Florida Department of Environmental Protection

Marjory Stoneman Douglas Building
3900 Commonwealth Boulevard
Tallahassee, Florida 32399-3000

Rick Scott
Governor

Carlos Lopez-Cantera
Lt. Governor

Noah Valenstein
Secretary

October 23, 2017

Steven Cutshaw
Division of Recreation and Parks
Department of Environmental Protection
3900 Commonwealth Boulevard, MS 525
Tallahassee, Florida 32399-3000

RE: Savannas Preserve State Park - Lease #3996, #4178, and #4290

Dear Mr. Cutshaw:

On **October 20, 2017**, the Acquisition and Restoration Council recommended approval of the **Savannas Preserve State Park** management plan. Therefore, the Division of State Lands, Office of Environmental Services, acting as agent for the Board of Trustees of the Internal Improvement Trust Fund, hereby approves the **Savannas Preserve State Park** management plan. The next management plan update is due October 20, 2027.

Approval of this land management plan does not waive the authority or jurisdiction of any governmental entity that may have an interest in this project. Implementation of any upland activities proposed by this management plan may require a permit or other authorization from federal and state agencies having regulatory jurisdiction over those particular activities. Pursuant to the conditions of your lease, please forward copies of all permits to this office upon issuance.

Sincerely,

Raymond V. Spaulding
Office of Environmental Services
Division of State Lands
Department of Environmental Protection

Savannas Preserve State Park

ARC Approved
Unit Management Plan

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Division of Recreation and Parks
October 2017

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INTRODUCTION

Savannas Preserve State Park is located in St. Lucie and Martin counties (see Vicinity Map). The Savannas Preserve State Park consists of two main properties - the "Savannas property" and the "North Fork property." The "Savannas property" section is located entirely east of U.S. Highway 1 (U.S. 1) and contains the basin marsh within. The "North Fork property" is located entirely west of U.S. 1, buffering the North Fork of the St. Lucie River. Portions of the park are also within the city limits of Port St. Lucie. There are several access points for the park, including entrances from U.S. 1, Walton Road, and Jensen Beach Boulevard (see Reference Map). The Vicinity Map also reflects significant land and water resources existing near the park.

Savannas Preserve State Park was initially acquired on April 25, 1977 with funds from the Environmentally Endangered Lands program. Since the 1977 initial purchase, the Board of Trustees of the Internal Improvement Trust Fund (Trustees) acquired several parcels through purchases under the state's different land acquisition programs such as Land Acquisition Trust Fund (LATF), Conservation and Recreation Lands (CARL), Preservation 2000 (P2000) and Florida Forever and through a donation and added these newly-acquired parcels to Savannas Preserve State Park. A portion of the park (241 acres of the North Fork property) was jointly acquired by the Trustees and the South Florida Water Management District (SFWMD). Currently, the park comprises 6,877 acres.

The Trustees and the SFWMD hold fee simple title to the park. The Division of Recreation and Parks (DRP) manages Savannas Preserve State Park under three different leases: Lease No. 3996, the lease for the Savannas portion; Lease No. 4178, the lease for the North Fork portion where the Trustees have 100% title interest; and Lease No. 4290, the lease for the portion of North Fork where the Trustees and SFWMD each have 50% undivided title interest (see Addendum 1).

At Savannas Preserve State Park, public outdoor recreation and conservation is the designated single-use of the property. There are no legislative or executive directives that constrain the use of this property (see Addendum 1).

Purpose and Significance of the Park

The purpose of Savannas Preserve State Park is to preserve and protect environmentally unique and irreplaceable lands associated with the North Fork of the St. Lucie River corridor, freshwater basin marsh and scrub ridge characteristic of the southeast Florida coast for the perpetual enjoyment of Florida residents and visitors.

Park Significance

- The park protects the last relatively undisturbed example of coastal freshwater basin marsh in southeastern Florida and provides a critical corridor of remaining natural communities, including scrub, along the North Fork of the St. Lucie River and the Savannas basin marsh.

- The park protects the North Fork St. Lucie River corridor, providing a buffer to naturally filter water and improve water quality in Indian River Lagoon.

- The park provides habitat for many rare species of flora and fauna, including the fragrant prickly apple cactus (*Harrisia fragrans*), Savannas mint (*Dicerandra immaculata* var. *savannarum*), four-petal pawpaw (*Asminnia tetramera*) and the federally-endangered Florida scrub-jay (*Aphelocoma coerulescens*).

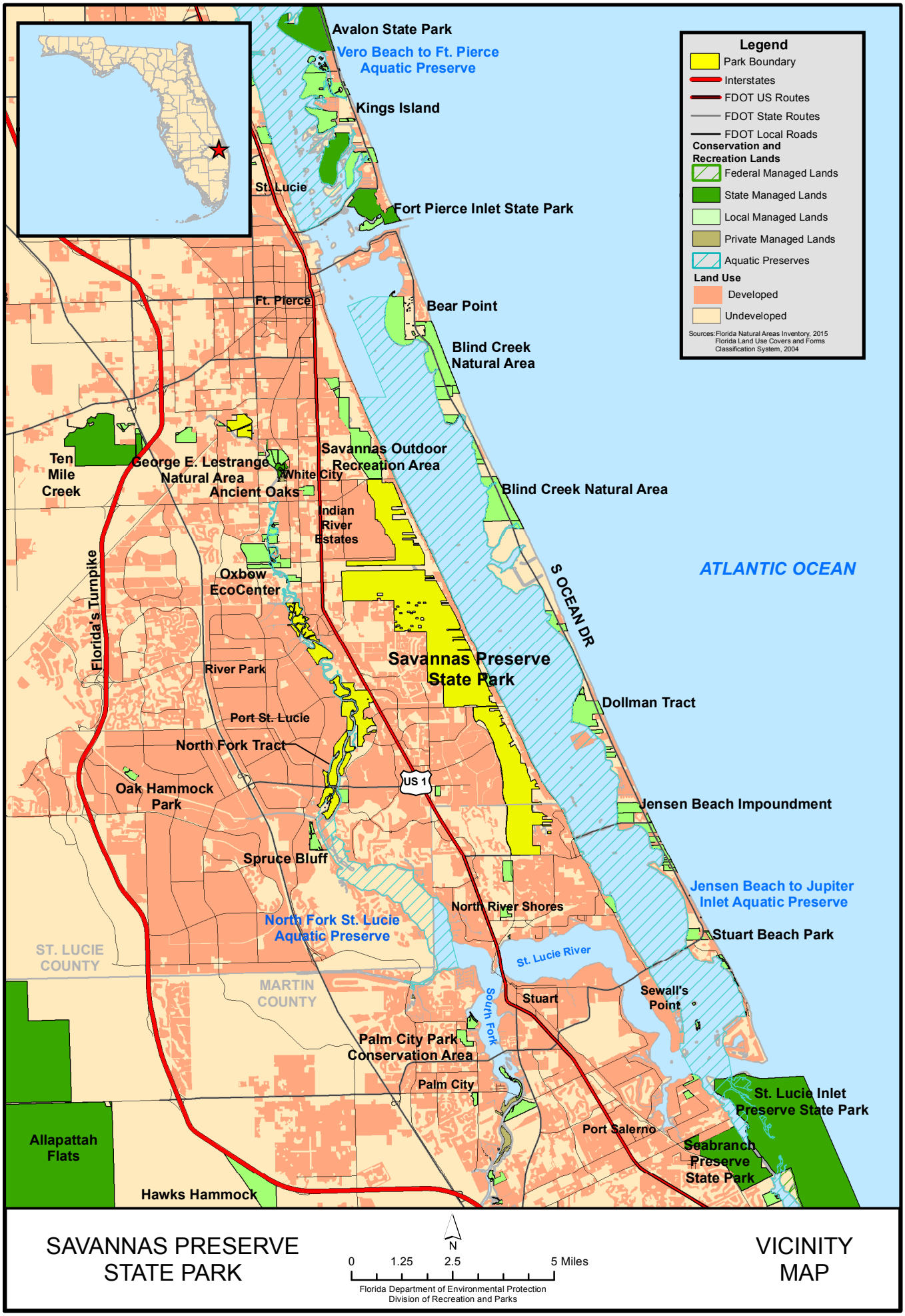
- The park provides residents and visitors with high-quality outdoor recreation, resource interpretation, and environmental education within a highly urban area of southeast Florida.

Savannas Preserve State Park is classified as a preserve in the DRP's unit classification system. In the management of a preserve, preservation and enhancement of natural conditions is all important. Resource considerations are given priority over user considerations and development is restricted to the minimum necessary for ensuring its protection and maintenance, limited access, user safety and convenience, and appropriate interpretation. Permitted uses are primarily of a passive nature, related to the aesthetic, educational and recreational enjoyment of the preserve, although other compatible uses are permitted in limited amounts. Program emphasis is placed on interpretation of the natural and cultural attributes of the preserve.

Purpose and Scope of the Plan

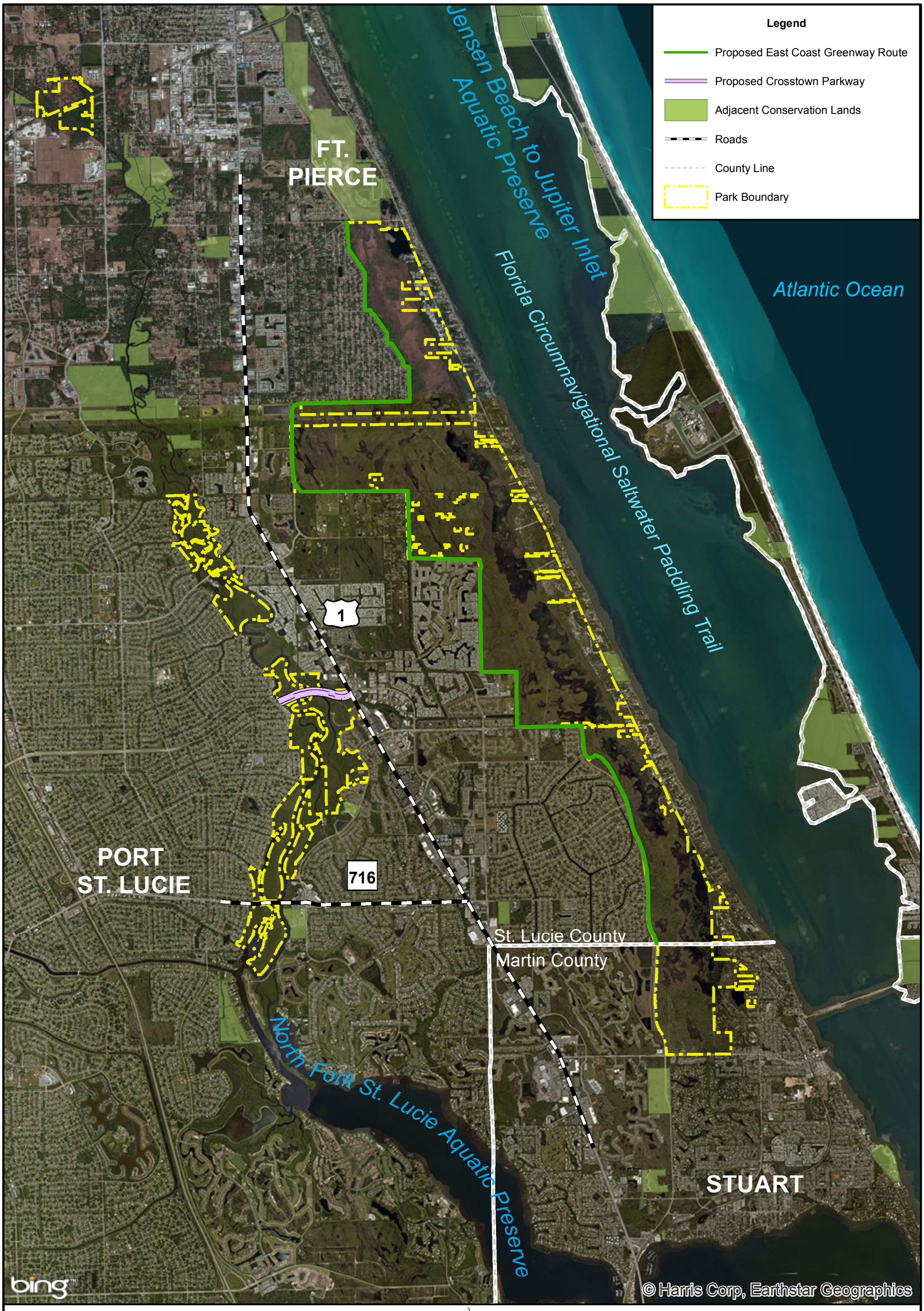
This plan serves as the basic statement of policy and direction for the management of Savannas Preserve State Park as a unit of Florida's state park system. It identifies the goals, objectives, actions and criteria or standards that guide each aspect of park administration, and sets forth the specific measures that will be implemented to meet management objectives and provide balanced public utilization. The plan is intended to meet the requirements of Sections 253.034 and 259.032, Florida Statutes, Chapter 18-2, Florida Administrative Code, and is intended to be consistent with the State Lands Management Plan. With approval, this management plan will replace the 2003 approved plan.

The plan consists of three interrelated components: the Resource Management Component, the Land Use Component and the Implementation Component. The Resource Management Component provides a detailed inventory and assessment of the natural and cultural resources of the park. Resource management needs and issues are identified, and measurable management objectives are established for each of the park's management goals and resource types. This component provides guidance on the application of such measures as prescribed burning, exotic species removal, imperiled species management, cultural resource management and restoration of natural conditions.



SAVANNAS PRESERVE STATE PARK

VICINITY MAP



SAVANNAS PRESERVE STATE PARK

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0 0.25 0.5 1 Miles

Florida Department of Environmental Protection
Division of Recreation and Parks
Date of aerial; 2011

REFERENCE MAP

The Land Use Component is the recreational resource allocation plan for the park. Based on considerations such as access, population, adjacent land uses, the natural and cultural resources of the park, current public uses and existing development. Measurable objectives are set to achieve the desired allocation of the physical space of the park. These objectives identify use areas and propose the types of facilities and programs as well as the volume of public use to be provided.

The Implementation Component consolidates the measurable objectives and actions for each of the park's management goals. An implementation schedule and cost estimates are included for each objective and action. Included in this table are (1) measures that will be used to evaluate the DRP's implementation progress, (2) timeframes for completing actions and objectives and (3) estimated costs to complete each action and objective.

In accordance with Section 253.034 F.S, the potential of the park to accommodate secondary management purposes was analyzed. These secondary purposes were considered within the context of DRP's statutory responsibilities and the resource needs and values of the park. This analysis considered the park's natural and cultural resources, management needs, aesthetic values, visitation and visitor experiences. Pursuant to the analysis required by and in accordance with the provisions of Section 253.034, F.S, it was determined that timber management conducted as part of the park's natural community management and restoration activities could be accommodated in a manner that would be compatible and not interfere with the primary purpose of resource-based outdoor recreation and conservation. This compatible secondary management purpose is addressed in the Resource Management Component of the plan.

DRP has determined that uses such as, water resource development projects, water supply projects, stormwater management projects, linear facilities and sustainable agriculture and forestry (other than those forest management activities specifically identified in this plan) would not be consistent with this plan or the management purposes of the park.

In accordance with 253.034(5) F.S., the potential for generating revenue to enhance management was also analyzed. Visitor fees and charges are the principal source of revenue generated by the park. It was also determined that the byproducts of timber management produced as part of the park's natural community management and restoration activities could be appropriate as additional sources of revenue for land management since this is compatible with the park's primary purpose of resource-based outdoor recreation and conservation. Generating revenue from consumptive uses that are not a byproduct of resource management activities is not contemplated in this management plan.

The DRP may provide the services and facilities outlined in this plan either with its own funds and staff or through an outsourcing contract. Private contractors may provide assistance with natural resource management and restoration activities or a concessionaire may provide services to park visitors in order to enhance the visitor experience. For example, a concessionaire could be authorized to sell merchandise

and food and to rent recreational equipment for use in the park. A concessionaire may also be authorized to provide specialized services, such as interpretive tours, or overnight accommodations when the required capital investment exceeds that which the DRP can elect to incur. Decisions regarding outsourcing, contracting with the private sector, the use of concessionaires, etc. are made on a case-by-case basis in accordance with the DRP's Operations Manual (OM).

Management Program Overview

Management Authority and Responsibility

In accordance with Chapter 258, Florida Statutes and Chapter 62D-2, Florida Administrative Code, the Division of Recreation and Parks (DRP) is charged with the responsibility of developing and operating Florida's recreation and parks system. These are administered in accordance with the following policy:

It shall be the policy of the Division of Recreation and Parks to promote the state park system for the use, enjoyment, and benefit of the people of Florida and visitors; to acquire typical portions of the original domain of the state which will be accessible to all of the people, and of such character as to emblemize the state's natural values; conserve these natural values for all time; administer the development, use and maintenance of these lands and render such public service in so doing, in such a manner as to enable the people of Florida and visitors to enjoy these values without depleting them; to contribute materially to the development of a strong mental, moral, and physical fiber in the people; to provide for perpetual preservation of historic sites and memorials of statewide significance and interpretation of their history to the people; to contribute to the tourist appeal of Florida.

The Board of Trustees of the Internal Improvement Trust Fund (Trustees) has granted management authority of certain sovereign submerged lands to the DRP under Management Agreement MA 68-086 (as amended January 19, 1988). The management area includes a 400-foot zone from the edge of mean high water where a park boundary borders sovereign submerged lands fronting beaches, bays, estuarine areas, rivers or streams. Where emergent wetland vegetation exists, the zone extends waterward 400 feet beyond the vegetation. The agreement is intended to provide additional protection to resources of the park and nearshore areas and to provide authority to manage activities that could adversely affect public recreational uses.

Many operating procedures are standardized system-wide and are set by internal direction. These procedures are outlined in the OM that covers such areas as personnel management, uniforms and personal appearance, training, signs, communications, fiscal procedures, interpretation, concessions, public use regulations, resource management, law enforcement, protection, safety and maintenance.

Park Management Goals

The following park goals express the DRP's long-term intent in managing the state park:

- Provide administrative support for all park functions.
- Protect water quality and quantity in the park, restore hydrology to the extent feasible and maintain the restored condition.
- Restore and maintain the natural communities/habitats of the park.
- Maintain, improve or restore imperiled species populations and habitats in the park.
- Remove exotic and invasive plants and animals from the park and conduct needed maintenance-control.
- Protect, preserve and maintain the cultural resources of the park.
- Provide public access and recreational opportunities in the park.
- Develop and maintain the capital facilities and infrastructure necessary to meet the goals and objectives of this management plan.

Management Coordination

The park is managed in accordance with all applicable laws and administrative rules. Agencies having a major or direct role in the management of the park are discussed in this plan.

The Florida Department of Agriculture and Consumer Services (FDACS), Florida Forest Service (FFS), assists DRP staff in the development of wildfire emergency plans and provides the authorization required for prescribed burning. The Florida Fish and Wildlife Conservation Commission (FWC) assists staff in the enforcement of state laws pertaining to wildlife, freshwater fish and other aquatic life existing within the park. In addition, the FWC aids the DRP with wildlife management programs, including imperiled species management. The Florida Department of State (FDOS), Division of Historical Resources (DHR) assists staff to ensure protection of archaeological and historical sites. The Florida Department of Environmental Protection (DEP), Florida Coastal Office (FCO) aids staff in aquatic preserves management programs.

Public Participation

The DRP provided an opportunity for public input by conducting a public workshop and an Advisory Group meeting to present the draft management plan to the public. These meetings were held on March 1, 2017 and March 2, 2017, respectively. Meeting notices were published in the Florida Administrative Register, February 20, 2017, Vol. 43/34, included on the Department Internet Calendar, posted in clear view at the park, and promoted locally. The purpose of the Advisory Group meeting is to provide the Advisory Group members an opportunity to discuss the draft management plan (see Addendum 2).

Other Designations

Savannas Preserve State Park is not within an Area of Critical State Concern as defined in Section 380.05, Florida Statutes, and it is not presently under study for such designation.

All waters within the park have been designated as Outstanding Florida Waters, pursuant to Chapter 62-302, Florida Administrative Code. This park is adjacent to the North Fork St. Lucie River Aquatic Preserve as designated under the Florida Aquatic Preserve Act of 1975 (Section 258.35, Florida Statutes).

RESOURCE MANAGEMENT COMPONENT

Introduction

The Florida Department of Environmental Protection (DEP), Division of Recreation and Parks (DRP) in accordance with Chapter 258, Florida Statutes, has implemented resource management programs for preserving for all time the representative examples of natural and cultural resources of statewide significance under its administration. This component of the unit plan describes the natural and cultural resources of the park and identifies the methods that will be used to manage them. Management measures expressed in this plan are consistent with DEP's overall mission in ecosystem management. Cited references are contained in Addendum 3.

The DRP's philosophy of resource management is natural systems management. Primary emphasis is placed on restoring and maintaining, to the degree possible, the natural processes that shaped the structure, function and species composition of Florida's diverse natural communities as they occurred in the original domain. Single species management for imperiled species is appropriate in state parks when the maintenance, recovery or restoration of a species or population is complicated due to constraints associated with long-term restoration efforts, unnaturally high mortality or insufficient habitat. Single species management should be compatible with the maintenance and restoration of natural processes, and should not imperil other native species or seriously compromise park values.

The DRP's management goal for cultural resources is to preserve sites and objects that represent Florida's cultural periods, significant historic events or persons. This goal often entails active measures to stabilize, reconstruct or restore resources, or to rehabilitate them for appropriate public use.

Because park units are often components of larger ecosystems, their proper management can be affected by conditions and events that occur beyond park boundaries. Ecosystem management is implemented through a resource management evaluation program that assesses resource conditions, evaluates management activities and refines management actions, and reviews local comprehensive plans and development permit applications for park/ecosystem impacts.

The entire park is divided into management zones that delineate areas on the ground that are used to reference management activities (see Management Zones Map). The shape and size of each zone may be based on natural community type, burn zone, and the location of existing roads and natural fire breaks. It is important to note that all burn zones are management zones; however, not all management zones include fire-dependent natural communities. Table 1 reflects the management zones with the acres of each zone.

Table 1: Savannas Preserve State Park Management Zones			
Management Zone	**Acreage**	**Managed with Prescribed Fire**	**Contains Cultural Resources**
SP-01	11.10	Yes	No
SP-02	18.67	Yes	No
SP-03	16.69	Yes	No
SP-04	16.92	Yes	No
SP-05	19.85	Yes	No
SP-06	34.14	Yes	No
SP-07	27.56	Yes	No
Sp-08	91.63	Yes	No
SP-09	237.67	Yes	Yes
SP-10	224.60	Yes	Yes
SP-11	115.43	Yes	No
SP-12A	56.90	Yes	No
SP-12B	305.21	Yes	No
SP-13	97.50	Yes	No
SP-14	253.65	Yes	No
SP-15A	33.81	Yes	No
SP-15B	68.10	Yes	No
SP-15C	125.42	Yes	No
SP-16A	17.21	Yes	No
SP-16B	17.12	Yes	No
SP-16C	112.25	Yes	No
SP-17	166.73	Yes	No
SP-18A	106.90	Yes	Yes
SP-18B	17.01	Yes	No
SP-19	56.45	Yes	No
SP-20A	46.40	Yes	No
SP-20B	12.47	Yes	No
SP-21	208.62	Yes	No
SP-22A	31.85	Yes	No
SP-22B	42.72	Yes	No
SP-22C	92.74	Yes	No
SP-22E	14.17	Yes	No
SP-22F	30.68	Yes	No
SP-22G	149.72	Yes	No
SP-23	3.33	No	No
SP-24A	3.17	Yes	No
SP-24B	48.11	Yes	Yes
SP-24C	20.17	Yes	Yes
SP-24D	6.03	Yes	No
SP-24E	46.25	Yes	No
SP-25A	14.37	Yes	No
SP-25B	39.32	Yes	No

Table 1: Savannas Preserve State Park Management Zones			
Management Zone	**Acreage**	**Managed with Prescribed Fire**	**Contains Cultural Resources**
SP-25C	63.79	Yes	No
SP-25E	94.05	Yes	No
SP-25F	111.16	Yes	No
SP-25G	21.05	Yes	No
SP-25H	45.86	Yes	No
SP-25I	53.24	Yes	No
SP-25J	17.08	Yes	Yes
SP-25K	6.73	Yes	Yes
SP-26A	16.44	Yes	No
SP-26B	14.39	Yes	No
SP-26C	10.43	Yes	No
SP-26D	15.94	Yes	No
SP-26E	15.21	Yes	No
SP-26F	8.40	Yes	No
SP-26G	32.58	Yes	No
SP-27	596.97	Yes	No
SP-28A	298.13	Yes	No
SP-28B	381.42	Yes	No
SP-29A	217.70	Yes	No
SP-29B	53.43	Yes	No
SP-29C	446.23	Yes	No
SP-E01	45.80	No	No
SP-E02	46.22	No	No
SP-E03	23.40	Yes	No
SP-E04	70.42	Yes	No
SP-E05	56.96	Yes	Yes
SP-E06	45.27	Yes	Yes
SP-E07	14.30	No	No
SP-E08	35.07	No	No
SP-E09	38.09	No	No
SP-E10	24.60	No	No
SP-E11	56.11	Yes	No
SP-E12	99.87	Yes	No
SP-I01	71.88	No	No
SP-I02	88.90	No	No
SP-I03	107.05	No	No
SP-I04	14.66	No	No
SP-W01	50.85	No	No
SP-W02	18.75	Yes	No
SP-W03	57.74	Yes	No
SP-W04	96.56	Yes	No
SP-W05	63.26	No	No

Table 1: Savannas Preserve State Park Management Zones			
Management Zone	**Acreage**	**Managed with Prescribed Fire**	**Contains Cultural Resources**
SP-W06	108.79	Yes	Yes
SP-W07	16.57	No	No
SP-W08	8.76	No	No
SP-W09	18.41	No	No

Resource Description and Assessment

Natural Resources

Topography

The park occupies lands in St. Lucie County and Martin County and is located east and west of U.S. Highway 1. Park property is located north of the unincorporated area of Jensen Beach and within the city of Port St. Lucie. The Savannas Preserve State Park is divided into two main properties, the “Savannas property” and the “North Fork property.” The “Savannas property” section is located entirely east of U.S. Highway 1 and contains the basin marsh within. The “North Fork property” is located entirely west of U.S. Highway 1 and contains the North Fork of the St. Lucie River within.

The physiographic landforms found within the preserve have been highly influenced by marine forces in the past and can be divided into two regions—the Atlantic Coastal Ridge and the Eastern Flatlands (Puri et al. 1964). The area along the Eastern boundary of the preserve lies within the Atlantic Coastal Ridge. It is comprised of old, relic dunes with elevations of up to 60 feet. Directly adjacent to the Atlantic Coastal Ridge is a freshwater marsh network for which the property acquired its name.

The remaining majority of the property is located within the Eastern Lowlands with elevations ranging from approximately 1 to 19 feet. Contained within this physiographic region is the North Fork of the St. Lucie River and its floodplain. Secondary watercourses included within the property are the North Fork’s two primary tributaries, Five Mile and Ten-Mile creeks.

Some major and minor topographic alterations caused by human activities have occurred to the preserve changing the natural topography. These activities include dredge and spoil piling; ditch/dike construction; and sand and peat mining and have occurred to various degrees across the property.

Geology

The Savannas Preserve State Park is situated on the eastern edge of the Eastern Valley geomorphic province of the Atlantic Coastal Lowlands. This province extends eastward from the Osceola Plain province of the central Florida peninsula to the Atlantic Ocean, and spans the eastern peninsula from Jacksonville southward to southern Palm Beach County. The Eastern Valley is characteristically flat with low

SAVANNAS PRESERVE
STATE PARK

N

0 0.25 0.5 1 Mile

Florida Department of Environmental Protection
Division of Recreation and Parks
Date of aerial; 2011

MANAGEMENT ZONES MAP

elevations. The land surface elevations vary between 0 and 35 feet above mean sea level (MSL). Surficial sediments are predominantly marine terrace sands and shelly sands, deposited during the Pleistocene age, Pamlico sea level highstand. Relict beach ridges, paralleling the modern east coast, are common features throughout the Eastern Valley.

Bordering the eastern edge of the Eastern Valley province, between the Savannas and the Indian River, is a narrow coast-parallel sand ridge named the Atlantic Coastal Ridge. This ridge system extends intermittently along Florida's east coast from Jacksonville Beach to just south of Miami. Elevations along that portion of the ridge near the preserve average about 30 to 35 feet above MSL, and isolated sand hills on the ridge may attain elevations of 50-60 feet above MSL. These higher elevations appear to represent now quiescent ancient dunes built up on the ridge core. Near the preserve, the ridge varies from 1/8- and ¼-mile wide. The Atlantic Coastal Ridge has a foundation composed of calcareous sandstone and sandy coquina of the Pleistocene Anastasia Formation, and is believed to be developed on former offshore bars of the Pamlico (Pleistocene) sea.

Situated along the western side of the Atlantic Coastal Ridge is a 13-mile long by 3/4-mile wide, north-south trending, marshy swale that contains a large extent of the park. This savanna terrain extends from approximately St. Lucie Inlet northward to Ft. Pierce. Land elevation within the swale is approximately 12 feet above MSL. During recent history, the marsh has been a freshwater marsh. It is believed that the topographically low, trough-like area occupied by the marsh is a portion of a relict Pleistocene waterway, analogous to the modern Indian River estuary. The Atlantic Coastal Ridge may have functioned as a barrier island during higher sea level in the late Pleistocene era. The current basin marsh area served as a shallow, parallel coastal lagoon behind the ridge to the west. Sand and silt infilling of this Pleistocene lagoon, in conjunction with a late Pleistocene sea level drop, eventually produced the modern savanna topography.

To the west of this Marshy swale lays the localized floodplain of the North Fork of the St. Lucie River, of which the remaining portions of the park lie. The headwaters at the extreme Northern end of the park drain the northern portions of Allapatah Flats and Green Ridge through ten mile creek; while the areas between Ten mile Ridge and the Atlantic Coastal Ridge are drained through Five Mile Creek. The majority of this part of the preserve is at or just above Mean High Water. These areas constitute the remaining intact floodplains of the area including tidal floodplain swamps and forests. Small localized areas border these floodplains where the highest communities are at roughly 10+ feet elevation and consist of scrub and pine flatwoods communities.

The stratigraphy and hydrostratigraphy underlying the preserve are shown in that the preserve is underlain by over 12,000 feet of Mesozoic and Cenozoic sedimentary rocks, resting on Mesozoic volcanic basement rock. Most of the younger overlying rocks are Cretaceous and Cenozoic age marine carbonates and siliclastics, which dip and thicken to the southeast. The Cenozoic rocks, which comprise the upper 3,000 feet of the sediment column, are Paleocene, Eocene and

Oligocene carbonates, which function as primary aquifers. These are overlain by Miocene to Recent age siliclastics. Most water wells penetrate Eocene and younger sediments. The three primary hydrostratigraphic units present near the preserve, in order of increasing depth, are: the surficial aquifer system, the intermediate aquifer system, and the Floridian aquifer system.

Soils

The soils of Savannas can be grouped into four major categories: Atlantic Coastal Ridge, the "Savannas," flatwoods, and North Fork St. Lucie River (see Soils map). The first three categories generally run in north-south bands and are very indicative of the natural communities to which they are associated. Detailed soils descriptions are contained in Addendum 4.

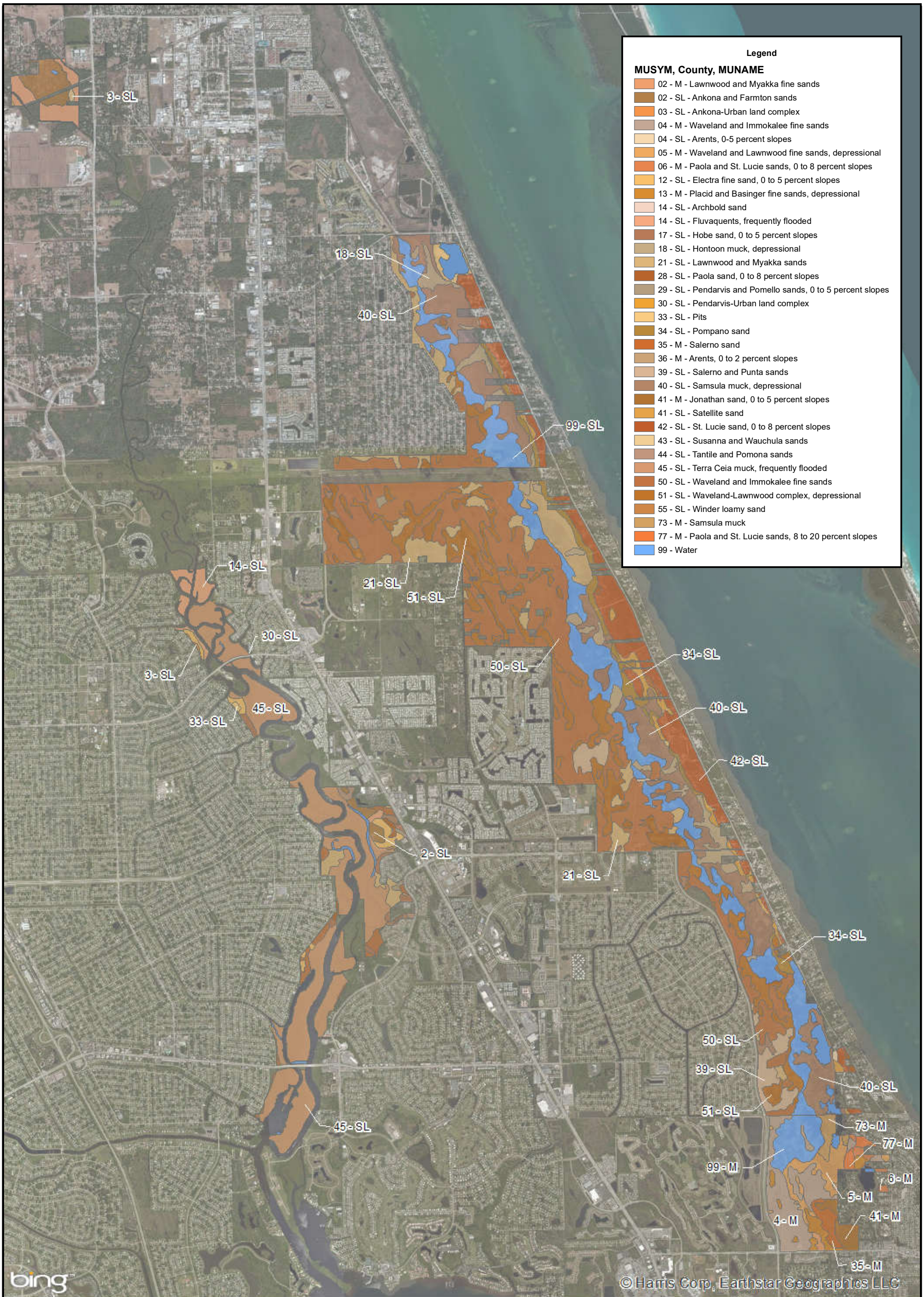
The majority of the Atlantic Coastal Ridge soil is dominated by St. Lucie and Satellite Sand. In general, these are sloping, well-drained soils that are sandy. The "Savannas" which lie to the west of the Atlantic Coastal Ridge is characterized by Samsula and Myakka Variant soils that are level, well-drained soils with varying degrees of muck and sand. To the west of the "Savannas" lies the flatwoods, dominated by Waveland and Lawnwood Sands. Typically, these soils are level, poorly drained soils and composed of a sandy surface layer and loamy subsoil. Soils along the North Fork St. Lucie River soils are primarily Terra Ceia Muck in their lower reaches and fluvaquents farther to the north.

Four types of soil alteration have occurred on the property because of human disturbance – sand mining, peat mining, agricultural activities, and dredging operations. The sand and peat mining areas are small primarily on the sand ridge and basin marsh. On the Atlantic Coastal Ridge, agricultural activities were probably extensive due to the cultivation of pineapples (*Ananas comosu)* that occurred in this area during the turn of the century. Along the North Fork of the St. Lucie River major soil alterations have occurred with the river dredging operations and water diversion canals.

Limited soil erosion is known in the park. However, soils occurring on the Atlantic Coastal Ridge are prone to erosion. Recreational activities in these soils need to be limited and closely monitored. All management activities will need to follow the best management practices to conserve soil resources and prevent soil erosion.

Minerals

There are no known minerals of commercial value in this unit.



SAVANNAS PRESERVE
STATE PARK

N

0 0.25 0.5 1 Mile

Florida Department of Environmental Protection
Division of Recreation and Parks
Date of aerial; 2011

SOIL MAP

Hydrology

Regional Hydrology

There are two main bodies of water within the park, the North Fork of the St. Lucie River and the Savannas basin marsh. These two water bodies were historically connected only during extreme high water. Today they are connected artificially through a channelized ditch (Hogpen Ditch) which is part of Hogpen Slough at its entrance to the St. Lucie River.

The two major aquifers in the park are the deep Floridan Aquifer and the shallow surficial aquifer. The Floridan is separated from the surface waters in the park, but the surficial is not. Two deeper-bodied lakes in the Southern portion of the Preserve, Henderson Pond and Eden Lake, hydraulically connect to the surficial aquifer. During periods of high water, the ground water and the surface water can intermix. It is important to monitor ground water withdrawals around the preserve. Martin County Utilities has a large well field south of the park, and most of the housing developments, which surround the preserve, have wells and septic tanks. The porous soils of the Atlantic Coastal Ridge are important for recharge of the surficial aquifer and to allow seepage into the wetlands located down slope of the Ridge.

North Fork of the St. Lucie River Hydrology

The North Fork of the St. Lucie River, which drains into the Indian River Lagoon-Jensen Beach to Jupiter-Inlet Aquatic Preserve. The aquatic preserve is a designated outstanding Florida waters. The entire St. Lucie River system was most likely predominantly freshwater until the opening of a permanent inlet to the Atlantic Ocean during the 1890s. The hydrology of the North Fork and its headwaters has been severely altered for purposes of navigation and drainage of adjacent lands for agricultural and urban development practices. (Refer to Hydrology map). Ten Mile and Five Mile Creeks, at the Northern end of the preserve are in present state canals with steep banks and narrow vestiges of floodplain habitats. The North Fork proper was dredged during the 1920s-1940s by the North St. Lucie Drainage District. Dredge spoil was piled during dredging operations onto the riverbank. In some areas the riverbank exceeds 20 feet in elevation due to spoil deposition.

The US Army Corps of Engineers (USACE) dredging operations in the North Fork commenced in 1922 and were preceded by mapping of the water course (in 1919) according to a report prepared for the St. Lucie County Board of County Commissioners (Dames and Moore, Inc. 1996). As a result of dredging operations, certain natural communities, including floodplain marsh, hydric hammock, and oxbows were highly altered. Many areas of the original water course are not fully connected to the existing main branch. This causes a significant portion of the river's natural filtration of water-born nutrients to not be utilized to its full capacity. Approximately 55 miles of the main branch of the riverbank currently exist between the point at Riverbend Lane to the upper reaches of Ten Mile Creek (to McCarty Road) and Five Mile Creek (to Metzger Road). Dredge spoil has been identified to occupy roughly 8.9 miles or 16.2% of the 55 miles. Further analysis of the

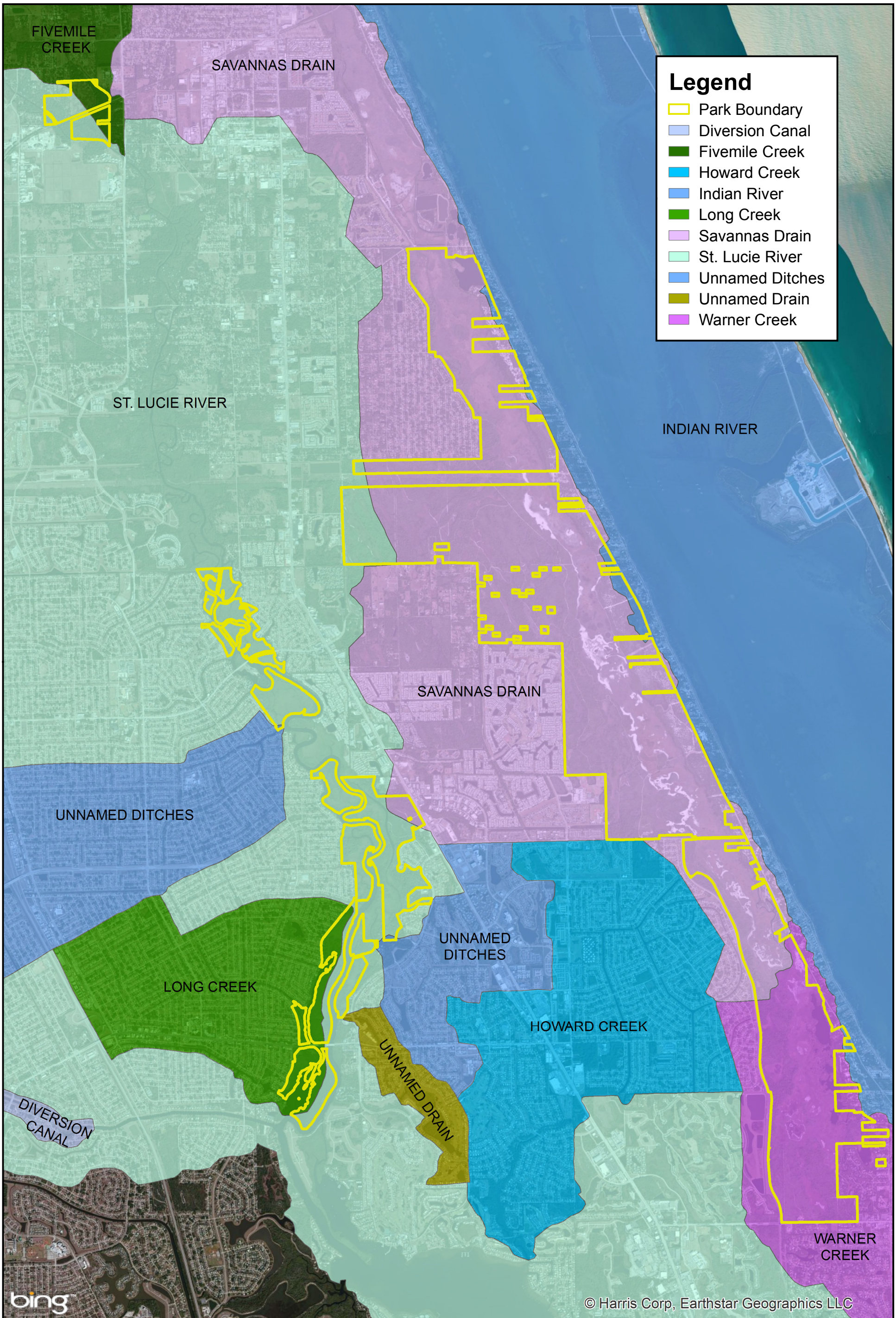
riverbank and pre-dredging surveys will most likely reveal that significantly more area contains soil deposition.

The North Fork is heavily impacted by an expanded watershed from the presence of numerous agricultural and residential canals and drainages associated with the North Fork St. Lucie River Water Control District, South Florida Water Management District (SFWMD), the city of Port St. Lucie, the City of Ft. Pierce, and St. Lucie County. For example the C-23 canal empties where the North Fork opens in to the North Fork Estuary. During the flood tide, water from the C-23 is pushed into the North Fork, which is tidal to the upstream water control structure at Gordy Road. The water quality degradation within the entire St. Lucie Estuary and the effects of storm water discharges to the estuarine system are well-documented (Chamerlin & Hayward 1996; Graves & Strom 1992; 1995a; Graves et al. 2002; Haunert & Startzman 1980; 1985). The system suffers from high nutrient and sediment loading as evidenced by chronic fish lesions and abnormalities, algae blooms, a depauperate estuarine fauna, and a lack of submerged aquatic vegetation. In some areas, improved retention/detention basins have been installed, but many more improvements are needed within the watershed.

The entire St. Lucie Estuary, which includes the North Fork, has been targeted for restoration under the Central and South Florida Indian River Lagoon Feasibility Study (USACE/SFWMD 2001), a portion of the Comprehensive Everglades Restoration Plan (CERP). A section of the Feasibility Plan is dedicated to the information and restoration needs of the North Fork but the Plan does not provide funding for these needs. In addition, the Indian River Lagoon Surface Water Improvement and Management Plan (Steward *et al*. 1994) and the National Estuary Program Comprehensive Conservation and Management Plan (Adams *et al*. 1996) specifically address the obvious needs of the St. Lucie Estuary. Currently, FDEP has developed needs of the North Fork via CAMA assessment (Coastal Aquatic Management Area) and has conducted a riverbank breaching pilot study to rehydrate floodplain wetlands within the North Fork of the St. Lucie River. Further analysis is needed to determine the restoration needs of the North Fork of the St. Lucie River portion of Savannas Preserve State Park, the associated aquatic preserves, and the North Fork in general. Savannas Preserve State Park cooperates with CAMA/ Indian River Lagoon Aquatic Preserves and The Florida Fish and Wildlife Conservation Commission- Aquatic Habitat Restoration/Enhancement Subsection to provide support on water quality and habitat improvements such as oxbow and seagrass restoration on the North Fork of the St. Lucie River. Additional information pertaining to the management of aquatic resources of the North Fork of the St. Lucie River can be found in the North Fork of the St. Lucie River management plan.

Savannas Hydrology

The freshwater basin marsh portion of the Preserve lies within a basin locally known as the “Savannas” which is bounded on its east side by the Atlantic Coastal Ridge and on its west side by a topographical ridge which separates the “Savannas” basin from the North Fork of the St. Lucie River basin. This narrow basin extends from Ft. Pierce south to Jensen Beach. Savannas Preserve State Park occupies the major



SAVANNAS PRESERVE STATE PARK

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Florida Department of Environmental Protection
Division of Recreation and Parks
Date of aerial: 2010

HYDROLOGY BASIN MAP

portion of this basin. Martin county, with the cooperation of the Savannas Preserve State Park, is in the process of developing a hydrological model of the “Savannas Watershed” via the Savannas Regional Restoration Project. This hydrological model will provide a platform for efficient management of the 22,000 acre watershed and associated resources. Improvements to infrastructure within the Savannas Preserve State Park have been identified in early stages of model development, these improvements will be addressed in *Natural Communities - Canals and Ditches*.

Historical information suggests that the “Savannas” was most likely two main water bodies separated by extensive marsh. The southern water body drained southward through Warner Creek into the St. Lucie River. The northern water body drained northward via Platt’s Creek into the North Fork St. Lucie River. The Platt’s Creek outflow no longer exists, but Warner Creek still flows. Impairments to a rudimentary weir structure located just north of Jensen Beach Blvd. have been identified. A project associated with Martin County’s storm water improvement will address these impairments. A proposed operable weir structure will greatly improve ability to address neighborhood flooding, regulate water flow and restore suitable hydroperiod of wetlands at the southern end of the Savannas Preserve. Current topographic maps suggest that historical flow through these two creeks was minimal until high water levels in the “Savannas” were reached.

Today the basin appears far different. At least half of the basin has been modified for residential and commercial interests. Water quality and quantity entering the preserve have been degraded due to the presence of storm water (Graves and Strom 1995b). The “Savannas” is a low-nutrient system which depends on periodic, natural drawdowns to maintain this regime. It receives most of its water directly from precipitation, which has historically always been the case. Currently, it receives storm water with varying levels of treatment. Investigations by the DEP Surface Water Ambient Monitoring Program have demonstrated that areas of the Savannas Preserve State Park are being degraded by some of these storm water inputs, particularly the area adjacent to Indian River Estates, a sub-division located on the northwest corner of the Savannas Property within the preserve. Lakewatch data gathered from 2012-2015 also suggests elevated levels of nitrogen present in the southern waters of the preserve. Lake Eden, a marsh lake situated within the basin marsh is the primary testing site. Elevated levels are likely associated with neighborhood and storm water runoff.

Wetlands comprise a large portion of the total acreage of the preserve and are a conspicuous part of its landscape. Surface water results mostly from direct precipitation. This aspect along with the fact that the “Savannas” lies within its own relatively small basin results in significant changes in water levels depending on the amount of rainfall and the time of year. These changes account for the system being low in nutrients in that any significant build-up of organic substrate will be oxidized during extreme low water levels. This results in water chemistry that is unusual in this part of Florida – low in conductivity, PH, and phosphate nutrients.

Several different man-made structures have altered the unit’s hydrology. Six ditches, three of which currently possess no easements, drain into the preserve

from Indian River Estates. Hog Pen Ditch connects the basin marsh of the preserve to the North Fork St. Lucie River. To the south of Walton Road a ditch parallels the park boundary along Green River Parkway, where 6 low water crossings carry storm water from adjacent neighborhoods into the preserve's wetland system from the West. Restoration via mitigation with Florida Power and Light allowed for the placement of two weirs in the preserve located within the eastern section of Hog Pen Ditch, these structures have aided in the restoration of flatwoods and wet prairie habitat that were interrupted by the ditch. Further information regarding the hydrology of the Savannas Preserve and the associated watershed will aid in proper operation of these structures, this will be facilitated by the Savannas Regional Restoration Project. Additional hydrological improvements around hog pen ditch include installation of a low water crossing along the white trail between the north and south blue trails. This addition will improve water supply to the basin marsh and provide for public and staff safety where the road washes out under high water conditions. There are at least two places within the preserve in which peat mining has occurred in the past. This altered topography has lengthened the hydroperiods in these areas.

Natural Communities

This section of the management plan describes and assesses each of the natural communities found in the state park. It also describes of the desired future condition (DFC) of each natural community and identifies the actions that will be required to bring the community to its desired future condition. Specific management objectives and actions for natural community management, exotic species management, imperiled species management and restoration are discussed in the Resource Management Program section of this component.

The system of classifying natural communities employed in this plan was developed by the Florida Natural Areas Inventory (FNAI). The premise of this system is that physical factors such as climate, geology, soil, hydrology, and fire frequency generally determine the species composition of an area, and that areas that are similar with respect to those factors will tend to have natural communities with similar species compositions. Obvious differences in species composition can occur, however, despite similar physical conditions. In other instances, physical factors are substantially different, yet the species compositions are quite similar. For example, coastal strand and scrub--two communities with similar species compositions--generally have quite different climatic environments, and these necessitate different management programs. Some physical influences, such as fire frequency, may vary from FNAI's descriptions for certain natural communities in this plan.

