Seminole Ranch Conservation Area
Land Management Plan

November 2010

LAND MANAGEMENT PLAN SUMMARY
Seminole Ranch Conservation Area

Acres: Approximately 29,223 acres

Dates of Acquisition: Five acquisitions to date and two mitigation donations: Seminole Ranch Parcel 2a in 1981, Seminole Ranch Parcels 2b and 2c, and Redditt in 1982, mitigation donation parcel from WalMart in 1994 and DOT in 1998, McGlynn parcel in 1998. A small parcel of 0.27 acres was sold in 2009 to the Midway Fish Camp.

Date of Plan: August 2010

Basin: Upper St. Johns River Basin **Planning Basin**: Puzzle Lake Unit

Location: Seminole, Brevard, Orange and Volusia Counties. Approximately 5 miles west of Mims and Titusville, between State Road 46 and State Road 50, north of Canaveral Marshes Conservation Area and Tosohatchee WMA and south of Buck Lake Conservation Area.

Funding Sources: Save Our Rivers, Preservation 2000 and Water Resources Development Account.

Management Partners: The District is the lead manager on the conservation area. The Florida Fish and Wildlife Conservation Commission (FFWCC) is the lead manager on the Wildlife Management Areas.

Key Resource Issues: Encroachment by cabbage palm into flatwoods and other communities is an ongoing issue affecting preservation of historic natural community types.

Resource Protection and Management:
Security – Security is provided by the District's contracted security company, FFWCC and the local sheriff's office when necessary. Also, the hog removal agent and the cattle lessee provide an occasional presence on the property. Construction of illegal structures on islands within the floodplain marsh has been an ongoing problem. District staff will be working with recreational airboat groups to ensure sufficient inclement weather shelters are provided and that construction of illegal structures is avoided.

Water Resources – The property acts as a natural flood storage area. The extensive marsh areas and numerous lakes exert a significant influence on the hydrology of surrounding regions by providing a nonstructural water management system affecting water quantity and quality. In addition, the marsh provides habitat for wildlife, including many listed species. The City of Orlando has a SUA which allows the flowage of treated effluent across the conservation area from the Orlando Wetlands Park. The Division of Environmental Sciences (ES) receives updates every 6 months on water quality outflow from the treatment wetlands in the Orlando Wetlands Park, along with a yearly report.

ES continues to monitor total phosphorus discharge from the area. In the event that discharge exceeds phosphorus concentration limits, The City of Orlando provides mitigation services on Seminole Ranch Conservation Area in conjunction with the Division of Land Management. Mitigation efforts during 2006-2008 within Orlando Wetlands Park itself, such as alum application, removal of saturated soils, and replanting of vegetation after soil removal has led to a substantial decrease in total phosphorus discharged during 2009-2010.

Fire – A burn program has been established and a fire management plan has been developed for the property. Mechanical treatments are sometimes used to enhance or supplement burning in areas that have become dominated by woody species.

Invasive and Exotic Species – There are a number of exotic plant species found on the property including Brazilian pepper, tropical soda apple, cogongrass, Chinese tallow, camphor tree, old world climbing fern, and creeping oxeye. District staff treat exotic and nuisance plants with herbicides and mechanically to achieve maintenance control of the species.
Feral hogs are found on site and the District has a feral hog agent contracted to work on the property. Other exotic animal species documented on site include the nine-banded armadillo, coyote, brown anole, Eurasian collared-dove, European starling, rock pigeon, and Cuban treefrog.

Forest Management – Approximately 413 acres of natural pine have been thinned, 127 acres of pine have been salvage cut, and 700 acres of cabbage palms have been thinned. Approximately 96 acres of slash pine have been planted.

Flora and Fauna – The property is a mosaic of plant communities dominated by floodplain marsh. Other plant communities and land cover include floodplain swamp, hydric hammock, mesic flatwoods, and salt flats. There are also approximately 700 acres of improved pasture.
Many species surveys have been conducted on SRCA. A species at risk study was conducted on site by a consultant. The Tarflower chapter of the Florida Native Plant Society (FNPS) conducted multiple surveys of the property. District staff have conducted bird surveys on site and a contractor was hired by the District to survey for rare and listed animal species in 2004-2005, and listed amphibians, reptiles and mammals in 2005-2007. FFWCC and the Audubon Society have both conducted species surveys on site. A variety of listed wading birds utilize the marsh portions of the property. These include the little blue heron, snowy egret, tricolored heron, and white ibis. Other listed species found on SRCA include woodstork, bald eagle, crested caracara, Florida black bear, American alligator, gopher tortoise, and eastern indigo snake.

Cultural Resources – There are 15 cultural sites located on the property according to the Master Site File stored with the Florida Division of Historical Resources. Appropriate protection of identified or suspected sites will be implemented.

Land Use Management:

Access – There are two parking areas with access points. Parking areas are located on the north side of the property off of State Road 46 along Hatbill Road, and on the south side of the property off of State Road 50 to County Road 520 and east on Wheeler Road. Boat ramps that allow access to SRCA are located along the St. Johns River at Hatbill Park (Brevard County owns and manages this property located at the south end of Hatbill Road), three are on State Road 50 including an airboat launch ramp installed by the District, and two are on State Road 46.

Recreation - The property is open to the public for nature study, hiking, fishing, horseback riding, bicycling, boating, canoeing, primitive camping, and seasonal hunting. There is a lookout tower overlooking the floodplain marsh area near the eastern boundary and a group campsite in the middle of the conservation area. Seminole Ranch Conservation Area borders, or is part of, 6 Wildlife Management Areas. It also borders numerous natural areas, managed by various public agencies, which can allow for cooperative agreements to increase public access and recreational opportunities. It is anticipated that during the 5 year life of this plan the District will evaluate whether entry into a lease of sovereign submerged lands along the St. Johns River between SR 46 and SR 50 would improve management of the property and allow for inclusion in a Wildlife Management Area. Construction of illegal structures, such as cabins, along the river has been an ongoing problem on the conservation area. District staff will be working with recreational airboat groups and the Florida Airboat Association to ensure sufficient inclement weather shelters are provided and that construction of illegal structures is avoided.

Cooperative Agreements, Leases, Easements, and Concessions

There are a number of agreements that apply to the property. The Nature Conservancy retains a restrictive covenant that runs with the land over the majority of the conservation area. The Florida Trail Association (FTA) has an agreement with the District allowing Florida National Scenic Trail to be built on District owned lands. The District has an agreement with Florida Fish and Wildlife Conservation Commission (FFWCC) to manage 6,000 acres of the property as the Seminole Ranch Wildlife Management Area, and approximately 2,623 acres of SRCA property has been added to the Salt Lake Wildlife Management Area for hunting purposes. The Department of the Army has an agreement allowing for the installation and operation of a weather monitoring station on the property. There is a Memorandum of Understanding (MOU) with the United States Fish and Wildlife Service (USFWS) for cooperating on prescribed burns and wildfire suppression, and an interlocal agreement with Brevard County to install, maintain and use a 10" draughting well for fire fighting. There are Special Use Authorizations (SUA) in place that allow scrub-jay and butterfly research. A SUA with the City of Orlando allows for the flowage of reclaimed water across the property. The agreement enables the City to discharge a regulated amount of treated effluent from the Orlando Wetlands Park into the St. Johns River, in exchange for land management services performed on the Conservation Area. Additional SUAs allow horse buggy access, feral hog removal, bee hives to be placed on site, and the Outward Bound School has an SUA to maintain a screen room, ropes course and to camp on site. There is a license agreement for the

harvest of fronds from cabbage palms, and a license agreement to the U.S. Air Force allowing the installation, operation and maintenance of a lightning detection system. There is also a lease for cattle grazing on 1980 acres.
Access easements exist for out-parcels including Baxter Point (20 acres) and Loughman Lake Lodge, where there are a number of private landowners. The easements are via Hatbill Road and Baxter Point Road.

INTRODUCTION

This document provides guidelines for land management activities to be implemented within the Seminole Ranch Conservation Area (SRCA) over the next five years. This plan updates the management plan approved by the Governing Board in March 2005. Lands in the Upper Basin were acquired to implement the restoration of the St. Johns River floodplain and to protect lands with high water resource value and related wildlife and environmental benefits.

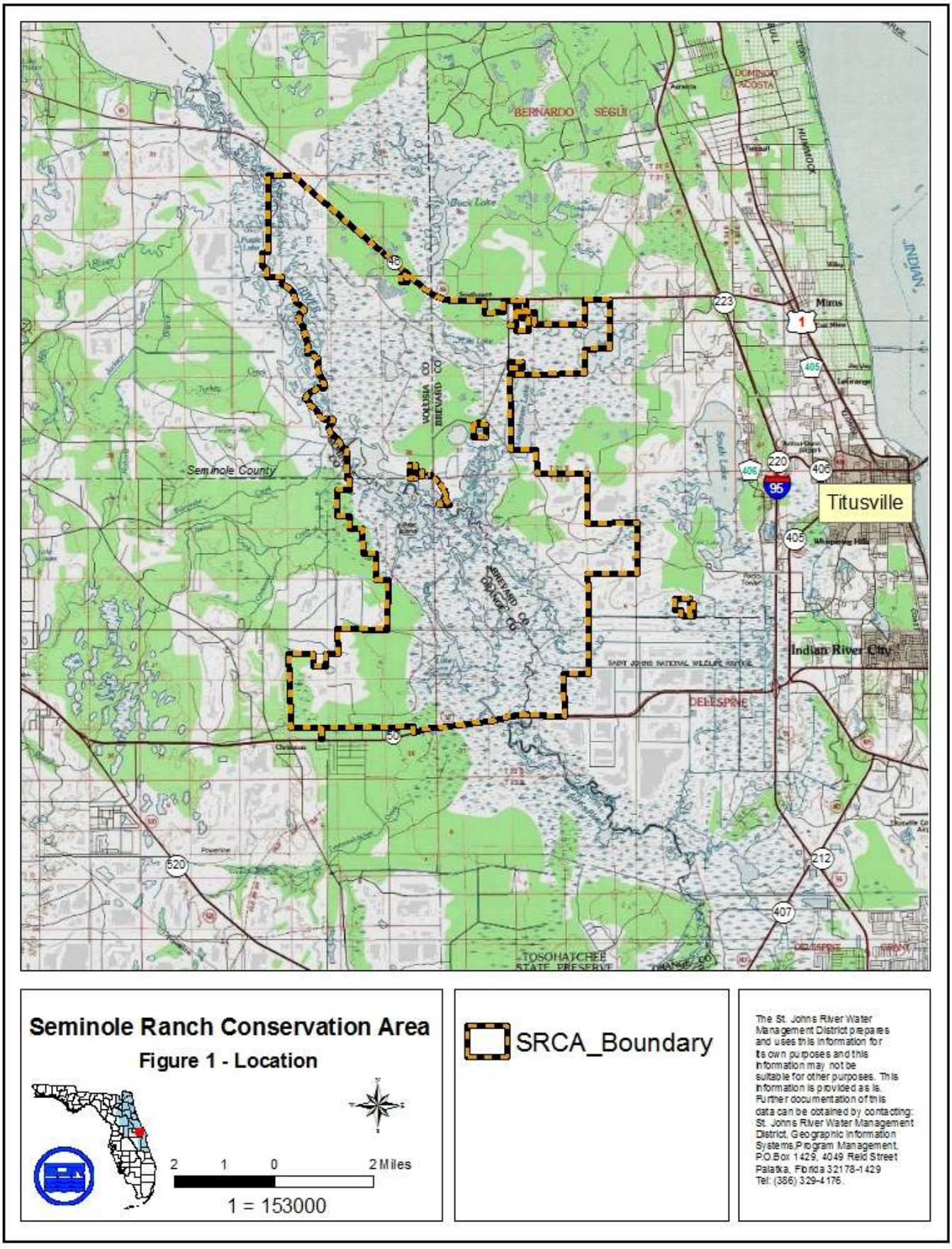
Seminole Ranch Conservation Area consists of approximately 29,223 acres and is located within the Upper St. Johns River Basin within Sections 3, 4, 9, 10, 11, 13, 14, 15, 22, 23, 24, 25, 26, 27, 35, 36, Township 21 South and Range 33 East; Sections 15, 16, 17, 18, 19, 20, 21, 22, 23, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, Township 21 South, and Range 34 East; Sections 1, 2, 11, 12, 13, 22, 23, 24, 25, 26, 27, 34, 35, Township 22 South, and Range 33 East; and Sections 4, 5, 6, 7, 8, 9, 10, 16, 17, 18, 19, 20, 29, 30, Township 22 South, Range 24 East.

Portions of the property occur in Seminole, Brevard, Orange and Volusia Counties. The property is located approximately 15 miles east of Orlando and 5 miles west of Titusville, between State Roads (SR) 46 and 50 (Figure 1). Much of the northern boundary is formed by Little Big Econ State Forest and Buck Lake Conservation Area. Most of the eastern boundary is formed by the Salt Lake Wildlife Management Area, the Brevard County Fox Lake Sanctuary and the St. Johns National Wildlife Refuge. Tosohatchee Wildlife Management Area borders portions of the southern boundary, and the Orlando Wetlands Park, Charles H. Bronson State Forest and portions of the Little Big Econ State Forest border much of the western boundary. The remainder of the boundary line is bordered by private lands. It is anticipated that during the 5 year life of this plan the District will obtain a lease to add submerged lands along the St. Johns River between SR 46 and SR 50 for ease of management and for inclusion in a Wildlife Management Area.

LAND MANAGEMENT GOALS

The land management goals for the Upper Basin and Seminole Ranch Conservation Area are:

I. Restore and maintain original hydrologic regime to the greatest extent practicable.
II. Conserve, protect, and manage natural communities and ecological systems.
III. Manage and enhance habitat for populations of listed plants and animals occurring on the property.
IV. Achieve maintenance control of exotic populations present.
V. Protect archaeological and cultural resources.
VI. Provide for public visitation and recreation to the extent that such activities are consistent with protection of natural resources.


Seminole Ranch Conservation Area
Figure 1 - Location
2 1 0 2 Miles
1 = 153000
SRCA_Boundary
The St. Johns River Water Management District prepares and uses this information for its own purposes and this information may not be suitable for other purposes. This information is provided as is. Further documentation of this data can be obtained by contacting: St. Johns River Water Management District, Geographic Information Systems,Program Management, P.O.Box 1429, 4049 Reid Street Palatka, Florida 32178-1429 Tel: (386) 329-4176.
Titusville
Indian River City
Seminole County
BERNARDO
SEGUI
DOMINGO ACOSTA
DELESPINE
TOSOHATCHEE STATE PRESERVE
Mims
Powerline
Chuluota

CONSERVATION AREA OVERVIEW

Regional Significance

The Seminole Ranch Conservation Area provides protection for approximately 22,553 acres of floodplain marsh and floodplain swamp associated with the St. Johns River. The broad floodplain within SRCA provides a significant amount of natural water retention and may serve to slow downstream flooding. The area helps to filter stormwater runoff before it reaches the St. Johns River. Connectivity of green space is increased through public ownership of this parcel. It is part of a contiguous corridor of 310,000 acres of publicly owned land, protecting the floodplain of the St. Johns River, and associated flora and fauna, that extends from the Fort Drum Conservation Area to the south, up to Lake Harney to the north (Figure 2).

The property provides public opportunities for nature study, hiking, fishing, horseback riding, bicycling, boating, canoeing, primitive camping, and seasonal hunting.

Acquisition History

The parcels making up SRCA are listed below and shown in Table 1 and Figure 3. The majority of the Conservation Area was acquired in the 3 Seminole Ranch parcel purchases, with smaller purchases and mitigation donations making up the remainder. The middle and north parcels of the Seminole Ranch purchase were the first by the District to use SOR funding.

LA 1980-002-P1. (Seminole Ranch south parcel), contains approximately 14,629.82 acres and was acquired on March 2, 1981, from Norris Grain Company for $5,100,000.00 using funds from the Water Resources Development Act (WRDA).

LA 1980-002-P2. (Seminole Ranch middle parcel), containing approximately 6,991.13 acres was acquired from The Nature Conservancy on March 23, 1982, for $2,100,900.00 using Save Our Rivers (SOR) funding.

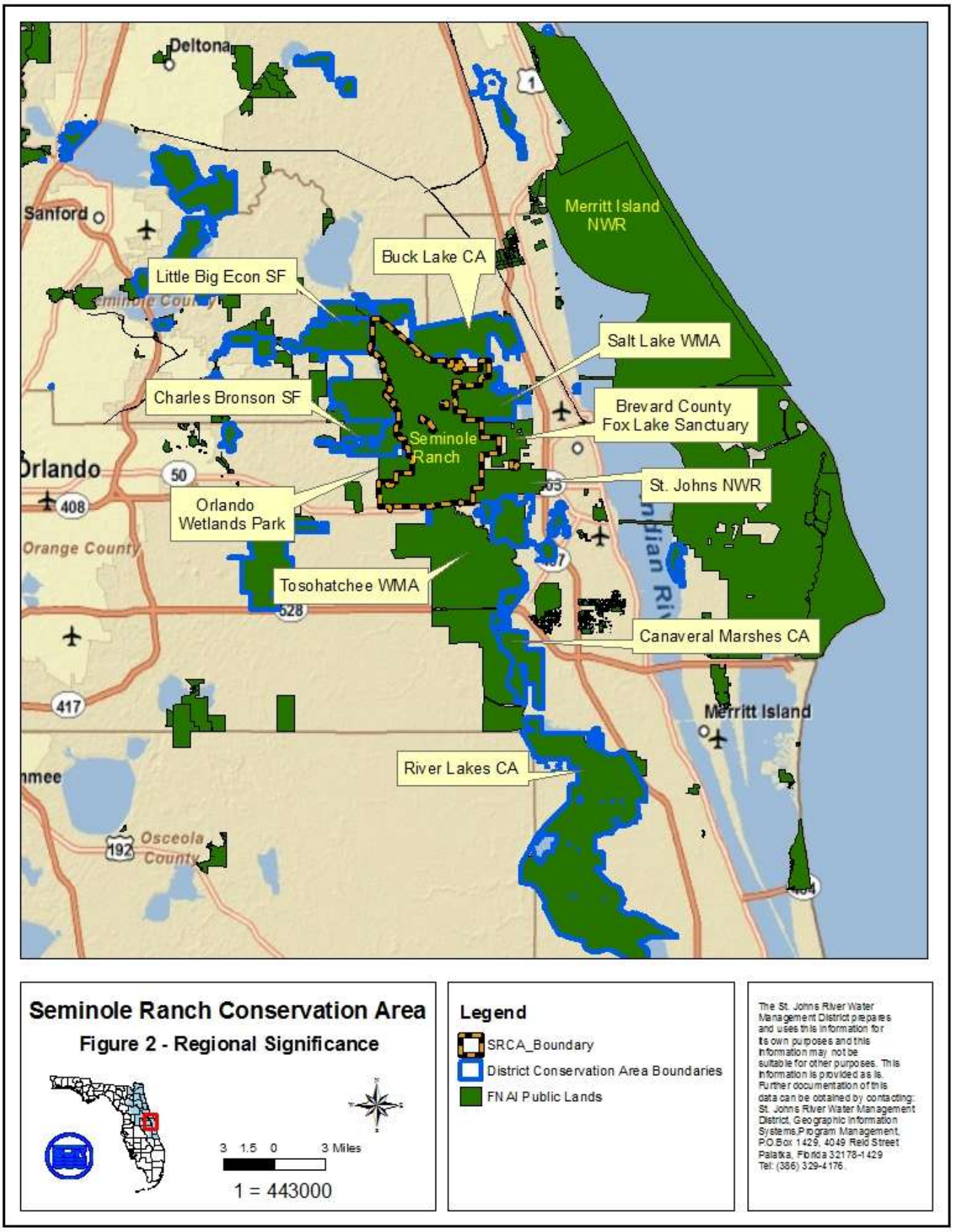
LA 1980-002-P3. (Seminole Ranch north parcel) containing approximately 7,119.99 acres was acquired on September 30, 1982 from The Nature Conservancy for $1,372,485.30 using SOR funding.

LA 1980-001-P1. A 39.81 acre out-parcel within Seminole Ranch was acquired from Redditt on June 10, 1982, for $14,000.00 with SOR funds.

LA 1993-049-P1. This parcel, containing approximately 288.47 acres on the southwest boundary of Seminole Ranch, was acquired from McGlynn for $50,000.00 on April 7, 1998, using Preservation 2000 funding.

LA 1993-019-P1. This was a DOT mitigation donation parcel from Modern, Inc., on August 4, 1998 totaling 82.28 acres.

LA 1993-084-P1. This was a mitigation donation from WalMart on June 10, 1994 totaling approximately 71.94 acres.


Deltona
Sanford
Merritt Island NWR
Buck Lake CA
Little Big Econ SF
Salt Lake WMA
Charles Bronson SF
Brevard County Fox Lake Sanctuary
Seminole Ranch
Orlando
St. Johns NWR
Orlando Wetlands Park
Orange County
Tosohatchee WMA
Canaveral Marshes CA
Merritt Island
River Lakes CA
Osceola County
Seminole Ranch Conservation Area
Figure 2 - Regional Significance
3 1.5 0 3 Miles
1 = 443000
Legend
SRCA_Boundary
District Conservation Area Boundaries
FNAI Public Lands
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A small parcel was sold in 2009 to an adjacent business owner to clean up boundary issues.
LA 2008-013-P1. A .27 acre parcel was sold to the Midway Fish Camp on March 4, 2009 for $7,604.00.

