

Emeralda Marsh Conservation Area

Land Management Plan

Lake County, Florida

St. Johns River Water Management District
Governing Board Approved
June 2016

Emeralda Marsh Conservation Area Land Management Plan Summary

Management Area Size: 6,577 acres

Date of Acquisition: Acquisition of parcels within the Emeralda Marsh Conservation Area (Emeralda, Conservation Area) began in 1991.

Date of Plan: June 2016

Previous Plan: March 2009

Major Basin: Ocklawaha River Basin **Planning Basin:** Lake Griffin Unit

Location: Southwest of the Ocala National Forest in Lake County, south of State Road 42 and north of State Road 44 and the unincorporated community of Lisbon. The property is located between Lake Griffin to the west and Lake Yale to the east.

Funding Source: Save Our Rivers, Preservation 2000, private donation, The Nature Conservancy donation, FDOT mitigation, ad valorem.

Management Partners: The District serves as lead manager for the entire Conservation Area. Hunting associated with the Public Small Game Hunt Area falls under the jurisdiction of the Florida Fish and Wildlife Conservation Commission (FWC).

Vision Statement: The Emeralda Marsh Conservation Area will be actively managed for the continued restoration of the water resources of Lake Griffin and the Ocklawaha River. The focus of the District's ongoing water resource efforts within the Conservation Area is to achieve reduced eutrophication of the lake while increasing the coverage of submerged aquatic vegetation through focused efforts to reduce phosphorus and pesticides that remain from past farming activities and to restore connectivity of the marsh systems to Lake Griffin. Land management activities in the marsh areas will focus on the restoration and enhancement of natural communities. Uplands will be managed to improve important habitat that supports site-appropriate floral and faunal species. Quality recreational opportunities will be maintained and developed in a manner consistent with the ecological needs of the property.

Key Land Use/Recreation Issues:

Resource Management Issues:

- WATER RESOURCES – Goals include restoration of the hydrological and ecological functions of the Ocklawaha River floodplain within the property and minimizing the nutrient discharge from the property to Lake Griffin and the Ocklawaha River Basin. Alterations to water resources within the property include levees, canals, ditches, culverts, low water crossings, bridges, several roads, firelines, and recreational trails.
- NATURAL COMMUNITY RESTORATION – Goals include the restoration and management of wetland and upland system through the control of invasive and exotic plant species and the planting of site appropriate species.

- FIRE MANAGEMENT – Implementation of prescribed burns occurs in accordance with annual burn plans and individual unit prescriptions.
- WILDLIFE – Emeraldal Marsh Conservation Area provides habitat for numerous wildlife species including a broad suite of avian species.
- EXOTICS – Invasive exotic pest plant and animal species occur on the property at light to moderate levels of infestation. The District regularly monitors for the presence of invasive plants and animals and responds with appropriate control actions.
- CULTURAL & ARCHEOLOGICAL RESOURCES – A review of the Department of State, Division of Historical Resources indicates no known Florida master site locations within the boundaries of the property.

Land Use Management Issues:

- **Access** – Five permanent public parking areas with trailheads are located on the property.
- **Recreation Use** – The property is open to the public for hiking, bicycling, equestrian activities, canoeing and kayaking, boating, fishing, and waterfowl hunting. An interpretive drive is also seasonally available for recreational users.
- **Security** – Maintenance of fence lines, parking areas, gates, and locks is conducted. The District maintains contact with FWC, local law enforcement, the security resident, and a private security firm for any potential security needs.
- **Administration:**
 - **Acquisition** – The District may pursue acquisition of small parcels, surpluses, donations, or exchanges with neighbors to improve and provide additional access to the property or as otherwise warranted. Through the District land’s assessment process, two areas within the Emeraldal Marsh Conservation Area are identified for potential surplus.
 - **Leases, Easements, Special Use Authorizations, and Agreements** - The District administers numerous leases, agreements, easements, special use authorizations (SUAs) and concessions.

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VISION STATEMENT

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OVERVIEW

This document provides the guidelines and goals for implementation of land management activities at Emeraldal Marsh Conservation Area through 2025. This is a revision of the March 2009 Governing Board approved land management plan.

The Emeraldal Marsh Conservation area is one of six management areas owned by the District within the Lake Apopka and Upper Ocklawaha River Basin. The Ocklawaha River is one of the oldest river/lake systems in Florida. Silver Springs is a major spring that flows into the Ocklawaha via Silver River. Water from Silver Springs plays a significant role in the water quality in the Lower St. Johns River Basin. The Ocklawaha River is categorized by the Department of Environment Protection as a Class III water body, whose intended uses, by definition, are the propagation and maintenance of healthy, well-balanced fish and wildlife populations, and recreation. The Emeraldal Marsh system was designated as a National Natural Landmark in 1974 by the US Department of the Interior, National Park Service and is one of only eighteen sites within the state to receive this designation.

Prior to development of the property, the conservation area included a mosaic of natural communities including broad areas of floodplain marsh dominated by sawgrass. In the early 1900s, the United States Army Corp of Engineers (USACE) authorized the Ocklawaha River Project. This large-scale project was initiated to remove obstructions from the river for enhanced navigation. In addition, the USACE cleared a channel through Lake Griffin and constructed levees to obtain a water depth of 4 feet through the lake to Leesburg. Local farming interests lobbied and won congressional support in 1917 to drain and dike the fertile lands adjacent to the river for agricultural use. In the 1940s, the marshes were drained and the exposed fertile muck soils were utilized for agriculture. Due to these agricultural practices, which also included cattle ranching, the exposed wetland soils oxidized. In addition to soil loss caused by oxidation, the soils within the conservation area were contaminated by fertilizer and pesticide applications.

The conservation area lies within the USACE Four River Basins Florida Project (FRBF) authorized by the Flood Control Act of 1962, it included works within the Ocklawaha River Basin for flood control, navigation and related purposes, particularly recreational boating.

Construction of the Ocklawaha River Basin portion of the FRBF project began in 1966 and finished in 1975. Specifically the FRBF project sought to improve 6 miles of levee L-212 from Moss Bluff to the north end of the Ocklawaha Prairie Restoration Area and enlarge 7.9 miles of the C-231 canal from Lake Griffin to Moss Bluff Lock and Dam.

In 1996, District staff developed a conceptual restoration plan for the conservation area. During the first phase of the restoration plan, flow-way systems were developed for water quality improvement and re-establishment of the floodplain ecosystems. The plan focused on reducing nutrient loading into Lake Griffin. This type of passive management did not achieve the desired effect of a marsh system, which would ultimately help to reduce nutrient loading into the lake, because lake stage was greater than the surface elevations of most of the conservation area. Deep water coupled with little or no extant wetland vegetation resulted in site dominance by open water. Residual excess soil nutrients from the farming history also resulted in excess nutrient loading to the overlying water. The District resorted to actively managing the water levels and flows within the conservation area. Through a combination of upstream nutrient reduction, eliminating agricultural discharge, harvesting gizzard shad and operating the flow-way, significant improvement of Lake Griffin water quality was achieved. The District has used alum treatments to improve water quality within portions of the conservation area and currently uses alum to reduce nutrient levels in pumped outflow water.

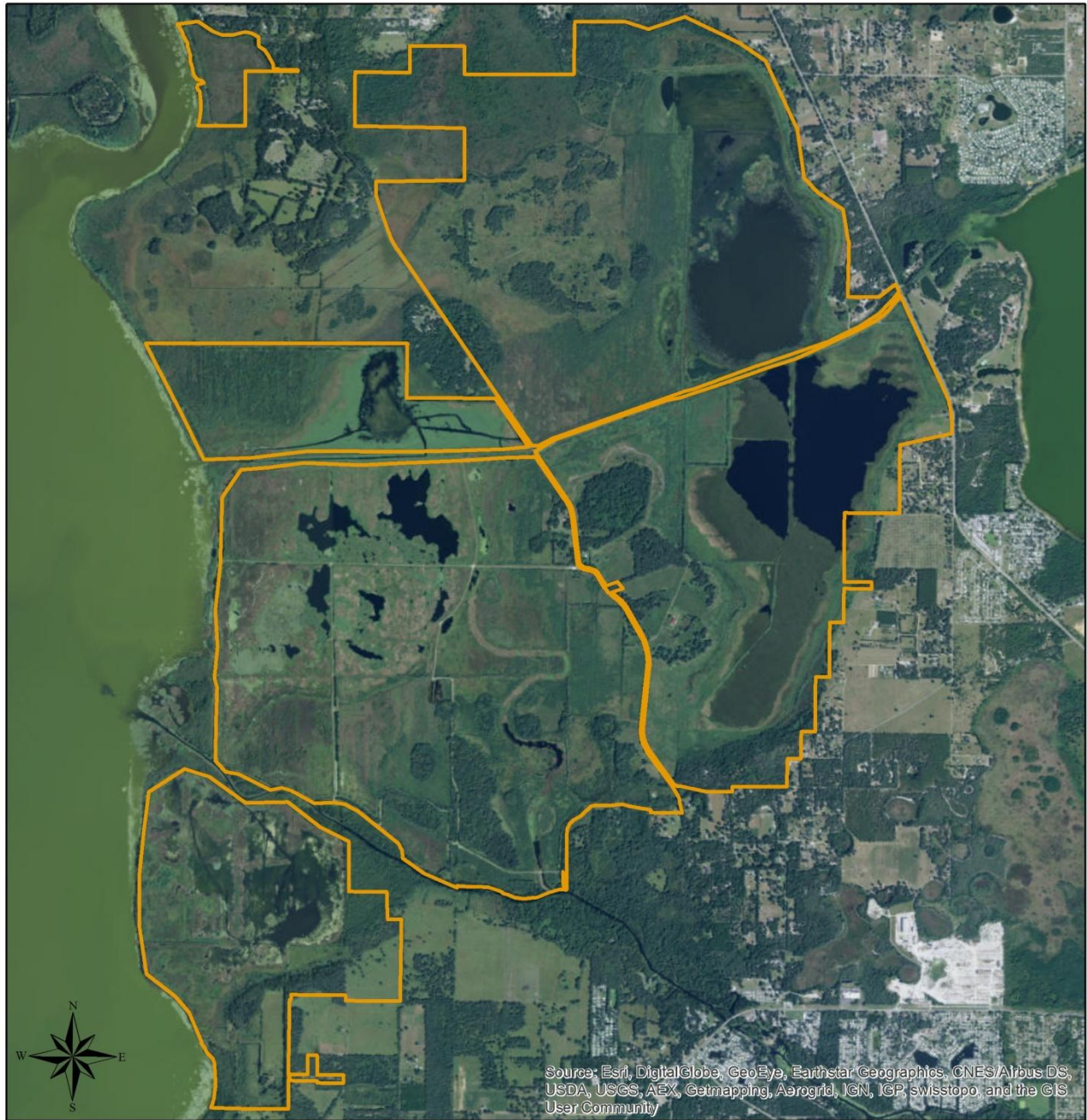
Location

The Emeraldal Marsh Conservation Area includes 6,577 acres in Lake County within the Ocklawaha River basin. Emeraldal Marsh Conservation Area is located in numerous sections of Townships 18 and 19 South and Range 25 East. Figure 1 provides an aerial view of the Conservation Area. The property is located (Figure 2) along Emeraldal Island Road between State Road 42 and Sate Road 44, just north of the town of Lisbon, to the east of Lake Griffin and just west of Lake Yale.