When a natural community within a park reaches the desired future condition, it is considered to be in a "maintenance condition." Required actions for sustaining a community's maintenance condition may include, maintaining optimal fire return intervals for fire-dependent communities, ongoing control of non-native plant and animal species, maintaining natural hydrological functions (including historic water flows and water quality), preserving a community's biodiversity and vegetative structure, protecting viable populations of plant and animal species (including those

that are imperiled or endemic), and preserving intact ecotones linking natural communities across the landscape.

The park contains 13 distinct natural communities as well as ruderal and developed areas (see Natural Communities Map). A list of known plants and animals occurring in the park is contained in Addendum 5.

Scrub

Desired Future Condition: Within scrub habitats, the dominant species will include scrub oak (*Quercus inopina*), sand live oak (*Quercus maritime*), myrtle oak (*Quercus myrtifolia*), Chapman's oak (*Quercus chapmanii*), saw palmetto (*Serenoa repens*), and rusty staggerbush (*Lyonia ferruginea*). The oak canopy will vary in height from 3 – 8 feet. There will be a variety of oak age classes/heights between different scrub patches. There will be scattered openings in the canopy with bare patches of sand that support many imperiled or endemic plant species; these species will be regularly flowering and replenishing their seed banks. Sand pine (*Pinus clausa*), where present, will usually not be dominant in abundance, percent cover, or height. Some areas of mature sand pine will occur; do not confuse sand pine age with needed fire return interval. The Optimal Fire Return Interval for this community will be regionally variable. Typically, 4-20 years when aiming to achieve a mosaic of burned and unburned areas.

Description and Assessment: The original extent of this community on the Atlantic Coastal Ridge ranged from North Miami to Cape Canaveral. Scrub has been almost eliminated in Dade and Broward Counties, and only remnants occur in Palm Beach County. Within Martin and St. Lucie County the remaining scrub habitats are generally disconnected and many are threatened by development. The park contains some of the last remaining contiguous coastal scrub stands in Southeast Florida. This community is ranked globally imperiled by FNAI and should receive high management priority.

Within the preserve this habitat provides for a number of scrub endemics and rare species, such as Prickly apple cactus, Large-Flowered rosemary, Savannas mint, Four petaled paw-paw, Scrub lizard, and the Florida scrub-jay.

This habitat is located adjacent to the freshwater basin marsh (Management Zones (MZ) SP-23, 24, 25, 26). Recently large portions of this community were naturally altered with the blow-down of sand pines during the 2004 Hurricanes of Jeanne and Frances. Current conditions leave ample amounts of large fuels available for consumption during wildfire and prescribed fires.

This community varies in condition from fair to good condition due to past fire suppression, former land usage and exotic plant infestations. The scrub community has received varying degrees of disturbance. Some areas were cleared for pineapple plantations, some were cleared in anticipation of development, and many were cut-up by off-road vehicle trails.

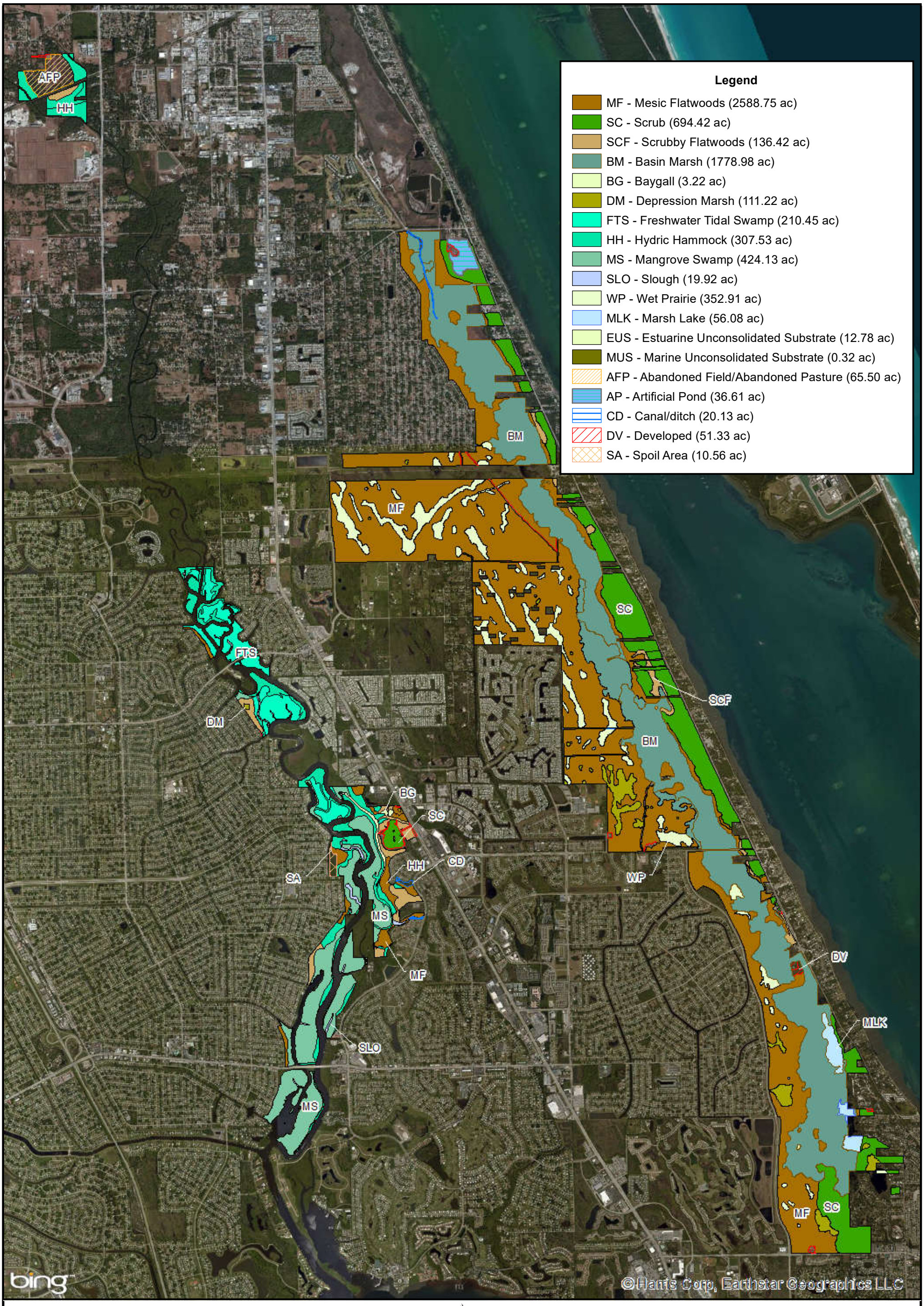
General Management Measures: Scrub is sensitive to disturbance with some scars taking more than 50 years to rehabilitate. In the past, recreationists have expressed interest in opening the scrub in the eastern portion of the preserve to trails, specifically for equestrian use. Due to the sensitivity of this habitat to disturbance, and the fact that ample trail opportunities exist elsewhere at the preserve, it is recommended that trail activities be prohibited or extremely limited within this community. All management activities should limit the amount of disturbance within this community to the best degree possible.

A large portion of the scrub within the park has transitioned into a senescent scrub community. The continued application of prescribed fire will be needed to transition more of this community into stages of early succession scrub for listed species of plants and animals. In 2005-2006 an effort was completed to install fire lines in this area and split areas into smaller burnable blocks. In 2016-17 an additional fire line will be installed from Walton Rd. north to the FPL transmission line corridor along the basin marsh/scrub ecotone. This fire line will allow for separation of natural communities with varied fire return intervals, and provide for greater firefighter safety during prescribed fire and suppression activities. The fire lines will also improve access to the eastern area of the park. During the years 2011-2017 two hundred acres of scrub were prescribed burned. Staff will continue to consider mechanical fuel reduction in conjunction with prescribed fire as a management tool for the scrub ecosystem, specifically SP25A, SP24E and SP23.

Exotic plants such as Brazillian pepper (*Schinus terebinthifolius*), Ear leaf acacia (*Acacia auriculiformis*), White cypress-pine (*Callitris columellaris)*, Natal grass (*Melinis repens*) and Golden trumpet (*Allamanda cathartica*) alter many areas of this community. The majority of these exotic species disturbances border the railroad tracks. Other exotic plants existing in disturbed areas include Madagascar periwinkle (*Catharanthus roseus*), rosary pea (*Abrus precatorius*), Strawberry Guava (*Psidium cattleianum*), Surinam cherry (*Eugenia uniflora*) and Australian pine (*Casuarina equisetifolia*). Continued efforts to eradicate these and other exotic species

Scrubby Flatwoods

Desired Future Condition: The dominant tree species of the interior of scrubby flatwoods will usually be south Florida slash pine (*Pinus elliottii*) depending on region of the state. Slash pines will be the dominant tree in North Florida barrier island scrubby flatwoods. Mature sand pines (*Pinus clausa*) will typically not be present. There will be a diverse shrubby understory often with patches of bare white sand. A scrub-type oak “canopy” will vary in height from 3 – 8 feet and there will be a variety of oak age classes/heights across the landscape. Dominant shrubs will include sand live oak (*Quercus geminata*), myrtle oak (*Quercus myrtifolia*), Chapman’s oak (*Quercus chapmanii*), saw palmetto (*Serenoa repens*), rusty staggerbush (*Lyonia ferruginea*), and tarflower (*Bejaria racemosa*). Cover by herbaceous species will often be well below 40%. The Optimal Fire Return Interval for this community will be regionally variable; typically, 3 -14 years when aiming to achieve a mosaic of burned and unburned areas.



SAVANNAS PRESERVE
STATE PARK

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Florida Department of Environmental Protection
Division of Recreation and Parks
Date of aerial; 2011

NATURAL COMMUNITIES MAP

Description and Assessment: The majority of this community is found in bands adjacent to and west of the scrub communities on the Eastern portion of the park (MZ SP-22, 24, 25). It is also represented along the crest of the floodplains along the North Fork of the St. Lucie River and its tributaries (MZ SP-E3, 4, 5, 6 & 11; SP W-3 & 6). It has received varying degrees of disturbance, but overall is in fair to good condition. The majority of this community lacks adequate fire history. Relative fuel heights in these areas are much higher and denser than expected in a high quality system.

General Management Measures: As with most of the natural communities within the preserve, it suffers from a lack of fire. The introduction of a prescribed fire program is necessary to perpetuate this community. Periodic prescribed fire treatments throughout this habitat will protect slash pines from high fuel build up mortality in the future. This area is relatively free of exotic plant species. The majority of the problems arise along the borders of this community near off-site developed areas. Close monitoring of these boundary areas will be need to keep these areas in maintenance condition should continue as a high priority.

Mesic Flatwoods

Desired Future Condition: Dominant pine overstory will be south Florida slash pine (*Pinus elliottii*). Native herbaceous groundcover should be over at least 50% of the area and less than 3 feet in height. Saw palmetto (*Serenoa repens*) will comprise no more than 50% of total shrub species cover, and are also less than 3 feet in height. Other shrub species may include gallberry (*Ilex glabra*), fetterbush (*Lyonia lucida*), dwarf live oak (*Quercus minima*), shiny blueberry (*Vaccinium myrsinites*), and dwarf huckleberry (*Gaylussacia dumosa*). Shrubs will generally be knee-high or less, and there are few if any large trunks of saw palmetto along the ground. The Optimal Fire Return Interval for this community is 1-5 years.

Description and Assessment: Mesic Flatwoods represent the dominant natural community in the preserve. The vast majority of this community is found west of the basin marsh within the main portion of the park. Along the North Fork of the St. Lucie River this community is found in the uplands adjacent to the river. During periods of extreme heavy rain and high water, the mesic flatwoods may be inundated with water for periods of up to a month.

The community can be rated from poor to good condition depending upon fire return intervals, altered hydrology, and non-native invasive plant infestation. The flatwoods of the preserve have received a number of human caused disturbances, such as old fire plow scars, ditches, and Off- Road Vehicle trails that have altered its hydrology. Exotic species, both animals and plants inhibit this community to a great degree.

Large portions of this community have little to no fire history. Some areas have not seen fire in over 30 years. Where prescribed fire has been applied in these areas the habitat is responding satisfactorily and approaching good condition. Past mechanical treatments have also increased the speed in which these habitats have been restored. Staff will continue to consider mechanical fuel reduction in

conjunction with prescribed fire as a management tool for the pine flatwoods ecosystem. Certain management zones within the park take precedent for mechanical treatment considerations due to location, extended burn frequency, and lack of ability to implement prescribed fire. SP1-SP7 will be considered in future mechanical treatments, SP12B, SP17, SP18B, SPW03, SPW06, and SPW07 will also be considered.

It should be noted that reintroduction of fire into some areas of the park has killed some older trees due to high fuel loadings; this should not however be a reason to stop the continued application of fire. Firing technique, drought condition, and burning during the summer when trees are more resilient are all tools to minimize old growth tree kill and maintain desirable tree densities. It is important to note that many areas in the park also have a higher density of younger slash pine *(Pinus elliotti)* that may prove to be undesirable in the long term.

Pine mortality naturally occurs due to age, disease, lightning strike and other causes. Standing partly or completely dead pine trees (snags) play an important role in the ecology and aesthetics of mesic flatwoods. Park staff will not remove dead or partially dead trees unless a snag is potentially dangerous to visitors, staff or property.

General Management Measures: Short interval prescribed fire application (1 to 5 years) will maintain and restore the understory of these communities and allow older slash pines to experience low intensity fires that are essential to their survival.

Hydrological alterations of the park's flatwoods community exist in areas with flood control ditches. The impacts of these human made drainages are much larger than the canals' footprints. Indicators include the proliferation of cabbage palms, larger saw palmettos and a lack of wiregrass in the groundcover. Hydrological alterations occur within the park on large and smaller scales, with the most obvious alterations near the Hogpen ditch and the five ditches adjacent to the Indian River Estates Communities.

Non-native, invasive plants are another threat to mesic flatwoods with Brazilian pepper (Schinus terebinthifolius) and Old world climbing fern (*Lygodium microphyllum*) being the most disruptive. Large infestations of both species occur adjacent to the park, making treatment and retreatment critical. Monitoring and treatment are important to minimizing their impact. The collection of byproducts of timber management conducted as part of the park's natural community management and restoration activities would be appropriate at this park as additional sources of revenue for land management since this is compatible with the park's primary purpose of resource-based outdoor recreation and conservation. Generating revenue from consumptive uses that are not a byproduct of resource management activities is not contemplated in this management plan.

Depression Marsh

Desired Future Condition: Depression marsh is characterized as containing low emergent herbaceous and shrub species which will be dominant over most of the area and include open vistas. Trees will be few and if present, will occur primarily in the deeper portions of the community. There will be little accumulation of dead grassy fuels due to frequent burning; one can often see the soil surface through the vegetation when the community is not inundated. Dominant vegetation in basin marsh and depression marsh may include maidencane (*Panicum hemitomon*), panic grasses (*Panicum* spp.), cutgrass (*Leersia* sp.), common reed (*Phragmites australis*), pickerelweed (*Pontederia cordata*), arrowheads (*Sagittaria* sp.), buttonbush (*Cephalanthus occidentalis*), St. John's wort (*Hypericum fasciculatum*), and coastal plain willow (*Salix caroliniana*). The Optimal Fire Return Interval for this community is 2-10 years depending on fire frequency of adjacent communities.

Description and Assessment: The Depression marshes are located throughout the flatwood and scrub communities in the park. Depression marshes support a variety of amphibians, reptiles, mammals and birds. These ephemeral wetlands have hydro-periods that vary from 50 to 200 days per year, which is important to those amphibian species that breed only in temporary wetlands.

This community is in poor to good condition, depending on hydrological impacts and the presence or absence of fire. Prolonged dry periods and lack of fire management have allowed hardwood species to dominate many of these marshes. Exotic species plant species have been documented and treated in these areas. Feral hog damage around the periphery of these areas is a common disturbance.

General Management Measures: Continued management needs to focus on non-native, invasive plant treatment especially Old World climbing fern, Brazilian pepper, melaleuca *(Melaleuca quinquenervia)*, and Torpedo grass *(Panicum repens)*. Feral hog removal throughout the park will assist with the quality of these habitats

In some areas, drainage ditches and fire suppression activities have impacted these communities. Re-habilitating these disturbances and reconnecting disjointed features will help these areas. Mechanical removal of hardwoods will have to be evaluated on a case-by-case basis as fire is returned into these areas.

Basin Marsh

Desired Future Condition: Basin marshes include emergent herbaceous and low shrub species dominating most of the area with an open vista. Trees will be few and if present occur primarily in the deeper portions of the community. There will be little accumulation of dead grassy fuels due to frequent burning; one will be able to see the soil surface through the vegetation when the community is not inundated. Dominant vegetation in basin marsh will include maidencane (*Panicum hemitomon*), cutgrass (*Leersia* sp.), common reed (*Phragmites australis*), pickerelweed (*Pontederia cordata*), arrowheads (*Sagittaria* sp.), buttonbush (*Cephalanthus occidentalis*), St. John's wort (*Hypericum fasciculatum*), and coastal plain willow

(*Salix caroliniana*). The Optimal Fire Return Interval for this community is 2-10 years depending on fire frequency of adjacent communities.

Description and Assessment: This community comprises the dominant wetland type in the main body of the preserve (MZ SP-27, 28, and 29). It is located down slope from the Atlantic coastal ridge. It is a high quality wetland that is ephemeral in nature. During the wetter times it is dominated by various grasses, sedges, and emergent plants. During drought times, major areas are open with white sand, with the deeper areas still containing wetland vegetation.

This community is in good to fair condition. Long term lack of fire management in this community has allowed hardwood encroachment into the peripheries of the community. Water quality issues in the northern reaches of this community, around Indian River Estates, have changed species composition of this community. Past agricultural practices such as peat mining and ditching have altered the hydrology in some areas.

General Management Measures: Management of this community should focus on returning fire into this system. Islands of scattered sawgrass scattered throughout this community contain years of dense accumulated vegetation. As fire is allowed to enter into this community habitat for wading birds and other marsh associated wildlife will increase.

Focus should also be on treating and monitoring of melaleuca and old-world climbing fern. During drought years of 2009 -2011 a focus on removal of melaleuca was done and should be reassessed for retreatment. Over the last few years an increase of old-world climbing fern has been encroaching into this community and should be monitored closely and treated where applicable.

Monitoring of influence of stormwater intrusion influence into this community should continue. Plans are in place and initial steps have been made to divert and filter direct stormwater from the Indian River Estates community in the North West portion of the “Savannas” portion of the park.

<u>Wet Prairie</u>
Desired Future Condition: Trees will be few or absent. Groundcover will be dense and exceptionally species-rich. Dominant species will be wiregrass (*Aristida beyrichiana*) and/or sedges (*Carex* spp.). In the peninsula, blue maidencane (*Amphicarpum muhlenbergianum*), cutthroatgrass (*Panicum absissum*), and Curtiss’ dropseed (*Sporobolus curtissii*) may also be dominant, with cutthroatgrass occasionally being the dominant species. Pitcherplants (*Sarracenia* spp.), other carnivorous plant species, and terrestrial orchids are present and abundant in some areas.

Description and Assessment: This community is located within the flatwoods communities and is characterized as a treeless wetland with a sparse to dense ground cover of grasses and herbs, especially St. John’s wort. This community is predominately located in MZ SP-8 through SP-18). Like the depression marsh, it is

ephemeral and important for a variety of animals. Many of these prairies are perched, so their water levels can apparently move independent of the basin marsh. Fire is an important component in maintaining the herbaceous plants in this community. Fire would naturally enter into this community in varying degrees from adjacent communities.

Within the park, this community serves as an important filtering system for sheet flowing water before it reaches the basin marsh (excess nutrients are used by plants of the wet prairie). The wet prairie community, like many communities within the park, may be rated from fair to good condition. With the increased artificial drainage surrounding the park, this community type is being stressed as indicated by the invasion of woody species, including wax myrtle and slash pine. If the elevations of the water table continue to lower and prescribed burns withheld from the management of these areas, the dominate St. John's wort understory of the wet prairie will eventually shift to a more woody community.

General Management Measures: Prescribed fire intervals should vary from to reflect wetter and drier years. The extent to which fire will enter these communities will vary depending upon water levels upon burns. When burning zones that these areas are contained within, water levels within these communities should be noted for future burning. Old plow scars that create sheet flow by connecting these communities to other wetlands are difficult to correct, but should be identified and restored if feasible. Further threats to this community come from feral hog damage, melaleuca, Old World climbing fern, and torpedo grass. Fire lanes that traverse through these communities should be limited or deleted where possible. These fire lanes create channelization of water and an increase in exotic plant dispersal. Torpedo grass has been noted to be entering where fire lanes cross these communities.

Marsh Lake

Desired Future Condition: Flatwoods/prairie Lake and Marsh Lake are often associated with depression marshes and are characterized as shallow, generally round or elliptical depressions, vegetated with concentric bands of aquatic vegetation. Depending upon the depth and slope of the depression, an open water zone, with or without floating plants, may occur at the center. The open water zone will be considered to be a marsh lake if it is small in comparison to the surrounding marsh. Otherwise, the system will be considered to be a flatwoods lake or a prairie lake, depending upon the surrounding community. The hydrosol will typically be acidic sand with some peat and occasionally a clay lens. Although water levels may fluctuate significantly, water will typically be present year-round.

Description and Assessment: This community is located within or adjacent to the basin marsh. The marsh lakes are deeper wetland communities, with mostly floating or emergent plants such as water lilies and pickerelweed and a peat bottom. The boundaries of this community blend with the basin marsh and make precise boundary delineation difficult. For this reason, this community type is described but not well defined on the Natural Community Map. These areas are extremely important breeding areas for fish and amphibians. They are important

sources of water for many mammals and birds that inhabit the surrounding community and they provide refuge areas for wildlife during natural times of drought.

This community is generally in good condition. There is a long-term concern with effects of water withdrawal from the well fields near this area. Water drawdowns can have dramatic effects on the long term refuge of these areas during drought times.

General Management Measures: The marsh lakes of the Savannas are very important to the park and are vulnerable to ground water manipulation. Because of their value to the park, any future and ongoing impacts that would alter their balance should not be permitted. Water quality is an important concern in these oligotrophic systems, especially where these lakes occur on the edges of the park. Monitoring for changes in water quality to these communities should continue to occur.

Hydric Hammock

Desired Future Condition: Hydric hammock is characterized with a closed canopy, evergreen hardwood and/or palm forest with a variable understory dominated by palms, with sparse to moderate ground cover of grasses and ferns. Typical canopy species will include laurel oak (*Quercus laurifolia*), cabbage palm (*Sabal palmetto*), live oak (*Quercus virginiana*), sweetbay (*Magnolia viginiana*), swamp tupelo (*Nyssa sylvatica biflora*), American elm (*Ulmus Americana*), red maple (*Acer rubrum*) and other hydrophytic tree species. Soils will be poorly drained, with a normal hydroperiod seldom over 60 days per year. Hydric hammock should occasionally burn by allowing fires to naturally burn across ecotones from fires originating in adjacent upland natural communities.

Description and Assessment: Hydric hammock on the buffer preserve is dominated by hardwoods (red maple, sweetgum, swamp and red bay, dahoon holly, laurel oak, gumbo limbo) intermingled with cabbage palm, wax myrtle, and numerous vines and epiphytes such as poison ivy, bromeliads, and orchids. This habitat is in fair to good condition depending upon the amount of hydrological alteration and invasion of exotic plant and animal species. Exotic plant species such as Brazilian pepper, shoe button ardesia, air potato and others have been highly problematic in these areas.

General Management Measures: Efforts to continue to treat exotic plants and control feral hogs in these areas should continue. Past efforts have been very good and a continued effort in exotic species eradication will improve the quality of these habitats.

Where these communities are adjacent to upland fire-type communities, fire should be allowed to enter the edge of the ecotones. This should be performed in wetter conditions to allow fire to enter the edge of the communities in a mosaic pattern.

Edges of these communities can have a very dense Palmetto component with fuel heights in some areas reaching 7 feet or more.

The hydrologic regime is the important factor determining the overall condition of these habitats. If the water table is lowered, the hammocks will gradually change to mesic conditions. If the hammock is flooded for extensive periods, many trees will die and will be replaced by hydrophytic species.

Slough

Desired Future Condition: Characterized by broad shallow channels, that is inundated with slow moving water except during extreme droughts. With a hydroperiod of at least 250 days, sloughs are the deepest drainage ways within marsh and swamp systems and can contain open water, herbaceous cover or be partially forested. Sloughs will occur in irregular linear arrangements within strand swamp, floodplain swamp, basin swamp, glades marsh, or slough marsh communities. The vegetation structure will be quite variable. In south Florida, sloughs are often dominated by a pond apple (*Annona glabra*) canopy with a large diversity of epiphytes (including many rare species). Other forested sloughs will have a canopy of tupelo (*Nyssa* spp.), Carolina ash (*Fraxinus caroliniana*), planer tree (*Planera aquatica*), bald cypress (*Taxodium distichum*) and buttonbush (*Cephalanthus occidentalis*). Sloughs dominated by emergent herbs often contain alligator flag (*Thalia geniculata*), arrowhead (*Sagittaria* spp.), canna (*Canna flaccida*), pickerelweed (*Pontederia cordata*), and lizard's tail (*Saururus cernuus*). Deeper Sloughs may contain submerged and floating vegetation including American white water lily (*Nymphaea odorata*), spatterdock (*Nupar advena*), frog's bit (*Limnobium spongia*), bladderworts (*Utricularia* spp.), and duckweeds (*Lemna* spp.). The soils will be peat, typically submerged, but may become exposed during extreme drought and subject to deep peat fires.

Description and Assessment: There are many sloughs that enter the "North Fork" property. Within the boundaries of the property the sloughs contain few exotic species and portions of some are natural in cross-section. Outside the boundaries, however many sloughs have been altered into channels to facilitate drainage of stormwater from urban areas. The quality of these waters is unknown, but the North Fork St. Lucie River receives considerable stormwater runoff and most is apparently untreated. Within the preserve the sloughs contain wetland associates such as swamp lilly, pickerel weed, and leather fern. The slough banks contain a diverse array of species including swamp and red bay, pop ash, laurel oak, pond apple, wax myrtle, saltbush, ludwiga, stoppers, wild coffees, various vines such as poison ivy and epiphytes. These areas are susceptible to disturbance caused by regular maintenance of drainage easements and by increased water volume and flow levels from stormwater alterations and new development in the watershed

General Management Measures: Maintaining the proper hydrology is the most important management measure in this community. However, most of the control of water flow and water quality into these areas is controlled offsite and in the urban environment. Educating the public on stormwater quality issues will assist with this issue. Providing comment on any stormwater improvement projects that

will negatively or positively affect this community can have the greatest impact. Continued exotic plant and animal monitoring should occur on a yearly basis, any treatment and retreatment by staff and contactors should be done as needed.

Baygall

Desired Future Condition: Baygall consists of a wet densely forested, peat filled depression typically near the base of a slope. Seepage from adjacent uplands will maintain saturated conditions. Medium to tall trees will mainly consist of sweetbay (*Magnolia virginiana*), loblolly bay (*Gordonia lasianthus*), and/or swamp bay (*Persea palustris*). Occasionally sparse pines (*Pinus* spp.) may also exist. A thick understory consisting of gallberry (*Ilex glabra*), fetterbush (*Lyonia lucida*), dahoon (*Ilex cassine*), titi (*Cyrilla racemiflora*), and red maple (*Acer rubrum*) will be typical with climbing vines such as greenbriar (*Smilax* spp.) and muscadine grape (*Vitis* spp.) will usually be abundant. The Optimal Fire Return Interval for this community is 25-100 years. Frequent fires from adjacent communities should be allowed to enter baygall ecotone.

Description and Assessment: The baygall is a rare seepage wetland that forms when water from a higher sandy landscape filters through the sand and out into lower adjacent terrain. The baygall community is a rare system in south Florida. This community is located at the base of a slope along the North Fork of the St. Lucie River (MZ SP-E06) that runs between the xeric and scrubby habitats and connects to Hogpen Slough to south. In May of 2017 construction of the Crosstown Parkway Bridge will affect the baygall community located in MZ SP-E06. It is yet unknown how much of the habitat will suffer impacts associated with construction of the bridge. The recreational “Halpatioke trail” which showcases the baygall habitat will close April 30, 2017, visitors will be redirected to the newly opened “Evans Creek Canoe Launch” located a ¼ mile south for access to the North Fork of the St. Lucie River.

The baygall is a closed-canopy swamp with dominant tree species red bay, swamp bay, dahoon holly, and other hydrophytic trees with a groundcover of mostly royal, bracken and cinnamon ferns. The baygall is highly susceptible to changes in hydrology and requires moist peat. Fire can alter this community greatly and change it into a different community type.

The baygall community is in poor condition mainly due disturbances by invasive exotic species. Old World climbing fern, Brazilian pepper, and arrowhead vine (*Syngonium podophyllum*) are now established in the baygall system. Several large infestations of Old World climbing fern and Brazilian pepper and potential ground disturbances from feral hogs threaten the structure and composition of the baygall swamp. In 2015-16 efforts to remove invasive exotic plants from the baygall community took place in cooperation with the Treasure Coast Cooperative Invasive Species Management Area (TC CISMA) and the Florida Conservation Corps (FLCC). Efforts focused on ecological improvement to the sensitive area and support of recreational activities along the trail.

General Management Measures: Due to the rare nature of this community and its high susceptibility to changes it is imperative to manage this area with high priority. This will require the close monitoring of off-site hydrological changes and potential ground-water draw downs. The continued existence of the baygall community is dependent upon receiving down slope seepage from the upland habitats. All permit applications to the SFWMD for water-use within approximately one mile of the park should be carefully reviewed. Monitoring this community for changes caused by nearby off-site development should continue

This community has been highly impacted by exotic plant species and should receive a high priority for future In-house or contractual exotic plant treatments. Feral hogs should continue to be removed from this area as needed.

Prescribed fires should be coordinated to avoid fire entering into this community. This can be done by avoiding burning the zone that contains this community during drought conditions.

Floodplain Swamp

Desired Future Condition: Floodplain swamp consists of a frequently or permanently flooded community in low-lying areas along streams and rivers. Soils will consist of a mixture of sand, organics and alluvial materials. The closed canopy will typically be dominated by bald cypress (*Taxodium distichum*) but commonly includes tupelo species (*Nyssa* spp.) as well as water hickory (*Carya aquatica*), and red maple. Trees bases are typically buttressed. Understory and groundcover will be typically sparse.

Description and Assessment: The floodplain swamps are associated with flooded soils along the North Fork of the St. Lucie River (MZ SP-E7, 8, 9 & 10; SP-W 7 & 9). These areas can be further classified as Freshwater Tidal Swamp- As a river approaches the coast, increasing stresses from daily tidal-driven inundation and occasional saltwater intrusion gradually influence vegetation structure. At the lower end of this gradient cypress absent or infrequent with closed/open canopy of swamp tupelo, pumpkin ash, and sweetbay. At the park, the dominant trees include pond apple, red maple, willow and red bay. With the heavy altercations to the hydrology this area is rated in fair condition.

Exotic species continually threaten the condition of this community. Feral pigs, Old World climbing fern, Brazilian pepper, shoebutton ardisia and strawberry guava are just a few of the exotic species that have invaded this habitat. Some plant species, mainly Brazilian pepper have been treated as part of an effort utilizing FWC Invasive Plant Management (IPM) funds during the last 15 years. Continued efforts to eradicate exotic plant species and maintain current exotic treatments are necessary.

General Management Measures: Maintaining the proper hydrology is the most important management measure in this community. Removing berm spoil and rehydrating these areas through oxbow reconnections will aid in rehabilitating these communities to their natural state. The alterations in the flow of freshwater

entering into this community remain its largest threat. Continued exotic plant and animal monitoring should occur on a yearly basis, any treatment and retreatment by staff and contactors should be done as needed. Reconnections in hydrology will also assist in the control efforts of exotic plant species.

Floodplain Marsh

Desired Future Condition: Floodplain marsh can be characterized as emergent low herbaceous and shrub species which are dominant over most of the area, and there is an open vista. Trees will be few and if present, will occur primarily in the deeper portions of the community. There will be little accumulation of dead grassy fuels due to frequent burning; one can see often see the soil surface through the vegetation when the community is not inundated. Dominant vegetation in floodplain marsh will include maidencane (*Panicum hemitomon*), panicgrasses (*Panicum* spp.), cutgrass (*Leersia* sp.), common reed (*Phragmites australis*), pickerelweed (*Pontederia cordata*), arrowheads (*Sagittaria* sp.), buttonbush (*Cephalanthus occidentalis*), St. John's wort (*Hypericum fasciculatum*), and coastal plain willow (*Salix caroliniana*). Floodplain marsh dominants will also typically include sand cordgrass (*Spartina alterniflora*) and sawgrass (*Cladium jamaicense*). The Optimal Fire Return Interval for this community is 2-10 years depending on fire frequency of adjacent communities.

Description and Assessment: floodplain Marsh is associated with flooded soils along the North Fork of the St. Lucie River (MZ SP-W5 & W6). This community is generally found in low spots and oxbows along river floodplains. A dense groundcover of sawgrass and leather fern exists with a sparse overstory of hydrophytic trees and shrubs (such as coastal plain willow and wax myrtle). The herbaceous plants are 2-5' in height and in places allow for vistas across the marsh. These areas are flooded with flowing water about 250 days per year. The hydrology redistributes detrital materials and moves them to downstream waters. Shortened hydroperiod and other drainage disturbances can degrade or eliminate these habitats. Floodplain marshes are extremely important as habitat for birds and juvenile estuarine and freshwater organisms such as fishes, crabs, and shrimps. Exotic species such as Brazilian pepper have heavily invaded the preserve floodplain marsh.

General Management Measures: Management measures should concentrate on restoring hydrology through oxbow reconnections. Exotic plant species, especially Brazilian pepper should be treated through contractual work. Hydrological reconnections in these areas will assist with exotic plant species control.

Mangrove Swamp

Desired Future Condition: Mangrove swamp is typically characterized as a dense forest occurring along relatively flat, low wave energy, marine and estuarine shorelines. The dominant overstory will include red mangrove (*Rhizophora mangle*), black mangrove (*Avicennia germinans*), white mangrove (*Laguncularia racemosa*), and buttonwood (*Conocarpus erectus*). These four species may occur either in mixed stands or often in differentiated, monospecific zones based on varying degrees of tidal influence, levels of salinity, and types of substrate. Red mangroves

will typically dominate the deepest water, followed by black mangrove in the intermediate zone, and white mangroves and buttonwood in the highest, least tidally influenced zone. Mangroves will typically occur in dense stands (with little to no understory) but may be sparse, particularly in the upper tidal reaches where salt marsh species predominate. When present, shrub species can include seaside oxeye (*Borrichia arborescens, B. frutescens*), and vines including gray nicker (*Caesalpinia bonduc*), coinvine (*Dalbergia ecastaphyllum*), rubbervine (*Rhabdadenia biflora*), and herbaceous species such as saltwort (*Batis maritime*), shoregrass (*Monanthocloe littoralis*), perennial glasswort (*Sarcocornia perennis*), and giant leather fern (*Acrostichum danaeifolium*). Soils will generally be anaerobic and are saturated with brackish water at all times, becoming inundated at high tides. Mangrove swamps will occur on a wide variety of soils, ranging from sands and mud to solid limestone rock. Soils in South Florida are primarily calcareous marl muds or calcareous sands and along Central Florida coastlines, siliceous sands. In older mangrove swamps containing red mangroves, a layer of peat may build up over the soil from decaying plant material (primarily red and black mangrove roots).

Description and Assessment: Mangrove swamps are located in the southern (downstream) ranges of the “North Fork Property” (MZ SP-W1, 2, 3, & 4; SP-I1, 2, & 3; SP-E1, 2, & 3). The vegetation in this community is made up of primarily red and white mangroves with occasional leather fern, coastal plain willow, pond apple, and sawgrass. These habitats play a critical role in the ecology of the river and the estuary. They protect the shoreline from erosion from tides and boat wakes. They contribute heavily to the input of organic material to the estuarine food web. They provide habitat for numerous estuarine fishes, crabs, and shrimps. The trees also play a role as the primary roosting and nesting site for wading birds and pelicans. The lone wading bird rookery found within the preserve is on a mangrove island. The upstream extent of mangroves is roughly one mile north of Prima Vista Blvd. Mangroves have naturally recruited into areas where Brazilian pepper trees were treated with herbicide; one artificial canal has been planted with red mangroves as a mitigation project.

General Management Measures: Future hydrologic changes within the watershed should be monitored by assessing mangrove survival and recruitment along the North Fork. In many areas Brazilian pepper, an invasive exotic, has replaced the mangroves; therefore, exotic removal efforts should be concentrated on removing pepper trees from the mangrove swamps. Natural re-vegetation will occur with the re-colonization of mangroves. Hydrological reconnections in these areas will assist with exotic plant species control.

<u>Unconsolidated Substrate</u>
Description and Assessment: Both Marine and Estuarine Unconsolidated Substrates exist along the North Fork of the St. Lucie River. These areas are often closely associated with mangrove swamps in sub tidal regions and exist mainly outside the parks management area. These areas are managed by Florida’s Aquatic Preserve program. The only extensive area of unconsolidated substrate under Savannas’ management exists adjacent to MZ I-03 and E-05 and is known as Evan’s creek.

General Management Measures: Continued management of exotic invasive species of plant and animals in the surrounding uplands, as well as maintaining a healthy prescribed fire regime to help promote biodiversity and limit soil erosion. All necessary measures shall take place to protect the waterway from siltation, pollution and turbidity when construction projects are present in the area. Park visitors shall be informed on precautions to protect Evan's creek when launching and recovering canoes and kayaks.

Abandoned Pasture

Description and Assessment: There is one area of approximately 50 acres of abandoned pasture in zone E-12 within the park. The overstory consists of mature slash pines with an understory of Bahia grass. Some logging has occurred in these areas and restoration plantings of Slash pines (2 acres) and pockets of oaks and cabbage palms (1.5 acres) have occurred in select areas.

General Management Measures: Management focus should be on removing priority invasive plant species (FLEPPC Category I and II species) with special attention to invasions from Brazilian pepper. Other management measures include grazing and fuel reduction removal utilizing mowing and prescribed fire.

Canals and Ditches

Description and Assessment: Multiple canals and ditches that are maintained as drainage corridor by the City of Port St. Lucie and St. Lucie County cross portions of the preserve. Near the North Fork St. Lucie River, canals run into the park from adjoining development near Veterans Memorial Parkway and Crowberry streets. At the Northern end of the park near Indian River Estates five ditches currently dump storm water into the savannas basin. Through management zone SP-12 runs a large water management canal called Hogpen Ditch. This canal is equipped with a weir system as it crosses the park that assists with controlling natural hydroperiods in the wetland communities in its vicinity. To the south of Walton Road a large ditch runs north and south parallel to the park boundary for 2.5 miles. There are 6 low water crossings that allow storm water to flow across a large berm into wetlands in management zone SP-21. The storm water from adjacent retention areas situated to the west of Green River Parkway are the main input for the ditch, large culverts flow across Green River Parkway into the ditch, it then evacuates eastward via low water crossings that eventually supply the southern marsh.

General Management Measures: These ditches are currently being maintained for vegetation control by their respective management authority. Special caution must be taken to monitor for imperiled species that may be impacted during this maintenance. Soil deposition and exotic plant species dispersal also must be monitored during this maintenance activity. Close cooperative efforts must be maintained during emergency drainage actions during high water events coordinated through St. Lucie County for raising and lowering the weir system at Hogpen ditch. One goal of the Savannas Regional Restoration Project is to improve the operating schedule of the Hogpen ditch weir system and provide greater cooperation between managing agencies, a crucial step to a comprehensive

management strategy of the Savannas watershed. Other considerations for infrastructure improvements within the preserve include repair/construction of the Warner Creek FPL weir at the southern end of the preserve, location and retrofit of the culverts associated with Walton Road, installation of a low water crossing at the northern white trail, and parkwide ditch restoration by means of plugging/filling to restore natural sheet flow characteristics. The long-term goal includes restoration of these areas as feasible, beginning with the removal of non-native invasive plants, followed by hydrological restoration and if needed replanting of native species. Restoration of these areas will involve much effort.

Developed

Description and Assessment: There are several developed areas in the park. The developed areas include administrative buildings, residences, roads, sidewalks and trailhead parking facilities.

General Management Measures: The developed areas within the park will be managed to minimize their effects on adjacent natural areas. Priority invasive plant species (FLEPPC Category I and II species) will be removed from all developed areas. Other management measures include providing proper storm water management and development guidelines that are compatible with prescribed fire management in adjacent natural areas.

Impoundment/Artificial Pond

Description and Assessment: One artificial pond has been created from prior sand mining at the northern end of the park near Midway Road. This area is impounded on all sides and naturally holds water year round.

General Management Measures: Monitoring for invasion of floating exotic plants (FLEPPC Category I and II species) will be a management priority.

Utility Corridor

Description and Assessment: A large Utility corridor bisects portions of the park. This corridor is owned and managed by Florida Power and Light. On the Eastern portion of the park and between zones E-11 and E-12 is a railroad corridor owned and operated by the Florida East Coast Railroad.

General Management Measures: Close cooperative efforts amongst the park and utility companies for managing invasive species, fire management, fuel reductions and imperiled species is highly desirable.

Spoil Area

Description and Assessment: Approximately 8.7 acres along the St. Lucie River portion of the preserve are filled with sediment that remains from development or dredging operations. These areas are often near residences or near canals associated with drainage. These areas also include the modified riverbank that contains river bottom spoil associated with the dredging operation that occurred in the 1920's

General Management Measures: These areas should be monitored closely for priority exotic plant species (FLEPPC Category I and II). There are large projects identified by Florida Coastal Office (FCO) that involve removing sections of the riverbank spoil and reconnection oxbows from the original river channel course.

Imperiled Species

Imperiled species are those that are (1) tracked by FNAI as critically imperiled (G1, S1) or imperiled (G2, S2); or (2) listed by the U.S. Fish and Wildlife Service (USFWS), Florida Fish and Wildlife Conservation Commission (FWC) or the Florida Department of Agriculture and Consumer Services (FDACS) as endangered, threatened or of special concern.

Many of the listed plant species occurring at the Savannas Preserve State Park are associated with the upland communities. Due to the pyrogenic nature of these communities many of these plants require fire for perpetuation. It is important that fire is continually introduced into the scrub and flatwoods or these plants may eventually disappear. Staff and volunteers regularly participate in educational programming opportunities at the Savannas Preserve Education Center. Programming highlights the importance of our endemic and threatened plant and animal species and management approaches that aid in the preservation of species and their habitat. In accordance with the protection of the preserves imperiled species, park staff works with FWC law enforcement in educating officers on species presence, locations, and special considerations. To further protect the resource, ongoing evaluation of protection needs are considered by park staff and relevant measures are taken. Measures may include implementation of infrastructure such as fencing, gates, or signage, as well as increased law enforcement presence.

Fragrant prickly apple cactus *(Harrisia fragrans):* This tree-like cactus has a limited range; found only along the Atlantic Coastal Ridge in southern St. Lucie Co. Little is known about the life history of this federally endangered plant. Preliminary research revealed what is apparently a declining population (Rae, J., 1994). Additional research involving the demographics and ecology has been undertaken in 2002 by IRC and FDEP with each census discovering new plants. Direct observations from that survey determined the population was relatively stable with slight increases and decreases (2010 USFWS 5-year review). In 2014-15 efforts were made to locate and GPS reference individuals along the FEC corridor.

Savannas mint *(Dicerandra immaculata* var. *savannarum):* In the fall of 1995, a population of *Dicerandra* mint was discovered in the preserve and adjacent to the preserve along the scrub ridge. This species is a newly-described, disjunct subspecies of the endangered Lakela's mint (*Dicerandra immaculata*) (2008 USFWS 5-year review). Since 2006, a joint effort has developed between the Park and Bok Tower Gardens to conduct routine monitoring and population augmentation. An experimental population of this plant is located on the Savannas property in MZ SP-25G. A second introduction site was established in MZ SP-24C in summer of 2012. In the summer and fall of 2015, a third introduction of Savannas Mint was

established in MZ SP-24B, augmentations of the first two sites will take place in 2016.

Four-petal pawpaw *(Asminnia tetramera):* This federally endangered plant has a limited range, occurring in Martin County and northern Palm Beach County. Currently at the Savannas Preserve State Park, it can be found at the Hawks Bluff trail area (MZ SP 24 E). Additional individuals were discovered in 2014-15 SE of Hawks Bluff and Henderson pond (MZ 23). In 2015-16 efforts were made to maintain individuals of the population located in the southern area of Hawks Bluff, this included GPS referencing, mechanical clearing of vegetation and invasive exotic plant removal.

Tiny milkwort *(Polygala smalli):* **"**Tiny polygala is currently known to occur in small populations located on tracts of suitable pineland or scrub vegetation, mostly within publicly owned lands. Its limited distribution renders tiny polygala vulnerable to random natural or human-induced effects, including fire suppression and invasive exotic species."(2010 USFWS 5-year review). A small population is known to occur on the North Fork property in MZ SP-E3. Past efforts have been made to GPS and monitor this population; however utilizing prescribed fire will provide the greatest benefit to this species by providing openings for expansion.

Gopher tortoise *(Gopherus polyphemus):* The gopher tortoise occurs mainly in the park's upland pine forest and the scrub ridge situated along the eastern boarder of the park. Gopher tortoise often associate with areas with dense herbaceous ground cover and sandy soils. The gopher tortoise is considered a keystone species because it provides shelter for many species, including invertebrates, amphibians, other reptiles and mammals. Several designated species also share its burrow. The FEC railway corridor is situated to the east of the Savannas Preserve State Park boundary line along the scrub ridge, many gopher tortoise use the corridor for grazing, transportation and burrow construction. There have been casualties documented where tortoises enter the tracks and are unable to exit. A second rail line is proposed for construction in 2017, additional monitoring for gopher tortoise casualties associated with the railway should be considered.

Florida scrub-jay *(Aphelocoma coerulescens):* The Florida scrub-jay is typically found in fire-maintained scrub and scrubby flatwoods communities. Ideal habitat consists of a single layer of evergreen shrubs, usually dominated by three main species of oaks. Even more specifically, Florida scrub-jays are seldom found as permanent residents of areas with dense sand pine canopy cover and vegetation that is over ten feet tall. These areas need to be interspersed with bare sand for foraging and caching surplus acorns. Snag management is also important since the birds use these standing dead trees as sentinel posts (Kent and Kindell 2010). Since the last management plan, the park has been monitoring the population annually and it has remained relatively steady. However there are many areas of potential habitat that could be made available through more prescribed fire, and mechanical means of fuel reduction. DRP staff also participate in the Southeast Florida Scrub Ecosystem Working Group and will continue to do so. The addition of a second rail line and high speed trains in the existing FEC corridor in 2017 will

pose an elevated threat to the Florida scrub jay population. Scrub-jay territories span the track to the east side of the scrub ridge, primary and secondary impacts such as collision with trains and noise pollution should be considered. Annual monitoring will continue to take place and effects of these additional impacts will be recorded.

Sandhill crane *(Grus canadensis pratensis)*: The Florida sandhill crane utilizes mostly wetland habitats for nesting and upland and transition areas for foraging. Observations indicate at least 2 breeding pairs are found within the park in MZs 29A, 29C. Sandhill cranes are also routinely seen along roads that border the park; most notably Green River Parkway on the SW border of the Savannas property within the park. As a result, direct mortality has been caused by vehicle collisions. Signage and increased law enforcement presence may help to curtail these incidents. Overall management for the sandhill crane relies on maintaining park appropriate hydrology and fire return intervals.

Wood stork *(Mycteria Americana):* Wood stork nesting activity has been monitored at the Mud Cove rookery since 2004 by the FCO Aquatic Preserve staff, Savannas Preserve State Park, the FWC, and one Ph.D. student. Despite the signage posted by the FWC, users have been seen to approach the islands and disturb the nesting adults and chicks. Savannas staff will continue partner with FCO to monitor wood stork nesting activities at this rookery and look for additional nesting activity within the preserve each year.

Bald eagles (*Haliaeetus leucocephalus*) are observed nesting in the park. Continued destruction of coastal feeding habitat is a serious threat to their continued presence at this location. Prescribed burning and non-native plant removal near the nest can only occur prior to the eagles' incubating the eggs in the nest or until after fledging of the eaglets. Therefore, it is important to monitor the nest on an annual basis to determine when management activity needs to stop and start. Adult eagles are observed in the park from early September to early June. After fledging, immature birds migrate north. The breeding pair is most vulnerable to disturbance from the start of courtship through the first 12 weeks of nesting. This time includes nest building, egg laying, incubation and early brooding of the eggs. If disturbed during this critical period, the nest may be abandoned with eggs or nestlings left to the elements. Monitoring of the nest site includes surveys between October to fledging (typically in April or May) to determine nesting success. Observations will continue into the future. Since bald eagles often use alternate nest sites and old nests are sometimes rebuilt and occupied after years of inactivity, all new and old nests alike are legally protected by federal law. Nesting locations are not advertised to visitors, nor are hikers brought to these sites as part of the park's interpretive programming.

Table 2 contains a list of all known imperiled species within the park and identifies their status as defined by various entities. It also identifies the types of management actions that are currently being taken by DRP staff or others, and identifies the current level of monitoring effort. The codes used under the column headings for management actions and monitoring level are defined following the

table. Explanations for federal and state status as well as FNAI global and state rank are provided in Addendum 6.

