LAKE NORRIS CONSERVATION AREA

ST. JOHNS RIVER WATER MANAGEMENT DISTRICT
Governing Board Approved November 2009

Lake Norris Conservation Area
Land Management Plan Summary

Management Area Size: 3,660 acres
Dates of Acquisition: 1996, 1999, 2002

Date of Plan: November 2009
Basin: Middle St. Johns River **Basin Planning Unit**: Wekiva River Subbasin

Location: The Conservation Area is located seven miles northeast of Eustis, off of Lake Norris Road, and north of CR 44A, in Lake County.

Funding Sources: Save Our Rivers/BOND95 and Orlando Orange County Expressway Authority mitigation funding.

Management Partners: The District is the lead manager of the property. Lake County Water Authority manages recreation through a 1996 cooperative management agreement.

Resource Protection and Management:

- SECURITY – Maintenance of fence lines, parking areas, gates, and locks is conducted as necessary. The onsite security resident will continue to monitor the property for security. The cattle lessee creates a presence on the property and will continue to report any suspicious activity. The District will continue to maintain contact with local law enforcement and a contracted security firm for any potential security needs.
- WATER RESOURCE PROTECTION – Most protection was accomplished through acquisition. The District maintains a sampling and monitoring program collecting data necessary to make effective management decisions. The cattle lease boundary prevents cattle from entering Black Water Creek and Lake Norris. Portions of the property, including Black Water Swamp and Black Water Creek and an associated buffer are designated as an Outstanding Florida Water. Portions of the property are also within the Wekiva Recharge Protection Basin.
- WETLAND RESTORATION – The Black Water Creek Mitigation Bank is working to restore the old Eustis Sand Mine located on site. District land management and regulatory staff will monitor progress of this wetland restoration project.
- FLORA AND FAUNA – The Conservation Area provides habitat for a wide variety of flora and fauna. The property contributes to a wildlife corridor from Wekiva to the Ocala National Forest and is found within an area designated as primary Florida black bear habitat by the Florida Fish and Wildlife Conservation Commission. The District will continue to manage habitat through fire and upland restoration to proliferate species diversity.
- FIRE MANAGEMENT – Implementation of prescribed burns occur in accordance with the LNCA Fire Management Plan and annual burn plans.
- FOREST MANAGEMENT AND RESTORATION – The District will implement forest restoration as identified in the LNCA Forest Management and Restoration

Plan, as funding becomes available. Upland restoration will include pasture conversion to sandhill, thinning pine stands, and utilizing prescribed burning to maintain sandhill habitat.

- EXOTIC AND INVASIVE SPECIES – Continue to treat the few exotic plants found on the property including cogon grass (*Imperata cylindrical*), Chinaberry tree (*Melia azedarach*), camphor tree (*Cinnamomum camphora*), Chinese tallow (*Triadica sebifera*), Japanese climbing fern (*Lygodium japonicum*), and hydrilla (*Hydrilla verticillata*). Continue to work with University of Florida to treat hydrilla in the man-made lake while experimenting with new herbicides. Continue to work with the United States Department of Agriculture to remove feral hogs from the property.
- CULTURAL AND ARCHAEOLOGICAL RESOURCES – There are no known cultural sites located on the property.

Land Use Management

Land Use Management:

- ACCESS – The District will continue to maintain the parking areas at Hart Ranch Road and the Lake Norris Road, both off County Road 44A.
- RECREATION AND OUTREACH – Hiking, bicycling, horseback riding, fishing, picnicking, canoeing, primitive group camping, and wildlife viewing are available on the property. Lake County Water Authority (LCWA) will continue to manage camping and canoeing permits on the property, which are reserved by contacting LCWA in Tavares with a $50 deposit per canoe and campsite. Recreation is not permitted within the core area of the former sand mine due to restoration construction. As the main recreation trail is closed due to construction, the area will be posted on site and on the District's website at floridaswater.com.

Administration Management:

- COOPERATIVE AGREEMENTS, LEASES, EASEMENTS, SPECIAL USE AUTHORIZATIONS, CONCESSIONS – The District will continue to monitor agreements as they come up for renewal. The following chart lists agreements on the property:

Agreements at Lake Norris Conservation Area

Agreement #	Agency/ Individual	Begin	Original Term Expiration	Acres	Renewals
Lease #54 Revenue Generating	Local Cattle Lessee	April 1, 2003	December 31, 2003	418	Year to year auto renewal on December 31 at Option of the District.
SUA #534	East Lake Holdings Gopher Tortoise Relocation	December 22, 2008	December 21, 2009	Mitigation Bank Area and Area Within Cattle Lease	None
SUA #441	Blackwater Creek Wetlands Mitigation, LLC	February 15, 2008	February 14, 2009	Area under travel trailer.	Autorenewal for four one-year terms expiring February 14, 2012.
Intergovernmental Management Agreement #452	Lake County Water Authority Management Designation	November 13, 1996	November 12, 2001	Canoe and camping reservations	Five-year autorenewals on November 12. Next renewal November 12, 2011.
Permissive Use Agreement #524	District access to LNCA through land of Adjacent Resident	November 1, 2008	Open Ended	Access Easement	Open ended except upon 30 days written notice of termination from the landowner.
Residence Agreement # 215	Resident Caretaker	August 21, 2003	Open Ended	Site of Residence	Open ended except upon 90 days notice from District

					to vacate.
Third Mitigation Agreement #592 with Two Amendments. Associated with District Permit # 4-069-92314-2	Blackwater	October 24, 2007	October 23, 2010 Completion Deadline (with the exception of phases 10, 11, and 15 which will begin once sand is removed or sand removal agreement ends and then these phases must end 18 months after construction begins). Permit expires November 11, 2013.	347	None Unless Consideration of Written Notification in Advance
Blackwater Mitigation Bank Covenants and Restrictions #593	Blackwater, USACE, District	June 10, 2009	Perpetual	416	Perpetual
Lake Norris Sand Removal Agreement #124	East Lake/Greg Wiggins	December 20, 2002	December 19, 2012	347	Expires December 19, 2012.
Mitigation Bank Access Easement #594	Blackwater	December 20, 2002	Perpetual unless terminated per easement agreement.	60-foot access easement and 30-foot access easement	Perpetual unless terminated per easement agreement.
Outparcel Owner Access Easement #327	Outparcel Owner	November 4, 2003	Perpetual.	Access easement plus 20-foot	Perpetual.

				telephone utility easement.	

REVENUE – The cattle lease generates $4,500 yearly. The mitigation bank will provide for wetland restoration of the old Eustis Sand Mine and a per credit dollar amount going to the District will reimburse the District the cost of acquisition of the parcel.

APPENDIX D. LAKE NORRIS CONSERVATION AREA FIRE MANAGEMENT PLAN

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INTRODUCTION

This Land Management Plan provides guidelines for land management activities to be implemented at Lake Norris Conservation Area (LNCA or Conservation Area) over the next five years. This is a revision of the land management plan approved by the Governing Board in December 2003.

LNCA comprises approximately 3,660 acres of land located in Lake County (Figure 1). The property is bordered on the east by Lake Norris, a lake with exceptionally good water quality, and Black Water Creek. Black Water Creek was designated a Wild and Scenic River Act in April 2000 (Public Law 90-542). Black Water Creek is a tributary of the Wekiva River along with Rock Springs Run, each of which were also added to the National Wild and Scenic Rivers designation system in April 2000. Portions of the property, including Black Water Swamp and Black Water Creek, are designated as an Outstanding Florida Water. An Outstanding Florida Water is classified by Florida Department of Environmental Protection as a water designated worthy of special protection because of its natural attributes (Protection, 2009). Portions of the property are also within the Wekiva Recharge Protection Basin.

The Conservation Area consists of three separate parcels acquired in 1996, 1999, and 2002 with Save Our Rivers, Western Beltway Part A Orlando Orange County Expressway Authority (OOCEA) mitigation funding, Beltway Mitigation Southern Connector Extension OOCEA mitigation funding, and funds from SJRWMD's land acquisition fund balance, respectively. The parcels were some of the first purchased within the Wekiva-Ocala Greenway Florida Forever Project Area, which identified lands to acquire to preserve a wildlife corridor from the Wekiva to the Ocala National Forest, an area important for Florida black bear movement. The property consists largely of basin swamp, floodplain swamp and remnant sandhill natural communities that were logged before the 1940's. The basin swamp and floodplain swamp is still relatively intact; most of the central sandhill is now in pasture. The old Eustis Sand Mine is located on the property, which left a man-made lake in former sandhill habitat and piled sand in former floodplain swamp areas. This sand mine area is part of the Black Water Creek Mitigation Bank established to create wetlands within the old sand mine piles, while off setting regional development projects.

LNCA parcels were acquired by the District to protect water resources, Florida black bear habitat, other ecological functions in the Middle St. Johns River Basin and Wekiva to Ocala Greenway wildlife habitat corridor, and potential water supply development.

LAND MANAGEMENT GOALS

Land management goals include re-establishment of the natural fire regime, preservation of rare plant and animal species and natural communities, and control of exotic and invasive species.

The land management goals for the Middle Basin and Lake Norris Conservation Area are:

Goals:

I. To improve water quality, maintain natural hydrological regime, and increase flood storage through restoration of floodplain communities.

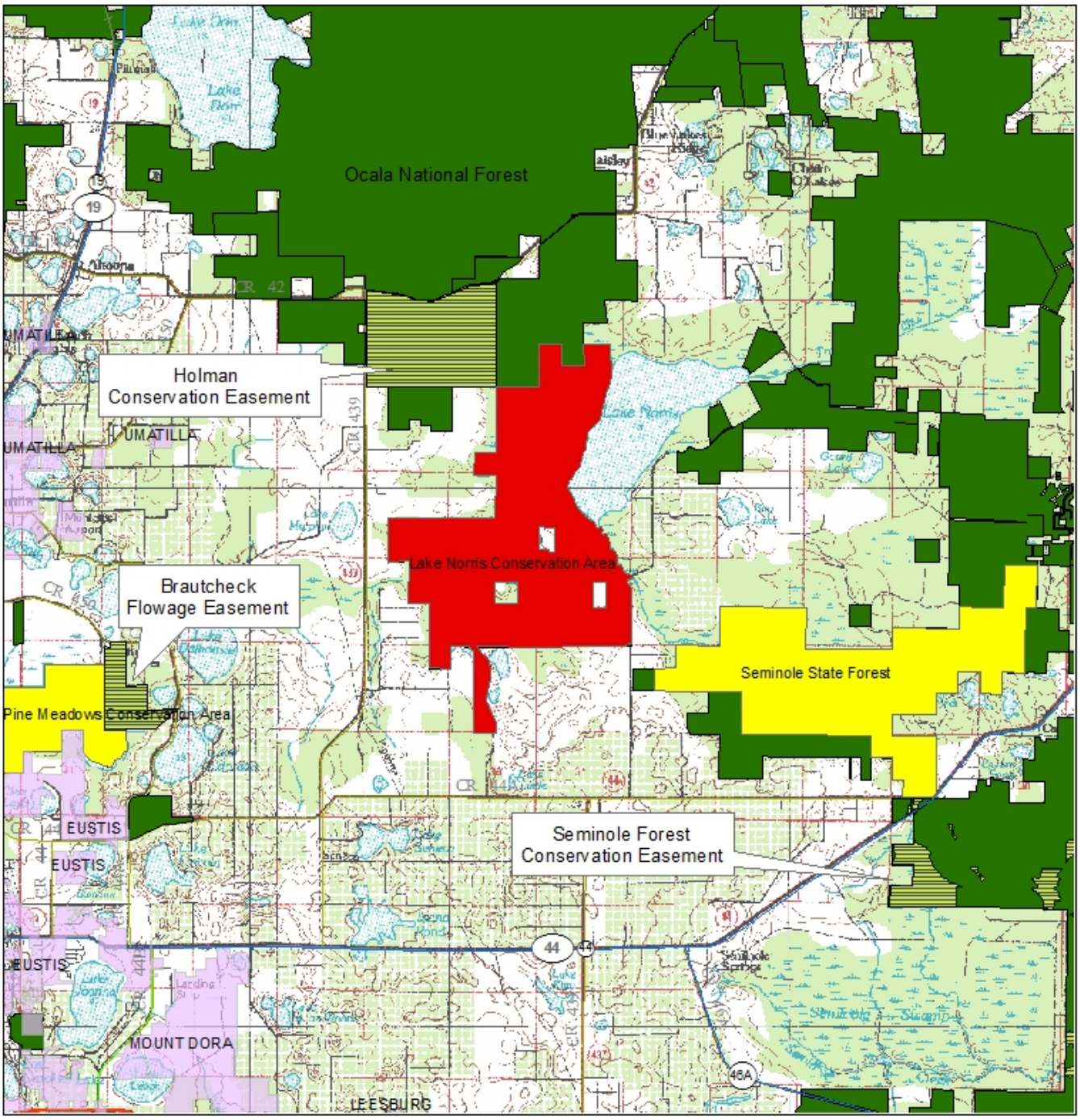
II. Conserve, protect, and manage natural communities and ecological systems and species diversity.

III. Manage and enhance habitat for populations of listed plants and animals occurring on the property.

IV. Achieve maintenance control of exotic populations present.

V. Protect cultural resources.

VI. Provide for public access and recreation to the extent that such activities are consistent with protection of natural resources.



Lake Norris Conservation Area

Figure 1. Location Map

1 0.5 0 1 Miles

1 = 100000

Legend

- Lake Norris Conservation Area
- District Owned Full Fee
- District Owned Conservation Easements
- FNAI Florida Public Lands, March 2009
- City Boundaries from 2007 Parcel Data

The St. Johns River Water Management District prepares and uses this information for its own purposes and this information may not be suitable for other purposes. This information is provided as is. Further documentation of this data can be obtained by contacting: St. Johns River Water Management District, Geographic Information Systems,Program Management, P.O.Box 1429, 4049 Reid Street Palatka, Florida 32178-1429 Tel: (386) 329-4176.

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CONSERVATION AREA OVERVIEW

Regional Significance

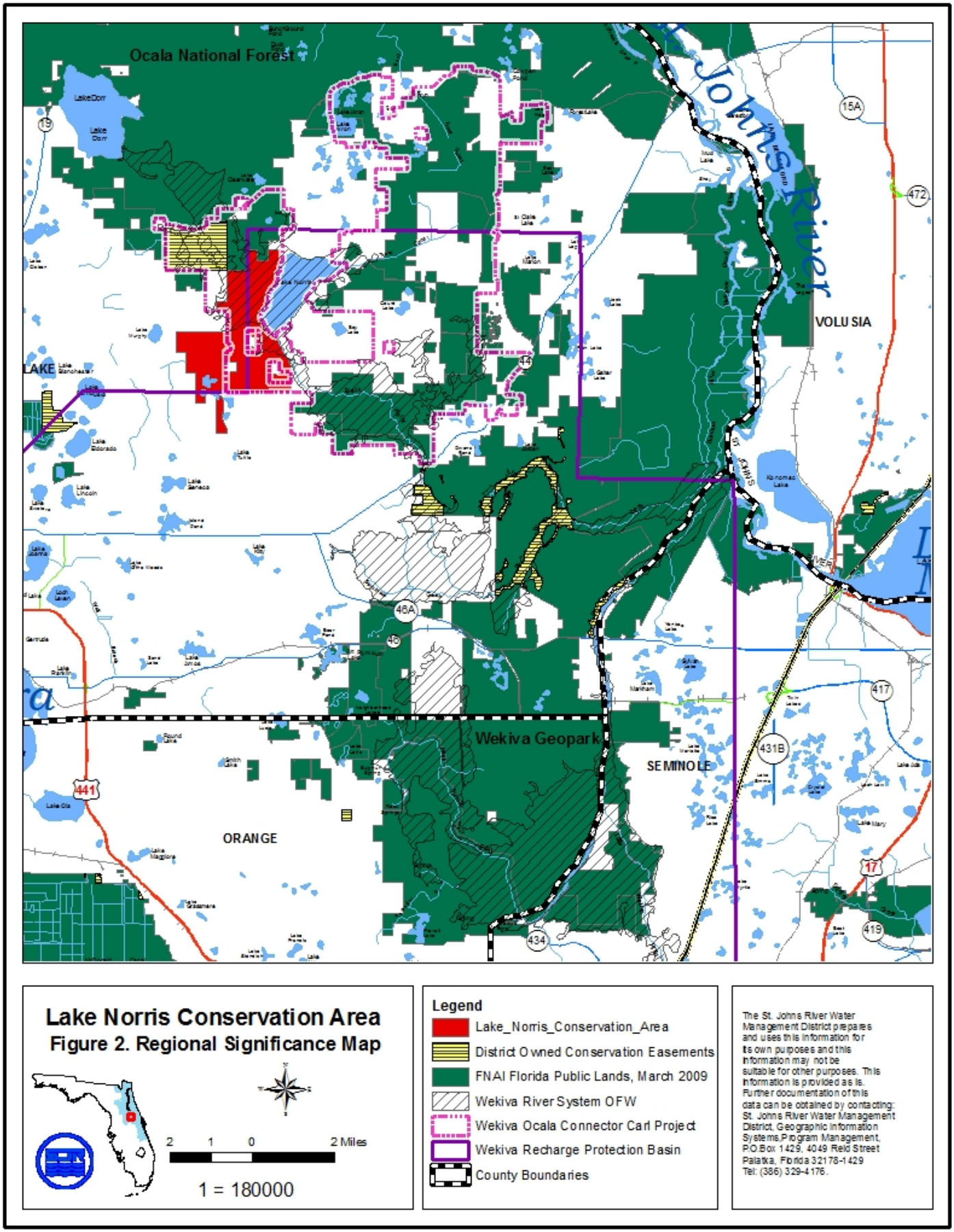
LNCA is located in the Middle St. Johns River Basin on the western border of Lake Norris. The Conservation Area protects land located within the Wekiva Recharge Protection Basin and within the Wekiva River System, which is designated as an Outstanding Florida Water. The property is also part of the Wekiva Ocala Connector Florida Forever project (formerly a Conservation and Recreation Lands project), which identifies land to acquire that will protect a wildlife habitat corridor from the Wekiva River to the Ocala National Forest.

Florida black bears once roamed the entire state of Florida and are now restricted to a primary range of approximately 10,000 square miles, or 18% of their historic range (Commission, Draft Black Bear Management Plan for Florida Ursus americanus floridanus, 2008). LNCA is within an area of primary range for the bears[1] as designated by the Florida Fish and Wildlife Conservation Commission (FWC). One goal of FWC's Black Bear Management Plan for Florida is to conserve and maintain an additional 745,000 acres of habitat within this Ocala/St. Johns region.

Agencies have worked to set aside over 80,000 acres of land for this wildlife habitat corridor and water recharge area of the Middle St. Johns River Basin. Conservation Areas in this region include the 42,000 acre Wekiva Geopark which is comprised of Rock Springs Run State Reserve, Wekiwa Springs State Park, Lower Wekiva River Preserve State Park and other properties including Seminole State Forest, Wekiva River Buffer Conservation Area, Hontoon Island State Park, Blue Spring State Park, LNCA, and conservation easements on private land (Figure 2). Ocala National Forest, just north of LNCA, consists of 383,000 acres between the Ocklawaha and St. Johns Rivers.

In addition to protecting sensitive land, LNCA provides opportunities for a variety of resource-based, resource compatible educational and recreational activities including hiking, biking, horseback riding, wildlife viewing, boating, primitive group camping, fishing, and canoeing.

[1] Primary range is defined as an area that contains a core bear population, habitat that is important to bear movement, and evidence of reproduction as designated by Florida Fish and Wildlife Conservation Commission (Commission, Black Bear Distribution Map, 2009).



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Acquisition History

The 3,660 acre Conservation Area consists of three separate parcels (Figure 4). Acquisition of parcels making up LNCA occurred in 1996, 1999, and 2002. The acquisition funding sources for LNCA include Save Our Rivers/BOND95, Western Beltway Part-A Orlando Orange County Expressway Authority funding, Beltway Mitigation Southern Connector Extension Orlando Orange County Expressway Authority mitigation funding, and Land Acquisition Fund Balance. The following properties were purchased by the District using funding sources as noted and were incorporated into the management area as they were acquired:

LA# 1991-059-P1 Harper Ranch

This 2,229-acre parcel was purchased on August 23, 1996 for $2,100,140, using Save Our Rivers/BOND95 funds. This parcel is located in the east side of the Conservation Area on the western border of Lake Norris and Black Water Creek. This parcel was purchased to protect significant water resources and is a keystone in the greenways project. The majority of the property consists of floodplain swamp and former sandhill that was logged and that is now in improved pasture. The property was purchased subject to a cattle lease. A District granted Access Easement to the southwest outparcel landowner is also located on this parcel along with a permit for gopher tortoise location (Figure 13).

LA # 1995-079-P1 Alger Enterprises

This 123-acre parcel was acquired on March 29, 1999 for $90,754 using Western Beltway Part-A Orlando Orange County Expressway Authority mitigation funds along with money for mitigation Circle Community Church funds associated with Permit # 40-095-0558-ERP. This parcel is north of the Harper Ranch parcel and consists of 67% floodplain swamp habitat and 33% forested uplands and was purchased to protect the natural corridor in the Black Creek watershed from the Ocala National Forest to the Wekiva River.

LA # 2002-002-P1 Lake Norris Conservation Area Addition

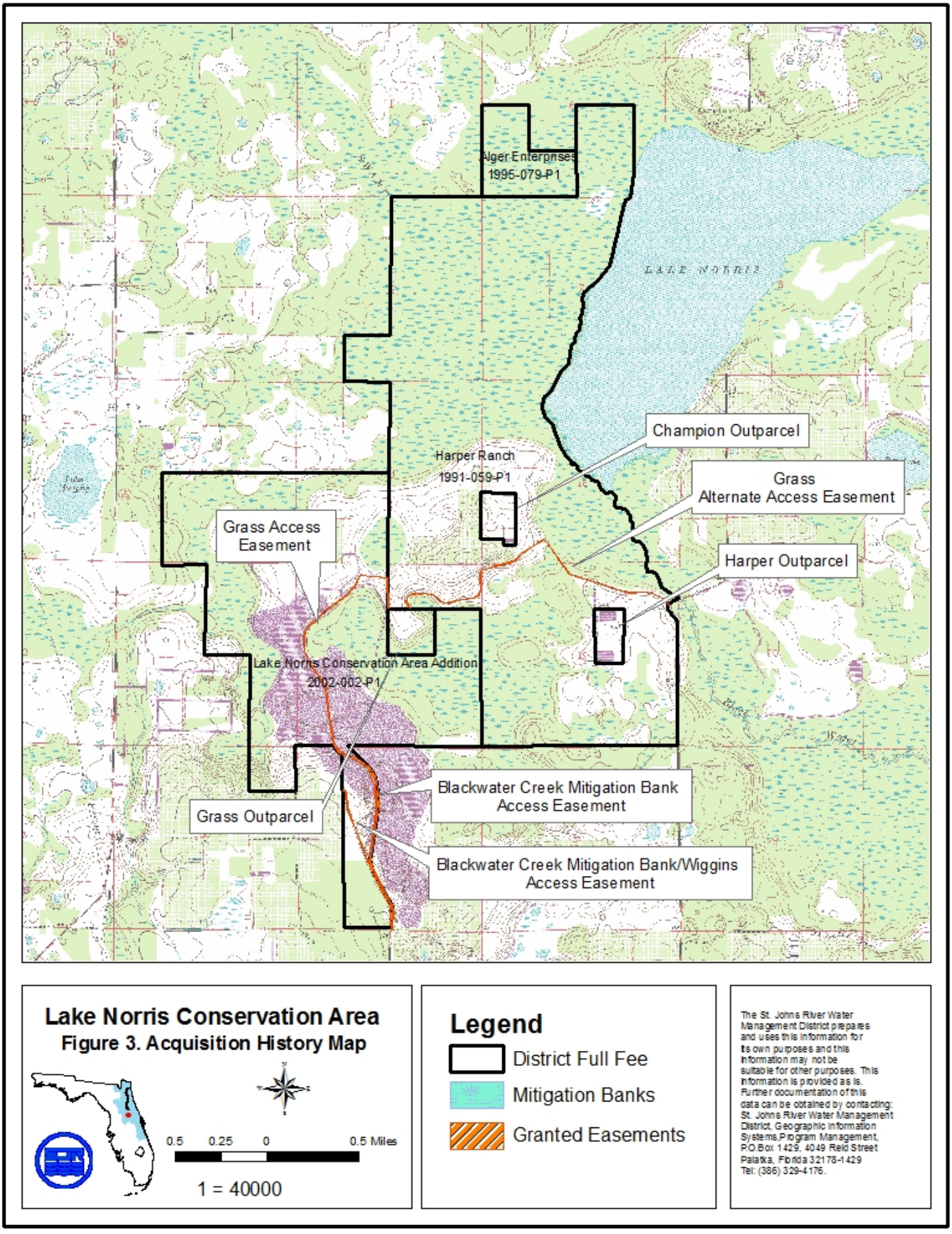
This 1,308-acre parcel (originally named Eustis Sand Mine) was acquired on December 23, 2002 for $3,088,221 using Beltway Mitigation Southern Connector Extension Orlando Orange County Expressway Authority mitigation funds, Western Beltway Part-A Orlando Orange County Expressway Authority mitigation funding, and Land Acquisition Fund Balance fund. This parcel is located on the southwestern border of the Harper Ranch parcel. The parcel provides habitat within the Florida black bear corridor and is within the Ocala/St. Johns primary habitat use area designated by Florida Fish and Wildlife Conservation Commission. The parcel was also considered for a water supply project due to the surface water in the artificial lake on site, which would help to lower water withdrawl from the Floridan Aquifer. In this area, additional withdrawal from the Floridan Aquifer has the potential to adversely impact springs associated with the Wekiva River. The man-made lake is a result of the old Eustis Sand Mine. At the time of purchase, Greg Wiggins held the contract to purchase the property of the original owner and reserved the exclusive right to harvest sand from stockpiles existing on the property, and to initiate mitigation projects on the property to restore the sand mine areas.

In 2005, the agreement was amended to extend the right to conduct mitigation activities on the property. In 2007, the seller received Permit #4-069-92314-1 from the District for the Blackwater Creek Mitigation Bank and the agreement was amended to reflect the changes of the agreement area to a mitigation bank. The District has approved a master plan for the mitigation bank release of credits and is working with the mitigation bank to complete each mitigation project according to the proprietary agreement between the District and Blackwater Creek Mitigation Bank.

Table 1. LNCA Acquisition History Table

LA#	Parcel Name	Date	Acres	Purchase Price	Funding Source
1991-059-P1	Harper Ranch	8/23/1996	2,229	$2,100,140	Save Our Rivers/ BOND95
1995-079-P1	Alger Enterprises	3/29/1999	123	$90,754	Western Beltway Part A-OOCEA Mitigation Funding, Money for Mitigation Community Circle Church ERP #40-095-0558.
2002-002-P1	Lake Norris Conservation Area Addition	12/23/2002	1,308	$3,088,221	Beltway Mitigation Southern Connector Extension OOCEA mitigation, Western Beltway Part-A OOCEA mitigation, Land Acquisition Fund Balance

Key: OOCEA-Orlando Orange County Expressway Authority



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Local Government Land Use Designation

The parcels that make up this Conservation Area are zoned as Conservation-1 (C-1). Land within this designation is zoned to allow zero dwelling units per acre.

Future Land Use: Sending Areas A-1-40 and A-1-20

The purpose and intent of this Chapter is the protection of the Wekiva River System, including water quantity, water quality, and hydrology; associated wetlands; aquatic and wetland-dependent wildlife species; habitat within the Wekiva River Protection Area of species designated pursuant to Rules 39-27.003, 39-27.004 and 39-27.005, Florida Administrative Code; and Native Vegetation within the Wekiva River Protection Area.

A. "A-1-40" Wekiva River Protection Area Overlay District 1. The purpose and intent of this district is to provide an area where low-density rural development can occur while preserving Environmentally Sensitive Areas. The continued use of the land for traditional agricultural purposes is maintained where consistent with Best Management Practices and policies of the Lake County Comprehensive Plan. This overlay district will protect Environmentally Sensitive Areas while encouraging rural uses which prevent further encroachment by urban uses. All applicable density, use and bulk standards for the A-1-40 district are set forth in Section 3.02.00 of these regulations.

B. "A-1-20" Wekiva River Protection Area Overlay District 2. The purpose of this district is to provide an area where low-density rural development can occur while preserving Environmentally Sensitive Areas. The continued use of the land for traditional agricultural purposes is maintained where consistent with Best Management Practices and policies of the Lake County Comprehensive Plan. This overlay district will protect Environmentally Sensitive Areas while encouraging rural uses which prevent further encroachment by urban uses. To further conserve agricultural uses of the land, clustering of units is encouraged to maintain usable open space for agricultural, conservation and recreation purposes. All applicable density, use and bulk standards for the A-1-20 district are set forth in Section 3.02.00 of these regulations.

C. "A" Agriculture District. The purpose of this district is to provide a method whereby parcels of land which are most suited to agricultural usage may be classified and preserved for this purpose. Agriculture is a major industry of the County; therefore it is the intent of this district to: Provide long-term means for preventing further encroachment upon agricultural enterprises; to encourage agricultural pursuits by preserving good soils and agricultural areas from subdivision development or commercial and industrial construction.

NATURAL AND CULTURAL RESOURCES OVERVIEW

Topography and Hydrology

According to the Physiographic Divisions of Florida (Brooks), LNCA is found in the Central Lake District. The eastern half of the property is found in the St. Johns Offset

subdivision and the western half is found in the Apopka Upland Subdivision, Apopka Hills subset. The Central Lake District has uplifted limestones of the Floridan Aquifer lying unconformably below surficial sands. This is a sandhill karst with solution basins. It is the region of most active collapsed sink hole development. Because of the xeric hills and the internal drainage, this is the principle recharge area of the Floridan aquifer (Brooks, 1981).

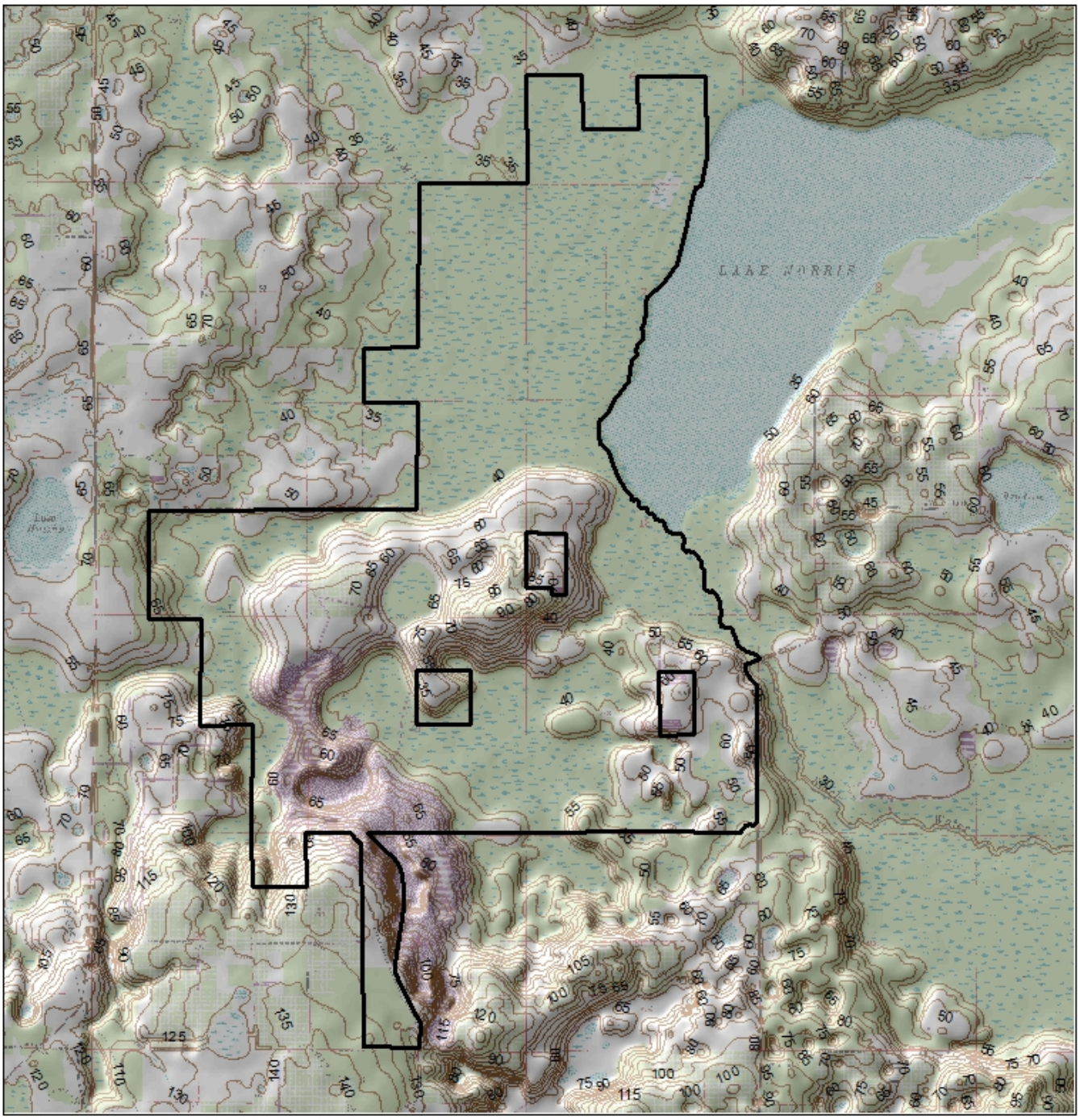
The St. Johns Offset subdivision, which classifies the eastern half of LNCA, consists of a portion of the St. Johns River Valley that is very ancient. It is partially filled with Pleistocene estuarine deposits. The Eocene limestone is very near the surface and solution has contributed to the development of the broad valley. Several large springs now discharge water from Wekiva northward to Salt Springs. Flatwoods occur on the Pleistocene terraces and a river swamp forest, generally with many cabbage palms, occurs on the floodplain (Brooks, 1981).

