Ocklawaha Prairie Restoration Area
Land Management Plan
September 2010

LAND MANAGEMENT PLAN SUMMARY
Ocklawaha Prairie Restoration Area

Management Area Size: Approximately 6,230 acres.

Dates of Acquisition: 1973, Transfers (5 Parcels) from Southwest Florida Water Management District; 1991, Ocklawaha Farms; 1994, Oxner Property; 1995, Turner/Walker and Green Properties; 2006, CR 464 widening project acquisitions: 2007, Griffin mitigation parcel; 2009, NRCS easement added.

Date of Plan: May 2010.

Basin: Upper Ocklawaha River Basin. **Planning Basin:** Marshall Swamp Unit.

Location: Marion County, approximately 15 miles southeast of Ocala, one mile north of Lake Weir, and 1.5 miles northwest of the Moss Bluff Lock and Dam on the Ocklawaha River.

Funding Sources: Properties were purchased using: Preservation 2000 funds, Save Our River Bond funds, and Ad Valorem funds.

Management Partners: The District is the lead manager on the Restoration Area.

Key Resource Issues: The Ocklawaha Prairie Restoration Area is one of the properties the District acquired to meet the goals for restoration of the Ocklawaha River Basin. Restoration of the previously farmed area is a major issue that has determined activities on site. Nutrient levels in the sediment and concerns relating to botulism in birds due to low water levels have governed water levels maintained on the farmed area. Prescribed fire and exotic plant control are major tools used for maintenance of the uplands and wetlands. A partnership with funding through the United States Department of Agriculture (USDA), Natural Resource Conservation Service (NRCS), requires specific protocols which are followed with respect to management.

Resource Protection and Management:

- Security – Security is provided by a contracted security company, a security resident and through coordination with the Marion County Sheriff's Department.
- Water Resources – Water resources were largely protected through acquisition. Water levels are currently regulated only by rainfall and static culverts placed on the south end for inflow, and north end for outflow, during periods of high water levels.
- Restoration – The District initiated development plans for long-term restoration of wetlands and hydrologic reconnection to the Ocklawaha River. Phase I included the earthwork to grade interior levees to approximate field elevations, remove woody vegetation and muck accumulations from the old river channel, plug or backfill farm ditches, and remove an airstrip and south pump station. Phase I also included partial flooding to restore wetland habitat to some of the farm area. Phase II completed partial hydrologic reconnection of the historic river channel to the C-231 Canal (present Ocklawaha River) and additional restoration of wetland habitat. Phase II was funded under the USDA Natural Resources Conservation Service (NRCS), Wetland Reserve Program (WRP). Proposed Phase III would

have been full hydrologic reconnection to the C-231 Canal. Further work on reconnection has been suspended due to elevational differences between the restoration area and the C-231 canal, and nutrient and pesticide concentration issues from past farming activities. The next phase of restoration may be developed some time in the future.

- Fire Management - District staff develops and implements annual prescribed burning plans and a comprehensive fire management plan for the area has been developed and attached in Appendix 4
- Forest Management - A comprehensive forest management plan has been developed and is incorporated into the appendix and implemented as a part of this management plan (Appendix 5).
- Flora and Fauna - The property provides important habitat for both wetland and upland dependent plant and animal species. District staff maintain an ongoing species list for the property. Fire management enhances the habitat for both plant and animal species.
- Exotic Species - Monitoring and treatment of invasive exotics plants is ongoing. Several species including Chinaberry tree and Japanese climbing fern have been found on site and treated as needed. The goal of the District's Invasive Plant Program is to achieve maintenance control of invasive plant populations present on District properties. Feral hogs are the most problematic exotic animal on site. An agreement allows the security resident to control hogs on OPRA.
- Cultural Resources - There are no cultural sites 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:

Ocklawaha Prairie Restoration Area provides opportunities for a variety of recreational uses. Current activities include hiking, canoeing, horseback riding, nature study and hunting.

- Access - An access area has been established off County Road 464C at the Chornobyl Memorial Forest that includes parking, an informational kiosk, and a walk-through for hiking, horseback riding, and biking. Access by water to the levee system and the basin marsh wetlands on the property is via the Ocklawaha River (C-231 Canal). The northeast access area is located on Old River Road (137th Avenue) and includes a parking area, kiosk and a walk-through leading to trails.
- Recreation - The property is open to the public for hiking, biking, horseback riding, canoeing, and wildlife viewing. Hunting is allowed in season on the small game hunting area in the basin marsh area. Outside of hunting season, the basin marsh wetland area provides an opportunity for bird watching, photography, nature study, and hiking along the levee trail and a boardwalk out into the marsh.

INTRODUCTION

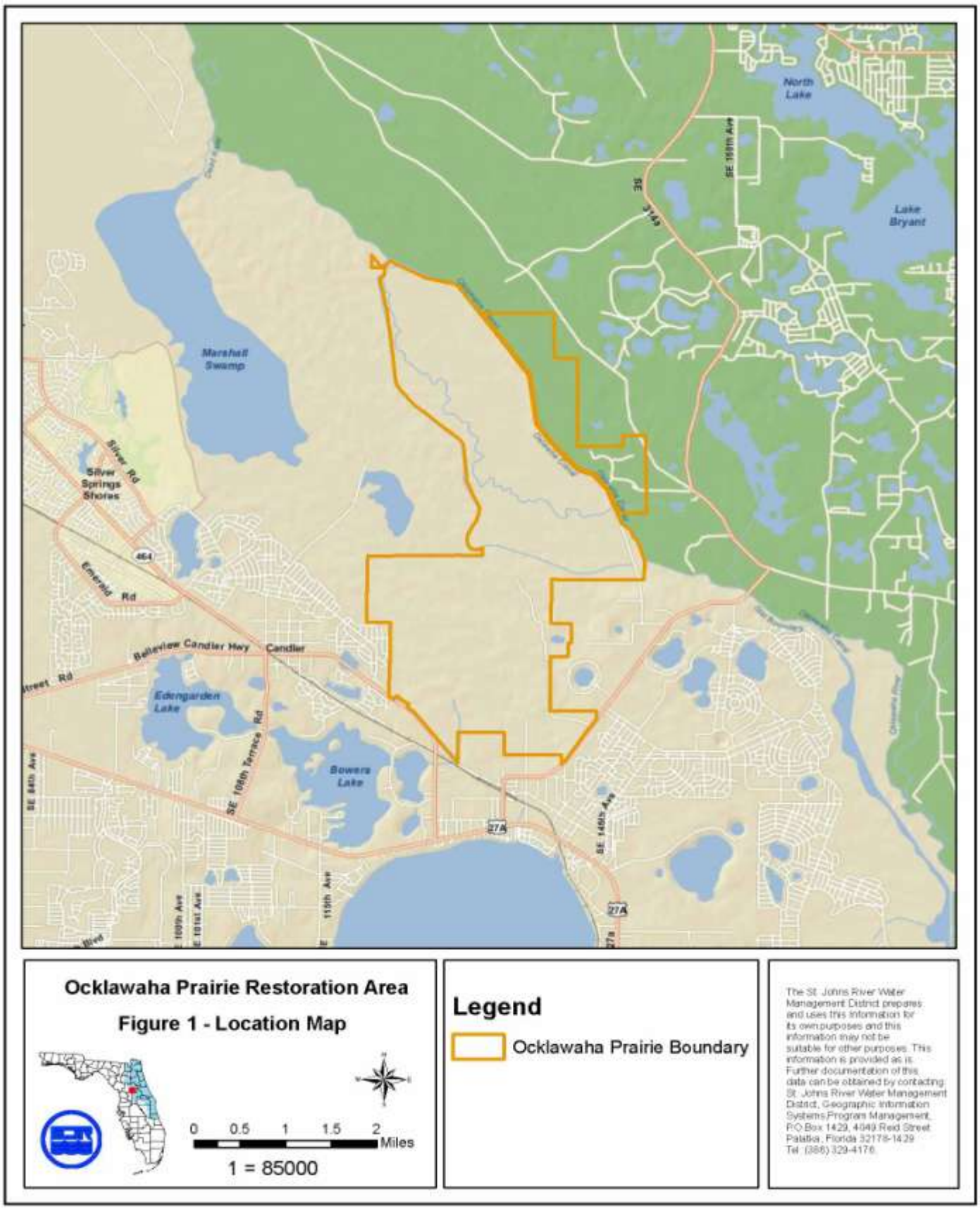
This document provides guidelines for land management activities to be implemented at the Ocklawaha Prairie Restoration Area (OPRA) over the next five years. This is a revision of the management plan approved by the Governing Board in May 2003.

The OPRA covers approximately 6230 acres in Marion County within the Upper Ocklawaha River Basin. It includes portions of Section 31, Townships -15, Range 24, and Sections 5,6,7,8,9,16,17,19,20,21,28,29,30,31,32 and 33 of Township -16, Range 24.
The property is approximately 12 miles southeast of Ocala, one mile north of Lake Weir and 1.5 miles northwest of the Moss Bluff Lock and Dam on the Ocklawaha River. The Ocala National Forest forms a large portion of the eastern boundary of the area and Marjorie Harris Carr Cross Florida Greenway State Recreation and Conservation Area property lies along the northern boundary. Portions of the property lie within the Tiger Den and Marshall Swamps, and much of the western boundary is formed by an area known as Heather Island (Figure 1).

The area lies within the U.S. Army Corps of Engineers' Four Rivers Basin Project, the Heather Island CARL (now Florida Forever) Project, and the Upper Ocklawaha Basin SWIM Project.

The name Ocklawaha came from the Indian word Ocki-Waha, meaning Great River.
Historically the river has played a major role in activities carried out in the area. Cultural artifacts found along the Ocklawaha date back to at least 1500 B.C. Subgroups of Timucuan Indians known as the Ocala and Potono tribes occupied Marion County until the 1600s and lived along the lakes and the river. More recently, the river was used as a supply route by Confederate forces. After the Civil War, steamships traveled the river and brought visitors and provisions to the area. There was once, before the draining of the land, an important steamboat landing at the northern end of the property with Starkes Ferry landing to the north. Local villages such as Weirsdale, Stanton, East Lake Weir and Ocklawaha were dependent on the river for supplies and transportation. When the canals were dug and the levees, locks, and dams were constructed, the fertile wetland soils were used for farming. The forested wetlands provided timber for houses and ships and the upland portions were used as pine plantations or cleared for agricultural fields and home sites.

The nearest communities, Weirsdale, East Lake Weir and Ocklawaha were founded at the beginning of the century when the river was a main route for travel. The area continues to be mostly rural with agriculture the main land use. Residential development, (mainly Silver Springs Shores), begins just south of the restoration area and extends westward, meeting Ocala as it develops eastward.


North Lake
Lake Bryant
Marshall Swamp
Silver Springs Shores
Silver Rd
464
Emerald Rd
Bellview Candler Hwy
Candler
Edengarden Lake
Bowers Lake
SE 108th Terrace Rd
SE 84th Ave
SE 149th Ave
SE 115th Ave
27A
Ocklawaha Prairie Restoration Area
Figure 1 - Location Map
0 0.5 1 1.5 2
Miles
1 = 85000
Legend
Ocklawaha Prairie Boundary
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LAND MANAGEMENT GOALS

District lands located within the Ocklawaha River Basin were identified in the basin overview section of the District's Five-Year Plan at time of acquisition, as being acquired for the following purposes:

1. To improve water quality.

2. To increase flood storage through restoration of floodplain communities.

3. Restore, maintain and protect native vegetation, fish and wildlife communities, and their diversity.

4. Provide opportunities for public recreation where compatible with the goals listed above.

5. Protect archaeological and cultural resources.

CONSERVATION AREA OVERVIEW

Regional Significance

The Ocklawaha Prairie Restoration Area provides an opportunity to restore and enhance significant wetland and upland habitat, potentially reconnect a portion of the historic Ocklawaha River bed, and protect vital water resources. Acquisition of the muck farm (levied portion of the Ocklawaha Farm parcel) significantly reduced agricultural discharge and nutrient loading of the Ocklawaha River. Acquisition of the upland areas provides for public recreation, timber and wildlife habitat areas. Additionally, connectivity with the Ocala National Forest, Cross Florida Greenway lands and other protected public lands increases available habitat corridors for wildlife.

The Ocklawaha River Basin is one of the oldest river systems in Florida. Ocklawaha Prairie Restoration Area is one of six management areas owned by the District within the Upper Ocklawaha River Basin. The Florida Department of Environmental Protection categorizes the Ocklawaha River as a Class III water body. Its designated use is "Recreation, propagation and maintenance of a healthy, well-balanced population of fish and wildlife."
The Ocklawaha River forms from two headwaters, Lake Apopka in Lake County and the Palatlakaha River in the Green Swamp area of northern Polk County. Silver Springs is the main spring flowing into the Ocklawaha via the Silver River. It is the principal tributary of the St. Johns River and drains approximately 2,800 square miles including parts of Alachua, Lake, Marion, Putnam and Orange counties. The Ocala National Forest borders approximately 40 miles of the river corridor (Figure 2).

Acquisition History

The Ocklawaha Prairie Restoration Area is comprised of 7 separate acquisitions and 11 different parcels (Table 1, Figure 3).

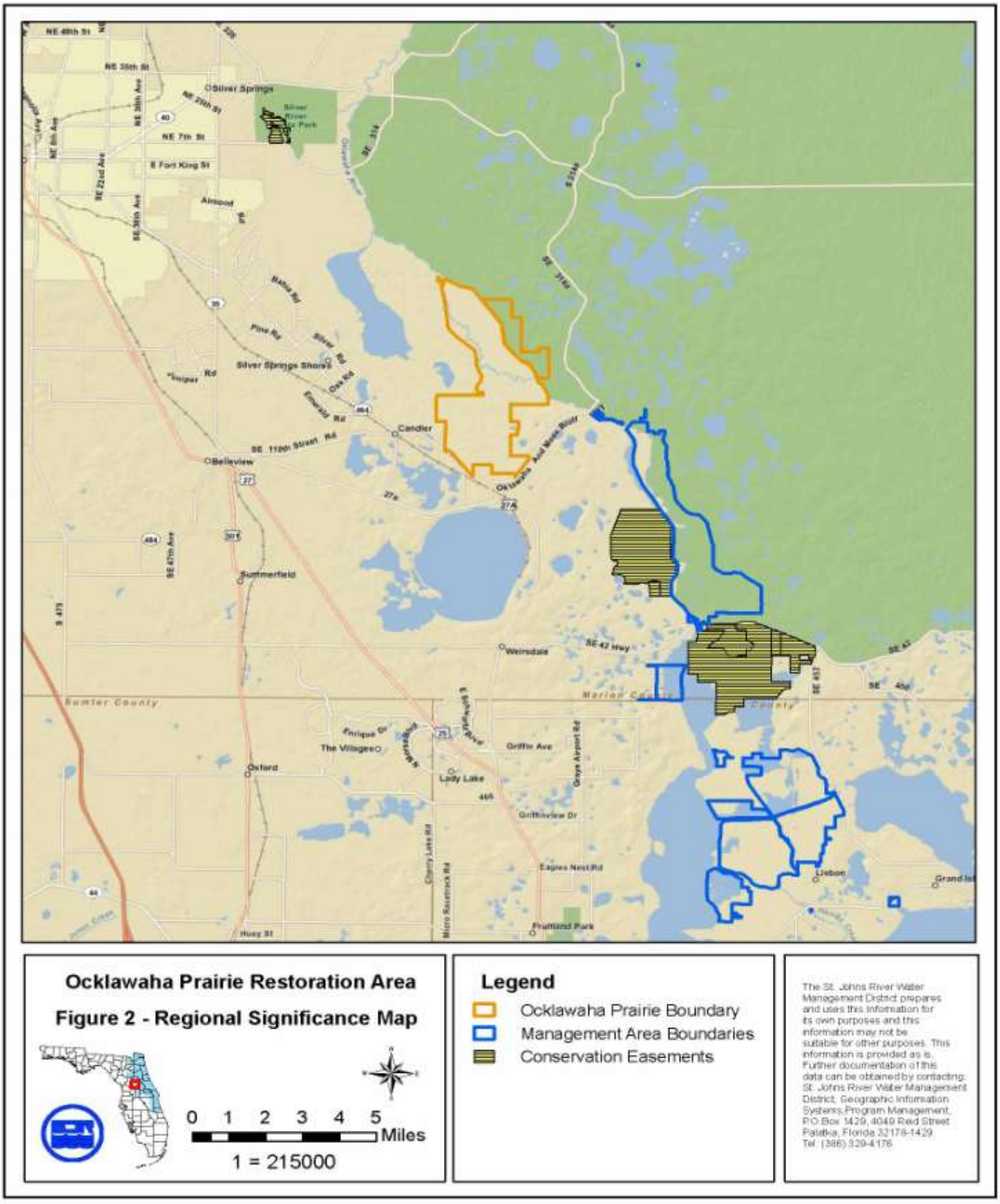
The following properties which make up OPRA, were acquired by the District through a variety of methods including: transfer from Southwest Florida Water Management District (SWFWMD), purchase using Preservation 2000 (P-2000) funds, purchase using Ad Valorem funds, exchange of properties, and mitigation.

The first parcels that were to become part of the OPRA were transfers from the Southwest Florida Water Management District in 1973. These 5 parcels make up 87.6 acres on the northern tip of the restoration area and along the C-231 canal. They range in size from 0.48 to 75.74 acres and are made up mostly of levee and a small area of basin marsh.

The 4,514.81 acre Ocklawaha Farms property, (LA #1983-017) purchased in February 1991, for $8,200,000.00 using Save Our Rivers bond funds, was the first purchase in the restoration area. This parcel was acquired as part of the Heather Island CARL Project, to restore the natural water resource and ecological functions of the area, reduce agricultural discharge and associated nutrient loading, and restore connectivity of the Ocklawaha River ecosystem. This parcel contains approximately 2,600 acres of marsh, 1,150 acres of forested wetlands, and approximately 765 acres of uplands, pasture and woodlands. The 2,600 acre marsh area (farmed area), was closed in by levees and ditches and large pump systems were installed to drain the area prior to District purchase. Most of the restoration efforts thus far have focused on this area. Approximately 82 acres on the eastern side of the parcel (east of the C-231 canal) currently have or had improvements such as residential dwellings, barns, sheds, silage bunkers, and other structures used in association with previous farming practices. A few improvement sites were also found inside the farmed area. Some of the improvements have been removed with only concrete slabs remaining. An approximate 52 acre portion of the area east of the canal has been leased out since purchase, initially to an ecotourism company that renovated the residential dwellings and added 22 cabins, and currently to The Refuge – A Healing Place which is an addiction rehabilitation facility.

The Ocklawaha Farms parcel has no paved road frontage but can be accessed through an access easement the District holds from State Road 314A which leads through The Refuge (for staff use only) or via Old River Road (SE 137th Avenue) where a public access site is located. The northeast corner has unpaved road frontage on both sides of Old River Road and access by water is possible through the C-231 Canal. There is also access for District staff through a perpetual easement on the south end of the parcel from CR 464.

The 813.78 acre Oxner property (LA #1993-069), purchased in December 1994 using P -2000 funds, for $1,132,880.43, lies adjacent to the southern boundary of the Ocklawaha Farms property with access from County Road 464C. It is located 1.5 miles southwest of the Ocklawaha River and Moss Bluff. It includes frontage along County Road 464C and


Ocklawaha Prairie Restoration Area
Figure 2 - Regional Significance Map
0 1 2 3 4 5
Miles
1 = 215000
Legend
Ocklawaha Prairie Boundary
Management Area Boundaries
Conservation Easements
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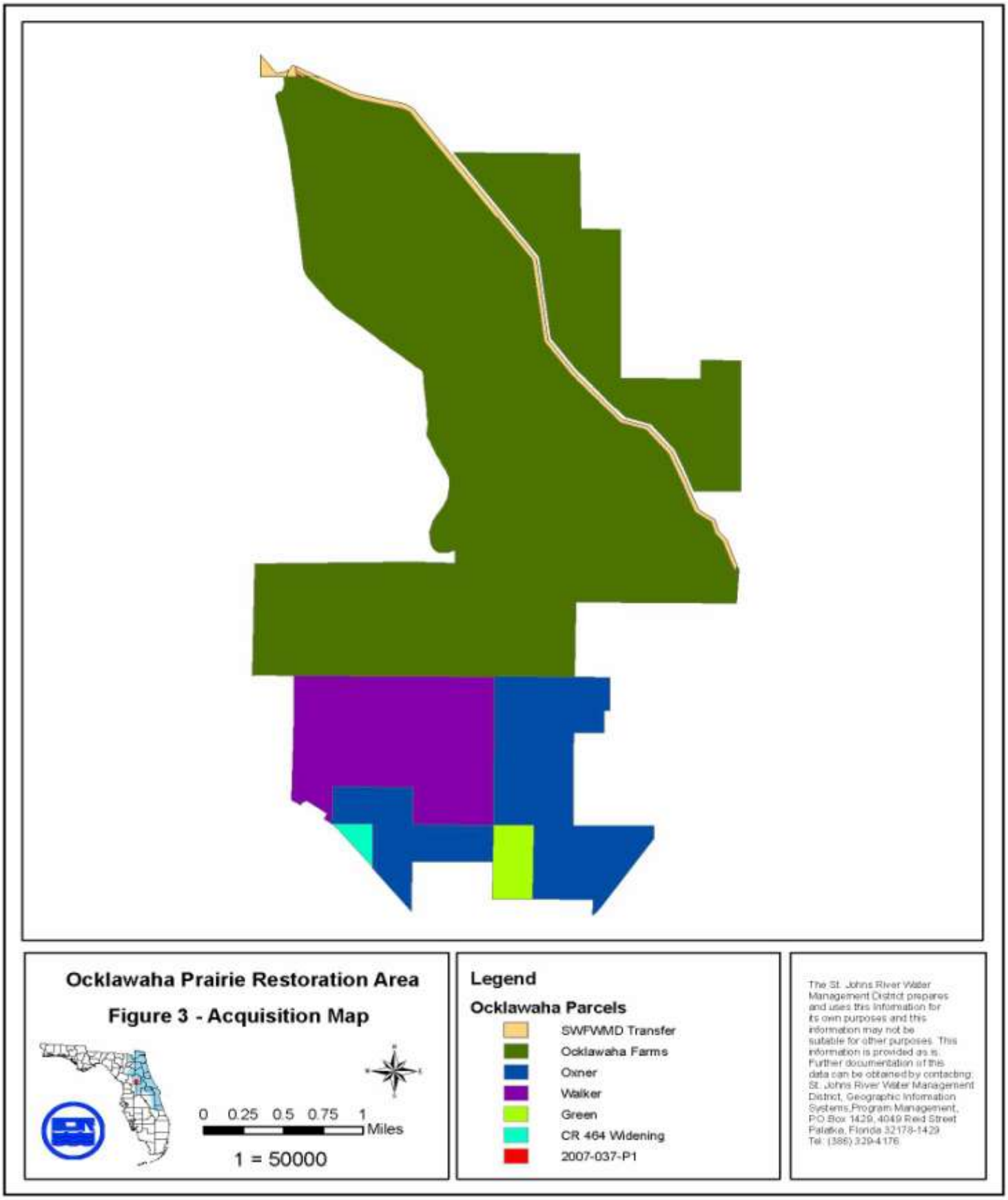
Silver Springs
Silver Springs Shores
Belleview
Summerfield
Candler
Oklawaha And Moss River
Weirsdale
SE 42 Hwy
Sumter County
Marion County
The Villages
Oxford
Lady Lake
Griffin Ave
Griffinview Dr
Eagles Nest Rd
Fruitland Park
Lisbon
Grand Is
NE 49th St
NE 35th St
NE 7th St
E Fort King St
Almond
Baha Rd
Pine Rd
Silver Rd
Juniper Rd
Emerald Rd
Ora Rd
SE 110th Street Rd
SE 47th Ave
Enrique Dr
Griffin Ave
Geyer Airport Rd
Cherry Lake Rd
Micro Racetrack Rd
Huey St


Ocklawaha Prairie Restoration Area
Figure 3 - Acquisition Map
0 0.25 0.5 0.75 1
Miles
1 = 50000
Legend
Ocklawaha Parcels
SWFWMD Transfer
Ocklawaha Farms
Oxner
Walker
Green
CR 464 Widening
2007-037-P1
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County Road 215. A Progress Energy power line easement which includes overhead power lines and supports, runs along the southern edge and through the western portion of the parcel. Approximately 749 acres or 92% of the property is uplands, with the remaining 65 acres (8%) considered jurisdictional wetlands. The 287-acre Chornobyl Memorial Forest is located on this parcel. The forest is a longleaf pine (*Pinus palustris*), wiregrass (*Aristida stricta*) restoration project funded by American Forest and Global ReLeaf and dedicated to the victims and survivors of the Chornobyl disaster.

The 80.81 acre Green property (LA #1994-002), purchased in April 1995 using P-2000 funds for $36,000.00, is adjacent to the southern boundary of the Oxner property. Of the total acreage, approximately 86% of the property, or 70 acres is considered to be jurisdictional wetlands and the remaining 10 acres consists primarily of scrubby flatwoods.

The 709.66 acre Turner/Walker property (LA #1993-082) purchased in August 1995 for $333,862.86, is irregular in shape and fits between the southern boundary of the Ocklawaha Farms parcel and the western Oxner property boundary. The property includes approximately 1/4 mile of frontage along County Road 464 and abuts the eastern boundary of the Silver Shores subdivision. Approximately 610 acres or 86% of the property is considered to be jurisdictional wetlands with the remaining 100 acres (14%) uplands.

A DOT project to widen CR 464 (LA # 2006-022) was the reason for the acquisition of a 23.3 acre upland parcel along CR 464. Per an agreement dated July 3, 2006 between the District and Marion County Board of County Commissioners, the 23.3 acre parcel was purchased by Marion county and conveyed to the District as follows: A 4.74 acre portion of the Turner/Walker property was exchanged for 4.74 acres of the parcel, 10.5 acres of the parcel was acquired as mitigation from Marion County for wetland impacts associated with the CR 464 widening project, and the remainder of the parcel was purchased by the District in August, 2006 for $250,000.00.

The .32 acre Griffin parcel (LA #2007-037) was acquired on November 27, 2007 as mitigation. The parcel is located adjacent to the northern tip of the Ocklawaha Farms parcel.

