Loxahatchee River

National Wild and Scenic River Management Plan

PLAN UPDATE

JUNE 2000

Florida Department of Environmental Protection
South Florida Water Management District

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CHAPTER I

INTRODUCTION

Rivers have always held a special importance and fascination for man. In the earliest days, interest in rivers centered on the more material things; a source of water, a means of transportation, a habitat of edible fish and fowl, and wastewater disposal. While these may still be important for modern man, rivers today have assumed yet another dimension in their ability to serve a wide variety of natural resource preservation and outdoor recreation needs. Whether for scientific research, education, boating, fishing, canoeing or simply marveling at the handiwork of nature, rivers and streams in all their diversity constitute one of the most valuable of natural resources.

But rivers, like most things in nature, are susceptible to drastic change at the hands of humans. They may be bridged for highways, dammed for hydroelectricity, dredged for navigation and canalized for water control. Their banks may be cleared and their attendant marshes and swamps drained or filled for development. While much of this change, good and bad, may be inevitable as a side-effect of human growth and activity, it is unfortunately true that most of it diminishes the biological and recreational potential of affected rivers. Unquestionably, the most serious consequence of such change is the irretrievable loss of aesthetic and wilderness qualities of the state's rivers and streams.

Because of their extreme importance as irreplaceable resources, Florida's remaining largely natural streams should be protected to the extent feasible from further human encroachment. The federal Wild and Scenic Rivers Program was created as one means of affording such protection through implementation of river preservation and enhancement programs. Such a program for the protection and preservation of the Loxahatchee River in southeastern Florida is set forth in the following plan update.

WILD AND SCENIC RIVERS PR0GRAM

The federal Wild and Scenic Rivers Program was established under the authority of Public Law 90-542, the Wild and Scenic Rivers Act of 1968 as amended (Addendum 1). The program was conceived as a means of preserving selected free-flowing rivers in their natural condition and protecting the water quality of such rivers. The National Wild and Scenic Rivers System was initially composed of eight rivers designated in P.L. 90-542. Subsequent amendments to the Act and administrative actions by the Secretary of the Interior pursuant to the Act have increased the number of rivers or segments of rivers in the system to 162 by 1997. The Suwannee River was the first river in Florida to be studied as a potential addition to the national system under the Act. It was subsequently recommended for inclusion in the system by the federal Bureau of Outdoor Recreation as a State-administered river but was never formally designated due to a lack of funds for land acquisition and management personnel.

The Wild and Scenic Rivers Act provides two basic options for obtaining designation of rivers as elements of the national system: designation by Congress, and designation by the Secretary of the Interior. Under the option of congressional designation, Congress designates the river and assigns responsibility for administering the river to an appropriate managing agent. The managing agent is required to develop a detailed management plan for the river within one year following designation. Generally, Congressional designation has been reserved for cases when federal lands are involved or when federal funds are appropriated for acquisition or management of the designated river.

Under the option of secretarial designation under section 2(a)(ii) of the Act, two basic requirements must be met. First, the river must be designated as a "wild, scenic, or recreational river" by or pursuant to an act of the applicable state legislature. Second, the river must be permanently administered as a wild, scenic or recreational river by an agency or political subdivision of the State. If these two conditions are met, the Governor of the state may apply to the Secretary of the Interior for administrative designation of the river as a component of the national system. It was within these guidelines that the Loxahatchee River was federally designated as the first Wild and Scenic River in Florida. Designation occurred on May 17, 1985. To date, the Loxahatchee River remains the only federally designated river in Florida.

PLANNING AUTHORITY

Specific authority for the development of a wild and scenic river management plan for the Loxahatchee River is provided by Chapter 83-358, Laws of Florida (Addendum 2). This legislation directs the Department of Environmental Protection (FDEP) and the South Florida Water Management District (SFWMD) to develop a plan to provide for the permanent protection of the river and to qualify the river for inclusion in the National Wild and Scenic River System. Section 83-358.5(2) provides for the involvement of other local, state and federal agencies and organizations in the plan development process. Specific criteria and conditions to be included in the plan are found in Section 83-358.5(3). Section 83-358.8 authorizes the FDEP and the SFWMD to develop procedures for periodically modifying or amending the plan.

PLAN DEVELOPMENT

Public awareness of the environmental problems of the Loxahatchee River began more than 30 years ago through the efforts of public officials, conservation groups, and individual citizens. These efforts led to the inclusion of the river's North and Northwest Forks in the National Parks and Recreation Act of 1978, which authorized the study of several rivers as potential additions to the National Wild and Scenic Rivers System. In 1984, the National Park Service published a final report on the Loxahatchee's eligibility for national designation. The results of that report provided important direction for subsequent planning and management of the river. The study concluded that the Northwest Fork was eligible for designation and recommended that it be managed as a State-administered component of the national system. The study also delineated the segment of the river to be considered for designation and established the management criteria and standards required for designation.

In 1983, the FDEP (then Florida Department of Natural Resources) established an interagency planning committee to assist the FDEP and the SFWMD in the development and review of a river management plan.

A broad spectrum of public agencies and private organizations at all levels were asked to participate in the activities of the committee, including the following:

Palm Beach County
Martin County
Jupiter Inlet District
Town of Jupiter
Village of Tequesta
Loxahatchee River Environmental Control District (aka. Loxahatchee River District)
Florida Department of Environmental Protection
Florida Department of Community Affairs
Florida Game & Fresh Water Fish Commission
Florida Department of Agriculture & Consumer Services
Florida Department of State, Division of Archives, History & Records Management
Florida Department of Transportation
Florida Division of Forestry
Treasure Coast Regional Planning Council
South Florida Water Management District
South Indian River Water Control District
Northern Palm Beach County Improvement District
Save the Loxahatchee River Coalition
Palm Beach County Farm Bureau
U.S. Fish & Wildlife Service
U.S. Geological Survey
National Park Service

Representatives from these agencies and organizations provided input to the FDEP and the SFWMD for the development and update of this management plan. Information was collected on a variety of topics, including natural and cultural resources, water quality and quantity, carrying capacity, public access and use of the river, resource management strategies, and demographic and economic considerations. Local governments provided input concerning their activities in the Loxahatchee River area and any potential impacts that designation of the river might have on their ongoing activities. The recommendations

contained in this plan are a direct result of the advice and assistance received from this interagency committee.

Since the completion of the original management plan in 1985, oversight of plan implementation and management has been provided by the Loxahatchee River Management Coordinating Council as provided in Chapter 83-858, Laws of Florida. This FDEP/SFWMD 2000 update of the Loxahatchee River Wild and Scenic River Management Plan has been reviewed by the Coordinating Council.

CONTENTS OF THE PLAN

The information presented in this plan is organized on a chapter basis. Each chapter of the plan corresponds to a particular aspect of the management program.

Chapter II provides an overall assessment of the natural and cultural resources of the Loxahatchee River area, with emphasis on the wild and scenic river corridor. This chapter discusses the river's drainage system, geology, water quantity and quality in the river, vegetative communities, fish and wildlife, archaeologic and historic features, land use, and land ownership.

Chapter III describes the existing access and use facilities which support public enjoyment of the river. This chapter also analyzes the patterns of recreational use which have been observed on the river during the ten years since the corridor was designated. It also identifies and discusses the various factors considered in determining a suitable carrying capacity for canoeing on the river and presents the plan's guidelines concerning maximum levels of canoeing on the river. Current use levels are compared with the management criteria.

Chapter IV summarizes the local, state and federal authorities on which this river management program is based.

Chapter V presents a comprehensive plan for management of the Loxahatchee River Wild and Scenic corridor. This plan is based upon the resource issues identified in Chapter II, the use issues presented in Chapter III, and the specific authorities described in Chapter IV. This chapter also includes the major sources of policy direction and guidance for this river management program. It contains the specific goals, objectives and strategies that must be implemented, as of 1998, to provide permanent protection of the Loxahatchee River's natural and scenic resources.

Chapter VI is the implementation program of the plan. It summarizes specific tasks to be accomplished, task responsibility, and target timelines. This chapter also describes the role of the Loxahatchee River Management Coordinating Council.

Chapter VII is a summary of accomplishments during the first fifteen years (1985-2000) since the Loxahatchee River was designated as a component of the National Wild and Scenic River system. It describes those tasks identified in the original management plan which have been completed.

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CHAPTER II

RESOURCE DESCRIPTION AND ASSESSMENT

LOXAHATCHEE RIVER WATERSHED

The Loxahatchee River watershed covers an area of approximately 200 square miles. The watershed includes both the Northern portion of Palm Beach County and the Southern portion of Martin County. Within this geographic region, seven general drainage basins, varying in size from seventeen to one hundred square miles, transport runoff to the three forks of the Loxahatchee River (FIGURE 1). The Northwest Fork of the Loxahatchee River is the largest of these three tributaries, and includes the area designated as a component of the National Wild and Scenic River system.

The Loxahatchee Wild and Scenic Study/Environmental Impact Statement conducted by the National Park Service contains an assessment of the natural and cultural resources of the Loxahatchee River. More recent studies conducted by various agencies and levels of government have also analyzed these resources in detail. This chapter provides an overview of the natural and cultural resources of the Loxahatchee River described in these studies, and summarizes key management issues addressed later in this management plan.

DESCRIPTION OF THE RIVER CORRIDOR

The federally designated Wild and Scenic Corridor lies along the middle portion of the Northwest Fork of the Loxahatchee River (FIGURE 2). This fork extends

Figure 1

Loxahatchee River Watershed

Figure 2

Loxahatchee River Corridor Classifications

from its headwaters in the Loxahatchee and Hungryland Sloughs downstream to its merger with the other two tributaries near Jupiter Inlet.

The Loxahatchee and Hungryland Sloughs surface water levels and flows have been altered by an extensive network of regional drainage canals and dikes. From its origin in these Sloughs, and continuing downstream approximately four miles to Indiantown Road, the Northwest Fork has been straightened and canalized - first by the SFWMD's C-18 canal which flows north out of the Loxahatchee Slough and then by the SIRWCD's C-14 canal that receives inflows from a series of smaller canals and drainage ditches.

The C-14 canal finally terminates where the river's natural meander pattern begins about 1/2 mile south of Indiantown Road. The river's designated 'Recreational' segment begins at this point and extends north to Indiantown Road. This segment is within the 600 acre Riverbend County Park (RCP) which will be developed to serve as the southern anchor and access point to the Wild and Scenic Corridor. North of the Indiantown Road bridge (State Road 706), the river enters Jonathan Dickinson State Park (JDSP) and turns northeasterly into a closed canopy of cypress swamp. This is Segment 2 of the corridor which is designated as 'Scenic'. The channel is still narrow at this point, and its sinuous, meandering course offers a challenging and interesting journey through the largely pristine river swamp. Bald cypress trees dominate in this reach of the river. The most mature of these trees range from 300-500 years old. Species diversity in the under story is high due to the overlapping of tropical and temperate vegetation communities. There are several small cabins maintained by the JDSP staff along this reach of the river, but these do not constitute a major intrusion on the natural scene. Land use beyond the river swamp vegetation corridor is primarily agricultural and low density housing, but little evidence of this is visible from the river.

The first major intrusions on the natural scene are the parallel Florida State Turnpike and Interstate 95 highway crossings. Beyond these road crossings, Segment 3 begins. This reach, approximately a mile long, is designated as 'Wild'. Here the river turns in a northerly direction and is once again characterized by a pristine cypress river swamp environment. There are no significant man-made intrusions between the I-95 highway and the Trapper Nelson Interpretive Site. FDEP manages the site, an early resident's homesite, as an interpretive center which is accessible to the public only by boat.

Downstream of the Trapper Nelson Interpretive Site, the character of the Northwest Fork undergoes a dramatic transition as it enters Segment 4 and is once again designated as 'Scenic'. The river widens and there is no longer a closed cypress canopy overhead. The cypress community gives way to a tidally-influenced mangrove system. The main channel is joined by Cypress Creek, Kitching Creek, and several smaller tributaries which swell the volume of the river.

The river leaves JDSP, and the designated Wild and Scenic corridor, at approximately River Mile 6.0. Once outside JDSP, the shoreline is typically lined with single-family homes downstream to the central embayment where all three tributaries merge. The last mile to Jupiter Inlet is a mixture of multi-family and commercial land uses along both shorelines, with the notable exception of the historic Jupiter Lighthouse and surrounding US Coast Guard/Bureau of Land Management property.

GEOLOGY

The geologic formations underlying the area of the Loxahatchee River form two aquifers separated by confining beds. A shallow, non-artesian aquifer known as the Surficial

Aquifer is composed of permeable Pamlico sand, Anastasia limestone, shell beds, and Caloosahatchee marl. While this aquifer is the primary source of potable water, the water bearing qualities of this aquifer vary widely throughout the area. The bottom of the shallow aquifer is generally about 180 feet below the land surface.

The second aquifer, the Floridan Aquifer, is separated from the Surficial by several hundred feet of impermeable clay, and extends to depths of about 1500 feet. This aquifer contains water under sufficient pressure to flow to the surface. In the Loxahatchee River area, the aquifer is composed of limestone of the Hawthorn, Tampa, Suwannee, Ocala and Avon Park Formations, ranging in age from 30 to 60 million years. This aquifer is hydrologically isolated from the Surficial Aquifer, and contains moderately high salt concentrations. It can be used for potable drinking water supply only with desalinization treatment.

LAND USE

Land Use in the Drainage Basin

Much of the Loxahatchee River watershed remains undeveloped (FIGURE 3). Wetlands comprise a large portion of the river's upper watershed and a total of one-half of the drainage basin's 200 square miles. Urban areas and areas committed to urban uses make up one-quarter of the basin. The large agricultural and forested upland areas in the northern portion of the basin collectively comprise another one-quarter of the basin.

Land in the river's watershed has most typically been converted to urban uses. The extreme southeastern section of the basin along the eastern edge of Loxahatchee Slough is one of the fastest developing areas in the basin. Another major area of land development is located in the central portions of the basin, both east and west of C-18. Jupiter Farms, located west of the Loxahatchee River and south of Indiantown Road, is one example of the type of land development activity that has occurred in this portion of the basin.

Figure 3

Current Generalized Land Use / Land Cover in the Loxahatchee Slough Watershed

This 9,000-acre subdivision was platted in the 1920s and consists of parcels generally ranging in size from one to five acres.

When completed, the project will contain over 4,600 dwelling units and a population of more than 11,000 residents. Since the area was subdivided before current water quality regulations were in effect, the area does not have modern provisions for the retention of surface water runoff. A third area undergoing urbanization, and perhaps the one with the greatest potential for directly affecting the river, is the area north of Indiantown Road, bordered on the west, northwest, and east by the Northwest Fork. Existing land use activity is predominately agricultural, with most of the land in pasture or pine flatwoods. Major developments have been proposed, or approved, in this area.

Land Use In The Corridor Area

Land use patterns in the immediate vicinity of the Northwest Fork are similar to those throughout the rest of the drainage basin (FIGURE 4). Wetlands are characterized primarily by extensive areas of pine and wet prairie, by the cypress swamp, and by mangroves.

Agriculture accounts for approximately 23 percent of the land use in the vicinity of the Northwest Fork. Croplands, consisting mainly of truck farms, were until quite recently, located along either side of the middle segment of the river. In most cases, these areas are separated from the river corridor by a band of pine and scrubby flatwoods. Orchards and groves predominate in the northwestern sections of the river area. Several old small citrus groves are located in the Indiantown Road area within approximately 250 feet of the river. Improved pasture comprises a portion of the agricultural land cover east of the Florida Turnpike/I-95 highway corridors.

Figure 4

Current Generalized Land Use / Land Cover Within One Mile of Corridor

Developed areas and areas that are committed to urban uses are scattered throughout the eastern and southern portions of the mapped area, primarily in the areas south of JDSP and south of Indiantown Road.. A small community shopping center is located 0.2 miles west of the river on Indiantown Road.

Land Use Planning and Regulation

Local land use planning and regulatory authority in the immediate vicinity of the river is shared between Palm Beach County, Martin County, and the Town of Jupiter. In general, land use regulatory techniques have been successful in preventing development in areas where direct adverse impacts on the natural and scenic qualities of the river would result. Zoning and other police power applications are the tools most commonly used to regulate development. Although most of the privately owned land in the basin area is zoned to permit land development of some type, allowable densities immediately adjacent to the river are generally low.

Palm Beach County

The Palm Beach County Comprehensive Plan identifies the Loxahatchee River as an "Area of Particular Concern" to be preserved in its natural state. County subdivision regulations provide two processes for approval of subdivision plans. The first process is applied in cases when the applicant demonstrates that the proposed activity satisfies standard subdivision requirements. The second process is utilized for evaluating applications for Planned Unit Developments (PUDs) and other cases when an applicant seeks an exception or exemption from standard criteria relating to density, drainage, or similar requirements. In the latter process, some of the standard requirements may be waived in lieu of negotiation of

the conditions for approval. In these cases, the County may require the applicant to meet certain performance criteria, such as higher-than-standard building setbacks from wetlands and other environmentally sensitive areas, as a condition of approval. This process has been effective in directing land development activities away from the river corridor area.

Special regulatory protection is provided for the Loxahatchee Slough. Development adjacent to the Slough is subject to special performance standards and a review coordination process. The Slough is designated as a "Conservation Area" and is zoned to permit development related directly to agricultural uses. Nevertheless, owners of property in this area may transfer a density allotment of one dwelling unit per 5 acres to other property within the Palm Beach County Urban Service Area to compensate for the loss of the right to develop their land for residential purposes. In 1997, Palm Beach County purchased more than 10,000 acres within the Slough for preservation under their Environmentally Sensitive Lands program. The Slough's southern extension (outside of the river's drainage basin) is the City of West Palm Beaches' Water Catchment Area, a principal storage area for municipal water supplies.

Martin County

The land use regulatory methods utilized by Martin County are similar in many respects to those of Palm Beach County, however several important differences exist. All development is prohibited in areas with wetland soils. In addition, a requirement for a 50-foot shoreline protection zone has been established in ecotonal areas adjacent to saltwater wetlands. No site alterations, including filling, grading or dredging, are permitted upland from the mean high water line in these buffer areas. Further, when subdivision approval or zoning exceptions are sought for activities in the vicinity of Cypress Creek, Kitching Creek, or the Loxahatchee River, an application review process is used to require mitigation of

adverse effects on water quantity and quality. If Planned Unit Development approval is sought, county regulations provide for the transfer of up to one-half of the permitted density for that portion of the property having wetland characteristics.

Town of Jupiter

All wetlands and environmentally sensitive areas within the Town of Jupiter, especially those subject to flooding, are classified as "Conservation Areas" in the Town's comprehensive plan. The plan discourages development in these areas, but there is no ordinance in effect to enforce compliance.

CORRIDOR LAND ACQUISITION

Approximately 4.8 miles of the 7.5-mile river segment were in public ownership at the time the river received the Wild and Scenic designation. These public lands included 4.25 miles of riverfront land in the then JDSP, approximately 0.5 mile of riverfront land in RCP, and approximately 750 feet of land along the west bank of the river North of Indiantown Road owned by the Town of Jupiter. The original (1985) Loxahatchee River National Wild and Scenic Management Plan proposed the public acquisition of the remaining 2.7 miles.

As of 1995, all targeted lands within the designated river corridor have been acquired. The SFWMD, under the Save Our Rivers program, has acquired 1461 acres from the major landowners. The largest parcel, over 900 acres along the central river corridor, was acquired from the MacArthur Foundation. Five smaller parcels were acquired by the SFWMD with the assistance of special condemnation legislation passed by the Florida Legislature. The last component, the Gildan Tract, was acquired by the SFWMD in 1994.

Therefore, as of 1995, the entire designated Wild and Scenic river corridor is in public ownership. Boundaries of the corridor are shown in FIGURE 5.

An additional 367 acres adjacent to the designated river corridor were acquired by Palm Beach County in 1995. These lands (FIGURE 5), acquired due to their environmental sensitivity, will be considered for possible addition to the designated Wild and Scenic corridor.

HYDROLOGY

Water is the most essential component of the Loxahatchee River ecosystem. Clean fresh water of sufficient quantity and appropriate periodicity is essential in maintaining the area's scenic qualities and diverse native plant communities and wildlife populations. Human alterations to the river's natural drainage patterns have reduced the quantity and quality of water in the river, and these changes have contributed to corresponding declines in the river's natural and scenic qualities.

In its natural condition, the Loxahatchee arose in the Loxahatchee and Hungryland Sloughs near West Palm Beach. Historically, this area was characterized by swampy flatlands interspersed with small, often interconnected ponds and streams that produced a sheet flow toward the north. Drainage patterns were determined by the poorly defined natural landforms of the area. The major features that presently influence drainage in the river basin are Canal 18 (C-18), the Florida Turnpike, I-95, and State Road 710 (which act as important subbasin divides), and the extensive systems of secondary canals developed by special drainage districts and landowners within the basin (FIGURE 6).

In 1973 the USGS published in a report entitled The Loxahatchee - A River in Distress, Southeast Florida. The study concluded that the primary cause of environmental

Figure 5

Proposed Addition to the Wild and Scenic Corridor

Figure 6

Loxahatchee Slough Area

problems facing the river was the upstream movement of salt water. The study attributed changes in the flora and fauna in Jonathan Dickinson State Park and other portions of the river to this cause. Data on salinity and rate of freshwater flow indicated that a minimum continuous flow of 23,000 gallons per minute, or 50 c.f.s across the Lainhart dam., was required to retard further upstream movement of salt water in the Northwest Fork under the drainage and development conditions that existed at the time of the study. This assumed that flows from other contributing tributaries would provide another 90 cfs such that the total NW fork flow would be 130 cfs below Kitching Creek.

Much of the reduction in flow observed by the USGS has been attributed to the diversion of historic NW fork flows due to construction of the C-18 canal. The C-18 drainage system is the most prominent feature in the Loxahatchee River basin. The C-18 was constructed in 1958 as part of the Central and South Florida Flood Control Project to improve drainage and flood protection for adjacent agricultural, residential, and industrial land and the J.W. Corbett Wildlife Management Area. This system drains a 106 square-mile area (more than 50 percent of the river basin), and empties into the Southwest Fork through control structure S-46. The C-18 is of particular significance because it: 1) drained the Loxahatchee Slough; and 2) redirected the historic flows from the Slough to the Northwest Fork into the Southwest Fork of the Loxahatchee River. The other major drainage system in the Loxahatchee River basin is maintained by the South Indian River Water Control District (SIRWCD). It lies west of C-18 in an area known as Jupiter Farms. This area has been subdivided and sold as residential tracts ranging in size from one to five acres. Drainage occurs through a series of seven east-west collector canals into Canal 14 (C-14), a North-South canal administered by SIRWCD. The C-14 discharges directly into the Northwest Fork just South of the bridge at Indiantown Road.

The main stem of the Loxahatchee River, fed by C-l4, is the primary source of flows to the Northwest Fork during most periods of the year (TABLE 1). On the average, this component accounted for 40 percent of the total discharge to the Northwest Fork during the period 1980-1982. On a monthly basis, however, discharge from this source ranged from as low as 28 percent to as high as 72 percent of the total discharge. In an attempt to restore the historic flowage between the Loxahatchee Slough and the NW fork, flows may be diverted from SFWMD's C-18 (which drains the Slough) to the SIRWCD C-14 (which leads to the NW fork). A SFWMD water control structure known as G-92 was constructed to recreate the connection severed by the construction of local drainage works. Originally a small culvert, this structure was enlarged to convey up to 130 cfs in 1975. In 1987 it was replaced by a gated control structure capable of passing up to 400 cfs in either direction. This structure is operated via remote telemetry from the SFWMD Operations Control Room, and is operated under a joint agreement with the SIRWCD to permit conveyance of environmental flow to the Northwest Fork. It also functions to convey excess water from SIRWCD into the C-18 during extreme storm events.

The operation schedule for G-92 is important to the river management program because of its role in determining water flows in the NW Fork. Water is discharged from C-18 through the diversion structure depending on the relationship between water levels in C-18 and in the Northwest Fork at Indiantown Road. Water is diverted to C-14 when (1) flows in C-14 fall below 50 c.f.s; and (2) when levels in C-18 exceed 12.5 feet above sea level (normal canal stage is 15.0 feet). As shown in FIGURE 7, minimum flow discharges to the Northwest Fork have increased significantly since the operation of G-92 began. This is partially because of higher rainfall amounts, but also because C-18 has been maintained at higher levels, and because water levels at Indiantown Road have been

Table 1

Average Freshwater Inflow into the Northwest Fork from Major Tributaries for Selected Periods During 1980-82

Figure 7

Northwest Fork Flow Across Lainhart Dam

improved due to the reconstruction of Lainhart and Masten Dams, two small weirs located respectively about 0.1 mile and 1.2 miles downstream of Indiantown Road. Erosion of these weirs, along with canal construction in the basin, probably increased historic drainage in the area, thus contributing to increased discharges into the river and subsequent over-drainage and loss of base flow. Since C-18 has virtually no capacity to store water for prolonged controlled discharge, supplemental discharges may be terminated during prolonged dry periods. While the installation of G-92 has significantly moderated the effects of drought conditions on water flow in the NW Fork, it has not completely achieved the goal of a guaranteed minimum flow of 50 cfs (a stage of 10.9 feet at the Lainhart dam) to preserve the freshwater character of the river. Restoration of more historic water levels in the Loxahatchee Slough, which could then sustain longer baseflow discharges to the Northwest Fork during drought, is the next step toward achieving the baseflow objective. Palm Beach County has recently acquired 10,389 acres within the Loxahatchee Slough as a component of the Palm Beach County's Environmentally Sensitive Lands Acquisition Program. (FIGURE 6) A plan for hydrologic restoration of the Slough and flow enhancement to the NW fork is currently being developed.