Table 2: Imperiled Species Inventory						
Common and *Scientific Name*	**Imperiled Species Status**				**Management Actions**	**Monitoring Level**
	FWC	**USFWS**	**FDACS**	**FNAI**		
PLANTS						
Curtiss' milkweed *Asclepias curtisii*		T			1,2,13	Tier 1
Four-petal pawpaw *Asimina tetramera*		E	E	G1,S1	1,2,3,10,12,13	Tier 4
Sanddune spurge *Chamaesyce cumulicola*			E	G2,S2		Tier 1
Florida jointtail grass *Coelorachis tuberculosa*			T	G3 S3		Tier 1
Savannas mint *Dicerandra immaculata* var. *savvanarum*		E	E	G1,S1	1,2, ,3,10,12,13	Tier 4
Fragrant prickly apple cactus *Harissia fragrans*		E	E	G1 S1	2,3,7,6, 10,12,13	Tier 4
Nodding pinweed *Lechea cernua*			T	G3,S3	1,2,10	Tier 1
Catesby's lily *Lilium catesbai*			T		1, 2	Tier 1
Hand fern *Ophioglossum palmatum*			E	G4,S2	2	Tier 1
Tiny polygala *Polygala smallii*		E	E	G1,S1	1,2	Tier 1

Table 2: Imperiled Species Inventory						
Common and *Scientific Name*	**Imperiled Species Status**				**Management Actions**	**Monitoring Level**
	FWC	**USFWS**	**FDACS**	**FNAI**		
Inflated wild pine *Tillandsia balbisiana*			T			Tier 1
Wild pine/Cardinal airplant *Tillandsia fasiculata*			E			Tier 1
Twisted airplant *Tillandsia flexousa*			T	G5,S3		Tier 1
Giant wild pine *Tillandsia utriculata*			E			Tier 1
Leatherleaf airplant *Tillandsia variabilis*			T			Tier 1
FISH						
Mangrove rivulus *Rivulus marmoratus*	SSC	SSC				Tier 1
Opossum pipefish *Microphis brachyurus lineatus*	SSC	SSC				Tier 1
AMPHIBIANS						
Gopher frog *Lithobates capito*	SSC				1,4	Tier 1
REPTILES						
American alligator *Alligator mississippiensis*	T	T				Tier 1

Table 2: Imperiled Species Inventory						
Common and *Scientific Name*	**Imperiled Species Status**				**Management Actions**	**Monitoring Level**
	FWC	**USFWS**	**FDACS**	**FNAI**		
Eastern Indigo snake *Drymarchon corais couperi*	T	T			1,2,7,13	Tier 1
Gopher tortoise *Gopherus polyphemus*	T				1,2,7,13	Tier 3
BIRDS						
Roseate spoonbill *Ajaia ajaja*	SSC				4, 10	Tier 1
Florida scrub-jay *Aphelocoma coerulescens*	T	T		G2,S2	1,2,3,7,13	Tier 4
Limpkin *Aramus guarauna*	SSC			G5,S3	4,10	Tier 1
Little blue heron *Egretta caerulea*	SSC				4,10	Tier 2
Snowy egret *Egretta thula*	SSC				4,10	Tier 2
Tricolored heron *Egretta tricolor*	SSC				4,10	Tier 2
Florida sandhill crane *Grus canadensis pratensis*	T				1,4,10	Tier 1
Bald eagle *Haliaeetus leucocephalus*		T/DM		S3	1,2,10	Tier 1,2, 3,4
Wood stork *Mycteria americana*	E	E			4,10	Tier 2
Brown pelican *Pelecanus occidentalis*	SSC					Tier 1

Table 2: Imperiled Species Inventory						
Common and *Scientific Name*	**Imperiled Species Status**				**Management Actions**	**Monitoring Level**
	FWC	**USFWS**	**FDACS**	**FNAI**		
Everglades snail kite *Rostrhamus sociabilis*	E				1,4,10	Tier 1
Black skimmer *Rynchops niger*	SSC				4	Tier 1
MAMMALS						
Florida mouse *Podomys floridanus*	SSC			S3	1	Tier 1
Sherman's fox squirrel *Sciurus niger shermanii*	SSC			G5, T3, S3	1,2	Tier 1
West Indian manatee *Trichechus manatus*	E	E	E		2, 9, 10, 13	Tier 1

Management Actions:

1. Prescribed Fire
2. Exotic Plant Removal
3. Population Translocation/Augmentation/Restocking
4. Hydrological Maintenance/Restoration
5. Nest Boxes/Artificial Cavities
6. Hardwood Removal
7. Mechanical Treatment
8. Predator Control
9. Erosion Control
10. Protection from visitor impacts (establish buffers)/law enforcement
11. Decoys (shorebirds)
12. Vegetation planting
13. Outreach and Education
14. Other

Monitoring Level:

Tier 1. Non-Targeted Observation/Documentation: includes documentation of species presence through casual/passive observation during routine park activities (i.e. not conducting species-specific searches). Documentation may be in the form of Wildlife Observation Forms, or other district specific methods used to communicate observations.

Tier 2. Targeted Presence/Absence: includes monitoring methods/activities that are specifically intended to document presence/absence of a particular species or suite of species.

Tier 3.	Population Estimate/Index: an approximation of the true population size or population index based on a widely accepted method of sampling.
Tier 4.	Population Census: A complete count of an entire population with demographic analysis, including mortality, reproduction, emigration, and immigration.
Tier 5.	Other: may include habitat assessments for a particular species or suite of species or any other specific methods used as indicators to gather information about a particular species.

Exotic and Nuisance Species

Exotic species are plants or animals not native to Florida. Invasive exotic species are able to out-compete, displace or destroy native species and their habitats, often because they have been released from the natural controls of their native range, such as diseases, predatory insects, etc. If left unchecked, invasive exotic plants and animals alter the character, productivity and conservation values of the natural areas they invade.

The policy of the Division is to remove exotic species from native natural communities. Removal plans are developed annually and will continue to be developed to eliminate them. The primary pest species found at the preserve are old-world climbing fern, Brazilian pepper, melaleuca and shoebutton ardisia. Other exotics that occur in the park at lower densities include: air potato, golden trumpet, carrotwood, strawberry guava, earleaf acacia, cogon grass, wedelia, Surinam cherry, rosary pea, torpedo grass, umbrella tree, natal grass and periwinkle.

The non-native plant problem within the preserve is very complex and active management will need to persist to keep this problem in check. With the large amount of urban interface, exotic plant species infiltrate the periphery of the preserve. Close monitoring of these periphery areas, and continued treatment of infestations will need to continue to eradicate incoming new infestations.

The Park along with District staff continues to work hard to control a number of exotic species in the upland portions of the park in-house. Monitoring and treatment efforts are ongoing for all exotic species, with an increased emphasis for those found on the Florida Exotic Pest Plant Council (FLEPPC) Category I and II plant lists. An early detection rapid response management approach to all exotic species should be continued within the preserve. Effective exotic removal efforts within the preserve rely on cooperative partnerships with organizations such as the TC CISMA, Florida Fish and Wildlife Conservation Commission's Invasive Plant Management Section (FWC IPMS), Florida Fish and Wildlife Conservation Commission's Aquatic Habitat Restoration/Enhancement Section (FWC AHRES), and the FLCC. Each organization provides crucial support to the preserve in the form of knowledge and resources, public education and outreach, funding, and manpower.

Recent contractors' efforts since the last unit management plan update have been concentrated on the North Fork property management zones SP-W5, SP-E11 & E12 and Savannas property management zones SP-1-8, SP-9 & SP-19. Heavy dense infestations occur in most management zones along the North Fork property and will take multiple efforts to bring zones into maintenance condition. Monitoring and evaluating the need for contracted treatments by district and park staff for all

exotic species should continue to be implemented on a yearly basis. The park should continue to search out all avenues for continued initial and retreatment contractor efforts. The following table illustrates treatment efforts throughout the park during the last 6 years of management.

Table 3: Large Scale Invasive Exotic Plant Treatments 2011-2016						
Year	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Acreage	107	1168	256	1110	280	338
Zone	SP-E11,12	SP-1-7; SP-9-11; SP-14; SP-29C	SP-E11,12; SP-29C	SP-1-7; SP-9-11; SP-19-21; SP-15C SP-16C SP-29C	SP-E11,12; SP-E7-10; SP-W6-9; SP-I4; SP-29C	SP-E1,2; SP-W1-3; SP-I1,2; SP-29C
Source	IPM	IPM/SFWMD	IPM/AHRES	IPM/AHRES	IPM/AHRES	IPM/AHRES

Two species, golden trumpet vine (*Allamanda cathartica)* and white cypress-pine *(Callitris columellaris)* have become highly invasive localized problems in the scrub community in the preserve. Both species are not FLEPPC Category I and II species, however they warrant the same attention. Golden trumpet vine has also been located moving into a couple locations within the flatwoods community.

Several emergent aquatic species have recently become established in the basin marsh of the preserve. Cuban bulrush (*Oxycaryum cubense)*, Feathered Mosquito fern (*Azolla pinnata)*, Parrotfeather (*Myriophyllum aquaticum*), Water fern (*Salvinia minima*) Water hyacinth (*Eichhornia crassipses*), Water lettuce (*Pistia stratiotes*). Not all species are listed as FLEPPC Category I and II species, however they are aggressively invading natural areas and outcompeting native vegetation. These species require aggressive management and monitoring. Concentrated control efforts have been ongoing in MZ SP-29C.

During the past two years two new exotic species, Chinese tallow (*Sapium sebiferum)* and jaragua grass (*Hyparrhenia rufa),* have been identified. Concentrated efforts to locate these species and eradicate them should be a high priority of exotic species management within the preserve. This will prevent these species from establishing a seed source within the park.

Table 3 contains a list of the FLEPPC Category I and II invasive, exotic plant species found within the park (FLEPPC 2013). The table also identifies relative distribution for each species and the management zones in which they are known to occur. An explanation of the codes is provided following the table. For an inventory of all exotic species found within the park, see Addendum 5.

Table 4: Inventory of FLEPPC Category I and II Exotic Plant Species			
Common and *Scientific Name*	**FLEPPC Category**	**Distribution**	**Management Zone(s)**
PLANTS			
Air-potato *Dioscera bulbifera*	I	1	SP-7, 19
		2	SP-3, 4, 5, 6, E4, E11, E12, W2
		3	SP-E3
		6	SP-W3, W6
Arrowhead vine *Syngonium podophylum*	I	3	SP-6, W9, E6
Australian pine *Casuarina sp.*	I	1	SP-24B
		2	SP-27, E9, W6
Bottlebrush *Callisternon viminalis*	II	1	SP-W2, W6
Cuban bulrush *Oxycaryum cubense*	N/A	2	SP-27, 28A, 28B, 29A, 22G, 24B
		3	29C
Balsampear *Momordica charantia*	II	1	SP-W3
		2	SP-24C, I1,I2,W2
Bowstring hemp *Sansaveria hyacinthoides*	II	1	SP-W3
		2	SP-22C, 24A, 24B, 24D, W6
		3	SP-24C, 24E
Brazilian pepper *Schinus terebinthifolius*	I	1	Throughout
		2	Throughout
		3	SP-8, 17, 21, 24D, 27, E1, E2, E3, E8, I1, W1, W3, W4, W6
		6	SP-25B, 25C, 25E, 25I, 25J
Bishopwood *Bischofia javanica*	I	2	SP-E1, W1, W2, W3
Caesar's weed *Urena lobata*	I	2	SP-4, 6, 7, 21, 22E, 22G, 24E, 27, E5, E11, E12, W2
		3	SP-3, 4, E12
		6	W2, W6
Carrotwood *Cupaniopsis anacardioides*	I	2	SP-19, 24C, 24D, 24E, 26A, E5, E11, E12, I2, W1, W2, W3, W6

Chinaberry *Melia azedarach*	II	2	SP-24B, SP-24D, W6
Chinese tallow tree *Sapium sebiferum*	I	1	SP-5, 17, 29A, W6
Climbing cassia *Senna pendula*	I	2	SP-24E
Cogon grass *Imperata cylindrical*	I	1	SP12B, 18A, 22A, 24B, E5
		2	SP-22E, W3, W6
		3	SP-5, 6, 16C, 17, 22A, W6
		4	SP-22B
		6	SP-25E, 25F, W2, W3
Dwarf papyrus *Cyperus prolifer*	II	2	SP-E7, E8
Earleaf acacia *Acacia auriculiformis*	I	1	SP-21, SP-22A, SP-24C
		2	SP-16C,17, 20A, 22A, 22B, 22E, 22G,24B, 26A, 28B, 29B, W2
Elephant ear	II	1	SP-3, 4
Golden Trumpet *Allamanda cathartica*	N/A		SP-24 A-E; SP-17; SP-18
Guniea grass *Panicum maximum*	II	2	SP-3, 6, 7, 16C, 18A 22C, 22E, 22G , 24B, 24C, 24D, 24E, 26A, 26G, 27, E5, E12, W03
		3	SP-4
		6	SP-2, 15B, 15C, 17, 18A, 18B, 19, 22A, 22C, 22D, 22 E, 22F, 29A
Jargua grass *Hyparrhenia rufa*	II	2	SP-3, 24B
		6	SP-17, SP-18B
Java Plum		1	SP-21
		2	DP-20A, E3, W6

Syzigium cumini	I	6	SP-1, 4, 5, 25K, E3, E4, W3, W4, W5,W6
		2	SP-20A, 21, 27, E3 E5, W1, W6
Laurel fig *Ficus microcarpa*	I	1	SP-24C, 28A
Life plant *Kalanchoe pinnata*	II	2	SP-24C, 24E, W6
Melaleuca *Melaleuca quinquenervia*	I	2	SP-5, 8, 9, 10, 11, 12A, 12B, 13, 14, 15A, 15B, 15C, 16C, 17, 18A, 19, 21, 22E, 22F, 22G, 24B, 24C, 24D, 24E, 26A, 27, 28A, 28B, 29B, 29C, E1, E3, E9, W6
Natal grass *Melinis repens*	I	2	SP-24E, 26A, 28B, W6
		3	SP-24C
		6	SP-15C, 17, 18A, 22A, 22C, 22E, 22F, 22G,25B, 25C, 25E ,25F, 25I
Old world climbing fern *Lygodium microphylum*	I	3	SP- 15C, 16C, 17, 21, 22B, 22F, 24E, 24B, 24C, E1, E6, W3,
		6	SP-25B, 25C, 25E, 25I
		2	SP-07, 9, 10, 11, 12A, 12B, 14, 15A, 15B, 19, 20A,20B, 21, 22C, 22D, 22E, 22G, 24B, 24D, 28B, 29A, E3, E4, E5, E11, E12, I3, W1, W2, W6
Oyster Plant *Tradescantia spatheacea*	II	3	SP-15B, 16C, 21, 22B, E6, W3
		1	SP-W3

Para grass *Urochloa mutica*	I	2	SP-24C
		3	SP-24E
Parrot feather Myriophyllum aquaticum	N/A	1	SP-29A
Peruvian primrose willow *Ludwiga peruviana*	I	2	SP-7, 16C, 20A, 22E, 22F, 22G, 27, E3, E6, W6
		3	SP-21, SP-24E
Pothos *Epipremnum pinnatum*	II	1	SP-E12
Rosary Pea *Abrus precatorius*	I	2	Throughout
Seaside mahoe *Thespesia populnea*	I	1	SP-24B
Schefflera *Schefflera actinophylla*	I	1	SP-21, 22B, 24C,E11, W6
		2	SP-21, 23, 24D, 24E, 26A, E1, E3, E5, E12, W1, W2, W3
Shoebutton ardisia *Ardisia elliptica*	I	2	SP-24D, 24E, 26A, E3, E5, E12, W1, W3, W6
		3	SP-E7, E8, E9, E10, E11, E12, W1, W2, W3, W6, W7, W8, W9, I1, I2, I3, I4
Strawberry guava *Psidium cattleianum*	I	2	SP-17, 24B, 24C, 24E, 26A, E1, E3, E11, E12, W6
Surinam cherry *Eugenia uniflora*	I	2	SP-17, 24B, 24E, 26A, 26B, W6
		3	SP-24C
Torpedo grass *Panicum repens*	I	2	SP-1, 4, 5, 6, E12
		3	SP-10, 19, 24B, 24E, 29C
		6	SP-2, 15B, 15C, 17, 18A, 18B, 19, 22A, 22C, 22D, 22E, 22F, 29A
Tropical soda apple *Solanum viarum*	I	2	SP-1,E12
		3	SP-15B, 18, 19, 24B, 24C, 24E, 29C
		6	SP-2, 3, 4, 12B, 16C, 17

		2	SP-E12
Water fern *Salvinia minima*	I	2	SP-27, 28A, 28B
Water hyacinth *Eichhornia crassipses*	I	2	SP-27, 28A, 28B, 29A, 29C
Water lettuce *Pistia stratioites*	I	2	SP-27
Wedelia *Sphagneticola trilobata*	II	2	SP-3, 4, 5, 6, 7, 17, 18, 22C, 24B, 24C, E1, E5, W3, W6
		3	SP-W6
		6	SP-17, 18A, 22C, 22E, 22F, W1, W2
White cypress-pine *Callitris columellaris*	N/A	6	SP-3, 5, 6, W2
			SP-24C
Wild Taro *Colocasia esculenta*	I	2	SP-W5, W6, 21
Woman's Tongue *Albizia lebbeck*	I	2	SP-22E, 22F, 24E, W04
		6	SP-22A, 22C, 25J

Distribution Categories:

0 No current infestation: All known sites have been treated and no plants are currently evident.

1 Single plant or clump: One individual plant or one small clump of a single species.

2 Scattered plants or clumps: Multiple individual plants or small clumps of a single species scattered within the gross area infested.

3 Scattered dense patches: Dense patches of a single species scattered within the gross area infested.

4 Dominant cover: Multiple plants or clumps of a single species that occupy a majority of the gross area infested.

5 Dense monoculture: Generally, a dense stand of a single dominant species that not only occupies more than a majority of the gross area infested, but also covers/excludes other plants.

6 Linearly scattered: Plants or clumps of a single species generally scattered along a linear feature, such as a road, trail, property line, ditch, ridge, slough, etc. within the gross area infested.

Exotic animal species include non-native wildlife species, free ranging domesticated pets or livestock, and feral animals. Because of the negative impacts to natural systems attributed to exotic animals, the DRP actively removes exotic animals from state parks, with priority being given to those species causing the greatest ecological damage.

In some cases, native wildlife may also pose management problems or nuisances within state parks. A nuisance animal is an individual native animal whose presence or activities create special management problems. Examples of animal species from which nuisance cases may arise include raccoons, venomous snakes and alligators

that are in public areas. Nuisance animals are dealt with on a case-by-case basis in accordance with the DRP's Nuisance and Exotic Animal Removal Standard.

All invasive and exotic wildlife species found at Savannas should be removed and reported as part of the early detection rapid response program. These include but are not limited to: the Brown anole, Marine toad, Greenhouse Frog, Cuban tree frog, Iguana, Nine-banded armadillo, Feral Hog, and Coyote. Monitoring for presence of pythons in the preserve should continue and reported to the FWC if sighted.

Feral Hogs are commonly found at Savannas and have the greatest potential to cause ecological damage. Hog rooting can devoid large areas of vegetation, create extensive ground disturbance, disrupt surface water flow, inhibit fire from moving across the landscape, decimate the arthropod community and compete with native wildlife species for food and resources. Extensive evidence of hog disturbance can easily be found on the edges of wetland communities, along river floodplains and among the flatwoods and scrub communities. Hogs also affect residential areas surrounding the park by rooting up yards and causing costly damage. Park staff is in cooperation with neighboring land owners to provide support with removal of feral hogs, this includes increased presence in areas of the preserve where hogs are damaging adjacent private property as well as logistical support in the form of reputable private trappers to operate outside the park boundary. Park staff monitors the park for signs of disturbance and currently traps and removes feral hogs on the property.

Employment of outsourced trappers will be explored in cases where hog population numbers outcompete the staff's ability to prevent overwhelming damage to the resource and private property, or where public interaction prevents the safe and effective operation of the feral hog removal program.

Coyotes have been documented on the property. Coyotes are opportunistic omnivores that can outcompete or directly predate other native wildlife species. The park staff is closely monitoring any impacts to species as a direct result of coyotes. Based on its proximity to suburban development, the park may also occasionally encounter feral or stray cats and dogs. These animals should be removed according to division policy.

A limited number of exotic fishes have been encountered in the basin marsh. Spotted Tilapia (*Tilapia mariae*) beds have been commonly seen along the edges of the water line of the marsh edge in recent years. Also, both Walking catfish *(Clarias batrachus)* and Armor-plated catfish (*Hoplesternum littoral)* have been noted within the basin marsh. The fact that the park's basin marsh is relatively disconnected from adjacent water sources keeps it relatively free of exotic fish species. More detailed surveys into the species present and abundant quantities within the park should continue. When encountered these species should be removed and not reintroduced into the system.

Detailed management goals, objectives and actions for management of invasive exotic plants and exotic and nuisance animals are discussed in the Resource Management Program section of this component.

Special Natural Features

Savannas Preserve State Park protects a representative sample of a basin marsh that extended throughout Southern Florida prior to the rapid spread of suburban sprawl. The park provides a critical corridor of remaining natural communities along the North Fork of the St. Lucie River and the Savannas basin marsh. The "North Fork property" and "Savannas Property" are hydrologically connected via a drainage swale system. The swales represent an important wildlife corridor between these two isolated natural areas.

The preserve buffers the North Fork of the St. Lucie River and the Savannas basin marsh as well as its downstream receiving water bodies (St. Lucie Estuary, Indian River Lagoon, and Atlantic Ocean). Most of the North Fork proper and a portion of the St. Lucie Estuary are an aquatic preserve and Outstanding Florida Waters. The Savannas marsh is also designated an Outstanding Florida Water. The North Fork is a large tributary to the globally-recognized Indian River Lagoon, a National Estuary. The Lagoon system contains few large tributary rivers and each is essential to the productivity of the system. The park provides both protection and a buffer to naturally filter water and improve water quality entering these waters. The park also provides habitats for many listed organisms and rare species of flora and fauna. These lands represent the last remaining vestiges of floodplain and upland habitats in the area watershed and therefore are scarce, unique, and irreplaceable.

Cultural Resources

This section addresses the cultural resources present in the park that may include archaeological sites, historic buildings and structures, cultural landscapes and collections. The Florida Department of State (FDOS) maintains the master inventory of such resources through the Florida Master Site File (FMSF). State law requires that all state agencies locate, inventory and evaluate cultural resources that appear to be eligible for listing in the National Register of Historic Places. Addendum 7 contains the FDOS, Division of Historical Resources (DHR) management procedures for archaeological and historical sites and properties on state-owned or controlled properties; the criteria used for evaluating eligibility for listing in the National Register of Historic Places, and the Secretary of Interior's definitions for the various preservation treatments (restoration, rehabilitation, stabilization and preservation). For the purposes of this plan, significant archaeological site, significant structure and significant landscape means those cultural resources listed or eligible for listing in the National Register of Historic Places. The terms archaeological site, historic structure or historic landscape refer to all resources that will become 50 years old during the term of this plan.

Condition Assessment

Evaluating the condition of cultural resources is accomplished using a three-part evaluation scale, expressed as good, fair and poor. These terms describe the

present condition, rather than comparing what exists to the ideal condition. Good describes a condition of structural stability and physical wholeness, where no obvious deterioration other than normal occurs. Fair describes a condition in which there is a discernible decline in condition between inspections, and the wholeness or physical integrity is and continues to be threatened by factors other than normal wear. A fair assessment is usually a cause for concern. Poor describes an unstable condition where there is palpable, accelerating decline, and physical integrity is being compromised quickly. A resource in poor condition suffers obvious declines in physical integrity from year to year. A poor condition suggests immediate action is needed to reestablish physical stability.

Level of Significance

Applying the criteria for listing in the National Register of Historic Places involves the use of contexts as well as an evaluation of integrity of the site. A cultural resource's significance derives from its historical, architectural, ethnographic or archaeological context. Evaluation of cultural resources will result in a designation of NRL (National Register or National Landmark Listed or located in an NR district), NR (National Register eligible), NE (not evaluated) or NS (not significant) as indicated in the table at the end of this section.

There are no criteria for use in determining the significance of collections or archival material. Usually, significance of a collection is based on what or whom it may represent. For instance, a collection of furniture from a single family and a particular era in connection with a significant historic site would be considered highly significant. In the same way, a high quality collection of artifacts from a significant archaeological site would be of important significance. A large herbarium collected from a specific park over many decades could be valuable to resource management efforts. Archival records are most significant as a research source. Any records depicting critical events in the park's history, including construction and resource management efforts, would all be significant.

The following is a summary of the FMSF inventory. In addition, this inventory contains the evaluation of significance.

<u>Prehistoric and Historic Archaeological Sites</u>

Desired Future Condition: All significant archaeological sites within the park that represent Florida's cultural periods or significant historic events or persons are preserved in good condition in perpetuity, protected from physical threats and interpreted to the public.

Description: The Florida Master Site File (FMSF) lists seven sites within Savannas Preserve State Park boundaries (Table 4).

The Savannas Preserve State Park lies within the area known archaeologically as the Glades Region, defined by Gerald Milanich (Milanich 1994). Several archaeological sites have been recorded within the Atlantic coastal ridge, part of which lies within the eastern boundary of the preserve. Two sites, 8SL 8 (Mount Elizabeth) and 8SL 9 (King's Mound), are relatively long-term habitation sites

whose inhabitants used the rich faunal and floral resources of the Indian River. While these sites are relatively limited for cultural material produced and technically located just outside the boundary of the preserve, they are important to understanding the overall lifestyles of the people who produced them. The sand mound, black earth and shell midden components represented by these sites are significant at the local and regional level.

Unlike 8SL 8 and 8SL 9, which are long-term habitation sites, Calamoso Drive Shell Scatter Site (8SL 75) appears to represent a short-term hunting and gathering campsite which is expected to be the most prevalent prehistoric site type in the preserve. This site may also contain a historic Seminole component. The areas where archaeological sites are most likely to occur in the preserve are the slightly higher ground elevations often associated with the hardwood hammocks and adjacent to fresh water marshes, and ponds. Scrub and mesic flatwoods communities are less likely to contain prehistoric sites. It is likely that sites in the area would range in age from the Late Archaic (ca. 3,000-4,00 years ago) to Seminole times (Approx. A.D. 1800). Nonetheless, further investigation may reveal earlier sites (Paleo-Indian to Early Archaic), which would most likely occur around the perimeters of depressions that contained water during lower sea level stands. These sites could lie beneath the ground surface a meter or more.

Remnants of late 19th and 20th century pioneers remain throughout the park. Newman and B. Weisman identified two scatters of historic artifacts, SL 291 and SL 292 containing evidence of early twentieth century homesteading. Additionally, a site consisting of an old early twentieth century road bed (SL 01145) transverses thorough the park east of the North Fork of the St. Lucie River and west of the basin marsh. In 1990, “Historic Property Associates” conducted a survey of historic properties in unincorporated areas of St. Lucie County. They identified thirty-one structures along Indian River Drive as significant. These houses accurately reflect the types of dwellings occupied by settlers during the “Great Florida Land Boom” of the 1920s. None of the structures identified are on park property, but many are adjacent to its boundaries. In the late 19th and early 20th century this region saw large pineapple plantations stretched across the Atlantic Coastal Ridge (the eastern boundary of the Savannas), including at Edenlawn Plantation (SL 3016). Edenlawn later became a commercial nursery followed by a tourist vacation resort by the mid-20th century. Hog Pen Slough Canal (8SL3036) is a historic feature that represents the land use changes associated with agriculture in the vicinity of the preserve. Hog Pen Slough Canal was constructed in the 1920s, likely for the purpose of drainage associated with agriculture and development. This feature enters the western boundary of the park near Sandhill Crane Park off SE Walton Rd. The construction of the Florida East Coast (FEC) Railroad at the turn of the twentieth century played an important role in the export of agricultural products from the Indian River area. The park is bisected by the historic FEC – Lake Harbor Branch to the north, a portion of which is recorded as SL 3014, and fronted by the historic FEC mainline to the east, a portion of which is recorded as SL 3046. While the recorded segments of railroad are not in or near the park, the park does contain Walton Railroad #1 (SL292), the possible remnants of a section house that housed railroad workers in the early 20th century.

Condition Assessment: All of the sites evaluated during the update to the unit management plan were in good condition. All sites were being preserved within the guidelines of general management measures.

Level of Significance: Savannas Preserve State Park is bisected by and adjacent to two segments of the Florida East Coast Railroad. Neighboring portions of these tracks appear to be eligible for listing on the National Register of Historic Places according to the State Historic Preservation Officer. It is possible that the unassessed portions of the track near and in the park are also eligible. Additionally, the park contains one recorded archaeological site associated with FEC railroad workers immediately adjacent to the tracks, whose significance has not been evaluated yet (SL 292).

General Management Measures: The primary management level for these sites is preservation. Preservation includes protection from damage from resource management, natural causes, construction or human damage including looting. Wildfire management activities also pose a threat to these areas and it is important locations of these sites be known by land managers. These sites should all be evaluated periodically for the duration of this management plan.

Historic Structures

Desired Future Condition: All significant historic structures and landscapes that represent Florida's cultural periods or significant historic events or persons are preserved in good condition in perpetuity, protected from physical threats and interpreted to the public.

Description: There are no known remaining or recorded historic structures in Savannas Preserve State Park.

Collections

Desired Future Condition: All historic, natural history and archaeological objects within the park that represent Florida's cultural periods, significant historic events or persons, or natural history specimens are preserved in good condition in perpetuity, protected from physical threats and interpreted to the public.

Description: Savannas Preserve State Park's collections contain a variety of objects pertaining to historical aspects of pineapple agriculture that occurred in the area. These items are on display in the pineapple packing house exhibit contained within the education center. The collections are being housed in a climate controlled space within the education center.

General Management Measures: A Scope of Collections Statement has not been developed for the park. As the DRP Operations Manual requires that each park adopt a Scope of Collections Statement, such a statement needs to be developed as a guide to any future collections within the park.

Level of Significance: Archival items related to the park (and the local area) and its existence since 1950 are important in terms of the park's management of its resources and the recreation that occurs on the property. Artifacts and documents from the era of Pineapple agriculture in the area are important and in the future, could be used on site to provide greater insight for visitors to the park. Historical pictures, historical documents and interviews of people who were around during this era provide insight of the working surroundings to the park during this era.

General Management Measures: A more detailed inventory of the parks cultural resource collections needs to be developed in the future. This will provide a better record keeping system to reference collections and manage the collections that are held.

Detailed management goals, objectives and actions for the management of cultural resources in this park are discussed in the Cultural Resource Management Program section of this component. Table 4 contains the name, reference number, culture or period, and brief description of all the cultural sites within the park that are listed in the Florida Master Site File. The table also summarizes each site's level of significance, existing condition and recommended management treatment. An explanation of the codes is provided following the table.

Table 5: Cultural Sites Listed in the Florida Master Site File

Site Name and FMSF #	Culture / Period	Description	Significance	Condition	Treatment
SL 01145 Old Road	20th Century	Linear Resource	NE	G	P
SL 291 Dump Road	20th Century	Archaeological Site	NE	G	P
SL 292 Walton Railroad #1	19/20th Century	Archaeological Site	NE	G	P
SL 75 Calamoso Drive Shell Scatter	Prehistoric-ceramic	Archaeological Site	NE	NA	P
8SL 3036 Hog Pen Slough Canal	20th Century	Linear Resource	NS	NA	NA
8SL 3257	20th Century	Linear Resource	NE	NA	
8SL 3258	19/20th Century	Archaeological Site	NE	NA	P

Table 5: Cultural Sites Listed in the Florida Master Site File					
Site Name and FMSF #	**Culture / Period**	**Description**	**Significance**	**Condition**	**Treatment**
SL 3016 Eden outbuildings and Tennis Court	20th Century	Archaeological Site	NS	P	
SL 1147 Walden Woods	20th Century	Archaeological Site	NS	NA	

Significance:
NRL National Register Listed
NRE National Register Eligible
NE Not evaluated
NS Not significant

Condition:
G Good
F Fair
P Poor
NA Not accessible
NE Not evaluated

Recommended Treatment:
RS Restoration
RH Rehabilitation
ST Stabilization
P Preservation
R Removal
N/A Not applicable

Resource Management Program

Management Goals, Objectives and Actions

Measurable objectives and actions have been identified for each of the DRP's management goals for Savannas Preserve State Park. Please refer to the Implementation Schedule and Cost Estimates in the Implementation Component of this plan for a consolidated spreadsheet of the recommended actions, measures of progress, target year for completion and estimated costs to fulfill the management goals and objectives of this park.

While the DRP utilizes the ten-year management plan to serve as the basic statement of policy and future direction for each park, a number of annual work plans provide more specific guidance for DRP staff to accomplish many of the resource management goals and objectives of the park. Where such detailed planning is appropriate to the character and scale of the park's natural resources, annual work plans are developed for prescribed fire management, exotic plant management and imperiled species management. Annual or longer- term work

plans are developed for natural community restoration and hydrological restoration. The work plans provide the DRP with crucial flexibility in its efforts to generate and implement adaptive resource management practices in the state park system.

The work plans are reviewed and updated annually. Through this process, the DRP's resource management strategies are systematically evaluated to determine their effectiveness. The process and the information collected is used to refine techniques, methodologies and strategies, and ensures that each park's prescribed management actions are monitored and reported as required by Sections 253.034 and 259.037, Florida Statutes.

The goals, objectives and actions identified in this management plan will serve as the basis for developing annual work plans for the park. The ten-year management plan is based on conditions that exist at the time the plan is developed, and the annual work provide the flexibility needed to adapt to future conditions as they change during the ten-year management planning cycle. As the park's annual work plans are implemented through the ten-year cycle, it may become necessary to adjust the management plan's priority schedules and cost estimates to reflect these changing conditions.

Natural Resource Management

Hydrological Management

Goal: Protect water quality and quantity in the park, restore hydrology to the extent feasible and maintain the restored condition.

The natural hydrology of most state parks has been impaired prior to acquisition to one degree or another. Florida's native habitats are precisely adapted to natural drainage patterns and seasonal water level fluctuations, and variations in these factors frequently determine the types of natural communities that occur on a particular site. Even minor changes to natural hydrology can result in the loss of plant and animal species from a landscape. Restoring state park lands to original natural conditions often depends on returning natural hydrological processes and conditions to the park. This is done primarily by filling or plugging ditches, removing obstructions to surface water "sheet flow," installing culverts or low-water crossings on roads, and installing water control structures to manage water levels.

Objective A: Conduct/obtain an assessment of the park's hydrological restoration needs.

Action 1 Inventory canals and ditches and develop a restoration plan for identified areas within the park.

Action 2 Continue to assist FCO in updating the hydrological needs of the North Fork St. Lucie River Aquatic Preserve.

Staff will inventory canals and ditches and develop a restoration plan for identified areas within the park. The park will continue to assist CAMA in updating of the hydrological needs of the North Fork St. Lucie River Aquatic Preserve as they

pertain to the “Savannas”. Restoration of oxbow reconnections on preserve lands will be a high priority.

Objective B: Restore natural hydrological conditions and functions to approximately 400 acres of pine flatwoods, wet prairie, depression marsh, and basin marsh natural communities.

Action 1 Attain permits and fill or plug one mile of drainage ditches.
Action 2 Attain permits and install two culverts or low water corssings to restore natural sheet flows.

Hydrological conditions are impaired in the northern end of the “Savannas property,” south of Easy Street, where there is a ditched road running approximately one mile separating the basin marsh from the chain of wetlands in the pine flatwoods. This road and ditch association acts as a dike to sheet flow action between these two naturally connected areas. Park staff will develop a plan to attain permits and fill or plug approximately one mile of drainage ditches and install two culverts to restore natural sheet flows to 400 acres of four natural communities.

Objective C: Monitor and analyze water resources in the park.

Action 1 Cooperate with SFWMD and Martin County to monitor data from groundwater stations in the park.
Action 2 Continue to monitor and comment on regional groundwater withdrawal changes that will impact the park.

Two monitoring stations operated by SFWMD and three monitoring stations operated by Martin County are located on park property. The park will cooperate with SFWMD and Martin County to monitor data from these groundwater monitoring stations within the park. Park Staff will continue to monitor and comment on all regional groundwater withdrawal changes that will have potential negative impacts to the park.

Objective D: Monitor improvement to storm water drainage enhancements around Indian River Estates.

Action 1 Cooperate with SFWMD and St. Lucie County in continued enhancements to alleviate direct stormwater drainage impacts in the park for Indian River Estates.
Action 2 Comment on all water quality and quantity issues entering the Savannas Preserve basin marsh.

The park will cooperate with SFWMD and St. Lucie County in continued enhancements to alleviate direct storm water drainage impacts into the park from the Indian River Estates development in the Northern end of the “Savannas property.” Current projects have been partially completed with further progress underway to alleviate potential negative park impacts on water quality on the northern end of the basin marsh. Enhancements should directly benefit

approximately 100 acres of basin marsh and associated wetlands while improving the entire basin marsh.

Objective E: Monitor quality and quantity of water entering the North Fork of the St. Lucie River.

Action 1 Comment on all water quality and quantity issues entering the North Fork of the St. Lucie River.

Action 2 Partner with other agencies to ensure that the water quality and quantity entering the park is maintained at acceptable levels.

The park will comment on all water quality and quantity issues entering the North Fork of the St. Lucie River. Urbanization and agriculture have altered most of the headwaters of the river. The presence of drainage canals entering the river have also drastically altered the amounts of storm water entering the river. Park and District staffs need to work in partnership with other agencies to ensure that the water quality and quantity entering the park is maintained at acceptable levels.

Natural Communities Management

Goal: Restore and maintain the natural communities/habitats of the park.

As discussed above, the DRP practices natural systems management. In most cases, this entails returning fire to its natural role in fire-dependent natural communities. Other methods to implement this goal include large-scale restoration projects as well as smaller scale natural communities' improvements. Following are the natural community management objectives and actions recommended for the state park.

Prescribed Fire Management

Prescribed fire is used to mimic natural lightning-set fires, which are one of the primary natural forces that shaped Florida's ecosystem. Prescribed burning increases the abundance and health of many wildlife species. A large number of Florida's imperiled species of plants and animals are dependent on periodic fire for their continued existence. Fire-dependent natural communities gradually accumulate flammable vegetation; therefore, prescribed fire reduces wildfire hazards by reducing these wild land fuels.

All prescribed burns in the Florida state park system are conducted with authorization from the FDACS, Florida Forest Service (FFS). Wildfire suppression activities in the park are coordinated with the FFS.

Objective A: Within 10 years, have 2,443 (50%) acres of the park maintained within the optimum fire return interval.

Action 1 Develop/update annual burn plan.

Action 2 Manage fire dependent communities for ecosystem function, structure and processes by burning 722-2,412 acres annually, as identified by the annual burn plan.

Action 3 Continue working with Florida Forest Service to burn management zones which contain privately-owned parcels.

Multiple fire-dependent communities are found at Savannas Preserve State Park. These systems require fire to maintain the diverse plant and wildlife assemblage. Without periodic fires, many of the flora and fauna will disappear from these communities. With continued application of prescribed fire plant and animal life will flourish.

District and Park staff will develop an annual burn plan at the beginning of each fiscal year and set out to accomplish the target acres.

Table 5 contains a list of all fire-dependent natural communities found within the park, their associated acreage and optimal fire return interval, and the annual average target for acres to be burned.

Table 6: Prescribed Fire Management

Natural Community	**Acres**	**Optimal Fire Return Interval (Years)**
Basin Marsh	1,414	2-10
Mesic Flatwoods	2,288	1–5
Sand Pine Scrub	433	6-20
Scrubby Flatwoods	207	3-14
Depression Marsh	181	2-4
Wet Prairie	365	1-4
Annual Target Acreage*	772-2,412	
*Annual Target Acreage Range is based on the fire return interval assigned to each burn zone. Each burn zone may include multiple natural communities.		

The park is partitioned into management zones including those designated as burn zones (see Management Zones Table and Map). Prescribed fire is planned for each burn zone on the appropriate interval. The park's burn plan is updated annually because fire management is a dynamic process. To provide adaptive responses to changing conditions, fire management requires careful planning based on annual and very specific burn objectives. Each annual burn plan is developed to support and implement the broader objectives and actions outlined in this ten-year management plan.

The park contains several fire-dependent communities, including mesic flatwoods, scrubby flatwoods, scrub, and wet prairie, which support many fire-dependent species. Plant and animal life diversity is closely related to the perpetuation of fire entering these communities. In many cases plants such as wiregrass in the scrub need fire during its growing season to allot the plants to set seed. Maintenance burning also protects the over story of slash pines in the Pine flatwoods and Scrubby flatwoods. Periodic fire minimizes potential damage by reducing heavy fuel build ups that accumulate in fire suppressed flatwoods ecosystems. In the scrub

and scrubby flatwoods, fire creates small pockets (less than 5 acres) of sand pine monocultures and pockets of bare sand gaps that are consistent with the habitat needs of many scrub species.

The park's general burning program needs to continue to grow in both sophistication and implementation due to smoke-management problems in the urban environment and designated-species considerations. Many of the park's designated species depend on vegetation management and fire-dependent species management. The prescribed burn program renders the function of a long-term ecological need for the park and a short-term solution to wildfire reductions in the park.

Within the next ten years, park staff will develop an annual burn plan at the beginning of each fiscal year and burn the plan's target acreages, ranging from 772 to 2412 acres. The park will manage fire dependent communities for ecosystem function, structure and processes through prescribed burns. While the park's annual prescribed burning goal ranges from 772 to 2412 acres per year, the average target acreage should aim to achieve at least 1,000 acres per year to consistently meet this goal. Staff will also create a long-range prescribed fire and wildfire plan to assist in long term fire management planning.

Fire line maintenance is very important due to the continuous increase suburban sprawl surrounding the park. Approximately 35 miles of existing firebreaks will be maintained in accordance with annual burn plan and to Division standards. Within the next ten years, park staff will establish 2 miles of new firebreaks adjacent to the scrub/marsh ecotone (MZ SP-25) to assist with prescribed and wildfire management. Need for new firebreaks will be analyzed on a yearly basis.

It is important to recognize the ongoing efforts and regional importance of training park staff. Crew availability is always an issue, especially if multiple burns are occurring within the District. District and district-wide burn staff from state parks up to 50 miles away augment the park's staff, depending on availability. In addition, county, federal, private land managers (The Nature Conservancy), adjacent landowners, staff from other state agencies, and volunteers assist the park's prescribed fire staff. Conversely, these other entities are able to benefit from park's trained staff.

Division-wide challenges towards enhancing the burn program include upgrading critical equipment such as fire trucks and tractors used to prepare fire lines. The park's staff is very resourceful in this area and is currently refurbishing military-style trucks (2.5 and 5 ton vehicles) to meet the Division's current standards and replace outdated equipment.

Staff will be trained to minimum Division standards, develop leaders where necessary and be equipped with the necessary personal protective equipment per the Division's standards. Rolling equipment will be maintained at the Division's standards. In addition, continue regular monitoring of targeted species or vegetation to monitor results of prescribed fire application.

In order to track fire management activities, the Division maintains a statewide burn database. The database allows staff to track various aspects of each park's fire management program including individual burn zone histories and fire return intervals, staff training/ experience, backlog, if burn objectives have been met, etc. The database is also used for annual burn planning which allows the Division to document fire management goals and objectives on an annual basis. Each quarter the database is updated and reports are produced that track progress towards meeting annual burn objectives.

Many of the management zones contained within the park contain outparcels held in private ownership. Continued work with Florida Forest Service, utilizing the Hawkins Bill, to burn these management zones which contain privately owned outparcels is a very high priority. These outparcels have been restrictive to the application of prescribed fire within these zones. In order to properly manage these areas, the park will work cooperatively with the Florida Forest Service to burn these outparcels along with the management zones that they are contained within. It is desired that 50% of the acreage contained within the zones with outparcels be burned with the next ten years.

Natural Communities Restoration

In some cases, the reintroduction and maintenance of natural processes is not enough to reach the natural community desired future conditions in the park, and active restoration programs are required. Restoration of altered natural communities to healthy, fully functioning natural landscapes often requires substantial efforts that may include mechanical treatment of vegetation or soils and reintroduction or augmentation of native plants and animals. For the purposes of this management plan, restoration is defined as the process of assisting the recovery and natural functioning of degraded natural communities to desired future condition, including the re-establishment of biodiversity, ecological processes, vegetation structure and physical characters.

Following are the natural community/habitat restoration and maintenance actions recommended to create the desired future conditions in the mangrove swamp, floodplain swamp, floodplain marsh, and hydric hammock communities.

Objective B: Conduct habitat/natural community restoration activities on improvements to a portion of 324 acres of mangrove swamp, floodplain swamp, floodplain marsh, and hydric hammock communities.

Action 1	Support and assist oxbow and floodplain reconnection projects along the North Fork St. Lucie Aquatic Preserve that cross within the park.
Action 2	Work with FCO in developing/updating any site-specific restoration plans for oxbow reconnections or floodplain enhancements on DRP lands.
Action 3	Implement habitat restoration plan.

Park staff will support and assist all identified oxbow and floodplain reconnection projects identified along the North Fork St. Lucie River Aquatic Preserve that cross onto Savannas Preserve State Park lands. These projects were identified as part of the needs assessment for hydrological restoration of the North Fork and its headwaters. Portions of the identified projects cross onto Savannas Preserve State Park land. These projects will contribute to the hydrological reconnection of approximately 324 acres of floodplain wetlands along the entire area of the North Fork of the St. Lucie River. All of these restoration projects have been identified in the North Fork St. Lucie River Aquatic Preserve Management plan (2009).

These identified projects will help rehydrate areas of altered hydrology along the floodplain of the North Fork of the St. Lucie River. It will re-create natural sheet flow patterns across wetlands. Projects will decrease sedimentation downstream on preserve lands and improve water quality conditions. It will also improve habitat quality in these areas and assist with exotic species densities in these altered communities. Such projects will also provide breeding grounds for fish in these areas, assisting with the health of regional fisheries.

Natural Communities Improvement

Improvements are similar to restoration but on a smaller, less intense scale. This typically includes small-scale vegetative management activities or minor habitat manipulation. Following are the natural community/habitat improvement actions recommended at the park.

Objective C: Conduct habitat/natural community improvement activities on ten acres of sand pine scrub community.

Action 1 Continue efforts to eradicate existing and incoming exotic plant species on this 10-acre site.

Action 2 Continue restoration planting to enhance scrub plant species in this area.

The park will continue with restoration efforts underway to restore ten acres of disturbed scrub habitat in MZ SP-24C. An initial project was started in 2007 to remove a monoculture stand of exotics across 50% of a ten-acre site. Continued efforts to eradicate existing and incoming exotic plant species will continue on this site. Once a successful control of exotic natal grass has been successful, continued restoration planting efforts will be sought to enhance scrub plant species in this area. This project will enhance habitat for two federally listed species found within this site, Florida scrub-jay and prickly apple cactus.

Objective D: Conduct habitat/natural community improvement activities involving mechanical treatment on 100 acres of sand pine scrub and pine flatwoods communities to augment the park's burn program results.

Action 1 Continue mechanical treatment on heavy fuel loading sites, focusing on urban interface areas.

The park will continue with mechanical treatment on heavy fuel loading sites throughout the park, focusing on the urban interface areas. This will involve mechanical mulching or roller-chopping activities to re-stratify fuels to a lower height in preparation for burning. In fire type communities where burning is no longer applicable this mechanical treatment will be utilized to enhance habitat and assist in preemptive wildfire control. All activities will follow the Division's Timber and Brush treatment standard (Florida Park Service Operations Manual).

Imperiled Species Management

Goal: Maintain, improve or restore imperiled species populations and habitats in the park.

The DRP strives to maintain and restore viable populations of imperiled plant and animal species primarily by implementing effective management of natural systems. Single species management is appropriate in state parks when the maintenance, recovery, or restoration of a species or population is complicated due to constraints associated with long-term restoration efforts, unnaturally high mortality, or insufficient habitat. Single species management should be compatible with the maintenance and restoration of natural processes, and should not imperil other native species or seriously compromise park values.

In the preparation of this management plan, DRP staff consulted with staff of the FWC's Imperiled Species Management or that agency's Regional Biologist and other appropriate federal, state and local agencies for assistance in developing imperiled animal species management objectives and actions. Likewise, for imperiled plant species, DRP staff consulted with FDACS. Data collected by the USFWS, FWC, FDACS and FNAI as part of their ongoing research and monitoring programs will be reviewed by park staff periodically to inform management of decisions that may have an impact on imperiled species at the park.

Ongoing inventory and monitoring of imperiled species in the state park system is necessary to meet the DRP's mission. Long-term monitoring is also essential to ensure the effectiveness of resource management programs. Monitoring efforts must be prioritized so that the data collected provides information that can be used to improve or confirm the effectiveness of management actions on conservation priorities. Monitoring intensity must at least be at a level that provides the minimum data needed to make informed decisions to meet conservation goals. Not all imperiled species require intensive monitoring efforts on a regular interval. Priority must be given to those species which can provide valuable data to guide adaptive management practices. Those species selected for specific management action and those that will provide management guidance through regular monitoring are addressed in the objectives below.

Objective A: Update baseline imperiled species occurrence inventory lists for plants and animals.

Action 1 Update imperiled species inventory.

DRP staff will continue to develop partnerships with other agencies and academic institutions to assist with the updates of inventory lists for additional imperiled species.

Objective B: Monitor and document six selected imperiled animal species in the park.

Action 1	Implement monitoring protocols for 6 imperiled animal species.
Action 2	Implement scrub-jay-specific activities, including snag management and surveys.
Action 3	Survey/monitor gopher tortoise population and determine need for augmentation.
Action 4	Monitor effects of prescribed burning on natural communities that support imperiled species
Action 5	Continue to monitor nesting activities of wood storks and other designated bird species in the park.

Park staff will implement monitoring protocols for six selected imperiled animal species, including the Florida scrub-jay and gopher tortoise and a selection of wading birds.

The Florida scrub-jay is typically found in well-maintained scrub or scrubby flatwoods communities. Ideal habitat consists of a single layer of evergreen shrubs, usually dominated by three main species of oaks. Even more specifically, Florida scrub-jays are seldom found as permanent residents of areas with dense sand pine canopy cover and vegetation that is over ten feet tall (Woolfenden and Fitzpatrick 1996). These areas need to be interspersed with bare sand for foraging and caching surplus acorns. Snag management is important since the birds use these standing dead trees as sentinel posts.

Savannas Preserve State park has a long history of scrub-jay monitoring. Since 2008, Florida scrub-jays have been monitored using the protocol set by Jay Watch, a citizen science program initiated through The Nature Conservancy and now coordinated through the Southeast Florida Scrub Ecosystem Working Group. The park has also been able to fund two separate banding projects to more accurately determine population sizes and demographics. Surveys will continue annually and will be supplemented throughout the year with informal park surveys.

Gopher tortoises are commonly seen at the park. The park will monitor the current population and determine the need for augmentation of gopher tortoises in the mesic flatwoods, scrubby flatwoods, and scrub communities. Protection of the gopher tortoises and their burrows, along with maintaining a prescribed burning cycle, should suffice to maintain tortoise populations and associated burrow commensals. To determine how many gopher tortoises are in this area and if any augmentation needs to be done; it is recommended that attempts will be made to survey for gopher tortoises following prescribed burns. Although a park-specific plan does not exist, Park and District staff will survey and monitor the park's gopher tortoise population per the DRP's established guidelines.

While monitoring is important, a well thought-out and executed prescribed fire program targeting scrub and scrubby flatwoods is an equally important ingredient for these animals' continued survival. Staff will continue to monitor the effects of prescribed fire treatments on supporting natural communities.

Savannas basin marsh community and the North Fork of the St Lucie River are also important areas of nesting, feeding and loafing for the areas wading bird populations. During periods of high water, the basin marsh has two locations acting as wading bird rookeries. The North Fork currently has one rookery in Mud Cove of Long Creek (MZ SPW1) that supports wood stork, egrets *(Ardeidae)*, herons *(Ardeidae)*. Wood stork nesting activities have been monitored at the Mud Cove rookery since 2004. Preserve staff will continue to monitor wood stork nesting activities at this rookery and look for additional nesting activity within the preserve each year for other designated bird species utilizing the Mud Cove and/or newly established rookeries within the preserve.