An NRCS conservation easement was added in 2009, Protocols were developed to assure that land management activities are aligned with NRCS management practices.

Table 1 – Acquisitions and Easements

NAME	LA #	ACRES	TOTAL PURCHASE PRICE	CLOSING DATE	FUNDING SOURCE
PARCELS					
SWFWMD Transfers	1977-002	87.6	N/A	1973	Transfer
Ocklawaha Farms	1983-017	4514.81	8,200,000.00	2/4/1991	Save Our Rivers Bond
Oxner	1993-069	813.78	1,132,880.43	12/21/1994	Preservation 2000

NAME	LA #	ACRES	TOTAL PURCHASE PRICE	CLOSING DATE	FUNDING SOURCE
Green	1994-002	80.81	36,000.00	4/19/1995	Preservation 2000
Walker	1993-082	709.66	333,862.86	8/21/1995	Preservation 2000
CR-464 Widening	2006-022	23.3	250,000.00	1/26/2007	Ad Valorem
Griffin Mitigation	2007-037	.32	N/A	11/27/2007	Mitigation
EASEMENTS					
NRCS Conservation Easement		5,093			Conservation Easement exchange with NRCS
Progress Energy					Underground electric line to Ocklawaha Refuge
Heather Island		2.5			Restoration associated with an adjacent Mitigation Bank
Eastern Access Road Easement		5			Access to eastern side of property from 464C
Florida Power Corporation		22			Transmission line across southwest portion of property
Lester Easement		3			Easement in favor of Lester for access to Lester property from 464C
SE 85th St					Access Easement from 314A to Ocklawaha Refuge

Zoning

According to the Marion County Future Land Use map (Marion County, 2010), portions of the property are located in designated Rural as well as Natural Reservation Zone. These areas are described as follows:

Rural Land - A land use category permitting a range of agricultural and/or agricultural related uses, and accommodating low density residential development at a maximum density of one (1) dwelling unit to ten (10) acres. Density exceptions may be permitted consistent with specific policies.

Natural Reservation - areas designated for conservation purposes, and operated by contractual agreement with or managed by a federal, state, regional, or local government or non-profit agency.

Cooperative Agreements

In accordance with District Policy #90-16, the District promotes entering into agreements with other agencies and private parties for cooperation and coordination in the management of District lands for increased efficiency, protection of natural resources, and improved recreation opportunities.

A cooperative agreement with Florida Fish and Wildlife Conservation Commission allows hunting on the Public Small Game Hunting Area on the basin marsh inside the levees (Table 2). District staff works with the USFS to cooperatively implement prescribed fires in the uplands in the northeastern portion of the property where a shared boundary with the Ocala National Forest occurs, there is no formal agreement for this.

Leases, Easements, and Concessions

The agreements pertaining to the OPRA are as follows:
A conservation easement is in place whereby land management activities on site are governed by protocols set forth between the Natural Resource Conservation Service and the District. (Appendix 3). An agreement is in place for The Refuge – A Healing Place, which is an addiction treatment facility. A residence agreement is in place for a security resident to live on site adjacent to CR 464 and an amendment to that agreement enables the resident to control feral hogs on the OPRA. The Marion County Duck Club is allowed to install and maintain/monitor wood duck nesting boxes inside the levee area through an agreement. (Table 2).

Table 2 – Cooperative Agreements, Leases, Easements, and Concessions

Agreement	**Agency/Individual**	**Begins**	**Term**	**Area**	**Expires**
The Refuge at OPRA	The Refuge	6/1/2003	13 years	E of C-231	5/31/2016
Security Services	Plantation Security		one year	All	annually
Residence Agreement	David Scott Byrd	10/22/2007	90 day notice	On CR 464	90 day notice
Hog Trapping Agreement	David Scott Byrd	10/5/2009	90 day notice	See agreement	90 day notice
Wood Duck Box Installation and Maint.	Marion Cty. Duck Club	2/10/2009	5 - 1 year terms	Inside levee Restoration Area	2/9/2014
Small Game Hunting	FFWCC	2004	Ongoing	Inside levee Restoration Area	Upon Consent

NATURAL RESOURCES OVERVIEW

Topography and Hydrology

The OPRA property has wetland elevations ranging from an average of 38 to 40 feet above sea level on the 2,600-acre muck farm area, to 42 to 45 feet average on the wetlands to the south of

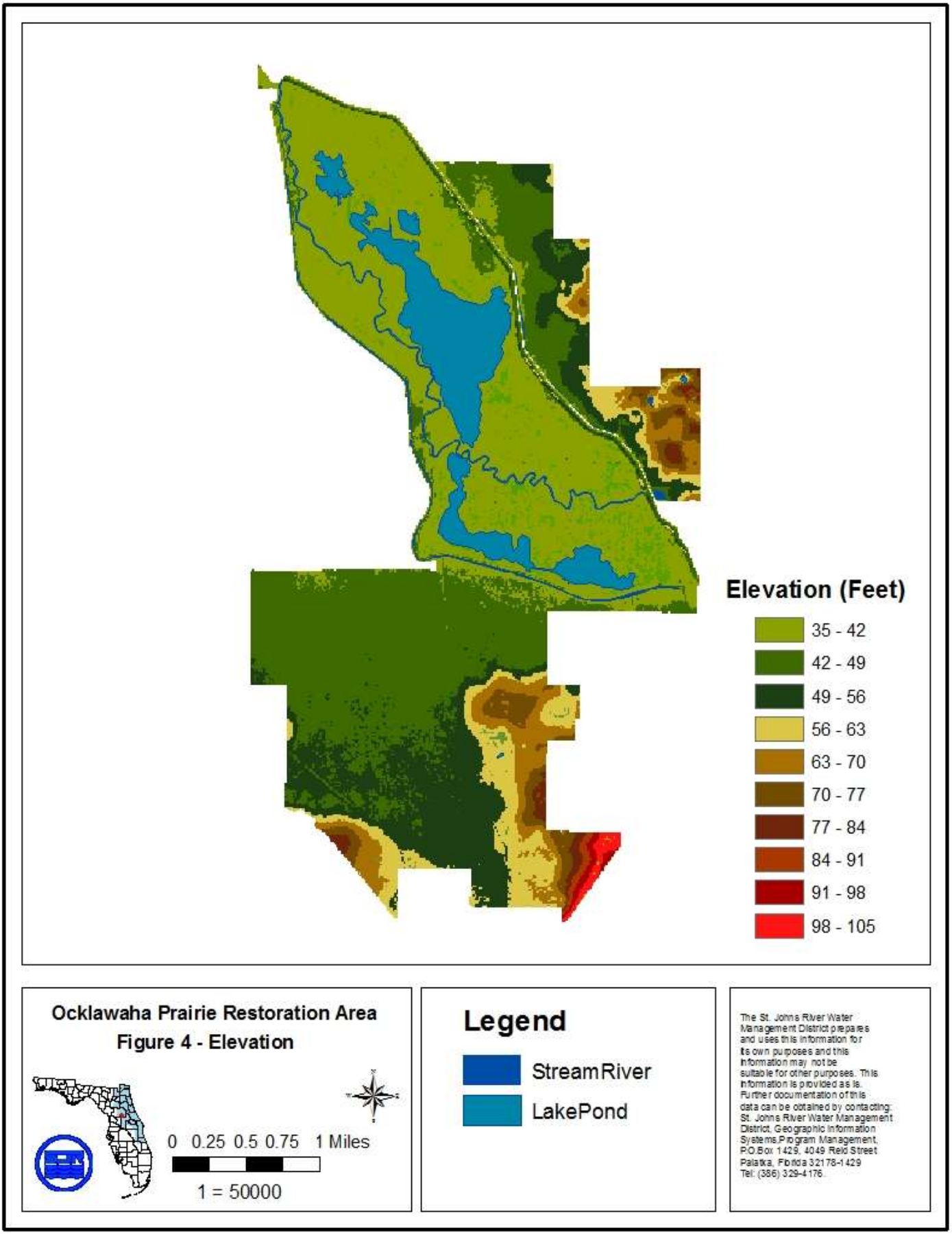
the farmed area (Figure 4). These areas were once connected hydrologically prior to the installation of the levees in the early 1900's. The elevational difference demonstrates the subsidence of organic material that occurred during the long period of agricultural operations and loss of deposition associated with river flooding, once connectivity with the river was disrupted.

Elevations of the majority of the uplands on the northeast portion of the OPRA range from approximately 50 feet to 70 feet with a few higher areas reaching over 82 feet. The majority of the uplands on the southern portion of the property (south of the muck farm area) average around 70 to 75 feet with a rise to over 100 feet on the southeast edge adjacent to County Road 464C.

Hydrologic patterns were highly altered in the farmed area due to ditching and draining associated with the farming practices. Through a lease agreement with the previous owner, extensive earthwork was performed on the area after purchase by the District, to remove all internal berms, roads and levees and to clean out much of the southern portion of the historic river channel. The agreement allowed the previous owner to continue farming the northern portion until 1994 after which all pumping to dewater the area stopped. As water levels rose, wetland vegetation returned to the area.

Flow and water levels throughout the Upper Ocklawaha River Basin are largely controlled by water regulatory structures. The Moss Bluff Dam controls water levels upstream to Lake Griffin. Surface water levels fluctuate between approximately 35 to 42 feet NGVD downstream of Moss Bluff and substantially higher upstream from Moss Bluff (58 to 59.5 feet NGVD in Lake Griffin). The C-231 Canal handles the flow that historically went down the natural Ocklawaha River channel. The historic channel of the Ocklawaha River that meanders for approximately 6 miles through the OPRA area, is severed from the flow going down the C-231 canal. The L-212 levee separates the C-231 canal from the wetlands on the previously farmed area. A farm levee and a wide drainage ditch surround the remainder of the farmed area on the north, west, and south side, effectively barring hydrologic connectivity except during times of abnormally high water in the C-231 canal when water can flow through culverts on the south side of the parcel, onto the restoration area. Widening of the canal has lowered water levels in the canal in relation to those inside the levees. Because of this, reconnection of the farmed area to the C-231 canal would drain the marsh wetland and defeat the restoration efforts.

The forested wetlands on the southern portion of the property are part of the Marshall, and Tiger Den Swamps and drain mostly northward to eventually reach the Ocklawaha River through the Dead River. Historic drainage patterns of the swamps have been altered due to the dredging and channelization of the Ocklawaha River and by diversion of flows through perimeter ditches around the farm. The Ocklawaha River, Dead River, and Marshall Swamp are Class III waters of the state. An outlet canal with a fixed crest weir allows outflow to flow northward from Lake Weir onto the OPRA under County Road 464C. A few depressional wetlands are scattered throughout the uplands of the property.


Elevation (Feet)
35 - 42
42 - 49
49 - 56
56 - 63
63 - 70
70 - 77
77 - 84
84 - 91
91 - 98
98 - 105
Ocklawaha Prairie Restoration Area
Figure 4 - Elevation
0 0.25 0.5 0.75 1 Miles
1 = 50000
Legend
StreamRiver
LakePond
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In the early 1900s, a large-scale project was initiated to remove obstructions from the river for enhanced river travel. The River and Harbor Act of 1916 included provisions to construct a lock and dam at Moss Bluff and allow private canals along the Ocklawaha River in lieu of natural portions of the riverbed. Local farming interests lobbied and won congressional support in 1917, to drain the fertile lands adjacent to the river. USACE engineers began construction on the lock and dam at Moss Bluff in 1920, and eventually more than 10 miles of the river channel were abandoned. In addition to the 6 miles of the original Ocklawaha River channel at Ocklawaha Prairie Restoration Area, there are more than 9 miles of original river channel at Sunnyhill Restoration Area. However, the channelized river, (the Kyle-Young Canal or C-231 Canal), serves as the main conduit of water through both properties.

The restoration area lies within the Four River Basins Florida Project that was authorized by the Flood Control Act of 1962, and included works within the Ocklawaha River Basin for flood control, navigation and related purposes (particularly recreational boating). Construction of the Ocklawaha River Basin portion of the Four River Basins project began in 1966 and was completed in 1975. The aim of the project was to improve 6 miles of levee L-212 from Moss Bluff to the north end of the Ocklawaha Prairie Restoration Area and enlarge 7.9 miles of the C-231 canal from Lake Griffin to Moss Bluff Lock and Dam. The C-231 Canal was also enlarged downstream of Moss Bluff; the enlargement of this section lowered water levels downstream.

The Ocklawaha Prairie Restoration Area also lies within what was, at the time of purchase, the Heather Island Conservation and Recreation Lands (CARL) Project that was initiated in 1990 to promote acquisition in the area. It is currently listed as the Heather Island/Ocklawaha River project under the Florida Forever initiative. The purpose of state acquisitions within the project area was for restoration of the river to its original channel, protection and restoration of part of the floodplain; and for protection and restoration of old growth forests in the floodplain. The CARL project area serves as a natural corridor to link the Ocala National Forest, the Cross-Florida Greenway lands, and Silver River State Park. Lands in and around the Heather Island CARL project were acquired through combined efforts of the Nature Conservancy, the Marion County "Pennies for Parks" Program, and CARL. District acquisition has been limited to those properties acquired and managed by the District within the Ocklawaha Prairie Restoration Area.

Flora and Fauna

A preliminary species survey by staff and observations by USFWS (USFWS, 2002) on the site have found a variety of species including black bear (*Ursus americanus*), Sherman's fox squirrel (*Sciurus niger shermani*), white-tailed deer (*Odocoileus virginianus*), red fox (*Vulpes vulpes*), wild turkey (*Meleagris gallopavo*), bald eagles (*Haliaeetus leucocephalus*), osprey (*Pandion haliaetus*), gopher tortoises (*gopherus polyphemus*), American alligator (*Alligator mississipiensis*), river otters (Lontra Canadensis), numerous waterfowl, wading birds such as wood storks (*Mycteria Americana*), and such exotic species as feral hogs (Sus scrofa) ,nine-banded armadillos (*Dasypus novemcinctus)*, and brown anoles (*Anolis sagrei).*

Natural Communities

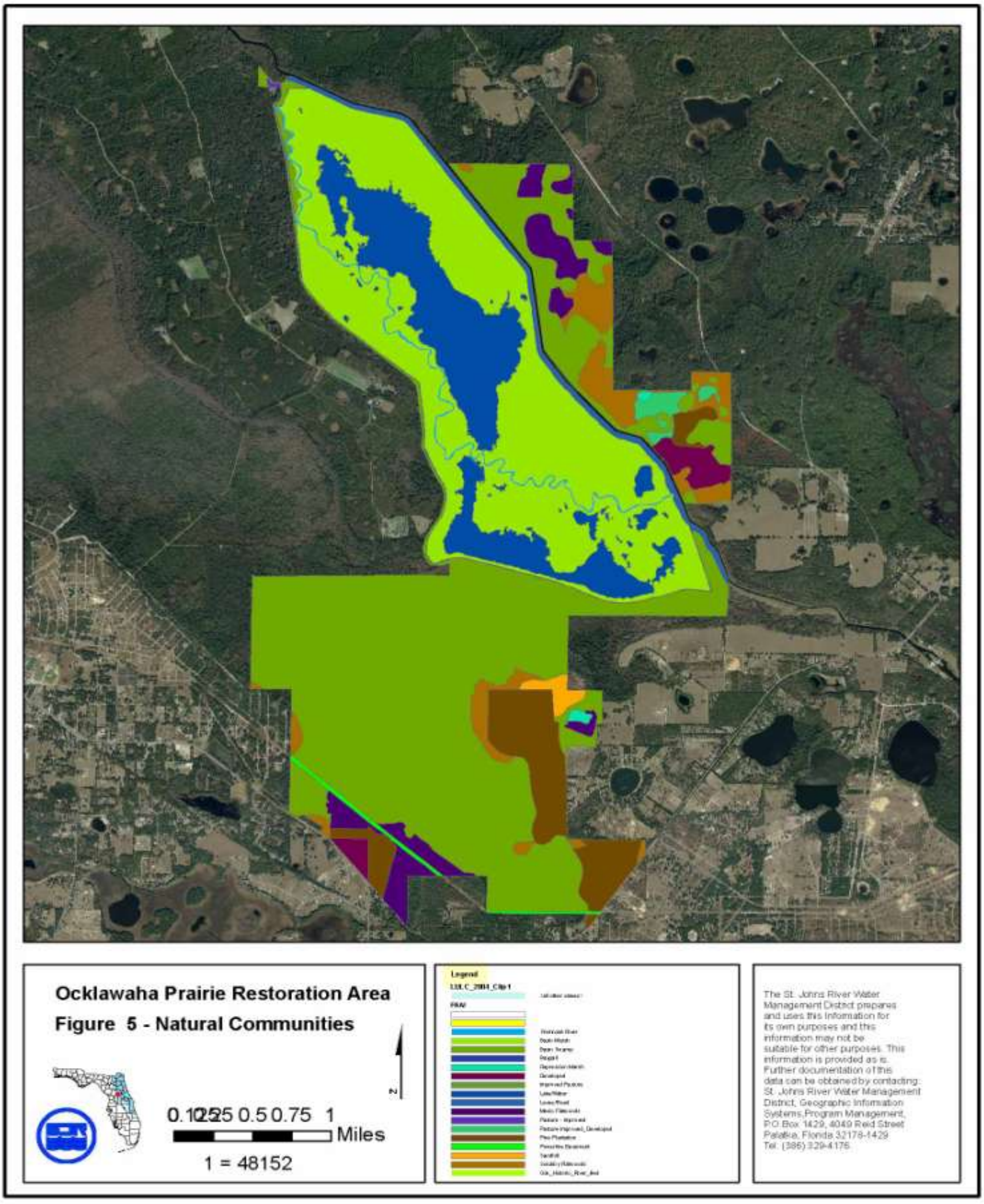
The Ocklawaha Restoration Area contains approximately 5087 acres of wetlands (82%) and 1143 acres of uplands (18%) (Figure 5). The wetland area includes the previously mentioned 2,600 acres that were diked, ditched and drained in the early 1900's for use as a muck farm. The

majority of the farmed area is now classified as basin marsh. Species found in the marsh restoration area include sawgrass (*Cladium jamaicense*), maidencane (*Panicum hemitomon*), sand cordgrass (*Spartina bakeri*), and cattail (***Typha latifolia*)**, and exotic aquatic plants including water hyacinth (*Eichornia crassipes*), and hydrilla (*Hydrilla verticillata).* The wetlands south and west of the muck farm area and outside the levee, are mostly forested basin swamp and include hardwood species such as cypress (*Taxodium distichum*), sweet bay (*Magnolia virginiana*), loblolly bay (*Gordonia lasianthus*), sweet gum (*Liquidambar styraciflua*), and red maple (*Acer rubrum*).
A few depressional wetlands are found in the upland areas and include mostly maidencane (*Panicum hemitomon*).

Community types in the northeastern uplands include scrubby flatwoods with sand pine (*Pinus glabra*), scrub oak (*Quercus inopina*) and saw palmetto (*Serenoa repens*) present. The mesic flatwoods include slash pine (*Pinus elliottii*) and gallberry (*Illex glabra*), Some of the flatwoods areas were probably used as pasture in the past but allowed to revegetate naturally.
Upland vegetation in the southern portion of the restoration area includes approximately 36 acres of sandhill habitat with scattered longleaf pine and turkey oak (*Quercus laevis*) with a groundcover of wiregrass and other native herbaceous plants. Recent burning has benefitted this area by encouraging the wiregrass and thinning oaks.
Also in the southern portion of the property are areas of pine flatwoods and longleaf pine plantation that includes the previously mentioned Chornobyl Memorial Forest.
Planting efforts on the OPRA include 264 acres of longleaf pine plantation which were planted at low density with wiregrass, and approximately 25 acres of the basin marsh area which was planted with sand cordgrass (Spartina bakeri).

Soils

Soils present on the OPRA are shown on the soils map (Figure 6), and described in Appendix 2. The dominant soils under the basin marsh and basin swamp areas are Terra Ceia, Tomoka muck and Hontoon muck soils. Soils under much of the uplands including the pine plantations and sandhill areas are Candler sands and Pomello sands. Astatula sands and Delks sands are found under some of the flatwoods areas.


Ocklawaha Prairie Restoration Area
Figure 5 - Natural Communities
N
0 0.125 0.25 0.5 0.75 1
Miles
1 = 48152
Legend
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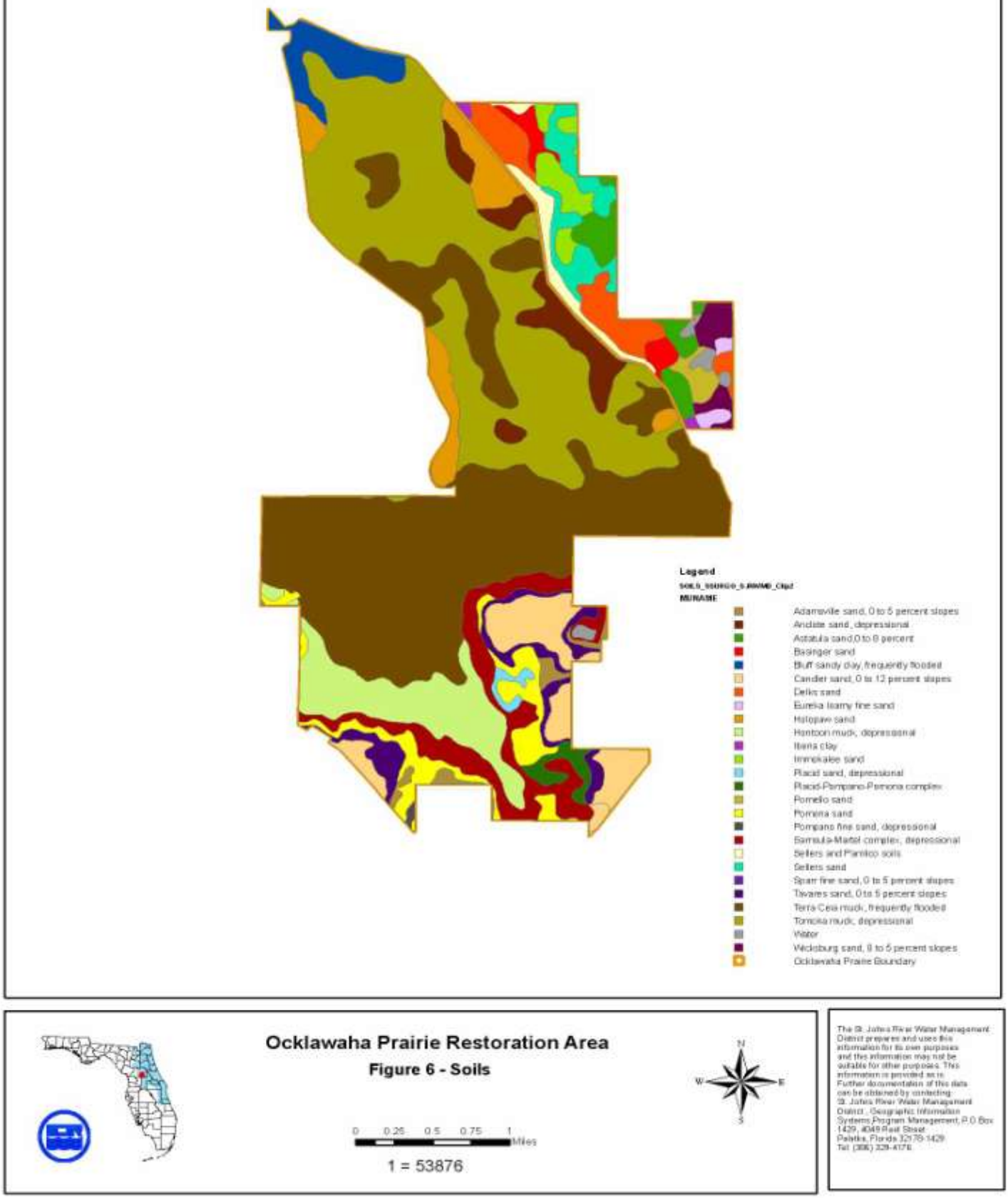
Legend
MUNAME
Adamsville sand, 0 to 5 percent slopes
Andate sand, depressional
Astatula sand,0 to 8 percent
Basinger sand
Bluff sandy clay, frequently flooded
Candler sand, 0 to 12 percent slopes
Delks sand
Eureka loamy fine sand
Holopaw sand
Hontoon muck, depressional
Ibera clay
Immokalee sand
Placid sand, depressional
Placid-Pompano-Pomona complex
Pomello sand
Pomona sand
Pompano fine sand, depressional
Samsula-Maital complex, depressional
Sellers and Pamlico soils
Sellers sand
Spam fine sand, 0 to 5 percent slopes
Tavares sand, 0 to 5 percent slopes
Terra Ceia muck, frequently flooded
Tomoka muck, depressional
Water
Wicksburg sand, 0 to 5 percent slopes
Ocklawaha Prairie Boundary
Ocklawaha Prairie Restoration Area
Figure 6 - Soils
0 0.25 0.5 0.75 1 Miles
1 = 53876
N
W
E
S
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PAST MANAGEMENT SUMMARY

RESOURCE PROTECTION AND MANAGEMENT

Security

- 2003 Plan Strategy: Maintain signage, fences, and gates.
  Status: Ongoing, this is done on an as needed basis.
- 2003 Plan Strategy: Coordinate with contracted security to begin regular surveillance of the property.
  Status: Ongoing.
- 2003 Plan Strategy: Report evidence of poaching and other illegal activity to local law enforcement and provide them with support as needed.
  Status: Ongoing, One illegally hunted deer case was prosecuted by FFWCC.

Wetland Restoration

- 2003 Plan Strategy: Continue coordination with USACE on hydrologic reconnection of the restoration area with the C-231 Canal.
  Status: Coordination with USACE has ceased and additional reconnection efforts have been suspended as of time of writing.
- 2003 Plan Strategy: Continue management of water levels for wetland restoration.
  Status: Water levels are maintained through rainfall and the intake and outflow culverts into the levee area.