The Apopka Upland subdivision, which classifies the western half of LNCA, consists of sandhills areas modified by karst processes. The lakes that occur are small (Brooks, 1981). The Apopka Hills subset consists of residual hills with the parent material containing more silt and clay. The deposits, now modified by weathering and erosion, are probably largely a seaward equivalent of the coastal deposits in the Mt. Dora Ridge. Most of the hills have elevations that are less than 150 feet.

At LNCA, elevations range from 125 feet off Hart Ranch Road at the western entrance to below 35 feet at Black Water Swamp. The center of the property is as high as 90 feet. This area was associated with the historic sandhill natural communities.

The Conservation Area is located in the Middle St. Johns River Basin, Wekiva River Subbasin. The eastern half of the property falls within the Wekiva Recharge Protection Basin (Figure 3). According to 373.415 Florida Statutes, “Not later than November 1, 1988, the District shall adopt rules establishing protection zones adjacent to the watercourses in the Wekiva River System as designated in 369.303.” In this statute, “Such protection zones shall be sufficiently wide to prevent harm to the Wekiva River System, including water quality, water quantity, hydrology, wetlands, and aquatic and wetland-dependent wildlife species, caused by any of the activities regulated under this part.” This statute also specifies that the District shall not issue any permit under this part within the Wekiva River Protection Area, as defined in s. 369.303(9), until the appropriate local government has provided written notification to the district that the proposed activity is consistent with the local comprehensive plan and is in compliance with any land development regulation in effect in the area where the development will take place.”

The northern and eastern portions of the Conservation Area, including Black Water Swamp and Lake Norris, are also located within the Wekiva River Surface Water Basin, which is designated an Outstanding Florida Water.



Lake Norris Conservation Area

Figure 4. Topography Map

0.5 0.25 0 0.5 Miles

1 = 40000

Legend

Lake Norris Conservation Area

Five Foot Contours

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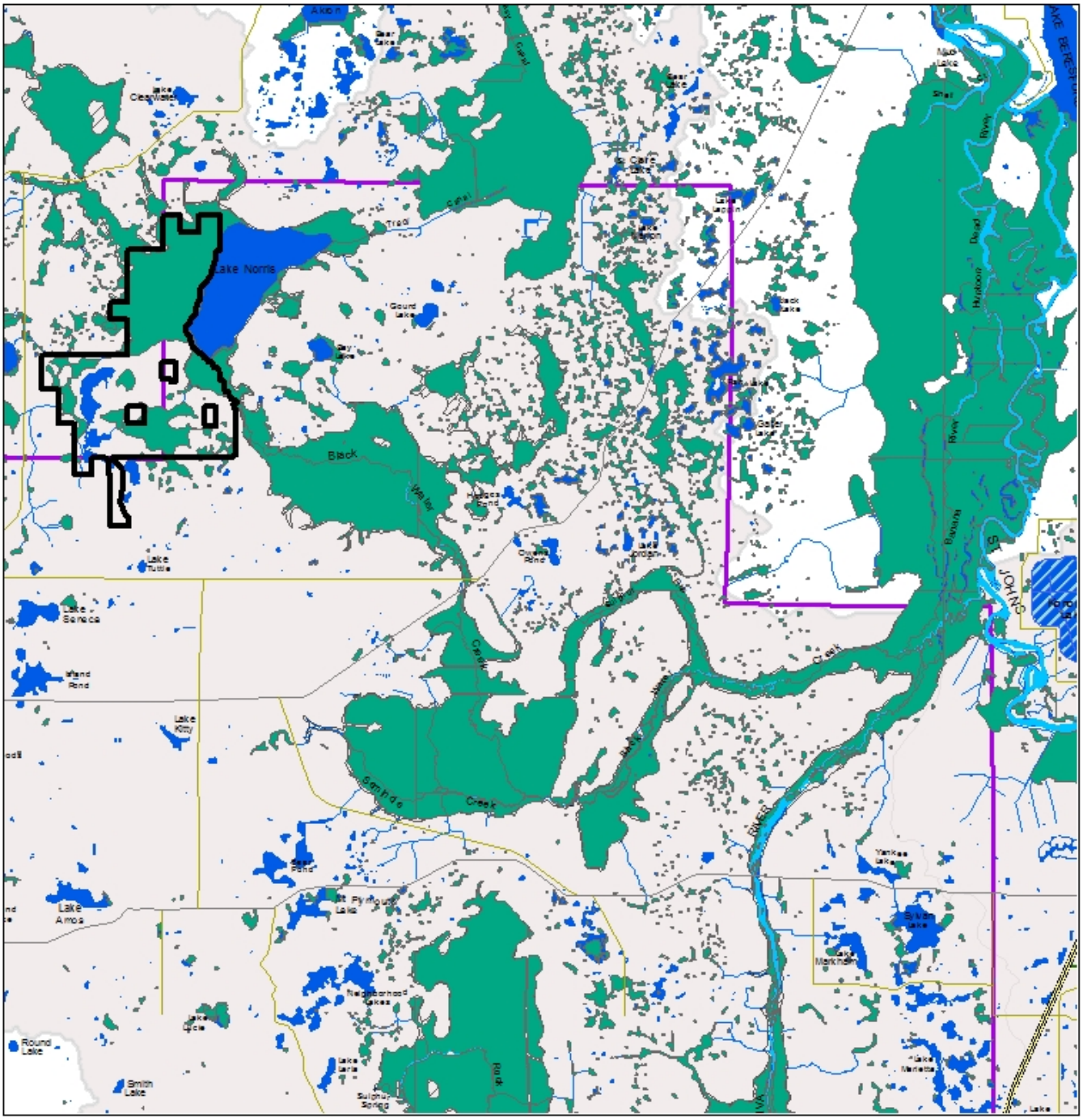

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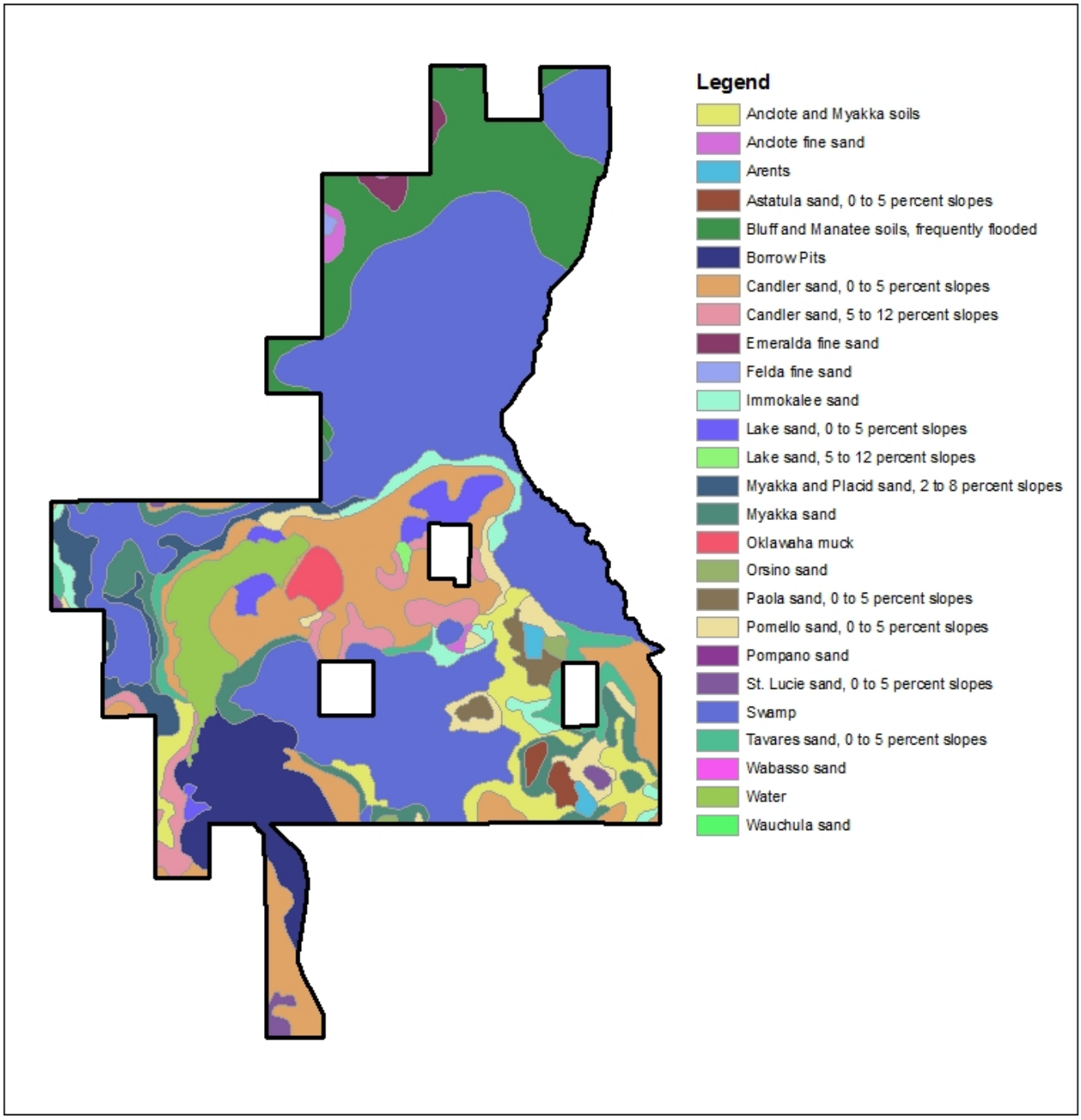
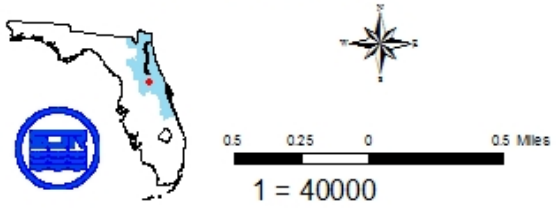
Soils

According to data produced from the United States Department of Agriculture, Natural Resource Conservation Service, 19 different soil types have been identified within LNCA (Descriptions, 2009) (Figure 6). The United States Department of Agriculture, Soil Conservation Service, was used to gather soil information about the soil types and produce the descriptions of the dominant soil types found on the property. The soil descriptions are located in Appendix A.



Lake Norris Conservation Area

Figure 6. Soils Map



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Natural Communities and Wildlife

Information regarding the historical natural communities within the Conservation Area is derived from 1940's historical aerial imagery analysis, 1984, 1990's, 2000's aerial imagery, and on site ground truthing. The natural communities are mapped according to historical land cover (Figure 7) and current conditions are overlayed on the historical natural communities if conditions have changed. The historical documentation is meant to serve as a target for ultimate restoration goals. The general natural community descriptions are characterized using descriptions published in the Florida Natural Areas Inventory's (FNAI) *Guide to the Natural Communities of Florida*.

Table 2. LNCA Natural Community Coverages

FNAI	Acres	Percent Coverage
Sandhill	1280	35
Basin Swamp	1156	31
Floodplain Swamp	1021	28
Mesic Flatwoods	105	3
Upland Mixed Forest	63	2
Depression Marsh	44	1
Wet Flatwoods	6	0
Blackwater Stream	-	Not Mapped
Total	3675	

LNCA historically consisted of basin swamp, floodplain swamp, sandhill, wet and mesic flatwoods, upland mixed forest, and depression marshes (Figure 8). As noted from the 1940s aerial imagery, the northern third of the property consists of basin swamp on the western border of Lake Norris, part of Black Water Swamp, on the western border of Black Water Creek; floodplain swamp is interspersed throughout the southern portion's low-lying areas of the property. Sandhill was once found throughout the majority of the upland areas interspersed with depression marsh and mesic flatwoods as ecotone between sandhill and floodplain swamp. At the time of the 1940s aerial photos, logging had long since occurred throughout the property along with cattle grazing. Logging tram roads and cattle trails are seen as white cleared or degraded lines. In the basin swamp area to the north, west of Lake Norris, three parallel lines are present with cleared dots in even increments shown with faint lines leading into the dots. These areas are where logs had been dragged into the clearings, dragged south down the parallel lines, and loaded onto the trams. The sandhill areas have also been logged down to a few trees and cattle have grazed, creating cattle trail white lines.

Today, hardwoods in the basin swamp have regenerated and hydrology in the floodplain swamp throughout the property is relatively intact. The logged sandhill areas in the center of the property have been converted to pasture. Sandhills in the southeastern portion of the property have been maintained through chopping and have regenerated into a thicket of sand live oaks and other scrub/scrubby flatwoods species. Sandhill areas on the western border have been managed through use of prescribed fire and thinning and

are regenerating towards healthier sandhill natural community. Sandhill areas at the southwestern entrance have been clear-cut of sand pine. A major change in the aerial imagery signature is the old Eustis Sand Mine shown as of the 1984 aerial imagery. The beginning of the mine work occurred earlier, but is not present by 1966. In the process of digging sandy soils in the former sandhill habitat, the lake was created and sand and mine tailings were stored in the basin swamp wetlands to the east of the lake. At this time, the mine is permitted as the Blackwater Creek Mitigation Bank in an effort to restore wetlands to the east of the lake.

Sandhill (1,280 acres)
Sandhills are characterized as a forest of widely spaced pine trees with a sparse understory of deciduous oaks and a fairly dense ground cover of grasses and herbs on rolling hills of sand. The most typical associations are dominated by longleaf pine, turkey oak, and wiregrass.

Flora and fauna of this community type, documented within the Conservation Area, include turkey oak (*Quercus laevis*), long leaf pine (*Pinus palustris*), slash pine (*Pinus elliottii*), gopher apple (*Licania michauxii*), wire grass *Aristida stricta beyrichiana*), and gopher tortoise (*Gopherus polyphemus*).

Fire is a dominant factor in the management of this community. Sandhills are a fire climax community, being dependent on frequent ground fires to reduce hardwood competition and to perpetuate pines and grasses. The natural fire frequency appears to be every two to five years. Without frequent fires, sandhills may eventually succeed to xeric hammock. Unburned or cutover sandhills may be dominated by turkey oak.

Basin Swamp (1,156 acres)
Basin swamp is a basin wetland vegetated with hydrophytic trees and shrubs that can withstand an extended hydroperiod. Basin swamps exist around lakes and are sometimes headwater sources for major rivers. In this case, the swamp is found west of Lake Norris, which feeds into Black Water Creek, which feeds into the Wekiva River. Fire intervals are variable and depend on such factors as dominant vegetation, fire exposure, and drought. Basin swamps that are situated within the matrix of a pyrogenic community, such as mesic flatwoods, will likely burn more frequently than basin swamps positioned within a matrix of mexic or hydric hammock.

Plant species documented onsite include cypress (*Taxidium ascendens*) (*Taxodium distichum*), sweet gum (*Liquidambar styraciflua*), tupelo (*Nyssa sylvatica*), ash (*Fraxinus caroliniana*), red maple (*Acer rubrum*), and cabbage palm (*Sabal palmetto*).

Floodplain Swamp (1,021 acres)
Floodplain swamp is a closed canopy forest of hydrophytic trees occurring on frequently or permanently flooded hydric soils adjacent to stream and river channels and in depressions and oxbows within floodplains. Floodplain swamp is located within floodplains of any permanently moving stream or river. Trees are often buttressed, and

the understory and groundcover are sparse. This area is connected to Black Water Creek and may flood as the creek floods.

Plant species documented onsite include cypress (*Taxidium ascendens*) (*Taxodium distichum*), sweet gum (*Liquidambar styraciflua*), tupelo (*Nyssa sylvatica*), ash (*Fraxinus caroliniana*), red maple (*Acer rubrum*), and cabbage palm (*Sabal palmetto*).

Floodplain swamp is usually too wet to support fire; however, large cypress trees are somewhat fire resistant, and thus infrequent fires during very dry conditions may contribute to cypress dominance.

Mesic Flatwoods (105 acres)
Mesic flatwoods are characterized as an open canopy forest of widely spaced pine trees with little or no understory, but a dense ground cover of herbs and shrubs.

Plant species within this natural community, documented onsite, include longleaf pine (*Pinus palustris*), slash pine (*P. elliottii*), wiregrass (*Aristida stricta*), and saw palmetto (*S. repens*).

Important factors to maintaining mesic flatwoods is seasonal hydroperiods and fire. Natural fire return intervals are approximately 1 to 8 years.

Upland Mixed Forest (63 acres)
Upland mixed forests are characterized as well-developed, closed canopy forests of upland hardwoods on rolling hills. Upland mixed forest is a climax community for their respective geographic locations.

Flora documented within this natural community include slash pine (*P. elliottii*), laurel oak (*Q. laurifolia*), hickory (*Carya glabra*), southern magnolia (*Magnolia grandiflora*), sweet gum (*Liquidambar styraciflua*), saw palmetto (*Serenoa repens*), and andropogon (*Andropogon sp.*).

The canopy is densely closed, except during winter in areas where deciduous trees predominate. Therefore, air movement and light penetration are generally low, making the humidity high and relatively constant. Because of these conditions, upland mixed forests rarely burn.

Depression Marsh (44 acres)
Depression marsh is characterized as a shallow, usually rounded depression in sand substrate with herbaceous vegetation often in concentric bands. Depression marshes occurring as isolated wetlands within larger upland ecosystems are of critical importance to many wetland and upland animals.

Flora and fauna documented within this natural community include sawgrass (*Cladium jamaicense*), buttonbush (*Cephalanthus occidentalis*), maidencane (*Panicum hemitomon*), and Carolina willow (*Salix caroliniana*) with a transition of maidencane and

sand cord grass (*Spartina bakeri*), Chinese tallow (*Sapium sebiferum*), and feral hog (*Sus scofa*).

Fire is important to maintaining this community type by restricting invasion of shrubs and trees and the formation of peat. Fire frequency is often greatest around the periphery of the marsh and least toward the center. A severe peat fire can lower the ground surface and create a pond at the center of the marsh. Depression marsh at LNCA will be burned on a 3-5 year burn return interval.

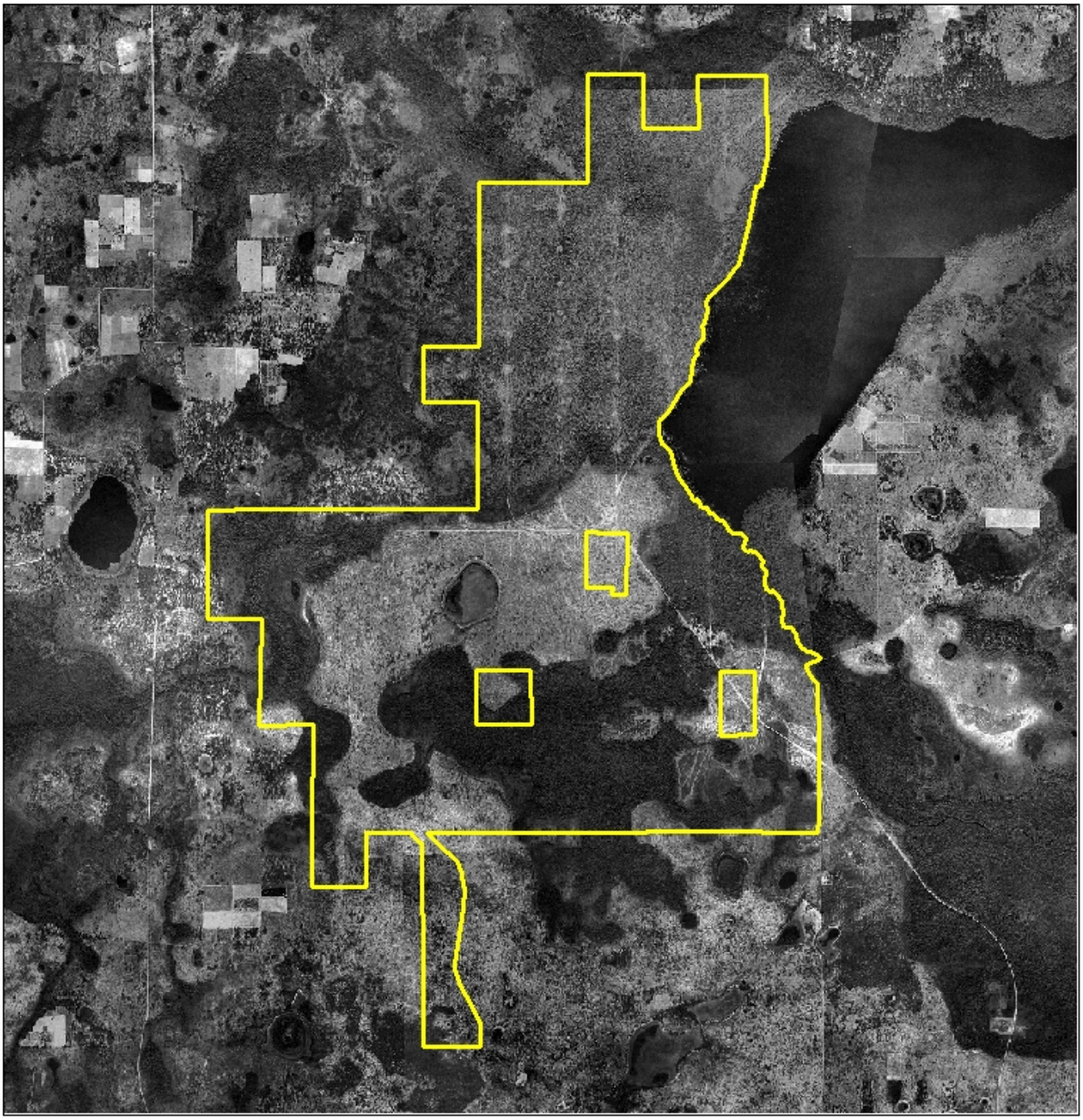
Wet Flatwoods (16 acres)
Wet flatwoods are characterized as relatively open-canopy forests of scattered pine trees or cabbage palms with either thick shrubby understory and very sparse ground cover or a sparse understory and a dense ground cover of hydrophytic herbs and shrubs.

Plant species within this natural community, documented onsite include pone pine (*Pinus serotina*), slash pine (*P. elliottii*), and saw palmetto (*S. repens*).

The wet flatwoods community is dependent on a hydroperiod of water saturation for one or more months per year and on a fire return interval of 3 to 10 years.

Blackwater Stream
Black Water Creek is a Blackwater Stream that runs from Lake Norris to the Wekiva River. Blackwater Streams are characterized as perennial or intermittent seasonal watercourses originating deep in sandy lowlands where extensive wetlands with organic soils function as reservoirs, collecting rainfall and discharging it slowly to the stream. The tea-colored waters of blackwater streams are laden with tannins, particulates, and dissolved organic matter and iron derived from drainage through swamps and marshes. The dark-colored water reduces light penetration and, thus, inhibits photosynthesis and the growth of submerged aquatic plants. This is not mapped and is located on the eastern border of the property.

Preservation of these riverine systems includes preventing adjacent forests from being clear-cut and limiting runoff from agricultural and industrial effluents.



Lake Norris Conservation Area

Figure 7. 1941 Aerial Imagery Map

0.5 0.25 0 0.5 Miles

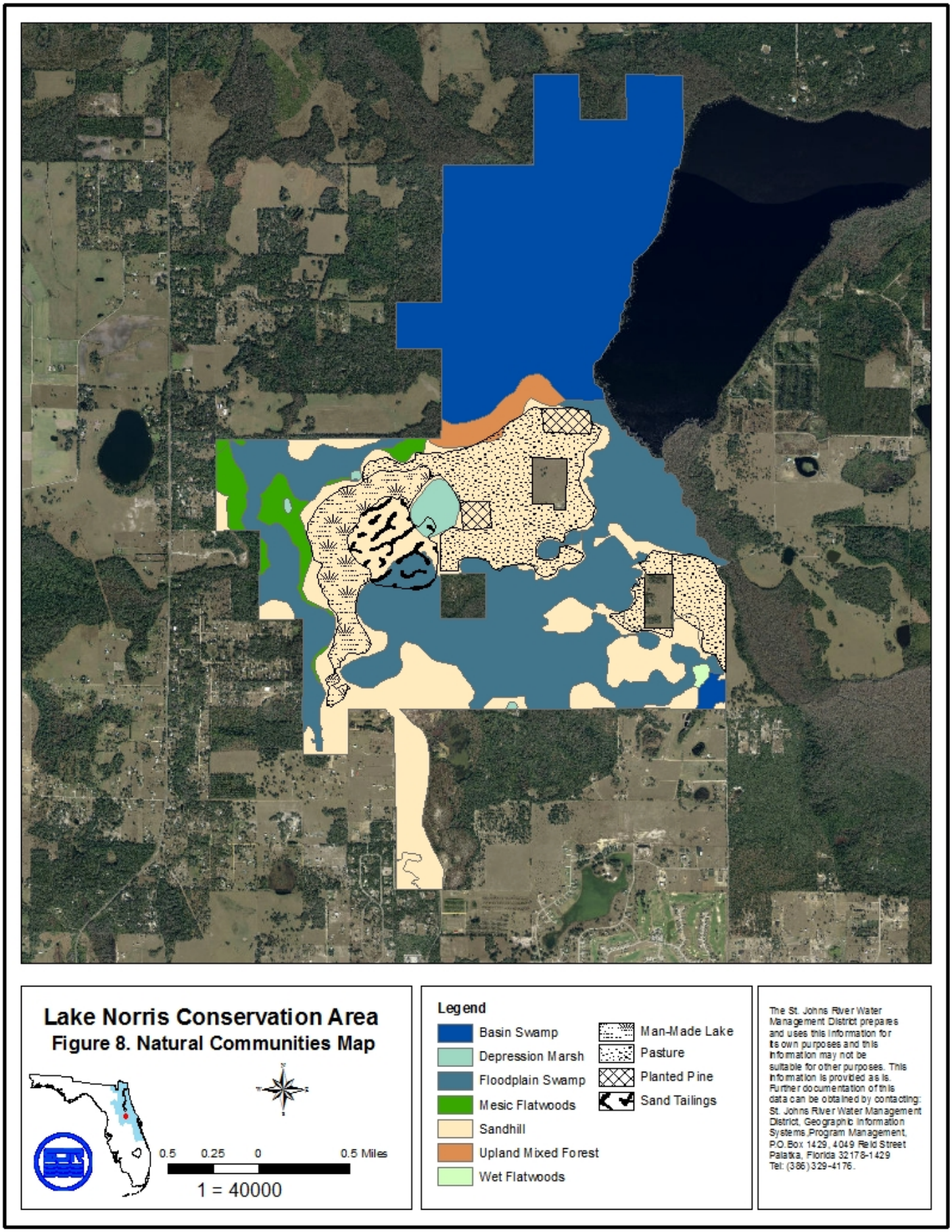
1 = 40000

Legend

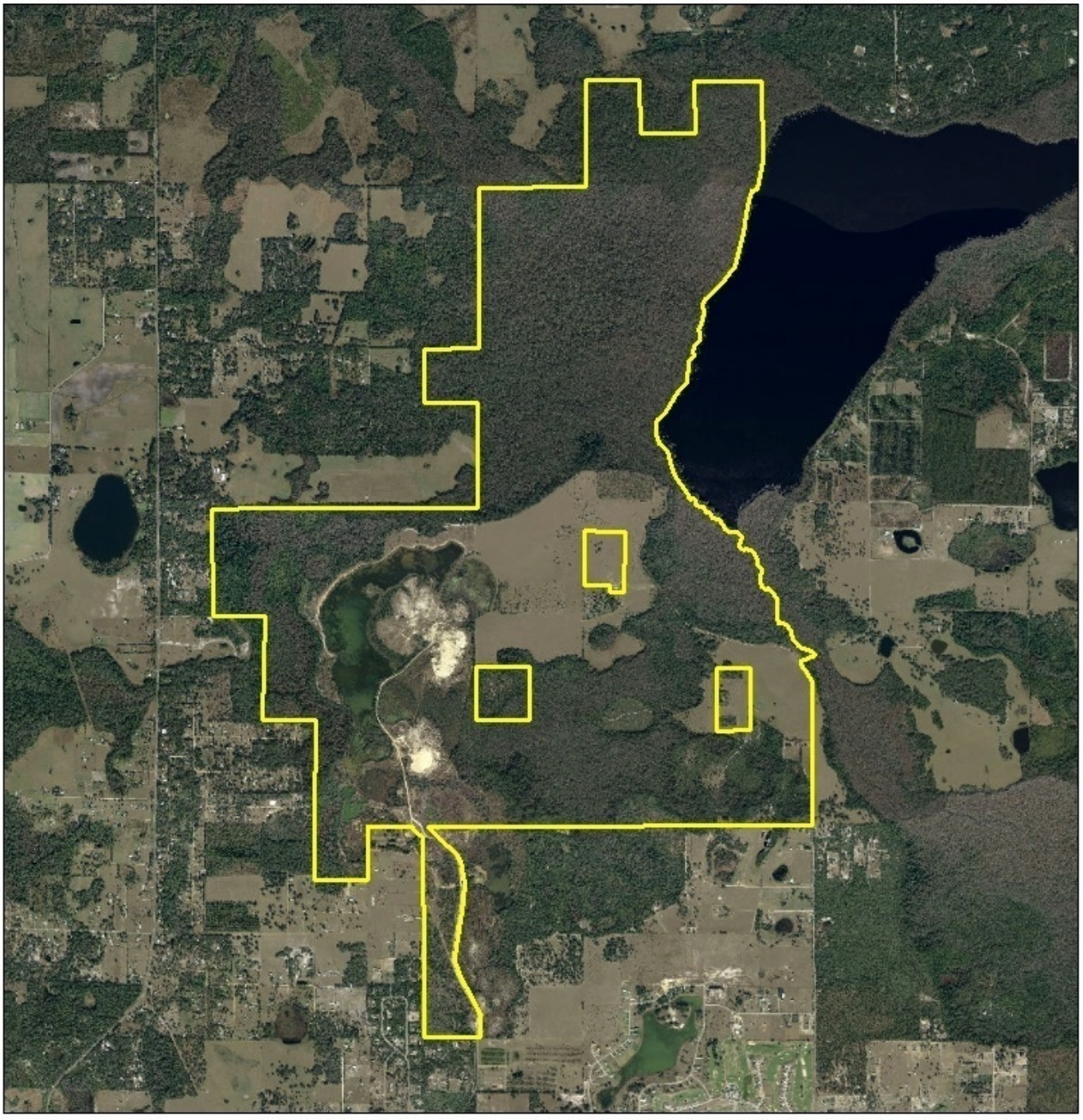
Lake Norris Conservation Area

The St. Johns River Water Management District prepares and uses this information for its own purposes and this information may not be suitable for other purposes. This information is provided as is. Further documentation of this data can be obtained by contacting: St. Johns River Water Management District, Geographic Information Systems,Program Management, P.O.Box 1429, 4049 Reid Street Palatka, Florida 32178-1429 Tel: (386) 329-4176.

Author:tmashour, Source:X:\Land\Mgmt\GIS\Users\Planners\West\Lake Norris\Lake Norris LMP 2009\Figure 1. Location Map.mxd, Time:6/24/2009 12:49:46 PM

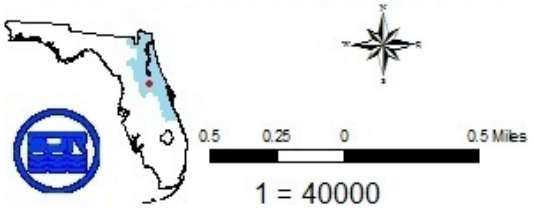


Author:tmashour, Source:X:\LandMgmt\GIS\Users\Planners\West\Lake Norris\Lake Norris LMP 2009\Figure 1. Location Map.mxd, Time:6/24/2009 12:49:46 PM



Lake Norris Conservation Area

Figure 9. 2009 Aerial Imagery Map



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Lake Norris Conservation Area

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Author:tmashour, Source:X:\LandMgmt\GIS\Users\Planners\West\Lake Norris\Lake Norris LMP 2009\Figure 1. Location Map.mxd, Time:6/24/2009 12:49:46 PM

Cultural Resources

A review of the Department of State, Division of Historical Resources GIS data for Lake County indicates that there are no registered Florida Master Sites at LNCA. If any sites are located, District staff will document and report the sites to the Division of Historical Resources. District land management and restoration activities that may affect any potential resources will be evaluated and modified to reduce any potential disturbance of identified sites.

PAST MANAGEMENT SUMMARY

This section outlines all strategies in previous plan and summarizes progress.

Water Resource Protection

2003 Plan Strategies	Status
Continue to evaluate area for any possible acquisitions that would enhance water resource protection.	The District has identified three parcels within or adjacent to LNCA as part of the District's 5-year land acquisition plan map. Within the Wekiva to Ocala Florida Forever Corridor, the District partnered to purchase the 526-acre Neighborhood Lakes property, west of the Wekiva Geo-park, in 2007. Also, in 2009 the District purchased the 17-acre Hubler-TNC parcel, adjacent to Seminole State Forest.

Fire Management

2003 Plan Strategies	Status
Continue prescribed burn program.	The District has accomplished nine prescribed burns at the Conservation Area burning approximately 265 acres.
Develop and implement a fire management plan to maintain native community structure and assemblages.	The District completed the LNCA Comprehensive Fire Management Plan in 2009. This plan outlines the goals and objectives for prescribed burning at the Conservation Area and outlines a plan for emergencies.

Table 3. Fire Management History at LNCA

Zone	Date	Land Type	Acres
LN-2	3/20/2004	Scrubby Flatwoods	60
LN-4	9/20/2002	Scrub chopped	26
LN-5	4/20/2004	Sawgrass Marsh	43
LN-5	8/12/2008	Marsh	36.0
LN-6	3/25/2004	Prairie	8
LN-7	3/9/2006	Flatwoods, bayhead	20
LN-8	1/25//2005	Hammock ecotone	17
LN-9	1/11/2006	Flatwoods, swamp, bayhead	25
LN-12	8/4/2004	Sandhill	15
LN-29	7/29/2009	Sandhill	15
Total Acres			265

Forest Management

2003 Plan Strategies	Status
Prepare bid packets to harvest timber in pine plantation.	The District has completed thinning or sand pine clear-cuts in seven stands at LNCA totaling 129.4 acres of timber management (Table 4).
Evaluate need to remove sand pine from uplands.	The District completed sand pine clear cuts in two stands at LNCA totaling 62.7 acres of sand pine removal (Table 4).

