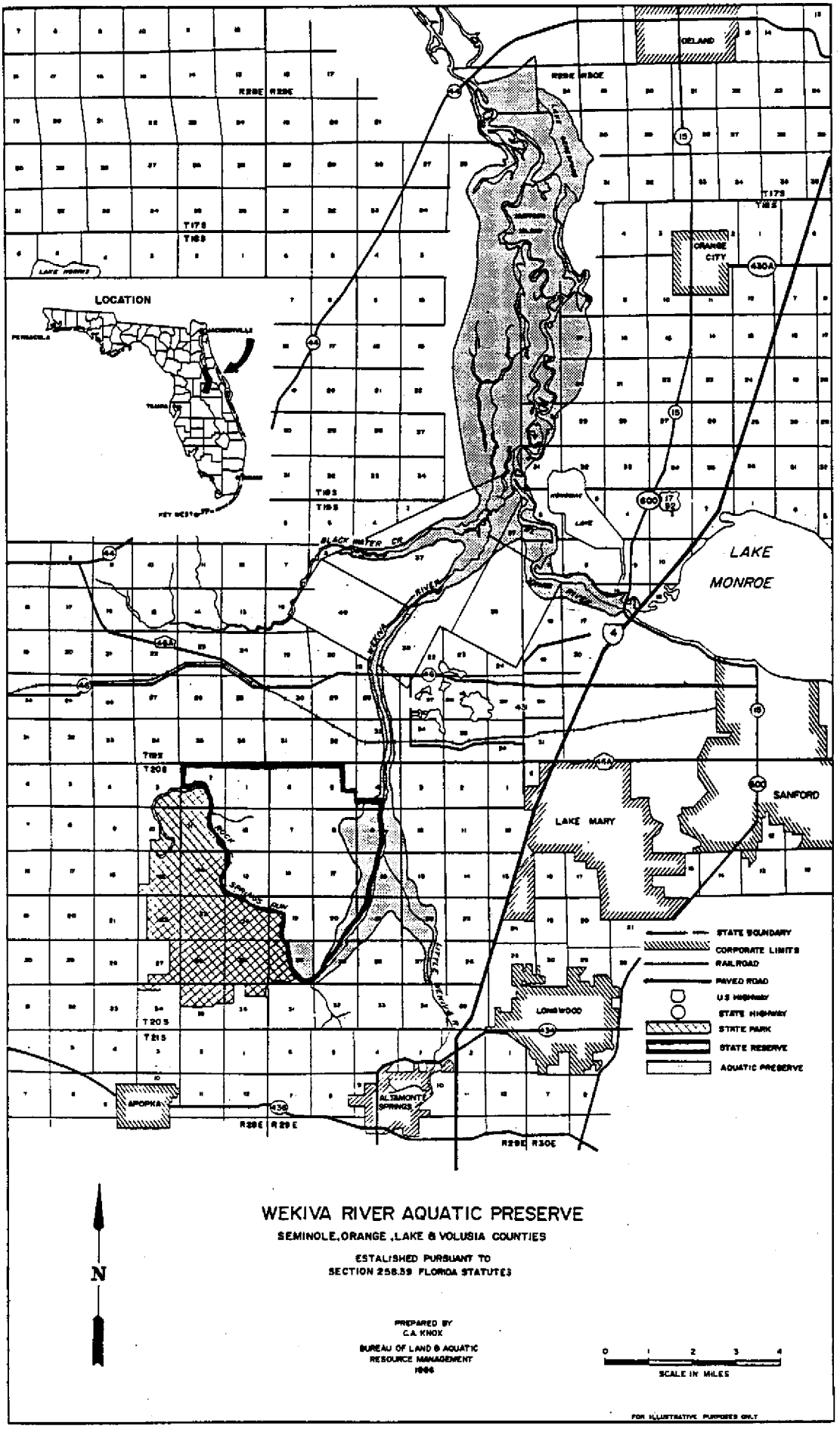
Of the aquatic preserves in Florida, Wekiva River is one of only two spring fed preserves; the other is Rainbow Springs in Marion County. Wekiva River is the larger of the two aquatic preserves and contains approximately 19,000 acres of wetland within its boundary. This environmentally sensitive and unique preserve harbors a variety of freshwater plant species, including floating, submerged and emergent types. These plants serve to stabilize bottom sediments, shoreline areas, and they provide food and shelter for a myriad of fish and other wildlife.

The Wekiva River Aquatic Preserve boundary (Figure 2) includes approximately one mile of Rock Springs Run, approximately three miles of the Little Wekiva River, the Wekiva River, the lower portion of Blackwater Creek, and was extended by SB 762 in 1985 to include the St. Johns River from State Road 44 south to Interstate 4.

The boundary line of Figure 2 represents the gross boundary of the aquatic preserve. The actual preserve includes those sovereignty submerged lands located waterward of the ordinary high water line (ohw) within this boundary


AQUATIC PRESERVES
AQUATIC PRESERVES ARE ESTABLISHED BY THE FLORIDA LEGISLATURE AND INCLUDE ONLY STATE OWNED SOVEREIGNTY SUBMERGED LANDS. THE GOVERNOR AND CABINET SITTING AS TRUSTEES OF THE INTERNAL IMPROVEMENT TRUST FUND ARE MANAGERS OF THESE AREAS.
FOR MORE INFORMATION REGARDING AQUATIC PRESERVES CONTACT:
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECREATION AND PARKS
BUREAU OF LAND AND AQUATIC RESOURCE MANAGEMENT
3900 COMMONWEALTH BLVD
TALLAHASSEE, FLORIDA 32303
CREATED BY CAROL A. KNOX
1986
YELLOW RIVER MARSH
ROCKY BAYOU STATE PARK
FT PICKENS STATE PARK
ST ANDREWS STATE PARK
ST JOSEPH BAY
APALACHICOLA BAY
LAKE JACKSON
ALLIGATOR HARBOR
BIG BEND SEAGRASSES
GULF
FT CLINCH
NASSAU RIVER - ST JOHNS RIVER MARSHES
GUANA RIVER
PELLICER CREEK
TOMOKA MARSH
ATLANTIC OCEAN
RAINBOW SPRINGS
ST MARTINS MARSH
WEKIVA RIVER
MOSQUITO LAGOON
TAMPA BAY
PINELLAS COUNTY
BOCA CIEGA BAY
COCKROACH BAY
TERRA CEIA BAY
INDIAN RIVER - MALABAR TO VERO BEACH
INDIAN RIVER VERO BEACH TO FT PIERCE
NORTH FORK ST LUCIE RIVER
JENSEN BEACH TO JUPITER INLET
LOXAHATCHEE RIVER
LEMON BAY
GASPARILLA SOUND CAPE HAZE
CHARLOTTE HARBOR
MATLACHA PASS
PINE ISLAND SOUND
ESTERO BAY
MEXICO
ROOKERY BAY
CAPE ROMANO 10,000 ISLANDS
BISCAYNE BAY
LIGNUMVITAE KEY
COUPON BIGHT

Figure 1.



WEKIVA RIVER AQUATIC PRESERVE

SEMINOLE, ORANGE, LAKE & VOLUSIA COUNTIES

ESTALISHED PURSUANT TO
SECTION 258.39 FLORIDA STATUTES

PREPARED BY
C.A. KNOX

BUREAU OF LAND & AQUATIC
RESOURCE MANAGEMENT
1986

area. This aquatic preserve will be managed to emphasize maintenance and enhancement of the existing natural conditions. As more site specific information becomes available, essentially natural conditions shall be identified and resources in disturbed areas restored to reestablish natural conditions where possible.

The Wekiva River is designated and will be managed as both an aquatic preserve and an Outstanding Florida Water (OFW). Note: the recent aquatic preserve boundary extension (St. Johns River from SR 44 to Interstate 4) has not yet been designated as an OFW. Outstanding Florida Waters are to be managed emphasizing the maintenance and enhancement of existing water quality conditions.

Prior to December 1986, management of the preserve was provided by the staff at Rock Springs Run State Reserve. Since then, a career service environmental specialist has been stationed at the Lower Wekiva River State Reserve, and is responsible for onsite management of Wekiva River Aquatic Preserve. Currently, administrative management involves the Division of Recreation and Parks' personnel (both in the field and in Tallahassee) and the Division of State Lands' personnel. These personnel cooperate in the review of applications for use of state-owned lands and related activities surrounding the preserve and interact with various government and non-governmental entities, interest groups, and individuals.

The central office coordinates activities with field personnel including project review and evaluation, local contract initiation, contractual

services, conflict resolution and routine support (payroll, operating expenses, etc). Central office staff also develop administrative rule additions, deletions and revisions.

On-site management includes evaluations of projects applying for use of state-owned lands (i.e. dock permits, dredge and fill, etc.), research and evaluation of preserves, public interaction, emergency response, etc.

A major component of the aquatic preserve management is project review and evaluation. Central office staff or field staff review all proposed activities requiring the use of state-owned lands within the preserve. These activities are reviewed according to requirements established in Sections 258.42 and 258.44, Florida Statutes (F.S.). These sections require that projects be basically water dependent or water enhanced, not contrary to the lawful and traditional uses of the preserve, and not infringing upon the traditional riparian rights of the upland property owners.

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.

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

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

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

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

This plan was written by the Department of Natural Resources (DNR), Division of Recreation and Parks, Bureau of Land and Aquatic Resource Management (BLARM) staff. Funding for the plan was by a coastal management grant (CM-130) through the U.S. Department of Commerce's National Oceanic and Atmospheric Administration, Office of Ocean and Coastal Resource Management, and the Florida Department of Environmental Regulation (DER), Office of Coastal Management.

Chapter II

MANAGEMENT AUTHORITY

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

Formal review comments are provided to the Department of Natural Resources (DNR), Division of State Lands by the Bureau of Land and Aquatic Resource

Management for inclusion in the comments and recommendations accompanying agenda items for Trustees consideration. This mechanism allows the Trustees, sitting as owners of the land, to evaluate public interest and project merits within the context of environmental impact upon the preserve.

BACKGROUND

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

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

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

It was not until October 21, 1969 that the Governor and Cabinet acted upon the recommendations of the Interagency Advisory Committee and adopted, by resolution, 18 of the waterbodies as aquatic preserves.

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.

On June 23, 1975 the Legislature established a Florida Aquatic Preserve Act (codified in Chapter 258.35-258.46, F.S.), thereby bringing all existing preserves under a standardized set of maintenance criteria. It was this act which established the Wekiva River Aquatic Preserve. Additional acts were passed subsequent to the 1975 action, such as the addition of the Cockroach Bay Aquatic Preserve in 1976 and the Gasparilla Sound--Charlotte Harbor Aquatic Preserve to the system in 1978.

The Charlotte Harbor Aquatic Preserve Management Plan, approved by the Trustees on May 18, 1983, was the first management plan for an aquatic preserve. The following aquatic preserves now also **have approved plans:**

Estero Bay - September 6, 1983; North Fork--St. Lucie - May 22, 1984; **Loxahatchee River--Lake** Worth Creek - June 12, 1984; and Indian River **Lagoon -** January 22, 1985; **Banana** River - September 17, 1985; Indian River - **Malabar** to Vero Beach- January 21, 1986; Nassau River, St. Johns River Marshes and Fort Clinch State Park Aquatic Preserves - March 22, 1986, Alligator Harbor - September 23, 1986, and Terra Ceia and Cockroach Bay - April 21, 1987.

In June 1985, the Legislature passed S.B. 762 which expanded the boundaries of the **Banana** River, Malabar to Vero Beach, Loxahatchee River--Lake Worth Creek, Wekiva River, and Rookery Bay Aquatic Preserves; and created Guana River Marsh and Big Bend Seagrasses Aquatic Preserves. Lemon Bay and Rainbow Springs were added as aquatic preserves by the 1986 Legislature.

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

ADMINISTRATIVE RULES

Chapters 18-21 and 18-20, Florida Administrative Code (F.A.C.), are two administrative rules directly applicable to the DNR's/Trustee's actions regarding allowable uses of submerged lands, in general, and aquatic preserves specifically. Chapter 18-21, F.A.C. controls activities conducted on

sovereignty submerged lands, and is predicated upon the provisions of Sections 253.03 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 18-20, F.A.C. addresses the aquatic preserves and derives its authority from Sections 258.35, 258.37, and 258.38, F.S. The intent of this rule is contained in Section 18-20.01, 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 of the managing agency.

(2) The aquatic preserves which are described in Section 258.39, 258.391, 258.392 and 258.393, F.S., Chapter 85-345, Laws of Florida and in Section 18-20.02, F.A.C., were established for the purpose of being preserved in an essentially natural or existing condition so that their aesthetic, biological and scientific values may endure for the enjoyment of future generations.

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

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

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

(c) To coordinate with federal, state, and local management programs, which are compatible with the intent of the Legislature in creating the 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 man-made 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 coral, submerged grasses, mangroves, salt water marshes, freshwater marshes, mud flats, estuarine, **aquatic and marine**

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

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

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

OTHER MANAGEMENT AUTHORITIES

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

Chapter 403, F.S., is an important adjunct to Chapter's 253 and 258, F.S. This governs, in part, the State's regulatory programs affecting water quality and biological resources. The Department of Environmental Regulation (DER), through a permitting and certification process, administers this program. Section 253.77, F.S., as amended by the Warren S. Henderson Wetlands

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

The DER's administrative rules of primary significance to the aquatic preserve management program include Chapters 17-3, 17-4 and 17-12, F.A.C. These 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 Chapters 17-4 and 17-12, F.A.C. address permit requirements and dredge and fill activities, respectively.

In December, 1982 a Memorandum of Understanding (MOU) between the DER, DNR, and the U.S. Army Corps of Engineers (COE) was executed. This MOU clearly establishes a process whereby the proprietary concerns of the Trustees, stated in Chapter 253, F.S. can be integrated into the DER/COE joint permit processing system.

Other opportunities for environmental review and input into activities potentially affecting aquatic preserves are afforded by the Department of Community Affairs (DCA), and the Department of State, Division of Historical Resources (DHR). The Executive Office of the Governor also provides a mechanism for agencies' input into federally funded projects via the State's "federal consistency" evaluation process.