Fire Management

- 2003 Plan Strategy: Continue prescribed burn program.
  Status: This is ongoing
- 2003 Plan Strategy: Develop and implement a fire management plan to maintain native community structure and assemblages.
  Status: A Fire Management Plan has been developed and attached as Appendix 3. Prescribed Fire has been implemented on a regular basis as weather and scheduling allowed. Following is approximate acres burned by fiscal year (Oct. 1 to Sept. 30).
  - 05/06 - 2604 acres (Marsh)
  - 06/07 – 22 acres (Uplands)
  - 07/08 – 1163 acres (Uplands and Marsh)
  - 08/09 – 172 acres (Uplands)
  - 09/10 – 818 acres (Uplands)
- 2003 Plan Strategy: Use mechanical means to alter vegetation that has senesced to a point that prevents fire from being an effective tool.
  Status: Mechanical removal in the form of mowing of oak trees has taken place on approximately 15 acres in the sandhill area to open up the canopy and encourage the wiregrass groundcover to expand.
  Mowing and chopping has taken place in the marsh area to control undesirable plant species. Approximately 300 acres were chopped and 150 acres were mowed in 2007.

Forest Management

- 2003 Plan Strategy: During times of high risk from southern pine beetle infestations, implement a regular monitoring program.
  Status: This will be continue to be the strategy that is implemented if infestation occurs.
- 2003 Plan Strategy: Evaluate all disease and pest infestations for treatment strategy on a case-by-case basis.
  Status: This will be continue to be the strategy that is implemented if infestation occurs.
- 2003 Plan Strategy: Develop a restoration plan for the sandhill in the southern portion of the property.
  Status: This item will be included in the overall forest management plan which will be completed by fall 2010 and will be incorporated and implemented as part of this management plan.

Water Resources

- 2003 Plan Strategy: Continue to coordinate proposed hydrologic reconnection and additional wetland restoration projects.
  Status: Options continue to be considered although reconnection of the historical river channel is currently on hold.
- 2003 Plan Strategy: Continue water quality monitoring.
  Status: Water quality monitoring is ongoing as needed.
- 2003 Plan Strategy: Further evaluate potential risks from pesticide residues in sediments and biota.
  Status: Further evaluation was complete in 2006. Pesticides were found to be low during fish toxicity level monitoring. There will be a biological assessment completed when the next phase of the restoration plan is developed.
- 2003 Plan Strategy: Continue interim water management to limit pesticide exposure and develop a long-term management plan.
  Status: This is ongoing, water levels are currently managed by static culverts. Water levels are maintained at a higher level than is optimum for many wetland plant species however bird botulism, transmitted by birds feeding on site during low water levels is a concern, as a result, higher water levels are maintained.
- 2003 Plan Strategy: Implement nutrient control treatments to limit phosphorus releases or downstream discharges.
  Status: Phosporus discharges are being controlled by limiting water intake and discharges which only take place during periods of high rainfall.

Listed Species

- 2003 Plan Strategy: Continue to maintain and build upon species list.
  Status: This is ongoing with species being added as encountered.

Exotic Species

- 2003 Plan Strategy: Monitor and continue to treat exotic and invasive vegetation.
  Status: This is ongoing with invasive exotics being treated as needed. Approximately 37 acres of Johnson grass was sprayed with herbicide after being mowed first. Species

treated since the last plan include China berry, Camphor, Japanese climbing fern, tropical soda apple and water hyacinth.

LAND USE MANAGEMENT

Access

- 2003 Plan Strategy: Continue regular maintenance on access areas.
  Status: This is ongoing.
- 2003 Plan Strategy: Maintain signs and kiosks.
  Status: This is ongoing.

Recreation

- 2003 Plan Strategy: Continue regular maintenance on trails.
  Status: This is ongoing.
- 2003 Plan Strategy: Evaluate potential for waterfowl hunting.
  Status: This was completed and a public small game hunting area is now being managed on site by Florida Fish and Wildlife Conservation Commission.

Cultural Resources

- 2003 Plan Strategy: Coordinate with the Florida Division of Historical Resources and take action to reduce any potential disturbance of any sites identified.
  Status: This is ongoing in the event any cultural sites are discovered.

IMPLEMENTATION

This section outlines land management strategies for resource protection, land use and administration for the next five years.

RESOURCE PROTECTION AND MANAGEMENT

Water Resource Protection

The OPRA area was identified in the District's Upper Ocklawaha River Basin SWIM Project (August 1989) as a restoration high priority area because of severely impacted ecologic, aesthetic, recreation, and aquatic resources.
The District developed plans for long-term restoration of wetlands and hydrologic reconnection to the Ocklawaha River. Phase I included earthwork that required grading interior levees to approximate field elevations, removing woody vegetation and muck accumulations from the old river channel, plugging or backfilling farm ditches and removal of an airstrip and pump station. Phase II completed partial hydrologic reconnection of the historic channel to the C-231 Canal (present Ocklawaha River) including management of water levels for wetland restoration and planting of native wetland vegetation. Phase II was funded under the USDA, NRCS, Wetland Reserve Program (WRP) which requires that specific protocols are followed with respect to management (Appendix 3).

The Proposed Phase III would have been full hydrologic reconnection to the C-231 Canal. Due to the previously mentioned difference in elevation of the restoration area and the canal, and potential release of nutrients from the sediment into down stream flow, and pesticide concerns, reconnection and restoration efforts have been suspended or adjusted.

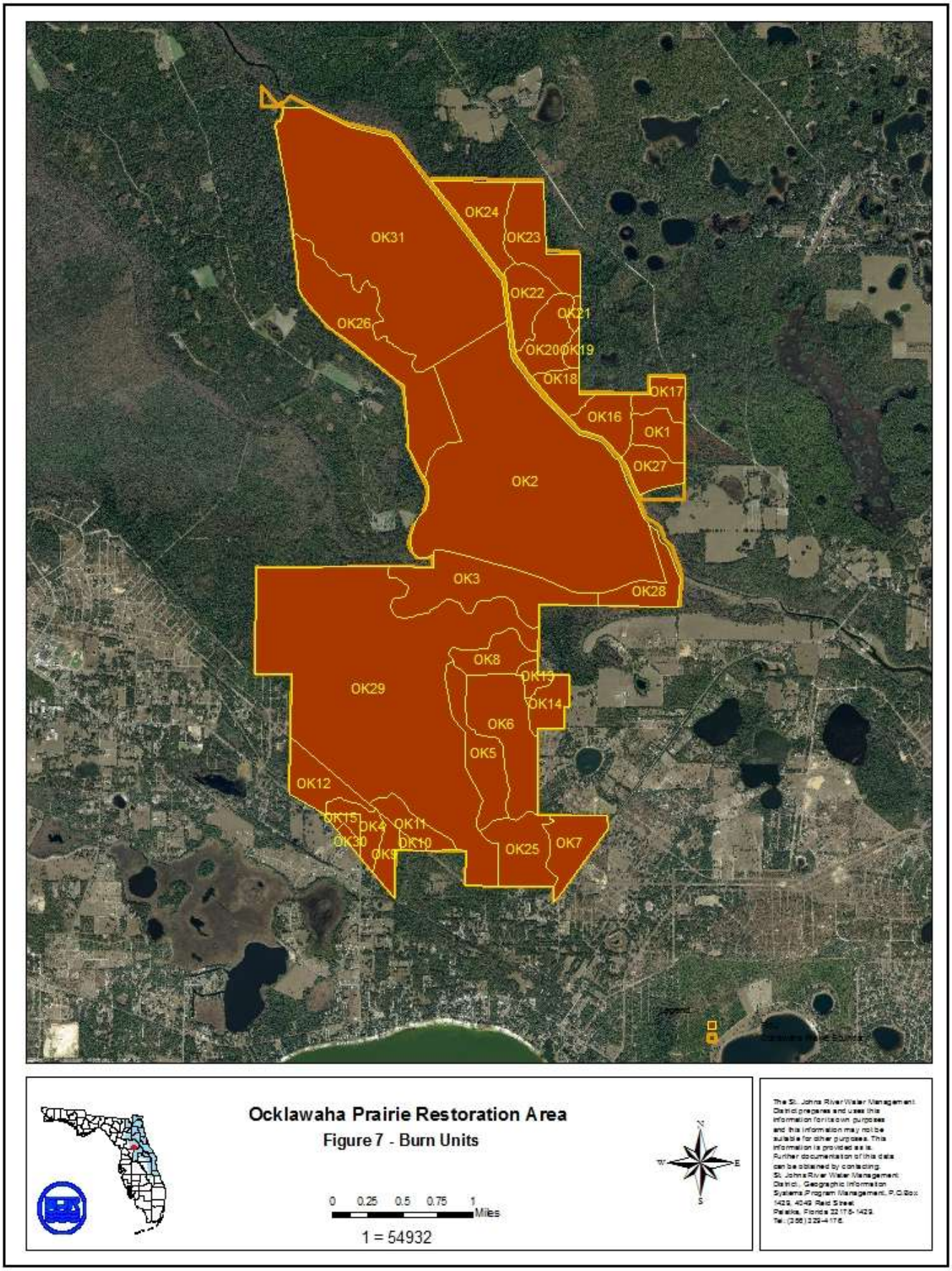
Several investigations related to nutrient release and the feasibility of reconnection of the historic river channel to the C-231 canal have been conducted including: a Phase I Environmental Site Assesment in 1990, a Phase I Site Assesment in 2001, a US Fish and Wildlife Service Coordination Act Report in 2002 The USACE conducted a feasibility study for funding under its Section 1135 Wetland Restoration Program and recommended a management and monitoring plan be developed and implemented to ensure that unacceptable contaminant releases did not occur. Fish sampling to look at toxicity levels were conducted in 2001, 2004, 2005 and 2006. An interim water management plan was developed to minimize exposure of pesticides to fish-eating birds. Weekly fly overs by fixed wing aircraft take place to monitor bird populations.

Several scenarios for restoration of the heavily impacted farmed area and reconnection of the historic river channel have been proposed. The scenarios dealt with among other issues, reduction of nutrient release through alum treatments and increasing drainage to the historic river channel by installing ditches. The nutrient issue is expected to be revisited in the next phase of the restoration plan. At the time of writing, a date has not been set for when this plan will be written.
Water levels in the farmed area are currently regulated by two culverts on the south end that allow water to flow onto the area from the C-231 canal during very high water, and one outflow culvert located on the north end that allows water to flow out of the area into a short section of the historic river channel and then into the C-231 canal.. The majority of the time, water inputs to the system are limited to rainfall falling directly onto the restoration area.

Fire Management

Fire is an essential tool for land management in Florida. It plays a vital role in restoring and maintaining some community types. Fire is the most natural and cost effective method of reducing shrubby species, facilitating growth of herbaceous forbs and grasses, and increasing general biodiversity in fire dependant communities. Prescribed fire is also a valuable tool for management of pine plantations. Regular intervals of fire applied to a plantation help reduce infestations of certain diseases and controls competition from shrubby species. Prescribed fire also reduces the risk and severity of damaging wildfires. Some fire dependant communities have become so senescent that they will no longer carry fire or will not support a fire intensity that is adequate to fire management goals. This senescence is usually due to a lack of fire, agricultural disturbances, and/or hydrologic changes. In these areas it becomes necessary to use mechanical or chemical means to reduce the shrubby component and enable the herbaceous fuel species to expand and thus allow fire to become the primary management tool.

Annually, District staff develop prescribed fire plans. These plans are based on fire return intervals that vary with plant community type as well as specific fuel based aspects, and the management goals of each burn unit (Figure 7). Prescribed burning has taken place on the area whenever weather and scheduling allows. A comprehensive fire management plan for the OPRA has been developed and is attached as Appendix 4.


OK24
OK23
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OK2
OK3
OK28
OK8
OK29
OK14
OK6
OK5
OK12
OK15
OK4
OK11
OK30
OK10
OK25
OK7
Ocklawaha Prairie Restoration Area
Figure 7 - Burn Units
0 0.25 0.5 0.75 1 Miles
1 = 54932
N
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S

Forest Management

Florida Statutes require public agencies to evaluate lands they manage for timber production. Current management of all pine tree communities including plantations consists of application of periodic prescribed fire and monitoring for disease and pest outbreaks. The naturally occurring pine tree communities have basal areas ranging from 20 to 70 dbh (diameter at breast height). The plantations range in age from 5 to 18 years. The stands with the higher basal areas will be evaluated during the 5 year scope of this management plan for harvesting needs. The areas of primary focus are the remaining slash pine plantations, the planted longleaf, and the natural strand of pines between the plantation, located on the western portion of the Chernobyl. During 2001 several stands of pines were infested with southern pine beetles and consequently approximately 20 acres were clear-cut to control the infestations. A restoration plan is being developed for the areas clear-cut during the beetle outbreaks. The restoration focus for the areas are to restore ground cover first then plant longleaf and or slash pine as determined by site appropriateness. The small sandhill in the southern portion of the property has a high density of mature turkey oaks resulting from a lack of fire. The increased canopy cover from the oaks along with the accumulation of forest fuel has significantly reduced the presences of wiregrass and other key groundcover species for sandhill communities. A restoration plan is being developed to reduce the density of turkey oaks, stimulate the reproduction of wiregrass and other groundcovers, and re-establish the presence of longleaf pine both from natural and artificial reforestation.
A comprehensive forest management plan is attached as appendix 5.

Flora and Fauna

Preservation of the OPRA through purchase provides habitat for a variety of wetland and upland species. Many species of wetland dependent plants and animals are found inside the basin marsh and basin swamp areas. Upland species are regularly encountered while managing the pine plantations and other uplands. Previously mentioned observational data collected from District staff and USFWS in recent years have identified a number plant and animal species including some listed species. Several listed wading bird species including snowy egret (*Egretta thula*), little blue heron (*Egretta caerulea*), tricolored heron (*Egretta tricolor*), and white ibis (*Eudocinnus albus*) have been observed. Other listed species include bald eagles (*Haliaeetus* leucocephalus), osprey (*Pandion haliaetus*), Florida black bear (*Ursus americanus* floridanus) and Sherman's fox squirrel (*Sciurus niger shermani*)

Exotic Species

Plants

Maintenance control using herbicides is necessary to prevent proliferation of exotic and nuisance species. Control of these species is problematic but vital to maintaining the ecological integrity of natural communities. The goal of the District's Invasive Plant Program is to achieve maintenance control of exotic and invasive plant populations present on District properties. Monitoring and treatment of exotic species is ongoing.
Exotic plant species that have been treated include water hyacinth (*Eichhornia crassipes*), hydrilla (*Hydrilla verticillata*), cogon grass (*Imperata cylindrical*), chinaberry (*Melia azederach*), camphor tree (*Cinnamomum camphora*), paper mulberry (*Broussonetia papyrifera*), and Japanese climbing fern (*Lygodium japonicum*).

Animals

With regard to exotic animals, feral hogs (*Sus scrofa*) are found throughout the property, and are the only exotic animal that is controlled. There is an amendment to the Residence Agreement that allows the site security resident to control hogs for the District. Other exotic animals that have been observed on the property include nine-banded armadillo *(Dasypus novemcinctus*), and Cuban brown anoles (*Anolis cubensis*).

LAND USE MANAGEMENT

Access

An access area has been established off County Road 464C at the Chornobyl Memorial Forest that includes parking, an informational kiosk, and a walk-through for hiking, horseback riding, and biking. Access by water to the levee system and the wetlands in the process of restoration on the property is via the Ocklawaha River (C-231 Canal). A boardwalk has been constructed out into the marsh to provide a closer look at the marsh and the associated wildlife. There are also opportunities for bird watching, photography, nature study and hiking along the levees. A canoe trail has been established within the historic Ocklawaha River channel but is little used due to difficulty with getting a canoe into the site. The northeast access area is located on Old River Road (137th Avenue) and includes a parking area, kiosk and a walk-through that provides access to trails on the uplands and across the C-231 Canal to the levee trails.

Recreation

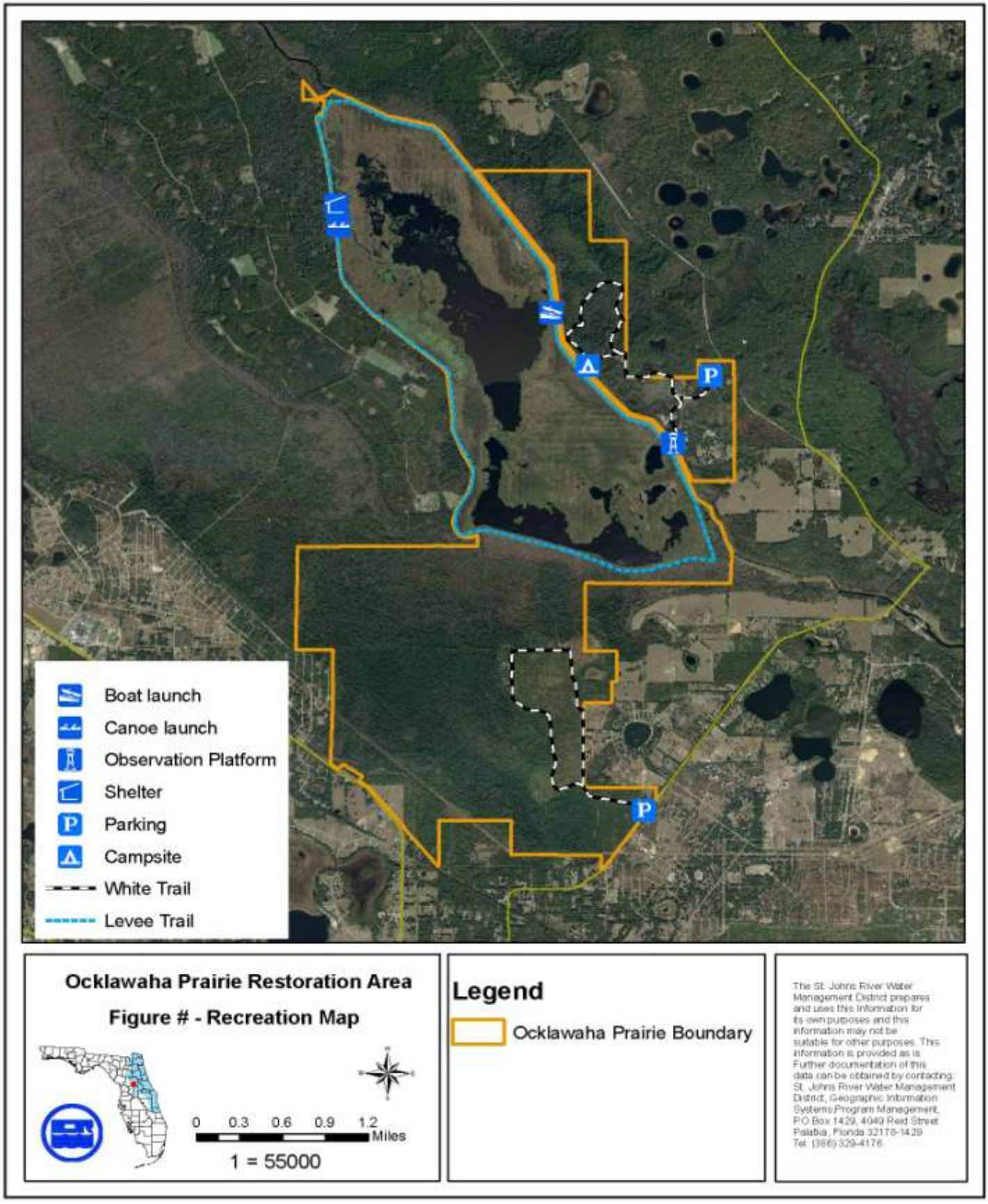
Resource-based recreational opportunities provided on this property include hiking, biking, horseback riding, fishing, access to the marsh via a boardwalk, and primitive camping in the uplands (Figure 8). District staff maintains the levee and upland trails. The Ocklawaha Farms parcel inside the levees has been opened up to hunting as a public small game hunting area through and Establishment Order with Florida Fish and wildlife Conservation Commission who manages the hunts.

Environmental Education

There are currently no plans for environmental education programs on the site.

Security

A private security firm is under contract with the District to patrol the area as needed. Staff also coordinates with the County Sheriff's Office on security issues.


Boat launch
Canoe launch
Observation Platform
Shelter
Parking
Campsite
White Trail
Levee Trail
Ocklawaha Prairie Restoration Area
Figure # - Recreation Map
0 0.3 0.6 0.9 1.2
Miles
1 = 55000
Legend
Ocklawaha Prairie Boundary
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ADMINISTRATION

Acquisition

There are currently no parcels being acquired adjacent to the OPRA. As opportunities arise in the future, further acquisitions will be evaluated.

Cooperative Agreements

No additional cooperative agreements are being written at the time of this plan writing.

Leases, Easements and Concessions

No new leases, easements or concessions are being written at the time of this plan writing.

IMPLEMENTATION CHART

Ocklawaha Prairie Restoration Area
Management Activity Implementation Chart

TASK	RESPONSIBLE LEAD	DUE DATE	COOPERATORS
RESOURCE PROTECTION AND MANAGEMENT			
Water Resource Protection			
Continue to coordinate proposed hydrologic reconnection and additional wetland restoration projects.	DWR	ongoing	DLM, NRCS
Continue management of water levels for wetland restoration.	DWR	ongoing	DLM
Continue water quality monitoring.	DWR	ongoing	DLM
Continue interim water management to limit pesticide exposure and develop a long-term management plan.	DWR	ongoing	DLM
Implement nutrient control treatments to limit phosphorus releases or downstream discharges.	DWR	to be determined	DLM
Fire Management			
Continue Prescribed burning program according to the Fire Management Plan.	DLM	ongoing	DOF
Forest Management			
Evaluate planted pine for thinning.	DLM	ongoing	
Evaluate all disease and pest infestations for treatment strategy on a case-by-case basis.	DLM	ongoing	DOF
Develop an overall Forest Management Plan including a restoration plan for the sandhill in the southern portion of OPRA. The Forest Management Plan will be incorporated into and be a part of this plan upon completion.	DLM	Fall 2010	
Flora and Fauna			
Continue to maintain and build upon species list.	DLM	ongoing	

TASK	RESPONSIBLE LEAD	DUE DATE	COOPERATORS
Exotic Species			
Monitor and continue to treat exotic and invasive vegetation.	DLM	ongoing	
Cultural Resources Protection			
Coordinate with the Florida Division of Historical Resources and take action to reduce any potential disturbance of any sites identified.	DLM		FDHR
LAND USE MANAGEMENT			
Access			
Continue regular maintenance on access areas.	DLM	ongoing	
Maintain signs and kiosks.	DLM	ongoing	
Recreation			
Continue regular maintenance on trails.	DLM	ongoing	FTA
Work with FFWCC to manage small game hunting area.	DLM	Annually by March	FFWCC
Environmental Education			
Evaluate potential for developing environmental education opportunities on the property.	OC	2007	DLM
Security			
Maintain signage, fences, and gates.	DLM	ongoing	
Coordinate with contracted security company and Sheriff's Department on security issues.	DLM	as needed	Marion County Sheriff's Department
Report evidence of poaching and other illegal activity to local law enforcement and provide them with support as needed.	DLM	as needed	

TASK	RESPONSIBLE LEAD	DUE DATE	COOPERATORS
Acquisition			
The District may consider purchase of parcels near OPRA as they become available or as needed.	DLA	ongoing	
Cooperative Agreements, Leases, Easements, and Concessions			
Annual site visits will be conducted to assure compliance with the NRCS easement and protocols	DLM	Annually by Dec.	
Monitor agreements and renew as needed.	DLM	ongoing	The Refuge, Progress Energy, Heather Island Mitigation Bank, Access Easements
Maintain agreements to assist with management, maintenance and security of OPRA	DLM	ongoing	Plantation Security, Security Resident
Coordinate with FFWCC for management of the small game hunting area.	DLM	Annually by March	FFWCC
Monitor southern area access easement	DLM	ongoing	
Coordinate with Ocala National Forest on Management issues related to adjacency.	DLM	ongoing	ONF

KEY

DLA	Division of Land Acquisition
DLM	Division of Land Management
DPWSR	Division of Public Works, Southern Region
DRM	Division of Resource Management
DWR	Department of Water Resources
ES	Division of Environmental Sciences
FDHR	Florida Division of Historical Resources
FDOT	Florida Department of Transportation
FFWCC	Florida Fish and Wildlife Conservation Commission
FTA	Florida Trail Association
NRCS	Natural Resources Conservation Service
OC	Office of Communication
ONF	Ocala National Forest
USFWS	United States Fish and Wildlife Service

APPENDIXES

APPENDIX 1 – Species List

Scientific Name	Common Name
Plants	
Pinus elliottii	Slash pine
Quercus laurifolia	Laurel Oak; Diamond Oak
Pinus palustris	Longleaf Pine
Pinus taeda	Loblolly Pine
Liquidambar styraciflua	Sweetgum
Vitis rotundifolia	Muscadine
Acer rubrum	Red Maple
Sabal palmetto	Cabbage Palm
Quercus virginiana	Live Oak
Tillandsia recurvata	Ballmoss
Tillandsia usneoides	Spanish Moss
Magnolia grandiflora	Southern Magnolia
Quercus nigra	Water Oak
Tillandsia setacea	Southern Needleleaf
Urena lobata	Caesarweed
Toxicodendron radicans	Eastern Poison Ivy
Parthenocissus quinquefolia	Virginia Creeper; Woodbine
Sambucus nigra canadensis	American Elder; Elderberry
Prunus serotina	Black Cherry
Quercus incana	Bluejack Oak
Quercus laevis	Turkey Oak
Celtis occidentalis	Hackberry
Quercus geminata	Sand Live Oak
Diospyros virginiana	Common Persimmon
Ilex glabra	Inkberry; Gallberry
Phytolacca americana	American Pokeweed
Serenoa repens	Saw Palmetto
Lyonia ferruginea	Rusty Staggerbush
Quercus inopina	Scrub Oak
Myrica cerifera	Southern Bayberry; Wax Myrtle
Gordonia lasianthus	Loblolly Bay
Vaccinium arboreum	Sparkleberry; Farkleberry
Andropogon virginicus	Broomsedge Bluestem
Aristida stricta beyrichiana	Wiregrass
Yucca aloifolia	Spanish Bayonet; Aloe Yucca
Opuntia humifusa	Pricklypear
Nyssa sylvatica	Blackgum
Gelsemium sempervirens	Yellow Jessamine; Carolina Jessamine
Vaccinium myrsinites	Shiny Blueberry
Pinus clausa	Sand Pine
Taxodium distichum	Bald-Cypress
Saururus cernuus	Lizard's Tail
Liquidambar styraciflua	Sweetgum
Geranium carolinianum	Carolina Cranesbill