Cypress Creek is another significant source of surface water to the Northwest Fork, particularly during periods of low flows. This tributary enters the river from the West, just downstream from the Trapper Nelson Interpretive Site in JDSP. Discharges from Cypress Creek are normally less than those from the Loxahatchee River at Indiantown Road. During the period 1980-1982, Cypress Creek discharged an average of 35 percent of the total tributary discharge to the Northwest Fork.

Cypress Creek is an outlet for an extensive network of agricultural canals, draining an area of about 4,500 acres, maintained by the Hobe-St. Lucie Conservancy District. The first portion of the Cypress Creek subbasin, however, is composed of

undeveloped wet prairie. These undeveloped areas are experiencing reductions in water levels due to canalization, but still act as an important freshwater reservoir for Cypress Creek and the Northwest Fork. In 1995, Palm Beach County acquired 367 acres near Cypress Creek as part of their Environmentally Sensitive lands program. This acquisition, and more importantly the Pal Mar wetlands acquisition, plus the concurrent modification of adjacent agricultural practices to improve on-site water management, will result in some improvements to the subbasin hydrology.

Hobe Groves Canal, which enters the river at approximately River Mile 9.0 and drains large agricultural areas east of the Florida Turnpike, averaged less than eight percent of the discharge to the Northwest Fork during the 1982 USGS study.

Kitching Creek, which originates in an area of scattered ponds and marshes both north of, and within, JDSP, provided an average of 4.1 percent of the discharge during the 1982 USGS study . Its drainage basin is the least developed of all the major tributaries of the Northwest Fork and allows for a high degree of water retention.

In addition to flows coming in from upstream via the C-14 canal, the segment of the NW Fork between Indiantown Road and the Florida Turnpike/I-95 receives an average of nearly 12 percent of its total flow from several small unnamed tributaries within this reach.

WATER QUALITY

Over the last two and one-half decades, the surface waters of the Jupiter Inlet - Loxahatchee River have been extensively sampled and analyzed for water quality. In the 1970's and 1980's, the United States Geological Survey provided a water quality monitoring presence from the federal perspective. The FDEP and the SFWMD each sponsored monitoring programs from the state and regional perspective. On the county and local level, the Palm Beach County Health Department, and Palm Beach County Department of

Environmental Resources Management, and the Loxahatchee River District also monitored water quality.

Since 1992, the Loxahatchee River District (LRD) has assumed responsibility for comprehensive monitoring in the watershed, monitoring 29 stations twice each month. In recent years, additional monitoring stations have been added.

In the early 1990's, the LRD, in cooperation with a technical advisory committee comprised of representatives of other monitoring efforts, organized the existing water quality data by collecting and screening all prior data. A common database was established, and the data presented in a format which could be indexed, composited, and compared to Florida State values and standards. The resultant information was further organized by dividing the Loxahatchee watershed into 29 sample locations in four ecological segments (Marine, Estuarine, Wild and Scenic, and Freshwater Tributaries). Five time-groupings covering 22 specific water quality parameters were developed. This summary was presented to the Loxahatchee River Management Coordinating Council in 1995.

As specifically relates to the Wild and Scenic portion of the Loxahatchee, seven reaches or groups of stations have been monitored over the years. Additionally, six sampling sites are located in the freshwater tributaries flowing into the designated corridor. FIGURE 8 shows the applicable water quality sampling sites.

In general terms, the sampling results show that the water quality of the freshwater tributaries discharging to the wild and scenic corridor have remained fair for the period of record 1970-1993. The trend is for an overall decline in water quality in inflows over time. The wild and scenic river corridor also graded fair for the first portion of the monitoring period, then improved to good in the mid-1980's. The major reason for the improvement, and apparent inconsistency with the declining quality of input waters, is

Figure 8

Loxahatchee River Water Quality Sampling Sites

believed to be the increased flows to the NW fork from the SFWMD C-18 canal. The quality of water in the C-18, a Class I waterbody (TABLE 2), has rated superior to the other freshwater inputs and has not shown significant degradation over time.

Comparison of the long-term composite values for the Loxahatchee River Wild and Scenic corridor with typical Florida stream water quality values (as documented by FDEP) yields the following conclusions:

* The clarity of the river water is near the statewide mean
* The dissolved oxygen concentrations are low, ranking below about two-thirds of the other streams in Florida
* The organic content of the waters is moderately better than statewide averages
* The trophic status, predominantly nutrient concentration, is slightly better than values for other streams
* The biological integrity of the Wild and Scenic reach is on the low sides of the state mean, with six out of ten State streams displaying better results
* The bacteria counts are substantially higher than the state standard, ranking ahead of only about 30% of other streams

The Florida Water Quality Index for several thousand Florida stream sampling sites averages 43. The statewide index considers ratings of 45 or below as good, while ratings above 45 are considered fair. The 24-year average for the Wild and Scenic corridor is 48, however the index number for the period since 1985 has improved to 43. A station-to-station comparison of the river shows long-term water quality in each reach to display an index number near the mid-40's with three exceptions. The reach above Indiantown Road, and the reach near the Trapper Nelson Interpretive Site both have index numbers at, or above, 50. These numbers are in the fair range, but more closely approximate poor. Flows entering from the C-18 canal have a composite index number of 40, which is very good.

Table 2

Loxahatchee River Water Quality Classifications

A summary of the Loxahatchee River District Wild and Scenic Corridor Water Quality Index Trend since 1985 is presented in FIGURE 9.

PLANT COMMUNITIES

The principal wetland plant communities in the vicinity of the river corridor are freshwater cypress and saltwater-tolerant mangrove swamps (FIGURE 10). Low pine flatwoods and scrubby flatwood communities occupy the slightly higher elevations bordering the floodplain. Other vegetation communities found in the area include sandhill, dome swamp, hydric hammock, strand swamp and wet prairie. The cypress swamp community solidly flanks the river and its tributaries upstream from the Trapper Nelson Interpretive Site, and is the dominant species to for a half-mile below the site . This community is composed of bald cypress, southern red maple, cabbage palm, pop ash, pond apple, laurel oak and water hickory. Shrubby species mixed among the taller vegetation include cocoplum, wild coffee, myrsine, and buttonbush. Vines, ferns, bromeliads and orchids also are characteristic of this community.

The mangrove community solidly lines the NW fork from one-half mile downstream of the Trapper Nelson Interpretive Site. Red mangroves front directly on the river where they will be most fully exposed to tidal flows. Dead cypress trees tower above the red mangroves for one or two miles downstream from this point, evidence of the extent of freshwater vegetation that existed before changes in the upstream movement of salt water. Somewhat removed from the river channel but near enough to be inundated at high tide are white mangroves.

The low pine flatwood community is dominated by widely scattered South Florida slash pine. The slightly elevated, level sandy areas in which this plant community

Figure 9

Water Quality Index Trend Wild and Scenic River Segment

Figure 10

Wild and Scenic Corridor Plant Communities Within Jonathan Dickinson State Park

are found lack the soils and drainage conditions necessary to support the type of dense understory found in the floodplain. Vegetation is typically shrubby in nature, and includes the saw palmetto, gallberry and fetterbush. Ground cover vegetation includes wiregrass, broom sedge and various herbacious species.

Scrubby flatwoods typically occupy the elevations above the pine flatwoods and alongside the floodplain. The sandy soil is usually several feet deep and drains rapidly even under extremely wet conditions.. The dominant species is the South Florida slash pine, as in the pine flatwoods community, but the understory is characterized by scrub oak and other scrub vegetation.

The principal problem affecting the river's plant communities is the gradual reduction in the number and geographic extent of healthy bald cypress in the floodplain and their replacement by mangroves. Virtually all of the cypress in the lowermost area of the Wild and Scenic river segment are now dead, and are not reproducing, as are the majority of cypress below Kitching Creek. Above Kitching Creek, the number of live trees increases with increasing distance up the river.

An analysis conducted by the U.S. Geological Survey between 1979 and 1982 further documented the extent of environmental stress in the cypress trees along the Loxahatchee River corridor. The study examined core samples to identify changes in tree ring width and quality. The results of the study indicated that although all of the trees sampled had experienced stress at periodic intervals over their life histories, the proportion of stressed trees in the downstream section (below river mile 9.0) increased from 30 percent in 1940 to 80 percent in 1982. Stressed trees above River Mile 9.0 decreased from 11 percent to 3 percent during the same period. Further, the study found a high correlation between the incidence of growth stress and high salinities in surface water and soils.

Based on this study, and the other available research, it is evident that the decline of cypress in the river is attributable to the upstream movement of salt water. Occasional inundation by saline surface water probably does not result in serious or long term effects. Frequent inundation, however, gradually increases the salinity of the floodplain's peat soils. Since these soils are not readily flushed, the resulting stress gradually spreads to more and more trees. Attempts to identify the principal cause of saltwater intrusion, and to make precise correlations between stress periods and the dates of known events likely to have affected tree growth, have been inconclusive. Nonetheless, three causes have been identified as contributing factors: (l) insufficient flows to the NW fork; (2) dredging activities in the river's estuary and in Jupiter Inlet; and (3) the drawdown of groundwater levels by wells in the Jupiter-Tequesta area. Each of these factors must be addressed if the deterioration of the river's cypress communities is to be reversed.

FISH AND WILDLIFE

The combination of climate, vegetation, and water bodies in the Loxahatchee River area has resulted in a high diversity of animal species. In 1965, two hundred sixty-seven species, consisting of 169 genera and 78 families were observed in and along the river and its estuary.

Invertebrate and vertebrate aquatic animals are numerous in the marshes, lakes and streams in the river area. Freshwater fish include largemouth bass, speckled perch, bluegill, shellcracker, redbreast, warmouth, bowfin, gar, channel catfish and many species of minnows. The manatee, an endangered aquatic mammal, frequents the Loxahatchee River

estuary. Numerous turtles also live in and around the river. Saltwater fish include snook, tarpon, mullet, bluefish, jack, sheepshead, drum, sand perch, grouper, snapper and flounder. Mammals and birds are frequently encountered along the riverbank. The more commonly seen species include raccoon, opossum, whitetail deer, osprey, barred owl, egrets, herons and ibis.

The area surrounding the Northwest Fork is inhabited by numerous vertebrate species identified as endangered, threatened or of special concern by the Game and Fresh Water Fish Commission, or listed as threatened or endangered by the U.S. Fish and Wildlife Service (TABLE 3). In addition, the entire Loxahatchee River has been designated by the U.S. Fish and Wildlife Service as a critical habitat for the West Indian manatee.

Additional species, although not identified on the official lists compiled by the State of Florida, may be identified as being either endangered, threatened or of special concern by the Florida Committee on Rare and Endangered Plants and Animals. The threatened osprey nests in dead cypress trees in the lower Northwest Fork. The great egret, the black-crowned night heron and the yellow-crowned night heron, classified as Species of Special Concern, are also found in the Loxahatchee River area.

ARCHAEOLOGICAL AND HISTORICAL RESOURCES

Cultural resources serve to portray the extent to which man has influenced the Loxahatchee River area historically. Man has left his imprint on the area as evidenced by the area's rich history and the archaeological resources that exist in the area. The geographic location of the river with its outlet to the Atlantic Ocean through Jupiter Inlet has drawn inhabitants to the area since it was first occupied by early Indian tribes. Through the years, the beauty of the area has continued to attract residents and tourists alike.

Table 3

Endangered Species, Threatened Species, and Species of Special Concern for the Loxahatchee National Wild and Scenic River and Jonathan Dickinson State Park

Table 3 (continued)

Endangered Species, Threatened Species, and Species of Special Concern for the Loxahatchee National Wild and Scenic River and Jonathan Dickinson State Park

History

Jupiter Inlet has been known by several names throughout its history. Originally, the inlet was known as Hobe or Jobe for a tribe of Jeaga Indians who lived nearby. The English interpretation of Jobe was Jove, which later became Jupiter. The name Loxahatchee originated from the two Seminole words, "Lowchow" meaning turtle, and "Hatchee" meaning river.

By the mid-1830s, Indians who subsequently became known as Seminoles began drifting into north Florida as a result of pressures from white settlers. The Seminoles occupied south Florida during and shortly after the Second Seminole War of 1835-1842, which drove them into the swamps of the Everglades. A battle with the Seminoles took place on January 24, 1838, in a dense hammock bordering the Loxahatchee River near the present Indiantown Road.

General Thomas Jesup marched south with about 1,500 men in search of the Seminoles who had clashed with an amphibious patrol earlier near the river. On January 24, Jesup's column encountered about 300 Seminoles and their black allies at a crossing of the Loxahatchee, some 6 miles above where it discharges through Jupiter Inlet. A brief but savage fight ensued. General Jesup was slightly wounded, seven of his soldiers were killed, and 31 were wounded. The Indians and their allies fought with skill and determination and retired with slight losses. The next day, after a march toward the Inlet, the soldiers erected an enclosure which they named Fort Jupiter, where they remained for a week. This is referred to as "Jesup's Battle" after the commanding officer of the force pursuing the Seminoles. The spelling of the river name was changed from Lowchowhatchee to Lochahatchee by General Jesup in letters he wrote while serving at Fort Jupiter. In later years, the spelling was again revised to Loxahatchee by a barge painter who had difficulty spelling the previous version.

Jupiter Inlet Lighthouse, listed in the Florida Master Site File, was commissioned on March 3, 1853 when Congress appropriated $35,000 for the erection of a first-class lighthouse near Jupiter Inlet. By the time the light was completed in 1859, nearly twice the original $35,000 had been spent. This was mainly due to the high cost of transporting construction materials to the area and opposition from local Indians causing a halt to the project.

During the Civil War, Confederate sympathizers removed the light mechanism and hid it to prevent its use, presumably by the Union navy. Because the lens was impossible to duplicate, the original parts were recovered and used to relight the beacon in June 1866.

Although not listed in the Florida Master Site File, Trapper Nelson's Zoo is located within the boundaries of Jonathan Dickinson State Park. Nelson was born in New Jersey in 1908. Dislike for the bitter northern winters caused Nelson to move to Florida while still in his teens. Because of poor trapping, Nelson abandoned his original beach settlement near Jupiter and moved to a wilderness area on the Northwest Fork of the Loxahatchee River. There he started to develop what was to become a nationally famous zoo after laws restricted him to trapping on a seasonal basis. In 1968, Trapper Nelson was found dead of a shotgun blast. The circumstances of his death remain the subject of conjecture. Following his death, his heirs negotiated a land swap for lands along the Loxahatchee with the state of Florida. His property became a component of Jonathan Dickinson State Park.

Archaeological and Historical Sites

Within the 1990's, a good deal of archeological work has been conducted in and around the lands associated with the Loxahatchee River National Wild and Scenic River (Kennedy, Lewis et al. 1991; Kennedy et al. 1993; Pepe and Kehoe 1992; Kennedy et al 1994; Carr, Steele, Pepe and Spears-Jester 1995; Carr, Spears-Jester, Pepe and Perez 1995; Pepe and Carr 1996a; Pepe and Carr 1996b; Pepe 1996a; Pepe 1996b; Wheeler and Lewis 1997; Pepe et al 1997). As of April 1998 a total of 69 archaeological and historic sites associated with the Loxahatchee River have been identified. Five of these sites are or once were located near the Jupiter Inlet. An additional site is on the North Fork of the River. Two sites, the East Slough Site, and the "Seminole Skirmish Line", have been destroyed by the recent widening of Indiantown Road (SR706) west of the Florida Turnpike. The remaining 61 sites are located on lands associated with the Loxahatchee River national Wild and Scenic River. Of these sites, 22 are managed completely by Jonathan Dickinson State Park and 39 by Palm Beach County Parks and Recreation. One site, Riverbend Park #7, is partially managed by Palm Beach County while other portions of the site are in private hands. Most of the final site the Loxahatchee Battlefield, is managed by Palm Beach County and the state of Florida, while smaller portions are also located on private lands.

Most of the sites associated with the Loxahatchee National Wild and Scenic River are prehistoric. Most are probably seasonal and/or temporary camps located in the hammocks and floodplain swamps bordering the Loxahatchee and its associated streams and

sloughs. Many of these sites can be described as “black dirt middens”. The oldest sites date to the Late Archaic period (3000-750 B.C.) while the most recent sites date to the East Okeechobee IV period (A.D. 1500-1750). However, the vast majority of sites seem to date to the East Okeechobee I period (750 B.C.- A.D. 800).

Archeological and historic investigations conducted in and around the Loxahatchee National Wild and Scenic River over the past few years have also shed important new light on the two battles of the Loxahatchee. This is especially true for recent work conducted by the Archeological and Historical Conservancy during the Indiantown Road widening project and a recent survey of the Northwest Fork (reports in progress). Jesup’s military camp and most of his battlefield can now be fairly safely interpreted as having been on the west side of the Loxahatchee River, mostly in Riverbend County Park, just a little to the north and perhaps a little to the west. The Seminole village can now similarly be interpreted as having been on the east side of the river, on what became the Shunk tract, the Reese Life Estate and/or former Riverbend Trailer Park. Powell’s battle began somewhere around the Eastern Slough of the Loxahatchee and his furthest advance was probably to the aforementioned Seminole village on the east bank of the Loxahatchee Rive. In addition, archival research has demonstrated that the military trail between Ft. Van Sweringen and Ft. Jupiter passed through lands associated with the Loxahatchee National Wild and Scenic River.

Unfortunately it seems that most of the artifacts from and portions of the Seminole and military camps and the two battlefields have been recovered from the periphery of the actual original locations of these sites. The development and other disturbances which have taken place in what is now the Divosta property, Riverbend Park, Loxahatchee River

District property, the original and present Sierra Square, and Indiantown Road have all severely disturbed or destroyed the main portion of Jessup's battlefield and camp, the Seminole village, and probably a good deal of Powell's battlefield as well.

Nonetheless, portions of all these sites and the military trail have been identified and have now all been subsumed under the site name "Loxahatchee Battlefield".

CHAPTER III

PUBLIC USE AND CARRYING CAPACITY

Unlike many rivers in Florida that are popular for outdoor recreation, the reaches of the Loxahatchee included in the Wild and Scenic corridor have relatively limited public access points to the river. Existing access and major facilities that support public use are clustered at each end of the 7.5 mile Wild and Scenic segment, concentrating public use in these areas. Most existing river related recreational uses and major facilities occur within JDSP, but in the future other major facilities will be provided and managed by PBC at RCP. These facilities will be in character with the 'Recreational' designation of the river corridor through RCP, and compatable with the management objectives for the adjacent Scenic and Wild portions of the river corridor. This chapter describes the river's access and support facilities and identifies the patterns of river use within the corridor. It further describes the principle of Carrying Capacity and its application to this Wild and Scenic River.

Existing Access Facilities

Riverbend County Park, (RCP) which includes the SFWMD's Reese and Gildan tracts, and Jonathan Dickinson State Park (JDSP) are the two primary public access areas on the river (FIGURE 2). RCP, located between Indiantown Road and the C-18 canal, comprises more than 600 acres and encompasses the half mile 'Recreational' segment of the river corridor. RCP is readily accessible from Indiantown Road and is the only designated launching point in this plan for canoe trips downriver through the Wild and Scenic Corridor to JDSP. A canoe outfitter, operating as a Palm Beach County concessionaire, is located at RCP.

Prior to PBC's acquisition of RCP the property experienced impacts from agricultural uses and land development along its banks. Major channelization of the river also occured South of Indiantown Road as part of local drainage improvements to the area. PBC is curently in the process of developing a Park Master Plan that will include major facilities for passive recreational use by the public. These include an interpretive center, canoe launch facility, picnicking, camping, and a variety of trails. Work is also underway to restore and enhance disturbed portions of the riverbank within this recreational segment to a more natural condition.

Public access to the river at the downstream end of the Wild and Scenic corridor is available at two points. Both are JDSP boat docks. The first is the primary launching and take-out point for canoeists who rent boats from the park concessionaire. It is also the staging area for river cruises on the 44-foot "Loxahatchee Queen II", operated by the JDSP concessionaire. Restrooms, trails, cabins, and picnicking facilities are nearby. The other facility is located 0.5 miles downriver and consists of a concrete boat dock and ramp. It is adjacent to a developed JDSP campground. This site is used primarily by park visitors who bring their own boats and canoes, but is also used as the take-out point by canoeists completing the trip downstream from RCP.

Several secondary access, or resting, points exist in the river corridor area, but these are relatively insignificant as contributing sources of use pressure. An unimproved site immediately north of the I-95 crossing was used as a rest stop and picnic area by canoeists on the trip from RCP to JDSP. This site was also utilized as a launching point in the past, but overland access has been eliminated. However in recent years, with the improvements to Masten Dam and its portage area, rest stop and swimming use at this site has increased. Another secondary access point is located just downstream of the designated Wild and Scenic river corridor at the Tanah Keeta Boy Scout Camp. The site has no development or

improvements of any kind, and is utilized exclusively as an access and take-out point for the Boy Scouts.

The Trapper Nelson Interpretive Site in JDSP is also used frequently as a rest stop by canoeists coming downstream from RCP. It is also a primary destination for canoeists who paddle upstream from the JDSP concession. The site is also the destination for the "Loxahatchee Queen II" cruises from JDSP. Overland public access to the site is prohibited, so the site does not contribute to the total volume of river use. Restroom, picnicking, and interpretive facilities are located at the site.

Finally, a single private residential access point exists in the 'Scenic' segment of the river corridor near Indiantown Road. This area was acquired for the Wild and Scenic river corridor, however the landowner, who retained lands adjacent to the acquired corridor, was granted continued access across their previous holdings along the river.

USE PATTERNS

The Loxahatchee's natural features and its proximity to the urban areas of Southeast Florida make it exceptionally well suited to provide outdoor recreation. Historically, canoeing has been the main recreational use of the river and its surrounding area, but other activities include kayaking, fishing, nature study, wildlife observation, and motor boating. Motor boating is effectively restricted to the portion of the river downstream from the Trapper Nelson Interpretive Site because of the narrow channel, numerous obstructions, and shallow depth of the upper river. Since virtually all public recreational use of the upper river involves paddling, either as the primary activity or as a means of gaining access to the river area to enjoy other activities, the following discussion is limited to use of the river by paddlers.

The Loxahatchee presents a relatively uncomplicated situation for measuring recreational use because of its limited access and comparatively homogeneous use. To estimate canoeing activity on the river, the FDEP has utilized trip records provided by Canoe Outfitters of Florida, Inc. (the concession operator at RCP), Jonathan Dickinson State Park River Tours. (the concession operator at JDSP), and the Tanah Keeta Boy Scout Camp. In cases when documentation or direct observations of use were not available, the FDEP relied on estimates provided by knowledgeable local experts.

The initial Loxahatchee River National Wild and Scenic River Management Plan stated that canoe usage on the Northwest Fork during 1982-1983, totaled more than 18,500 canoes (TABLE 4). Total usage in 1995 appears to be at a similar level, however significant changes in the type of usage (commercial versus private) and distribution of traffic within the corridor have occurred. Variations in the location, nature, and timing of these trips may have important implications on the management of recreational activity on the river. The following sections examine this activity in terms of its major components, temporal patterns and user characteristics.

COMPONENTS OF USE

Two general components of use have been identified: (1) a commercial component, comprised of concession patrons; and (2) a non-commercial component, comprised of private individuals, or groups (such as scout troops, church groups, paddling clubs etc..) which utilize their own boats. Together, these two components account for all identified canoeing on the river (TABLE 4).

Table 4

Components of Canoeing on the Northwest Fork, Loxahatchee River:

1982-83 Versus 1994-95.

In 1983 non-commercial use accounted for 6%, and commercial use 94% of all use. This mix has changed over the years as non-commercial use has steadily increased. In 1995 non-commercial use accounted for 24%, and commercial use 76%, of all paddle trips.

Commercial Component

The two concession operations, situated at opposite ends of the 7.5-mile segment, are ideal to serve canoeists' needs for boats, equipment and transportation. The Riverbend County Park (RCP) concession operation serves canoeists who either paddle short distances and return to RCP, or run the entire length of the Wild and Scenic river corridor. Canoeists assemble at RCP and are launched in groups of varying sizes at periodic intervals. They paddle downstream through the entire Wild and Scenic corridor. This requires four to six hours and ends at the concessionaire's access site at the JDSP boat ramp. The concessionaire provides shuttle service back to RCP.

Significant growth in usage has occurred from this location; in 1983, the RCP concession generated about 2400 trips/year; by 1995 it produced almost 5000 trips.

The JDSP concessionaire mainly serves canoeists who paddle upstream from the JDSP dock to Kitching Creek or the Trapper Nelson Interpretive site. The trip to the Trapper Nelson Interpretive Site consists of a round trip of approximately 7.0 miles. A relatively small portion of paddlers from JDSP actually reach the Trapper Nelson Interpretive Site, and very few continue any further upstream.

An estimated 15,000 canoe trips were generated from the JDSP concession in 1983. In 1995, this total declined to about 8,000 trips. It appears that this decline may be partially due to increased canoe availability at RCP, both from the RCP concessionaire and other local outfitters . Additionally, when canoe traffic was surveyed in 1982-83, the JDSP

concessionaire provided a shuttle from JDSP to the upstream launch site at RCP. This service has been discontinued and today all JDSP canoe traffic terminates back at the JDSP launch site. This has eliminated about 400 JDSP trips/year to the upper corridor area.

Non-Commercial Component

The Tanah Keeta Boy Scout Camp is located immediately downstream of the JDSP boat launching facilities. In the late 1980s, the camp maintained approximately 20 canoes and provided a shuttle service to RCP for launch and return to the scout camp via the Wild and Scenic corridor. This generated slightly more than 700 trips/year down the river corridor. During the summer camp season corridor trips were reduced because scout use was restricted to the immediate camp vicinity (just outside designated corridor).