Objective C: Monitor and document three selected imperiled plant species in the park following existing monitoring protocols.

Action 1	Develop monitoring protocols for 2 select imperiled plant species including Prickly apple cactus.
Action 2	Implement monitoring protocols for 4 imperiled plant species including Prickly apple cactus, Four Petaled paw-paw, Tiny Milkwort, and Savannas Mint.
Action 3	Support continued research and monitoring on population demographics of the fragrant Prickly apple cactus.
Action 4	Monitor diceranda to determine survival in coordination with Bok Tower Gardens.

Fragrant Prickly-Apple Cactus: Beginning in 1999 as part of USFWS Multi-Species Recovery plan the Institute for Regional Conservation Population performed a study producing a demography report that tagged and mapped all plants within Savannas property. Continued research on population demographics of this plant should be supported by the park. Priorities remain as "Nine of the 10 confirmed sites occur on or around SPSP in St. Lucie County" (FNAI 2009) (USFWS 5-year review). Bradley et al (2002 IRC) recommended "continued monitoring of the SPSP and Volusia County populations on an annual basis and after stochastic events, such as fires." (USFWS 5-year review). It was also suggested that 33% of the population be monitored every year, so the entire population is monitored every three years. (Bradley et al 2002 IRC). The park should assist with all recommended actions laid out as part of the USFWS five year review.

It should also be noted that from the report by IRC, Bradley et al. (IRC 2002) recommended "the continued acquisition of private in holdings, which contain 37% of plants from the 2002 study, should be a high priority."

Recently, an experimental population using stock grown in the park shade house was established in the park for research. These experimental transplantations have and should continue to be implemented on a case-by-case basis for scientific

research. The park has partnered with Florida Atlantic University in translocation of park shade house-grown plants to other sites in the region along with the population established in the park.

Diceranda: From 2006-2012, population augmentation in coordination with Bok Tower Gardens transplanted over 1,600 plants into two sites in the park from seed and cuttings from an adjacent parcel containing the last remaining natural population. This experimental population provides two protected populations within the park boundary less than .5 km from the natural population. Monitoring to determine survival for this species will be an ongoing collaboration between park staff and Bok Tower Gardens as long as grant funding is available.
Tiny Milkwort: This species has been documented on the North Fork property in MZ SPE-03. A USFWS recovery plan exists, however, a site-specific plan to identify individual plants and to protect and maintain optimal habitat needs to be developed. “Bradley and Gann (1995) documented the species in a portion of Savannas Preserve State Park near Lynngate Park, in St. Lucie County. However, Woodmansee et al. (2007) reported no plants during a 2006 survey and indicated that fire suppression over time was the most likely cause for the plants’ disappearance from this site” (2010 USFWS recovery plan 5-year review).

Exotic Species Management

Goal: Remove exotic and invasive plants and animals from the park and conduct needed maintenance control.

The DRP actively removes invasive exotic species from state parks, with priority being given to those causing the ecological damage. Removal techniques may include mechanical treatment, herbicides or biocontrol agents.

Objective A: Annually treat 150 acres of exotic plant species in the park.

Action 1	Annually develop/update exotic plant management work plan.
Action 2	Implement annual work plan by treating 150 acres in park, annually, and continuing maintenance and follow-up treatments, as needed.

Exotic plant species can be detrimental to the environment they are contained in, if they are left unchecked. These species will eventually form exotic monocultures, which displace natural communities and associated animal species. Current management efforts target all FLEPPC’s Category I and II plant species for treatment.

At the beginning of each fiscal year, park management will determine which areas of the park will have focused invasive exotic plant treatment for the upcoming year. Each zone that has been treated must be maintained free of invasive exotics through a follow-up monitoring program. The follow-up program will involve walking an area that has been treated, on a quarterly to bi-annual basis to remove newly established plants. Records will be kept on these follow-up workdays in the same manner as is done on an active treatment day. Current and new contract projects will have participation from both park management and District Biologists.

All contractor removal efforts will be reported to the District for the annual invasive exotic removal report. A continued commitment to attain efforts of treating areas and providing needed follow-up efforts of treated areas is necessary in order for this plan to be successful.

Objective B: Implement control measures on six exotic animal species and any deemed nuisance animal species in the park.

Action 1 Continue removal of feral cats and dogs to county animal control facility, concentrating along park boundaries.

Action 2 Continue removal of other exotic species, including feral hogs, nine-banded armadillos, coyote, and iguanas.

The park will continue removal of six exotic species from the park, including feral hogs, nine-banded armadillos, coyote, iguana, feral cat and feral dog. Exotic animals are removed from the park as authorized by the FWC. The animals will continue to be removed as they are encountered through regular trapping programs, by park staff, volunteers and contracted trappers. Since most of the park is surrounded by residential areas, the immigration of feral cats and dogs is a continuous problem. Removal efforts should be concentrated along park boundaries or where the greatest damage to park resources occurs. All other exotic species should be documented and removed as encountered.

Nuisance animal species are defined as native species whose habits create specific management problems or concerns. Occasionally, nuisance species are also a listed species, such as alligators. Occasionally these species are deemed with need for removal under the above listed reasons.

The park will adhere to guidance provided by the nuisance and exotic removal standard provided in Chapter 10 section 4F of the Operations manual in dealing with all exotic and nuisance animal species. The DRP will consult and coordinate with appropriate federal, state and local agencies for management of listed species that are considered a threat or problem.

Cultural Resource Management

Cultural resources are individually unique, and collectively, very challenging for the public land manager whose goal is to preserve and protect them in perpetuity. The DRP is implementing the following goals, objectives and actions, as funding becomes available, to preserve the cultural resources found in Savannas Preserve State Park.

Goal: Protect, preserve and maintain the cultural resources of the park.

The management of cultural resources is often complicated because these resources are irreplaceable and extremely vulnerable to disturbances. The advice of historical and archaeological experts is required in this effort. All activities related to land clearing, ground disturbing activities, major repairs or additions to historic structures listed or eligible for listing in the National Register of Historic Places must be reviewed by an ARM trained staff member and may require submittal to the

FDOS, Division of Historical Resources (DHR) for review and comment prior to undertaking the proposed project. Recommendations may include, but are not limited to concurrence with the project as submitted, cultural resource assessment survey by a qualified professional archaeologist, modifications to the proposed project to avoid or mitigate potential adverse effect. In addition, any demolition or substantial alteration to any historic structure or resource must be submitted to the DHR for consultation and the DRP must demonstrate that there is no feasible alternative to removal and must provide a strategy for documentation or salvage of the resource. Florida law further requires that the DRP consider the reuse of historic buildings in the park in lieu of new construction and must undertake a cost comparison of new development versus rehabilitation of a building before electing to construct a new or replacement building. This comparison must be accomplished with the assistance of the DHR.

Objective A: Assess and evaluate four of six recorded cultural resources in the park.

Action 1	Complete 4 assessments/evaluations of archaeological sites. Prioritize preservation and stabilization projects.

The park intends to have four of the six cultural sites evaluated and updated during the plan period. Staff will provide information to include any threats to the site's condition such as natural erosion; vehicular damage; horse, bicycle or pedestrian damage; looting; construction including damage from firebreak construction; animal damage; plant or root damage or other factors that might cause deterioration of the site. This site condition assessment should attempt to compare the current condition with previous evaluations using photo points or high resolution scanning or similar techniques. Site assessments will be documented on appropriate forms and a copy will be sent to the Division of Historical Resource and maintained at the park and district offices.

Objective B: Compile reliable documentation for all recorded historic and archaeological resources.

Action 1	Ensure all known sites are recorded or updated in the Florida Master Site File.
Action 2	Complete a predictive model for high, medium and low probability of locating archaeological sites within the park.
Action 3	Develop and adopt a Scope of Collections Statement.
Action 4	Conduct oral history interviews.
Action 5	Compile a park administrative history.

Management should develop and implement a routine monitoring program that enables personnel to report on the location and condition of the parks' recorded prehistoric and historic cultural resources. Any additional artifacts or sites found should be recorded and updated in the FMSF as needed.

Efforts should be made to conduct oral history interviews and/or compile administrative history for the park and surrounding areas to help further guide cultural management decisions.

A Scope of Collections will need to be developed and updated for any current collections or for any new collections the park may acquire.

A Predictive model was completed in 2013 by University of South Florida, new resource groups identified in table 4.

Objective C: Bring four of six recorded cultural resources into good condition.

Action 1	Design and implement regular monitoring programs for six cultural sites
Action 2	Create and implement a cyclical maintenance program for each cultural resource.
Action 3	Monitor Eden lawn outbuildings and tennis court for disturbance.

A cyclical maintenance plan should be developed and implemented to help guide the park with needed preservation of its sites. Park staff should develop and implement a regular monitoring schedule for all 6 cultural resource sites.

Eden lawn outbuildings and Tennis Court site (SL 3016) should be monitored for disturbance however no preservation actions are needed. Buildings associated with this site have been documented and removed in consultation with DHR. Any artifacts or remaining structure found on this site should be removed only with documentation and consultation with BNCR. Staff will ensure that any ground disturbing activities shall be conducted in accordance with DHR guidelines and monitored by appropriately trained personnel.

Special Management Considerations

Timber Management Analysis

Chapters 253 and 259, Florida Statutes, require an assessment of the feasibility of managing timber in land management plans for parcels greater than 1,000 acres if the lead agency determines that timber management is not in conflict with the primary management objectives of the land. The feasibility of harvesting timber at this park during the period covered by this plan was considered in context of the DRP's statutory responsibilities and an analysis of the park's resource needs and values.

The long-term management goal for forest communities in the state park system is to maintain or re-establish old-growth characteristics to the degree practicable, except in those forest communities specifically managed as early successional. Timber management is utilized for the specific purpose of helping restore or improve current habitat conditions and enhance the overall integrity of the natural community. Revenue generation from timber management is not the goal but rather, a by-product of taking such actions to help restore/improve target conditions of specific natural

communities. In all situations, forest/stand/timber management activities undertaken will adhere to the current Florida Silvicultural Best Management Practices and Florida Forestry Wildlife Best Management Practices for State Imperiled Species.

Due to multiple factors, timber management that could generate revenue is likely not feasible. Low overstory stocking levels mean that few of the management zones and natural communities evaluated are outside the FNAI Reference Site target range. In addition, the geographic location of the park in relation to timber processing facilities, the small aggregate area (< 50 acres) of the few natural communities that could support removals, and the low level of available timber on site makes it unlikely that a thinning/harvesting operation could be considered feasible. Activities related to stand improvement, including palmetto and midstory reduction, are needed in many areas.

The Timber Management Analysis found in Addendum 8 provides additional details. This analysis has been evaluated and found to be consistent with the recommendations found in the subject RMC.

Arthropod Control Plan

All DRP lands are designated as "environmentally sensitive and biologically highly productive" in accordance with Ch. 388 and Ch. 388.4111 Florida Statutes. If a local mosquito control district proposes a treatment plan, the DRP works with the local mosquito control district to achieve consensus. By policy of the DEP since 1987, aerial adulticiding is not allowed, but larviciding and ground adulticiding (truck spraying in public use areas) is typically allowed. The DRP does not authorize new physical alterations of marshes through ditching or water control structures. Mosquito control plans temporarily may be set aside under declared threats to public or animal health, or during a Governor's Emergency Proclamation.

Sea Level Rise

Potential sea level rise is now under study and will be addressed by Florida's residents and governments in the future. The DRP will stay current on existing research and predictive models, in coordination with other DEP programs and federal, state, and local agencies. The DRP will continue to observe and document the changes that occur to the park's shorelines, natural features, imperiled species populations, and cultural resources. This ongoing data collection and analysis will inform the Division's adaptive management response to future conditions, including the effects of sea level rise, as they develop.

Resource Management Schedule

A priority schedule for conducting all management activities that is based on the purposes for which these lands were acquired, and to enhance the resource values, is located in the Implementation Component of this management plan.

Land Management Review

Section 259.036, Florida Statutes, established land management review teams to determine whether conservation, preservation and recreation lands titled in the name of the Board of Trustees are being managed for the purposes for which they were acquired and in accordance with their approved land management plans. The DRP considered recommendations of the land management review team and updated this plan accordingly.

Savannas Preserve State Park was subject to a land management review on March 17-18, 2011**.** The review team made the following determinations:

1. The land is being managed for the purpose for which it was acquired.
2. The actual management practices, including public access, complied with the management plan for this site

LAND USE COMPONENT

Introduction

Land use planning and park development decisions for the state park system are based on the dual responsibilities of the Florida Department of Environmental Protection (DEP), Division of Recreation and Parks (DRP). These responsibilities are to preserve representative examples of original natural Florida and its cultural resources, and to provide outdoor recreation opportunities for Florida's citizens and visitors.

The general planning and design process begins with an analysis of the natural and cultural resources of the unit, and then proceeds through the creation of a conceptual land use plan that culminates in the actual design and construction of park facilities. Input to the plan is provided by experts in environmental sciences, cultural resources, park operation and management. Additional input is received through public workshops, and through environmental and recreational-user groups. With this approach, the DRP objective is to provide quality development for resource-based recreation throughout the state with a high level of sensitivity to the natural and cultural resources at each park.

This component of the unit plan includes a brief inventory of the external conditions and the recreational potential of the unit. Existing uses, facilities, special conditions on use, and specific areas within the park that will be given special protection, are identified. The land use component then summarizes the current conceptual land use plan for the park, identifying the existing or proposed activities suited to the resource base of the park. Any new facilities needed to support the proposed activities are expressed in general terms.

External Conditions

An assessment of the conditions that exist beyond the boundaries of the unit can identify any special development problems or opportunities that exist because of the unit's unique setting or environment. This also provides an opportunity to deal systematically with various planning issues such as location, regional demographics, adjacent land uses and park interaction with other facilities

Savannas Preserve State Park is located within St. Lucie and Martin counties, partially within the City of Port St. Lucie, in southeastern Florida. The cities of Stuart and Ft. Pierce are within five miles of the park.

The Environmental Education Center, the main use area of the park, is located approximately 2 miles east of U.S. 1 on Walton Road. A trailhead is located about 4.5 miles south of the education center on Jensen Beach Boulevard, just east of the Green River Parkway Access to the North. Access to the western portion of the park along the North Fork of the St. Lucie River is also from U.S. 1.

The populations of St. Lucie and Martin counties are relatively diverse in terms of demographic characteristics. According to U.S. Census data (2013), approximately one-third of residents in these counties identify as black, Hispanic or Latino, or another minority group. Over half (62%) of residents can be described as youth or seniors (U.S. Census 2013). The two counties rank fifth and sixth statewide in per capita personal income at approximately $53,000; above the statewide average of $41,012 (U.S. Bureau of Economic Analysis 2014).

The park is in the Central East Vacation Region, which includes Volusia, Brevard, Indian River, St. Lucie, Martin, and Okeechobee counties (Visit Florida 2015). According to the 2015 Florida Visitor Survey, approximately 7% of domestic visitors to Florida visited this region. Roughly nine out of ten visitors to the region traveled to the Central East for leisure purposes. The top activities for domestic visitors were beach/waterfront and visiting friends or relatives. Spring was the most popular travel season, but visitation was generally spread throughout the year. Most visitors traveled by non-air (77%), reporting an average of 4.2 nights and spending an average of $156 per person per day (Visit Florida 2015).

There is a considerable amount of publicly owned resource-based recreation opportunities near the park. A portion of the East Coast Greenway, a developing 3,000-mile trail system that links all the major cities of the eastern seaboard between Canada and Key West, runs along the western boundary of the park along the Green River Parkway. A spur trail connects the Greenway to the park's trailhead facilities and trail system at the Jensen Beach Day Use Area.

St. Lucie County manages several recreational facilities and preservation areas in the area. West of U.S. 1, River Park Marina and White City Park offer access to the North Fork of the St. Lucie River as well as fishing, picnicking, paddling access/rentals, hiking, and more. The Oxbow Eco-Center also provides educational programming, birding, fishing, hiking, picnicking, and observation areas. East of U.S. 1, the county's Savannas Recreation Area provides opportunities for camping, hiking and biking, fishing, picnicking, paddling, and wildlife observation. Other public lands in the area include Weldon B. Lewis Park/Ancient Oaks Preserve and the Gordy Road Recreation Area at Ten Mile Creek. The City of Port St. Lucie's Lyngate Park, directly adjacent to the southeastern portion of the North Fork property, provides ball fields, picnicking, and short hiking trails. Sandhill Crane Park, adjacent to the Walton Road section of Savannas, offers amenities such as a playground, picnic pavilions, and fishing areas.

Six other state parks are within a 15-mile radius of Savannas Preserve State Park, including Avalon, Fort Pierce Inlet, Seabranch Preserve, St. Lucie Inlet Preserve, Atlantic Ridge Preserve, and Jonathan Dickinson State Parks. These parks offer hiking, biking and equestrian trails, paddling, beach activities, shoreline fishing, scuba diving, picnicking, and overnight stays (camping and cabins), along with opportunities for wildlife viewing and interpretive activities.

The North Fork property surrounds the North Fork St. Lucie River Aquatic Preserve, which provides opportunities for canoeing, kayaking, motor boating, sailing, water skiing, wake boarding, catch-and-release fishing and nature viewing. To the east, the Jensen Beach to Jupiter Inlet Aquatic Preserve is a part of the Indian River Lagoon National Estuary Program, one of 28 designated estuaries of national significance. The natural communities within the estuary's submerged lands and open waters combine to create one of the most productive estuaries in the United States. Recreational uses include boating, fishing and swimming. On Hutchinson Island, numerous beach parks and natural areas provide seashore fishing, picnicking, hiking, wildlife viewing, beach activities, boating, and paddling access.

Florida's Statewide Comprehensive Outdoor Recreation Plan (SCORP) indicates that participation rates in this region for saltwater non-boat fishing, saltwater and freshwater boat ramp use, freshwater boat fishing, wildlife viewing, picnicking, bicycle riding, hiking, tent camping, horseback riding, and hunting are higher than the state average with demand for additional facilities increasing through 2020 (FDEP 2013).

Existing Use of Adjacent Lands

The park lies within four jurisdictions which include the City of Port St. Lucie, the City of Ft. Pierce, Martin County, and St. Lucie County. To the north of the Savannas property, in Ft. Pierce, is the Savannas Outdoor Recreation Area, designated as Conservation Open Space (OS-2). Also to the immediate north is the Gator Trace Country Club Planned Unit Development. Adjacent to the park are many residential parcels, allowing nine dwelling units per acre. Most the residential units surrounding the park are low density with rural character. There are also several neighboring parcels classified for Conservation Open Space, allowing limited use for recreational and open space activities. Commercial uses are zoned in the City of Stuart and Martin County to the south of the park. Most of the park is surrounded by expansive auto-dependent suburban sprawl with a large commercial retail corridor along U.S. 1 in between the eastern and western portions of the park. This presents challenges to park managers related to increased storm water pollution, exotic species control, and utilization of prescribed fire as a natural resource management tool.

The North Fork property follows the St. Lucie River. Uses in this area range from recreation and conservation to single-family residential. Lyngate Park and Veterans Memorial Park are adjacent to the park on the east. U.S. 1 and Downtown Port St. Lucie also act as an eastern boundary to this portion of the park. The Five-mile and Ten-mile Creeks surround Miller-Wild to the north. These lands serve low-density agriculture and residential uses. West of Miller-Wild is zoned for light and heavy industrial allowing for manufacturing activities. The current activities on these parcels is fruit juice manufacturing and agricultural chemical distribution.

Savannas Preserve is bound to the west by the Green River Parkway, to the north by Midway Road, and to the south by State Road 732, or NE Jensen

Beach Blvd, and on the east by the CSX Railroad right-of-way. The SE Veterans Memorial Parkway and U.S. 1 border North Fork on the east and SE Crowberry Drive is to the west. Ten Mile Creek surrounds Miller-Wild to the south and Five Mile Creek runs to the north and east.

Planned Use of Adjacent Lands

The resident population of St. Lucie and Martin Counties is projected to exceed 449,000 by the year 2020 (BEBR 2015). Rapid development of residential and commercial properties and increasing tourist populations should be anticipated near the state park. Since the park contains one of the highest-quality natural ecosystems in southeast Florida, the demand for resource-based recreational and educational opportunities will increase with the expansion of these populations.

St. Lucie County was a relatively rural community that has experienced rapid population growth over the last 30 years. From 1980 to 2010, the population almost tripled. Growth in the area slowed somewhat during the economic downturn of the late 2000s, and business and real estate growth is projected to increase over the timeframe of this plan. The surrounding area is expected to grow by approximately 70% by 2040 (BEBR 2015) further exacerbating challenges associated with auto-dependent sprawl. A review of proposed comprehensive plan amendments in St. Lucie County show no substantial development projects influencing the park.

In terms of population, Martin County is a relatively small county in southeast Florida. While it has not experienced the rapid growth rate of St. Lucie County to the north, its growth has been consistent with the overall population growth in the state. From 1980 to 2010, the population of the Martin County more than doubled. Growth in the area slowed somewhat during the economic downturn of the late 2000s, and business and real estate growth is projected to increase over the timeframe of this plan. The surrounding area is expected to grow by approximately 35% by 2040 (BEBR 2015). The future development patterns in the area will reflect those identified in the county's plans, especially for the Community Redevelopment Areas, one of which (Port Salerno) is just a few miles south of the park.

Adjacent lands previously zoned as open space or conservation will continue to maintain this designation. Surrounding jurisdictions have implemented transitional zones for residential densities, allowing transitions between agricultural areas and more intense residential development. For instance, Residential Estate (RE) and Residential Suburban (RS) are specifically designated around the North Fork of the St. Lucie River with large lots, single-family dwellings at a maximum of two units per acre while Residential Urban (RU) lands allow a maximum of five dwelling units per acre (St. Lucie County 2014). In Port St. Lucie, adjacent lands are designated for Open Space-Preservation (OSP) and Open Space-Conservation (OSC) to maintain the ecological importance of the natural environment while allowing recreational activities (City of Port St. Lucie 2012). Commercial uses are maintained in the

future land use maps for the City of Stuart and Martin County (Martin County 2014). North Fork is mostly surrounded by lands designated for single-family residential with some parcels specified for open space or public conservation activities. Miller-Wild shares land in St. Lucie County and the City of Ft. Pierce. Lands to the west will permit Heavy Industrial (HI) development, as the city aims to promote themselves as a major employment center, allowing manufacturing, processing, distribution, and other related activities (City of Fort Pierce 2011). Adjacent parcels not zoned for industry are designated for residential development ranging from urban to low density.

There are several potential transportation projects in or near the park that may affect the park in the future. A privately financed, operated, and maintained high-speed passenger rail system is proposed for the Florida East Coast Railway track that runs along the eastern border of the park. Access to the eastern portions of the park, including the shop and residence areas, is provided across the rail line through a lease from the Florida East Coast Railway.

The City of Port St. Lucie is planning to construct the Crosstown Parkway Extension, which would extend the Crosstown Parkway from Manth Lane on the west, across the North Fork St. Lucie River to U.S. 1 on the east. The proposed route would pass through Savannas Preserve State Park and would include a bridge over the river. To mitigate for impacts to state lands from the project, the city has funded several projects that will benefit the park, including expansion of the Education Center, construction of a new (replacement) Halpatiokee canoe/kayak launch with picnic facilities, parking and access road, and purchase properties to be added to the park.

DRP staff should be involved in all transportation planning decisions that may affect the state park outlined in the St. Lucie County and Martin County Long Range Transportation Plans. Current projects of concern include the planned Lennard Road extension north to U.S. Highway 1 and the widening of Walton Road.

Property Analysis

Effective planning requires a thorough understanding of the unit's natural and cultural resources. This section describes the resource characteristics and existing uses of the property. The unit's recreation resource elements are examined to identify the opportunities and constraints they present for recreational development. Past and present uses are assessed for their effects on the property, compatibility with the site, and relation to the unit's classification.

Recreational Resource Elements

This section assesses the park’s recreational resource elements, those physical qualities that, either singly or in certain combinations, can support various resource-based recreation activities. Breaking down the property into such elements provides a means for measuring the property's capability to support

potential recreational activities. This process also analyzes the existing spatial factors that either favor or limit the provision of each activity.

Land Area

Savannas Preserve State Park includes over 6,741 acres of upland and wetland plant communities. The range of this unit and the unique natural resources contained within creates a significant feature of the landscapes of southern St. Lucie and northern Martin Counties. The park offers ideal resources for hiking, bicycling, equestrian activities, paddling, picnicking, and wildlife viewing.

The North Fork property consists of a buffer of floodplain swamp, hydric hammock, and unconsolidated substrate along the North Fork of the St. Lucie River. Most of the land area along this section is heavily influenced by the river and is often inundated preventing heavy visitor use.

Water Area

North Fork, buffering the St. Lucie River, and the Savannas basin marsh provide visitor access to these waterbodies allowing for aquatic recreational use, such as fishing and paddling. Likewise, the buffer protects significant habitats that foster diverse wildlife. The river and marsh create opportunities for wildlife viewing and nature study at the park. The park is uniquely situated to provide a paddling trail along the St. Lucie River and in the future, should continue to coordinate with the North Fork of the St. Lucie River Aquatic Preserve, the St. Lucie County Environmental Resources Division, and other relevant agencies in its development.

Shoreline

Savannas Preserve State Park has over 8 miles of shoreline along the St. Lucie River and as such is uniquely situated to provide extensive opportunities for access to the river.

Natural Scenery

The impressive viewsheds of the park is one of its most important resources. Vistas across the basin, the variety of natural communities, and the diversity of wildlife, provide great visual interest for visitors to the park. A large population of wading birds in feeding, roosting, and nesting areas on the park is indicative of the significant wildlife habitat that this area provides. Extensive viewsheds of outstanding natural features in an increasingly urban part of the state make this a valuable resource element for the park.

Significant Habitat

The park contains portions of the last remaining scrub habitat for the Florida scrub jay along Florida's Atlantic Ridge. Likewise, the park contains the last intact basin marsh in southeast Florida, which provides habitat for valuable wildlife.

Natural Features

The basin marsh in Savannas and North Fork property are connected through a drainage swale system that also serves as a wildlife corridor between the two fragmented natural areas. The Savannas marsh and North Fork property are designated Outstanding Florida Waters and represent the last remaining remnants of floodplain and upland habitats in the region's watershed. These features provide habitats for many listed and rare species of plants and animals, which increases visitor opportunities to observe and enjoy the wildlife within the park.

The park protects extensive segments of the Atlantic Coastal Ridge and the largest, most ecologically intact stretch of freshwater marsh in southeast Florida. The marsh is representative of the regional freshwater marsh that covered a significant portion of southeast Florida before the rapid urbanization of this part of the state.

Archaeological and Historical Features

Cultural resources in the park date from the aboriginal and prehistoric period to the American 19th century. Evidence suggests that native people have inhabited the area for over 7,000 years while historic sites provide culturally important resources that showcase the pineapple plantations of the early 20th century.

Assessment of Use

All legal boundaries, significant natural features, structures, facilities, roads and trails existing in the unit are delineated on the base map (see Base Map). Specific uses made of the unit are briefly described in the following sections.

Past Uses

The Ais populated the area surrounding the Indian River between the St. Lucie Inlet and Cape Canaveral prior to European arrival and up until the middle 1700's. Native populations declined due to disease, conflict, and enslavement by European settlers. In the late 1800s and early 1900s, the sandy ridge east of the Savannas marsh was covered with pineapple plantations. Jensen Beach was known as the "pineapple capital of the world." These plantations were very successful until the 1920s when insects destroyed the crops and lower cost Cuban pineapples entered the market. The production of pineapples was abandoned, and the Savannas could return to pre-development state. General Development Corporation and City of Port St. Lucie previously owned the bulk of the North Fork land. Numerous drainage easements bisect the park serving to drain adjacent lands for the construction of the City of Port St. Lucie residential areas. Apparently, no other land management activities (logging, exotic species removal, prescribed burning, permitting/compliance of encroachments, etc.) occurred on the property. Dredge spoil remains along the riverbank from dredging operations conducted in the 1920s. The Miller-Wild property (northernmost area) was logged and used as pasture for cattle. A cattle pond that was dug in the pasture now functions as a depression marsh.

Cattle were removed from the site in 1998, and the former pasture contains mostly exotic grasses, debris, and artificial mounds/depressions.

Future Land Use and Zoning

The DRP works with local governments to establish designations that provide both consistency between comprehensive plans and zoning codes and permit typical state park uses and facilities necessary for the provision of resource-based recreation.

The current future land use designation for lands in St. Lucie County is Public Conservation (CPUB), permitting preservation and/or recreational uses (St. Lucie County 2014). Residential uses also fall within the park boundaries ranging from Residential Estate (RE) serving as a transitional zone between agricultural areas and intense development to Residential Urban (RU) allowing maximum density of five dwelling units per acre. As you move south in Savannas Preserve, future land uses move from medium-density residential to recreational to low-density development. Land in Martin County allows densities up to 5 units per acre, as well as commercial activities (Martin County 2014). North Fork future land use is classified for Open-Space Preservation (OSP) and Public Conservation (CPUB). One area of the park allows low-density residential uses with a maximum density of five dwelling units per acre. Miller-Wild lands in Ft. Pierce allow medium density residential (RM) while adjoining lands in St. Lucie County provide for Residential Urban (RU), Residential Suburban (RS), and Industrial (IND).

The current zoning designation for parcels of Savannas Preserve in Port St. Lucie are zoned Open Space-Conservation (OSC), Open Space-Recreation (OSR), and General Use (GU). The Open Space classes establish districts that protect the natural character of the land and allow recreational activities. General Use is zoned for land that is currently undeveloped. Park land in Ft. Pierce allows medium density residential development and is currently owned by the South Florida Water Management District (SFWMD). Southern parcels share a boundary with St. Lucie and Martin County. Martin County parcels are zoned for a golf course planned unit development in West Jensen, single-family residential, and multiple-family units. The majority of the park is in St. Lucie County. To the north, parcels are zoned for Agricultural and Residential (AR-1), Residential/Conservation (R/C), and multi-family residential (RM-5). Zoning for these North Folk property changes from recreation and open space in the north to residential in the south. There is a parcel within the park in Port St. Lucie zoned for RM-11, allowing low-density multiple family residential areas. Most of the land in North Fork are zoned for General Use (GU), a category designated for undeveloped land or where future use is uncertain. Land in Miller-Wild property is zoned for single family residential (RS-3), medium density residential (R-4), and multiple family residential (RM-9). The southwest parcel of this segment is zoned for heavy industry.

Current Recreational Use and Visitor Programs

The park is currently open to the public for nature appreciation and day use activities, such as horseback riding, canoeing, and fishing. Nine miles of hiking trails are available to visitors to explore. Trails traverse hydric hammock, wet prairie, and mesic flatwoods communities, and users can observe a wide variety of wildlife. Savannas Preserve State Park is part of the Great Florida Birding and Wildlife Trail. A small picnic area with a pavilion is also available to visitors. The Education Center features interactive exhibits and displays that allow visitors to learn about this natural area. Live animal exhibits are also hosted at the facility. Additionally, park visitors enjoy guided walks and paddling excursions throughout the property.

The Savannas Preserve State Park and Oxbow Eco-Center team up to offer Basic and Advanced Survival Summer Camps for ages 10 and up. Some of the skills campers will develop include constructing a shelter from only natural resources, building a fire using primitive tools and tracking wildlife. The Friends of Savannas has recently entered a partnership with the Friends in Pink, a local non-profit organization devoted to helping families affected by breast cancer. In March of this year, we hosted the first annual Leprechaun Dash for Pink 5K Run/Walk. Proceeds from the event benefitted both organizations.

Visitation to the park is generally consistent throughout the year. The park offers interpretive and educational programming to educate the public on the park's resources. An interpretive kiosk at the entrance area near the Education Center provides park information. The Education Center itself hosts around 12,000 visitors per year.

The East Coast Greenway adjacent to and within the park has increased access to the park. While facilitating regional trail connectivity is a priority for outdoor recreation planners, it is important to highlight the associated park management challenges. Controlling access to park property after hours is an important component of recreation and conservation lands management, especially in urban areas as part of an effort to mitigate negative impacts to park resources. Regional trails and bike paths often make it possible for individuals to access park resources 24/7 and thus provide a challenge for park managers and might require certain steps to limit access at specific locations to protect park resources and ensure their continual enjoyment by the public.

Savannas Preserve State Park recorded 43,745 visitors in FY 2015/2016. By DRP estimates, the FY 2015/2016 visitors contributed $4.2 million in direct economic impact, the equivalent of adding 67 jobs to the local economy (FDEP 2016).

Other Uses

Florida Power and Light (FPL) owns a 600+ foot wide transmission line corridor for the Port St. Lucie nuclear power plant at the northern end of the state park. FPL also has an easement along an existing park maintenance road to access the transmission line corridor. A 1/3-mile spur trail within the park boundary

connects the East Coast Greenway to the park's Jensen Beach Day Use Area with restrooms and picnic facilities.

Protected Zones

A protected zone is an area of high sensitivity or outstanding character from which most types of development are excluded as a protective measure. Generally, facilities requiring extensive land alteration or resulting in intensive resource use, such as parking lots, camping areas, shops or maintenance areas, are not permitted in protected zones. Facilities with minimal resource impacts, such as trails, interpretive signs and boardwalks are generally allowed. All decisions involving the use of protected zones are made on a case-by-case basis after careful site planning and analysis.

At Savannas Preserve State Park, all wetlands and floodplain as well as the scrubby flatwoods and scrub communities of the Atlantic Coastal Ridge, the hydric hammock, baygall and alluvial forest communities of the North Fork and known imperiled species habitat have been designated as protected zones.

Existing Facilities

Savannas Preserve State Park provides a unique opportunity for visitors to experience a natural coastal barrier island ecosystem. The park's recreational facilities create a wilderness experience in an urban and densely developed area of the state (see Base Map).

Recreation Facilities

Recreational facilities are concentrated in nine main areas: Jensen Beach and Hawk's Bluff Trailheads, Education Center Area, North Fork and Savannas canoe launches, Macquillen Trailhead, Scenic Park Drive Trailhead, and Miller-Wild Property.

The Environmental Education Center, located off Walton Road, is the focal point of interpretation at the park and includes exhibits about the natural and cultural resources of the Savannas. Water access is provided a short distance north of the Education Center at the Savannas Canoe Launch Area Day Use Area. Facilities include a canoe/kayak launch, picnicking facilities, restroom, horse corral, unpaved parking, and interpretive exhibits. Through mitigation funds for the Crosstown Parkway, the Education Center was expanded, an entrance road and shared use path were constructed, and the Education Center parking lot was improved. Mitigation funds also went to develop the Evans Creek Day Use Area, adding an access road, canoe and kayak launch to Evans Creek, walkway to the launch, and parking spaces.

Approximately 17.5 miles of shared use trails for hiking, biking and equestrian use are provided between Walton Road and Easy Street, just north of the FPL power line corridor. Primary access to the trail system for hiking and biking is from the Environmental Education Center parking area. An equestrian trailhead

SAVANNAS PRESERVE STATE PARK

N

0 0.25 0.5 1 Miles

Florida Department of Environmental Protection
Division of Recreation and Parks
Date of aerial; 2011

BASE MAP

off Scenic Park Drive provides access for equestrian users. The equestrian trailhead includes parking, and an interpretive sign. Hawk's Bluff Trail is in the southern portion of the park off Savanna Road, with parking limited to the road right of way. The Jensen Beach Trailhead includes gravel parking, restrooms, and a picnic shelter.

Support Facilities

The park's support facilities are located throughout the property. At the main shop area, three residences, an office, storage, and shop provide maintenance support to park staff. Support facilities at the Education Center include restrooms and an office area. The Macquillen Residence Area contains a residence and shed. The Florida Coastal Office (FCO) maintains an office at Miller-Wild property. An inventory of the park's recreational and support facilities is included below.

Recreation Facilities

Education Center Area
Education Center
Paved parking (38 spaces)
Medium picnic shelter
Shared use path (0.1 miles)

Savannah Canoe Launch Day Use Area
Canoe/kayak launch
Small picnic shelter
Composting restroom
Unpaved parking
Horse corral
Interpretive sign

Scenic Park Drive Trailhead
Unpaved parking
Accessible parking space (1)
Interpretive sign

Evans Creek Day Use Area
Canoe/kayak launch
Parking area

Hawk's Bluff Trailhead
Hawk's Bluff Trail (0.75 miles)
Residence (1 mobile home)

Parkwide
Shared-use trail (17.5 miles)

Jensen Beach Day Use Area
Paved parking (35 spaces)
Interpretive kiosk
Medium picnic shelter
Restrooms
Shared-use trail connector (0.2 miles)

Miller-Wild Property
Hiking trails (1.7 miles)
Canoe/kayak launch
Aquatic Preserve office

Macquillen Trailhead
Interpretive sign
Honor box

Support Facilities

Shop/Residence Area
Shop building
Office
Staff residences (2-mobile homes)

Macquillen Residence Area
Trailhead/kiosk
Residence
Shed
Staff Residence (mobile home)

Finn Residence Area
Residence
Storage building

Conceptual Land Use Plan

The following narrative represents the current conceptual land use proposal for this park. The conceptual land use plan is the long-term, optimal development plan for the park, based on current conditions and knowledge of the park's resources, landscape and social setting (see Conceptual Land Use Plan). The conceptual land use plan is modified or amended, as new information becomes available regarding the park's natural and cultural resources or trends in recreational uses, in order to adapt to changing conditions. Additionally, the acquisition of new parkland may provide opportunities for alternative or expanded land uses. The DRP develops a detailed development plan for the park and a site plan for specific facilities based on this conceptual land use plan, as funding becomes available.

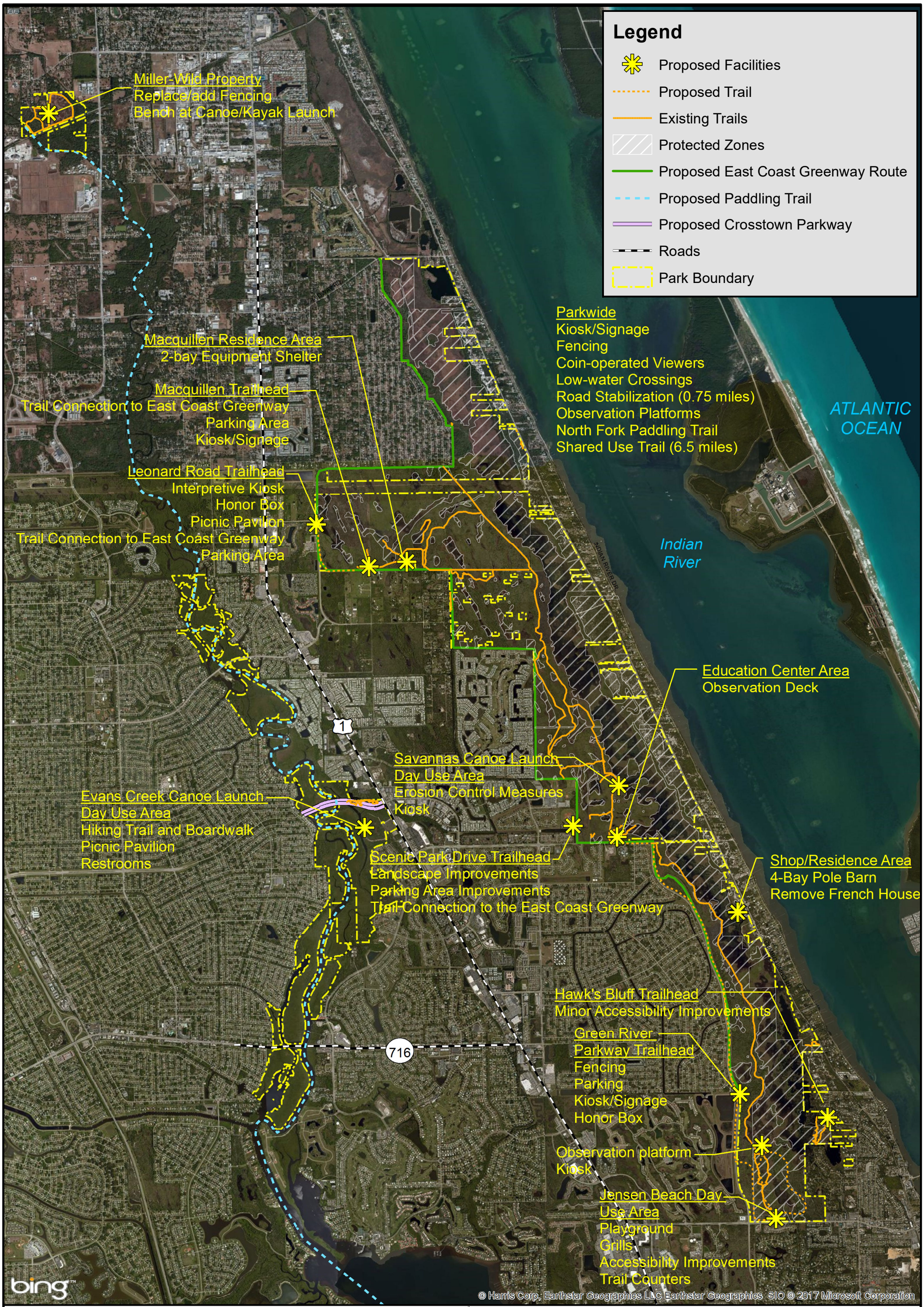
During the development of the conceptual land use plan, the DRP assessed the potential impact of proposed uses or development on the park resources and applied that analysis to determine the future physical plan of the park as well as the scale and character of proposed development. Potential resource impacts are also identified and assessed as part of the site planning process once funding is available for facility development. At that stage, design elements (such as existing topography and vegetation, sewage disposal and stormwater management) and design constraints (such as imperiled species or cultural site locations) will be investigated in greater detail. Municipal sewer connections, advanced wastewater treatment or best available technology systems are applied for on-site sewage disposal. Creation of impervious surfaces is minimized to the greatest extent feasible to limit the need for stormwater management systems, and all facilities are designed and constructed using best management practices to limit and avoid resource impacts. Federal, state and local permit and regulatory requirements are addressed during facility development. This includes the design of all new park facilities consistent with the universal access requirements of the Americans with Disabilities Act (ADA). After new facilities are constructed, park staff monitors conditions to ensure that impacts remain within acceptable levels.

Potential Uses

Public Access and Recreational Opportunities

Goal: Provide public access and recreational opportunities in the park.

The existing recreational activities and programs of this state park are appropriate to the natural and cultural resources contained in the park and should be continued. New and improved activities and programs are also recommended and discussed below.



SAVANNAS PRESERVE STATE PARK

N

0 0.25 0.5 1 Mile

Florida Department of Environmental Protection
Division of Recreation and Parks
Date of aerial; 2014

CONCEPTUAL LAND USE PLAN

Objective: Maintain the park's current recreational carrying capacity of 2,559 users per day.

The park will continue to provide the current range of recreational day use opportunities. Hiking, biking, picnicking, fishing, padding, equestrian uses, and nature study are popular activities for park patrons. The park serves as a picnicking and hiking stop for users of the East Coast Greenway, which runs along the park.

Objective: Expand the park's recreational carrying capacity by 182 users per day.

The expansion of trails and addition of picnic pavilions throughout the park will create additional opportunities for outdoor recreation such as hiking and picnicking, expanding the park's carrying capacity. Paddling launches will also increase visitor access to the waterways, potentially facilitating the development of a paddling trail in partnership with the North Fork St. Lucie River Aquatic Preserve, St. Lucie County Environmental Resources Division, and other relevant agencies.

Objective: Continue to provide the current repertoire of 43 interpretive, educational and recreational programs on a regular basis.

The Education Center currently offers 43 educational, recreational and interpretive programs and events. The educational and interpretive programs focus primarily on the park's natural resources, with programs on cultural resources playing an important, but smaller role. The goal of these programs is to facilitate an appreciation and understanding of the natural and cultural resources within Savannas Preserve State Park. Current programs for children include *Land & Marsh,* a look at the park's habitats and how they support local wildlife species. *Marsh Madness* is an immersion program in which students learn about the basin marsh and participate in a fauna sampling (dip-netting) experience. Other interpretive programs are specific to imperiled species on the park property and cover topics such as the American alligator and the gopher tortoise. Still others focus on wetlands, wildflowers and other botanical features, as well as resource management topics as in *Fire in Florida's Landscape*.

Recreational programming offered at the park gives visitors a chance to have outdoor adventures and learn about potential new hobbies and activities. Currently, the park's recreational programs include guided kayak tours, a family-fun Halloween event each October, as well as classes on birding, geocaching, and orienteering.

Objective: Develop 10 new interpretive, educational, and recreational programs.

The park plans to update and improve existing programs and interpretive materials over the next ten years, as well as reviving former ones. Examples include expanding the water quality program to include land use and watershed

concepts and bringing back the Learning in Florida's Environment (LIFE) program by developing new partnerships with area schools.

The construction of a new classroom/wet lab will afford programming for older students in areas such as plant identification, macro-invertebrate studies, use of microscopes and more. The new facility will also provide opportunities for new interpretive exhibits.

New programs at the park will seek to diversify the target audiences to include groups such as veterans, assisted-living residents and persons with special needs. Development of these programs will involve both modifying current programs or designing new programs to meet the needs of these groups.

The park will also expand the recreational-based programs offered through the Savannas Education Center. Through partnerships, the park intends to add activities such as Yoga, Tai Chi, musical concerts, and drum circles to the program list.

Maps and interpretive kiosks should be incorporated throughout the park to showcase the numerous recreational opportunities available to park visitors.

Proposed Facilities

Capital Facilities and Infrastructure

Goal: Develop and maintain the capital facilities and infrastructure necessary to implement the recommendations of the management plan.

The existing facilities of this state park are appropriate to the natural and cultural resources contained in the park and should be maintained. New construction, as discussed further below, is recommended to improve the quality and safety of the recreational opportunities, to improve the protection of park resources, and to streamline the efficiency of park operations. The following is a summary of improvements or new facilities needed to implement the conceptual land use plan for Savannas Preserve State Park:

Objective: Maintain all public and support facilities in the park.

All capital facilities, trails and roads within the park will be kept in proper condition through the daily or regular work of park staff and/or contracted help.

Objective: Improve/repair 10 existing facilities and 0.75 miles of road.

Major repair projects for park facilities may be accomplished within the ten-year term of this management plan, if funding is made available. These include the modification of existing park facilities to bring them into compliance with the Americans with Disabilities Act (a top priority for all facilities maintained by DRP). The following discussion of other recommended improvements and repairs are organized by use area within the park.

Jensen Beach Day Use Area
The addition to picnic-related facilities, a playground with an accessible path from the picnic pavilion and parking area is recommended. Trail counters should be installed to capture East Coast Greenway users and picnic area users to contribute to the park visitation counts.

Education Center Area
An observation deck should be constructed to connect to the existing shared-use trail. The observation deck will provide viewsheds of the basin marsh and flatwoods.

Hawk's Bluff Trailhead
Minor modifications. will be made to ensure public safety and the protection of the surrounding sensitive habitat from major disturbances.

Savannas Canoe Launch Day Use Area
Erosion control measures are proposed at the informal launch area. An interpretive kiosk should also be installed in this area to provide information on the area's significant geology.

Scenic Park Drive Trailhead
Landscape improvements are proposed at the Scenic Park Drive Trailhead. These improvements should include adding grass, removing gravel, linking to the adjacent East Coast Greenway, and adding a vegetative buffer. Additionally, parking area improvements should be implemented to better serve park visitors.

Macquillen Trailhead
A connection to the East Coast Greenway is proposed at the northern terminus of Silver Oak Drive which will include a small permeable parking area along with additional signage and a kiosk.

Evans Creek Canoe Launch Day Use Area
Trails and boardwalks, a picnic pavilion, and restroom facility are proposed to be placed alongside the existing facilities at the Evans Creek Day Use Area off South Federal Highway.

Miller-Wild Property
To the north, at the Miller-Wild Property, fencing should be upgraded along the property boundary. In addition, a bench will be added at the existing canoe/kayak launch.

Support Areas
A 2-bay pole barn is proposed at the Macquillen Residence Area off Macquillen Road. Likewise, a 4-bay pole barn will replace an existing structure at the main shop area of the park. The French house north of the shop area should be removed, and an asbestos survey should be conducted as needed.

Parkwide
Signage throughout the park should be upgraded to clarify that all property is managed as Savannas Preserve State Park. Signs should be installed at different access points to illustrate a visitor's location within the park. Trailheads should include an overview map of the entire park with detail for the specific use area. Ways to connect the Savannas portion of the park to the North Fork of the St. Lucie River should also be considered through existing regional trails nearby.

Coin-operated viewers should be installed at various overlooks and observation platforms in the park to enhance visitor opportunities to view the park's resources.

The .75 miles of the road running from the education center area to the canoe/kayak launch and trailhead should be stabilized. Low-water crossings should be constructed along the trails, rather than boardwalks, where flooding is an issue. Illegal access by ATVs is an issue and opportunities to limit intrusion should be studied.

Objective: Construct 2 new facilities and 7.5 miles of trail and a 16-mile Paddling Trail.

Green River Parkway Trailhead
The trailhead should have signage directing visitors to the trail from Green River Parkway into the park trail network at the East Coast Greenway bridge (north of Jensen Beach Boulevard). Improving or constructing fencing along the parkway will also help clarify parking areas. An honor box should also be installed in this use area.

Leonard Road Trailhead and Trail
A new trailhead is proposed at Lennard Road to provide a trail connection to the East Coast Greenway. This will allow the park to function as a stopover for cyclists along the regional trail. The trail connection should be a multi-use unpaved trail that will follow the cleared fire-line to the Macquillen Trailhead. The trailhead will also provide an honor box, parking area, small picnic pavilion, and an interpretive kiosk.

Parkwide
A shared use trail is proposed along the western edge of the Savannas property from the Education Center Area to the Jensen Beach Day Use Area. The trail will be about 6.5 miles and allow hiking and biking. A trail connection to the East Coast Greenway should also be constructed from the Jensen Beach Day Use Area to the western park boundary where the greenway runs. Trail surface materials should be applied in a context appropriate manner. In higher use areas, at intersections, and adjacent to park day use facilities, asphalt or concrete is recommended. When the proposed trail is located further away from park facilities, intersections, and other high use areas, permeable pavement is recommended to reduce hydrological impacts.

In addition, a 16-mile paddling trail along the North Fork of the St. Lucie River in partnership with the North Fork St. Lucie River Aquatic Preserve, St. Lucie County Environmental Resources Division, and other relevant agencies, is proposed.