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

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

The Department of Health and Rehabilitative Services, under their public mandate, administers two programs directly affecting the aquatic preserve management program. These programs are (1) septic tank regulation, usually administered by county health departments and (2) arthropod (mosquito) control programs, usually implemented through local mosquito control districts. Each of these programs holds the potential for creating significant impacts upon the aquatic preserves. Establishment of close **working relationships between**

the aquatic preserve staff and the Department of Health and Rehabilitative Services will be a necessary element of the aquatic preserves management program.

Each of the above referenced programs may provide an effective means of protecting aquatic preserves and their ecologically sensitive resources.

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 impetus of this management effort. Adoption of these policies will provide specific staff direction for implementing the day-to-day aquatic preserve management program. Major program policy directives are:

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

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

(C) Develop a resource inventory and map natural habitat types within the aquatic preserve, with an emphasis on those habitat types of highest quality, including threatened and-or endangered species habitat, and species of special concern.

(D) Protect and, where possible, enhance threatened and endangered species habitats and species of special concern habitats within the aquatic preserve.

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

(F) Prohibit the removal of natural shoreline vegetation within the aquatic preserve, except when necessitated by the pursuit of legally authorized projects and local protection ordinances.

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

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

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

(J) Prohibit non-water dependent uses of submerged lands within the aquatic preserve except in those cases where the Board has determined that the project

is overwhelmingly in the public interest and no reasonable alternatives exist. This prohibition shall include floating residential units, as defined in Section 125.0106(2), F.S.

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

(L) Prohibit those mosquito control practices within the aquatic preserve that would result in habitat modification or manipulation (i.e. diking, ditching) unless there are no reasonable alternatives and failure to conduct such practices would result in a threat to public health.

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

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

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

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

(Q) Require, through the efforts of DER and the St. Johns River Water

Management District, the maintenance of the naturally high water quality of the River, and ensure the natural seasonal flow fluctuations of water into the river.

(R) Apply the management criteria contained in the **adopted Wekiva River** Aquatic Preserve Management Plan to all subsequent legislative additions of land to the aquatic preserve.

(S) 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.**

(T) Prohibit marinas in Class 1 or 2 Resource Protection Areas.

(U) Identify and document any problems caused by fishing activities and report them to the Florida Game and Freshwater Fish Commission.

Chapter IV:

RESOURCE DESCRIPTION

Part 1

The Resource Setting

A Profile of the Wekiva Area

A. Geological Notes

Over geologic time, changes in sea level formed the region now occupied by the Wekiva River and its tributaries. The river occupies the physiographic region known as the Wekiva Plain, an area slightly lower in elevation than the surrounding Marion Uplands, Mount Dora Ridge and Orlando Ridge. The Wekiva Plain was apparently "cut down" during periods of receding sea level. When recurrent rises in sea level inundated the lowered areas, deposited sediments contributed to form the present Wekiva Plain. The surface and near surface deposits in the area range from unconsolidated sands to well hardened limestones and dolomites (White, 1970). The Hawthorn Formation, a sandy phosphatic limestone of late middle Miocene age (approximately 13 MYBP) underlies the entire area, and outcrops of this formation are exposed at Rock Springs and Wekiwa Spring (U.S. Geological Survey, 1980).

Archaeological Notes

From an archaeological perspective, the St. Johns/Wekiva area provided abundant natural resources for prehistoric communities. The spring runs,

river, hardwood hammocks and dense forests offered food, water, shelter and breeding sites for many forms of wildlife and provided excellent plant and animal foods for human inhabitants (Milanich and Fairbanks, 1980).

Early human inhabitation in central Florida strongly correlated with the dominant geographic feature, the St. Johns River and its associated tributaries **and** lakes. About 12,000 B.C., the peoples of the Paleo-Indian period characteristically led a nomadic existence based on hunting, with small groups continually moving from water source to water source. Remains of Pleistocene megafauna, which are now extinct, and large herd animals which have since migrated to more northern latitudes, have been found in association with the distinctive fluted projectile points made by the Paleo-Indians. Cultural remains of these early peoples are limited and consist mainly of projectile points and other lithics identified from sites located at river crossings, which probably represent hunting/kill sites (Dickenson and Wayne, 1985).

Later Paleo-Indians (circa 6500 B.C.) began to develop a more sedentary culture of fishing, gathering and hunting smaller game animals, most likely in response to climatic changes, extinction of some animal species, increased competition for dietary resources, **and** other social changes.

The peoples of the Archaic period (6000 B.C. - 1000 B.C.) were more dependant on the exploitation of a variety of seasonal resources. Hardwood nuts and native plants assumed greater importance in their diet, but fish, birds, mammals, and reptiles were also harvested. Freshwater snails also appeared to

be first exploited during this time period. Seasonal excursions to the coastal strands where oysters were harvested in large numbers were also characteristic.

The increasingly sedentary life of the Mount Taylor peoples (late Archaic, 4000 B.C. - 2000 B.C.) is indicated by village sites along the St. Johns River. Extensive shell middens are also characteristic of this period. The Orange/Traditional periods (2000 B.C. - 500 B.C.) marked an important change in Florida prehistoric cultures, with the appearance of fiber-tempered pottery. The distinctive characters of fiber-tempered pottery has allowed archaeologists to date the development and evolution of these cultures. While the Orange period is characterized by exclusive use of fiber-tempered pottery, the Transitional period is characterized by fiber-tempered and sand - and fiber-tempered pottery. The use of fiber as a tempering agent gradually declined, and by 500 B.C., which marked the beginning of the St. Johns period, all pottery manufactured was sand-tempered. Changes in pottery manufacturing techniques reflected other changes occurring within the culture, such as **a** shift from the subsistence lifestyle of hunting, fishing and collecting, to the incorporation of horticulture practices and **a** more sedentary village lifestyle.

During the St. Johns cultural period (500 B.C. - A.D. 1565) horticultural practices and population increases led to an increasingly complex social organization. The 2000 year span of the St. Johns culture is subdivided into six temporal periods distinguished by characteristic pottery styles which reflected various types of cultural influences. Many important archaeological

sites are located along the St. Johns river and are recorded in the Florida Master Site File.

The Rock Springs/Wekiva Area is considered to be one of the most important **archaeological** areas in Orange county (Stewart 1982). Over 20 archaeological and historical sites occur in the Wekiva area from Rock Springs to the St. Johns River and these sites are also recorded in the Florida Master Site File. Although a systematic archaeological site assessment has not yet been conducted in the area, several mound sites have been examined by Dr. Marilyn Steward of Rollins College. Many of the sites contain freshwater snail remains, pottery sherds, animal bones, turtle shells or deer antlers. Artifacts are characteristic of the St. Johns I cultural era (Stewart, 1982).

Historical Notes

The Timucuan Indians were descendants of the peoples of the St. Johns period and occupied areas along the St. Johns River when Europeans first ventured into Florida. Cultural changes related to Hernando de Soto's 1539-1540 Florida expedition marked the beginning of the decline of Florida's native Indian populations. During the next 150 years the Timucuans were subjected to enforced migration or forced onto Spanish missions and ranches where many succumbed to European diseases. The cultures of other tribes, fleeing invasions of their homelands in southwest and southern Georgia, merged with that of the Timucuans. By 1763, when St. Augustine fell into British control, the Timucuan population was decimated and for the remaining few, much of their original cultural pattern had been altered (Milanich and Fairbanks 1980). In

the early 1800's Seminole Indians frequented the headwaters of the Wekiva to hunt; they also used the river as a route to the St. Johns River (Strofner, 1982).

During the 1840's early settlers and winter visitors began to populate the Wekiva area. A hotel, newspaper and winery were located in the town of Clay Springs, now Wekiva Springs. In 1875, Clay Springs supported a wharf and warehouse for cargo steamers navigating up the St. Johns to the Wekiva River from the town of Mellonville, which is now Sanford (Shofner, 1982).

Modern land use, population characteristics and development pressures in the Wekiva Basin are discussed more completely in the following sections.

B. Present Population Characteristics

The East Central Florida Region (Orange, Seminole, Lake, Osceola, **Brevard** and Volusia counties) has experienced phenomenal growth over the past 16 years. Influenced by the opening of Walt Disney World in the early 1970's, the population in the region grew from 900,000 in 1970 to 1.3 million in 1980, an increase of 41 percent. Between 1980 and 1984, the total population increased to 1.55 million. Official estimates for 1986-1989 predict an increase of 13.1 percent, bringing the total population to 1.85 million (East Central Florida Regional Planning Council, 1985). Orange, Seminole and Lake Counties were among the top third highly populated counties in the state in 1984, Orange County, with its 530,424 residents was the 7th most populated county in the state, while Seminole County, with its 214,870 residents was ranked 15th out

of the 67 Florida counties. Lake County was 27th with 119,902 residents (Department of Commerce, 1985).

Growth in Orange County from 1974 to 1984 was slower than growth in Lake and Seminole Counties (25.2 percent in ten years, compared with 38.0 and 60.2 percent, respectively). The 60.2 percent increase in Seminole County over the ten year period was the 12th fastest growth rate in the state. Growth rates for the ten year period in Orange and Lake Counties ranked 42nd and 25th, respectively, out of the 67 Florida counties (Department of Commerce, 1985).

The projected population growth of Orange, Lake, and Seminole counties during 1985-1989 indicates the addition of over 64,251, new residents for Orange County, approximately 13,000 new residents for Lake County, and over 35,000 new residents for Seminole County. These new residents represent increases of 11.6 percent for Orange County and 15.49 percent for and Seminole County during the five year period, bringing the total estimated populations by 1989 to 618,910 and 265,299, respectively. A 10.5 percent increase is expected for Lake County, bringing its total population to 137,273 by 1989 (East Central Florida Regional Planning Council, 1985).

Traditionally, central Florida was characterized as a vacation and retirement center, but in recent years the contributions of the highly successful tourism industry has accelerated growth patterns. Population increases in the region are based on immigration, with new residents requiring additional consumer services (food, housing, etc.,) and other improvements to the areas infrastructure which help sustain the growth pattern.

In 1984, almost half the regions total **population** fell within the 25-44 and 45-64 age groups, representing a large supply of working age adults to meet the demand of local employers for trained and skilled workers. The 25-44 age group is expected to increase by 1989, in response to new job opportunities anticipated for the region. 15.5 percent of the total 1984 population of the region were in the 65+ age group. This group is also expected to increase by 1989, as more retirees immigrate to the area (East Central Florida Regional Planning Council, 1985).

The immigration of new residents has created housing demands. Housing requirements are variable from county to county and are primarily a function of socio-economic factors such as income, age, and number of household members. In south Orange County, near Walt Disney World low cost and rental housing is in demand to meet the needs of many trade and service workers. Lake County has attracted a large number of retirees on fixed incomes, which has created a demand for an inexpensive form of housing such as mobile homes. Many high paid professionals residing in Seminole County prefer more elaborate and expensive housing (East Central Florida Regional Planning Council 1985).

The availability of affordable housing is a major problem in most of the Region. The average cost of a new single-family home is presently beyond the financial reach of many residents of the area and is becoming increasingly more so. During the next five years, a high rate of population growth as well as employment expansions are expected, creating a major challenge for the housing industry to produce affordable housing to meet the needs of new residents.

In summary, the population profile for the area is one of continued growth with an expanding economy helping to sustain the growth. 31

C. Economic Development Issues

Economic growth and development within the Wekiva Basin is directly proportional to regional growth. Tourism, the largest industry in the region, is the primary growth source. In 1984, over 7.5 million tourists visited the Orlando area. Walt Disney World, EPCOT, Sea World and Kennedy Space Center accounted for the majority of all attraction admissions. (East Central Florida Regional Planning Council, 1985).

The tourism and convention industry are responsible for a significant amount of development. Commercial projects, retail trade, office construction and industrial and research parks are also contributing greatly to the economic growth of the area. Seventy-seven major development projects are planned or underway in Orange and Seminole counties for 1985-1989, with the majority in Orange County. Total dollar value of these projects is close to 7 billion dollars and approximately 121,845 new jobs will be created (East Central Florida Regional Planning Council, 1985).

A large percentage of the labor force is employed in tourist related jobs. In 1984, trade and service workers supporting tourism accounted for 59 percent of the total employment distribution for the region. Manufacturing, Financial-Insurance-Real Estate and Transportation-Communications-Utilities sectors accounted for 13.7, 5.9 and 5.6 percent of employment distribution for the region, respectively. Agriculture accounted for 2.7 percent (East Central Florida Regional Planning Council, 1985).

Trade and Service workers were, however, among the lowest paid employees in

1984 with salaries averaging $12,028 and $15,690, respectively. Transportation-Communications-Utilities workers were among the higher paid (averaging $22,731) as were Manufacturing workers (averaging $21,283). Agricultural workers were the lowest paid employees in 1984 (averaging $10,484) (East Central Florida Regional Planning Council, 1985).

From 1978 to 1983, per capita income in the region increased 65 percent. Compared to state and national per capita incomes, the rate of increase in east central Florida has been consistently higher than the rate of increase for the state and the nation over the same time period. Per capita income in most of east central Florida, however, was lower than that of state and **national** per **capita** incomes **($11,593** and $11,687, respectively). Per capita incomes for Orange, Seminole and Lake counties in 1983 were $11,520, $11,747, $10,595, respectively. Only Seminole County had per capita incomes higher than that of the nation. The predominance of lower paying Trade and Service jobs and a relatively large proportion of retirees on fixed incomes account for the region's comparatively low per capita income. (East Central Florida Regional Planning Council, 1985).

Estimates for 1989 indicate an increase in per capita income for the region, but the predominance of low paying Trade and Service jobs and continued immigration of retirees on fixed incomes will keep the region's per capita income below the national value. Orlando and Orange County are economically orientated toward tourism, retirement, and more recently, the electronics industry. On the urban fringe of the Orlando metropolitan area, Seminole County is experiencing economic trends similar to Orange County. Lake County has an agricultural-based economy, and in 1983, was the second largest citrus county in Florida (Department of Environmental Regulation 1983).

In summary, the Wekiva area is in the process of urbanizing as part of the East Central Florida Region, or more locally, the Orlando/Altamonte Springs metropolitan area. Regional development will continue to affect growth in the Wekiva area, and contribute to the area's economy. Tourism is presently the largest component of the regions economy, but industrial and research expansions are beginning to diversify it.