Tanah Keeta Scout Camp use of the river has changed over the years. First, shuttle service to RCP is no longer provided. As a result, all scout use is now restricted to the extreme downstream portion of the river corridor adjacent to the scout camp. This traffic rarely extends upriver as far as the Trapper Nelson Interpretive Site. Additionally, the number of scout camp canoes has been reduced. Because of these changes, total canoe trips from the scout camp declined from 726 trips in 1983 to only 290 in 1995. While in 1983 most scout trips traversed the entire corridor, only 84 of the recent trips from Tanah Keeta are believed to have traveled the entire route.

Just as the decline of one component of the commercial use has been offset by another concessionaire, the decline in non-commercial use of the Wild and Scenic corridor by the Boy Scouts has been more than offset by the growth of the other component of non-commercial use; the private recreational paddler. At the time the Loxahatchee corridor was designated, private boat use was estimated to generate only 364 canoe trips each year, representing less than 2% of the total use. In the ensuing 10 years, the

Loxahatchee River has been widely promoted as an attractive canoe/kayak trip. The river corridor is now described in several paddling guides and brochures. Florida has also experienced phenomenal growth in the paddle sports industry, and numerous paddling clubs and outfitters now exist in South Florida. Kayaks, which encourage individual paddling, have become highly popular. As a result of these changes, private boat use, either as individual trips, or as club outings, has increased significantly. Unfortunately, no records are maintained for private boat launchings at either RCP, or JDSP, so these trips may not be accurately quantified. However, based upon observations by the concessionaires and park staff, and discussions with club representatives, current private boat use is now estimated at about 4000 trips per year from RCP alone.

The increase in non-commercial usage is particularly significant because an increasing proportion of paddlers are not receiving any guidance regarding use policies, safety, or general river corridor information prior to embarking on their trip.

Temporal Patterns Of Use

Usage of the river exhibits both seasonal and daily fluctuations. The heaviest use, in terms of total volume, occurred during the Spring quarter during the 1983 sample period (TABLE 5). By 1995, the seasonal differences appear less pronounced, with almost uniform usage occurring throughout the year. Annual usage is influenced by weather and water conditions; during extreme drought conditions with resultant low flow, paddlers may find insufficient water for an easy passage, so use drops quickly. The RCP outfitter suspends operations during extreme low water. Although a potential safety issue**,** extreme high water conditions may actually promote increased use by experienced paddlers as they are tempted to test their skills in the unusual current conditions. Winter use may be reduced substantially by the passage of cold fronts, particularly during the weekend use periods.

Table 5

Seasonal Canoeing on the Northwest Fork, Loxahatchee River by Commercial Component: 1983 versus 1995

The second type of temporal fluctuation is the variation between weekend and weekday canoeing. As would be expected, higher river traffic occurs on weekends. In 1983, the JDSP concessionaire's weekend rentals were 66% of total rentals; the 34% weekday use probably reflected JDSP campers. In 1995, weekend use was 61% of total use. The RCP launch site, with no accommodations nearby, shows a more pronounced difference between weekday and weekend use; 4299 of 4923 trips, or 87% of total 1995 concessionaire traffic was on weekends at this site.

Using information from the commercial component alone probably still underestimates the true ratio of weekend to weekday usage through the Wild and Scenic corridor inasmuch as the private boat component is probably even more skewed toward weekend usage.

A third type of temporal variation is that associated with holiday versus non-holiday use of the river corridor. Public holidays which generate three-day "weekends" have been observed to substantially increase use above normal weekend levels. The highest levels of use observed in the Wild and Scenic river corridor typically occur over Labor Day, Independence Day, and Memorial Day holidays.

Group Size

Surveys in 1982-1983 identified that single canoes, or paired canoes comprised most of the river traffic; only 25% to 50% of river use was by groups of more than two canoes. While no comparable census has been done recently, field observations in 1994-1995 suggest that organized groups of more than two canoes now comprise a far greater proportion of river use. Use by large groups (greater than 10 canoes) also appears to be increasing. The trend toward increasing group size may be attributable to the greater

public awareness of the river as a recreational destination, and the concurrent increase in use by organized paddling clubs and social organizations.

CARRYING CAPACITY

An important function of the river management program is to determine and monitor the quantity and mixture of recreation and other public use which can utilize the river without adverse impacts on its resource values. The recreation "carrying capacity" of rivers has received the attention of river managers for more than a decade, but there is little consensus as to the most appropriate means for estimating carrying capacity. This is because carrying capacity is a dynamic concept and a number of factors exist, including management objectives, the physical and biological nature of the resource, and the preferences and tolerances of users, which must be considered together in determining a river's carrying capacity.

Considerations in Determining Carrying Capacity

The concept of carrying capacity may be approached from two standpoints: the capacity of natural features, and/or the demands of the human component. These may be further differentiated into four related categories: physical capacity, ecological capacity, facility capacity, and social capacity. These may then be used in roughly a descending order to establish capacity.

The upper limit of capacity is the amount of space available to humans. In the case of canoeing on the Loxahatchee, this might ultimately be the number of canoes that could physically occupy the river at one time with only enough spacing between them to

allow for a minimum level of user safety. Allocating all of the available space in the river to areas large enough to accommodate a canoe would yield a carrying capacity far in excess of current levels of canoeing on the river.

A second, and probably the most widely recognized and discussed capacity, concerns human impacts on the resource. Obviously, if the physical capacity of the river was reached every day of the year, dramatic impacts on animal and plant life would result. Ecological capacity is difficult to establish because any human use will have an impact, but also because the impacts of some uses -particularly canoeing - are low in comparison with others such as tubing, camping, or picnicking. The critical question is how much impact is tolerable.

To accommodate use, physical facilities such as parking lots and launching areas are needed. When parking lots are full or launching areas are covered with canoes, the carrying capacity of the facilities has been reached. Over a long term, facility capacity is probably the most flexible of the categories, although it may well be fixed over short periods. While physical or ecological capacity may be minimally adjusted by the application of mitigation measures or other technology, facility capacity may perhaps more easily be modified by expanding parking lots, building additional boat ramps, or hiring personnel if funds for these purposes are available.

Social capacity, the fourth category, involves the question of how many visitors can be placed into an area before their recreational experience is significantly reduced. Social carrying capacity inevitably requires a value judgment concerning how much human interaction is too much, and at what point is the "wild" outdoor experience significantly reduced. The problem is made more difficult in the case of social carrying capacity because there is even less value agreement about a preferred recreational experience than there is about a preferred ecosystem. Under one set of values, social capacity might be

reached when there is one boat on the river; under another set, when there are enough boats to make the activity a pleasurable social experience.

The application of these four general types of carrying capacity on the Loxahatchee River Wild and Scenic corridor provides some guidelines for use. Currently, canoeing does not approach physical capacity, even on the narrow upper portion of the river. Because of the generally low impact of canoeing, and also because other, higher impact activities do not occur in conjunction with canoeing, ecological capacity is probably also above current use levels.

The real limiting factor on the Loxahatchee River is probably social carrying capacity, where the number of canoeists influences the nature of the experience. In establishing such a carrying capacity for the river, the management program must recognize that there is no widely shared premise regarding preferred experiences among canoeists. The management program must therefore attempt to accommodate as wide a range of canoeing preferences as possible without causing overcrowding or natural resource deterioration.

Derivation of Carrying Capacity

Two basic patterns of canoeing occur on the Loxahatchee River. Small groups - those consisting of one or two canoes - historically comprised almost half of the canoeing that originates at RCP. Larger groups, ranging in size from three to more than ten canoes, comprised the other half. This observed behavior reflects preferences for two distinct types of recreational experience. The first type is a wilderness experience, characterized by quiet, slow movement and the opportunity to observe and appreciate the river's vegetation and wildlife. The canoeist who prefers this type of experience may tolerate some limited visual or auditory contact with other canoeists, but, in general, prefers an experience of solitude. The second type of experience is less of a wilderness-oriented, resource-based

activity than it is a social experience. Camaraderie, occasional racing, and the desire to share the experience with others all typify the elements of this style of canoeing. To the canoeist who prefers this experience, the primary emphasis is on social considerations, with natural resource considerations being either of secondary importance or none at all. Of course, not all of the canoeing that occurs on the river can be characterized so conveniently by these two extremes; most canoeists probably fall somewhere on a continuum between them. The distinction is useful, however, in illustrating the range of preferences currently displayed on the river.

In order to provide opportunities for both general types of canoeing, two separate use periods and corresponding maximum use levels for each period are established. These restrictions apply only to use that originates at RCP. An early morning "quiet" period allows an opportunity to enjoy a high quality, wilderness canoeing experience. The remainder of the day is available for canoeists who prefer a more social experience, or who prefer to travel in larger groups. The precise duration of the two use periods varies according to seasonal changes in daylight hours available for canoeing. Because large groups are essentially incompatible with wilderness canoeing, groups during the "quiet" period are limited in size to no more than two boats. No maximum group size has been established for the "group" use period.

A spacing interval, or the average distance between canoeing groups, is utilized as the means of influencing the opportunity for visual and auditory contact between groups, and thus, the nature of the recreational experience provided. Spacing interval is a theoretical notion since the actual spacing between groups and between individual canoes within groups depends on a number of factors including velocity and level of river flow, channel size and configuration, group size, canoeist experience and preference. Further, it is difficult to determine a single effective interval for all parts of the river because the spacing

needed to achieve a specified experience in one setting may be insufficient - or excessive - to achieve the same experience in other settings. Despite these limitations, interval spacing is a useful planning concept and helps to further define the range of recreational experiences anticipated by this plan. In order to be implemented in an operational plan, this concept must be translated into a more practical management tool such as launching in designated time slots.

Based on field observations and empirical estimates, it was determined that an average interval between groups of approximately one-quarter mile (1,320 feet) on the portion of the river downstream from RCP to the Trapper Nelson Interpretive Site will reduce the likelihood of seeing or hearing another group of canoeists to reasonable minimum levels. The resulting recreational experience may be termed a wilderness experience. Similarly, it was determined that an average spacing of one-eighth mile (660 feet) is the minimum interval needed to ensure a reasonable separation between groups during the late morning "group" use period. At this interval, occasional sight and sound contact may occur between groups, and opportunities for wildlife observation may be somewhat less frequent than at the wider spacing. The recreational experience derived from a trip on the river at this interval, however, should still be essentially natural and offer ample opportunities to appreciate the river's natural character.

After determining the appropriate hours available for "quiet" and "group" use, calculations of maximum use levels for each period, may be derived from the formula in TABLE 6. Utilizing the values presented in Table 6, resulted in the carrying capacities shown in TABLE 7 being developed during formulation of the original Loxahatchee River Wild and Scenic River management plan in 1985.

Table 6

Carrying Capacity Formula for the Loxahatchee Wild and Scenic River Corridor

Table 7

Maximum Use Levels in the Loxahatchee Wild and Scenic River Corridor Downstream from Riverbend Park

Current River Use Levels Compared To Carrying Capacity

The Carrying Capacity limitations for the corridor (TABLE 7), as developed in the original Loxahatchee River Wild and Scenic River Management Plan have never been formally implemented. While these guidelines are voluntarily used by the RCP concessionaire, they have not been applied to other launchings at RCP due to the lack of developed facilities and appropriate management agreements between Palm Beach County and the FDEP.

As of 1997, no detailed monitoring to precisely quantify the specific use patterns has been conducted. Field observations by FDEP staff indicate that while use over the past ten years has generally been within the Carrying Capacity guidelines, and has been adequately controlled by the RCP concessionaire, two important milestones appear to have now been reached; total river corridor use is approaching the Carrying Capacity limits during weekend use periods, and use is probably exceeding the Carrying Capacity limits on summer holiday weekends.

In addition to these two milestones, several other important changes in use have occurred which must be considered in regard to Carrying Capacity implementation. These include:

* Private groups comprised of greater numbers of canoes are now using the corridor. These larger groups have been observed to cause "logjams" at portage points, resulting in increased shoreline impacts and impedance of other, faster paddlers. The management plan does not currently specify a maximum group size permitted to traverse the

corridor, but it appears that criteria will be required to address this issue.

* "Upstream paddling"- the occurrence of paddling back upstream in the area upstream of the Trapper Nelson Interpretive Site rather than one-way travel downstream has become an increasing and significant component of use. This use pattern generates two-way traffic in the corridor upstream of the Trapper Nelson Site, and may result in canoe congestion at the portage sites. It may also increase canoe collisions due to the congestion of inexperienced users and challenge of paddling river currents. The Wild and Scenic River Management Plan Carrying Capacity criteria, when drafted in 1985, did not envision this use pattern developing. To help insure the preservation of the "Quiet Period", the Operational Plan, while allowing for some upstream paddling, should address timing and spacing for one-way traffic.
* Private boat usage of the river corridor has increased dramatically. This has increased the potential for improperly prepared paddlers to use the corridor. This issue should be addressed by the development of the RCP launch facility and related management agreements with FDEP.
* Other commercial outfitters, not concessionaires of Palm Beach County, have begun to utilize the RCP launch site. Because these groups are not currently regulated by the Carrying Capacity guidelines, the possibility of private groups, the RCP outfitter, and these other commercial outfitters, cumulatively exceeding the Carrying Capacity is becoming increasingly likely.

* Usage within the river corridor, while not showing a significant increase in over-all traffic level, has shown a dramatic change in the relative distribution of this use within the corridor. In 1985, access from JDSP and the Scout Camp generated significant use in the lower river corridor (the area downstream of the Trapper Nelson Interpretive Site). The very significant growth of private use at RCP, and the doubling of RCP concession activity since 1985 has now focused a much greater portion of total use into the upper portion of the corridor (RCP to Trapper Nelson Interpretive Site). "Upstream paddling" has further increased use within the upper portions of the river corridor.

CARRYING CAPACITY EVALUATION AND IMPLEMENTATION

Since the concept of a social carrying capacity limitation for river use was proposed in the original Loxahatchee River Wild and Scenic River Plan, the changes in river use discussed above illustrate the need to further modify and refine this carrying capacity concept prior to implementation.

Two specific tasks must be completed in order to effectively implement a system to manage river use. First, a quantitative and qualitative evaluation of current annual river use must be completed by the FDEP. This evaluation must include both the private and commercial components of river traffic and include an assessment of the temporal, group size, and spatial patterns of usage from all launch sites . Second, a detailed Operational Plan for implementing appropriate river use management concepts must then be developed.

Primary consideration should be given to protecting the resource and its wild and scenic nature. This plan should include an evaluation and report on the carrying capacity determination methodology, the results of the determination and the management strategies developed. The plan should also address management strategies employed on other Wild and Scenic rivers. This plan should address not only the appropriate social carrying capacity limitations for the Loxahatchee River, but also provide for both one-way and two-way paddling without user conflicts. The appropriate hours for river paddling should also be reconsidered. The original plan envisioned no launching beyond 1:00 pm due to the inability to complete the entire corridor trip; afternoon use for two-way traffic may be appropriate. This plan should also consider the possibility of shorter one-way trips through the river corridor with possible take-outs at either Masten Dam or the Trapper Nelson Interpretive Site. Issues such as emergency access and organized river cleanups must be addressed. Consideration should also be given during the development of this operational plan to establishing use guidelines based upon upper and lower water levels. For example, the river corridor may be adversely impacted by canoeing under extreme low water conditions, or potentially hazardous to inexperienced paddlers under extreme high flows. Above certain stages, paddling back upstream to the launch site may become impossible due to river current velocities.

This Operational Plan should establish appropriate launching intervals for use periods and allocate available launches between commercial and non-commercial components.

Since the only upstream access point is Palm Beach County's Riverbend Park, this plan should be developed and implemented jointly by FDEP and Palm Beach County. A permit system may be instituted if determined necessary to regulate canoeing, or facilitate

monitoring of the river. A formal interagency agreement, for purposes of implementing the Operational Plan, is recommended.

The proposed Operational Plan should be presented to the Loxahatchee River Management Coordinating Council for consideration and comment prior to adoption and implementation. The Operational Plan should be reviewed on at least an annual basis with the LRMCC and adjustments made as needed after considering resource impacts, increases in use, user preferences, river conditions and other factors. To assist the LRMCC, an "Operational Committee" should be established annually by the LRMCC. This "Operational Committee" would be advisory to the LRMCC and should include, at a minimum, representatives from Jonathan Dickinson State Park, the South Florida Water Management District, Palm Beach County Department of Parks and Recreation, Park concessionaires and representatives of local river user groups. This committee should review the annual use, current Operational Plan, and carrying capacity guidelines and report to the LRMCC as part of the annual review conducted by the council.

CHAPTER IV

MANAGEMENT AUTHORITY AND DIRECTION

The number and variety of management authorities referenced in this chapter reflect the broad scope of the river management program. The discussion of authorizing statutes, rules, and policies is organized according to the governmental bodies in which authority is vested, beginning with the two primary management agencies. Where noted, the respective laws and administrative rules are included as addenda to the plan.

PRIMARY MANAGEMENT AGENCIES

The Florida Department of Environmental Protection (FDEP) and the South Florida Water Management District (SFWMD) are the lead agencies responsible for implementing the management program for the wild and scenic river. The statutory authority for each agency's participation in the river management program is summarized below.

Department of Environmental Protection

Executive authority for administration and management of the designated river corridor area ultimately lies with the Governor and Cabinet, serving as both the Executive Board of the FDEP and as the Board of Trustees of the Internal Improvement Trust Fund, acting through the FDEP. The FDEP's basic authority for planning and implementing a program for managing the river is found in Chapter 83-358, Laws of Florida (Addendum 2). This statute authorizes the FDEP, in cooperation with the SFWMD to develop and periodically amend a river management plan, conduct necessary resource management activities, establish a carrying capacity for recreational use on the river, and

adopt rules to regulate activities in the designated river corridor area. This statute and the specific authorities it provides are discussed later in this chapter.

Chapter 258, Florida Statutes, authorizes the FDEP to manage State-owned parks and recreation areas and to adopt rules for managing these areas. Section 258.034, declares the policy to be, in part, to acquire typical portions of the state's original environment for access by the general public, and to manage these areas so as to conserve the natural values which derive from them. In implementing this policy, the FDEP is authorized to cooperate with county governments in park and recreation matters (Section 258.041), and to negotiate interagency agreements with water management districts to manage district lands reserved for recreational purposes (Section 258.004).

Chapter 258 also clearly establishes the proprietary overview role of the Board of Trustees of the Internal Improvement Trust Fund in the management of sovereignty submerged lands. The Florida Aquatic Preserve Act (Sections 258.35-258.46), authorizes the FDEP to establish aquatic preserves on sovereignty submerged lands and to evaluate the use of submerged lands within preserves based on the public interest and on the merits of proposed projects within the context of environmental impact. Chapter 16Q-20, Florida Administrative Code, provides for management of sovereignty lands within a preserve primarily to maintain essentially natural conditions, promote development of fish and wildlife, and provide opportunities for public recreation, including hunting, fishing, and boating where deemed consistent with the overall purpose of the Aquatic Preserve Act.

Chapter 403, Florida Statutes, provides for the maintenance and enhancement of water quality and wetlands protection through programs administered by the FDEP. Section 403.061 authorizes the FDEP to perform a variety of functions with regard to waters of the state. As far as protection of the wild and scenic river is concerned, the most important FDEP responsibilities involve the establishment of ambient water quality standards, water

quality sampling, regulation of known sources of pollution, and enforcement of rules pertaining to Outstanding Florida Waters. The FDEP's administrative rules concerning ambient water quality standards and Outstanding Florida Waters are contained in Chapters 17-3 and 17-4, Florida Administrative Code, respectively. Chapter 84-79, Laws of Florida, The Warren S. Henderson Wetlands Protection Act of 1984, authorizes the FDEP to establish rules concerning water quality criteria for wetlands to enable the State to more effectively regulate use of wetlands under FDEP jurisdiction.

The Florida Environmental Reorganization Act of 1993 requires FDEP to develop and implement measures to "Protect the functions of entire ecological systems through enhanced coordination of public land acquisition, regulatory, and planning programs". The FDEP has since developed the Ecosystem Management (EM) Initiative, which is being implemented to reach the above-stated goal. Ecosystem Management encourages innovative and cooperative solutions to environmental problems, accountability in decision-making, better integration of governmental and private programs, and the dismantling of institutional barriers to wise stewardship of Florida's natural and cultural resources.

The goals of EM are to improve environmental protection, to develop an environmental ethic and sustainable lifestyle among Floridians, and to promote a sustainable environment and economy. The four cornerstones of EM include: (1) *Place-based Management* which involves the interaction and input of diverse interests (agencies, local government, private landowners, environmental organizations, research institutions, industries, recreational users, etc.) within areas that share regional hydrological and ecological connections, and the establishment of Ecosystem Management Areas (EMA's) to address environmental issues within regional drainage basins; (2) *Cultural Change* which requires retraining and reorganizing FDEP staff, reallocating FDEP resources, and

developing public outreach programs; (3) *Common-sense Regulation* based on net environmental benefit, team permitting, and a shift from pollution control to pollution prevention; and (4) *Improved Foundations for Ecosystem Management* which are the tools for accomplishing successful EM and include the development of a statewide natural resource atlas, public linear infrastructure planning, environmental assessments, education, employee training, and audit and evaluation.

As a result of the implementation of EM, Loxahatchee River watershed has been identified as an EMA. Environmental issues within the Loxahatchee River watershed are being addressed by various federal, state, and local agencies working with local citizens, not-for-profit organizations, industry, and private landowners. The watershed planning committee has drafted the Loxahatchee River Watershed Action Plan which incorporates many of the environmental tasks identified in this Wild and Scenic River Management Plan, and projects from other management plans that address other portions of the Loxahatchee watershed. By combining all of the existing work into one plan, the FDEP is striving for a coordinated management approach that effectively integrates regulation with other management tools such as education, environmental enhancement, technical assistance, grass-roots stakeholder support, and incentives to promote wise stewardship on private and public lands.

South Florida Water Management District

The Florida Water Resources Act of 1972 (Chapter 373, Florida Statutes), is the basic source of the SFWMD's authority to acquire land and to regulate surface water and groundwater management and water consumption. Specific authority for these activities is contained in Chapter 373, Parts II, III and IV. Section 373.59 creates the Water Management Lands Trust Fund, which is the source of funding for the Save Our Rivers Program, and

authorizes the SFWMD to acquire property for a variety of management purposes, including the conservation and protection of water resources. The SFWMD, under provisions of Chapter 373.042 FS is also charged with establishing minimum flows and levels for waterbodies within its jurisdiction, including the Loxahatchee River.

The SFWMD is specifically authorized to participate in the management of the Wild and Scenic River by the provisions of Chapter 83-358, Laws of Florida (Addendum 2). This Act provides the SFWMD with broad permitting authority to regulate activities outside of the designated river corridor which would have direct and substantial adverse effects on the river. The specific authorities provided by this statute are discussed later in this chapter.

LOCAL GOVERNMENTS

Palm Beach County

Chapters 125, 162, and 163, Florida Statutes, vest the County with authority to regulate use and development of private property within its jurisdiction, including property within the wild and scenic river corridor. Specifically, Chapter 125 authorizes the County to adopt and enforce a comprehensive plan for development, zoning ordinances to implement the Comprehensive plan, and other regulations necessary for the protection of the public's health, safety and welfare. Section 125.01(f), Florida Statutes, grants Palm Beach County the power to provide parks, preserves, playgrounds, recreational areas, and other recreational facilities for the welfare of its citizens. It also allows for the Board of County Commissioners to promulgate rules for the use of its parks and recreational areas so as to provide for the effective utilization of such areas. Additionally, Chapter 125 empowers the County to prescribe fines and penalties for violations of the regulations. Chapter 162

authorizes the County to establish a code enforcement board to enforce land development regulations. Chapter 163 (Local Government Comprehensive Planning and Land Development Regulation Act) expressly elaborates on the County's authority to establish and implement comprehensive plan programs to guide and control future development and growth. Rule 9J-5, Florida Administrative Code, provides the minimum criteria for the preparation, review, and determination of compliance of comprehensive plans and plan amendments pursuant to Chapter 163. The 1989 Palm Beach County Comprehensive Plan provides for the protection and conservation of the Loxahatchee Slough area natural resources with the implementation of the land use, conservation, and coastal elements. In 1992, the County adopted the Unified Land Development Code to implement and insure that all development orders approved in the unincorporated County are consistent with the comprehensive plan.

Riverbend County Park (RCP) is managed by the Parks and Recreation Department under the authority of the Board of County Commissioners and the 'Palm Beach County Parks and Recreation Ordinance' (No.89-34). This ordinance provides for rules and regulations for all recreation areas operated and maintained by PBC, for control of park traffic, wildlife, and recreational activity. It also defines prohibited acts, provides for sanitation and pollution control, public utility regulation, park hours, enforcement of traffic regulations, park rules, permit regulations, and for penalties and the prosecution of offenders.

Under the County's Home Rule powers of Chapter 125 through its Department of Environmental Resources Management (ERM), an Environmentally Sensitive Lands Acquisition Program was initiated on March 12, 1991. On that date, Palm Beach County voters approved a $100 million bond issue to fund the acquisition, preservation, and capital maintenance of environmentally sensitive lands. Two significant sites that were given

high priority for acquisition were the 367 acre Loxahatchee River site located adjacent to the Loxahatchee River Wild and Scenic corridor and the 10,389 acre Loxahatchee Slough which provides the headwaters for the Northwest Fork of the Loxahatchee River. Management plans for these sites will be prepared and reviewed by the County's Natural Areas Management Advisory Committee. The Management plans will inventory resource information, list goals and objectives for overall management, and identify management responsibilities. In addition, the plans will specify management needs with regard to prescribed burns, exotic vegetation eradication or removal, hydrologic restoration needs, site security, and public use.