The Nature Conservancy retains a restrictive covenant that runs with the land over all 3 Seminole Ranch parcels, north, middle and south, which is recognized through signage and which contains the following conditions:

> **1a**. The land shall remain, as nearly as practicable, in a natural state, while recognizing that the Grantee may manage the land in a manner that is both consistent with this purpose and not inconsistent with its responsibility under the laws of the State of Florida.
> **1b**. All improvements to the land shall be of such a nature and extent that will be compatible with the natural hydrologic, scientific, archaeological and ecological value and characteristics of the land and that will conserve and protect the plant and animal communities.
> **1c**. The use and development of the land shall be limited, as far as practicable, to those uses and development, the purpose of which does not conflict with the maintenance of the land in a natural condition.
> **2.** The District agrees to erect and maintain a plaque or other appropriate marker at a prominent location on the conservation area, bearing the following statement: "This area was acquired with the assistance of The Nature Conservancy."

There are seven out-parcels within the Seminole Ranch Conservation Area. Several of the parcels contain a variety of structures including Loughman Lake Lodge which has small cabins, trailers, and houses. Baxter Point, the largest out-parcel, is a 20-acre subdivision containing 50 lots, most of which contain some form of dwelling.
Brevard County owns the approximately 10-acre Hatbill Park which is accessed from SR 46 along the north end of SRCA. The road to the park, Hatbill Road, is also owned by Brevard County and is approximately 5 miles in length and extends from S.R. 46 south into the center of the conservation area.
There is a ribbon of land separating portions of Fox Lake Sanctuary from SRCA on the western boundary. Acquisition of this parcel of land would simplify management of both areas.

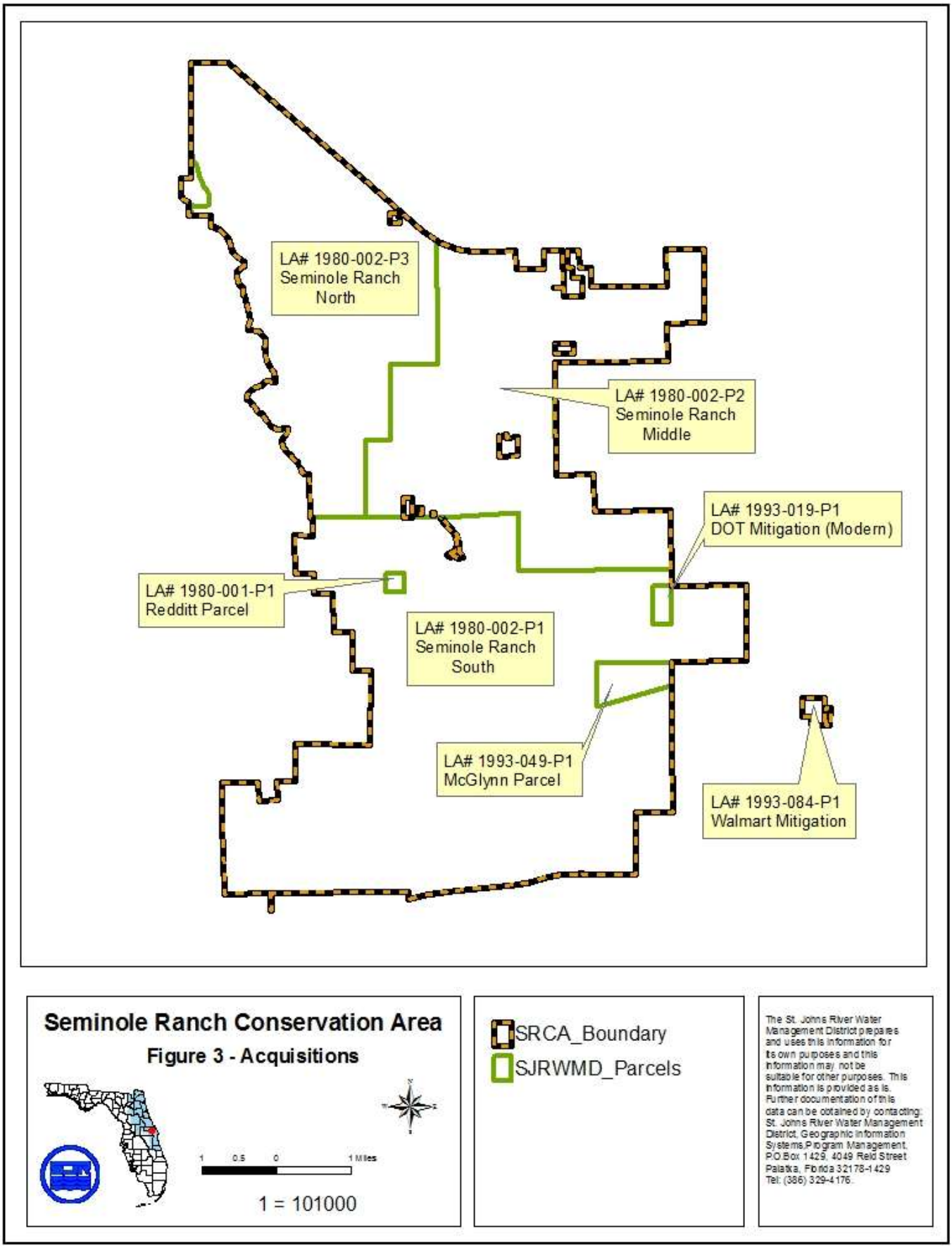
LA# 1980-002-P3
Seminole Ranch
North
LA# 1980-002-P2
Seminole Ranch
Middle
LA# 1993-019-P1
DOT Mitigation (Modern)
LA# 1980-001-P1
Redditt Parcel
LA# 1980-002-P1
Seminole Ranch
South
LA# 1993-049-P1
McGlynn Parcel
LA# 1993-084-P1
Walmart Mitigation
Seminole Ranch Conservation Area
Figure 3 - Acquisitions
1 0.5 0 1 Miles
1 = 101000
SRCA_Boundary
SJRWMD_Parcels
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Table 1: Acquisition Summary

Name	LA Number	Acres	Date Acq'd.	Funding Source	Purchase Price
Sem. Ranch, South (P1)	LA 1980-002-P1	14,629.82	3/2/81	WRDA	$5,100,000.00
Sem. Ranch, Middle P2)	LA 1980-002-P2	6,991.13	3/23/82	SOR	$2,100,900.00
Sem. Ranch, North (P3)	LA 1980-002-P3	7,119.99	9/30/82	SOR	$1,372,485.30
Redditt	LA 1980-001-P1	39.81	6/10/82	SOR	$14,000.00
DOT-Modern	LA 1993-019-P1	82.28	8/4/98	Mitigation	Donation
Walmart	LA 1993-084-P1	71.94	6/10/94	Mitigation	Donation
McGlynn	LA 1993-049-P1	288.47	4/7/98	P-2000	$50,000.00
Midway Fish Camp (Sale)	LA 2008-013-P1	-.27	3/4/09	Sale to Fish Camp	Sold For $7,604.00
Total Acreage		29,223.17			

Local Government Land Use Designations

The SRCA falls within the boundaries of 4 counties.
Seminole County designates the portion within its boundary as Rural 10 on its future land use map. Rural 10 allows a maximum of 1 dwelling unit per 10 acres.

Brevard County has most of the SRCA within it's boundary zoned as GU, or General Use, which allows single family residential development. This designation is often given to lands which have no current or specific development trends. The remainder of the SRCA within Brevard County is zoned AU, or Agricultural Residential, which allows single family detached residential dwellings and many agricultural uses.

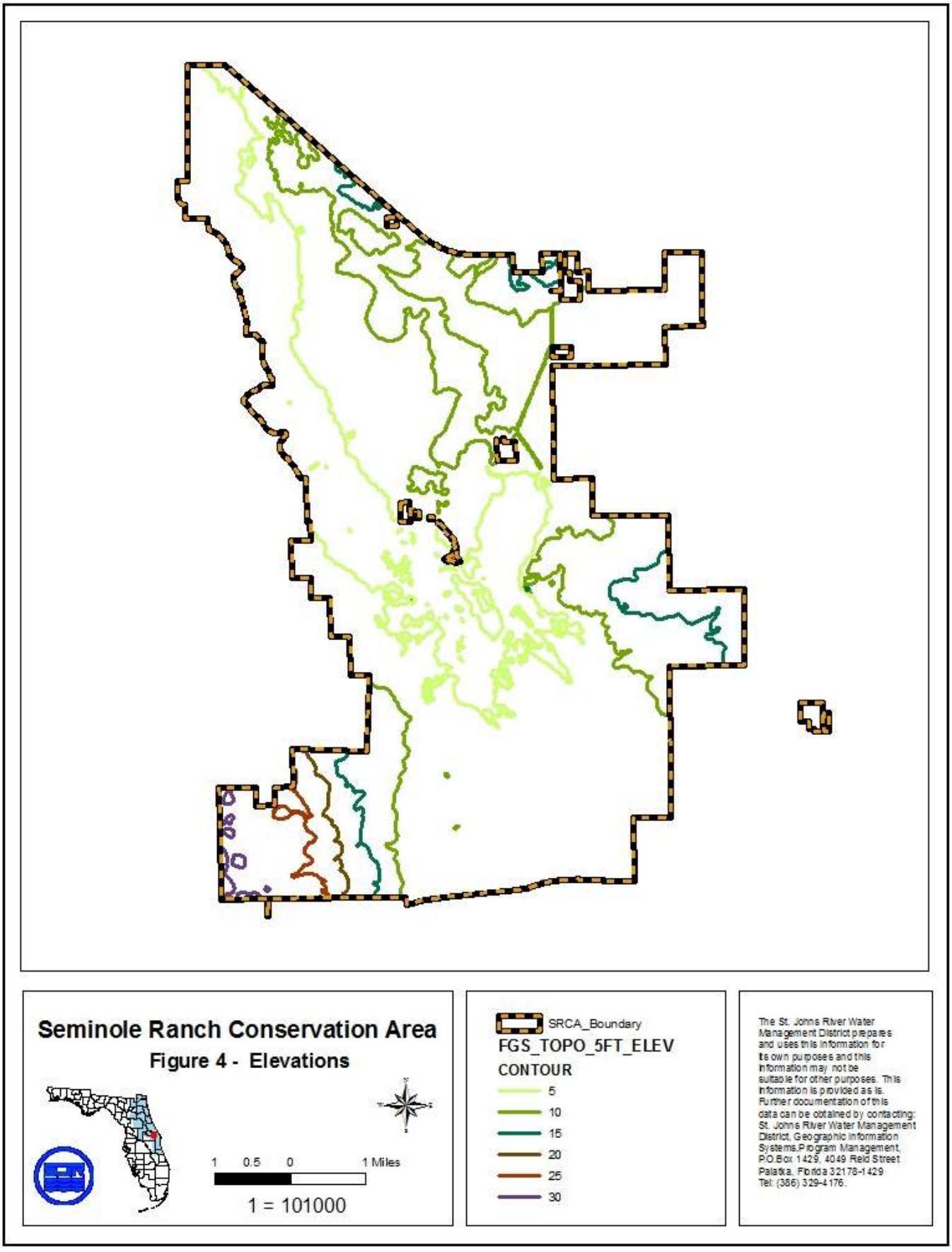
The *Orange County* future land use map designates it's portion of SRCA as Parks and Recreation, with a Conservation overlay. Parks and Recreation refers to undeveloped or developed lands as passive and active parks. The Conservation overlay element recognizes and helps protect lands designated for conserving natural resources.

Volusia County designates the portion of SRCA within the County as Conservation. With reference to natural communities and wildlife, the goal for the Conservation designation in Volusia County is to "Protect, conserve, and enhance the ecological resources of the County, maintaining their quality and contribution to the quality of life and economic well-being of Volusia County".

NATURAL RESOURCES OVERVIEW

Topography and Hydrology

Seminole Ranch Conservation Area contains approximately 12 miles of the St. Johns River. The section of the River within the Conservation Area is characterized by a wide expanse of flat, open floodplain primarily below the 10 foot contour, and mostly floodplain marsh community type. Approximately 96 percent of the property lies within the 100-year flood plain with elevations ranging between 7 and 30 feet above mean sea


Seminole Ranch Conservation Area
Figure 4 - Elevations
1 0.5 0 1 Miles
1 = 101000
SRCA_Boundary
FGS_TOPO_5FT_ELEV
CONTOUR
5
10
15
20
25
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level (Figure 4). The property contains Lake Cone, half of Puzzle Lake, and most of the East Chain of Lakes (Ruth, Clark, Silver, Loughman, and Salt Lakes).

The low gradient and large floodplain allows the Upper St. Johns River to function as a water storage area, serving as a natural regulator during high and low water stages. During low water stages, numerous secondary channels and sloughs are evident, but sheet flow during high water periods results in the loss of channel identity.

The extensive marsh areas and numerous lakes exert a significant influence on the hydrology of surrounding regions effectively providing a nonstructural water management system affecting water quantity and quality. In addition to these functions, the marsh provides habitat for wildlife, including many listed species.

Natural Comunities and Wildlife

Floodplain marsh communities support a diverse array of wildlife species including both temporary and permanent residents. The Upper Basin contains the largest freshwater marsh in the District. Many shell mounds are found in the area and are listed in the Florida Master Site File data maintained by the Department of State Division of Historical Resources.

Several inventories of wildlife species have been conducted on the property by the District, the Florida Fish and Wildlife Conservation Commission (FWC), and by the National Audubon Society. The Tarflower Chapter of the Florida Native Plant Society has conducted multiple surveys on site. Volunteers conducted a bird survey that was started in 1997 and completed in September of 1999, and the District contracted a survey for rare and listed plant species which ran from 2004 to 2005, and a survey for listed amphibians, reptiles and mammals which ran from 2005-2007. A species list is attached as Appendix A.

There are 5 natural communities and other land covers as shown in Figure 5 and Table 2. The majority of the property is floodplain marsh with a lesser amount of floodplain swamp. The remaining 4 community types are interspersed among these 2 main types. Fire intervals given in the descriptions are from the FNAI Guide to the Natural Communities of Florida, 2010. Natural community refinement and reclassification will likely occur throughout the property as restoration and fire management activities within the conservation area progress.

Table 2. Acreage by natural community or altered landcover type.

Natural Community Type	Acres
Floodplain Marsh	18083
Floodplain Swamp	4,470
Water	2,795
Hydric Hammock	2,461
Mesic Flatwoods	511
Dome Swamp	3

Altered Landcover	Acres
Pasture	677
Levees, roads, berms	128
Impoundment/Borrow Pit	46
Spoil Area	22
Clearing	14
Pine Plantation	12
Canal/Ditch	1

Floodplain Marsh: Approximately 18,083 acres (62%) of the property is comprised of floodplain marsh. The marsh supports vast stretches of sand cordgrass (*Spartina bakeri*) and sawgrass (*Cladium jamaicense*) and areas where swamp rosemallow (Hibiscus grandiflorus) is prevelant. Interspersed are depressions that contain mostly emergent aquatic species such as pickerelweed (*Pontederia cordata*) and arrowhead (*Sagittaria spp*.). Certain species in this community type such as wax myrtle (*Myrica cerifera*), saltbush (*Baccharis halimifolia*), cabbage palm (*Sabal palmetto*), and other shrubs, tend to be pervasive due to altered hydrology and lack of fire. Phragmites australis, an invasive exotic, is also expanding coverage in some areas.
The appropriate fire interval, according to FNAI, to maintain sand cordgrass marsh is every 3 years, or as often as needed to control invasion by woody species.
A unique vegetated community within the northern portion of SRCA is supported by connate saltwater, which flows from small springs. These springs in the Lake Harney-Puzzle Lake area form the East Chain of Lakes, which consists of small, slough-like lakes with salinity approaching 1/3 that of sea water. Many salt tolerant and marine dwelling organisms present in this area are not found elsewhere in the Upper St. Johns River. Salt flats or salt pans occur on approximately 418 acres of the floodplain marsh in this area. These are areas of hyper-saline conditions that are typically devoid of vegetation on the most concentrated areas. The salt deposits are believed to be from the Pleistocene epoch which began approximately 2.6 million years ago when the area was part of the bottom of the Atlantic Ocean.

Floodplain Swamp: There are approximately 4,470 acres (15%) of this community type within the conservation area. This community occurs at slightly higher elevations within the floodplain. The dominant tree species are laurel oak (*Quercus laurifolia*), water oak (*Quercus nigra*), bald cypress (*Taxodium distichum*) red maple (*Acer rubrum*), sweetgum (*Liquidambar styraciflua*), southern magnolia (*Magnolia grandiflora*), and water hickory (*Carya aquatica*). Other species include wax myrtle, saw palmetto, Florida elm (*Ulmus americana*) and sweetbay. Floodplain swamp is usually too wet to support fire.

Hydric Hammock: There are approximately 2,461 acres (8%) of hydric hammock on the property. This community includes such species as live oak (*Quercus virginiana*), cabbage palm, red cedar (*Juniperus virginiana*), sweetbay (*Magnolia virginiana*), saw palmetto (*Serenoa repens*), and wax myrtle. Due to the saturated soils and sparse ground cover, hydric hammocks rarely burn. Some areas however are dominated by cabbage palm and may be the result of altered hydrology and fire regime.

Mesic Flatwoods: There are approximately 511 acres (<2%) of flatwoods located on the property. Typical plants include slash pine (*Pinus elliottii*), saw palmetto, wiregrass (*Aristida beyrichiana*), gallberry (*Ilex glabra*), roundpod St. Johns wort (*Hypericum cistifolium*), wax myrtle and shiny blueberry (*Vaccinium myrsinites*). This is a fire dependent plant community and typically burns every 2 to 10 years. Cabbage palm density has increased within these flatwoods to the point where they can prevent the growth of new pine tree seedlings and alter the effects of fires.

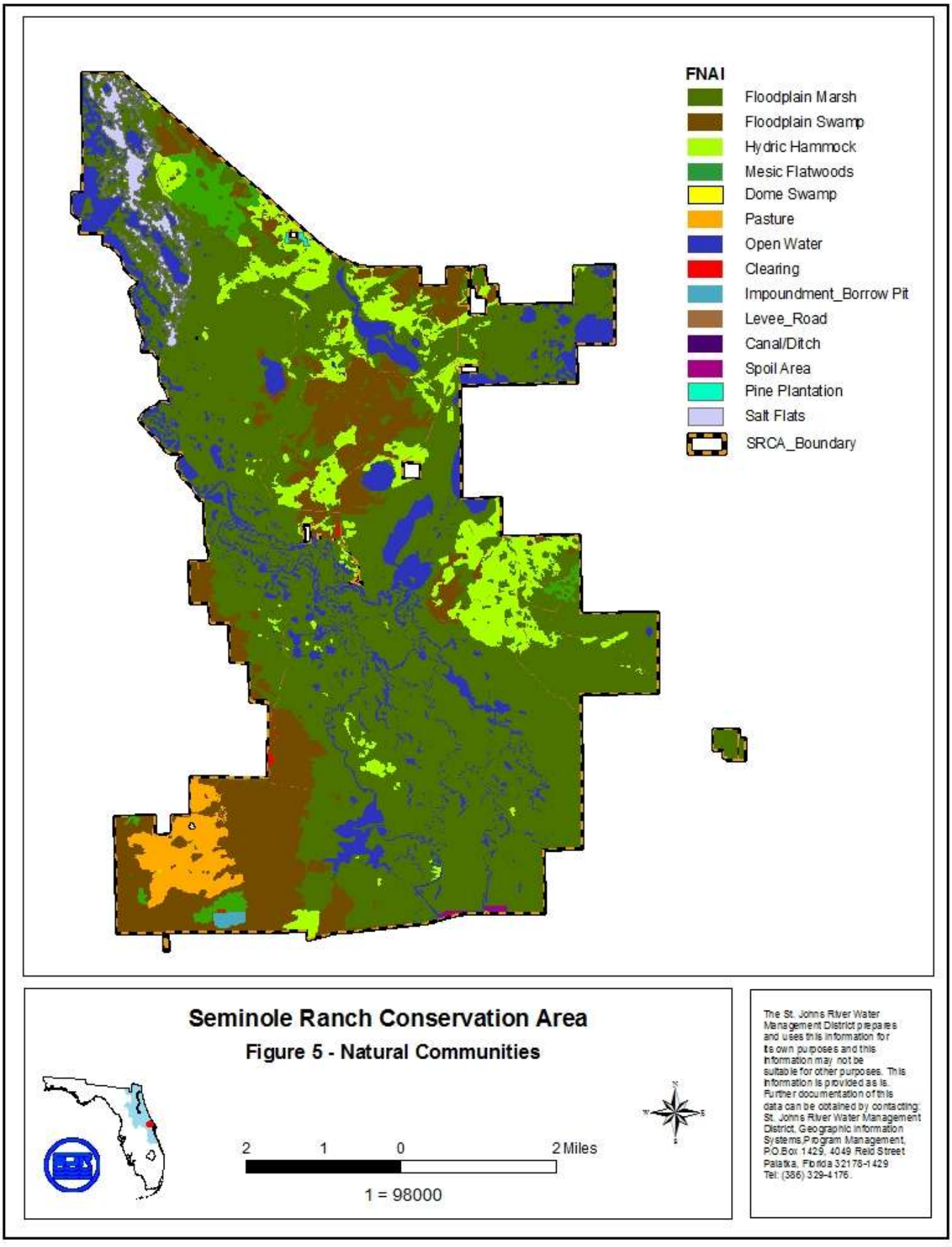
Dome Swamp: There is a small, approximately 3 acre (<1%), dome swamp located in the southwest corner of the property. The predominant species is bald cypress (*Taxodium distichum*). This is not a fire dependent plant community but fire may carry into the edge from adjacent communities.