D. Land Use and Infrastructure

Several large land parcels, totaling over 20,000 acres, bordering the Aquatic Preserve are in public ownership and are maintained as parks or reserves. The headwaters of Rock Springs Run are located within Kelly Park {200 acres), maintained by Orange County. Rock Springs Run is bordered on the east by Rock Springs Run State Reserve (RSRSR) (8,723 acres) and on the west by Wekiva Springs State Park (6,400 acres), both maintained by the Department of Natural Resources. The west bank of the upper reaches of the Wekiva River south of State Road 46 is bordered by RSRSR, except for a two mile stretch of land south of State Road 46 which consists of residential lots, a 100-acre private park/campground "Wekiva Falls", and pastureland. An 1,800 acre parcel adjacent to this pastureland, bordering approximately one mile along the Wekiva River, has been proposed for residential development. The east bank of the upper reaches of the Wekiva River in Seminole County south of State Road 46 is prime housing development property, and several sub-divisions have already been constructed, are underway, or are proposed. Residential development is rapidly **advancing** northward along the **undeveloped** sections of the Little Wekiva River and merging with development along the east bank of

the Wekiva River. The southernmost sections of the Little Wekiva Sub basin are heavily urban and commercial, with stream flow extensively channelized. Downstream of State Road 46, a two mile segment of the east bank supports residential units, a fish camp and a RV/camping/canoe rental facility. One mile of the west bank immediately downstream of S.R. 46 is undeveloped land in private ownership and is presently for sale (approximately 7,000 acres). Lower Wekiva River State Reserve (5500 acres) borders the remainder of the Wekiva River until its confluence with the St. John River, four miles downstream.

Land use trends indicate continued urbanization on private lands within the basin. A recent report by the Friends of the Wekiva (FOW) indicated that the present trends of land use intensification along the east banks of the Little Wekiva and Wekiva Rivers in Seminole County will have negative impacts on the water resources of the Wekiva Basin (Technical Committee of the Friends of the Wekiva River, 1985). The Seminole County Comprehensive Land Use Plan designates this area as General Rural with one unit per acre maximum density, not requiring infrastructures support. Development in this area over the past ten years has resulted in the predominance of one-acre residential sites, with septic tank disposal of wastes, a mixture of private well systems and public water supply, and little investment in road improvements. The report indicates densities of one unit per acre require urban level infrastructure support and that the lack of such support, in addition to increase pressures from conversion of forested or pasture lands to one-acre or more dense development, can only result in the degradation of the water resources of the basin.

The most immediate concern regarding the Wekiva River Aquatic Preserve is the ecological impact of urban residential development along the east bank of the Little Wekiva and Wekiva River in Seminole County. This area within Planning Area 1, the **Markham/Paola** Area is identified in the Seminole County
Comprehensive Plan. Six new housing developments covering approximately 4,248 acres, with approximately six miles bordering the Aquatic Preserve, are proposed for this area. Potential impacts to the Wekiva River resulting from increased urban developments are primarily related to water quality and water quantity. These concerns also apply to potential development areas bordering the Wekiva River in Lake and Orange Counties, although zoning regulation may vary.

Several proposed Planned Unit Developments (PUD) **are located along east banks** of the Little Wekiva and Wekiva Rivers in Seminole County. One PUD is currently under appeal before the Land and Water Adjudicatory Commission (Plantation) and other PUD applications are anticipated.

Seminole County officials maintain that PUD's with densities higher than one unit/acre conflict with the County Comprehensive Plan policy for the area, and must be presented before the Seminole County Planning and Zoning Commission and two County Commission public hearings requesting rezoning amendments to the Comprehensive Plan. The County Commission has maintained a policy of denying all applications which would effect a change in the community character from "rural" to "urban", as such a change is not in conformance with the Comprehensive Plans designation of the area as "General Rural". Section 163.3194, Florida Statutes, mandates that: After a comprehensive plan or

element or portion thereof has been adopted in conformity with this act, all development undertaken by, and all actions taken in regard to development orders by, **governmental** agencies in regard to land **covered** by such plan **or** element shall be consistent with such plan or element as adopted.

The inability of environmentally sensitive areas to absorb impacts associated with urban development has been demonstrated in many aquatic environments throughout Florida, and even with the most prudent planning and management strategies some degree of alteration to the balance of the natural system can occur. In addition, frequent amendments to comprehensive plans **have** the potential to undermine the achievement of planning goals. (Florida River Study Committee, 1985). In recognition of the significance of the Wekiva River system, advocation of higher population densities in areas adjacent to the Wekiva River should be discouraged.

Developments within the Wekiva Basin are subject to regulation criteria defined by **County, State, and Federal agencies.** Table 1 outlines current regulations applicable to construction in Seminole County.

Table 1. Current Regulations applicable to construction in the Wekiva River Corrodor, Seminole County (from Wekiva River Basin Study Committee Report, Clabaugh, et al., 1985).

FP-1 Floodprone Classification: No structures constructed and no land filling or grand level changes permitted which inhibit the flow of flood and drainage waters.

200 Foot Setback (2-22-72 Resolution): Prohibits the issuance of building permits in the 200 foot area parallel to the mean high water mark of the East Bank.

Wetlands (LDC 6.4.2.2 Drainage Design Standards): No site alteration shall cause the siltation of wetlands or reduce the natural retention or filtering capabilities of wetlands.

Drainage and Water Conservation Easements (DWCE): Mandatory dedication of easements over floodprone and wetland areas to maintain the natural storage and water quality enhancement functions of these areas (LDC 6.4.6.12(a) 19.).

Dredge and Fill Permits (LDC Chapter 10): Permits are required for boat docks, seawalls, outfalls and drainage structures, dredging and filling, and removal of shoreline vegetation.

Arbor Permits (LDC Chapter 8): Permit required for the removal of trees 3" in diameter or larger.

Site Runoff (LDC 6.4.6.2): Requires storage and controlled release of excess stormwater so that post development conditions are not substantially greater than pre-development conditions. Requires the use of retention and detention facilities to attenuate peak flows, remove solids, and remove nutrients.

Groundwater Table and Runoff to Surface Waters (LDC 6.4.6.2): Prohibits the use of canals, channels, ditches, storm water systems which rapidly convey runoff to receiving waters without treatment or to reduce the groundwater table.

Erosion Control (LDC 6.5.10): Seeding, mulching, sodding and other appropriate measures required to prevent erosion during construction activities.

Borrow Pit (LDC Section 9): Permits required for the removal of any materials. Over 500 cubic yards requires DRC review and a public hearing.

Water Conservation (Building Code): County Building codes require that water closets have a maximum 3.5 gallon capacity on residential units and 3 gallon maximum on flush valve units; showerheads and water faucets are required to have flow restriction devices which limit flows to 3 gallons per minute.

Part Two:

Natural Systems and their Components

A. Wekiva River Basin

The Wekiva River System is comprised of artisan spring flow, small creeks, numerous tributaries and secondary drainage. A tributary of the St. Johns River, the Wekiva represents one of the major routes of surface drainage from portions of Orange, Seminole and Lake Counties (East Central Florida Regional Planning Council, 1984). The Wekiva, Little Wekiva and Rock Springs Run form a basin of approximately 130 square miles (Orange County Pollution Control, 1977). Upstream of Blackwater Creek, a major tributary of the Wekiva, is additional drainage of 112 square miles in Lake County (U.S. Army Corps of Engineers, 1974).

The Wekiva River Basin is comprised of many diverse and productive habitats characteristic of natural Florida. Extensive areas of wetlands border a major portion of the river. Pine flatwoods, scrub, and sandhills interspersed with lakes and sink holes occur throughout the basin.

Elevations within the basin range from sea level to about 35 feet above sea level. In some areas sandhills rise abruptly to elevations ranging from 60 to 100 feet above sea level. (Lichtler, 1972).

The climate is subtropical, with an average annual temperature of about 72 degrees. Daily maximum temperature in the summer **approaches 90^0 Fahrenheit.**

Mean annual rainfall over the Wekiva Basin is 52 inches, most of which occurs during the June-October rainy season (U.S. Army Corps of Engineers, 1974).

The Wekiva River System can more adequately be described in terms of its components: Rock Springs/Rock Springs Run, Wekiwa Springs, Little Wekiva Sub-basin, Big Wekiva, and Blackwater Creek.

Rock Springs/Rock Springs Run

Rock Springs is located within Kelly Park, a 200-acre facility owned by Orange County. The park is utilized by the public for swimming, picnicking, camping, nature study, and is maintained as a wildlife preserve.

Rock Springs represents one of the few areas in central Florida where the limestone of the Hawthorn Formation is exposed. The Hawthorn Formation, which contains impervious layers of marl and clay, overlies the Floridian aquifer and acts as a confining bed for the artesian water present in the area, Crevices and solution channels have developed in the Hawthorn providing an outflow for the Floridian aquifer (Orange County Pollution Control Department, 1977).

The principal discharge from Rock Springs originates at the base of a partly submerged limestone bluff. Average discharge is about 41.7 MGD. A large public swimming area is located several hundred feet below the spring, where some of the flow has been diverted and partly retained by concrete walls. Overflow from the swimming area is directed back to the spring run via a concrete weir. Rock Springs Run flows northward about 1.5 miles, then turns

southward. The flood plain in this area is approximately three miles in an east-west direction (Rosenau et al., 1977). Rock Springs Run meanders for approximately nine miles before meeting Wekiwa Spring Run to form the Wekiva River. One mile of Rock Springs Run is included in the Aquatic Preserve. Rock Springs and eight miles downstream of the springhead are not included in the Aquatic Preserve.

Wekiwa Springs

Wekiwa Springs and its spring run are located within Wekiwa Springs State Park, a 6,400 acre publicly owned state park, managed by the Department of Natural Resources.

The springs discharge from at least five horizontal caverns 14 feet below the water surface forming a kidney shaped pool. The pool bottom is mostly sand, except for an area in the southeast section where limestone rock of the Hawthorn Formation is exposed. Openings in this rock allows water to percolate, creating the pool and spring run.

The spring run flows in a northeasterly direction for approximately one-half mile until its confluence with Rock Springs Run forming the Wekiva River.

Witherington Springs, forms a small pool about 60 feet in diameter, and is located near the center of Wekiwa Springs State Park, Discharges from Witherington Springs form the headwaters of Mill Creek, which flows east through a swampy area and then eventually joins Rock Springs Run (Rosenau et al., 1977).

Little **Wekiva** River **sub-basin**

The Little Wekiva River sub-basin occupies approximately 43 square miles located in the north central portion of Orange County and the western portion of Seminole County (East Central Florida Regional Planning Council, 1980).

Areas of extensive urban development border the lower reaches of the Little Wekiva from its headwaters at Lake Lawne in western Orlando to approximately one mile north of State Road 434 in Seminole County. Most of the natural vegetation in these areas has been replaced by housing, commercial and industrial enterprises, pasture, citrus grove and other economic activities. The impacts of development within the sub-basin has been the reduction of natural drainage patterns and flow ways creating stormwater management problems. Several sections of the river have been channelized and numerous ditches, canals and storm drains discharge directly into the river (East Central Regional Planning Council, 1980).

Prior to 1977, several sewage treatment plants (STP) discharged poor quality water into the Little Wekiva (Pine Hills STP, Lake Lawne STP, Fairvilla STP). Subsequent water quality problems prompted local government to effect more stringent wastewater and wetland regulations, which ceased most wastewater discharges and initiated restoration procedures on several lakes within the sub-basin. Recent studies have indicated improved water quality within the Little Wekiva sub-basin, but high nutrient loading still exists in some areas.

In Orange County, ground water exfiltration contributes to stream flow, but the primary source of stream flow is storm water runoff. In Seminole County,

upstream of several springs, the Altamonte Regional Wastewater Facility and Hi Acre Citrus Processing Plant constitute about 85 percent of the stream flow (Department of Environmental Regulation, 1982).

The areas surrounding the upper reaches of the Little Wekiva in Seminole County one mile north of State Road 434 are much less developed, and here the river flows through about six miles of unaltered stream bed. One wastewater facility, however, indirectly discharges into the river along this reach (Wekiva Hunt Club).

Approximately three miles south of its confluence with the Big Wekiva, the Little Wekiva receives discharge from Seminole, Palm, and Starbuck Springs. The combined 14 MGD increases the river's flow and dilutes the pollutants remaining from the upstream point sources. Bacteriological and biological data from Orange County Pollution Control indicate improved water quality downstream of the spring discharges (Orange County Pollution Control Department, 1977). Downstream of the springs, the spring flow represents approximately 71 percent of total flow, and dominates stream flow until confluence with the Big Wekiva. The Altamonte Wastewater Treatment Plant, however, represents a significant source of nutrient input to the Little Wekiva River. Nonpoint nutrient sources also contribute significantly but are most significant under high flow conditions (Canfield and Hoyer, 1986). For three miles south of its confluence with the Big Wekiva, the Little Wekiva is bordered by undeveloped swamp. These three miles of the upper reaches of the Little Wekiva River are designated as Outstanding Florida Waters (OFW) and are included in the Aquatic Preserve.

Wekiva River

The headwaters of the Wekiva River begin at the confluence of Wekiva Springs Run and Rock Springs Run. The waters forming the upper portion of the Wekiva River arise from both the Floridian aquifer in the form of natural springs, and from drainage of approximately 130 square miles of water shed in north Orange County and northwest Seminole County (Department of Natural Resources, 1986).

From the convergence of the Wekiwa Spring and Rock Spring Runs, the upper Wekiva flows about 0.25 mile to where it receives discharge from Miami Spring Run/Canal. The Little Wekiva River converges with the Upper Wekiva River about 3.75 miles downstream from Miami Spring Run/Canal (Orange County Pollution Control Department, 1977). As the river passes through the Wekiva Swamp, the region between the inflow from the Wekiva Springs Run and Little Wekiva River, numerous small islands divert the flow. Low current velocity caused by the islands and submerged vegetation enhances the deposition of silt and organic debris along this reach. Eel grass (Vallisneria americana) is common along this reach and Brazilian elodia (Egeria densa), is present also. Water hyacinth (Eichhornia crassipes) an exotic floating macrophyte, also contributes to organic siltation in this area. Approximately six miles downstream from Wekiwa Springs the floodplain narrows and the sediments change from organic silt to sand, where Brazilian elodea becomes the dominant aquatic plant (Courtney, unpub. data). From here the Wekiva River meanders northeasterly towards the St. Johns River. Wekiva Falls run, a 2,000 foot tributary originating at Wekiva Falls campground, merges with the Wekiva River

just south of State Road 46. Wekiva Falls issues from two flowing wells, one 14-inch in diameter and the other 24-inch in diameter, with a combined discharge of 12-16 MGD. Approximately one mile south of its confluence with the St. Johns River, the Wekiva is joined by Blackwater Creek.