Typha latifolia	Broadleaf Cattail
Ludwigia peruviana	Peruvian Primrosewillow
Salix caroliniana	Carolina Willow; Coastalplain Willow
Cirsium vulgare	Bull Thistle
Sagittaria latifolia	Broadleaf Arrowhead; Common Arrowhead; Duck Potato
Geranium carolinianum	Carolina Cranesbill
Smilax bona-nox	saw greenbrier
Osmunda cinnamomea	cinnamon fern
Osmunda regalis	royal fern
Viola sororia	Common Blue Violet
Quercus stellata	post oak
Quercus elliottii	Running Oak
Phoradendron leucarpum	oak mistletoe

Exotics

Eichhornia crassipes	water hyacinth
Hydrilla verticillata	hydrilla
Imperata cylindrical	Cogon grass
Melia azederach	Chinaberry
Cinnamomum camphora	Camphor tree
Broussonetia papyrifera	Paper mulberry
Sorghum halepense	Tropical soda apple
Solanum viarum	Johnson's grass
Lygodium japonicum	Japanese climbing fern

Invertebrates

Butterflies

Papilio glaucus	Eastern tiger swallowtail
solenopsis invicta	Red Imported Fire Ant

Vertebrates

Fish

Ameiurus nebulosus	Brown bullhead
Lepisosteus platyrhincus	Florida gar
Lepomis microlophus	Red-Eared Sunfish
Lepomis macrochirus	Bluegill
Dorosoma cepedianum	Gizzard shad
Amia calva	Bowfin
Pomoxis nigromaculatus	Black crappie
Notemigonus crysoleucas	Golden shiner
Gambusia holbrooki	Mosquitofish
Poecilia latipinna	Sailfin molly
Heterandria formosa	Least killifish
Notemigonus crysoleucas	Golden shiner

Reptiles

Crotalus adamanteus	Eastern diamondback rattlesnake
Farancia abacura abacura	Eastern mud snake
Regina alleni	Striped crayfish snake
Heterodon simus	Southern hognose snake
Lampropeltis getula	Common kingsnake
Agkistrodon piscivorus	Cottonmouth
Masticophis flagellum	Coachwhip
Nerodia fasciata pictiventris	Florida Water Snake
Terrapene carolina	Eastern box turtle
Gopherus polyphemus	Gopher tortoise
Scincella lateralis	Ground skink

Amphibians

Notophthalmus viridescens piaropicola	Peninsula newt
Lithobates sphenocephalus utricularius	Southern leopard frog
Acris gryllus	Southern Cricket Frog
Anaxyrus terrestris	Southern toad

Birds

Strix varia	Barred owl
Meleagris gallopavo	Wild Turkey
Haliaeetus leucocephalus	Bald eagle
Vireo griseus	White-eyed vireo
Cardinalis cardinalis	Northern cardinal
Cathartes aura	Turkey vulture
Falco sparverius	American kestrel
Mimus polyglottos	Northern mockingbird
Aythya collaris	Ring-necked duck
Anas discors	Blue-winged teal
Anas crecca	Green-winged teal
Nycticorax nycticorax	Black-crowned night-heron
Quiscalus major	Boat-tailed grackle
Agelaius phoeniceus	Red-winged blackbird
Ardea herodias	Great blue heron
Egretta caerulea	Little blue heron
Butorides virescens	Green heron
Sialia sialis	Eastern bluebird
Melanerpes carolinus	Red-bellied woodpecker

Mammals

Odocoileus virginianus	White-tailed deer
Sciurus niger	Eastern fox squirrel
Geomys pinetis	Southeastern pocket gopher

Exotics

Sus scrofa	Feral hog
Dasypus novemcinctus	Nine banded armadillo
Anolis cubensis	Cuban brown anoles

APPENDIX 2 – Soils

ADAMSVILLE SERIES The Adamsville series consists of very deep, somewhat poorly drained, rapidly permeable soils on broad flats, low knolls, and lower side slopes. They formed in thick sandy marine sediments in central and southern Florida. Near the type location, the mean annual temperature is about 74 degrees F., and the mean annual precipitation is about 52 inches. Slopes range from 0 to 5 percent. Natural vegetation consists of pines, laurel, and water oaks with a ground cover of saw palmetto, pineland threeawn, indiangrass, bluestem grasses, and several low panicums.

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.

ASTATULA SERIES The Astatula series consists of very deep, excessively drained, rapidly permeable soils that formed in eolian and marine sands. Near the type location, the mean annual temperature is about 73 degrees F., and the mean annual precipitation is about 52 inches. Astatula soils are on uplands in the lower Coastal Plain. Slopes range from 0 to 30 percent. Natural vegetation consists of bluejack, blackjack, turkey oaks, longleaf pine, sand pine, and an understory of rosemary, pineland threeawn, bluestem, paspalum, lopsided indiangrass, and panicum.

The Basinger series consists of very deep, poorly drained and very poorly drained, rapidly permeable soils in sloughs, depressions, low flats, and poorly defined drainageways. They formed in sandy marine sediments. Near the type location, the mean annual temperature is about 72 degrees F., and the mean annual precipitation is about 55 inches. Slopes range from 0 to 2 percent. The natural vegetation may consist of wax myrtle, St. Johns wort, maidencane, pineland threeawn, cypress, slash pine, longleaf pine, pond pine, and other water tolerant plants.

CANDLER SERIES The Candler series consists of very deep, excessively drained, rapidly permeable soils on uplands. They formed in thick beds of eolian or marine deposits of coarse textured materials. Near the type location, the mean annual temperature is about 72 degrees F., and the mean annual precipitation is about 55 inches. Slopes range from 0 to up to 25 percent in dissected areas. The climate is humid subtropical. Native vegetation consists of bluejack oak, turkey oak, post oak, live oak, and longleaf pine with a sparse understory of indiangrass, chalky bluestem, pineland threeawn, hairy panicum, and other annual forbs.

DELKS SERIES The Delks series consists of very deep, poorly drained, very slowly or slowly permeable soils in broad areas of the flatwoods in the Lower Coastal Plain of Peninsular Florida. They formed from sandy marine sediments over clayey materials. Near the type location, the mean annual temperature is about 72 degrees F., and the mean annual precipitation is about 53 inches. Slopes range from 0 to 2 percent. The native vegetation consists of longleaf pine, slash

pine, laurel oak, live oak, sawpalmetto, huckleberry, waxmyrtle, gallberry, bluestem, and pineland threeawn.

EUREKA SERIES The Eureka series consists of deep, poorly drained, slowly and very slowly permeable soils that formed in clayey and loamy marine sediments. These soils are on low, broad flat interstream divides and depressions of central and south Florida. Slopes range from 0 to 2 percent. Most areas are in native vegetation of longleaf and slash pines, sweetbay, magnolia, water oak, and sweetgum with an understory of inkberry, pineland threeawn, bluestems, indiangrass, and waxmyrtle.

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.

IBERIA SERIES The Iberia series consists of very deep, poorly drained, very slowly permeable soils that formed in alkaline clayey alluvium. They are on backswamp positions flanking natural levees on older deta plains of the Mississippi River. Slope is dominantly less than 0.5 percent but ranges up to 1 percent.

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.

PLACID SERIES The Placid series consists of very deep, very poorly drained, rapidly permeable soils on low flats, depressions, poorly defined drainageways on uplands, and flood plains on the Lower Coastal Plain. They formed in sandy marine sediments. Near the type location, the mean annual temperature is about 72 degrees F., and the mean annual precipitation is about 55 inches. Slopes range from 0 to 2 percent. Natural vegetation consists of pond pine, bay, cypress, gum, pickerel weed, and coarse grasses.

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.

POMONA SERIES The Pomona series consists of very deep, poorly and very poorly drained, moderate to moderately slowly permeable soils on broad low ridges on the Lower Coastal Plain. They formed in sandy and loamy marine sediments. Near the type location, the mean annual temperature is about 72 degrees F., and the mean annual precipitation is about 55 inches. Slopes are 0 to 2 percent. The native vegetation consists of slash pine (Pinus Elliottii), longleaf pine (Pinus Palustris), and south Florida slash pine (Pinus Elliottii Densa) with an understory of sawpalmetto, waxmyrtle, gallberry, creeping bluestem, chalky bluestem, indiangrass, and pineland 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.

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.

SELLERS SERIES The Sellers series consists of very deep, very poorly drained, rapidly permeable soils in low, depressional areas and poorly defined drainage ways. They formed in sandy marine sediments. Near the type location, the mean annual temperature is about 73 degrees F., and the mean annual precipitation is about 55 inches. Slopes range from 0 to 2 percent. The natural vegetation consists of pond pine, sweet bay, bald cypress, sweetgum, red maple, and a ground cover of pickerelweed and perennial grasses.

SPARR SERIES The Sparr series consists of very deep, somewhat poorly drained, moderately slowly to slowly permeable soils on uplands of the coastal plain. They formed in thick beds of sandy and loamy marine sediments. Near the type location, the mean annual temperature is about 72 degrees F., and the mean annual precipitation is about 55 inches. Slopes range from 0 to 8 percent. Native vegetation consists of longleaf pine, slash pine, loblolly pine, magnolia, dogwood, hickory, and live oak, laurel oak, and water oak.

TAVARES SERIES The Tavares series consists of very deep, moderately well drained, rapidly or very rapidly permeable soils on lower slopes of hills and knolls of the lower Coastal Plain. They formed in sandy marine or eolian deposits. Near the type location, the mean annual temperature is about 72 degrees F., and the mean annual precipitation is about 55 inches. Slopes range from 0 to 8 percent. In most places the natural vegetation consists of slash pine, longleaf pine, a few scattered blackjack oak, turkey oak, and post oak with an undercover of pineland

threeawn. In some places natural vegetation consists of turkey oak, blackjack oak, and post oak with scattered slash pine and longleaf pine.

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.

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.

WICKSBURG SERIES The Wicksburg series consists of very deep, well drained, moderately permeable soils that formed in sandy and clayey marine sediments of the Coastal Plain. They are on nearly level to strongly sloping uplands. Slopes range from 0 to 12 percent. Near the type location, the average annual air temperature is about 65 degrees F., and the average annual precipitation is about 53 inches. Common trees in wooded areas include longleaf pine, loblolly pine, Southern red oak, bluejack oak, turkey oak, and willow oak.

APPENDIX 3 –NRCS Protocols

St. Johns River Water Management District Protocols
For the Compatible Use Authorizations for Land Management Activities
Within the Ocklawaha Prairie Restoration Area
August 20, 2009

The following protocols for management of the Ocklawaha Prairie Restoration Area are based on the management objectives of the St. Johns River Water Management District (District) and the USDA Natural Resources Conservation Service (NRCS) as stated in the District's Ocklawaha Prairie Restoration Area Land Management Plan and the NRCS Conservation Programs Manual, Part 514. Any changes to the protocols must be agreed to by the St. Johns River Water Management District and the USDA Natural Resources Conservation Service.

A. Vegetation Maintenance

Field Mowing

1. Field mowing is performed to prevent encroachment of woody vegetation in areas to be restored. Mowing is done to a maximum vegetation height of fifteen (15) inches on an "as needed" basis when fields are dry with 85-125 hp tractors and heavy-duty batwing mowers.
2. The entire field is mowed.
3. Vegetation is typically dormant from the middle of December to the middle of March, therefore mowing is not scheduled, however may be conducted as needed.

Levee, Road, Parking Lot, Pavilion Area, and Other Mowing

1. Levee top and side mowing is conducted sixteen (16) times per year during the normal growing season (March through December) to a maximum grass height of six (6) inches. Boom type slope mowers may be used on slopes that are steeper than 3-to-1.
2. Road mowing and associated parking, pavilion areas, and other areas within six (6) feet of structures, pump stations, facilities, telemetry sites and other artificial structures are mowed sixteen (16) times per year, during the entire calendar year. Roads are mowed to a width of up to thirty (30) feet, plus swale areas.
3. Mowing is performed by District personnel and annual mowing contractors.
4. Mowing is performed with 50-200 hp tractors, heavy-duty batwing mowers, small mowers (up to 100-inches), and weed trimmers.

Drum (Roller) Chopping

1. Drum chopping woody vegetation is conducted during dry soil conditions with a dual wheeled, low ground pressure, 250-400 hp 4 WD tractor/skidder that is attached to a

12–foot, 42-inch diameter aerator drum chopper. It may be used either with or without ballast water.
2. Drum chopping is performed to control exotic or nuisance woody vegetation at ground level and can be used in vegetation up to six (6) inches in diameter.
3. Drum chopper blades are six (6) inches in height to limit soil disturbance to no more than six (6) inches below the ground surface.

Brontosaurus Mowing/Mulching

1. Mowing/Mulching trees and woody vegetation is conducted using a track vehicle (track hoe with tracks 28" wide) with boom and mulcher head.
2. Mowing/Mulching is performed to remove woody vegetation for projects such as roads, trails, and firelines. The mower/mulcher will remove woody vegetation at or above ground level and can be used in vegetation up to twenty-four (24) inches in diameter.

Invasive Plant Management

1. District staff or contractors treat populations of plant species that are identified on the Exotic Pest Plant Council Category I or II list.
2. Treatment consists of the application of herbicides as directed by label instructions or specific instructions developed by the University of Florida Institute for Food and Agricultural Science (UF-IFAS). All treatments will be performed by applicators licensed by the Florida Department of Agriculture and Consumer Services.
3. Application may be performed by hand, or from a vehicle, ATV, boat, airboat, aircraft, or track machine.

B. General Maintenance

Lime Rock Road Maintenance

1. Scarify damaged area with scarifier teeth attached to a grader or backhoe.
2. If conditions are dry, wet the scarified section with a water distributor.
3. Deposit lime rock.
4. Place lime rock to a height of one (1) to two (2) inches above existing road grade.
5. Compact repaired area and spread excess material onto existing roadway.
6. Typical equipment may include a bulldozer, excavator, dump truck, vibratory roller, road grader, and a water distributor.

Earthen Levee Erosion and Pothole Repair

1. Same procedure as listed above, except substitute sand/clay that contains 60% clay as a base material
2. Compaction may be obtained with a rubber-tired vehicle.

3. Rip-rap may be placed along levees adjacent to canals and water ways to prevent levee erosion.
4. Sheet piling may be used if rip-rap is deemed to be unsuitable by the District

Seeding or Sodding of Disturbed Erodible Areas

1. Placement of seed is performed mechanically or with individually operated equipment.
2. Seeding and sodding may be contracted or performed by District staff.
3. Ground disturbance will not exceed twelve (12) inches below surface.

Sign Posting

1. Sign posts shall be placed in the ground by means of driving and/or posthole diggers.
2. Metal or wooden posts shall be utilized, as determined by District staff.
3. District authorized signs may be placed on fence posts, at the discretion of the District or NRCS.

Fencing and Gates

1. Either wood or metal fence posts shall be used for all new fence construction or replacement of existing fencing. Fencing shall consist of barbed wire, hog wire, wood or other materials, as deemed necessary by the District .
2. New or replacement gates shall be constructed of metal.
3. Fence lines shall be kept free of vegetation and other debris in a manner, schedule, or frequency to be determined by District personnel.

Recreational Use Facilities

1. Trails shall be maintained to allow clear access by the public, as deemed appropriate by the District.
2. Raised wooden structures (pavilions, observation platforms, boardwalks, weather shelters) shall be kept in good repair and periodically cleaned and water sealed, as determined by District personnel.
3. Boat landings and docks shall be kept in a good state of repair.
4. All maintenance of structures or other recreational facilities shall be performed by District personnel and/or contracted personnel, at the discretion of the District.
5. Construction or addition of new recreational use facilities is subject to authorization by NRCS.

Power Line Maintenance

1. Power Company (Progress Energy) will need access to power line structures and systems that require routine maintenance and repairs. Power Company will be performing routine vegetation management in access area.

2. Due to the high voltage present in transmission lines, it is necessary to ensure that wire fencing under or near the line is properly grounded to remove voltage that may be induced in the fence wire. District personnel, Progress Energy personnel, or associated contract personnel shall be granted access to the property for the purpose of maintaining a ground rod system.

Rescue Operations

1. District personnel shall grant access to the property for all forms of rescue operations, as deemed necessary.

Surveying

1. Survey work shall be performed as deemed necessary by the District or NRCS. Access to the property by survey crews and their equipment may be necessary for project or land management reasons. Contract personnel may be used.

Feral Hog Control

Feral hogs are considered to be an invasive exotic animal. Left unchecked, hog populations increase to detrimental levels that result in ecosystem harm. Damage occurs when hogs root up the ground in their effort to find food. This rooting activity has been documented to damage groundcover, including listed plant species; destroy young longleaf pine seedlings; damage roads and levees contributing to erosion and increased maintenance costs. Feral hogs will be controlled by volunteer hog trappers or USDA Hog Control Agents. Hogs are trapped and killed within the trap or hunted and moved to untraveled areas and left for scavengers. State law prohibits them from being transported live

C. Hydrologic Maintenance

Bridge, Culverts, Pump Station, and Structures

1. The above sites require maintenance. Additionally, gated culverts and structures, and pump stations may require personnel to be on site to tend or operate them.
2. Typical equipment used to make repairs to, or replacement of, the above sites may include excavators, loaders, dump trucks, crane service, service trucks and all associated staff, to include District contracted equipment and personnel.
3. The Ocklawaha Prairie bridge shall be inspected, inventoried, serviced, and repaired by District staff. The Florida Department of Transportation (FDOT) performs semi-annual inspections of bridge.

Management of Water Levels

Water levels within the Ocklawaha Prairie Restoration Area will be managed within a typical range of 38 – 40 feet NGVD, and an infrequent range (once every five years during a single

wet or dry season) of 36 – 41 ft NGVD. To a large extent, water levels have been controlled by natural weather cycles. If necessary to meet these management objectives, the culverts and pump at the inlet structure, or supplementary portable pumps are used to introduce water from the Ocklawaha River, and the outlet culvert is used to discharge water from the restoration area to the Ocklawaha River.

D. Management of Wetland and Upland Habitats

Maintenance of Existing Fire Lines

1. Fire lines require disking periodically during the growing season (March through December). The line may be disked at a width of six (6) to twelve (12) feet wide, and up to twelve (12) inches below surface, or deep enough to reach the mineral layer to eliminate vegetation overgrowth and deter spreading of fire, as well as to provide access for firefighting staff and equipment. A trackhoe may be needed to rehabilitate firelines that were established during emergency fire fighting operations and other special projects.
2. Firelines within wetland communities will be maintained with Marsh Master tracked vehicles and airboats as necessary.

New Fire Lines

1. New fire lines may be established as deemed necessary by the District
2. New firelines may be constructed using dozer, tractor plow and farm tractor w/ disk in upland areas. Marsh Master tracked type vehicles or airboats may be used with or without the aid of a mower to establish firelines within the wetland communities.

Fire Fighting

1. In the event of a wildfire, all necessary personnel and equipment, to include aircraft, shall have access to the property for the purpose of fighting the fire.
2. Temporary fire lines shall be cut as deemed necessary for the purpose of controlling the wildfire.
3. All sources of water on the property shall be made available for the purposes of fire fighting.
4. Temporary pumps may be established as deemed necessary by the District and NRCS for the purpose of fire fighting.

Prescribed Burning

1. Prescribed burns will be conducted on the property in accordance with an annual prescribed burning plan developed by the District specifically for this property and in accordance with the District's Fire Management Plan (currently in draft form)..
2. Ignition, control, and observation may be facilitated by the use of ground vehicles and aircraft.

Forest Management

The District is charged by statutes to manage forested ecosystems. All forestry activities will be implemented in accordance with the District's Forest Management Plan and are likely to include:

1 Planting native tree species using either hand or mechanical tree planting.
2. Marking timber with paint to identify trees to be harvested.
3. Harvesting trees to thin the overstory to provide growing space for remaining trees and to provide adequate growing condition of groundcover species.
4. Clearcutting trees to restore native species or to control insect or disease infestations.

Ground Cover Restoration

The District is charged by statute to manage and restore land to their natural state and condition to the extent practicable. One aspect of this charge is to reestablish native groundcover to previously disturbed lands. Such restoration may occur in the future as needed in uplands and may include:

1. Spreading native seed by hand or with the use of a tractor or ATV mounted spreader.
2. Planting of native seed with a tractor mounted seed or grain drill.
3. Packing seed into the soil using a roller packer.
4. Hydromulching to hold seed in place.
5. Planting may occur in uplands, transitional wetlands and wetland sites.
6. Hand or machine planting native grass and or shrub plugs.
7. Planting depth shall not exceed 12" below surface.

Once groundcover restoration efforts prove successful the District may use restored sites as donors for ground cover seed to restore other sites. Harvesting seed for restoration may include the following activities:

1. Mowing grasses to discourage shrubs and encourage seed production.
2. Herbicide to control shrubs to facilitate seed harvest.
3. Flail-vac harvesting of seed.
4. Silage harvesting of native ground cover to serve as sprigging material for recipient sites.

Site Preparation for Forest Management and Ground Cover Restoration

In order to accomplish set goals for Forest Management and Groundcover Restoration certain site preparation operations must be conducted to prepare sites for planting and re-establishment. Site preparation activities will vary from site to site depending upon location and type of planting to occur and will occur in upland, transitional and wetland communities as needed to accomplish restoration goals. Site prep activities will follow the District's Forest Management Plan and will include:

1. Roller chopping (straight blade and or aerator type spiral blade types) to reduce/ remove competing woody vegetation.
2. Herbicide (aerial and ground) applications to control shrubs, offsite tree species and non-native or offsite grasses in upland and wetland areas.
3. Mulching of shrubs and or trees with a drum type, mulching mower mounted on tracked or rubber tired equipment.
4. Mowing of shrubs native and non native in wetlands and transitional areas with a drum type mulching mower or rotary mower mounted to a marsh master or bombardier type amphibious tracked vehicle.
5. Whole tree chipping operations.
6. Ground disturbance by equipment shall not exceed 12" below surface.

Planting of Wetland Vegetation

Planting of beneficial wetland vegetation in restored areas is a minor, but ongoing project. A variety of herbaceous species are planted, including sand cordgrass, giant bulrush, and sawgrass. Four- to eight-foot saplings of wetland-tolerant tress species, such as bald cypress, pop-ash and black gum may be planted in areas that are seasonally inundated. Until they become established, the trees may be hand-watered up to twice weekly using a hose from a 1,000 gallon diesel water truck driven to the nearest location on a maintained levee road.

E. Monitoring Activities

Monitoring of Biota

Fish and other aquatic organisms, such as amphibians or dragonfly nymphs, are collected for organochlorine pesticide analyses. For all animal collections, staff wear protective gloves and immediately wrap the specimens in food-grade aluminum foil, dull side in contact with the animal, and place the specimens into food-grade zip lock bags on ice. An airboat equipped with a portable Smith-Root Inc. electroshock unit is generally used to capture fish. Additional fish sampling may occur using dip nets.

Monitoring of vegetation in planting areas has been conducted. Surviving plants are counted and measured (height, diameter). In larger stands, water depths and percent cover are estimated in 1 m^2 plots and GPS is used to map the periphery of the stand. Vegetation in the general area is also noted, and samples of unknown species may be collected and placed in labeled plastic bags for later identification.

Monitoring of Water Levels

Water levels are monitored both remotely and manually. For remote observation of data, water level telemetry equipment is deployed in the field to record water levels and provide information to help in making operation decisions. Remote equipment includes pressure transducers used to measure water depth, and radios used to transmit information back to a collection station. Maintenance on the water level monitoring stations is conducted at least once a month by the District's Hydrologic Data Services Division, and consists of cleaning and servicing the equipment.

For manual recording water level, staff gauges are deployed around the property, and these are read monthly to weekly depending on the level of operation of a particular project. Staff gauges are cleaned periodically.

Monitoring of Water Quality

Four sites are monitored regularly with grab samples to measure nutrients and other constituents in ambient water and in discharges to the Ocklawaha River. Sampling generally occurs monthly, but the frequency may be increased during active discharge periods.

Collections of surface water samples follow the District's Field Standard Operating Procedures, and the Field Quality Manual. Both documents are reviewed annually and adhere to the Florida Department of Environmental Protection's Standard Operating Procedures for field data activities. Water samples are collected by immersing the sample bottles. At all sample events field data are also collected, which include weather conditions and depth of the water column, along with determination of water temperature, dissolved oxygen, pH, and conductivity using a multi-parameter instrument.

Soil/Sediment Collections

Soil and sediment samples are collected for analyses of pesticides and other contaminants. Samples may be collected anywhere on the property and are collected with a 2.5"-diameter soil auger or with a Ponar dredge, a small box with shovel like blades used to sample the first few inches of sediment in a water body. Sampling complies with the Department of Environmental Protection's Standard Operating Procedures for field data activities, and with the Memorandum of Understanding between SJRWMD and the United States of America regarding the Lake Apopka north shore avian mortality event.

F. Cultural Resources

The District and NRCS agree that NRCS will complete a cultural resources assessment /survey of the NRCS easement property. Where cultural resources are identified, the District will ensure that those resources are appropriately managed and protected in accordance with the National Historic Preservation Act of 1966, and will promulgate those cultural resource management strategies in an updated version of the land management plan to be completed within one year from the date of completion of the cultural resources assessment.