Table 4. Forest Management History at LNCA

Year	Manipulation	Stand	Acres
2006	Slash Pine Thinning	26	21
2007	Roller Chopping	89	10
2007	Roller Chopping	52	18
2008	Roller Chopping	33	25.7
2008	Roller Chopping	34	15
2008	Slash Pine Thinning	38	23
2008	Slash Pine Thinning	39	4
2008	Slash Pine Thinning	59	9.7
2008	Slash Pine Thinning	61	9
2008	Sand Pine Clear Cut	60	37
2008	Sand Pine Clear Cut	33	25.7
2008	Fuel Reduction Mowing	82	2
2009	Fuel Reduction Mowing	60	37
Total			237.1

Mitigation/Upland Restoration

2003 Plan Strategies	**Status**
Develop Plan.	The District entered into a Mitigation Agreement in 2002 to allow the previous owner of the property to conduct mitigation on the former sand mine. The Mitigation Master Plan was written by Blackwater and approved by the District's Land Management Staff in February 2005. Table 5 illustrates a timeline of the Mitigation Agreement process and the Mitigation Master Plan development process.
Seek funding for any projects.	The former sand mine was converted into the Blackwater Mitigation Bank in March of 2007 and the Mitigation Agreement was updated in October of 2007. Black Water Mitigation bank will conduct the restoration work and be reimbursed by selling mitigation credits for mitigation needs throughout the region. As credits are sold, the District will receive a special use authorization fee per credit along with a land management fee per credit.

Table 5. Mitigation Agreement Timeline

Date	**Action**
December 20, 2002	First Mitigation Agreement executed to assign rights to mitigation reserved by seller in the purchase agreement to Blackwater.
December 23, 2002	Lake Norris Addition Parcel was purchased by the District.
February 2005	Mitigation Master Plan approved by the District's Division of Land Management.
February 17, 2005	Second Mitigation Agreement executed due to First Mitigation Agreement expiration.
April through November 2005	Special use authorization for Black Water to conduct gopher tortoise survey at LNCA.
December 1, 2005-May 2006	Gopher tortoise survey time period was amended to extend the term of the survey authorization to May 31, 2006.
June 1, 2006-May 31, 2011	Special use authorization to relocate gopher tortoises from the mitigation bank boundary to LNCA pursuant to Florida Fish and Wildlife Conservation Commission Permit #WR05207a.
March 2007	Regulatory permit #4-069-92314-1 issued for Blackwater Mitigation Bank.
October 24, 2007	Third Mitigation Agreement executed to update to a mitigation bank based agreement with land management fees charged per credits of work instead of acres of work. Construction of mitigation Master Plan and Mitigation Bank Permit, with the exception of phases 10, 11, and 15, shall be completed by October 23, 2010. Phases 10, 11, and 15 shall begin construction upon the earlier of the two: completion of the

	fill removal by Mr. Wiggins through a fill removal agreement or expiration of the fill removal agreement. Phases 10, 11, and 15 shall be completed in 18 months from the beginning of construction of each phase.
May 2, 2008	First Amendment to Third Mitigation Agreement executed to agree that if construction completion timeframe of October 23, 2010 is not met for the mitigation work, master plan will become null and void unless Blackwater applies for, and District provides written approval for, extension or unless delayed by acts of God; also, if Blackwater Mitigation Bank changes hands, the agreement will become null and void.
December 9, 2008	The first Blackwater Mitigation Bank credits were released for, (1) Execution of the construction and implementation and perpetual management financial documents, and (2) Submittal of acceptable restrictive covenants for the mitigation bank property.
April 22, 2009	Covenants and Restrictions re-recorded on the property to add the US Army Corps of Engineers permitted portion of the Blackwater Mitigation Bank to the District permitted Blackwater Mitigation Bank. The Covenants and Restrictions were created as an alternative to a regulatory conservation easement due to the bank being in District ownership. The acres in this rerecorded covenants and restrictions were increased from 347 to 416.
June 26, 2009	Second Amendment to Third Mitigation Agreement executed to increase the mitigation bank credit special use authorization fee to adjust the fees from acres based charge to credits based charge.
October 23, 2010	Failure by Blackwater Creek Mitigation Bank to meet this October 23, 2010 timeframe shall cause the District's approval of the Master Plan to become null and void, at which time the permits and all unreleased credits remaining in the bank to become the sole property of the District, unless written approval to extend the time frame has been received by the District.

Listed Plants/Animals

2003 Plan Strategy	**Status**
Continue development of the plant species list.	A LNCA Land Management Planning Work Day was conducted on July 21, 2009. Many wildlife and plant species were documented including two Florida black bears. The species list is found in Appendix B. District staff continues to document species as sighted.

Exotic Plant and Animal Species

2003 Plan Strategy	**Status**
Monitor and continue to treat exotic and invasive vegetation.	The District's Invasive Plant Management staff has treated Chinaberry tree, camphor tree, Chinese tallow, cogon grass, Japanese climbing fern, and

	hydrilla on the property. Natal grass is also found on the property. Staff maps new infestations and treatments on the property as they are found.
Develop a plan to treat hydrilla while avoiding desirable aquatic vegetation.	The District is working with University of Florida (UF) to test hydrilla herbicide treatments in the man-made lake. UF set up the experimental design and has provided various herbicides along with experimental herbicide and the District has applied the mixture. UF visits the property to record results. Not much additional success has been found with the new herbicides; however, it has been helpful to UF to utilize LNCA, as it is a controlled site with no public access to the lake at this time.
Evaluate need to remove feral hogs.	The District works with the United States Department of Agriculture to remove feral hogs from the property.

Access Species

2003 Plan Strategies	**Status**
Continue regular maintenance on access area.	The District has continued regular maintenance on the eastern access area including mowing and adding trail guides to the kiosk.
Maintain signs and kiosk.	The District maintains the signs and kiosks as needed.
Develop public access to Lake Norris Addition.	The District developed the western parking area in 2005 to access the western side of the property with connecting hiking, biking, and horseback riding trails. The trail system was connected to the eastern trail system in 2006 creating one contiguous trail from the western entrance to the eastern entrance.

Recreation 2003 Plan Strategies	**Status**
Continue regular maintenance on trails.	Lake County Water Authority (LCWA) manages recreation at LNCA through a 1996 intergovernmental management agreement. LCWA fields phone calls from the public, takes group campsite reservations, provides canoes for public use, and clears the Black Water Creek canoe run of obstructions. The public can reserve the canoes by contacting LCWA and dropping off a $50 refundable security deposit. The District trail contractor conducts trail maintenance quarterly and the mowing contractor mows strategic areas per a mowing schedule.

Cooperative Agreement

2003 Plan Strategy	Status
Maintain agreements to assist with the management and maintenance of Lake Norris Conservation Area.	The District maintains ten agreements on the property. The agreements are monitored to ensure compliance and evaluated when they come due for renewal.

Security

2003 Plan Strategy	Status
Maintain signage, fences, and gates.	The District maintains signs, fences and gates on the property. Additional boundary marking of the Lake Norris Addition parcel was conducted in Spring of 2009.
Coordinate with security resident.	The District entered into a residence agreement in 2003 with a security resident. The District coordinates with the resident in surveillance of the property and in reporting unusual incidents and accidents, hazards, etc. The District owns the residence building and is responsible for maintaining the residence. The home includes a single-family residence, electric service facilities, septic tank, pump, and well.
Coordinate, when necessary, with contracted security firm.	The District coordinates with Lake County sheriff's office and a private security firm to patrol the property as needed.

Cattle Management

2003 Plan Strategy	Status
Continue to evaluate the need for cattle.	The cattle lease was signed in January 2003 and expired on December 31, 2004 with automatic renewals yearly at the District's approval. The District has determined that the cattle lease is accomplishing management goals for the property including grazing that prevents shrubs from growing. The District aims to continue the cattle lease under the purview of this plan.

IMPLEMENTATION

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

RESOURCE PROTECTION AND MANAGEMENT

Security

The Harper Ranch and Alger enterprises parcels were posted soon after they were purchased. Portions of the Lake Norris Addition parcel were posted after purchase; additional posting was completed in spring of 2009. Fencing has been erected where possible and gates are located at the eastern entrance and at the western entrance. Maintenance of the fence lines and replacement of boundary signs is ongoing as needed.

The District has a Residence Agreement with an onsite security resident, whose home is located on the eastern side of the property. Through this agreement, the resident periodically patrols the property and reports unusual incidents and accidents, hazards, etc. The District owns the residence building and is responsible for maintaining the structure. The home includes a single-family residence, electric service facilities, septic tank, pump, and well.

Through an agreement with Lake County Water Authority (LCWA), LCWA manages recreation on the property. The LCWA office is located in Tavares, within 45 minutes of the property and they create a presence on the property, as they are able to visit the site more often. The cattle lessee is also required to report any suspicious activity as part of the lease and creates an additional presence on the property.

The District coordinates with the Lake County Sheriff's office, FWC law enforcement, and a private security firm under contract by the District for any potential security needs.

Security Strategies

- Maintain signage, fences, and gates.
- Continue coordinating with LCWA, Lake County Sheriff's office, onsite security resident, FWC law enforcement, and cattle lessee for security of the property.

Water Resource Protection

A large portion of water resources protection was accomplished through acquisition of the property. Cattle have also been prevented from entering Lake Norris. The property protects land on the western banks of Lake Norris and a portion of Black Water Creek from development. Lake Norris is a rural lake with little development and is traditionally a lake with good water quality. The District is monitoring well water on the northern border of Lake Norris (Lk Norris T1N), on the southwest border (Lk Norris T2S), a well site north of the man-made lake (Lk Norris Wells), and a surface water site that will go off line in September 2009 (Lk Norris).

The Conservation Area is located in the Middle St. Johns River Basin, Wekiva River Subbasin. The eastern half of the property falls within the Wekiva Recharge Protection Basin (Figure 3). According to 373.415 Florida Statutes, "Not later than November 1, 1988, the District shall adopt rules establishing protection zones adjacent to the watercourses in the Wekiva River System as designated in 369.303." In this statute, "Such protection zones shall be sufficiently wide to prevent harm to the Wekiva River System, including water quality, water quantity, hydrology, wetlands, and aquatic and

wetland-dependent wildlife species, caused by any of the activities regulated under this part." This statute also specifies that the District shall not issue any permit under this part within the Wekiva River Protection Area, as defined in s. 369.303(9), until the appropriate local government has provided written notification to the district that the proposed activity is consistent with the local comprehensive plan and is in compliance with any land development regulation in effect in the area where the development will take place."

The northern and eastern portions of the Conservation Area, including Black Water Swamp and Lake Norris, are also located within the Wekiva River Surface Water Basin, which is designated an Outstanding Florida Water.

Over the next five years, the District will continue to manage the property for conservation and support the on site efforts of water resources and resource management in hydrologic data monitoring.

Water Resource Protection Strategies

- Coordinate with other District departments in hydrologic data monitoring.
- Continue to manage the property for natural community enhancement to protect water resources on or adjacent to the property.

Wetland Restoration

The majority of LNCA wetlands have remained relatively intact, with the exception of the former Eustis Sand Mine area on the Lake Norris Addition parcel. The sand mine operators extracted soils from the upland sandhills and in the process converted these areas to an open lake. Former basin swamp on the eastern side of the lake were filled with mining deposition and converted to sand piles. Before the District purchased the property in December 2002, Greg Wiggins, who held the original contract to purchase Lake Norris Addition from the previous owners, reserved the right to mitigation work on the property under the name of Blackwater. Since that time, the agreement has been updated and amended, formalizing the project into a permitted mitigation bank in March 2007. The key components of the mitigation bank are:

1. Removing spoil mounds to create/restore herbaceous and forested wetlands.
2. Removing berms and haul roads in strategic locations to restore historic sheet flow to provide a more natural hydroperiod for existing and planted wetland species.
3. Eradicating and managing exotic/nuisance vegetation throughout the mitigation area.
4. Creating shallow sloping transitional areas between wetlands to provide a more natural and functional interface for wildlife movement and habitat improvements.

Along with the permitted Blackwater Creek Mitigation Bank, the District's Division of Land Management has approved a Mitigation Master Plan, as part of the proprietary Mitigation Bank Agreement. The District's land resource specialist in the Division of Land Management, specializing in mitigation on District lands, will monitor the progress of the work. If the work, excepting phases 10, 11, and 15, is not completed by October

23, 2010, the Master Plan will become null and void. If the project is not completed by that time, and the District has not received a written request for an extension, the permit and all unreleased credits in the mitigation bank will become the sole ownership of the District.

At this time, Blackwater Creek Mitigation Bank operators have conducted the following work items:

1. December 2005-May 2006 – Conducted a gopher tortoise survey on the site of the work and a site at LNCA to evaluate relocation needs and capabilities.
2. December 9, 2008- The first Blackwater Mitigation Bank credits were released for, (1) Execution of the construction and implementation and perpetual management financial documents, and (2) Submittal of acceptable restrictive covenants for the mitigation bank property.
3. June 2009-Began gopher tortoise relocation to site at LNCA through FWC permit #WR05207a.
4. Covenants and Restrictions re-recorded on the property to add the US Army Corps of Engineers permitted portion of the Blackwater Mitigation Bank to the District permitted Blackwater Mitigation Bank. The Covenants and Restrictions were created as an alternative to a regulatory conservation easement due to the bank being in District ownership.
5. July 2009-Begin earthwork for restoration project (District, Individual Environmental Resource Permit, Technical Staff Report March 13, 2007 Application # 4-069-92314-1., 2007).

The 347-acre mitigation project site is protected in perpetuity through a recorded covenants and restrictions document between the District and US Army Corps of Engineers (USACE) (Figure 14). Whereas the property is in public ownership with the District and therefore did not need a regulatory conservation easement through the District, the USACE required this covenants and restrictions document. The document outlines restrictions including managing the property in its natural state to retain areas as suitable habitat for wildlife, improvements shall be compatible with the natural hydrologic and ecological value, uses and development shall be limited to maintaining the property in a natural condition, and identifies that Blackwater shall be solely responsible for costs or liabilities from the beginning of construction to the declaration of final success by the District. The covenants and restrictions document was recorded in April 2009 to add United States Army Corps of Engineers permitted mitigation acreage, increasing the boundary from 347 acres to 416 acres (Appendix E).

Portions of the 347-acre mitigation project site is currently closed to the public. As construction continues, various road closures will occur. These closures will be posted on site and will be posted on the District website at floridaswater.com.

Wetland Restoration Strategies

- Continue to monitor the progress of the Blackwater Creek Mitigation bank. Monitor the completion of the work in terms of the Third Mitigation Bank Agreement timeframe of expiration date of October 23, 2010.

Flora and Fauna

The basin swamp, floodplain swamp, and sandhill, Lake Norris, and Black Water Creek provide habitat for many species of flora and fauna. The property is important habitat for the state threatened Florida black bear. The property is part of the area designated as primary habitat for the Florida Black bear and is a wildlife corridor in protecting a link from the Ocala National Forest Florida black bear population to the Wekiva population. The 2003 management plan for the property had a limited flora and fauna list. In July of 2009, District staff implemented a Management Planning Work Day at LNCA in which a flora and fauna survey was conducted. The rapid assessment documented a wide variety of flora and fauna, which were incorporated into the Conservation Area species lists in Appendix B. Two Florida black bears were documented during the rapid assessment.

Detailed below are the listed or rare species documented within the Conservation Area. The scientific names are hyper-linked for electronic viewing (press ctrl and click to follow the link) of species descriptions including listing status and distribution. This detail is also available at www.fnai.org and http://www.florida.plantatlas.usf.edu/.

- Florida black bear — Ursus americanus floridanus
- Sherman's fox squirrel — Sciurus niger shermani
- Florida burrowing owl — Athene cunicularia floridana
- Gopher tortoise — Gopherus polyphemus
- Woodstork — Mycteria americana
- White ibis — Eudocimus albus
- Short-tailed hawk — Buteo brachyurus

Florida Black Bear

LNCA is located in the Ocala/St. Johns Bear Management Unit, Ocala to Wekiva corridor, and is primary habitat of the Florida black bear. Primary habitat is defined as an area that contains a core bear population, habitat that is important to bear movement, and shows evidence of reproduction (Commission, Draft Black Bear Management Plan for Florida Ursus americanus floridanus, 2008). This unit is currently above the desired range of bear numbers; however, conserved habitat is approximately 59% of the desired amount. Further habitat conservation efforts in this unit should focus on maintaining the functionality of the Ocala to Wekiva corridor. Threats to this unit include increasing frequency and severity of human-bear interactions and habitat fragmentation, which has the potential to isolate subpopulations within this unit. Conservation goals established in the 2008 Draft Black Bear Management Plan for Florida include increasing the bears in this unit from 750 to 850 by 2018 and increasing the conserved acres by 745,000 acres by 2028 (Commission, Draft Black Bear Management Plan for Florida Ursus americanus floridanus, 2008). Florida black bear need a wide variety of forested communities to support their varied seasonal diet (Inventory, 2009). Forested wetlands are particularly important for diurnal cover and baygalls are important for cover and dens (Inventory,

2009). Habitat diversity should be maintained over extensive acreage, including dense baygalls that are inaccessible to humans (Inventory, 2009). The District will continue the prescribed burning program and the LNCA Forest Management and Restoration Plan to maintain and improve habitat for the Florida black bear and other species that utilize similar habitat.

Gopher Tortoise

Gopher tortoises are typically found in dry upland habitats and excavate deep burrows for refuge from predators, weather, and fire (Inventory, 2009). Large, undivided tracts of upland habitat should be managed to maintain native vegetative conditions, which generally requires periodic prescribed fire beneath trees to reduce brush and favor growth of grasses and forbs (Inventory, 2009). The District will continue the prescribed burning program to maintain and improve habitat for the gopher tortoise and other species that utilize similar habitat. Through an FWC Conservation Permit, gopher tortoises within the Blackwater Mitigation bank boundary at LNCA have been temporarily relocated to a pasture site on the LNCA proper. The tortoises will be relocated to the restored site post construction. Silt fencing has been utilized to enclose the tortoises until the tortoises are returned to their previous location. Due to the recipient site being located within the cattle lease on the property, the permitee must ensure that the silt fencing will not prevent cattle from using the area. The District will oversee the permitting to ensure Blackwater Creek complies with their gopher tortoise relocation permit (Commission, Gopher Tortoise Permitting Guidelines Gopherus polyphemus., 2008).

Sherman's Fox Squirrel

Sherman's fox squirrel habitat is longleaf pine and wiregrass communities, particularly sandhills (Inventory, 2009). Management should include burning these habitats every two to five years in summer burns if possible to control shrubby vegetation and maintain park-like conditions (Inventory, 2009).

Florida Burrowing Owl

Florida burrowing owls are listed as a species of special concern with the Florida Fish and Wildlife Conservation Service. Habitat is high, sparsely vegetated, sandy ground including dry prairie and sandhill (Inventory, 2009). The owls make extensive use of ruderal areas such as pasture (Inventory, 2009). Florida burrowing owls were historically located on the property at four locations within the pasture areas as noted beginning in 1997. In 1997, 6 pairs were determined to be located on the property. The District installed artificial burrows in summer 1999 to assist in creating habitat for the resident owls. Owls were last documented on the property on May 5, 2004. A survey in January 2005 uncovered no owls on the property. The owls have since been documented on the adjacent golf course. It is thought that the owls have become prey to coyote that have increased on the property as many of the former owl burrows are now coyote dens. Protection and management needs for the birds includes maintaining optimum condition of natural and ruderal sites including utilizing prescribed burning in natural areas and mowing in ruderal areas (Inventory, 2009). The District will continue to support pasture grasses through the cattle lease on site for an additional five years at which time the

habitat management for burrowing owls will be re-evaluated. The District will continue to conduct yearly surveys for the birds.

Over the next five years, LNCA habitat will be managed for the protection and proliferation of listed species and other wildlife and plants. The District will also monitor the gopher tortoise relocation project to ensure proper management by the permitee. As restoration projects are planned, the District will work to minimize the effects on listed species habitat and consider nesting season in restoration work timeframes. The District will continue to add to the species lists.

Flora and Fauna Strategies

- Utilize prescribed burning and the LNCA Upland Restoration Plan to manage the property for the protection and proliferation of listed species and other wildlife and plants.
- Oversee gopher tortoise permit ensuring Monitor Blackwater Creek complies with gopher tortoise relocation permit.
- Continue to conduct diversity surveys, including surveying for burrowing owls, and enhance species lists.

Forest Management and Restoration

Chapter 253.036, Florida Statutes, requires the lead agency of state lands to prepare a forest resource analysis, "…which shall contain a component or section…which assesses the feasibility of managing timber resources on the parcel for resource conservation and revenue generation purposes through a stewardship ethic that embraces sustainable forest management practices if the lead management agency determines that the timber resource management is not in conflict with the primary management of the parcel."

A review of the 1940's aerial imagery identifies LNCA parcels as once dominated by the sandhill natural community along with basin swamp and floodplain swamp wetlands most likely associated with Black Water Swamp and the Lake Norris/Black Water Creek system. In the 1940's photos, the sandhill has been logged of most trees with a few leave trees for natural regeneration left behind. Basin swamp wetland areas to the north show historical logging evidence with second growth trees. In the 1984 aerial imagery, the man-made lake and large piles of sand mine tailings east of the lake, both created by the former sand mine, are present. Also present are a large area of pasture, and various areas of pasture in between the still relatively intact floodplain swamp areas.

The District has reviewed restoration potential for the property by evaluating 1940's aerial imagery and soil types and has produced the LNCA Forest Management and Restoration Plan (Appendix D). The plan outlines restoration potential for the various stands. The long-term restoration goals include:

1. Improve sandhill habitat in areas that have been thinned or clear-cut.
2. Restore areas of pasture to sandhill
3. Improve areas to mesic and wet flatwoods through the use of prescribed burning or mechanical treatment as necessary.

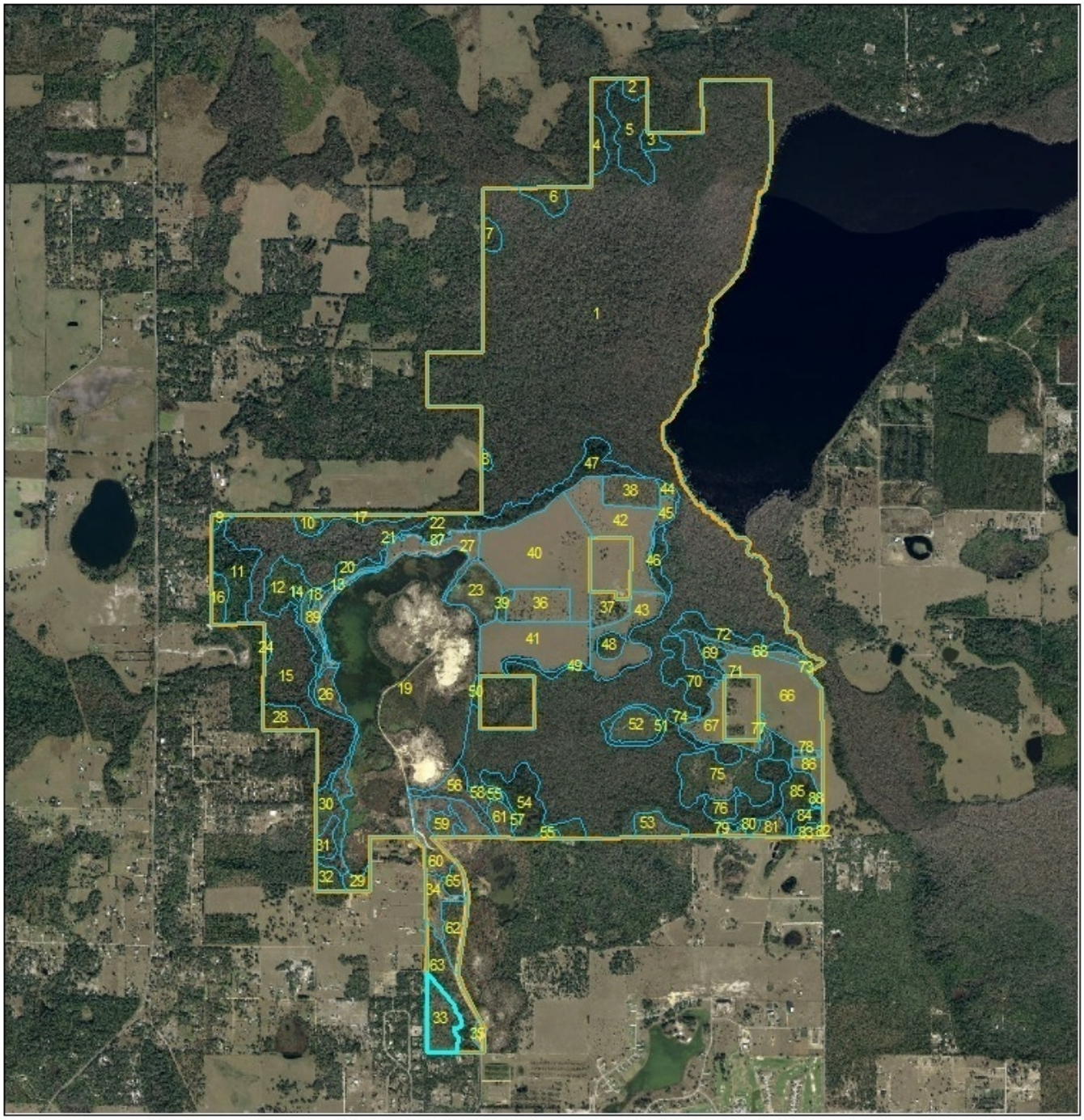
Restoration work may involve harvesting trees to thin areas, clear-cutting trees, chopping and mowing, herbicide treatment of exotics or for site preparation, and prescribed burning. LNCA has been divided into stands to help manage the property (Figure 10). These stands will help delineate areas identified for management or restoration.

Over the next five years, the District will make headway on those management items classified in the LNCA Forest Management and Restoration Plan as Priority 1 and may begin on Priority 2 classified items as well.

In the event of tree harvest, the District will abide by Florida Silviculture Best Management Practices. The District will remove trees as needed in the case of insect infestations, disease, and damage from severe weather, wildfire, or other occurrences that could jeopardize the health of natural communities. Site preparation techniques employed prior to replanting in any potential harvested areas in the Conservation Area may include mechanical treatment of vegetation, chemical treatment of vegetation, and prescribed fire. These techniques may be used singularly or in combination. Any potential revenue will be applied toward the District's land management budget to offset management costs.

Forest Management Strategies

- Make headway on management items classified as Priority 1 in the LNCA Forest Management and Restoration Plan (Appendix C) and begin items classified as Priority 2 if possible.



Lake Norris Conservation Area
Figure 10.
Forest Management Stands Map

0.5 0.25 0 0.5 Miles

1 = 40000

Legend

Forest Management Stands

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Fire Management

The District's primary use of fire is to mimic natural fire regimes to encourage the perpetuation and amelioration of native pyric plant communities and dependent wildlife. Additionally, the application of fire aids in the reduction of fuels and minimizes the potential for catastrophic and damaging wildfires. Fire management activities are critical to maintaining the natural communities within LNCA as many of the resident communities evolved with fire. Therefore, prescribed fire is an important, and relatively inexpensive, tool for use in the maintenance of plant communities within the Conservation Area.

Historically, the majority of fires occurring on what is now LNCA would have been ignited by lightning during the growing season. The District has utilized prescribed burning on the property since 2002 integrating growing season and dormant season burns. Over 250 acres have been burned in nine separate fires (Figure 11). The District intends to continue growing season fires where possible, understanding that various constraints, such as high fuel loading and/or weather conditions, may necessitate the use of dormant season burning.

The property is in a relatively rural area with Seminole State Forest to the east and Ocala National Forest to the north. State Road 44A to the south, County Road 42 to the North, and County Road 439 to the west provide smoke management considerations (Figure 12) along with schools and hospitals as development occurs to the southwest at the approximately 5 mile radius. Smoke management is of utmost concern and any potential burns will be conducted to minimize off-site impacts by maneuvering smoke plumes away from smoke sensitive areas and by ensuring adequate smoke dispersal.

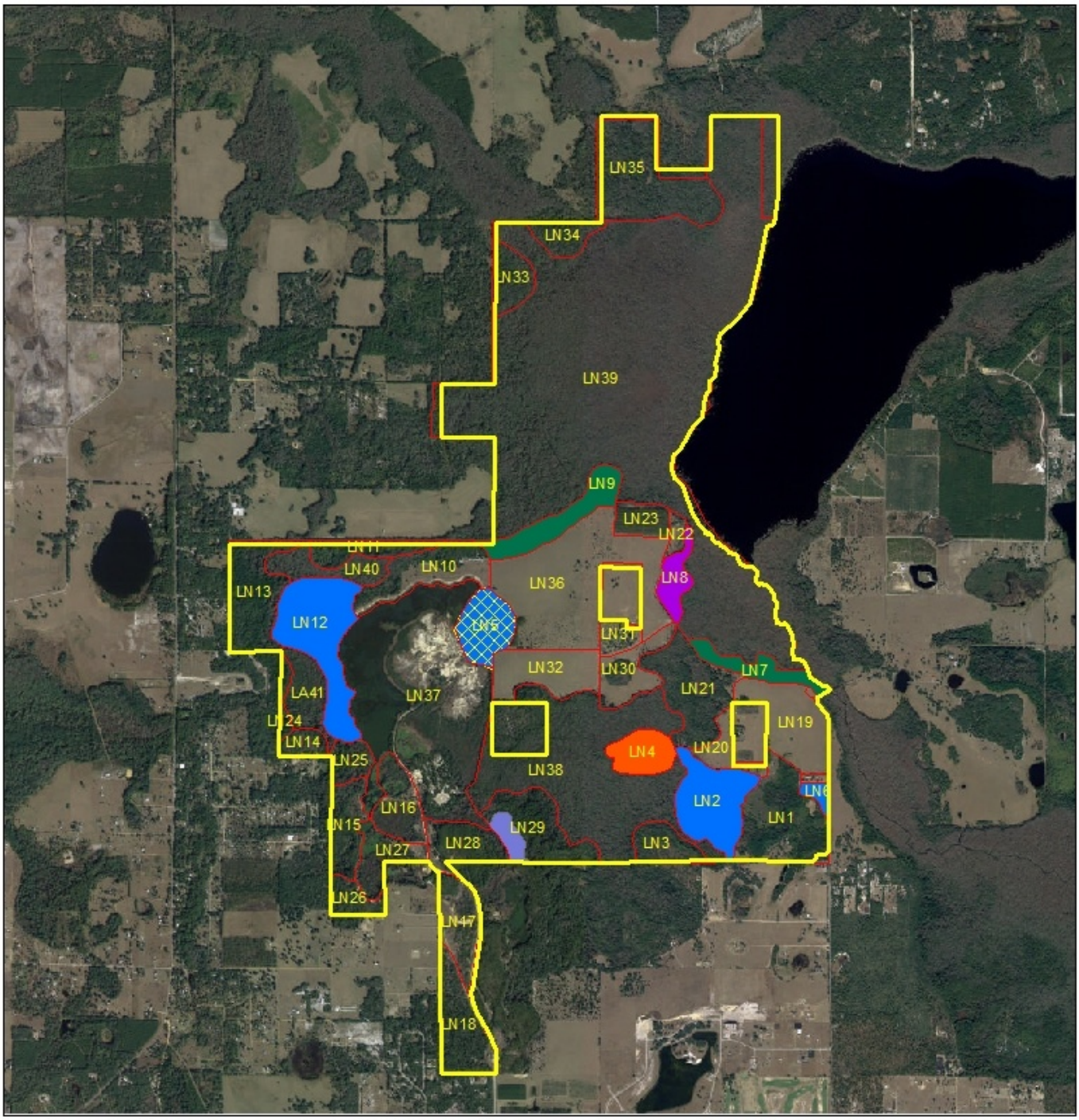
While prescribed fire is the preferred tool for restoration and maintenance within the Conservation Area, it may be necessary to implement mechanical methods of vegetation management. During periods of extended drought or in areas where implementing prescribed fire safely is not feasible, the District may employ management methods such as selective herbicide treatments, mowing, roller chopping, and overstory manipulation.

During the next five years, the District aims to utilize prescribed fire at LNCA to perpetuate fire dependent natural communities such as sandhill, mesic and wet flatwoods, and scrubby flatwoods and to assist with restoration of various stands within the property. Firelines, both internal and boundary, will be maintained as needed. All implementation of prescribed fire within the Conservation Area will be conducted in accordance with the District's Fire Management Plan, the Lake Norris Conservation Area Fire Management Plan (Appendix D), and the annual burn plans for the property.

<u>Fire Management Strategies</u>

- Implement prescribed burning as described in the District's Fire Management Plan and the Lake Norris Conservation Area Fire Management Plan.
- Develop annual burn plans.
- Utilize growing season burns where possible.

- Conduct dormant season burns when not feasible in the growing season and in areas of high fuel loading and/or extended fire exclusion.