Regional Significance

The Emeraldal Marsh Conservation Area is part of a regional complex of conservation lands providing protection for the Ocklawaha River, Lake Apopka and the Ocklawaha Chain of Lakes, which include Lake Harris, Lake Dora, Lake Eustis, Lake Griffin, and Lake Yale. Figure 3 illustrates the regional context of the property. In addition to several conservation easements, public conservation lands contiguous with or within close proximity to the property include:

- Lake Apopka North Shore
- Lake Harris Conservation Area
- Sunnyhill Restoration Area
- Ocklawaha Prairie Restoration Area



Emeralda Marsh Conservation Area

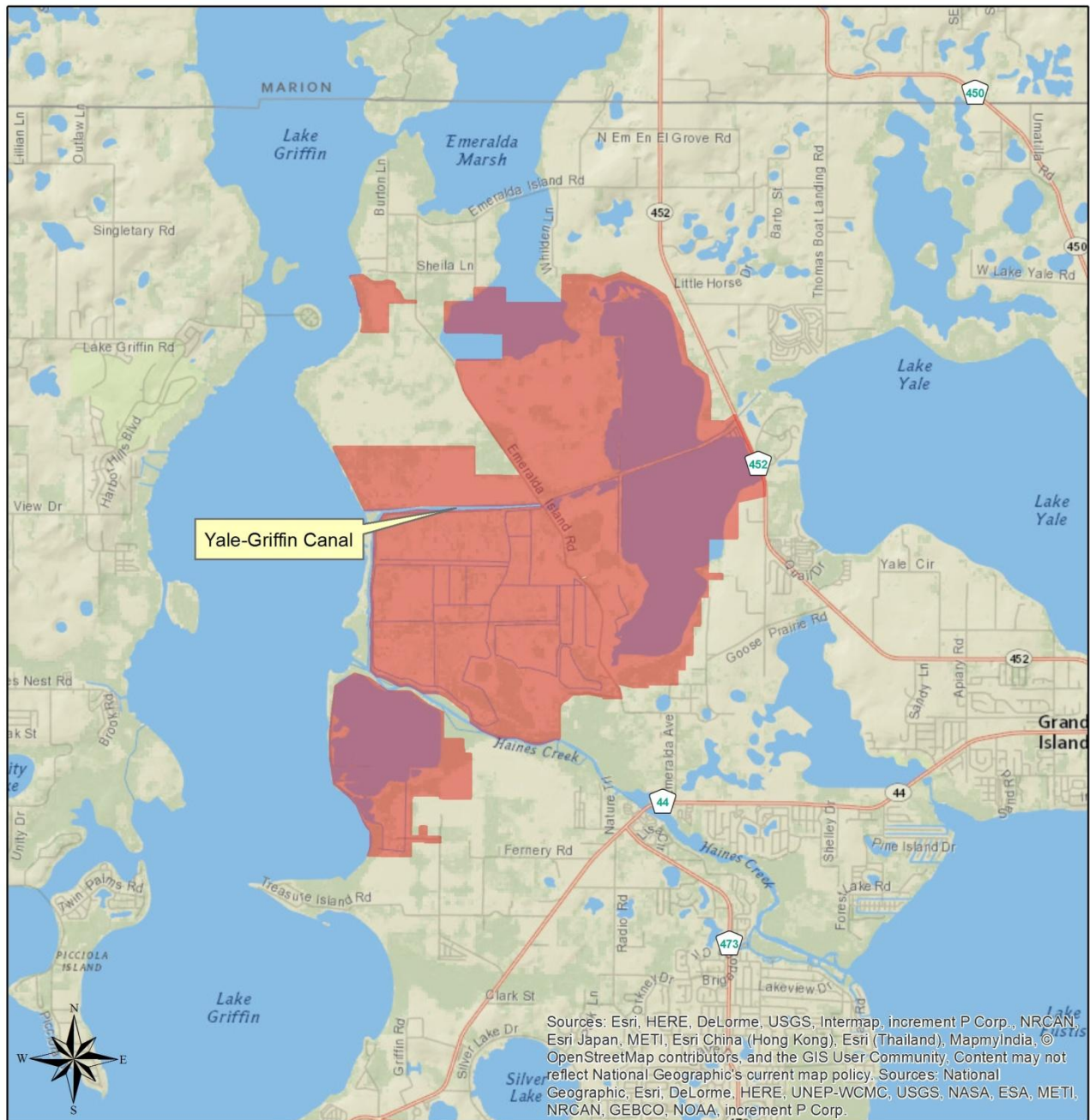
Figure 1 - Aerial Image Map



0.75
Miles

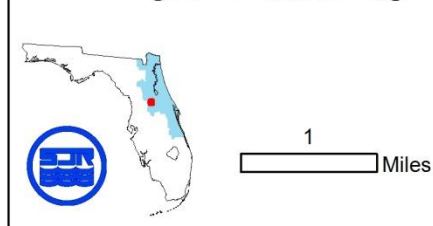
 **Conservation Area**

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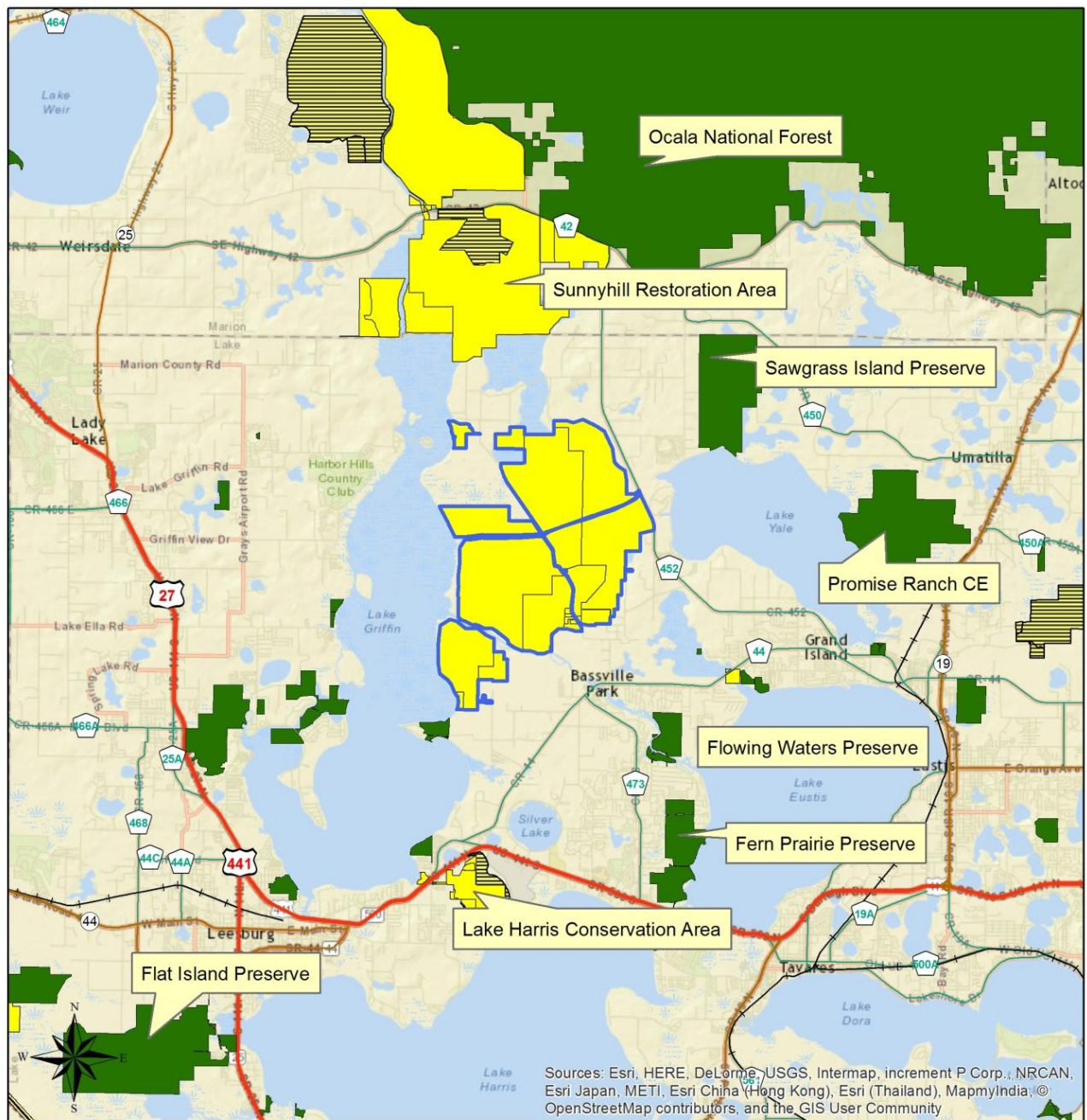
Emeralda Marsh Conservation Area

Figure 2 - Location Map



 Conservation Area

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Emeralda Marsh Conservation Area
Figure 3 - Regional Significance Map



2.5
 Miles

- Conservation Area
- Other Public Lands
- District Title Interest**
- Full Fee
- Conservation Easement

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Acquisition History

The acquisition of the parcels that comprise the Emeraldal Marsh Conservation Area provides for the protection of important water resources and ecological functions. This acquisition is consistent with the goals of the Upper Ocklawaha River Basin. These goals, as they apply to Emeraldal Marsh Conservation Area include:

- Improve water quality, maintain natural hydrologic regimes, and increase flood protection by preserving important floodplain areas.
- Restore, maintain, and protect native natural communities and diversity.
- Provide opportunities for recreation where compatible with resource management needs and the above listed goals.

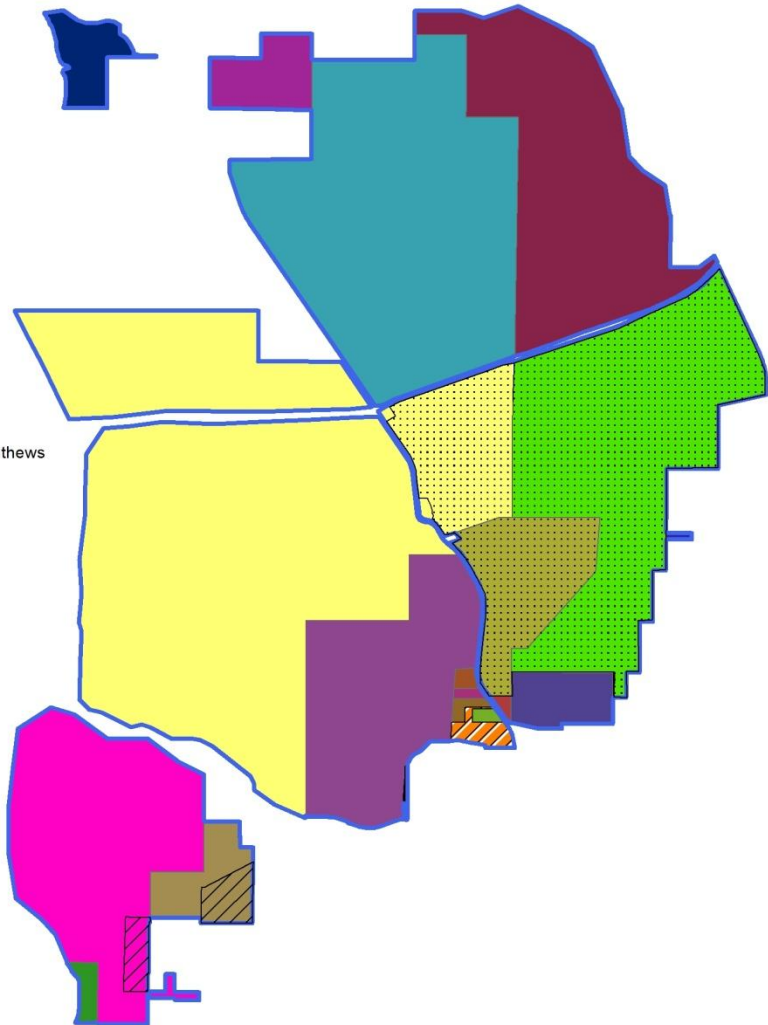
Acquisition of the Emeraldal Marsh Conservation Area began in 1991. The Emeraldal Marsh Conservation Area is comprised of eighteen (18) parcels. The combined acreage of all parcels incorporated into the Emeraldal Marsh Conservation Area totals 6,577 (Figure 4). Table (1) one summarizes the land acquisition accomplishments of the District. All acreage reported is derived from GIS calculations.

Also identified in Figure 4 are areas of potential surplus and alternative uses. Through the District land's assessment process, two areas within the Emeraldal Marsh Conservation Area are identified for potential surplus. The easternmost area is identified for surplus for sale/exchange, where the District is interested in the sale or exchange of this property on the open market. Disposition of this property will be organized in such a way as to ensure that any future uses will not be incompatible with the conservation values of the retained portions of District property. The western most area is identified for sale with an accompanying conservation easement to ensure continued conservation. An additional area within the property is identified for potential alternative uses. This area, per the *2012 District Lands Assessment Implementation Plan* (SJRWMD 2012) is an area of former muck farm that has not been reconnected to Lake Griffin due to residual high levels of phosphorus. Alternative uses in this area that will be considered are those that will aid in the reduction of phosphorus and/or pesticides in this area, providing future opportunity for reconnection.