Discharges from Wekiwa Springs (48 MGD), Rock Springs (41,8 MGD), **Sanlando** Springs (14 MGD) and Sheppard Springs (11 MGD) contribute to the high base flow rate of the Wekiva River, which increases significantly by seasonal drainage within the basin. The flow gradient is one of the steepest in east central Florida averaging a drop of 1.6 feet per mile along the rivers boundary in eastern Lake County until meeting the lower elevations of the St. Johns River Floodplain.

Average discharge of the Wekiva River at State Road 46 is 186 MGD. A distinct stream habitat is created by, and is dependent on, the consistency of this flow (East Central Florida Regional Planning Council, 1985).

Blackwater Creek

Blackwater Creek is a major tributary to the Wekiva River. Almost entirely in Lake County, Blackwater Creek flows approximately 28 miles from its headwaters at Lake Dorr to its confluence with the Wekiva. As an important surface drainage system for Lake County, the creek provides flood drainage relief for an area of approximately 125 square miles. The creek's 100-year floodplain varies greatly in width from 800 feet at State Road 44A to 5,100-7,000 feet along upstream and downstream reaches (East Central Florida Regional Planning Council, 1985).

Agricultural land drainage has affected water quality in some areas of the creek's floodplain, but most areas remain undisturbed. Land use in the Blackwater Creek basin is predominantly rural and agricultural, and many areas bordering the Creek are remote and inaccessible. Cypress trees were extensively logged in the past along the Creek. Predevelopment activity is now occurring along the Creek in some parts.

St. Johns

The St. Johns River system is one of Florida's important economic and ecologic units. It is unique in that it is one of the few rivers in the world that flows northward, and it is the largest river that is entirely in Florida. From its headwaters in low, marshy areas of St. Lucie and Indian River counties, at an altitude of less than 25 feet above mean sea level, the river begins its slow meandering course 300 miles toward Jacksonville where it enters the Atlantic Ocean. The average gradient of the river is less that 0.1 feet/mile. Throughout its course the river passes through several large shallow lakes including Lakes Washington, Winder, Poinsett, Harney, Jessup, Monroe, and George. Tributaries of the St. Johns include the Oklawaha, Econolockhatchee and Wekiva Rivers and Jane Green, Taylor, Dunns, Rice and Black Creeks.

The St. Johns is divided into four major hydrologic units: the upper St. Johns, middle St. Johns, lower St. Johns, and the Oklawaha River (the Okalwaha is the largest tributary draining approximately 2,718 square miles). Approximately 15 miles of the middle St. Johns from Interstate 4, just north of Lake Monroe in Seminole County to State Road 44 in Volusia County are included in the aquatic preserve.

Average overall water quality from 1970-1985 STORET data indicate good water quality in this reach of the river (DER, 1986). Bimonthly water quality sampling by the Lower St. Johns River Project personnel initiated in July 1981 has shown that average total phosphorus (0.23 ppm) and average total nitrogen (2.1 ppm) in the river exiting Lake Monroe, places the system in the eutrophic status. (Lawson Snyder, Florida Game and Fresh Water Fish Commission, pers. comm.).

Several lakes immediately upstream (Monroe, Jessup, Harney) have for many years received nutrient loadings from sources generally related to urban development and from agricultural sources around Orlando. Input from poorly treated sewage and runoff has resulted in an accelerated rate of eutrophication in the lakes, and associated intermittent destabilizing events such as algae blooms, highly fluctuating dissolved oxygen levels, and fish kills have occurred. Efforts to improve water quality included phasing out older sewage treatment plants and rerouting influent to regional advanced treatment facilities. Some degree of recovery is expected, but non-point sources of pollution from urban, agricultural, and silvicultural activities may contribute significantly to the total nutrient input (DER, 1986; Florida Rivers Study Committee, 1985).

Water quality in the St. Johns River improves northward of Lake Monroe. Hardwood swamp borders the river for most of Its course within the aquatic preserve. There is little development within this reach of the river. There are two state parks, (Hontoon Island, Blue Springs) **a** state reserve, (Lower Wekiva) and two proposed acquisitions in the Conservation and **Recreational** Lands (CARL) program bordering the St. Johns river.

Blue Spring and Hontoon Island State Parks are comprised of approximately 3,100 acres of wetland and upland communities. The wetland communities consist of swamps, marshes and lagoons along the St. Johns River. Two areas of higher elevation, Pine Island and Hontoon Island, are located within wetlands associated with the St. Johns River floodplain.

Blue Spring and its spring run are registered in the Florida Natural Features Program and are designated as a "unique natural resource". Blue Spring Run is a critical warm-water refuge for the endangered West Indian Manatee (Trichechus manatus) wintering in the St. John's River basin. The importance of this winter habitat was recognized in 1978 by the Manatee Sanctuary Act which gave legal protection to manatees at refuges throughout the state. This sanctuary designation established restricted speed zones in the St. Johns River and prohibited motor boats in Blue Spring Run. A study of winter feeding of manatees that use Blue Spring determined that they travel into the St. Johns south to the Goat Island area and north into Lake Beresford and Mud Lake. The manatees are feeding well outside of the manatee sanctuary designation and travel back and forth through these unprotected waters on a daily basis (Bengtson, 1981).

Lower Wekiva River State Reserve (4500 acres) borders approximately one mile of the St. Johns River just north of Lake Monroe.

Approximately 13,800 acres bordering eight miles along this reach of the St. Johns River are proposed for acquisition in the CARL program. The Stark Tract, E.K. Ranch, and St. Johns River Forest Estates will compliment the

state parks and preserves in protecting water resources and endangered species, and provide additional public recreational opportunities.

South of State Road 44, Blackwater Creek flows through **a** portion of the Seminole Springs tract, a 8,820 acre parcel located just west of Lower Wekiva River State Reserve. This land is currently under review for inclusion on the C.A.R.L. Priority Acquisition List. The property contains over 50 springs of various sizes, the largest of which are Seminole Springs, which issues approximately 30.1 MGD and Messant Springs, which issues 95 MGD. Seminole and Messant Creeks, along with numerous other small tributaries, converge with Blackwater Creek.

The area surrounding Blackwater Creek was heavily logged in the early 1900's, but mixed hardwood swamp, cypress swamp, and hydric hardwood plant communities have reestablished within the floodplain of the creek.

Approximately 1800 acres bordering the lower reaches of the creek are protected as part of the Lower Wekiva River State Reserve. Three miles of the lower reaches of Blackwater Creek are included in the Wekiva River Aquatic Preserve.

B. The **Aquatic** Environment

Rock Springs Run has excellent water quality resulting from the consistency of spring flow originating at Rock Springs. The unaltered watershed and few urban and agricultural land uses limits stormwater runoff and associated water

quality problems. There are no large tributaries to Rock Springs Run, but significant inflow from surrounding swamps occurs during periods of high rainfall (Department of Environmental Regulation, 1983).

The USGS has collected flow and temperature data at Rock Spring head since 1931, and additional parameters have been monitored since 1959. Since 1972, Orange County has collected data from Rock Spring Run approximately one mile downstream of the spring head.

USGS data from Rock Springs indicate consistently excellent water quality since monitoring began in 1959 (Department of Environmental Regulation, 1983). Turbidity, color, organic-N., ammonia-N and dissolved oxygen are low, while total phosphorous, nitrate-N and conductivity are slightly elevated. Low dissolved oxygen is characteristic of many artesian springs. Elevated levels of nutrients may be attributed to the limestone feeding the spring source. As the water flows downstream, it gains oxygen from aeration and from photosynthesis during the daytime (Hynes, 1970). Dissolved oxygen levels at Rock Springs Run from Orange County data during 1976-1982 were above standards, and averaged 6.4 mg-1.

Water quality data from several stations in the Wekiva River, just downstream of its confluence with Rock Springs Run, **are also available from** USGS and Orange County. These data also indicate excellent water quality in those areas reflecting the excellent quality of the spring flow.

The Little Wekiva River has experienced severe water quality problems in the past resulting from sewage discharge and stormwater runoff. Several sampling

sites along the Little Wekiva are monitored by either USGS, FDER or Seminole County. Recent improvements in water quality have been indicated at some stations along the lower Little Wekiva.

Water quality in the upper reaches of the Little Wekiva improves as a result of dilution from Sanlando, Palm, and Starbuck Springs. Water quality of these springs is similar to that of Rock Springs (Department of Environmental Regulation, 1983).

Excessive aquatic vegetation is present in some reaches of the upper Little Wekiva. It is suspected that nutrient enrichment from waste water treatment facility discharge is contributing to aquatic plant growth. However, in areas where a forest canopy shades the river, there is little aquatic vegetation (Canfield and Royer, 1985). It has been suggested that the availability of light may be the limiting factor controlling aquatic plant growth in these areas (EPA, 1981; Seminole County, 1981; Canfield, 1981). Canfield and Hager (1985) suggested that past dredging operations may have encouraged the growth of aquatic plants by providing substrate through sedimentation of many formerly deep areas. Another cause of increased plant growth may be the reduction of shade through the removal of forest canopy. A three year study to determine the nutrient assimilation capacity of the Little Wekiva river is currently in progress. The study will also look at the effect of shading and includes a comparison of rivers throughout Florida ranging from those with no major discharges of treated effluent, to those with significant nutrient loadings. The Wekiva River is included in this study to determine the effect of discharges from the Little Wekiva on the Wekiva river farther downstream (Canfield and Hoyner 1985).

C. Plant Communities

The Wekiva River Basin is located in a region of biological transition between two climatic zones, where the range of temperate zone plants overlaps the northern limit of many tropical species, creating an area of diverse floral composition. (DER, 1983).

Although many areas within the basin were extensively logged during the 1920's and 1930's, when cypress dominated the wetland forests, much of the forest has revegetated and the river's floodplain is now almost entirely wooded. Plant communities characteristic of the basin and representative plant species include:

Mixed hardwood swamp - tupelo, red maple, water ash, bald cypress, sweet gum, button bush, willow, pond apple, wax myrtle, dahoon holly.

Cypress swamp - predominately bald cypress with a lesser percentage of hardwoods similar to those found in mixed hardwood swamp.

Hardwood hammock - sweet gum, magnolia, tupelo, live oak, laurel oak, water oak, hickory, wax myrtle, sweet bay, cedar, American holly, red maple.

Pine flatwoods - pond pine, loblolly pine or slash pine, longleaf pine, saw palmetto, wire grass, gallberry.

Scrub - stagger bush, rosemary, silk bay, wild olive, blueberry, gopher apple, prickly pear cactus, wire grass, lichens.

Scrubby flatwoods - slash pine, chapman's oak, myrtle oak, saw palmetto, runner oak, wire grass.

Freshwater marsh - saw grass, arrowhead pickerelweed, coastal plain willow, button bush, red maple, bald cypress.

Bayhead - loblolly bay, sweet bay, red bay, black tupelo, red maple, loblolly pine, dahoon holly, coastal plain willow, galiberry, wax myrtle.

The designated plant species of the Wekiva basin are shown in Table 2. For management of designated plant species in the aquatic preserve, the Florida Department of Agriculture and Consumer Services (list published in Preservation of Native Flora of Florida Act, Section 581.185-187, Florida Statutes) is the primary reference source. A more complete list of plant species' characteristic of this area, including many aquatic species, is maintained in the resource inventory file located in the field office.

D. Wildlife

The water related resources of the Wekiva River support an abundance of wildlife. The river, its tributaries, associated hardwood and cypress swamps provide food, shelter and breeding sites for many native species, as well as several designated as endangered, threatened, rare, or of special concern.

Table 2. Designated plant and animal species of the Wekiva River Aquatic Preserve area. Many of these species are associated with upland habitats, but are represented in the Wekiva Basin.

Common Names	Scientific Names	Designation
PLANTS		
bluestem palmetto	Sabel minor	(2)T
Florida shield fern	_____ te_____ iudoviciana	2)T
golden polypody	hie oddum aureum	(2)T
hairy tri-vein fern	Thel pteris hispidula	(2)T
spready tri-vein fern	TheTʸpteris interrupta	(2)T
ovate maiden fern	TheTypteris **ovata**	(2)T
water spider orchid	Habenaria repens	(2)T,(4)II
wildpine	Tillandsia spp.	(2)T
yellow-eyed grass	X ris sue~.	(3)UR2
ladies tresses	Spiranth s s	(2)T,(3)UR2
needle palm	Rhappidopph lTti hystrix	(2)T,(3)UR5
giant wild pine	Tillandsia utriculata	(2)T
needle-leaved wild pine	Tillandsia setacea	(2)T
stiff-leaved wild pine	Tillandsia_ asT sc cc uulata	(2)T
butterfly orchid	Encyclia tampensis	(2)T,(4)II
Virginia chain fern	Woodwardia virginica	(2)T
AMIMALS		
Invertebrates		
Wekiwa Spring Aphaostracon	Aphaostracon monas	(3)UR2
Blue Spring Aphaostracon	**AOaostracon** a m i n e s	(3)UR2
Wekiwa Spring Snail	Cincinnatia wek w	Rare
Blue Spring Snail	Cincinnatia parva	Rare
Amphibians and Reptiles		
American Alligator	Alligator mississipiensis	(1)SSC,(3)T(S/A),(4)I
gopher tortoise	Gopherus polyphemus	(1)SSC,(3)UR2
blue-tailed mole skink	Eumeces egregius lividus	(1)T,(3)UR2
sand skink	Neoseps reynol dsi	(1)T,3UR2
Florida pine snake	Pituophis melanoleucus mug tus	(3)UR2
gopher frog	Rana areolata	(1)SSC,(3)UR2
Fish		
bfi enose shiner	Notropis welaka	Rare
snail bullhead	I c t a l u r u s e u s	Rare
Birds		
Barman's sparrow	Aimophila aestivalis	(3)UR2
little blue heron	Florida caeru ea	(1)SSC
wood stork	ycFF cteria **a m a n a**	**(1)E,(3)E**
tri-color heron	Hydranassa tricolor	(1)SSC
osprey	Pandion halia' tus	(4)II