Lake Norris Conservation Area

Figure 11. Fire History Map

0.5 0.25 0 0.5 Miles

1 = 40000

Legend

- Lake Norris Conservation Area
- Fire Management Units
- 2001-2002
- 2003-2004
- 2004-2005
- 2005-2006
- 2007-2008
- 2008-2009

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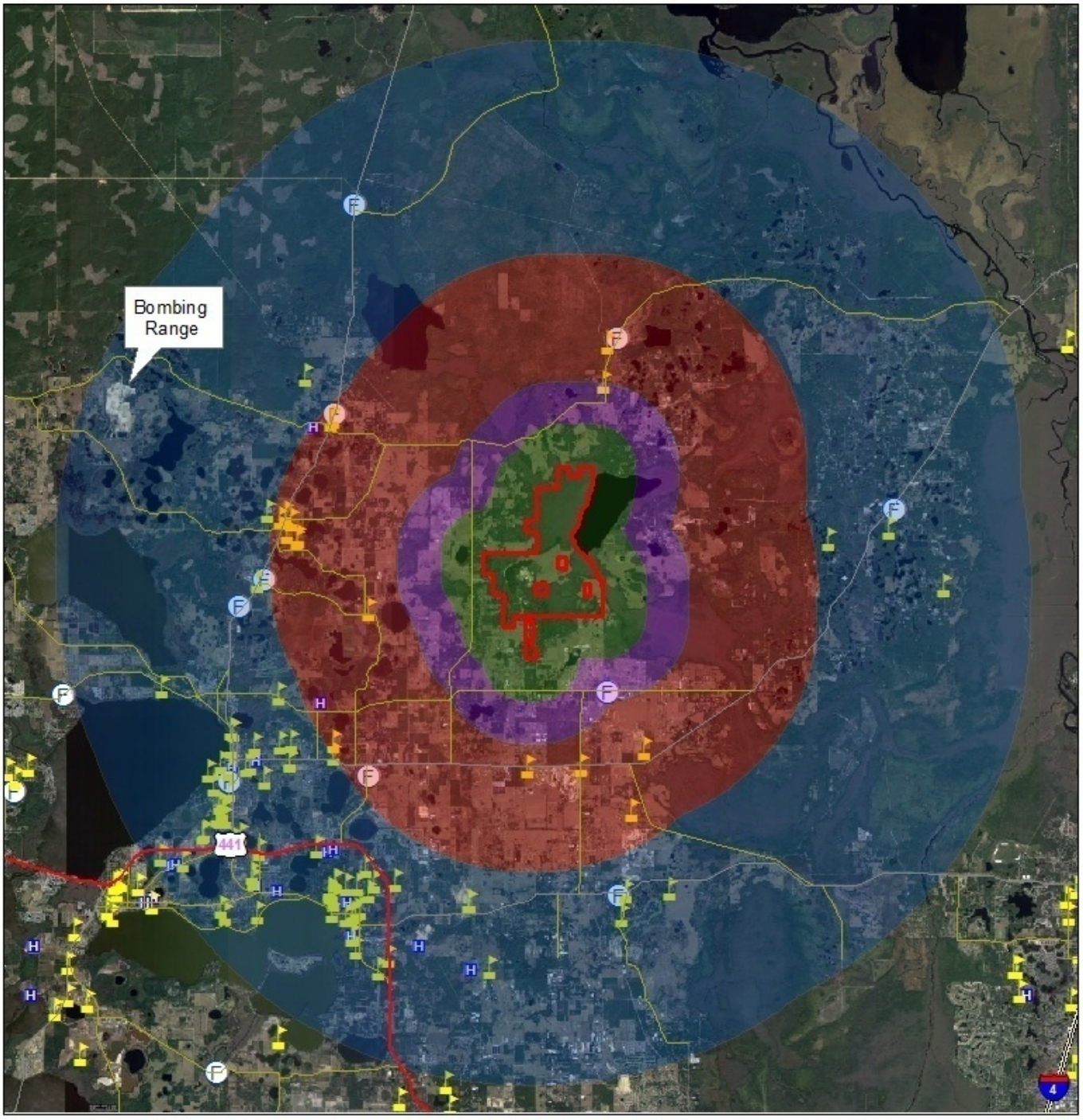
Author:tmashour, Source:X:\LandMgmt\GIS\Users\Planners\West\Lake Norris\Lake Norris LMP 2009\Figure 1. Location Map.mxd, Time:6/24/2009 12:49:46 PM



Lake Norris Conservation Area

Figure 12. Smoke Management Map

2 1 0 2 Miles

1 = 200000

Legend

- Lake Norris Conservation Area
- Schools
- Health Care Facility
- Lake County FireStation
- 1 Mile
- 2 Miles
- 5 Miles
- 10 Miles

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Author:tmashour, Source:X:\LandMgmt\GIS\Users\Planners\West\Lake Norris\Lake Norris LMP 2009\Figure 1. Location Map.mxd, Time:6/24/2009 12:49:46 PM

Exotic and Invasive Species

Several exotic pest plants are treated within the Conservation Area including cogon grass (*Imperata cylindrica*), Chinaberry tree (*Melia azedarach*), camphor tree (*Cinnamomum camphora*), Chinese tallow (*Sapium sebiferum*), Japanese climbing fern (*Lygodium japonicum*), and hydrilla (*Hydrilla verticillata*) (Figure 13). Natal grass (*Melinis repens*) is also found on site, but is not treated on a regular basis.

LNCA is part of the District's Invasive Plant Management Program. The program has targeted the abovementioned species at LNCA and over the next five years will treat and monitor these species as requested by land management staff. Although it is unlikely that the Invasive Plant Management Program will completely eradicate invasive and exotic plant populations in the Conservation Area, management is aimed toward holding populations to a "maintenance control" level. At this level, the property is regularly monitored and herbicide treatments are applied as necessary in order to keep the populations from spreading. Information regarding treatment of these species can be found at http://www.fleppc.org/index.cfm.

LNCA is part of a University of Florida UF research program regarding removal of hydrilla from the man-made lake. The lake is an ideal site as it is currently off limits to the public, allowing for safety from chemicals and a site that will not be disturbed. Research plots are located throughout the lake marked with small buoys, treating four one-acre plots at a time. Labeled contact herbicides are mixed with experimental herbicides to evaluate new chemicals. The District applies UF provided herbicides and experimental herbicide mixes. Results are not known at this time.

Exotic wildlife species known to occur within the Conservation Area include feral hogs (*Sus scrofa*), coyote (*Canis latrans*), and nine banded armadillos (*Dasypus novemcinctus*). The District utilizes the United States Department of Agriculture (USDA) to remove hogs from the property. The District will continue this hog removal effort over the next five years.

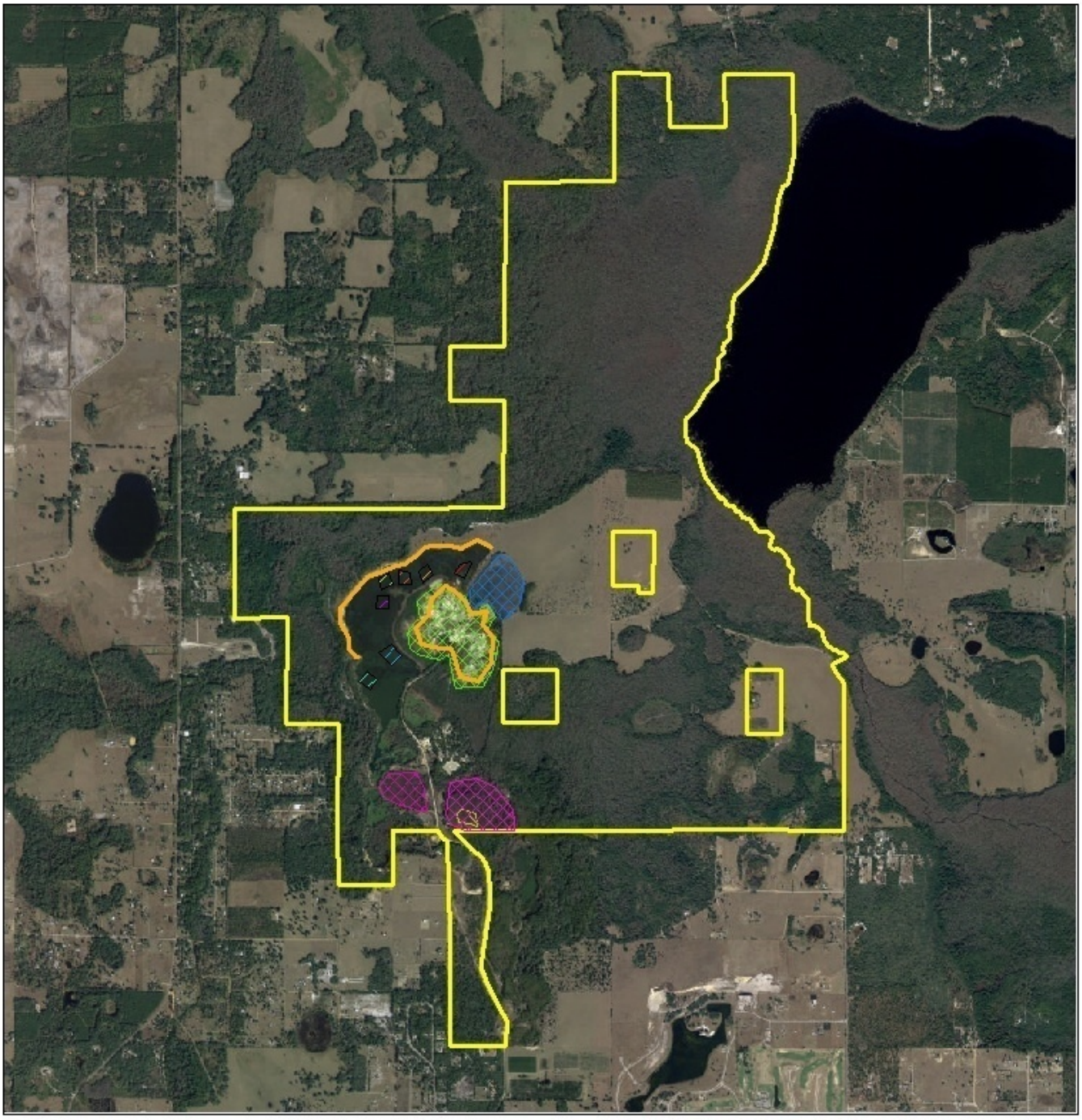
Laurel wilt, a disease of red bays (*Persea borbona*) and other trees in the laurel family has been observed in red bay populations within the Conservation Area. Caused by a fungus, laurel wilt is carried and transmitted by the non-native red bay ambrosia beetle (*Xyleborus glabratus*). The beetle generally attacks healthy, mature trees and the subsequent fungal infection causes the flow of water to be restricted to the leaves and branches and the eventual mortality. Laurel wilt is devastating to infected populations and there are currently no known methods for controlling the disease. Additional information on laurel wilt disease and the red bay ambrosia beetle can be found at http://www.fl-dof.com/publications/fh_pdfs/Laurel_Wilt.pdf and http://edis.ifas.ufl.edu/HS 391.

A September 2009 University of Florida study discusses a natal grass biology and management. The District will review this study to determine future plans for natal grass treatment.

Over the next five years, the District will continue to monitor and treat invasive and exotic plant species, continue to work with USDA to remove feral hogs from the property as needed, and continue to work with University of Florida in experimental herbicides aimed to reduce hydrilla on site and eventually throughout Florida.

Exotic Species Strategies

- Continue to monitor and treat invasive and exotic plant species within the property.
- Continue to work with University of Florida in experimental herbicide mixes to remove hydrilla on site and throughout Florida.
- Continue to utilize USDA to remove feral hogs from the property.



Lake Norris Conservation Area

Figure 13. Exotic Species Map

0.5 0.25 0 0.5 Miles

1 = 40000

Legend

- Lake Norris Conservation Area
- Cogon grass
- Chinese tallow
- Japanese climbing fern
- Natal Grass
- Hydrilla treatment plots

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Cultural Resources Protection
According to Chapter 40C-9.220, all archaeological and cultural resources on District Lands are protected. Removal, alteration, or destruction of archaeological or cultural resources is prohibited on all District Lands unless authorized by the District. The District shall consult the Florida Department of State, Division of Historical Resources prior to authorizing the removal, alteration or destruction of any archaeological or cultural resources on District Lands. There are no known cultural resources found within the boundary of LNCA.

Cultural Resources Protection Strategies

- Identify and report any new sites to Florida Department of State, Division of Historical Resources.

LAND USE MANAGEMENT

Access
LNCA has two public entrances. The eastern entrance is off Lake Norris Road and the second is off Hart Ranch Road, both off State Road 44A. Vehicular access is restricted to the parking areas. The eastern access has a picnic table and a kiosk for information about the property. The access is very close to Black Water Creek for access to canoeing. From the parking area, the public may hike into the property to a trail system and to canoe rentals. For use of the primitive group campsite and canoe rentals, the public may contact Lake County Water Authority at (352) 343-3777, extension 0, for reservations.

As a means to create maintenance schedules and for budget planning assistance, the District has mapped and categorized the roads and trails at LNCA (Figure 14). Road types within the Conservation Area include Type B, C, D, and E described as:

Type B Road: All weather roads stabilized with lime-rock or a similar product graded frequently. There are 2.24 miles of Type B roads on the property.
Type C Road: Stabilized road with a surface of native soils or a combination of clay, lime or coquina rock, sand and grass. Maintenance consists of routine mowing and repairing holes. There are 1.05 miles of Type C roads on the property.
Type D Road: Limited stabilized surface, with or without ditches, that receives occasional traffic. Maintenance consists of mowing annually or as needed. There are 7.66 miles of Type D roads on the property.
Type E Road: Seasonal road that receives infrequent traffic. Maintenance is limited to mowing as needed. May be mowed by recreational trails mowing contractor. There are 6.95 miles of Type E roads on the property.

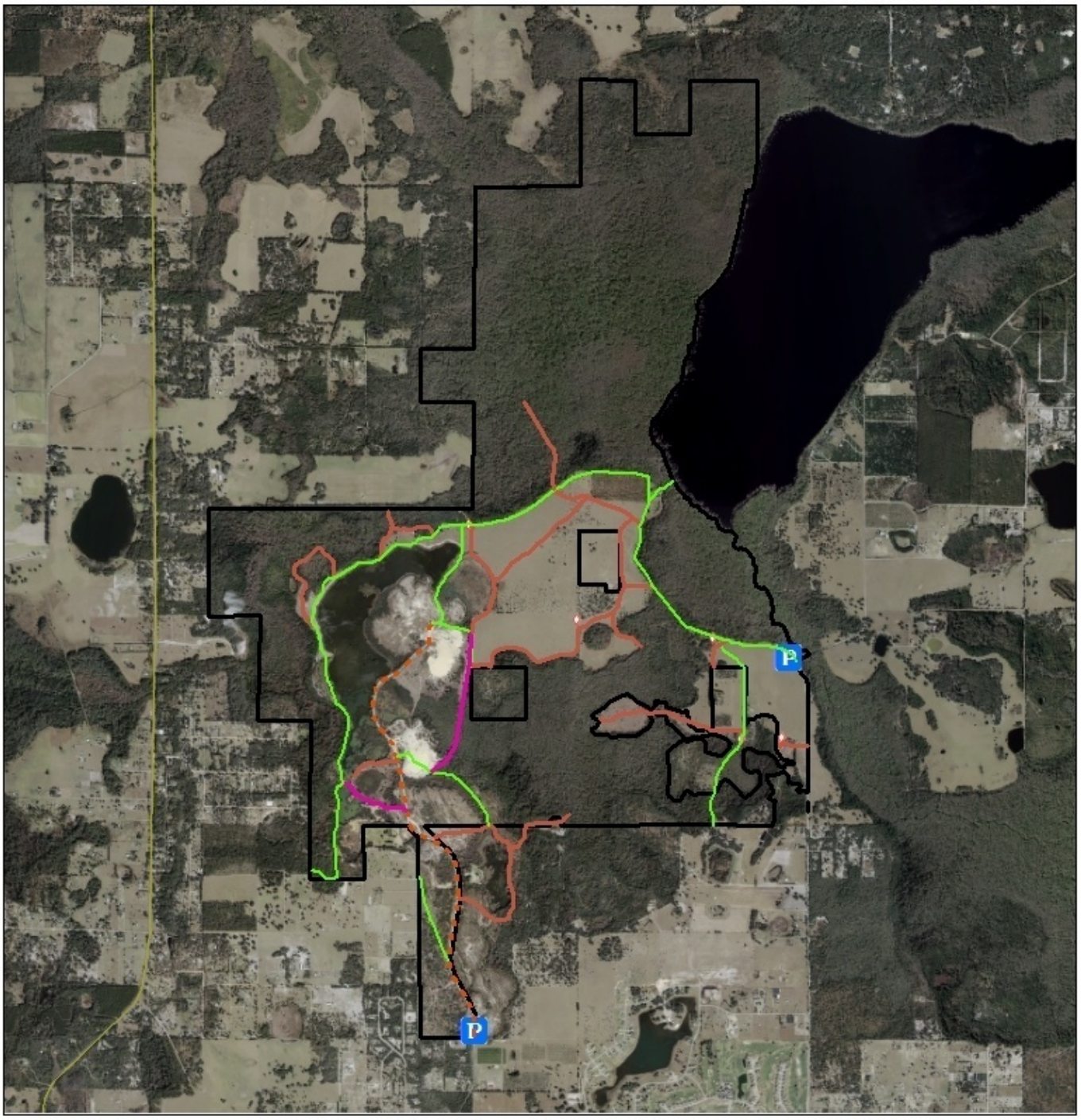
During the time interval when sand is being removed from onsite stockpiles (until December 2012), there will be periodic heavy truck travel on Hart Ranch Road, the county road leading to the southwest corner of the property. The District has received complaints from neighboring landowners concerned about public safety on Hart Ranch Road due to sand truck use. The District communicated these concerns to Lake County, the entity responsible for road maintenance and safety, in September 2009. Lake

County's traffic operation safety director inspected the road and determined that the posted speed limit was appropriate (35 mph), however a blind curve was not adequately posted. Lake County indicated additional signage would be in place sometime in October 2009.

Over the next five years, the District will continue to improve roads as needed for land management access. At the time roads, trails or firelines are added or repaired, roads may be closed as needed.

Access Strategies

- Maintain parking areas, signs, gates, trails, and roads.



Lake Norris Conservation Area

Figure 14. Roads Classification Map

0.6 0.3 0 0.6 Miles

1 = 40000

Legend

- Lake Norris Conservation Area
- Parking Areas
- Type B
- Type C
- Type D
- Type E

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Recreation and Outreach

According to the District's Recreation Management Plan, the primary objective of the Recreation Management Program is to facilitate resource-based recreational activities on District lands (District, District Recreation Management Plan, 2002). Resource-based recreation includes those activities dependent on some particular element or combination of elements in the natural environment. SJRWMD conservation areas are mostly geared toward dispersed resource-based activities. Dispersed recreation is passive outdoor recreation that occurs outside of developed sites where modern facilities and concentrated use typically occurs. The typical District conservation area consists of a trailhead with a designated parking area, an information kiosk, and access to the lands using trails that are primarily interior roads, fire lines, or levees that are maintained for land and water management purposes. The trail system is used predominantly for hiking, off-road bicycling, and/or horseback riding and may access areas for primitive group camping, fishing, and wildlife viewing. Based on these guidelines, the paragraphs below describe the recreation provided at LNCA.

LNCA recreation is managed by Lake County Water Authority (LCWA) per a 1996 intergovernmental agreement. LCWA recreation management is limited to District dispersed recreation standards. Recreational opportunities available within the Conservation Area include hiking, bicycling, horseback riding, fishing, picnicking, canoeing, primitive group camping, and wildlife viewing (Figure 15). Around 7 miles of trails have been developed on the property delineated in a white, red, and yellow trail system that spans from the western entrance to the eastern entrance. A trail guide was developed by the District in 2009 for the property, which can be found online along with a map of the property, directions, and additional recreation information at http://floridaswater.com/recreationguide/index.html; the trail guide is also found on site at the parking area kiosks.

Lake County Water Authority (LCWA) has four canoes near the shore of Lake Norris that can be used by the public after a completed application and deposit has been left at their headquarters in Tavares. Paddles and life vests are also located on site. Paddlers can enjoy paddling Lake Norris via entrance from the campsite area. Paddlers can also park at the eastern parking area and carry canoes to the Black Water Creek canoe entrance and paddle north up the creek to Lake Norris. Paddling south on Black Water Creek is not encouraged, as the trail beyond this point is not maintained. LNCA blazes the canoe run trail, clears the canoe run of obstructions and garbage from the canoe entrance north to Lake Norris, and LCWA oversees the reservation of a primitive group camping area located in the vicinity of the canoe rack. A completed application and deposit are also required. Vehicle access is allowed for those who have completed their application and submitted their deposit for the primitive group camping area. All recreational questions, primitive group camping reservations, and canoe rentals are directed to or reserved by contacting LCWA at (352) 343-3777.

A trailhead parking area, kiosk, and picnic table are located at the east LNCA entrance off Lake Norris Road. This is a large parking area that allows for equestrian parking along with close access to Black Water Creek for canoe put in access. A second trailhead

parking area is located off Hart Ranch Road. This parking area has a kiosk and is large enough to allow for equestrian trailers.

No motorized vehicles are allowed on the property except as utilized by District staff for management, contractors, the permitted mitigation bank, outparcel owners associated use, permitted campsite users, and the cattle lessee. Off-road vehicles (including motorcycles and all terrain or track vehicles) are not allowed.

The LNCA mitigation bank area is closed to recreation except for a trail on the western side of the property. At times, this trail will be closed due to construction. When the trail is closed, it will be posted on site along with a mitigation bank fact sheet that was developed in summer 2009, and on the web at floridaswater.com.

Users interested in commenting on recreation at LNCA attend Central Recreational Public Meetings twice yearly. At these meetings, the District provides information on recreation, land management and restoration projects as well as provides time for public comment. These meetings are noticed at http://floridaswater.com/othermeetings.

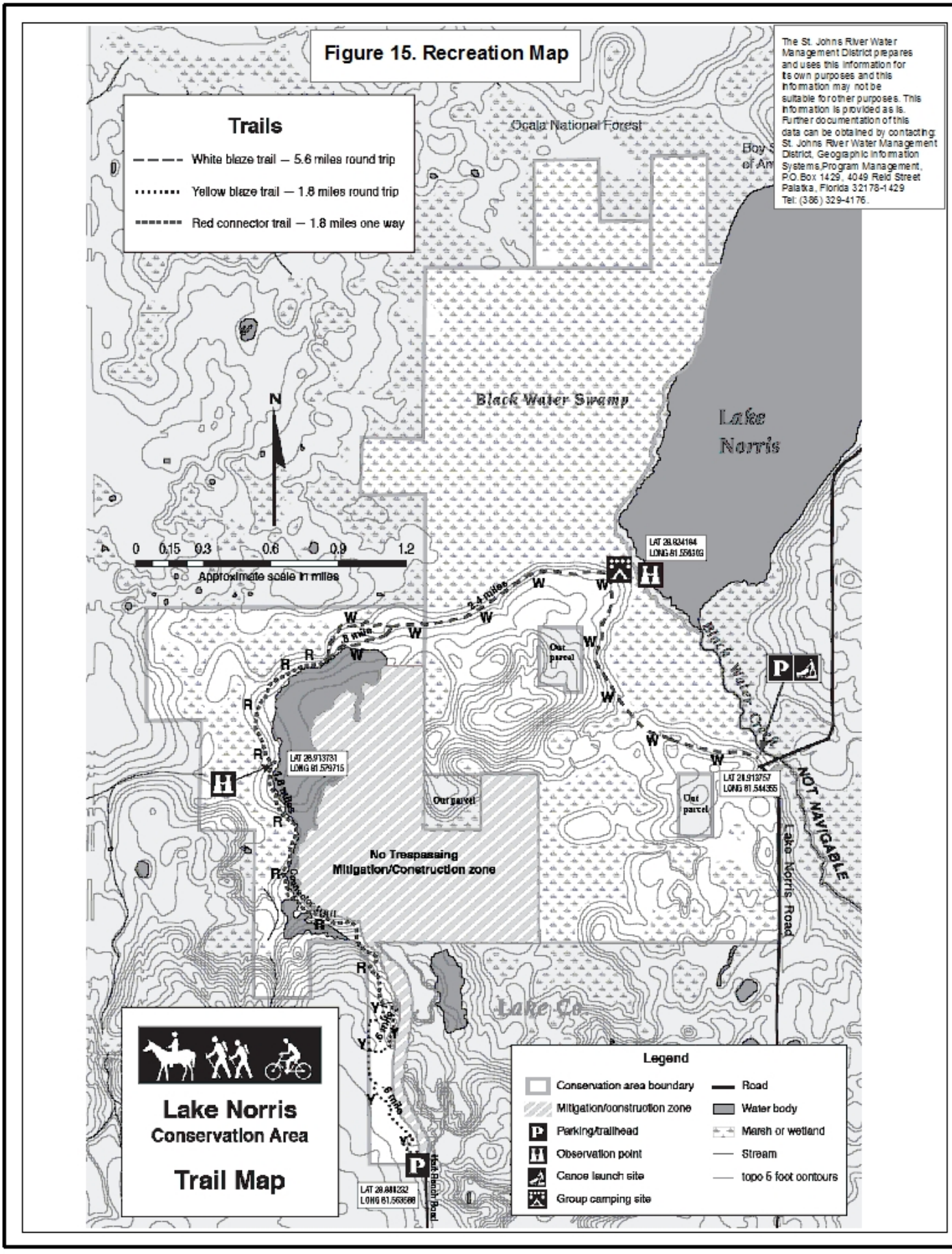
According to Chapter 40C-9.115 Florida Administrative Code, the District is required to establish and implement a Land Management Review Team in accordance with Section 373.591, Florida Statutes, to evaluate whether public conservation, preservation, and recreation lands are being appropriately managed, based on the approved land management plan for each specific owned property. Management Review Team tours for each property are conducted every five years. The District conducted the LNCA Management Review Team tour May 6, 2009 and comments were incorporated into this plan revision as appropriate.

Over the next five years, the District will maintain parking entrances, trails, campsites and recreation structures through vegetative trimming, erosion control with stabilizing material, blazing of trees or installation of posts with blazes, benches, and interpretive signage. The District will install a portable toilet at the Conservation Area. It is possible the Florida Trail Association will create trail linkages from LNCA north through Black Water Swamp on old tram roads to other parcels within the Ocala National Forest. The District will evaluate future accommodations for boat or canoe access to the man-made lake upon completion of both the mitigation bank construction and the hydrilla research with University of Florida. The District will host two Central Recreational Public Meetings per year and conduct one Management Review Team Tour of LNCA under the purview of this plan. During the next five years, the District will update the property recreation guide map to account for the enhanced recreation trails that now connect the west parking area trailhead to the eastern trails. The District will continue to coordinate with Lake County Water Authority in their continued recreation management of LNCA.

Recreation Strategies

- Maintain recreation trails and amenities and update as needed.
- Set up and maintain portable restroom beginning Fiscal Year 2009-2010.

- Evaluate providing parking and boat access to the man-made lake once mitigation construction is complete and hydrilla research is complete.
- Host two Central Recreational Public meetings per year and one Management Review Team Tour during the next five years.
- Update recreation guide to reflect the enhanced recreation trails reaching from the east entrance to the west entrance.
- Continue to coordinate with Lake County Water Authority in their continued recreation management of LNCA.



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Administration

Acquisition
According to Chapter 40C-9.031 Florida Administrative Code, the District shall adopt a five-year plan designating the areas of land to be acquired. As the District considers purchasing parcels that become available near LNCA that will aid in the conservation of water resources in the Middle Basin, the parcels will be added to the five-year plan. As part of the land acquisition program, the District may consider surplussing land when needed.

Acquisition Strategies
- Evaluate parcels as they become available.

Cooperative Agreements, Leases, Easements, and Special Use Authorizations
The District is authorized to enter into Cooperative Agreements/Cooperative Management Leases, Leases, Easements and Special Use Authorizations. According to Chapter 373.1391 Florida Statutes, Chapter 40C-9.410, the District is authorized and encouraged to enter into cooperative land management agreements with state agencies or local governments to provide for the coordinated and cost-effective management of lands to which the water management districts, the Board of Trustees of the Internal Improvement Trust Fund, or local governments hold title. According to Chapter 40C-9.370, a person shall apply for a District Lease to use District Land if the use constitutes an agricultural activity or is of such nature as to require a legal interest in the District Land according to guidelines in the aforementioned section. According to Chapter 40C-9.380, the District does not encourage the use of District Lands for utility right-of-way easements or other similar purposes except according to the aforementioned section's criteria. According to Chapter 40C-9.360, a person shall apply for a Special Use Authorization to use District Lands according to guidelines in the aforementioned section.

The following list and Table 6 identify all current agreements at LNCA.

Cattle Lease

Lease #54- **Cattle Lease**. This agreement began on April 1, 2003 and terminated on December 1, 2003 with automatic renewals year to year. The District reviews the lease yearly and determines whether to renew or terminate the lease. The lease fee is $4,500 and is based on 100 animal units at a rate of $45 per animal unit. Work service credits can substitute for the lease fee.

Special Use Authorization

Agreement # 534 - **East Lake Holdings Gopher Tortoise Relocation** - December 22, 2008-December 21, 2009. Allows mitigation bank permittee to relocate gopher tortoises from the mitigation bank on LNCA to another part of LNCA (Figure 16) per permit restrictions and following a land management plan.

Agreement # 441 – **Black Water Creek Mitigation Bank Travel Trailer for Staff Housing**. February 15, 2008 – February 14, 2009. Automatically renews for four consecutive one-year terms, terminating on February 14, 2012.

Intergovernmental Management Agreement

Agreement # 452 **Lake County Water Authority Wekiva-Ocala Greenways Intergovernmental Management Agreement** November 13, 1996 – November 12, 2001. This agreement originally outlined District responsibilities as resource management only and LCWA responsibilities as writing the management plan, recreation coordination, and lead manager. Responsibilities have changed since 1996 to the District becoming lead manager and writing the land management plan and LCWA responsible for recreation management only. This agreement will be rewritten under the purview of this plan to reflect these updated responsibilities.

Permissive Use Agreement

Agreement #524 – **Adjacent Resident**. This agreement began on November 1, 2008 and ends upon 30 days written notice from the landowner. The agreement allows the District, their agents, and contractors to utilize an existing road on Mr. Quails' property to gain access to the adjacent District owned LNCA property. The District shall maintain insurance and be responsible for negligent acts or omissions of its staff or agents.

Residence Agreement

Agreement # 215 – **Resident Caretaker** – This agreement began on August 21, 2003 and ends upon 90 days District notice to vacate. The District owns the home of the resident, which includes a single-family residence, septic tank, pump, and well. The fee for use of the property is $225 per month; in lieu of cash payment, the resident may provide services and materials on the property. The resident pays all utility services. The resident provides security and surveillance of LNCA and caretaker/maintenance of the home.

Mitigation Related Agreements

Agreement #592 – **Third Mitigation Agreement** - October 24, 2007 – October 23, 2010. Allows Blackwater to conduct restoration work at the Eustis Sand Mine as the Black Water Mitigation Bank as permitted by the District regulatory division as permit # 4-069-92314. Master Plan for the project was approved by the Division of Land Management per proprietary interests prior to Blackwater obtaining regulatory permit. Master Plan becomes null and void if construction is not completed by October 23, 2010, with the exception that phases 10, 11, and 15 do not need to be completed by that time. These phases shall begin once completion of the fill removal or upon expiration of the fill removal agreement and shall be completed in eighteen (18) months from the beginning of construction of each phase.

Failure by Blackwater Creek Mitigation Bank to meet this October 23, 2010 timeframe will cause the permits and all unreleased credits remaining in the bank to become the sole property of the District, unless written approval to extend the time frame has been received by the District.

Agreement #592 - **Third Mitigation Agreement, First Amendment** – May 2, 2008. Master Plan becomes null and void if Blackwater fails to meet the October 23, 2010 timeframe for completion of the construction, if there is no delay by acts of God. The Agreement shall terminate pending the signator or family ceases to be majority owner or majority shareholder of Blackwater or if Blackwater becomes inactive or should file for bankruptcy.

Agreement #592 - **Third Mitigation Agreement, Second Amendment** – June 26, 2009. Increases the Special Use Authorization fee to $6,576.53 per mitigation credit. Increases the land management fee to $822.07 per mitigation credit. Fees apply retroactively to any mitigation credits for which the District has been paid. This amendment was necessary adjust fees for mitigation bank credits instead of a per acre fee.

Covenants and Restrictions # 593 –Rerecorded June 10, 2009. Mitigation Bank Covenants and Restrictions for the boundary of the mitigation bank permitted by the District expands the boundary to include the area permitted by US Army Corps of Engineers. Acreage increased from 347 to 416. Outlines that the area must be maintained in a natural state, improvements must be compatible with natural characteristics, Blackwater is responsible for upkeep until final success has been approved by USACE and the District. Public access is permitted within the area, once the mitigation bank construction is complete.

Lake Norris Sand Removal Agreement #124 – December 20, 2002 – December 19, 2012. Provides the right for East Lake/Greg Wiggins the right to remove sand from the sand mounds at LNCA. This also provides a non-exclusive easement and right of way to remove sand. This also provides the ability to utilize the construction trailer mobile office, two story equipment building, and use of the well at the western entrance to LNCA.

Easements

Easement # 594 - **Mitigation Bank Access Easement**-December 20, 2002. Allows for a 60-foot perpetual access easement for Blackwater to access the mitigation bank for restoration purposes. Also includes a 30-foot perpetual access easement for Blackwater/Greg Wiggins to access private property to the west of LNCA. The 30-foot easement may be terminated if Greg Wiggins subdivides into more than six new parcels or if Grantee (Blackwater Mitigation) acquires the property from the Grantor (District).

Access Easement #327 – **Kevin Grass Easement** – November 4, 2003. Perpetual access easement plus 20 foot telephone utility easement for an outparcel owner within LNCA.

Table 6. Leases, Easements, and Special Use Authorizations at LNCA.