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Parcel

- Connie Bearden Personal Rep. of Earl J Lewis Estate
- Curless Anne Patterson Barnett
- Dennis L. Floyd and Alice L. Floyd
- Estate of Victor Zerbs, Jr. a/k/a Victor Zerbs
- Frank S Paulhamus and Batrice E. Paulhamus, a/k/a Bea Paulhamus
- G.K.Fuller and Margaret B. Fuller
- Gary N. Brown
- Huffman Products, Inc.
- John Mathews
- John P. Mathews and Pamela Ann Mathews
- John P. Wilkerson
- Joseph L/ Veilleux
- Knight Holdings, Ltd.
- Long Farms North, Inc.
- Lowrie Brown Investment Co.
- Lowrie Brown Investment Company
- Melvin Coleman and Gloria Coleman
- Phoebe Agatha Allicock and Helen Linda Allicock
- Ruth G. Rogers Family Trust
- William Franklin Matthews, as Trustee and Verna P. Mathews



Emeralda Marsh Conservation Area

Figure 4 - Land Aquisition Map



0.9
Miles

- Conservation Area
- Potential Surplus
- Potential Alternative Use

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○ Table 1 – Land Acquisition Summary

Parcel	LA Number	Acres*	Total Purchase Price	District Amount	District Funding Source	External Funding Source (Amount)	Transaction Dates
Long Farm (North)	1989-015-P1	854.89	\$3,000,000.00	\$3,000,000.00	P2000	-----	07/22/1992
Walker Ranch	1989-023-P1	1092.72	\$775,000.00	\$775,000.00	SOR/BOND89	-----	06/27/1991
Lowrie Brown	1989-028-P1	621.06	\$1,450,000.00	\$1,450,000.00	P2000	-----	10/31/1991
S.N. Knight Lisbon	1990-037-PB	2132.77	\$5,884,932.08	\$5,884,932.08	SOR/BOND89	-----	05/29/1991
Ashley (Rogers) Farm	1990-093-P1	77.42	\$35,000.00	\$35,000.00	SOR/BOND89	-----	04/29/1992
K. Fuller – Mathews Farm	1991-022-P1`	719.41	\$1,200,000.00	\$1,200,000.00	P2000	-----	08/11/1992
Brown, Gary	1991-039-P1	100.02	\$39,000.00	\$39,000.00	P2000	-----	05/06/1994
Anne Patterson Barnett	1992-048-P1	19.67	-----	-----	-----	Donation	12/31/1992
Veilleux	1992-065-P1	4.99	\$60,000.00	\$60,000.00	Ad Valorem	-----	06/28/1993
Paulhamus	1992-066-P1	706.07	\$2,390,000.00	\$2,390,000.00	P2000	-----	12/07/1993
Floyd	1993-030-P1	7.02	\$66,000.00	\$66,000.00	Ad Valorem	-----	07/29/1994
Mathews, John	1993-031-P1	25.45	\$130,000.00	\$130,000.00	Ad Valorem	-----	02/04/1994
Allicook	1993-032-P1	7.99	\$37,500.00	\$37,500.00	Ad Valorem	-----	01/27/1994
Coleman	1993-003-P1	5.0	\$57,000.00	\$57,000.00	Ad Valorem	-----	02/04/1994
Mathews, William	1993-034-P1	5.75	\$47,000.00	\$47,000.00	Ad Valorem	-----	01/27/1994
Huffman	1994-022-P1	2.53	\$8,500.00	\$8,500.00	Ad Valorem	-----	03/22/1996
Wilkerson	1995-012-P1	110.68	\$290,500.77	\$290,500.77	Ad Valorem	-----	08/21/1998
Lewis Property	2010-004-P1	83.70	\$330,000.00	\$330,000.00	FDOT Mitigation Plan	-----	01/28/2011
Property Total	-----	6577.14	\$16,045,987.85	\$16,045,987.85	-----	-----	-----

*GIS Acres

Local Government Land Use Designations

Lake County

Lake County includes the Emeraldal Marsh Conservation Area in its Comprehensive Plan Future Land Use element as Emeraldal Marsh Protection Area. The area is designated Rural Protection Area 2. The intent of this designation is to ensure long-term ecological integrity of the Emeraldal Marsh area through the promotion of land conservation efforts, responsible agricultural practices, and the protection of low-density rural land (Lake County).

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NATURAL RESOURCES OVERVIEW

Topography, Hydrology, and Water Resources

The Emeralda Marsh Conservation Area lies within the Central Lakes, a physiographic subdivision of the Central Lake District. The Central Lakes are areas of solution basins that incorporate lakes, marshes, and wet prairies (Brooks 1981). Elevations within the Emeralda Marsh Conservation Area range between 49 and 82 feet (NAVD88) above sea level with the highest portion of the property located along the eastern boundary.

The Emeralda Marsh Conservation Area is located within the Ocklawaha River Basin, Lake Griffin Unit along the eastern shore of Lake Griffin. Lakes within the Ocklawaha River Basin flow in a northerly direction forming the Ocklawaha River, which continues to flow north into the St. Johns River. The chain of lakes within this system include Lake Apopka, Lake Beauclair, Lake Dora, Lake Harris, Lake Eustis, Lake Griffin, and Lake Yale. Lake regulation schedules are maintained through three locks and dams including, Apopka-Beauclair Lock and Dam, the Burrell Lock and Dam, and the Moss Bluff Lock and Dam. Figure 5 depicts the hydrologic infrastructure for the area.

Four water bodies affected by the conservation area are included on the FDEP Statewide Comprehensive Verified Lists of Impaired Waters (FDEP 2016). Lake Griffin is on the 2002 Verified List for impairment due to high nutrient (trophic state index) concentrations and for violations of the un-ionized ammonia criterion. Non contributing area, which includes the conservation area between Haynes Creek and the Yale-Griffin Canal, is on the 2009 Verified List for impairment due to high nutrient (Chlorophyll-a) concentrations. Also, the Ocklawaha River/Sunnyhill section of the river downstream of Lake Griffin is on the 2009 Verified List for impairment due to high nutrient (Chlorophyll-a) concentrations, violations of the dissolved oxygen criterion, and mercury (fish consumption advisory). Haynes Creek Reach is on the 2013 Verified List for impairment due to high nutrient (Chlorophyll-a) concentrations.

In 2003, FDEP adopted a total maximum daily load (TMDL) for Lake Griffin. This target was based on pollution load reduction goals (PLRG) developed by the District. The proposed target is 0.032 mg/L for total phosphorus (TP) (Fulton 2004). Historically, discharges from the Emeralda muck farm areas were a major source of TP for Lake Griffin. The conservation area is now managed to limit TP discharges to the Lake.

The Ocklawaha River Basin Management Action Plan (BMAP) Phase 2 was adopted by FDEP in July 2014. This BMAP is focused on action plans and projected to reduce nutrient loadings to the Upper Ocklawaha River Basin water bodies with adopted TMDLs, including Lake Apopka, Lake Beauclair, Lake Carlton, Lake Dora, Lake Harris, Lake Eustis, Lake Yale, Trout Lake, and the Palatkaha River (FDEP 2014).

Minimum flows and levels (MFLs) are adopted to prevent harm to the water resources or ecological systems of an area as a result of permitted water withdrawals. MFLs define the frequency and duration at which high, intermediate, and low water flows and levels should occur

to prevent significant harm to water and ecological resources from water withdrawals. The MFLs are scheduled to be set for Lake Griffin in 2016.

In 1987, the Surface Water Improvement Act was created by the Florida Legislature to protect, restore, and maintain Florida's highly threatened surface water bodies. Under this act, the District has identified a list of priority water bodies for which Surface Water Improvement and Management Plans (SWIM) were adopted. These plans provide provisions for the improvement and management of degraded surface waters, in coordination with state agencies, local governments, and other stakeholders. The most recent SWIM plan for the Upper Ocklawaha Basin, adopted in 1995, addresses a range of surface water management issues including excessive nutrient levels, potentially hazardous levels of metals and organic pollutants, and loss of wetland and other fish and wildlife habitats (Fulton 1995).

Lake Griffin State Recreation Area is designated by FDEP under rule 62.302.700 as an Outstanding Florida Water.

Currently, the District has designated the entire District a Water Resource Caution Area (Chapter 62-40, F.A.C.). In making this designation, it has been determined that all parts of the District have been subject to declarations of water shortages recently.

Soil

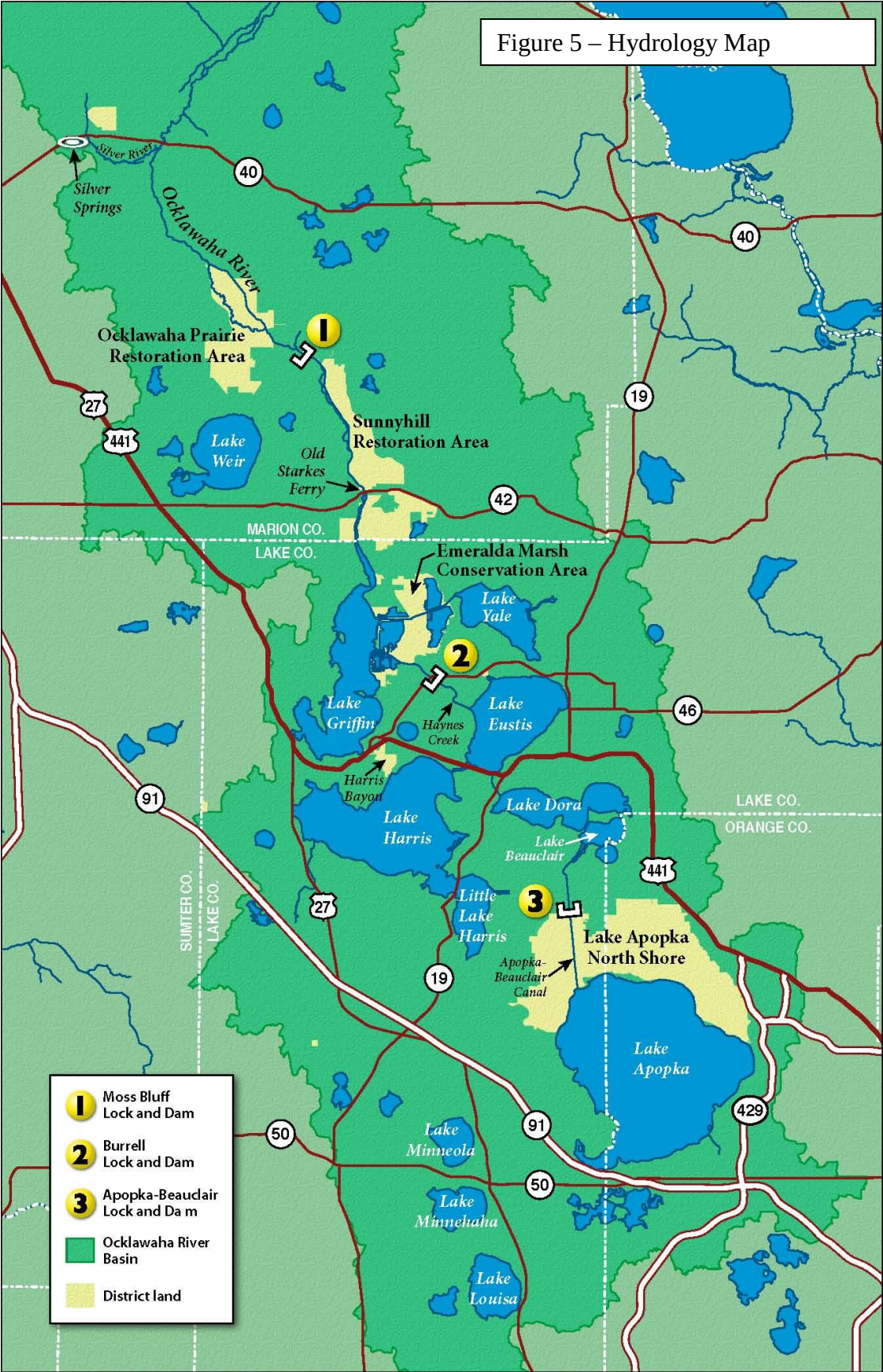
The soils within the Emeraldal Marsh Conservation Area include hydric, partially hydric and non hydric conditions, as well as areas of open water. Hydric soils are soils that "formed under saturated conditions during the growing season and for a duration sufficient enough to develop anaerobic conditions in the upper parts of the soil" (NRCS, 2013). Within the property, hydric soils account for 69% of the land area (Figure 6). According to data produced by the United States Department of Agriculture, Natural Resources Conservation Services (NRCS), 21 unique soil series types are present within the property. Addendum 1 includes a detailed map of the various soil series present within the Emeraldal Marsh Conservation Area and includes associated series descriptions.