In 1999, Palm Beach County voters approved a $150,000,000 Conservation Lands referendum that provided additional money for land acquisition and management. Under this program, PBC has continued to acquire additional lands within the Hungryland Slough and Pal-Mar regions of the Loxahatchee River watershed.

In addition to ERM's Environmentally Sensitive Lands program, other programs administered by ERM that may influence the quality of the river corridor include: Pollutant Storage tank compliance and petroleum cleanup, Water and Irrigation Conservation, Upland and Wetland regulations including provisions for listed species, and Stormwater Pollution Prevention.

Martin County

The general local government statutory authorities identified for Palm Beach County apply as well to Martin County. In addition to these authorities, the 1982 Martin County Comprehensive Plan prohibits development in wetland areas, specifically including the Loxahatchee River, Cypress Creek and Kitching Creek. This plan also applies the

requirement for a 50-foot building setback in ecotonal areas adjacent to wetlands as a performance standard for new development.

In 1999, Martin County voters approved a sales tax increase specifically to finance the acquisition of environmentally sensitive lands. This should generate $37 million dollars over three years. The County has partnered with the SFWMD in the acquisition of lands within the Loxahatchee watershed. Most of this land has been in the Cypress Creek and Kitching Creek sub basins.

Town of Jupiter

Like Palm Beach and Martin Counties, the Town of Jupiter is authorized by applicable laws to regulate the use and development of private lands for the public health, safety and welfare. The Town has adopted a comprehensive plan in accordance with Section 163.3161, Florida Statutes. This plan designates areas subject to flooding as Conservation Areas and discourages development in these areas.

The Town of Jupiter owns and operates a regional water supply system that currently serves more than 20,000 accounts in the area, and delivers more than 14 MGD. In 1990, the Town completed a reverse osmosis treatment facility that permits utilization of the Floridan aquifer as a raw water source rather than the traditional Surficial aquifer. This advanced system is the largest such treatment facility in Southeast Florida. Utilization of the deeper Florida aquifer avoids the potential for induced saltwater intrusion in the shallower surficial system, as well as the possibility of shallow water table drawdowns near wetland systems.

In 1994, the Town of Jupiter created a stormwater utility. In cooperation with other Palm Beach county governmental entities, it has funded more than $2 million of engineering studies and capital improvements throughout the Town.

Village of Tequesta

In addition to Palm Beach County, Martin County and the Town of Jupiter, which exercise direct control over portions of the river corridor, the Village of Tequesta exercises control over land use and development within the vicinity of the Wild and Scenic River corridor. The Village of Tequesta Comprehensive plan includes a number of Objectives and Policies that address protection of the Loxahatchee River, including specific reference to the Wild and Scenic River Management Plan.

OTHER AGENCIES

In addition to the agencies with direct management responsibilities in the Wild and Scenic river corridor area, numerous other agencies and private interests are involved in activities which affect the river. These agencies are directed by various federal, state, and local authorities.

FEDERAL AGENCIES

Three federal entities are involved in activities affecting the management of the river. These are the National Park Service, the U.S. Fish and Wildlife Service, and the U.S. Army Corps of Engineers.

National Park Service

This agency administers the National Wild and Scenic River Program in accordance with the Wild and Scenic Rivers Act (16 U.S. Code 1271). Under the broad authority of this act, the National Park Service conducts studies on the eligibility of rivers

proposed for designation in the national system and coordinates with states in the development and implementation of management plans for rivers in the system. The National Park Service also reviews permits required by the U.S. Army Corps of Engineers under Section 404 of the Clean Waters Act(1972 for potential environmental impacts on national wild and scenic rivers. Based on the authority of Section 7(a) of this Act, no federal agency may assist by loan, grant, license or otherwise in the construction of any water resources project that would have a direct and adverse effect on any of the resource values of the designated segment of the river.

Fish and Wildlife Service

Section 401 of the Fish and Wildlife Coordination Act of 1958 (16 U.S. Code 661, as amended), authorizes the U.S. Fish and Wildlife Service to participate in the review of dredge and fill permit applications. The Service's participation in this activity is based on its vested interest in the conservation of wetlands as wildlife habitat for federally protected species. In addition, the Service is authorized to administer the Endangered Species Act of 1973 (10 U.S. Code 1531, as amended) This Act seeks to ensure the continued existence of endangered species by requiring federal agencies to consult with the Service whenever an agency's actions may be detrimental to an identified species or its habitat.

U.S. Army Corps of Engineers

Section 10 of the Rivers and Harbors Act of 1899, (30 Statute 1131, as amended), authorizes the U.S. Army Corps of Engineers to regulate dredging of obstructions and review proposals for channel construction and improvements in navigable waterways including the Loxahatchee River. This Act, together with Section 404 of the Clean Waters Act of 1972 (33 U.S. Code 1344, as amended), relating to the regulation of dredge and fill

activities in wetlands, involves the Corps indirectly in the State's management of the wild and scenic river.

STATE AGENCIES

In addition to the FDEP and SFWMD, six other state agencies affect the river in less direct, but nonetheless important capacities. Authority for these agencies' involvement is based on various chapters of the Florida Statutes.

Department of Community Affairs

The Department's efforts to ensure consideration of unique natural resources such as the Loxahatchee River in local and regional planning are authorized by Chapters 380 and 163, Florida Statutes. Sections 380.045, 380.05, and 380.06 respectively authorize the Department to establish resource planning and management committees, coordinate designation of areas of critical state concern, and administer the review of developments of regional impact. Section 163.3184 authorizes the Department to coordinate State agency review of local government comprehensive plans.

Department of State

Chapter 267, Florida Statutes, vests the Division of Archives, History and Records Management with title to historical and archaeological resources and artifacts on state-owned lands. The statute provides the Division with the authority to locate and arrange for the protection, preservation and restoration of historical and archaeological property of other governmental agencies.

Fish and Wildlife Commission

Chapter 372, Florida Statutes, vests the Fish and Wildlife Commission with administrative, management and enforcement authority with respect to the State's freshwater

fish and wildlife. Specific sections which authorize Commission activities in the river management program include Sections 372.07(2) (enforcement of freshwater fishing laws), 372.072(4)(a)(1) (research and management of freshwater/upland species), and 372.77 (implementation of wildlife restoration projects).

Department of Agriculture and Consumer Services

Section 589.04, Florida Statutes, authorizes the Division of Forestry to assist governmental agencies in gathering information concerning forest management and in combating forest fires on government lands. Section 589.275 provides the Division with authority to assist State agencies "to partially restore the original domain of Florida by planting native trees on state lands..."

Department of Transportation

Section 335.16, Florida Statutes, authorizes the Department to control access from State roads to public waters within highway rights-of-way. As provided by Chapter 14-41, Florida Administrative Code, it is the policy of the Department to cooperate fully with other public agencies regarding maintenance of fishing and boating facilities at state road system bridges.

Treasure Coast Regional Planning Council

Authority for the participation of the Treasure Coast Regional Planning Council in the river management program is based on Sections 380.06 and 163.3164, Florida Statutes. The former provides for regional planning councils to coordinate the review of development of regional impact applications with affected governmental agencies. The latter

mandates the Council to review and comment on the content of local comprehensive plans prior to their adoption by local governments.

LOCAL SPECIAL DISTRICTS

Drainage Districts

Six drainage districts, authorized under the general provisions of Chapter 298, Florida Statutes, are located within the Loxahatchee River basin, as follows:

* Hobe-St. Lucie Conservancy District
* Indian Trail Water Control District
* Northern Palm Beach County Improvement District
* North Palm Beach Heights Water Control District
* Pal-Mar Water Control District
* South Indian River Water Control District

Under Chapter 298 and various special acts and amendments, these drainage districts are authorized to levy special taxes and to provide surface water management and control in areas not served by municipal or county agencies. The districts are also authorized to construct and maintain canals, ditches, levees, dikes, pumping plants and other works and improvements. The activities of the districts are subject to state regulation by the FDEP and the SFWMD under authority of Section 403.061 and Chapter 373, Part IV, Florida Statutes.

Jupiter Inlet District

The Jupiter Inlet District (JID) was established by Chapter 8910, Special Acts of Florida, 1921. The JID was given broad authority to construct and maintain an inlet at the

mouth of the Loxahatchee River and to deepen and maintain the river where required. JID is also authorized to construct any improvements needed to accomplish these purposes. The JID has completed management plans for both Jupiter Inlet and the Loxahatchee River estuary and has undertaken environmental enhancement and restoration efforts in the area.

Loxahatchee River District (aka Loxahatchee River Environmental Control District)

Chapter 71-822, Special Acts of Florida, 1971, as amended, established the Loxahatchee River District (LRD) to meet local needs for water supply, wastewater management and storm drainage, and authorized the LRD to conduct various planning, regulatory and operational functions to meet these needs. The jurisdictional area of the LRD is the watershed of the Loxahatchee River. The LRD has active roles in wastewater management, aquatic monitoring, environmental education, and public information. Its wastewater management responsibilities include operation of a national-award-winning regional wastewater treatment system which covers much of the Loxahatchee basin east of I-95. For over twenty years, the LRD has served as one of the primary agencies conducting research and monitoring on the Loxahatchee River. The LRD has developed a water quality index for the Loxahatchee River patterned after that of FDEP and produces semi-annual reports on the quality of surface waters in the watershed. The LRD also maintains the WildPine Ecological Laboratory. This laboratory is available to the public and scientific community for the purpose of advancing knowledge about the river. Among its other programs is the cooperative venture with the Friends of the Loxahatchee to promote understanding and involvement in river issues.

POLICY DIRECTION

The river management program described in this plan derives its direction from several sources, including state and federal legislation and policy resolutions. Together, these sources represent the policy foundations of the management program. The following section discusses these sources of direction.

The Wild and Scenic Rivers Act

The Wild and Scenic Rivers Act provides the framework for the establishment of a national system of wild and scenic rivers (see Addendum 1). The Act identifies the processes by which the Loxahatchee River and other rivers throughout the United States are selected for study, recommended for designation, and included in the National Wild and Scenic Rivers System. The Act also defines the philosophy that will be pursued in the management of rivers in the system. Section 10(a) of the Act provides that:

> *Each component of the national wild and scenic rivers system shall be administered in such a manner as to protect and enhance the values which caused it to be included in said system without, insofar as is consistent therewith, limiting other uses that do not substantially interfere with public use and enjoyment of these values. In such administration primary emphasis shall be given to protecting its esthetic, scenic, historic, archaeological, and scientific features.*

The Act establishes a classification system for designated rivers. This classification system is important to the management program for the Loxahatchee, in that it provides the basic criteria for approval of the program at the federal level. In order for designation to be approved, the State's management program must ensure that the various river segments will continue to meet the criteria for each classification.

Federal Register Guidelines

On August 26, 1982, the Department of the Interior published guidelines for implementing the Wild and Scenic Rivers Act in the Federal Register. These guidelines expand upon the provisions of the legislation and interpret how the Wild and Scenic Rivers Act will be applied with respect to river studies and management plans. The interpretation of Section 10(a) of the Act contained in these guidelines provides the river management program with its basic philosophy.

> *This section is interpreted as stating a non- degradation and enhancement policy for all designated river areas, regardless of classification. Each component will be managed to protect and enhance the values for which the river was designated, while providing for public recreation and resource uses which do not adversely impact or degrade those values. Specific management strategies will vary according to classification but will always be designed to protect and enhance the values of the river area. Land uses and developments on private lands within the river which were in existence when the river was designated may be permitted to continue. New land uses must be evaluated for their compatibility with the purposes of the Act.*

Clearly, the direction of this and subsequent sections of the guidelines is that protection and enhancement of the river's natural and cultural qualities must be the highest priorities for the management program. Further, while the management program may allow for the continuation of existing land uses and developments within the corridor, new developments must be considered within the context of their effects on the special attributes of the protected area. These program guidelines are contained in Addendum 3.

Direction by the Governor and Cabinet

On January 11, 1983, the Governor and Cabinet, sitting as the Executive Board of the FDEP, adopted a resolution directing the FDEP, with the assistance of affected

local, regional, state and federal agencies, to begin the development of a management plan for the river (Addendum 4). The resolution provides that:

> *The principal goals of the plan will be to preserve and enhance the river's unique natural values, restore the river's historical hydrologic regime, and reverse deleterious saltwater intrusion into the river.*

To fully accomplish these goals, the river management program, within the jurisdictional framework of Chapter 83-358, Laws of Florida, must deal with water quantity and quality problems at their sources.

Chapter 83-358, Laws of Florida

Loxahatchee River Wild and Scenic Designation and Preservation Act

This legislation was enacted in 1983 to serve as the "Act of the State Legislature" required by Section 2(a) (ii) of the Wild and Scenic Rivers Act for designation of the Loxahatchee by the Secretary of the Interior. This Act is by far the most comprehensive of the management program's various legal authorities, and provides the management program with its basic and most important source of policy direction (see Addendum 2). The Act reaffirms the environmental preservation and enhancement policy of the national act. The Act directs the management plan and the program it creates to provide for the permanent protection and enhancement of the river's natural values. It states that:

> *The Legislature finds and declares that a certain segment of the Loxahatchee River.....possesses outstandingly remarkable ecological, fish and wildlife, and recreational values which are unique in the United States. These values give national significance to the river as one which should be permanently preserved and enhanced, not only for the citizens of the State of Florida, but for citizens of the United States, of present and future generations.*

Section 9 provides for adoption of rules and for separation of regulatory authority between the Department of Environmental Protection (FDEP) and the South Florida Water Management District (SFWMD). The FDEP is authorized to regulate activities within the river corridor area, and the SFWMD is authorized to regulate activities outside the river corridor area. Section 10 authorizes the FDEP and the SFWMD to create permit systems to regulate activities that will have direct and substantial adverse effects on resource values in the river area. Section 10(1) states that:

> *No person or entity shall conduct any activity or do anything which will or may have an adverse impact on any resource value in the river area without first having received a permit from the board or the department, as appropriate*.

Further, this section defines the conditions under which the FDEP and the SFWMD may approve required permits. It provides that:

> *A permit may be granted only after a finding by the board or the department, whichever has regulatory authority, that the activity for which a permit has been requested will not have a substantial adverse impact on resource values in the river area*.

CHAPTER V

RIVER MANAGEMENT PROGRAM

The preceding chapters of this plan have assessed the unique natural and cultural features which exist in the Loxahatchee River area and have discussed the patterns of recreational use currently being exerted on the river. This chapter defines the general objectives to be achieved toward the goal of protecting and enhancing the wild and scenic corridor, identifies the strategies to be employed to achieve these objectives, and describes the specific tasks which must be undertaken by the various entities with management responsibilities.

GENERAL MANAGEMENT PRINCIPLES

Direction for the establishment, and update of this management program, and the specific objectives and procedures to be implemented as part of this program, were derived from the legislative authorization and respective agency policy previously presented in this plan. In drafting the original plan, the FDEP researched and solicited a wide range of technical information and guidance to help in the refinement of principles. This information was obtained from state and federal environmental agencies, from planning agencies in the Loxahatchee River area, and from experts in various technical fields. In addition, the FDEP surveyed the other states for information on their progress in managing State-administered components of the National Wild and Scenic Rivers System. This 2000 plan represents an updated document which reflects the original guidelines established when the river was designated as a component of the Wild and Scenic River system, as well as revisions based upon subsequent experiences in managing the Loxahatchee River corridor.

The recommendations of this plan for the day-to-day management of the river and its adjoining upland corridor are based on the general principles listed below:

1. The preservation and enhancement of the river's outstanding natural and cultural values are the primary purposes of the program. These values include the unique diversity of temperate and subtropical plant and animal species, and the aesthetic, scientific, and recreational values which derive from these features.

2. Effective management of the river corridor cannot take place in isolation from river basin management. Activities beyond the river corridor which might affect the designated river area will be managed in accordance with existing authorities, except as otherwise provided by Chapter 83-358, Laws of Florida. The river management plan, as well as subsequent resource management activities implemented as a result of the plan, should be utilized to help direct land use and water management decisions which have the potential for substantial adverse impact on the river.

3. Management will be accomplished through a range of management tools, including an aggressive land acquisition program, effective resource management activities, regulation of the corridor area, local government land use controls, and voluntary actions by private citizens.

4. Management will be a continuing effort. The specific management actions proposed in this plan will be supplemented or modified as necessary based on their effectiveness in meeting the goals of the management program.

5. The specific management methods used and the type of management provided by these methods may differ considerably from segment to segment. For example, the "wild" river segment generally will be managed less intensively than the "recreational" segment of the river. Irrespective of management methods along any particular segment, however, the basic policies and intent of the management program apply.

6. Existing legal authorities and jurisdictions will not be curtailed or limited by any policy or action of the management program. The management program proposed in this plan is applicable to private lands only to the extent allowed by existing law. The river management program does not open private lands to public recreation.

7. Coordination and cooperation between local, state and federal agencies and private citizens are crucial to the success of the management program. The principles of the management program are intended to be implemented to the fullest extent possible under each managing agency's statutory authority and other applicable laws.

8. In conjunction with the above, the cooperation of the public is critical to the success of the management program. The process of formulating this management plan has been opened to a wide range of public involvement. Maintaining this involvement in the management program will be just as essential to long-range public understanding and support for the program.

2000 MANAGEMENT PLAN GOAL AND OBJECTIVES

This plan is required as a condition for designation of the Loxahatchee River as a component of the National Wild and Scenic Rivers program. The goal of this management plan is to insure protection and enhancement of the natural and cultural values of the Loxahatchee National Wild and Scenic River as required by PL 90-542 (The Wild and Scenic Rivers Act of 1968, as amended) and Chapter 83-358 Florida Statutes (The Loxahatchee River Wild and Scenic Designation and Preservation Act). To achieve this goal, consistent with the previously stated general principals, the following four specific objectives have been developed to guide management efforts:

OBJECTIVE I **PROTECT AND ENHANCE NATURAL AND CULTURAL VALUES WITHIN THE DESIGNATED WILD AND SCENIC RIVER CORRIDOR**

OBJECTIVE II **ENHANCE THE HYDROLOGIC RELATIONSHIP BETWEEN THE LOXAHATCHEE SLOUGH AND THE WILD AND SCENIC NORTHWEST FORK OF THE LOXAHATCHEE RIVER**

OBJECTIVE III **INSURE THAT LAND USE ACTIVITIES WITHIN THE LOXAHATCHEE BASINS ARE CONDUCIVE TO MAINTAINING THE VALUES OF THE WILD AND SCENIC RIVER.**

OBJECTIVE IV **FACILITATE PUBLIC INVOLVEMENT IN BOTH PLANNING AND IMPLEMENTATION OF EFFORTS TO PROTECT THE WILD AND SCENIC LOXAHATCHEE RIVER.**

These four objectives provide a focus for those efforts necessary to: 1.) manage the natural resources within the publicly owned corridor, and the public use of that corridor, 2.) restore and enhance the historic hydrologic linkages to the upstream drainage basin deemed critical to the long-term survival of the NW fork, 3.) identify, and manage through appropriate legal avenues, those land use activities on private lands surrounding the river corridor so as to insure that the river corridor is not adversely impacted., and 4.) encourage the understanding, and involvement, of the general public relative to Loxahatchee River corridor protection and management.

For each of the four objectives, the respective implementation strategies and specific tasks proposed to be undertaken are discussed below. The tasks discussed below are those which either remain uncompleted from the previous plan update or have been added during this 2000 plan update. The specific entities responsible for implementation, and respective timelines, are presented in Chapter VI. Tasks identified in the original plan, and which have been completed, are discussed in Chapter VII.

OBJECTIVE I PROTECT AND ENHANCE NATURAL AND CULTURAL VALUES WITHIN THE DESIGNATED WILD AND SCENIC RIVER CORRIDOR

The evaluation of the Loxahatchee River for possible inclusion as a component of the Wild and Scenic River system identified several efforts necessary to support this designation, including public acquisition of the river corridor, development of appropriate local management authorities and responsibilities, development and maintenance of this management plan, and finally, periodic oversight and review of river conditions and management efforts. The following strategies and tasks reflect these obligations.

The initial management plan identified a corridor area to be acquired. This area extended from River Mile 13.0 downstream to the then-existing boundary of Jonathan Dickinson State Park. The SFWMD, through the State of Florida Save Our Rivers Program, was responsible for this acquisition effort. As of 2000, all targeted lands within the Loxahatchee River Wild and Scenic River corridor have been acquired, and management responsibility conveyed to the Florida Department of Environmental Protection.

Recently, Palm Beach County acquired 367 acres immediately adjacent to the river corridor, and has proposed that this area be considered for addition to the designated Wild and Scenic corridor

Strategy I-A: Acquire Designated Wild and Scenic River Corridor

Task*: *Consider Adding Palm Beach County Loxahatchee River acquisition to the Wild and Scenic Corridor.

All components of the National Wild and Scenic River system are required to have management plans. In addition to federal guidelines, the State of Florida provided legislative direction regarding the development and updating of this management plan.

Strategy I-B: Develop and Maintain Corridor Management Plan

Task:* *Update Management Plan by year 2005

The Wild and Scenic River Management Plan is intended to serve as a general guide for activities related to management of the river corridor. In support of this plan, more detailed resource management plans must be developed and implemented by

appropriate agencies. The Loxahatchee River Management Council, the legislatively-created oversight body for the management plan, has recommended that the following detailed plans be developed.

Strategy I-C: Develop Detailed Implementation Plans in Support of Wild and Scenic River Management Plan

Task: Develop Upland Vegetation Management Plan

Task: Develop Archeological/Historical Survey

Task: Develop Solid Waste Management Plan

Task: Develop Aquatic Plant Management Plan

During the corridor designation process, certain protective designations available under state statute and rule were deemed applicable and desirable for the Loxahatchee. In addition to these, special specific cooperative agreements between management agencies were identified which would enhance river corridor management.

The FDEP may promulgate rules to implement a coordinated program for protecting the resource values of the river corridor. This program may include the establishment of a permitting system, developed in accordance with the requirements of Section 83-358.10, Laws of Florida, for the purpose of preventing activities which would have substantial adverse impacts on the resource values of the river corridor.

The FDEP rules will apply to activities on lands in the designated river corridor area. These rules are intended to utilize, to the greatest possible extent, all existing protections afforded under current authorities, the intent being to ensure that the rules will be coordinated as much as possible with other environmental and land use regulatory programs, and will avoid duplication of effort and conflicting regulations. These rules will be utilized as supplementary measures to local governmental land use regulations and other existing

protections, and will in no way divest any agency of any authority or jurisdiction in existence at the time of designation. The issuance of an FDEP permit under this system will not relieve the applicant of the responsibility for obtaining other required local, state or federal permits.

In accordance with Chapter 83-358, the FDEP's rules will provide for the continuation of existing land uses within the river corridor area which are not incompatible with the purposes of designation. The FDEP may receive comments on any proposed rules from the Coordinating Council established by Section 83-358.5(3). The Coordinating Council will also review all permits required by these rules, and render its non-binding, advisory recommendations to the FDEP. Enforcement of program rules will be carried out by the FDEP in accordance with its authority under Section 83-358.11.

Effective on-site control of public access and use is essential to the ability of the management program to prevent adverse impacts on the natural values of the river and the upland corridor. Following designation and acquisition, the SFWMD transferred management authority for the properties purchased by the District under the Save Our Rivers Program to the FDEP. These lands are incorporated under the management jurisdiction of JDSP, and administered in accordance with rules promulgated by the FDEP. Any rules promulgated for the management of these lands must be consistent with the applicable provisions of Chapter 62D-2, Florida Administrative Code.

The responsibility for controlling public access and managing public recreational use of the river necessarily will be shared between the FDEP and PBC which is responsible for the development and management of Riverbend County Park (RCP). In situations where neither agency has full management authority over the resource, cooperation and coordination will be indispensable to the success of the total management effort. To this end, the FDEP and the County should enter a formal agreement for joint management of access and use of the river. The sections below identify the general

objectives and policies which the FDEP and the County will follow in providing public access facilities and managing public recreational use of the river area.

Public Access

The intent of the management program is to avoid adverse impacts to the Wild and Scenic River corridor by properly managing opportunities for public access to the river. This can be accomplished by restricting river access in the corridor to those areas which already exist or are planned for RCP and controlling the number of trips per day on the river. No new access points (including roads, boat ramps, docks, launching areas, and parking areas), will be established in the corridor except those which are components of the RCP Master Plan or the JDSP Unit Plan. Any proposed modification of these plans should be presented to the LRMCC for review and comment.

Future master plan improvements are contemplated as part of PBC's Riverbend County Park that will be consistent with the character of its 'Recreation' designation and provide for public recreation and resource uses that will not adversely impact the existing quality of the designated river corridor. Improvements to RCP will be designed to upgrade the overall quality of the river's 'Recreational' segment, and enhance management efforts in the adjacent 'Wild and Scenic' segments. These improvements will follow basic and major facilities guidelines for placing primary emphasis on the protection and enhancement of the aesthetic, scenic, historic, archeological, and scientific features and values of the river corridor area.

The FDEP must ensure close coordination with Palm Beach County in order to avoid conflicts between development plans for Riverbend County Park and management activities within the Wild and Scenic River corridor downstream. The FDEP will identify the capacity of the river area to support recreation activities without degrading its natural

resource values, and will determine the spatial factors that either favor or limit the provision of individual activities. It will address various non-design related issues such as external environmental threats, relationships with other management and regulatory programs, and other similar issues.

The objective of the management program in administering the Wild and Scenic river area is to provide maximum public use consistent with the preservation of the river's natural and scenic values. Following designation of the river and transfer of management authority, the FDEP will promulgate, as necessary, rules for managing the use of public lands in the river area. Additional lands will be brought under the jurisdiction of these rules as they are purchased. These rules will identify the policies and procedures to be followed in managing the day-to-day operation of the designated river area, and will address such matters as allowable and prohibited uses, visitor services, vehicle use, concessions, interpretive activities, and enforcement of carrying capacity.