Facilities Development

Preliminary cost estimates for these recommended facilities and improvements are provided in the Ten-Year Implementation Schedule and Cost Estimates (Table 7) located in the Implementation Component of this plan. These cost estimates are based on the most cost-effective construction standards available at this time. The preliminary estimates are provided to assist DRP in budgeting future park improvements, and may be revised as more information is collected through the planning and design processes. New facilities and improvements to existing facilities recommended by the plan include:

Recreational Facilities

Macquillen Trailhead
Trail connection to East Coast Greenway
Parking area
Kiosk/signage

Education Center Area
Observation Deck

Leonard Road Trailhead
Kiosk/signage
Honor box
Picnic pavilion
Parking Area
Trail connection to East Coast Greenway

Green River Parkway Trailhead
Fencing
Parking
Kiosk/signage
Honor box

Scenic Park Drive Trailhead
Parking area improvements
Landscape Improvements
Trail connection to East Coast Greenway

Hawk's Bluff Trailhead
Minor Accessibility Improvements

Miller-Wild Property
Replace/add boundary fencing
Bench at canoe/kayak landing

Savannas Canoe Launch Day Use Area
Erosion control measures
Kiosk

Jensen Beach Day Use Area
Playground
Grills
Accessibility improvements
Trail counters

Parkwide
Kiosk/signage
Fencing
Coin-operated viewers
Low-water crossings
Road stabilization (0.75 miles)
Observation platform
North Fork Paddling Trail (16 miles)
Shared Use Trail (6.5 miles)

Evans Creek Canoe Launch Day Use Area
Hiking Trail/Boardwalk
Picnic Pavilion
Restrooms

Support Facilities

Shop/Residence Area
4-bay equipment shelter
Remove French House

Macquillen Residence Area
2-bay equipment shelter

Recreational Carrying Capacity

Carrying capacity is an estimate of the number of users a recreation resource or facility can accommodate and still provide a high quality recreational experience and preserve the natural values of the site. The carrying capacity of a unit is determined by identifying the land and water requirements for each recreation activity at the unit, and then applying these requirements to the unit's land and water base. Next, guidelines are applied which estimate the physical capacity of the unit's natural communities to withstand recreational uses without significant degradation. This analysis identifies a range within which the carrying capacity most appropriate to the specific activity, the activity site and the unit's classification is selected (see Table 6).

The recreational carrying capacity for this park is a preliminary estimate of the number of users the unit could accommodate after the current conceptual development program has been implemented. When developed, the proposed new facilities would approximately increase the unit's carrying capacity as shown in Table 6.

Table 7. Recreational Carrying Capacity

	Existing Capacity*		Proposed Additional Capacity		Estimated Recreational Capacity	
Activity / Facility	**One Time**	**Daily**	**One Time**	**Daily**	**One Time**	**Daily**
Trails						
Shared Use (Paved)	2	8	2	8	4	16
Shared Use (Unpaved)	175	700	17	68	192	768
Hiking	29	115	0	0	29	115
Picnicking	68	136	43	86	68	136
Paddling	80	160	10	20	90	180
Education Center	360	1,440	0	0	360	1,440
TOTAL	**714**	**2,559**	**72**	**182**	**743**	**2,655**

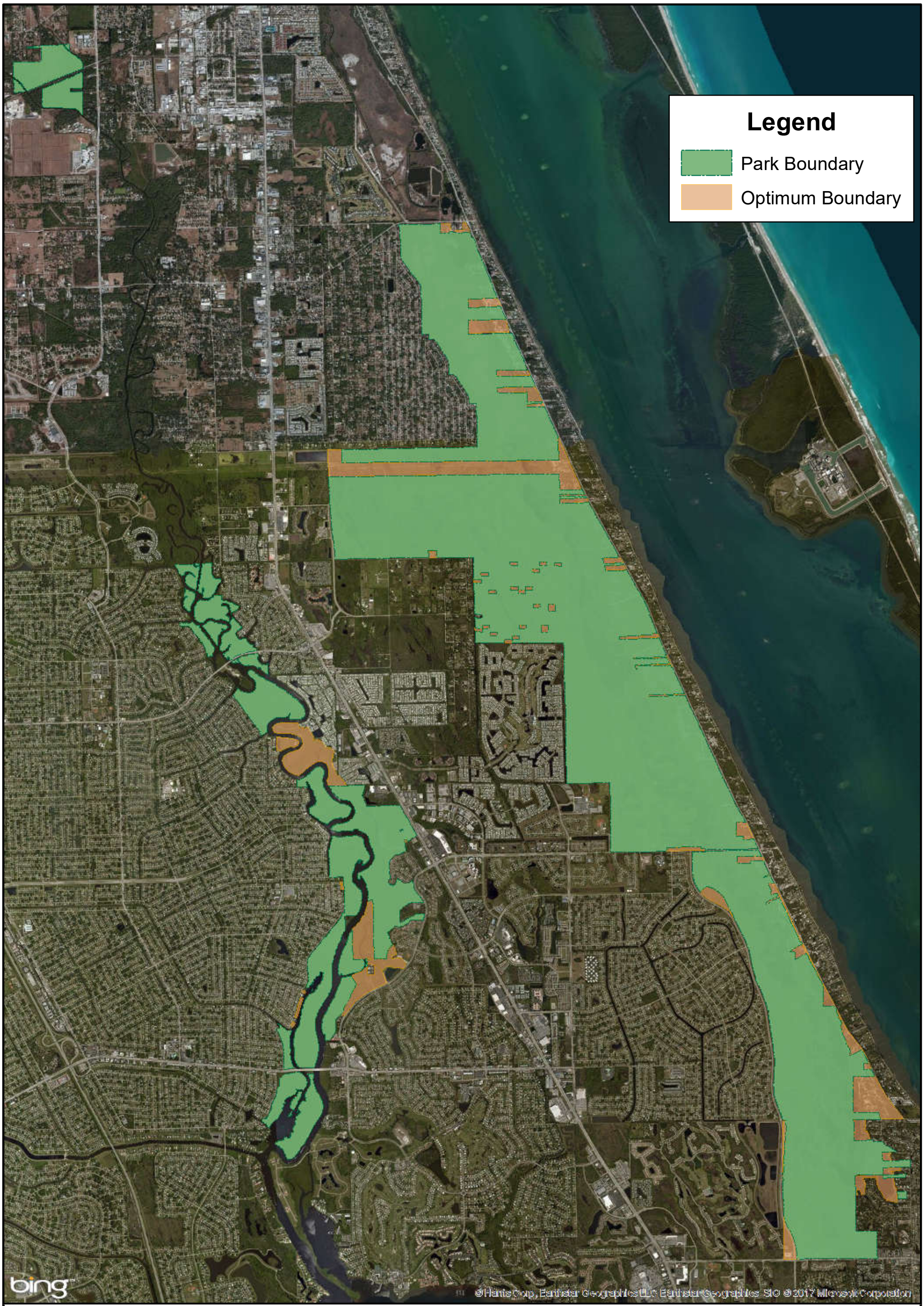
*Existing capacity revised from approved plan according to DRP guidelines.

Optimum Boundary

The optimum boundary map reflects lands considered desirable for direct management by the DRP as part of the state park. These parcels may include public or privately-owned land that would improve the continuity of existing parklands, provide the most efficient boundary configuration, improve access to the park, provide additional natural and cultural resource protection or allow for future expansion of recreational activities. Parklands that are potentially surplus to the management needs of DRP are also identified. As additional needs are identified through park use, development, and research, and as land use changes on adjacent property, modification of the park's optimum boundary may be necessary.

Identification of parcels on the optimum boundary map is intended solely for planning purposes. It is not to be used in connection with any regulatory purposes. Any party or governmental entity should not use a property's identification on the optimum boundary map to reduce or restrict the lawful rights of private landowners. Identification on the map does not empower or suggest that any government entity should impose additional or more restrictive environmental land use or zoning regulations. Identification should not be used as the basis for permit denial or the imposition of permit conditions.

Sixty-two parcels, totaling 825 acres, are identified within the optimum boundary. Eleven parcels near the North Fork property contribute 212 acres. Property near Savannas proper contain the remaining 613 acres. Acquisition of these parcels would provide opportunities to expand recreational opportunities and allow park staff to manage these areas as part of the larger park property. The addition of these properties also facilitates the land management efforts to conserve and protect water quality in the area.



SAVANNAS PRESERVE
STATE PARK

N

0 0.25 0.5 1 Mile

Florida Department of Environmental Protection
Division of Recreation and Parks
Date of aerial; 2011

OPTIMUM BOUNDARY MAP

IMPLEMENTATION COMPONENT

The resource management and land use components of this management plan provide a thorough inventory of the park's natural, cultural and recreational resources. They outline the park's management needs and problems, and recommend both short and long-term objectives and actions to meet those needs. The implementation component addresses the administrative goal for the park and reports on the Division of Recreation and Parks (DRP) progress toward achieving resource management, operational and capital improvement goals and objectives since approval of the previous management plan for this park. This component also compiles the management goals, objectives and actions expressed in the separate parts of this management plan for easy review. Estimated costs for the ten-year period of this plan are provided for each action and objective, and the costs are summarized under standard categories of land management activities.

MANAGEMENT PROGRESS

Since the approval of the last management plan for Savannas Preserve State Park in 2003, significant work has been accomplished and progress made towards meeting the DRP's management objectives for the park. These accomplishments fall within three of the five general categories that encompass the mission of the park and the DRP.

Acquisition

- The park has acquired some donations from private companies owning in-parcels of the park. There is also the potential of additional acquisition through mitigation work.

Park Administration and Operations

- The park has worked closely with municipal partners in the development and implementation of road signage, parking, and accessibility.
- The park has secured over $125,000 for new or replacement equipment for safer, more efficient operations.
- The park has expanded its relationship with the Citizen Support Organization (CSO), creating a subgroup called "Junior Friends of Savannas." This group has created and held two events on its own and is leading the future of the CSO.
- The park and CSO have partnered with the Friends of Florida State Parks (statewide CSO) to secure a grant helping to fund new educational displays on the St. Lucie River.
- The park has worked closely with the City of Port St. Lucie to develop mitigation projects to offset the impact of a bridge crossing through the park. These projects will include $2 million for an expansion of the Education Center, walkway, canoe/kayak launch, road, and picnic facilities in the park as well as the addition of 110 acres distributed across the property to increase connectivity of environmentally sensitive lands.

- The park has provided guidance to the environmental impacts of a planned high speed rail project on the rail corridor that runs just east of the park's eastern boundary.

Resource Management

Natural Resources

- Exotic animal removal, including the removal of feral hogs, has been ongoing in the park since 2003. Removal efforts utilized staff resources and contracted sources from the United States Department of Agriculture. Removal efforts have averaged 150 feral hogs annually. These efforts have reduced negative impacts to the park's natural resources.
- Exotic plant removal has been ongoing in most areas of the park since the last unit management plan update. 13 major contracts have been funded treating approximately 2,300 gross acres of exotic category I/II species during the last ten years. Funding sources included FWC, DEP, and SFWMD.
- More than 5,000 native wetland trees and plants were planted in basin marsh and marsh lake natural communities to assist with restoration efforts across the park. Funding and contract work have been provided by FWC. This work will enhance these natural communities and improve the performance of fisheries located throughout the park.
- Three hydrological restoration activities have occurred since the last unit management plan update. The first project consisted of restoring man-made depressions to natural elevations and restoring 14 acres of wet prairie and depression marsh with native plantings and conducting exotic vegetation removal. The other projects enhanced two depression marsh areas and one wet prairie area on the scrub ridge, which enhanced 13 acres of wetland communities and restored natural hydrological flow to one of these wetland sites.
- A 7-acre restoration project was conducted and completed in 2010. This project reconnected a historic river oxbow to the main channel of the North Fork of the St. Lucie River at the northern end of the park. The project rehydrated a large section of the North Fork of the St. Lucie River's floodplain in this area, enhancing habitat and increasing the productivity of fisheries. This projected was funded by FWC with joint efforts from DEP.
- Ten acres of native scrub habitat were improved utilizing funding from DEP. The project removed exotic plant species infestations as well as abandoned structures and trash left on site from prior habitation. The project benefited multiple listed species in the area, including the Florida scrub-jay and prickly apple cactus.
- Prescribed burning has continued in the park during the last ten years and has seen a steady increase. Over 3,700 acres of prescribed burning has been conducted as a resource management tool during the last ten years. Savannas Preserve State Park has averaged 375 acres burned per year over this ten-year term and has seen a significant increase in acres burned in the last few years.
- Mechanical fuel reduction utilizing roller chopping or mowing of 100 acres of pine flatwoods and 50 acres or scrub habitat has occurred in the last ten

years, assisting with habitat restoration in combination with prescribed fire application.

- 5.5 miles of urban interface fuels were either chopped or mowed using heavy equipment utilizing funds and cooperative work provided through FFS and DEP.
- Approximately 18 miles of perimeter fire lines were installed along the park boundaries easing fire operation and protecting the Wildland Urban Interface against wildfires. These fire line installations were done utilizing park staff, park expenses, and a USFWS grant.
- An ongoing study and cooperative effort between Bok Tower Gardens and Savannas Preserve State Park to save the endangered Savannas mint (*Dicerandra immaculata* var. *savvanarum*) was initiated on park property. The effort used federal funding to propagate plants from the original germplasm remaining on the original unprotected sites. Plants were propagated and grown at Bok Historical Garden, researched and catalogued, then planted on two sites at Savannas Preserve State Park. Plantings augmenting the current experimental population have occurred every year since June 2006. Currently over 2,500 individual plants have been planted with a high success rate.
- A small experimental population of prickly-apple cactus (*Harissia fragrans*) was planted on park property utilizing plants propagated in the park shade house. Ongoing research is being done on their survival and health.
- Ongoing research is being done on natural populations of three endangered plants in the park; four-petaled paw-paw (*Asimina tetramera*), prickly-apple cactus, and Savannas mint.
- A SFWMD study was initiated in 2009 to provide initial taxonomic support on identification of floodplain vegetation communities, prepare an inventory list of plants to be encountered, and to provide a reference herbarium collection.

Cultural Resources

- Additional research has provided a more accurate record of locations of cultural resource sites within the park. Further literature review by park staff and volunteers has contributed to our understanding of the pineapple plantations from the turn of the century.
- Work has been done at the Education Center to interpret the cultural resources at the park, and an in-depth collections survey was conducted to maintain an accurate resource inventory.

Recreation and Visitor Services

- The park has seen an increase in visitation most years by 10%.
- The Education Center has reached over 13,000 students per school year by providing over 300 interpretive programs.
- Public access has been significantly improved by adding over 15 miles of trails across the park.
- The park has worked to improve Americans with Disabilities Act (ADA) accessibility by improving parking areas and sidewalks at day use facilities.
- The park holds at least three public events each year.

- The park partnered with Martin County on the installation of over ¼ mile of a paved East Coast Greenway connector trail. This trail is expected to continue to significantly increase park visitation.

Park Facilities

- The park has replaced and repaired structures that were damaged during numerous hurricanes that occurred between 2003 and 2005.
- The park has made modifications to facilities to enhance compliance with the ADA, thus increasing the accessibility of the park's facilities and use areas.
- The park has worked on renovation of current facilities including roof replacements and preventive maintenance measures.
- The park has renovated a shed into an overnight bunkhouse for working crews such as AmeriCorps, fire crews, and exotic plant removal crews.
- New fencing has been installed at all day use locations providing for better security and visual uniformity.
- The park has worked with the City of Port St. Lucie on the following projects to be provided as mitigation for the proposed Crosstown Parkway Bridge:
    - The design of an addition to the Education Center, with a sidewalk to an observation deck and new parking;
    - A new day use facility and canoe/kayak launch.

MANAGEMENT PLAN IMPLEMENTATION

This management plan is written for a timeframe of ten years, as required by Section 253.034 Florida Statutes. The Ten-Year Implementation Schedule and Cost Estimates (Table 7) summarizes the management goals, objectives and actions that are recommended for implementation over this period, and beyond. Measures are identified for assessing progress toward completing each objective and action. A time frame for completing each objective and action is provided. Preliminary cost estimates for each action are provided and the estimated total costs to complete each objective are computed. Finally, all costs are consolidated under the following five standard land management categories: Resource Management, Administration and Support, Capital Improvements, Recreation Visitor Services and Law Enforcement.

Many of the actions identified in the plan can be implemented using existing staff and funding. However, several continuing activities and new activities with measurable quantity targets and projected completion dates are identified that cannot be completed during the life of this plan unless additional resources for these purposes are provided. The plan's recommended actions, time frames and cost estimates will guide the DRP's planning and budgeting activities over the period of this plan. It must be noted that these recommendations are based on the information that exists at the time the plan was prepared. A high degree of adaptability and flexibility must be built into this process to ensure that the DRP can adjust to changes in the availability of funds, improved understanding of the park's natural and cultural resources, and changes in statewide land management issues, priorities and policies.

Statewide priorities for all aspects of land management are evaluated each year as part of the process for developing the DRP's annual legislative budget requests. When preparing these annual requests, the DRP considers the needs and priorities of the entire state park system and the projected availability of funding from all sources during the upcoming fiscal year. In addition to annual legislative appropriations, the DRP pursues supplemental sources of funds and staff resources wherever possible, including grants, volunteers and partnerships with other entities. The DRP's ability to accomplish the specific actions identified in the plan will be determined largely by the availability of funds and staff for these purposes, which may vary from year to year. Consequently, the target schedules and estimated costs identified in Table 7 may need to be adjusted during the ten-year management planning cycle.

Table 8
Savannas Preserve State Park Ten-Year Implementation Schedule
and Cost Estimates Sheet 1 of 5

DRAFT

NOTE: THE DIVISION'S ABILITY TO COMPLETE THE OBJECTIVES OUTLINED BY THE MANAGEMENT PLAN IS CONTINGENT ON THE AVAILABILITY OF FUNDING AND OTHER RESOURCES FOR THESE PURPOSES.

Goal I: Provide administrative support for all park functions.		**Measure**	**Planning Period**	**Estimated Manpower and Expense Cost* (10-years)**
Objective A	**Continue day-to-day administrative support at current levels.**	**Administrative support ongoing**	**C**	**$430,000**
Objective B	**Expand administrative support as new lands are acquired, new facilities are developed, or as other needs arise.**	**Administrative support expanded**	**C**	**$30,000**
Goal II: Protect water quality and quantity in the park, restore hydrology to the extent feasible, and maintain the restored condition.		**Measure**	**Planning Period**	**Estimated Manpower and Expense Cost* (10-years)**
Objective A	**Conduct/obtain an assessment of the park's hydrological needs.**	**Assessment conducted**	**LT**	**$18,000**
Action 1	Inventory canals and ditches and develop a restoration plan for identified areas within the park.	Inventory completed and plan developed	LT	$8,000
Action 2	Continue to assist FCO in updating the hydrological needs of the North Fork St. Lucie River Aquatic Preserve.	Assistance provided	C	$10,000
Objective B	**Restore natural hydrological conditions and function to approximately 400 acres of pine flatwoods, wet prairie, depression marsh, and basin marsh natural communities.**	**# Acres restored or with restoration underway**	**UFN**	**$50,000**
Action 1	Attain permits and fill or plug one mile of drainage ditches.	# Miles of ditches filled	UFN	$35,000
Action 2	Attain permits and install two culverts or low water corssings to restore natural sheet flows.	# Crossings/culverts installed	UFN	$15,000
Objective C	**Monitor and analyze water resources in the park.**	**Water Resources Monitored**	**C**	**$10,000**
Action 1	Cooperate with SFWMD and Martin County to monitor data from groundwater stations in the park.	Monitoring data reviewed	LT	$8,000
Action 2	Continue to monitor and comment on regional groundwater withdrawal changes that will impact the park.	Monitoring data reviewed	LT	$2,000
Objective D	**Monitor improvement to stormwater drainage enhancements around Indian River Estates.**	**Stormwater enhancements monitored**	**LT**	**$12,000**
Action 1	Cooperate with SFWMD and St. Lucie County in continued enhancements to alleviate direct stormwater drainage impacts in the park for Indian River Estates.	Project completion/ H20 quality monitoring	LT	$2,000
Action 2	Comment on all water quality and quantity issues entering the Savannas Preserve basin marsh.	Coopertative commenting	LT	$10,000
Objective E	**Monitor quality and quantity of water entering the North Fork of the St. Lucie River.**	**Cooperative meetings attended**	**C**	**15,000**
Action 1	Comment on all water quality and quantity issues entering the North Fork of the St. Lucie River.	Coopertative commenting	C	$10,000
Action 2	Partner with other agencies to ensure that the water quality and quantity entering the park is maintained at acceptable levels.	Assistance provided	LT	$5,000

* 2011 Dollars
ST = actions within 2 years
LT = actions within 10 years
C = long term or short term actions that are continuous or cyclical
UFN = currently unfunded need

Table 8
Savannas Preserve State Park Ten-Year Implementation Schedule
and Cost Estimates Sheet 2 of 5

NOTE: THE DIVISION'S ABILITY TO COMPLETE THE OBJECTIVES OUTLINED BY THE MANAGEMENT PLAN IS CONTINGENT ON THE AVAILABILITY OF FUNDING AND OTHER RESOURCES FOR THESE PURPOSES.

Goal III: Restore and maintain the natural communities/habitats of the park.		**Measure**	**Planning Period**	**Estimated Manpower and Expense Cost* (10-years)**
Objective A	**Within 10 years, have 2,443 acres of the park maintained within optimal fire return interval.**	**# Acres within fire return interval target**	**LT**	**$1,238,000**
Action 1	Develop/update annual burn plan.	Plan updated	C	$16,000
Action 2	Manage fire dependent communities for ecosystem function, structure and processes by burning 722 - 2,412 acres annually, as identified by the annual burn plan.	Average # acres burned annually	C	$1,206,000
Action 3	Continue working with Florida Forest Service to burn management zones which contain privately-owned parcels.	# Acres within outparcels burned	LT	$16,000
Objective B	**Conduct habitat/natural community restoration activities on 324 acres of mangrove swamp, floodplain swamp, floodplain marsh, and hydric hammock communities.**	**# Acres restored or with restoration underway**	**LT**	**$65,000**
Action 1	Support and assist oxbow and floodplain reconnection projects along the North Fork St. Lucie Aquatic Preserve that cross within the park.	# Projects completed.	ST	$10,000
Action 2	Work with FCO in developing/updating any site-specific restoration plans for oxbow reconnections or floodplain enhancements on DRP lands	Plan developed/updated	ST	$15,000
Action 2	Implement habitat restoration plan.	# Acres with restoration underway	LT	$40,000
Objective C	**Conduct habitat/natural community improvement activities on 10 acres of sand pine scrub community.**	**# Acres improved or with improvements underway**	**LT**	**$21,400**
Action 1	Continue efforts to eradicate existing and incoming exotic plant species on this 10-acre site.	# Acres on which exotic plans eradicated	LT	$6,400
Action 2	Continue restoration planting to enhance scrub plant species in this area.	# Acres planted	LT	$15,000
Objective D	**Conduct habitat/natural community improvement activities involving mechanical treatment on 100 acres of sand pine scrub and pine flatwoods communities to augment the park's burn program results.**	**# Acres improved or with improvements underway**	**LT**	**$175,000**
Action 1	Continue mechanical treatment on heavy fuel loading sites, focusing on urban interface areas.	# Acres treated mechanically	LT	$175,000

* 2011 Dollars
ST = actions within 2 years
LT = actions within 10 years
C = long term or short term actions that are continuous or cyclical
UFN = currently unfunded need

Table 8
Savannas Preserve State Park Ten-Year Implementation Schedule
and Cost Estimates Sheet 3 of 5

NOTE: THE DIVISION'S ABILITY TO COMPLETE THE OBJECTIVES OUTLINED BY THE MANAGEMENT PLAN IS CONTINGENT ON THE AVAILABILITY OF FUNDING AND OTHER RESOURCES FOR THESE PURPOSES.				
Goal IV: Maintain, improve or restore imperiled species populations and habitats in the park.		**Measure**	**Planning Period**	**Estimated Manpower and Expense Cost* (10-years)**
Objective A	**Update baseline imperiled species occurrence inventory lists for plants and animals, as needed.**	**List updated**	**C**	**$5,000**
Action 1	Update imperiled species inventory.	List updated	ST	$5,000
Objective B	**Monitor and document 6 selected imperiled animal species in the park.**	**# Species monitored**	**C**	**$85,000**
Action 1	Implement monitoring protocols for 6 imperiled animal species.	# Species monitored	ST	$10,000
Action 2	Implement scrub-jay-specific activities, including snag management and jaywatch surveys.	# Actvities conducted	C	$45,000
Action 3	Survey/monitor gopher tortoise population and determine need for augmentation.	Survey completed; plan developed	ST	$10,000
Action 4	Monitor effects of prescribed burning on natural communities that support imperiled species.	Evaluation completed	LT	$10,000
Action 5	Continue to monitor nesting activities of wood storks and other designated bird species in the park.	# Monitoring activities	LT	$10,000
Objective C	**Monitor and document 4 selected imperiled plant species in the park.**	**# Species monitored**	**C**	**$60,000**
Action 1	Develop monitoring protocols for 2 select imperiled plant species including Prickly apple cactus.	# Protocols developed	ST	$5,000
Action 2	Implement monitoring protocols for 4 imperiled plant species including Prickly apple cactus, Four Petaled paw-paw, Tiny Milkwort, and Savannas Mint.	# Species monitored	C	$40,000
Action 3	Support continued research and monitoring on population demographics of the fragrant prickly apple cactus.	# Research and monitoring activities conducted	LT	$5,000
Action 4	Monitor diceranda to determine survival in coordination with Bok Tower Gardens.	# Monitoring activities	LT	$10,000
Goal V: Remove exotic and invasive plants and animals from the park and conduct needed maintenance-control.		**Measure**	**Planning Period**	**Estimated Manpower and Expense Cost* (10-years)**
Objective A	**Annually treat 150 acres of exotic plant species in the park.**	**# Acres treated**	**C**	**$1,016,000**
Action 1	Annually develop/update exotic plant management work plan.	Plan developed/updated	C	$16,000
Action 2	Implement annual work plan by treating 150 acres in park, annually, and continuing maintenance and follow-up treatments, as needed.	Plan implemented	C	$1,000,000
Objective B	**Implement control measures on 6 exotic animal species in the park.**	**# Species for which control measures implemented**	**C**	**$125,000**
Action 1	Continue removal of feral cats and dogs to county animal control facility, concentrating along park boundaries.	# Animals removed	C	$25,000
Action 2	Continue removal of other exotic species, including feral hogs, nine-banded armadillos, coyote, and iguanas.	# Animals removed	C	$100,000

* 2011 Dollars
ST = actions within 2 years
LT = actions within 10 years
C = long term or short term actions that are continuous or cyclical
UFN = currently unfunded need

Table 8
Savannas Preserve State Park Ten-Year Implementation Schedule
and Cost Estimates Sheet 4 of 5

NOTE: THE DIVISION'S ABILITY TO COMPLETE THE OBJECTIVES OUTLINED BY THE MANAGEMENT PLAN IS CONTINGENT ON THE AVAILABILITY OF FUNDING AND OTHER RESOURCES FOR THESE PURPOSES.

Goal VI: Protect, preserve and maintain the cultural resources of the park.		**Measure**	**Planning Period**	**Estimated Manpower and Expense Cost* (10-years)**
Objective A	**Assess and evaluate 4 of 6 recorded cultural resources in the park.**	**Documentation complete**	**LT**	**$2,000**
Action 1	Complete 4 assessments/evaluations of archaeological sites. Prioritize preservation and stabilization projects.	Assessments complete	ST	$2,000
Objective B	**Compile reliable documentation for all recorded historic and archaeological sites.**	**Documentation complete**	**LT**	**$38,600**
Action 1	Ensure all known sites are recorded or updated in the Florida Master Site File.	# Sites recorded or updated	ST	$4,000
Action 2	Complete a predictive model for high, medium and low probability of locating archaeological sites within the park.	Probability Map completed	ST	$25,000
Action 3	Develop and adopt a Scope of Collections Statement.	Document completed	ST	$2,300
Action 4	Conduct oral history interviews.	Interviews complete	LT	$3,600
Action 5	Compile a park administrative history.	Report completed	ST	$3,700
Objective C	**Bring 4 of 6 recorded cultural resources into good condition.**	**# Sites in good condition**	**LT**	**$6,000**
Action 1	Design and implement regular monitoring programs for 6 cultural sites	# Sites monitored	C	$4,000
Action 2	Create and implement a cyclical maintenance program for each cultural resource.	Programs implemented	C	$1,000
Action 3	Monitor Edenlawn outbuildings and tennis court for disturbance.	Site monitored	LT	$1,000

Goal VII: Provide public access and recreational opportunities in the park.		**Measure**	**Planning Period**	**Estimated Manpower and Expense Cost* (10-years)**
Objective A	**Maintain the park's current recreational carrying capacity of 2,559 users per day.**	**# Recreation/visitor opportunities per day**	**C**	**$430,000**
Objective B	**Expand the park's recreational carrying capacity by 182 users per day.**	**# Recreation/visitor opportunities per day**	**LT**	**$30,000**
Objective C	**Continue to provide the current repertoire of 43 interpretive, educational and recreational programs on a regular basis.**	**# Interpretive/education programs**	**C**	**$215,000**
Objective D	**Develop 10 new interpretive, educational and recreational programs.**	**# Interpretive/education programs**	**LT**	**$70,000**

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Table 8
Savannas Preserve State Park Ten-Year Implementation Schedule
and Cost Estimates Sheet 5 of 5

NOTE: THE DIVISION'S ABILITY TO COMPLETE THE OBJECTIVES OUTLINED BY THE MANAGEMENT PLAN IS CONTINGENT ON THE AVAILABILITY OF FUNDING AND OTHER RESOURCES FOR THESE PURPOSES.				
Goal VIII: Develop and maintain the capital facilities and infrastructure necessary to meet the goals and objectives of this management plan.		**Measure**	**Planning Period**	**Estimated Manpower and Expense Cost* (10-years)**
Objective A	**Maintain all public and support facilities in the park.**	**Facilities maintained**	**C**	**$1,714,000**
Objective B	**Continue to implement the park's transition plan to ensure facilities are accessible in accordance with the American with Disabilities Act of 1990.**	**Plan implemented**	**LT**	**$10,000**
Objective C	**Improve and/or repair 7 existing facilites and 0.75 miles of trail as identified in the Land Use Component.**	**# Facilities/Miles of Trail/Miles of Road**	**LT**	**$3,220,000**
Objective D	**Construct 2 new facilities and 6.5 miles of trail as identified in the Land Use Component.**	**# Facilities/Miles of Trail/Miles of Road**	**LT**	**$200,000**
Objective E	**Expand maintenance activities as existing facilities are improved and new facilities are developed.**	**Facilities maintained**	**C**	**$122,000**
Summary of Estimated Costs				
	Management Categories			**Total Estimated Manpower and Expense Cost* (10-years)**
	Resource Management			**$2,942,000**
	Administration and Support			**$460,000**
	Capital Improvements			**$3,430,000**
	Recreation Visitor Services			**$2,581,000**
	Law Enforcement Activities[1]			
		1Law enforcement activities in Florida State Parks are conducted by the DEP Division of Law Enforcement and by local law enforcement agencies.		

* 2011 Dollars
ST = actions within 2 years
LT = actions within 10 years
C = long term or short term actions that are continuous or cyclical
UFN = currently unfunded need

Addendum 1—Acquisition History

Purpose of Acquisition:

The Board of Trustees of the Internal Improvement Fund (Trustees) of the State of Florida acquired the Savannas portion of Savannas Preserve State Park primarily as an "environmentally endangered land." An environmentally endangered land is any land area and related water resources that may be determined to contain naturally occurring and relatively unaltered flora, fauna or geologic conditions and whose interdependent biophysical components including historical and archaeological resources that might be essentially preserved intact by acquisition. The North Fork portion of Savannas Preserve State Park was acquired as a buffer preserve to (1) protect water quality in the North Fork of the St. Lucie River, (2) protect the river corridor and several rare and threatened plant and animal species in this area from rapid population growth, and (3) enhance public recreational opportunities by providing the residents and visitors to the City of Port St. Lucie and surrounding area with a place to enjoy boating, paddling, fishing, hiking, camping, and picnicking.

Sequence of Acquisition:

The initial acquisition of Savannas Preserve State Park took place on April 25, 1977, when the Trustees obtained title to a 9.85-acre property in St. Lucie County. The property was purchased from W. B. Tilton and his wife Anita R. Tilton. This purchase was funded under the Environmentally Endangered Land (EEL) program.

Since the 1977 initial purchase, the Trustees acquired several parcels through purchases under the state's different land acquisition programs such as Land Acquisition Trust Fund (LATF), Conservation and Recreation Lands (CARL), Preservation 2000 (P2000) and Florida Forever and through a donation and added these newly-acquired parcels to Savannas Preserve State Park.

The Trustees do not have 100% title interest in the whole North Fork property. The total area of this portion of the park is 1,261 acres. Out of this total area, the Trustees have 100% undivided title interest in about 1,020 acres. The Trustees hold only 50% undivided title interest in the remaining 241 acres, and the remaining 50% undivided interest is held by the South Florida Water Management District (SFWMD).

The Trustees purchased approximately 1,020 acres on December 28, 1994 as the initial area of North Fork St. Lucie River State Buffer Preserve (now the North Fork portion of Savannas Preserve State Park). The Trustees purchased the property from the City of Port St. Lucie.

The Trustees and SFWMD made their first joint acquisition related to the North Fork portion on February 12, 1999, when they purchased approximately a 36-acre property from Terrain Developers Corporation. Since this initial purchase, the parties jointly acquired several parcels and added them to the North Fork portion of the park. The current area of this joint ownership is approximately 241 acres.

Title Interest:

The Trustees and SFWMD hold fee simple title to Savannas Preserve State Park.

Lease Agreement:

The State of Florida Department of Environmental Protection, Division of Recreation and Parks (DRP) manages Savannas Preserve State Park under three different leases: Lease No. 3996, the lease for the Savannas portion; Lease No. 4178, the lease for the portion of North Fork portion where the Trustees have 100% title interest; and Lease No. 4290, the lease for the portion of North Fork where the Trustees and SFWMD each has 50% undivided title interest.

(1) Lease No. 3996: Lease No. 3996 is for a term of 50 years that became effective on August 18, 1993. This lease will expire on August 18, 2043. According to this lease, the DRP manages Savannas Preserve State Park only for conservation, protection, management and operation of natural and historical resource-based public outdoor recreation which is compatible with the conservation and protection of these public lands.

On June 21, 1984, the Trustees leased Savannas Preserve State Park to DRP and the Florida Game and Fresh Water Fish Commission, predecessor in interest to the Florida Fish and Wildlife Conservation Commission (FWC), under a multiple-agency Lease Agreement No. 745-9002. On June 26, 1988, the Trustees changed Lease No. 745-9002 to Lease No. 3566 without changing any of the terms and conditions of Lease No. 745-9002.

On November 18, 1988, Trustees transferred the management responsibility for Savannas Preserve State Park from the DRP to the Division of State Lands, Bureau of Aquatic Preserves. On February 20, 1989, the DRP released its management leasehold interest in the park by releasing Lease No. 3566.

On July 1, 1993, the DRP resumed its management responsibility of Savannas Preserve State Park under a letter of interim management. On August 18, 1993, the DRP entered into a new 50-year lease agreement, Lease No. 3996, to manage the park.

(2) Lease No. 4178 and Lease No. 4290: Initially both lease agreements were made between the Trustees and the State of Florida Department of Environmental Protection, Bureau of Coastal and Aquatic Managed Areas (CAMA) for the North Fork St. Lucie River State Buffer Preserve. CAMA assigned its leasehold interest to the DRP on December 5, 2003, and the former buffer preserve became part of Savannas Preserve State Park.

(3) Lease No. 4178: Lease No. 4178 is for the portion of the North Fork where the Trustees have 100% undivided title interest. The DRP manages this property under a 50-year lease that became effective on November 19, 1997. This lease is scheduled to expire on November 18, 2047. According to the lease, the DRP manages the North Fork portion only for conservation, protection, management and operation of natural and historical resource-based public outdoor recreation which is compatible with the conservation and protection of these public lands.

(4) Lease No. 4290: Lease No. 4290 is for the portion of the North Fork that is jointly-owned by the Trustees and the SFWMD. The DRP manages this property under a 50-year lease that became effective on December 12.

2000. The lease will expire on December 11, 2050. According to this lease, the DRP manages this portion of the North Fork only for conservation, protection, management and operation of natural and historical resource-based public outdoor recreation which is compatible with the conservation and protection of these public lands.

(5) Changing Management Objectives of Lease No. 4178 and 4290 and Designation: As stated earlier, one of the primary purposes of acquiring the North Fork portion was to protect water quality in North Fork St. Lucie River. For this reason, the property was initially acquired to be managed by CAMA as a buffer preserve. At present, the DRP is managing the property as part of Savannas Preserve State Park.

Special Conditions on Use:

Savannas Preserve State Park is designated as a single-use property to provide resource-based public outdoor recreation and park related uses. Uses such as water resource development projects, water supply projects, storm-water management projects, and linear facilities and sustainable agriculture and forestry are not consistent with the purpose for which DRP manages the park.

Outstanding Reservations:

The DRP's lease from Trustees stipulates that all the property be used for public outdoor recreation and related purposes. The following is a list of outstanding rights, reservations and encumbrances that apply to Savannas Preserve State Park.

Type of Instrument	Easement, Easement No. 31530
Grantor:	Trustees
Grantee:	City of Port St. Lucie, Florida
Beginning Date:	June 8, 2006
Ending Date:	As long as the easement is used and maintained for an underground utility line.
Outstanding Rights:	This easement allows the City to use the subject area for an underground utility line.

Type of Instrument:	Warranty Deed
Grantors:	Carl E. Wild et al.
Grantee:	Trustees
Beginning Date:	March 19, 2003
Ending Date:	Perpetuity
Outstanding Rights:	This deed is subject to a perpetual non-exclusive easement for ingress and egress over and across a certain portion of the subject deed.

Type of Instrument:	Easement, Easement No. 30871
Grantor:	Trustees

Grantee: ..... Florida Power & Light Company
Beginning Date: ..... January 25, 2002
Ending Date: ..... Indefinite period of time
Outstanding Rights: ..... This easement allows Florida Power & Light Company to construct, operate and maintain overhead and underground electric facilities.

Type of Instrument: ..... Warranty Deed
Grantor: ..... Mary Louise Ernst Meyer et. al.
Grantee: ..... Trustees
Beginning Date: ..... May 31, 2001
Ending Date: ..... Perpetuity
Outstanding Rights: ..... This deed is subject to easements and rights of ways as recorded in ORB 190, page 2261 of St. Lucie County, Florida.

Type of Instrument: ..... Warranty Deed
Grantor: ..... Clara H. Noguiera
Grantee: ..... Trustees
Beginning Date: ..... May 2, 2000
Ending Date: ..... Forever
Outstanding Rights: ..... This deed is subject to a non-exclusive easement in favor of Florida Power and Light Company for the purpose of construction and maintenance of utility facilities as recorded in ORB 970, page 1891 in St. Lucie County, Florida.

Type of Instrument: ..... Warranty Deed
Grantors: ..... Gregory and Deborah Younkin
Grantee: ..... Trustees
Beginning Date: ..... February 16, 1999
Ending Date: ..... Indefinite period of time
Outstanding Rights: ..... This deed is subject to (1) existing road ingress and ingress as recorded in ORB 675, page 2028, St. Lucie County, and (2) an access easement as recorded in ORB 1054, page 59 in St. Lucie County.

Type of Instrument: ..... Warranty Deed
Grantors: ..... Grant and Sheryle Williams
Grantee: ..... Trustees
Beginning Date: ..... June 24, 1998
Ending Date: ..... Indefinite period of time
Outstanding Rights: ..... This deed is subject to an easement recorded in ORB 15, page 589, St. Lucie County, Florida.

Type of Instrument: ..... Warranty Deed
Grantors: ..... Maria and Avellino Donascimento.
Grantee: ..... Trustees
Beginning Date: ..... April 4, 1997
Ending Date: ..... perpetuity
Outstanding Rights: ..... This deed is subject to a certain easement for the purposes of road, utility and drainage as recorded in ORB 413, page 1010, St. Lucie County, Florida.

Type of Instrument: ..... Warranty Deed
Grantors: ..... Rita and Herman Kastner
Grantee: ..... Trustees
Beginning Date: ..... May 2, 1997
Ending Date: ..... Indefinite period of time
Outstanding Rights: ..... This deed is subject to a certain easement for the purposes of road, utility and drainage as recorded in ORB 403, page 103, St. Lucie County, Florida.

Type of Instrument: ..... Warranty Deed
Grantor: ..... City of Port St. Lucie
Grantee: ..... Trustees
Beginning Date: ..... February 14, 1994
Ending Date: ..... Perpetuity
Outstanding Rights: ..... This deed is subject to (1) a certain right-of-way recorded in Flat Book 1, page 35, St. Lucie County, Florida, and (2) an easement in favor of American Telephone and Telegraph Company, as recorded in ORB 85, page 373, St. Lucie County, Florida.

Type of Instrument: ..... Warranty Deed
Grantor: ..... Atlantic Gulf Communities Corporation
Grantee: ..... Trustees
Beginning Date: ..... September 20, 1993
Ending Date: ..... In definite period of time
Outstanding Rights: ..... This deed is subject to an easement granted to Florida Power and Light Company dated February 5, 1990, as recorded in ORB 706, Page 2028 St. Lucie County, Florida.

Type of Instrument: ..... Warranty Deed
Grantors: ..... Theresa Kozik, et. al.
Grantee: ..... Trustees
Beginning Date: ..... October 12, 1992
Ending Date: ..... Perpetuity

Outstanding Rights: ..... This deed is subject to a perpetual, non-exclusive easement for ingress and egress over, across and upon a certain portion of the subject property.

Type of Instrument: ..... Warranty Deed
Grantor: ..... The Trust for Public Land
Grantee: ..... Trustees
Beginning Date: ..... October 12, 1992
Ending Date: ..... Perpetuity
Outstanding Reservations: ..... This deed is subject to a reservation in a certain deed in Martin County, Florida, as recorded in Official Deed Book 35, page 268.

Type of Instrument: ..... Warranty Deed
Grantor: ..... Lavaughn Tilton
Grantee: ..... Trustees
Beginning Date: ..... June 3, 1992
Ending Date: ..... Perpetuity
Outstanding Rights: ..... This deed is subject to right-of-way set forth on Plat Book 1, page 35, St. Lucie County, Florida.

Type of Instrument: ..... Warranty Deed
Grantor: ..... Ransom R. Tilton
Grantee: ..... Trustees
Beginning Date: ..... June 3, 1992
Ending Date: ..... Perpetuity
Outstanding Rights: ..... This deed is subject to right of way for Walton Road recorded in St. Lucie County commissioner's minute book 4, page 410.

Type of Instrument: ..... Warranty Deed
Grantor: ..... City of Port St. Lucie
Grantee: ..... Trustees
Beginning Date: ..... September 30, 1992
Ending Date: ..... Forever
Outstanding Rights..... This deed is subject to (1) easements, restrictions and reservations recorded in Plat Book 23, Page 41, St. Lucie County, Florida, (2) reservations contained in certain deed dated 3-7-1984 recorded in BRB 430, page 2983, St. Lucie County, Florida, and (3) a certain easement granted in favor of Florida Power and Light Company recorded in ORB 189, page 2165 St. Lucie County, Florida.

Addendum 2—Advisory Group Members and Report

Elected Officials
The Honorable Gregory Oravec,
Mayor
City of Port St. Lucie

Agency Representatives
Amy Griffin,
Environmental Resources Director
St. Lucie County

Kevin Abbate,
Parks and Recreation Director
Martin County

Chris Vandello, Park Manager
Savannas Preserve State Park

Bess McKinney,
St. Lucie County Soil and Water
Conservation District

Daniel O'Keefe, Chair
South Florida Water Management
District

Trevor Taylor, Senior Forester
Florida Forest Service

Michael Anderson, Regional Biologist
Florida Fish and Wildlife Commission

Percy Griffin, Regional Commander
Florida Fish and Wildlife Commission

Mike Wisenbaker,
Archaeology Supervisor
Division of Historical Resources
Florida Department of State

Tourism / Economic Development Representative
Chris Dzadovsky, Chairman
St. Lucie County Tourism
Development
Council

Environmental Representatives
John Nelson, President
Audubon of Martin County

Shari Anker, President
Conservation Alliance of St. Lucie County

Ryan Smart, President
1000 Friends of Florida

Recreational Representatives
Jim Couillard, Chair
Florida Trail Association – Tropical
Trekkers

Paul Haydt, Florida Coordinator
East Coast Greenway Alliance

Matt Landry, President
Heroes on the Water

Local Private Property Owners
Bruce Wunner, President
Indian River Drive Freeholders Home
Owners Association

Citizen Support Organizations
Paul Salazar, President
Friends of Savannas Preserve State Park

The advisory group meeting to review the proposed unit management plan (UMP) for Savannas Preserve State Park was held at the Savannas Preserve State Park Education Center in Port St. Lucie on Thursday, March 2, 2017, at 9:00 AM.

Mike Middlebrook represented Commissioner Chris Dzadovsky for St. Lucie County. Dianne Hughes represented Kevin Abbate for Martin County. Valerie Sparling represented Michael Anderson for the Florida Fish and Wildlife Conservation Commission (FWC). John Suggs represented Percy Griffin for the Law Enforcement division of the FWC. Mike Wisenbaker (Florida Department of State – Division of Historic Resources (DHR)) and Ryan Smart (1000 Friends of Florida) were not in attendance, but submitted comments on the proposed UMP. Bess McKinney (St. Lucie County Soil and Water Conservation District), Daniel O'Keefe (South Florida Water Management District), and Matt Landry (Heroes on the Water – Treasure Coast Chapter) were not in attendance and did not submit comments. All other appointed advisory group members were present at the meeting.

Attending Division of Recreation and Parks (DRP) staff members attending the meeting were Sine Murray, Jason Mahon, John Maehl, and Douglas Rogers. Greg Vaughn (Atkins) and Gene Stillman (F4 Tech) were also in attendance to facilitate the meeting on behalf of DRP.

Mr. Vaughn began the meeting by explaining the purpose of the advisory group and reviewing the meeting agenda. He then afforded advisory group members an opportunity to introduce themselves. Following introductions, he provided a brief overview of the DRP's planning process and asked Ms. Murray to provide opening remarks and an overview of the proposed UMP.

Ms. Murray indicated that the meeting was being held to obtain technical input and stakeholder concerns. She also addressed a recent article in the *Tampa Bay Times* mentioning DRP's interest in consumptive uses, such as cattle grazing and timber harvesting. She clarified that consumptive use revenue is not part of the plan and that there is no plan to harvest timber or place cattle on the park, unless it is part of a resource management plan. By statute, DRP is required to look at revenue opportunities through secondary uses. Based on feedback from the public, the language in the UMP concerning consumptive uses will be clarified. She also acknowledged concerns over the City of Port St. Lucie's Crosstown Parkway Extension which will result in impacts to the state park. She commented on proposed improvements within the UMP, but emphasized that since the park is a preserve, focus is on passive recreational uses.

<u>Key goals of the proposed UMP include:</u>
Hydrologic restoration
Natural restoration management
Invasive exotics
Cultural resource interpretation

Key connection with the East Coast Greenway
Improving existing facilities
Improving interpretive signage
Preserve is not conducive to cabins or camping

After Ms. Murray's comments, Mr. Vaughn asked each member of the advisory group to express his or her comments on the proposed UMP. A summary of those comments are provided below, in addition to the emailed comments supplied by DHR, 1000 Friends of Florida, and the Florida Trail Association (FTA). After all comments were shared, public comments were taken. Afterwards, Ms. Murray described next steps for drafting the plan and the meeting was adjourned.

During the two-week public comment period following the advisory group meeting, the DRP received numerous emails from members of the public about the Savannas Preserve State Park management plan. The major themes of these emails are as follows:

- Residents emphasized their disapproval of the selected route of the Crosstown Parkway bridge and requested that DEP not allow future road widening projects adjacent to the Park.

- Members of the public opposed language in the plan referring to potential revenue generation and secondary management purposes such as timber management and cattle grazing.

- Several comments lamented the lack of funding provided to public land managers for park operations and resource management efforts.

- Several comments requested the removal from the plan of proposed improvements to the park including ADA modifications at the Hawk's Bluff Day Use Area, a playground at the Jensen Beach Day Use Area, and mountain biking trails on the Miller-Wild property.

SUMMARY OF ADVISORY GROUP COMMENTS

Valerie Sparling (FWC) was interested in the imperiled species discussion in the UMP; specifically, the number of scrub jays and gopher tortoises in the state park. Scrub jays are considered a keystone species. She mentioned that while burning is a key management tool, consideration should also be given to mechanical processes to reduce overall fuel load. Fire line improvements should also be considered.

John Suggs (FWC – Law Enforcement) had no comments on the UMP.

Dianne Hughes (Martin County) expressed the importance of the hydrological component of the UMP to the overall management of the park. She asked for

consideration of repair to the FPL mitigation weir and commented how the Savannas interagency team is working on the development of a hydrological model. This model will assist with providing a better understanding of the flow of water at the Preserve.

Mike Middlebrook (St. Lucie County) was interested in creating more regional partnering opportunities with municipal and surrounding landowners. He indicated that land adjacent to the Preserve should be managed similarly with common management goals. He stated that state parks set the bar high regarding natural resource management, but language in the document could be combined with language used by the County. The park and the County share interests in hydrological restoration. He was interested in the development of ecotourism goals for the County and the City of Port St. Lucie. He also wanted to see more Memorandum of Understanding agreements to share resources in more of a partnership between local agencies. Additional information should also be included in the document pertaining to sharing resources and working together. He also expressed support for connections with the East Coast Greenway.

John Nelson (Audubon of Martin County) indicated that additional protection and preservation was needed for waterfowl lands. He expressed concern of the "All Aboard Florida" passenger train route being placed adjacent to the Florida Scrub jay habitat, since Florida jays are very sensitive to ecological disturbance. He was interested in the Preserve continuing to be a park for wildlife, while people should be considered secondarily. If education increases at the Preserve, a focus should be on adults, as adults are voters. The Audubon Field Academy is an excellent opportunity for educating adults on nature and is graduating its first 16 birding naturalists. Having an education facility is critical but educating adults is imperative for them to understand the significance of nature and Savannas Preserve State Park.

Jim Couillard (FTA, Tropical Trekkers) commented that he is available for input to trails within the park.