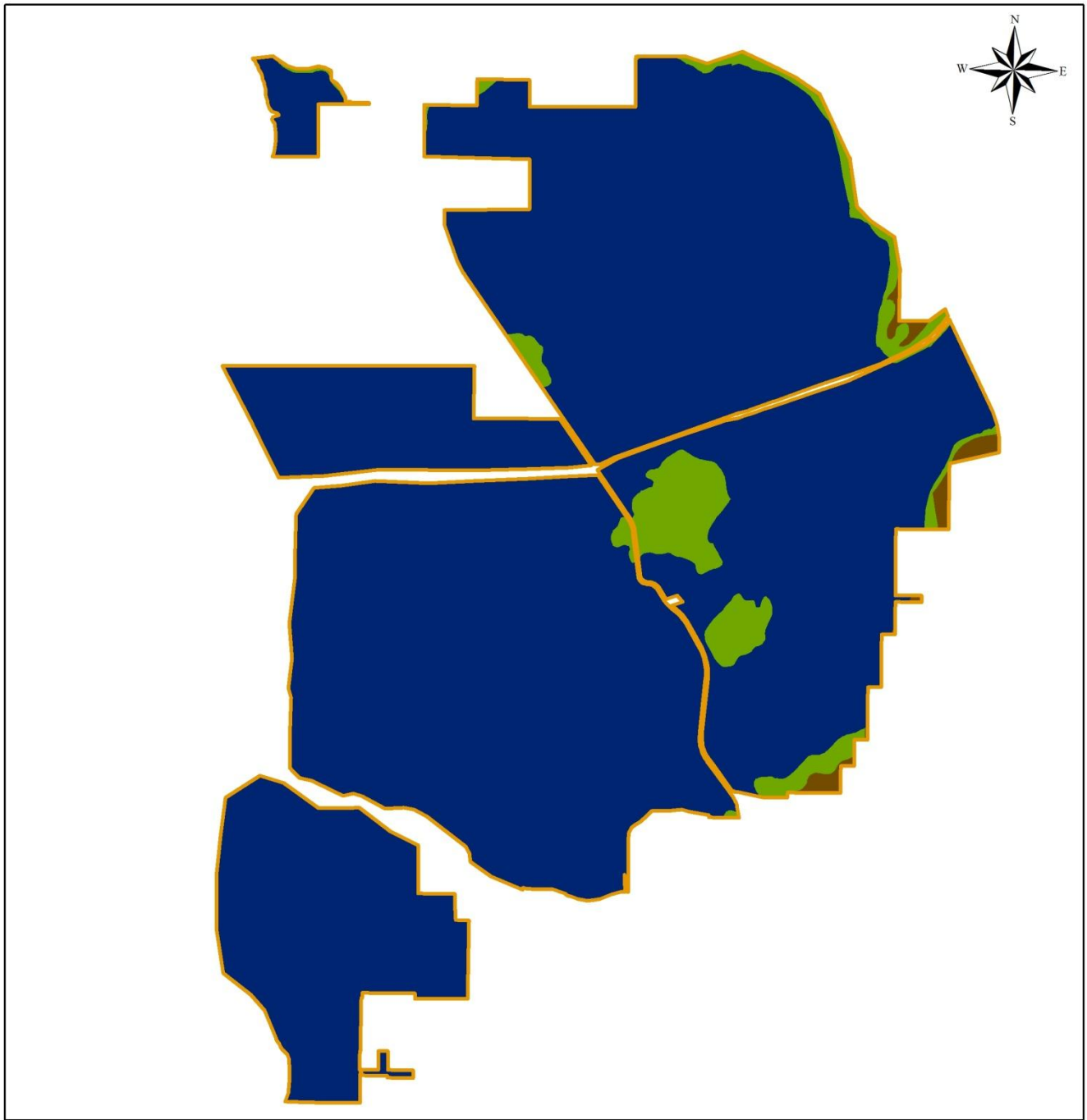
Natural Communities

Past agricultural land use activities and associated changes in hydrology within the property and surrounding areas have resulted in alterations to the natural communities within the Emeraldal Marsh Conservation Area.

The 6,577 acres that comprise the Emeraldal Marsh Conservation Area consist primarily of floodplain marsh and includes a diverse array of other natural communities (Figure 7). Table 2 details the percent coverage associated with each natural community documented within the property.) Figure 7a depicts locations of restoration plantings within the Conservation Area and Figure 7b details the funding source for those plantings. Information relative to the natural communities within the Emeraldal Marsh Conservation Area is derived from several sources including personal observations of District staff and contracted interpretation of true-color and infrared aerial imagery.

Figure 5 – Hydrology Map





Emeralda Marsh Conservation Area

Figure 6 - Hydric Soils Map



1 Miles

Conservation Area

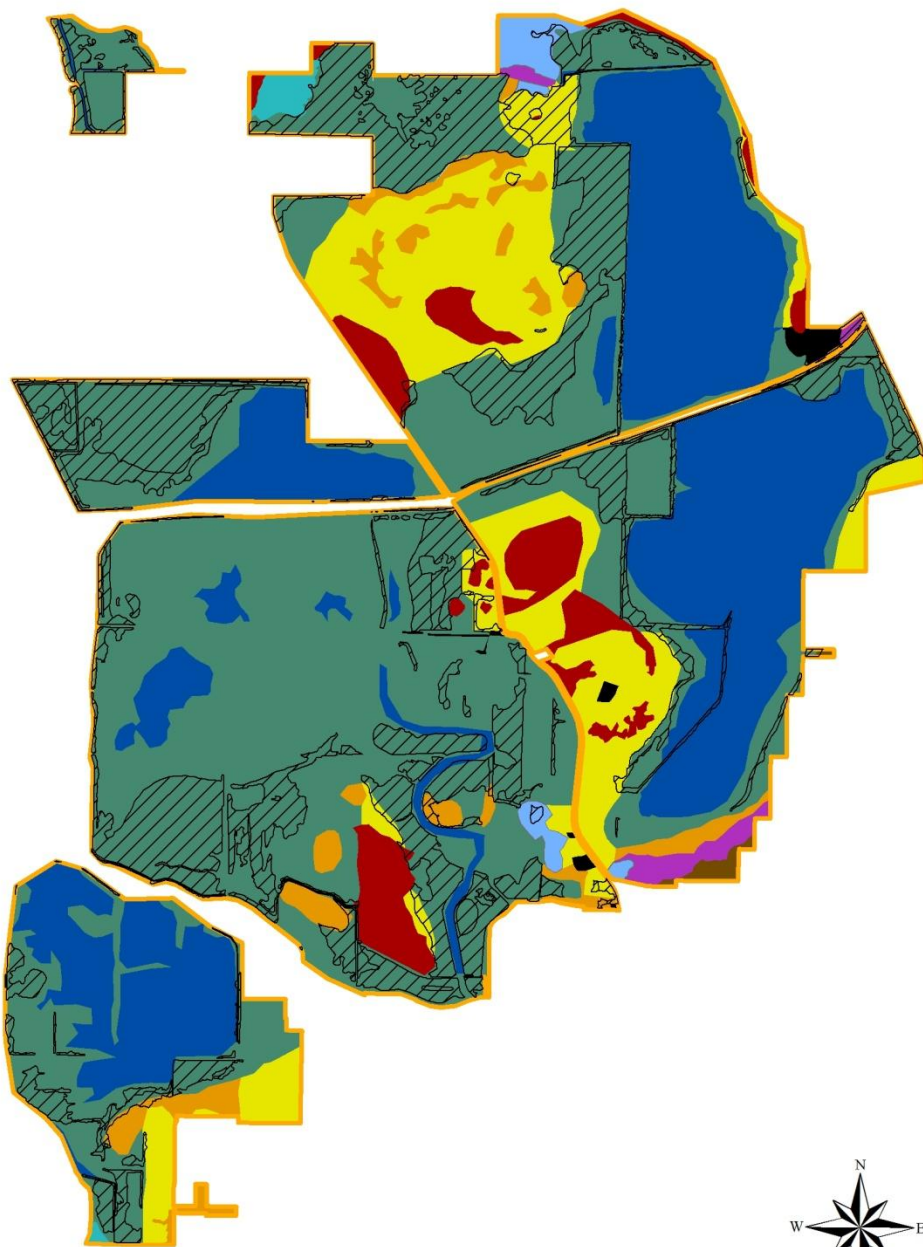
Hydric Soils

- All hydric
- Not hydric
- Partially hydric

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Natural Community Type

-  Xeric Hammock
-  Mesic Flatwoods
-  Wet Flatwoods
-  Developed
-  Floodplain Marsh
-  Floodplain Swamp
-  Hydric Hammock
-  Open Water
-  Pasture - Abandoned
-  Upland Hardwood Forest



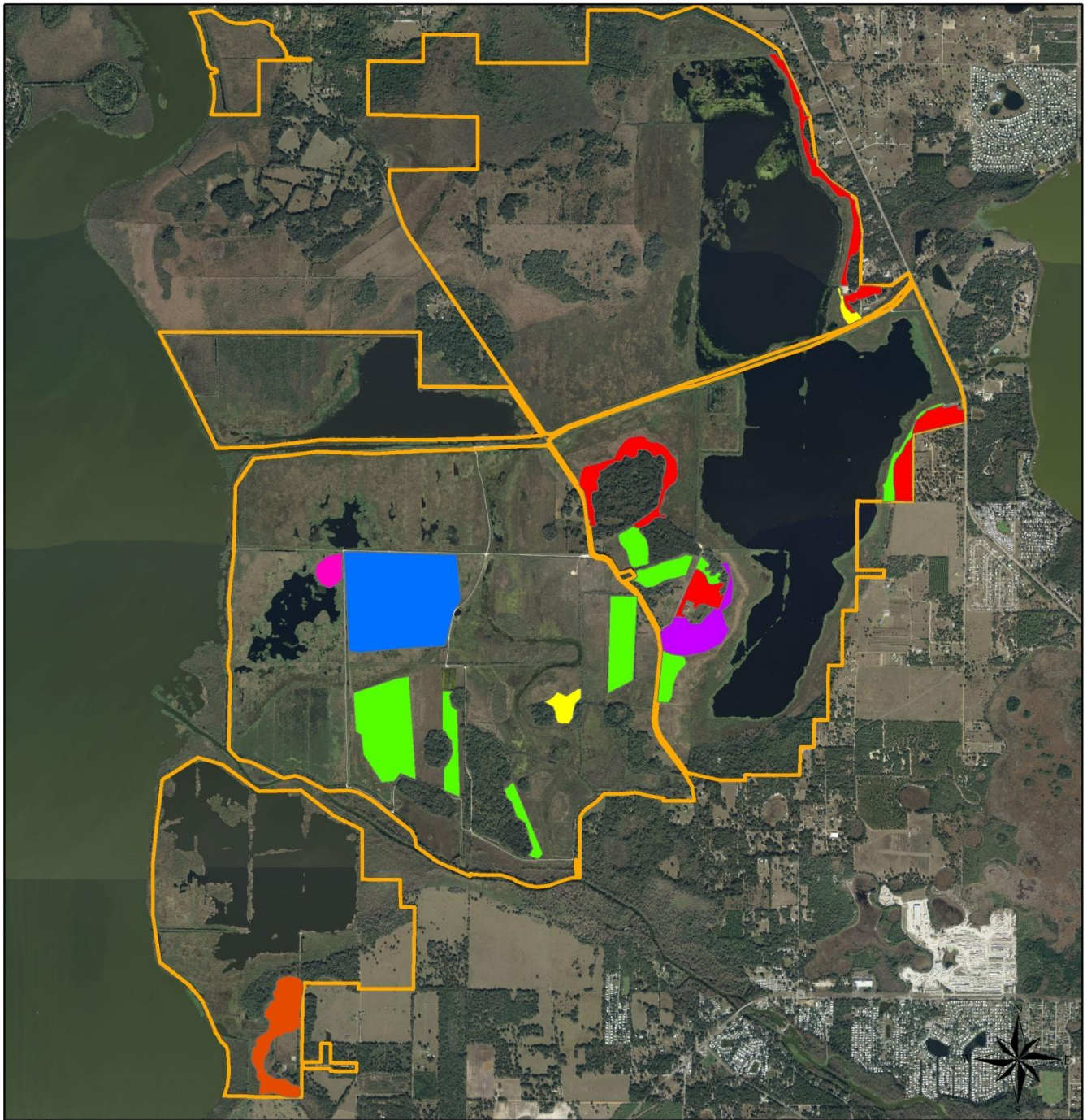
Emeraldal Marsh Conservation Area **Figure 7 - Natural Community Map**



0.5
Miles

-  Boundary
-  Shrub Encroachment

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Emeralda Marsh Conservation Area
Figure 7a - Restoration Plantings Map