The FDEP and the County will implement a monitoring program to measure the effectiveness of the plan's carrying capacity in meeting the objectives of the management program. The monitoring program will contain the specific procedures to be utilized by on-site management personnel in determining the degree of human impact received by the river's resources and facilities. The program will also identify specific methods to be used to measure recreational use levels on the river (including any increases in use that occur as a result of national designation), and to monitor canoeists' satisfaction levels.

Strategy I-D: Develop Rules and Management Agreements For River Corridor

Task: ***Include Corridor within Ecosystem Mgmt. Area***

Task: ***Develop FDEP/PBC Agreement For Riverbend Park***

Task: ***Enact Corridor Administrative Rule***

Task: ***Develop Corridor Use Permit System***

The Wild and Scenic River corridor is intended for public uses, consistent with protecting the natural resources of the river and aesthetic enjoyment of the river experience. A basic premise of the river designation is that river use is to be carefully managed through the use of designated access points and facilities.

The general criteria for locating basic and major facilities to be utilized in this analysis are identified below:

Basic facilities. –

Basic support facilities may be placed in the corridor to absorb user impacts on the river's resources. The FDEP and the County will avoid placing any developed facilities or other improvements in the "wild" segment of the corridor. Basic comfort facilities such as toilets, shelters, cooking grills, picnic tables and refuse containers may be placed in the "scenic" and "recreational" segments. When placed within the river corridor, these facilities will be judiciously located so as to avoid any visual encroachment on the river and prevent excessive user impacts on the area. Each agency will minimize the placement of signs in the corridor area.

Major Facilities. –

Construction of major public use facilities such as campgrounds, major visitor centers and administrative headquarters will be located outside of the river corridor area whenever feasible. If such facilities are necessary to provide for public use or protect the river's resources, and if location outside the corridor area is unfeasible, then they may be located within the corridor provided that they do not have an adverse effect on the natural or scenic values of the river. Access to the corridor area will be by roads and trails which existed at the time of corridor designation, with two future additions: First, an extension of the Florida Trail through the river corridor from RCP into JDSP may be allowed providing that hikers can be kept isolated from river users within the designated river corridor. Any potential trail route will be reviewed by the LRMCC. Second, new roads and trails which are components of the Riverbend County Park Master Plan may be created in the 'Recreational' segment of the river corridor.

As lands are transferred to the FDEP for management, the FDEP will identify and schedule for removal any artificial facilities or conditions in the corridor area that are incompatible with the purposes of the management program. Such facilities may include dikes, canals, fences, buildings or other features or conditions that occur in unnatural situations. Care will be taken to avoid removing any structure that may have historical or archaeological significance, or that may be useful in interpreting a particular era in the river's history.

Strategy I-E: Develop and Maintain Appropriate Public Use Facilities Within River Corridor

Task: Maintain Lainhart And Masten Dams

Task: Implement JDSP Unit Plan

Task: Develop Quantitative and Qualitative Evaluation of River Use

Task: Develop and Staff Riverbend County Park

Task: Adopt and Implement Operational Plan

The Loxahatchee River Management Coordinating was created by the Florida Legislature to provide oversight of the on-going management efforts relative to the Loxahatchee River Wild and Scenic River management Plan. The enacting legislation charges the SFWMD with the responsibility to provide the necessary staff support to the Coordinating Council.

Strategy I-F: Create and Maintain Loxahatchee River Management Coordinating Council

Task: ***Staff and Maintain LRMCC***

Strategy I-G: Maintain Resource Monitoring Programs

Task: Develop Biological Monitoring Protocols

Task: Provide Water Quality and Hydrologic Monitoring

OBJECTIVE II ENHANCE THE HYDROLOGIC RELATIONSHIP BETWEEN THE WILD AND SCENIC NORTHWEST FORK OF THE LOXAHATCHEE AND THE LOXAHATCHEE SLOUGH

The Northwest Fork of the Loxahatchee River historically derived a substantial portion of its total flow from the Loxahatchee Slough. Construction of the SFWMD C-18 canal in 1958 diverted this flow away from the Northwest Fork to the Southwest Fork of the river, and significantly reduced groundwater levels in the Slough. As a result, prolonged reduced flows and resultant saltwater encroachment have generated undesirable changes in the biological community of the NW fork. Protection and restoration of biological components of the NW fork requires the reconnection of the Loxahatchee Slough and river to provide historic flows, and restoration of water levels within the Slough to provide adequate storage to sustain dry season flows down the river. The following strategies and tasks represent the complimentary steps necessary to restore the adequate baseflows and the hydrology of the Loxahatchee Slough, and improve areas between historic Slough and NW fork.

Strategy II-A: Provide Adequate Baseflow From C-18 to the Wild and Scenic Northwest Fork

Task: ***Provide a Minimum Baseflow of 50 cfs to the NW fork***

Task: ***Evaluate Appropriateness of USGS 50 cfs Minimum Flow Target and Develop New Target (s) as Necessary***

Task: ***Establish minimum flows and levels for Loxhatchee River***

Task: ***Define Loxahatchee Slough Hydrologic Restoration Area***

Task: ***Acquire Private Lands Necessary for Restoration***

Task: ***Develop Hydrologic Restoration Plan for Loxahatchee Slough (including flows to NW fork)***

Task: ***Modify S-46 Operation Schedule***

Strategy II-B: Maintain and Enhance Hydrology Between the Loxahatchee Slough and Wild And Scenic Northwest Fork

Task: ***Improve Jupiter Farms Water Management System***

Task: ***Develop and Implement Hydrologic Restoration Plan for the Reese Gildan Properties***

OBJECTIVE III INSURE THAT LAND USE ACTIVITIES WITHIN LOXAHATCHEE DRAINAGE BASINS ARE CONDUCIVE TO MAINTAINING THE VALUES OF THE WILD AND SCENIC RIVER

The effective exercise of local government land use regulatory authority is an integral component of the river management program in two respects. First, in order for national designation to have been approved, the management plan was required to demonstrate that alterations which would degrade the natural or scenic values of the designated river corridor area would be prevented. In the short term, local land use regulations are the best management tool available for directing potentially harmful land alteration activities away from the river corridor area. Until such time as other rules to implement the management programs outlined in this plan might be promulgated by the FDEP and/or the SFWMD, local governments bear the responsibility for preventing development that would impair the natural or scenic qualities of the river.

Land use controls also play a critical role in the overall management of the river's drainage system as a hydrologic unit. Land use changes in the basin inevitably affect the quantity and quality of water in the river. Since local land use controls help direct the timing, location and character of land development activities in the basin, the application and proper coordination of such controls are of continuing importance to the long term management of the river.

During consideration of the Wild and Scenic River designation, it was recognized that local government land use decisions for properties surrounding the river

corridor could impact the attributes of the river system. Local governments (which supported the river designation), were expected to review their respective comprehensive plans to insure consistency with river corridor management objectives. Local governments were to maintain currently allowed zoning densities in the river corridor and in other areas with a potential to generate adverse impacts upon the river area. Requests for increases in zoning density anywhere in the area should undergo careful and rigorous review. Increases should only be granted when it is shown that such actions will not result in a reduction of water storage capacity or deleterious effects on the natural or scenic qualities of the river or adjoining upland corridor. Additionally, local governments and agencies are to insure that stormwater management practices do not adversely affect the river corridor.

Public improvements such as drainage, utility, and road facilities have a profound influence on the location, timing, and extent of land development in the drainage basin. The provision of these facilities should be carefully managed to ensure that development takes place in an orderly, planned manner, and that development does not result in negative environmental impacts on the resource values of the river or the river corridor area. When new improvements such as water and sewer lines are necessary, they should be located and sized to prevent incremental connections that could result in additional demand for improvements. New major road construction, because of its potential for further fragmenting natural systems, disturbing drainage patterns, and encouraging "leapfrog" development, particularly should be avoided. When no alternative routes are available, however, the location and construction of new utility or road rights-of-way should be done in a manner that minimizes adverse effects on resource values in the river corridor.

If a land-use change is granted, every effort should be made to reduce the degradation of resources of the adjacent Jonathan Dickinson State Park and the Loxahatchee National Wild and Scenic River. Potential impacts of newly proposed developments can include visual encroachment, noise pollution, edge effects, exotic pest plant invasions, stray dog or cat problems, interference with prescribed burns, and hydrological impacts. Whenever possible, a buffer on private lands should be established to minimize any impacts caused by the proposed development plan. This would be in keeping with the 660 foot buffer strip that Palm Beach County enacted for development adjacent to the Park and Loxahatchee Wild and Scenic River corridor in the land use element of their Comprehensive Plan.

Strategy III-A: Review/Amend Local Government Comprehensive Plans To Insure Consistency With Corridor Management Goal

Task: ***Review Palm Beach County Comprehensive Plan***

Task: ***Review Martin County Comprehensive Plan***

Task: ***Review Town Of Jupiter Comprehensive Plan***

Task: ***Review Village of Tequesta Comprehensive Plan***

Task: ***Review City of Plan Beach Gardens Comprehensive Plan***

Water quality and quantity in the river can be threatened by a variety of activities, many of which originate outside the river corridor area. Stormwater runoff from disturbed sites transports pollutants and sediments into canals and the river. Inadequately treated sewage from unpermitted sources contributes to bacterial and nutrient contamination of the river and, perhaps, groundwater. Activities necessary for agriculture, navigation and

even recreation can disrupt natural hydrological patterns, affecting drainage areas, vegetation, and ultimately, water quality.

Strategy III-B: Develop Stormwater Management Plan For Areas Contributing To The Wild And Scenic Corridor

Task: Develop Stormwater Management Plan

Task: Encourage Local Stormwater Planning/Implementation

Task: Promulgate Basin Management Rules (as needed)

Non-point source pollution (stormwater runoff) is emerging as a primary degrading element in the condition of surface waters in the river and in the estuary. As the drainage basin continues to develop, the diversity of land use activities, each with its own type of runoff, will grow. Urban and agricultural land uses generally produce runoff that can be particularly degrading to water quality. As agricultural lands in the watershed are converted to urban uses however, urban runoff will pose more of a long-term threat to surface water quality than agricultural runoff. The proper control of all stormwater pollution in the drainage basin is essential to the overall health of the river. The basin management rules which may be promulgated by the South Florida Water Management District should be effective in preventing adverse impacts on water quality caused by new development. On-site management personnel will assist the SFWMD in ensuring that the best management practices for non-point source pollution are initiated. On-site personnel will also work with the Martin and Palm Beach County Farm Bureaus, local Soil and Water Conservation Districts, the Florida Department of Agriculture and Consumer Services, and individual growers and drainage districts to develop and implement conservation plans to mitigate potential negative impacts of agricultural runoff on the river. Management personnel will

become active participants in the development and revision of local government comprehensive plans, in the review of Developments of Regional Impact, and in the review of existing and proposed land use activities which could affect the environmental integrity of the river. On-site personnel, in cooperation with the Loxahatchee River District and the South Florida Water Management District, will also monitor conditions on the river to help ensure compliance with the water quality standards of Chapter 17-3, Florida Administrative Code and maintenance of existing water quality (Addendum 2)

Strategy III-C: Acquire and Manage Natural Systems Important To Protection Of The Northwest Fork

Task: ***Acquire Pal Mar Wetlands***

Task: ***Develop Management Plan for Pal Mar and Cypress Creek Basin***

Through 1999, more than __,____ acres have been acquired within the Pal Mar area by SFWMD, Martin County, and Palm Beach County. Efforts are continuing to acquire additional lands within the target area.

OBJECTIVE IV: FACILITATE PUBLIC INVOLVEMENT IN PROTECTING THE WILD AND SCENIC RIVER CORRIDOR, INCLUDING BOTH PLANNING AND IMPLEMENTATION EFFORTS

The designation of the Northwest Fork of the Loxahatchee River as a component of the federal Wild and Scenic river system was the result of a local grass-roots effort. Throughout the designation and plan development process, local public involvement was invaluable. Effective implementation of this management plan requires a continuing local interest and participation. Public education relative to river issues and efforts can be directed toward both users on the river, and the local community. Strategies to achieve this objective include:

Strategy IV-A: Provide Educational Information To River Users

Task: ***Develop and Distribute Educational Materials***

Task: ***Develop Otter Creek Environmental Learning Center***

Task: ***Develop Jonathan Dickinson State Park Visitor Center***

The Loxahatchee River District completed the initial phase of the Otter Creek Learning Center in 1999. Included are educational displays and an animal rehabilitation facility. Additional educational components are planned, but still incomplete.

Strategy IV-B: Coordinate Efforts To Insure That Local Environmental Education And Public Information Programs Include River Information

Task: ***Encourage and Support Local Initiatives***

Task: ***Provide River Information to River Users and Local Educational Institutions***

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CHAPTER VI

PLAN IMPLEMENTATION

In the preceding chapters, this plan has sought to identify the natural and cultural features that combine to make the Loxahatchee River an area of unique natural resource values. It has sought, as well, to set forth a program of goals, objectives and specific tasks to be accomplished to ensure that these resource values are permanently protected and enhanced. By conscientious efforts to implement the actions discussed herein, public agencies and private interests can work together toward achieving the goals and objectives set forth in this plan.

MANAGEMENT COORDINATION

Management of the Loxahatchee Wild and Scenic River will be accomplished through the cooperative actions of many local, state, and federal agencies having vested interests in this area of the river. An important function of the river management program will be to coordinate the management activities of the various involved agencies. The Department of Environmental Protection and the South Florida Water Management District have, as provided in Section 83-358.5(3) (o), Laws of Florida, established the Loxahatchee River Management Coordinating Council (LRMCC) to ensure that effective interagency management coordination is maintained.

The LRMCC is composed of one representative from each of the agencies specified below, in accordance with Section 83-358.5(3)(o).

U.S. Department of the Interior
Department of Environmental Regulation
Department of Transportation
Game & Fresh Water Fish Commission
Department of Community Affairs
Department of Agriculture & Consumer Services, Division of Forestry
Department of State, Division of Archives, History & Records Management
Treasure Coast Regional Planning Council
Martin County
Palm Beach County
Town of Jupiter
Jupiter Inlet District
Loxahatchee River Environmental Control District
South Indian River Water Control District
Northern Palm Beach County Improvement District
Palm Beach County Farm Bureau

Members also represent, among others, local environmental groups, public entities within the basin, and private property owners who may be affected by the plan.

The LRMCC advises the FDEP and the SFWMD on matters that affect the administration of the river within its authority as granted by Chapter 83-358. The LRMCC plays a vital role in ensuring that the preservation and enhancement goals of the plan are realized by identifying and resolving coordination problems and enhancing communication between all interests in the river area. Most of this function is conducted at the on-site staff level. Conflicts that may arise between user groups and agencies, or problems that have no established channels for resolution, are identified and resolved through coordination and negotiation. When necessary, the Council may formally review problems and provide its recommendations to the appropriate decision-making or management agencies.

The LRMCC also reviews and provides advisory recommendations on all permits required by Chapter 83-358. Permits required under this Act are subject to the provisions of Chapter 120, Florida Statutes, and the LRMCC's review will not impede the timely processing of those permits. The specific process for the LRMCC's review of such permits will be established by the FDEP and the SFWMD in their respective rules for the administration of the Wild and Scenic River. In reviewing permits, the LRMCC may find it necessary to conduct in-depth analyses of the potential impacts of proposed activities. On-site management personnel may assist the council in these assessments, as requested.

The LRMCC also reviews and make recommendations concerning all proposed modifications to this plan. Plan amendments may be proposed to the Council by individual member agencies, or to the FDEP and the SFWMD by the LRMCC. In either case, the LRMCC will conduct a formal review of the proposed amendment, including an assessment of any potential effects on the natural and scenic values of the river or the corridor area. If appropriate, the LRMCC may issue its recommendations concerning amendments to the FDEP and the SFWMD.

Finally, the LRMCC reviews all rules required by Chapter 83-358 for the protection, management, and operation of the river. The LRMCC reviews these rules for their impact on management program goals. Recommendations will be made to the FDEP through its Executive Director, or to the Governing Board of the SFWMD through the Executive Director, as appropriate.

The LRMCC elects appropriate officers as provided in Section 83-358.5(3)(o). The LRMCC may adopt by-laws to provide for the conduct of its business on behalf of the State and other matters as the members deem advisable, subject to the approval of the FDEP and the SFWMD. The SFWMD will provide necessary professional staff to the LRMCC.

PLAN REVIEW AND AMENDMENT

The Loxahatchee Wild and Scenic River Management Plan will be reviewed and, if necessary, revised periodically, but at least at five-year intervals to ensure that the objectives and measures of the management program remain relevant to achieving the plan's preservation and enhancement goals. All regular (five-year) reviews of the plan will be conducted by the FDEP and the SFWMD. A report on such reviews will be submitted to the LRMCC for review and comment. The report will then be submitted to the FDEP and the SFWMD for acceptance.

Any revision or modification of the approved management plan will be accomplished through essentially the same process utilized to adopt the original plan. Plan amendments may be proposed at any time by the FDEP, the SFWMD, or the LRMCC. All proposed amendments will be submitted to the SFWMD, acting as staff to the LRMCC. The SFWMD will then schedule the proposal for joint discussion by the LRMCC and by staff of the FDEP and SFWMD. The LRMCC may, at its discretion, appoint a subcommittee or other appropriate work group to further analyze the proposed revision before making its final recommendations. The analysis of the work group will identify or predict: (1) any potential adverse affect on any natural, cultural, or scenic resource of the river or the designated corridor area which may result as a direct or indirect consequence of the proposed plan amendment; and (2) any other matters the LRMCC finds desirable. On-site management personnel will issue recommendations on all proposed plan amendments. After the work group submits its findings to the LRMCC, the LRMCC will meet to make its recommendations to the FDEP and the SFWMD. All amendments to the plan must be approved by the FDEP and the SFWMD.

TABLE 8 summarizes the implementation tasks previously identified in this 1996 Update of the Loxahatchee River Wild and Scenic River Management Plan. The agencies responsible for implementation, and the target year for task completion are also included.

Table 8

Plan Implementation Schedule: 2000-2005

Table 8 (continued)

Plan Implementation Schedule: 2000-2005

Table 8 (continued)

Plan Implementation Schedule: 2000-2005

Table 8 (continued)

Plan Implementation Schedule: 2000-2005

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CHAPTER VII

PROGRESS TO DATE

In the preceding chapters, this plan has identified the key issues that must be addressed to effectively manage the Wild and Scenic River corridor. The plan, in Chapter V, has also laid out key tasks that must be accomplished in the future to protect and enhance the biological and cultural values of the Northwest fork of the Loxahatchee River. These represent a dynamic combination of tasks identified in the initial plan which remain uncompleted, and newly identified tasks.

This chapter summarizes the progress made in completing tasks identified in the original plan. The following discussion presents these accomplishments in the context of the most appropriate management plan objective.

OBJECTIVE I: PROTECT AND ENHANCE NATURAL AND CULTURAL VALUES WITHIN THE DESIGNATED WILD AND SCENIC RIVER CORRIDOR

The initial management plan proposed the boundaries and classification of a Wild and Scenic corridor on the Loxahatchee River and proposed the public acquisition of lands within the corridor. These three tasks; delineation, classification, and acquisition, have been completed.

The various sections of the river corridor are classified as "Wild", "Scenic", or "Recreational", based on the degree of evidence of human alteration and other factors. The particular classification of a segment is both an assessment of its current condition and a statement of management philosophy. As used in this plan, "Wild" river areas are free of

impoundments and generally inaccessible except by trail. Their shorelines are essentially primitive and their waters unpolluted. "Scenic" river areas are free of impoundments with shorelines largely primitive and undeveloped. These areas may be accessible in places by roads. "Recreational" river areas may be readily accessible by road and may have undergone some impoundment or diversion in the past. Some development may exist along their shorelines.

The Northwest Fork is divided into four segments for purposes of classification. Segment l is classified as "Recreational". It begins in Riverbend Park at River Mile 13.5 and extends 0.5 miles north to Indiantown Road. Segment 2 is classified as "Scenic" and extends from Indiantown Road to just north of the Florida Turnpike (River Mile 13 to River Mile 11.5) , a total of about 1.50 miles. Segment 3 is the "Wild" segment of the river, between River Mile 11.5 and about River Mile 10. Segment 4 is also classified as "Scenic", and extends approximately four miles between the Trapper Nelson Interpretive Site and the southern boundary of JDSP at River Mile 6.

CORRIDOR DELINEATION

The river corridor area is the central geographic focus of the river management program. Section 83-358.3(8), Laws of Florida, defines the river corridor area as follows:

> *That portion of the Northwest Fork of the Loxahatchee River from river mile 6 to river mile 13.5, together with such abutting uplands as determined in the permanent management plan to form the corridor having visual impact on the river user, and which may be necessary to maintain the natural and scenic appeal of the river.*

Three criteria were utilized to delineate the river corridor area protected by this plan. First, the corridor area had to be of sufficient width to include all of the natural

resource values identified as being outstanding, remarkable or worthy of note by the National Park Service in its feasibility study of the river. The geographic extent of these resources coincides with the extent of the river's wetland vegetation communities. Secondly, the corridor area had to be configured in a manner that facilitates management by on-site personnel. A regularly-shaped corridor can be identified and managed more effectively than one with an irregular configuration. Thirdly, as a practical consideration, the corridor had to lie entirely within the area identified for purchase by the South Florida Water Management District under the Save Our Rivers Program. In those locations where the lateral extent of corridor area, as defined by the first two criteria above, would extend beyond the boundaries of the acquisition area, the corridor boundaries were adjusted to coincide with the acquisition area.

Based on these factors, the proposed boundaries of the designated river corridor area were determined. The corridor area was generally expressed as either (l) the maximum upland extent of the floodplain's freshwater or saltwater wetland vegetation plus a buffer area of 100 feet on each side of the river; or (2) 350 feet on each side of the river, measured from the center of the main river channel, whichever is greater. The corridor area did not include the river's tributaries. The 350-foot alternative corridor measurement applied to those areas where the width of the wetland vegetation area (measured from the center of the river) was less than the observed average for the entire 7.5-mile segment. This average was determined by measurements based on large scale aerial photography, which indicated an average wetland vegetation width of 500 feet, or 250 feet on each side of the river. This distance, plus a 100-foot buffer, was utilized to determine the alternate corridor standard.

The corridor area as defined above comprised approximately 795 acres of land, of which some 500 acres were initially under public ownership. The corridor area extended approximately 150 feet beyond the Save Our Rivers Program land acquisition

boundary in two locations: (1) for a distance of about 1,900 feet on the west bank of the river north of Indiantown Road in the vicinity of the Blankenship property, and (2) for approximately 1000 feet just north of the right-of-way of Interstate Highway 95. In these three specific locations, the FDEP determined that the buffer provided by the SFWMD's acquisition area would be effective in screening visual intrusions on the river from adjacent uplands. Thus, in these areas, the corridor boundary was modified to conform to the boundaries of the acquisition area.

The actual boundaries, as determined by the SFWMD SOR acquisition program, and previous public holdings (JDSP and RCP), are shown in FIGURE 2.

CORRIDOR MANAGEMENT

Among the important initial tasks was the completion of this management plan and the development of agreements necessary to begin implementation. As proposed in the original plan, SFWMD and the FDEP developed and executed a Cooperative Agreement to permit FDEP management of the SOR lands acquired by SFWMD for the river corridor. The FDEP and SFWMD have also cooperated in the creation and support of the Loxahatchee River Management Coordinating Council. The Council continues to meet on a quarterly basis to fulfill its responsibilities as defined in this plan.

To enhance corridor management, it was proposed that the corridor be designated as; 1) an Outstanding Florida Water (OFW), 2) an Aquatic Preserve, and 3) a component of the Indian River Lagoon *SWIM* Plan. All three of these tasks have been accomplished.

The Wild and Scenic Management Plan has recognized the need to develop more specific guidelines to achieve certain plan objectives. In support of this intent, FDEP

has completed plant community maps, a Fire Management Plan, and an Upland Exotic plant Management Plan which encompass the corridor.

Finally, the FDEP has designated a program manager for the Wild and Scenic corridor to provide the "On-site" management recommended in the plan, and has undertaken numerous specific management activities within the corridor including biological sampling, use surveys, and species management efforts.

The management plan recognized that a sound technical date base is required for corridor management decisions and further noted that the water quality monitoring efforts were inadequate at the time the corridor was designated. The plan recommended that the SFWMD take the lead in establishing a greater monitoring effort in the Loxahatchee River. This effort was undertaken by the Loxahatchee River District (LRD) rather than SFWMD. The LRD has compiled all outstanding water quality data into a single data base, and established an on-going monitoring program throughout the river. The LRD periodically compiles assessments of trends and conditions for the Coordinating Council and general public.

OBJECTIVE II: ENHANCE THE HYDROLOGIC RELATIONSHIP BETWEEN THE LOXAHATCHEE SLOUGH AND THE WILD AND SCENIC NORTHWEST FORK OF THE LOXAHATCHEE RIVER

The management plan has noted that enhancing water storage capacity in the drainage basin, and increasing flows into the NW fork during dry period are critical for survival of the river corridor. The plan identified a number of structural, and non-structural measures to be undertaken to better manage water resources within the river basin. The following have been successfully implemented:

To assist in restoring a more historic salinity regime in the Northwest Fork, the Jupiter Inlet District, the Florida Park Service (FDEP) and the South Florida Water Management District closed several breeches cut through oxbows in the river. These breeches were generated by canoe and boat traffic rather than natural conditions. Closure restored primary river flow to approximately one/half mile of channel previously partially circumvented by the breeches and resulted in lower salinity within the sensitive freshwater upper reach of the Northwest fork

The C-18 canal is constructed with levees on each side within the Loxahatchee Slough area. Runoff from the Slough enters the canal through culverts placed through the levees. The height of the flashboard control devices on the culverts was increased to allow for higher elevation and greater storage in the Slough. This inundates the Slough for longer periods of time, thereby enhancing existing wetlands and improving storage capacity. Increased detention in the Slough creates a higher potential for flows to the river during low water periods. To further enhance storage, the control elevation for the C-18 canal was also raised slightly.