Water (Black Water Stream): Much of the approximate 2,795 (<10%) acres of water on the property is river bordering the marsh. The river in this area is wide with multiple meandering channels during low water and one wide channel with a lack of distinct banks during high water. Water is tannin stained typical of a blackwater stream community and associated plants include golden club (*Orontium aquaticum),* smartweed or mild water pepper (*Polygonum hydropiperoides),* and various sedges *(Carex sp.).* Typical fish include gizzard shad (*Dorosoma cepedianum),* banded topminnow (Fundulus auroguttatus), banded sunfish (*Enneacanthus obesus*) and chain pickerel (*Esox niger).*

Other Landcovers: There is approximately 677 (2%) acres of improved pasture that is subject to the cattle lease. Another 12 acres of pine plantation and approximately 211 acres of altered land cover types including; levees, roads, clearings and spoil areas occur on the property. Open water covers approximately 2,810 acres but varies with rainfall. Other natural community types may exist on the conservation area, a through survey is needed to further identify and delineate the areas natural communities.

Soils

The property lies in the eastern valley of the coastal lowlands in the Atlantic Coastal Plain. The coastal lowlands consist of an area of low relief that represents several ancient marine terraces. Most of the eastern valley is less than 25 feet above mean sea level, with soils that are organic or that have an organic layer underlain by loamy subsoil. Soil types are shown on Figure 6. Definitions of the dominant soil types follow, with a comprehensive list found in Appendix B.


FNAI
Floodplain Marsh
Floodplain Swamp
Hydric Hammock
Mesic Flatwoods
Dome Swamp
Pasture
Open Water
Clearing
Impoundment_Borrow Pit
Levee_Road
Canal/Ditch
Spoil Area
Pine Plantation
Salt Flats
SRCA_Boundary
Seminole Ranch Conservation Area
Figure 5 - Natural Communities
2 1 0 2 Miles
1 = 98000
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Floridana and Chobee series soils are the dominant soil type on the conservation area. Soils in the *Floridana* series are loamy very poorly drained, slowly permeable to very slowly permeable soils that formed in thick beds of sandy and loamy marine sediment. These nearly level soils are in depressions, in poorly defined drainage ways, and on broad low flats. The water table is above the surface for short periods after heavy rainfall or within a depth of 10 inches for more than 6 months during most years. This soil is on broad flats of flood plains that are frequently flooded. Most areas are continuously flooded for 3 to 6 months or more each year. Most areas are in natural vegetation of sand cordgrass.

Soils in the *Chobee* series are very deep, very poorly drained, slowly to very slowly permeable soils in depressions, flats, and occasionally on river floodplains in the Lower Coastal Plain, formed in thick beds of loamy marine sediments. Drained areas are used for citrus, pasture, and range. Most of the soils remain in their natural state and have vegetation consisting of pickerelweed, lilies, sawgrass, and scattered red maples in treeless areas. Some areas have a growth of ash, gum, maple and cypress.

.

The soils of the *Riviera* series are loamy, poorly drained, and slowly permeable to very slowly permeable soils that formed in beds of sandy and loamy marine sediment. These nearly level soils are on low hammocks, in poorly defined drainageways, on broad, low flats, and in depressional areas. The water table is within a depth of 10 inches of surface for 1 to 6 months of the year and to 40 inches during extended dry periods. The depressional areas are ponded for 6 to 9 months or more each year. The slope ranges from 0 to 2 percent.

The *Tequesta* series consists of very deep, very poorly drained, moderately slowly permeable soils in depressional areas, fresh water swamps and marshes, and broad low flats adjacent to organic soils. They formed in stratified marine sandy and loamy sediments on the Lower Coastal Plain. The natural vegetation consists of needle grass, pickerelweed, maidencane, ferns, wax myrtle, and scattered cypress.

The *Tomoka* series consists of nearly level, very poorly drained, well-decomposed organic soils in broad flat marshes, small depressions, and swamps. These soils formed in moderately thick beds of hydrophytic, non-woody plant remains underlain by sandy and loamy mineral layers. Permeability is rapid in the organic layers and sandy layers and moderate to moderately rapid in the loamy layers. Organic matter content is very high. The water table is within 10 inches for 9 to 12 months in most years, and water is frequently above the surface. During extended dry periods, the water table is between 10 to 30 inches.

Malabar soils are very deep, poorly to very poorly drained soils in sloughs, shallow depressions, and along flood plains. Formed in sandy and loamy marine sediments. Slopes in areas where these soils are found range from 0-2%. Native vegetation consists of scattered slash pine, cypress, wax myrtle, cabbage palm, pineland threeawn, and maidencane. In depressions, the vegetation is dominantly St. Johns Wort or maidencane.

Pineda series soils are deep and very deep, poorly and very poorly drained, very slowly permeable soils in depressions, low hammocks, poorly defined drainageways, broad low flats, and floodplains, formed in thick beds of sandy and loamy marine sediments on the lower coastal plain. Slopes in areas where these soils are found range from 0-2%. Native vegetation consists of slash pine, cypress, myrtle, cabbage palm, blue maidencane, chalky bluestem, blue point panicum, sedges, pineland threeawn, and sand cordgrass.

Cultural Resources

There are 15 cultural sites located on the property according to the Master Site File stored with the Florida Division of Historical Resources. Appropriate protection of identified or suspected sites will be implemented.

PAST MANAGEMENT SUMMARY

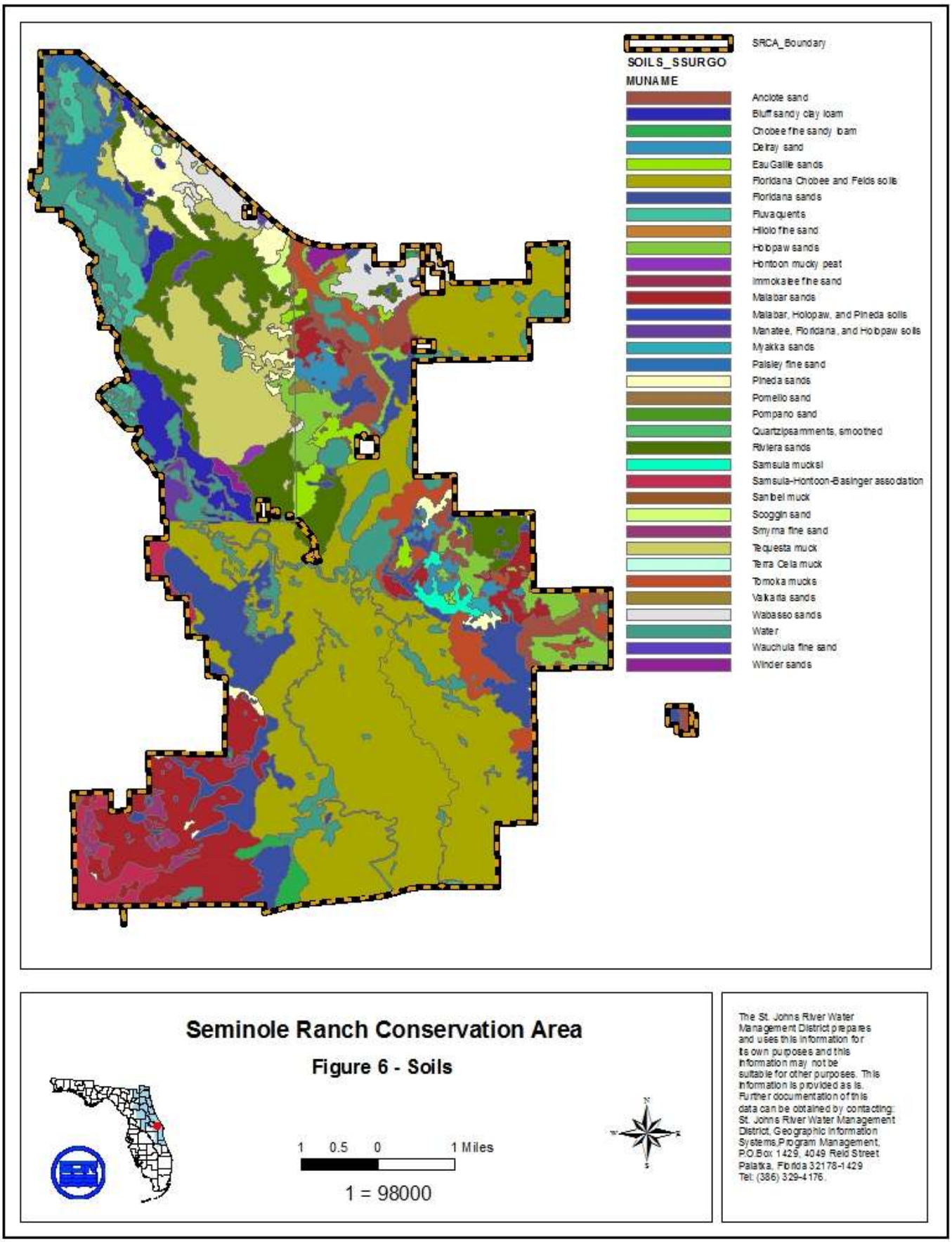
RESOURCE PROTECTION AND MANAGEMENT

Water Resource Protection

2005 Plan Strategy: Identify and work to acquire additional lands within the floodplain.
Status: A significant amount of floodplain, approximately 8,187 acres (100yr. floodplain), has been acquired adjacent to the western side of the SRCA.
2005 Plan Strategy: Continue monitoring outflow from the Orlando Wetlands Park and cooperating with the City of Orlando.
Status: The Division of Environmental Sciences (ES) receives updates every 6 months on water quality outflow from the treatment wetlands in the Orlando Wetlands Park, along with a yearly report. ES continues to monitor total phosphorus discharge from the area. In the event that discharge exceeds phosphorus concentration limits, The City of Orlando provides mitigation services on Seminole Ranch Conservation Area in conjunction with the Division of Land Management. Mitigation efforts during 2006-2008 within Orlando Wetlands Park itself, such as alum application, removal of saturated soils, and replanting of vegetation after soil removal has led to a substantial decrease in total phosphorus discharged during the 2009-2010 time period.

Fire Management

2005 Plan Strategy: Continue prescribed burn program.
Status: On-going, since the last plan, 14 prescribed burns have resulted in 11,301 acres burned. An MOU with the USFWS for cooperative burning and suppression has been renewed for several District and USFWS areas including SRCA.
2005 Plan Strategy: Continue mechanical treatment of invasive shrub species to aid facilitation of prescribed fire, which in turn facilitates herbaceous plant growth.
Status: Approximately 100 acres will be roller chopped in 2010.
2005 Plan Strategy: Continue close coordination in suppression through unified command.
Status: An MOU with the USFWS for cooperative burning and suppression has been renewed for several District and USFWS areas including SRCA. The District also coordinates with DOF on wildfire supression.


SRCA_Boundary
SOILS_SSURGO
MUNAME
Anclote sand
Bluff sandy clay loam
Chobee fine sandy loam
Delray sand
EauGallie sands
Floridana Chobee and Felda soils
Floridana sands
Fluvaquents
Hilolo fine sand
Holopaw sands
Hontoon mucky peat
Immokalee fine sand
Malabar sands
Malabar, Holopaw, and Pineda soils
Manatee, Floridana, and Holopaw soils
Myakka sands
Paisley fine sand
Pineda sands
Pomello sand
Pompano sand
Quartzipsamments, smoothed
Riviera sands
Samsula muckst
Samsula-Hontoon-Basinger association
Sanibel muck
Scoggin sand
Smyrna fine sand
Tequesta muck
Terra Ceia muck
Tomoka mucks
Valkaria sands
Wabasso sands
Water
Wauchula fine sand
Winder sands
Seminole Ranch Conservation Area
Figure 6 - Soils
1 0.5 0 1 Miles
1 = 98000
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Forest Management
2005 Plan Strategy: Continue to evaluate areas for potential harvesting for restoration purposes.
Status: 700 acres of cabbage palm harvesting was conducted from 2005 to 2007, and 413 acres of pine thinnings were conducted in 2008. Salvage cuts were conducted in 1996-97 (48 acres) and 1999 (50 acres) and 2001 (29 acres).

Listed Species
Plants & animals
2005 Plan Strategy: Continue to add to species lists.
Status: On going. Species are added as encountered.
2005 Plan Strategy: Coordinate project with rare and listed species contractor.
Status: Contracted survey for rare and listed plant species completed in 2005, and listed amphibians, reptiles and mammals survey completed in 2007. Data is included in the Appendix and also available in the Biological Database and District library.

Exotic Species
Plants & animals
2005 Plan Strategy: Continue coordinating with invasive plant management staff to set up monitoring and treatment of Brazilian pepper and other exotic plants.
Status: Plants have been treated as needed. Species treated include: Brazilian pepper, cogon grass, Chinese tallow, strawberry guava, creeping oxeye and old world climbing fern.
2005 Plan Strategy: Closely monitor and treat old world climbing fern on the property.
Status: Climbing fern has been treated along with other exotics as needed. Old world climbing fern is in maintenance control mode.
2005 Plan Strategy: Continue hog removal program.
Status: On going, Contractors have averaged 146 hogs removed per year from site.

LAND USE MANAGEMENT
Access
2005 Plan Strategy: Continue regular maintenance on public access area.
Status: On going.
2005 Plan Strategy: Maintain signs and kiosks.
Status: On going.

Recreation
2005 Plan Strategy: Continue regular maintenance on trails.
Status: Trails are maintained by FTA.
2005 Plan Strategy: Develop new trails if feasible.
Status: No new trails were installed since the last plan.
2005 Plan Strategy: Assess need to add marked trail route with trail contractor, and develop group campsite.
Status: Developed group campsite at Hatbill Point and installed observation tower walk over, and added a portion of SRCA to the Salt Lake Wildlife Management Area.

Security
2005 Plan Strategy: Continue coordinating with cattle lessee, local law enforcement and Plantation Security, if necessary.
Status: Two illegal structures were identified and removed under authority of Chapter 40C-9, F.A.C.

Acquisition
2005 Plan Strategy: Continue to pursue potential acquisitions in this area.
Status: No additional parcels were acquired as part of SRCA however a .27 acre surplus parcel was sold to the Midway Fish Camp. Several parcels including approximately 8,187 acres of floodplain (100yr. floodplain), has been acquired adjacent to the western side of the SRCA.

Cooperative Agreements
2005 Plan Strategy: Maintain agreements to assist with the management and maintenance of Seminole Ranch Conservation Area.
Status: On going. The 1988 agreement with Eckerd Family Youth Alternatives was terminated and the facility was removed in 2009. The 1982 fire tower lease with Florida Department of Agriculture and Consumer Services was terminated in 2005 and the tower was removed. Renewed USFWS agreement for cooperative prescribed burning and wildfire suppression. Renewed US Air Force agreement allowing the installation, operation and maintenance of a lightning detection system.

Leases, Easements, and Concessions
2005 Plan Strategy: Monitor access easements.
Status: On going.
2005 Plan Strategy: Continue cooperating with easement holders.
Status: Ongoing.
2005 Plan Strategy: Monitor contractors surveying for rare and listed animal species.
Status: Monitored contracted survey for rare and listed plant species which ran from 2004 to 2005, and survey for amphibians, reptiles and mammals which ran from 2005 to 2007. Data is in the Biological Database and District library.

DOF	Division of Forestry
FTA	Florida Trail Association
MOU	Memorandum Of Understanding
USFWS	United States Fish and Wildlife Service

IMPLEMENTATION

The following sections outline land management strategies for resource protection, land use, and administration for the next five years.

RESOURCE PROTECTION AND MANAGEMENT

Water Resource Protection

Management issues regarding flood protection include the preservation and restoration of the natural hydrologic regime to the extent possible, to allow the maximum flood storage potential within this management area. The identification and acquisition of additional lands within the floodplain would provide greater protection for water quality and flood storage capability. A SUA with the City of Orlando allows for the flowage of reclaimed water onto the SRCA property. The agreement enables the City to discharge a regulated amount of treated effluent from the Orlando Wilderness Park into the St. Johns River, in exchange for land management services performed on the Conservation Area. The District monitors outflow and yearly reports from the Orlando Wetlands Park treatment area and works with the City of Orlando to meet compliance conditions.

Water Resource Protection Strategies

- Continue monitoring outflow updates and yearly reports for the Orlando Wilderness Park and cooperating with the City of Orlando.

Fire Management

Fire is an essential tool for land management in Florida and plays an important role in maintaining natural landscapes and pine plantations. Seminole Ranch Conservation Area has been divided into manageable burn units. The fire dependent communities on this property are floodplain marsh, wet prairie, and mesic flatwoods. Reduced fire activity and hydrologic alterations have resulted in an increase in cover of shrub species in these 3 communities and an increase in cabbage palm in the wet prairie and mesic flatwoods. Current strategies include frequent prescribed burning and mechanical treatments such as roller chopping and mowing in order to restore the herbaceous nature of the freshwater marsh system. Two fire management units that became dominated by shrubs were roller chopped in the past and approximately 100 acres are being chopped in 2010.

The authors of the species survey conducted by the University of Central Florida emphasized the importance of timing and frequency of presecibed fires on site. They strongly recommended conducting prescribed burns on a schedule that mimics the historical fire regime of communities in central Florida to preserve and restore the diverse fauna of the SRCA. They further stated they expect species loss to occur if regular controlled burns are not conducted on SRCA during the historic, late-spring fire season. A Fire Management Plan has been developed for this property and is attached in Appendix C.

Figure 7 depicts the burn zones and the year of the last prescribed burn. Table 3 shows community types and fire return intervals, and Table 4 shows prescribed and wildfire history since 2004 on the conservation area.

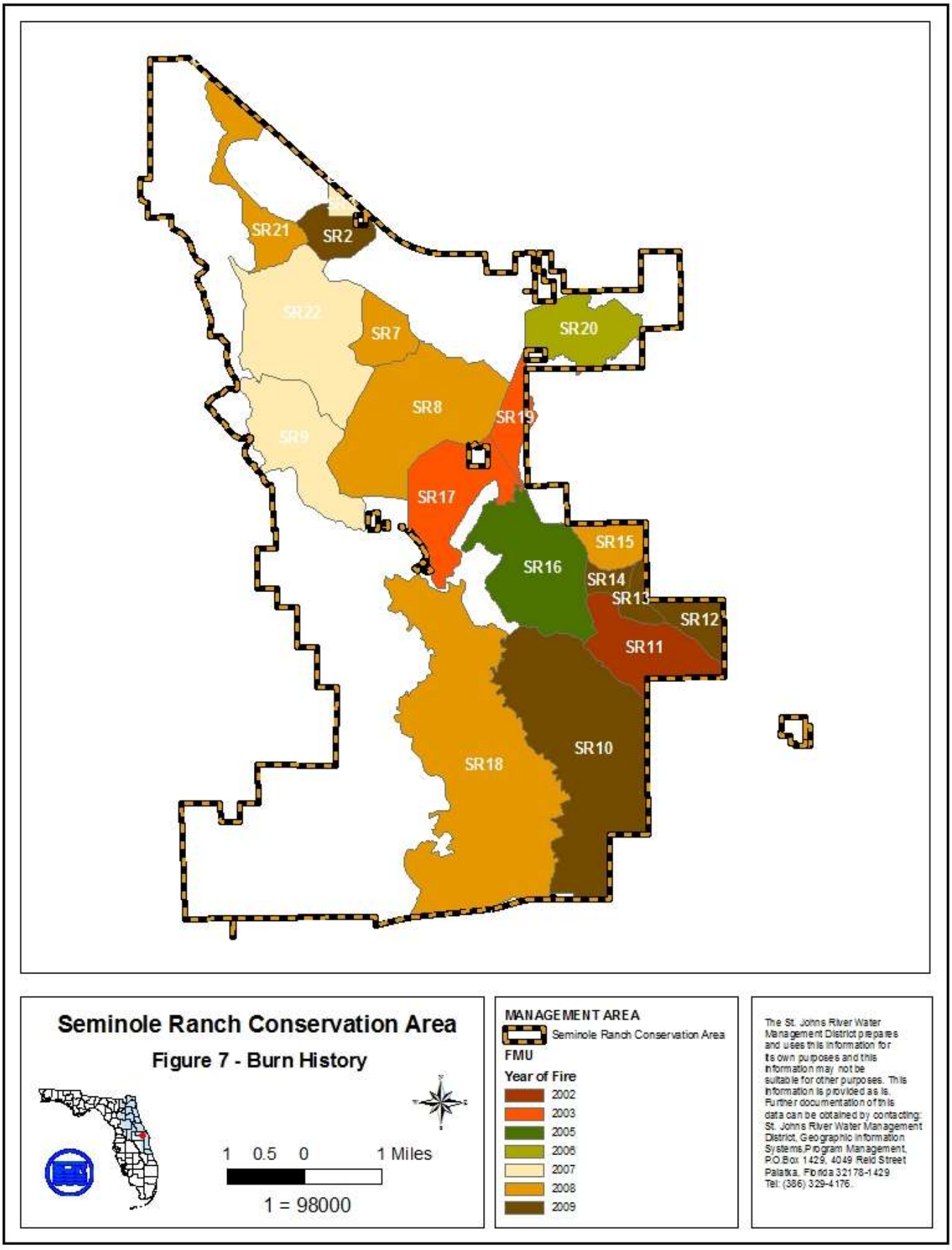
SR21
SR2
SR22
SR7
SR20
SR8
SR19
SR9
SR17
SR15
SR16
SR14
SR13
SR12
SR11
SR10
SR18
Seminole Ranch Conservation Area
Figure 7 - Burn History
1 0.5 0 1 Miles
1 = 98000
MANAGEMENT AREA
Seminole Ranch Conservation Area
FMU
Year of Fire
2002
2003
2005
2006
2007
2008
2009
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Table 3: Natural Community and Fire Return Interval

Natural Community Type	Acreage	Percent Coverage	FNAI Ranking	FNAI Fire Return Interval*
Floodplain Marsh	17,378	60%	G3/S2	3 years or as needed to control woody species
Floodplain Swamp	4,470	15%	G4/S4	This is not a fire adapted community
Hydric Hammock	2,461	8%	G4/S4	Fire not an important component however will burn ocasionally
Wet Prairie	704	>2%	G3/S2	Burns with adjacent communities, as frequently as every 2-3 years
Mesic Flatwoods	511	>2%	G4/S4	2-10 years
Dome Swamp	3	<1%	G4/S4	3-150 years with lower intervals along edges
Open Water	2810	10%	N/A	N/A
Altered Landcover				**Preferred Fire Return Interval**
Pasture	677	>2%	N/A	N/A
Levees, Roads, Berms	128	<1%	N/A	N/A
Impoundment, Borrow Pit	46	<1%	N/A	N/A
Spoil Area	22	<1%	N/A	N/A
Clearing	14	<1%	N/A	N/A
Pine Plantation	12	<1%	N/A	2-5 years
Canal, Ditch	2	<1%	N/A	N/A
Total	**29,238**	**100%**		

*Stated FNAI fire return intervals are based on regional differences in communities and fuel loading. The District will target the lowest interval possible that will effectively carry fire.