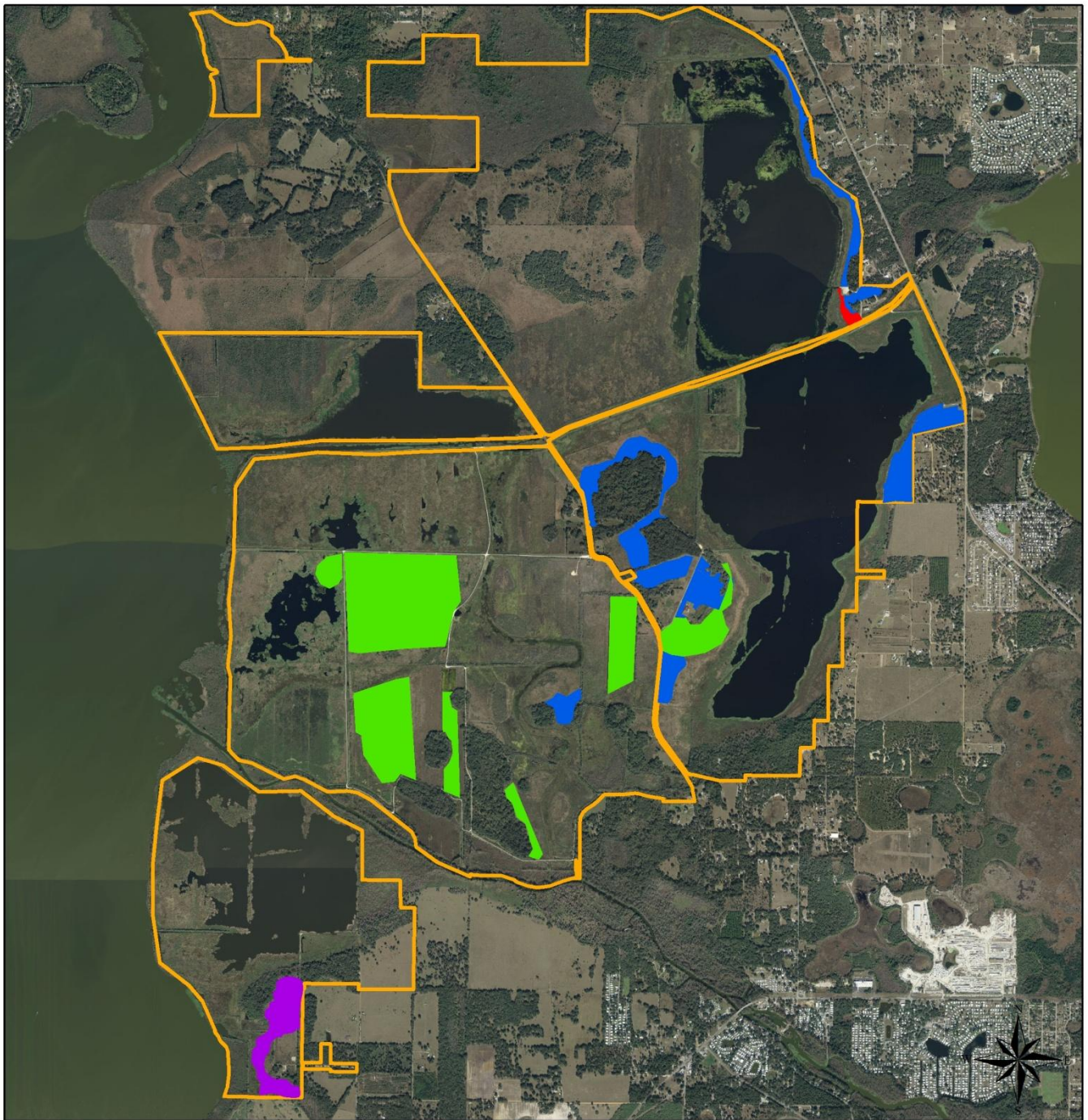
0.5

Miles

Restoration Plantings

-  Mixed Upland Plantings
-  Bald Cypress
-  Mixed Wetland Trees
-  Longleaf Pine
-  Submerged Aquatic Vegetation
-  Sand Cordgrass
-  Spatterdock

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Emeralda Marsh Conservation Area
Figure 7b - Plantings By Funding Source Map



0.5
 Miles

Funding Source

- District
- FDOT
- FDOT-FWC
- FNPS

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Additionally, 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*. Natural community and species ranking definitions are listed in Addendum 2.

Table 2 – Natural Community Coverages

Natural Community Type	Acreage*	Percent Coverage	FNAI Ranking	FNAI Fire Return Interval*
Mesic Flatwoods	45	<1%	G4/S4	2-4 years
Wet Flatwoods	62	<1%	G4/S4	1-3 years in grass dominated systems; 5-7 years in shrubbier systems
Hydric Hammock	205	3%	G4/S4	Rare; depending on size and adjacent community types
Xeric Hammock	16	<1%	G3/S3	Site Specific
Floodplain Marsh	3,424**	52%	G3/S3	1-3 years in areas of pyric plants. Floating and shrub vegetation will require chemical and mechanical treatments.
Floodplain Swamp	28	<1%	G4/S4	This is not a fire adapted community
Upland Hardwood Forest	279	4%	G5/S3	Rare; fires from adjacent pyric communities may burn edges
Open Water	1,690	26%	-----	-----
Subtotal	5,749	-----	-----	-----
Altered Land Types		Percent Coverage		Fire Return Interval
Abandoned Field/Abandoned Pasture	803	12%	-----	1-3 years or in conjunction with adjacent pyric plant communities
Developed/Parking Area	25	<1%	-----	-----
Subtotal	828	-----	-----	-----
Total	6,577	-----	-----	-----

*GIS Acres

**Due to planned reconnection activities within Area 3, a portion of the acres below the 58' contour that are currently identified as floodplain marsh will be inundated and the natural community type will likely transition to an open water type.

Mesic Flatwoods (45 acres)

Soils that support mesic flatwoods communities are generally poorly drained, acidic, and sandy soils deposited on ancient, shallow seabeds. Many flatwoods communities have a clay or organic hardpan. Hardpan soils saturate during the rainy season causing the accumulation of surface water. These soils are often droughty during dry periods. The presence of the hardpan translates to extreme seasonal fluctuations in the amount of water available to support plant life. These seasonal hydroperiods are essential in the maintenance of the flatwoods system.

Intact mesic flatwoods typically have a layered appearance, with a distinct, high, discontinuous canopy, low shrub layer, and diverse herbaceous layer. The canopy densities are variable and may include (depending on location) longleaf pine (*Pinus palustris*), slash pine (*P. elliottii*), loblolly pine (*P. taeda*), or pond pine (*P. serotina*). The shrub layer may include a mixture of species or be dominated by species such as saw palmetto (*Serenoa repens*), wax myrtle (*Myrica cerifera*), and numerous Ericaceous plants. The herbaceous coverage may be dominated by wiregrass, however species abundance and diversity is often dictated by the openness of both shrub and canopy layers.

Fire is an important physical factor associated with the shaping and maintenance of this community type. The District targets natural fire frequency intervals of approximately every two to four years within the mesic flatwoods, which is consistent with the FNAI 2010 description. Fires in well-maintained mesic flatwoods tend to burn quickly and at relatively low temperatures. Areas of prolonged fire exclusion, altered hydrology, or hardwood encroachment typically have higher soil and fuel moistures and may require more extreme conditions to facilitate a fire.

Wet Flatwoods (62 acres)

Soils that support wet flatwoods communities are generally very poorly drained sandy soils that may have a mucky texture in upper horizons. Wet flatwoods occur as ecotonal areas between the drier mesic flatwoods and wetland areas. They may also occur in broad, low flatlands embedded within these communities.

Well-maintained wet flatwoods exhibit a relatively open-canopy forest of scattered pine trees (longleaf, loblolly, slash, or pond) or cabbage palms (*Sabal palmetto*) with either a thick shrubby understory and sparse groundcover or sparse understory with dense groundcover. Understory species of the subcanopy and shrub layers may include sweetbay (*Magnolia virginiana*), loblolly bay (*Gordonia lasianthus*), and saw palmetto and other shrubs. The groundcover layer may include species such as wiregrass, blue maidencane (*Amphicarpum muhlenbergianum*), and numerous hydrophytic species. The variations in structure and composition may be attributed to subtle edaphic differences as well as differences in hydrologic and fire regimes.

The wet flatwoods plant community is fire dependent and the District targets return intervals ranging from one to three years, which is consistent with FNAI 2010 descriptions.

Hydric Hammock (205 acres)

Soils that support hydric hammock communities are generally poorly drained and may be acidic to slightly alkaline, with little organic matter. While hydric hammocks may often have limestone at or near the surface, no outcropping is known to occur within Emeraldal Marsh Conservation

Area. Hydric hammocks are well-developed hardwood and/or palm forests with a variable understory. The closed canopy may include a variety of species, such as cabbage palm (*Sabal palmetto*), live oak (*Quercus virginiana*), water oak (*Q. nigra*), swamp tupelo (*Nyssa sylvatica* var. *biflora*), red cedar (*Juniperus virginiana*), and loblolly pine (*Pinus taeda*), all of which are present within the property.

The hydric hammock communities are scattered across the property and are generally located in areas of slightly higher elevations than the surrounding floodplain marsh or are associated with areas of abandoned pasture. Fire is not a primary mechanism of disturbance; however, these communities do occasionally burn in conjunction with surrounding pyric plant communities.

Floodplain Marsh (3,424 acres)

Floodplain marshes occur within river floodplains, often extending from just below the headwaters to the tidally influenced portions of river mouths. Soils are often sand with some organics over sand and may be saturated throughout the year. The maintenance of these systems is directly influenced by flooding. The relatively flat topography and subsequent slow drainage results in extended hydroperiods, with most areas inundated for between 120-350 days each year.

Floodplain marsh communities are typically herbaceous communities that may include vegetational changes into woody or shrub species that coincide with transitions from high to low marsh. Fire is another important factor in the shaping and maintenance of the floodplain marsh systems. Frequent fires limit shrub invasion while the characteristic sand cordgrass re-sprouts readily post-fire.

The floodplain marsh areas within the Emerald Marsh Conservation Area are disturbed, with many areas lacking sufficient coverages of pyrophytic grasses to carry fire. As a result, many areas include heavy coverages of shrubs such as Carolina willow and other undesirable woody vegetation.

Floodplain Swamp (28 acres)

Floodplain swamp communities typically occur on flooded soils along stream channels and within floodplains.

Soils that support floodplain swamp communities are variable, but may include a mixture of sand, organic, and alluvial material. The most important physical factor associated with the shaping and maintenance of the floodplain swamp is the hydroperiod. Extended periods of inundation, which may last for most of the year, are common in the floodplain swamp environment. Since this community type is maintained by hydrologic regimes, it is not fire dependent; however, fires may occur during times of drought.

Due to planned reconnection activities within Area 3, a portion of the acres below the 58' contour that are currently identified as floodplain marsh will be inundated and the natural community type will likely transition to an open water type.

Xeric Hammock (16 acres)

Xeric hammock is characterized as an evergreen forest with a low canopy and little understory plants other than palmetto, or a multi-storied forest of tall trees with an open or closed canopy. Several gradations between these extremes may occur.

The xeric hammock natural community is typically an advanced successional stage of scrub or sandhill. It is a climax community, having been protected from fire for 30 or more years. When fire does occur in the xeric hammock, it is under extreme conditions, burns catastrophically and it may revert the community back to an earlier successional stage.

Upland Hardwood Forest (279 acres)

Upland hardwood forests are characterized as well-developed, closed-canopy forests dominated by deciduous hardwood trees. The soils that support these communities are typically sandy clays with substantial organic matter. These areas may also have limestone or phosphatic rock near the surface and the soils may also have calcareous components.

Light gap succession is the primary natural process required for the maintenance of upland hardwood forests. This occurs when an emergent tree falls causing an opening in the canopy and allowing direct sunlight to reach the forest floor. While localized damage from fires that creep in from adjacent pyric plant communities may occur along the edges of the upland hardwood forest, fires rarely burn completely through the system.

Altered Land Types (828 acres)

Emeralda Marsh Conservation Area includes altered land types as described by FNAI. These land types include abandoned field/abandoned pasture and developed/parking area

Open Water

The Emeralda Marsh Conservation Area includes broad areas of open water of varying depths. Present in these areas of open water are mats of floating vegetation. While some coverage of floating vegetation is desirable, large mats, which are often moved by wind, can create problems with management and access.

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PAST MANAGEMENT SUMMARY

This section describes the management strategies outlined in 2009 and provides the status for each item. The summaries are consistent with the previous plan's implementation schedule.

Water Resources 2009 Plan Strategy

Status

Reduce nutrient loading to Lake Griffin	A comparison of total phosphorus loading between 2010-2014 and 1994-1998 indicates greater than 99% reduction in total phosphorus discharges from the conservation area to Lake Griffin.
Establish diverse habitat	Several wetland plantings have been implemented by District staff in an effort to establish more diverse habitat conditions.
Purchase land to provide additional flood storage in the basin	In 2011 the District acquired the 83-acre Lewis property.
Implement the Emerald Marsh Long Term Restoration Plan as a means for restoration of the property	Reconnection of Area 3 to Lake Griffin is scheduled to be completed during FY 2016-2017.

Wetland Restoration 2009 Plan Strategy

Status

Install two bridges on the levees	Bridges were installed.
Consider a new wildlife viewing platform on new Wildlife Drive route	The platform was removed. Since the Wildlife Drive has not been rerouted, no new wildlife-viewing platform has been installed.
Relocate security residence to Area 5	The security residence was relocated from Area 3 to Area 5 to facilitate flooding associated with utilizing portions of Area 3 as a treatment pond for water received from Area 5.
Provide access to the Area 7 Lake through eventual connection of Area 7 and Long Pond	Since a consumption advisory for fish from Area 7 was set by DOH, plans to provide public access to Area 7 are moving forward. Access; however, will be via roads and not through reconnection to any other areas of the Yale-Griffin canal.

Upland Restoration 2009 Plan Strategy

Status

Finalize and Implement EMCA Upland Restoration Plan	This was complete and outstanding projects incorporated into this plan.
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Fire Management 2009 Plan Strategy

Status

Follow the Comprehensive Fire Management Plan	District staff applies prescribed fire in a manner consistent with the property's most current fire management plan.
Implement the annual prescribed fire management plan.	Since the writing of the previous plan, District staff have applied prescribed fire to 2,034 acres within the conservation area.