Flows from the C-18 to the NW fork are controlled by the SFWMD's G-92 structure. To facilitate increased flows, a Cooperative Agreement between the South Indian River Water Control District and the South Florida Water Management District was executed to permit greater discharge into the SIRWCD C-14 canal (and thence to the NW fork). The G-92 structure was enlarged to convey up to 400 cfs and equipped with telemetry monitoring and control linked to the SFWMD Operations Room.

To better manage flows and levels within the river corridor, the SFWMD rebuilt the historic Lainhart and Masten dams. These low-level structures had deteriorated due to age and were no longer holding appropriate tailwater levels. During the reconstruction, portage ramps for canoeists were added to each structure.

OBJECTIVE III: **INSURE THAT LAND USE ACTIVITIES WITHIN THE LOXAHATCHEE BASINS ARE CONDUCIVE TO MAINTAINING THE VALUES OF THE WILD AND SCENIC RIVER.**

The Wild and Scenic river designation preceded the development of local government comprehensive plans. These plans, required under the State Comprehensive Planning Act, are intended to assist local governments in developing in a manner consistent with their resources. During the plan development process, the local governments in the Loxahatchee watershed adopted specific policies regarding protection of the Loxahatchee River corridor. These local governments continue to participate as members of the Coordinating Council to insure that local land use decisions are appropriate to the management plan objectives.

The FDEP has also developed an Ecosystem Management Area (EMA) initiative to further protect the river basin by enhancing the coordination of planning, acquisition, and regulation.

OBJECTIVE IV: FACILITATE PUBLIC INVOLVEMENT IN BOTH PLANNING AND IMPLEMENTATION OF EFFORTS TO PROTECT THE WILD AND SCENIC LOXAHATCHEE RIVER.

The designation of the Wild and Scenic corridor has resulted in greater public attention being focused upon the area. The local paddling community, most notably the "Coconut Kayakers" kayaking group, has undertaken repeated, and intensive, trash clean-up efforts on the river corridor and contributing tributaries. They have also undertaken exotic aquatic weed removal efforts within the river corridor.

The Riverbend County Park concessionaire has provided the use of his boats on numerous occasions to facilitate education and interest among local government and management agency personnel, and has actively encouraged education and understanding among recreational users of the river.

AMENDMENTS TO OCTOBER 1998 DRAFT LOXAHATCHEE RIVER WILD AND SCENIC RIVER MANAGEMENT PLAN

The Loxahatchee River Management Coordinating Council has reviewed and approved the following two revisions of the October 1998 draft of the Loxahatchee River Wild and Scenic River Management Plan. These two revisions are proposed for incorporation into the final plan where noted below:

(1) Archeological and Historical Sites (revision to pages 44-45)

Within the 1990's, a good deal of archeological work has been conducted in and around the lands associated with the Loxahatchee River National Wild and Scenic River (Kennedy, Lewis et al. 1991; Kennedy et al. 1993; Pepe and Kehoe 1992; Kennedy et al 1994; Carr, Steele, Pepe and Spears-Jester 1995; Carr, Spears-Jester, Pepe and Perez 1995; Pepe and Carr 1996a; Pepe and Carr 1996b; Pepe 1996a; Pepe 1996b; Wheeler and Lewis 1997; Pepe et al 1997). As of April 1998 a total of 69 archaeological and historic sites associated with the Loxahatchee River have been identified. Five of these sites are or once were located near the Jupiter Inlet. An additional site is on the North Fork of the River. Two sites, the East Slough Site, and the "Seminole Skirmish Line", have been destroyed by the recent widening of Indiantown Road (SR706) west of the Florida Turnpike. The remaining 61 sites are located on lands associated with the Loxahatchee River national Wild and Scenic River. Of these sites, 22 are managed completely by Jonathan Dickinson State Park and 39 by Palm Beach County Parks and Recreation. One site, Riverbend Park #7, is partially managed by Palm Beach County while other portions of the site are in private hands. Most of the final site the Loxahatchee Battlefield, is managed by Palm Beach County and the state of Florida, while smaller portions are also located on private lands.

Most of the sites associated with the Loxahatchee National Wild and Scenic River are prehistoric. Most are probably seasonal and/or temporary camps located in the hammocks and floodplain swamps bordering the Loxahatchee and its associated streams and sloughs. Many of these sites can be described as “black dirt middens”. The oldest sites date to the Late Archaic period (3000-750 B.C.) while the most recent sites date to the East Okeechobee IV period (A.D. 1500-1750). However, the vast majority of sites seem to date to the East Okeechobee I period (750 B.C.- A.D. 800).

Archeological and historic investigations conducted in and around the Loxahatchee National Wild and Scenic River over the past few years have also shed important new light on the two battles of the Loxahatchee. This is especially true for recent work conducted by the Archeological and Historical Conservancy during the Indiantown Road widening project and a recent survey of the Northwest Fork (reports in progress). Jesup’s military camp and most of his battlefield can now be fairly safely interpreted as having been on the west side of the Loxahatchee River, mostly in Riverbend County Park, just a little to the north and perhaps a little to the west. The Seminole village can now similarly be interpreted as having been on the east side of the river, on what became the Shunk tract, the Reese Life Estate and/or former Riverbend Trailer Park. Powell’s battle began somewhere around the Eastern Slough of the Loxahatchee and his furthest advance was probably to the aforementioned Seminole village on the east bank of the Loxahatchee Rive. In addition, archival research has demonstrated that the military trail between Ft. Van Sweringen and Ft. Jupiter passed through lands associated with the Loxahatchee National Wild and Scenic River.

Unfortunately it seems that most of the artifacts from and portions of the Seminole and military camps and the two battlefields have been recovered from the periphery of the actual original locations of these sites. The development and other disturbances which have taken place in what is now the Divosta property, Riverbend Park, Loxahatchee River District property, the original and present Sierra Square, and Indiantown Road have all severely disturbed or destroyed the main portion of Jessup's battlefield and camp, the Seminole village, and probably a good deal of Powell's battlefield as well.

Nonetheless, portions of all these sites and the military trail have been identified and have now all been subsumed under the site name "Loxahatchee Battlefield".

(2) Buffers (addition to page 102)

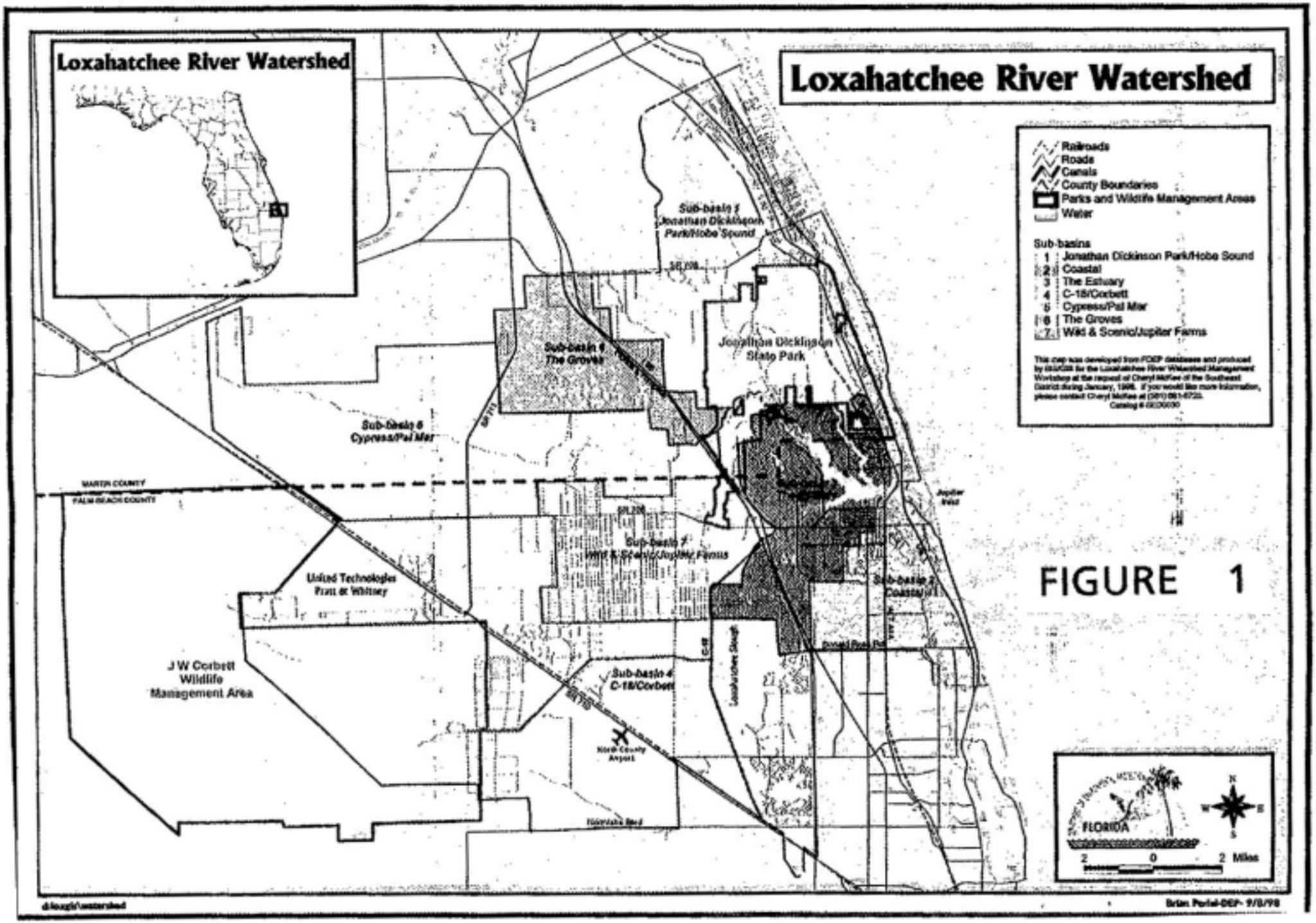
If a land-use change is granted, every effort should be made to reduce the degradation of resources of the adjacent Jonathan Dickinson State Park and the Loxahatchee National Wild and Scenic River. Potential impacts of newly proposed developments can include visual encroachment, noise pollution, edge effects, exotic pest plant invasions, stray dog or cat problems, interference with prescribed burns, and hydrological impacts. Whenever possible, a buffer on private lands should be established to minimize any impacts caused by the proposed development plan. This would be in keeping with the 660 foot buffer strip that Palm Beach County enacted for development

adjacent to the Park and Loxahatchee Wild and Scenic River corridor in the land use element of their Comprehensive Plan.

LOXAHATCHEE RIVER
WILD AND SCENIC RIVER
MANAGEMENT PLAN

FIGURES

TABLES


Loxahatchee River Watershed
Loxahatchee River Watershed
Railroads
Roads
Canals
County Boundaries
Parks and Wildlife Management Areas
Water
Sub-basins
1 Jonathan Dickinson Park/Hobe Sound
2 Coastal
3 The Estuary
4 C-18/Corbett
5 Cypress/Pal Mar
6 The Groves
7 Wild & Scenic/Jupiter Farms
Sub-basin 1 Jonathan Dickinson Park/Hobe Sound
Sub-basin 6 The Groves
Jonathan Dickinson State Park
Sub-basin 5 Cypress/Pal Mar
MARTIN COUNTY
PALM BEACH COUNTY
Sub-basin 7 Wild & Scenic/Jupiter Farms
Sub-basin 2 Coastal
United Technologies Pratt & Whitney
J W Corbett Wildlife Management Area
Sub-basin 4 C-18/Corbett
Loxahatchee Slough
North County Airport
FLORIDA
N
W
E
S
2 0 2 Miles
FIGURE 1
dlougls\watershed
Brian Parisi-DEP- 9/8/98

LOXAHATCHEE RIVER CORRIDOR CLASSIFICATIONS

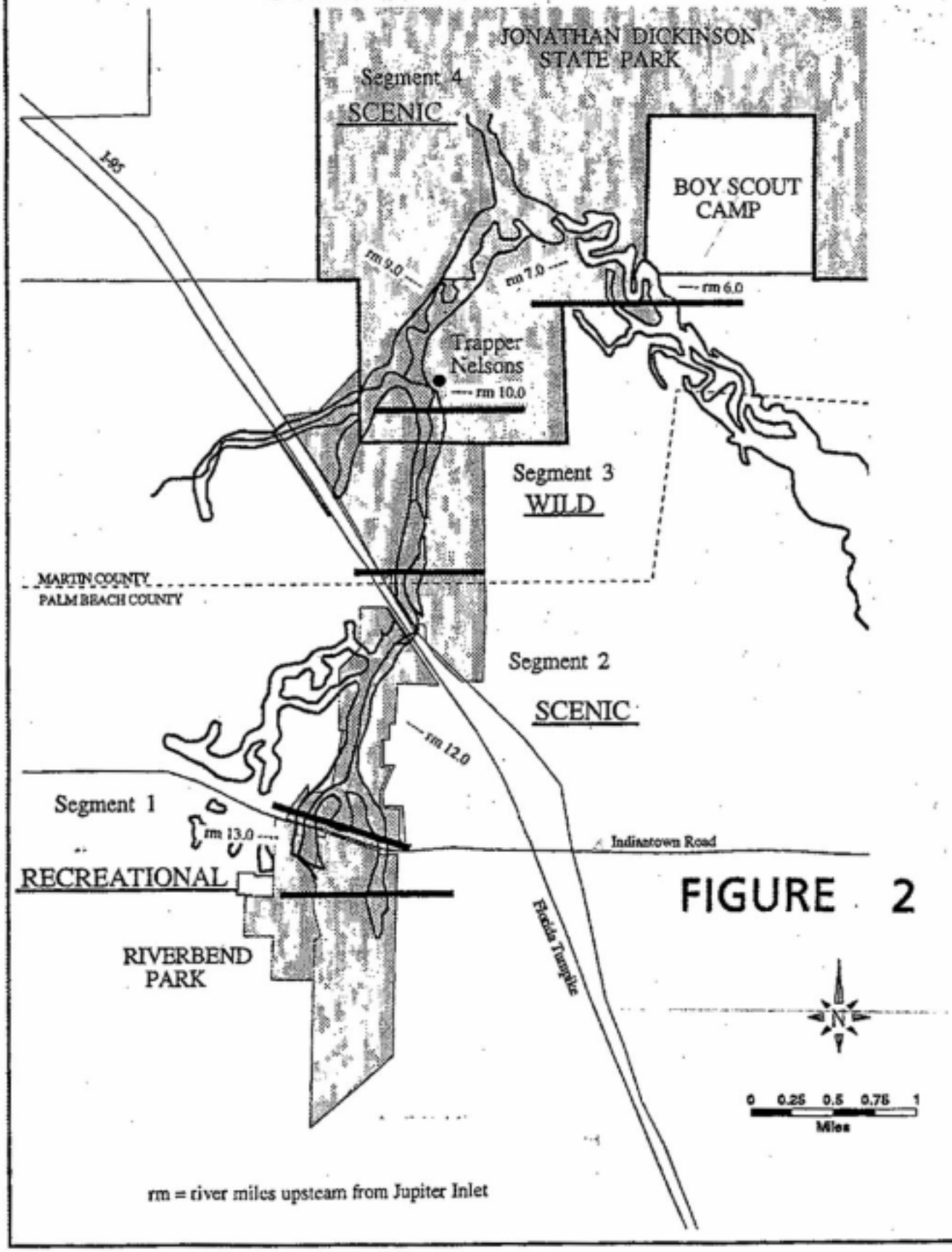
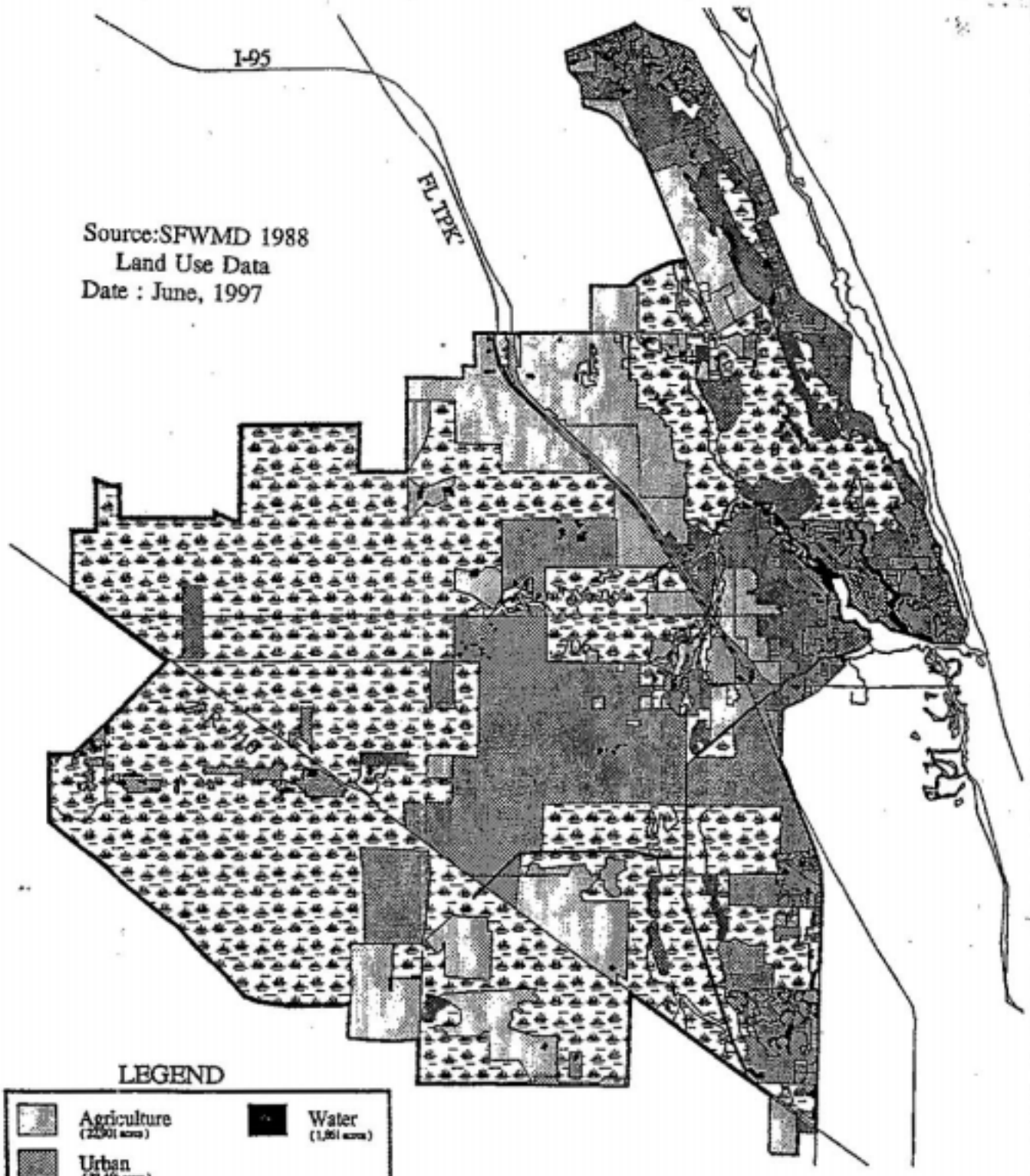


FIGURE 2

rm = river miles upsteam from Jupiter Inlet

CURRENT GENERALIZED LAND USE / LAND COVER IN THE LOXAHATCHEE SLOUGH WATERSHED



This map is used for planning purposes only.

FIGURE 3

CURRENT GENERALIZED LAND USE / LAND COVER WITHIN ONE MILE OF CORRIDOR

Source:SFWMD 1988
Land Use Data
Date : June, 1997

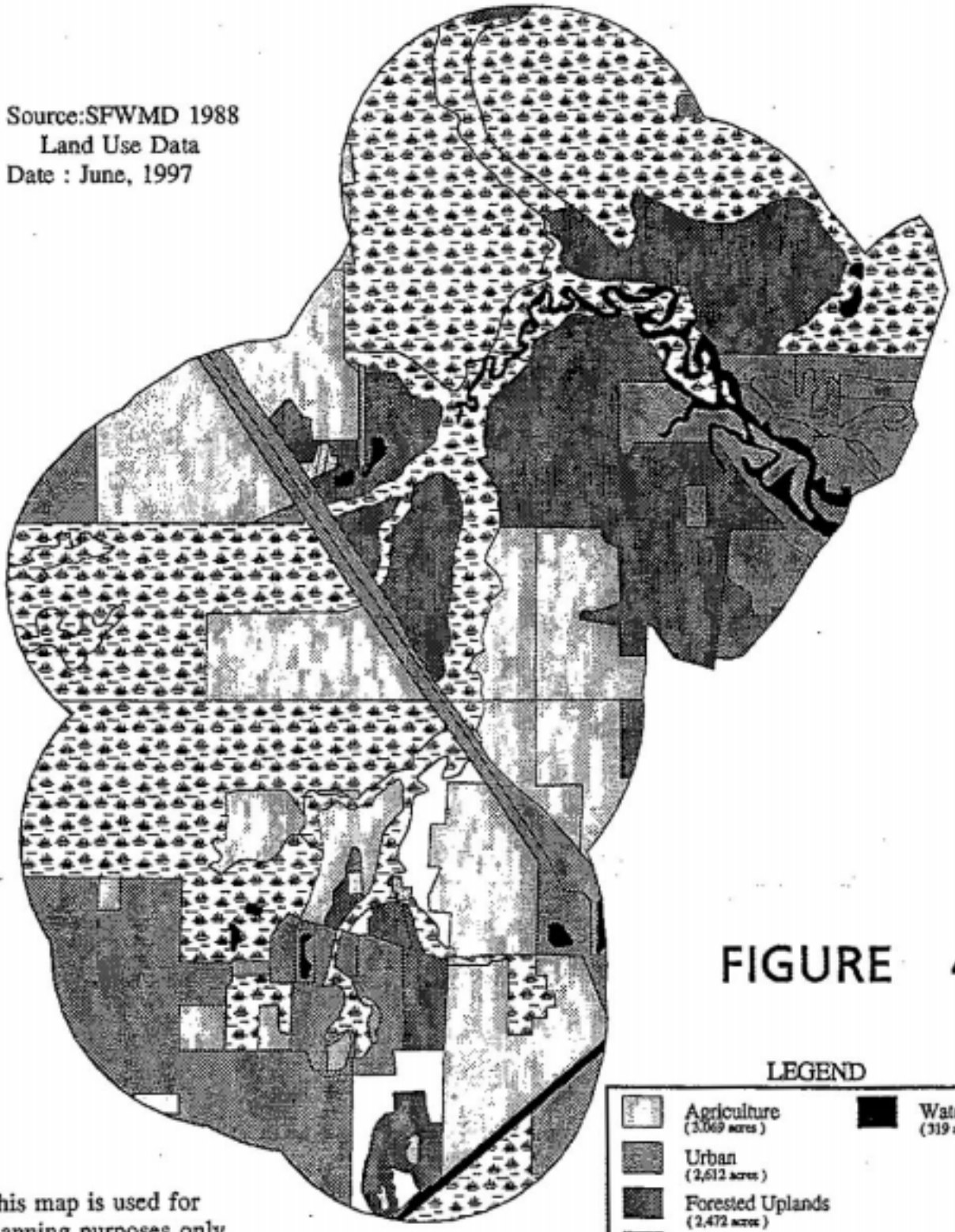


FIGURE 4

LEGEND

- Agriculture (3,069 acres)
- Water (319 acres)
- Urban (2,612 acres)
- Forested Uplands (2,472 acres)
- Wetlands (5,718 acres)

This map is used for planning purposes only.