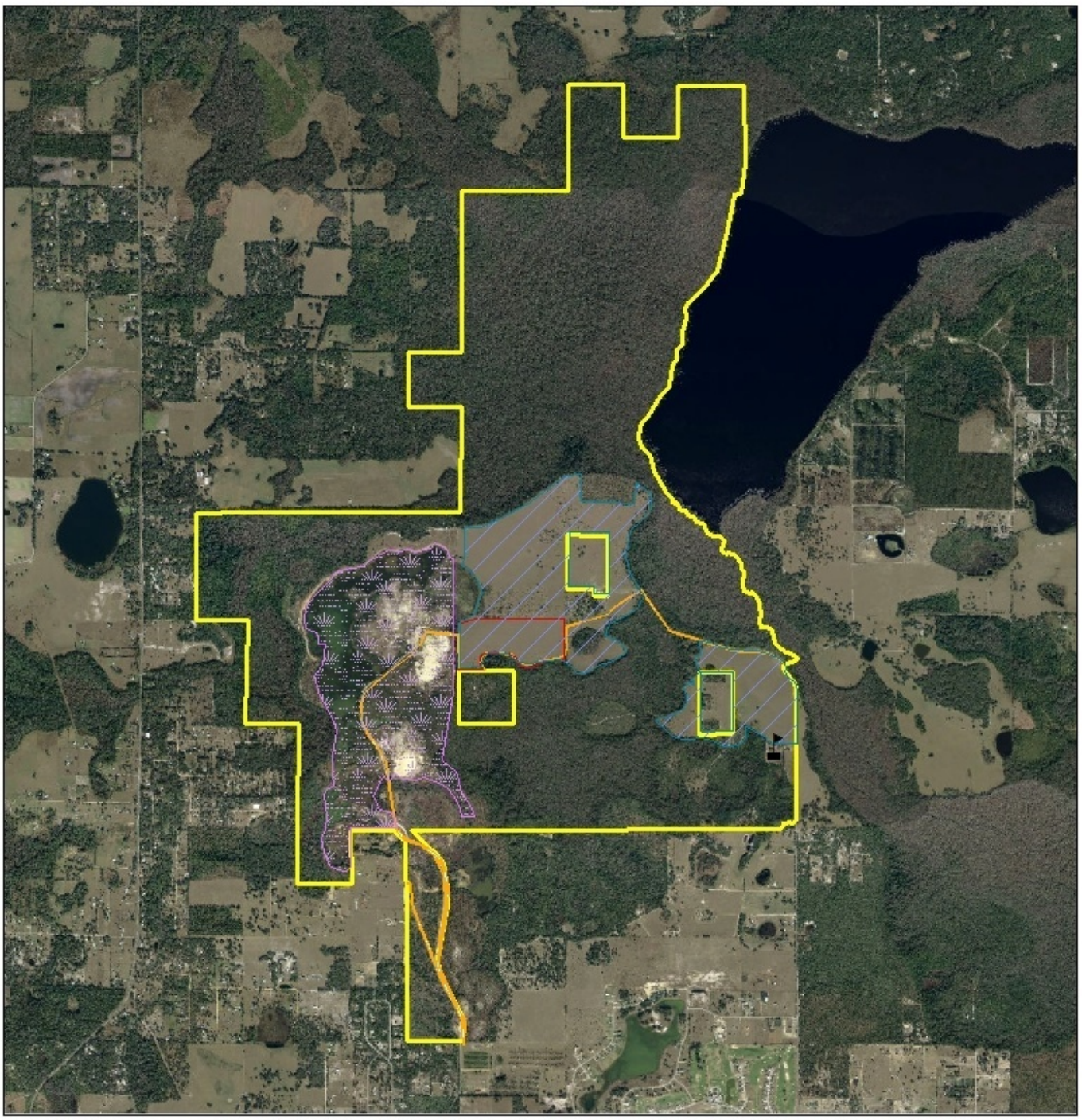
Agreement #	Agency/ Individual	Begin	Original Term Expiration	Acres	Renewals
Lease #54 Revenue Generating	Local Cattle Lessee	April 1, 2003	December 31, 2003	418	Year to year auto renewal on December 31 at Option of the District.
SUA #534	East Lake Holdings Gopher Tortoise Relocation	December 22, 2008	December 21, 2009	Mitigation Bank Area and Area Within Cattle Lease	
SUA #441	Black Water Creek Wetlands Mitigation, LLC	February 15, 2008	February 14, 2009	Area under travel trailer.	Autorenewal for four one-year terms expiring February 14, 2012.
Intergovernmental Management Agreement #452	Lake County Water Authority Management Designation	November 13, 1996	November 12, 2001	Canoe and primitive group camping reservations.	Five-year autorenewals on November 12. Next renewal November 12, 2011.
Permissive Use Agreement #524	District access to LNCA through land of Adjacent Resident	November 1, 2008	Open Ended	Access Easement	Open ended except upon 30 days written notice from the landowner.
Residence Agreement # 215	Resident Caretaker	August 21, 2003	Open Ended	Site of Residence	Open ended except upon 90 days notice from District to vacate.
Third Mitigation Agreement #592 with Two Amendments permit # 4-069-92314-2	Blackwater	October 24, 2007	October 23, 2010 mitigation work must be completed (with the exception of phases 10, 11, and 15 which will begin once sand is removed or sand removal agreement ends and then these phases must end 18 months after construction	347	None Unless Consideration of Written Notification in Advance

			begins). Permit expires November 11, 2013.		
Blackwater Mitigation Bank Covenants and Restrictions #593	Blackwater, USACE, District	June 10, 2009	Perpetual	416	Perpetual
Lake Norris Sand Removal Agreement #124	East Lake/Greg Wiggins	December 20, 2002	December 19, 2012	347	Expires December 19, 2012.
Mitigation Bank Access Easement #594	Blackwater	December 20, 2002	Perpetual unless terminated per easement agreement.	60-foot access easement and 30-foot access easement	Perpetual unless terminated per easement agreement.
Outparcel Owner Access Easement #327	Outparcel Owner	November 4, 2003	Perpetual.	Access easement plus 20-foot telephone utility easement.	Perpetual.

Over the next five years, the District will evaluate the need for additional agreements to assist with management of the property, assist with research projects, and assist with other events or projects that could utilize LNCA as a useful site. These include, but are not limited to, the installation of cell towers on disturbed areas within the property, university research, GIS geospatial referencing projects, wildlife management area, cattle leasing, public tours, etc. The District will rewrite the LCWA agreement #452 to reflect the current recreation responsibilities of the District and LCWA. The District will update the boundary of Cattle Lease #534 to add an area of planted pine and to eliminate an area of pasture that the District plans to restore.

Leases, Special Use Authorizations, and Agreements Strategies

- Continue to monitor all agreements and continue to evaluate as they come up for renewal.
- Update LCWA intergovernmental management agreement #452.
- Update Cattle Lease #534 boundary.



Lake Norris Conservation Area

Figure 16. Agreements Map

0.5 0.25 0 0.5 Miles

1 = 40000

Legend

- Lake Norris Conservation Area
- Blackwater Mitigation Bank
- Cattle
- Gopher Tortoise Relocation Site
- Granted Easements
- Security Resident

The St. Johns River Water Management District prepares and uses this information for its own purposes and this information may not be suitable for other purposes. This information is provided as is. Further documentation of this data can be obtained by contacting: St. Johns River Water Management District, Geographic Information Systems,Program Management, P.O.Box 1429, 4049 Reid Street Palatka, Florida 32178-1429 Tel: (386) 329-4176.

Author:tmashour, Source:X:\LandMgmt\GIS\Users\Planners\West\Lake Norris\Lake Norris LMP 2009\Figure 1. Location Map.mxd, Time:6/24/2009 12:49:46 PM

Revenue Generation

According to Chapter 40C-9.420, Revenues Generated from District Lands, "All revenues generated from the use of District Lands shall be used for District land acquisition or management." Timber revenue of $16,237 was generated on December 8, 2007 for a thinning on 120 acres and on March 1998 for $17,653 on 30 acres. Yearly revenues from LNCA as of 2009 include $4,500 per year from cattle lease #54. Additional revenue will be generated from the release of mitigation bank credits as the banker must pay special use authorization fees and land management fees for each credit released. Table 7 below lists all agreements for revenue generation at LNCA.

Mitigation Agreement

Agreement #592 – October 24, 2007 – October 23, 2010. For each mitigation credit under the Mitigation Bank Permit that has been contracted for and for which payment has been received by Blackwater, Blackwater shall pay the District $6,576.53 per mitigation credit, $822.07 for the land management fee per mitigation credit, and $2,500 at the beginning of each phase of construction (both per Third Mitigation Agreement, Second Amendment signed June 26, 2009). The mitigation bank will provide for wetland restoration of the old Eustis Sand Mine and reimburse the District the cost of acquisition of the parcel.

Lease

Cattle Lease # 54. Local cattle lessee grazes 100 cattle at $45 per animal unit. This lease brings in $4,500 yearly.

Table 7. Revenue Generation at LNCA

Agreement #	**Agency/ Individual**	**Payment Frequency**	**Term**	**Expiration**	**Revenue**
Lease #54	Local Cattle Lessee	Yearly	Year to year auto renewal at option of the District.	December 31, 2003; year-to-year auto renewal at option of the District.	$4,500
Third Mitigation Agreement #592 with Two Amendments	Blackwater	As credits are released and sold.	October 23, 2010 with the exception of phases 10, 11, and 15 which will begin once sand is removed or sand removal agreement ends and then these phases must end 18 months after construction begins.	October 23, 2010 with the exception of phases 10, 11, and 15 which will begin once sand is removed or sand removal agreement ends and then these phases must end 18 months after construction begins.	$786,750 for Special Use Authorization Fee; $98,344 for land management fee.
Total Yearly					**$4,500**

Potential Income When All Mitigation Bank Credits are Sold					**$885,094**

Revenue Strategies

- Continue to monitor all revenue generating agreements for receipt of payment and upon expiration for renewal evaluation.

IMPLEMENTATION CHART

Table 8. LNCA Implementation Chart

TASK	RESPONSIBLE LEAD	DUE DATE	PARTNERS
RESOURCE PROTECTION AND MANAGEMENT			
Security			
Maintain signage, fences, and gates.	LM	Ongoing	
Continue coordinating with LCWA, Lake County Sheriff's office, onsite security resident, FWC law enforcement, and cattle lessee for security of the property.	LM	Ongoing	LCSO, Onsite Security Resident, FWC Law Enforcement, Cattle Lessee
Water Resource Protection			
Coordinate with other District departments in hydrologic data monitoring.	WR, RM	Ongoing	LM
Continue to manage the property for natural community enhancement to protect water resources on or adjacent to the property.	LM	Ongoing	
Wetland Restoration			
Continue to monitor the progress of the Blackwater Creek Mitigation bank. Monitor the completion of the work in terms of the Third Mitigation Bank Agreement timeframe of expiration date of October 23, 2010.	LM	October 23, 2010	Regulatory
Flora and Fauna			
Manage the property for the protection and proliferation of listed species and other wildlife and plants.	LM	Ongoing	
Oversee gopher tortoise permit ensuring Monitor Blackwater Creek complies with gopher tortoise relocation permit.	LM	Ongoing	
Continue to conduct diversity surveys, including surveying for burrowing owls, and enhance species lists.	LM	Ongoing	ES
Forest Management and Restoration			

TASK	RESPONSIBLE LEAD	DUE DATE	PARTNERS
Make headway on management items classified as Priority 1 in the LNCA Forest Management and Restoration Plan (Appendix C) and begin items classified as Priority 2 if possible.	LM	October 2014	
Fire Management			
Implement prescribed burning as described in the District's Fire Management Plan and the Lake Norris Conservation Area Fire Management Plan.	LM	Ongoing	DOF
Develop annual burn plans.	LM	Yearly	
Utilize growing season burns where possible.	LM	Ongoing	
Conduct dormant season burns when not feasible in the growing season and in areas of high fuel loading and/or extended fire exclusion.	LM	Ongoing	
Exotic and Invasive Species			
Continue to monitor and treat invasive and exotic plant species within the property.	LM	Ongoing	IPM
Continue to work with University of Florida in experimental herbicide mixes to remove hydrilla on site and throughout Florida.	LM	Ongoing	IPM
Continue to utilize USDA to remove feral hogs from the property.	LM	Ongoing	USDA
Cultural Resources			
Identify and report any new sites to Florida Department of State, Division of Historical Resources.	LM	Ongoing	DHR
LAND USE MANAGEMENT			
Access			
Maintain parking areas, signs, gates, trails, and roads.	LM	Ongoing	LCWA
Recreation and Outreach			
Maintain recreation trails and amenities and update as needed.	LM	Ongoing	LCWA
Set up and maintain portable restroom beginning Fiscal Year 2009-2010.	LM	Ongoing	
Evaluate providing parking and boat access to the man-made lake once mitigation construction is complete and hydrilla research is complete.	LM	Pending mitigation construction completion and hydrilla research completion.	

TASK	RESPONSIBLE LEAD	DUE DATE	PARTNERS
Host two Central Recreational Public meetings per year and one Management Review Team Tour during the next five years.	LM	Ongoing	
Update recreation guide to reflect the enhanced recreation trails reaching from the east entrance to the west entrance.	LM	Ongoing	
Continue to coordinate with Lake County Water Authority in their continued recreation management of LNCA.	LM	Ongoing	LCWA
ADMINISTRATION			
Acquisition			
Evaluate parcels as they become available.	LA	Ongoing	LM
Cooperative Agreements, Leases, Easements, and Special Use Authorizations			
Continue to monitor all agreements and continue to evaluate as they come up for renewal.	LM, DOLR	As agreements come due for renewal	
Update LCWA intergovernmental management agreement #452.	LM	October 2010	LCWA
Update Cattle Lease #534 boundary.	LM	October 2014	
Revenue Generation			
Continue to monitor all revenue generating agreements for receipt of payment and upon expiration for renewal evaluation.	LM, DOLR	As agreements come due for renewal	

Key:
LM-District Land Management
ES-District Environmental Sciences
IPM-District Invasive Plant Management
OC-District Office of Communications
LA-District Division of Land Acquisition
PW-District Public Works
DOLR-District Department of Operations and Land Resources
RM-Department of Resource Management
WR-Department of Water Resources
FWC-Florida Fish and Wildlife Conservation Commission
IPM-Invasive Plant Management
LCSO-Lake County Sheriff's Office
USDA-United States Department of Agriculture

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APPENDIX A. SOILS

Anclote Fine Sand – 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. Anclote soils are in depressions, flats, or poorly defined drainage ways in the Lower Coastal Plain. Native vegetation consists of cypress, bay, popash, pond pine, cabbage palm, red maple, and juncus species.

Arents - Arents are nearly level soils made up of soils from numerous other soils. Typically, there are no soil horizons because you might have subsoil of one soil type and the surface layer of another type mixed up. Arent soils are most often associated with land leveling activities, dredging, or sanitary landfill areas (the covering material).

Astatula Sand - The Astatula series consists of very deep, excessively drained, rapidly permeable soils that formed in eolian and marine sands. Natural vegetation may consist of blue jack, blackjack, turkey oaks, longleaf pine, sand pine, and an understory of rosemary, pineland threeawn, bluestem, paspalum, lopsided indiangrass, and panicum.

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

Candler Sand – 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. They are typically located in Marion County, Florida; approximately 200 feet west of the Base Line Road; about 0.75 mile north of Silver Springs. Native vegetation consists of bluejack oak, turkey oak, post oak, live oak, and longleaf pine with a sparse understory of indiangrass, chalky bluestem, wiregrass, hairy panicum, and other annual forbs.

Emeralda Fine Sand – The Emeralda series consists of very deep, poorly drained, slowly or very slowly permeable soils in broad, low areas generally near lakes and streams in the lower Coastal Plain. They formed in clayey marine sediments. Emeralda soils are on broad areas in the lower Coastal Plain. Native vegetation consists of live oak, laurel oak, water oak, scattered slash pine, sweetgum, and red maple with an understory of wax myrtle, cabbage palm, saw palmetto, gallberry, cutgrass, beaked panicum, and sand cordgrass.

Felda Fine Sand - The Felda series consists of very deep, poorly drained and very poorly drained, moderately permeable soils in drainageways, sloughs and depressions, and on flood plains and low flats. They formed in stratified, unconsolidated marine sands and clays. Felda soils are in depressions, poorly defined drainageways, sloughs, flood plains, or low flat. Natural vegetation consists of cypress, wax myrtle, pond pine, slash pine, cabbage palm, pineland threeawn, and various grasses, vines, and shrubs.

Immokalee Sand – These soils are deep to very deep and poorly drained to very poorly drained soils that formed in sandy marine sediments. They occur on flatwoods and in depressions of Peninsular Florida. Slopes tend to be 0 – 2%, but may range to 5%. Principle vegetation is longleaf and slash pine with undergrowth of saw palmetto, gallberry, wax myrtle, and pineland threeawn. In depressions, water tolerant plants such as cypress, loblolly bay, gorodonia, red maple, sweetbay, maidencane, bluestem, sand cordgrass, and blue joint panicum are more common. Most areas with Immokalee soils are in rangeland and forests.

Lake Sand - The Lake series consists of excessively drained, rapidly to very rapidly permeable soils formed in thick beds of sand. They are on nearly level to steep slopes in central Florida. They are located in Lake County, Florida about 3 miles south of Astatula; 1/2 mile west of intersection of State Roads 561 and 455; 150 feet south of Highway 455.

Myakka Sand – Deep and very deep, poorly to very poorly drained soils formed in sandy marine deposits. These soils are on flatwoods, high tidal areas, flood plains, depressions, and gently sloping to barrier islands. Slopes in areas where these soils are found range from 0-8%. Native vegetation includes longleaf and slash pines with an undergrowth of saw palmetto, running oak, inkberry, wax myrtle, huckleberry, chalky bluestem, pineland threeawn, and scattered fetterbush.

Ocklawaha Muck – The Ocklawaha series consists of deep, very poorly drained soils that formed in herbaceous organic material and loamy and clayey mineral material. These soils are on floodplain, freshwater marshes, and depressions. These soils are located in Lake County, Florida; floodplain between Lake Apopka and Lake Dora. Most areas are in natural vegetation of sawgrass, lilies, sedges, cypress, bay, maple, and blackgum and used for range, wildlife habitat, or water storage areas.

Orsino Sand - The Orsino series consists of very deep, moderately well drained, very rapidly permeable soils that formed in thick beds of sandy marine or aeolian deposits. They are on moderately high ridges in the coastal plain. Native vegetation consists primarily of scrub vegetation with sand live oak, Chapman oak, myrtle oak, and scrub hickory. Scattered sand, slash, and longleaf pines and scattered blue jack, turkey, and post oak are found with a sparse understory.

Paola Sand – The Paola series consists of very deep, excessively drained, very rapidly permeable soils on uplands. They formed in thick sandy marine deposits. These soils are on uplands of the Coastal Plain. Native vegetation consists of sand pine, slash

pine, longleaf pine, scrub live oak, scattered turkey oak, and bluejack oak. The undergrowth consists of cacti, mosses, lichens, creeping dodder, rosemary, and scattered sawpalmetto.

Placid Sand – 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. Placid soils are in depressions, low flats, poorly defined drainageways, and in flood plains on the lower Coastal Plain. Natural vegetation consists of pond pine, bay, cypress, gum, pickerel weed, and coarse grasses.

Pomello Sand - 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. Native vegetation is dominated by scrub oak, dwarf live oak, saw palmetto, longleaf pine, slash pine, and wiregrass.

Pompano Sand – 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. Mean annual precipitation is about 50 inches and slopes range from 0-2%. Natural vegetation consists of palmetto, widely spaced cypress, gum, slash pine, and native grasses.

St. Lucie Sand – The St. Lucie series consists of very deep, excessively drained, very rapidly permeable soils on dune-like ridges and on isolated knolls. They formed in marine or eolian sand. St. Lucie soils are on dune-like ridges and on isolated knolls. Vegetation is dominated by sand live oak, sand pine, dwarf willow, sawpalmetto, rosemary, pricklypear cactus, and lichens.

Tavares Sand - 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. Tavares soils are on the lower slopes of hills and knolls. 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.

Wabasso Sand – Deep or very deep, very poorly drained, very slowly and slowly permeable soils on flatwoods, floodplains, and depressions in Peninsular Florida. They formed in sandy and loamy marine sediments. Slopes range from 0-2% in areas where these soils are found. Natural vegetation consists of longleaf pine, slash pine, cabbage palm, and live oak with an understory of saw palmetto, laurel oak, wax myrtle, chalky bluestem, and pineland threeawn.

Wauchula Sand - The Wauchula series consists of very deep, very poorly or poorly drained, moderately slow or slowly permeable soils on flatwoods on the lower

coastal plains. They formed in sandy and loamy marine sediments. The natural vegetation consists of longleaf pine, slash pine, saw palmetto, with an understory of inkberry, fetter, southern bayberry, and pineland threeawn.

APPENDIX B. SPECIES LISTS

Listed Species				
Scientific Name	**Common Name**	**FWC**	**USFWS**	**FNAI**
Avian				
Athene cunicularia floridana	Burrowing Owl	LS	N	G4T3, S3
Pandion haliaetus	Osprey	LS	N	G5, S3S4
Eudocimus albus	White ibis	LS	N	G5, S4
Mycteria americana	Wood stork	LE	LE	G4, S2
Mammals				
Ursus americanus floridanus	Florida black bear	LT	N	GTG2, S2
Sciurus niger shermani	Sherman's fox squirrel	LS	N	G5T3, S3

Exotic Species	
Scientific Name	**Common Name**
Plants	
Colocasia esculenta	Wild taro
Phyllanthus urinaria	Chamber bitter
Wahlenbergia marginata	Southern rockbell
Cerastium glomeratum	Mouse-ear chickweed
Cinnamomum camphora	Camphor-tree
Crotalaria spectabilis	Rattle-box
Hydrilla verticillata	Waterthyme
Imperata cylindrica	Cogongrass
Indigofera hirsuta	Hairy indigo
Lantana camara	Shrub verbena
Lygodium japonicum	Japanese climbing fern
Melia azedarach	Chinaberry
Momordica charantia	Wild balsam apple
Paspalum notatum	Bahiagrass
Rhynchelytrum repens	Natalgrass
Richardia brasiliensis	Brazil pusley
Sapium sebiferum	Chinese tallow tree
Sisyrinchium exile	Yellow blue-eyed grass
Syagrus romanzoffiana	Queen palm
Urena lobata	Caesar-weed

Fish	
Hoplosternum littorale	Brown hoplo
Mammals	
Canis latrans	Coyote
Sus scrofa	Feral Hog
Dasypus novemcinctus	Nine-banded armadillo

Comprehensive Species List	
Genus Species	**Common Name**
Plants	
Acer rubrum	Red maple
Agalinis spp.	False foxglove
Ambrosia artemisiifolia	Common ragweed
Amorpha fruticosa	Bastard indigo, false indigo
Ampelopsis arborea	Pepper vine
Andropogon virginicus	Broomsedge bluestem
Andropogon glomeratus var. pumilus	Bushy bluestem
Aristida stricta var. beyrichiana	Wiregrass
Arnoglossum floridanum	Florida Indian plantain
Arundinaria gigantea	Switch cane
Asclepias spp.	Milkweed
Aster dumosus	Rice button aster
Baccharis halimifolia	Groundsel tree/Sea myrtle
Balduina angustifolia	Yellow buttons
Bejaria racemosa	Tarflower
Berlandiera subacaulis	Florida green-eyes
Bidens alba	Begger-ticks
Bidens pilosa	Spanish needle
Blechnum serrulatum	Swamp fern
Buchnera americana	Blueheart
Callicarpa americana	Beautyberry
Campsis radicans	Trumpet creeper
Carphephorus corymbosus	Deer tongue
Carphephorus odoratissimus	Vanilla plant
Carpinus caroliniana	Bluebeech
Carya glabra	Pignut hickory
Cenchrus incertus	Coastal Sandspur
Cephalanthus occidentalis	Buttonbush
Cerastium glomeratum	Mouse-ear chickweed*
Chamaecrista fasciculata	Partridge pea
Chenopodium ambrosioides	Mexican tea

Cinnamomum camphora	Camphor-tree*
Cirsium horridulum	Thistle
Cladium jamaicense	Sawgrass
Cladonia sp.	
Clematis reticulata	Netleaf leather-flower
Cnidoscolus stimulosus	Tread softly
Colocasia esculenta	Wild taro*
Commelina erecta	Whitemouth dayflower
Cornus foemina	Stiff cornel, Swamp dogwood
Crotalaria rotundifolia	Rabbit-bells
Crotalaria spectabilis	Rattle-box*
Cynodon dactylon	Bermudagrass
Cyperus globulosus	Globe sedge
Datura stramonium	Jimsonweed
Dichanthelium aciculare	Needleleaf witchgrass
Diospyros virginiana	Persimmon
Eleocharis vivipara	Viviparous spikerush, Trail rush
Elephantopus carolinianus	Elephant’s foot
Erechtites hieracifolia	Fireweed
Eriogonum tomentosum	Wild buckwheat
Erythrina herbacea	Coralbean
Eupatorium sp.	Dog fennel
Fraxinus caroliniana	Water ash; Pop ash
Froelichia floridana	Cottonweed
Galactia elliottii	Milk pea
Gelsemium sempervirens	Carolina jessamine
Gnaphalium obtusifolium	Sweet everlasting; Rabbit's tobacco
Gordonia lasianthus	Loblolly bay
Hydrilla verticillata	Waterthyme*
Hydrocotyle umbellata	Marsh pennywort
Hydrocotyle bonariensis	Water pennywort
Hypericum sp.	St. John’s Wort
Ilex opaca	American holly
Ilex cassine	Dahoon holly
Ilex glabra	Inkberry, Gallberry
Imperata cylindrica	Cogongrass*
Indigofera hirsuta	Hairy indigo*
Ipomoea alba	White morning glory
Itea virginica	Virginia willow
Juncus tenuis	Path rush
Juncus sp.	

Juniperus silicicola	Southern red cedar
Lantana camara	Shrub verbena*
Liatris tenuifolia	Shortleaf gayfeather
Licania michauxii	Gopher apple
Limnobium spongia	Frog's-bit
Liquidambar styraciflua	Sweetgum
Ludwigia spp.	Primrose willow
Lupinus diffusus	Skyblue lupine
Lygodium japonicum	Japanese climbing fern*
Lyonia lucida	Fetterbush
Lyonia ferruginea	Rusty lyonia
Magnolia grandiflora	Southern magnolia
Magnolia virginiana	Sweet bay
Melia azedarach	Chinaberry*
Micranthemum umbrosum	Shade mudflower
Mikania scandens	Climbing hempweed
Mimosa quadrivalvis	Sensitive briar
Mitchella repens	Partridge berry
Momordica balsamina	Balsam apple
Momordica charantia	Wild balsam apple*
Monarda punctata	Horsemint; Spotted beebalm
Morus spp.	Mulberry
Myrica cerifera	Wax myrtle
Nidosculus stimulosus	Wood neddle
Nuphar lutea var. macrophyllum	Spatter-dock
Nyssa sylvatica var. biflora	Black gum
Opuntia humifusa	Prickly-pear cactus
Osmanthus americanus	Wild olive
Osmunda cinnamomea	Cinnamon fern
Osmunda regalis	Royal fern
Palafoxia feayi	Palafoxia
Paligula lutea var. macrophyllum	Orange Palligula
Panicum hemitomon	Maidencane
Parthenocissus quinquefolia	Virginia creeper
Paspalum notatum	Bahiagrass*
Passiflora incarnata	Purple passionflower
Peltandra virginica	Green arum
Persea borbonia var. borbonia	Red bay
Phlebodium aureum	Golden polypody
Phoradendron serotinum	Mistletoe
Phyllanthus urinaria	Chamber bitter

Physalis walteri	Ground Cherry
Pinus taeda	Loblolly pine
Pinus palustris	Longleaf pine
Pinus serotina	Pond pine
Pinus clausa	Sand pine
Pinus elliottii	Slash pine
Pityopsis graminifolia	Grass-leafed golden aster
Pluchea odorata	Saltmarsh fleabane
Polygonum hydropiperoides	Smartweed; Mild water-pepper
Polypodium polypodioides var. michauxiana	Resurrection fern
Prunus geniculata	Scrub plum
Prunus serotina	Wild cherry
Prunus umbellata	Hog plum
Pteridium aquilinum var. pseudocaudatum	Bracken fern
Pterocaulon pycnostachyum	Blackroot
Quercus marilandica	Blackjack oak
Quercus laurifolia	Laurel oak; Diamond oak
Quercus virginiana	Live oak
Quercus myrtifolia	Myrtle oak
Quercus geminata	Sand live oak
Quercus inopina	Scrub oak
Quercus laevis	Turkey oak
Quercus nigra	Water Oak
Rhexia spp.	Meadow beauty
Rhododendron viscosum	Swamp azelia
Rhus copallinum	Winged sumac
Rhynchelytrum repens	Natalgrass*
Rhynchospora colorata	White bract sedge
Richardia brasiliensis	Brazil pusley*
Rubus betulifolius	Blackberry
Sabal palmetto	Cabbage palm
Sabal minor	Dwarf palmetto
Sabal etonia	Scrub palmetto
Salix caroliniana	Carolina willow
Salix floridana	Florida willow
Sapium sebiferum	Chinese tallow tree*
Saururus cernuus	Lizard's tail
Scutellaria spp.	Skullcap
Serenoa repens	Saw palmetto
Setaria geniculata	Knotroot foxtail
Sideroxylon tenax	Tough bully

Sisyrinchium exile	Yellow blue-eyed grass*
Smilax laurifolia	Catbrier
Smilax auriculata	Greenbrier; Catbrier
Smilax bona-nox	Greenbrier; Catbrier
Solanum capsicoides	Soda apple
Solidago odora var. chapmanii	Chapman's goldenrod
Solidago fistulosa	Hollow goldenrod
Sorghastrum secundum	Lopsided Indiangrass
Spartina bakeri	Sand cordgrass
Sphagnum sp.	
Stillingia sylvatica	Queen's delight
Syagrus romanzoffiana	Queen palm*
Taxodium distichum	Bald cypress
Taxodium ascendens	Pond-cypress
Tilia caroliniana	Carolina basswood
Tillandsia recurvata	Ball-moss
Tillandsia usneoides	Spanish moss
Tillandsia fasciculata	Wild pine
Tillandsia setacea	Wild plant; Air plant
Toxicodendron radicans	Poison ivy
Typha latifolia	Common cattail
Ulmus spp.	Elm
Urena lobata	Caesar-weed*
Vaccinium corymbosum	Highbush blueberry
Vaccinium myrsinites	Shiny blueberry
Vitis rotundifolia	Muscadine grape
Vitis aestivalis	Summer grape
Vittaria lineata	Shoestring fern
Wahlenbergia marginata	Southern rockbell
Woodwardia areolata	Netted chain fern
Xyris difformis	Bog yellow-eyed grass
Yucca filamentosa	Adam's needle
	Pillow moss
	Raindeer moss
	Large sedge

Genus Species	**Common Name**
Insects	
Nephila clavipes	Banana spider
Diapheromera femorata	Northern walking stick
Augochlora spp.	Metallic bee

Tipula spp.	Crane fly
Butterflies	
Agraulis vanillae	Gulf fritillary
Limenitis archippus	Viceroy
Heliconius charitonius	Zebra Longwing
Papilio palamedes	Palamedes Swallowtail
Papilio glaucus	Eastern Tiger Swallowtail
Danaus gilippus	Queen
Dragonfly	
Anax junius	Common green darner
Brachymesia gravida	Four-spotted Pennant
Celithemis eponina	Halloween Pennant
Epiaeschna heros	Swamp Darner
Erythemis simplicicollis	Green clearwing, Eastern Pondhawk
Erythemis simplicicollis	Eastern Pondhawk
Erythrodiplax berenice	Little Blue Dragonlet
Libellula vibrans	Great blue skimmer
Pachydiplax longipennis	Blue Dasher
Pantala flavescens	Wandering Glider
Tramea carolina	Carolina Saddlebags
Damselflies	
Argia fumipennis atra	Black Dancer
Calopteryx maculata	Ebony jewelwing
Hetaerina titia	Smoky rubyspot
Ischnura ramburii	Rambur's Forktail

Genus Species	**Common Name**
Fish	
Ameiurus nebulosus	Brown bullhead
Apoecilia latipinna	Sailfin molly
Etheostoma fusiforma	Swamp darter
Gambusia holbrooki	Mosquito fish
Heterandria formosa	Least killifish
Hoplosternum littorale	Brown hoplo
Micropterus salmoides	Largemouth bass

Genus Species	**Common Name**

Reptiles	
Coluber constrictor priapus	Southern black racer
Heterodon platyrhinos	Eastern Hognose Snake
Crotalus adamanteus	Eastern diamondback rattlesnake
Agkistrodon piscivorus conanti	Florida cottonmouth
Thamnophis sirtalis sirtalis	Eastern garter snake
Thamnophis sauritus sackeni	Peninsula ribbon snake
Cnemidophorus sexlineatus sexlineatus	Six lined racerunner
Sceloporus undulatus undulatus	Southern fence lizard
Anolis carolinensis carolinensis	Green anole
Anolis sagrei	Cuban brown anole
Terrapene carolina bauri	Florida box turtle
Gopherus polyphemus	Gopher tortoise
Pseudemys nelsoni	Florida red-bellied turtle
Apalone ferox	Florida soft shelled turtle
Opheodrys aestivus	Rough green snake

Genus Species	**Common Name**
Amphibians	
Hyla squirella	Squirrel tree frog
Rana grylio	Pig frog
Bufo terrestris	Southern toad
Hyla squirella	Green tree frog
Hyla femoralis	Pinewoods tree frog
Scaphiopus spp.	Spadefoot toad

Genus Species	**Common Name**
Birds	
Aix sponsa	Wood Duck
Aythya collaris	Ring-necked Duck
Meleagris gallopavo	Wild Turkey
Colinus virginianus	Northern Bobwhite
Anhinga anhinga	Anhinga
Ardea herodias	Great Blue Heron
Ardea alba	Great Egret
Bubulcus ibis	Cattle Egret
Butorides virescens	Green Heron
Eudocimus albus	White Ibis**
Mycteria americana	Wood Stork**

Coragyps atratus	Black Vulture
Cathartes aura	Turkey Vulture
Pandion haliaetus	Osprey**
Buteo lineatus	Red-shouldered Hawk
Buteo brachyurus	Short-tailed Hawk
Buteo jamaicensis	Red-tailed Hawk
Gallinula chloropus	Common Moorhen
Fulica americana	American Coot
Grus canadensis	Sandhill Crane
Athene cunicularia floridana	Burrowing Owl**
Strix varia	Barred Owl
Chordeiles minor	Common Nighthawk
Chaetura pelagica	Chimney Swift
Archilochus colubris	Ruby-throated Hummingbird
Melanerpes erythrocephalus	Red-headed Woodpecker
Melanerpes carolinus	Red-bellied Woodpecker
Picoides pubescens	Downy Woodpecker
Dryocopus pileatus	Pileated Woodpecker
Myiarchus crinitus	Great Crested Flycatcher
Vireo griseus	White-eyed Vireo
Vireo olivaceus	Red-eyed Vireo
Cyanocitta cristata	Blue Jay
Corvus brachyrhynchos	American Crow
Poecile carolinensis	Carolina Chickadee
Thryothorus ludovicianus	Carolina Wren
Mimus polyglottos	Northern Mockingbird
Parula americana	Northern Parula
Dendroica pinus	Pine Warbler
Mniotilta varia	Black-and-white Warbler
Cardinalis cardinalis	Northern Cardinal
Agelaius phoeniceus	Red-winged Blackbird
Quiscalus quiscula	Common Grackle
Quiscalus major	Boat-tailed Grackle

Genus Species	**Common Name**
Mammals	
Sigmodon hispidus	Cotton rat
Ursus americanus floridanus	Florida black bear**
Odocoileus virginianus	White tailed deer

Felis rufus	Bobcat
Canis latrans	Coyote
Sus scrofa	Feral Hog
Sciurus carolinensis	Gray squirrel
Dasypus novemcinctus	Nine-banded armadillo
Procyon lotor	Raccoon
Sciurus niger shermani	Sherman's fox squirrel**
Didelphis virginiana	Virginia opossum

*-Exotic
**-Listed

FNAI GLOBAL RANK DEFINITIONS

G1 = Critically imperiled globally because of extreme rarity (5 or fewer occurrences or less than 1000 individuals) or because of extreme vulnerability to extinction due to some natural or man-made factor.
G2 = Imperiled globally because of rarity (6 to 20 occurrences or less than 3000 individuals) or because of vulnerability to extinction due to some natural or man-made factor.
G3 = Either very rare and local throughout its range (21-100 occurrences or less than 10,000 individuals) or found locally in a restricted range or vulnerable to extinction from other factors.
G4 = Apparently secure globally (may be rare in parts of range).
G5 = Demonstrably secure globally.
GH = Of historical occurrence throughout its range, may be rediscovered (e.g., ivory-billed woodpecker).
GX = Believed to be extinct throughout range.
GXC = Extirpated from the wild but still known from captivity or cultivation.
G#? = Tentative rank (e.g., G2?).
G#G# = Range of rank; insufficient data to assign specific global rank (e.g., G2G3).
G#T# = Rank of a taxonomic subgroup such as a subspecies or variety; the G portion of the rank refers to the entire species and the T portion refers to the specific subgroup; numbers have same definition as above (e.g., G3T1).
G#Q = Rank of questionable species - ranked as species but questionable whether it is species or subspecies; numbers have same definition as above (e.g., G2Q).
G#T#Q = Same as above, but validity as subspecies or variety is questioned.
GU = Unrankable; due to a lack of information no rank or range can be assigned (e.g., GUT2).
GNA = Ranking is not applicable because the element is not a suitable target for conservation (e.g. a hybrid species).
GNR = Element not yet ranked (temporary).
GNRTNR = Neither the element nor the taxonomic subgroup has yet been ranked.