Flora and Fauna 2009 Plan Strategy	Status
Continue to manage the property as part of the public Small Game Hunt Area	Public hunting opportunities are available and administered through FWC.
Continue to manage habitat for the benefit of wildlife	District staff manage the property for the betterment of natural communities.

Exotic Species 2009 Plan Strategy	Status
Monitor and continue to treat exotic invasive vegetation.	District staff monitor and treat for exotic and invasive vegetation as needed.
Continue to utilize USDA and other agents to remove feral hogs from the property.	Since the writing of the last plan, 453 feral hogs have been removed from the property. The District continues to implement feral hog control measures.

Cultural Resources 2009 Plan Strategy	Status
Identify and report any new sites to Florida Division of Historical Resources.	New sites are documented and reported as identified. No new sites were identified during the scope of the previous plan.

Access 2009 Plan Strategy	Status
Continue to maintain access points	Access points to the property are maintained as needed.
Relocate route of interpretive drive at the time the marsh is reconnected to Lake Griffin	Completion of this task is anticipated during the scope of this plan, likely within FY 16/17.
Install bridges on wildlife drive in preparation for marsh reconnection to Lake Griffin	Bridge installation was completed in January 2010.
Improve road through Area 6	Road improvements within Area 6 were accomplished and included pulling ditches and recrowning the road surface.
Improve road within Area 4	In response to chronic illegal activity within Area 4, this area is open only to boats.

Recreation and Outreach 2009 Plan Strategy	Status
Develop trail guides as needed: update Wildlife Drive trail guide once drive is rerouted	Trail guides are updated as routes are changed or infrastructure is added or removed.
Consider new location of wildlife viewing platform once wildlife Drive is rerouted	The wildlife drive has not yet been rerouted.
Maintain recreational parking areas	Recreational parking areas are regularly maintained. District staff coordinate with law enforcement to address continuing illegal activity within parking areas and on recreational trails.
Maintain agreement with FWC designating EMCA a Public Small Game Hunting Area and coordinate with FWC for updates on hunting regulations	The agreement with FWC designating EMCA for public hunting opportunities is maintained. District staff coordinate with FWC as needed.

Remove the carrot barn in Area 5	The carrot barn was not removed. This task is assigned for implementation during the scope of this plan.
Work with Florida Department of Public Health to determine whether Area 7 is safe to open to the public and what fishing regulations should be implemented.	District staff continue to work with the Florida Department of Public Health. As of October 2015, the District has received a consumption advisory for most (8) common game fish species in Area 7. However, the consumption advisory is more conservative than the one for Lake Griffin. Consequently, the District is looking into providing public access to Area 7 but will not be reconnecting the area to Lake Griffin or any of the other areas where it is currently not connected. Reanalysis of fish tissues may occur in 2021 to update the consumption advisory and determine whether Area 7 can be reconnected to Lake Griffin.

Acquisition 2009 Plan Strategy

Status

Continue to pursue those parcels that will aid in the conservation of the Ocklawaha River basin	The District works to identify potential acquisitions that will aid in the conservation of the Ocklawaha River basin and the Emerald Marsh Conservation Area.
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Security 2009 Plan Strategy

Status

Maintain signage, fences, gates and boundary	District staff perform regular maintenance on signage, fences, gates, and boundaries.
Maintain security residence on site and move resident to new home site once construction is completed in 2009	The security residence was relocated from Area 3 to Area 5.
Continue coordinating with local law enforcement and contracted security	District staff coordinate with local law enforcement and onsite security resident to address security concerns within the property.
Coordinate with FWC to establish and enforce Public Small Game Hunt Area rules	District staff coordinate with FWC regarding public hunting opportunities.

Cooperative Agreements, Leases, Easements, and SUAs 2009 Plan Strategy

Status

Monitor agreements and evaluate as they come up for renewal	District staff monitor and maintain existing agreements and evaluate new agreements as they are requested or necessary.
Monitor leases, special use authorizations, and easement agreements and evaluate as they come up for renewal	District staff monitor and maintain existing agreements and evaluate new agreements as they are requested or necessary.
Consider entering into a cattle lease on Area 4	Though a cattle lease has not been developed on Area 4, District staff continue to consider this as a management strategy.

IMPLEMENTATION

The following sections outline land management strategies for resource protection, land use, and administration on the Emeralda Marsh Conservation Area for the next ten years. For planning and discussion, The Emeralda Marsh Conservation Area is divided into two hydrologic basins and is further divided into seven sub-basins or “Areas”. See Figure 8 for location of Areas.

RESOURCE PROTECTION, RESTORATION, AND MANAGEMENT

Special Management Considerations

Residual Pesticides

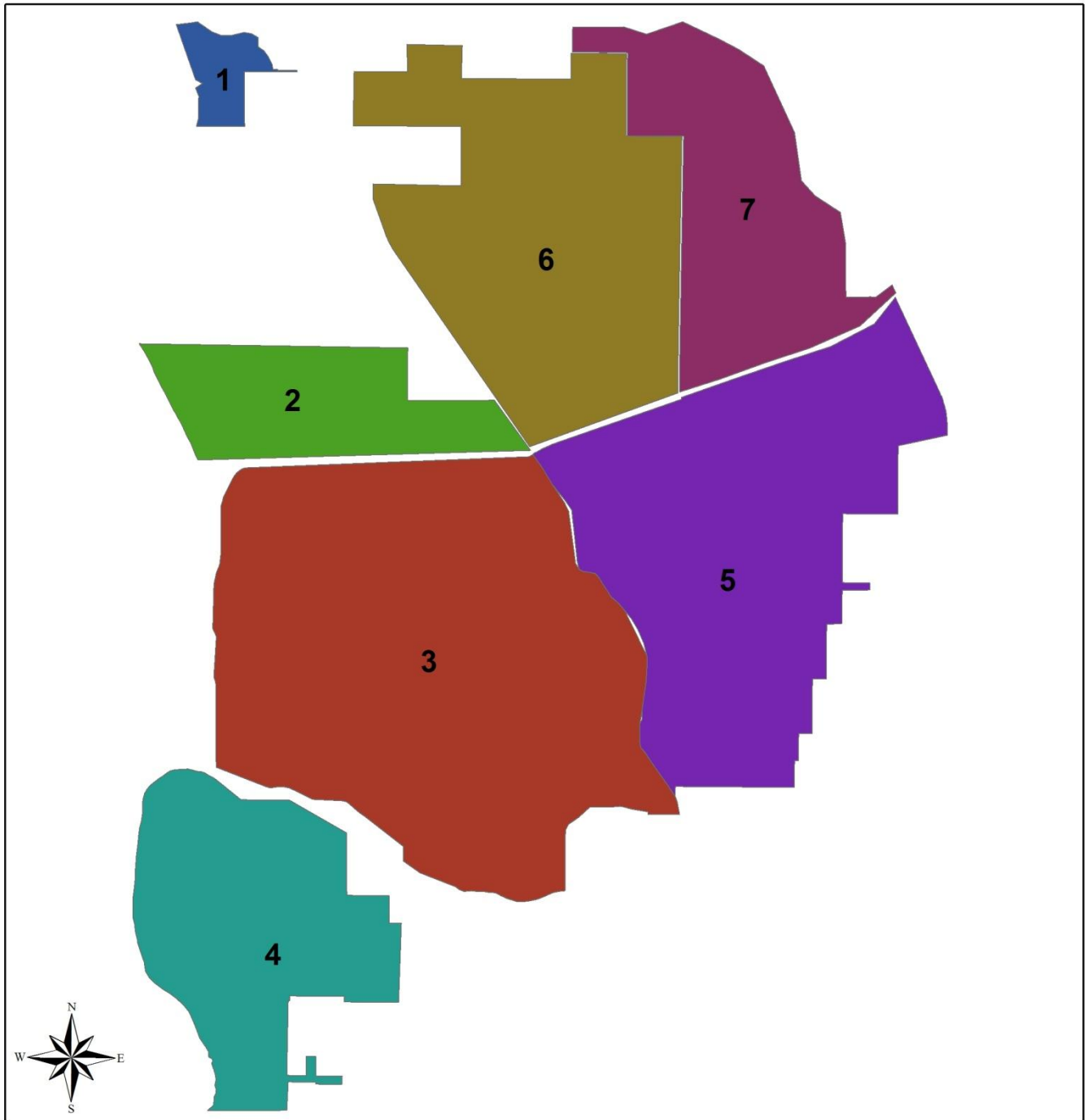
The Eustis Muck Farm (Area 7), which is currently closed to the public, was used as a spoil deposition site for the Lake Griffin dredging navigation project from 2005 through June 2008. Dredge material was deposited in specific areas within Area 7 where pesticide levels in the soil were of concern. Subsequent testing of fish from this area has shown a significant lowering of tissue pesticide levels as contaminated soils were buried by cleaner lake sediments. In 2015, eight species of common game fish were collected from Area 7 and analyzed for pesticide levels. All results showed pesticide levels that were below levels necessary for wildlife protection. These results were then sent to the Florida Department of Health (DOH) with a request for a human consumption advisory. DOH issued a consumption advisory for largemouth bass (*Micropterus salmoides*), redear sunfish (*Lepomis microlophus*), warmouth (*Lepomis gulosus*), bluegill (*Lepomis macrochirus*), golden shiner (*Notemigonus crysoleucas*), brown bullhead (*Ameiurus nebulosus*), black crappie (*Pomoxis nigromaculatus*), and blue tilapia (*Tilapia aurea*). Other fish species did not occur in enough abundance for an advisory to be issued. Because the consumption advisories for Area 7 are more stringent than those for Lake Griffin, there are no plans to reconnect the two areas in the near future. However, pesticide levels in fish from Area 7 will be re-evaluated in 5-7 years to determine if reconnection is possible at that time. The Florida Department of Health has issued a consumption advisory for fish in Area 7 and the District is evaluating access options for the site. Should Area 7 be opened for fishing, the Florida Fish and Wildlife Conservation Commission will assume the lead in establishing fishing guidelines for this area.

Special Management Areas

FDOT contributed funds to offset multiple road improvement projects that were permitted through the District and the US Army Corps of Engineers. The District’s FDOT Mitigation Program, as directed by section 373.4137 Florida Statutes, utilized the FDOT funds to provide mitigation that met both state and federal regulatory requirements. Funds utilized for preservation, restoration, and enhancement at Emeralda Marsh Conservation Area contributed to 8.8 percent of the restoration project (~6,550 acres at the time of project implementation), providing up to 576.46 acres of potential mitigation. Projects implemented in part or in full using FDOT Mitigation Program funds included degrading and breaching levees, alum treatments, wetland plantings, and acquisition (See Figures 7a and 7b).

Water Resource Protection, Restoration, and Management

While some measure of water resource protection was accomplished through acquisition of the parcels within the Emeralda Marsh Conservation Area, the majority of the wetlands and surface waters within the property are disturbed. Hydrologic disturbances are largely attributed to past agricultural land uses and currently include roads, low water crossings, levees, ditches, canals,



Emeralda Marsh Conservation Area
Figure 8 - Area Location Map



0.75
 Miles

Area Number

-  Area - 1
-  Area - 2
-  Area - 3

-  Area - 4
-  Area - 5
-  Area - 6
-  Area - 7

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.

culverts, and bridges. For management purposes and for the descriptions of activities provided within this section of the plan, the Emeraldal Marsh Conservation Area has been divided into 7 Areas.

Roads and associated ditches occur and are maintained within the conservation area, providing access for management and recreation. The District continues to make improvements to roads within the property, helping to reduce the potential for erosion. Canals, some remnant of the former farms, run throughout the property providing for the opportunity to actively manage water within the property. Additionally, pumps and other infrastructure are regularly inspected and maintained. Figure 9 depicts the location of pumps and other infrastructure within the property.

Lake Griffin, one of nine lakes that make of the Ocklawaha Chain of Lakes receives water from rainfall and flows from upstream lakes through the Burrell Lock and Dam on Haynes Creek. Water levels in Lake Griffin are also controlled via a downstream dam, Moss Bluff, on the Ocklawaha River. For decades prior to public acquisition, Lake Griffin was highly polluted by phosphorus-laden discharges from nearby farmland, local wastewater and industrial pollutants, and from upstream lakes.

Restoration of Emeraldal Marsh to a functional marsh system is ongoing and management and maintenance is anticipated to be perpetual. Efforts to restore water quality within Lake Griffin have been extensive and range from land acquisition, eliminating sewage and reducing stormwater discharges, reconnection projects, native wetland plantings, gizzard shad harvesting, and similar projects in upstream lakes. These efforts are implemented, in part, under SWIM, which was passed by the state legislature in 1987. The SWIM act provided authorization to all water management districts to develop surface water improvement and management plans for identified priority water bodies, which includes the Ocklawaha Chain-of-Lakes, including Lake Griffin.