PROPOSED ADDITION TO THE WILD AND SCENIC CORRIDOR

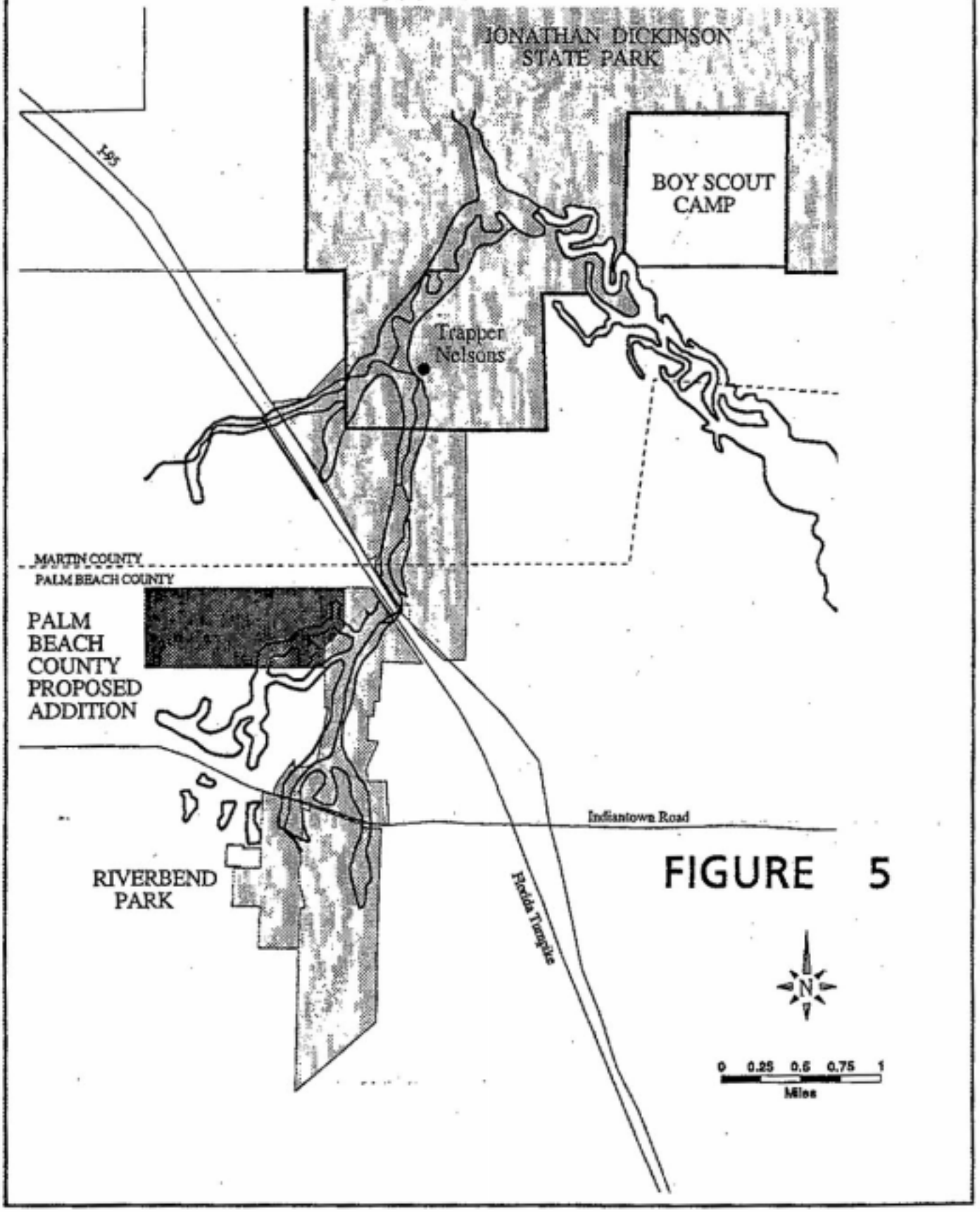


FIGURE 5

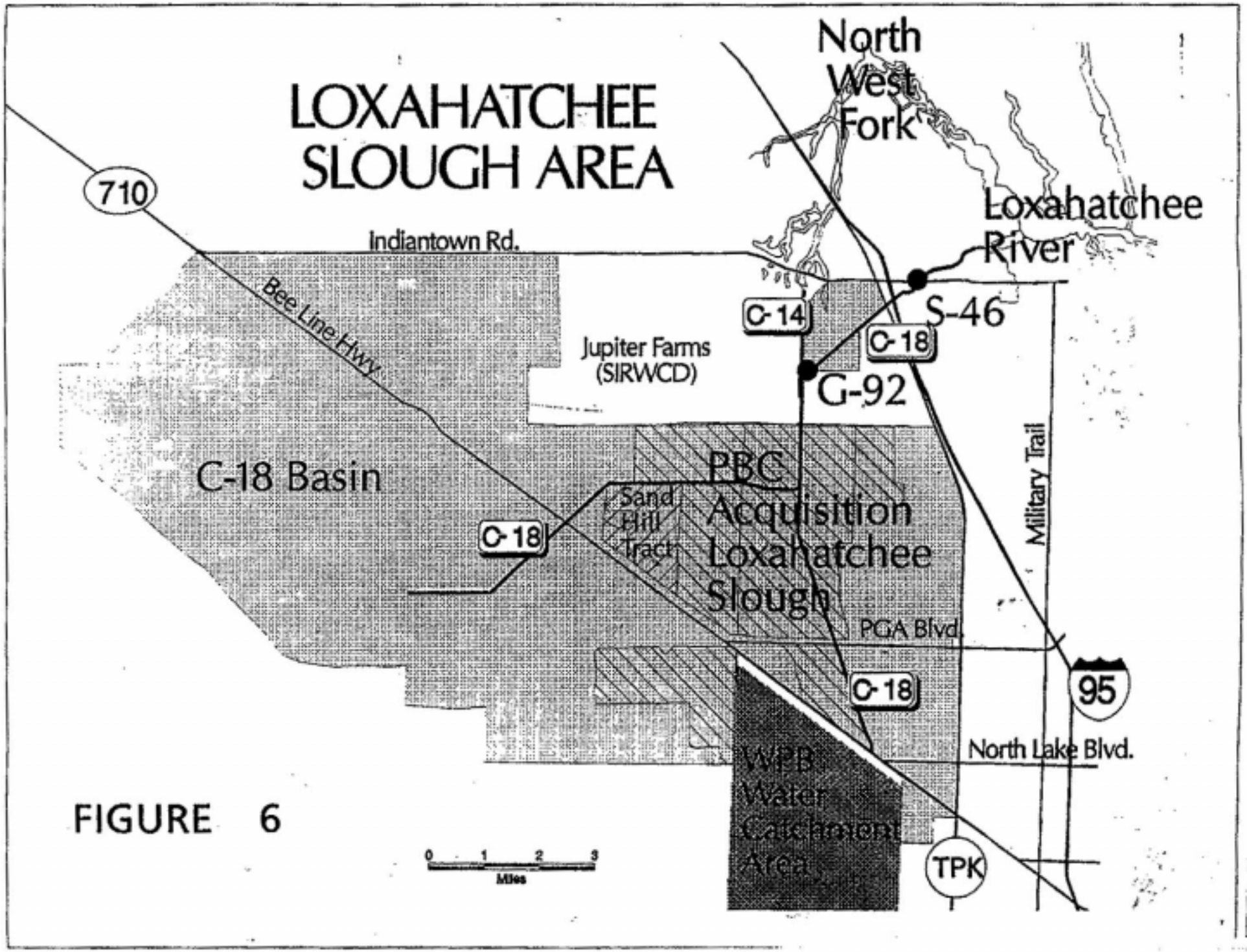
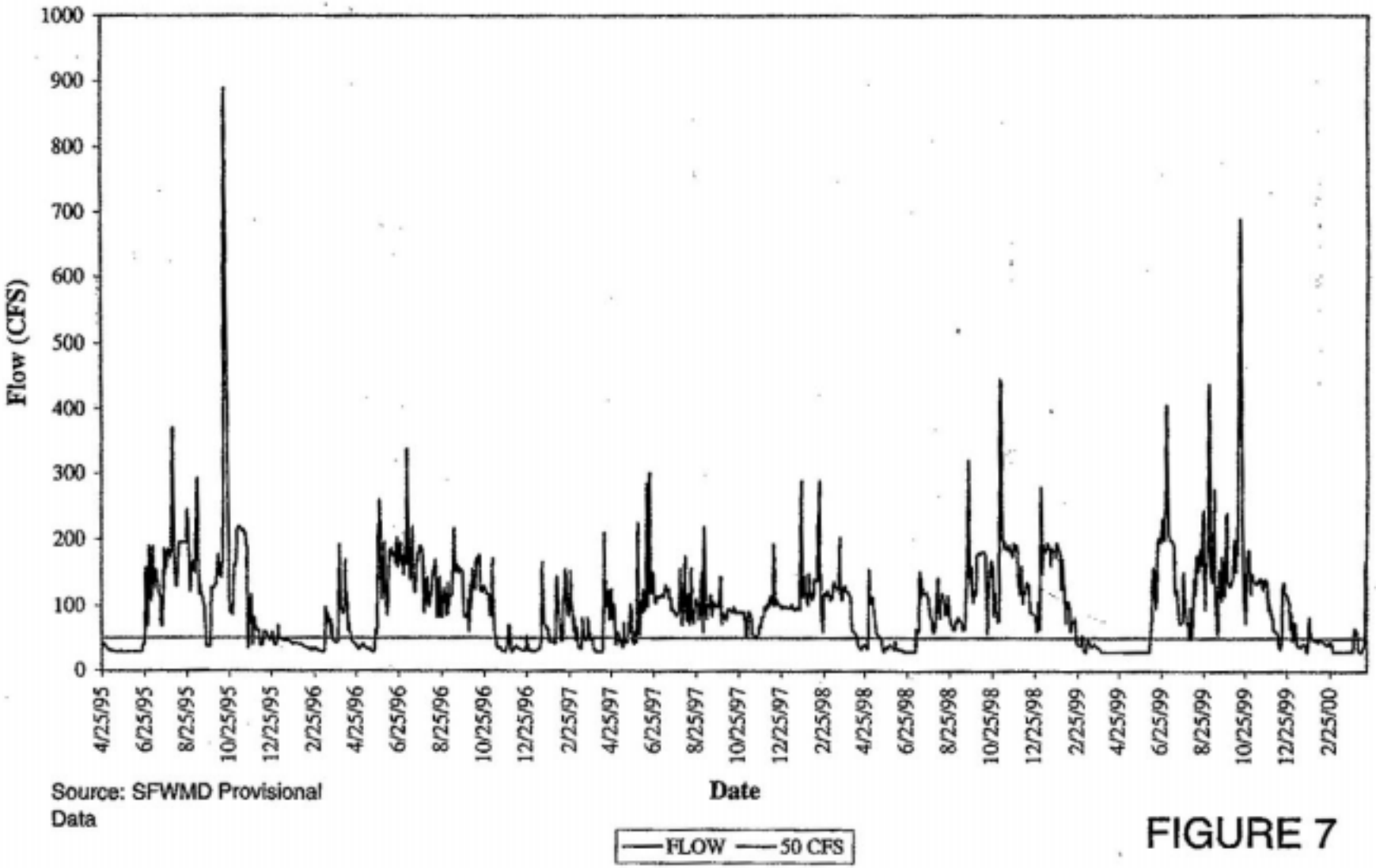

LOXAHATCHEE
SLOUGH AREA
North
West
Fork
Loxahatchee
River
710
Indiantown Rd.
Bee Line Hwy
C-14
S-46
C-18
Jupiter Farms
(SIRWCD)
G-92
C-18 Basin
PBC
Acquisition
Loxahatchee
Slough
Sand
Hill
Tract
C-18
Military Trail
PGA Blvd.
C-18
95
North Lake Blvd.
WPB
Water
Catchment
Area
TPK
0 1 2 3
Miles

FIGURE 6

Northwest Fork Flow Across Lainhart Dam



Source: SFWMD Provisional Data

FIGURE 7

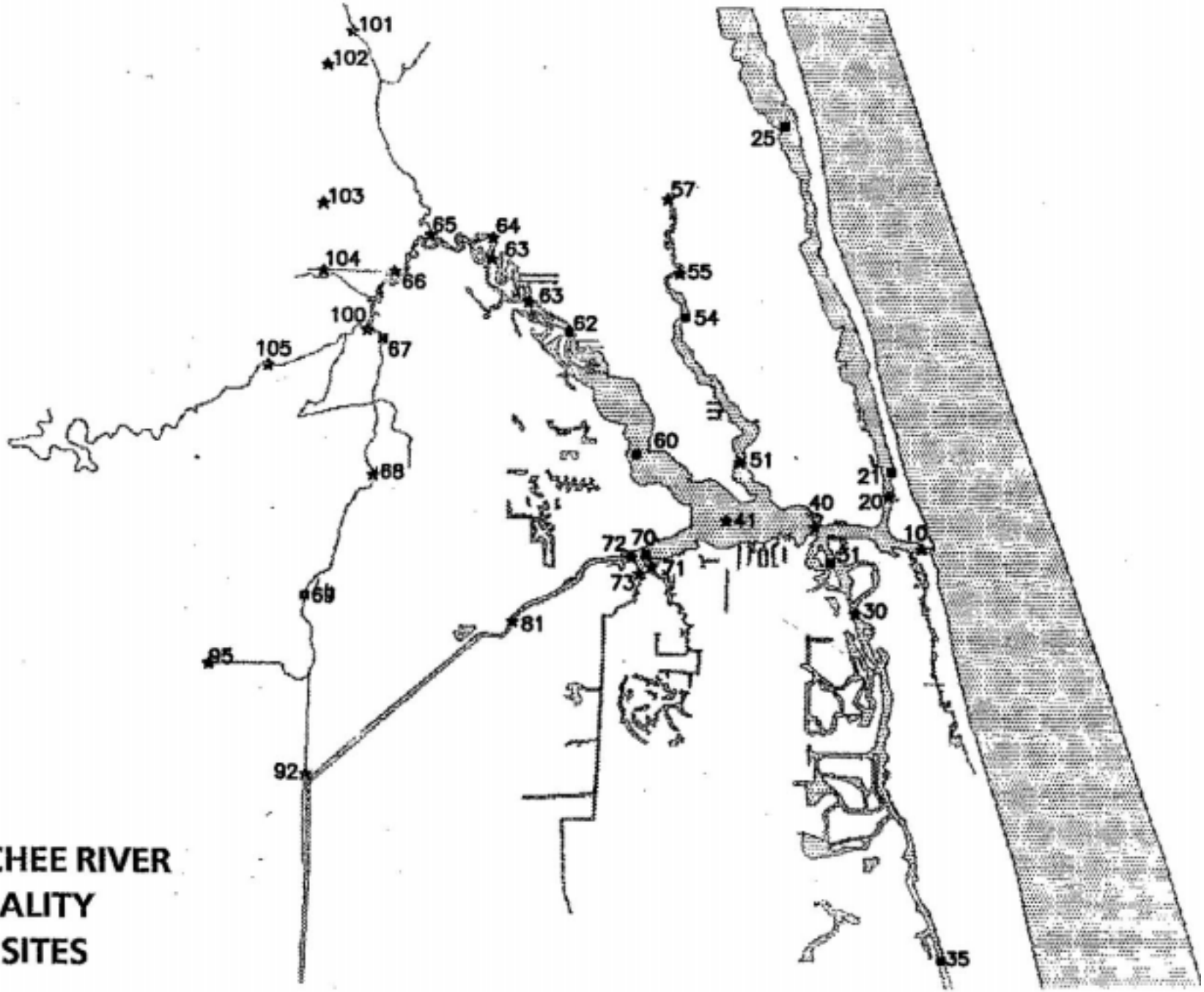
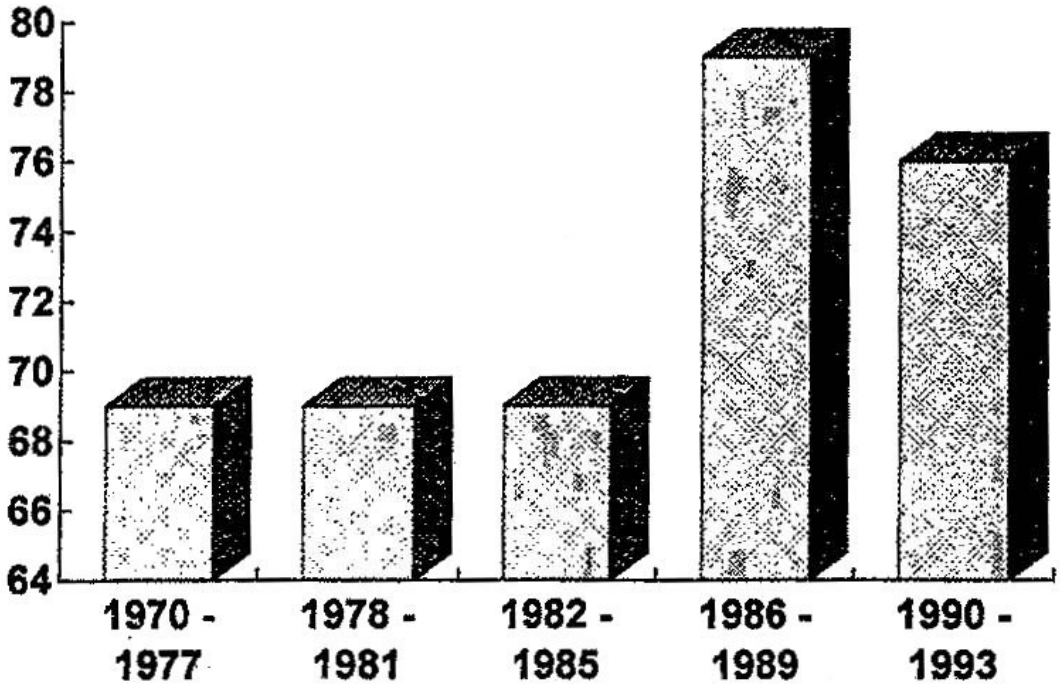


FIGURE 8

LOXAHATCHEE RIVER WATER QUALITY SAMPLING SITES

Water Quality Index Trend
Wild and Scenic River Segment



SOURCE:
LOXAHATCHEE RIVER DISTRICT, 1995

FIGURE 9

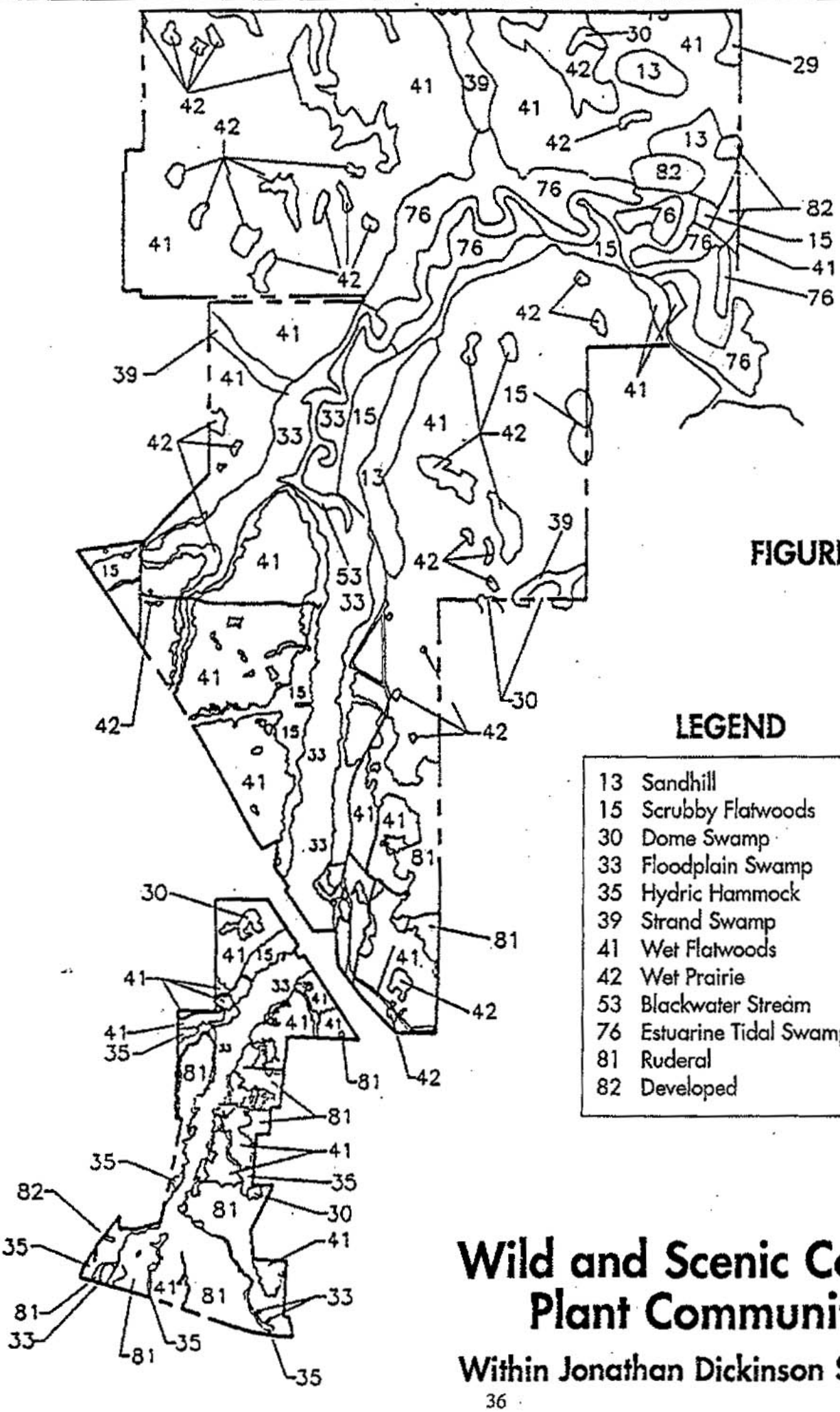


FIGURE 10

LEGEND

13	Sandhill
15	Scrubby Flatwoods
30	Dome Swamp
33	Floodplain Swamp
35	Hydric Hammock
39	Strand Swamp
41	Wet Flatwoods
42	Wet Prairie
53	Blackwater Stream
76	Estuarine Tidal Swamp
81	Ruderal
82	Developed

Wild and Scenic Corridor Plant Communities

Within Jonathan Dickinson State Park

MAJOR TRIBUTARIES	1980 WET SEASON May-Oct. 1980 (184 days)		1980-81 EXTENDED DRY SEASON Nov. 1980-July 1981 (273 days)		1981 WET SEASON Aug.-Sept. 1981 (61 days)		1981 TROPICAL STORM DENNIS Aug. 1981 (5 days)		1982 SPRING STORM Mar. – April 1982 (9days)	
	cfs	% total	*cfs*	% total	*cfs*	% total	*cfs*	% total	*cfs*	% total
NW FORK - At Indiantown Road (C-14 canal)	65	(44)	28	(49)	106	(35)	242	(29)	236	(45)
NW FORK - Inflow between Indiantown Road and Turnpike	17	(12)	3	(5)	32	(10)	198	(24)	44	(9)
CYPRESS CREEK	45	(31)	20	(35)	132	(43)	265	(32)	190	(36)
HOBE GROVES CANAL	12	(8)	5	(8)	18	(6)	108	(13)	51	(10)
KITCHING CREEK	8	(5)	2	(3)	17	(6)	21	(3)	ND*	---
TOTAL INFLOW	147	(100)	58	(100)	305	(100)	834	(100)	521	(100)

SOURCE: USGS * No data

TABLE 1

AVERAGE FRESHWATER INFLOW INTO THE NORTHWEST FORK
FROM MAJOR TRIBUTARIES FOR SELECTED PERIODS DURING 1980-82

CLASSIFICATION	GENERAL DESCRIPTIVE USE	APPLICATION WITHIN THE LOXAHATCHE RIVER
CLASS I	Potable Water Supply	SFWMD Canal C-18: Freshwater Portion Upstream of Control Structure S-46
CLASS II	Shellfish Harvesting and Propagation	Loxahatchee River Upstream from FEC Railroad Bridge including North Fork, Northwest Fork, and Southwest Fork to the SFWMD Structure S-46
CLASS III	Recreation and Propagation of Fish and Wildlife	Loxahatchee River Downstream from the FEC Railroad Bridge to the Jupiter Inlet, and the SIRWCD Canal C-14

TABLE 2

LOXAHATCHEE RIVER WATER QUALITY CLASSIFICATIONS

	COMMON NAME	SCIENTIFIC NAME	DESIGNATED STATUS	
			GFC	FWS
FISH				
	Common Snook	*Centropomus undecimalis*	SSC	
REPTILES & AMPHIBIANS				
	Gopher Frog	*Rana capito*	SSC	
	American Alligator	*Alligator mississippiensis*	SSC	T(S/A)
	Eastern Indigo snake	*Drymarchon corais couperi*	T	T
	Gopher Tortoise	*Gopherus polyphemus*	SSC	
	Florida Pine Snake	*Pituophis melanoleucus mugitus*	SSC	
BIRDS				
	Roseate Spoonbill	*Ajaia ajaja*	SSC	
	Florida Scrub-jay	*Aphelocoma coerulescens*	T	T
	Limpkin	*Aramus guarauna*	T	
	Little Blue Heron	*Egretta caerulea*	SSC	
	Snowy Egret	*Egretta thula*	SSC	
	Tricolored Heron	*Egretta tricolor*	SSC	
	White Ibis	*Eudocimus albus*	SSC	
	Arctic Peregrine Falcon	*Falco peregrinus tundrius*	E	
	Florida Sandhill Crane	*Grus canadensis pratensis*	T	
	Bald Eagle	*Haliaeetus leucocephalus*	T	T
	Wood Stork	*Mycteria americana*	E	E
	Brown Pelican	*Pelecanus occidentalis*	SSC	
	Snail Kite	*Rostrhamus sociabilis*	E	E
	Burrowing Owl	*Speotyto cunicularia*	SSC	
	Least Tern	*Sterna antillarum*	T	
MAMMALS				
	Florida Mouse	*Podomys floridanus*	SSC	
	Florida Manatee	*Trichechus manatus*	E	E

GFC = Florida Game and Fresh Water Fish Commission
FWS = United States Fish and Wildlife Service
SSC = Species of Special Concern
S/A = Similarity of Appearance
T = Threatened
E = Endangered

TABLE 3

ENDANGERED SPECIES, THREATENED SPECIES, AND SPECIES OF SPECIAL CONCERN FOR THE LOXAHATCHEE NATIONAL WILD AND SCENIC RIVER AND JONATHAN DICKINSON STATE PARK

	COMMON NAME	SCIENTIFIC NAME	DESIGNATED STATUS	
			GFC	FWS
PLANTS				
	Giant Leather Fern	*Acrostichum danaeifolium*	C	
	Curtiss' Milkweed	*Asclepias curtissii*	E	
	Four-petal Pawpaw	*Asimina tetramera*	E	E
	Pine Pink Orchid	*Bletia purpurea*	T	
	Bearded Grass Pink	*Calopogon barbatus*	T	
	Many-flowered Grass Pink	*Calopogon multiflorus*	E	
	Sand Dune Spurge	*Chamaesyce cumulicola*	E	
	Satinleaf	*Chrysophyllum oliviforme*	E	
	Perforate Reindeer Lichen	*Cladonia perforata*	E	E
	Large-flowered Rosemary	*Conradina grandiflora*	E	
	Clamshell Orchid	*Encyclia cochleata*	E	
	Butterfly Orchid	*Encyclia tampensis*	C	
	Rigid Epidendrum	*Epidendrum rigidum*	E	
	Beach Creeper	*Ernodea littoralis*	T	
	Wild Coco	*Eulophia alta*	T	
	Nodding Pinweed	*Lechea cernua*	T	
	Pine Pinweed	*Lechea divaricata*	E	
	Catesby's Lily	*Lilium catesbaei*	T	
	Nodding Clubmoss	*Lycopodium cernuum*	C	
	Dancing Lady Orchid	*Tolumnia bahamensis*	E	
	Hand Fern	*Ophioglossum palmatum*	E	
	Cinnamon Fern	*Osmunda cinnamomea*	C	
	Royal Fern	*Osmunda regalis*	C	
	Low Peperomia	*Peperomia humilis*	E	
	Snowy Orchid	*Habenaria nivea*	T	
	Rose Pogonia	*Pogonia ophioglossoides*	T	
	Small's Milkwort	*Polygala smallii*	E	E
	Non-crested Coco	*Pteroglossaspis ecristata*	T	
	Lace-lip Ladie's Tresses	*Spiranthes laciniata*	T	
	Common Wild Pine	*Tillandsia fasciculata*	E	
	Giant Wild Pine	*Tillandsia utriculata*	E	
	Soft-leaved Wild Pine	*Tillandsia variabilis*	T	

FDA = Florida Department of Agriculture and Consumer Services
FWS = United States Fish and Wildlife Service
C = Commercially exploited
T = Threatened
E = Endangered

TABLE 3 (continued)

ENDANGERED SPECIES, THREATENED SPECIES, AND SPECIES OF SPECIAL CONCERN FOR THE LOXAHATCHEE NATIONAL WILD AND SCENIC RIVER AND JONATHAN DICKINSON STATE PARK

SOURCE OF CANOE TRIPS		1982-1983		1994-1995	
		Number of Canoes	% of Use	Number of Canoes	% of Use
	Riverbend Park Concession	2,426	(13)	4,923	(29)
	JD State Park Concession	15,000	(81)	7,982	(47)
	Other Commercial	None reported		*240	(1)
Commercial Subtotal		*17,426*	(94)	*13,145*	(77)
	Boy Scout Camp	726	(4)	*84	(0.5)
	Private Individuals	364	(2)	*2600	(15)
	Private Groups	No data		*1176	(7)
Non-commercial Subtotal		*1,090*	(6)	*3860*	(23)
TOTAL		18,516	(100)	17,005	(100)

Sources: 1985 Management Plan, Concessionaire Records, FDEP/SFWMD Estimates*

TABLE 4

COMPONENTS OF CANOEING ON THE NORTHWEST FORK, LOXAHATCHEE RIVER: 1982-83 VERSUS 1994-95.