Table 2 continued ....

bald eagle	Haliaeetus leucocephalus	{1)T,(3)E,{4)I
southeastern kestrel	Falco sparverius	(1)T,(3)UR2,(4)II
limpkin	r~C amus guarauna	(1)SSC
Florida sandhill crane	r~ us canadensis	(1)T,(4)II
red-cockaded	1976ides borealis	(1)T,(3)E
Florida scrubjay	Aphelocoma coerulescens	(1)T,(3)UR2
Mammals		
Sherman's fox squirrel	Sciurus niger shermani	(1)SSC(3)UR2
Florida mouse	a ____ cus flori anus	(1)SSC(3)UR2
Florida black bear	Ursus americanus __ oridanus	(1)T,(3)UR2
West Indian Manatee	Trichec us manatus atirostris	(1)E,(2)E

Key to designations

E = **Endangered**
T = Threatened
SSC = Species of Special Concern
C = Commercially exploited
I = Appendix I Species
II = Appendix II Species
UR = Under review for federal listing, with substantial evidence in existence indicating at least some degree of biological vulnerability and/or threat.
UR2 = Under review for listing, but substantial evidence of biological vulnerability and-or threat is lacking.
UR3 = Still formally under review for listing, but no longer being considered for listing due to existing pervasive evidence of extinction.
UR4 = Still formally under review for listing, but no longer being considered for listing because current taxonomic understanding indicates species is an invalid taxon and thus ineligible for listing.
UR5 = Still formally under review for listing, but no longer considered for listing because recent information indicates species is more widespread or abundant that previously believed.
1 = Florida Game and Fresh Water Fish Commission (list published in 39-27.03-05, Florida Administrative Code).
2 = Florida Department of Agriculture and Consumer Services (list published in Preservation of Native Flora of Florida Act, Section 581.185-187, Florida Statutes).
3 = United States Fish and Wildlife Service (list published in List of Endangered and Threatened Wildlife and Plants, 50 CFR 17.11-12).
4 = Convention of International Trade in Endangered Species of Wild Fauna and Flora.
T(S-A) = Threatened due to similarity of **appearance.**

White tail deer, otter, grey fox, bobcat, raccoon, opossum, wild turkey, pileated woodpecker, and raptor species such as the red-tailed hawk, red-shouldered hawk, barred and great horn owl are typical inhabitants of the Wekiva basin. Osprey, anhinga, cormorant, great blue heron, great egret, green backed heron, several other wading birds, shore birds and water fowl are more closely associated with the river. In addition, stingray (Dasyatis sue.), which are primarily marine, have been observed in the preserve waters.

The reserved areas of the basin offer dense and relatively isolated habitats with protection for many endangered, threatened, rare or species of special concern. Designated species identified within the Wekiva Aquatic Preserve area are found in Table 2 above. For management of designated animal species in the aquatic preserve, the Florida Game and Fresh Water Fish Commission (list published in 39-27.03-05, Florida Administrative Code) is the primary reference source.

A more complete list of wildlife characteristic of the Wekiva Basin is included in the resource inventory file in the field office.

E. Summary of Natural Systems

The Wekiva River, its tributaries, associated wetlands and uplands are a unique ecological resource in east central Florida. The system supports a productive and diverse array of aquatic and upland natural systems and is a refuge for many **threatened, endangered and rare species.**

The Wekiva River, Rock Springs Run, three miles of the lower reach of the Little Wekiva River, and the portion of Blackwater Creek within the Aquatic Preserve Boundary is designated an Outstanding Florida Waters. In addition the last 4.5 miles of the Lower Wekiva are designated a Scenic and Wild River by the State's Scenic and Wild Rivers Program.

The Wekiva River Aquatic Preserve along with publicly owned state and local parks and reserves are a significant recreational resource: Swimming at the spring heads and picnicking are major attractions drawing visitors from throughout Florida. In 1985, over 495,000 people visited Rock Springs at Kelly Park. Also in 1985, 225,657 people visited Wekiwa Springs Park. The entire length of the Wekiva River and Rock Springs Run is a heavily traveled State Canoe Trail. Sport fishing is also an important recreational activity.

As a result of all this activity, damage to eel grass beds, erosion of the stream bed with increased siltation downstream, and refuse associated with recreation are continuing problems. The rapid urbanization of the area puts ever increasing demands on the riverine system. Continued enjoyment and health of the preserve depends on protection of this unique natural resource.

Chapter V

RESOURCE MANAGEMENT

A. Introduction

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

B. Onsite Management Objectives

The onsite management objectives are reflected in the activities that the field personnel become involved in (i.e., observation, application reviews, research, public interaction, education, and emergency responses, etc.) to protect and enhance the resources within the aquatic preserve. Other

activities, such as the interaction with other government and non-government entities, are covered in more detail in Chapter VI (Management Implementation Network). The field personnel's duties are, with respect to management of the various uses of the aquatic preserve, addressed in more detail in Chapters VII and XI. The field personnel are involved in all management activities concerning the Wekiva River 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 aquatic system:

a. they tend to stabilize shorelines and other geologic features in the face of dynamic forces {i.e., currents, winds, and waves).

b. they create, from recycled nutrients and solar energy, the organic materials that fuel the aquatic food web which supports the area's fisheries, endangered species, migratory waterfowl, colonial water bird nesting colonies, raptors, aquatic mammals (manatees) and **invertebrate** life.

c. they provide protected fisheries habitat for spawning and juvenile development, many of which are of economic importance to the recreational and commercial (catfish) fisheries.

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

e. they filter pollutants from contaminated and channelized runoff from uplands within the adjacent watershed **and,** buffer the uplands from erosion.

The management objectives for plant communities will be to maintain and enhance these functions. Because these plant communities are critically

important to the well-being of the Preserve, a program to work toward the protection and restoration of those communities affected by human activities should be developed.

Management Policy

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

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

c. Preparation of Guidelines of Management of Endangered Species. Field personnel, based on their field observations and literature reviews, will develop maps (using 7.5 minute quadrangles or other appropriate scales) showing the locations of threatened and endangered plant species within the aquatic preserve. A set of management guidelines for each species, outlining the habitat requirements and the methods to sustain and-or restore these habitats will be developed. Field personnel, in the course of documenting the occurrence of threatened and endangered animals, will develop maps showing the locations and types of plant communities used by these animals for nesting,

roosting, feeding, resting, spawning, etc. Literature information and personal observations will then be used to develop guidelines for maintaining (or restoring if necessary) the "critical habitat" required by each species.

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

1. wind and wave damage to plant communities from storms and hurricanes;
2. invasions of exotic plant species and revegetation by native species after exotic plant removal projects;
3. pathogen damage to and recovery of plant communities.

e. Identification of Areas and Communities in Need of Restoration. Field personnel will 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 site according to whether the site is publicly or privately owned, and the cost and feasibility of restoration.

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

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

i. Removal of plant vegetation shall only be permitted for minimum access from the ordinary high water line to a dock or pier. The destructive clearing of plants in sovereignty lands shall be strictly prohibited.

ii. Freshwater grassbed communities will be protected against removal or shading to such an extent as to cause the death of a significant area of the community. They shall not be subjected to unacceptable turbidity, decreased light penetration, propeller or canoe traffic damage.

2. Field personnel will be notified of applications for uses of sub-merged lands within the aquatic preserve by the Bureau of Land and Aquatic Resource Management central office. No applications will be approved within Resource Protection Areas 1 and 2 (see Section C of this chapter) without a thorough review by the field personnel. The field personnel will inspect the site, assess the potential impacts to the plant communities, and then convey their recommendations to the central office as required.

3. Field personnel will initiate various educational programs and supplement existing educational programs designed to increase public awareness of the damage that recreational, private and commercial uses (i.e., propeller damage) can inflict on grassbed and other riverine communities. Education programs can also be undertaken with other federal, state or local groups (i.e., Florida Audubon Society, school boards, etc.).

4. Field personnel will develop an exotic plant control and removal plan after monitoring the rate and extent of invasion by exotic species.

g. Restoration of Plant Communities. Field personnel will consult with professionals in the wetlands restoration-revegetation field to determine the advisability of using healthy grassbeds as a stock source to restore damaged grassbeds. Field personnel will develop guidelines for restoring and nurturing these communities in the aquatic preserve.

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

h. Identification of Research Needs. Field personnel will identify research needs concerning plant communities within the aquatic preserve with special emphasis given to data needs that would increase the capability of field personnel to manage plant communities under environmental stress, and to determine threshold tolerances for plant community health and diversity in relation to degraded environmental conditions.

i. Coordination With Other Researchers. Field personnel will become familiar with research projects being conducted within the aquatic preserve by state and federal agency biologists and non-government researchers. Water quality research issues, as they *affect plant* communities, should also be closely followed. This familiarization should lead to a better understanding

of both agencies' personnel and a better awareness of the data findings and uses. The research liaison will also be addressed in Chapter X (Scientific Research).

2. ANIMAL LIFE

The richness of the animal life of the Wekiva area is important to its designation as an aquatic preserve. The fish within the aquatic preserve are valuable resources on which recreational and some commercial fisheries depend. Large areas of undisturbed wetlands are excellent habitat for many types of wildlife. These wildlife include an extensive list of endangered, threatened, or species of special concern and their habitats, migratory waterfowl, colonial wading birds, invertebrates and vertebrates.

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

Management Policy

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

b. Literature Familiarization. The field personnel will assemble a working library of existing literature concerning the major animal species and

communities within the aquatic preserve. The field personnel will become familiar with life histories, ecological requirements, position in the community, habitat and other factors necessary for sound management.

c. Preparation of Guidelines for the Management of the Endangered Species Within the Aquatic Preserve. The field personnel will become familiar with the guidelines of the Florida Game and Fresh Water Fish Commission, U.S. Fish and Wildlife Service, Department of Natural Resources' Division of Marine Resources, and any other applicable agencies and non-government organizations involved in the management of endangered or threatened species, species of special concern, and their habitats. 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 Changes in Animal Populations. Field personnel will study and monitor changes in animal species that are caused by natural phenomena, such as:

i, storms and hurricanes;

ii. changes in habitat due to changes in plant types;

iii. changes in habitat due to water quality changes; and

iv. geologic or hydrologic changes including erosion 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, will strive for 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 within the aquatic preserve that might affect the well-being of animal life and should be involved in planning the activity so as to cause the least amount of stress on animal life.

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

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

3. GEOLOGIC FEATURES

The management of geologic features will require that the field personnel become aware of the natural geologic features and the changes, both human and

natural, which affect these features within the aquatic preserve to better enable a review of applications for state-owned land uses that might affect these features. These geologic features will include inlets, islands, shoals, shorelines, embayments, and channels. The overall objective of the management of these features is to allow the naturally dynamic system to operate without man's influence or interference. Active management in this area shall include the review of proposed uses that might affect the geologic features within the aquatic preserve. The majority of these reviews will concern bulkheads, bridges and channels as they might affect state owned lands. The objective in the placement of bulkheads on lands upland of the aquatic preserve shall be to alter the natural contour and drainage as little as possible. The use of rip rap with suitable native plantings is 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.

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

The field personnel shall also be involved in the review of project proposals submitted to other agencies, such as the U.S. Army Corps of Engineers, Department of Environmental Regulation, the Department of Transportation or the St. Johns River Water Management District, and may formally review and

comment on any permit application that impacts the aquatic preserve. These projects may be reviewed jointly with those agencies' personnel whenever possible. The field personnel may review these projects on behalf of the aquatic preserve and its resources.

4. ARCHAEOLOGICAL AND HISTORICAL SITES

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

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

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

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

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

Administering Agency

The management of the archaeological and historical sites is authorized and

administered by the Division of Historical Resources (DHR) in the Florida Department of State. The management authority for this area of management is presented in Chapter II (Management Authority).

Management Policy

The management policy presented here is one of conservation, as recommended by the DHR 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 DHR in order to prevent any unauthorized disturbance of archaeological and historical sites that may exist on the affected tract. DHR 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 DHR (Section 267.13, F.S.). Therefore, agencies planning activities should coordinate their plans with DHR at a sufficiently early stage to preclude inadvertent damage or destruction to these resources.

2. The nature of these sites' fragility and vulnerability to looting and other destructive forces required that the location of these sites not be widely known, if the exact location is known at all. In many instances DHR will have knowledge of the known and expected site distribution in an area. Special field surveys for unknown

areas may be required by DHR 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 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, DHR 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 DHR 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 DHR. Cooperation with other agencies in this activity is also

encouraged by DHR. The DHR 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 DHR so that appropriate action may be initiated. The Game and Freshwater Fisheries Commission and other enforcement personnel shall provide enforcement assistance to DHR 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 DHR 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 preserve's plant and animal communities is one of the most critical aspects of aquatic preserve management. Research to understand how human activity can alter or detrimentally affect the dynamic characteristics of the preserve's various habitats can be approached confidently after monitoring data has been used to model the effects of naturally occurring variations on the same habitat. Only a single toxic substance may be necessary to initiate irreparable ecological damage and change in the water resources of the aquatic preserve riverine ecosystem.

The maintenance of the exceptional water quality of the Wekiva River is dependent upon the balance of a myriad of interrelating environmental factors

associated with water quantity, velocity of streamflow, aquatic flora and fauna, surrounding wetlands, upland recharge areas, etc. Activities associated with urban development may affect any or all of these factors and should be closely monitored by all agencies involved.

1. Wastewater - Zoning within this area of the basin is General Rural with one unit per acre density, permitting the septic tank method of wastewater treatment. Several proposed PUD's with densities of three or more units per acre, if approved, will require central wastewater facilities. At the present time, insufficient data exists to analyze the impacts of increased sewage disposal through septic tanks, percolation ponds or spray fields on wetlands and the Wekiva River system. Studies are currently in progress to determine septic tank densities that would not have significant effects on the Wekiva River. Further assessments by appropriate agencies are required to establish guidelines to effect wastewater management without detriment to the Wekiva River.