Area 3 Reconnection

In continuing implementation of long-term restoration plans for the Emeraldal Marsh Conservation Area, the District in coordination with FWC plans to reconnect most of Area 3 with Lake Griffin. An eastern parcel, K Cell, was reconnected to Haines Creek in January 2010. Design and permitting for this project was completed in 2015 and early 2016 by District staff. It is anticipated that vegetation management activities will precede construction activities and will be conducted by District and FWC staff. The reconnection effort will occur in phases (below). Funding for work associated with Phase I and II (Figure 9a) will be accomplished via cost reimbursements through the FWC Aquatic Habitat Restoration/Enhancement program.

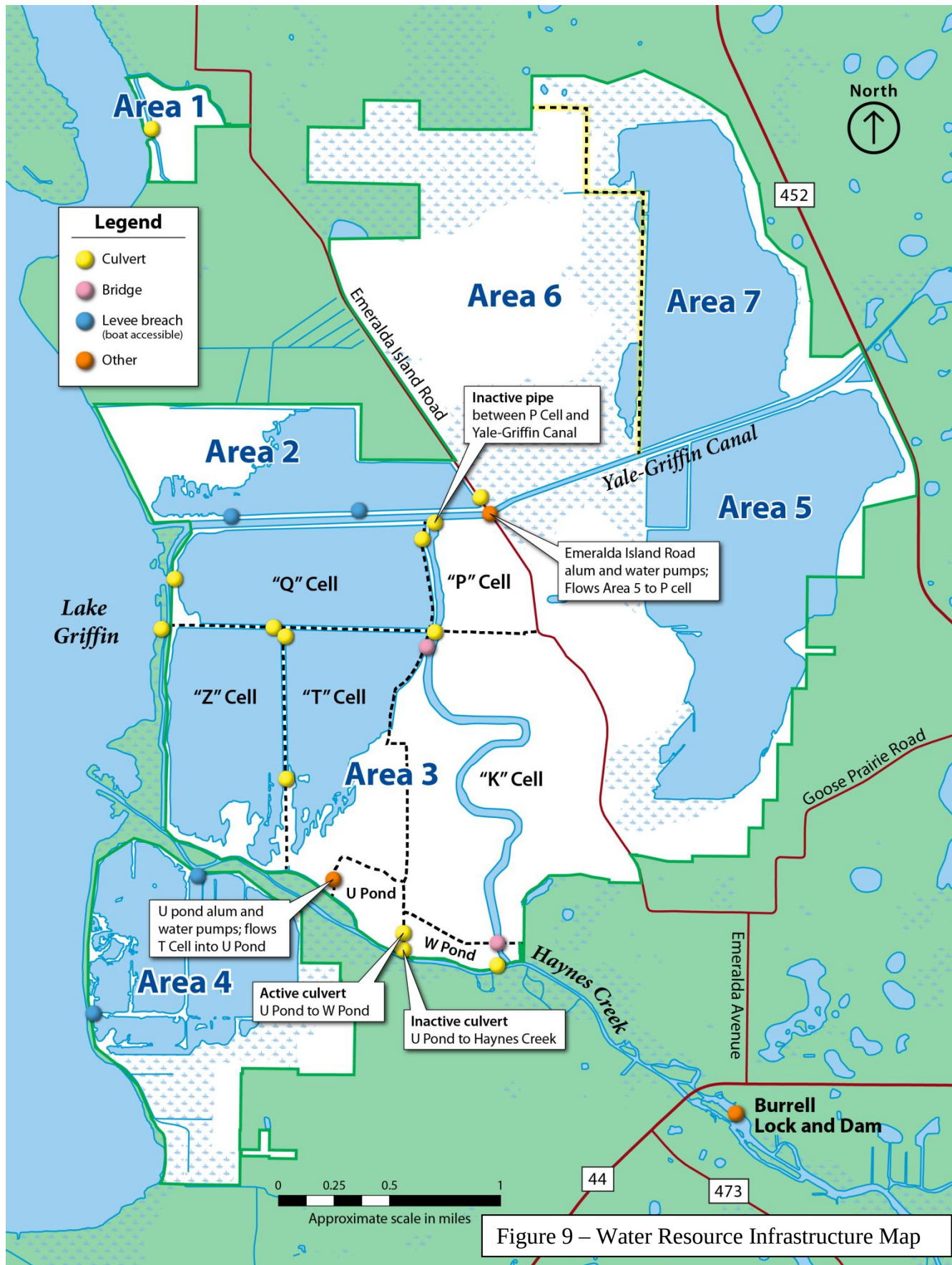


Figure 9 – Water Resource Infrastructure Map

Phase I – Internal Levee Breaches and Earthwork

Phase I will include internal levee and road removal projects. Project plans include the scraping and removal of all lime rock material from the levee along the south side of the Q cell and the levee between cells Z and T. A single 200-foot breach will be constructed in the southern levee of the Q cell near the southeastern corner. Three 200-foot breaches will be created at the junction of the Q/T/Z cells. Fill material from the breach areas will be added to portions of the remaining sections of the T/Z levee to increase elevations to 58.5 (NAVD 88), creating mounds which will be planted with size appropriate wetland trees. A portion of the Q cell levee at the junction of cells K/P/Q/T will be retained as a site for a future development of boating access and infrastructure.

Additionally, existing primitive boat ramps along the Q cell levee will be pushed into the canal and any remaining material will be recycled into other parts of the reconnection project. Water level increases and road surface changes associated with this project will result in the need to relocate the current wildlife drive to an existing alternate route.

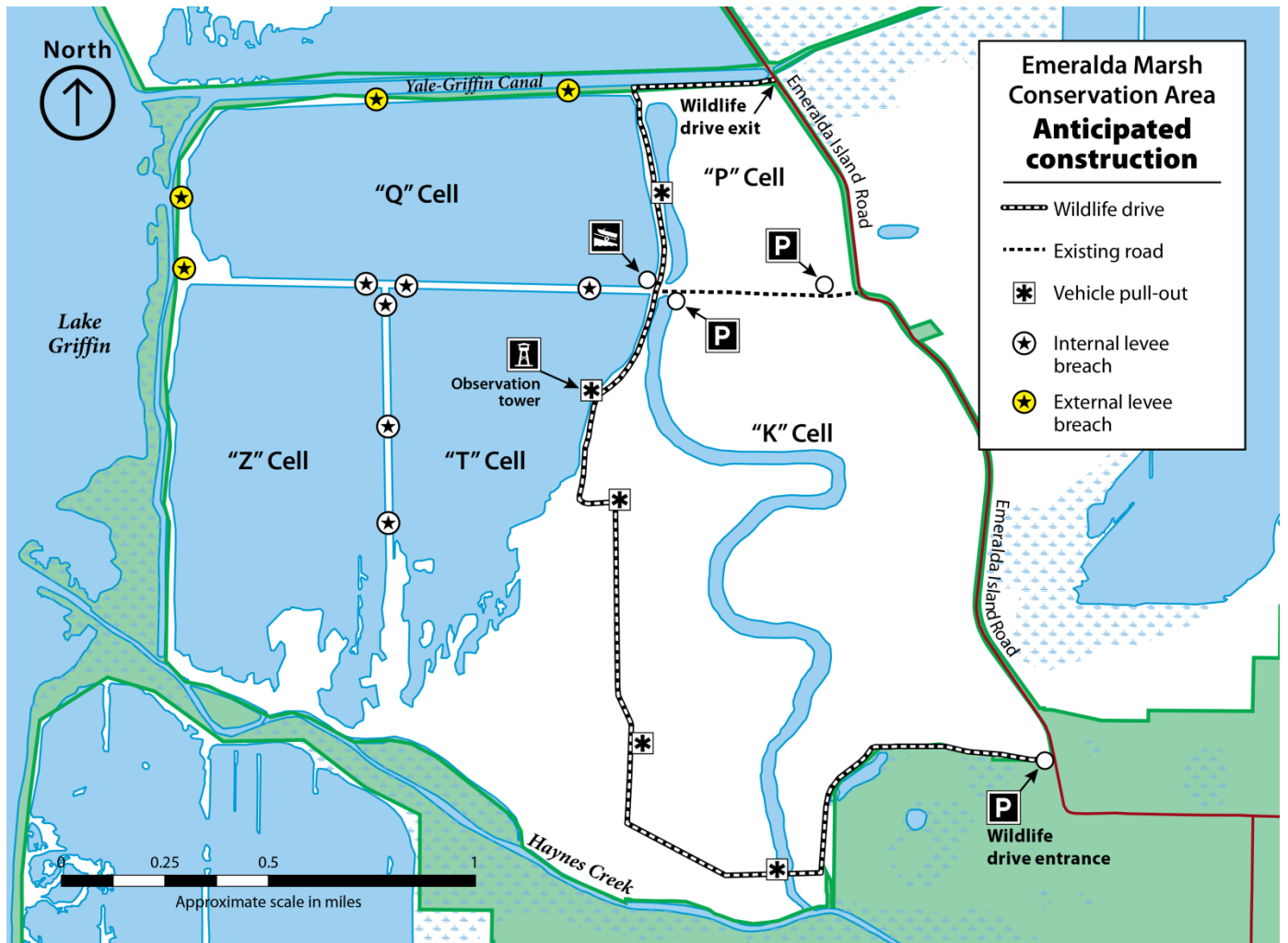
Unused material from the levee scraping and breaches will be recycled to provide surface fill on improved boat launch and parking areas. Implementation of work associated with Phase I of the Area 3 reconnection is expected to be completed by June 2016.

Phase II – External Levee Breaches and Earthwork

Upon completion of Phase I of the reconnection project, the external levee will be breached in four locations. Two 200-foot breaches will be constructed on the west side of Q cell adjacent to Lake Griffin and two additional breaches (200 feet and 600 feet) will be constructed on the north side of Q cell, opening into the Yale-Griffin Canal. Using material from these breaches, staging and parking areas in Area 3 will be constructed. Finally, the earthen plug at the northwest corner of the K cell, separating the K and T cells will be removed. Concurrent with levee breaching, infrastructure, including the U-1 pump, alum storage and delivery system, culverts, and platforms will be removed. Implementation of work associated with Phase II of the Area 3 reconnection is expected to be completed by June 2017, if water levels allow.

Phase III – Access, Boating, and Parking Area Improvements

As part of the Area 3 reconnection project, boating access improvements are proposed. The District will seek grant funding through FWC Florida Boating Improvement Program to help facilitate these improvements. Implementation of these improvements is subject to grant approval and to District staff and budgetary considerations. These projects will provide better access opportunities for fishing and hunting in Area 3 of the Emerald Marsh Conservation Area. Excess material from the breaches will provide base fill for District boat launch and parking area projects. These improvements are expected to be complete by June 2019.



The Area 3 boat ramp and associated infrastructure are proposed for installation. This ramp will include two launch lanes, a floating boarding dock, and parking area to support 40 boat trailers. This ramp will be constructed at the junction of the K/P/Q/T cells.

In addition to the restoration and improvements mentioned above, the District will evaluate the need for a boat ramp in Area 2, based on usage of the new boat ramp in Area 3. These improvements may include a single launch lane, floating boarding dock, and a parking area to support 20 boat trailers. If constructed, it is anticipated that this boat ramp will be installed off Emerald Island Road north of the Yale Griffin Canal.

Total phosphorus levels in water in Area 5 have dramatically decreased since its acquisition in 1992, mostly due to alum treatments in 2003 and 2005. Since 2009, total phosphorus levels have continued to decrease, however they are still above concentrations necessary for the reconnection of this area to Lake Griffin. The District will continue to evaluate and implement strategies to decrease total phosphorus levels within Area 5 during the term of this management plan.

Water Resource Strategies

General Maintenance Activities

- Conduct maintenance and incidental or emergency repair of water management structures as necessary.
- Maintain water management structures database and incorporate maintenance, repair, and any new structures.

Specific Strategies

Recurrent

- Visually inspect roads, trails, firelines, culverts, bridges, and low water crossings for erosion problems and maintenance and repair needs.
- Re-examine tissue pesticide concentrations in fish from Area 7 in 2021.

Short-term planning horizon (1-5 years)

- Conduct repairs and replacements to road structures as needed.
- Implement Phase I of the Area 3 reconnection project by 2016
- Implement Phase II of the Area 3 reconnection project by 2017.
- Implement construction of boat launches and associated infrastructure by 2019.
- Relocate and open Wildlife Drive.

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FLORA AND FAUNA

Native Species

Despite extensive disturbance, the Emeraldal Marsh Conservation Area supports a wide range of conditions that provide important habitat for a variety of floral and faunal species. Of notable occurrence is the suite of avian species known to utilize the property.

Flora

Since the time of public acquisition and as part of restoration and management activities, District staff with the assistance of cooperators, volunteers, and contractors have recorded plant species observations from within the property. These observations are recorded in the Emeraldal Marsh Conservation Area species list (Addendum 4) and the District's biological database. Additional observation data will be documented and recorded in the biological database.