FNAI STATE RANK DEFINITIONS

S1 = Critically imperiled in Florida because of extreme rarity (5 or fewer occurrences or less than 1000 individuals) or because of extreme vulnerability to extinction due to some natural or man-made factor.
S2 = Imperiled in Florida because of rarity (6 to 20 occurrences or less than 3000 individuals) or because of vulnerability to extinction due to some natural or man-made factor.
S3 = Either very rare and local in Florida (21-100 occurrences or less than 10,000 individuals) or found locally in a restricted range or vulnerable to extinction from other factors.
S4 = Apparently secure in Florida (may be rare in parts of range).
S5 = Demonstrably secure in Florida.
SH = Of historical occurrence in Florida, possibly extirpated, but may be rediscovered (e.g., ivory-billed woodpecker).
SX = Believed to be extirpated throughout Florida.
SU = Unrankable; due to a lack of information no rank or range can be assigned.
SNA = State ranking is not applicable because the element is not a suitable target for conservation (e.g. a hybrid species).
SNR = Element not yet ranked (temporary).

FEDERAL LEGAL STATUS

Provided by FNAI for information only.
For official definitions and lists of protected species, consult the relevant federal agency.
Definitions derived from U.S. Endangered Species Act of 1973, Sec. 3. Note that the federal status given by FNAI refers only to Florida populations and that federal status may differ elsewhere.
LE Endangered: species in danger of extinction throughout all or a significant portion of its range.
LT Threatened: species likely to become Endangered within the foreseeable future throughout all or a significant portion of its range.
LT,PDL Species currently listed threatened but has been proposed for delisting.
LT,PE Species currently listed Threatened but has been proposed for listing as Endangered.

SAT Treated as threatened due to similarity of appearance to a species which is federally listed such that enforcement personnel have difficulty in attempting to differentiate between the listed and unlisted species.
PE Proposed for listing as Endangered species.
PT Proposed for listing as Threatened species.
C Candidate species for which federal listing agencies have sufficient information on biological vulnerability and threats to support proposing to list the species as Endangered or Threatened.
XN Non-essential experimental population.
SC Not currently listed, but considered a "species of concern" to USFWS.
N Not currently listed, nor currently being considered for listing as Endangered or Threatened.

STATE LEGAL STATUS

Provided by FNAI for information only.
For official definitions and lists of protected species, consult the relevant state agency.
Animals: Definitions derived from "Florida's Endangered Species and Species of Special Concern, Official Lists" published by Florida Fish and Wildlife Conservation Commission, 1 August 1997, and subsequent updates.
LE Endangered: species, subspecies, or isolated population so few or depleted in number or so restricted in range that it is in imminent danger of extinction.
LT Threatened: species, subspecies, or isolated population facing a very high risk of extinction in the future.
LS Species of Special Concern is a species, subspecies, or isolated population which is facing a moderate risk of extinction in the future.
PE Proposed for listing as Endangered.
PT Proposed for listing as Threatened.
PS Proposed for listing as Species of Special Concern.
N Not currently listed, nor currently being considered for listing.

APPENDIX C.

Lake Norris Conservation Area
Forest Management and Restoration Plan

PREPARED BY:

St. Johns River Water Management District

Division of Land Management

2009

Table of Contents

Lake Norris Conservation Area
Lake County, Florida

The following Forest Management and Restoration Plan provides general management guidelines which focuses on uplands and transition zones from uplands to wetlands. This document will provide the guidelines necessary to implement land management activities within the LNCA.

Introduction:

The LNCA encompasses approximately 3,660 acres in Eastern Lake County. The Conservation Area is located south of State Road 42, North of State Road 44A and borders the western edge of Lake Norris. The purchases of the different parcels that make up the LNCA (Figure 1) spanned from August of 1996 through December of 2002.

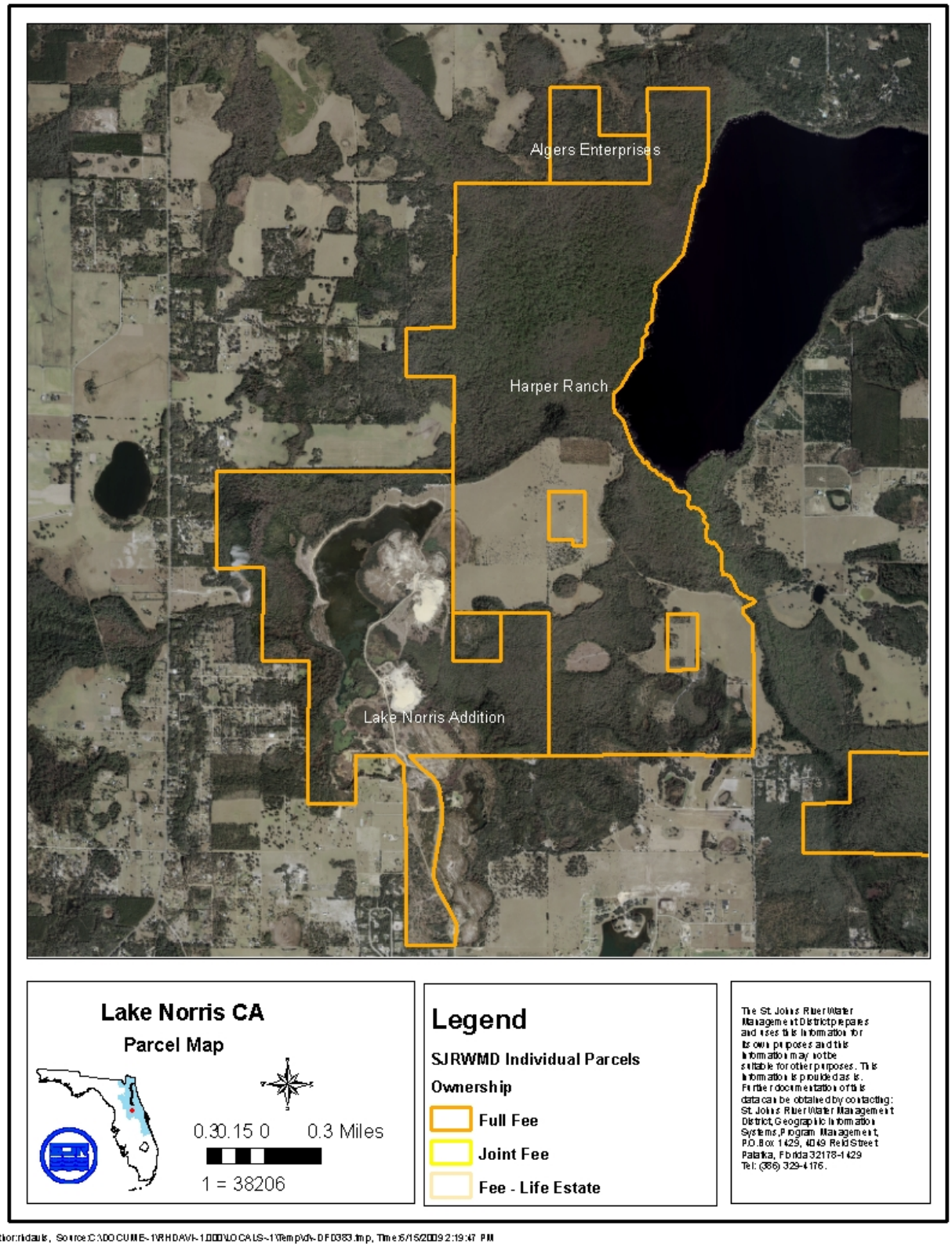
The primary land use for the area, pre-District ownership was agriculture in the form of cattle, poultry and citrus, timber and commercial sand mining operation. Large-scale timber harvesting began within the LNCA in the late 1920's, early 1930's. Cypress was the sought after product during that era; sought after so intensively that it was all but depleted from the area. In the late 1950's, early 1960's development of the lands within the Conservation Area began with the construction of the Eustis Sand Mine. The Eustis Sand Mine dredged and produced sand until 1999 at which point they closed and sold the property to the East Lake Holdings.

Years of agricultural and mining activities have resulted in a vastly altered landscape and ultimately the loss of a large portion of the native species within the site. Along with changes in hydrology, excess nutrients and disturbance came encroachment of undesired species. Furthermore, the lack of fire in these communities brought more encroachment. Restoration activities across LNCA 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 LNCA.

With the sand mine mitigation project under way, restoration activities depend on superior communication between groups and Restoration will be an adaptive management based process.

Figure 1.**The parcels that make up the LNCA.**



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Goals:

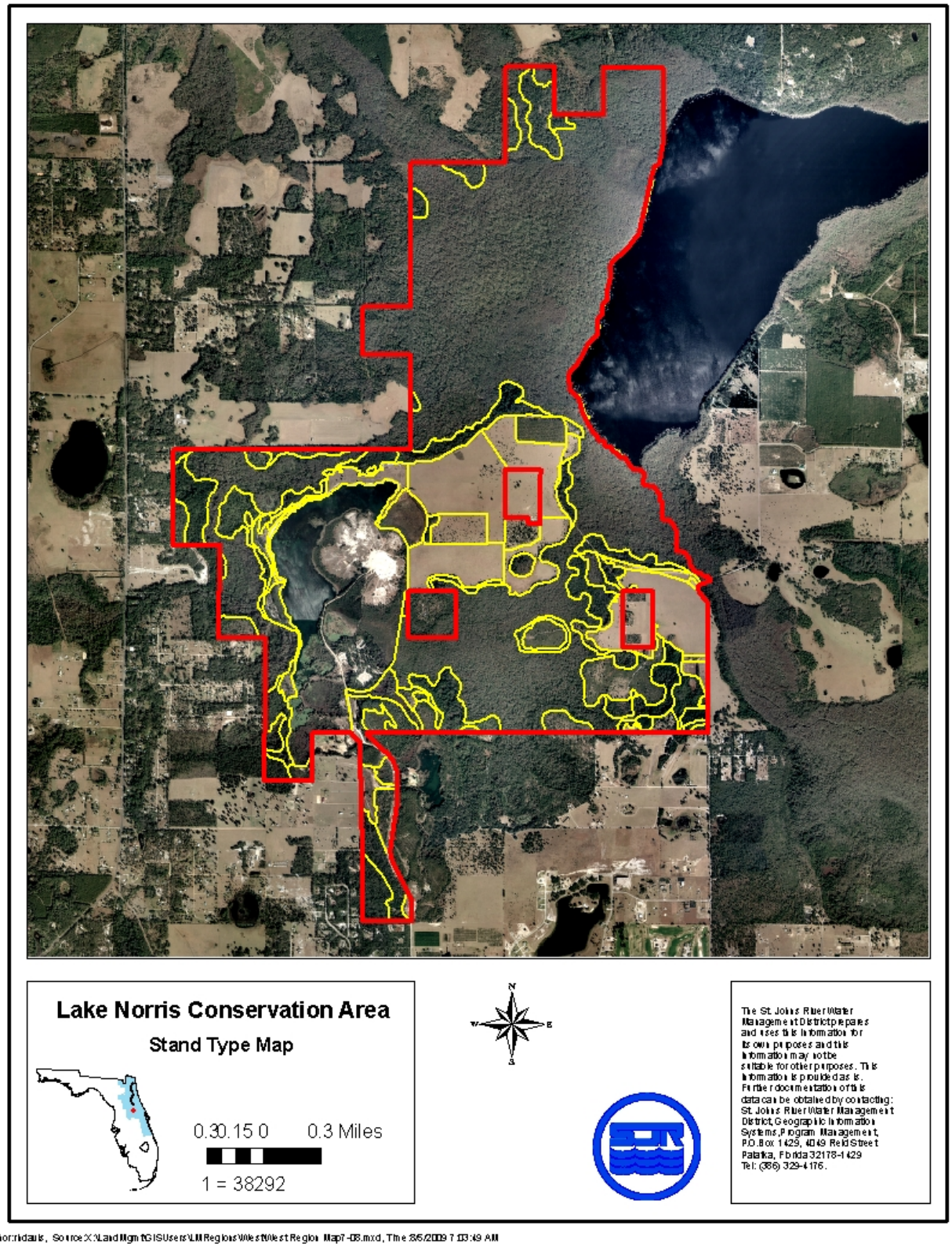
The goals of this Forest Management and Restoration Plan are to:

- 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 Description:

For convenience and implementation of management techniques, LNCA has been divided into management unit types by natural community breaks. (Figure 2)

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



Historic Natural Community Descriptions:

According to the 1970's *Soil Survey Report, Maps and Interpretations-Lake County Area, Florida*, there are 17 different soil map units occurring in the uplands and transition zones from uplands to wetlands at EMCA (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.

Scrub:
The natural vegetation of this community consists of dense oaks such as bluejack oaks (Quercus incana), chapman oaks (Quercus chapmannii), sand live oaks (Quercus virginiana), and myrtle oaks. The ground cover under the oaks may consist of dwarf huckleberry (Gaylussacia dumos), gopher apple (Chrysobalanus oblongifolius), prickly pear (Opuntia spp.) and saw palmetto (Serenoa repens). Along with this scattered vegetation will be open areas of light colored sand.

Scrubby Flatwoods:
The natural vegetation of this community consists of a combination of Mesic Flatwoods and Scrub species such as longleaf pine (Pinus palustris), slash pine (Pinus elliottii), sand live oak (Quercus virginiana), chapman oak (Quercus chapmannii), myrtle oak, and scrub oak with an understory of saw palmetto (Serenoa repens), staggerbush, wiregrass, dwarf huckleberry (Gaylussacia dumos), gopher apple (Chrysobalanus oblongifolius), wiregrass (Aristida Spp.), rusty lyonia, tarflower, golden rod and runner oak. Along with this vegetation will be open areas of light colored sand.

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.

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.).

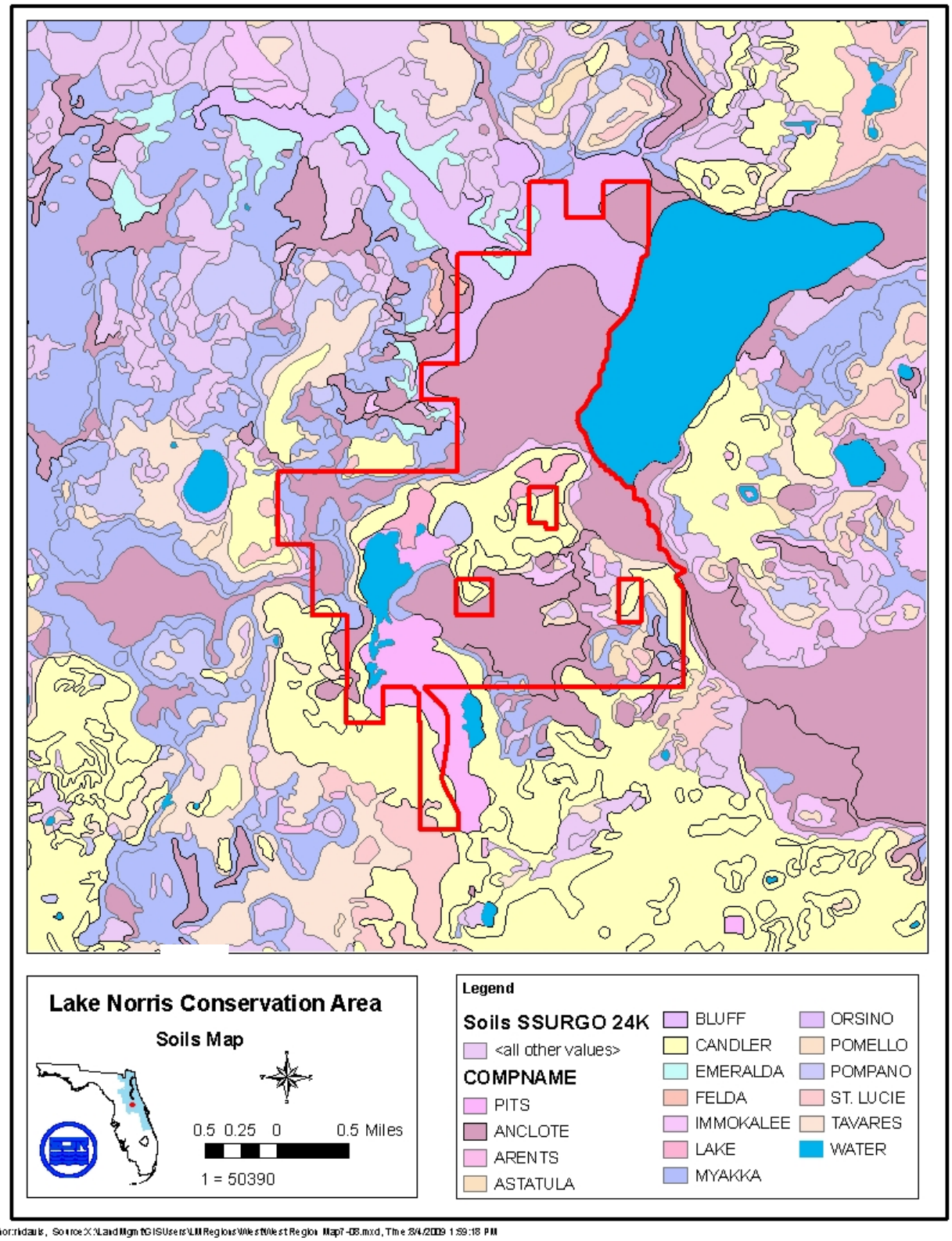
Wet Flatwoods:
The natural vegetation consists of live oak (Quercus virginiana), laurel oak (Quercus laurifolia), water oak (Quercus nigra), scattered slash pine (Pinus ellioti), sweetgum (Liquidambar styraciflua), and bald cypress (Taxodium distichum), red maple (Acer rubrum). The understory commonly 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).

Bottomland Forest:
The natural vegetation found in this community consists of water oak (Quercus nigra), live oak (Quercus virginiana), red maple (Acer rubrum), loblolly pine (Pinus taeda), Florida elm (Ulmus americana var. floridana), American hornbeam (Carpinus caroliniana) and cabbage palm (Sabal palmetto).

Basin Swamp:
The vegetation 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).

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).

Figure 3.**Soils Map of LNCA**



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

Emeralda - This is a very deep, poorly drained, slowly or very slowly permeable soils in broad, low areas generally near lakes and streams in the lower Coastal Plain. Slopes range from zero to 2 percent. Solum thickness ranges from 40 to 70 inches and silt content is less than 30 percent throughout. Native vegetation consists of live oak, laurel oak, water oak, scattered slash pine, sweetgum, and red maple with an understory of waxmyrtle, cabbage palm, sawpalmetto, gallberry, cutgrass, beaked panicum, and sand cordgrass.

Felda - This is a very deep, poorly drained to very poorly drained, moderately permeable soils in drainage ways, sloughs and depressions, and on flood plains and low flats. Slopes range from 0 to 1 percent. Solum thickness ranges from 30 to 80 inches, the total thickness of the A and E horizons ranges from 20 to 40 inches. Natural vegetation consists of cypress, waxmyrtle, pond pine, slash pine, cabbage palm, and various grasses, vines, and shrubs.

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.

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.

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.

Myakka - This is a deep, poorly to very poorly drained soils formed in sandy marine deposits. These soils are on flatwoods, high tidal areas, flood plains, depressions, and

gently sloping to sloping barrier islands. Slopes range from zero to 8 percent. Solum thickness is more than 30 inches. Reaction commonly ranges from extremely acid to slightly acid. Native vegetation includes longleaf and slash pines with an undergrowth of sawpalmetto, running oak, inkberry, waxmyrtle, huckleberry, chalky bluestem, pineland three-awn, and scattered fetterbush.

Pits - This is a very deep, poorly drained soil, which formed in fine-textured alluvium weathered from extrusive and basic igneous rocks. Pit soils are on flood plains and in basins. Slopes range from 0 to 5 percent. Native Vegetation is tuffed hairgrass, alpine timothy, Baltic rush, sedges, bluegrass, and scattered silver sagebrush in the drier locations.

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 is dominated by scrub oak, dwarf live oak, sawpalmetto, longleaf pine, slash pine, and pineland three-awn.

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.

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 – 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. 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.

Lake – This is an excessively drained, rapidly to very rapidly permeable soils formed in thick beds of sand. They are on nearly level to steep slopes in central Florida. Large areas are used for citrus, and some are used for watermelons and improved pasture. Natural vegetation consists of bluejack, blackjack, turkey and live oaks, scattered longleaf pine, and an understory of scattered palmetto, pineland threeawn, bluestem, and paspalum.

Orsino – Consists of very deep, moderately well drained, very rapidly permeable soils that formed in thick beds of sandy marine or aeolian deposits. Soil reaction ranges from extremely acid to moderately acid. Native vegetation consists primarily of scrub vegetation with sand live oak, Chapman oak, myrtle oak, and scrub hickory. Scattered sand, slash, and longleaf pines and scattered bluejack, turkey, and post oak are found with a sparse understory.

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.

St. Lucie – This is a very deep, excessively drained, very rapidly permeable soils on dune-like ridges and on isolated knolls. They formed in marine or eolian sand. Most areas of St. Lucie soil are in scrub forest. Some areas are used for building sites and as a source of sand for concrete. Natural vegetation consists of sand live oak, sand pine, dwarf willow, sawpalmetto, rosemary, pricklypear cactus, and lichens.

Paola – Consists of very deep, excessively drained, very rapidly permeable soils on uplands. They formed in thick sandy marine deposits. Depth of the profile exceeds 80 inches. Soil reaction ranges from very extremely acid to neutral throughout, except where limed. Native vegetation consists of sand pine, slash pine, longleaf pine, scrub live oak, scattered turkey oak, and bluejack oak. The undergrowth consists of cacti, mosses, lichens, creeping dodder, rosemary, and scattered sawpalmetto.

Orsino – consists of very deep, moderately well drained, very rapidly permeable soils that formed in thick beds of sandy marine or aeolian deposits. They are on moderately high ridges in the Coastal Plain. Native vegetation consists primarily of scrub vegetation with sand live oak, Chapman oak, myrtle oak, and scrub hickory. Scattered sand, slash, and longleaf pines and scattered bluejack, turkey, and post oak are found with a sparse understory.

Arents – Consists of well drained to moderately well drained, heterogeneous soil material. This soil material has been excavated and stockpiled adjacent to large pits. The water table varies but is usually at a depth of 6 feet or more. The Arents have been mixed by movement and have no defined horizonation.

Area Restoration Plans:
Restoration activities across LNCA 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.

This plan incorporates a lower basal area than recommended on other District lands. The recommendation to maintain these stands at a basal area of 40 to 70 square feet per acre was made because natural communities of this type historically supported basal areas less than recommended in the District's overall Forest Management Plan. Furthermore, timber harvesting options are limited due to the distance from mills and willingness of timber brokers to make such long trips.

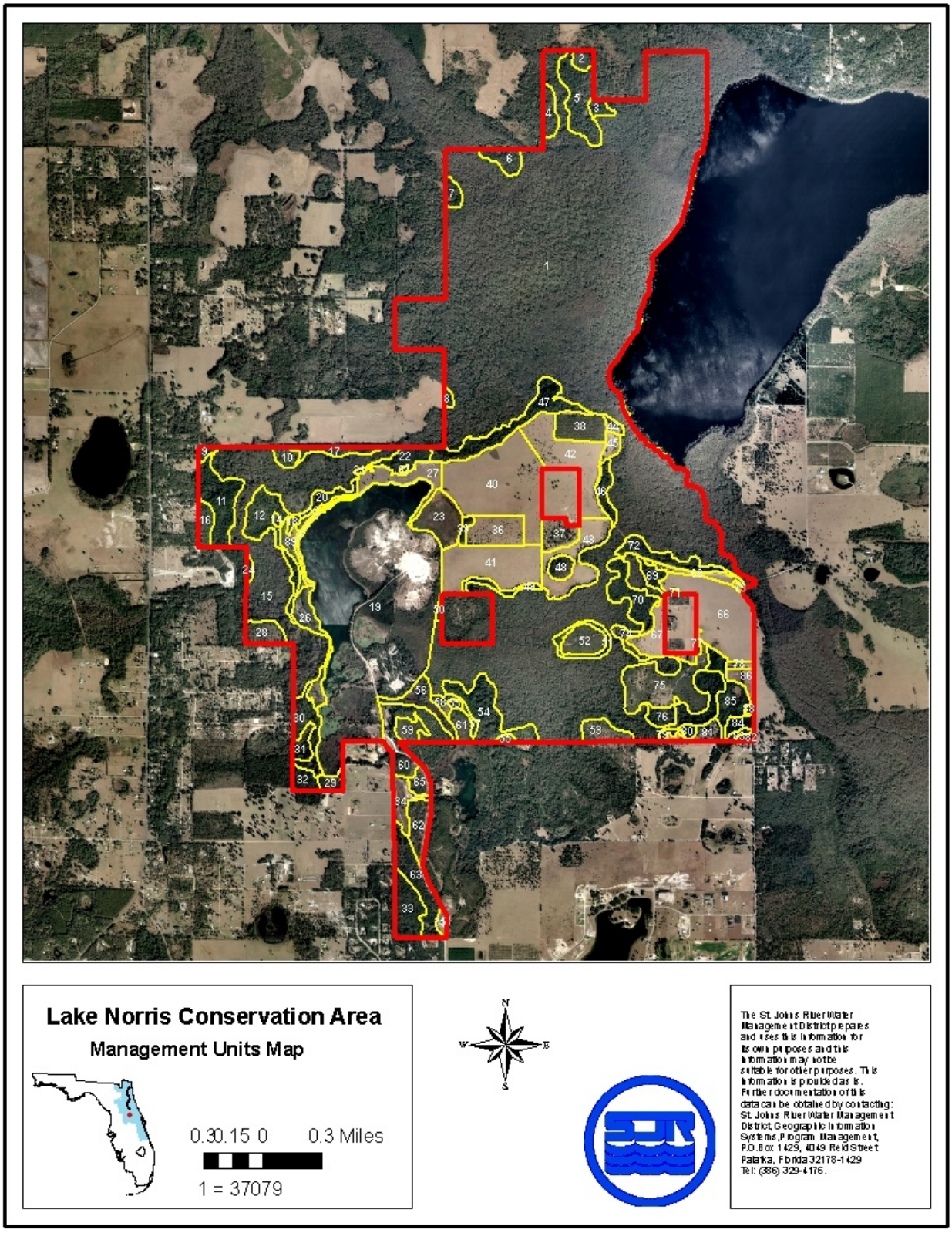
The ***current condition*** classification gives a community summary as a management unit whole. ***Desired condition*** descriptions are based on soils descriptions, ***proposed action or treatment*** is the suggested process in which it will take to restore the management unit, ***probability of success*** 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. Restoration activities depend on superior communication between groups and will have to be adaptive, especially within the transition zones.

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 LNCA**



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Management Unit	Current Vegetation Description	Natural Community Type
1	Mixed Hardwood Swamp	Flood Plain Swamp
2	Mixed Bottomland Hardwoods	Basin Swamp
3	Scattered Pines / Hardwoods	Basin Swamp
4	Mixed Mesic Oaks / Pines	Wet Flatwoods
5	Mixed Mesic Oaks / Pines	Basin Swamp
6	Mixed Mesic Oaks / Pines	Wet Flatwoods
7	Mixed Mesic Oaks / Pines	Mesic Flatwoods
8	Mixed Mesic Oaks / Pines	Mesic Flatwoods
9	Scrub Oaks / Scattered Pines	Wet Flatwoods
10	Xeric Pine / Scrub Oaks	Sand Hill
11	Mixed Slash Pine / Bay	Bottomland Forest
12	Mixed Pine / Bay	Wet Flatwoods
13	Xeric Oaks and Longleaf Pine	Sand Hill
14	Scattered Wetland Shrub / Brush	Mesic Flatwoods
15	Mixed Pine / Bay	Flood Plain Swamp
16	Sand Pine Scrub	Scrub
17	Mixed Xeric Oaks	Scrubby Flatwoods
18	Xeric Oaks / Scattered Pine	Sand Hill
19	Eustis Sand Mine and Mitigation Area	Part of The Mitigation Project
20	Xeric Pine / Mixed Oaks	Sand Hill
21	Xeric Pine / Mixed Oaks	Bottomland Forest
22	Scattered Pine / Scrub Oaks	Wet Flatwoods
23	Fresh Water Marsh	Flood Plain Marsh
24	Mixed Slash Pine / Bay	Mesic Flatwoods
26	Mixed Xeric Pine / Oaks	Scrubby Flatwoods
27	Open Sandhill with Scattered Palmetto	Sand Hill
28	Longleaf Pine / Scattered Scrub Oaks	Scrubby Flatwoods
29	Scattered Pine / Mixed Xeric Oaks	Sand Hill
30	Scattered Pine / Mixed Hardwoods	Sand Hill
31	Xeric Oaks / Scattered Pines	Bottomland Forest
32	Xeric Pines / Oaks	Sand Hill
33	Scattered Longleaf Pine / Scrub Oaks	Sand Hill
34	Sand Pine Scrub	Sand Hill
35	Parking Area / Scale House / Barn	Developed
36	Feral Orange Tree Grove	Sand Hill
37	Scattered Xeric Oak / Cabbage Palm	Sand Hill
38	Planted Slash Pine	Sand Hill
39	Planted Slash Pine	Sand Hill
40	Pasture	Sand Hill
41	Pasture	Sand Hill
42	Pasture	Sand Hill
43	Pasture	Sand Hill
44	Campsite / Canoe Launch	Developed

Management Unit	Current Vegetation Description	Natural Community Type
46	Mixed Bay / Pine	Basin Swamp
47	Mixed Bay / Pine	Basin Swamp
48	Mixed Cypress / Bottomland Hardwoods	Basin Swamp
49	Mixed Xeric Oaks	Mesic Flatwoods
50	Mixed Bottomland Hardwoods / Cabbage Palm	Basin Swamp
51	Mixed Xeric Oaks	Wet Flatwoods
52	Scrub Oaks	Scrub
53	Xeric Flatwoods	Mesic Flatwoods
54	Mesic Flatwoods	Mesic Flatwoods
55	Scattered Xeric Oaks	Scrub
56	Scattered Xeric Oaks	Part of The Mitigation Project
57	Mixed Xeric Oaks	Sand Hill
58	Scattered Xeric Oaks	Sand Hill
59	Slash Pine Stand	Sand Hill
60	Clear-cut	Sand Hill
61	Planted Slash Pine / Xeric Oaks	Sand Hill
62	Longleaf Pine Stand	Sand Hill
63	Scattered Xeric Oaks / Pine	Sand Hill
65	Isolated Mixed Bottomland Hardwoods	Bottomland Forest
66	Pasture	Sand Hill
67	Pasture	Sand Hill
68	Pasture	Scrubby Flatwoods
69	Mixed Bottomland Hardwoods	Scrubby Flatwoods
70	Mixed Xeric Oaks	Mesic Flatwoods
71	Mixed Xeric Hardwoods	Mesic Flatwoods
72	Mixed Xeric Oaks / Pines	Mesic Flatwoods
73	Parking Area	Developed
74	Mixed Xeric Hardwoods	Wet Flatwoods
75	Scattered Scrub / Live Oaks	Sand Hill
76	Mixed Xeric Hardwoods	Sand Hill
77	Mixed Xeric Oaks	Scrubby Flatwoods
78	Security Residence	Developed
79	Mixed Bottomland Hardwoods	Bottomland Forest
80	Red Bay / Scattered Pine	Basin Swamp
81	Mixed Scrub Oaks / Live Oaks	Mesic Flatwoods
82	Scrub Oaks	Scrub
83	Mixed Slash & Pond Pine / Bay	Wet Flatwoods
84	Mixed Bottomland Hardwoods	Basin Swamp
85	Mixed Slash & Pond Pine / Bay	Wet Flatwoods
86	Pasture / Scattered Pine	Sandhill
87	Mixed Bottomland Hardwoods	Basin Swamp
88	Scrub Oaks	Scrub
89	Scrubby Flatwoods	Scrub

Management unit by community type according to soils descriptions.