The following fire management activities have occurred on the property since the last plan in March, 2004. A long term fire history can be found in the fire management plan in Appendix C.

Table 4 – Prescribed and Wildfire History

SRCA Prescribed Burns			
Date	Acres	Community Type	Burn Unit(s)
5/18/2005	770	Marsh	SR16
11/20/2006	707	Marsh	SR 20
2/23/2007	2630	Marsh	SR 9, 22
3/9/2007	75	Flatwoods	SR3
1/10/2008	2429	Marsh	SR18
2/11/2008	687	Marsh	SR21
3/26/2008	335	Marsh	SR7
4/2/2008	1000	Marsh	SR8
4/2/2008	763	Marsh	SR8
5/1/2008	296	Flatwoods	SR15
1/27/2009	129	Marsh	SR14
1/27/2009	152	Marsh	SR13
2/17/2009	285	Flatwoods	SR2
2/24/2009	275	Marsh	SR12
10/23/2009	3100	Marsh	SR10
SRCA Wildfires			
Date	Acres	Burn Unit/Area	Cause
4/11/2004	163	SR10	?
6/6/2004	1390	SR18	?
4/10/2006	8	Wildlife Mgmt. Area	Lightning
7/24/2006	1	SR23	Lightning
2/14/2007	246	SR10	Arson
5/13/2007	204	Wildlife Mgmt. Area	Lightning
5/13/2007	170	SR10	Lightning

The Division of Forestry is the initial responder for wildfires. However, their equipment is limited for responding to fires in marshes, therefore, suppression actions are generally joint operations under unified command.

Fire Management Strategies

- Continue prescribed burn program.
- Continue mechanical treatment of invasive shrub species as needed to aid facilitation of prescribed fire and restore community types.
- Continue close coordination during suppression, and on prescribed burns as needed, with USFWS and DOF.

Forest Management

According to 1940s aerial photographs of Seminole Ranch Conservation Area, uplands in the form of mesic flatwoods were less densely forested than today. These areas are being managed by the District to protect, enhance, or restore the pine canopy and associated groundcover species.

Ninety six acres of salvage harvesting of overstory pine has occurred in response to wildfires and insect damage. Planting of slash pine has been conducted both aerially and on the ground. A 413 acre thinning of the pine flatwoods and hydric hammock on the northeast portion of the conservation area took place in 2008-2009 along with a salvage harvest of portions of 2 small wildfires in the area, Table 5.

Table 5 – Forestry Harvest and Plantings

Date	Harvest Type	Amount	Acres
1996-97	Pine Salvage	$ 20,576	48
1999	Pine Salvage	25,928	50
2001	Pine Salvage	1,761	29
2005-07	Palm Harvest	178,000	700
2008-09	Pine Thinning	37,463	413
	Total Revenue:	$263,728	
Date	Planting Type	Planting Method	Acres
2000	South Florida Slash Pine	Hand	50
2006	Slash Pine	Aerial	46

Other management practices in the mesic flatwoods, wet prairies and hydric hammock include the harvesting of cabbage palms on approximately 700 acres. Altered hydrology and fire regimes as well as influences from cattle grazing have likely caused the increase in cabbage palms in mesic flatwoods communities. The District's intent was to reduce cabbage palms to a density more compatible with the perpetuation of these communities. Dense stands of cabbage palms cause excessive shading, which has reduced, and in some areas eliminated, groundcover vegetation. The removal of cabbage palms reduces hazardous ladder fuels, which can cause crown fires resulting in undesirable pine mortality and allows for the recovery/restoration of groundcover species and natural pine regeneration.

Forest Management Strategies

- Continue to prescribe burn planted pine and mesic flatwoods and monitor for insect infestations.
- Evaluate planted pines for thinning.
- Thin cabbage palms from approximately 800 additional acres.

Flora and Fauna

The property provides habitat for a variety of species including listed species such as bald eagles (*Haliaeetus leucocephalus*). Several eagle nests are found on the property. Other listed species on site include; woodstork (*Mycteria americana*), crested caracara (*Caracara cheriway*), little blue heron (*Egretta caerulea*), snowy egret (*Egretta thula*),

tricolored heron (*Egretta tricolor*), Florida black bear (*Ursus americanus floridanus*), American alligator (*Alligator mississipiensis*), gopher tortoise (*Gopherus polyphemus*), eastern indigo snake (*Drymarchon corais couperi*) and celestial lily (*Nemastylis floridana*).

Flora and Fauna Strategies

- Continue to record on-site observations and add to Biological Database.
- Coordinate with FFWCC and the Florida Audubon Society to obtain their species lists.

Exotic Species

Plants

The goal of the District's Invasive Plant Program is to achieve maintenance control of invasive exotic and problematic native plant populations present on District properties. Maintenance control using herbicides is necessary to prevent proliferation of exotic and nuisance species. Control of these species is more challenging in some community types than others but is important to maintaining the ecological integrity of areas.

There are a number of exotic plant species found on the property including Brazilian pepper (*Schinus terebinthefolius*), tropical soda apple (TSA) (*Solanum viarum*), cogongrass (*Imperata cylindrica*), Chinese tallow (*Sapium sebiferum*), strawberry guava (*Psidium cattleianum*), camphor tree (C*innamomum camphora*), old world climbing fern (*Lygodium microphyllum*), and creeping oxeye (*Sphagneticola trilobata*).

Brazilian pepper occurs in scattered disturbed areas at slightly higher elevations than the freshwater marsh. Approximately 26 acres of Brazilian pepper have been treated on SRCA. Approximately 48 acres of cogongrass have been treated making it the most prevalent exotic species, with respect to area covered. Lesser amounts of Chinese tallow, strawberry guava, camphor tree, old world climbing fern, and creeping oxeye have been found and treated on the property. Old world climbing fern is an extremely aggressive exotic species that reproduces by spores that are easily spread by wind and water. District staff monitor for the presence of old world climbing fern along with all other invasive exotic plant and animal species on a regular basis and treat as needed. The cattle lessee is responsible for control of TSA within the lease area.

Animals

Feral hogs (*Sus scrofa*) are found on site. The District has a feral hog removal agreement with an individual and also with the United States Department of Agricultural. Hogs are also taken during seasonal hunting periods. Other exotic animal species documented on-site include the nine-banded armadillo (*Dasypus novemcinctus*), coyote (*Canis latrans*), brown anole (*Anolis sagrei*), Eurasian collared-dove (*Streptopelia decaocto*), European starling (*Sturnus vulgaris*), rock pigeon (*Columba livia*), and Cuban treefrog (*Osteopilus septentrionalis*).

Exotic Species Strategies

- Continue coordinating with Vegetation Management staff to treat exotics as needed.
- Continue feral hog removal program.

Cultural Resources Protection
District Policy #90-11 establishes management policies for archaeological and cultural sites on District property. A review of the Florida Master Site File data maintained by the Department of State Division of Historical Resources indicates that there are 15 registered sites within the conservation area.

Cultural Resources Protection Strategies
- Identify and report any new sites encountered.
- Protect known sites as required.

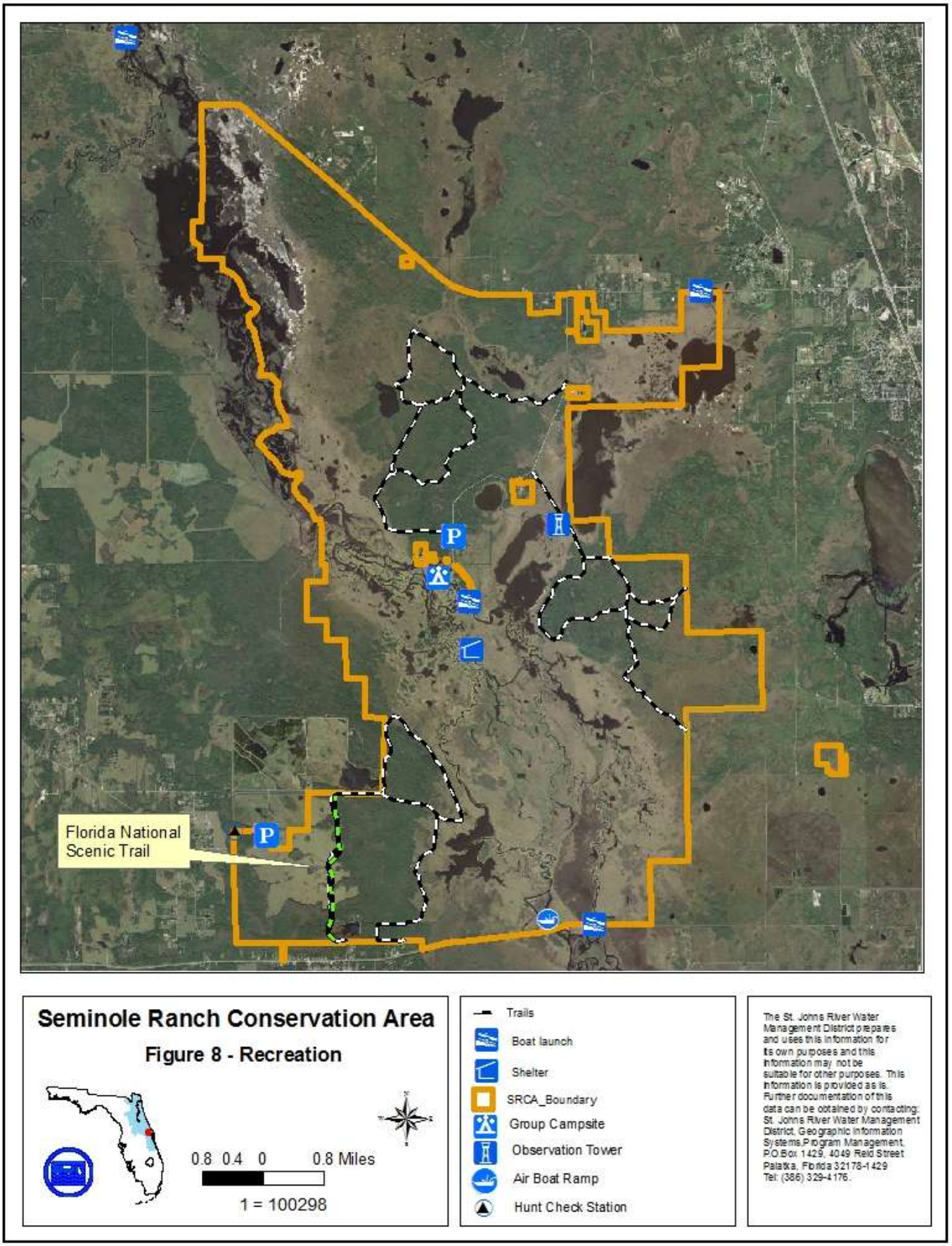
LAND USE MANAGEMENT

Access
There are two designated parking areas, one off Hatbill Road which is reached via SR 46, and one off Wheeler Road which is accessed from SR 50. There are 6 nearby boat launch areas that allow access to the lake and river portions of the SRCA. Two launch ramps are on SR 46, three are on SR 50 and one is at Hatbill Park. One of the launch sites on SR 50 was installed by the District to allow airboat access.

Access Strategies
- Continue regular maintenance at public access areas.
- Maintain signs and kiosk.

Recreation
Resource-based recreational opportunities provided on this property include hiking, biking, horseback riding, primitive camping, fishing, canoeing, boating, hunting and wildlife viewing (Figure 8). Several recreational structures have been constructed to facilitate these activities. These include three inclement weather shelters (1 built by the District and the other 2 authorized by the District), an observation tower, and a group campsite. District staff may develop additional trails for the property. The Florida National Scenic Trail (FNST) traverses SRCA connecting the Tosohatchee WMA to the Orlando Wetlands Park and is maintained by the Florida Trail Association (FTA). Seminole Ranch Conservation Area contains a 6,000 acre Wildlife Management Area (WMA) and a portion of another WMA within its boundaries and it borders 4 other WMAs (Figure 9). It also borders numerous natural areas managed by various Federal, State, and County agencies as seen on Figure 2, which may allow for cooperative agreements to increase public recreational opportunities. It is anticipated that during the 5 year life of this plan the District will evaluate whether entry into a lease of sovereign submerged lands along the St. Johns River between SR 46 and SR 50 would improve management of the property and allow for inclusion in a Wildlife Management Area. Construction of illegal structures, such as cabins, along the river has been an ongoing problem on the conservation area. District staff will be working with recreational airboat groups and the Florida Airboat Association to ensure sufficient inclement weather shelters are provided and that construction of illegal structures is avoided.

Recreation Strategies
- Evaluate need for sovereign submerged lands lease.


Florida National
Scenic Trail
P
P
Seminole Ranch Conservation Area
Figure 8 - Recreation
0.8 0.4 0 0.8 Miles
1 = 100298
Trails
Boat launch
Shelter
SRCA_Boundary
Group Campsite
Observation Tower
Air Boat Ramp
Hunt Check Station
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- Work with recreational airboat groups and Florida Airboat Association to assess need to add inclement weather shelters and camping platforms, and avoid illegal structures.
- Evaluate feasibility of expanding Wildlife Management Areas.
- Continue cooperation with FTA.
- Assess feasibility of a reservable group campsite at old Eckerd Youth campsite.

Environmental Education
District staff are not pursuing an environmental education program for SRCA at this time.

Security
Most of the boundary is fenced. The area is regularly visited by staff. Local law enforcement agencies or the District security contractor are contacted as the need arises. Conservation areas have been established upland from the potential sovereign land line via posted signs that restrict vessel, vehicular and firearm use. During periods of low water, issues arise with ATV and truck use disturbing marsh vegetation, and construction of illegal structures is an ongoing issue. There is no longer a security resident on site due to problems with maintaining a residence in the area, including, flooding and drinking water issues.

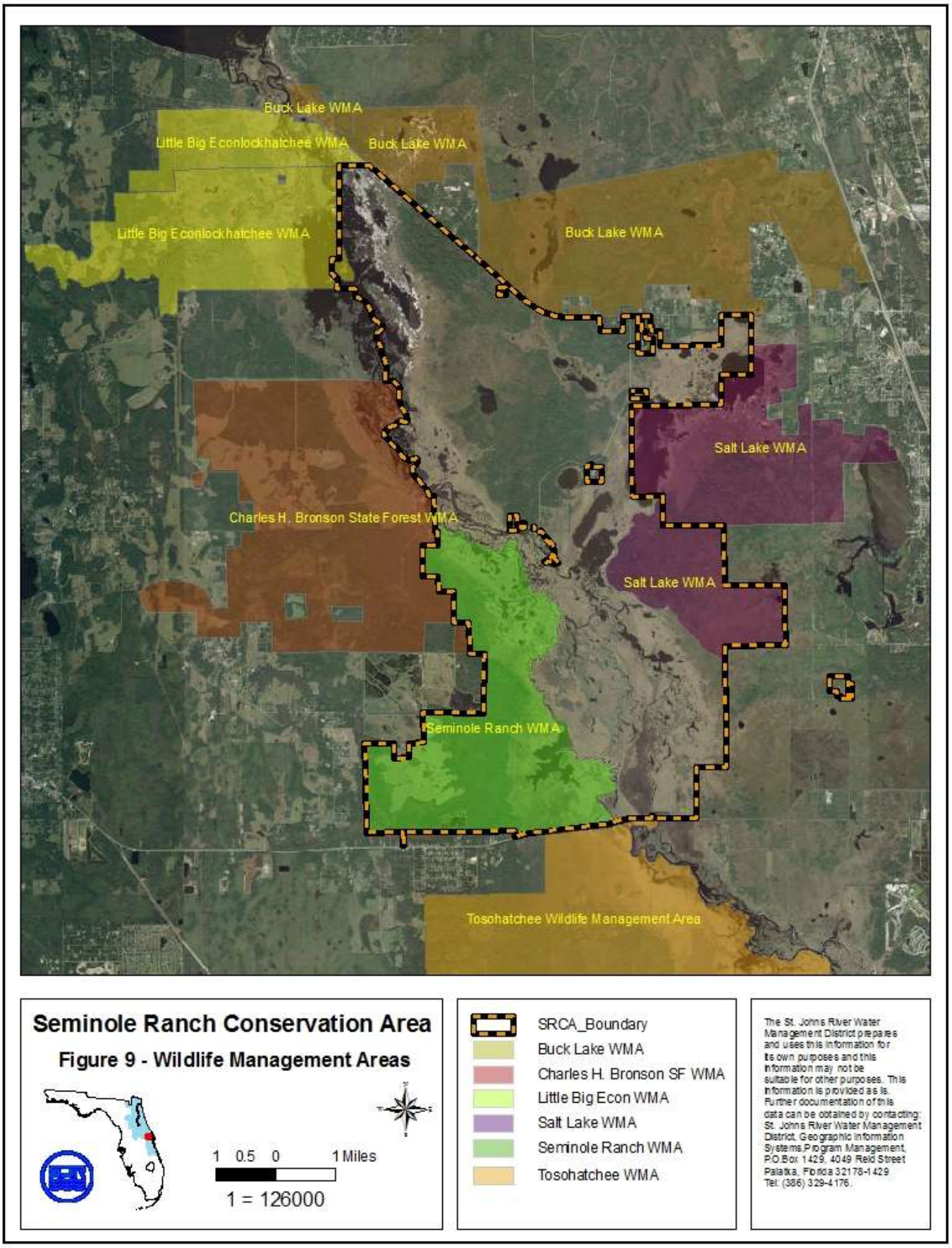
Security Strategies
- Continue coordinating with local law enforcement and Plantation Security, as necessary.
- Focus efforts on eliminating ATV and truck damage, and construction of illegal structures.

ADMINISTRATION

Acquisition
Protecting the St. Johns River floodplain in this area is vital to protecting the water quality of the river. Potential acquisitions in the area will be evaluated as they arise.

Acquisition Strategies
- Continue to pursue potential acquisitions in the area.

Cooperative Agreements, Leases, Easements and Concessions
In accordance with District Policy #90-16, the District promotes inter-agency coordination in the management of District lands for increased efficiency, protection of natural resources, and improved recreation opportunities. The District believes these agreements are vital for proper stewardship of public lands, and those cooperators should be acknowledged and recognized for their contributions.
There are a number of agreements that apply to the property. The Florida Trail Association (FTA) has an agreement with the District allowing Florida National Scenic Trail to be built on District owned lands. The District has an agreement with Florida Fish and Wildlife Conservation Commission (FFWCC) to manage 6,000 acres of the property as the Seminole Ranch Wildlife Management Area, and approximately 2,623 acres of


Buck Lake WMA
Little Big Econlockhatchee WMA
Buck Lake WMA
Little Big Econlockhatchee WMA
Buck Lake WMA
Salt Lake WMA
Charles H. Bronson State Forest WMA
Salt Lake WMA
Seminole Ranch WMA
Tosohatchee Wildlife Management Area
Seminole Ranch Conservation Area
Figure 9 - Wildlife Management Areas
1 0.5 0 1 Miles
1 = 126000
SRCA_Boundary
Buck Lake WMA
Charles H. Bronson SF WMA
Little Big Econ WMA
Salt Lake WMA
Seminole Ranch WMA
Tosohatchee WMA
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SRCA property has been added to the Salt Lake Wildlife Management Area for hunting purposes. The Department of the Army has an agreement allowing for the installation and operation of a weather monitoring station on the property. There is a Memorandum of Understanding (MOU) with the United States Fish and Wildlife Service (USFWS) for cooperating on prescribed burns and wildfire suppression, and an interlocal agreement with Brevard County to install, maintain and use a 10" draughting well for fire fighting. There are Special Use Authorizations (SUA) in place that allow scrub-jay and butterfly research. A SUA with the City of Orlando allows for the flowage of reclaimed water onto the property. The agreement enables the City to discharge a regulated amount of treated effluent from the Orlando Wetlands Park into the St. Johns River, in exchange for land management services performed on the Conservation Area. Additional SUAs allow horse buggy access, feral hog removal, bee hives to be placed on site, and the Outward Bound School has a SUA to maintain a screen room, ropes course and to camp on site. There is a license agreement for the harvest of fronds from cabbage palms, and a license agreement to the U.S. Air Force allowing the installation, operation and maintenance of a lightning detection system. There is also a lease for cattle grazing on 1980 acres.
Access easements exist for out-parcels including Baxter Point (20 acres) and Loughman Lake Lodge, where there are a number of private landowners. The easements are via Hatbill Road and Baxter Point Road
The 1988 agreement with Eckerd Family Youth Alternatives, as amended, which provided work and educational programs for youth, was terminated and the facility was removed in 2009.
The 1982 fire tower lease with Florida Department of Agriculture and Consumer Services was terminated in 2005 and the tower was removed.
Active agreements will be re-evaluated at the time of renewal and additional agreements may be entered into to facilitate management of the SRCA.