2. Saltwater Intrusion - The Wekiva Basin lies within an area where the freshwaters of the Floridian aquifer overlie more saline waters. The underlying high salinity water is a remnant of an earlier geologic era when the sea level was much higher than its present level. The top 1,000 feet of the Floridian aquifer generally contains large quantities of potable water. Excessive withdrawals, or lack of rainfall for adequate recharge, may induce the upward movement of the more saline waters. Increased population density would necessitate additional groundwater withdrawals that could diminish quality of potable water available to

residents. A salt tongue is present in the Wekiva Basin. Data from the St. Johns River Water **Management** District indicate that the range of chloride ion concentration (251-1000 ppm) has expanded approximately four miles south, from one mile north of S.R. 46 to three miles south of S.R. 46 (St. Johns River Water Management District, upub. 1986 data). To date, the hydrological capabilities of the groundwater resources in the Wekiva Basin have not been determined. Additional hydrological investigations should be performed by appropriate agencies: to determine the quantity of ground water in the **area;** to provide information for adequately evaluating the water supply potential; and to evaluate possible impacts to the groundwater resource from increased use.

3. Stormwater Runoff - Excess nutrients (nitrogen, phosphorus) and heavy metals (lead, zinc, copper) in stormwater runoff originate from increases in impervious surfaces associated with residential and commercial development. The degrading nature of runoff water has been well documented. The use of retention/detention ponds has become common practice both to prevent the discharge of runoff waters into receiving lakes and streams, and to treat the water prior to release. The effectiveness of retention-detention ponds in removing excess nutrients has not been fully investigated. Several system designs require periodic maintenance to maintain their efficiency, which may or may not be performed on a regular basis (the SJWMD is responsible for monitoring the efficiency of such systems). Urban stormwater runoff is presently not a

problem in the proposed development area, but as development pressures increase, so will the potential for problems associated with untreated stormwater.

4. Decline in Spring Flow - Groundwater Discharge from the Floridan aquifer at the various springs is the principle source of flow to the Wekiva River. The maintenance and integrity of the biotic habitat is dependent upon the consistency of this spring flow. A trend line analysis of U.S. Geological Survey data from the 14-year period from 1969-1982, indicated declines in spring flow for Wekiva and Rock Springs of 25% and 20% respectively. A trend line analysis for Sanlando and Starbuck Springs, which supply the Little Wekiwa, indicate a 12% increase and a 9% decrease, respectively (Tech. Comm. Friends of Wekiva, 1985). The complexity of the relationship between aquifer potentiometric levels and springs flow is demonstrated by the difference in spring flow trends. Differences in flow trends may be attributed to a variety of factors including precipitation trends, storm drainage wells and consumptive use.

Continued declining trends can result is **a** permanent alteration of the ecosystem, reduction of the recreational and aesthetic value of the Wekiva, as well as impact the St. Johns River. Point and non-point pollution loadings will become more concentrated and negatively impact water quality and biotic integrity.

Management Policy

The successful management of the water resources of the aquatic preserve

depends heavily on other government agencies (i.e., DER and the Water Management District) charged with regulating water quality and quantity. The objective of the water resources management shall be to maintain the naturally high water quality and to ensure the natural seasonal fluctuations of fresh water into the system. Sources of water resources data from non-government agencies, are dependent on or may be found among colleges, universities, scientific foundations and private consultants working in the Wekiva River area. The aquatic preserve management program will manage the water resources through coordination with these various entities. The field personnel will not conduct water sampling, but through the review of these data from other entities and from their own field observations, they will be able to identify water resource problems in the aquatic preserve. Efforts will be made to ensure consistency in project design and sampling techniques so that data from various studies can be used for integrated analysis.

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

1. Florida Department of Environmental Regulation

2. **Lake, Orange, Seminole and Volusia** County Health Departments

3. Lake, Orange, Seminole and Volusia County Environmental Services.
4. St. Johns River Water Management District
5. Lake, Orange, Seminole and Volusia County Planning Departments.
6. U. S. Geological Survey
7. U. S. Fish and Wildlife Service
8. National Oceanic and Atmospheric Administration
9. Florida Department of Transportation
10. East Central Florida Regional Planning Council
11. Florida Game and Fresh Water Fish Commission
12. Florida Department of Natural Resources Marine Research Laboratory
13 University of Central Florida
14. U. S. Army Corps of Engineers
15. U. S. Environmental Protection Agency
16. Lake County Water Authority
17. Florida Division of Forestry
18. Rollins College

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

c. Review of Lease Applications 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 to monitor the potential impacts 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 occur and when they affect other resources.

6. CUMULATIVE IMPACT ANALYSIS

Cumulative impacts are the sum total of major and minor changes or effects upon a natural system. Taken singularly these effects may not constitute a notable change in the condition of the natural system, but as these single

changes or uses accumulate, their combined impact may result in a substantive environmental disturbance or degradation of the natural system.

The review of proposed uses in the aquatic preserve from the perspective of cumulative impact analysis requires a thorough knowledge of the natural system and the various interactions and dynamics within that system. This aquatic preserve management program will initiate development of a cumulative impact analysis program. The evaluation of cumulative impacts shall include the following criteria from Chapter 18-20, F.A.C.:

"(1) The number and extent of similar 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 Aquatic Preserve Act; and,

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

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

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

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

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

(7) The extent to which mitigation measures may partially off-set adverse impacts. Proposed mitigation to compensate for damages to resources in the preserve will only be considered when no other reasonable alternatives exist."

The availability of onsite preserve 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, unauthorized dredging or filling, 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, or extension of an approved channel).

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

verify the title of the property and to determine whether or not the use is an approved activity. Due to the extensive areas involved in the aquatic preserve, this will be a progressive activity depending on the field personnel's eventual familiarization with the preserve and the approved uses. The potential for unauthorized activities in such an extensive area may possibly require some type of mapping and recording system to assist the field personnel in their monitoring.

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

C. RESOURCE MAPPING AND RESOURCE PROTECTION AREAS

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

The vegetation and land use mapping done in this study will become the basis for the development of a Resource Protection Area management system in the aquatic preserves (18-20.03(31-33) F.A.C. This mapping system identifies and

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

The onsite manager(s) will supplement this mapping with the above information to develop and update a Resource Protection Area (RPA) mapping program. The RPA mapping system is based on three levels of resource classification. The RPA 1 level may contain resources of the highest quality. Uses proposed for these areas will receive the most rigorous review. Examples of RPA resource 1 areas include the following: grassbeds and other submerged vegetation; emergent vegetation; archaeological and historical sites; endangered species habitat; and wading bird nesting sites.

The RPA 2 areas are defined as those areas containing the resources of RPA 1, but in a transitional condition compared to RPA I. These resources may either be building toward RPA 1 status or declining to RPA 3 status. RPA 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 more sensitive to disturbances than RPA 1 areas. The resources of RPA 2 include: recolonizing vegetation and other resources of RPA I that fit in the RPA 2 condition.

RPA 3 areas are characterized by the general absence of the attributes of the above two classes. RPA 3 areas may have small localized RPA 1 or 2 areas within them. RPA 3 generally have deep water areas or areas with no significant vegetation or wildlife attributes. Nearshore and bottom areas significantly modified by man are designated RPA 3. Some of these areas are sites for future restoration.

These RPA maps will require periodic revisions as the onsite managers learn more about the resource's reaction 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.
Ground truthing and periodic checking by LANDSAT satellite imagery will become useful for remote sensor monitoring as its use is more fully developed.

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

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

D. ADMINISTRATIVE MANAGEMENT OBJECTIVES

This section of the chapter addresses the role of the central office, in the aquatic preserve management planning and implementation process. The central

office's role is generally interpreted within the context of coordinating activities with the field personnel. This coordination linkage is important to many program aspects, including project review and evaluation, local contact initiation, administrative rule development, contractual services and conflict resolution, and 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

The following administrative objectives will be pursued for 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 assist in a conflict resolution.

f. To review existing and past activities as to their effect 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. The central office staff reviews all proposed project activities requiring the use of state-owned lands within the preserve, and develops an official response to the Division of State Lands. Certain projects, such as single family private dock applications may be assigned directly to field staff.

Sections 258.42 through 258.44, F.S., establish the legal context within which proposed uses of the aquatic preserve must be evaluated. Essentially, these sections require that projects be basically water dependent or water-enhanced, not contrary to the lawful and traditional uses of the preserve, and not infringing upon the traditional riparian rights of the upland property owner.

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

In conducting the environmental evaluations, the central office staff will rely heavily upon the most current, readily available data such as staff field reports, Department of Transportation (DOT) aerial photography, LANDSAT imagery, DER biological reports, and other data resources. If a proposed activity is legally consistent with the maintenance criteria outlined in

Section 258.42, F.S. and Chapter 18-20, F.A.C., and is generally of negligible environmental concern, then the project review will likely be conducted in its entirety by the central office staff, utilizing the generalized environmental **data.**

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

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

While the State Lands Management Program authorized by Chapters 253 and 258, F.S. and Chapter 18-20 and 18-21, F.A.C. is expected to be the primary **manage**ment implementation vehicle for the aquatic preserve, it is not the only vehicle. Section 253.77, F.S., as amended, and the December 1982 Memorandum of Understanding between the COE, DER and DNR provide direct access to DER's permitting process for DNR. The Development of Regional Impact (DRI) and

other regional or state level review processes represent other implementation mechanisms. The basic review approach and the evaluation relationship between the field personnel and the central office staff will be the same as the case involving the State Lands Management program.

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

> "(1) No further sale, lease, or transfer of sovereignty submerged lands shall be approved or consummated by the trustees except when such sale, lease, or transfer is in the public interest.
>
> (2) The trustees shall not approve the waterward relocation or setting of bulkhead lines waterward of the line of mean high water within the preserve except when public road and bridge construction projects have no reasonable alternative and it is shown to be not contrary to the public interest.
>
> (3) (a) No further dredging or filling of submerged lands shall be approved by the trustees except the following activities may be authorized pursuant to a permit:
>
> 1. Such minimum dredging and spoiling as may be authorized for public navigation projects.

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

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

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

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

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

7. Installation and maintenance of oil and gas **transportation** facilities, provided such facilities are properly marked with marine aids to **navigation** as prescribed by federal law.

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

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

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

(e) There shall be no erection of structures within the preserve; except:
1. Private docks for reasonable ingress or egress of riparian owners;

2. Commercial docking facilities shown to be consistent with the use or management criteria of the preserve; and

3. Structures for shore protection, **approved** navigational aids, or public utility crossings authorized under subsection (3)(a).

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

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

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

a. Request 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 Appeal.

3. Liaison Between Field Personnel and Other Interested Parties

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

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

Chapter VI

MANAGEMENT IMPLEMENTATION NETWORK

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

A. FEDERAL

Many federal agencies have property interests, land and wildlife management programs, research activities, construction activities, and regulation programs existing or potentially existing within the aquatic preserve, 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. The review shall be coordinated through the DER's Office of Coastal Management for the purposes of enforcing the provisions of the Federal Coastal Zone Management Act of 1972, as amended.

1. United States Fish and Wildlife Service. The Aquatic Preserve program will be involved in the review of proposed preserve uses in conjunction with the Fish and Wildlife Service. The USFWS reviews dredge and fill requests and other federal level permitting under the Fish and Wildlife Coordination Act.

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

2. U.S. Army Corps of Engineers. The U.S. Army 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 Wekiva River area include their involvement with the DER in the dredge and fill **permitting process, technical oversight** of channel, inlet and canal maintenance, and evaluating requests for new channels, canals and other such public works projects. The field personnel will become familiar with the various programs, policies and procedures as they apply to the aquatic preserve.

The field personnel and central office staff will also review activities

proposed by the COE for conformance to the objectives of the aquatic preserve management plan. This involvement should begin in the early stages of project planning in order to facilitate the best protection of the aquatic preserve possible.

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

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

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

R. STATE

Many state agencies have programs which affect the resources or regulate activities within the aquatic preserve. There are other DNR programs that are within or affect the Wekiva River Aquatic Preserve management.

1. Department of Environmental Regulation. The Department of Environmental Regulation (DER) is the state agency in charge of state-wide regulation of water quality. The DER is also the local contact in the aquatic preserves area 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 one of the most important agencies to the management of the aquatic preserve. Maintaining water quality in the preserve is critical to the health of the River, and dredge and fill activities are one of the most potentially destructive activities affecting water quality within the preserve. The DER also monitors and regulates other potential forms of pollution, such as air pollution, wastewater discharges, and hazardous waste, all of which can affect the ability to maintain essential natural conditions.

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 advanced copies of the permit applications from DER to improve the response time within the review process.

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

The ACSC program is intended to protect the areas of the state where unsuitable land development would endanger resources of regional or statewide significance. When an area is identified as a possible ACSC, a Resource Planning and Management Program (RPMP) is established. The RPMP evaluates the resources, and the local government's land development practices. After this evaluation is complete, the RPMP committee makes recommendations to the local governments on how their land development practices could be improved to ensure an orderly land well-planned growth that would protect the critical resources. When these modifications are not made to the RPMP committee's approval, areas of local government that are not in conformance could be designated an ACSC or the entire area may be designated an ACSC by the Legislature. The Wekiva River Aquatic Preserve area is not currently designated an ACSC.

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

DNR's Marine Research Laboratory in St. Petersburg, under the Division of Marine Resources, has several studies and programs ongoing statewide involving fisheries habitat loss which will benefit the aquatic preserve program. The Resource Protection Area mapping developed as part of these studies will also be used in the management of Wekiva River Aquatic Preserve.

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

The Division of Resource Management, through the Bureau of Aquatic Plant Research and Control, is responsible for various aquatic plant programs potentially affecting the aquatic preserve. Staff will establish communication links with this Division to ensure that adequate consideration is given to potential impacts upon the preserve that may result from the conduct of their various programs.

The Division of Recreation and Parks, in addition to the work related to aquatic preserves by BLARM and the Florida Park Service, is also involved in

the management of State parks and recreation areas nearby. The aquatic preserve program will work closely with these programs as they relate to aquatic preserve management objectives.

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

The GFWFC also has law enforcement officers working in this area. The field personnel will interact with these officers where there are common goals of protecting wildlife and other resources within the Wekiva River.

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

Currently on going studies by the Game and Fresh Water Fish Commission in that portion of the St. Johns River included in the Aquatic Preserve include both angler utilization and fish population dynamics for largemouth bass, black crappie, and striped bass hybrids. Additionally, two water quality sampling stations are located in the preserve boundaries: one downstream of the I-4 bridge on the St. Johns River, and one located in the Wekiva River near its confluence with the St. Johns River.