Paul Salazar (Friends of Savannas Preserve State Park) indicated the importance of educating the public, particularly the youth, concerning protecting our natural resources. Our society suffers from a "nature deficit disorder" with children more focused on video games and other indoor activities versus getting outside and enjoying nature. Preservation is important, as is the use of the Preserve for the public. He had an interest in increasing public awareness and educating the public regarding the significance of the Preserve. Educational facilities need to be a bigger part of the experience at the park.

Mayor Greg Oravec (City of Port St. Lucie) was in favor of increasing public awareness of the Preserve, as well as potential camping opportunities at the park. He mentioned maximizing visitors to the park with the least amount of park resources. Mayor Oravec acknowledged hydrological concerns and commented that

the City will support efforts to improve the hydrology within the park. He commented that he was glad that cattle and timbering was addressed in the meeting. Mayor Oravec also acknowledged concerns from conservation groups over the City's Crosstown Parkway Extension project and asked that those organizations not allow that one issue to ruin what has been a good relationship. He mentioned that mitigation for impacts from the project had resulted in improvements to Savannas Preserve State Park, including the park's Education Center.

Shari Anker (Conservation Alliance of St. Lucie County) stated that her organization remains focused on the conservation and protection of natural resources within the community, specifically, preserving the state park. The Conservation Alliance was critical to the Savannas receiving its "Preserve" designation. She commented about the difference between the 2003 UMP and the proposed UMP in regards to the park's purpose. She expressed concerns with increased urban sprawl, stormwater runoff and pollution. The North Fork Buffer Preserve is an incredibly splendid natural resource. Ms. Anker noted that there is no language in the 2003 UMP about secondary resources. She asked Ms. Murray for clarification if the state statute referenced earlier by Ms. Murray indicated that secondary uses of the state park should be evaluated or accepted.

Ms. Murray responded that DRP is required to identify secondary purposes. This has been done at other state parks. The UMP does not require secondary purposes, but does state that evaluation of secondary purposes may occur to determine if they are consistent with the management of the park. Public participation opportunities are a hallmark for the state park system.

Ms. Anker expressed that there should be some way of conducting an ecosystem services evaluation to place a dollar figure on how the natural resources benefit the public (examples: wetlands, hydrology, and carbon sequestration). Marshlands provide good clean water for Indian River Lagoon. A dollar value needs to be placed on these natural resource benefits in future plans.

She stated that the North Fork of the St. Lucie River is presently incurring problems with pollution and needs more attention. There is a tremendous amount of diversity in fish species, with 90% of species occurring at the North Fork. Education of the public is needed regarding aquatic biodiversity. Ms. Anker referenced biologists/ecologists whose studies should be considered for inclusion which would show the negative effects of allowing cattle grazing and timber harvesting in the park. Inserting cattle in this ecosystem could result in water pollution through increased nutrients. She expressed that preservation of the 100-year floodplain should be a priority and the language regarding potential roadway improvements should be clarified within the UMP.

Ms. Anker asked Ms. Murray if the proposed UMP was a pre-authorization of widening roadways adjacent to the park (example: Walton Road). Ms. Murray

responded that the UMP does not authorize those future capital improvements. She clarified that the references within the UMP concerning future widening projects is included to monitor those potential projects outside the state park's boundaries which could have an impact to the park. Ms. Anker stated that there is no mention of Hog Pen Slough, a historic waterway, which also serves as a nursery for tarpon and should be discussed as part of the overall hydrology for the Preserve. Fire plan seems to require burns too frequently – 2 years may be too much, and would like to see the park have more mature pine trees. She also commended the park's Citizen Support Organization for their efforts.

Paul Haydt (East Coast Greenway Alliance) indicated that the Preserve is an amazing resource. He expressed interest in increasing partnership opportunities (Water Management District, counties, etc.). Partnership opportunities would increase by incorporating each other's management plans within the area and would help with limited resources. Mr. Haydt suggested including language pertaining to other area burn plans (i.e. county plans). Resources should be available to educate every 3rd grader, and agencies should work together to make up for lack of resources.

Mr. Haydt was excited about the opportunities that come with the linkage to the East Coast Greenway, which will be suitable for all users. The Greenway will not only connect users but also parks along the eastern coast of the US. A bike path is not just simply a bike path, as it connects communities. East Coast Greenway connection results in more people coming to and learning about Savannas Preserve State Park. He acknowledged the concern in Florida that sometimes concrete is not the best material for the trail, while concerns also exist that dirt may result in increased siltation. Some paths have been constructed utilizing recycled tires, while some trails are part of the stormwater system. Others remove sidewalks and put in pervious surface material. He commented that the UMP is a great opportunity to broaden the multi-use trail language to enhance the number of users.

Trevor Taylor (Florida Forest Service) mentioned that his first memories of nature included 5th grade field trips walking through swamps. He commented that it is important to do anything you can to get people in the park, including guided rides through the park along trails or fire lines. He commented that hunting opportunities could be utilized, especially for feral hogs. As urban sprawl has surrounded the park, the focus should be on promoting the natural aspects of the Preserve. He also stated that fire is a needed component of managing the state park.

Chris Vandello (Savannas Preserve State Park, Park Manager) commented that connections with different agencies and support from volunteers are needed to continue improvements to the park. Mr. Vandello commented that the proposed UMP includes the North Fork Buffer and the Savannas Preserve State Park to move forward as one whole park. He stated that the park needs to focus on "showcasing" the entire size of the park, as many park visitors come to the Education Center and mistakenly think that this is all of the park, not realizing that it goes all the way to

Ft. Pierce and Jenson Beach. He added that the state park is a preserve and we need to strike a balance between meeting the needs of users and being a preserve.

SUMMARY OF PUBLIC COMMENTS

Diane Goldberg (St. Lucie Audubon and St. Lucie Chapter of the Florida Native Plant Society) stated that she did not agree with logging within the state park or allowing cattle grazing. By doing this, you preempt the use of the land for wildlife and the public. No beehives should be allowed as there are viruses that bees can bring into the area. She stated that the park should not accept relocated tortoises, as there are diseases associated with this species that could jeopardize existing gopher tortoise communities. Day rentals within the state park (examples: wedding parties, meetings, guided ranger tours) would be acceptable. Hawks Bluff Trailhead is a small part of the Savannas Preserve and does not need Americans with Disabilities (ADA) accommodations. Stabilization of the roadway between the Education Center and canoe launch is acceptable, but should not be completed with pavement. Use of recycled tires for trail surface is not a good idea as this would result in the leaching of poisonous materials. She also stated that the Indian River Road right of way could be a potential biking opportunity. Ms. Goldberg felt that any road expansion should be removed from the UMP. More frequent intervals of prescribed burning are a good idea, as it keeps the undergrowth contained.

Martin Baum (Indian Riverkeeper) expressed his opposition to cattle on any part of the state park. He also commented that the Park Service should leave dead trees alone as they provide valuable habitat. The East Coast Greenway Connector should have a surface that is compatible for walking, hiking and other uses, adding that he felt the Greenway was a good idea to bring people to the park. Mr. Baum stated that another alternative rather than Alternative 1C should be chosen for the Crosstown Parkway stating that there are less expensive and less impactful alternatives. He questioned why no camping or cabins are being allowed in the park, yet the Crosstown Parkway Bridge is being permitted.

George Jones (Concerned Citizen) commented that there was no discussion of a bridge in the 2003 UMP (reference to Crosstown Parkway). He stated he was concerned that the consumptive use issue was being pushed by politicians and felt this language was unnecessary and references to timbering within the state park needed to be removed. He stated that the Florida State Park system is the gold standard in the nation. He also stated that the Department of Environmental Protection's "Linear Policy" covers utility lines and gas lines, not roadways. The completed boat ramp should have never been constructed in its current location, but should be ½ mile up the river in St. Lucie County. Growth has happened and will continue to occur in this area, but we should continue to preserve and protect portions of the original domain. He stated that it was a shame that the public must fight our own government to protect our resources. Mr. Jones also expressed concerns with the Crosstown Parkway project and its impacts.

Susan Hamburger (Savannas Preserve State Park Citizen Support Organization) expressed the need for additional staffing resources for support of the public educational program, which is currently being staffed by one dedicated park service specialist. Volunteers are getting older and more difficult to find. The park needs more than one paid educational representative and the UMP should address this.

Ms. Hamburger questioned why on page 9 of the proposed UMP, it states that the park is not an area of critical state concern, citing that this is an area of aquifer recharge for the Floridan aquifer. She questioned why a playground is being proposed in the UMP and not something for education purposes where children can experience nature, adding that wildlife should be primary and people secondary. She also stated her objection to handicapped parking at Hawks Bluff Trailhead, adding that the area has a steep decline. She expressed her opinion that not everything needs to be accessible by everyone. There are areas along the rail track where gopher tortoises cross and are trapped become dehydrated and dying. She also commented that intrusions into the Preserve continue to occur.

Charles Grande (Conservation Alliance of St. Lucie County) echoed previous comments about providing education on natural resources to adults and politicians. He commented on the potential for camping on the north side of the Preserve, but stated that the Preserve needs to be protected. He expressed concerns with the selection of the most expensive and environmentally impactful alternative for the placement of the Crosstown Parkway Extension. Mr. Grande expressed concern over impacts to Hog Pen Slough due to the placement of the bridge and commented that the mitigation plan developed for the project could be used for any of the project's alternatives.

Chuck Barrowclough (Martin Soil and Water Conservation District) applauded the process for the UMP update. Mr. Barrowclough stated that increasing visitors and educational opportunities should be part of the process moving forward. He commented that the park should continue to engage the public and get more people out to the park to learn about natural resources. He suggested that the Florida Natural Areas Inventory (FNAI) staff should be engaged to be "boots on the ground" to add to depleted park staff.

SUMMARY OF WRITTEN ADVISORY GROUP COMMENTS

Mike Wisenbaker (Florida Department of State – DHR) provided email comments on February 23, 2017. Mr. Wisenbaker stated that the goals regarding cultural resources within the UMP are adequate. He asked for clarification regarding a statement within the UMP concerning "one possible recorded prehistoric site", as well as pointing out several discrepancies regarding the number of cultural resource sites shown in the UMP. Please see comments attached.

Thomas Hawkins (1000 Friends of Florida), representing Ryan Smart, provided email comments on February 28, 2017. Mr. Hawkins suggested adding a description of public right-of-ways that abut the park to the land use discussion in the UMP. He

also suggested that language regarding planned transportation projects through the park should include discussions on walking and biking. Mr. Hawkins suggested that DRP staff initiate amendments to applicable comprehensive plans and land development regulations to update the future land use designations within that park that allow residential development. Lastly, he recommended supplementing the large-scale maps within the UMP with maps that focus on areas of interest. Please see comments attached.

Jim Couillard (FTA, Tropical Trekkers) provided email comments on March 9, 2017. Mr. Couillard expressed opposition to adding ADA accessibility to Hawks Bluff Trailhead. He explained that this trail, which is maintained by Tropical Trekkers, has a steep slope and uneven footing, which would not be accommodating to those with disabilities. Please see comments attached.

Shari Anker (Conservation Alliance of St. Lucie County) provided email comments on March 15, 2017. She asked the Florida Park Service to acknowledge that the social and public health benefits of conservation lands is of critical importance to Florida's fast-growing population in the plan. She also reiterated and further elaborated on her concerns over many issues including those previously mentioned at the meeting. Please see comments attached.

Dianne Hughes (Martin County) provided email comments on March 13, 2017. Ms. Hughes elaborated on several issues that she brought to the attention of the Advisory Group. Please see comments attached.

STAFF RECOMENDATIONS

Suggestions received from the Advisory Group meeting resulted in the following modifications to the draft management plan:

- Changes to the text in the Introduction of the plan on pg. 7 now limit revenue generating activities at the park to the byproduct of timber management conducted as part of the park's natural community management and restoration activities.
- References to partnerships with a wide variety of agencies have been included in both the Resource Management Component and the Land Use Component to better highlight beneficial partnerships.
- The park's Timber Assessment is currently being updated. An updated timber assessment will be included in the final draft plan to be presented to ARC. The Timber Management Analysis section on pg. 78 will be updated to reflect park specific and accurate information on Timber Management issues.
- The Cultural Resources section (pg. 59) of the Resource Management Component will be changed to clarify and include information requested by the Division of Historical Resources.
- Additional information regarding efforts to reduce feral hog populations within the park has been incorporated on page 58.

- Text outlining the need for repairs to the Florida Power and Light mitigation weir has been added to the Hydrology section of the Resource Management Component.
- Text outlining the important role of Hogpen Slough in natural resource management at the park has been included in the Resource Management Component on pg. 42 and 43.
- Text highlighting the role of the Education Center and other interpretive programming at the park will be added to better communicate the importance of such programs in the surrounding community.
- The section discussing how the DRP monitors proposed roadway improvements has been shortened to remove the potential for stakeholders to infer automatic support for proposed transportation projects on pg. 83.
- Text elaborating on the potential for alternative trail surface materials to reduce hydrological impacts will be added to the plan on pg. 88.
- Text proposing mountain bike trails on the Miller-Wild property will be removed.
- Text calling for the establishment of a paddling trail along the North Fork of the St. Lucie River in partnership with the North Fork St. Lucie River Aquatic Preserve and St. Lucie County Environmental Resources Division will be added to the plan.
- In place of the previously proposed ADA improvements at the Hawk's Bluff Day Use Area, the plan will indicate that only minor modifications will be made to ensure public safety and the protection of the surrounding sensitive habitat from major disturbances.

Additional revisions were made throughout the document to address editorial corrections, consistency of spelling and notations, and other minor corrections.

NOTES ON COMPOSITION OF THE ADVISORY GROUP

Florida Statutes Chapter 259.032 Paragraph 10(b) establishes a requirement that all state land management plans for properties greater than 160 acres will be reviewed by an advisory group:

"Individual management plans required by s. 253.034(5), for parcels over 160 acres, shall be developed with input from an advisory group. Members of this advisory group shall include, at a minimum, representatives of the lead land managing agency, co-managing entities, local private property owners, the appropriate soil and water conservation district, a local conservation organization, and a local elected official."

Advisory groups that are composed in compliance with these requirements complete the review of State park management plans. Additional members may be appointed to the groups, such as a representative of the park's Citizen Support Organization (if one exists), representatives of the recreational activities that exist in or are planned for the park, or representatives of any agency with an ownership

interest in the property. Special issues or conditions that require a broader representation for adequate review of the management plan may require the appointment of additional members. DRP's intent in making these appointments is to create a group that represents a balanced cross-section of the park's stakeholders. Decisions on appointments are made on a case-by-case basis by DRP staff.

Comment received from Mike Wisenbaker (Florida Department of State – DHR):

From: Wisenbaker, Mike
Sent: Thursday, February 23, 2017 1:07 PM
Subject: RE: Savannas Preserve State Park - Advisory Group

First, we would like to thank the Florida Park Service for giving us an opportunity to participate in this process. The FPS has done a good job in addressing historical resources concerns in this draft management plan. Our comments and suggestions on this plan are as follows:

1) The Goals regarding cultural resources are adequate to address known and unknown cultural resources with the park.

2) We are somewhat puzzled by the statement on page 59, "One possible recorded prehistoric site lies within the boundaries of Savannas State Preserve Park." Was this statement made because the coordinates of the referenced-site are not very accurate? If not, what is the reason for writing the sentence in this way?

3) We show a discrepancy with the information in Table 5 (page 61). Our GIS analysis of the park shows four archaeological sites and three resource groups are located either partially or wholly within Savannas Preserve, whereas the table is showing a total of nine sites. The sites in the table, which include SL3258 and SL1147 (both archaeological sites) and resource group SL3257 (a resource group—linear resource) do not show up in our site inventory for the park. Perhaps the GIS boundaries that we get from State Lands are in error? In this vein, our GIS analysis also is showing SL3014 (Florida East Coast RR resource group as at least being tangent with park boundaries. Probably the best way to reconcile these discrepancies would be for park planners to work directly with our Florida Master Site File to figure out a way to make our records correspond with those of the park regarding these particular sites.

4) Similarly, on pages 75 and 76 (specifically Objective A), we are showing seven rather than six sites as being located within SPSP. This figure, which occurs in several instances on these two pages, differs from both our recent GIS analysis as well as the information presented in Table 5 of the draft plan.

5) With the action under objective B, that reads “Complete a predictive model for high medium and low probability of locating archaeological sites within the park.” This should not be necessary in that staff here in our Public Lands Archaeology program should be able to provide that information at no cost to the Florida Park Service. Beyond that, most proposed major ground disturbing or land altering activities should be submitted to our Compliance Review Section in the Bureau of Historic Preservation and they will give specific directions about the proposed land disturbing activities.

6) As for monitoring of archeological and historical sites, it was determined by the Land Management Uniform Council, that state agencies that manage 25 or less recorded sites should monitor each site at least annually.

7) On page 85, we encourage the park to follow through with doing some interpretation of archaeological and historical sites that are found in or in the immediate vicinity of Savannas Preserve. Just contact us if we may be of any assistance in this endeavor.

Please let us know if you have any questions or concerns regarding our comments.

Regards,
Mike Wisenbaker
Public Lands Archaeology
Division of Historical Resources

Comment received from Thomas Hawkins (1000 Friends of Florida):

1000 Friends of Florida has reviewed the draft version of the updated Unit Management Plan and we have a few comments that we hope will be helpful. Unfortunately, no representative of 1000 Friends of Florida will be able to attend the March 2 meeting. If you have any questions, or if we can provide more information to the Savannas Preserve State Park Advisory Group, feel free to call me at 352-377-3141 or to call Ryan Smart at 850-222-6277.

Our comments:
-The Land Use Component describes land uses on parcels adjacent to the park. The descriptions generally describe development patterns but do not identify whether immediately adjacent properties are rights of way or developed lands. That additional information would be helpful in identifying locations to expand access to the park by developing or improving trailheads. For example, where a right of way with existing sidewalks abuts the park, new pedestrian access to the park might be appropriate. We suggest adding to the land use discussion a description of the public rights-of-way that abut the park.

-The discussion entitled “Planned Use of Adjacent Lands” beginning on page 82 notes planned transportation projects through the park. The report notes that DRP staff should be involved in all transportation planning decisions that may affect the park. We suggest adding to the report a discussion of whether planned transportation projects include access for people walking or biking and/or a suggestion that transportation projects through the park enhance access to the park for people walking and biking.

-The discussion entitled “Future Land Use and Zoning” beginning on page 86 identifies future land use and zoning designations on park property. Several of those designations allow residential development. We suggest the DRP initiate amendments to applicable comprehensive plans and land development regulations so that the local government rules governing the property are consistent with DRP’s intended uses.

-The maps included in the draft version of the updated Unit Management Plan are very general. We suggest supplementing large-scale maps with maps that focus on particular areas of interest. For example, the Conceptual Land Use Plan map identifies the location of proposed facilities throughout the park. However, the scale of the map is so great that it does not clearly show the context of the proposed facilities. This map could be supplemented by additional maps, with a smaller scale, that present the proposed facilities clustered in the northern, middle and southern areas of the park.

Thomas Hawkins
Policy and Planning Director
1000 Friends of Florida, Inc.

Comment received from Jim Couillard (Florida Trail Association – Tropical Trekkers):

Savannas Preserve State Park Advisory Board

I was requested to attend and represent the Florida Trail Association (FTA) at the Savannas Preserve State Park Advisory Board on March 2, 2017 as an Advisory Board member. The purpose was to review the Proposed Unit Management Plan for the Park.

As an Advisory Board Member I would like to make the following comments regarding the Hawks Bluff improvement being planned. This trail leading to the Savannas is maintained by Tropical Trekkers, a chapter of the FTA. It has been recommended by the plan that an improvement to the trailhead be the addition of ADA accessibility to the trail.

As a trail maintainer and user of Hawks Bluff, adding an ADA Accessibility to that site is not practical. There is no street parking area at the trail head, and adding ADA accessibility down a steep slope onto sugar sand base of uneven footing is not accommodating to those that are handicapped.

James E Couillard 3/9/2017

Jim Couillard

Florida Trail Association

Tropical Trekkers, Chair

Comment received from Shari Anker (Conservation Alliance of St. Lucie County):

March 15, 2017

Office of Park Planning
Florida Department of Environmental Planning
Division of Recreation and Parks
3900 Commonwealth Boulevard, MS 525
Tallahassee, FL 32399-3000

To the Office of Park Planning:

This letter is from the Conservation Alliance of St. Lucie County. Shari Anker, its president, served on the Advisory Group committee that met on March 7th re: 2016 Unit Management Plan for Savannas Preserve State Park.

As was stated during that meeting and as background, it was through the hard work of the Alliance (CASLC) and notable Martin County residents, Maggy Hurchalla and Dr. Richard Stokes, that the creation of the Savannas (SPSP) was initiated in 1977.

We have organized our comments into three topic areas and ask that you bear with us as we review the Unit Management Plan of 2016 and detail our responses, both in general overview and comments on specific aspects of the Plan.

I. The Big Picture: Florida and its State Park System

A. The human value of our state parks:

1. Florida's rapid population growth and development has resulted in the correspondingly rapid loss of its native Florida beauty along with its healthy and well-functioning ecosystems. For many, our state parks are the only places they can go to experience the "real Florida."
2. Florida's three time Gold-medal-award-winning state park system is a huge tourism draw, both from in-state and out-of-state. Some people desire to reside near state parks.
3. Floridians want to protect even more of their rapidly disappearing special native Florida areas – as evidenced by the more than 70% "Yes" vote for Amendment One (which set aside taxpayer monies to purchase more land to set aside for conservation). One can, with great assurance, make the case that that same percentage of voters do NOT wish to see the already protected parks being used for golf courses, roads and bridges, resource exploitation like timber and other plant harvesting, cattle grazing, etc. We imagine that that same percentage of voters would urge DEP to continue to fully protect its state parks as they exist, and NOT alter the purpose for which they were created in the first place.
4. Many of us who use our state parks experience deep bonding with them; they become part of our personal and community identity. They are the place where we go to rejuvenate from the stresses of our lives, learn about nature

by actually being immersed within it, overcome "nature deficit disorder," and most importantly, experience wonder – the joy of discovering our intimate connection with the whole of life as it is represented right here in this park.

5. We urge DEP to recognize and affirm these human values of the state park experience, to understand that that deep bonding means that it must refrain from politically based impulses to incorrectly and inappropriately "monetize" our beloved state parks.

B. Accounting for Uncounted Economic Values of our State Parks

If the current political impulse to monetize our State Parks to what is a deviation from the historical mission of the park system (protection and conservation) is set aside to allow for a bigger picture analysis of the broad benefits that the parks are already providing, we expect that change in perspective would result in a park system that can truly honor its original mandate. DEP would not feel pressured to negotiate away important sections and values of our state parks.

1. Former Bureau Chief of District V, George Jones, states that tourism dollars associated with our state parks is greater than all of the theme parks combined. Those economic benefits accruing to local municipalities and businesses should be included in the accounting ledgers.
2. The DEP must begin to employ "Ecosystem Services Valuation" (ESV) of each of its state parks. We would expect many of the larger units, such as Savannas Preserve State Park, contribute heavily to the good health and function of critically important ecosystems, now increasingly under grave threat due to rapid population growth and development.
    a. The SPSP is the largest contiguous freshwater marshland ecosystem in the southeast U.S. It parallels the Indian River Lagoon (IRL), and constitutes the longest stretch of perched wetlands in direct proximity to the IRL. Its pristine condition provides water absorption, storage and filtration. Its water seeps naturally into nearby residents' wells, recharges the aquifer, and the IRL. The non-development of this area has insured clean and abundant water (and local municipalities do not have to pay to create and maintain storm water infrastructure).
    b. What is the economic value of this clean water that the pristine SPSP provides? Using the methodology of ESV that service of the Savannas freshwater marshland can be given an economic value. For example, what might its economic value to the adjacent cities be?
    c. Along with clean air, healthy soil, carbon sequestration, habitat for keystone species that enable the ecosystem to function, habitat for listed species increasingly imperiled, etc., every service Savannas provides must be given a fair assessment of its economic value.

   d. There is a growing scientific literature on ESV[1] and we suggest that DEP enable staff to be trained in this new accounting system, and begin granting the "natural capital" found in state parks its due recognition and valuation.
3. In 2017 we are more aware of the better mental health and increase in cognitive capabilities that time in nature provides to humans. We can say with assurance due to the results of numerous studies that that time produces a more peaceful state of mind, increases our problem solving abilities, and extends our cognitive capacities well beyond those developed in the usual classroom and digital learning settings.[2] Time spent in nature is part of the curriculum in some schools, and could be for schools close to SPSP. WE urge DEP to factor in what formerly would be called "intangibles," but what now can be measured in the local community.

Thus, tourism dollars, ESV, and the mental health and intelligence of the local populace making use of the SPSP (and indirectly those they interact with) should be counted in the "benefits" side of the accounting ledger.

II. Historic Mission vs. New Political Directive to Allow "Secondary Compatible Uses" in State Parks, beginning with the SPSP

The SPSP was established in 1977. Its designation as a "Preserve" meant that it was of superb ecological significance and value – aesthetically, biologically, and scientifically – and that it was to be ***preserved*** in the same condition for future generations. The 2003 Unit Management Plan (UMP) states, "For this park, it was determined that no secondary purposes could be accommodated in a manner that would not interfere with the primary purpose of resource-based recreation and conservation."

That UMP held true to the purpose by which the SPSP was created. The August 2016 UMP does not.

While the new state statute requires an economic analysis of the larger units, it does NOT require the adoption of secondary compatible uses such as timber and sabal palm harvesting, cattle grazing, etc. The CASLC is aware that even under the existing accounting system revenue from the parks is by-and-large paying for the parks. With the addition of a bigger picture analysis just discussed (and other creative strategies) there is no need to alter and degrade well-functioning ecosystems by way of secondary compatible uses or "multiple uses" additions to any parks, but especially in those parks designated as Preserves.

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[1] Robert Costanza et al, "The Values of Ecosystem Services and Natural Capital," *Nature* 387 (May 15, 1997). One of the earliest and most cited analyses, it is a good introduction to ESV.

[2] Richard Louv, *The Nature Principle: Human Restoration and the End of Nature-Deficit Disorder* (Chapel Hill, NC, Algonquin Books of Chapel Hill, 2011)

In our view, this is a violation of the public trust placed in the state government – that the use by which the taxpayers fund these special places remain true to the original philosophy and mission of their creation.

A, Our response to suggested secondary use and improvements in the UMP:

1. Logging or timber removal from the Savannas Preserves or any other State Preserve is already accomplished on as needed basis by park staff, or coordinated by them. It does not need to be instituted in the UMP as an ongoing objective, which could ultimately result in exploitation of the resource for income. Dying and dead trees provide necessary ecological functions and should remain on site whenever possible to provide food and housing for wildlife, and provide nutrients to the soil as they decompose.
2. Cattle grazing, at the SPSP, even at the disconnected site, is not advisable due to the nutrients from the manure ending up in our already very compromised and nutrient overloaded waterways. It is not clear what this unit was purchased for. Were there plans to restore it to its original ecology and thus qualify it to be considered as a Preserve? Cattle grazing is out of category not only for Preserve State Parks but also for any state park. We consider allowing it to be a slippery slope in which our parks' open space will be offered to the highest bidder. And the original character of the state park would be dramatically altered. Our parks are not farms.
3. The introduction of the apiary industry is also an inappropriate use of SPSP. Our concerns include the transmission of viruses and other diseases to our healthy native bees, and any industrial honeybees escaping their confines can invade and extirpate our species of native bees.
4. Using the SPSP as a site for tortoise relocation is also inadvisable. Up until now it has been the strict policy of SPSP to decline to accept any outside tortoises as they can potentially introduce diseases, and also that the SPSP needs to maintain territory for its existing population. We already have problems with the railroad tracks impeding the mobility of resident tortoises.
5. ADA accessibility at Hawk's Bluff in Jensen Beach cannot be achieved as the area is minute and the terrain is steep. Existing parking along the side of the road is sufficient for the small groups that tour there. Any alteration would destroy too much of the fragile (and beautiful) scrub habitat. Perhaps a video tour could be offered at the education center for those unable to visit.
6. A playground and grill in Jensen Beach Day Area has several drawbacks. The area is frequently burned by SPSP staff, thus compromising its visual appeal. It is hot as there are no mature trees. Any wayward spark from a grill could easily ignite an unintended fire. Numerous local city parks already offer playgrounds.
7. Stabilize roads between the education center and canoe/kayak launch: we caution that no concrete or asphalt or other impervious road should be

used.

B. Other specifics in the UMP:

1. P. 26. We suggest that the burn interval mimic the historic natural fire pattern. We also suggest that not every square inch be burned as some areas such as those surrounded by water or in distinct segregated area would normally escape fire.
2. P. 83. Widening and extension of roads: The CASLC must assert in the strongest possible terms that state parks and especially Preserves are not simply areas in reserve for municipalities to use as their populations grow to build bridges and roads. This is clearly "an incompatible use" of our state parks. Logically, due to rapid population growth and development there is no state park that will escape being in the crosshairs of municipalities hungrily eyeing what looks to them as undeveloped land. The Parks system must insure that our parks are not easy prey.
    a. With respect to Port St. Lucie wishing to widen Walton Road, please understand that increasing traffic to the fragile 2-lane Indian River Drive is NOT possible. That road is already falling apart, and due to its proximity to the IRL no widening can be done.
    b. We are well aware of Port St. Lucie's decades-long desire to build a bridge through the SPSP and over the IRL (which is an Aquatic Preserve) in order t o reach Hutchinson Island (which is a narrow stripped barrier island). The terminus on Hutchinson Island is not doable either as that area is susceptible to forming an inlet when a strong storm or hurricane hits. Additionally, factoring in sea level rise makes this undertaking extraordinarily unwise. Recall that it was the CASLC who successfully organized the opposition to the IRL bridge in 1999/2000. A1A on Hutchinson is already congested with its current local resident traffic.
    c. The Lennard Road extension if planned through the SPSP could also present yet another 'incompatible use" for a state park. Every **avoidanc**e option must be thoroughly evaluated. Minimization or mitigation must never serve as a compromise by which the SPSP is fragmented.
    d. We ask that DEP preemptively advise Port ST. Lucie and St. Lucie County that these road projects cannot be accomplished within SPSP boundaries. The language in the UMP that mentions "minimization" of impacts should be replaced with **avoidance** of incompatible uses – as the law and the parks' own rules and guidelines instruct.

III. Speaking of Incompatible Use: the North Fork of the St. Lucie River Buffer Preserve: a Section of the North Fork Property of the SPSP

In the UMP, page 57, under the "Special Natural Features" it states:

> *Most of the North Fork proper and a portion of the St. Lucie Estuary are an aquatic preserve and Outstanding Florida Waters. ... The North Fork is a large tributary to the globally recognized Indian River Lagoon, a National Estuary. The Lagoon system contains few large tributary rivers and each is essential to the productivity of the system The park provides both protection and a* ***buffer*** *to naturally filter water and improve water quality entering these waters. The park also provides habitats for many listed organisms and rare species of flora and fauna. These lands represent the last remaining vestiges of floodplain and upland habitats in the area watershed and* ***therefore are scarce, unique, and irreplaceable.*** (Emphases added.)

We begin this part of our comments with the above quote from DEP, which clearly established the worth and irreplaceability of this area along the North Fork of the St. Lucie River (NFSLR).

As DEP is well aware the taking of what is known as the Halpatiokee Trails section (nearly 50 acres in the area along US1 in Port St. Lucie alone) to build the Crosstown Parkway Bridge has been controversial for decades, the opposition to which is currently led by the Conservation Alliance and the Indian Riverkeeper. We continue to gain support from local, statewide, and national environmental groups, such as:

Audubon Florida
Florida Native Plant Society
Florida Wildlife Federation
Florida Conservation Voters Education Fund
Florida Conservation Coalition
Sierra Club Loxahatchee
Wild Earth Guardians
Bonefish & Tarpon Trust
Martin County Conservation Alliance
Martin County Native Plant Society
St. Lucie County Audubon
Pelican Island Audubon
St. Lucie County Native Plant Society

We are obligated here to record our continued and principled opposition to this taking as we see that it serves as both precedent for DEP to negotiate away even the most valuable state parklands, and a template for municipalities to employ to get their own roads and bridges built through their adjacent state parks.

It is unequivocal that the taking of state parks for roads and bridges is not part of any purpose or mission of Florida state parks, and constitutes an "incompatible use".

Here is what DEP said in 1999 about the use of Route 1C (in contrast to 5-6 alternate routes):

> This location is in the "widest part of the aquatic/buffer preserve complex ... impacting public lands to the greatest possible extent," and that "it is unlikely that a location with a greater environmental or recreational impact could be chosen."

This area represents the largest remaining intact 100-year floodplain wetland complex, with an index of 14 FNAI habitats along the full length of the 1C corridor (with Halpatiokee said to contain 7 FNAI habitats alone: the best Essential Fish Habitat for listed, rare and commercially important fish species, and habitat for hundreds of other native and migratory bird species, a good number of which are also listed.) The area was purchased as a **Buffer** Preserve for the NFSLR.

Without exception every single regulatory agency objected to Route 1C. The U.S. Army Corps of Engineers stated that 1C was the "MOST environmentally damaging route" with respect to Section 404 of the Clean Water Act. There is no doubt that its ecosystems functions will be degraded or lost, with practically two-thirds of the US1 bordering section either paved over, shaded or covered with run-off basins. It is the height of irony that in what has been called the site of the most pristine high functioning floodplain wetland complex along the NFSLR that these "pristine" wetlands are being sacrificed for and replaced by man-made structures, very likely to add pollution to Evans Creek and the NFSLR. Not to mention remove critical habitat for all time.

We have much to say on this issue and refer DEP and put into the record our White Paper and video, "Halpatiokee Trails: More than Meets the Eye," both accessible on the CASLC's website. (See links below.) Both document the incredible park and ecologically valuable resources of this unit. On the video you can see Dr. Grant Gilmore, Ph.D., a highly reputable scientist who has studied fish in these waters since the 1970s, talking about the irreplaceability of a backwater fish nursery for tarpon, fed by Hogpen Slough. Such places are rare and the bridge will mean the death of one of the few remaining fish nurseries along the St. Lucie River.

White Paper:
www.conservationallianceslc.org/uploads/5/0/3/6/50361177/white_paper.pdf

Halpatiokee Trails video on opening page of the CASLC's website:
www.conservationallianceslc.org

If the DEP itself is proclaiming such areas in the NFSLR watershed as "scarce, unique, and irreplaceable," then why did it allow one such critically important area, residing within a supposedly protected PRESERVE state parkland, to be negotiated away?

Mitigation is supposed to be the last step in analysis of alternative routes. Any mitigation package must not be allowed to persuade DEP to sacrifice any park to degradation and outright destruction. Mitigation is not a negotiating tool for municipalities to take any parkland they wish, and most egregiously, the "ecological gem," the crown jewel that Halpatiokee Trails is along the NFSLR.

Recall that in the MOU the mitigation package counted for ANY route, and thus should have obligated the DEP to choose the least impacting route to the NFSLR-Aquatic Preserve, the NFSLR-BP, and its terrestrial parklands (uplands and wetlands) found in Halpatiokee Trails itself.

We challenge any DEP staffer or any scientist to prove that the mitigation the city offered replaces any of the ecosystem values, functions, and habitat that Halpatiokee Trails and bridge corridor will lose when the bridge is built.

The DEP still has time to reverse its decision to grant the upland easement through Halpatokee Trails. To do so will be the first step to restore the public's trust that the sanctity of our state parks has a chance to prevail. If not, those people who revere our state parks will continue to distrust any initiative DEP undertakes, and will take to the mainstream and social media to present their case, and to the courts when no other option remains for the protection of our beloved state parks.

We are grateful that DEP included the CASLC in their Advisory Group. When representatives from outside advocacy groups are included, we feel that DEP obtains a better range of useful comments in their analysis. City, county, and state staffers' inputs are very important but may be restrained. We encourage the free expression of opinions and comments, both individually and in a group setting. Oftentimes, problems and potential solutions are best uncovered as folks get a chance to hear what others think.

Thank you for your indulgence of this lengthy comment letter. Please know that we have the very best interest of our state parks at heart.

Sincerely,

Shari Anker, President
Conservation Alliance of St. Lucie County
P.O. Box 12515
Fort Pierce, FL 34979-2515
slcconservationalliance@gmail.com

Comment received from Diane Hughes (Martin County):

Savannas Preserve State Park
Advisory Group Draft
Unit Management Plan
Martin County Comments
Dianne Hughes, Senior Ecosystem Specialist
Ecosystem Restoration & Management Division
March 13, 2017

1. The hydrology section (page 21) of the report references the Indian River Lagoon South Feasibility Study (2001). It should reference the Indian River Lagoon – South Project Implementation Report (PIR) Final - March 2004 which was authorized by Congress in the Water Resources Development Act of 2000.
2. The hydrology section or other appropriate section of the plan should include a discussion of the Savannas Interagency Working Group (formerly known as the "Savannas State Reserve Ecosystem Management Project Task Force") which was re-formed to include Martin County, St. Lucie County, City of Port St. Lucie, City of Ft. Pierce, the Florida Department of Environmental Protection –Division of Recreation and Parks (DRP), and the South Florida Water Management District (SFWMD). These agencies are interested in resolving restoration and flooding issues in and around the Savannas Preserve State Park. The previously named "Savannas State Reserve Ecosystem Management Project Task Force" was active in the mid- to late 1990's, and apparently stopped meeting around the year 2000. The agencies listed above have recently reconvened to discuss the outstanding issues related to the hydrology of the Savannas, including persistent neighborhood flooding issues, and the need to ensure that the restoration hydrology of the Savannas is appropriate and consistent with flood protection and environmental needs. Although some minor agreements have been made throughout the years on appropriate weir elevation stages within the system, outstanding issues related to the hydrology of the Savannas, including persistent neighborhood flooding and water quality issues, and peak discharges to the Indian River Lagoon, North Fork St. Lucie River Aquatic Preserve and the St. Lucie River Estuary continue to exist.
3. The last paragraph of the hydrology section mentions the Florida Power & Light mitigation for Hog Pen Slough but does not mention the mitigation weir further south in Warner Creek which has failed and no longer functional.
4. Natural Resource Management – Hydrological Management (page 63) should include an objective for the replacement of the FP&L mitigation weir at Warner Creek just north of Jensen Beach Boulevard. We respectfully request that this objective be added to the Unit Management Plan. Martin County has interests in the repair of this weir as we continue to have downstream flooding in communities adjacent to Warner Creek during major storm events. The County would coordinate and potentially fund any structure replacements in this area.
5. Conceptual Land Use Plan – Proposed Facilities (page 87)
    a. Jensen Beach Day Use Area – We recommend no habitat impacts occur in siting playground location.
    b. Hawk's Bluff Trailhead – The entrance into the Hawk's Bluff trailhead is located on the Atlantic Coastal Ridge, a series of relict sand dunes. There is a very steep incline to the trail at this site. In fact, in the first 171 feet from the road to the first lowest point there is a 24 foot drop with a slope of 1:7. In order to install an ADA compliant ramp, significant impacts to the sand pine scrub habitat would likely be necessary. Additionally, there is no formal parking at this site. There would need to be ADA compliant parking in conjunction with such a ramp. This may not be an appropriate site for ADA facilities.

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Addendum 4—Soil Descriptions

2 – Ankona Sand – This poorly drained, nearly level soil is on broad flatwoods. Slopes are smooth to concave and are less than one percent in most places. The water table is with a depth of 10 inches for 1 to 4 months and between depths of 10 to 40 inches for 6 months or more most of the year. The natural vegetation is south Florida slash pine and an understory of saw palmetto, wax myrtle, pawpaw inkberry, fetterbush, lopsided Indian grass, creeping bluestem, chalky blue stem, Florida threeawn, and pine threeawn

4 - Arents, 0-5% Slopes - This soil is an amalgamation of different soil types dug from different areas to be used as fill material. It is mainly a loose sandy mineral material: loamy and weakly cemented sandy materials that were subsoils in other areas are mixed throughout. The water table is between 20 and 50 inches for most of the year.

12 - Electra Fine Sand, 0-5% Slopes - This nearly level to gently sloping soil is poorly drained and is associated with low ridges within the flatwoods. The slopes are smooth to convex and range from 0 to 5 percent.

Typically, the surface layer is composed of gray, fine sand while the subsurface layer is white, fine sand.

12 - St. Johns Variant Sand - This nearly level soil is very poorly drained. It is in depressions and sloughs and at the base of short slopes in areas of flatwoods. Areas are generally long and narrow and range from about 5 to 50 acres. Slopes are smooth to concave and range from 0 to 2 percent.

Typically, the surface layer is black sand about 14 inches thick. The subsurface layer is sand to a depth of about 40 inches. The upper 16 inches of the subsurface layer is dark gray, and the lower 10 inches is gray. The subsoil is sand to a depth of 72 inches or more. The upper 8 inches of the subsoil is dark grayish brown, and the next 6 inches is black and has dark grayish brown pockets or mottles. The next 8 inches of the subsoil is dark reddish brown mixed with black and grayish brown, and the lower 10 inches is brown.

13 - Placid Sand - This nearly level soil is very poorly drained. It is in wet depressions and drainageways in the flatwoods. Areas range from a few acres to about 30 acres. Slopes are smooth to concave and range from 0 to 2 percent.

Typically, the surface layer is black sand. The subsurface layer is sand to a depth of more than 80 inches. It is dark grayish brown, gray and light brownish gray.

14 – Fluvaquents – This very poorly drained, nearly level soik is on flood plains of rivers and creeks. Color texture, and thisckness of the soil layers are variable within short distances. Thxture ranges from sand to clay. Thew water table is at a depth of less than 10 inces fro 4 to 6 months and within a depth of 40 inches fro 9 to 12 months. Natural vegetain is cabbage palms, wetland hardwoods and an understory of saw palmetto and herbaceous plants.

17 – Hobe Sand, 0-5% Slopes – This somewhat excessively drained, nearly level and gently sloping soil is on ridges and knolls in the flatwoods. Slopes

are smooth to convex. The water table is generally between depths of 60 to 80 inches. The natural vegetation is slash pine in the lower areas and sand pine in the higher areas. The understory is scrub oak, rosemary, saw palmetto, running oak, and pineland threeawn

18 - Hontoon Muck - This nearly level organic soil is very poorly drained. It is in low, wet areas. Slopes are smooth to concave and range from 0 - 2 percent.

The surface layer is typically dark, reddish-brown muck.

19 - Jonathan Sand, 0-5% Slopes - This nearly level to gently sloping soil is moderately well drained. It is associated with scrubby flatwoods with slopes that are smooth to convex.

Typically, the surface layer is comprised of gray sand and the subsurface layer is white sand.

21 - Lawnwood Sand - This nearly level soil is poorly drained and is associated with pine flatwoods. Slopes are smooth to concave and range from 0 to 2 percent.

The surface layer is black sand above and dark gray sand below. The subsurface layer is composed of gray sand.

28 - Paola Sand, 0-8% Slopes - This nearly level to sloping soil is excessively drained. It is on the coastal ridge and isolated knolls in coastal areas. Areas are many hundreds of acres in size. Slopes are smooth to convex.

Typically, the surface layer is gray sand. The subsurface layer is white sand. Below this is yellowish brown and brownish yellow sand to a depth of 80 inches or more.

29 - Pendarvis Sand, 0-5% Slopes - This nearly level to gently sloping soil is moderately well drained. It is associated with low ridges located within the flatwoods and has slopes that are smooth to convex.

Typically, the surface layer is very dark gray sand and the subsurface layer is light gray sand.

34 - Pompano Sand - This nearly level soil is poorly drained. It is in narrow drainageways. Areas are long, narrow, and highly dissected by stream action. Slopes are dominantly 0 to 2 percent, but stream dissection has created numerous short steep side slopes.

Typically, the surface layer is dark gray fine sand. Below this is fine sand to a depth of 80 inches or more. The upper part is light gray and has white pockets. Next is mottled light brownish gray with dark grayish brown and very dark grayish brown pockets. The lower part is light gray fine sand with a few grayish brown pockets.

39 - Salerno Sand - This nearly level soil is poorly drained. It is in broad areas of flatwoods. Areas range from about 20 to 500 acres. Slopes are dominantly smooth and range from 0 to 2 percent.

Typically, the surface layer is black to very dray gray sand about 9 inches thick. The subsurface layer is dark gray to brown fine sand about 15 inches thick. Below this is dark reddish brown sand that has weakly cemented fragments to a depth of 100 inches or more.

40 - Samsula Variant-Myakka Variant Association - This nearly level soil type is very poorly drained and is associated with the savannah-like wetlands. Slope is less than 2 percent.

Although these two soil types can be separated, mapping is difficult due to the wetness and dense vegetation. In general, the surface layer consists of dark or black muck followed by mucky sand and gray sand.

41 - Satellite Sand - This deep, nearly level sandy soil is moderately well drained. It is on slightly elevated ridges and knolls in the flatwoods. Areas range from about 5 to 200 acres. Slopes are smooth to convex and range from 0 to 2 percent.

Typically, the surface layer is gray sand about 5 inches thick. Underlying this is sand to a depth of more than 80 inches. The upper 12 inches of this sand is light gray, the next 22 inches is light brownish gray, and the lower 41 inches is grayish brown.

42 - St. Lucie Sand, 0-8% Slopes - This deep, nearly level to sloping sandy soil is excessively drained. It is on dry coastal ridges and on isolated knolls in the flatwoods. Areas range from a few acres to several hundred acres. Slopes are generally uniform and range from 0 to 8 percent.

Typically, the surface layer is gray sand about 3 inches thick. Underlying this is white sand to a depth of 80 inches or more.

43 – Susanna Sand – This poorly drained, nearly level soil is on the flatwoods. The surface layer is typically black sand 6 inches thick with water table of less than 10 inches. The natural vegetation is Slash pine and an understory of saw palmetto, running oak, inkberry, fetterbush, pineland and Florida threeawn, and chalky bluestem.

44 – Tantile sand – This poorly drained, nearly level soil is in the flatwoods. The water table is within a depth of 10 inches for 2 to 4 months and up to 40 inches for 6 months or more during most years. Typically, the surface layer is sand about 9 inches thick. The upper 2 inches are black and the next seven inches transition from very dark gray to dark gray.

45 – Terra Ceia Muck – This very poorly drained, nearly level soil is on the lower floodplains of rivers and streams. The water table is at or aboe the surface for 6 to 9 months annually. The soil is subject to flooding by stream overflow. The soil is typically black muck to a depth of 80 inches or more.

48 – Wabasso Sand – This poorly drained, nearly level soil is in the flatwoods. Typically, the surface layer is sand about 8 inches thick. It is black in the upper 4 inches and very dark gray in the lower 4 inches. The subsurface layer is gray sand 17 inches thick.

50 - Waveland Sand - This nearly level soil is poorly drained. It is in broad areas of flatwoods. Slopes are dominantly smooth and range from 0 to 2 percent.

Typically, the surface layer is dark gray sand. The subsurface layer is light gray and grayish brown. The subsoil begins at a depth of 43 inches. The upper 4 inches of the subsoil is black sand and is not cemented. The next 30 inches is weakly cemented, black and dark reddish brown loamy sand. The next 14 inches is loose black sand, and below that is dark brown sand.

51 - Waveland-Lawnwood Complex - This nearly level soil complex is poorly drained and is associated with wet prairies and other depressions in the flatwoods. Slopes range from 0 - 2 percent.

This complex is difficult to separate due to the high degree of intermixing. In general, the surface layer is comprised of dark sand while the subsurface layer is gray sand.

55 – Waveland-Lawnwood Complex - this poorly drained, nearly level soil is in hammocks and along drainageways. The water table is at a depth of less than 10 inches during the rainy season. Natural vegetation is cabbage palm, willow, oak, and slash pine with an understory of wax myrtle and saw palmetto, blue maidencane, toothache grass, broomsedge and panicums.

77 - St. Lucie Sand, 8-20% Slopes - This deep, strongly sloping moderately steep sandy soil is excessively drained. It is on the coastal ridge. Areas range from about 10 to 100 acres. Slopes are single or complex and range from 8 to 20 percent.