Cooperative Agreements, Leases, Easements and Concessions Strategies

- Maintain agreements to assist with the management and maintenance of Seminole Ranch Conservation Area.
- Monitor access easements and continue cooperating with easement holders.
- Ensure compliance with TNC restrictive covenants.
- Look at opportunities for linkages and cooperation with neighboring agencies.

Table 6 - Existing Agreements, Leases, Easements and Concessions

Agreement/Type/#	Agency/Individual	Begins	Term	Area	Expires
Palm Frond Harvesting/License #179	Ralph Higginbotham	11/1/2009	Yearly	N and E portions	4/30/2014
Scrub-Jay Research/SUA #209	Archbold Biological Station	1/1/2006	Yearly/Auto renewal	All	12/31/2010
Lightning Detection System/License #220	Secretary of the Air Force	2/1/2006	Continuous	East of Hatbill Road	1/31/2011

Agreement/Type/#	Agency/Individual	Begins	Term	Area	Expires
Cattle Grazing/Lease #243	John Tanner	4/12/2000	Yearly/Auto renewal	SW portion	Upon 30 Day Notice
Wildlife Mgmt Area Designation/Lease #325	Florida Fish and Wildlife Conservation Commission	4/10/1984	Until terminated	SW portion	Upon 1 or 3 Year Notice
Flowage Easement/SUA #326	City of Orlando	9/20/1999	Continuous	SW portion	8/31/2029
Butterfly Research/SUA #466	Florida Natural Areas Inventory	5/15/2008	Yearly/Auto renewal	All	5/14/2013
Apiary/SUA #497	Webb's Honey	8/1/2008	Yearly/Auto renewal	Site east of Hatbill Road	7/31/2013
Horse Buggy Access/SUA #533	Rebecca Smith	11/25/2008	Yearly/Auto renewal	Access off SR 46, Use of all Roads	11/24/2013
Tick and Sand Fly Research # 585	College of Vet erinary Medicine, University of Georgia	6/2/2010	3- one year intervals after 6/21/2011 Autorenewal	All	6/21/2014
Screen Room and Ropes Course/SUA #626	Outward Bound	9/23/2009	Yearly/Auto renewal	North portion, west of Hatbill Rd.	9/22/2014
Camping/SUA #627	Outward Bound	9/23/2009	Yearly/Auto renewal	On existing campsites	9/22/2014
Feral Hog Removal/SUA #635	Patrick Trevison	1/1/2010	Yearly/Auto renewal	Within WMA boundaries	12/31/2012
Trail Installation and Maintenance/ Florida National Scenic Trail Designation #671	Florida Trail Association	9/23/2003	5 year interval/Auto renewal	South of border with Orlando Wilderness Park	Indefinite
Climate Testing Station Site 47 /Lease #673	Department of the Army	5/13/10	Until 11/30/2013	N side of parcel	11/30/2013
Climate Testing Station Site 57 /Lease #674	Department of the Army	5/13/10	Until 11/30/2013	E side of parcel	11/30/2013
Cooperative Prescribed Burns &	United States Fish and Wildlife	6/15/07	5-One year intervals	All	1/1/2013

Agreement/Type/#	Agency/Individual	Begins	Term	Area	Expires
Suppression/MOU #676	Service		beginning 1/1/08		
Installation of fire protection well/Lease #682	Brevard County	8/29/02	50 years	SW corner of Hatbill Rd. and SR 46	8/28/2052
Access Easement for Baxter Point Road	Robert and Joyce Harvey	8/14/2002	Perpetual	Baxter Point Road	Perpetual

IMPLEMENTATION CHART

TASK	RESPONSIBLE LEAD	DUE DATE	COOPERATORS
RESOURCE PROTECTION AND MANAGEMENT			
Water Resource Protection			
Continue to review 6 month updates and yearly reports regarding outflow from Orlando Wetlands Park provided by the City of Orlando	ES	Every 6 months	City of Orlando
Fire Management			
Continue prescribed burn program	DLM	Ongoing	DOF, USFWS
Continue mechanical treatment of invasive shrubs to aid facilitation of prescribed fire, encourage herbaceous plant growth	DLM	Ongoing	DPWSR
Continue coordination with USFWS and DOFon prescribed burning and wildfire suppression as needed	DLM	Ongoing	USFWS, DOF
Forest Management			
Continue to evaluate planted pine areas for potential harvesting	DLM	Ongoing	
Continue to prescribe burn planted pine and mesic flatwoods and monitor for insect infestations	DLM	Ongoing	
Thin cabbage palms on approximately 800 additional acres	DLM	2015	
Flora and Fauna			
Continue to add to species lists	DLM	Ongoing	ES
Coordinate with FFWCC to obtain current and new species lists	DLM	Ongoing	FFWCC
Exotic Species			
Continue coordinating with Vegatation Management staff for monitoring and treatment of exotic plants	DLM	Ongoing	
Continue hog removal program	DLM	Ongoing	Contractor, USDA

TASK	RESPONSIBLE LEAD	DUE DATE	COOPERATORS
Cultural Resource Protection			
Identify and report any sites to Florida Division of Historical Resources	DLM	Ongoing	FDHR
Protect known sites as required	DLM	Ongoing	FDHR
LAND USE MANAGEMENT			
Access			
Continue regular maintenance on public access areas	DLM	Ongoing	DPWSR
Maintain signs and kiosks	DLM	Ongoing	DPWSR
Recreation			
Pursue submerged soveriegn lands lease along St. Johns River between SR46 and SR50.	DLM	Ongoing	TIITF, DOF, FFWCC
Continue regular maintenance on trails	FTA	Ongoing	DLM
Assess need to add inclement weather shelters and camping platforms	DLM	2011	Florida Airboat Association, Recreational Airboat groups, DPWSR
Assess feasibility of expanding Wildlife Management Areas	DLM	Ongoing	FFWCC
Assess feasibility of converting old Eckerd Youth Camp site to reservable group campsite	DLM	2011	FFWCC
Security			
Continue coordinating with cattle lessee, Sheriffs Dept. and District security contractor as necessary	DLM	Ongoing	Cattle Lessee, Sheriffs Dept. District security contractor
Focus efforts on eliminating ATV and truck damage and construction of illegal structures	DLM	Ongoing	Security contractor, FFWCC, Sheriff
ADMINISTRATION			
Acquisition			
Continue to pursue potential acquisitions in this area	DLA	Ongoing	

TASK	RESPONSIBLE LEAD	DUE DATE	COOPERATORS
Cooperative Agreements, Leases, Easements, and Concessions			
Maintain agreements to assist with the management and maintenance of Seminole Ranch Conservation Area	DLM	Ongoing	
Monitor access easements	DLM	Ongoing	
Continue cooperating with easement holders	DLM	Ongoing	
Ensure compliance with TNC restrictive covenants	DLM	Ongoing	TNC
Recognize TNC restrictive covenants on signage	DLM	2011	TNC
Look at opportunities for linkages and cooperation with neighboring agencies	DLM	Ongoing	DOF, USFWS, City of Orlando, Counties

KEY

DLA	Division of Land Acquisition
DLM	Division of Land Management
DOF	Division of Forestry
DPWSR	Division of Public Works, Southern Region
ES	Division of Environmental Sciences
FDHR	Florida Division of Historical Resources
FTA	Florida Trail Association
FFWCC	Florida Fish and Wildlife Conservation Commission
TIITF	Trustees of the Internal Improvement Trust Fund
TNC	The Nature Conservancy
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service

APPENDIX A – SPECIES LIST

Listed Species					
Scientific Name	**Common Name**	**FFWCC**	**FNAI**	**USFWS**	**FDACS**
Birds					
Ardea alba	Great Egret		G5 S4		
Egretta caerulea	Little Blue Heron	SSC	G5 S4		
Egretta thula	Snowy Egret	SSC	G5 S3		
Egretta tricolor	Tricolored Heron	SSC	G5 S4		
Elanoides forficatus	Swallow-tailed Kite		G5 S2		
Eudocimus albus	White Ibis	SSC	G5 S4		
Falco columbarius	Merlin		G5 S2		
Haliaeetus leucocephalus	Bald Eagle		G5 S3		
Mycteria americana	Wood Stork	E	G4 S2	E	
Pandion haliaetus	Osprey	SSC *	G5 S3S4		
Platalea ajaja	Roseate Spoonbill	SSC	S2		
Plegadis falcinellus	Glossy Ibis		S3		
Rynchops niger	Black Skimmer		S3		
Setophaga ruticilla	American Redstart		S2		
Sterna caspia	Caspian Tern		S2		
Mammals					
Ursus americanus	Florida black bear		G5T2 S2	LT*	
Reptiles					
Alligator mississippiensis	American Alligator	SSC	G5 S4	T(S/A)	
Crotalus adamanteus	E. Diamondback Rattlesnake		G4 S3		
Drymarchon couperi	Eastern Indigo Snake	T	G3 S3	T	
Gopherus polyphemus	Gopher Tortoise	T	G3 S3		
Plants					
Drosera intermedia	Water Sundew	T	G5 S3		T
Nemastylis floridana	Celestial Lily		G2 S2	E	E
Pecluma plumula	Plume Polypody	E	G5 S2		E
Sacoila lanceolata	Leafless Beaked Ladiestresses	T	G4T1 S1		T
Encyclia tampensis	Butterfly Orchid				C
Epididnrum canopseum	Greenfly Orchid				C
Osmunda cinnamomea	Cinnamon Fern				C

Exotic Species	
Scientific Name	**Common Name**
Plants	
Alternanthera philoxeroides	Alligatorweed
Carya illinoinensis	Pecan
Ceratopteris thalictroides	Watersprite
Cinnamomum camphora	Camphortree
Citrus x aurantium	Sweet Orange; Grapefruit
Commelina diffusa	Common Dayflower
Cuphea carthagenensis	Colombian Waxweed
Cynodon dactylon	Bermudagrass
Cyperus esculentus	Yellow Nutgrass
Desmodium incanum	Zarzabacoa Comun
Desmodium triflorum	Threeflower Ticktrefoil
Diplazium esculentum	Vegetable Fern
Echinochloa crusgalli	Barnyardgrass
Eichhornia crassipes	Common Water-Hyacinth
Emilia fosbergii	Florida Tasselflower
Eremochloa ophiuroides	Centipedegrass
Hyptis mutabilis	Tropical Bushmint
Imperata cylindrica	Cogongrass
Ludwigia peruviana	Peruvian Primrosewillow
Lygodium japonicum	Japanese Climbing Fern
Lygodium microphyllum	Old World Climbing Fern
Momordica charantia	Balsampear
Murdannia nudiflora	Nakedstem Dewflower
Oxalis debilis corymbosa	Pink Woodsorrel
Oxycaryum cubense	Cuban Bulrush
Panicum repens	Torpedo Grass
Paspalum notatum	Bahiagrass
Paspalum urvillei	Vaseygrass
Phyllanthus urinaria	Chamber Bitter
Polypogon monspeliensis	Rabbitsfootgrass
Psidium cattleianum	Strawberry Guava
Psidium guajava	Guava
Sacciolepis indica	Indian Cupscale
Salvinia minima	Water Spangles
Sapium sebiferum	Popcorntree, Chinese tallow
Schinus terebinthifolius	Brazilian Pepper
Solanum viarum	Tropical Soda Apple
Sonchus oleraceus	Common Sowthistle
Sphagneticola trilobata	Creeping Oxeye
Sporobolus indicus	Smutgrass
Trifolium campestre	Field Clover; Hop Clover
Trifolium repens	White Clover
Urena lobata	Caesarweed
Urochloa mutica	Paragrass
Youngia japonica	Oriental False Hawksbeard
Mammals	
Anolis sagrei	Brown Anole
Canis latrans	Coyote

Columba livia	Rock Dove
Dasypus novemcinctus	Cuban Treefrog
Eleutherodactylus planirostris	Greenhouse Frog
Hoplosternum littorale	Brown Hoplo
Osteopilus septentrionalis	Nine-Banded Armadillo
Pterygoplichthys multiradiatus	Sailfin Catfish
Streptopelia decaocto	Eurasian Collared-Dove
Sturnus vulgaris	European Starling
Sus scrofa	Feral Hog

Comprehensive Species List

Scientific Name	**Common Name**
Plants	
Acalypha gracilens	Slender Threeseed Mercury
Acer rubrum	Red Maple
Acrostichum danaeifolium	Giant Leather Fern
Agalinis linifolia	Flaxleaf False Foxglove
Aletris lutea	Yellow Colicroot
Alternanthera philoxeroides	Alligatorweed
Ambrosia artemisiifolia	Common Ragweed
Ammannia coccinea	Valley Redstem
Amorpha fruticosa	Bastard Indigobush
Ampelopsis arborea	Peppervine
Amphicarpum muhlenbergianum	Blue Maidencane
Andropogon brachystachyus	Shortspike Bluestem
Andropogon glomeratus	Bushy Bluestem
Andropogon glomeratus glaucopsis	Purple Bluestem
Andropogon glomeratus hirsutior	Bushy Bluestem
Andropogon ternarius	Splitbeard Bluestem
Andropogon virginicus	Broomsedge Bluestem
Andropogon virginicus glaucus	Chalky Bluestem
Arisaema triphyllum	Jack-In-The-Pulpit
Aristida purpurascens	Arrowfeather Threeawn
Aristida spiciformis	Bottlebrush Threeawn
Aristida stricta beyrichiana	Wiregrass
Asclepias incarnata	Swamp Milkweed
Asclepias lanceolata	Fewflower Milkweed
Asclepias longifolia	Longleaf Milkweed
Asclepias pedicellata	Savannah Milkweed
Asclepias perennis	Swamp Milkweed
Asimina parviflora	Smallflower Pawpaw
Asimina reticulata	Netted Pawpaw
Axonopus fissifolius	Common Carpetgrass
Axonopus furcatus	Big Carpetgrass
Azolla caroliniana	Carolina Mosquito Fern
Baccharis angustifolia	Saltwater Falsewillow
Baccharis halimifolia	Groundsel Tree; Sea Myrtle
Bacopa caroliniana	Lemon Bacopa
Bacopa monnieri	Herb-Of-Grace
Bejaria racemosa	Tarflower
Berchemia scandens	Alabama Supplejack
Bidens alba radiata	Beggarticks; Romerillo

Bidens mitis	Smallfruit Beggarticks
Bigelowia nudata	Pineland Rayless Goldenrod
Blechnum serrulatum	Toothed Midsorus Fern
Blutaparon vermiculare	Samphire; Silverhead
Boehmeria cylindrica	False Nettle; Bog Hemp
Borrichia frutescens	Bushy Seaside Oxeye
Buchnera americana	American Bluehearts
Callicarpa americana	American Beautyberry
Campsis radicans	Trumpet Creeper
Canna flaccida	Bandana Of The Everglades
Carex alata	Broadwing Sedge
Carex atlantica	Atlantic Sedge
Carex gigantea	Giant Sedge
Carex glaucescens	Clustered Sedge
Carex longii	Long's Sedge
Carex lupuliformis	False Hop Sedge
Carphephorus corymbosus	Coastalplain Chaffhead
Carphephorus odoratissimus	Vanillaleaf
Carphephorus paniculatus	Hairy Chaffhead
Carpinus caroliniana	American Hornbeam
Carya aquatica	Water Hickory
Carya glabra	Pignut Hickory
Carya illinoinensis	Pecan
Celtis laevigata	Sugarberry; Hackberry
Centella asiatica	Spadeleaf
Cephalanthus occidentalis	Common Buttonbush
Ceratopteris thalictroides	Watersprite
Chamaecrista fasciculata	Partridge Pea
Chamaecrista nictitans	Sensitive Pea
Chaptalia tomentosa	Woolly Sunbonnets
Chasmanthium laxum	Slender Woodoats
Chasmanthium nitidum	Shiny Woodoats
Cinnamomum camphora	Camphortree
Cirsium horridulum	Purple Thistle
Cirsium nuttallii	Nuttall's Thistle
Citrus x aurantiifolia	Key Lime
Citrus x aurantium	Sweet Orange; Grapefruit
Cladium jamaicense	Jamaica Swamp Sawgrass
Clematis crispa	Swamp Leather-Flower
Coelorachis rugosa	Wrinkled Jointtail Grass
Commelina diffusa	Common Dayflower
Conoclinium coelestinum	Blue Mistflower
Conyza canadensis	Canadian Horseweed
Coreopsis leavenworthii	Leavenworth's Tickseed
Cornus foemina	Swamp Dogwood
Crinum americanum	Seven-Sisters; String-Lily
Crotalaria rotundifolia	Rabbitbells
Cuphea carthagenensis	Colombian Waxweed
Cuscuta compacta	Compact Dodder
Cynodon dactylon	Bermudagrass
Cyperus croceus	Baldwin's Flatsedge
Cyperus esculentus	Yellow Nutgrass
Cyperus haspan	Haspan Flatsedge

Cyperus odoratus	Fragrant Flatsedge
Cyperus polystachyos	Manyspike Flatsedge
Cyperus retrorsus	Pinebarren Flatsedge
Cyperus surinamensis	Tropical Flatsedge
Dalea carnea	Whitetassels
Desmodium incanum	Zarzabacoa Comun
Desmodium triflorum	Threeflower Ticktrefoil
Dichanthelium aciculare	Needleleaf Witchgrass
Dichanthelium commutatum	Variable Witchgrass
Dichanthelium dichotomum	Cypress Witchgrass
Dichanthelium ensifolium	Cypress Witchgrass
Dichanthelium erectifolium	Erectleaf Witchgrass
Dichanthelium scabriusculum	Woolly Witchgrass
Dichanthelium scoparium	Velvet Witchgrass
Dichondra carolinensis	Carolina Ponysfoot
Diodia virginiana	Virginia Buttonweed
Diospyros virginiana	Common Persimmon
Diplazium esculentum	Vegetable Fern
Distichlis spicata	Saltgrass
Drosera brevifolia	Dwarf Sundew
Drosera intermedia	Water Sundew
Drymaria cordata	Drymary
Echinochloa crusgalli	Barnyardgrass
Echinochloa walteri	Coast Cockspur
Eclipta prostrata	False Daisy
Eichhornia crassipes	Common Water-Hyacinth
Eleocharis atropurpurea	Purple Spikeru
Eleocharis baldwinii	Baldwin's Spikerush
Eleocharis flavescens	Yellow Spikerush
Eleocharis geniculata	Canada Spikerush
Eleocharis vivipara	Viviparous Spikerush
Elephantopus carolinianus	Carolina Elephantsfoot
Elephantopus elatus	Tall Elephantsfoot
Emilia fosbergii	Florida Tasselflower
Encyclia tampensis	Florida Butterfly Orchid
Epidendrum conopseum	Green-Fly Orchid
Eragrostis bahiensis	Bahia Lovegrass
Eragrostis elliottii	Elliott's Lovegrass
Eragrostis spectabilis	Purple Lovegrass
Eragrostis virginica	Coastal Lovegrass
Erechtites hieraciifolius	American Burnweed
Eremochloa ophiuroides	Centipedegrass
Erigeron quercifolius	Oakleaf Fleabane
Erigeron vernus	Early Whitetop Fleabane
Eriocaulon compressum	Flattened Pipewort
Eriocaulon decangulare	Tenangle Pipewort
Eryngium baldwinii	Baldwin's Eryngo
Eryngium yuccifolium	Button Rattlesnakemaster
Eucalyptus grandis	Grand Eucalyptus
Eulophia alta	Wild Coco
Eupatorium capillifolium	Dogfennel
Eupatorium leptophyllum	Falsefennel
Eupatorium mikanioides	Semaphore Thoroughwort