APPENDIX 4 – Fire Management Plan

Ocklawaha Prairie Restoration Area
FIRE MANAGEMENT PLAN

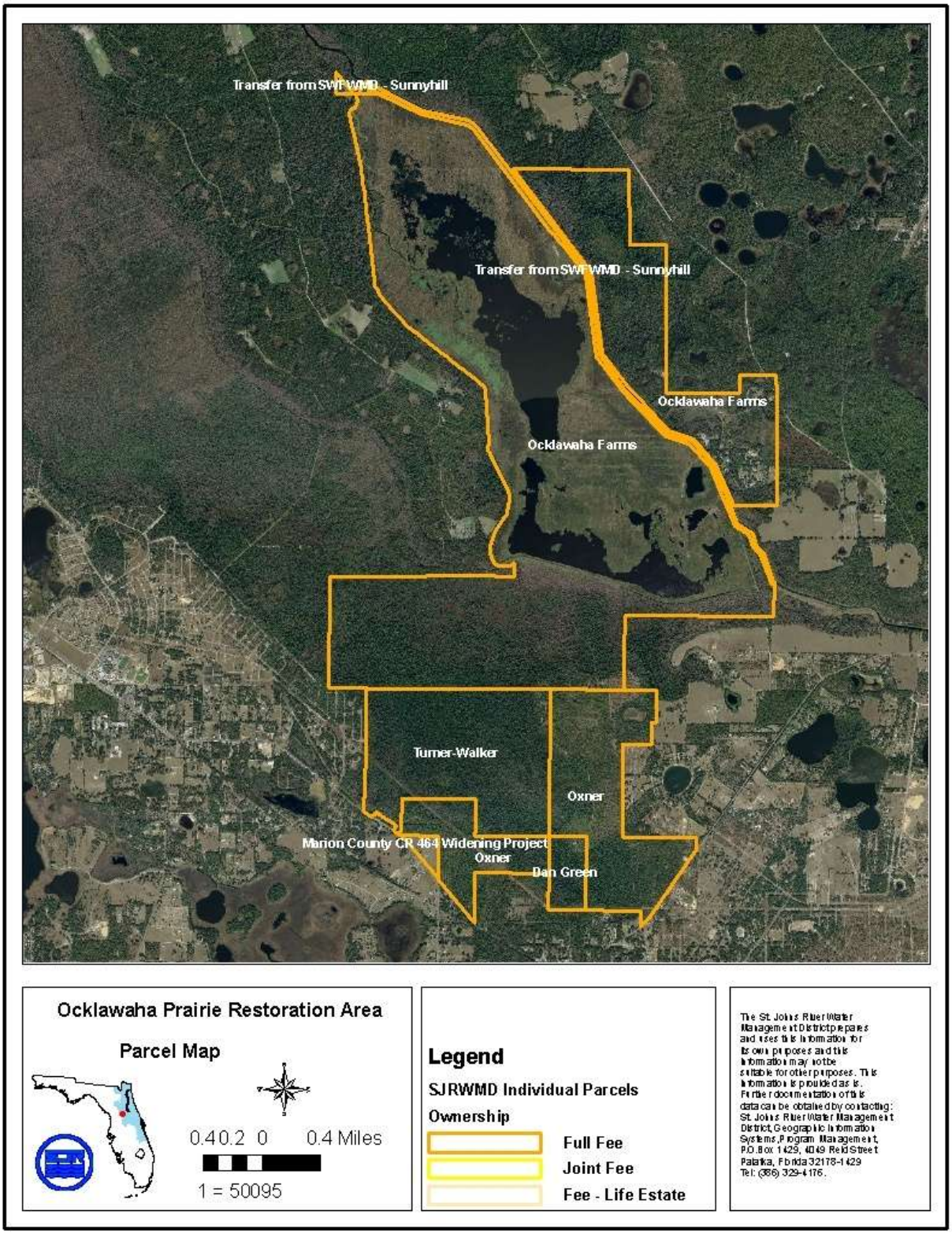
PREPARED BY:
St. Johns River Water Management District
Division of Land Management

Ocklawaha Prairie Restoration Area
Fire Management Plan
Marion County, Florida

The purpose of the following Fire Management Plan is to provide general fire management guidelines and information relative to District policies, procedures and reporting. This document will provide the guidelines necessary to implement prescribed fire activities within the Ocklawaha Prairie Restoration Area (OPRA).

Introduction:

The OPRA encompasses approximately 6095 acres in Marion County. The Conservation Area is located north of the Town of Ocklawaha, north C.R. 464 (Maricamp Rd.), and west of the community of Moss Bluff, west of C.R. 314A and C.R. 464 C. The purchase of the six different parcels that make up the OPRA spanned from February of 1991 through November of 2007. The primary land use for the area pre District ownership was primarily agriculture in the form of cattle ranching, row crops, and timber. Management strategies for the area include water resource protection, resource management, natural community restoration and passive recreation. Years of farming, timbering and drainage activities have resulted in a vastly altered landscape and ultimately the loss of a large portion of the native species within the site. The District has and will continue to initiate projects in the future to restore native vegetation within the site to the extent possible and practical. Prescribed fire will play an integral role in the restoration and management of the natural communities within the OPRA.



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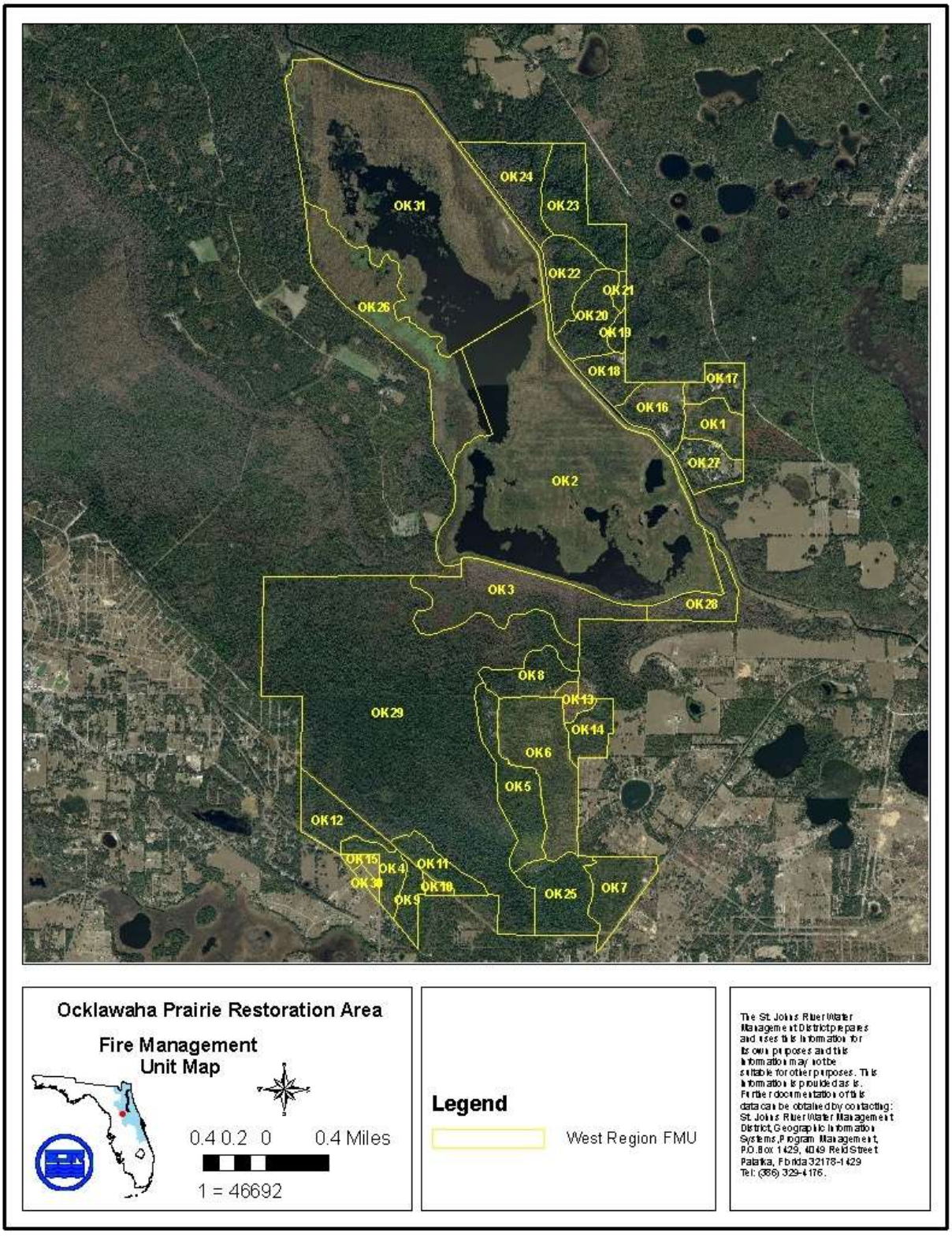
Objectives:
Throughout history, fire has played a vital role in shaping many of the natural communities in Florida. Many of the natural communities of Florida are fire dependant, requiring periodic burning to perpetuate and maintain diversity. Without periodic fire, many areas would undergo successional changes resulting in a loss of plant species and degraded wildlife habitat. Exclusion of fire would also result in excessive fuel load accumulation and increased risk of catastrophic wildfires.
The goals for the implementation of fire management at the OPRA include:

- Conduct dormant season burns to reduce hazardous fuel loading and in follow up to mechanical vegetation management activities
- Re-introduce growing season fire to promote recruitment of native fire dependant species
- Use fire to promote and maintain ecological diversity
- Incorporate fire as a tool in the overall restoration and management of onsite natural communities
- Mitigation of smoke management issues
- Implement post burn monitoring guidelines to ensure fire management goals are achieved

Fire Management Units:
The ability to achieve the above listed goals requires the OPRA be divided into manageable Fire Management Units (FMU's) prior to implementation of prescribed fire within the property. Where possible FMU boundaries were established using existing roads, firebreaks and natural barriers to minimize negative impacts to the land. Staff constructed firebreaks where necessary along the Conservation Area boundary and internally by disking with a farm tractor and harrow.



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Below is a brief description of each of the individual FMU's contained within OPRA. The descriptions will contain acreage, burn history, fire return interval, fuel model information[1] and a brief narrative of the unit's condition.

Unit	Acreage	Wind	Fire History	Expected Fire Return Interval	Fuel Model	Condition
OK1	65	E,SE,S, SW,W	Prescribed fire 2010	2-5 years	GR6,TL8,, NB8	Unit contains a longleaf pine plantation with nonnative grass understory, shrub and grass field and a depressional wetland
OK2	1242	N, any East	Prescribed Burn 2006	3 to 5 years	NB8,GR8 ,SH3	Unit consists of shrub dominated wet prairie and open water
OK3	249	Any	None	5 to 7 years	TU2,TL3, SB2,SH8	Wet Flatwoods and Bay Swamp
OK4	51	NW,W, SW,S	Prescribed burn 2008	2 to 5 years	GR6,TL8	Unit is a longleaf pine plantation with non native grass understory
OK5	131	Any except NE	Prescribed Burn 2003	3 to 5 years	SH9,TU3, TL2	Area Consists of scrubby flatwoods, bay swamp, sandhill, and hardwood hammock
OK6	203	N,NE,E, SE,S,SW	Prescribed Burn 2010	2 to 5 years	GR6,TL8	Unit is a longleaf pine plantation with non native grass understory with scattered wiregrass, blackberry and andropogon
OK7	96	SE,E	Prescribed Burn 2004	2 to 5 years	GR6,TL8	Unit is a longleaf pine plantation with non native grass understory with scattered wiregrass, blackberry and andropogon, unit contains a large power transmission line
OK8	78	Any	Partial prescribed Burn 2009	2 to 5 years	TL2,GR3, SH3	Area consists of hardwood dominated sandhill, an old borrow pit, oak hammock and swamp
OK9	39	NW,W, SW,S	None	3 to 5 years	TU3	Area is mesic flatwoods containing mature pine and two small depressional wetlands
OK10	10	NW,W, SW,S	None	2 to 5 years	TU3	Unit consists of young pine regeneration, small hardwoods, native grasses, and palmetto
OK11	33	NW,W, SW,S	None	2 to 5 years	TU3,TU2	Unit is primarily flatwoods consisting of scattered pine and palmetto with bays mixed throughout grading into hardwood swamp
OK12	87	W, SW,S	None	3 to 5 years	TU3,SH8, TL2	Unit is a mix of flatwoods, bay swamp and hardwood hammock
OK13	22	Any	Prescribed Fire 2009	2 to 5 years	TL6,GS4	Unit is sandhill with a high volume of oaks and wiregrass

[1] Standard Fire Behavior Fuel Models A Comprehensive Set for Use with Rothermel's Surface Fire Spread Model, Joe H. Scott & Robert E. Burgan, USDA Forest Service, General Technical Report RMRS- GTR-153, June 2005

OK14	56	S,SE,E, NE	Prescribed Fire 2009	2 to 5 years	TL6,GS4, SH4,TL2	Area is hardwood dominated sandhill, flatwoods, oak hammock, and contains a depressional wetland in the center of the unit
OK15	15	W,SW,S	None	2 to 5 years	GR3	Unit is a bahia grass pasture
OK16	79	Any except NW	Prescribed fire 2010	2 to 5 years	GR3,TU3, TL2	Area is a mix of bahia grass pasture, hardwood hammock and loblolly pine
OK17	54	Any	Prescribed fire 2010	3 to 5 years	GR3,TU3, TL2	Area is a mix of bahia grass pasture, hardwood hammock and loblolly pine with five small depressional wetlands, and an old clay pit
OK18	51	Any	Prescribed fire 2010	2 to 5 years	TL2,TL8	Unit is an old field with naturally regenerated loblolly and slash pine with remnants of old field ditches, contains sparse groundcover
OK19	15	Any	Prescribed fire 2010	3 to 5 years	TL2,SH8, TL7	Area is overgrown scrubby flatwoods surrounding a bay swamp
OK20	94	Any	Prescribed fire 2010	3 to 5 years	TL2,SH8, GR6	Unit is a mixture of hardwood hammock, hardwood dominated sandhill, scrubby flatwoods and bay swamp
OK21	10	Any	Prescribed fire 2010	3 to 5 years	TL2	Unit is a mixture of hardwood dominated sandhill and hardwoods hammock grading into bay swamp
OK22	84	Any	Prescribed fire 2010	3 to 5 years	SH8,TL2	Area is primarily scrubby flatwoods with small areas of oak hammock and a bay swamp on the western side
OK23	144	Any	Prescribed fire 2010	3 to 5 years	SH6,TU2	Unit is a mix of scrubby and wet flatwoods with a bay swamp along the eastern edge
OK24	122	Any	Partial prescribed fire 2010	3 to 5 years	SH6,TU2, TL2	Area is primarily a mix of bay swamp and hardwoods hammock with a scrubby flatwoods fringe along the east side
OK25	127	S,SE,E, NE	None	3 to 5 years	TL2,SH8	Unit contains a mix of bay swamp, scrubby flatwoods, scrub, and mesic flatwoods
OK26	316	Any	Prescribed fire 2009	3 to 5 years	NB8,GR8 ,SH3	Unit consists of shrub dominated wet prairie and open water
OK27	66	NA	None	None	NB1,TL2	This area is occupied by The Refuge, contains multiple structures, non-developed areas are not maintained with fire.
OK28	77	Any	None	3to 5 years	SH6,TL2	Unit is primarily bay swamp with a small fringe of hardwood hammock and flatwoods along the southern side
OK29	1446	N,NW, W,SW,S	None	7 years +	TL2,SH6, SH8	Unit contains a large bay swamp (Tiger Den Swamp) with fringes of pine flatwoods and islands of wet flatwoods dispersed throughout

OK30	10	NA	None	None	NB1,GR3	Area is occupied by the security residence and is not fire maintained
OK31	1047	Any	Partial prescribed fire 2008	2 to 5 years	NB8,GR8 ,SH3,GR9	Unit consists of shrub dominated wet prairie and open water, portions of the eastern side of unit contains planted spartina

Fuel Models[2]:

Below is a brief description of each fuel model occurring within the OPRA. The previous table lists multiple models for several of the units that were described, this is due to the vast differences that occur within the individual FMU. The combined fuel models for each individual unit will be used in the planning process to assist in the prediction of fire behavior and rates of spread.

Fuel Model NB1: This category occurs in areas with residential or commercial development. This model typically occurs in areas that will not support any spread from a wildland fire. This model has been adapted as a best fit for developed areas with in the OPRA.

Fuel Model NB8: This category occurs within FMU's that have or are primarily comprised of open water bodies.

Fuel Model GR3: This fuel model occurs in units that contain nonnative pasture grasses and other low load grass fuels. The primary carrier with in this model is the grasses and associated fine dead fuels. The fuel bed is somewhat continuous with a depth of 1 to 2 feet. Shrubs, when present do not have a significant effect of fire behavior. Fuel loading is typically near 2 tons/ac and the moisture of extinction is around 15%. Rates of spread can vary from 0 to 500 chains/hr dependant upon weather conditions with flame lengths from 2 to 25 feet.

Fuel Model GR6: This category occurs in units with a mix of nonnative and native grasses. The primary carrier with in this model is the grasses and associated fine dead fuels. The fuel bed is continuous with a depth of 1 to 2 feet. Shrubs, when present do not have a significant effect of fire behavior. Fuel loading is typically near 3.5 tons/ac and the moisture of extinction is around 40%. Rates of spread can vary from 0 to over 500 chains/hr dependant upon weather conditions with flame lengths from 2 to 35 feet.

Fuel Model GR8: This category occurs in units containing primarily tall native grasses with a fuel bed depth of about 3 feet or greater. Fuel loading is typically near 8 tons/ac and the moisture of extinction is around 30%. Rates of spread can vary from 0 to over 500 chains/hr dependant upon weather conditions with flame lengths from 4 to over 50 feet.

Fuel Model GR9: This fuel model occurs in units containing primarily tall native grasses with a fuel bed depth of about 5 feet or greater. Fuel loading is typically near 10 tons/ac and the moisture of extinction is around 40%. Rates of spread can vary from 0 to over 500 chains/hr dependant upon weather conditions with flame lengths from 7 to over 50 feet.

Fuel Model GS4: This fuel model occurs within units having a moderate loading of grasses and shrubs with a fuel bed depth greater than 2 feet. Fuel loading is typically near 12 tons/ac and the moisture of extinction is around 40%. Rates of spread can vary from 0 to near 200 chains/hr dependant upon weather conditions with flame lengths from 3 to over25 feet.

Fuel Model SH3: This category occurs in FMU's containing a high volume of shrubs and less grasses than the previously described models. The primary carrier of the fire in this model is the

[2] Standard Fire Behavior Fuel Models A Comprehensive Set for Use with Rothermel's Surface Fire Spread Model, Joe H. Scott & Robert E. Burgan, USDA Forest Service, General Technical Report RMRS- GTR-153, June 2005

shrubs and shrub litter, the model typically has a fuel bed depth of 2 to 3 feet. Fuel loads are typically near 6.5 tons/ac with a moisture of extinction of 40%. Rates of spread range from 0 to 25 chains/hr with flame lengths ranging from .5 to 5 feet.

Fuel Model SH4: This category occurs in FMU's containing a moderate volume of shrubs and shrub litter, with or without a pine overstory. The primary carrier of the fire in this model is the shrubs and shrub litter, the model typically has a fuel bed depth of about 3 feet. Fuel loads are typically near 3.4 tons/ac with a moisture of extinction of 30%. Rates of spread range from 0 to 210 chains/hr with flame lengths ranging from .5 to 18 feet.

Fuel Model SH6: This category occurs in FMU's containing a dense volume of woody shrubs and shrub litter. The primary carrier of the fire in this model is the shrubs and shrub litter, the model typically has a fuel bed depth of about 2 feet. Fuel loads are typically near 4.3 tons/ac with a moisture of extinction of 30%. Rates of spread range from 0 to 120 chains/hr with flame lengths ranging from 2 to 22 feet.

Fuel Model SH8: This category occurs in FMU's containing a dense volume of woody shrubs and shrub litter and little to no herbaceous fuel, with or without a pine overstory. The primary carrier of the fire in this model is the woody shrubs and shrub litter, the model typically has a fuel bed depth of about 3 feet. Fuel loads are typically near 6.4 tons/ac with a moisture of extinction of 40%. Rates of spread range from 0 to 110 chains/hr with flame lengths ranging from 3 to 24 feet.

Fuel Model SH9: This category occurs in FMU's containing a dense volume of finely branched shrubs with significant dead fuel and shrub litter, with or without a pine overstory. The primary carrier of the fire in this model is the shrubs and shrub litter, the model typically contains shrubs about 4 to 6 feet tall. Fuel loads are typically near 13.05 tons/ac with a moisture of extinction of 40%. Rates of spread range from 0 to 250 chains/hr with flame lengths ranging from 5 to 35 feet.

Fuel Model TU2: This category occurs within units that primarily consist of a dense hardwood overstory with a ground cover low shrubs and hardwood leaf litter. The primary carrier of the fire in this model is a moderate load hardwood litter. Fuel loads are typically near 1.15 tons/ac with a moisture of extinction of 30%. Rates of spread range from 0 to 105 chains/hr with flame lengths ranging from 1 to 12 feet.

Fuel Model TU3: This category occurs within units that primarily consist of a hardwood overstory with a ground cover of grasses, low shrubs and hardwood leaf litter. The primary carrier of the fire in this model is a moderate load of grass and shrub components. Fuel loads are typically near 2.85 tons/ac with a moisture of extinction of 30%. Rates of spread range from 0 to 160 chains/hr with flame lengths ranging from 2 to 18 feet.

Fuel Model TL2: This fuel model occurs within units that contain hardwood hammocks and wetland hardwoods. The primary carrier of the fire within this model is primarily broadleaf litter. The fuel load is typically about 1 ton/ac and consists of compact hardwood leaf litter that has a moisture of extinction of 25%. Rates of spread range from .3 to 4 chains/hr with flame lengths from .25 to 1.5 feet.

Fuel Model TL3: This category occurs within units that contain wetland hardwoods and scattered pine. The primary carrier of the fire within this model is primarily mix of pine and hardwood litter. The fuel load is typically about .5 tons/ac and consists of light load of coarse fuels that has a moisture of extinction of 20%. Rates of spread range from .3 to 4.5 chains/hr with flame lengths from .5 to about 2 feet.

Fuel Model TL6: This fuel model occurs within units that contain moderate loads of broadleaf litter. The fuel load is typically about 2.4 tons/ac and consists of blowy leaf litter that has a

moisture of extinction of 25%. Rates of spread range from 1 to over 25 chains/hr with flame lengths from .1 to 8 feet.
Fuel Model TL7: This fuel model occurs within units that contain wetland hardwoods and a large volume of large downed logs. The primary carrier of the fire within this model is heavy forest litter. The fuel load is typically about .3 tons/ac, consists of compact hardwood leaf litter and large downed logs, and has a moisture of extinction of 25%. Rates of spread range from 0 to 15 chains/hr with flame lengths from 1 to 4 feet.

Fuel Model TL8: This fuel model occurs within units that contain open stands of planted and or natural pine with a groundcover of primarily pine needle litter. The primary carrier of the fire within this model is primarily long needle pine litter with a small amount of herbaceous fuels. The fuel load is typically about 5.8 tons/ac and has a moisture of extinction of 35%. Rates of spread range from 0 to 51 chains/hr with flame lengths from 1.5 to 9 feet.

Fuel Model SB2: This category occurs in units containing a low to moderate volume of downed woody debris or logging slash, ranging in diameter from 1 to 3 inches. The primary carrier of the fire in these units is light dead and down activity fuel. The fuel load is typically about 4.5 tons/ac, with a moisture of extinction of 25%. Rates of spread range from 0 to 140 chains/hr with flame lengths from 1 to 18 feet.

Seasonality and Type of Fire:
Historically, most natural fire in Florida occurred during the "growing season" which is typically from March through July. Natural fires were most often ignited by lightning from nearby thunderstorms. These lightning caused fires would burn until they were rained out or impeded by some natural barrier.
Growing season fires generally have significant ecological benefits and are necessary for the perpetuation of fire-adapted flora. Prescribed fires implemented during the growing season mimic these lighting caused natural fires and provide benefits to the natural systems by controlling shrubs, diversifying groundcover species and promoting the growth of fire dependant grasses within natural communities.
Dormant season fires, which are typically implemented from November through the end of February are normally less intense than growing season fires. Dormant season burns typically are used to reduce heavy fuel loads and therefore reducing safety and smoke management risks. The end goal of dormant season fire is to transition the unit into a growing season burn rotation after sufficient fuel loads have been removed.
Due to the range of conditions found within the FMU's within the OPRA only portions of the property can currently receive growing season fire. The vegetative composition the remaining FMU's of the area will require one or more rotations of dormant season burns before the introduction of growing season fire.
District staff conduct prescribed burns using two primary methods, ground and aerial ignition. Ground ignited prescribed burns are the primary method used within the LNCA at this time due to fuel loads and FMU size. District burn crews ignite these burns by hand, horse or with the use of an ATV mounted drip torch. Aerial ignited prescribed burns may be used under certain situations and most certainly, once fuel loads are reduced by burning multiple units simultaneously. Aerial ignition allows fire to be easily applied to all portions of the units, resulting in a more complete burn than is possible with ground crews. Burns conducted using the

aerial method allow staff to ignite the units faster, lessening the time for burnout and reducing the possibility of late day smoke management issues.
An aerial burn safety plan[3] will accompany the individual burn prescriptions and will be onsite the day of all aerial burns.

Prescription Elements:

Prescribed fire prescriptions[4] provide beneficial information about the area to be burned and necessary instructions needed to conduct the operation safely. The following section will provide brief descriptions of the key elements contained within the Prescribed Fire Prescription.

Prescription Elements
1. Location and Signatures
Lists the exact location of the burn site (legal description), acreage to be burned, burn date(s), county, FMU number, property name, Certified Prescribed Burn Manager number, landowner name/number, burn authorization number , helispot coordinates and Division of Forestry District and dispatch phone number
2. Site Description
Gives a detailed description of the area to be burned, fuel types and loading, natural community type, previous burn date, site topography, firebreak description (harrowed, dozer, ecotone etc.), list of improvements to be protected and hazards to mitigate.
3. Purpose of Burn/Specific Objectives
Describes the reason for conducting the burn and discusses quantifiable management objectives.
4. Fire Weather Forecast and Prescription Parameters
Lists weather parameters needed to successfully implement the burn such as % cloud cover, rain chance, relative humidity, 20 foot wind speed and direction, Transport wind speed and direction, fuel moistures, mixing height, dispersion index[5], LVORI[6], Drought Index (KBDI)[7], and ceiling height. The section lists minimum and maximum ranges for each weather factor to implement the burn safely and effectively, day of burn fire weather forecast (day and night) and conditions actually observed onsite.
5. Fire Behavior
Lists specific information related to fire behavior such as, fuel model (inside and outside the unit), predicted and observed rates of spread, flame length and Probability of Ignition (PIG)
6. Precipitation Summary
Lists number of rain days received within the FMU within the last 30 days, date of last event and amount of rain received and amount of rain within the last 7 days before burn

[3] Exhibit 2

[4] Exhibit 1

[5] Lavdas Dispersion Index assesses the atmospheres capacity to disperse the smoke plume.