USE COMPONENT	QUARTER				TOTAL
	July – Sept.	Oct. – Dec.	Jan. - Mar.	April - June	
1983 USE					
Riverbend Park Concession	593	446	487	900	2,426
JD State Park Concession	3,990	2,535	3,825	4,650	15,000
TOTAL	4,583	2,981	4,312	5,550	17,426
%	(26)	(17)	(25)	(32)	(100)
1995 USE					
Riverbend Park Concession	1,378	1,182	1,133	1,230	4,923
JD State Park Concession	1,385	1,634	2,429	2,534	7,982
TOTAL	2,763	2,816	3,562	3,764	12,905
%	(21)	(22)	(28)	(29)	(100)

TABLE 5

SEASONAL CANOEING ON THE NORTHWEST FORK,
LOXAHATCHEE RIVER –BY COMMERCIAL COMPONENT:
1983 VERSUS 1995

CARRYING CAPACITY = (Trip Distance) *times* (Hours Available For Launching)
(Spacing Interval) *times* (Average Trip Time)

Where:

TRIP DISTANCE = 7 miles

HOURS AVAILABLE FOR LAUNCHING:

April – September (7:00am –1:00pm)
"Quiet" Use Period = 3 hours
"Group" Use Period = 3 hours

October – March (7:00am – 11:00 am)
"Quiet" Use Period = 2 hours
"Group" Use Period= 2 hours

SPACING INTERVAL:

"Quiet" Use Period = 1,320 feet
"Group" Use Period = 660 feet

AVERAGE TRIP TIME = 6 hours

Source: FDEP/SFWMD 1985 Loxahatchee Wild and Scenic River Management Plan

TABLE 6

CARRYING CAPACITY FORMULA FOR THE LOXAHATCHEE WILD AND SCENIC RIVER CORRIDOR

MAXIMUM USE BY PERIOD		SUMMER SEASON (April – Sept.)	WINTER SEASON (Oct. – March)
USE PERIODS		7:00am – 1:00pm	7:00am –11:00am
QUIET PERIOD		7:00am – 10:00am	7:00am – 9:00am
	Maximum Number of Groups	14	9
	Maximum Group Size	2 canoes	2 canoes
	Maximum Use	28 canoes	18 canoes
GROUP PERIOD		10:00am – 1:00pm	9:00am – 11:00am
	Maximum Number of Groups	28	19
	Maximum Group Size	4 canoes	4 canoes
	Maximum Use	112 canoes	76 canoes
TOTAL DAILY USE		140 canoes	94 canoes

TABLE 7

MAXIMUM USE LEVELS IN THE LOXAHATCHEE WILD AND SCENIC CORRIDOR DOWNSTREAM FROM RIVERBEND PARK

PLAN IMPLEMENTATION		
OBJECTIVE I: PROTECT AND ENHANCE NATURAL AND CULTURAL VALUES WITHIN THE DESIGNATED WILD AND SCENIC RIVER CORRIDOR		
STRATEGY I-A: Acquire Designated Wild and Scenic Corridor	PRIMARY ENTITIES	YEAR TO FINISH
Task: Consider Addition of Palm Beach County Loxahatchee River Acquisition to the Wild and Scenic Corridor	*PBC/SFWMD/ FDEP*	*2005*
STRATEGY I-B: Develop and Maintain Corridor Management Plan		
Task: Update Management Plan by Year 2000	*FDEP/SFWMD*	*2000*
STRATEGY I-C: Develop Detailed Implementation Plans in Support of the Wild and Scenic River Management Plan		
Task: Develop Upland Vegetation Management Survey	*FDEP*	*2000*
Task: Develop Archeological-Historical Plan	*FDEP/PBC*	*2000*
Task: Develop Solid Waste Management Plan	*FDEP/SFWMD SIRWCD/PBC*	*2001*
Task: Develop Aquatic Plant Management Plan	*FDEP/SFWMD SIRWCD/PBC*	*2002*
STRATEGY I-D: Develop Rules and Management Agreements for Corridor		
Task: Include Corridor within FDEP Ecosystem Management Area	*FDEP*	*2000*
Task: Develop FDEP/PBC Agreement for Riverbend Park	*FDEP/PBC*	*2000*
Task: Enact Corridor Administrative Rules	*FDEP*	*2004*
Task: Develop Corridor Use Permit System	*FDEP/PBC*	*2002*
STRATEGY 1-E: Develop and Maintain Appropriate Public Use Facilities within River Corridor		
Task: Maintain Lainhart and Masten Dams	*SFWMD*	*ongoing*
Task: Implement JDSP Unit Plan	*FDEP*	*2000*
Task: Develop Quantitative and Qualitative Evaluation of River Use	*FDEP*	*2000*
Task: Develop and Staff Riverbend Park	*PBC*	*2000*
Task: Adopt and Implement Operational Plan	*FDEP/PBC*	*2003*

TABLE 8

PLAN IMPLEMENTATION SCHEDULE: 2000-2005

PLAN IMPLEMENTATION		
OBJECTIVE I: PROTECT AND ENHANCE NATURAL AND CULTURAL VALUES WITHIN THE DESIGNATED WILD AND SCENIC RIVER CORRIDOR		
STRATEGY I-F: Create and Maintain Loxahatchee River Management Coordinating Council	PRIMARY ENTITIES	YEAR TO FINISH
Task: Staff and Maintain LRMCC	*SFWMD*	*ongoing*
STRATEGY 1-G: Maintain Resource Monitoring Programs		
Task: Develop Biological Monitoring Protocols	*FDEP*	*ongoing*
Task: Provide Water Quality and Hydrologic Monitoring	*LRD/FDEP /SFWMD*	*ongoing*
OBJECTIVE II: ENHANCE THE HYDROLOGIC RELATIONSHIP BETWEEN THE WILD AND SCENIC NORTHWEST FORK OF THE LOXAHATCHEE AND THE LOXAHATCHEE SLOUGH		
STRATEGY II-A: Provide Adequate Baseflow to the Northwest Fork from the C-18 canal		
Task: Provide a Minimum Baseflow of 50 cfs from the C-18	*SFWMD*	*ongoing*
Task: Evaluate Appropriateness of USGS 50 cfs Minimum and Develop New Target(s) as Necessary	*LRD/SFWMD*	*2000*
Task: Acquire Private Lands Necessary for Loxahatchee Slough Restoration	*PBC/SFWMD*	*2000*
Task: Define Loxahatchee Slough Hydrologic Restoration Area	*PBC/SFWMD*	*2000*
Task: Develop Hydrologic Restoration Plan for Loxahatchee Slough (including flows to NW fork)	*SFWMD/PBC*	*2000*
Task: Establish Minimum Flows and Levels	*SFWMD*	*2001*
Task: Modify S-46 Operations	*SFWMD*	*2001*
STRATEGY II-B: Maintain and Enhance Hydrology between the Wild and Scenic Corridor and the Loxahatchee Slough		
Task: Improve Jupiter Farms Water Management System	*SIRWCD/ SFWMD*	*2000*
Task: Develop and Implement Hydrologic Restoration Plan for Reese and Gildan Properties	*SFWMD/PBC*	*2000*

TABLE 8 (continued)

PLAN IMPLEMENTATION SCHEDULE: 2000-2005

PLAN IMPLEMENTATION		
OBJECTIVE III: INSURE THAT LAND USE ACTIVITIES WITHIN THE LOXAHATCHEE DRAINAGE BASINS ARE CONDUCIVE TO MAINTAINING THE VALUES OF THE WILD AND SCENIC RIVER		
STRATEGY III-A: Review/Amend Local Government Comprehensive Plans to Insure Consistency with Corridor Management	PRIMARY ENTITIES	YEAR TO FINISH
Task: Review Palm Beach County Comprehensive Plan	*TCRPC LRMCC*	*2000*
Task: Review Martin Comprehensive Plan	*TCRPC LRMCC*	*2000*
Task: Review Town of Jupiter Comprehensive Plan	*TCRPC LRMCC*	*2000*
Task: Review Village of Tequesta Comprehensive Plan	*TCRPC LRMCC*	*2000*
Task: Review City of Palm Beach Gardens Comprehensive Plan	*TCRPC LRMCC*	*2000*
STRATEGY III-B: Develop Stormwater Management Plan for Areas Contributing to the Wild and Scenic Corridor		
Task: Develop Stormwater Management Plan		
Task: Encourage Local Stormwater Planning and Implementation	*all*	*ongoing*
Task: Promulgate Basin Rules (as needed)	*SFWMD*	*2000*
STRATEGY III-C: Acquire and Manage Other Natural Systems Important to Protection of the Wild and Scenic Corridor		
Task: Acquire Pal Mar Wetlands	*SFWMD*	*2000*
Task: Develop Management Plan for Pal Mar and Cypress Creek Basin	*SFWMD*	*2000*

TABLE 8 (continued)

PLAN IMPLEMENTATION SCHEDULE: 2000-2005

PLAN IMPLEMENTATION		
OBJECTIVE IV: FACILITATE PUBLIC INVOLVEMENT IN PROTECTING THE WILD AND SCENIC RIVER CORRIDOR, INCLUDING BOTH PLANIING AND IMPLEMENTATION EFFORTS		
STRATEGY IV-A: Provide Educational Information to River Users	PRIMARY ENTITIES	YEAR TO FINISH
Task: Develop and Distribute Educational Materials	*LRD*	*2000*
Task: Develop Otter Creek Learning Center	*LRD*	*2000*
Task: Develop Jonathan Dickinson State Park Visitor Center	*FDEP*	*2002*
STRATEGY IV-B: Coordinate Efforts to Insure that Local Environmental Education and Public Information Programs Include Loxahatchee River Information		
Task: Encourage and Support Local Initiatives	*all*	*ongoing*
Task: Provide River Information to River Users and Local Educational Instituitions	*FDEP/SFWMD*	*ongoing*

TABLE 8 (continued)

PLAN IMPLEMENTATION SCHEDULE: 2000-2005

ADDENDA

Addendum 1	Wild & Scenic Rivers Act of 1968, as amended
Addendum 2	Chapter 83-358, Laws of Florida
Addendum 3	National Wild and Scenic Rivers System: Final Revised Guidelines for Eligibility, Classification & Management of River Areas
Addendum 4	Resolution by Florida Cabinet – January 11, 1983

ADDENDUM 2

Loxahatchee River Wild and Scenic Designation and Preservation Act
(Chapter 83-358, Laws of Florida)

CHAPTER 83-358, Laws of Florida
Committee Substitute for Senate bill No. 459

An act relating to the Loxahatchee River; creating the Loxahatchee River Wild and Scenic Designation and Preservation Act; providing legislative declarations and intent; providing definitions; designating a portion of the river as a wild and scenic river; providing for development of a management plan; providing for a coordinating council; authorizing the Governor to apply for inclusion of the designated portion of the river in the National Wild and Scenic Rivers System; providing for preservation of existing governmental authority; providing for rules; specifying regulatory and permitting authority; providing for enforcement; providing for injunctions; specifying violations and penalties; providing for repeal; providing an effective date.

Be It Enacted by the Legislature of the State of Florida.

Section 1. Short title.--Sections 1 through 12 of this act may be cited as the "Loxahatchee River Wild and Scenic Designation and Preservation Act."

Section 2. Legislative declaration.--The Legislature finds and declares that a certain segment of the Loxahatchee River in Palm Beach and Martin Counties possesses outstandingly remarkable ecological, fish and wildlife, and recreational values which are unique in the United States. These values give national significance to the river as one which should be permanently preserved and enhanced, not only for the citizens of the State of Florida, but for the citizens of the United States, of present and future generations. The permanent management and administration of the river, however, involves a complex interaction of national, state, regional, and local interests which require balancing, coordination of purpose and continuing participation by and access to the public, through its elected representatives. It is the intention of the Legislature to provide for the permanent preservation of the designated segment of the Loxahatchee River by way of development of a plan for permanent administration by agencies of the state and local government which will ensure the degree of protection necessary for inclusion of that segment of the river in the National Wild and Scenic Rivers System but retaining that degree of flexibility, responsiveness, and expertise which will accommodate all of the diverse interests involved in a manner best calculated to be in the public interest.

Section 3. Definitions.--As used in this act:

(1) "Activity" means the doing of any act or the failing to do any act, whether by a natural person or a corporation.

(2) "Board" means the governing board of the South Florida Water Management District.

(3) "Coordination Council" means the council created by s.5(3)(o).

(4) "Department" means the Division of Recreation and Parks of the Department of Natural Resources.

(5) "Division" means the Division of Recreation and Parks of the Department of natural Resources.

(6) "Executive Board" means the Governor and Cabinet sitting as the head of the Department of Natural Resources.

(7) "Resource value" means any one or more of the specific scenic, recreational, geologic, fish and wildlife, historic, cultural, or ecological features identified by the National Park Service, Department of the Interior, in its Draft Wild and Scenic Rivers Study/Draft Environmental Impact Statement as being outstandingly remarkable or worthy of note.

(8) "River area" means that portion of the Northwest Fork of the Loxahatchee River from river mile 6 to river mile 13.5, together with such abutting uplands as determined in the permanent management plan to form the corridor having visual impact on the river user, and which may be necessary to maintain the natural and scenic appeal of the river.

Section 4. Designation of wild and scenic river.--The Northwest Fork of the Loxahatchee River between river mile 6 and river mile 13.5 is hereby designated as a wild and scenic river for the purposes of this act and subject to all of the provisions of this act. Such designated portion is more particularly described as that portion of the Northwest Fork downstream of the southern boundary of Riverbend County Park located in Palm Beach County and upstream of an east-west line passing through a point where the southern boundary of Jonathan Dickinson State Park intersects the eastern shoreline of the river.

Section 5. Development of management plan.--

(1) The department and the South Florida Water Management District shall jointly develop a proposed management plan for the designated segment of the Loxahatchee River, which management plan, subject to and consistent with the provisions of this act, will be designed to qualify the designated segment of the river for inclusion in the national Wild and Scenic rivers System.

(2) The development of the proposed management plan shall include participation by the National Park Service, by all appropriate state agencies, by all appropriate or interested local governments, including but not limited to Palm Beach County, Martin County, the Jupiter Inlet District, the Town of Jupiter, the Loxahatchee River Environmental Control District, the South Indian River Water Control District, and the Northern Palm Beach County Water Control District, the Palm Beach County Farm Bureau, and by any others deemed advisable by the department or board. To the extent not inconsistent with the provisions of this act, the plan shall include such conditions as the United State Secretary of the Interior may require.

(3) The proposed management plan shall include provision for:

(a) Permanent protection and enhancement of the ecological, fish and wildlife, and recreational values identified by the National Park Service in its draft study of the river and

for which the river was chosen for inclusion in the system without, insofar as is consistent therewith, limiting other uses that do not substantially interfere with public use and enjoyment of those values; primary emphasis being given to protecting esthetic, scenic, historic, archaeologic, and scientific features;

(b) Continuation of land uses and developments on private lands within the river area which are in existence on the effective date of this act which are not incompatible with the purposes of designation;

(c) Periodic studies to determine the quantity and mixture of recreation and other public uses which can be permitted without adverse impact on the resource values of the river area;

(d) Regulation and distribution of public access where necessary to protect and enhance the resource values of the river area;

(e) Basic facilities to absorb user impact on the river area, including necessary toilet r refuse containers, but located in order to minimize their intrusive impact;

(f) Location of major facilities such as developed campgrounds, visitor centers, and administrative headquarters outside the river area;

(g) Restriction of motorized travel by land vehicle or boat where necessary to protect the resource values in the river area;

(h) Agricultural and forestry practices similar in nature and intensity or less intensive than those present in the river area on the effective date of this act;

(i) Limitation of resource management practices to those necessary for protection, conservation, rehabilitation, or enhancement of river area resource values;

(j) Maintenance of existing water quality;

(k) Whenever alternative routes are unavailable, location and construction of new public utility or road, rights-of-way in a way which minimizes adverse effects on scenic, recreational, fish and wildlife, and other resource values in the river area;

(l) Continuance of existing drainage and water management practices, unless such existing practices will degrade or diminish existing water quality or existing practices will degrade or diminish existing water quality or existing resource values in the river area, and allowances of new water resource management practices which will not have a substantial adverse impact on resource values in the river area;

(m) Review and regulation of all activities conducted or proposed to be conducted which will or may have a substantial adverse impact on any of the resource values in the river area as provided in this act;

(n) Continuation of activities or developments below or above the designated segment which will not invade the river area or substantially diminish the scenic, recreational, and fish and wildlife resource values present in the river area on the effective date of this act; and

(o) A permanent management coordinating council composed of one representative from each of the participants provided for in subsection (2). The coordinating council shall review and make recommendations, in the first instance, on all applications for permits required by this act, as well as all proposals for amendments or modifications to the permanent management plan, and render its nonbinding advisory opinion to the board and the department. Each participant shall appoint one member to the coordinating council. The coordinating council shall elect a chairman, vice chairman, and secretary to serve for a term of one year. The coordinating council shall adopt bylaws to provide for such other officers as it may deem necessary, election of officers, removal of officers for just cause, meetings, quorum, procedures for the conduct of its business, and such other matters as the membership may deem advisable in the conduct of its business. Such professional staff as the coordinating council may require shall be provided by the South Florida Water Management District.

(4) To the extent not inconsistent with this act, the proposed management plan may also include any other provisions deemed by the department and the board to be necessary or advisable for the permanent protection of the river as a component of the National Wild and Scenic Rivers System.

Section 6. Authority for application for inclusion in National Wild and Scenic Rivers System.--Upon completion of the development of a proposed management plan, the executive director of the department shall forward the proposed management plan to the executive board. After the executive board has received, reviewed and accepted a proposed management plan, the Governor may apply to the United States Secretary of the Interior for inclusion of the designated segment of the Loxahatchee River into the National Wild and Scenic Rivers System.

Section 7. Preservation of existing governmental authority.--

(1) Nothing contained in this act shall operate to divest any agency, water management district, municipality, county, or special district of any authority or jurisdiction in existence on the effective date of this act.

(2) Construction and maintenance of improvements at the Jupiter Inlet and in the Loxahatchee River downstream from the designator segment for purposes of navigation, waterway flushing, or upland drainage, including creation or preservation of channels, maintenance dredging, jetty improvements, riprapping, construction of groins and similar improvements, and removal of sand or dead oyster shall bare when deemed to have a potential for substantial adverse impact on the resource values of the river area shall be undertaken using techniques which minimize adverse effects on scenic, recreational, fish and wildlife and other values of the river area.

Section 8. Rulemaking authority.--After approval by the Secretary of the Interior of an application by the Governor under this act for inclusion of the Loxahatchee River in the National Wild and Scenic Rivers System, the board and the department shall each have full authority under their separate jurisdictions as provided in s.9 to adopt rules deemed necessary for the discharge of the respective duties of each as provided herein, including the adoption of the proposed management plan as the permanent management plan, and including the power to adopt rules modifying or amending the management plan in accordance with the provisions of this act and rules providing for permanent management of the designated segment as a component of the National Wild and Scenic Rivers System.

Section 9. Separation of regulatory authority.--

(1) The department shall have full and exclusive authority to adopt rules concerning and to regulate activities within the river area having a direct and substantial adverse effect on any resource value within the river area.

(2) The board shall have full and exclusive authority to adopt rules concerning and to regulate activities outside the river area having substantial adverse impact on resource values within the river area.

(3) The department and the board shall coordinate all activities related to rule adoption and enforcement in order to avoid to the maximum extent possible any conflicts or duplication arising therefrom.

Section 10. Permitting authority.--

(1) No person or entity shall conduct any activity or do anything which will or may have an adverse impact on any resource value in the river area without first having received a permit from the board or the department, as appropriate.

(2) Any applicant for a permit shall file an application for a permit with the board or the department, whichever has regulatory authority, upon such forms and in such manner as the board or the department shall by rule require. The board and the department may require, with or in addition to such applications, the furnishing of any information deemed necessary or desirable for full and complete consideration of all factors relevant to informed decisions on the applications.

(3) A permit may be granted only after a finding by the board or the department, whichever has regulatory authority, that the activity for which a permit has been requested will not have a substantial adverse impact on resource values in the river area.

(4) the board and the department may adopt an application fee schedule providing for payment of reasonable fees to defray the cost of processing applications.

(5) the provisions of Chapter 120, Florida Statutes, shall apply to the board and to the department, but not to the coordinating council, in carrying out the functions and duties prescribed for each by this act.

Section 11. Enforcement.--

(1) Officers of the division shall have full authority to enforce any rule adopted under this act with the same police powers given them by law to enforce the rules of state parks.

(2) The board shall have full power to enforce this act or any rule adopted under this act by action for injunctive relief or by any other method available for enforcement of rules adopted under Chapter 373.

Section 12. Penalties.--Violation of any rule adopted under this act constitutes a misdemeanor of the second degree, punishable as provided in s.775.082 or s.775.083, Florida Statues. Continuing violation after notice constitutes a separate violation for each day so continued.

Section 13. This act is repealed on a date two years after the effective date of this act, unless the portion of the Loxahatchee River designated by this act as a wild and scenic river is included in the National Wild and Scenic Rivers System on or before that date.

Section 14. This act shall take effect upon becoming a law.

Approved by the Governor June 24, 1983.

Filed in Office Secretary of State June 24, 1983.

RESOLUTION

WHEREAS the Governor and Cabinet sitting as Head of the Department of Natural Resources have considered a Loxahatchee River Wild and Scenic Rivers Study and draft Environmental Impact Statement prepared by the United States Department of the Interior; and

WHEREAS the Department of the Interior has concluded that a 7.5-mile segment of the Loxahatchee River in Palm Beach and Martin Counties meets the criteria for inclusion in the National Wild and Scenic Rivers System; and

WHEREAS it would be in the best interest of the State to preserve and, to the maximum degree possible, enhance this exceptional resource:

NOW, THEREFORE, BE IT RESOLVED that the Governor and Cabinet sitting as Head of the State of Florida Department of Natural Resources do hereby endorse in concept the inclusion of the identified 7.5-mile segment of the Loxahatchee River in the National Wild and Scenic Rivers System, and do direct the Department of Natural Resources staff, in concert with affected state, federal, regional, and local agencies, to develop a management plan which satisfies federal requirements for including the Loxahatchee River in the National Wild and Scenic Rivers System. The principal goals of the plan will be to preserve and enhance the river's unique natural values, restore the river's historical hydrologic regime, and reverse deleterious saltwater intrusion into the river. The staff is further directed to submit the plan to the Board for final consideration.

Adopted this 11th day of January, 1983, by the Governor and the Cabinet of the State of Florida as Head of the State of Florida Department of Natural Resources.

Governor

Secretary of State

Attorney General

Comptroller

Treasurer

Commissioner of Agriculture

Commissioner of Education