Eupatorium mohrii	Mohr's Thoroughwort
Eupatorium rotundifolium	Roundleaf Thoroughwort
Eupatorium serotinum	Lateflowering Thoroughwort
Eustachys glauca	Saltmarsh Fingergrass
Euthamia caroliniana	Slender Flattop Goldenrod
Fimbristylis autumnalis	Slender Fimbry
Fimbristylis caroliniana	Carolina Fimbry
Fimbristylis spadicea	Marsh Fimbry
Flaveria linearis	Narrowleaf Yellowtops
Forestiera segregata	Florida Swampprivet
Fraxinus caroliniana	Carolina Ash; Water Ash
Fuirena pumila	Dwarf Umbrellasedge
Fuirena scirpoidea	Southern Umbrellasedge
Galactia elliottii	Elliott's Milkpea
Galactia regularis	Eastern Milkpea
Galium tinctorium	Stiff Marsh Bedstraw
Gamochaeta falcata	Narrowleaf Purple Everlasting
Gaura angustifolia	Southern Beeblossom
Gaylussacia dumosa	Dwarf Huckleberry
Gelsemium sempervirens	Yellow Jessamine
Geranium carolinianum	Carolina Cranesbill
Gleditsia aquatica	Water Locust
Gordonia lasianthus	Loblolly Bay
Gratiola hispida	Rough Hedgehyssop
Habenaria floribunda	Toothpetal False Reinorchid
Helenium pinnatifidum	Southeastern Sneezeweed
Helianthemum corymbosum	Pinebarren Frostweed
Helianthus agrestis	Southeastern Sunflower
Helianthus angustifolius	Narrowleaf Sunflower
Helianthus radula	Stiff Sunflower
Heliotropium curassavicum	Seaside Heliotrope
Hibiscus grandiflorus	Swamp Rosemallow
Hieracium gronovii	Queen-Devil
Houstonia procumbens	Innocence; Roundleaf Bluet
Hydrocotyle ranunculoides	Floating Marshpennywort
Hydrocotyle umbellata	Manyflower Marshpennywort
Hydrolea corymbosa	Skyflower
Hymenocallis palmeri	Alligatorlily
Hypericum cistifolium	Roundpod St.John's-Wort
Hypericum fasciculatum	Sandweed
Hypericum hypericoides	St.Andrew's-Cross
Hypericum mutilum	Dwarf St.John's-Wort
Hypericum reductum	Atlantic St.John's-Wort
Hypericum tetrapetalum	Fourpetal St.John's-Wort
Hypoxis curtissii	Common Yellow Stargrass
Hypoxis juncea	Fringed Yellow Stargrass
Hyptis alata	Clustered Bushmint
Hyptis mutabilis	Tropical Bushmint
Ilex cassine	Dahoon
Ilex glabra	Inkberry; Gallberry
Ilex vomitoria	Yaupon
Imperata cylindrica	Cogongrass
Ipomoea sagittata	Saltmarsh Morning-Glory

Iresine diffusa	Juba's Bush
Iris hexagona	Dixie Iris; Prairie Iris
Iva microcephala	Piedmont Marshelder
Juncus canadensis	Canadian Rush
Juncus coriaceus	Leathery Rush
Juncus effusus solutus	Soft Rush
Juncus elliottii	Bog Rush; Elliott's Rush
Juncus marginatus	Shore Rush; Grassleaf Rush
Juncus megacephalus	Bighead Rush
Juncus polycephalos	Manyhead Rush
Juncus repens	Lesser Creeping Rush
Juncus roemerianus	Needle Rush
Juncus scirpoides	Needlepod Rush
Juncus tenuis	Path Rush; Poverty Rush
Juniperus virginiana	Red Cedar
Kosteletzkya virginica	Virginia Saltmarsh Mallow
Lachnanthes caroliana	Carolina Redroot
Lachnocaulon anceps	Whitehead Bogbutton
Lechea torreyi	Piedmont Pinweed
Leersia hexandra	Southern Cutgrass
Liatris gracilis	Slender Gayfeather
Liatris spicata	Dense Gayfeather
Limnobium spongia	American Spongeplant
Linaria canadensis	Canadian Toadflax
Lindernia grandiflora	Savannah False Pimpernel
Liquidambar styraciflua	Sweetgum
Lobelia feayana	Bay Lobelia
Lobelia glandulosa	Glade Lobelia
Lobelia homophylla	Pineland Lobelia
Ludwigia maritima	Seaside Primrosewillow
Ludwigia microcarpa	Smallfruit Primrosewillow
Ludwigia peruviana	Peruvian Primrosewillow
Ludwigia repens	Creeping Primrosewillow
Ludwigia sphaerocarpa	Globefruit Primrosewillow
Luziola fluitans	Southern Watergrass
Lycium carolinianum	Christmasberry
Lycopus rubellus	Taperleaf Waterhorehound
Lygodesmia aphylla	Rose-Rush
Lygodium japonicum	Japanese Climbing Fern
Lygodium microphyllum	Old World Climbing Fern
Lyonia ferruginea	Rusty Staggerbush
Lyonia fruticosa	Coastalplain Staggerbush
Lyonia lucida	Fetterbush
Lythrum alatum	Winged Lythrum
Magnolia grandiflora	Southern Magnolia
Magnolia virginiana	Sweetbay
Matelea gonocarpos	Angularfruit Milkvine
Mecardonia acuminata	Axilflower
Melanthera nivea	Snow Squarestem
Melothria pendula	Creeping Cucumber
Micranthemum umbrosum	Shade Mudflower
Micromeria brownei pilosiuscula	Browne's Savory
Mikania scandens	Climbing Hempvine

Mimosa quadrivalvis floridana	Florida Sensitive Brier
Mitchella repens	Partridgeberry; Twinberry
Momordica charantia	Balsampear
Morus rubra	Red Mulberry
Muhlenbergia capillaris	Hairawn Muhly
Murdannia nudiflora	Nakedstem Dewflower
Myrcianthes fragrans	Twinberry; Simpson's Stopper
Myrica cerifera	Southern Bayberry
Nemastylis floridana	Celestial Lily
Nephrolepis exaltata	Sword Fern
Nothoscordum bivalve	Crowpoison; False Garlic
Nymphoides aquatica	Big Floatingheart
Nyssa sylvatica biflora	Swamp Tupelo
Oldenlandia uniflora	Clustered Mille Graines
Ophioglossum petiolatum	Stalked Adder's Tongue
Oplismenus hirtellus	Woodsgrass; Basketgrass
Orontium aquaticum	Goldenclub; Neverwet
Osmanthus americanus	Wild Olive
Osmunda cinnamomea	Cinnamon Fern
Osmunda regalis spectabilis	Royal Fern
Oxalis corniculata	Common Yellow Woodsorrel
Oxalis debilis corymbosa	Pink Woodsorrel
Oxycaryum cubense	Cuban Bulrush
Oxypolis filiformis	Water Cowbane
Packera glabella	Butterweed
Panicum dichotomiflorum	Fall Panicgrass
Panicum hemitomon	Maidencane
Panicum hians	Gaping Panicum
Panicum repens	Torpedo Grass
Panicum rigidulum	Redtop Panicum
Panicum verrucosum	Warty Panicgrass
Panicum virgatum	Switchgrass
Parietaria floridana	Florida Pellitory
Parthenocissus quinquefolia	Virginia Creeper
Paspalum boscianum	Bull Crowngrass
Paspalum conjugatum	Sour Paspalum; Hilograss
Paspalum floridanum	Florida Paspalum
Paspalum laeve	Field Paspalum
Paspalum notatum	Bahiagrass
Paspalum setaceum	Thin Paspalum
Paspalum urvillei	Vaseygrass
Passiflora suberosa	Corkystem Passionflower
Pecluma plumula	Plume Polypody
Peltandra sagittifolia	White Arrow Arum
Peltandra virginica	Green Arrow Arum
Persea borbonia	Red Bay
Persea palustris	Swamp Bay
Petiveria alliacea	Guinea Hen Weed
Phlebodium aureum	Golden Polypody
Phoradendron leucarpum	Oak Mistletoe
Phragmites australis	Common Reed
Phyla nodiflora	Turkey Tangle Fogfruit
Phyllanthus urinaria	Chamber Bitter

Physalis walteri	Walter's Groundcherry
Phytolacca americana	American Pokeweed
Piloblephis rigida	Wild Pennyroyal
Pinguicula caerulea	Blueflower Butterwort
Pinguicula pumila	Small Butterwort
Pinus elliottii	Slash Pine
Pinus serotina	Pond Pine
Piptochaetium avenaceum	Blackseed Needlegrass
Piriqueta cistoides caroliniana	Pitted Stripeseed
Pistia stratiotes	Water-Lettuce
Pityopsis graminifolia	Narrowleaf Silkgrass
Plantago virginica	Virginia Plantain
Pleopeltis polypodioides michauxiana	Resurrection Fern
Pluchea baccharis	Rosy Camphorweed
Pluchea foetida	Stinking Camphorweed
Pluchea odorata	Sweetscent
Polygala balduinii	Baldwin's Milkwort
Polygala cruciata	Drumheads
Polygala incarnata	Procession Flower
Polygala lutea	Orange Milkwort
Polygala rugelii	Yellow Milkwort
Polygonum hydropiperoides	Mild Waterpepper
Polygonum punctatum	Dotted Smartweed
Polypogon monspeliensis	Rabbitsfootgrass
Polypremum procumbens	Rustweed; Juniperleaf
Pontederia cordata	Pickerelweed
Proserpinaca palustris	Marsh Mermaidweed
Proserpinaca pectinata	Combleaf Mermaidweed
Psidium cattleianum	Strawberry Guava
Psidium guajava	Guava
Psychotria nervosa	Wild Coffee
Psychotria sulzneri	Shortleaf Wild Coffee
Pteridium aquilinum caudatum	Lacy Bracken
Pteridium aquilinum pseudocaudatum	Tailed Bracken
Pterocaulon pycnostachyum	Blackroot
Ptilimnium capillaceum	Mock Bishopsweed
Quercus elliottii	Running Oak
Quercus geminata	Sand Live Oak
Quercus laurifolia	Laurel Oak; Diamond Oak
Quercus minima	Dwarf Live Oak
Quercus myrtifolia	Myrtle Oak
Quercus nigra	Water Oak
Quercus virginiana	Live Oak
Rapanea punctata	Myrsine; Colicwood
Rhexia mariana	Pale Meadowbeauty
Rhexia nuttallii	Nuttall's Meadowbeauty
Rhododendron viscosum	Swamp Azalea
Rhus copallinum	Winged Sumac
Rhynchospora chalarocephala	Loosehead Beaksedge
Rhynchospora colorata	Starrush Whitetop
Rhynchospora corniculata	Shortbristle Horned Beaksedge
Rhynchospora elliottii	Elliott's Beaksedge
Rhynchospora fascicularis	Fascicled Beaksedge

Rhynchospora globularis	Globe Beaksedge
Rhynchospora harperi	Harper's Beaksedge
Rhynchospora inundata	Narrowfruit Horned Beaksedge
Rhynchospora microcarpa	Southern Beaksedge
Rhynchospora miliacea	Millet Beaksedge
Rhynchospora sulcata	Dixie Beaksedge
Rhynchospora tracyi	Tracy's Beaksedge
Rivina humilis	Rougeplant
Rorippa teres	Southern Marsh Yellowcress
Rotala ramosior	Lowland Rotala; Toothcup
Rubus argutus	Sawtooth Blackberry
Rudbeckia hirta	Blackeyed Susan
Ruellia caroliniensis	Carolina Wild Petunia
Rumex hastatulus	Heartwing Dock
Rumex verticillatus	Swamp Dock
Sabal palmetto	Cabbage Palm
Sabatia calycina	Coastal Rosegentian
Sabatia grandiflora	Largeflower Rosegentian
Sabatia stellaris	Rose-Of-Plymouth
Saccharum giganteum	Sugarcane Plumegrass
Sacciolepis indica	Indian Cupscale
Sacoila lanceolata	Leafless Beaked Ladiestresses
Sagittaria lancifolia	Bulltongue Arrowhead
Sagittaria subulata	Awl-Leaf Arrowhead
Salix caroliniana	Carolina Willow
Salvia lyrata	Lyreleaf Sage
Salvia misella	Southern River Sage; River Sage
Salvinia minima	Water Spangles
Sambucus nigra canadensis	American Elder; Elderberry
Samolus ebracteatus	Water Pimpernel
Samolus valerandi parviflorus	Pineland Pimpernel
Sapium sebiferum	Popcorntree
Sarcocornia perennis	Perennial Glasswort
Sarcostemma clausum	White Twinevine
Saururus cernuus	Lizard's Tail
Schinus terebinthifolius	Brazilian Pepper
Schizachyrium scoparium	Little Bluestem
Schoenoplectus pungens	Threesquare Bulrush
Schoenoplectus tabernaemontani	Softstem Bulrush
Scleria oligantha	Littlehead Nutrush
Scleria reticularis	Netted Nutrush
Scleria triglomerata	Tall Nutgrass; Whip Nutrush
Scoparia dulcis	Sweetbroom; Licoriceweed
Scutellaria integrifolia	Helmet Skullcap
Serenoa repens	Saw Palmetto
Sesuvium portulacastrum	Shoreline Seapurslane
Setaria magna	Giant Bristlegrass
Setaria parviflora	Yellow Bristlegrass
Sida rhombifolia	Cuban Jute; Indian Hemp
Sideroxylon reclinatum	Florida Bully
Sisyrinchium angustifolium	Narrowleaf Blue-Eyed Grass
Smilax auriculata	Earleaf Greenbrier
Smilax bona-nox	Saw Greenbrier

Smilax glauca	Cat Greenbrier; Wild Sarsaparilla
Smilax laurifolia	Laurel Greenbrier; Bamboo Vine
Smilax rotundifolia	Bullbrier; Roundleaf Greenbrier
Solanum americanum	American Black Nightshade
Solanum viarum	Tropical Soda Apple
Solanum carolinense	Carolina Horsenettle
Solidago fistulosa	Pinebarren Goldenrod
Solidago odora	Anisescented Goldenrod
Solidago odora chapmanii	Chapman's Goldenrod
Solidago sempervirens	Seaside Goldenrod
Solidago stricta	Wand Goldenrod
Sonchus oleraceus	Common Sowthistle
Spartina bakeri	Sand Cordgrass
Spergularia marina	Salt Sandspurry
Spermacoce assurgens	Woodland False Buttonweed
Spermacoce prostrata	Prostrate False Buttonweed
Sphagneticola trilobata	Creeping Oxeye
Spiranthes praecox	Greenvein Ladiestresses
Spiranthes vernalis	Spring Ladiestresses
Sporobolus indicus	Smutgrass
Sporobolus junceus	Pineywoods Dropseed
Sporobolus virginicus	Seashore Dropseed
Stachys floridana	Florida Hedgenettle
Stenotaphrum secundatum	St. Augustine Grass
Stillingia sylvatica	Queensdelight
Suaeda linearis	Sea Blite; Annual Seepweed
Symphyotrichum carolinianum	Climbing Aster
Symphyotrichum subulatum	Annual Saltmarsh Aster
Symphyotrichum tenuifolium	Perennial Saltmarsh Aster
Syngonanthus flavidulus	Yellow Hatpins
Taxodium distichum	Bald-Cypress
Teucrium canadense	Woodsage
Thalia geniculata	Alligatorflag; Fireflag
Thelypteris hispidula versicolor	Hairy Maiden Fern
Tillandsia bartramii	Bartram's Airplant
Tillandsia fasciculata densispica	Cardinal Airplant
Tillandsia recurvata	Ballmoss
Tillandsia setacea	Southern Needleleaf
Tillandsia usneoides	Spanish Moss
Tillandsia utriculata	Giant Airplant
Toxicodendron radicans	Eastern Poison Ivy
Tradescantia ohiensis	Bluejacket
Trichostema dichotomum	Forked Bluecurls
Trifolium campestre	Field Clover; Hop Clover
Trifolium repens	White Clover
Tripsacum dactyloides	Eastern Gamagrass
Typha domingensis	Southern Cattail
Typha latifolia	Broadleaf Cattail
Ulmus americana	American Elm
Urena lobata	Caesarweed
Urochloa mutica	Paragrass
Urtica chamaedryoides	Heartleaf Nettle
Utricularia cornuta	Horned Bladderwort

Utricularia floridana	Florida Yellow Bladderwort
Utricularia subulata	Zigzag Bladderwort
Vaccinium corymbosum	Highbush Blueberry
Vaccinium darrowii	Darrow's Blueberry
Vaccinium myrsinites	Shiny Blueberry
Vaccinium stamineum	Deerberry
Verbena scabra	Sandpaper Vervain
Verbesina virginica	White Crownbeard
Viburnum obovatum	Walter's Viburnum
Vicia acutifolia	Fourleaf Vetch
Vicia floridana	Florida Vetch
Vigna luteola	Hairypod Cowpea
Viola lanceolata	Bog White Violet
Viola primulifolia	Primroseleaf Violet
Viola sororia	Common Blue Violet
Vitis rotundifolia	Muscadine
Vitis shuttleworthii	Calloose Grape
Vittaria lineata	Shoestring Fern
Woodwardia areolata	Netted Chain Fern
Woodwardia virginica	Virginia Chain Fern
Ximenia americana	Tallow Wood; Hog Plum
Xyris ambigua	Coastalplain Yelloweyed Grass
Xyris baldwiniana	Baldwin's Yelloweyed Grass
Xyris brevifolia	Shortleaf Yelloweyed Grass
Xyris caroliniana	Carolina Yelloweyed Grass
Xyris elliottii	Elliott's Yelloweyed Grass
Xyris flabelliformis	Savannah Yelloweyed Grass
Xyris platylepis	Tall Yelloweyed Grass
Youngia japonica	Oriental False Hawksbeard
Yucca aloifolia	Spanish Bayonet; Aloe Yucca
Zanthoxylum clava-herculis	Hercules'-Club
INVERTEBRATES	
Scientific Name	**Common Name**
Actinopterygii	
Belostoma testaceum	
Cybister fimbriolatus	
Lethocerus uhleri	Uhler's Water Bug
Ranatra kirkaldyi	
Benthic	
Palaemonetes	Grass Shrimp
Procambarus	Crayfish
VERTEBRATES	
Scientific Name	**Common Name**
Mammals	
Blarina carolinensis	Southern Short-Tailed Shrew
Canis latrans	Coyote
Didelphis virginiana	Virginia Opossum
Lontra canadensis	River Otter
Lynx rufus	Bobcat
Ochrotomys nuttalli	Golden Mouse
Odocoileus virginianus	White-Tailed Deer

Osteopilus septentrionalis	Nine-Banded Armadillo
Peromyscus gossypinus	Cotton Mouse
Procyon lotor	Raccoon
Sigmodon hispidus	Hispid Cotton Rat
Sorex longirostris	Southeastern Shrew
Sus scrofa	Feral Hog
Sylvilagus	
Ursus americanus	Florida Black Bear
Fish	
Ameiurus natalis	Yellow Bullhead
Ameiurus nebulosus	Brown Bullhead
Aphredoderus sayanus	Pirate Perch
Cyprinodon variegatus	Sheepshead Minnow
Enneacanthus obesus	Banded Sunfish
Erimyzon sucetta	Lake Cubsucker
Esox niger	Chain Pickerel
Etheostoma fusiforme	Swamp Darter
Fundulus chrysotus	Golden Topminnow
Fundulus cingulatus	Banded Topminnow
Fundulus lineolatus	Southern Starhead Minnow
Fundulus seminolis	Seminole Killifish
Gambusia holbrooki	Mosquitofish
Heterandria formosa	Least Killifish
Hoplosternum littorale	Brown Hoplo
Jordanella floridae	Flagfish
Labidesthes sicculus	Brook Silverside
Lepisosteus platyrhincus	Florida Gar
Lepomis gulosus	Warmouth
Lepomis macrochirus	Bluegill
Lepomis marginatus	Dollar Sunfish
Lepomis microlophus	Red-Eared Sunfish
Mugil cephalus	Striped Mullet
Notemigonus crysoleucas	Golden Shiner
Notropis maculatus	Tail-Light Shiner
Poecilia latipinna	Sailfin Molly
Pterygoplichthys multiradiatus	Sailfin Catfish
Tilapia	
Amphibians	
Acris gryllus	Southern Cricket Frog
Amphiuma means	Two-Toed Amphiuma
Anaxyrus quercicus	Oak Toad
Anaxyrus terrestris	Southern Toad
Eleutherodactylus planirostris	Greenhouse Frog
Gastrophryne carolinensis	Eastern Narrowmouth Toad
Hyla cinerea	Green Treefrog
Hyla femoralis	Pinewoods Treefrog
Hyla squirella	Squirrel Treefrog
Lithobates catesbeianus	Bullfrog
Lithobates grylio	Pig Frog
Lithobates sphenocephalus	Florida Leopard Frog
Notophthalmus viridescens	Eastern Newt