Typically, the surface layer is gray sand about 3 inches thick. Underlying this is white sand to a depth of 80 inches or more. (SCS, 1980)

Addendum 5—Plant and Animal List

Savannas Preserve State Park Plants

Common Name	*Scientific Name*	Primary Habitat Codes (for imperiled species)
Rosary pea	*Abrus precatorius**	
Earleaf acacia	*Acacia auriculiformis**	
Red maple	*Acer rubrum*	
Giant leather fern	*Acrostichum danaeifolium*	
Shy leaves	*Aeschynomene americana*	
False foxglove	*Agalinis filifolia*	
	Agalinis linifolia	
	Agalinis obtusifolia	
	Agalinis purpurea	
Women's tongue	*Albizia lebbecck**	
Alligator weed	*Alternathera philoxeroides**	
Common ragweed	*Ambrosia artemisiifolia*	
False indigo	*Amorpha fruticosa*	
Peppervine	*Ampelopsis arborea*	
Blue maidencane	*Amphicarpum muhlenbergianum*	
Shortspike bluestem	*Andropogon brachystachyus*	
Florida bluestem	*Andropogon floridanus*	
Bushy bluestem	*Andropogon glomeratus*	
Bluestem	*Andropogon gyrans*	
Bluestem	*Andropogon longiberbis*	
Splitbeard bluestem	*Andropogon ternarius*	
Broomsedge	*Andropogon virginicus*	
Pond apple	*Annona glabra*	
Coral vine	*Antigonon leptopus**	
Groundnut	*Apios americana**	
Coral ardisia	*Ardisia crenata**	
Shoebutton ardisia	*Ardisia elliptica**	
Marlberry	*Ardisia escallonioides*	
Wiregrass/Threeawn	*Aristida beyrichiana*	
Corkscrew threeawn	*Aristida gyrans*	
Longleaf threeawn	*Aristida lanosa*	
Tall threeawn	*Aristida patula*	
Arrowfeather	*Aristida purpurascens*	
Threeawn grass	*Aristida rhizomophora*	
	Aristida spiciformis	
Wire grass	*Aristida stricta*	
Milkweed	*Asclepias curtissii*	SC, SCF
Swamp milkweed	*Asclepias incarnata*	
Lanceleaf milkweed	*Asclepias lanceolata*	
	Asclepias pedicellata	
Butterfly milkweed	*Asclepias tuberosa*	
	Asclepias verticillata	
Dwarf pawpaw	*Asimina reticulata*	
Four-petaled pawpaw	*Asimina tetramera*	SC, SCF
Asparagus fern	*Asparagus denssiflorus**	
Spleenwort	*Asplenium heterochroum*	
Climbing aster	*Aster caroliniensis*	

* Non-native Species

Common Name	*Scientific Name*	Primary Habitat Codes (for imperiled species)
.....	*Aster dumosus*	
White topped aster	*Aster reticulatus*	
.....	*Aster subulatus*	
White topped aster	*Aster tortifolius*	
Black mangrove	*Avicennia germinans*	
Big carpetgrass	*Axonopus furcatus*	
Azolla	*Azolla caroliniana*	
.....	*Azolla pinnata*	
Saltbush	*Baccharis angustifolia*	
Groundsel tree	*Baccharis glomerulifora*	
Saltbush	*Baccharis halimifolia*	
Blue hyssop	*Bacopa caroliniana*	
Mattel figwort	*Bacopa monnieri*	
.....	*Balduina angustifolia*	
.....	*Bartonia verna*	
Tarflower	*Befaria racemosa*	
Spanish needle	*Bidens alba*	
Beggar-ticks	*Bidens mitis*	
.....	*Bigelowia nudata*	
Bischofia	*Bischofia javanica**	
Swamp fern	*Blechnum serrulatum*	
Browne's blechum	*Blechum pyramidatum**	
False nettle	*Boehmeria cylindrica*	
Red spiderling	*Boerhavia diffusa*	
.....	*Brachiaria subquadripara*	
Watergrass	*Bulbostylis barbata*	
.....	*Bulbostylis ciliatifolia*	
.....	*Bulbostylis stenophylla*	
.....	*Bulbostylis warei*	
Slender buckthorn	*Bumelia reclinata*	
Tough buckthorn	*Bumelia tenax*	
.....	*Burmannia biflora*	
.....	*Burmannia capitata*	
Gumbo limbo	*Bursera simaruba*	
American beautyberry	*Callicarpa Americana*	
Bottlebrush	*Callistremon viminalis**	
Grass pink	*Calopogon barbatus*	
.....	*Calopogon pallidus*	
.....	*Calopogon tuberosus*	
Trumpet creeper	*Campis radicans*	
Florida bluebell	*Campanula floridana*	
Goatweed	*Capraria biflora*	
Balloon vine	*Cardiospermum microcarpum*	
Florida hammock sedge	*Carex vexans*	
Sedge	*Carex spp.*	
Papaya	*Carica papaya**	
Deer-tongue	*Carphephorous paniculatus*	

* Non-native Species

Common Name	*Scientific Name*	Primary Habitat Codes (for imperiled species)
.....	*Carphephorus carnosus*	
.....	*Carphephorus corymbosus*	
Deer's tongue	*Carphephorus odoratissimus*	
Vanilla plant	*Carphephorus paniculatus*	
Water hickory	*Carya aquatica*	
Scrub hickory	*Carya floridana*	
Coffee senna	*Cassia occidentalis*	
Love vine	*Cassytha filliformis*	
Australian pine	*Casuarina litorea**	
Periwinkle	*Catharanthus roseus**	
Slender sandspur	*Cenchrus gracillimus*	
Coast sandspur	*Cenchrus incertus*	
Coinwort	*Centella asiatica*	
Butterfly-pea	*Centrosema virginianum*	
Buttonbush	*Cephalanthus occidentalis*	
Rosemary	*Ceratiola ericoides*	
Water horn fern	*Ceratopteris thalictroides*	
Partridge pea	*Chamaecrista fasiculata*	
Sand Dune Spurge	*Chamaesyce cumulicola*	SC, SCF
Hairy spurge	*Chamaesyce hirta*	
Spurge	*Chamaesyce hypericifolia*	
Eyebane	*Chamaesyce hyssopifolia*	
Milk purslane	*Chamaesyce maculata*	
Sunbonnets	*Chaptalia tomentosa*	
Mexican tea	*Chenopodium ambrosioides*	
Jack-in-the-bush	*Chromolaena odorata*	
Cocoplum	*Chrysobalanus icaco*	
Goldenaster	*Chrysopsis gossypina*	
Golden aster	*Chrysopsis scabrella*	
Water hemlock	*Cicuta mexicana*	
Camphor tree	*Cinnamomum camphora**	
Sorrel vine	*Cissus trifoliate*	
Citrus x aurantium	*Sour orange**	
Saw-grass	*Cladium jamaicense*	
Reindeer moss	*Cladonia spp.*	
Tread softly	*Cnidoscolus stimulosus*	
Sea grape	*Coccoloba uvifera*	
Florida Jointtail grass	*Coelorachis tuberculosa*	WP, DM, BM
Taro	*Colocasia esculenta**	
Day flower	*Commelina diffusa*	
Erect day flower	*Commelina erecta*	
Argeratum	*Conoclinium coelestinum*	
Large-flowered conradina	*Conradina grandiflora*	
Horseweed	*Conyza canadensis*	
Tickseed	*Coreopsis gladiata*	
Tickseed	*Coreopsis leavenworthii*	
Redflower ragleaf	*Crassocephalum crepidioides*	

* Non-native Species

Common Name	*Scientific Name*	Primary Habitat Codes (for imperiled species)
Swamp lilly	*Crinum americanum*	
Rattle box	*Crotalaria incana*	
	*Crotalaria retusa**	
Rabbit-bells	*Crotalaria rotundifolia*	
Showy rattle box	*Crotalaria spectabilis**	
	Croton glandulosus	
	Ctenium aromaticum	
Carrotwood	*Cupaniopsis anacardioides**	
Tarweed cuphea	*Cuphea carthagenensis*	
Roseling	*Cuthbertia ornate*	
	Cyperus brevifolius	
	Cyperus compressus	
Baldwin's flatsedge	*Cyperus croceus*	
Swamp flatsedge	*Cyperus distinctus*	
	Cyperus flavescens	
	Cyperus haspan	
	Cyperus lecontei	
	Cyperus ligularis	
	Cyperus polystachyos	
Dwarf papyrus	*Cyperus prolifer**	
	Cyperus retrorsus	
Purple nut sedge	*Cyperus rotundus*	
	Cyperus stenolepis	
	Cyperus surinamensis	
Durban crowfoot grass	*Dactyloctenium aegyptium*	
Coin vine	*Dahlbergia ecastophyllum*	
Prairie clover	*Dalea feayi*	
	Desmanthus virgatus	
Beggar's ticks	*Desmodium incanum**	
Beggars-tick	*Desmodium tortuosum**	
Savannas Mint	*Dicerandra immaculata var. savvanarum*	SC, SCF
Panic grass	*Dichanthelium erectifolium*	
Variable witchgrass	*Dichanthelium laxiflorum*	
Rough witchgrass	*Dichanthelium portoricense*	
Panic grass	*Dichanthelium sabulorum*	
White-top sedge	*Dichromena colorata*	
Star rush	*Dichromena latifolia*	
Southern crabgrass	*Digitaria ciliaris*	
Shaggy crabgrass	*Digitaria villosa*	
Buttonweed	*Diodia teres*	
Buttonweed	*Diodia virginiana*	
Air potato	*Dioscorea bulbifera**	
Common persimmon	*Diospyros virginiana*	
Dwarf sundew	*Drosera brevifolia*	
Pink sundew	*Drosera capillaris*	
West Indian chickweed	*Drymaria cordata**	
Areca palm	*Dypsis lutescens**	

* Non-native Species

Common Name	*Scientific Name*	Primary Habitat Codes (for imperiled species)
False daisy	*Eclipta prostrata*	
Water hyacinth	*Eichhornia crassipes*	
Spike rush	*Eleocharis baldwinii*	
Spike rush	*Eleocharis cellulosa*	
Spike rush	*Eleocharis elongata*	
Spike rush	*Eleocharis geniculata*	
Spike rush	*Eleocharis vivipara*	
Elephant's foot	*Elephantopus elatus*	
Yardgrass or Goosegras	*Eleusine indica**	
Tassel flower	*Emilia fosbergii**	
Tassel flower	*Emilia sonchifolia**	
Butterfly orchid	*Encyclia tampensis*	
Ear-pod tree	*Enterolobium contortisliquum**	
Pothos	*Epipremnum pinnatum**	
Thalia lovegrass	*Eragrostis atrovirens**	
Gophertail lovegrass	*Eragrostis ciliaris*	
Elliott lovegrass	*Eragrostis elliottii*	
Carolina lovegrass	*Eragrostis pectinacea*	
Purple lovegrass	*Eragrostis spectabilis*	
Feather lovegrass	*Eragrostis tenella**	
Fireweed	*Erechtites hieracifolia*	
Fleabane	*Erigeron quercifolius*	
	Erigeron vernus	
Hat Pins	*Eriocaulon compressum*	
Giant hat pins	*Eriocaulon decangulare*	
Fragrant eryngium	*Eryngium aromaticum*	
Coral bean	*Erythrina herbacea*	
Swamp Mahogony	*Eucalyptus robusta**	
White stopper	*Eugenia axillaris*	
Surinam cherry	*Eugenia uniflora**	
Wild coco	*Eulophia alta*	
Dog fennel	*Eupatorium capillifolium*	
	Eupatorium leptohyllum	
	Eupatorium mohrii	
	Eupatorium rotundifolium	
	Eupatoruim serotinum	
Erect scrub spurge	*Euphorbia polyphylla*	
Finger grass	*Eustachys petraea*	
Creeping morning-glories	*Evolvulus alsinoides*	
Strangler fig	*Ficus aurea*	
Weeping fig	*Ficus benjamina**	
Laurel fig	*Ficus microcarpa**	
	Fimbristylis autumnalis	
	Fimbristylis dichotoma	
Yellowtop	*Flaveria linearis*	
Pop ash	*Fraxinus caroliniana*	
Umbrellagrass	*Fuirena breviseta*	

* Non-native Species

Common Name	*Scientific Name*	Primary Habitat Codes (for imperiled species)
.....	*Fuirena longa*	
.....	*Fuirena scirpoidea*	
.....	*Fuirena squarrosa*	
Galactia	*Galactia regularis*	
Milk pea	*Galactia volubilis*	
Bedstraw	*Galium hispidulum*	
Southern guara.....	*Gaura angustifolia*	
Dwarf Huckleberry	*Gaylussacia dumosa*	
Verbena.....	*Glandularia tampensis*	
Cudweed.....	*Gnaphalium falcatum*	
Cudweed.....	*Gnaphalium pensylvanicum*	
Purple cudweed	*Gnaphalium purpureum*	
Globe amaranth	*Gomphrena serrata**	
Loblolly bay.....	*Gordonia lisianthus*	
.....	*Gratiola hispida*	
.....	*Gratiola ramosa*	
Water spider orchid	*Habenaria repens*	
Rein orchid.....	*Habenaria floribunda*	
Firebush	*Hamelia patens*	
Prickly apple cactus	*Harrisia fragrans*.....	SC
.....	*Hedyotis corymbosa*	
.....	*Hedyotis uniflora*	
Sneezeweed	*Helenium pinnatifidum*	
Rock-rose	*Helianthemum corymbosum*	
.....	*Heliotropium angiospermum*	
Heliotrope	*Heliotropium polyphyllum*	
.....	*Hemicarpha aristulata*	
.....	*Hemicarpha micrantha*	
Camphor weed	*Heterotheca subaxillaris*	
.....	*Hibiscus furcellatus*	
Swamp hibiscus	*Hibiscus grandiflorus*	
Hawkweed	*Hieracium gronovii*	
.....	*Hieracium megacephalon*	
Water pennywort	*Hydrocotyle bonariensis*	
Marsh pennywort	*Hydrocotyle umbellate*	
Whorled marsh pennywort	*Hydrocotyle verticellata hydropiperoides*	
Spider lily	*Hymenocallis latifolia*	
Alligator lily	*Hymenocallis palmeri*	
Jaruagua grass	*Hyparrhenia rufa**	
.....	*Hypericum cistifolium*	
Sandweed	*Hypericum fasciculatum*	
St. Andrew's-cross	*Hypericum hypericoides*	
St. John's-wort	*Hypericum reductum*	
.....	*Hypericum tetrapetalum*	
Yellow stargrass.....	*Hypoxis juncea*	
Common yellow stargrass	*Hypoxis curtissi*	
Musky mint	*Hyptis alata*	

* Non-native Species

Common Name	*Scientific Name*	Primary Habitat Codes (for imperiled species)
John Charles	*Hyptis verticillata**	
Dahoon holly	*Ilex cassine*	
Gallberry	*Ilex glabra*	
Cogon grass	*Imperata cylindrica**	
Moonflower	*Ipomoea alba*	
Glades morning-glory	*Ipomoea sagittata*	
Marsh elder	*Iva microcephala*	
Rush	*Juncus marginatus*	
	Juncus megacephalus	
	Juncus polycephalus	
	Juncus scirpoides	
Rush	*Juncus spp.*	
Shrimpplant	*Justicia brandegeena**	
Chandelier Plant	*Kalanchoe diagermontiana**	
Chandelier plant	*Kalanchoe delagonesis**	
Chandalier Plant	*Kalanchoe pinnata**	
Salt marsh mallow	*Kosteletzkya virginica*	
Red root	*Lachnanthes caroliniana*	
Bog buttons	*Lachnocaulon anceps*	
Bogbutton	*Lachnocaulon engleri*	
Bogbutton	*Lachnocaulon minus*	
White mangrove	*Laguncularia racemosa*	
Lantana	*Lantana camara**	
Nodding Pimweed	*Lechea cernua*	SC, SCF
	Lemnaceae	
Peppergrass	*Lepidium virginicum*	
Blazing star	*Liatris barberi*	
Blazing stars	*Liatris chapmanii*	
Blazing stars	*Liatris tenuifolia*	
Gopher apple	*Licania michauxii*	
Pine lily	*Lilium catesbaei*	MF, WP
Blue toadflax	*Linaria canadensis*	
	Linaria floridana	
Yellow flax	*Linum medium*	
Carpetweed	*Lippia nodiflora*	
Sweetgum	*Liquidambar styraciflua*	
Bay lobelia	*Lobelia feayana*	
Swamp lobelia	*Lobelia glandulosa*	
Glades lobelia	*Lobelia paludosa*	
	Ludwigia alata	
	Ludwigia curtissii	
	Ludwigia erecta	
	Ludwigia leptocarpa	
	Ludwigia linifolia	
	Ludwigia maritima	
	Ludwigia microcarpa	
	Ludwigia octovalvis	

* Non-native Species

Common Name	*Scientific Name*	Primary Habitat Codes (for imperiled species)
Primrose willow	*Ludwigia peruviana**	
	Ludwigia repens	
	Ludwigia suffruticosa	
Sky blue lupine	*Lupinus diffusus*	
Southern club moss	*Lycopodium appressum*	
Slender club moss	*Lycopodium carolinianum*	
Rush pink	*Lygodesmia aphylla*	
Old-world climbing fern	*Lygodium microphyllum**	
Japanese climbing fern	*Lygodium japonicum**	
Staggerbush	*Lyonia fruticosa*	
Fetterbush	*Lyonia lucida*	
Loosestrife	*Lythrum alatum*	
Barbara's buttons	*Marshallia tenuifolia*	
	Mecardonia acuminata	
Melaleuca	*Melaleuca quinquenervia**	
	Melanthera nivea	
Natal grass	*Melinesis repens**	
Molassesgrass	*Melinis minutiflora**	
Creeping cucumber	*Melothria pendula*	
Climbing hempweed	*Mikania scandens*	
Twinberry	*Mitchella repens*	
Miterwort	*Mitreola petiolata*	
Miterwort	*Mitreola sessilifolium*	
Carpetweed	*Mollugo verticillata*	
Wild balsam apple	*Momordica charantia**	
Indian pipe	*Monotropa uniflora*	
Wax myrtle	*Myrica cerifera*	
Green Parrot's-feather	*Myriophyllum pinnatum*	
Myrsine	*Myrsine guinanensis*	
Common water nymph	*Najas guadalupensis*	
Tuberous sword fern	*Nephrolepis cordifolia**	
Boston fern	*Nephrolepsis exaltata*	
Fishtail swordfern	*Nephrolepsis falcate*	
Asian sword fern	*Nephrolepis multiflora**	
Spatter-dock	*Nuphar lutea*	
White waterlily	*Nymphaea odorata*	
Floating hearts	*Nymphoides aquatica*	
Hand fern	*Ophioglossum palmatum*	BG, MF, HH
Wood grass	*Oplismenus hirtellus*	
Prickly pear	*Opuntia humifusa*	
Cinnamon fern	*Osmunda cinnamomum*	
Royal fern	*Osmunda regalis*	
Cuban bulrush	*Oxycarum cubense**	
Water dropwort	*Oxypolis filiformis*	
	Oxalis sp.	
	Palafoxia feayi	
Maidencane	*Panicum hemitomon*	

* Non-native Species

Common Name	*Scientific Name*	Primary Habitat Codes (for imperiled species)
Gaping panicum	*Panicum hians*	
Guinea grass	*Panicum maximum**	
Torpedo grass	*Panicum repens**	
Redtop panicum	*Panicum rigidulum*	
Bluejoint panicum	*Panicum tenerum*	
Warty panicum	*Panicum verrucosum*	
Switch grass	*Panicum virgatum*	
Pellitory	*Parietaria praetermissa*	
Virginia creeper	*Parthenocissus quinquefolia*	
Sour paspalum	*Paspalum conjugatum*	
Florida paspalum	*Paspalum floridanum*	
Field paspalum	*Paspalum laeve*	
Bahia grass	*Paspalum notatum**	
Brownseed paspalum	*Paspalum plicatulum*	
Thin paspalum	*Paspalum setaceum*	
Vaseygrass	*Paspalum urvillei**	
	Pectis prostrata	
Spoonflower	*Peltandra sagittifolia*	
Green arum	*Peltandra virginica*	
Yellow Poinciana	*Peltophorum pterocarpum**	
Red bay	*Persea borbonia*	
Swamp bay	*Persea palustris*	
Philodendron	*Philodendron sp.**	
Golden polypody	*Phlebodium aureum*	
	Phyllanthus abnormis	
Leafflower	*Phyllanthus tenellus**	
Ground cherry	*Physalis angulata*	
Ground cherry	*Physalis arenicola*	
Pokeweed	*Phytolacca americana*	
Pennyroyal	*Piloblephis rigida*	
Blue butterwort	*Pinguicula caerulea*	
Yellow butterwort	*Pinguicula lutea*	
Sand pine	*Pinus clausa*	
S. Fla. Slash pine	*Pinus elliottii var. densa*	
	Piriqueta caroliniana	
Goldenaster	*Pityopsis graminifolia*	
Water lettuce	*Pistia stratiotes*	
Snowy orchid	*Platanthera nivea*	
	Pluchea foetida	
Camphorweed	*Pluchea rosea*	
Rose Pogonia	*Pogonia ophioglossoides*	
Painted-leaf	*Poinsettia cyathophora*	
	Polanisia tenuifolia	
Batchelor's button	*Polygala balduinii*	
Drumheads	*Polygala cruciata*	
Tall milkwort	*Polygala cymosa*	
	Polygala grandiflora	

* Non-native Species

Common Name	*Scientific Name*	Primary Habitat Codes (for imperiled species)
Wild batchelor's button	*Polygala lutea*	
Wild bachelor's button	*Polygala nana*	
	Polygala ramosa	
Yellow bachelor's buttons	*Polygala rugelii*	
	Polygala setacea	
Tiny polygala, Tiny milkwort	*Polygala smallii*	SC, SCF
Wireweed	*Polygonella ciliata*	
Sandhill wireweed	*Polygonella fimbriata*	
Wireweed	*Polygonella gracilis*	
Jointweed	*Polygonella polygama*	
Mild water-pepper	*Polygonum*	
Dotted smartweed	*Polygonum punctatum*	
	Polygonum setaceum	
Knotweed	*Polygonum spp.*	
Resurrection fern	*Polypodium polypodioides*	
Rust weed	*Polypremum procumbens*	
Pickerel weed	*Pontederia cordata*	
Purslane	*Portulaca oleracea**	
Pink purslane	*Portulaca pilosa*	
Mermaid-weed	*Proserpinaca palustris*	
Mermaid-weed	*Proserpinaca pectinata*	
Rabit tobacco	*Pseudognaphalium obtusifolium*	
Strawberry guava	*Psidium cattleianum**	
Common guava	*Psidium guajava**	
	Psilocarya nitens	
Whisk fern	*Psilotum nudum*	
Shiny-leaved wild coffee	*Psychotria nervosa*	
Soft-leaved wild coffee	*Psychotria sulzneri*	
Pineland braken fern	*Pteridium aquilinum*	
Blackroot	*Pterocaulon virgatum*	
Mock bishop's weed	*Ptillimnium capillaceum*	
Chapman's Oak	*Quercus chapmanii*	
Sand live oak	*Quercus geminata*	
Scrub oak	*Quercus inopina*	
Laurel oak	*Quercus laurifolia*	
Dwarf live oak	*Quercus minima*	
Myrtle oak	*Quercus myrtifolia*	
Live oak	*Quercus virginiana*	
White indigo berry	*Randia aculeata*	
Myrsine	*Rapanea punctata*	
Mangrove rubber vine	*Rhabdadenia biflora*	
Meadow beauty	*Rhexia cubensis*	
Meadow beauty	*Rhexia mariana*	
Meadow beauty	*Rhexia nashii*	
Meadow beauty	*Rhexia nuttallii*	
Red mangrove	*Rhizophora mangle*	
Sumac	*Rhus copallina*	

* Non-native Species

Common Name	*Scientific Name*	Primary Habitat Codes (for imperiled species)
Brown-haired snoutbean	*Rhynchosia cinerea*	
Beak rush	*Rhynchospora cephalantha*	
	Rhynchospora ciliaris	
White-tops	*Rhynchospora colorata*	
	Rhynchospora filifolia	
	Rhynchospora globularis	
	Rhynchospora intermedia	
	Rhynchospora inundata	
Star rush	*Rhynchospora latifolia*	
	Rhynchospora megalocarpa	
	Rhynchospora pleiantha	
	Rhynchospora plumosa	
	Rhynchospora pusilla	
	Rhynchospora tracyi	
	Rhynchospora wrightiana	
Mexican clover	*Richardia brasiliensis**	
Large flowered mexiacan clover	*Richardia grandiflora**	
	*Richardia scabra**	
Castor bean	*Ricinus communis**	
Southern dewberry	*Rubus trivialis*	
Mexican petunia	*Ruellia brittoniana**	
Swamp dock	*Rumex verticellatis*	
Cabbage palm	*Sabal palmetto*	
Marsh pink	*Sabatia brevifolia*	
Marsh pink	*Sabatia calycina*	
Large-flowered sabatia	*Sabatia grandiflora*	
	Sabatia spp.	
India cupscale	*Sacciolepis indica**	
American cupscale	*Sacciolepis striata*	
Arrowhead	*Sagittaria graminea*	
Arrowhead	*Sagittaria lancifolia*	
Arrowhead	*Sagittaria spp.*	
Carolina willow	*Salix caroliniana*	
Southern river sage	*Salvia misella*	
Water spangles	*Salvinia minima*	
Elderberry	*Sambucus canadensis*	
Water pimpernel	*Samolus valerandi*	
Bowstring hemp	*Sansevieria hyacinthoides**	
Chinese tallow	*Sapium sebiferum**	
White vine	*Sarcostema clausum*	
Schefflera	*Schefflera actinophylla**	
Brazilian pepper	*Schinus terebinthifolius**	
Little bluestem	*Schizachyrium scoparium*	
Sunnybell	*Schoenolirion albiflorum*	
	Schoenus nigricans	
Sensitive briar	*Schrankia microphylla*	
Nut sedge	*Scleria ciliata*	

* Non-native Species

Common Name	*Scientific Name*	Primary Habitat Codes (for imperiled species)
.....	*Scleria georgiana*	
.....	*Scleria oligantha*	
.....	*Scleria pauciflora*	
.....	*Scleria reticularis*	
.....	*Scleria triglomerata*	
Sweet broom.....	*Scoparia dulcis*	
Spike moss	*Selanginella arenicola*	
Climbing cassia.....	*Senna pendula**	
Saw palmetto	*Serenoa repens*	
Sesbania.....	*Sesbania sp.**	
Bladderpod.....	*Sesbania vesicaria*	
Knotroot foxtail	*Setaria geniculata*	
Broomweed.....	*Sida acuta*	
Indian hemp.....	*Sida rhombifolia*	
Yellow blue-eyed grass	*Sisyrinchium exile*	
Blue-eyed grass.....	*Sisyrinchium solstitiale*	
Greenbrier, Catbrier	*Smilax auriculata*	
Greenbrier, Catbrier	*Smilax bona-nox*	
Bamboo vine	*Smilax laurifolia*	
Bantum buttons.....	*Snygonanthus flavidulus*	
Common nightshade.....	*Solanum americanum*	
Twinleaf nightshade	*Solanum diphyllum**	
Tropical soda apple	*Solanum viarum**	
Goldenrod	*Solidago chapmanii*	
Goldenrod	*Solidago fistulosa*	
Goldenrod	*Solidago sempervirens*	
Goldenrod	*Solidago tortifolia*	
Lopsided indiangrass	*Sorghastrum secundum*	
Cordgrass	*Spartina bakeri*	
Saltmeadow cordgrass.....	*Spartina patens*	
.....	*Spermacoce assurgens*	
.....	*Spermacoce verticillata**	
Wedelia	*Sphagneticola trilobata**	
Ladies'-tresses.....	*Spiranthes laciniata*	
Ladies'-tresses.....	*Spiranthes vernalis*	
Duckweed	*Spirodela punctata*	
Coral dropseed	*Sporobolus domingensis*	
Smutgrass	*Sporobolus indicus**	
Pineywoods dropseed	*Sporobolus junceus*	
St. Augustine grass	*Stenotaphrum secundatum**	
Corkwood.....	*Stillingia aquatica*	
Wire plant	*Stipulicida setacea*	
Monkey-orange.....	*Strychnos spinosa**	
Trailing morning glory	*Stylisma patens*	
Arrowhead vine	*Syngonium podophyllum**	
Climbing aster	*Symphhyotrichum carolinianum*	
Java plum	*Syzygium cumini**	

* Non-native Species

Common Name	*Scientific Name*	Primary Habitat Codes (for imperiled species)
Bald cypress	*Taxodium distichum*	
Tropical alomond	*Terminalia cattapa**	
Tri-vein fern	*Thelypteris interrupta*	
Marsh fern	*Thelypteris palustris*	
Seaside mahoe	*Thespia poulnea**	
Black eyed susan vine	*Thunbergia alata**	
Northern needleleaf	*Tillandsia balbisiana*	BG, FS, HH
Red wild pine	*Tillandsia fasciculate*	SC, SCF, BG, FS, FM, MF, HH
Twisted airplant	*Tillandsia flexuosa*	SC, HH, FS, FM
Ball moss	*Tillandsia paucifolia*	
Ball moss	*Tillandsia recurvata*	
Red wild pine	*Tillandsia setacea*	
	Tillandsia simulata	
Spanish moss	*Tillandsia usneoides*	
Green wild pine	*Tillandsia utriculata*	SC, SCF, BG, FS, FM, MF, HH
Leatherleaf aiplant	*Tillandsia variabilis*	BG, HH, FS
	Tillandsia x smalliana	
Poison ivy	*Toxicodendron radicans*	
Green wandering jew	*Tradescantia fluminensis**	
Oyster plant	*Tradescantia spathacea**	
Marsh St. John's-wort	*Triadenum virginicum*	
Blue curls	*Trichostema dichotomum*	
Southern Cattail	*Typha domingensis*	
Cattails	*Typha latifolia*	
Caesar-weed	*Urena lobata**	
Para grass	*Urochloa mutica**	
Horned bladderwort	*Utricularia cornuta*	
Bladderwort	*Utricularia foliosa*	
Purple bladderwort	*Utricularia purpurea*	
Small purple bladderwort	*Utricularia resupinata*	
Bladderwort	*Utricularia subulata*	
Shiny blueberry	*Vaccinium myrsinites*	
Freshwater eelgrass	*Vallisneria americana*	
Harsh verbena	*Verbena scabra*	
Frostweed	*Verbesina virginica*	
Ironweed	*Vernonia cinerea*	
Wild cow pea	*Vigna luteola*	
Long-leaf violet	*Viola lanceolata*	
Vitex	*Vitex trifolia**	
Southern fox Grape	*Vitis munsoniana*	
Muscadine grape	*Vitis rotundifolia*	
Shoestring fern	*Vittaria lineata*	
Shoestring fern	*Vittaria lineata*	
Chain fern	*Woodwardia virginica*	
Tallow-wood, Hog plum	*Ximenia americana*	
Yellow-eyed grass	*Xyris ambigua*	
Yellow-eyed grass	*Xyris brevifolia*	

* Non-native Species

Common Name	*Scientific Name*	Primary Habitat Codes (for imperiled species)
Yellow-eyed grass	*Xyris caroliniana*	
Yellow-eyed grass	*Xyris difformis*	
Yellow-eyed grass	*Xyris elliottii*	
Yellow-eyed grass	*Xyris fimbriata*	
Yellow-eyed grass	*Xyris jupicai*	
Yellow-eyed grass	*Xyris smalliana*	
Adam's needle	*Yucca filamentosa*	
Hercules club	*Zanthoxylum clava-herculis*	
Wild lime	*Zanthoxylum fagara*	
	Zuexine strateumatica	

* Non-native Species

Common Name	*Scientific Name*	Primary Habitat Codes (for imperiled species)

INVERTEBRATES

Tanypodinae	*Ablabesmyia idei*
	Ablabesmyia mallochi
	Ablabesmyia rhamphe
Naididae	*Allonais paraguayensis*
Ceratopogonidae	*Alluaudomyia sp.*
Cerambicidae	*Anelaphus inermis*
Chrysomelidae	*Anisostena ariadne*
Bivalvia	*Anodonta imbecilis*
Gomphidae	*Aphylla williamsoni*
Hydrachnida	*Arrenurus problemicornis*
	Arrenurus sp.
Chironomini	*Asheum beckae*
Glossiphoniidae	*Batrachobdella phalera*
Noctuidae	*Bellura sp.*
Hydrophilidae	*Berosus exiguus*
	Berosus sp.
	Berosus striatus group
	Bezzia group
	Bezzia sp.
Dytiscidae	*Bidessonotus pulicarius*
Collembola	*Bourlettiella sp.*
Aeschnidae	*Boyera vinosa*
Libellulidae	*Brachymesia gravida*
	Bratislavia unidentata
Ephemeroptera	*Caenis diminuta*
	Callibaetis floridanus
	Celina sp.
	Celithemis eponina
Orbatei	*cf. Heminothrus sp.*
	Chaetarthria pallida
	Chaetogaster diaphanus
Chaoboridae	*Chaoborus punctipennis*
	Chironomus decorus
	Chironomus stigmaterus
	Cladopelma sp.
Tanytarsini	*Cladotanytarsus sp*
	Clinotanypus sp.
	Coelotanypus tricolor
Cnidaria	*Cordylophora lacustris*
	Cryptochironomus fulvus
Culicidae	*Culex sp.*
	Cybister sp.
	Dasyhelea sp.
	Dero digitata

Common Name	*Scientific Name*	Primary Habitat Codes (for imperiled species)
.....	*Dero furcata*	
.....	*Dero nivea*	
.....	*Dicrotendipes sp.*	
.....	*Dicrotendipes sp.*	
.....	*Dicrotendipes sp.*	
Gyrinidae	*Dineutus sp.*	
.....	*Donacea militaris*	
.....	*Donacea palmata*	
.....	*Donacea sp.*	
Platyhelminthes	*Dugesia sp.*	
.....	*Einfeldia natchitoocheae*	
Coenagrionidae.....	*Enallagma sp.*	
.....	*Endochironomus nigricans*	
.....	*Enochrus interruptus*	
Pyralidae.....	*Eoparagyractis floridalis*	
.....	*Erythodiplax sp.*	
.....	*Glyptotendipes sp.*	
.....	*Glyptotendipes sp.*	
.....	*Goeldichironomus sp.*	
Gastropoda	*Hebatancylus excentricus*	
.....	*Helobdella sp.*	
.....	*Helobdella triseralis*	
Amphipoda.....	*Hyalella azteca*	
.....	*Hydra sp.*	
Hydraenidae.....	*Hydraena sp.*	
.....	*Hydrobius sp.*	
Noteridae.....	*Hydrocanthus oblongus*	
.....	*Hydrocanthus sp.*	
Hydrochidae	*Hydrochus sp.*	
.....	*Hydroma sp.*	
Hydrometridae.....	*Hydrometra sp.*	
.....	*Hydrovatus pustulatus*	
.....	*Hydrovatus sp.*	
.....	*Hydrozetes sp.*	
.....	*Hyporygma quadripunctatum*	
.....	*Ischnura posita*	
.....	*Ischnura ramburii*	
.....	*Ischnura sp.*	
.....	*Isotomurus sp*.	
.....	*Koenickea aphrasta*	
.....	*Labrundinia sp.*	
.....	*Larsia sp.*	
.....	*Limnesia sp.*	
Tubificidae	*Limnodrilus hoffmiesteri*	
.....	*Longitarsus testaceus*	
.....	*Melanoides tuberculata*	

Common Name	*Scientific Name*	Primary Habitat Codes (for imperiled species)
Hebridae	*Merragata brunnea*	
	Merragata hebriodes	
Mesoveliidae	*Mesovelia mulsanti*	
	Micromenetus dilatatus	
	Microtendipes sp.	
Erpobdellidae	*Mooreobdella tetragon*	
	Munroessa gyralis	
	Nais variabilis	
Orthocladinae	*Nanocladius sp.*	
Leptoceridae	*Nectopsyche tavara*	
	Neumania sp.	
Corduliidae	*Neurocordulia sp.*	
	Nilothauma sp.	
	Nimbocera pinderi	
Notonectidae	*Notonecta indica*	
	Notonecta sp.	
Stratiomyiidae	*Odontomyia hedriodiscus*	
	Oecetis cinerascens	
	Oecetis inconspicua	
	Oecetis osteni	
	Oecetis parva	
	Oecetis porteri	
Hydroptilidae	*Orthotrichia sp.*	
	Oxyethira spp.	
Palaemonidae	*Palaemonetes paludosus*	
	Palpomyia sp.	
	Parachironomus carinatus	
	Parachironomus hirtalatus	
	Parachironomus sp.	
	Parachironomus sp.	
	Paracymus subcupreus	
	Parapoynx sp.	
	Paratanytarsus sp.	
Naucoridae	*Pelocoris femoratus*	
Haliplidae	*Peltodytes shermani*	
	Peltodytes sp.	
	Perithemis tenera	
	Physella sp.	
	Planorbella scalaris	
Ectoprocta	*Plumatella repens*	
Polycentropodidae	*Polycentropus sp.*	
	Polypedilum halterale	
	Polypedilum illinoense	
	Polypedilum laetum	
	Polypedilum sp.	

Common Name	*Scientific Name*	Primary Habitat Codes (for imperiled species)
.....	*Polypedilum sp.*	
.....	*Pomacea paludosa*	
.....	*Pristina leidyi*	
Cambaridae	*Procambarus sp.*	
.....	Procladius sp.	
Nemertea	Prostoma sp.	
Pseudochironomini	Pseudochironomus fulviventris	
Nepidae	Ranatra nigra	
.....	Samea multiplicatus	
Corixidae	Sigara compressoidea	
.....	Slavina appendiculata	
Porifera	Spongilla lacustris	
.....	Suphisellus insularis	
.....	Tanytarsus glabrescens	
.....	Tanytarsus guerlus	
.....	Tanytarsus sp.	
.....	Triaenoides abus	
Nematoda	undetermined sp.	
Ancylidae	undetermined sp.	
Hydrobiidae	undetermined sp.	
Araneae	undetermined sp.	
Ephydridae	undetermined sp.	
.....	Uniomeris carolinianus	
.....	Unionicola sp.	
.....	Xenochironomus xenolabis	
.....	Zavreliella varipennis	
Lumbriculidae		
Decapoda		
Baetidae		
Odonata		
Orthoptera		
Tettigoniidae		
Thysanoptera		
Hemiptera		
Reduviidae		
Homoptera		
Aphididae		
Cicadellidae		
Coleoptera		
Corylophidae		
Staphylinidae		
Diptera		
Chironomidae		
Chironominae		
Trichoptera		
Lepidoptera		

Common Name	*Scientific Name*	Primary Habitat Codes (for imperiled species)
Hymenoptera		

FISH

Sergeant major.....	*Abudefduf saxatilis*
Lined sole	*Achirus lineatus*
Bonefish	*Albula vulpes*
Blueback herring.....	*Alosa aestivalis*
Bowfin	*Amia calva*
Cuban anchovy.....	*Anchoa cubana*
Striped anchovy.....	*Anchoa hepsetus*
Dusky anchovy	*Anchoa lyolepis*
Bay anchovy.....	*Anchoa mitchilli*
Common eel.....	*Anguilla rostrata*
Black margate	*Anisotremus surinamensis*
Hog choker	*Archirus lineatus*
Sheepshead	*Archosargus probatocephalus*
Hardhead catfish.....	*Arius (=Galeichthys) felis*
River goby	*Awaous tajasica*
Gafftopsail catfish	*Bagre marinus*
Silver perch.....	*Bairdiella chrysura*
Gray triggerfish	*Balistes capriscus*
Triggerfish	*Balistidae, juveniles*
Frillfin goby	*Bathygobius soporator*
Highfin blenny	*Blennius (=Lupinoblennius) nicholsi*
Menhaden	*Brevoortia smithi*
Atlantic menhaden	*Brevoortia tyrannus*
Yellow jack.....	*Caranx bartholomaei*
Blue runner	*Caranx crysos*
Crevalle jack	*Caranx hippos*
Horse-eye jack	*Caranx latus*
Fat snook.....	*Centropomus parallelus*
Tarpon snook	*Centropomus pectinatus*
Common snook.....	*Centropomus undecimalis*
Rock sea bass.....	*Centropristis philadelphica*
Atlantic spadefish.....	*Chaetodipterus faber*
Striped burrfish	*Chilomycterus schoepfi*
Atlantic bumper	*Chloroscombrus chrysurus*
Gulf whiff.....	*Citharichthys macrops*
Bay whiff	*Citharichthys spilopterus*
Walking catfish	*Clarias batrachus**
Herring, juveniles.....	*Clupeidae, juveniles*
Spotted seatrout.....	*Cynoscion nebulosus*
Silver seatrout.....	*Cynoscion nothus*
Weakfish.....	*Cynoscion regalis*
Sheepshead minnow	*Cyprinodon variegatus*

Common Name	*Scientific Name*	Primary Habitat Codes (for imperiled species)
Bigeye stargazer	*Dactyloscopus crossotus*	
Southern stingray	*Dasyatis sabina*	
Irish pompano	*Diapterus olisthostomus (=auratus)*	
Striped mojarra	*Diapterys (=Eugerres) plumieri*	
Sand perch	*Diplectrum formosum*	
Silver porgy	*Diplodus argenteus*	
Spotted pinfish	*Diplodus holbrooki*	
Fat sleeper	*Dormitator maculatus*	
Gizzard shad	*Dorosoma cepedianum*	
Threadfin shad	*Dorosoma petenense*	
Everglades pygmy sunfish	*Elassoma evergladei*	
	Elassoma okefenokee	
Sleeper	Eleotris *spp.*	
Ladyfish	*Elops saurus*	
Anchovy juveniles	*Engraulidae, juveniles*	
Bluespotted sunfish	*Enneacanthus gloriosus*	
Red grouper	*Epinephelus morio*	
Nassau grouper	*Epinephelus striatus*	
Lake chubsucker	*Erimyzon sucetta*	
Emerald sleeper	*Erotelis smaragdus*	
Chain pickerel	*Esox niger*	
Swamp darter	*Etheostoma fusiforme*	
Fringed flounder	*Etropus crossotus*	
Spotfin mojarra	*Eucinostomus argenteus*	
Silver jenny	*Eucinostomus gula*	
Lyre goby	*Evorthodus lyricus*	
Bluespotted cornetfish	*Fistularia tabacaria*	
Golden topminnow	*Fundulus chrysotus*	
Marsh killifish	*Fundulus confluentus*	
Lined topminnow	*Fundulus lineolatus*	
Seminole killifish	*Fundulus seminolis*	
Mosquitofish	*Gambusia affinis (=holbrooki)*	
Mosquitofish	*Gambusia holbrooki*	
Yellowfin mojarra	*Gerres cinereus*	
Sand stargazer	*Gillellus spp*	
Violet goby	*Gobiodes broussoneti*	
Bigmouth sleeper	*Gobiomorus dormitor*	
Darter goby	*Gobionellus boleosoma*	
Slim goby	*Gobionellus gracillimus*	
Sharptail goby	*Gobionellus hastatus*	
Small-scaled goby	*Gobionellus oceanicus*	
Slashcheek goby	*Gobionellus pseudofasciatus*	
Emerald goby	*Gobionellus smaragdus*	
Naked goby	*Gobiosoma bosci (=bosc)*	
Code goby	*Gobiosoma robustum*	
Goby	*Gobiosoma strumosus*	

Common Name	*Scientific Name*	Primary Habitat Codes (for imperiled species)
French grunt	*Haemulon flavolineatum*	
Sailor's choice	*Haemulon parra*	
White grunt	*Haemulon plumieri*	
Bluestriped grunt	*Haemulon sciurus*	
Grunt	*Haemulon spp.*	
Slippery dick	*Halichoeres bivittatus*	
Scaled sardine	*Harengula pensacolae (=jagauna)*	
Ballyhoo	*Hemiramphus brasiliensis*	
Least killifish	*Heterandria formosa*	
Seahorse	*Hippocampus hudsonius (=erectus?)*	
Seahorse	*Hippocampus spp.*	
Sargassumfish	*Histrio histrio*	
Armor-plated catfish	*Hoplesternum littorale**	
Yellow bullhead	*Ictalurus (=Ameiurus) natalis*	
Brown bullhead	*Ictalurus (=Ameiurus) nebulosus*	
Channel catfish	*Ictalurus (=Ameiurus) punctatus*	
White catfish	*Ictalurus catus*	
Yellow bullhead	*Ictalurus natalis*	
Flagfish	*Jordanella floridae*	
Brook silversides	*Labidesthes sicculus*	
Hairy blenny	*Labrisomus nuchipinnis*	
Trunkfish	*Lactophrys trigonus*	
Smooth trunkfish	*Lactophrys triqueter*	
Smooth puffer	*Lagocephalus laevigatus*	
Pinfish	*Lagodon rhomboides*	
Spot	*Leiostomus xanthurus*	
Florida gar	*Lepisosteus platyrhincus*	
Spotted gar	*Lepisosteus platyrhincus*	
Gar	*Lepisosteus spp.*	
Warmouth	*Lepomis gulosus*	
Bluegill	*Lepomis macrochirus*	
Dollar sunfish	*Lepomis marginatus*	
Redear sunfish	*Lepomis microlophus*	
Spotted sunfish	*Lepomis punctatus*	
Pygmy killifish	*Leptolucania ommata*	
Tripletail	*Lobotes surinamensis*	
Crested goby	*Lophogobius cyprinoides*	
Bluefin killifish	*Lucania goodei*	
Rainwater killfish	*Lucania parva*	
Mutton snapper	*Lutjanus analis*	
Schoolmaster	*Lutjanus apodus*	
Gray snapper	*Lutjanus griseus*	
Mahogany snapper	*Lutjanus mahogoni*	
Lane snapper	*Lutjanus synagris*	
Tarpon	*Magalops atlanticus*	
Rough silverside	*Membras martinica*	

Common Name	*Scientific Name*	Primary Habitat Codes (for imperiled species)
Inland silverside	*Menidia beryllina*	
Southern kingfish/whiting	*Menticirrhus americanus*	
Northern kingfish	*Menticirrhus saxatilis*	
Largemouth goby	*Microgobius gulosus*	
Green goby	*Microgobius thalassinus*	
Opossum pipefish	*Microphis brachyurus lineatus*	MS, SLO
Atlantic croaker	*Micropogonias undulatus*	
Largemouth bass	*Micropterus salmoides*	
Planehead filefish	*Monacanthus hispidus*	
Striped mullet	*Mugil cephalus*	
White mullet	*Mugil curema*	
Moray eels, larval	*Muraenidea, leptocephalus*	
Worm eel	*Myrophis punctatus*	
Golden shiner	*Notemigonus chrysoleucas*	
Red or taillight shiner	*Notropis maculatus*	
Tadpole madtom	*Noturus gyrinus*	
Leatherjacket	*Oligoplites saurus*	
Jawfish	*Opisthognathus sp.*	
Atlantic thread herring	*Opisthonema oglinum*	
Oyster toadfish	*Opsanus tau*	
Pigfish	*Orthopristis chrysopterus*	
Flounder	*Paralichthys albigutta*	
Southern flounder	*Paralichthys lethostigma*	
Sailfin molly	*Poecilia latipinna*	
Black drum	*Pogonias chromis*	
Threadfin	*Polydactylus octonemus*	
Bluefish	*Pomatomus saltatrix*	
Black crappie	*Pomoxis nigromaculatus*	
Atlantic midshipman	*Porichthys porosissimus*	
Searobin	*Prionotus spp.*	
Bighead sea robin	*Prionotus tribulus*	
Jewfish	*Promicrops itajara*	
Yellow goatfish	*Pseudupeneus maculatus*	
Mangrove rivulus	*Rivulus marmoratus*	MS, SLO
Spanish sardine	*Sardinella anchovia*	
Parrotfish	*Scarus spp.*	
Red drum	*Sciaenops ocellata*	
Spanish mackeral	*Scomberomorus maculatus*	
Plumed scorpionfish	*Scorpaena grandicornis*	
Spotted scorpionfish	*Scorpaena plumieri*	
Scorpion fish	*Scorpaena spp.*	
Lookdown	*Selene vomer*	
Seabass Juveniles	*Serranidae, juveniles*	
Parrotfish	*Sparisoma sp*	
Northern puffer	*Sphoeroides maculatus*	
Southern puffer	*Sphoeroides nephelus*	

Common Name	*Scientific Name*	Primary Habitat Codes (for imperiled species)
Checkered puffer	*Sphoeroides testudineus*	
Great barracuda	*Sphyraena barracuda*	
Northern sennet	*Sphyraena borealis*	
Southern sennet	*Sphyraena picudilla*	
Star drum	*Stellifer lanceolatus*	
Atlantic needlefish	*Strongylura marina*	
Needlefishes	*Strongylura spp.*	
Shark	*Subclass Elasmobranchii*	
Stingrays	*Subclass Elasmobranchii*	
Tonguefish	*Symphurus plagiusa*	
Dusky pipefish	*Syngnathus floridae*	
Chain pipefish	*Syngnathus louisianae*	
Gulf pipefish	*Syngnathus scovelli*	
Inshore lizardfish	*Synodus foetens*	
Florida pompano	*Trachinotus carolinus*	
Permit	*Trachinotus falcatus*	
Atlantic cutlassfish	*Trichiurus lepturus*	
Hogchoker	*Trinectes maculatus*	
Houndfish	*Tylosurus sp.*	
Atlantic moonfish	*Vomer setapinnis*	
AMPHIBIANS		
Florida cricket frog	*Acris gryllus*	
Two-toed Amphiuma	*Amphiuma means*	
Oak toad	*Anaxyrus quercicus*	
Southern toad	*Anaxyrus terrestris*	
Green house frog	*Eleutherodactylus planirostris planirostris**	
Gopher frog	*Lithobates capito*	MF, SC, SCF
Green treefrog	*Hyla cinerea*	
Pinewoods tree frog	*Hyla femoralis*	
Barking treefrog	*Hyla gratiosa*	
Squirrel tree frog	*Hyla squirella*	
Little grass frog	*Limnaoedus ocularis*	
Pig frog	*Lithobates grylio*	
Southern leopard frog	*Lithobates sphenocephala*	
Cuban treefrog	*Osteopilus septentrionalis**	
Florida chorus frog	*Pseudacris nigrita*	
Marine toad	*Rhinella marina**	
Eastern spadefoot toad	*Scaphiopus holbrooki*	
Greater or lesser siren	*Siren sp.*	
REPTILES		
Florida cottonmouth	*Agkistrodon piscivorus conanti*	
American alligator	*Alligator mississippiensis*	MTC
Green anole	*Anolis carolinensis*	

Common Name	*Scientific Name*	Primary Habitat Codes (for imperiled species)
Florida softshell	*Apalone ferox*	
Six-lined racerunner	*Cnemidophorus sexlineatus*	
Southern black racer	*Coluber constrictor priapus*	
Eastern diamondback rattlesnake	*Crotalus adamanteus*	
Eastern indigo snake	*Drymarchon corais couperi*	SC, SCF
Corn/Red rat snake	*Elaphe guttata guttata*	
Yellow rat snake	*Elaphe obsoleta quadrivittata*	
Peninsula mole skink	*Eumeces egregius onocrepis*	
Southeastern five-lined skink	*Eumeces inexpectatus*	
Eastern mud snake	*Farancia abacura abacura*	
Gopher tortoise	*Gopherus polyphemus*	MF, SC, SCF
Green iguana	*Iguana iguana**	
Striped mud turtle	*Kinosternon baurii*	
Scarlet kingsnake	*Lampropeltis triangulum elapsoides*	
Eastern coachwhip	*Masticophis flagellum*	
Eastern coral snake	*Micrurus fulvius*	
Brown anole	*Norops sagrei**	
Rough green snake	*Opheodrys aestivus*	
Florida pine Snake	*Pituophis melanoleucus mugitus*	
Florida scrub lizard	*Sceloporus woodi*	
Pigmy rattlesnake	*Sistrurus miliarius*	
Crowned snake	*Tantilla relicta pamlica*	
Florida box turtle	*Terrapene Carolina bauri*	
Southern garter snake	*Thamnophis sirtalis*	

BIRDS

Cooper's hawk	*Accipiter cooperii*	
Sharp-shinned hawk	*Accipiter striatus*	
Spotted sandpiper	*Actitis macularia*	
Red-winged blackbird	*Agelaius phoeniceus*	
Wood duck	*Aix sponsa*	
American wigeon	*Anas americana*	
Northern shoveler	*Anas clypeata*	
Green-winged teal	*Anas crecca*	
Blue-winged teal	*Anas discors*	
Mottled duck	*Anas fulvigula*	
Mallard	*Anas platyrynchos*	
Gadwall	*Anas strepera*	
Anhinga	*Anhinga anhinga*	
Florida scrub-jay	*Aphelocoma coerulescens*	SC, SCF
Limpkin	*Aramus guarauna*	BM, DM, FM, MS, WP, MLK
Ruby-throated hummingbird	*Archilochus colubris*	
Great egret	*Ardea alba*	
Great blue heron	*Ardea herodias*	
Ruddy turnstone	*Arenaria interpres*	