5. Department of Transportation. (DOT) The DOT has its State headquarters office in Tallahassee and District office in Orlando, and the aquatic preserve field personnel and the central office will work with the resident engineer on anticipated projects having possible impacts on the aquatic preserve. The field personnel and administrative staff will review any major highway or bridge projects that may be proposed in the future.

6. Department of State. The Division of Historical Resources (DHR) 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 DHR, 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. Although mosquito control serves a useful public function, the effects of pesticides (adulticides and larvacides) in the waters of the preserve are a primary concern. Additionally, the central office staff will become involved in future meetings and management programs developed by the Florida Coordinating Council 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 Wekiva River Aquatic Preserve will include the St. Johns River Water

Management District and The East Central Florida 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. Water Management District. The St. Johns River Water Management District includes Lake, Orange Seminole and Volusia Counties. The water management district administers permitting programs for consumptive water use, management and storage of surface waters, well drilling and operation, regulation of artificial recharge facilities, and works of the district. This includes the withdrawal and use of water from rivers, streams, and wells. The types of water uses they permit in the preserve area include irrigation and public water supply. The field personnel will become familiar with the review and permitting procedures as they might apply to water supply in this basin. The water management district is also involved in various studies on water supply and management, and other related research that may be of use to aquatic preserve management.

The St. Johns River Water Management District (SJRWMD) recently adopted additional stormwater management criteria applicable to the Wekiva Basin. The additional criteria identifies the Wekiva Basin as a "Hydrological Sensitive Area" and defines the boundaries of the "Wekiva River Hydrological Basin". Stormwater management system design criteria requires three inches of runoff be retained for projects within "Most Effective Recharge Areas" ("Most Effective Recharge Areas" are defined by the L.S. Geological Survey as areas which have 10-20 inches of recharge per year). The system design criteria also requires that a system not cause a net reduction in flood storage within the 100-year flood plain of a stream or other water **course which has a**

drainage area of more than one square mile and which has a direct hydrologic connection to the Little Wekiva River, Wekiva River, or Black Water Creek.

Recently adopted "Wetland Review Criteria" also apply to wetlands within the Wekiva Basin and require an applicant provide reasonable assurance that a proposed system will not cause adverse off-site changes in: (a) the habitat of an aquatic and wetland dependent species, (b) the abundance and diversity of aquatic and wetland dependent species, and (c) the food sources of aquatic and wetland dependent species. Where wetlands are used by threatened or endangered species which are aquatic or wetland dependent, both off-site and on-site impacts will be assessed and the applicant must provide reasonable assurance that a proposed system will not cause adverse changes in: (a) the habitat of threatened or endangered species (b) the abundance and diversity of threatened or endangered species, and (c) the food sources of threatened and endangered species.

The Trustees support and will advocate the concept of establishing a variable buffer zone for the Wekiva River and will coordinate and cooperate with the St. Johns River Water Management District as it attempts to adopt such a buffer zone.

2. Regional Planning Councils. The East Central Florida Regional Planning Council (ECFRPC) serves as a regional planning body for the local governments of Lake, Orange, Osceola, Brevard, Volusia and Seminole Counties. Among its duties, the ECFRPC:

a. aids local governments with planning expertise;

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

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

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

f. prepares and administers the regional policy plan.

The field personnel will become familiar with the various projects, programs, and data sources that the ECFRPC has within their administration that may affect or prove useful to the aquatic preserve program.

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

D. LOCAL GOVERNMENTS AND SPECIAL DISTRICTS

This section will address the relationship of the aquatic preserve management program to the various local governmental agencies, special districts and their programs. The local governments for Wekiva River Aquatic Preserve involve Lake, Seminole Orange and Volusia Counties. The various special

districts (drainage and mosquito control) and their relationship to aquatic preserve management, are also presented.

The field personnel will be the local liaison for the aquatic preserve to these local governmental 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: Local (municipal and county) governments are required by the Local Government Comprehensive Planning Act of 1975 (Section 163.3161, F.S.) [as ammended by Chapter 85-55, Laws of Florida, to the Local Government Comprehensive Planning and Land Development Regulation Act] to update their local plans and among other requirements adopt land development regulations and improve coastal management protection. The coastal management element of the LGCP along with the land use and conservation elements establishes long range plans for orderly, and balanced development, with particular attention to the identification and protection of environmental resources in the planning area. Conformance with the criteria, policies and practices of a local government comprehensive plan is required for all development within the local governmental jurisdiction.
The intent of the aquatic preserve management program and this plan is to guide Lake, Orange, Seminole and Volusia County governments during their comprehensive planning toward developing local plan criteria and standards to be consistent with the objectives of the aquatic preserve program. Review of the comprehensive plans for Lake, Orange, Seminole and Volusia Counties, has produced no obvious inconsistencies between the policies of these local plans

and the resource management policies of this aquatic preserve plan. As these local governments proceed to revise their plans, staff will review existing and new policies that apply to resource protection in the Wekiva Basin, and will advise local governments of their consistency with Trustees adopted policies for the Preserve.

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

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

3. Special Districts (Drainage, Inlet and Mosquito Control). The special districts are taxing districts established to correct drainage and mosquito control problems. Lake, Orange and the eastern part of Volusia Counties have mosquito control districts. Seminole County does not have a mosquito control district but control is regulated by the City of Sanford.

These districts may not have an official comprehensive management plan, but they do have management policies and program statements that are similar to such a plan, The field personnel will become familiar with these policies and the activities of these districts and will monitor their effect on the aquatic preserve. For example, the field personnel might recommend identifying areas that should not receive mosquito spraying or other alternative management because of remoteness to inhabited areas and because of possible damage to the resources of the aquatic preserve; or drainage districts might be asked not to use certain types of herbicides or to use them only at certain times of the year.

E. Other Entities

This section will apply to the numerous entities that have an interest in the aquatic preserve but are non-governmental agencies. They include the environmental interest groups (i.e., Friends of Wekiva River, Inc., Audubon Society, Sierra Club, Florida Native Plant Society, and others), universities and the fishing and sporting groups. 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.

Preface

(Chapters VII - IX)

Authorized Activities **and** Uses of Aquatic Preserves

The following chapters provide a description of public, private and commercial activities-uses that are allowable pursuant to statutory direction and all other applicable authorities in aquatic preserves. These activities-uses are subject to the approval of the Board (Governor and Cabinet) or their designee. Approval of these activities-uses is normally predicated upon a demonstration that the proposed activity-use is environmentally sound and-or is, in the opinion of the Board, necessary in conjunction with an overriding public need.

In all cases, approved activities-uses that adversely impact the resources of an aquatic preserve shall only be approved when accompanied by adequate compensation measures that contribute to an overall net public benefit.

Mitigation measures, other than those associated directly with programs for habitat reestablishment or rehabilitation, are viewed by the Board as inadequate attempts to compensate for alteration of essentially natural ecological conditions through the establishment of artificial resource systems. Therefore, mitigation will only be encouraged in conjunction with on and off-site projects that are designed to reestablish natural habitat values and where the aquatic preserve will biologically and aesthetically benefit from the proposed restoration actions.

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 258.43f1], F.S.) These and other traditional uses that do not involve a commercial intent or the use of a riparian right to place a structure in the preserve, and do not degrade or otherwise destroy the preserve will be considered public uses, This section will be further divided into consumptive and non-consumptive uses as applicable to each resource.

A. Consumptive Uses.

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

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

Consumptive uses will also be monitored for their effect on other resources (e.g., bird rookeries, grassbeds, 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. Mon-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's resources {e.g., destroys grassbeds, or 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 education programs (Chapter XI).

C. Other Uses.

For a number of years, various individuals have constructed and occupied cabins or camps on sovereign lands within the Wekiva River. Since the middle 1970's, staff of the Department has compiled information on these unauthorized cabins and attempted, through various mechanisms, to bring these trespasses under active management control of the Department.

Thirty nine cabins were involved in the initial lease negotiations. Throughout the years, many cabins have been upgraded or expanded, while many others have been neglected or abandoned. Construction activities associated with cabin restoration and improvement are in potential violation of one or more of the following aquatic preserve rules, Section 18-20, F.A.C.:

18-20.004(1)(c) construction of seawalls waterward of the ordinary high water line

18-20.004(1)(e)(5) construction of private docks without lease, easement or consent of use

18-20.004(1)(f) construction of non-water dependent structures

18-20.004(5)(a)1construction of docks within areas of special or unique importance

18-20.004(5)(b)1construction of main access dock in excess of four (4) feet

18-20.004(5)(b)2construction of dock decking without insuring maximum light penetration

Structures over sovereignty lands also represent loss of habitat and loss of biological function. Localized water quality degredation may be attributed to individual sewage disposal systems which do not meet minimum county standards.

Cabins that have been neglected or abandoned have been a source of litter, especially during high water when numerous cans and other debris readily float **downstream. Abandoned or neglected cabins are** permanent detractions that must be addressed through legal actions or management strategies. On November 19, 1985 the Governor and Cabinet directed staff to pursue the removal of unauthorized structures from state owned lands within the Aquatic Preserve.

In December 1985, certain individuals, claiming an ownership interest by adverse possession of the islands upon which the cabins are located, filed a quiet title suit against the DNR. The Department then counterclaimed for ejectment.

Currently, the litigation is proceeding on three fronts. First, discovery is underway in terms of requests for admissions, interrogatories, and depositions. Second, DNR is conducting an ordinary high water survey of the River. This is a time consuming task, but DNR estimates late fall as a target completion date. Third, both DNR and the Attorney General's Office are in contact with the St. Johns River Water Management District to seek their technical assistance. The Department is committed to vigorous pursuit of litigation to insure that all trespassers and structures are removed as quickly as possible.

Chapter VIII

PRIVATE NON-COMMERCIAL USES

This section will apply to those private, non-commercial uses which are associated with riparian land ownership. The management of the aquatic preserve recognizes the traditional riparian rights of upland property owners. The right of ingress, egress, boating, swimming, fishing and other incidental uses of sovereignty lands, historically has allowed for the placement of certain structures, such as docks, within the preserve. The right to make any preemptive use of sovereign lands is a qualified one and can only be exercised with the prior consent of the Board after a finding that such uses will not impair public uses, or destroy or damage areas of environmental significance. The review of proposed activities will require the interaction of the Resource Protection Area mapping with administrative and possible field review and later monitoring by field personnel as projected by Chapter V., Section B.

Private non-commercial uses shall be designed to avoid critical Resource Protection Areas (RPA 1 and 2) and shall be designed to reduce the uses' 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 criteria described in Section 18-20.04(5) P.A.C. of the revised Aquatic Preserve Rule:

1. no dock shall extend waterward of the mean or ordinary high water line more than 500 feet or 20 percent of the width of the waterbody at that particular location whichever is less;

2. certain docks may fall within areas of special or unique importance. These areas may be of significant biological, scientific, historic and-or aesthetic value and require special management considerations. Modifications may be more restrictive than the normally accepted criteria. Such modifications shall be determined on a case-by-case analysis, and may include, but shall not be limited to changes in location, configuration, length, width and height;

3. the number, lengths, drafts and types of vessels allowed to utilize the proposed facility may also be stipulated;

4. where local governments have more stringent standards and criteria for docking facilities, the more stringent standards for the protection and enhancement of the aquatic preserve shall prevail;

5. any main access dock shall be limited to a maximum width of four (4) feet;

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

7. the dock will extend out from the shoreline no further than to a maximum depth of minus four (- 4) feet (mean low water);

8. when the water depth is minus four (-4) feet (mean low water) at an existing bulkhead the maximum dock length from the bulkhead shall be 25 feet, subject to modifications accommodating shoreline vegetation overhang;

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

10. terminal platform size shall be no more that 160 square feet; and

11. dredging to obtain navigable water depths in conjunction with private residential, single dock applications is strongly discouraged.

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

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 RPA 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 RPA 1 or 2 areas or in nearby areas if it will adversely impact these areas.

The location of proposed multiple docking facilities, such as for condominium developments, shall be based on the marina siting criteria described in Section 18-20.04(5) F.R.C. of the revised General Aquatic Preserve Rule:

1. no dock shall extend waterward of the mean or ordinary high water line more that 500 feet or 20 percent of the width of the waterbody at that particular location whichever is less;

2. certain docks may fall within areas of special or unique importance. These areas may be of significant biological, scientific, historic and-or aesthetic value and require special management considerations. Modifications may be more restrictive than the normally accepted criteria. Such modifications shall be determined on a case-by-case analysis, and may include, but shall not be limited to changes in location, configuration, length, width and height;

3. the number, lengths, drafts and types of vessels allowed to utilize the proposed facility may also be stipulated;

4. where local governments have more stringent standards and criteria for docking facilities, the more stringent standards for the protection and enhancement of the aquatic preserve shall prevail;

5. the area of sovereignty, submerged land preempted by the docking facility shall not exceed the square footage amounting to ten times the riparian waterfront footage of the affected waterbody of the applicant, or the square footage attendant to providing a single dock in accordance with the criteria for private residential single docks, whichever is greater. A conservation easement or other such use restriction acceptable to the Board must be placed on the riparian shoreline, used for the calculation of the 10:1 threshold, to conserve and protect shoreline resources and subordinate-waive any further riparian rights of ingress and egress for additional docking facilities;

6. docking facilities and access channels shall be prohibited to Resource Protection Area 1 or 2, except as allowed pursuant to Section 258.42(3)(e)1., Florida Statutes, while dredging in Resource Protection Area 3 shall be strongly discouraged;

7. docking facilities shall only be approved in locations having adequate existing water depths in the boat mooring, turning basin, access channels, and other such areas which will accommodate the proposed boat use in order to insure that a minimum of one foot clearance is provided between the deepest draft of a vessel and the bottom at mean low water;

8. main access docks and connecting or cross walks shall not exceed six (6) feet in width;

9. terminal platforms shall not exceed eight (8) feet in width;

10. finger piers shall not exceed three (3) feet in width, and 25 feet in length;

11. pilings may be utilized as required to provide adequate mooring capabilities; and

12. docking facilities shall only be located in or near areas with good circulation, flushing and adequate water depths;

13. docking facilities and access channels shall be prohibited in Resource Protection Area 1 or 2, except as allowed pursuant to Sections 258.42(3)(e)1., Florida Statutes; while dredging in Resource Protection Area 3 shall be strongly discouraged;

14. the docking facilities shall not be located in Resource Protection Area 1 or 2; however, main access docks may be allowed to pass through Resource Protection Area 1 or 2, that are located along the shoreline, to reach an acceptable Resource Protection Area 3, provided that such crossing will generate minimal environmental impact;

15. beginning July 1, 1986 new docking facilities may obtain a lease only where the local governments have an adopted marina plan and-or policies dealing with the siting of commercial-industrial and private, residential, multi-slip docking facilities in their local government comprehensive plan; [Senate Bill 607 enacted by the Florida Legislature in June 1986 amended section 258.42(3)(e) F.S., and provided that "no structure under this provision or Chapter 253 shall be prohibited solely because the local government fails to adopt a marina plan or other policies dealing with the siting of such structure in their local comprehensive plan".]