Osteopilus septentrionalis	Cuban Treefrog
Pseudacris crucifer	Spring Peeper
Pseudacris nigrita	Southern Chorus Frog
Pseudacris ocularis	Little Grass Frog
Scaphiopus holbrookii	Eastern Spadefoot
Siren intermedia	Lesser Siren
Siren lacertina	Greater Siren
Reptiles	
Agkistrodon piscivorus conanti	Florida Cottonmouth
Alligator mississippiensis	American Alligator
Anolis carolinensis	Green Anole
Anolis sagrei	Brown Anole
Apalone ferox	Florida Softshell Turtle
Boa constrictor	Boa Constrictor
Chelydra serpentina	Common Snapping Turtle
Coluber constrictor	Eastern Racer
Coluber constrictor priapus	Southern Black Racer
Crotalus adamanteus	E. Diamondback Rattlesnake
Diadophis punctatus	Ringneck Snake
Drymarchon couperi	Eastern Indigo Snake
Gopherus polyphemus	Gopher Tortoise
Kinosternon baurii	Striped Mud Turtle
Micrurus fulvius	Eastern Coral Snake
Nerodia fasciata	Southern Water Snake
Nerodia fasciata pictiventris	Florida Water Snake
Opheodrys aestivus	Rough Green Snake
Ophisaurus ventralis	Eastern Glass Lizard
Pantherophis guttatus	Corn Snake
Plestiodon inexpectatus	Southeastern Five-Lined Skink
Plestiodon laticeps	Broadhead Skink
Pseudemys floridana	Florida Cooter
Pseudemys nelsoni	Florida Redbelly Turtle
Rhadinaea flavilata	Pine Woods Snake
Scincella lateralis	Ground Skink
Scotophis alleghaniensis	Eastern Rat Snake
Sistrurus miliarius	Pigmy Rattlesnake
Sistrurus miliarius barbouri	Dusky Pygmy Rattlesnake
Terrapene carolina	Eastern Box Turtle
Terrapene carolina bauri	Florida Box Turtle
Thamnophis sauritus	Eastern Ribbon Snake
Thamnophis sauritus sackenii	Peninsula Ribbon Snake
Thamnophis sirtalis	Common Garter Snake
Thamnophis sirtalis sirtalis	Eastern Garter Snake
Birds	
Accipiter striatus	Sharp-Shinned Hawk
Actitis macularius	Spotted Sandpiper
Agelaius phoeniceus	Red-Winged Blackbird
Anas fulvigula	Mottled Duck
Anhinga anhinga	Anhinga
Ardea alba	Great Egret
Ardea herodias	Great Blue Heron

Baeolophus bicolor	Tufted Titmouse
Bubulcus ibis	Cattle Egret
Bubulcus ibis	Cattle Egret
Buteo lineatus	Red-Shouldered Hawk
Butorides virescens	Green Heron
Calidris himantopus	Stilt Sandpiper
Calidris mauri	Western Sandpiper
Calidris minutilla	Least Sandpiper
Calidris pusilla	Semipalmated Sandpiper
Cardinalis cardinalis	Northern Cardinal
Cathartes aura	Turkey Vulture
Ceryle alcyon	Belted Kingfisher
Charadrius semipalmatus	Semipalmated Plover
Charadrius vociferus	Killdeer
Cistothorus palustris	Marsh Wren
Colinus virginianus	Northern Bobwhite
Columbina passerina	Common Ground-Dove
Coragyps atratus	Black Vulture
Corvus ossifragus	Fish Crow
Dendroica caerulescens	Black-Throated Blue Warbler
Dendroica coronata	Yellow-Rumped Warbler
Dendroica palmarum	Palm Warbler
Dendroica striata	Blackpoll Warbler
Dendroica tigrina	Cape May Warbler
Dolichonyx oryzivorus	Bobolink
Dryocopus pileatus	Pileated Woodpecker
Dumetella carolinensis	Gray Catbird
Egretta caerulea	Little Blue Heron
Egretta thula	Snowy Egret
Egretta tricolor	Tricolored Heron
Elanoides forficatus	Swallow-Tailed Kite
Eudocimus albus	White Ibis
Falco columbarius	Merlin
Falco sparverius	American Kestrel
Gallinago delicata	Wilson's Snipe
Geothlypis trichas	Common Yellowthroat
Haliaeetus leucocephalus	Bald Eagle
Himantopus mexicanus	Black-Necked Stilt
Hirundo rustica	Barn Swallow
Lanius ludovicianus	Loggerhead Shrike
Larus delawarensis	Ring-Billed Gull
Melanerpes carolinus	Red-Bellied Woodpecker
Melospiza georgiana	Swamp Sparrow
Mimus polyglottos	Northern Mockingbird
Mniotilta varia	Black-And-White Warbler
Mycteria americana	Wood Stork
Myiarchus crinitus	Great Crested Flycatcher
Pandion haliaetus	Osprey
Parula americana	Northern Parula
Passerculus sandwichensis	Savannah Sparrow
Passerina cyanea	Indigo Bunting
Pelecanus erythrorhynchos	American White Pelican
Phalacrocorax auritus	Double-Crested Cormorant

Picoides pubescens	Downy Woodpecker
Pipilo erythrophthalmus	Eastern Towhee
Platalea ajaja	Roseate Spoonbill
Plegadis falcinellus	Glossy Ibis
Polioptila caerulea	Blue-Gray Gnatcatcher
Quiscalus major	Boat-Tailed Grackle
Regulus calendula	Ruby-Crowned Kinglet
Rynchops niger	Black Skimmer
Sayornis phoebe	Eastern Phoebe
Setophaga ruticilla	American Redstart
Sterna caspia	Caspian Tern
Sturnella magna	Eastern Meadowlark
Tachycineta bicolor	Tree Swallow
Thryothorus ludovicianus	Carolina Wren
Tringa flavipes	Lesser Yellowlegs
Tringa melanoleuca	Greater Yellowlegs
Troglodytes aedon	House Wren
Vireo griseus	White-Eyed Vireo
Vireo olivaceus	Red-Eyed Vireo
Zenaida macroura	Mourning Dove

Key

FWC: Florida Fish and Wildlife Conservation Commission

- E- Endangered
- T- Threatened
- SSC- Species of Special Concern

FNAI State: Florida Natural Areas Inventory

- S1- Critically imperiled in Florida, extreme rarity
- S2- Imperilled in Florida, rarity.
- S3- Very rare and local in Florida.
- S4- Apparently secure in Florida.
- S5- Demonstrably secure in Florida.

FNAI Global: Definition parallels state element rank: substitute "G" for "S" in above state ranks.

USFWS: United States Fish and Wildlife Service

- E- Endangered
- T- Threatened
- SSC- Species of Special Concern

FDACS: Florida Department of Agriculture and Consumer Services

- E Endangered
- T Threatened
- C Commercially Exploited

* indicates that a species has that status only in selected portions of its range.

APPENDIX B – SOILS DESCRIPTIONS

ANCLOTE SERIES The Anclote series consists of very deep, very poorly drained, rapidly permeable soils in depressions, poorly defined drainage ways, and flood plains. They formed in thick beds of sandy marine sediments. Near the type location, the mean annual temperature is about 75 degrees F., and the mean annual precipitation is about 55 inches. Slopes range from 0 to 2 percent. Native vegetation consists of cypress, bay, popash, pond pine, cabbage palm, red maple, and juncus species.

BLUFF - The Bluff series consists of very deep, very poorly drained, slowly permeable soils in marshes and on broad low terraces along rivers. They formed in thick beds of alkaline loamy marine sediments. They are typically located in Marion County, Florida; approximately 200 feet south of State Road 40, about 0.25 miles west of Oklawaha River, and just west of the boat basin. These soils are primarily used for woodland or wildlife habitat. The native vegetation consists of swamp white oak, tupelo gum, swamp maple, cypress, and palm, with scattered loblolly pine some areas. The understory vegetation consists of several bluestem species, hairy panicum, longleaf uniola, vines, and forbs.

CHOBEE – Very deep, very poorly drained, slowly to very slowly permeable soils in depressions, flats, and occasionally on river floodplains in the Lower Coastal Plain. Formed in thick beds of loamy marine sediments. Drained areas are used for citrus, pasture, and range. Most of the soils remain in their natural state and have vegetation consisting of pickerelweed, lilies, sawgrass, and scattered swamp maples in treeless areas. Some areas have a growth of ash, gum, maple and cypress.

DELRAY - Delray soils consist of very deep, very poorly drained, moderately permeable soils on broad flats, floodplains, and depressions in the lower coastal plain. Slopes in these areas range from 0-2%. These soils were formed in sandy and loamy marine sediments. Natural vegetation in these soils includes southern bayberry, pickerelweed, sedges, reeds, water tolerant grasses, and cypress, bay, tupelo, and other water tolerant trees.

The EAUGALLIE series consists of deep or very deep, poorly or very poorly drained, slowly permeable soils in flats, sloughs and depressional areas. They formed in sandy and loamy marine sediments in Peninsula Florida. Natural vegetation may consist of longleaf pine, South Florida slash pine, and saw palmetto, with understory vegetation possibly including inkberry, southern bayberry, and pineland threeawn.

FLORIDANA – Very deep, very poorly drained, slowly to very slowly permeable soils on low, broad flats, flood plains, and in depressional areas. They formed in thick beds of sandy and loamy marine sediments. Slopes in areas where this soil is found ranges from 0-1%. Natural vegetation consists of sand cordgrass, cabbage palmetto, myrtle, and pineland threeawn. In depressional areas, most of the soil has a sparse to dense cover of cypress. In floodplains, the vegetation is mostly sweetgum, black gum, red maple, and cypress.

The HILOLO series consists of deep, poorly drained slowlypermeable soils formed in sandy and loamy marine sediments influenced by underlying alkaline materials. They occur on nearly level areas and along borders of depressions and sloughs in Peninsular Florida. Slopes are less than 2 percent. Native vegetation is primarily cabbage palm with scattered water oaks and longleaf and slash pines and an understory of waxmyrtle, sawpalmetto, and inkberry. Pineland threeawn is the dominant grass.

HOLOPAW SERIES The Holopaw series consists of deep and very deep, poorly and very poorly drained soils formed in sandy marine sediments. These soils are rapidly permeable in the A and E horizons and moderately or moderately slowly permeable in the B horizon. These soils are on low lying flats, in poorly defined drainages or depressional areas. Slopes range from 0 to 2 percent. Native vegetation is scattered slash and pond pine, cabbage and sawpalmettos, scattered cypress, myrtle, sand cordgrass, and pineland threeawn.

HONTOON SERIES The Hontoon series consists of deep, very poorly drained, rapidly permeable organic soils formed in hydrophytic non-woody plant remains. These soils occur in fresh water swamps and marshes. Slopes range from 0 to 2 percent. Native vegetation is loblolly, bay, maple, gum, and scattered cypress trees with a ground cover of greenbriers, ferns, and other aquatic plants. In a few areas there are slash pines with a ground cover of osmunda fern.

IMMOKALEE SERIES The Immokalee series consists of deep and very deep, poorly drained and very poorly drained soils that formed in sandy marine sediments. They occur on flatwoods and in depressions of Peninsular Florida. Slopes are dominantly 0 to 2 percent but range to 5 percent. Principal vegetation is longleaf and slash pines and undergrowth of sawpalmetto, gallberry, waxmyrtle, and pineland threeawn. In depressions, water tolerant plants such as cypress, loblollybay gorodonia, red maple, sweetbay, maidencane, blue maidencane, chalky bluestem, sand cordgrass, and bluejoint panicum are more common.

MALABAR – Very deep, poorly to very poorly drained soils in sloughs, shallow depressions, and along flood plains. Formed in sandy and loamy marine sediments. Slopes in areas where these soils are found range from 0-2%. Native vegetation consists of scattered slash pine, cypress, wax myrtle, cabbage palm, pineland threeawn, and maidencane. In depressions, the vegetation is dominantly St. Johns Wort or maidencane. Manatee – Manatee soils are very deep, very poorly drained, and moderately permeable soils in depressions, broad drainage ways, and on floodplains. They formed in sandy and loamy marine sediments. Slope is dominantly less than 1%, but may range to 2%. Natural vegetation in these soils includes red maple, gum, cabbage palm, and widely spaced cypress. Treeless areas are covered by pickerelweed, sedge, maidencane, sawgrass, cutgrass bluestem, panicum, cinnamon fern, sand cordgrass, St. Johns Wort, and other perennial grasses.

MYAKKA – Deep and very deep, poorly to very poorly drained soils formed in sandy marine deposits. These soils are on flatwoods, high tidal areas, flood plains, depressions,

and gently sloping to barrier islands. Slopes in areas where these soils are found range from 0-8%. Native vegetation includes longleaf and slash pines with an undergrowth of saw palmetto, running oak, inkberry, wax myrtle, huckleberry, chalky bluestem, pineland threeawn, and scattered fetterbush.

The PAISLEY series consists of deep, poorly drained, slowly permeable soils that formed in clayey marine sediments influenced by underlying calcareous materials. These soils are on nearly level, low board coastal plains with slopes of less than 1%. Native vegetation consists of slash, longleaf, and loblolly pine, swamp white oak, swamp maple, and sweetgum with an understory of wax myrtle, cabbage palmetto, bluestem, and native grasses.

PINEDA – Deep and very deep, poorly and very poorly drained, very slowly permeable soils in depressions, low hammocks, poorly defined drainageways, broad low flats, and floodplains. Formed in thick beds of sandy and loamy marine sediments on the lower coastal plain. Slopes in areas where these soils are found range from 0-2%. Native vegetation consists of slash pine, cypress, myrtle, cabbage palm, blue maidencane, chalky bluestem, blue point panicum, sedges, pineland threeawn, and sand cordgrass.

POMELLO SERIES The Pomello series consists of very deep, moderately well to somewhat poorly drained soils that are sandy to depths of more than 80 inches. Pomello soils formed in sandy marine sediments in the flatwoods areas of Peninsular Florida. Slopes range from 0 to 5 percent. Native vegetation is dominated by scrub oak, dwarf live oak, sawpalmetto, longleaf pine, slash pine, and pine land threeawn.

POMPANO SERIES The Pompano series consists of very deep, very poorly drained, rapidly permeable soils in depressions, drainageways, and broad flats. They formed in thick beds of marine sands. Near the type location, the mean annual temperature is about 73 degrees F., and the mean annual precipitation is about 50 inches. Slopes range from 0 to 2 percent. Natural vegetation consists of palmetto, widely spaced cypress, gum, and slash pine, and native grasses.

QUARTZIPAMMENTS – Soil usually associated with a borrow pit site.

RIVIERA – Very deep, poorly drained, very slowly permeable soils on broad, low flats and in depressions in the lower coastal plain. They formed in stratified sandy and loamy marine sediments on the lower coastal plain. Slopes in areas where these soils are found range from 0-2%. Native vegetation consists of slash pine, cabbage, and saw palmetto, scattered cypress, maidencane, and pineland threeawn.

SAMSULA SERIES The Samsula series consists of very deep, very poorly drained, rapidly permeable soils that formed in moderately thick beds of hydrophytic plant remains and are underlain by sandy marine sediments. These soils are in swamps, poorly defined drainageways and flood plains. Slopes are less than 2 percent. Natural vegetation is loblolly bay with scattered cypress, maple, gum, and pine trees with a ground cover of greenbriers, ferns, and other aquatic plants.

The SANIBEL series consists of very poorly drained sandy soils with organic surfaces. They formed in rapidly permeable marine sediments. The soils occur on nearly level to depressional areas with slopes less than 2 percent. Most areas are in natural vegetation which consists mostly of sawgrass, melaleuca, and waxmyrtle.

The SCOGGIN series consists of very poorly drained soils formed in loamy and sandy marine sediments on the low Coastal Plain in central Peninsular Florida. They occur in swamps and low areas bordering swamps. They are covered with standing water for as much as 6 months in most years beginning in the summer rainy season. Most areas are in a sparse forest of slash pine and swamp hardwoods with a ground cover of maidencane, pineland threeawn, gallberry, and clumps of saw palmetto. The Smyrna series consists of very deep, poorly to very poorly drained soils formed in thick deposits of sandy marine materials. Slopes range from 0 to 2 percent. Natural vegetation consists of longleaf and slash pines with an undergrowth of sawpalmetto, running oak, gallberry, waxmyrtle, and pineland threeawn.

TERRA CEIA SERIES The Terra Ceia series consists of very deep, very poorly drained organic soils that formed from nonwoody fibrous hydrophytic plant remains. They occur mostly in nearly level fresh water marshes and occasionally on river flood plains and in tidal swamps or flats. Natural vegetation includes sawgrass, lilies, sedges, reeds, maidencane, and other aquatic plants. Wooded areas include cypress, blackgum, cabbage palm, carolina ash, loblolly bay, red maple, sweetbay, and pond pine. American and white mangrove trees are dominate in tidal areas.

The TEQUESTA series consists of very deep, very poorly drained, moderately slowly permeable soils in depressional areas, fresh water swamps and marshes, and broad low flats adjacent to organic soils. They formed in stratified marine sandy and loamy sediments on the Lower Coastal Plain. The natural vegetation consists of needle grass, pickerelweed, maidencane, ferns, wax myrtle, and scattered cypress.

TOMOKA SERIES The Tomoka series consists of deep, very poorly drained, moderately permeable soils that formed in decomposed dark reddish brown and black organic material about 27 inches thick over sand and loamy mineral material. Slopes range from 0 to 2 percent. Native vegetation is sawgrass, lilies, reeds, sedges, myrtle and other aquatic plants. Cypress, red and white bay, maple and pond pine are common tree species.

The VALKARIA series consists of deep, rapidly permeable soils that formed in thick beds of marine sands. These soils occur in broad, poorly defined, low gradient drainageways, depressions and low nearly level areas. Natural vegetation is palms, cabbage palmettos, St. Johnswort, wax myrtle, blue maidencane, chalky bluestem, pineland threeawn, and widely spaced pine and cypress. Maidencane is the most common plant in depressions.

WABASSO – Deep or very deep, very poorly drained, very slowly and slowly permeable soils on flatwoods, floodplains, and depressions in Peninsular Florida. They formed in

sandy and loamy marine sediments. Slopes range from 0-2% in areas where these soils are found. Natural vegetation consists of longleaf pine, slash pine, cabbage palm, and live oak with an understory of saw palmetto, laurel oak, wax myrtle, chalky bluestem, and pineland threeawn.

The WAUCHULA series consists of very deep, very poorly or poorly drained, moderately slow or slowly permeable soils on flatwoods on the lower coastal plains. They formed in sandy and loamy marine sediments. The natural vegetation consists of longleaf pine, slash pine, saw palmetto, with an understory of inkberry, fetter, southern bayberry, and pineland threeawn.

WINDER – Very deep, poorly drained, slowly to very slowly permeable soils on broad, low flats, and depressional areas. Formed in loamy marine sediments on the lower coastal plain. Slopes in areas where these soils are found range from 0-2%. Most areas are native vegetation and used for wildlife habitat. Natural vegetation consists of cordgrass, maidencane, cabbage palmetto, saw palmetto, and pineland threeawn.

APPENDIX C –FIRE MANAGEMENT PLAN

Seminole Ranch Conservation Area

Introduction

The Seminole Ranch Conservation Area lies within the Upper St. Johns River Basin. The majority of this management area falls within the 100-year floodplain of the river. The lands within the conservation area were purchased to provide habitat, water quality improvement, and flood protection in the Upper St. Johns River basin.

The Seminole Ranch Conservation Area (SRCA) is approximately 29,789 acres. The conservation area is located approximately 15 miles east of Orlando, 2 miles west of Titusville, 10 miles west of the Kennedy Space Center in Brevard County. It extends from State Road 50 north to State Road 46. The Salt Lake Wildlife Management Area (WMA) managed by the Florida Fish and Wildlife Conservation Commission (FWC), the St. Johns National Wildlife Refuge managed by the U.S. Fish and Wildlife Service, and a private parcel of land are contiguous on the east side. The Buck Lake Conservation Area lies north of SR 46. The west side is bordered by the St. Johns River and the Little Big Econ and Charles H. Bronson State Forests on the northwest side and the City of Orlando property to the southwest. The 6,000-acre Seminole Ranch WMA comprising the southwest portion of the property, owned by the St. Johns River Water Management District (District), is managed by the FWC. The Tosohatchee State Reserve lies south of SR 50. The area has supported cattle grazing and some minor row crop operations since the early 1900's.

Purpose

The objective of prescribed burning in the Seminole Ranch Conservation Area is to maintain a mosaic of native plant communities. Prescribed burning can maintain and improve wildlife habitat, perpetuate fire dependent communities, promote species diversity, and reduce the accumulation of hazardous fuel loads and associated wildfire risks (Main 1999, Van Lear 2000, Vogl 1973, Wade 1989). We can also minimize and/or exclude smoke impacts to adjoining or nearby urbanized areas, roads and highways.

An intertwined cycle of fire and hydrology played a major role in shaping Florida marshes (Myers 1990). In the Upper St. Johns River Basin, periodic fire and fluctuating hydroperiods naturally created a mosaic of herbaceous dominated plant communities throughout the marsh. Alteration in hydroperiod or fire cycles can lead to the expansion of shrub swamp, dominated by species such as wax myrtle or willow. Shrub swamp alters the plant community and habitat structure by shading out the understory vegetation. This not only changes the habitat for wildlife, but without sufficient understory vegetation there will not be enough fuel to conduct prescribed burning. In some areas, shrub invasion has been so extensive that prescribed fire may not be effective because of the lack of fine fuels. This encroachment is due possibly because of altered hydrology and lack of fire. These areas will require mechanical restoration, such as drum-chopping or bush-hogging, to reduce the shrub canopy and encourage understory vegetation before prescribed burning can be utilized.

Community Types, Ecotones, and Fuel Model

The FNAI community types that are most prevalent within the Conservation Area include floodplain marsh and wet prairie, pock marked by prairie hydric hammock, shell mound, hydric hammock, floodplain swamp and mesic flatwoods. Remnant salt flats occur on the east side of Puzzle Lake and continue north into Cabbage Slough (Buck Lake Conservation Area). There are approximately 1,000 acres of pine/cabbage tree flatwoods on the very northwestern portion of the conservation area.

Floodplain marshes are adjacent to riverine communities and inundated for approximately 250 days annually (FNAI 1990). These often grade up into wet prairie, which is seasonally inundated for 50 to 100 days per year (FNAI 1990). Wet prairie grades into mesic flatwoods.