Common Name	*Scientific Name*	Primary Habitat Codes (for imperiled species)
Ring necked duck	*Arthya collaris*	
Lesser scaup	*Aytha affinis*	
Ring-necked duck	*Aythya collaris*	
Tufted titmouse	*Baeolophus bicolor*	
Cedar waxwing	*Bombycilla cedrorum*	
Least bittern	*Botaurus lentiginosus*	
Great horned owl	*Bubo virginianus*	
Cattle egret	*Bubulcus ibis*	
Bufflehead	*Bucephala albeola*	
Short-tailed hawk	*Buteo brachyurus*	
Red-tailed hawk	*Buteo jamaicensis*	
Red-shouldered hawk	*Buteo lineatus*	
Broad-winged hawk	*Buteo platypterus*	
Green heron	*Butorides virescens*	
Sanderling	*Calidris alba*	
Dunlin	*Calidris alpina*	
Western sandpiper	*Calidris mauri*	
Least sandpiper	*Calidris minutilla*	
Semipalmated sandpiper	*Calidris pusilla*	
Chuck-will's widow	*Caprimulgus carolinensis*	
Whip-poor-will	*Caprimulgus vociferus*	
Northern cardinal	*Cardinalis cardinalis*	
American goldfinch	*Carduelis tristis*	
Great egret	*Casmerodius albus*	
Turkey vulture	*Cathartes aura*	
Veery	*Catharus fuscescens*	
Hermit thrush	*Catharus ustulatus*	
Willet	*Catoptrophorus*	
Belted kingfisher	*Ceryle alcyon*	
Chimney swift	*Chaetura pelagica*	
Piping plover	*Charadrius melodus*	
Semipalmated plover	*Charadrius semipalmatus*	
Killdeer	*Charadrius vociferus*	
Wilson's plover	*Charadrius wilsonia*	
Common nighthawk	*Chordeiles minor*	
Northern harrier	*Circus cyaneus*	
Marsh wren	*Cistothorus palustris*	
Sedge wren	*Cistothorus platensis*	
Yellow-billed cuckoo	*Coccyzus americanus*	
Northern flicker	*Colaptes auratus*	
Northern bobwhite	*Colinus virginianus*	
Common ground-dove	*Columbina passerina*	
Eastern wood-pewee	*Contopus virens*	
Black vulture	*Coragyps atratus*	
American crow	*Corvus brachrhynchos*	
Fish crow	*Corvus ossifragus*	

Common Name	*Scientific Name*	Primary Habitat Codes (for imperiled species)
Smooth-billed ani	*Crotophaga ani*	
Blue jay	*Cyanocitta cristata*	
Black-bellied whistling-duck	*Dendrocygna autumnalis*	
Fulvous whistling-duck	*Dendrocygna bicolor*	
Bobolink	*Dolichonyx oryzivorus*	
Pileated woodpecker	*Dryocopus pileatus*	
Gray catbird	*Dumetella carolinensis*	
Little blue heron	*Egretta caerulea*	BM, DM, FM, MS, WP, MLK, MF
Snowy egret	*Egretta thula*	
Tricolored heron	*Egretta tricolor*	BM, DM, FM, MS, WP, MLK, MF
Swallow-tailed kite	*Elanoides forticatus*	
Flycatcher	*Empidonax spp.*	
White ibis	*Eudocimus albus*	
Merlin	*Falco columbarius*	
Peregrine falcon	*Falco peregrinus*	
American kestrel	*Falco sparverius*	
Magnificent frigatebird	*Fregata magnificens*	
American coot	*Fulica americana*	
Wilson's snipe	*Gallinago delicata*	
Common moorhen	*Gallinula chloropus*	
Common loon	*Gavia immer*	
Common yellowthroat	*Geothlypis trichas*	
Sandhill crane	*Grus canadensis*	BM, DM, WP, MLK, MF, DV
American oystercatcher	*Haematopus palliatus*	
Bald eagle	*Haliaeetus leucocephalus*	MTC
Worm-eating warbler	*Helmitheros vermivorum*	
Black-necked stilt	*Himantopus mexicanus*	
Baltimore oriole	*Icterus galbula*	
Loggerhead shrike	*Lanius ludovicianus*	
Herring gull	*Larus argentatus*	
Laughing gull	*Larus artricilla*	
Ring-billed gull	*Larus delawarensis*	
Great black-backed gull	*Larus marinus*	
Bonaparte's gull	*Larus philadelphia*	
Hooded merganser	Lophodytes cucullatus	
Eastern screech-owl	*Megascops asio*	
Red-bellied woodpecker	*Melanerpes carolinus*	
Red-headed woodpecker	*Melanerpes erthrocephalus*	
Wild turkey	*Meleagris gallopavo*	
Swamp sparrow	*Melospiza georgiana*	
Song sparrow	*Melospiza melodia*	
Red-breasted merganser	*Mergus serrator*	
Northern mockingbird	*Mimus polyglottos*	
Black-and-white warbler	*Mniotilta varia*	
Brown-headed cowbird	*Molothrus ater*	
Wood stork	*Mycteria americana*	BM, DM, WP, MLK, MF, MS

Common Name	*Scientific Name*	Primary Habitat Codes (for imperiled species)
Great crested flycatcher	*Myiarchus crinitus*	
Yellow-crowned night-heron	*Nyctananssa violacea*	
Black-crowned night-heron	*Nycticorax nycticorax*	
Orange-crowned warbler	*Oreothlypis celata*	
Osprey	*Pandion haliateus*	
Louisianna waterthrush	*Parkesia motacilla*	
Northern waterthrush	*Parkesia noveboracensis*	
House sparrow	*Passer domesticus**	
Savannah sparrow	*Passerculus sandwichensis*	
Painted bunting	*Passerina ciris*	
Indigo bunting	*Passerina cyanea*	
Brown pelican	*Pelecanus occidentalis*	BM, DM
Double-crested cormorant	*Phalacrocorx auritus*	
Downy woodpecker	*Picoides pubescens*	
Hairy woodpecker	*Picoides villosus*	
Eastern towhee	*Pipilo erythrophthalmus*	
Summer tanager	*Piranga rubra*	
Roseate spoonbill	*Platalea ajaja*	BM, DM, WP, MS, MLK
Glossy ibis	*Plegadis falcinellus*	
Black-bellied plover	*Pluvialis squatarola*	
Pied-billed grebe	*Podilymbus podiceps*	
Blue-gray gnatcatcher	*Polioptila caerulea*	
Purple gallinule	*Porphyrula martinica*	
Sora	*Porzana carolina*	
Boat-tailed grackle	*Quiscalus major*	
Common grackle	*Quiscalus quiscula*	
Clapper rail	*Rallus longirostris*	
Ruby-crowned kinglet	*Regulus calendula*	
Snail kite	*Rostrhamus sociabilis*	MLK, BM
Black skimmer	*Rynchops niger*	MS, MLK
Eastern phoebe	*Sayornis phoebe*	
Ovenbird	*Seiurus aurocapilla*	
Northern parula	*Setophaga amaricana*	
Black-throated blue warbler	*Setophaga caerulescens*	
Hooded warbler	*Setophaga citrina*	
Yellow-rumped warbler	*Setophaga coronata*	
Prairie warbler	*Setophaga discolor*	
Yellow-throated warbler	*Setophaga dominica*	
Palm warbler	*Setophaga palmarum*	
Yellow warbler	*Setophaga petechia*	
Pine warbler	*Setophaga pinus*	
American redstart	*Setophaga ruticilla*	
Blackpoll warbler	*Setophaga striata*	
Cape May warbler	*Setophaga tigrina*	
Eastern bluebird	*Sialia sialis*	
Yellow-bellied sapsucker	*Sphyrapicus varius*	

Common Name	*Scientific Name*	Primary Habitat Codes (for imperiled species)
Chipping sparrow	*Spizella passerina*	
Least tern	*Sterna antillarum*	
Caspian tern	*Sterna caspia*	
Forster's tern	*Sterna forsteria*	
Royal tern	*Sterna maxima*	
Sandwich tern	*Sterna sandvicensis*	
Eurasian collared-dove	*Streptopelia decaocto**	
Barred owl	*Strix varia*	
Eastern meadowlark	*Sturnella magna*	
European starling	*Sturnus vulgaris**	
Tree swallow	*Tachycineta bicolor*	
Carolina wren	*Thryothorus ludovicianus*	
Brown thrasher	*Toxostoma rufum*	
Lesser yellowlegs	*Tringa flavipes*	
House wren	*Troglodytes aedon*	
American robin	*Turdus migratorius*	
Barn owl	*Tyto alba*	
Yellow-throated vireo	*Vireo flavifrons*	
White-eyed vireo	*Vireo griseus*	
Red-eyed vireo	*Vireo olivaceus*	
Blue-headed vireo	*Vireo solitarius*	
Mourning Dove	*Zenaida macroura*	

MAMMALS

Coyote	*Canis latrans**	
Least shrew	*Cryptotis parva*	
Nine-banded armadillo	*Dasypus novemcinctus**	
Virginia opossum	*Didelphis virginiana*	
Feral cat	*Felis catus*	
Pocket gopher	*Geomys pinetis*	
Southern flying squirrel	*Glaucomys volans*	
River otter	*Lontra canadensis*	
Bobcat	*Lynx rufus*	
Whitetail deer	*Odocoileus virginianus*	
Cotton mouse	*Peromyscus gossypinus*	
Florida mouse	*Podomys floridanus*	SC, SCF
Raccoon	*Procyon lotor*	
Eastern mole	*Scalopus aquaticus*	
Gray squirrel	*Sciurus carolinensis*	
Sherman's fox squirrel	*Sciurus niger shermani*	MF, HH, ABP
Hispid cotton rat	*Sigmodon hispidus*	
Southeastern shrew	*Sorex longirostris*	
Eastern spotted skunk	*Spilogale putorius*	
Feral pig	*Sus scrofa**	
Eastern cottontail	*Sylvilagus floridanus*	

Savannas Preserve State Park Animals

Common Name	*Scientific Name*	Primary Habitat Codes (for imperiled species)
Marsh rabbit	*Sylvilagus palustris*	
Brazilian free-tailed bat	*Tadarida brasiliensis*	
West Indian manatee	*Trichechus manatus*	SLO, MS
Gray fox	*Urocyon cinereoargenteus*	

Primary Habitat Codes

TERRESTRIAL

Beach Dune	BD
Coastal Berm	CB
Coastal Grassland	CG
Coastal Strand	CS
Dry Prairie	DP
Keys Cactus Barren	KCB
Limestone Outcrop	LO
Maritime Hammock	MAH
Mesic Flatwoods	MF
Mesic Hammock	MEH
Pine Rockland	PR
Rockland Hammock	RH
Sandhill	SH
Scrub	SC
Scrubby Flatwoods	SCF
Shell Mound	SHM
Sinkhole	SK
Slope Forest	SPF
Upland Glade	UG
Upland Hardwood Forest	UHF
Upland Mixed Woodland	UMW
Upland Pine	UP
Wet Flatwoods	WF
Xeric Hammock	XH

PALUSTRINE

Alluvial Forest	AF
Basin Marsh	BM
Basin Swamp	BS
Baygall	BG
Bottomland Forest	BF
Coastal Interdunal Swale	CIS
Depression Marsh	DM
Dome Swamp	DS
Floodplain Marsh	FM
Floodplain Swamp	FS
Glades Marsh	GM
Hydric Hammock	HH
Keys Tidal Rock Barren	KTRB
Mangrove Swamp	MS
Marl Prairie	MP
Salt Marsh	SAM
Seepage Slope	SSL
Shrub Bog	SHB
Slough	SLO
Slough Marsh	SLM

Strand Swamp ..... STS
Wet Prairie ..... WP

LACUSTRINE
Clastic Upland Lake ..... CULK
Coastal Dune Lake ..... CDLK
Coastal Rockland Lake ..... CRLK
Flatwoods/Prairie ..... FPLK
Marsh Lake ..... MLK
River Floodplain Lake ..... RFLK
Sandhill Upland Lake ..... SULK
Sinkhole Lake ..... SKLK
Swamp Lake ..... SWLK

RIVERINE
Alluvial Stream ..... AST
Blackwater Stream ..... BST
Seepage Stream ..... SST
Spring-run Stream ..... SRST

SUBTERRANEAN
Aquatic Cave ..... ACV
Terrestrial Cave ..... TCV

ESTUARINE
Algal Bed ..... EAB
Composite Substrate ..... ECPS
Consolidated Substrate ..... ECNS
Coral Reef ..... ECR
Mollusk Reef ..... EMR
Octocoral Bed ..... EOB
Seagrass Bed ..... ESGB
Sponge Bed ..... ESPB
Unconsolidated Substrate ..... EUS
Worm Reef ..... EWR

MARINE
Algal Bed ..... MAB
Composite Substrate ..... MCPS
Consolidated Substrate ..... MCNS
Coral Reef ..... MCR
Mollusk Reef ..... MMR
Octocoral Bed ..... MOB
Seagrass Bed ..... MSGB
Sponge Bed ..... MSPB
Unconsolidated Substrate ..... MUS
Worm Reef ..... MWR

ALTERED LANDCOVER TYPES

Abandoned field	ABF
Abandoned pasture	ABP
Agriculture	AG
Canal/ditch	CD
Clearcut pine plantation	CPP
Clearing	CL
Developed	DV
Impoundment/artificial pond	IAP
Invasive exotic monoculture	IEM
Pasture - improved	PI
Pasture - semi-improved	PSI
Pine plantation	PP
Road	RD
Spoil area	SA
Successional hardwood forest	SHF
Utility corridor	UC

MISCELLANEOUS

Many Types of Communities	MTC
Overflying	OF

Addendum 6—Imperiled Species Ranking Definitions

The Nature Conservancy and the Natural Heritage Program Network (of which FNAI is a part) define an element as any exemplary or rare component of the natural environment, such as a species, natural community, bird rookery, spring, sinkhole, cave or other ecological feature. An element occurrence (EO) is a single extant habitat that sustains or otherwise contributes to the survival of a population or a distinct, self-sustaining example of a particular element.

Using a ranking system developed by The Nature Conservancy and the Natural Heritage Program Network, the Florida Natural Areas Inventory assigns two ranks to each element. The global rank is based on an element's worldwide status; the state rank is based on the status of the element in Florida. Element ranks are based on many factors, the most important ones being estimated number of Element occurrences, estimated abundance (number of individuals for species; area for natural communities), range, estimated adequately protected EOs, relative threat of destruction, and ecological fragility.

Federal and State status information is from the U.S. Fish and Wildlife Service; and the Florida Fish and Wildlife Conservation Commission (animals), and the Florida Department of Agriculture and Consumer Services (plants), respectively.

FNAI GLOBAL RANK DEFINITIONS

G1 ..... Critically imperiled globally because of extreme rarity (5 or fewer occurrences or less than 1000 individuals) or because of extreme vulnerability to extinction due to some natural or fabricated factor.

G2 ..... Imperiled globally because of rarity (6 to 20 occurrences or less than 3000 individuals) or because of vulnerability to extinction due to some natural or man-made factor.

G3 ..... Either very rare or local throughout its range (21-100 occurrences or less than 10,000 individuals) or found locally in a restricted range or vulnerable to extinction of other factors.

G4 ..... apparently secure globally (may be rare in parts of range)

G5 ..... demonstrably secure globally

GH ..... of historical occurrence throughout its range may be rediscovered (e.g., ivory-billed woodpecker)

GX ..... believed to be extinct throughout range

GXC ..... extirpated from the wild but still known from captivity or cultivation

G#? ..... Tentative rank (e.g.,G2?)

G#G# ..... range of rank; insufficient data to assign specific global rank (e.g., G2G3)

G#T# ..... rank of a taxonomic subgroup such as a subspecies or variety; the G portion of the rank refers to the entire species and the T portion refers to the specific subgroup; numbers have same definition as above (e.g., G3T1)

G#Q..... rank of questionable species - ranked as species but questionable whether it is species or subspecies; numbers have same definition as above (e.g., G2Q)
G#T#Q..... same as above, but validity as subspecies or variety is questioned.
GU ..... due to lack of information, no rank or range can be assigned (e.g., GUT2).
G?..... Not yet ranked (temporary)
S1..... Critically imperiled in Florida because of extreme rarity (5 or fewer occurrences or less than 1000 individuals) or because of extreme vulnerability to extinction due to some natural or man-made factor.
S2..... Imperiled in Florida because of rarity (6 to 20 occurrences or less than 3000 individuals) or because of vulnerability to extinction due to some natural or man-made factor.
S3..... Either very rare or local throughout its range (21-100 occurrences or less than 10,000 individuals) or found locally in a restricted range or vulnerable to extinction of other factors.
S4..... apparently secure in Florida (may be rare in parts of range)
S5..... demonstrably secure in Florida
SH ..... of historical occurrence throughout its range, may be rediscovered (e.g., ivory-billed woodpecker)
SX..... believed to be extinct throughout range
SA..... accidental in Florida, i.e., not part of the established biota
SE..... an exotic species established in Florida may be native elsewhere in North America
SN ..... regularly occurring but widely and unreliably distributed; sites for conservation hard to determine
SU ..... due to lack of information, no rank or range can be assigned (e.g., SUT2).
S?..... Not yet ranked (temporary)
N ..... Not currently listed, nor currently being considered for listing, by state or federal agencies.

LEGAL STATUS

FEDERAL

(Listed by the U. S. Fish and Wildlife Service - USFWS)

LE ..... Listed as Endangered Species in the List of Endangered and Threatened Wildlife and Plants under the provisions of the Endangered Species Act. Defined as any species that is in danger of extinction throughout all or a significant portion of its range.
PE..... Proposed for addition to the List of Endangered and Threatened Wildlife and Plants as Endangered Species.
LT ..... Listed as Threatened Species. Defined as any species that is likely to become an endangered species within the near future throughout all or a significant portion of its range.
PT..... Proposed for listing as Threatened Species.

C ..... Candidate Species for addition to the list of Endangered and Threatened Wildlife and Plants. Defined as those species for which the USFWS currently has on file sufficient information on biological vulnerability and threats to support proposing to list the species as endangered or threatened.

E(S/A) ..... Endangered due to similarity of appearance.

T(S/A) ..... Threatened due to similarity of appearance.

EXPE, XE..... Experimental essential population. A species listed as experimental and essential.

EXPN, XN .... Experimental non-essential population. A species listed as experimental and non-essential. Experimental, nonessential populations of endangered species are treated as threatened species on public land, for consultation purposes.

STATE

ANIMALS .. (Listed by the Florida Fish and Wildlife Conservation Commission - FWC)

FE ..... Federally-designated Endangered

FT ..... Federally-designated Threatened

FXN..... Federally-designated Threatened Nonessential Experimental Population

FT(S/A) ..... Federally-designated Threatened species due to similarity of appearance

ST..... Listed as Threatened Species by the FWC. Defined as a species, subspecies, or isolated population, which is acutely vulnerable to environmental alteration, declining in number at a rapid rate, or whose range or habitat, is decreasing in area at a rapid rate and therefore is destined or very likely to become an endangered species within the near future.

SSC..... Listed as Species of Special Concern by the FWC. Defined as a population which warrants special protection, recognition or consideration because it has an inherent significant vulnerability to habitat modification, environmental alteration, human disturbance or substantial human exploitation that, in the near future, may result in its becoming a threatened species.

PLANTS .... (Listed by the Florida Department of Agriculture and Consumer Services - FDACS)

LE ..... Listed as Endangered Plants in the Preservation of Native Flora of Florida Act. Defined as species of plants native to the state that are in imminent danger of extinction within the state, the survival of which is unlikely if the causes of a decline in the number of plants continue, and

includes all species determined to be endangered or threatened pursuant to the Federal Endangered Species Act of 1973,as amended.

LT ..... Listed as Threatened Plants in the Preservation of Native Flora of Florida Act. Defined as species native to the state that are in rapid decline in the number of plants within the state, but which have not so decreased in such number as to cause them to be endangered.

Addendum 7—Cultural Information

These procedures apply to state agencies, local governments, and non-profits that manage state-owned properties.

A. General Discussion

Historic resources are both archaeological sites and historic structures. Per Chapter 267, Florida Statutes, '*Historic property' or 'historic resource' means any prehistoric district, site, building, object, or other real or personal property of historical, architectural, or archaeological value, and folklife resources. These properties or resources may include, but are not limited to, monuments, memorials, Indian habitations, ceremonial sites, abandoned settlements, sunken or abandoned ships, engineering works, treasure trove, artifacts, or other objects with intrinsic historical or archaeological value, or any part thereof, relating to the history, government, and culture of the state."*

B. Agency Responsibilities

Per State Policy relative to historic properties, state agencies of the executive branch must allow the Division of Historical Resources (Division) the opportunity to comment on any undertakings, whether these undertakings directly involve the state agency, i.e., land management responsibilities, or the state agency has indirect jurisdiction, i.e. permitting authority, grants, etc. No state funds should be expended on the undertaking until the Division has the opportunity to review and comment on the project, permit, grant, etc.

State agencies shall preserve the historic resources which are owned or controlled by the agency.

Regarding proposed demolition or substantial alterations of historic properties, consultation with the Division must occur, and alternatives to demolition must be considered.

State agencies must consult with Division to establish a program to location, inventory and evaluate all historic properties under ownership or controlled by the agency.

C. Statutory Authority

Statutory Authority and more in depth information can be found at:
http://www.flheritage.com/preservation/compliance/guidelines.cfm

D. Management Implementation

Even though the Division sits on the Acquisition and Restoration Council and approves land management plans, these plans are conceptual. Specific information regarding individual projects must be submitted to the Division for review and recommendations.

Managers of state lands must coordinate any land clearing or ground disturbing activities with the Division to allow for review and comment on the proposed project. Recommendations may include, but are not limited to: approval of the project as submitted, cultural resource assessment survey by a qualified professional archaeologist, modifications to the proposed project to avoid or mitigate potential adverse effects.

Projects such as additions, exterior alteration, or related new construction regarding historic structures must also be submitted to the Division of Historical Resources for review and comment by the Division's architects. Projects involving structures fifty years of age or older, must be submitted to this agency for a significance determination. In rare cases, structures under fifty years of age may be deemed historically significant. These must be evaluated on a case by case basis.

Adverse impacts to significant sites, either archaeological sites or historic buildings, must be avoided. Furthermore, managers of state property should make preparations for locating and evaluating historic resources, both archaeological sites and historic structures.

E. Minimum Review Documentation Requirements

In order to have a proposed project reviewed by the Division, certain information must be submitted for comments and recommendations. The minimum review documentation requirements can be found at: http://www.flheritage.com/preservation/compliance/docs/minimum_review_documentation_requirements.pdf .

* * *

Questions relating to the treatment of archaeological and historic resources on state lands should be directed to:

Deena S. Woodward
Division of Historical Resources
Bureau of Historic Preservation
Compliance and Review Section
R. A. Gray Building
500 South Bronough Street
Tallahassee, FL 32399-0250

Phone: (850) 245-6425

Toll Free: (800) 847-7278
Fax: (850) 245-6435

The criteria to be used for evaluating eligibility for listing in the National Register of Historic Places are as follows:

1) Districts, sites, buildings, structures, and objects may be considered to have significance in American history, architecture, archaeology, engineering, and/or culture if they possess integrity of location, design, setting, materials, workmanship, feeling, and association, and:

- **a)** are associated with events that have made a significant contribution to the broad patterns of our history; and/or
- **b)** are associated with the lives of persons significant in our past; and/or
- **c)** embody the distinctive characteristics of type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; and/or
- **d)** have yielded, or may be likely to yield, information important in prehistory or history.

2) Ordinarily cemeteries, birthplaces, or graves of historical figures; properties owned by religious institutions or used for religious purposes; structures that have been moved from their original locations; reconstructed historic buildings; properties primarily commemorative in nature; and properties that have achieved significance within the past 50 years shall not be considered eligible for the *National Register*. However, such properties will qualify if they are integral parts of districts that do meet the criteria or if they fall within the following categories:

- **a)** a religious property deriving its primary significance from architectural or artistic distinction or historical importance; or
- **b)** a building or structure removed from its original location but which is significant primarily for architectural value, or which is the surviving structure most importantly associated with a historic person or event; or
- **c)** a birthplace or grave of an historical figure of outstanding importance if there is no appropriate site or building directly associated with his productive life; or
- **d)** a cemetery which derives its primary significance from graves of persons of transcendent importance, from age, distinctive design features, or association with historic events; or

e) a reconstructed building, when it is accurately executed in a suitable environment and presented in a dignified manner as part of a restoration master plan, and no other building or structure with the same association has survived; or a property primarily commemorative in intent, if design, age, tradition, or symbolic value has invested it with its own exceptional significance; or

f) a property achieving significance within the past 50 years, if it is of exceptional importance.

Restoration is defined as the act or process of accurately depicting the form, features, and character of a property as it appeared at a particular period of time by means of the removal of features from other periods in its history and reconstruction of missing features from the restoration period. The limited and sensitive upgrading of mechanical, electrical and plumbing systems and other code-required work to make properties functional is appropriate within a restoration project.

Rehabilitation is defined as the act or process of making possible a compatible use for a property through repair, alterations and additions while preserving those portions or features that convey its historical, cultural or architectural values.

Stabilization is defined as the act or process of applying measures designed to reestablish a weather resistant enclosure and the structural stability of an unsafe or deteriorated property while maintaining the essential form as it exists at present.

Preservation is defined as the act or process of applying measures necessary to sustain the existing form, integrity and materials of an historic property. Work, including preliminary measures to protect and stabilize the property, generally focuses upon the ongoing maintenance and repair of historic materials and features rather than extensive replacement and new construction. New exterior additions are not within the scope of this treatment; however, the limited and sensitive upgrading of mechanical, electrical and plumbing systems and other code-required work to make properties functional is appropriate within a preservation project.

Addendum 8—Timber Management Analysis

1. *Describe management context, any management partners, parties conducting the assessment, identify compliance with Florida State Silvicultural and Wildlife BMPs, etc.*

Timber management prescriptions and actions at Savannas Preserve State Park are based on the desired future condition (DFC) of a stand or natural community as determined by guidelines determined by the Division of Recreation and Parks (DRP). In most cases, the DFC will be closely related to the historic natural community. However, where the historic community has been severely altered by past land use practices, the DFC may not always be the same as the historic natural community. All forest/stand/timber management activities undertaken will adhere to the current Florida Silvicultural Best Management Practices and Florida Forestry Wildlife Best Management Practices for State Imperiled Species. DRP is responsible for managing timber resources within corresponding management zones. This timber assessment was conducted by F4 Tech on behalf of DRP.

2. *Describe purpose of timber management activities.*

Timber management activities will be conducted to help restore and/or improve current conditions so that the associated DFC (typically an historic condition) can be achieved or maintained. Timber management will primarily be conducted in pine-dominated natural communities. Upland communities typically include mesic flatwoods, sandhill, upland pine, upland mixed woodland, and altered landcover areas such as successional hardwood forest and pine plantations. Other historically hardwood-dominated natural communities will likely have little to no timber management activities scheduled. In some circumstances, actions may be conducted to remove overstory invasive/exotic trees, e.g. Melaleuca, Chinese tallow, Brazilian pepper, occupying contiguous areas of land to help restore or maintain natural communities.

3. *Describe potential silvicultural treatments to be used and their purpose.*

Several silvicultural treatments may be considered and utilized over the next ten years to work toward the long-term DFC for candidate natural communities at the Savannas Preserve State Park. These include timber harvests, timber stand improvement, and reforestation. The various types of timber harvests may include pine thinning, targeted hardwood removal, and clearcutting. Silvicultural treatments should be implemented such that disturbance to non-target vegetation, soil, and wildlife is minimized.

Thinning is done to reduce the basal area (BA) or density of stems in a stand to improve forest health and growth conditions for residual trees. The “opening up” of high density forest stands increases tree and stand vigor, which helps mitigate the potential for damaging insect outbreaks. Thinning also serves to increase sunlight reaching the forest floor, which when combined with routine prescribed fire, can increase groundcover vegetation abundance, species richness, and overall ecological diversity. The disruption of a historic natural fire regime and/or fire return interval can often result in the need to remove undesirable or overstocked hardwood stems that currently occupy growing space in the canopy and sub-canopy. Tree removal/harvest also serves to increase groundcover vegetation,

ecological diversity, and fine fuels that facilitate consistent fire return intervals and responses.

Clearcutting supports restoration goals by removing offsite pine or hardwood species and is a precursor to establishing site-appropriate species. It is also used to control insect infestations that are damaging or threatening forest resources and ecosystem conditions on or off site.

A tangible by-product of conducting timber harvests for restoring or improving forested communities is the generation of revenue.

Stand or natural community improvement activities are often conducted to reduce unwanted hardwood or palmetto competition. Stand improvement treatments serve to reduce fuel or fuel height to improve groundcover conditions and aid in maintaining proper prescribed burning return intervals. The two main stand improvement activities used on park property are herbicide treatments and mechanically cutting vegetation. Herbicide may be applied aerially, by mechanized equipment, or via backpack sprayers. Herbicides are used to reduce the amount of hardwood competition in areas that are unable to carry sufficient prescribed fire due to shading and lack of adequate groundcover fuels. Mechanical cutting is used to reduce the height of smaller shrub and hardwood competition, allowing for the establishment of fire-dependent herbs and grasses. Decreasing fuel loadings and enhancing groundcover allows prescribed fire to be reintroduced safely into a stand that has been unable to carry fire adequately.

Reforestation is used to establish the appropriate southern pine species in areas that have been harvested and lack sufficient natural regeneration in terms of abundance (seedlings/acre) and/or species composition. Reforestation candidate areas can also include those that are fire suppressed or have been recently impacted by natural events such as windthrow, bark beetle attack, or wildfire. The two methods used to reestablish the overstory will be natural and artificial regeneration. Both methods may require site preparation to facilitate survival of the desired species. Site preparation activities may include mechanical treatment, e.g. roller chopping, herbicide application, and/or prescribed fire. Site preparation technique(s) will be selected that address the current vegetative cover type and condition, the need to minimize seedling competition while avoiding any long-term disturbance to native groundcover species, and minimize wildlife impacts. Where artificial regeneration is not needed, natural regeneration may be used in areas that have an adequate seed source of the desired tree species located on site or in the immediate vicinity. Artificial regeneration may include machine or hand planting. Hand planting is preferred on wetter sites, rougher sites, and/or sites where groundcover protection is a concern and a more natural appearance of randomly growing trees is desired. Machine planting generally allows for more consistent planting and often allows higher survival rates if the site is properly prepared.

4. Generally describe source and vintage of inventory data, Management Zone(s) and Natural Communities in play, acres per Natural Community, generalized condition description, and potential actions to take – leads to summary tables below Management Zone summaries.

Savannas Preserve State Park comprises approximately 6,881 acres in St. Lucie and Martin Counties. Approximately 888 acres are associated with several upland natural communities (mesic flatwoods, scrub, scrubby flatwoods, and xeric hammock) that are potential candidates for timber management (Table 1). In June 2017, a plot-based forest/vegetation inventory was conducted across and within these areas to quantify overstory conditions. Site photographs were taken and used, in conjunction with publicly-available aerial photographs, to generally assess understory/midstory conditions.

A review and analysis of this data suggests that current ecological conditions for multiple management zones and associated forested communities could benefit from non-revenue generating vegetation treatments. This assessment was based on a comparison of current conditions and the corresponding natural community analog or target conditions as defined per FNAI Reference Site descriptions. In general, inventory data indicates that upland habitats in several management zones have an average pine basal area (BA) that is within or less than the acceptable range for the desired future condition of the natural community types. Some natural communities considered may need midstory and overstory control to become, or remain, in compliance with FNAI defined ranges for palmetto and non-pine midstory. These assessments were made utilizing the photographs taken during the installation of vegetation plots as well as through interpretation of aerial photographs. Stands with low stocking levels, or a complete lack of preferred species, would likely benefit from midstory control and the planting of preferred pine species. In areas where planting is deemed necessary, the site should be assessed for site preparation needs including midstory/understory reduction. Tables 1 and 2 provide a summary of potential management zones and natural community polygons that may be included in forest management treatment plans over the ensuing 10-year period.

Table 1. General summary statistics for Savannas Preserve State Park.

Number of Management Zones within the Park	88
Number of Management Zones needing timber management	13
Number of unique upland Natural Communities (split by MZ)	113
Number of unique upland Natural Communities potentially needing timber management	17
Upland Natural Community acres	3,261
Acres potentially needing timber management	888

A general description of each management zone within Savannas Preserve State Park that has upland natural communities as well as their general condition and need for restoration and/or improvement actions via timber management follows. A further summarization of this data can be found in Table 2.

Management Zone SP-12B (364.6 acres)
This management zone has an average overstory BA of 14 ft^2 per acre, within sampled areas that are considered for timber management activities. The principal natural community within this management zone is mesic flatwoods which occupies 79.5% of the total acreage, and has been considered for timber management activities. The preferred overstory species of mesic flatwoods north in Martin and St. Lucie Counties is slash pine (*Pinus elliottii)* and represents 96% or ~14 ft^2 per acre of the overstory BA. The average DBH of slash pine in this management zone and natural community type is 9.6 inches. The remainder of the overstory is made up of longleaf pine and has average DBH of longleaf pine is 14.6 inches.

The management zone also contains three other natural communities including wet prairie, depression mash, and developed. These natural communities occupy the remainder of the total acreage, and have not been considered for timber management activities due to ecological or site-specific considerations that would preclude these activities.

Management Zone SP-17 (166.7 acres)
This management zone has an average overstory BA of 13 ft^2 per acre, within sampled areas that are considered for timber management activities. The principal natural community within this management zone is wet prairie which occupies 86.3% of the total acreage, and has not been considered for timber management activities.

This management zone also contains mesic flatwoods which occupy 11.5% of the total acreage, and has been considered for timber management activities. The preferred overstory species of mesic flatwoods in Martin and St. Lucie Counties is slash pine and represents 100%, or 13 ft^2 per acre of the overstory BA. The average DBH of slash pine in this management zone and natural community type is 9.9 inches.

The management zone also contains areas identified as being developed, which are not suitable for timber management activities.

Management Zone SP-21 (217.1 acres)
This management zone has an average overstory BA of 20 ft^2 per acre, within sampled areas that are considered for timber management activities. The principal natural community within this management zone is mesic flatwoods which occupies 81.9% of the total acreage, and has been considered for timber management activities. The preferred overstory species of mesic flatwoods in Martin and St. Lucie Counties is slash pine and represents 20 ft^2 per acre of the overstory BA. The

average DBH of slash pine in this management zone and natural community type is 12.0 inches.

This management zone also contains basin marsh, depression marsh, and wet prairie natural communities. These natural communities occupy the remainder of the total acreage and have not been considered for timber management activities due to ecological or site-specific considerations that would preclude these activities.

Management Zone SP-22D (22.4 acres)
This management zone has an average overstory BA of 17 ft^2 per acre, within sampled areas that are considered for timber management activities. The principal natural community within this management zone is mesic flatwoods which occupies 99.8% of the total acreage, and has been considered for timber management activities. The preferred overstory species of mesic flatwoods in Martin and St. Lucie Counties is slash pine and represents 100%, or 20 ft^2 per acre, of the overstory BA. The average DBH of slash pine in this management zone and natural community type is 12.5 inches.

This management zone also contains the basin marsh natural community. This natural community occupies the remainder of the total acreage, and has not been considered for timber management activities due to ecological or site-specific considerations that would preclude these activities.

Management Zone SP-22E (14.2 acres)
This management zone has an average overstory BA of 23 ft^2 per acre, within sampled areas that are considered for timber management activities. The principal natural community within this management zone is scrub which occupies 100% of the total acreage, and has been considered for timber management activities. The preferred overstory species of coastal scrub in this region is sand pine and represents 0% of the overstory BA. The overstory is made up entirely of a non-preferred pine species, slash pine, which represents 100% of the total overstory BA of 23 ft^2 per acre. The average DBH of slash pine in this management zone and natural community type is 14.1 inches. Due to the presence/dominance of non-preferred pine species in the overstory, this stand could be a candidate for overstory removal of slash pine, followed by the establishment of preferred species.

Management Zone SP-22F (30.7 acres)
This management zone has an average overstory BA of 25 ft^2 per acre, within sampled areas that are considered for timber management activities. The principal natural community within this management zone is scrub which occupies 99.8% of the total acreage, and has been considered for timber management activities. The preferred overstory species of coastal scrub in this region is sand pine and represents 0% of the overstory BA. The overstory is made up entirely of a non-preferred pine species, slash pine, which represents 100% of the total overstory BA of 25 ft^2 per acre. The average DBH of slash pine in this management zone and natural community type is 10.6 inches. Due to the presence/dominance of non-preferred pine species in the overstory, this stand could be a candidate for

overstory removal, of slash pine, followed by the establishment of preferred species.

Management Zone SP-24E (34.6 acres)
This management zone has an average overstory BA of 14 ft^2 per acre, within sampled areas that are considered for timber management activities. The principal natural community within this management zone is scrub which occupies 100% of the total acreage, and has been considered for timber management activities. The preferred overstory species of coastal scrub in this region is sand pine and represents 28.6%, or 4 ft^2 per acre, of the overstory BA. The average DBH of sand pine in this management zone and natural community type is 10.8 inches. The remainder of the overstory is composed of live oak *(Quercus virginiana)* which has a BA of 10 ft^2 per acre, with an average DBH of 16.3 inches.

Management Zone SP-25B (39.3 acres)
This management zone has an average overstory BA of 6 ft^2 per acre, within sampled areas that are considered for timber management activities. The principal natural community within this management zone is scrub which occupies 76.6% of the total acreage, and has been considered for timber management activities. The preferred overstory species of coastal scrub in this region is sand pine and represents 10 ft^2 per acre, of the overstory BA. The average DBH of sand pine *(Pinus clausa)* in this management zone and natural community type is 8.7 inches.

The management zone also contains the natural community mesic flatwoods which occupies 10.6% of the total acreage, and has been considered for timber management activities. The preferred overstory species of mesic flatwoods in Martin and St. Lucie Counties is slash pine though this area has no reported overstory BA of any species.

This management zone also contains the natural community scrubby flatwoods which occupies 4.2% of the total acreage, and has been considered for timber management activities. The preferred overstory species of scrubby flatwoods in Martin and St. Lucie Counties is slash pine and represents 100%, or 7 ft^2 per acre, of the overstory basal area. The average DBH slash pine in this management zone and natural community type is 10.6 inches.

Management Zone SP-25C (63.7 acres)
This management zone has an average overstory BA of 9 ft^2 per acre, within sampled areas that are considered for timber management activities. The principal natural community within this management zone is scrub which occupies 89.5% of the total acreage, and has been considered for timber management activities. The preferred overstory species of coastal scrub in this region is sand pine and represents 100%, or 12 ft^2 per acre, of the overstory BA. The average DBH of sand pine in this management zone and natural community type is 7.6 inches.

The management zone also contains the natural community mesic flatwoods which occupies 10.6% of the total acreage, and has been considered for timber

management activities. The preferred overstory species of mesic flatwoods in Martin and St. Lucie Counties is slash pine though this area has no reported overstory BA of any species.

Management Zone SP-25E (90.8 acres)
This management zone has an average overstory BA of 4 ft^2 per acre, within sampled areas that are considered for timber management activities. The principal natural community within this management zone is scrub which occupies 84.5% of the total acreage, and has been considered for timber management activities. The preferred overstory species of coastal scrub in this region is sand pine and represents 100%, or 5 ft^2 per acre, of the overstory BA. The average DBH of sand pine in this management zone and natural community type is 8.2 inches.

The management zone also contains the natural community mesic flatwoods which occupies 13.3% of the total acreage, and has been considered for timber management activities. The preferred overstory species of mesic flatwoods in Martin and St. Lucie Counties is slash pine though this area has no reported overstory basal area of any species.

The management zone also contains the natural community scrubby flatwoods which occupies 2.3% of the total acreage, and has been considered for timber management activities. The preferred overstory species of scrubby flatwoods in Martin and St. Lucie Counties is slash pine though this area has no reported overstory BA of any species.

Management Zone SP-25G (21.2 acres)
This management zone has an average overstory BA of 7 ft^2 per acre, within sampled areas that are considered for timber management activities. The principal natural community within this management zone is scrub which occupies 100% of the total acreage, and has been considered for timber management activities. The preferred overstory species of coastal scrub in this region is sand pine and represents 100%, or 7 ft^2 per acre, of the overstory BA. The average DBH of sand pine in this management zone and natural community type is 7.9 inches.

Management Zone SP-25I (52.6 acres)
This management zone has an average overstory BA of 6 ft^2 per acre, within sampled areas that are considered for timber management activities. The principal natural community within this management zone is scrub which occupies 82.4% of the total acreage, and has been considered for timber management activities. The preferred overstory species of coastal scrub in this region is sand pine and represents 100%, or 7 ft^2 per acre, of the overstory BA in this natural community type. The average DBH of sand pine in this management zone and natural community type is 8.1 inches.

The management zone also contains the natural community mesic flatwoods which occupies 17.6% of the total acreage, and has been considered for timber management activities. The preferred overstory species of mesic flatwoods in

Martin and St. Lucie Counties is slash pine and represents 0% of the overstory BA. The overstory is made up entirely of a non-preferred pine species, sand pine, which represents 100% of the total overstory BA of 3 ft^2 per acre. The average DBH of slash pine in this management zone and natural community type is 9.0 inches.

Management Zone SP-26G (32.1 acres)

This management zone has an average overstory Basal Area of 11 ft^2 per acre, within sampled areas that are considered for timber management activities. The principal natural community within this management zone is scrub which occupies 70.3% of the total acreage, and has been considered for timber management activities. The preferred overstory species of coastal scrub in this region is sand pine and represents 100%, or 10 ft^2 per acre, of the overstory BA. The average DBH of sand pine in this management zone and natural community type is 6.6 inches.

The management zone also contains the natural community mesic flatwoods which occupies 13.7% of the total acreage, and has been considered for timber management activities. The preferred overstory species of mesic flatwoods in Martin and St. Lucie Counties is slash pine and represents 0% of the overstory basal area. The overstory is made up entirely of a non-preferred pine species, sand pine, which represents 100% of the total overstory BA of 13 ft^2 per acre. The average DBH of sand pine in this management zone and natural community type is 7.5 inches.

The management zone also contains the natural community scrubby flatwoods which occupies 16.0% of the total acreage, and has been considered for timber management activities. The preferred overstory species of scrubby flatwoods in Martin and St. Lucie Counties is slash pine and represents 0%, of the overstory BA. The overstory has an average BA of 10 preferred pine species, sand pine, which represents 100% of the total overstory BA of 13 ft^2 per acre and is made up of two species, one is the non-preferred sand pine and the other is live oak. Sand pine represents 3 ft^2 per acre of BA with an average DBH of 4.1 inches. Live oak represents 7 ft^2 per acre of BA (60 trees per acre) with an average DBH of 4.6 inches. This natural community could be a candidate for thinning operation targeting non-pine overstory stems.

Table 2. Summary of proposed timber management actions for upland natural communities (NatComs) to help restore or improve ecosystem conditions.

MZ	Candidate NatComs	Acres	Current Average Overstory Pine BA (ft^2/AC)	Target Overstory Pine BA (ft^2/AC)	Current Non-Pine Overstory TPA	Target Non-Pine Overstory TPA	Potential Actions/Treatments			
							Harvest or Thin	Stand Improv-ement*	Site Prep	Plant
SP-12B	Mesic Flatwoods	289.0	14	10-50	0	0	N	Y	Y	Y
SP-17	Mesic Flatwoods	19.2	13	10-50	0	0	N	Y	Y	Y
SP-21	Mesic Flatwoods	177.8	20	10-50	0	0	N	Y	Y	Y
SP-22D	Mesic Flatwoods	22.4	17	10-50	0	0	N	Y	Y	Y
SP-22E	Scrub	14.2	23	0-20	0	< 26.2	Y	Y	Y	Y
SP-22F	Scrub	30.2	25	0-20	0	< 26.2	Y	Y	Y	Y
SP-24E	Scrub	34.6	14	0-20	11	< 26.2	N	Y	Y	Y
SP-25B	Mesic Flatwoods	4.2	0	10-50	0	0	N	Y	Y	Y
	Scrub	30.1	10	0-20	0	< 26.2	N	Y	Y	Y
	Scrubby Flatwoods	5.0	7	10-60	0	< 26.2	N	Y	Y	Y
SP-25C	Mesic Flatwoods	6.7	0	10-50	0	0	N	Y	Y	Y
	Scrub	57.0	12	0-20	0	< 26.2	N	Y	Y	Y
SP-25E	Mesic Flatwoods	12.0	0	10-50	0	0	N	Y	Y	Y
	Scrub	76.7	5	0-20	0	< 26.2	N	Y	Y	Y
	Scrubby Flatwoods	2.1	0	10-60	0	< 26.2	N	Y	Y	Y
SP-25G	Scrub	21.2	7	0-20	0	< 26.2	N	Y	Y	Y
SP-25I	Mesic Flatwoods	9.3	3	10-50	0	0	N	Y	Y	Y
	Scrub	43.4	7	0-20	0	< 26.2	N	Y	Y	Y
SP-26G	Mesic Flatwoods	4.4	13	10-50	0	0	N	Y	Y	Y
	Scrub	22.5	10	0-20	0	< 26.2	N	Y	Y	Y
	Scrubby Flatwoods	5.2	10	10-60	60	< 26.2	Y	Y	Y	Y

Addendum 9 —Land Management Review

Memorandum

Florida Department of
Environmental Protection

August 29, 2011

TO: Marianne Gengenbach, Program Administrator
Division of State Lands

FROM: Parks Small, Chief, Bureau of Natural and Cultural Resources
Division of Recreation and Parks

Albert Gregory, Chief, Office of Park Planning
Division of Recreation and Parks

SUBJECT: Response to Draft Land Management Review (LMR)
Savannas Preserve State Park

The Land Management Review draft report provided to DRP determined that management of Savannas Preserve State Park by the Division of Recreation and Parks met the two tests prescribed by law. Namely, the review team concluded that the land is being managed for the purposes for which it was acquired and in accordance with the land management plan.

Below are Additional Recommendations and Checklist Findings (items the LMR determined should be further addressed in the management plan update) of the draft LMR report, with our Manager's Response to each. The responses were prepared via a coordinated effort of the park, district office, and our offices.

The team recommends that DRP maintain the focus to increase the acreage of prescribed fire on the area. (VOTE: 5+, 0-)
Managing Agency Response: Agree.

The team recommends that DRP resolve parking related to issues at several of the public access sites. (VOTE: 5+, 0-)
Managing Agency Response: Agree. This will be addressed in the next Unit Management Plan Update.

Management of Natural Communities, specifically mesic flatwoods, scrub, scrubby flatwoods, basin marsh, depression marsh, wet prairie, marsh lake, hydric hammock, baygall, floodplain forest, floodplain marsh, blackwater stream, xeric hammock, tidal swamp and slough, with documentation in the management plan.
Managing Agency Response: Agree. The management of these natural communities and their desired future conditions will be addressed in the next Unit Management Plan Update.

Increased protection of listed species, specifically scrub jays, bald eagle, fragrant cactus, four petal paw paw, and savanna mint, with documentation in the management plan.
Managing Agency Response: Agree. The management of these listed species, including monitoring levels and management actions will be addressed in the next Unit Management Plan Update.

Discussion regarding the deficiencies relating to natural resource survey , more specifically listed species or habitat monitoring, other non-game species or habitat monitoring, fire effects monitoring, other habitat management effects monitoring, and invasive species survey/monitoring, with documentation in the management plan.
Managing Agency Response: Disagree. The Unit Management Plan will include updates on these resources management activities and provide guidance for future management, but is not a document designed to track monitoring. That type of data is captured by other methods within the Division.

Increased resource management activities related to prescribed fire, specifically the areas being burned, frequency of these burns and their quality, with documentation in the management plan.
Managing Agency Response: Agree.

Increased restoration of ruderal areas, specifically the ox bow restoration (blackwater stream) and Eden Lawn (scrub restoration), with documentation in the management plan.
Managing Agency Response: Agree. Both of these ruderal areas have ongoing restoration projects that will be continued in the next Unit Management Plan Update.

More information regarding non-native, invasive and problem species, specifically the prevention and control of plants, animals and pests/pathogens, with documentation in the management plan.
Managing Agency Response: Agree. The management of exotic species and the desired future conditions will be addressed in the next Unit Management Plan Update.

Hydrologic/Geologic Function, specifically roads and culverts, with documentation in the management plan.
Managing Agency Response: Agree. The hydrology of the Park and the desired future conditions will be addressed in the next Unit Management Plan Update.

The need for ground and surface water monitoring, specifically ground water quantity and surface water quality, with documentation in the management plan.
Managing Agency Response: Disagree. Park and District staff will not be able to maintain a water quality monitoring program on their own. Instead, staff will attempt to enlist assistance of the Water Management District (or local Water Authority or local health department) to assist the park in regular water quality/quantity monitoring.

Increased resource protection, specifically the boundary survey, gates/fencing, signage and law enforcement presence, with documentation in the management plan.
Managing Agency Response: Disagree. Fencing is addressed in the management plan. It has also been identified as a need in the Divisions Park Project and Management Tracking system database.

Adjacent property concerns, specifically Cross Town Bridge and Surplus Lands Identified, with documentation in the management plan.
Managing Agency Response: The division will consider these recommendations during the next unit management plan revision.

Management of natural communities, specifically mesic flatwoods, scrubby flatwoods, basin marsh, depression marsh, wet prairie, hydric hammock, baygall, floodplain forest, floodplain marsh, tidal swamp, slough and scrub, with documentation in the management plan.

Management District (or local Water Authority or local health department) to assist the park in regular water quality/quantity monitoring.

The need for increased resource protection, specifically signage and law enforcement presence, with documentation in the management plan.
Managing Agency Response: Agree. The management plan update will address law enforcement needs. The Division must request additional assistance through the Division of Law Enforcement or from a local law enforcement agency. However, no new law enforcement can be assigned to this or any other park unit unless they are appropriated by the Legislature or reassigned from other units. Funding is determined annually by the Florida Legislature.

Adjacent property concerns, specifically expanding development and hydrological issues (Indian river estates), with documentation in the management plan.
Managing Agency Response: The division will consider these recommendations during the next unit management plan revision.

Discussion regarding public access and education, specifically roads and parking, with documentation in the management plan.
Managing Agency Response: Agree. This will be addressed in the next Unit Management Plan Update.

The need for management resources, specifically waste disposal, buildings, equipment, staff and funding, with documentation in the management plan.
Managing Agency Response: Agree. The updated unit management plan will address funding needs. However, Division funding is determined annually by the Florida Legislature and funds are allocated to the 160 state parks according to priority needs.

Thank you for your attention.

GK

CC: Paul Rice, Chief, Bureau of Parks District 5
Kevin Jones, Assistant Chief, Bureau of Parks District 5
Dylan Gavagni, Park Manager, Savannas Preserve State Park
Ernie Cowan, Environmental Specialist, Bureau of Parks District 5