16. the siting of the docking facilities shall also take into account the access of the boat traffic to avoid marine grassbeds or other aquatic resources in the surrounding areas;

17. the siting of new facilities within the preserve shall be secondary to the expansions of existing facilities within the preserve when such expansion is consistent with the other standards;

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

19. marina siting will be coordinated with local governments to insure consistency with all local plans and ordinances;

20. marinas shall not be sited within state designated manatee sanctuaries; and

21. in any areas with known manatee concentrations, manatee warning-notice and-or speed limit signs shall be erected at the marina and-or ingress and egress channels, according to Florida Marine Patrol specifications.

Authorization of such facilities will be conditioned upon receipt of documentation evidencing the subordination of the riparian rights of ingress and egress for the remainder of the applicant's shoreline for the life of the proposed docking facility. Boat ramps and travel life platforms or other similar launching facilities, with associated temporary mooring facilities, and non-residential docking facilities (commercial) are addressed in Chapter Ix.

In addition to the above rules regarding docking facilities in aquatic preserves, other agencies, including St. Johns River Water Management District, Department of Environmental Regulation, Army Corps of Engineers and State Lands Division of DNR, have their own sets of rules which in some cases may be more restrictive than the above criteria. Applications must be filed and approved prior to building any structure on state-owned or leased submerged lands. Interested parties who may be considering projects should be aware of the multi-agency permitting process.

Airboat and seaplane activities in the aquatic preserve can present a negative impact on the wildlife resources and visitor amenities of the area due to the high noise levels generated by these vehicles. Airboats, in particular, traversing the narrow, pristine Wekiva River, Little Wekiva River and Black Water Creek, may damage vegetation, create a disturbance to nesting wildlife and present a potential hazard to canoeists and boaters. For these reasons, the use of these vehicles in the preserve is recognized as non-traditional, and their use will be discouraged. The Trustees, through the central office and field staff, will encourage local governments and appropriate law enforcement agencies having jurisdiction in the Wekiva Basin, to adopt local ordinances and enforcement policies against airboats and seaplanes in the preserve (except for emergency uses). Preserve staff will assist in monitoring and reporting airboat and seaplane activities to local law enforcement personnel following the adoption of local ordinances.

Field staff will also support local ordinances designed to promote trolling motors only in portions of the Wekiva River, Little Wekiva River and Black Water Creek segments of the aquatic preserve, where propeller damage to submerged vegetation has been documented.

Chapter IX COMMERCIAL USES

This section addresses the variety of traditional and non-traditional (i.e., new uses in this area) commercial uses which might occur within the aquatic preserve. Among the traditional uses in the Wekiva River area are utility crossings, marinas and commercial uses.

A. TRADITIONAL COMMERCIAL USES

1. Utility Crossin 9s. 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 (Chapter V[C]). 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 advance planning, for placement of these crossings in the best environmental location possible. The utility crossing plans, when completed, will become a part of this plan. Crossings should be limited to open water areas to minimize disturbance to grassbeds or other critical habitat areas and should not interfere with traditional public uses.

2. Marinas. The locating of marinas and their related uses will be a major concern of the Wekiva River Aquatic Preserve management. Marinas represent a use with many potential impacts on the preserve's resources. The siting policy of Section 18-20.04(5) F.A.C. of the revised General Aquatic Preserve Rule shall be used for siting marinas in the aquatic preserves:

1. no dock shall extend waterward of the mean or ordinary high water line more that 500 feet or 20 percent of the width of the waterbody at that particular location whichever is less;
2. certain docks may fall within areas of special or unique importance. These areas may be of significant biological, scientific, historic and-or aesthetic value and require special management considerations. Modifications may be more restrictive than the normally
3. the number, lengths, drafts and types of vessels allowed to utilize the proposed facility may also be stipulated;
4. where local governments have more stringent standards and criteria for docking facilities, the more stringent standards for the protection and enhancement of the aquatic preserve shall prevail;
5. docking facilities shall only be located in or near areas with good circulation, flushing and adequate water depths;
6. docking facilities and access channels shall be prohibited in Resource Protection Area 1 or 2, except as allowed pursuant to Sections 258.42(3)(e)1., Florida Statutes; while dredging in Resource Protection Area 3 shall be strongly discouraged;
7. the docking facilities shall not be located in Resource Protection Area 1 or 2; however, main access docks may be allowed to pass through Resource Protection Area 1 or 2, that are located along the shoreline, to reach an acceptable Resource Protection Area 3, provided that such crossing will generate minimal environmental impact;
8. beginning July 1, 1986 new docking facilities may obtain a lease only where the local governments have an adopted marina plan and-or policies dealing with the siting of commercial-industrial and private, residential, multi-slip docking facilities in their local government comprehensive plan; [Senate Bill 607 enacted by the Florida Legislature in June 1986 amended section 258.42(3)(e) F.S., and provided that "no structure under this provision or Chapter 253 shall be prohibited solely because the local government fails to adopt a marina plan or other policies dealing with the siting of such structure in their local comprehensive plan".]
9. the siting of the docking facilities shall also take into account the access of the boat traffic to avoid marine grassbeds or other aquatic resources in the surrounding areas;
10. the siting of new facilities within the preserve shall be secondary to the expansions of existing facilities within the preserve when such expansion is consistent with the other standards;
11. the location of new facilities and **expansion** of existing facilities shall consider the use of upland dry storage as an alternative to multiple wet-slip docking;
12. marina siting will be coordinated with local governments to insure consistency with all local plans and ordinances;

13. marinas shall not be sited within state designated manatee sanctuaries; and

14. in any areas with known manatee concentrations, manatee warning-notice and-or speed limit signs shall be erected at the marina and-or ingress and egress channels, according to Florida Marine Patrol specifications.

3. Other Docking. Any other type of commercial docking, not mentioned in the preceding sections, will follow the marina siting policy as stated in Section 18-20.04(5) F.A.C. of the revised General Aquatic Preserve Rule. B. Non-traditional Commercial Uses

1. Deep Water Port Facilities. There are no facilities of this type within the Wekiva River Aquatic Preserve at the present time. New deep water port facilities within the preserve boundary shall be prohibited.

2. Power Plants. Power plants have the potential for causing major changes in the air quality, water quality, and plant and animal life of the aquatic preserve. For these reasons, they are incompatible with the purposes of this aquatic preserve. The location of proposed power plants upstream of a preserve should also be evaluated as to the effects on the downstream preserve.

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. The best location for the activity will be identified, and compatibility to the resource protection areas will be assured.

Chapter X

SCIENTIFIC RESEARCH

The field personnel attached to the Wekiva River Aquatic Preserve should serve as the area coordinators of scientific research in the preserve. 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, specific procedures, and time of year, should be carefully reviewed for the possible disturbance or effect of the research on the other resources of the aquatic preserve. The field personnel will be aware of the possibility of working with other government agencies, colleges, universities, research foundations and government programs to fill the data needs of the aquatic preserve (see Chapter V and XII). The field personnel will assist in the selection of possible test sites and other research needs within the preserve.

Chapter XI ENVIRONMENTAL EDUCATION

The aquatic preserve should be used to enhance **environmental** educational programs at every opportunity. The goal of maintaining the aquatic preserve for the benefit of future generations can begin to be realized through the use of aquatic preserves for environmental education. Through education, the youth of Lake, Orange, Seminole and Volusia Counties can acquire a knowledge of the natural systems and an appreciation for the aquatic preserve program.

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

The environmental education activities of the Wekiva River Aquatic Preserve may be coordinated with the public information and education program of the Rock Springs Run State Reserve. The educational goals of the preserve and reserve are similar. A cooperative effort between both programs and a sharing of resources would strengthen the educational impact of each. Educating the public about the freshwater environment and related resources 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

G. funding and staffing 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 or threatened species, species of special concern and their habitats, and freshwater source wetlands as well as other wetlands. The protection of these areas is necessary to the wilderness preserve designation areas. Formal management agreements, memoranda of understanding, etc. that will ensure the compatible management of these areas will be developed. Other areas within or adjacent to the preserve that are in private ownership should be closely examined to determine the advisability of bringing them into public ownership. The acquisition of these lands might act as a buffer to critical resources, prevent development of sensitive areas, allow the restoration of areas adversely affected by previous development or allow removal of disrupting uses within a preserve. The field personnel, during normal management activities, should be aware of significant upland areas and sovereign land conveyances which, if developed, would compromise the integrity of the aquatic preserve. The field personnel will keep a 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 political lines or artificial delineations of the natural systems within and surrounding the preserve. The field personnel, in their normal management activities, will be sensitive to

the possible need for boundary modifications in areas where resources would be better protected. Potential boundary changes might include areas adjacent to the present boundary or previously conveyed sovereign lands. Two possible extensions would be to include the entire Rock Springs Run and entire Blackwater Creek. Another boundary need is to encourage the Department of Environmental Regulation to designated that portion of the St. Johns River, within the Aquatic Preserve boundary, as and Outstanding Florida Water. Formal boundary determination on whether or not an activity may be approved in an Aquatic Preserve shall be determined by staff of the Division of State Lands. Any boundary change will require legislative approval.

C. Legislative Needs

Management needs could involve changes in the legislation pertaining to aquatic preserves or changes in the other statutes upon which aquatic preserve management is based. These changes may include boundary realignments or the strengthening of certain management authorities.

D. Administrative Rule Changes

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

E. Data (Information) Needs

The field personnel and central office staff will note data needs and promote research or other means to fulfill them. Data needs in the near future could possibly be supplied by such ongoing projects as the U.S. **Geological** Survey's, and St. Johns River Water Management District studies, Department of Environmental Regulation water quality monitoring, and or by the research of other agencies including the Game and Fresh Water Fish Commission's studies concerning angler utilization and water quality. The field personnel will be aware of data needs as they interact with the various levels of government and with other entities. These data needs might include additional mapping, ownership information, water quality data or any other data. The major suppliers of data will probably be other public agencies that are conducting programs in and around the preserve. Other potential sources of data are the colleges and universities that have, in the past, conducted research projects in the area. Studies on the control of Colacasia esculenta (Elephant ears) and other exotic plants need to be done. Other needed studies which might lead to future restrictions include: canoe overuse; airboat disturbance to bird rookeries; and size limits on motors to 10hp.

F. Resource Protection and Enforcement Capabilities

As the problems associated with increasing population create changes in the Wekiva Area, additional research will be necessary both to determine the impact of those changes and to aid in preparing planning and management strategies to limit detrimental effects on the river ecosystem.

An important factor in the evaluation process is the availability of data pertinent to the situation. Water quality and water quantity data have been collected at various stations in the Wekiva River system for many years by at least five agencies. This data is available through the EPA retrieval system "STORET." Additional information on the Wekiva River is available in the form of various water quality reports, agency files, and other environmental reports.

To date, no one agency has a complete file on the available information concerning the Wekiva River System. A comprehensive compilation of available information on the Wekiva River system and the accessibility of the body of information is fundamental to the adequate assessment of future developments and trends. A complete inventory of the Wekiva River System would aid in determining the ecological tolerance of the ecosystem and also render a more accurate profile of the cumulative effects of various factors on the system. This type of research is particularly identified in the departments Agency Functional Plan as a priority, for without reliable data the concept of cumulative impact analysis is more a theoretical construct than a useful decision making tool.

Another area of importance that requires additional research is related to disturbances to eel grass communities. As boat traffic and canoe activities increase, erosion and disturbances to eel grass beds and erosion will also increase. Baseline data, including mapping of eel grass communities, and eroded and problem areas on USGS Quads, is essential for the development of management strategies to offset further damage.

Several interrelated issues concerning intensified land use within the Wekiva Basin require additional research: water supply, wastewater treatment, effluent disposal, and stormwater drainage. Major planning issues related to water resources and infrastructure support presently confront northwestern Seminole County and will soon face east Lake County. Without adequate research, planning, and management, the cumulative effects to the Wekiva Basin will be highly detrimental.

G. Funding and Staffing Needs

In the past, the aquatic preserve program has been largely dependent on federal coastal zone management grant funds for its operation, and as a result, the funding of both field positions and central office positions has been limited. The 1986 Florida Legislature changed this situation by authorizing 11 positions, most of which are field positions. A field position for an aquatic biologist was designated for the Wekiva River Aquatic Preserve, and was implemented in December 1986.

A budget covering projected staff time, equipment, travel, and other expenses is shown below. The budget required is to fulfill the short range needs of the Wekiva River as described in this management plan, and also to insure the fulfillment of the midrange Department goal of on-site management for all aquatic preserves by 1991, as expressed in the Agency Functional Plan.

Proposed Continuation Budget for Fiscal Year 1987-1988
for the
Wekiva River Aquatic Preserve Management

Salary (Environmental Specialist II) and Associated Overhead	$ 30,000
(OPS Employment)	**10,000**
Operating Capital Outlay	20,000
Expenses	10,000
TOTAL	$ **70,000**

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CONTENTS OF APPENDICES*

A. Florida Aquatic Preserve Act of 1975 (§ 258.35-258.46, F.S.)

B. Administrative Rules for Florida's Aquatic Preserve (§ 18-20, F.A.C.)

C. Administrative Rules for Florida Sovereignty Submerged Lands Management (§ 18-21. F.A.C.)

D. Legal Description of Wekiva River Aquatic Preserve.

E. Plant and Animal Species List * Copies of the above

appendices may be obtained from:

Bureau of Land and Aquatic Resource Management
Department of Natural Resources
Cedars Executive Center, Suite 232-B
Mail Box 21, 2639 North Monroe Street
Tallahassee, Florida 32399