[6] Low Visibility Occurrence Risk Index assesses the potential of a vehicle accident caused by residual smoke

[7] Keetch-Byram Drought Index assesses moisture deficiency in the soil and is based on the amount of water needed in the soil to achieve saturation, the scale ranges from 0-800 with 800 being the maximum drought possible. KBDI is designed specifically for fire potential assessment.

occurs.
7. Smoke Management
Lists specific objectives for successfully mitigating smoke during and after the burn, location of smoke sensitive areas, their distance and direction from the burn location, and any special precautions.
8. Personnel and Equipment Summary
Detailed list of all personnel and equipment needed to conduct the actual burn
9. Ignition Plan
Gives instruction and methodologies for ignition during the burn, provides specific information about firing techniques, timing of ignition, equipment needs and safety considerations.
10. Holding and Contingency Plan
Lists resources needed to contain the fire within the burn unit and outlines specific instructions and assignments for crews. Also identifies actions and lists contacts to be notified in the event of an escape and cannot be contained with onsite resources. Contingency resources should listed by type, travel time, and location.
11. Public Relations
Identifies contacts for coordination of burn including, agency (press release), cooperators, news media, public and adjacent landowners. Also specifies contact procedures.
12. Pre-burn Preparations and Checklist
Includes on and offsite tasks to be performed before burn takes place, go-no-go checklist, and briefing outlines.

Wildfire Policy:

When a wildfire occurs, if conditions permit, a confine – contain strategy will be implemented utilizing existing fuel breaks to contain the fire. Fuel breaks are defined as roads, trails, existing firelines, previous burns, wetlands and water bodies. This strategy will only be implemented given that the Florida Division of Forestry, local fire rescue and District staff agree that containment is possible through this method. Direct suppression action will be taken if there is extreme weather expected, wildfire occurrence is such that crews will need to respond to additional fires, sufficient resources are not available, and smoke sensitive areas will t be affected.

Plans should be developed and implemented as soon as possible after each wildfire requiring direct suppression to rehab all firelines plowed to contain the fire.

Post Burn Reporting:

Post burn/wildfire reports[8]must be completed and submitted after each prescribed fire of wildfire. The burn report includes pertinent information regarding acreage, natural community type, planning time, implementation time; mop up hours, equipment type and hours of use and names of participating staff. Timely completion of these reports is necessary to compile information relative to the District-wide prescribed fire program.

[8] Exhibit 3

Regional staff are currently developing methodologies to implement a post burn monitoring process to evaluate the effects of prescribed fires and to determine if specific objectives are being met. Post burn monitoring will document information relative to the burns effects, which will be beneficial for planning of future burns and management projects.

Smoke Management:

Smoke management in relation to prescribed fire has become one of the most difficult challenges for the prescribed fire manager to overcome. As urban sprawl in Florida continues creep further into previously rural areas, there become fewer areas to maneuver a smoke column from a prescribed burn. Smoke management is one of the major limiting factors when attempting to conduct burns within the Restoration Area. Due to the location of SSA's surrounding the OPRA, applicable wind directions for prescribed fire are somewhat limited for certain FMU's. Several subdivisions and private residences are also located adjacent to or near the southern and western boundaries of the property. As the population in the area continues to grow and highway traffic continues to increase fire management will continue to become more difficult.

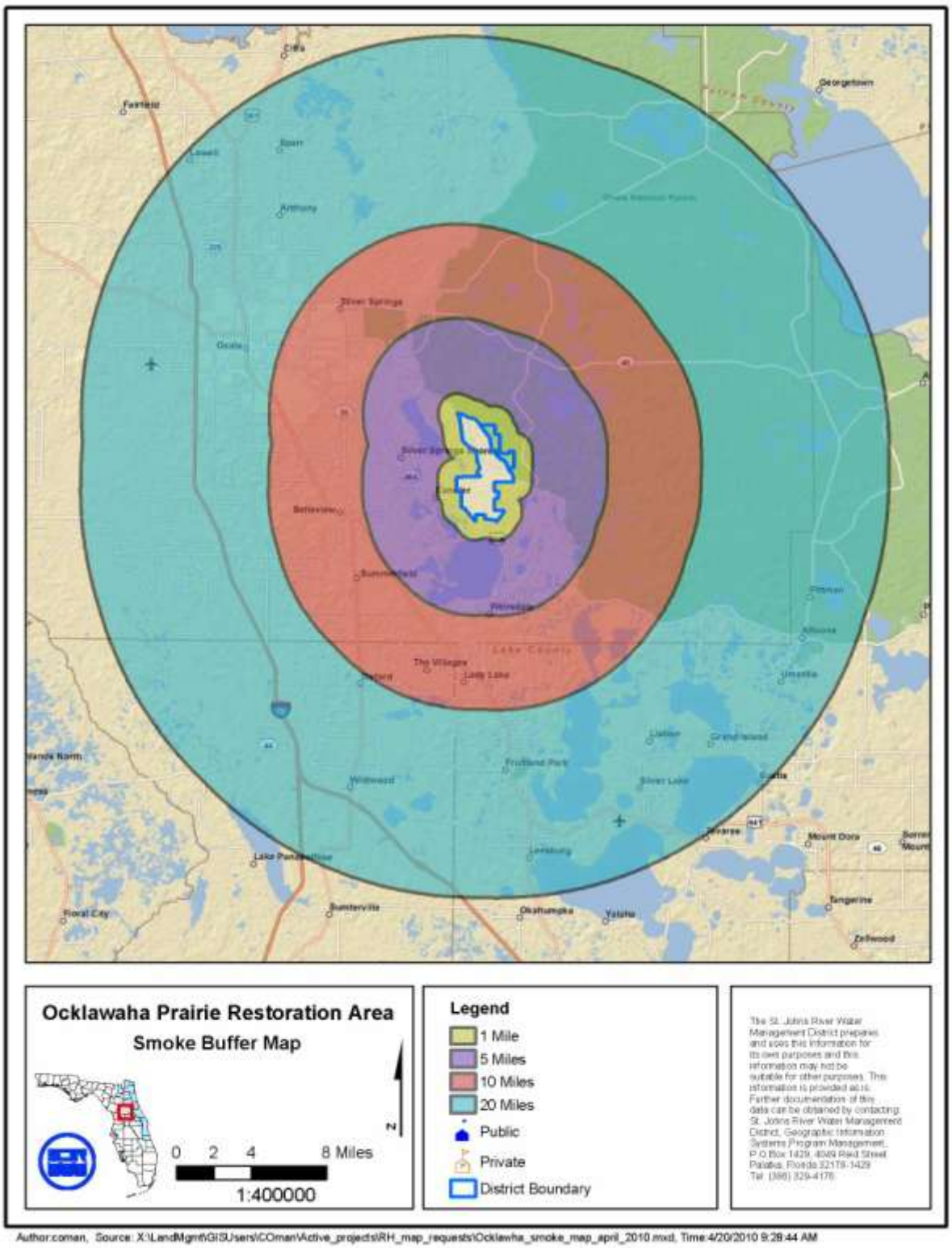
Along with each prescription, an extensive smoke screening process must be completed before burn authorizations are obtained from the Florida Division of Forestry (FDOF). District staff obtain a fire weather forecast and evaluate for suitable weather conditions to meet burn and smoke management objectives. Wind directions are chosen for each FMU that will transport smoke away from SSA's. When possible staff chose a wind direction that will direct the smoke column across the conservation area minimizing smoke impacts to SSA's.

Smoke dispersion[9] is a key element to successful smoke management. The burn manager must select days when the smokes ability to mix and disperse into the atmosphere are good, dispersion indices should be greater than 35 and less than 70. An index of less than 35 indicates a stable weather environment, therefore reducing the ability of smoke to effectively mix and disperse into the atmosphere. Conversely, an index greater than 70 indicates a very unstable weather environment, which allows for very rapid mixing and dispersal of smoke but also indicates an increased risk of very active, extreme fire behavior. Forecast mixing heights[10]should be above 1700 feet and transport wind speeds[11] should be at least 9 mph effectively minimizing residual smoke impacts.

[9] Lavdas Dispersion Index assesses the atmospheres capacity to disperse the smoke plume.

[10] Mixing Height is measured from the surface upward and is the height in the atmosphere which vigorous mixing of smoke occurs due to convection.

[11] Transport wind speed is the measure of the average rate of the horizontal transport of air within the mixing layer, refers to the rate in which emissions will be transported from one area to another.


Ocklawaha Prairie Restoration Area
Smoke Buffer Map
0 2 4 8 Miles
1:400000
Legend
1 Mile
5 Miles
10 Miles
20 Miles
Public
Private
District Boundary
Author:coman, Source: X:\LandMgmt\GIS\Users\COman\Active_projects\RH_map_requests\Ocklawha_smoke_map_april_2010.mxd, Time:4/20/2010 9:28:44 AM

Mechanical Treatments:

Due to the shrubby and somewhat non-pyric nature of some of the FMU's within the area, mechanical treatments have and may be employed in the future to improve individual units' ability to carry fire, each time reducing the volume of shrubs and allowing grasses to establish. Mowing and roller chopping and herbicide application are the preferred methods of mechanical treatments within the OPRA. Mowing and roller chopping treatments are utilized within shrubby units to reduce shrub height and stature allowing grasses and other fine fuels to establish..

In addition to these mechanical treatments, herbicide applications are occasionally implemented as a means of reducing non-desirable competing vegetation and removing invasive exotic species. Herbicide applications will be used in the future to thin dense hardwoods, shrubs, and to remove pasture grasses during restoration projects.

Management Concerns and Challenges:

Due to years of agricultural use across the Conservation Area, the natural communities across portions of the property are severely degraded or non-existent. One of the foremost challenges lies within the restoration of the native groundcover indicative to the natural communities of the area. Past land use in some instances has totally removed the native seed bank; restoration of certain key species to these sites will be difficult, time consuming and expensive to achieve. Prescribed fire must remain an integral part of the management scheme to achieve successful restoration of the natural communities within the OPRA. The primary concern for the longevity of the prescribed fire program within the conservation area is smoke management. Management of smoke is becoming an issue in many parts of the state due to population growth an urban sprawl. Due to many factors such as weather, scheduling, season and resource availability the window of opportunity for prescribed burning is becoming smaller. While fire is generally held as the priority mission, these factors limit the amount of days within a year that burns can be conducted.

Legal Considerations[12]:

Only burn managers certified by FDOF will approve the unit prescriptions and must be on site while the burn is being conducted. Certified burn managers adhering to the requirements of State Statute 590.026 are protected from liability for damage or injury caused by fire or resulting smoke, unless negligence is proven.

Exhibit 1

ST. JOHNS RIVER WATER MANAGEMENT DISTRICT
FIRE MANGEMENT UNIT PRESCRIPTION

AREA:	Ocklawaha Prairie Restoration Area	**FIRE MGMT. UNIT:**	OK19,20,21,22,23
TOTAL BURN AREA:	Ok19-15,OK20-94,OK21-10,OK22-84,OK23-144 Total-347	**BURNABLE ACRES:**	OK19-15,OK20-75,OK21-10,OK22-84,OK23-120 Total-304

[12] Thomas Creek Conservation Area Draft Fire Management Plan, prepared by Joanna Emanuel

BURN DATE:				**CERT.#:**				
COUNTY(S):	Marion	**S:**	5,8,9		**T:**	16S	**R:**	24E
		S:			**T:**		**R:**	
LANDOWNER#:	**16824**			**CONTACT FOR AUTHORIZATION**				
AUTHORIZATION#:				Florida Division of Forestry WaFc, Waccasassa, 352-955-2010				
HELISPOT COORDINATES:	**LAT. LONG.**							
Certified Burn Manager Signature:								

SITE DESCRIPTION

Last burn date:	1997
Community type and general information:	Entire area consists of a mix of Flatwoods, bay swamp, sandhill, scrubby flatwoods and bay swamp natural communities; fuel loads a re high in the flatwoods areas. Units 19 and 23 have bay swamps along the eastern boundary which prevents burning from being possible without joint participation with the USFS
Topography:	Flat well drained sands in uplands, poorly drained sands and organic muck in the wetlands
Firebreak description:	Units are bordered south and east by mineral soil breaks and trail roads, the exception being the eastern side of units 19 and 21 where line construction is not possible. The western side of the burn area is the Kyle Young Canal (aka. Ocklawaha River)

PURPOSE OF BURN:	Fuel Reduction
Specific Objectives	Reduce fine fuel accumulations by 60%, increase accessibility into units, prepare site to receive growing season fire, reduce risk of catastrophic wildfire.

FIRE WEATHER FORECAST AND PRESCRIPTION PARAMETERS					
Parameter	Minimum	Maximum	Day	Night	Observed
CLOUD AMOUNT		60%			
CHANCE PRECIPITATION (%)		30			
PRECIPITATION TYPE					
TEMPERATURE (°F)		80			
RELATIVE HUMIDITY (%)	35	60			
WIND DIRECTION		Any			
WIND SPEED (MPH)	5	18			
PRECIPITATION AMOUNT					
PRECIPITATION BEGINS					
PRECIPITATION ENDS					
PRECIP DURATION					
LIGHTNING FREQUENCY					
TRANSPORT WINDS (DIR)		Any			
TRANSPORT WIND (MPH)	9	25			
1 HR FUEL MOISTURE	3	11			
MIXING HEIGHT (FT)	1700	6500			
DISPERSION INDEX	30	65			
LVORI					<7
DROUGHT INDEX		<500			
CEILING HEIGHT					

FIRE BEHAVIOR (CALCULATED FACTORS)	INSIDE (used min and max weather values)		OUTSIDE		TODAY	OBSERVED
FUEL MODEL	SH7,SH4, TL9		SH7,SH4, TL9, GR2			
RATE OF SPREAD (CH/HR)	7.3	312.6	7.3	312.6		
FIRELINE INTENSITY (Btu/ft/s)	125	10081	125	10081		
HEADFIRE FLAME LENGTH (ft)	4.1	31.2	4.1	31.2		
PROBABILITY OF IGNITION (%)		34		34		

PRECIPITATION SUMMARY		
# Rain Days (at least 0.5") in Previous 30 Days	Date of last rain event of at least .5” and actual amount	Amount of Rain in Last 7 Days

SMOKE MANAGEMENT

Objectives:	Use winds that direct smoke across conservation lands. Use a dispersion index and mixing height that provide for sufficient lift and mixing. Complete ignition by 1630. Begin mop-up in respective areas ASAP.
Smoke sensitive areas and distances:	CR314 A 1.3 miles east, The Refuge .7 miles SE.
Special precautions:	Monitor winds and lifting to recognize potential issues regarding smoke management, post signs if needed on highways. Ensure unit contains enough soil moisture to prevent ignition of organic soils

Fuel model	Fuel category	Firing technique	Impact distance	LVORI forecast	Organic soils present Y/N
					Y

PERSONNEL AND EQUIPMENT SUMMARY

Position/ Personnel	Equipment	Notes
1 (burn boss)	ATV/Pickup	
2 Engine boss & crew	Type VI Engine	
2 Engine boss & crew	Type VI Engine	
1 (ignition)	Wet ATV	
2 (holding)	Wet JD Gator	
1	Tractor Plow	

IGNITION PLAN

If East Component Wind, Begin by establishing north and south lines of area, once established use interior lines and roads to flank fire into interior of unit. Use flare gun to ignite spots ahead of flanks to aid in keeping intensity down

HOLDING AND CONTINGENCY PLAN

- Use weather and fire behavior parameters that allow for containment of spot fires with the use of Tractor plow and one type 6 engine with crew of two.
- Limit PIG to 40% or less.

- Dispatch on-site tractor plow and one type 6 engine to initial attack and mop-up spot fires. When IA is complete rehab resources and get back in position. Continue to mop-up and monitor any spots with appropriate resources.
- All spot fires will be contained to <2 acres no spot fires shall leave the property.

Sources for assistance:
FDOF, dispatch #352-955-2010, travel time= 20'
County Fire Services, dispatch #352-369-6779, travel time=10'

PUBLIC RELATIONS PLAN

Objective: Ensure that public is made aware of burn and public impression is positive.

Contact Name/Agency	Phone Number	Proposed Contact Time Frame/Issue	Contact Type, Date & Time
SJRWMD office of communications, Hank Larkin	407-659-4835 407-832-3703	24 hours prior and morning of burn/ media contact	
Ocala Fire Center	352-759-2081	Day of burn/courtesy	
DOF Waccasassa Dispatch	352-955-2010	Day of burn/courtesy	
Marion Sheriff Department	352-732-9111	Day of burn/courtesy	
Marion county fire rescue	352-369-6779	Day of burn/courtesy	
Scott Byrd Sec. resident	352-721-1810	Day of burn/courtesy	
Brian Emanuel	386-937-0552	Day of burn/courtesy	
The Refuge	352-288-3333	Day of burn/courtesy	

SAFETY PLAN

Objective: Ensure safety of all burn crew members and public

Safety Issue	Mitigation Measure
Escape Routes and Safety zones	Designate escape routes and safety zones and ensure all crews know locations and exit procedures
Thick vegetation	Limit ignition to established trails and lines, no interior ignition off trails.

PREBURN PREPARATIONS AND CHECKLIST
ON-SITE

- Ensure Organic soils have sufficient moisture to prevent ground fire
- Disk Firelines
- Establish line on North side of unit 23

OFF-SITE

- Notify office of communications for press release
- Implement public relations plan
- Notify The Refuge

GO/NO-GO CHECKLIST FOR DAY OF BURN

- ❑ Burn Plan Complete and Approved
- ❑ All prescription requisites met
- ❑ Required Environmental and Fire Behavior Factors Verified Within Prescription
- ❑ Authorization obtained
- ❑ Adjacent landowners notified
- ❑ Local contacts made
- ❑ Smoke screening performed and documented
- ❑ All equipment and personnel required on scene and fully operational
- ❑ Each crew member has proper personal gear, map and clothing
- ❑ Current and projected forecast favorable
- ❑ Crew members briefed and given an opportunity to decline participation

BRIEFING OUTLINE

- ❑ Objectives of Burn
- ❑ Exact area of burn
- ❑ Hazards Discussed (volatile fuels, spotting potential, points of concern, terrain features)
- ❑ Crew assignments made
- ❑ Ignition pattern and technique
- ❑ Location of extra equipment, fuel, water, vehicle keys
- ❑ Authority and communications
- ❑ Contingencies covered including escape routes or procedures
- ❑ Sources of nearest assistance. Nearest phone and emergency numbers
- ❑ Special instructions regarding smoke management, contact with the public and others.
- ❑ Questions

PREPARED BY	R.H. Davis	**DATE**	4/21/2010

Exhibit 2

Aerial Burn Safety Plan
Ocklawaha Prairie Restoration Area

The hazards associated with this type of burning are related to working with the helicopter, the sphere dispenser, and dealing with active fire. All helicopter safety procedures and all district fireline policies and procedures will be followed.

1. **BRIEFING -** During the operational briefing, the safety plan will be reviewed with all personnel on the burn.
2. **HELICOPTER SAFETY -** The pilot will give a helicopter safety briefing at the morning operational briefing.
3. **AIDS SAFETY –** The operator will review the operation and cleaning procedures for the dispenser at the morning briefing.
4. **PERSONAL PROTECTIVE EQUIPMENT –** The incident commander will ensure that all personnel have the required PPE.
5. **HIGH HAZARD AREAS –** All high hazard areas such as power lines shall be designated on the map and attached to the burn plan.
6. **EMERGENCY LANDING ZONES –** These should be confirmed with the pilot and indicated on the burn map.
7. **Helispot 1**
   Latitude N 29.06010 Chornobyl Parking Area
   Longitude W 081.91398

Crash Rescue Plan

In the event of an accident involving the helicopter, the following procedures will be followed.

INCIDENT COMMANDER or BURN BOSS

1. Notify Marion Fire and Rescue (352-694-6667), Marion County Sheriff (352-732-9111) or 911.
2. Assume responsibility of the Rescue Operation.
3. Notify NTSB (305-957-4610 or 404-462-1666)
4. Delegate responsibility of fire control to the second in command or the most qualified.
5.

SECOND IN COMMAND

1. Assume responsibility of the burn.
2. Assist the IC or Burn Boss with resource and personnel needs for the rescue operation.
3. If the IC is in the helicopter, second in command will assume rescue operation responsibilities and assign the most qualified to fire control.

Emergency Phone Numbers

AIR RESCUE UNITS

1. Orlando Regional Medical Center
   Air Services **407-843-5783 or 800-895-4615**

BURN UNIT LOCATIONS

1. Orlando Regional Medical Center – Burn Unit **407-237-6398**

DIVISION OF FORESTRY

1. Waccasassa Forestry Dispatch **352-955-2010**

NTSB

1. Southeast Regional Office **305-957-4610**
2. Southeast Field Office **404-462-1666**

Exhibit 3

Prescribed Burn Report

Quantitative Data

Date	3/25/10
Burn Boss	R.H. Davis/Dwight Snow
Authorization #	27679
Management Unit	Ocklawaha Prairie
Burn Zone	
Natural Community Burned	Flatwoods, Hammock
District Staff Hours Burning	63
District Staff Hours Planning Burn	20
DOF/Cooperator Hours	56
Mop up Hours	1
District Dozer Hours (report hours dozer was at fire)	8
DOF Dozer Hours (report hours dozer was at fire)	USFS 1@7
Engine Hours (report hours engine was at fire)	District- 2@8ea USFS-2 @ 6ea
ATV's # and hours	District- 1@8 USFS-1@6
Marsh master Hours	0
Airboat Hours	0
Helicopter Hours	3
Helicopter Owner	USFS
# Cases of Ping-Pong Balls	4-5
# Of Flares Used	0
Hours and gallons of Tera torch use	0
Acres to be Burned	**615** (1107 acres total area including USFS portion)
Acres Completed	**511** (Units 20/21 were fired but did not burn reduction of 104 acres)
Horse Days Used	0

District staff participating in the burn. (Names) .	R.H. Davis, D.J. Hill, Daniel Kennedy, Jim Godfrey, Tom Boyette, Maryann Kickendall, David Kickendall USFS Staff- Dwight Snow, Cory Cromer, Harvey Howard, Chris Jare, Jason Thompson, Jay Garcia, Ann Lugibill

Ocklawaha Prairie Restoration Area Forest Management and Restoration Plan

PREPARED BY:
St. Johns River Water Management District
Division of Land Management
2010

Ocklawaha Prairie Restoration Area
Marion County, Florida

The following Forest Management and Restoration Plan provides general management guidelines which focuses on uplands, wetland transition zones, and wetlands. This document will provide the guidelines necessary to implement land management activities within the Ocklawaha Prairie Restoration Area (OPRA).

Introduction:

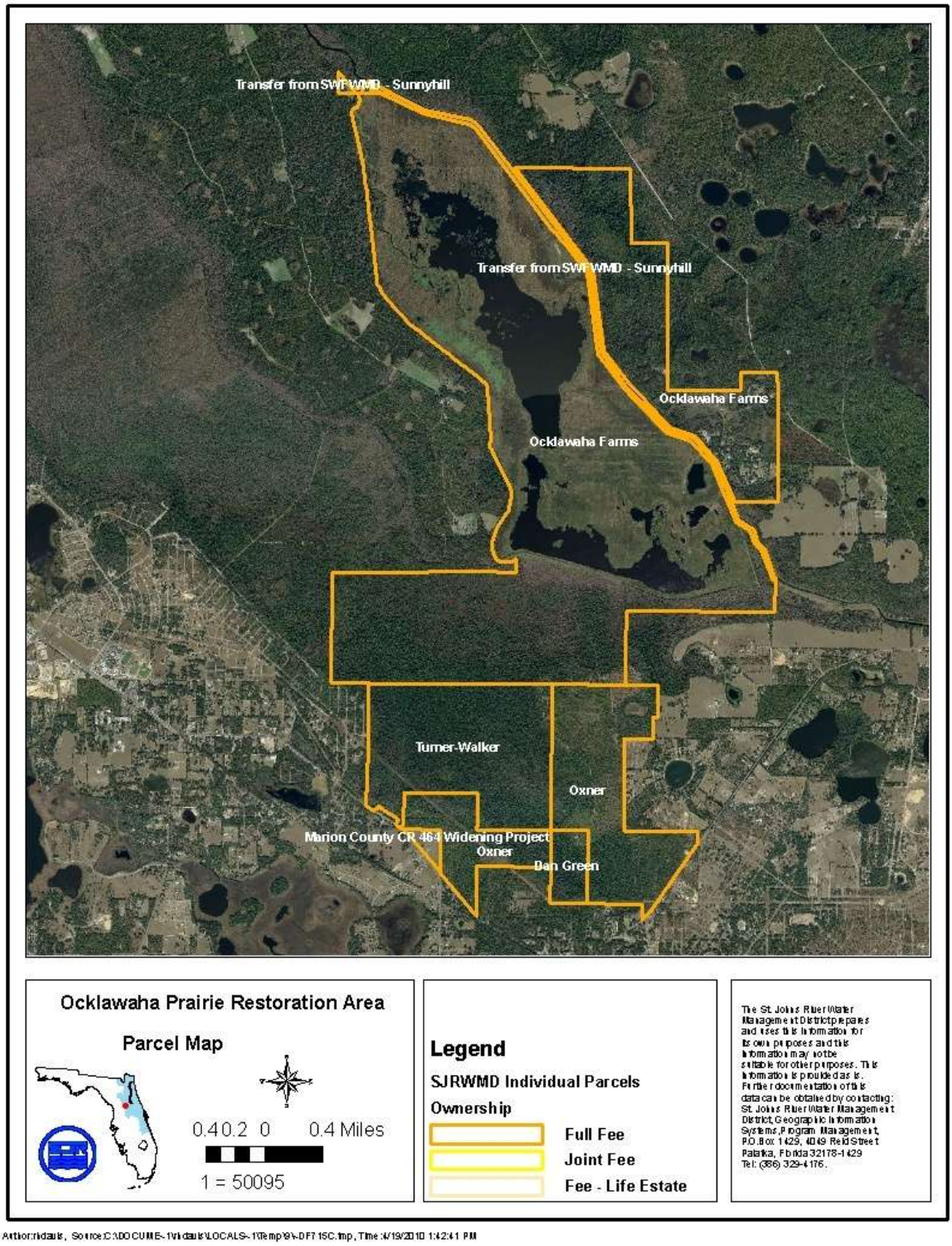
The OPRA encompasses approximately 6095 acres in Marion County. The Conservation Area is located north of the Town of Ocklawaha, north C.R. 464 (Maricamp Rd.), and west of the community of Moss Bluff, west of C.R. 314A and C.R. 464 C. The purchase of the six different parcels that make up the OPRA (Figure 1) spanned from February of 1991 through November of 2007.