Scrub:

Management unit 16: 10 acres

- **Historic Condition** - Scrub
- **Current Condition –** Sand Pine Scrub
- **Desired Condition –** Sand Pine Scrub
- **Proposed Action / Treatment –** Management units similar to this can be restored. Unfortunately, access is limited due to being land locked by adjacent landowners and an impassable swamp basin.
    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 units 52,55, 82,88, 89: 34 total acres ,

- **Historic Condition** - Scrub
- **Current Condition –** Scrub Oaks
- **Desired Condition –** Scrub
- **Proposed Action / Treatment –**
    1. First a form of hardwood reduction operation, either by mulching, chipping or heavy mowing should occur.
    2. Maintain community by implementing a fire regime every 5 to 7 years
    3. Monitor community for invasive and exotic species
- **Probability of Success – 90%**
- **Management Priority – 2**

Scrubby Flatwoods:

Management units 17, 22: 24 total acres

- **Historic Condition** – Scrubby Flatwoods
- **Current Condition –** Mixed Xeric Oaks
- **Desired Condition –** Scrubby Flatwoods
- **Proposed Action / Treatment –**
    1. Either a mechanical or herbicide treatment should occur first in order to get overgrown vegetation under control.
    2. Monitor the native tree species, keeping close watch that exotics do not encroach.
    3. Implement 3 to 5 year prescribed fire intervals

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

Management unit 26: 22 acres

- **Historic Condition** – Scrubby Flatwoods
- **Current Condition –** Mixed Xeric Pine / Oaks
- **Desired Condition –** Scrubby Flatwoods
- **Proposed Action / Treatment –**
  1. A District approved herbicide treatment should be implemented first in order to reduce the hardwood volume.
  2. Following this procedure, planting of trees and grasses native to this community should occur.
  3. Monitoring of this site should occur yearly for continued growth and encroachment of invasive and exotic species.
  4. Implementation of a prescribed fire interval of 3 to 5 years should occur.
- **Probability of Success – 90%**
- **Management Priority - 3**

Management unit 28: 14 acres

- **Historic Condition** – Scrubby Flatwoods
- **Current Condition –** Scrubby Flatwoods
- **Desired Condition –** Scrubby Flatwoods
- **Proposed Action / Treatment –**
  1. Implement prescribed fire intervals of 3 to 5 years
  2. Continue to monitor for invasive and exotic species.
- **Probability of Success – 90%**
- **Management Priority - 1**

Management unit 53: 14 acres

- **Historic Condition** – Scrubby Flatwoods
- **Current Condition –** Scrubby Flatwoods
- **Desired Condition –** Scrubby Flatwoods
- **Proposed Action / Treatment –**
  This unit is currently scattered slash / longleaf pine and oaks with small patches of wiregrass throughout. Fortunately, this community is not far from where it needs to be.
  1. A mowing / mulching operation should occur to reduce vegetative loads and promote wiregrass growth.
  2. Conduct planting operation to expand groundcover grasses.
  3. After 1 to 2 years of groundcover growth, a fire rotation of 3-5 years should be implemented in this community.
- **Probability of Success – 90%**
- **Management Priority - 2**

Management unit 68: 10 acres

- **Historic Condition** – Scrubby Flatwoods
- **Current Condition –** Pasture
- **Desired Condition –** Scrubby Flatwoods
  Proposed Action / Treatment –

1. District approved herbicide treatment should be implemented first in order to reduce the unwanted grasses.
2. Following this procedure, planting of grasses native to this community should occur.
3. A plantation of longleaf pines should be established, as this is the desired overstory in this community.
4. Once the pine is of harvesting age a mechanical thinning should occur to reduce the basal area to a density of about 40-70 square feet per acre.
5. Upon establishment of the overstory, midstory, species indicative to the area should be reintroduced.
6. Continue to monitor for invasive and exotic species.

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

Management unit 69: 8 acres

- **Historic Condition** – Scrubby Flatwoods
- **Current Condition –** Mixed Bottomland Hardwood
- **Desired Condition –** Mixed Bottomland Hardwood
  Proposed Action / Treatment –
  According to the soils descriptions, this management unit appears to lack a key species. Past land clearing operations have changed this community into a mixed hardwood hammock. Suggested steps for restoration are to reintroduce fire to reduce further hardwood encroachment.
- **Probability of Success – 20%**
- **Management Priority – 5**

Management unit 77: 2 acres

- **Historic Condition** – Scrubby Flatwoods
- **Current Condition –** Mixed Xeric Oaks
- **Desired Condition –** Mixed Xeric Oaks
- **Proposed Action / Treatment –**
  Due to the small size and succession of this unit there are no restoration activities suggested.
- **Probability of Success – 90%**
- **Management Priority – 2**

Sandhill:

Management unit 10: 7 acres

- **Historic Condition** – Sandhill
- **Current Condition –** Xeric Pine / Scrub Oaks
- **Desired Condition –** Xeric Pine / Scrub Oaks
- **Proposed Action / Treatment -** Management units similar to this can be restored. Unfortunately, access is limited due to being land locked by adjacent landowners and an impassable swamp basin.
  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 units 13, 20, 63: 46 total acres

- **Historic Condition** – Sandhill
- **Current Condition –** Xeric Oaks / Longleaf Pine
- **Desired Condition –** Sandhill
- **Proposed Action / Treatment -**
  1. Conduct a District approved herbicide treatment focused on reducing the hardwood volume and/or undesired species, pasture grasses, etc.
  2. Ground cover planting project would follow herbicide treatments, which would consist of establishing grasses indicative of the Sand hill community.
  3. A fire return interval of 2-5 years should be reintroduced.
- **Probability of Success – 90%**
- **Management Priority - 3**

Management unit 18: 3 acres

- **Historic Condition** – Sandhill
- **Current Condition –** Xeric Oaks / Scattered Pine
- **Desired Condition –** Sandhill
- **Proposed Action / Treatment –** Attempts will be made to change the structure of this unit through prescribed 2 to 5 year fire intervals. If burning does not achieve the desired goal then either a mechanical or District approved herbicide treatment will occur in order to get overgrown vegetation under control.
- **Probability of Success - 90%**
- **Management Priority – 2**

Management unit 27: 34 acres

- **Historic Condition** – Sandhill
- **Current Condition –** Open Sand Hill / Scattered Palmetto
- **Desired Condition –** Sandhill
- **Proposed Action / Treatment –**
  1. Implementation of brush mowing should occur first in order to get overgrown vegetation under control.
  2. District approved herbicide treatment should be implemented in order to reduce the pasture grasses.
  3. Implement a mechanical planting operation of sand hill grasses across the community
  4. After one year of growth of the grasses, another mowing should occur to stimulate seed dispersion of the grass.
  5. After a defined management unit of grass is reestablished, woody species indicative to the community should be established.
  6. Once the woody species are firmly established a fire return interval of 2-5 years should be reintroduced.
- **Probability of Success – 90%**
- **Management Priority - 2**

Management units 29, 30: 30 total acres

- **Historic Condition** – Sandhill
- **Current Condition –** Scattered Pine / Mixed Xeric Oaks

- **Desired Condition –** Scattered Pine / Mixed Xeric Oaks
- **Proposed Action/ Treatment –** This management unit is currently a mature Xeric hardwood and scattered pine community. According to the soils description and onsite field confirmation, notable species led to the decision that no attempts will be made to change the structure of this community.
- **Probability of success – 10%**
- **Management Priority – 4**

Management unit 32: 10 acres

- **Historic Condition** – Sandhill
- **Current Condition –** Xeric Pine / Oaks
- **Desired Condition –** Sandhill
- **Proposed Action / Treatment –** Management unit 32 has extreme young hardwood encroachment.
    1. Implementation of a District approved herbicide treatment should be first in order to control encroaching and undesired species.
    2. Monitor the site for encroachment of invasive and exotic species.
    3. Followed by implementing a 2 to 5 year fire regime, in order to maintain the desired community condition.
- **Probability of Success – 75%**
- **Management Priority - 2**

Management unit 33: 26 acres

- **Historic Condition** – Sandhill
- **Current Condition –** Sandhill
- **Desired Condition –** Sandhill
- **Proposed Action / Treatment –** According to the soils description and onsite field confirmation, notable species led to the decision that implementing a 2 to 5 year fire regime is recommended to maintain this community.
- **Probability of Success – 90%**
- **Management Priority - 1**

Management unit 34: 16 acres

- **Historic Condition** – Sandhill
- **Current Condition –** Sand Pine Scrub
- **Desired Condition –** Sandhill
- **Proposed Action / Treatment –**
    1. A District approved herbicide treatment should be implemented first in order to control undesired species.
    2. Following this procedure, planting of trees native to this community should occur. These species should be Longleaf Pine and Xeric Oaks along with other listed species.
    3. Implement a 2 to 5 year fire regime
    4. Monitoring of this site should occur yearly for continued growth and encroachment of invasive and exotic species.
- **Probability of Success – 90%**
- **Management Priority - 1**

Management unit 36: 28 acres

- **Historic Condition** – Sandhill

- **Current Condition –** Feral Citrus Tree Grove
- **Desired Condition –** Sandhill
- **Proposed Action/Treatment –**
  1. Pile and burn old orange grove
  2. Implement a mechanical planting operation of sand hill grasses across the community
  3. A plantation of longleaf pines should be established, as this is the desired overstory in this community.
  4. Once the pine is of harvesting age a mechanical thinning should occur to reduce the basal area to a density of about 40-70 square feet per acre.
  5. Upon establishment of the overstory, midstory, species such as turkey oaks can be reintroduced. Similar to the scrub, this community will also have scattered vegetation with open areas of light colored sand.
  6. Monitoring should occur throughout, observing for predicted growth rates and invasive and exotic species.
- **Probability of Success – 90%**
- **Management Priority – 2**

Management unit 37: 17 acres

- **Historic Condition** – Sandhill
- **Current Condition –** Pasture with Scattered Xeric Oak / Cabbage Palm
- **Desired Condition –** Sandhill
- **Proposed Action / Treatment-**
  1. Research Palm Tree harvesting contract options, if not applicable, pile and burn palms
  2. District approved herbicide treatment should be implemented first in order to reduce the pasture grasses.
  3. Implement a mechanical planting operation of sand hill grasses across the community
  4. A plantation of longleaf pines should be established, as this is the desired overstory in this community.
  5. Once the pine is of harvesting age a mechanical thinning should occur to reduce the basal area to a density of about 40-70 square feet per acre.
  6. Upon establishment of the overstory, midstory, species such as turkey oaks can be reintroduced. Similar to the scrub, this community will also have scattered vegetation with open areas of light colored sand.
  7. Monitoring should occur throughout, observing for predicted growth rates and invasive and exotic species.
  8. Implement a mechanical planting operation of sand hill grasses across the community
- **Probability of Success – 90%**
- **Management Priority – 3**

Management units 38 and 39: 27 total acres

- **Historic Condition** – Sandhill
- **Current Condition –** Planted Slash Pine
- **Desired Condition –** Sandhill
- **Proposed Action/Treatment –**
  1. In 3 to 5 years a mechanical thinning should occur to reduce the basal area to about 40-70 square feet per acre.
  2. District approved herbicide treatment should be implemented first in order to reduce the pasture grasses.
  3. Implement a mechanical planting operation of sand hill grasses across the community
  4. After reduction of basal area of the overstory, midstory, species such as turkey oaks can

be reintroduced. Similar to the scrub, this community will also have scattered vegetation with open areas of light colored sand.
5. Monitoring should occur throughout, observing for predicted growth rates and invasive and exotic species.
6. Implement a mechanical planting operation of sand hill grasses across the community

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

Management units 41, 40, 42, 43, 66, 67: 443 total acres

- **Historic Condition** – Sandhill
- **Current Condition –**Pasture
- **Desired Condition –** Sandhill
  Proposed Action / Treatment –
  1. District approved herbicide treatment should be implemented first in order to reduce the undesired grasses.
  2. Implement a mechanical planting operation of sand hill grasses across the community
  3. A plantation of longleaf pines should be established, as this is the desired overstory in this community.
  4. Once the pine is of harvesting age a mechanical thinning should occur to reduce the basal area to a density of about 40-70 square feet per acre.
  5. Upon establishment of the overstory, midstory, species such as turkey oaks can be reintroduced. Similar to the scrub, this community will also have scattered vegetation with open areas of light colored sand.
  6. Monitoring should occur throughout, observing for predicted growth rates and invasive and exotic species.
  7. Implement a mechanical planting operation of sand hill grasses across the community
- **Probability of Success – 90%**
- **Management Priority – 2**

Management unit 45: 7 acres

- **Historic Condition** – Sandhill
- **Current Condition –** Pasture with Scattered Cabbage Palm
- **Desired Condition –** Sandhill
- **Proposed Action / Treatment –**
  1. Research Palm Tree harvesting contract options, if not applicable, pile and burn palms
  2. District approved herbicide treatment should be implemented first in order to reduce the pasture grasses.
  3. Implement a mechanical planting operation of sand hill grasses across the community
  4. A plantation of longleaf pines should be established, as this is the desired overstory in this community.
  5. Once the pine is of harvesting age a mechanical thinning should occur to reduce the basal area to a density of about 40-70 square feet per acre.
  6. Upon establishment of the overstory, midstory, species such as turkey oaks can be reintroduced. Similar to the scrub, this community will also have scattered vegetation with open areas of light colored sand.
  7. Monitoring should occur throughout, observing for predicted growth rates and invasive and exotic species.
  8. Implement a mechanical planting operation of sand hill grasses across the community
- **Probability of Success – 90%**
- **Management Priority – 3**

Management unit 57: 3 acres

- **Historic Condition** – Sandhill
- **Current Condition –** Mixed Xeric Oaks
- **Desired Condition –** Mixed Xeric Oaks
- **Proposed Action / Treatment** – The management unit is currently a mature, healthy, oak hammock and no attempts will be made to change the structures of this community.
- **Probability of Success – 10%**
- **Management Priority - 5**

Management unit 58: 6 acres

- **Historic Condition** – Sandhill
- **Current Condition** – Scattered Xeric Oaks
- **Desired Condition** – Sandhill
- **Proposed Action / Treatment** –
  1. A District approved herbicide treatment should occur to remove the unwanted vegetation.
  2. Implementation of mowing/mulching should occur next in order to get overgrown vegetation under control.
  3 Longleaf pine trees should then be randomly hand planted at a rate of about 250-300 trees per acre.
  4. Monitor the site for about two years for recovery of the native groundcover species.
  5. If needed a ground cover planting project will be implemented, which would consist of establishing grasses indicative to this community.
  6. Once the trees are of proper age, a burn regime should be reintroduced. A fire return interval for this community should be anywhere from 2-5 years.
- **Probability of Success – 75%**
- **Management Priority - 3**

Management unit 59: 10 acres

- **Historic Condition** – Floodplain
- **Current Condition –** Planted Slash Pine
- **Desired Condition –** Due to past sand mining operations this community has been completely changed. FNAI does not have an adequate community description for this soil type. Due to current site conditions the decision was made to restore this into a sandhill community. NOTE: see soils description on page 11.
- **Proposed Action / Treatment –**
  1. District approved herbicide treatment should be implemented first in order to reduce the undesired species
  2. A ground cover planting project, which would consist of establishing grasses indicative to the sand hill community.
  3. Monitor the site for about two years for recovery of the indicative species.
  4. Once the ground cover species have reached the age to management the unit with fire, a burn regime should be reintroduced. A fire return interval for this community will range from 2-5years
- **Probability of Success – 80%**
- **Management Priority - 2**

Management unit 60: 38 acres

- **Historic Condition** – Floodplain
- **Current Condition –** Clear Cut
- **Desired Condition –** Due to past sand mining operations this community has been completely changed. FNAI does not have an adequate community description for this soil

type. Due to current site conditions the decision was made to restore this into a sandhill community. NOTE: see soils description on page 11.

- **Proposed Action / Treatment –**
  1. District approved herbicide treatment should be implemented first in order to reduce the undesired species
  2. A ground cover planting project, which would consist of establishing grasses indicative to the sand hill community.
  3. Monitor the site for about two years for recovery of the indicative species.
  4. Once the ground cover species have reached the age to management the unit with fire, a burn regime should be reintroduced. A fire return interval for this community will range from 2-5 years
- **Probability of Success – 80%**
- **Management Priority - 2**

Management unit 61: 10 acres

- **Historic Condition** – Sandhill
- **Current Condition** – Planted Slash Pine / Scattered Xeric Oaks
- **Desired Condition** – Sandhill
- **Proposed Action / Treatment –**
  1. A ground cover planting project should occur first, which would consist of establishing grasses indicative of the sandhill community.
  2. Monitor the site for about two years for recovery of the native species.
  3. Once the ground cover species have reached the age to management the unit with fire, a burn regime should be reintroduced. A fire return interval for this community will range from 2-5years.
- **Probability of Success – 90%**
- **Management Priority - 2**

Management unit 62: 19 acres

- **Historic Condition** – Floodplain
- **Current Condition –** Planted Longleaf Pine
- **Desired Condition –** Due to past sand mining operations this community has been completely changed. FNAI does not have an adequate community description for this soil type. Due to current site conditions the decision was made to restore this into a sandhill community. NOTE: see soils description on page 11.
- **Proposed Action / Treatment** – However, a healthy stand of longleaf pine was planted by the past landowner. Due to the superior survival of the pines restoration is recommended as followed:
  1. A mechanical planting operation of sand hill grasses across the community
  2. After one year of growth of the grasses, prescribed fire should occur to stimulate seed dispersion of the grass.
  3. Continue to monitor for invasive and exotic species and 2 to 5 year fire return interval.
- **Probability of Success – 80%**
- **Management Priority - 2**

Management units 75, 76: 65 total acres

- **Historic Condition** – Sandhill
- **Current Condition –** Scattered Scrub / Live Oaks
- **Desired Condition –** Sandhill
- **Proposed Action / Treatment –**
  1. Implementation of brush mowing should occur first in order to get overgrown vegetation

under control.
2. District approved herbicide treatment should be implemented in order to reduce the pasture grasses and hardwoods.
3. A mechanical planting operation of sand hill grasses across the community
4. After one year of growth of the grasses, another mowing should occur to stimulate seed dispersion of the grass.
5. After a defined management unit of grass is reestablished woody species indicative to this area should be established.
6. Once the woody species are firmly established, a fire return interval of 2-5 years should be reintroduced.
7. Next, a hand planting operation of pine trees should occur.
8. After planting, monitoring this site for about 3-5 years for native growth of trees should occur, followed with a planting of various native grasses, vines, and shrubs.

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

Management unit 86: 9 acres

- **Historic Condition** – Sandhill
- **Current Condition –** Pasture
- **Desired Condition –** Sandhill
  Proposed Action / Treatment –
  1. District approved herbicide treatment should be implemented first in order to reduce the pasture grasses.
  2. A mechanical planting operation of sand hill grasses across the community
  3. A plantation of longleaf pines should be established, as this is the desired overstory in this community.
  4. Once the pine is of harvesting age a mechanical thinning should occur to reduce the basal area to a density of about 40-70 square feet per acre.
  5. Upon establishment of the overstory, mid-story, species indicative to the area can be reintroduced.
  6. A fire return interval of 2-5 years should be reintroduced.
  7. Monitor for invasive and exotic species.
- **Probability of Success – 90%**
- **Management Priority – 2**

Mesic Flatwoods:

Management units 7, 8, 24: 12 total acres

- **Historic Condition** – Mesic Flatwoods
- **Current Condition –** Mixed Mesic Oaks / Pines
- **Desired Condition –** Mixed Mesic Oaks / Pines
- **Proposed Action / Treatment -** Management units similar to this can effectively be restored. Unfortunately, access is limited to ATV, due to being land locked by adjacent landowners and an impassable swamp basin.
  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 14: 2 acres

- **Historic Condition** – Mesic Flatwoods
- **Current Condition –** Scattered Wetland Shrub / Brush
- **Desired Condition –** Scattered Wetland Shrub / Brush
- **Proposed Action / Treatment –** Due to the small size and succession of this unit there are no restoration activities suggested.
- **Probability of Success – 10%**
- **Management Priority - 5**

Management units 49, 71: 8 acres

- **Historic Condition** – Mesic Flatwoods
- **Current Condition –** Mixed Xeric Oaks
- **Desired Condition –** Mixed Xeric Oaks
  Proposed Action / Treatment – According to onsite confirmation, this unit has transitioned into a mixed hardwood hammock and no restoration is recommended. Continue to monitor for invasive and exotic species.
- **Probability of Success – 10%**
- **Management Priority - 5**

Management unit 54: 39 acres

- **Historic Condition** – Mesic Flatwoods
- **Current Condition –** Mesic Flatwoods
- **Desired Condition –** Mesic Flatwoods
- **Proposed Action / Treatment –** This site is in relatively good condition, however, a 3-5 year fire regime needs to be reintroduced to this community.
- **Probability Of Success – 90%**
- **Management Priority - 1**

Management units 70, 72, 81: 57 total acres

- **Historic Condition** – Mesic Flatwoods
- **Current Condition –** Mixed Xeric Oaks / Scattered Pine
- **Desired Condition –** Mesic Flatwoods
- **Proposed Action / Treatment –**Longleaf Pine is the notable species missing from this community.
  1. A mowing/mulching operation should occur to reduce overgrown oaks.
  2. Conduct a hand planting operation to reintroduce longleaf pine to the site.
  3. After 1 – 2 years of growth a fire regime should be introduced to the community, and continued on a 3-5 year rotation
  4. Continue to monitor for invasive and exotic species.
- **Probability of Success – 90%**
- **Management Priority – 2**

Wet Flatwoods:

Management units 4, 6: 22 total acres

- **Historic Condition** – Wet Flatwoods
- **Current Condition –** Mixed Mesic Oaks / Pines
- **Desired Condition –** Mixed Mesic Oaks / Pines
- **Proposed Action / Treatment –**
  1. Due to limited access this unit will be difficult to manage
  2. Continue to monitor for invasive and exotic species.
- **Probability of Success – 10%**
- **Management Priority – 5**

Management unit 9: 3 acres

- **Historic Condition** – Wet Flatwoods
- **Current Condition –** Scrub Oaks / Scattered Pines
- **Desired Condition –** Scrub Oaks / Scattered Pines
- **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 swamp basin.
  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 11: 36 acres

- **Historic Condition** – Wet Flatwoods
- **Current Condition –** Mixed Slash Pine / Bay
- **Desired Condition –** Mixed Slash Pine / Bay
- **Proposed Action / Treatment –**
  Management units similar to this can effectively be restored. Unfortunately, access is, due to being land locked by adjacent landowners and an impassable swamp basin.
  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 12: 33 acres

- **Historic Condition** – Wet Flatwoods
- **Current Condition –** Mixed Pine / Bay
- **Desired Condition –** Wet Flatwoods
- **Proposed Action / Treatment –** Management units similar to this can effectively be restored. Attempts will be made to change the structure of this unit through 3-5 year prescribed fire intervals.

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

Management units 51, 74, 83, 85: 44 acres

- **Historic Condition** – Wet Flatwoods
- **Current Condition –** Mixed Hardwood
- **Desired Condition –** Wet Flatwoods
- **Proposed Action / Treatment –** Management units similar to this can effectively be restored. Attempts will be made to change the structure of this unit through 3-5 year prescribed fire intervals.
- **Probability of Success – 90%**
- **Management Priority – 2**

Bottomland Forest:

Management units 21, 65, 79: 13 total acres

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

Management unit 31: 9 acres

- **Historic Condition** – Bottomland Forest
- **Current Condition –** Bottomland Forest
- **Desired Condition –** Bottomland Forest
- **Proposed Action / Treatment –** According to the soils description and onsite field confirmation, notable species led to the decision that no attempts will be made to change the structure of this community.
- **Probability of Success – 90%**
- **Management Priority - 1**

Basin Swamp:

Management units 2, 3, 5: 48 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**

Management units 46, 47, 84, 87: 60 total acres

- **Historic Condition** – Basin Swamp
- **Current Condition –** Mixed Bay / Pine
- **Desired Condition –** Basin Swamp
- **Proposed Action / Treatment -** Onsite groundcover and occurring vegetation according to soils descriptions show evidence that this management unit appears to lack a key species. The notable key species missing is cypress. Due to the isolation and terrain of these management units, this key species will be difficult to reestablish. Below are suggested steps for restoration:
    1. Hand-plant cypress seedlings and try to reestablish their presence.
    2. Monitor the communities for progression of native species.
- **Probability of Success – 50%**
- **Management Priority – 1**

Management unit 48: 8 acres

- **Historic Condition** – Basin Swamp
- **Current Condition –** Basin Swamp
- **Desired Condition –** Basin Swamp
- **Proposed Action / Treatment –** This site is in relatively good condition, no attempts will be made to change the structure of this community.
- **Probability of Success – 90%**
- **Management Priority - 1**

Management unit 50: 3 acres

- **Historic Condition** – Basin Swamp
- **Current Condition –** Mixed Bottomland Hardwoods / Cabbage Palm
- **Desired Condition –** Mixed Bottomland Hardwoods / Cabbage Palm
- **Proposed Action / Treatment –** Due to the small size, location and limited access restoration of this stand would be difficult. Due to these aspects, no recommendation for restoration is suggested.
- **Probability of Success – 10%**
- **Management Priority - 5**

Management unit 80: 4 acres

- **Historic Condition** – Basin Swamp
- **Current Condition –** Basin Swamp
- **Desired Condition –** Basin Swamp
- **Proposed Action / Treatment –**

1. Continue to monitor for invasive and exotic species.

- **Probability of Success – 90%**
- **Management Priority – 1**

Floodplain Swamp:

Management units 1, 15: 1863 total acres

- **Historic Condition** – Floodplain Swamp
- **Current Condition –** Mixed Hardwood Swamp
- **Desired Condition -** Floodplain Swamp
- **Proposed Action / Treatment -** Onsite groundcover and occurring vegetation according to soils descriptions show evidence that this management unit appears to lack a key species. The notable key species missing is cypress. Due to the isolation and terrain of these management units, this key species will be difficult to reestablish. Below are suggested steps for restoration:
  1. Hand-plant cypress seedlings and try to reestablish their presence.
  2. Monitor the communities for progression of native species.
- **Probability of Success – 90%**
- **Management Priority – 2**

Management unit 23: 29 acres

- **Historic Condition** – Floodplain Swamp
- **Current Condition –** Fresh Water Marsh
- **Desired Condition –** Flood Plain Marsh
- **Proposed Action / Treatment –**
  1. A District approved herbicide treatment should be implemented first in order to control undesired species.
  2. Following this procedure, hand planting of trees / grasses native to this community should occur. 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 –90%**
- **Management Priority - 2**

Floodplain Marsh:

Management unit 23: 29 acres

- **Historic Condition** – Floodplain Marsh
- **Current Condition –** Fresh Water Marsh
- **Desired Condition –** Floodplain Marsh
- **Proposed Action / Treatment –**
  1. A District approved herbicide treatment should be implemented first in order to control undesired species.
  2. Following this procedure, hand planting of grasses native to this community should occur
  3. Monitoring of this site should occur yearly for continued growth and encroachment of invasive and exotic species.
  4. Implement a 5 to 7 year fire return interval
- **Probability of Success –90%**
- **Management Priority - 2**

Developed:

Management units 19, 56: 462 total acres

- **Historic Condition** – Floodplain
- **Current Condition –** Eustis Sand Mine Mitigation Area
- **Desired Condition –** Developed
- **Proposed Action / Treatment –** Continue to monitor for invasive and exotic aquatic species.
- **Probability of Success – 90%**
- **Management Priority - 5**

Management units 35, 44, 73, 78: 16 acres

- **Historic Condition** – Sandhill
- **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.
- **Probability of Success – 90%**
- **Management Priority - 5**

References:

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

- *Soil Conservation Service – 26 Ecological Communities Of Florida*

- 1970 - Soil Survey Report / Maps and Interpretations Lake County Area, Florida

- http://www.fnps.org/palmetto/v07i2p6duever.pdf - **The Palmetto** Quarterly Magazine of the Florida Native Plant Society

- *Florida Natural Areas Inventory*, *"Guide to the Natural Communities of Florida".*

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

APPENDIX D.

Lake Norris Conservation Area

FIRE MANAGEMENT PLAN

PREPARED BY:

St. Johns River Water Management District

Division of Land Management

November 2009

TABLE OF CONTENTS

Lake Norris Conservation Area
Fire Management Plan
Lake 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 Lake Norris Conservation Area (LNCA).

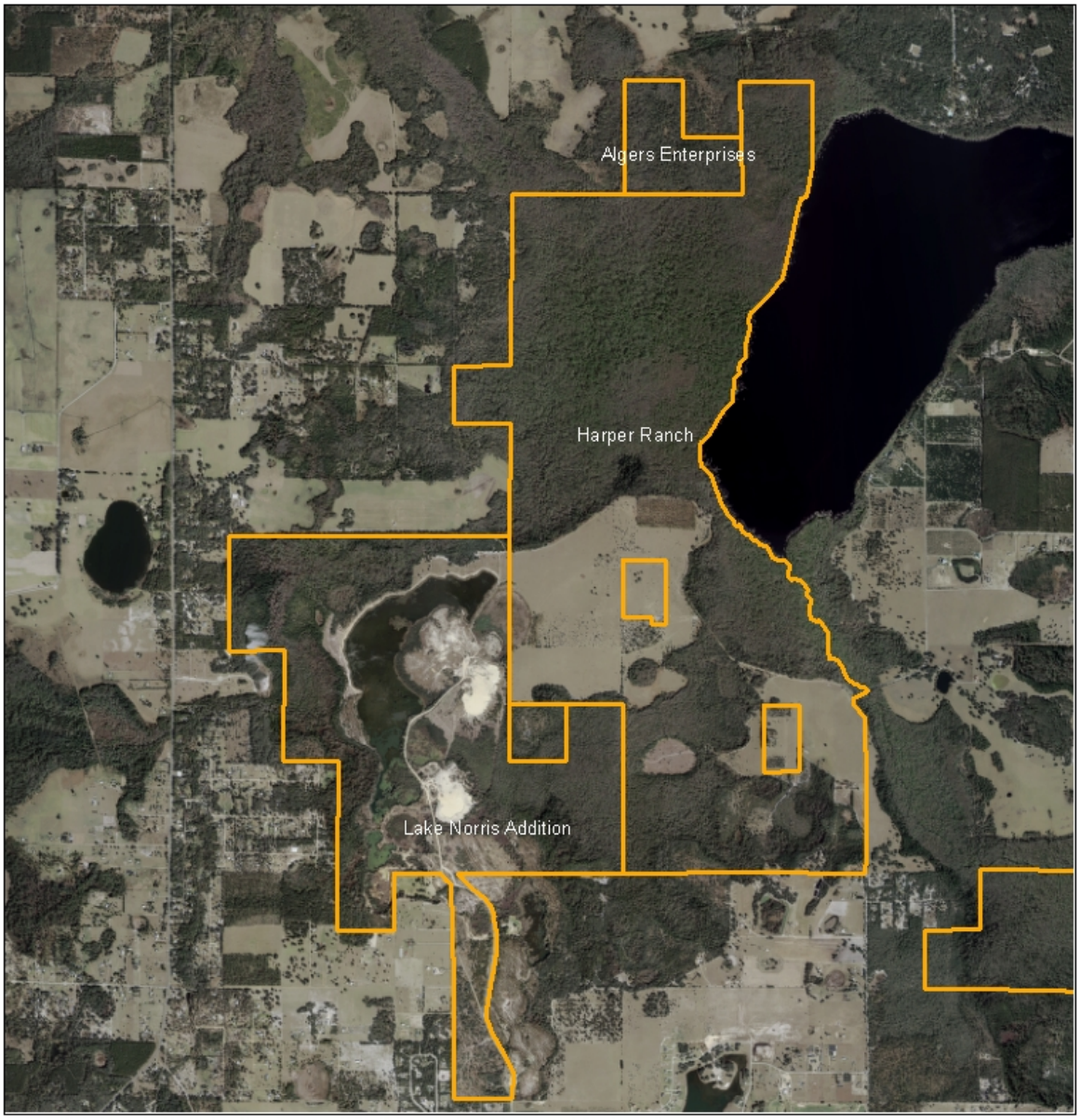
Introduction:

The LNCA encompasses approximately 3,660 acres in Lake County. The Conservation Area is located south of State Road 42, North of County Rd. 44A, West of Lake Norris Rd., borders the western edge of Lake Norris and a portion of Black Water Creek. The purchase of the three different parcels that make up the LNCA spanned from January of 1996 through December of 2002.

The primary land use for the area pre District ownership was primarily agriculture in the form of cattle ranching, poultry, citrus, timber, nursery and a sand mining operation.

Management strategies for the area include Water Resource Protection, Resource Management and Passive Recreation. Restoration of the Lake Norris Addition Property and the associated Sand Mine is underway through Blackwater Creek Mitigation Bank.

Years of farming, timbering and mining 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 LNCA.



Lake Norris CA

Parcel Map

0.30.15 0 0.3 Miles

1 = 38206

Legend

SJRWMD Individual Parcels

Ownership

- Full Fee
- Joint Fee
- Fee - Life Estate

The St. Johns River Water Management District prepares and uses this information for its own purposes and this information may not be suitable for other purposes. This information is provided as is. Further documentation of this data can be obtained by contacting: St. Johns River Water Management District, Geographic Information Systems, Program Management, P.O. Box 1429, 4049 Reid Street Palatka, Florida 32178-1429 Tel: (386) 329-4176.

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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.