The dominant vegetation within the conservation area is *Spartina bakeri* (sand cord-grass/ switch-grass). This species grows to an average of 3 to 4 feet tall but can grow to 6 feet. It is densely tufted and accumulates considerable dead matter. Most of the fire management units within the SRCA behave as a fuel model 3 (Anderson 1982), the tall grass group. Four units behave as a combination of fuel models 4 of the shrub group, and 7, the southern rough, characterized by a pine overstory and palmetto-gallberry understory (Anderson 1982). Average height of the understory is about 2-5 feet and fuel bed depth is roughly 2-3 feet. A lack of fire has allowed a midstory of water oak, live oak, and cabbage palms in unit SR-4.

Ecotonal areas would include the remnant salt flats, prairie hammock, shell mound, hydric hammock, and floodplain swamp. The effects of fire will be incidental in and around these communities, as fire will merely be allowed to burn into these if conditions permit. Anecdotal observations indicate that fire intensity tends to decrease near such communities generally due to associated higher relative humidity, higher soil moisture, and lesser winds. Generally these communities will not receive fire unless burning conditions are very good to extreme as observed during the 1998 wildland fire season. Several acres of hydric hammock received fire that started from lightning in wet prairie and swept into the hammock killing old canopy live oak, cedar, and some cabbage palms. Many cabbage palms remained stressed for several months to a year later and eventually succumbed to the cabbage palm weevil.

Season and Rotation

The natural fire season coincides with the lightning season, which is generally from May to July. Before the influx of settlers, lightning fires would burn unimpeded through fire adapted communities and landscapes until extinguished via changes in weather and/or fuel characteristics (Johnson 2000). Also, Native Americans would burn at various times of the year to attract wild game and to keep the landscape open for easy travel. Since the turn of the century the property has been used for cattle grazing and was likely burned on a 2-3 year rotation to improve forage for cattle. According to local cattlemen, these land use practices were in effect until the 1980's. With more strict regulations regarding smoke management and because of urbanization in proximity to the area, the window of opportunity for prescribed burning has decreased dramatically.

Prescribed burns in the marsh should take place primarily during the growing season, as many plant species respond favorably to fire during this time (Main and Barry 2002). However, different desired effects can be achieved during different seasons and should be considered when planning burn rotations for each unit. For example, spring burns may be more effective in controlling the expansion of shrub swamp. Many of the units within Seminole Ranch are targeted for burning in the growing season. However because of magnitude of the burning effort, excluding the winter season from the rotation is not realistic toward accomplishing conservation area, regional, and District wide goals. Also, many of the burn units along the north end of the property near to State Road 46 will require the use of northerly winds to keep smoke from impacting the highway and private residences. These winds are more prevalent in the winter season. The focus for the burn regime on Seminole Ranch will be growing season burns except in areas where it is not practical. The map (figure 1) illustrates the extent of each fire management unit and depicts the approximate season that fire will be administered.

FNAI states that historically, fires burned on a one-five year basis under natural conditions in the floodplain marsh community type (FNAI 1990) and every two-four years in wet prairie. Other experts suggest a three to five year burn rotation for the freshwater marsh (Schmalzer pers. comm. 2004, Wade et al. 1980). It has been found that *Spartina* marshes may not accumulate enough dead matter to carry a significant fire until three years after a burn (Schmalzer pers. comm. 2004). The U.S. Fish and Wildlife Service burn floodplain marsh at the St. Johns National Wildlife Refuge on a 2-3 year rotation (Fred Adrian pers. comm. 2004). One personal observation made from wildfires that burned in adjacent units, in consecutive years (June1998 and July 1999), on the Seminole Ranch Conservation Area showed that one-year fuel loads might not be adequate enough to carry fire through a *Spartina* marsh under "normal" weather conditions. Conversely, during the summer wildfires of 1998, fires burned though one unit that was prescribed burned 1 ¼ years prior, and two units that were prescribed burned 1 ½ years prior. However the latter three burned in June- July 1998 under "extreme" fire weather conditions. On the Seminole Ranch Conservation Area District personnel suggest a burn rotation of 3 to 5 years for the short hydroperiod units isolated from the St. Johns River which are primarily wet prairie, and 5 to 7 years for units adjacent to the river, which experience longer hydroperiods, and are primarily floodplain marsh. FNAI proposes a fire rotation for 3-10 years for wet flatwoods, and notes that hammocks rarely burn.

Only Florida certified burners may perform prescribed burns on District owned lands. All prescribed burns will be conducted under authorization from the Florida Department of Agriculture and Consumer Services, Division of Forestry (FDOF).

Weather Parameters

A burn prescription should be carefully planned indicating weather parameters, seasonality, burn purpose and desired effects, site description, smoke management concerns, and contingency plans also to ensure a safe and effective burn. When conditions get too dry, (i.e. KBDI above 500 in upland and 600 in marsh) chances for completing a safe burn become less and chances of causing undesirable and potentially dangerous muck fires increase. However, with differing weather conditions come differing fire behavior and effects, enabling various fire management objectives to be achieved. Recording and monitoring of these parameters allows the fire manager to become familiar with subsequent fire behavior, and resultant fire effects, thus improving upon the efficacy of the burn program.

Temperature- Since most of the property is a non-forested wetland we are not concerned with scorching, charring or killing trees except in units SR-1, 2, 3 & 4 which are predominately pine flatwoods. It is possible to attempt a burn at a higher temperature in order to keep shrubs in check. Temperatures of 85°-90°F are preferred as caution must given to burning under hotter temperatures because of increased potential for heat stress to burn crews.

Relative Humidity- Fine fuels may reach their moisture of extinction levels when relative humidity is greater than 65%, causing fuel ignition to be low. Relative humidity of 35% or lower may increase spotting potential, cause erratic fire behavior, and increase control problems. Relative humidity of 40-65% may provide optimal burning conditions and minimize control problems.

Midflame Wind Speed- the wind speeds may be from 3 to 15 miles/hour. Winds of less speed may cause smoke management problems and may also cause control problems as fire-generated winds can overcome weak prevailing winds. Wind speeds of greater than 15 mph can increase spotting potential and other control problems.

Transport Wind Speed- Preferred transport wind speed is between 9mph and 20 mph (Wade 1989). Winds of less than 9 mph may cause smoke management problems. Winds of greater than 20 mph indicates the potential for erratic fire behavior, and control problems. Lower speeds may be sufficient to transport smoke if dispersion index and mixing height are above average

Wind Direction- Prescribed burns will be conducted when winds will direct smoke plumes away from or cause minimal impact to developed areas, residences, roads and highways. See smoke management.

Fine Fuel Moisture (1 hour)- Preferred one-hour fuel moisture is from 8-20%. Fuel moistures of less than 10% may cause control problems. Fuel moisture of greater than 20% may cause ignition problems. A value on the lower end of the range may aid in achieving goals of reducing shrub encroachment.

Dispersion Index- Preferred values will range from 40 to 69. Indices of less than 40 indicate potential smoke management problems while indices higher than 69 indicate potential control problems and erratic fire behavior. DI's of greater than 69 may be utilized when other weather conditions permit i.e., higher relative humidity, recent significant rain, and fine fuel moisture on the higher side. However, careful planning should take place so that burn objectives are met.

Mixing Height- Mixing heights for prescribed burns will range between 1650- 6500 feet (Wade 1989). Altitudes lower than 1650 feet will cause smoke management problems. Heights of greater than 6500 feet may indicate potential fire control problems and increased possibility of erratic fire behavior. Heights of 3500-5500 feet may allow the fire manager to successfully meet objectives of the burn, provide for good smoke dispersion, and conduct a safe burn.

Smoke Management

There are several smoke sensitive areas that surround the property and effect the smoke management of each burn unit according to their location and distance from each unit. Before an authorization is obtained from the FDOF, a fire weather forecast is obtained and evaluated for suitable burning conditions and smoke management objectives. A wind direction is chosen that will transport smoke away from urbanized areas and/or impact these smoke sensitive areas in the least possible way.

A smoke screening process will be completed with each prescription to plot the direction of the smoke plume, to allow for horizontal dispersion and wind shifts, and to identify critical smoke sensitive areas (Wade 1989). A critical area is a smoke sensitive area within one mile downwind of the burn unit. If a critical smoke sensitive area is downwind from the projected smoke plume, then the burn should not be conducted. A more suitable wind direction should be plotted.

Burn prescriptions should also take into account the atmospheres ability to ventilate smoke. The dispersion index, which is a numerical index that estimates the atmospheres capacity to disperse smoke should not be lower than 40 (Wade 1989). The mixing height, defined as the height at which thorough mixing of the atmosphere occurs, should not be less than 1650 ft (Wade 1989). Transport winds should be at least 9 mph to effectively minimize residual smoke. Lower transport wind speeds can be utilized if dispersion index and mixing heights are above average.

The smoke sensitive areas near the Seminole Ranch Conservation Area include: SR 50, SR 46, residences along the north boundary, the Great Outdoors community, I-95, the City of Titusville, the City of Mims, the City of Christmas. The FDOF will not issue burn authorizations on a Space Shuttle launch day or one day prior to launch for any burns conducted within a 25-mile radius of the launch pads at the Kennedy Space Center. The easternmost portion of the SRCA boundary is approximately 17 miles from the pads. Distances and directions of smoke sensitive areas from each fire management unit are delineated in respective prescriptions.

Management Concerns

Black rails, a species at risk, are known to occur near Oak Mound Lake in unit SR-22 and possibly throughout. Burning in the winter may possibly negatively impact this species (Legare 2000, Ashton 1992). Burning during the breeding season may also impact the black rail (Legare pers. comm. 1999). Care should be taken to ensure that a mosaic effect is achieved through prescribed burning to promote the proliferation of this species and the multitude of other marsh species. This can be accomplished by simply guaranteeing that soils are moist and standing water is present. Additionally, since many of these units are not homogeneous in terms of vegetation type, it is not the objective of these prescribed fires to completely burn an entire unit. For example the hammocks embedded in the wet prairie would not be expected to burn in a prescribed fire.

Several bald eagle nests exost on the Conservation Area. A bald eagle nest exists near the northeast side of unit SR-5. Prescribed burning and other management activities involving heavy equipment shall not take place within 660 feet of nest from October 1, through May 15, each year unless special permission is granted in writing by the Florida Fish and Wildlife Conservation Commission (FWC). It has been extremely difficult to prescribe burn SR-5 because of the presence of an eagle nest and the fact that a north wind is required. Special permission may need to be sought out to allow a burn during the restricted period.

Fuels in unit SR-4 and SR-6 are approaching an unmanageable level. A few wildfires have occurred in these units however prescribed burns have not been conducted in either since District ownership. Unit SR-4 is over 600 acres and adjacent to SR 46. Smoke management is a particular concern in both units because of urban interface and because of fuel characteristics. The duff layer is relatively thick in many areas and ground fuels tend to be matted. These units have become overgrown with cabbage trees, oaks, and shrubs. The density of pine and other canopy species is high. The concern is that fire will be introduced but may creep around in the duff/ litter layer and take days to mop-up. According to 1940 aerial photographs this area was not quite as densely forested and expansive as it is today. To begin to deal with this situation cabbage palms are going to be harvested to thin out the canopy and midstory.

To date only two units have received mechanical treatment to reduce shrub coverage. The situation is not as critical on Seminole Ranch as it is on Canaveral Marshes because of an active and effective burn program and because of past wildland fire activity. However, some mechanical treatment will still be needed near the north end of unit SR-9 and the south end of SR-22.

Arson has been a problem especially on the north end of the property and along Hatbill road. It is noticeably more prevalent in the fall and winter (during hunting season).

Fire Management Unit Descriptions and Burn History

To accomplish our objectives, the property has been divided into 23 burn units ranging from 75 acres to 3200 acres. Parcels of private property are included in some units with the intent of minimizing control and suppression efforts and to reduce placement of fire-lines in the marsh. Details regarding each fire management unit are outlined in the burn prescription for each respective unit.

The 6,000-acre Seminole Ranch Wildlife Management Area although owned by the District is not included in this fire management plan since the FWC has historically taken a lead role in the management and have been coordinating prescribed burning here. The FWC have been designated the lead manager of the 5,500-acre Salt Lake WMA under the CARL program. The FWC will be responsible for completion of a fire management plan and execution of the plan. District personnel and equipment are available for assistance if requested by the FWC.

Unit	Size (ac.)	Fire History	Preferred Wind Direction	Fuel Model; Firelines; Hazards; Notes
SR-1	155 155 155	 Rx 12/4/96 WF 7/98-☂	NE-N	7, model 8 along east and south. Timber salvaged. Approx. 50 acres re-planted with slashpine in fall 1999. Harrowed firelines. 7/98 fire part of 3020ac fire.
SR-2	265 265 250 13.6 285	 WF 6/20/97-unk. WF 7/98-☂ Arson 6/10/01 Rx 2/17/09	NE-N	7,8,3. About 100 acres of timber salvaged. 100 acres planted with slashpine fall1999. Harrowed firelines. 7/98 fire part of 3020ac fire. 9 fires were set on 6/10/01 in units SR-2,5, & 8.
SR-3	75 75 75	 WF 7/98-☂ Rx 3/9/07	NE-N	7,8. Timber salvaged after ’98 fire season. Harrowed firelines. 7/98 fire part of 3020ac fire.
SR-4	630 78 29 1.5 2 31	 WF 5/15/00-☂. WF 8/13/00-unk. WF6/9/01-☂ WF 6/2/04-☂ WF 6/26/04-☂	N-NE	3,4,7. Salvaged timber from 8/13 fire. Harrowed firelines. 5/15 part of 403ac fire w/SR-21.
SR-5	1011 346 400 914 0.5 37	 Arson 11/27/96 Rx 1/21/97 WF 7/98-☂ Arson 6/8/01 Arson 6/10/01	NE-N	3. The 11/26 fire was north of Ellis lk. The 1/22 rx was south of Ellis lk. Unit contains an eagle nest. Unit should not be burned Oct.1 through May 15. Harrowed firelines except at bend in SR46. Hazards include SR46 traffic. 6/98 fire part of 3020ac fire.

SR-6	295 295 0.5	 WF 7/98-☂ WF 6/14/01-☂	NE	4,7,8. Harrowed firelines. 7/98 part of 3020ac fire.
SR-7	465 181 300 160 257 358 335	 Arson 11/96 WF 1/1/97-unk. Rx 1/21/97 WF 7/98 WF 5/27/00-☂ Rx 3/26/08	S-E-N	3. Harrowed firelines. 11/96 part of 302ac fire. 1/97rx was to burn out pockets from previous wildfire. 7/98 part of 3020ac fire.
SR-8	1600 26 18.2 1000 763	 WF 5/00-☂ Arson 6/10/01 Aerial 4/2/08 Aerial 4/2/08	SE-NE	3,8. Harrowed firelines. 9 fires were set on 6/10 in various units. 5/00 fire part of 332ac fire.
SR-9	750 2630	None documented Aerial 2/23/07 (This acreage includes area burned on SR-22)	SE-NE	3. Harrowed firelines on east, north, south with river on the west side of unit.
SR-10	2559 2559 2559 1500 163 246 170 3100	 Rx 8/5/93 Rx 11/25/96 WF 7/31/99-unk. WF 4/11/04-unk. WF 2/14/07 arson WF 5/13/07 ☂ RX 10/23/09	SE	3. Harrowed line on north & NE sides, river on west side, USFWS land to east, SR50 on south. Rx burns should be done in conjunction with USFWS burn as were the preceding.
SR-11	732 732 732 732	 Rx 8/5/93 WF 6/6/98-☂ Rx 11/8/02	S-E-N	3. Harrowed lines around entire unit. The 8/5 rx burn was a cooperative effort with the USFWS. 6/98 part of 2547 ac fire.
SR-12	295 295 295 275	 Rx 3/12/97 WF 6/6/98 Rx 2/24/09	NE-E	3. Harrowed firelines surround all but part of the north line. This part will need to be mowed out with MMIII. 6/98 part of 2547 ac fire.
SR-13	158 158	 WF 6/6/98-☂	SE-NE	3. Harrowed firelines surround entire unit. 6/98 part of 2547 ac fire.

	158 152	Rx 3/18/02 Rx 1/27/09		
SR-14	129 129 129 100 129 129	 Rx 8/93 Rx 4/28/98 WF 6/6/98-☂ Rx 3/15/02 Rx 1/27/09	Any	3 Harrowed lines around entire unit. 6/98 part of 2547 ac fire.
SR-15	292 292 292 296	 Rx 4/27/98 Rx 8/30/01 Rx 5/1/08	S-E-N	3. Harrowed lines around entire unit.
SR-16	1159 1159 770	 WF 6/6/98-☂ Aerial 5/18/2005	SE-NE	3,8. Harrowed lines on east and north sides, river on west, interior road on south. 6/98 part of 2547 ac fire
SR-17	480 480 33 480	 Rx 3/26/97 Arson 4/00 Rx burn 5/9/03	SW-NW	3. Harrowed line on north to northeast, Hatbill road on west, river on east and south. 165 acres were drum chopped to reduce shrub coverage.
SR-18	3200 537 3200 5 102 458 1390 2429	 WF 5/99-☂ Rx 8/10/99 WF 6/01-unk. WF 7/03-☂ WF 12/1/03-Acc. WF 6/6/04-☂ Aerial 1/10/08	S-SE	3. The river and a canal surround the unit. 12/1fire caused from distress signal.
SR-19	275 275 275	 Arson 12/96 Rx 4/22/03	SW-NW	3. Loughman lake borders the east and north, there is a harrowed line on the south, and Hatbill road is on the west. Approximately 113 acres were drum chopped to reduce shrub coverage.
SR-20	707 651 4.5 707	 Arson 1/21/97 WF 6/14/01 ☂ Aerial 11/20/06	NW-N	3. Harrowed line along north. 1/21 fire was started by arson while we were burning unit SR-5.
SR-21 21a	560 14	 WF 7/99-unk.	NE-NW	3. Roadside swale and SR46 on north, river to west, Harrowed lines on south and east.

	325 10 687	WF 5/15/00-☂ WF 5/9/04 Rx 2/11/08		Formerly unit 21a. 5/15 was part of 403ac fire w/ SR-4. 5/9 part of 70ac fire w/ Buck Lake; possibly arson.
SR-22 21b	1636 1367 785 2630	 WF 7/98-☂ WF 7/29/00-☂ Aerial 2/23/07 (This Acreage includes area burned on SR-9)	SE-N	3. Harrowed line on north and east, river to west, harrowed line partially along south. Unit may need to be combined with SR-9 to accomplish burn. 7/98 part of 3020ac fire.
SR-23	1	WF 7/24/06-☂		
Wild-life Mgmt. Area	8 204	WF 4/10/06-☂ WF 5/13/07-☂		

WF- wildfire; Rx- prescribed burn; ☂- lightning caused; Unk.- unknown origin

Equipment and Personnel Needs
This should list equipment and personnel required for the completion of a safe and effective burn. For example it should list how many engines are needed, the need for a helicopter, bulldozer, and staffing needs.

District land management staff recommend the use of aerial ignition techniques for fire management units over 300 acres. This involves the use of a helicopter and PREMO Mark III. At least one dozer crew should standby on site or at least be accessible for all burns. Two to three engines with crews of two should be on site for most units. Firing some perimeter lines from horseback has been very successful. At least one portable pump should be set up to fill engines. An ATV should be on-site for patrolling perimeter.

Firing Plan
The firing plan should describe exactly where and how to begin firing the unit and how to complete firing throughout the unit. It should be described according to the wind directions that the prescription dictates. Generally a backfire is ignited on the downwind side (holding line) of the unit. When the holding line is lit completely and is secure then fire can be grid into the unit with the helicopter, or by other means, progressing from the holding line, into the wind and through the unit. Spacing of the grid can be manipulated according to intensity of fire needed to achieve objectives and current and expected fire behavior. A widely spaced grid pattern will increase fire intensity and burn "hotter" because it increases the ratio of the fuel bed that spots will consume before burning out. Tight grids enable spots to burn together more rapidly, decreasing intensity with a resultant "cooler" burn.

Map
The prescription should contain a map of the unit that shows fire lines, staging areas, special concern areas, escape routes and safety units.

Crew Briefing
During the briefing the burn boss should explain the objectives of the burn. Maps should be distributed to the burn crew to discuss the burn area, crew assignments, identify areas of special concern, to show safety units and escape routes, and to explain the firing plan. The forecasted weather should be given to the crew during the briefing. The contingency plan should be discussed at this time.

Notification
This section includes cooperating agencies, residents/homeowners associations, adjacent landowners and other relevant agencies that should receive a courtesy call on the day of burn. A simple courtesy call can aid tremendously in mitigating concerns, questions and complaints from the public, the press and local agencies. The local entities to be given notice of any burns on SRCA include: the Florida Highway Patrol (Brevard Office), the Brevard County Sheriff's Office, Florida Fish and Wildlife Conservation Commission, Merritt Island National Wildlife Refuge (Fire Office), The Great Outdoors Community, Tosohatchee State Reserve, Titusville Fire Department, Brevard County Fire Department. Since the phone numbers on the call out list tend to change over the years the current numbers will be listed and updated on the burn prescription.

The District Public Information Office should be informed of potential burn dates and of essential information regarding the burn. PIO should be given as much notice as possible prior to burn.

Agreements

The District maintains a Memorandum of Understanding with the U.S Fish and Wildlife Service, Merritt Island National Wildlife Refuge (MINWR). The MOU states that each entity at its sole expense shall furnish qualified personnel, satisfactory equipment and materials, and respective permits to assist each other with prescribed burning on the Seminole Ranch Conservation Area, the Canaveral Marshes Conservation Area, and the St. Johns National Wildlife Refuge administered by the MINWR.

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