The primary land use for the area pre District ownership was primarily agriculture in the form of cattle ranching, row crops, and timber. Management strategies for the area include water resource protection, resource management, natural community restoration and passive recreation.

Years of farming, timbering and drainage activities have resulted in a vastly altered landscape and ultimately the loss of portion of the native species within the site. Furthermore, the lack of fire in these communities brought more encroachment. Restoration activities across the OPRA will vary depending on the current condition, location and community in a given area. The District has and will continue to initiate projects in the future to restore the native vegetation within the site to the extent possible and practical.

The purpose of this Forest Management and Restoration Plan is to develop a strategy that will allow the District to implement, over time, techniques that will create desired future conditions (DFC's). The DFC's are derived from aerial interpretation from the 1940's to present, studying soil surveys, and using on-site data collected from the OPRA.

Figure 1. The parcels that make up the OPRA.



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Goals:

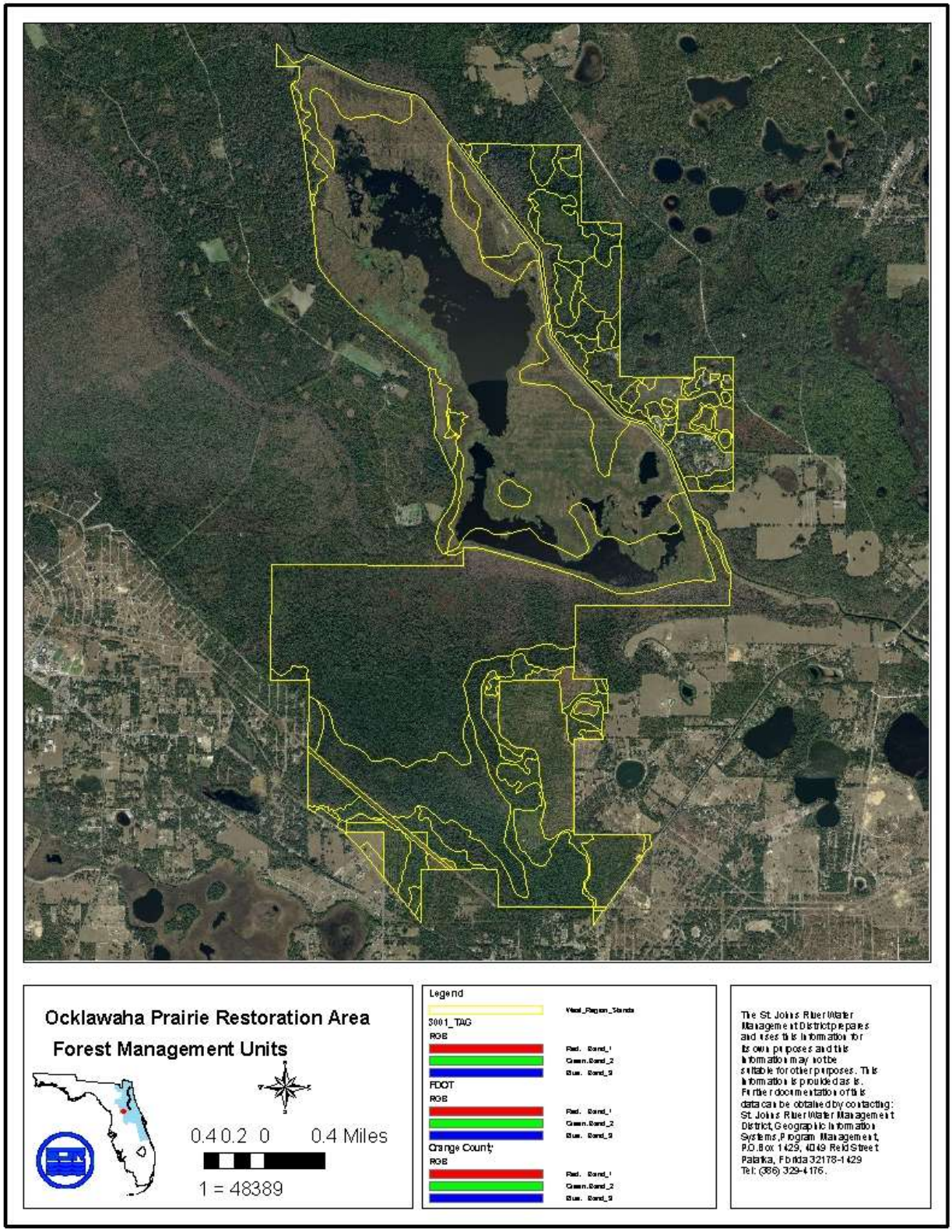
The goals of this Forest Management and Restoration Plan are to:

- Increase natural communities that are indicative to this area
- Reduce exotics and control encroachment of undesired species
- Increase the population of listed species
- Improve the overall health of the ecosystem

Management unit descriptions:

The OPRA has been divided into management units by utilizing existing natural community breaks and soil delineations. (Figure 2)

Figure 2. The OPRA divided into management units typed by natural community breaks



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Historic Natural Community Descriptions:
According to the 1970's *Soil Survey Report, Maps and Interpretations-Lake County Area, Florida*, there are 28 different soil map units occurring in the uplands and transition zones from uplands to wetlands at OPRA (Figure 3). Listed below are the community descriptions according to the *Florida Natural Areas Inventory, "Guide to the Natural Communities of Florida"*, beginning with the driest: scrub, sandhill, mesic flatwoods, wet flatwoods, bottomland forest, basin swamp, and floodplain. Note: there are several variations to each community type, depending on plant composition and site location within a given region.

Sandhill:
The natural vegetation of this community consists of mature scattered longleaf pine (Pinus palustris) as an overstory. Areas of which pine have been removed are primarily turkey oaks (Quercus laevis). The ground cover under the pines may consist of bracken fern (Pteridum aquilinum), partridge pea (Cassia spp.), pineland beggarweed (Desmodium strictum) and wire grass (Aristida Spp.) along with many other upland species. Similar to the scrub this community will also have scattered vegetation with open areas of light colored sand.

Xeric Hammock:
The natural vegetation of this community consists of xeric oaks (Quercus Spp.), pignut hickory (**Carya glabra**), southern magnolia (Magnolia grandiflora), redbay (Persea borbonia), and American holly (**Ilex opaca**).The understory usually consists of saw palmetto (Serenoa repens), beautyberry (Callicarpa americana), persimmon (Diospyros virginiana) and yaupon (Ilex vomitoria).

Mesic Flatwoods:
The natural vegetation of this community consists of slash pine (Pinus elliottii) with scattered live oaks (Quercus virginiana). The understory usually consists of saw palmetto (Serenoa repens), dwarf huckleberry (Gaylussacia dumosa), shining sumac (Rhus lanceoluta), and gallberry (Ilex glabra). Grasses usually found in this area are broomsedge bluestem (Andropogon virginicus), lopsided indiangrass (Sorghastrum secundum), wiregrass (Aristida Spp.) and sedges (Cyperus spp.).

Hydric Hammock:
The natural vegetation consists of laurel oak (Quercus laurifolia), cabbage palm (Sabal palmetto), water oak (Quercus nigra), sweetbay (**Magnolia virginiana** *L*), sweetgum (Liquidambar styraciflua), red maple (Acer rubrum) and loblolly pine (Pinus taeda). The understory commonly found in this community are waxmyrtle (Myrica cerifera), sawpalmetto (Serenoa repens), Florida elm (Ulmus americana var. floridana), poision ivy (Rhus radicans), Virginia creeper (Parthenocissus quinquefolia), and dahoon holly (Ilex cassine)**.**

Wet Flatwoods:

The natural vegetation consists of live oak (Quercus virginiana), laurel oak (Quercus laurifolia), water oak (Quercus nigra), scattered slash pine (Pinus ellioti), sweetgum (Liquidambar styraciflua), and bald cypress (Taxodium distichum), red maple (Acer rubrum). The understory commonly found in this community are waxmyrtle (Myrica cerifera), cabbage palm (Sabal palmetto), sawpalmetto (Serenoa repens) gallberry (Ilex glabra), cutgrass (Panicum abscissium), wiregrass (Aristida Spp.) beaked panicum (Panicum anceps), and sand cordgrass (*Spartina bakeri).*

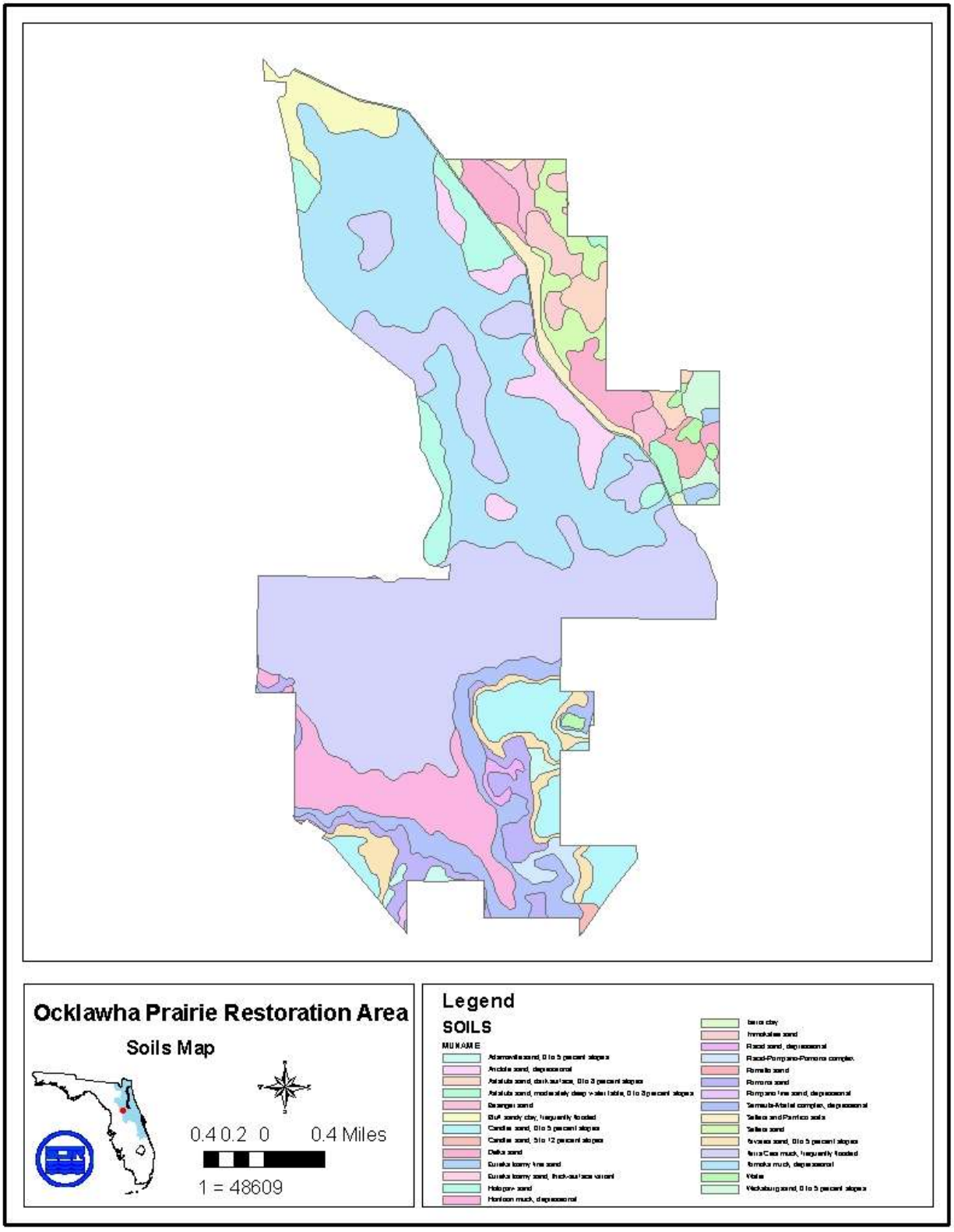
Basin Swamp:
The dominant species found in this community is cypress (Taxodium); other natural vegetation types found in this community are red maple (Acer rubrum), blackgum (Nyssa sylvatica), water tupelo (Nyssa aquatica) and slash pine (Pinus ellioti). Shrubs commonly found in this type of community are buttonbush (Cephalanthus occidentalis) and southern waxmyrtle (Myrica cerifera). Other vegetation commonly found is cinnamon fern (Osmunda cinnamomea), lizard's tail (Saururs cernuus) and royal fern (Osmunda regalis).

Depression Marsh:
Similar to, but are generally smaller than basin swamps. Shrubs commonly found in this type of community are buttonbush (Cephalanthus occidentalis) and southern waxmyrtle (Myrica cerifera). Other vegetation commonly found is chain fern (**Woodwardia virginica**), yellow-eye grass (Sisyrinchium californica) and maidencane (**Panicum hemitomon**).

Floodplain Swamp:
The natural vegetation found in this community is red maple (Acer rubrum), blackgum (Nyssa sylvatica), water tupelo (Nyssa aquatica) and bald cypress (Taxodium distichum). Shrubs commonly found in this type of community are buttonbush (Cephalanthus occidentalis) and dahoon holly (Ilex cassine). Other vegetation commonly found is cinnamon fern (Osmunda cinnamomea), lizard's tail (Saururs cernuus) and royal fern (Osmunda regalis).

Floodplain Marsh:
This community appears as an open expanse of sawgrass (Cladium jamaicense) in an area where the soil is saturated or completely covered with surface water during most of the year. Other vegetation commonly found is plume grass (Erianthus spp.), pickerelweed (Pontederia cordata) and (Pontederia lanceoluta). Muhly grass (Muhlenbergia capillaries) will become evident when the sawgrass marsh is repeatedly exposed to fire.

Figure 3.Soils Map of the OPRA



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Soils:
Below are brief descriptions of different soil types found on the OPRA. Each description contains drainage and permeability, slope, range in characteristics, and naturally occurring vegetation. The soils descriptions were obtained from the USDA-NCRS Official Soil Series Description Website.

Adamsville - This is a, somewhat poorly drained, rapidly permeable soils on broad flats, low knolls, and lower side slopes. Slopes range from zero to 5 percent. The depth of sand or fine sand extends to 80 inches, or more. Soil reaction ranges from very strongly acid to moderately acid. Natural vegetation consists of pines, laurel, and water oaks with a ground cover of saw palmetto, pineland three-awn, indiangrass, bluestem grasses, and several low panicums.

Anclote - This is a very deep, very poorly drained, rapidly permeable soil in depressions, poorly defined drainage ways, and flood plains. They formed in thick beds of sandy marine sediments. Slopes range from zero to 1 percent. Depth of sand is 60 inches or more. The content of silt plus clay is less than 15 percent in the 10 to 40 inch particle-size control sections. Soil reaction is strongly acid through moderately alkaline throughout. Native vegetation consists of cypress, bay, popash, pond pine, cabbage palm, red maple, and juncus species.

Astatula - Consists of very deep, excessively drained, rapidly permeable soils that formed in eolian and marine sands. Reaction ranges from very strongly acid through slightly acid throughout, except where the surface has been limed. Natural vegetation consists of bluejack, blackjack, turkey oaks, longleaf pine, sand pine, and an understory of rosemary, pineland threeawn, bluestem, paspalum, lopsided indiangrass, and panicum.

Basinger – This is a very deep, very poorly drained, rapidly permeable soil found in sloughs, low flats, depressions, and drainage ways. Slopes range from zero to two percent. Native vegetation consists of wax myrtle, st. johns wort, maiden cane, pineland threeawn, bald cypress, slash pine, longleaf pine, and pond pine.

Bluff – This is a 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. Reaction of the A horizon ranges from moderately acid to slightly alkaline and the Bkg horizons range from slightly acid to moderately alkaline. 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.

Candler - This is a deep, excessively drained, rapidly permeable soil on uplands. They formed in thick beds of marine deposits of coarse textured materials. Slopes range from zero to up to 25 percent in dissected areas. Reaction is very strongly acid to moderately acid throughout. Native vegetation consists of blue jack oak, turkey oak, post oak, live oak, and longleaf pine with a sparse understory of indiangrass, chalky bluestem, pineland three-awn, hairy panicum, and other annual forbs.

Delks – Consists of very deep, poorly drained, slowly permeable soils found in broad areas of the flatwoods in the lower coastal plain. They are formed from sandy marine sediments overlaying a clayey material. Slopes range from zero to two percent. The native vegetation consists of slash pine, laurel oak, longleaf pine, live oak, saw palmetto, huckleberry, wax myrtle, gallberry, bluestems, and pineland threeawn.

Eureka – This is a deep poorly drained, very slowly permeable soil that are formed in loamy clay marine sediments. This soil series typically occurs along broad flats and interstream divides amd depressions in central and southern Florida. Slopes range from zero to 2%. The native vegetation for this series consists of longleaf and slash pine, bays, magnolia, wateroak, sweet gum, inkberry, pineland threeawn, bluestems, lopsided indiangrass, and wax myrtle.

Holopaw - The holopaw soil series consists of very deep, very poorly drained soils found in sandy marine sediments along low lying flats, drainageways and depressional areas. Slopes range form zero to two percent. The natural vegetation consists of slash pine, pond pine, sabal palm, saw palmetto, bald cypress, wax myrtle, sand cord grass, and pineland threeawn.

Hontoon Muck- Consists of deep, very poorly drained, rapidly permeable organic soils formed in hydrophytic non-woody plant remains. This series occurs primarily within freshwater swamps and marshes, with slopes ranging from zero to two percent. The natural vegetation associated with this series consists of loblolly pine, bay, maple, gum, bald cypress, green briar and ferns.

Immokalee - This is a deep, poorly drained soil, which formed in sandy marine sediments. Slopes are dominantly zero to 2 percent but range to 5 percent. Reaction ranges from extremely acid to moderately acid except in limestone phases, which are strongly acid to mildly alkaline. Principal vegetation is longleaf and slash pines and undergrowth of sawpalmetto, gallberry, waxmyrtle, and pineland three-awn. In depressions, water tolerant plants such as cypress, loblolly bay, red maple, sweetbay, maidencane, blue maidencane, chalky bluestem, sand cordgrass, and blue joint panicum are more common.

Pamlico Muck – this series consists of very poorly drained soils formed in decomposing organic material underlain by sandy sediments. This soil occurs in floodplains, bays, and depressions within the southern coastal plain. Slopes are generally less than one percent. The native vegetation consists of pond pine, gum, bay, cypress, green briar, wax myrtle, and gallberry.

Placid - This is a very deep, very poorly drained, rapidly permeable soil on low flats, depressions, poorly defined drainage ways on uplands, and flood plains on the Lower Coastal Plain. Slopes range from zero to 2 percent. Thickness of the soil is more than 80 inches. Reaction ranges from extremely acid to strongly acid. Natural vegetation consists of pond pine, bay, cypress, gum, pickerelweed, and coarse grasses.

Pomello - This deep, moderately, poorly drained soil is 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 zero to 5 percent. Solum thickness is 40 inches or more. The soil is sand, fine sand, or coarse sand to 80 or more inches. Reaction ranges from very strongly acid to moderately acid. Native vegetation consists of scrub oak, dwarf live oak, sawpalmetto, longleaf pine, slash pine, and pineland three-awn.

Pomona – This series consists of very deep, very poorly drained, moderately slowly permeable soils occurring on broad low ridges in the lower coastal plain. These soils are formed in sandy loam marine sediments with slopes ranging from zero to two percent. The natural vegetation consists of slash and longleaf pine, south Florida slash pine, palmetto, wax myrtle, gallberry, bluestem, lopsided indiangrass, and pineland threeawn.

Pompano – Consists of very deep, very poorly drained, rapidly permeable soils in depressions, drainageways, and broad flats. They formed in thick beds of marine sands. The soils are in poorly defined drainage ways, broad flats, and in depressions. Natural vegetation consists of palmetto, widely spaced cypress, gum, and slash pine, and native grasses.

Samsula – Martel Complex – this complex of soils consists of poorly drained, rapidly permeable soils formed in hydrophytic plant remains, underlain by sandy marine sediments. This complex typically occurs within swamps and floodplains with slopes less than two percent. Typical natural vegetation consists of cypress, maple, loblolly bay, gum, pond pine, green briar, and fern.

Sellars - Consists of poorly drained, rapidly permeable soils formed in sandy marine sediments. This series occurs in low depressional areas with slopes ranging from zero to two percent. The native vegetation cosists of pond pine , bay , cypress, sweet gum, red maple, pickerel weed, and various perennial grasses.

Tavares- This is a very deep, moderately well drained, rapidly or very rapidly permeable soil on lower slopes of hills and knolls of the lower Coastal Plain. They formed in sandy marine deposits. Slopes range from zero to 8 percent. Soil reaction ranges from extremely acid to moderately acid in the A-horizon and extremely acid to slightly acid in the C-horizon. In most places, the natural vegetation consists of slash pine, longleaf pine, a few scattered blackjack oak, turkey oak, and post oak. In some places, natural vegetation consists of turkey oak, blackjack oak, and post oak with scattered slash pine and longleaf pine.

Terra Ceia Muck – This soil series is comprised of very deep, very poorly drained organic soils formed from non-woody hydrophytic plant remains. This soil occurs in freshwater marshes, river floodplains, tidal flats, and swamps with nearly level slopes. The natural vegetation has two variants. The marsh variant consists of saw grass, lilies, sedges, maidencane, and reeds. The wooded variant consists of cypress, black gum, sabal palm, Carolina ash, bay and pond pine.

Tomoka Muck – Consists of very deep, poorly drained, moderately permeable soils formed in decomposed reddish brown and black organic about 27 inches thick, underlain by a sandy loam mineral material. Slope ranges from zero to two percent. The native vegetation generally consists of saw grass, lilies, sedges, reeds, wax myrtle, cypress, bay, red maple, and pond pine.

AREA RESTORATION PLANS:

Restoration and management activities across OPRA will vary depending on the current condition, location and community in a given area. This section contains site descriptions of each management unit type by natural community breaks, giving individual management unit acres, current management unit condition, desired management unit condition, proposed action or treatment, probability of success and management priority.

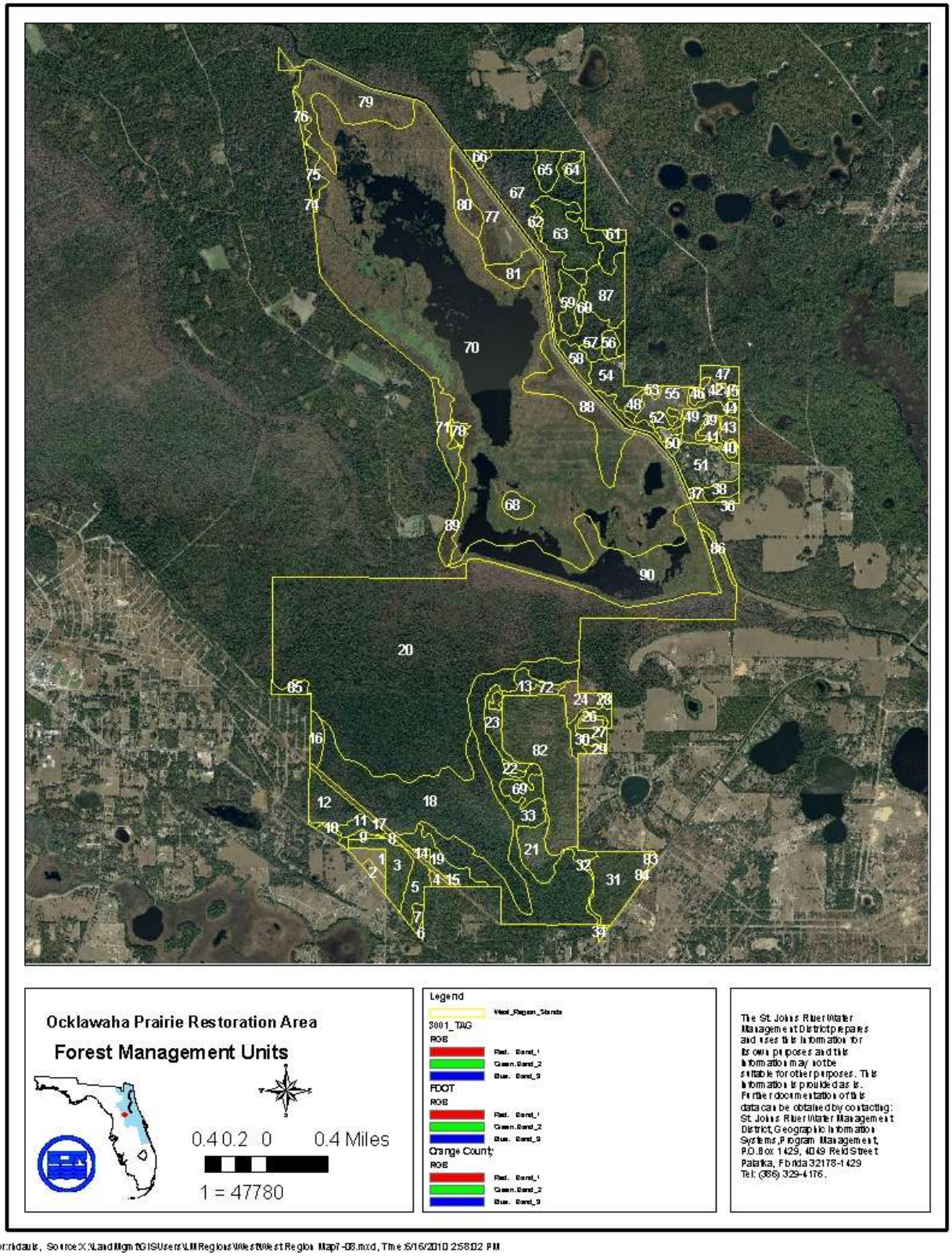
The ***current condition*** classification gives a community summary as a management unit whole. ***Desired condition*** descriptions are based on soils descriptions, ***proposed action or treatment*** is the suggested process in which it will take to restore the management unit,

probability of success is classified as a percentage by variables of ten, the higher the number the greater the probability of expected achievement and ***management priority*** is classified into five classes, listed below.