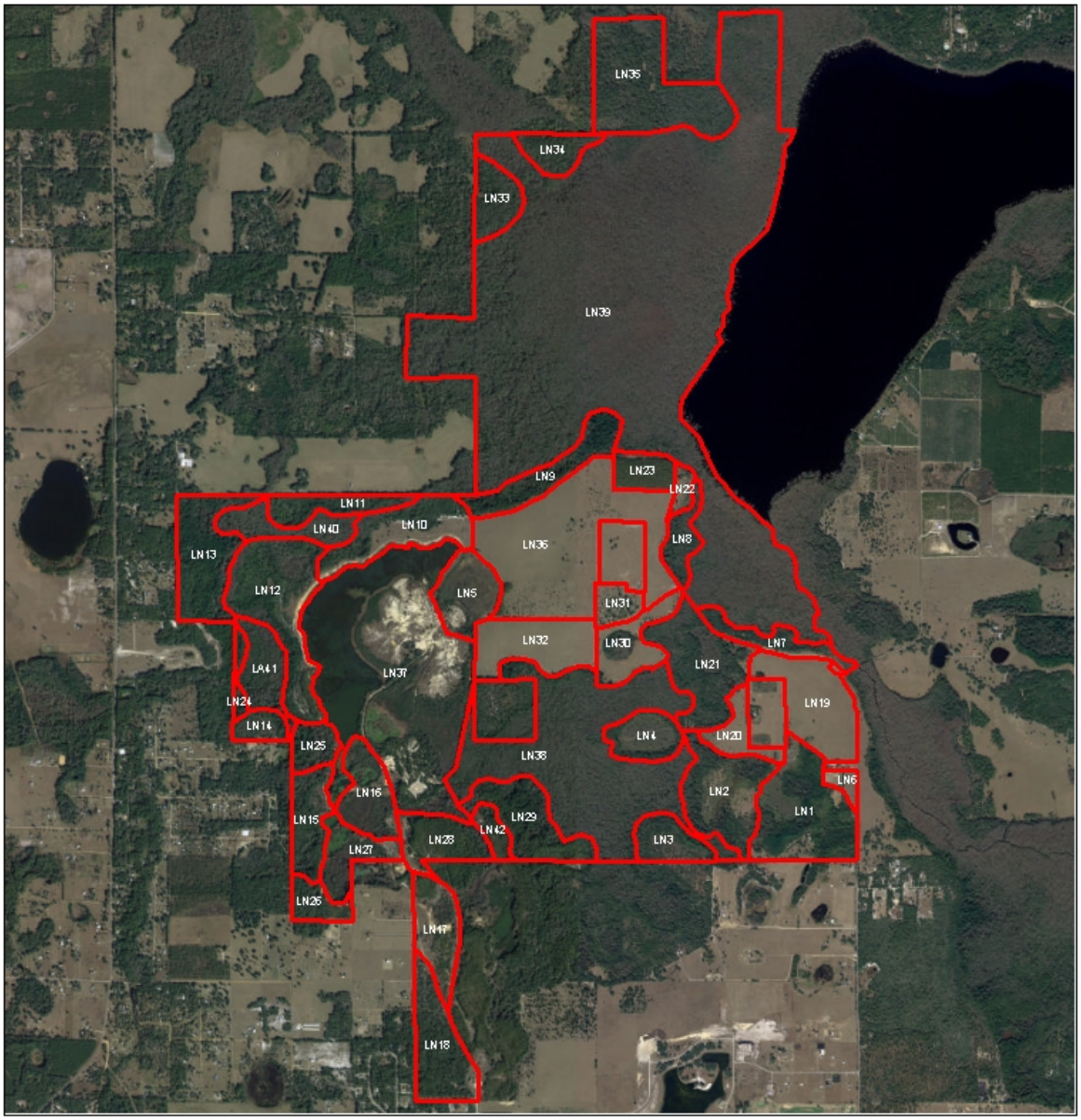
The goals for the implementation of fire management at the LNCA include:

- 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 LNCA be divided into manageable Fire Management Units (FMU's) prior to implementation of prescribed fire within the property. FMU's were established soon after acquisition and were recently revised to include areas that were not included in the original mapping.

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.



Lake Norris Conservation Area

Fire Management Units

1 = 35805

Legend

West Region FMU

The St. Johns River Water Management District prepares and uses this information for its own purposes and this information may not be suitable for other purposes. This information is provided as is. Further documentation of this data can be obtained by contacting: St. Johns River Water Management District, Geographic Information Systems, Program Management, P.O. Box 1429, 4049 Reid Street Palatka, Florida 32178-1429 Tel: (386) 329-4176.

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Below is a brief description of each of the individual FMU's contained within LNCA. 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
LN1	101	SE	None	3-5 years	SH9,SH4, SH3,GR3	Unit contains a mix of scrubby flatwoods, Wet Flatwoods, scrub and bay swamp
LN2	77	E,SE,S	Prescribed Burn 2004	3 to 5 years	SH8	Unit consists of a mixture of wet and scrubby flatwoods
LN3	31	S,SE	None	3 to 5 years	TU3	scrubby flatwoods
LN4	34	E,SE,SW	Prescribed burn 2002	5 to 7 years	SH6	scrubby flatwoods
LN5	46	Any	Prescribed Burns 2004,2008	3 to 5 years	SH3,GR9	Unit consists of a mixture of sawgrass, buttonbush, pickerelweed, panicum and willow with a transition of panicum and sand cord grass. Unit also contains scattered Chinese Tallow tree
LN6	9	E.NE,SE	Prescribed Burn 2004	3 to 7 years	GR3	Unit primarily consists of pasture grasses and sparse amounts of native groundcover. Exotic natal grass is also present.
LN7	30	SE,S	Prescribed Burn 2006	3 to 5 years	SH3	Consists of hardwood dominated flatwoods with sparse native grasses, shrubs and pockets of Cabbage Palm
LN8	24	N,NE,E, SE,S,SW ,W	Prescribed Burn 2005	3 to 5 years	SH3	Unit is primarily cabbage palm and small sweet gum with areas of andropogon and various other grasses
LN9	52	Any	Prescribed Burn 2006	3 to 5 years	SH3	Area contains scattered pine and hardwoods with a groundcover of saw palmetto, andropogon and hardwood leaf litter
LN10	69	SE,S,SW ,W,NW, N,NE	None	2 to 5 years	SH8,GR3	Area consists of fallow improved pasture and hardwood dominated remnant sandhill and scrubby flatwoods
LN11	33	N,NW	None	2 to 5 years	SH4,TU2	Unit is primarily flatwoods consisting of scattered pine and palmetto with a fringe of hardwoods grading into hardwood swamp
LN12	107	S,SW, NW	Prescribed Fire 2004	2 to 5 years	SH6,SH4	Unit is primarily flatwoods and wet flatwoods with small areas of hardwood

[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

						and shrub dominated sandhill.
LN13	76	W	None	2 to 5 years	TL2,SH9, SH6	Unit consist of mature sand pine scrub and flatwoods grading into hardwood swamp
LN14	16	SW	None	2 to 5 years	TU3	Unit has an overstory of turkey oak and scattered longleaf pine with an understory of wiregrass and oak litter
LN15	42	W,SW	None	2 to 5 years	TL2,SH3	Unit is primarily a mixture of live oak with a palmetto understory, hardwood hammock and hardwood swamp with a fringe of shrub dominated sandhill along the eastern edge.
LN16	46	NA	None	none	NB9	Unit consists of old sand mine pits and associated tailings, most of which is not pyric in nature. Unit lies within Blackwater Creek Mitigation Bank.
LN17	46	SW,W	None	3 to 5 years	TU3,TL8, SB1	Unit consists of a longleaf pine plantation and sparsely vegetated open fields atop sand tailings with a small hardwood dominated depression on the eastern side
LN18	62	SW	None	2 to 5 years	TU3,SH6	Unit consists of a mixture of scrubby flatwoods and hardwood dominated sandhill, A timber harvest was conducted on the west side in 2007 and the harvest area was roller chopped in 2008
LN19	76	E,SE,	None	2 to 5 years	GR3	Unit is improved pasture under cattle lease
LN20	25	S,SE,NE	None	2 to 5 years	GR3	Unit is improved pasture with scattered palmetto and persimmon trees.
LN21	85	NE,E,SE, S,SW	None	5 to 10 years	TU2	Unit consists of a mature hardwood overstory with palmetto and hardwood leaf litter understory
LN22	10	Any	None	10 to 20 years	GS3	Area consists of pastures grasses and cabbage palm
LN23	25	Any	None	3 to 5 years	TU3	Site is a slash pine plantation that was thinned in 2007, groundcover is pasture grasses and small cabbage palm
LN24	9	W	None	3 to 5 years	SH4	Unit is slash pine/bay mix with a palmetto/fetterbush understory
LN25	22	W,SW,S	None	3 to 5 years	TL2	Unit is primarily bay swamp with a fringe of flatwoods along the eastern side
LN26	22	S,SW	None	2 to 5 years	TU3	Eastern side of unit is a slash pine plantation with a grass/shrub understory, western side is a pine/hardwood mix with a wiregrass/leaf litter understory
LN27	38	NA	None	2 to 5 years	NB9	Unit consists of old sand mine pits and associated tailings, most of which is not pyric in nature. Unit lies within Blackwater Creek Mitigation Bank.

LN28	44	SW,S,SE	None	2 to 5 years	GR4,SB1	Unit contains a small area of planted slash pine that was thinned in 2007, remainder of unit was clear-cut and remaining vegetation was mulched in 2009. Area has sparse groundcover primarily consisting of partridge pea and logging slash
LN29	61	SW,SE	None	3 to 5 years	TU1,SH4, SH6	Unit contains natural pine with a palmetto understory transitioning into hardwood swamp on the northern and eastern side.
LN30	43	Any	None	2 to 5 years	GR3	Unit is improved pasture under cattle lease and contains a small timbered seepage slope within the interior.
LN31	19	Any	None	2 to 5 years	TU1	Unit is an old citrus grove dominated by cabbage palm with sparse groundcover
LN32	67	S,SE,E, SW,W	None	2 to 5 years	GR3	Unit is improved pasture under cattle lease
LN33	33	W	None	3 to 5 years	TU2	Unit is primarily hardwoods with palmetto and hardwood litter understory
LN34	26	NW,N, NE	None	5 to 10 years	TU2	Unit consists of a mature hardwood overstory with palmetto and hardwood leaf litter understory
LN35	124	NW,N, NE	None	10 to 20 years	TU2, TL2	Unit consists of a mature hardwood overstory and small pockets of large natural pine with palmetto and hardwood leaf litter understory
LN36	206	Any	None	2 to 5 years	GR3	Unit is improved pasture under cattle lease
LN37	353	NA	None	none	NB8,NB9	Unit consists of old sand mine pits and associated tailings, most of which is not pyric in nature. Unit lies within Blackwater Creek Mitigation Bank.
LN38	281	S,SW,SE	None	50+	TL2	Unit is a large hardwood swamp
LN39	1119	N,NE	None	50+	TL2	Unit is a large hardwood swamp
LN40	38	N,NW, W		50+	TL2	Unit is a hardwood swamp
LN41	40	W,SW ,NW	None	50+	TL2	Unit is a hardwood swamp
LN42	14	S,SW,SE	Prescribed Fire 2009	2 to 5 years	TU1	Unit consists of a slash pine plantation, a small southern red cedar plantation and remnant sandhill

Fuel Models[2]:

Below is a brief description of each fuel model occurring within the LNCA. 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 NB8: This category occurs within FMU's that have or are primarily comprised of open water bodies.

Fuel Model NB9: This category occurs within units lacking enough fuel to facilitate fire spread. Areas may include gravel pits, deserts, sand dunes, beaches and so forth.

Fuel Model GR3 : This category occurs within units that are primarily improved pasture. 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 GR4: This category occurs in units containing primarily native grasses with a fuel bed depth of about 2 feet. Fuel loading is typically near 2 tons/ac and the moisture of extinction is around 15%. Rates of spread can vary from 0 to over 500 chains/hr dependant upon weather conditions with flame lengths from 2 to 25 feet.

Fuel Model GS3: This fuel model is found within units having a moderate loading of grasses and shrubs. Fuel loading is typically near 3 tons/ac and the moisture of extinction is around 40%. Rates of spread can vary from 0 to over 200 chains/hr dependant upon weather conditions with flame lengths from 2 to 18 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 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

[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 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 TU1: This category occurs within units that primarily consist of a dense hardwood overstory with a ground cover of sparse grasses, low shrubs and hardwood leaf litter. The primary carrier of the fire in this model is a low load of grass and shrub litter. Fuel loads are typically near 1 ton/ac with a moisture of extinction of 20%. Rates of spread range from 0 to 18 chains/hr with flame lengths ranging from .25 to 4.5 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 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 SB1: 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 1.5 tons/ac, with a moisture of extinction of 25%. Rates of spread range from 0 to 52 chains/hr with flame lengths from 1 to 9 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 LNCA 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. Many of the uplands within the area were converted to pasture by the previous landowner and normally require frost to produce enough fine dead fuels to sustain fire. Through time and area-specific projects implemented by staff, native fire dependant vegetation will begin to re-establish in the area making growing season burns possible.

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

[3] Exhibit 2
[4] Exhibit 1

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 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.

[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.

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.

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

[8] Exhibit 3

column from a prescribed burn. There are several smoke sensitive areas (SSA's) surrounding the LNCA and each effect the smoke management of the individual FMU. Smoke management is one of the major limiting factors when attempting to conduct burns within the Conservation Area. Due to the location of SSA's surrounding the LNCA, applicable wind directions for prescribed fire are severely limited for certain FMU's. The town of Paisley is 2.8 miles North, Umatilla is 5 miles west, State Road 42 lies 1.2 miles north, County Road 44A lies .76 miles south and Lake Norris Rd lies adjacent to the Eastern boundary of the Conservation Area. 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.

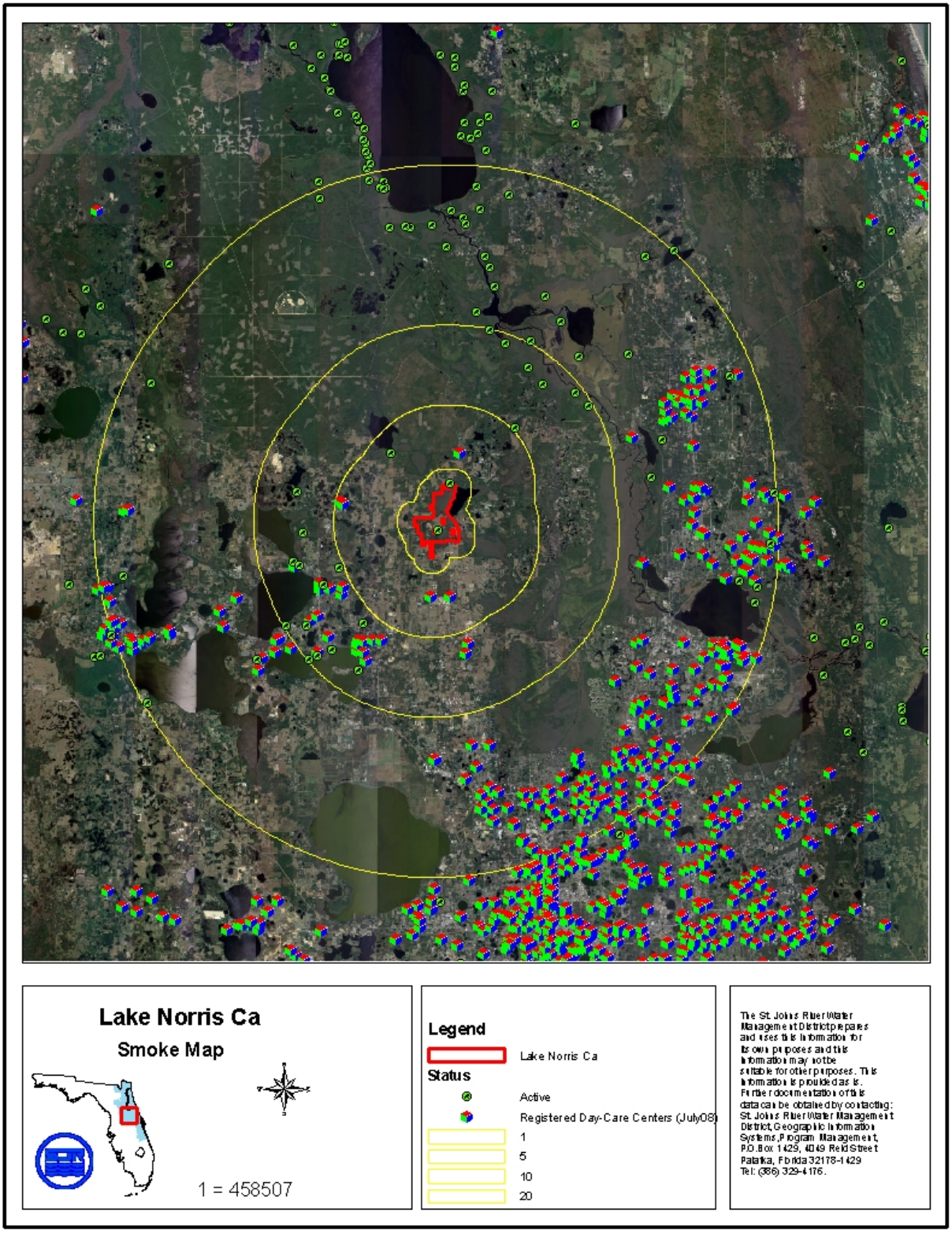
Along with each prescription, an extensive smoke screening process must be completed before burn authorizations are obtained from the Florida Division of Forestry (FDOF). District staff obtain a fire weather forecast and evaluate for suitable weather conditions to meet burn and smoke management objectives. 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 and or Lake Norris 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.



Author:ridaris, Source:C:\DOCUME~1\RHDAVI~1.000\LOCALS~1\Temp\ch-DF6A27.tmp, Time:8/6/2009 3:37:23 PM

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 LNCA. 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 in sandhill units and to remove pasture grasses during groundcover restoration projects

Management Concerns and Challenges:

Due to years of agricultural and mining use across the Conservation Area, the natural communities across portions of the property are severely degraded or non-existent. One of the foremost challenges to management of the area lies within the restoration of the natural communities. Past land use in some instances has totally removed the entire native seed bank; restoration of certain key species to these sites will be difficult, time consuming and expensive to achieve.

The sand mining operation located within the Lake Norris Addition Parcel has resulted in a vastly altered landscape across much of the parcel. The District has an agreement in place with East Lake Holdings and Blackwater Creek Mitigation Bank (BWCMB) to restore the remnant mine pits within the property. While much of the area within the footprint of the mine was historically sandhill, the amount of material removed through years of mining makes it impossible over much of the site to restore the pre-existing natural communities. BWCMB is currently implementing a plan to restore the pits and adjacent tailings into functional wetland, transitional and slope forest communities. Once mitigation construction and planting operations complete, BWCMB will be responsible for maintenance of the area for 4 years. The District will then transition into full management responsibilities for the mitigation area.

Prescribed fire must remain an integral part of the management scheme to achieve successful restoration of the natural communities within the LNCA. 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.

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

Exhibit 1

ST. JOHNS RIVER WATER MANAGEMENT DISTRICT
FIRE MANGEMENT UNIT PRESCRIPTION

AREA:	Lake Norris Conservation Area			**FIRE MGMT. UNIT:**	LN-8,9,10,12,15,17,18,22,25,26,28			
TOTAL BURN AREA:	499			**BURNABLE ACRES:**	378			
BURN DATE:				**CERT.#:**				
COUNTY(S):	Lake	**S:**	13,14,23,24,25,26	**T:**	18S	**R:**	27E	
			18		18S		28E	
		S:		**T:**		**R:**		
LANDOWNER#:	**16824**		**CONTACT FOR AUTHORIZATION**					
AUTHORIZATION#:			Florida Division of Forestry WFC, Withlacoochee, 352-754-6757					
HELISPOT COORDINATES:	**LAT.**	28`54'48.34"						
	LONG.	81`32'46.28"						
Certified Burn Manager Signature:								

SITE DESCRIPTION	
Last burn date:	LN 12 -2004, LN8 – 2005, LN9 – 2006, remaining units -Unknown
Community type and general information:	Sand hill/Hammock/Flatwoods/Scrubby Flatwoods/Pasture/Hardwood Swamp; Overstory consists of Various pine and hardwood species and Cabbage Palms. Understory consists of native grasses, palmetto, ferns, pasture grasses and hardwood leaf litter. Sandhill and scrubby flatwoods areas have irregular shaped areas of bare white sands.
Topography:	Gently rolling topography consisting of extremely well drained sands on the uplands, grading into moderately well drained sands mid slope and poorly drained sands within the flatwoods. Wetland areas contain wet organic soils that range from saturated to partially flooded.
Firebreak description:	Entire burn area is bounded by a combination of trail roads and disked firelines along upland perimeters, portions of the burn area perimeter utilizes ecotones as firebreaks. Care will be taken to ensure that ecotonal areas have sufficient moisture to ensure fire containment.
PURPOSE OF BURN:	Ecological
SPECIFIC OBJECTIVES:	Reduce fine fuel loading by 60%, use fire to encourage propagation of native groundcover. Remove 70% of downed woody vegetation from roller chopped and mulched areas within the burn area. Top kill 30% of hardwood species and shrubs < 4" in diameter.

FIRE WEATHER FORECAST AND PRESCRIPTION PARAMETERS					
Parameter	Minimum	Maximum	Day	Night	Observed
CLOUD AMOUNT					
CHANCE PRECIPITATION (%)					
PRECIPITATION TYPE					
TEMPERATURE (°F)		97			
RELATIVE HUMIDITY (%)	45	65			
WIND DIRECTION	SW				
WIND SPEED (MPH)	6	18			
PRECIPITATION AMOUNT					
PRECIPITATION BEGINS					
PRECIPITATION ENDS					
PRECIP DURATION					
LIGHTNING FREQUENCY					
TRANSPORT WINDS (DIR)	SW				
TRANSPORT WIND (MPH)	10	20			
1 HR FUEL MOISTURE					
MIXING HEIGHT (FT)	1700	6500			
DISPERSION INDEX	40	65			
LVORI				<7	
DROUGHT INDEX		<500			
CEILING HEIGHT					

FIRE BEHAVIOR (CALCULATED FACTORS)	INSIDE (used min and max weather values)		OUTSIDE		TODAY	OBSERVED
FUEL MODEL						
RATE OF SPREAD (CH/HR)	2	60				
FIRELINE INTENSITY (Btu/ft/s)						
HEADFIRE FLAME LENGTH (ft)	5	15				
PROBABILITY OF IGNITION (%)						

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:	Adjacent Landowners Kevin Grass, ½ mile downrange, Greg Wiggins , Adjacent to Divisions C & D, Valerie Dennison, adjacent to the south side of Div C.
Special precautions:	Notify; L.C.F.R., S.O., D.O.F. and Adjacent landowners, Monitor for changes in wind direction, Shut down ignition if any sustained wind directions are observed outside of listed prescription parameters. SW corner of Division Charlie will need additional mop up post burn to ensure all heavy residual smokes are extinguished due to adjacent resident's health related issues.

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

PERSONNEL AND EQUIPMENT SUMMARY		
Position/ Personnel	Equipment	Notes
2	Type VI Engine (Alpha)	Individual equipment and crew assignments defined in the Division assignment sheets.
2	Type VI Engine (Bravo)	
2	Type VI Engine (Charlie)	
2	Type VI Engine (Delta)	
1	Tractor Plow (Charlie)	
1	Tractor Plow (Delta)	
2	RTV (Bravo)	
2	RTV (Charlie)	
2	RTV (Delta)	
1	ATV (Alpha)	
1	ATV (Charlie)	
1	ATV (Delta)	
1	Helicopter	
1	MKIII Operator	
1	Pickup truck (Field OPS Chief)	
1	IC	

IGNITION PLAN

Crews will simultaneously establish base lines of each division.

Division Alpha: no base line establishment by ground crews, Alpha crews will need to burn out and defend the canoe storage unit and the pole barn near the group campsite. Once ignition of these areas has been completed and the improvements are secured the helicopter will complete interior ignition of the division. Ground Crews will complete ignition by burning out the remaining fringe from point A – B and C-D, holding on the pasture edge.

Division Bravo: Ground crews will establish the baseline along the northern and eastern sides of unit 10, beginning at point E and progressing westward along the property boundary fireline until ignition ties into the creek at point F. Ignition of the eastern side will begin at point D and progress southward to the sand mine lake at point G. Once the baselines are established, the helicopter will complete ignition of the division. Ground crews will follow up the Helo and burn out remaining pockets.

Division Charlie: Ground Crews will establish baseline beginning at point L and progress to point M. Once this line is established the helicopter will begin firing the unit starting at point O the unit will be fired in an east – west pattern with ground crews on the west line firing the edge keeping pace with the Helo starting at point O and progressing south to point N. Once aerial ignition completes ground crews will complete the unit by firing from point M-N.

Division Delta: Ground Crews will establish the base line beginning at point P, progressing to point Q and beginning at point R, progressing to point U. once baseline is established the helicopter will begin interior ignition at point P and work in an east-west pattern toward the south end of the division. Ground crews will begin firing the west line of the division at point S keeping pace with the aircraft to point V. Once interior ignition is complete ground crews will complete ignition by firing the south line beginning at point U and progressing to point V.

HOLDING AND CONTINGENCY PLAN

- Use weather and fire behavior parameters that allow for containment of spot fires with the use of one tractor/plow unit in tandem with one type 6 engine with crew of two.
- Limit PIG to 40% or less.
- Dispatch on-site tractor/plow unit 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 <10 acres no spot fires shall leave the property.

Sources for assistance:

FDOF, dispatch #, travel time= 10’

County Fire Services, dispatch #, 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	
Lake Co. Dispatch S.O.	352-343-2101	Day of burn/courtesy	
Lake Co. F.R.	352-383-1200	Day of burn/courtesy	
Withlacoochee	352-754-6757	Day of burn/courtesy	
Greg Wiggins	352-267-0102	Day of burn/courtesy	
Kevin Steinke	352-589-8655	Day of burn/courtesy	
Dick and Jane Scovil	352-669-3446	Day of burn/courtesy	
Valerie Dennison	352-483-0248	Day of burn/courtesy	
Kevin Grass	407-293-1885	Day of burn/courtesy	
Kenny Cousins (BWCMB)	407-466-7810	Day of burn/courtesy	
Patricia Burgos (LCWA)	352-343-3777 ext. 30	Day of burn/courtesy	
The Harpers	352-357-4240	Day of burn/courtesy	
Mo Williams	407-869-5866	Day of burn/courtesy	
Ray Lewis	352-267-0907	Day of burn/courtesy	

SAFETY PLAN	
Objective: Ensure safety of all burn crew members and public	
Safety Issue	Mitigation Measure
Heavy truck traffic in sand mine	Put out smoke on road signs (sand mine rd)
Brief and Debrief crews	Monitor fire and smoke issue`s
Venomous snake`s	Ensure crews to be aware
Aerial hazards	Brief crews on hazards related to aerial ignition
Extreme heat/ heat exhaustion/heat stroke	Ensure crews stay properly hydrated/take cool down breaks

DIVISION ASSIGNMENT LIST	1. Branch	2. Division/Group **Alpha**
3. Incident Name Lake Norris CA Aerial Burn	4. Operational Period Date: Time:	

5. Operations Personnel

Operations Chief		Division/Group Supervisor	
Branch Director		Air Attack Supervisor No.	

6. Resources Assigned this Period

Strike Team/Task Force/ Resource Designator	Leader	Number Persons	Trans. Needed	Drop Off PT./Time	Pick Up PT./Time
Type VI Engine		2	N		
Wet ATV		1	N		

7. Control Operations

Black line around campsite, pole barn and canoe storage rack. Once improvements are secure, support aerial operations by igniting along pastures edge keeping pace with aircraft firing from point B-A and then from point C-D. Once ignition is complete, patrol and mop up where necessary.

8. Special Instructions

Establish safe perimeter of at least 30 feet wide black line around all improvements. Use wet lines where necessary to hold fire around improvements and along western and southern unit boundaries. Mop up all smokes within 20' of all control lines.

9. Division/Group Communication Summary

Function	Frequency	System		Function	Frequency	System	Channel
Command		King NIFC	9	Logistics		King NIFC	
Tactical		King NIFC	9	Air to Ground Ground		King NIFC	9

Prepared by (Resource Unit Leader)R.H. Davis	Approved by (Planning Section Chief)	Date 7/30/09	Time 12:58

DIVISION ASSIGNMENT LIST	1. Branch	2. Division/Group **Bravo**
3. Incident Name Lake Norris CA Aerial Burn	4. Operational Period Date: Time:	

5. Operations Personnel			
Operations Chief		Division/Group Supervisor	
Branch Director		Air Attack Supervisor No.	

6. Resources Assigned this Period

Strike Team/Task Force/ Resource Designator	Leader	Number Persons	Trans. Needed	Drop Off PT./Time	Pick Up PT./Time
Type VI Engine		2	N		
RTV		2	N		

7. Control Operations

Crews will establish the baseline along the northern and eastern sides of unit 10, beginning at point E and progressing westward along the property boundary fireline until ignition ties into the creek at point F. Ignition of the eastern side will begin at point D and progress southward to the sand mine lake at point G. Once the baselines are established, the helicopter will complete ignition of the division. Ground crews will follow up the Helo and burn out remaining pockets.

8. Special Instructions

Mop up all smokes within 20' of all control lines.

9. Division/Group Communication Summary

Function	Frequency	System		Function	Frequency	System	Channel
Command		King NIFC	9	Logistics		King NIFC	
Tactical		King NIFC	Red	Air to Ground Ground		King NIFC	9

Prepared by (Resource Unit Leader)R.H. Davis	Approved by (Planning Section Chief)	Date 7/30/09	Time 13:35

DIVISION ASSIGNMENT LIST	1. Branch	2. Division/Group **Charlie**
3. Incident Name Lake Norris CA Aerial Burn	4. Operational Period Date: Time:	

5. Operations Personnel

Operations Chief		Division/Group Supervisor	
Branch Director		Air Attack Supervisor No.	

6. Resources Assigned this Period

Strike Team/Task Force/ Resource Designator	Leader	Number Persons	Trans. Needed	Drop Off PT./Time	Pick Up PT./Time
Type VI Engine		2	N		
Wet ATV		1	N		
RTV		2	N		
Tractor Plow		1	N		

7. Control Operations

Crews will establish baseline beginning at point L and progress to point M. Once this line is established the helicopter will begin firing the unit starting at point O the unit will be fired in an east –west pattern with ground crews on the west line firing the edge keeping pace with the Helo starting at point O and progressing south to point N. Once aerial ignition completes ground crews will complete the unit by firing from point M-N.

8. Special Instructions

Mop up all smokes within 20' of all control lines except south line. Mop up all smokes within 50" of south line and heavy smokes within 100".

9. Division/Group Communication Summary

Function	Frequency	System		Function	Frequency	System	Channel
Command		King NIFC	9	Logistics		King NIFC	
Tactical		King NIFC	White	Air to Ground Ground		King NIFC	9

Prepared by (Resource Unit Leader)R.H. Davis	Approved by (Planning Section Chief)	Date 7/30/09	Time 13:38

DIVISION ASSIGNMENT LIST	1. Branch	2. Division/Group **Delta**
3. Incident Name Lake Norris CA Aerial Burn	4. Operational Period Date: Time:	

5. Operations Personnel			
Operations Chief		Division/Group Supervisor	
Branch Director		Air Attack Supervisor No.	

6. Resources Assigned this Period

Strike Team/Task Force/ Resource Designator	Leader	Number Persons	Trans. Needed	Drop Off PT./Time	Pick Up PT./Time
Type VI Engine		2	N		
Wet ATV		1	N		
RTV		2	N		
Tractor Plow		1	N		

7. Control Operations

Crews will establish the base line beginning at point P and progressing to point Q and beginning at point R and progressing to point U. once baseline is established the helicopter will begin interior ignition at point P and work in an east-west pattern toward the south end of the division. Ground crews will begin firing the west line of the division at point S keeping pace with the aircraft to point V. Once interior ignition is complete ground crews will complete ignition by firing the south line beginning at point U and progressing to point V.

8. Special Instructions

Mop up all smokes within 20’ of all control lines and within 50” of any roadway.

9. Division/Group Communication Summary

Function	Frequency	System		Function	Frequency	System	Channel
Command		King NIFC	9	Logistics		King NIFC	
Tactical		King NIFC	Blue	Air to Ground Ground		King NIFC	9

Prepared by (Resource Unit Leader)R.H. Davis	Approved by (Planning Section Chief)	Date 7/30/09	Time 12:58

MEDICAL PLAN	1. Incident Name	2. Date Prepared	3. Time Prepared	4. Operational Period

5. Incident Medical Aid Station

Medical Aid Stations	Location	Paramedics Yes	No

6. Transportation

A. Ambulance Services

Name	Address	Phone	Paramedics Yes	No
Lake County Fire Rescue	Dispatch	352-383-1200	x	

B. Incident Ambulances

Name	Location	Paramedics Yes	No

7. Hospitals

Name	Address	Travel Time Air	Ground	Phone	Helipad Yes	No	Burn Center Yes	No
Orlando Regional Medical Center, Burn Unit	Orlando	30’	60’	407-237-6398	x		x	
Orlando Regional Medical Center, Air services	Orlando	30’	60’	407-843-5783	x		x	
Florida Hospital Waterman	Tavares	15’	30’	352-253-3333	x		x	

8. Medical Emergency Procedures

PREBURN PREPARATIONS AND CHECKLIST

ON-SITE

- Disk firelines

OFF-SITE

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

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		**DATE**	

Exhibit 2

Aerial Burn Safety Plan

Lake Norris Conservation 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: Lake Norris Rd Trailhead**

LAT.	28`54'48.34"W
LONG.	81`32'46.28"N

8. **Helispot 2: Hill Top SW of Champion Parcel**

LAT.	28`55'01.65" N
LONG.	81`33'46.21"W

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 Lake Fire and Rescue (352-383-1200), Lake County Sheriff (352-343-2101) 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.

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. Withlacoochee Forestry Center Dispatch **352-754-6757**

NTSB

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

.

Exhibit 3

Prescribed Burn Report

Quantitative Data

Date	07/29/09
Burn Boss	D.J. HILL
Authorization #	2009054919
Management Unit	Lake Norris Conservation Area
Burn Zone	LN-29
Natural Community Burned	SANDHILL
District Staff Hours Burning	32
District Staff Hours Planning Burn	1
DOF/Cooperator Hours	0
Mop up Hours	0
District Dozer Hours (report hours dozer was at fire)	8
DOF Dozer Hours (report hours dozer was at fire)	0
Engine Hours (report hours engine was at fire)	8
ATV's # and hours	24
Marsh master Hours	0
Airboat Hours	0
Helicopter Hours	0
Helicopter Owner	0
# Cases of Ping-Pong Balls	0
# Of Flares Used	0
Hours and gallons of Tera torch use	0
Acres to be Burned	20
Acres Completed	15
Horse Days Used	0
District staff participating in the burn. (Names)	Duff Swan, Alex Auton, Daniel Kennedy and D.J. Hill