- ***(1)*** *– Site contains a high volume of native vegetation either naturally occurring or through past management activities and requires little to no manipulation to achieve objectives. Site is in maintenance mode*.
- ***(2)*** *Site contains some native species and has low to moderate volumes of non-native or offsite species encroachment. Site is recoverable and requires some manipulation to achieve objectives.*
- ***(3)*** *Site contains some native species but has high volume of non-native or offsite species encroachment. Site is recoverable but would be moderately labor intensive to achieve objectives.*
- ***(4)*** *Site is dominated by non-native and/or off site species. Site is possibly recoverable but would be highly labor intensive and time consuming to accomplish objectives*
- ***(5)*** *Site is too far gone to recover due to succession or other means, has no legal access or access has been lost due to past management activities.*

Site descriptions are only a guideline. As management techniques adapt, so must restoration methods.
Below is a chart that give brief descriptions of each management unit type, lead by a location map of each management unit. The chart contains management unit number, current vegetation description and natural community type according to the Florida Natural Areas Inventory, *"Guide to the Natural Communities of Florida"*.

Figure 4. Management Units of the OPRA



Management Unit	Current Vegetation Description	Natural Community Type
1	Pasture	Sandhill
2	Security Residence / Pasture	Developed
3	Longleaf Plantation	Sandhill
4	Slash and Longleaf Regeneration	Mesic Flatwoods
5	Mixed Slash and Pond Pine	Mesic Flatwoods
6	Mixed Slash and Pond Pine	Mesic Flatwoods
7	Mixed Pond, Slash Pine & Scattered Hardwoods	Wet Flatwoods
8	Mixed Oaks with Scattered Pine	Mesic Flatwoods
9	Scattered Pine and Mixed Oaks	Sandhill
10	Mixed Oaks with Scattered Pine	Xeric Hammock
11	Mixed Pine and Bay With Scattered Hardwoods	Mesic Flatwoods
12	Mixed Wetland Forest	Basin Swamp
13	Xeric Hammock	Xeric Hammock
14	Mixed Slash and Pond Pine	Mesic Flatwoods
15	Slash and Longleaf Regeneration	Mesic Flatwoods
16	Mixed Oaks and Scattered Pines	Mesic Flatwoods
17	Transmission Lines	Developed
18	Mixed Wetland With Scattered Bay & Tupelo	Basin Swamp
19	Mesic Flatwoods and Scattered Bay	Mesic Flatwoods
20	Mixed Wetland Forest	Basin Swamp
21	Southern Scrub Oak and Scattered Pine	Mesic Flatwoods
22	Slash Pine With Mixed Hardwoods	Wet Flatwoods
23	Live Oak Hammock	Xeric Hammock
24	Mixed Oak and Scattered Pine	Sandhill
25	Bay with Scattered Pine and Tupelo	Basin Swamp
26	Wetland With Panic Grass	Depression Marsh
27	Slash Pine with Scattered Mixed Oaks	Mesic Flatwoods
28	Mixed Oaks and Scattered Pines	Sandhill
29	Mixed Oaks and Scattered Pines	Sandhill
30	Mixed Oaks and Scattered Longleaf	Sandhill
31	Planted Longleaf Pines	Sandhill
32	Mixed Oaks and Scattered Longleaf	Xeric Hammock
33	Scattered Pines and Mixed Hardwoods	Basin Swamp
34	Planted Longleaf Pines	Sandhill
35	Transmission Lines	Developed
36	Mixed Xeric Oak and Pasture	Sandhill
37	Floodplain Cypress Swamp	Floodplain Swamp
38	Mixed Mesic Oaks and Scattered Cypress Pockets	Hydric Hammock
39	Pockets of Water and Scattered Cypress Pockets	Depression Marsh
40	Pockets of Water and Scattered Cypress Pockets	Depression Marsh
41	Scattered Tupelo and Bay	Basin Swamp
42	Game Check Station and Parking Area	Developed
43	Shrub and Brushland	Mesic Flatwoods

Management Unit	Current Vegetation Description	Natural Community Type
44	Tupelo and Scattered Bay	Depression Marsh
45	Borrow Pit with Scattered Pines and Oaks	Sandhill
46	Tupelo and Scattered Sweetgum	Depression Marsh
47	Mixed Hardwoods and Slash Pines	Sandhill/Hydric Hammock
48	Mixed Upland Hardwoods	Mesic Flatwoods
49	Planted Longleaf Pines	Mesic Flatwoods
50	Mixed Xeric Oak Hammock	Xeric Hammock
51	Refuge	Developed
52	Mixed Hardwoods with Scattered Cypress and Pine	Floodplain Swamp
53	Carolina Willow and elderberry	Depression marsh
54	Slash Pine and Scattered Bay	Mesic Flatwoods
55	Pasture	Mesic Flatwoods
56	Scrub Oaks and Scattered Pine	Mesic Flatwoods
57	Slash Pine and Mixed Oaks	Mesic Flatwoods
58	Mesic Hammock with Scattered Pine and Oaks	Floodplain Swamp
59	Pine Flatwoods	Mesic Flatwoods
60	Scrub Oaks	Mesic Flatwoods
61	Xeric Oaks and Scattered Longleaf Pine	Sandhill
62	Mixed Oak Hammock	Mesic Flatwoods
63	Mesic Pine Flatwoods with Scattered Bay	Mesic Flatwoods
64	Mixed Pine Flatwoods with Mixed Oaks	Mesic Flatwoods
65	Mixed Pine Flatwoods with Mixed Oaks	Mesic Flatwoods
66	Mesic Flatwoods	Mesic Flatwoods
67	Cypress with Mixed Pine and Hardwoods	Mesic Flatwoods
68	Scattered Willow and Brush	Floodplain Swamp
69	Slash Pine and Mixed Hardwoods	Mesic Flatwoods
70	Freshwater Marsh	Floodplain Marsh
71	Feral Farm Fields	Wet Flatwoods
72	Scattered Upland Hardwoods	Sandhill
74	Boat Ramp, Weather Shelter and Parking Area	Developed
75	Mesic Upland Mixed Pines and Oaks	Wet Flatwoods
76	Mixed Oaks and Scattered Pines	Floodplain Swamp
77	Mixed Oaks, Sweetgum and Sand Cord Grass	Wet Flatwoods
78	Scattered Slash Pine and Mixed Hardwoods	Wet Flatwoods
79	Freshwater Marsh	Floodplain Swamp
80	Freshwater Marsh / Mesic Transition	Floodplain Swamp
81	Mixed Oaks, Sweetgum and Sand Cord Grass	Floodplain Swamp
82	Longleaf Plantation	Sandhill
83	Mixed Xeric Oaks	Sandhill
84	Parking Area	Developed
85	Mixed Xeric Oaks	Mesic Flatwoods
86	Levee	Developed

87	Xeric Oaks and Scattered Longleaf Pine	Sandhill

Management Unit	Current Vegetation Description	Natural Community Type
88	Freshwater Marsh with Scattered Shrub and Brush	Floodplain Swamp
89	Freshwater Marsh with Scattered Shrub and Brush	Wet Flatwoods
90	Freshwater Marsh with Scattered Shrub and Brush	Floodplain Swamp

Management unit by community type according to soils descriptions.

Sandhill:

Management unit 1: 15 acres

- **Historic Condition** – Sandhill
- **Current Condition –** Pasture
- **Desired Condition –** Sandhill
- **Proposed Action / Treatment –**
  1. Conduct a District approved herbicide treatment focused on reducing the undesired species, pasture grasses , exotics, etc, followed by a burn to reduce thatch.
  2. Ground cover planting project would follow herbicide treatments, which would consist of establishing grasses indicative of the Sandhill community.
  3. Monitor the site for at least 2 years to determine planting success.
  4. Establish a 2-5 year burn rotation.
  5. Site will be used as a seed donor site once groundcover has established, no attempt will be made to establish the overstory component at this time

- **Probability of Success – 90%**
- **Management Priority – 3**

Management unit 3, 31, 34, 82: 331 total acres

- **Historic Condition** – Sandhill
- **Current Condition –** Longleaf Pine Plantation
- **Desired Condition –** Sandhill
- **Proposed Action / Treatment -** Two possible options for restoration exist for these units
  1. **Option A**
     1. Evaluate potential for pine straw harvest operation, until first tree thinning operation.
     2. Conduct herbicide treatments in conjunction with pine straw operations.
     3. Post tree thinning, mechanically plant native groundcover between rows of remaining trees
     4. A fire return interval of 2-5 years should be reintroduced
  - **Option B**

1. Conduct two herbicide operations using Plateau™ herbicide to release planted wiregrass and control bahia grass.
2. Prescribe burn on a two to five year rotation
3. Evaluate units for a selective harvest to reduce pine density
4. Mechanically plant additional native groundcover between pine rows

- **Probability of Success – 90%**
- **Management Priority - 2**

Management unit 9: 5 acres

- **Historic Condition** – Sandhill
- **Current Condition –** Scattered Pines and Mixed Oaks
- **Desired Condition –** Sandhill
- **Proposed Action / Treatment –**
    1. Conduct a herbicide and or mechanical treatment to reduce the undesired shrubs and grasses.
    2. Conduct a hand/mechanical planting operation of groundcover species indicative to this community.
    3. A fire return interval of 2-5 years should be reintroduced.
- **Probability of Success – 90%**
- **Management Priority - 2**

Management unit 24, 29: 30 acres

- **Historic Condition** – Sandhill
- **Current Condition –** Mixed Xeric Oaks and Scattered Pine
- **Desired Condition –** Sandhill
- **Proposed Action / Treatment –** Unit 24 is a wiregrass seed donor site for other restoration projects.
    1. Conduct a herbicide and or mechanical treatment to reduce the hardwood volume by 60 to 75%.
    2. Maintain a fire return interval of 2-5 years.
- **Probability of Success – 90%**
- **Management Priority – 1**

Management unit 28,30,61,72,83: 46 acres

- **Historic Condition** – Sandhill
- **Current Condition –** Xeric Oak and Longleaf Pine
- **Desired Condition –** Sandhill
- **Proposed Action / Treatment –**
    1. A mowing/mulching operation should occur to reduce overgrown oaks up to six inches in diameter.
    2. Conduct a District approved herbicide treatment to control hardwood re-sprout, followed by a prescribed fire.
    3. Reintroduce native groundcover species, if needed by hand / mechanical operations.
    4. Maintain a fire return interval of 2-5 years.
- **Probability of Success – 75%**
- **Management Priority – 3**

Management unit 36: 5 acres

- **Historic Condition** – Sandhill
- **Current Condition –** Xeric Oak and Pasture
- **Desired Condition –** Sandhill
- **Proposed Action / Treatment –** This unit has no legal access, therefore no treatments will be prescribed
- **Probability of Success – 10%**
- **Management Priority – 5**

Management unit 45: 4 acres

- **Historic Condition** – Sandhill
- **Current Condition –** Borrow Pit with Scattered Pines and Oaks
- **Desired Condition** – Sandhill
- **Proposed Action / Treatment –**
  1. Mechanically contour borrow pit edges to mimic natural topography within the site.
  2. Conduct a District approved herbicide treatment to reduce encroaching hardwoods.
  3. Reintroduce native groundcover species, by hand / mechanical operations.
  4. Maintain a fire return interval of 2-5 years.
- **Probability of Success – 50%**
- **Management Priority – 3**

Management unit 66: 7 acres

- **Historic Condition** – Sandhill
- **Current Condition –** Mesic Flatwoods
- **Desired Condition –** Mesic Flatwoods
- **Proposed Action / Treatment –** Management units similar to this can effectively be restored. Unfortunately, access is limited to foot travel only, due to being land locked by adjacent landowners and an impassable canal.
  1. Acquire some better form of access whether it is by easement or purchase of adjacent property that would allow sufficient access.
  2. Review the options for restoration
- **Probability Of Success – 10%**
- **Management Priority – 5**

Management unit 87: 57 acres

- **Historic Condition** – Sandhill
- **Current Condition –** Mixed Xeric Oaks and Scattered Pine
- **Desired Condition –** Sandhill
- **Proposed Action / Treatment –**
  1. Conduct a herbicide and or mechanical treatment to reduce the hardwood volume by 60 to 75%.
  2. Maintain a fire return interval of 2-5 years.
- **Probability of Success – 75%**
- **Management Priority – 2**

Xeric Hammock:

Management unit 10, 13, 32, 50: 24 acres

- **Historic Condition** – Xeric Hammock
- **Current Condition –** Xeric Oaks and Scattered Pine
- **Desired Condition –** Xeric Hammock
- **Proposed Action / Treatment -**
    1. Monitor for exotic and invasive plants
    2. Allow prescribed fire to burn into hammock edges to mimic natural processes
- **Probability of Success – 90%**
- **Management Priority – 1**

Management unit 16, 62, 85: 34 acres

- **Historic Condition** – Mesic Flatwoods
- **Current Condition –** Xeric Hammock
- **Desired Condition –** Xeric Hammock
- **Proposed Action / Treatment –** Past management practices have removed much of the vegetation indicative to the flatwoods community, resulting in the succession of these units into hammocks. No attempts will be made to change the structure of these communities.
    1. Monitor for exotics and invasive plants.
    2. Allow prescribed fire to burn into hammock edges to mimic natural processes.
- **Probability of Success – 90%**
- **Management Priority – 1**

Mesic Flatwoods:

Management units 4, 15: 7 acres

- **Historic Condition** – Mesic Flatwoods
- **Current Condition –** Slash and Longleaf Regeneration
- **Desired Condition –** Mesic Flatwoods
- **Proposed Action / Treatment –**
    1. A mowing/mulching operation should occur to reduce overgrown oaks, followed by a prescribed fire.
    2. Conduct a District approved herbicide treatment in order to control nonnative grasses and hardwood re-sprouts.
    3. Followed by a hand / mechanical planting operation of ground cover species indicative to this community.
- **Probability of Success – 90%**
- **Management Priority – 2**

Management units 5, 8, 11, 14, 19, 54, 57, 69: 156 acres

- **Historic Condition** – Mesic Flatwoods
- **Current Condition –** Mixed Slash and Pond Pine
- **Desired Condition –** Mesic Flatwoods
- **Proposed Action / Treatment –**
    1. Establish and maintain an 3-5 year fire return interval.
    2. Evaluate unit for tree thinning operation as needed to maintaining a 50-70 ft² pine basal area.
- **Probability of Success – 90%**
- **Management Priority - 2**

Management unit 6: 2 acres

- **Historic Condition –** Mesic Flatwoods
- **Current Condition –** Mixed Slash and Pond Pine
- **Desired Condition –** Mesic Flatwoods
- **Proposed Action / Treatment –** Management units similar to this can effectively be restored. Unfortunately, access is limited to foot travel only, due to being land locked by adjacent landowners and an impassable canal.
  1. Acquire some better form of access whether it is by easement or purchase of adjacent property that would allow sufficient access.
  2. Review the options for restoration
- **Probability Of Success – 10%**
- **Management Priority - 5**

Management unit 21: 45 acres

- **Historic Condition** – Mesic Flatwoods
- **Current Condition –** Scrub Oaks and Scattered Pines
- **Desired Condition –** Mesic Flatwoods
- **Proposed Action / Treatment –**
  1. A mowing/mulching operation should occur to reduce overgrown oaks, followed by a prescribed fire.
  2. Establish and maintain a 3-5 year fire return interval.
  3. Monitor for exotic and invasive plants.
- **Probability Of Success – 90%**
- **Management Priority - 2**

Management unit 27: 12 acres

- **Historic Condition** – Mesic Flatwoods
- **Current Condition –** Slash Pine with Scattered Mixed Oaks
- **Desired Condition –** Mesic Flatwoods
- **Proposed Action / Treatment –**
  1. Evaluate tree-thinning options to reduce volume and improve stand health.
  2. Continue to implement a 3-5 year fire regime
- **Probability Of Success – 90%**
- **Management Priority - 2**

Management units 43, 48: 20 total acres

- **Historic Condition** – Mesic Flatwoods
- **Current Condition –** Shrub, Brushland and Scattered Trees
- **Desired Condition –** Mesic Flatwoods
- **Proposed Action / Treatment –**
  1. A mowing/mulching operation should occur to reduce overgrown vegetation, followed by a prescribed burn.
  2. Conduct a District approved herbicide treatment in order to control shrubs and nonnative grasses.
  3. Implement a hand / mechanical planting operation of ground cover species indicative to this community.
  4. Implement a planting operation of longleaf pine trees at 250-300 trees per acre.
  5. Continue to implement a 3-5 year burn rotation.

- **Probability of Success – 90%**
- **Management Priority - 3**

Management unit 49: 27 acres

- **Historic Condition** – Mesic Flatwoods
- **Current Condition –** Longleaf Plantation
- **Desired Condition –** Mesic Flatwoods
- **Proposed Action / Treatment -**
    1. Evaluate potential for pine straw harvest operation, until first tree thinning operation.
    2. Post tree thinning, reevaluate unit for ground cover restoration options.
    3. Continue to maintain a fire return interval of 3-5 years.
- **Probability of Success – 90%**
- **Management Priority – 2**

Management unit 55: 40 acres

- **Historic Condition** – Mesic Flatwoods
- **Current Condition –** Pasture
- **Desired Condition –** Mesic Flatwoods
- **Proposed Action / Treatment -**
    1. Evaluate options for concrete removal from site.
    2. Once concrete has been removed reevaluate site for restoration.
    3. Continue to maintain a 3-5 year fire return interval.
- **Probability of Success – 75%**
- **Management Priority – 4**

Management unit 56, 60: 19 acres

- **Historic Condition** – Mesic Flatwoods
- **Current Condition –** Scrubby Flatwoods
- **Desired Condition –** Scrubby Flatwoods
- **Proposed Action / Treatment –**
  Due to the succession of this unit, it's recommended to maintain this community as a scrubby flatwoods.
    1. Conduct a mowing/mulching and or herbicide operation to reduce hardwood volume.
    2. Implement a 5-7 year burn rotation.
- **Probability of Success – 90%**
- **Management Priority – 2**

Management units 59, 63, 64, 65: 138 total acres

- **Historic Condition** – Mesic Flatwoods
- **Current Condition –** Shrub, Brush-land and Scattered Trees
- **Desired Condition –** Mesic Flatwoods
    - **Proposed Action / Treatment –**
      1. A mowing/mulching operation should occur to reduce overgrown vegetation, followed by a prescribed burn.
      2. Conduct a District approved herbicide treatment in order to control hardwood re-sprout.
      3. Continue to implement a 3-5 year burn rotation.

- **Probability of Success – 90%**
- **Management Priority - 2**

Hydric Hammock:

Management unit 38, 47: 52 acres

- **Historic Condition** – Hydric Hammock
- **Current Condition –** Mixed Mesic Oaks with Scattered Depressions and Pine Pockets
- **Desired Condition –** Hydric Hammock
- **Proposed Action / Treatment -**
    1. Monitor for exotic and invasive plants
    2. Allow prescribed fire to burn into hammock edges to mimic natural processes
- **Probability of Success – 90%**
- **Management Priority – 1**

Wet Flatwoods:

Management unit 7, 22: 13 acres

- **Historic Condition** – Wet Flatwoods
- **Current Condition –** Mixed Oaks with Scattered Pines
- **Desired Condition –** Wet Flatwoods
- **Proposed Action / Treatment –**
  1. Evaluate unit for tree thinning operation as needed to maintaining a 50-70 ft^2 pine basal area.
  2. Implement and maintain a fire return interval of 5-7 years.
- **Probability of Success – 90%**
- **Management Priority - 2**

Management unit 71, 77: 124 acres

- **Historic Condition** – Wet Flatwoods
- **Current Condition –** Feral Farm Fields
- **Desired Condition –** Wet Flatwoods
- **Proposed Action / Treatment –**
  1. Conduct a herbicide / mechanical treatment to control undesired grasses and shrubs.
  2. Implement a groundcover planting operation of species native to this community.
  3. Implement a hand planting operation to establish over-story species, leaving random openings across the unit.
  4. Continue to monitor for invasive and exotic species.
  5. Implement and maintain a burn rotation of 5-7 years.
- **Probability of Success – 75%**
- **Management Priority - 3**

Management unit 75, 89: 43 acres

- **Historic Condition** – Wet Flatwoods
- **Current Condition –** Mesic Upland Mixed Pines and Oaks
- **Desired Condition –** Wet Flatwoods
- **Proposed Action / Treatment –**
  1. Conduct a mower/mulching treatment to reduce undesired vegetation.

2. Conduct a herbicide treatment to control undesired grasses and shrubs.
3. Implement a groundcover planting operation of species native to this community.
4. Monitor for invasive and exotics species.
5. Implement and maintain a burn rotation of 5-7 years.

- **Probability of Success – 75%**
- **Management Priority - 3**

Management unit 78: 12 acres

- **Historic Condition** – Wet Flatwoods
- **Current Condition –** Mesic Pines and Hardwoods
- **Desired Condition –** Wet Flatwoods
- **Proposed Action / Treatment –**
  1. Conduct a District approved herbicide treatment to control shrubs.
  2. Monitor for invasive and exotics species.
  3. Implement and maintain a burn rotation of 5-7 years.
- **Probability of Success – 50%**
- **Management Priority - 3**

Basin Swamp:

Management units 12, 18, 20, 25, 33: 1,977 acres

- **Historic Condition** – Basin Swamp
- **Current Condition –** Basin Swamp
- **Desired Condition –** Basin Swamp
- **Proposed Action / Treatment -** Continue to monitor for invasive and exotic species.
- **Probability of Success – 90%**
- **Management Priority – 1**

Depression Marsh:

Management unit 26: 7 total acres

- **Historic Condition** – Depression Marsh
- **Current Condition –** Wetland covered with panic grasses
- **Desired Condition -** Depression Marsh
- **Proposed Action / Treatment -**
  1. Continue with a fire return interval of 2-5 years to stimulate native species.
  2. Continue to monitor for invasive and exotic species.
  3. Implement and continue a 3-5 year burn rotation.
- **Probability of Success – 90%**
- **Management Priority – 1**

Management units 39, 40, 44, 46, 53: 23 total acres

- **Historic Condition** – Depression Marsh
- **Current Condition –** Wetland covered almost entirely with willows and/or elderberry
- **Desired Condition -** Depression Marsh
- **Proposed Action / Treatment -**
  1. Conduct a District approved herbicide treatment focusing on reducing the encroachment of the willows.

2. Implement a planting operation of species indicative to the community.
3. Implement and continue a 3-5 year burn rotation.

- **Probability of Success – 75%**
- **Management Priority – 3**

Floodplain Swamp:

Management unit 52, 58: 42 total acres

- **Historic Condition** – Floodplain Swamp
- **Current Condition –** Mesic Hammock
- **Desired Condition –** Mesic Hammock
  Proposed Action / Treatment – Due to the hydrologic changes of this unit, it's recommended to maintain this community as a Mesic Hammock.
  1. Monitor for exotic and invasive species.
- **Probability of Success – 90%**
- **Management Priority – 2**

Management unit 68, 76, 79, 80, 81, 88, 90: 629 acres

- **Historic Condition** – Floodplain Swamp
- **Current Condition –** Fresh Water Marsh
- **Desired Condition –** Flood Plain Swamp
- **Proposed Action / Treatment –**
  1. A District approved herbicide treatment should be implemented in order to control undesired species.
  2. Conduct a hand planting of trees and groundcover native to this community. These species should
     be cypress, black gum, slash and spartina along with other listed species.
  3. Monitoring of this site should occur yearly for continued growth and encroachment of invasive and exotic species.
- **Probability of Success –75%**
- **Management Priority - 3**

Management unit 37: 5 acres

- **Historic Condition** – Floodplain Swamp
- **Current Condition –** Cypress Swamp
- **Desired Condition –** Floodplain Swamp
  Proposed Action / Treatment –
  1. Monitor for exotic and invasive species.
- **Probability of Success –90%**
- **Management Priority - 1**

Management unit 67: 218 acres

- **Historic Condition** – Floodplain Swamp
- **Current Condition –** Fresh Water Marsh
- **Desired Condition –** Flood Plain Swamp
- **Proposed Action / Treatment –**
  1. Monitor for exotic and invasive species.
- **Probability of Success –75%**
- **Management Priority** - **2**

Floodplain Marsh:

Management unit 70: 1885 acres

- **Historic Condition** – Floodplain Marsh
- **Current Condition –** Fresh Water Marsh
- **Desired Condition –** Flood Plain Marsh
- **Proposed Action / Treatment –**
  1. A District approved herbicide treatment to reduce shrubs and encourage species indicative to this community.
  2. Continue to implement a 1-5 year burn rotation.
  3. Monitoring of this site should occur yearly for continued growth and encroachment of invasive and exotic species.
- **Probability of Success –75%**
- **Management Priority - 3**

Developed:

Management units 2, 17 ,35 ,42, 51, 74, 84, 86: 100 acres

- **Historic Condition** – Undeveloped
- **Current Condition –** Developed
- **Desired Condition** – Developed
- **Proposed Action / Treatment –** This management unit has been manipulated either by past landowners or by the District in order to create better access or benefit public usage. At this point, no attempts will be made to change these areas. Refer back to the management unit descriptions section of this report to see what type of development has occurred in each management unit.
  1. Continue to monitor for invasive and exotic aquatic species.
- **Probability of Success – 90%**
- **Management Priority - 1**

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- http://ortho.ftw.nrcs.usda.gov/cgi-bin/osd/osdname.cgi - USDA-NCRS Official Soil Series Description Website.

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- *Soil Survey of Alachua County Florid.* By B.P. Thomas, Eddie Cummings, and William H. Wittstruck, Soil Conservation Service. (In

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