Fauna

Florida Black Bear

Florida black bear (*Ursus americanus floridanus*) occurrence is documented within Emeraldal Marsh Conservation Area and surrounding area. The Emeraldal Marsh Conservation Area is located within the secondary range of the Ocala population of Florida black bear. In addition to habitat loss and fragmentation, threats to the bear include human caused mortality such as road kill and incompatible habitat management (FFWCC, 2012). To the extent that issues relate to District managed lands, District staff will coordinate as necessary with the FWC and other relevant parties regarding the management of bear habitat and the facilitation of movement across the landscape.

American Alligator

American alligator (*Alligator mississippiensis*) is classified by the U.S. Fish and Wildlife Service (FWS) as threatened due to similarity of appearance to other endangered crocodilians. This classification provides federal protection for American alligators while allowing state level management and control. In May 2015, the District entered into a revenue agreement with a licensed alligator farm for the sale of American alligator eggs harvested from a 3,000-acre portion of the Emeraldal Marsh Conservation Area. While the egg harvest quota is established by FWC and specific to each permit, this agreement does not allow for harvests of more than 50% of nests identified in aerial nest surveys of the harvest area. The District will consider future agreements for the sale of American alligator eggs and will consider expanding the harvest area to other portions of the Emeraldal Marsh Conservation Area.

Bald Eagle

Active Bald Eagle (*Haliaeetus leucocephalus*) nests have been observed within the Emeraldal Marsh Conservation Area, notably within Area 1 and Area 7, though current activity status of nest sites is unknown. Should nesting activity be observed or any new nests be discovered, the District will document the occurrence and incorporate the data into the District's Bald Eagle database with relevant activity status. The District will adhere to the guidelines established in the May 2007 U.S. Fish and Wildlife Service *National Bald Eagle Guidelines*, or most recent

applicable document. This document is effective following the delisting of the species from the Endangered Species list. The Bald Eagle continues to receive protection through the Bald and Golden Eagle Protection Act and the [Migratory Bird Treaty Act](#). The District will consult with the FWC and/or the FWS as applicable, prior to conducting management activities within the established management zones that may affect Bald Eagle nesting between the dates of October 1 to May 15. If nests are discovered on the property, the District will confirm activity status each year

Wading Bird Rookery

An active wading bird rookery is located on the western portion of the property along Lake Griffin just south of the Yale Griffin Canal. This rookery is located in stands of Carolina willow and extends from Haynes Creek to the NW corner of Area 2. Due to the sensitive nature of the rookery, particularly during nesting season, District staff will minimize activity in the immediate vicinity during nesting season.

General Bird

In an effort to garner detailed knowledge regarding bird usage of the former farm fields within the Emeraldal Marsh Conservation Area, the District, in 1995 began conducting monthly bird surveys. Initially, District staff conducted these survey efforts with the assistance of volunteers, primarily from the Oklawaha Valley Audubon Society (OVAS) and The Village Birders. In 2011, the OVAS began coordinating and conducting monthly bird surveys. A Special Use Authorization (SUA) issued by the District provides an opportunity for the OVAS to conduct surveys in a manner consistent with previous surveys and provides the District valuable data on a monthly basis. This is a significant undertaking on the part of the ardent birders and volunteers from the OVAS, which in combination with existing District observations has yielded 201 bird species from within the Emeraldal Marsh Conservation Area.

Exotic and Invasive Species

Several exotic pest plants are known to occur within the Emeraldal Marsh Conservation Area. The property is part of the District's Invasive Plant Management Program. Invasive plant management is necessary to inhibit the continued proliferation of invasive and exotic plants and is integral in the maintenance and restoration of natural plant communities. The Invasive Plant Management Program applies various herbicides according to label rates using the most appropriate method of application for the target species.

While it is unlikely that the District will entirely eradicate invasive and exotic plants within the property, depending on species and level of infestation, maintaining or achieving maintenance control of such species is targeted within the scope of this plan. Exotic pest plant infestations are light to moderate across the property, and the property is regularly monitored and treated as necessary. Exotic plant species identified within the property are included in the species list.

Hydrilla

Hydrilla spp. is an invasive aquatic plant that forms dense mats of vegetation and can be detrimental to aquatic habitats. This species is listed federally as a noxious weed and spreads rapidly from fragmented stems, tubers, and turions. Once established in a water body, hydrilla quickly gains dominance, shading out many submerged plants below. While control methods

such as mechanical removal, or drawdown of controlled water bodies can be effective, the District primarily utilizes broadcast treatments with herbicides. The District will implement control activities as need is indicated and will manage in such a way that this species is not discharged into uninfested water bodies.

Undesirable Vegetation Encroachment

In addition to treating exotic plant species, the District's Invasive Plant Management Program also treats areas of invasive or encroaching native plants such as Carolina willow (*Salix caroliniana*), wax myrtle, salt bush (*Baccharis halimifolia*), cattail (*Typha, spp.*) and common reed (*Phragmites australis*). While shrubs and other woody vegetation naturally occur within herbaceous marsh systems, coverage is generally limited to isolated thickets in wetter areas, though broader distributions may occur in conjunction with transitions from areas of high to low marsh. Under normal hydrologic conditions and with frequent fire, the distribution of these species is limited. Due to hydrologic disturbance and highly elongated fire return intervals within portions the floodplain marsh, areas of extensive encroachment of shrubs and other woody plants occurs and may pose a significant obstacle to the establishment of a highly diverse marsh community.

Within the property, shrub encroached areas of the floodplain marsh range from monoculture stands of Carolina willow to mixed stands of willow and wax myrtle, primrose willow, and other shrubs as well as some hardwood trees such as red maple and sweet gum. In areas where shrub distributions are precluding the development of diversity within the marsh community, an integrated approach to shrub management will be necessary. District staff will initiate control actions in areas identified for treatment and target long-term reduction goals of less than 20% coverage of Carolina willow or other shrubs and woody vegetation within the treatment area. District staff will also initiate survey and monitoring efforts to measure efficacy of treatments and determine the best, most efficient methods for continued control and maintenance.

Floating Mats

Under more natural conditions, when the roots of wetland vegetation become tangled and separate from the soil, floating mats form. Wetlands restored on former agricultural lands, as with Emeraldal Marsh Conservation Area, have floating mat forming tendency because of the "plow layer", a layer of disturbed soil. Buoyant species, such as cattail easily colonize and contribute to mat flotation. Within the conservation area, many of these floating mats consist of cattail stands as well as large areas of water lettuce and water hyacinth, some of which includes a layer of associated soil. These mats typically result from increased water levels and present challenges for access and management. The need for controlling floating mats and hydrilla will increase with increasing water levels and reconnection of marsh systems to Lake Griffin.

Feral Hogs

Exotic wildlife species including feral hogs (*Sus scrofa*) occur within the Emeraldal Marsh Conservation Area. The District currently utilizes feral hog removal agents through a Special Use Authorization (SUA) process to assist in the control of feral hogs. Since 2009, feral hog removal agents have removed 453 hogs from the property.

The District has coordinated via contract with the United States Department of Agriculture (USDA) to assist in the removal of feral hogs on the Lake Apopka North Shore. If necessary, the

District has the flexibility to coordinate short-term special projects with the USDA through this contract to address specific population reduction initiatives.

Flora and Fauna Strategies

General Maintenance and Management Strategies

- Collect species occurrence data and incorporate into the District biological database.
- Conduct management activities in a manner consistent with relative rules, regulations, guidelines, and species management plans and in a manner that provides maximum protection for listed, rare, sensitive, or otherwise desirable species.
- Conduct feral hog removal activities as need is indicated.
- Continue appropriate treatment of exotic vegetation.
- Continue treatment of Carolina willow and other shrubs and woody species to augment restoration activities within the floodplain marsh system.
- Continue treatment of floating vegetation mats to achieve restoration objectives and maintain access.
- Continue to support the bird survey efforts of volunteers through maintenance of an SUA.
- Increase efforts to control aquatic nuisance and exotic species.

Specific Strategies

Short-term planning horizon (1-5 years)

- Manage Alligator Egg Harvest Agreement through September 30, 2017.
- Evaluate expansion of alligator egg harvest area.
- Evaluate future alligator egg harvest agreements.

NATURAL COMMUNITY MANAGEMENT

Forest Management

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 objectives of the parcel." The Emerald Marsh Conservation Area is dominated by marsh systems. The uplands within the conservation area will require little in the way of forest management. The District may harvest trees as needed in the event of insect infestations, disease, and damage from severe weather, wildfire, or other occurrences that could jeopardize the health of natural communities. The District may also utilize other management techniques such as mowing, chopping, prescribed fire, and/or herbicide treatments to assist in forest management activities.

Natural Community Restoration and Enhancement

Restoration and enhancement activities identified for implementation with the Emerald Marsh Conservation Area are based on an analysis of current conditions, desired future conditions, and a determination of the probability of success for each Area. Restoration and enhancement activities will occur as site conditions and staff and fiscal resources permit. Each Area within the property is further divided into smaller management units which District Land Management staff utilize to prescribe and implement various management activities.

Area 1

Area 1 is largely in a maintenance phase; however, portions of this area are difficult to maintain due to the lack of fire lines. In order to establish control lines necessary for the implementation of prescribed fire in this area, District staff will need to secure an agreement with a neighboring land owner to establish firelines on a portion of a levee where it leaves District land and traverses private land.

Area 2

Area 2 consists of 3 individual management units. Access to Area 2 is limited to water access due to several levee breaches. This area includes wet flatwoods communities where management activities are hindered due to limited access. District staff will evaluate the potential to establish access to this area via an easement or agreement with a neighboring landowner. Other portions of this area are in good condition but will require invasive and exotic plant management to reduce coverage of hydrilla and to maintain areas of open water.

Area 3

Area 3 includes 39 management units and is dominated by floodplain marsh. The majority of the western portions of this area are expected to be impacted by flooding associated with the Area 3 Reconnection (Discussed in the Water Resource Protection, Restoration, and Management Section of the plan). Once the reconnection is complete and the ordinary high water is determined, District staff will evaluate and determine management needs in those areas. The majority of the eastern portions of Area 3 are in a maintenance phase. In these areas, District staff will apply management based on ecological need. Beyond these areas, District staff have identified portions of Area 3 for more specific restoration and management activities. This will include the treatment of shrubs and other undesirable vegetation and will likely include a combination of mowing and herbicide treatments to be followed by mechanical planting of spartina or sawgrass in lower elevations. Portions of this area that include wet flatwoods community types will be subject to pine and wiregrass plantings. Once plantings are sufficiently established, prescribed fire will be introduced. These activities will augment previous herbaceous plantings conducted by the District and will aid in the continued restoration of these areas to herbaceous marsh systems managed with prescribed fire.

Area 4

Area 4 consists primarily of floodplain marsh, open water, hydric hammock, and improved pasture managed via cattle grazing lease. In addition to invasive plant management activities to control hydrilla and cattail in the marshes, portions of this area will require shrub control treatments and hardwood plantings, augmenting previous bald cypress plantings, to continue to restore forested wetlands and hydric hammock type communities. A potential project to re-route

runoff along the southern boundary may improve wetland conditions onsite and reduce nutrient input to Lake Griffin.

Area 5

Area 5 includes large areas of open water surrounded by floodplain marsh, pastures, and hammocks. This area also includes some upland communities to the south and west. Additional restoration will include continued shrub reduction activities and possible pine plantings in the uplands.

Area 6

Area 6 is dominated by floodplain marsh, former pastures, and areas of open water. The northern reaches of Area 6 include good quality sawgrass marsh slowly being lost to shrub encroachment. The implementation of prescribed fire necessary to maintain sawgrass coverages in this area is hampered due to lack of adequate control lines. In order to burn this area, District staff will need to construct a fire break along the northern boundary. This may be achieved through a combination of chemical and mechanical treatments. Marsh areas within Area 6 will be evaluated for sawgrass and spartina plantings. Additionally, District staff will evaluate the potential for conducting hardwood harvests from areas of wet flatwoods.

Area 7

Area 7 includes a pyric component along the eastern border. There is a dredge spoil deposition site located along a NE-SW line. This area will be evaluated for planting with submerged aquatic vegetation. Plantings in this area were not conducted immediately after the spoil deposition due to the softness of the freshly deposited material. The southern levee bordering the Yale-Griffin Canal is in poor condition. Discussions and a plan to protect the levee and isolate fish within Area 7 are ongoing.

Natural Community Management

General Maintenance Activities

- Conduct visual monitoring and forest management activities as necessary in response to disease, insect infestation, or wind damage.

Specific Strategies

Recurrent

- Conduct invasive and exotic plant management activities as needed to support restoration and management goals.

Short-term planning horizon (1-5 years)

- Coordinate with neighboring landowner to establish firelines along the southern portions of Area 1.
- Evaluate the feasibility of coordinating with neighboring landowners to establish access to Area 2.
- Conduct spartina, sawgrass, and wet flatwoods plantings in Area 3.
- Conduct hardwood plantings in Area 4.
- Construct fireline along the northern boundary of Area 6.

Long-term planning horizon (6-10 years)

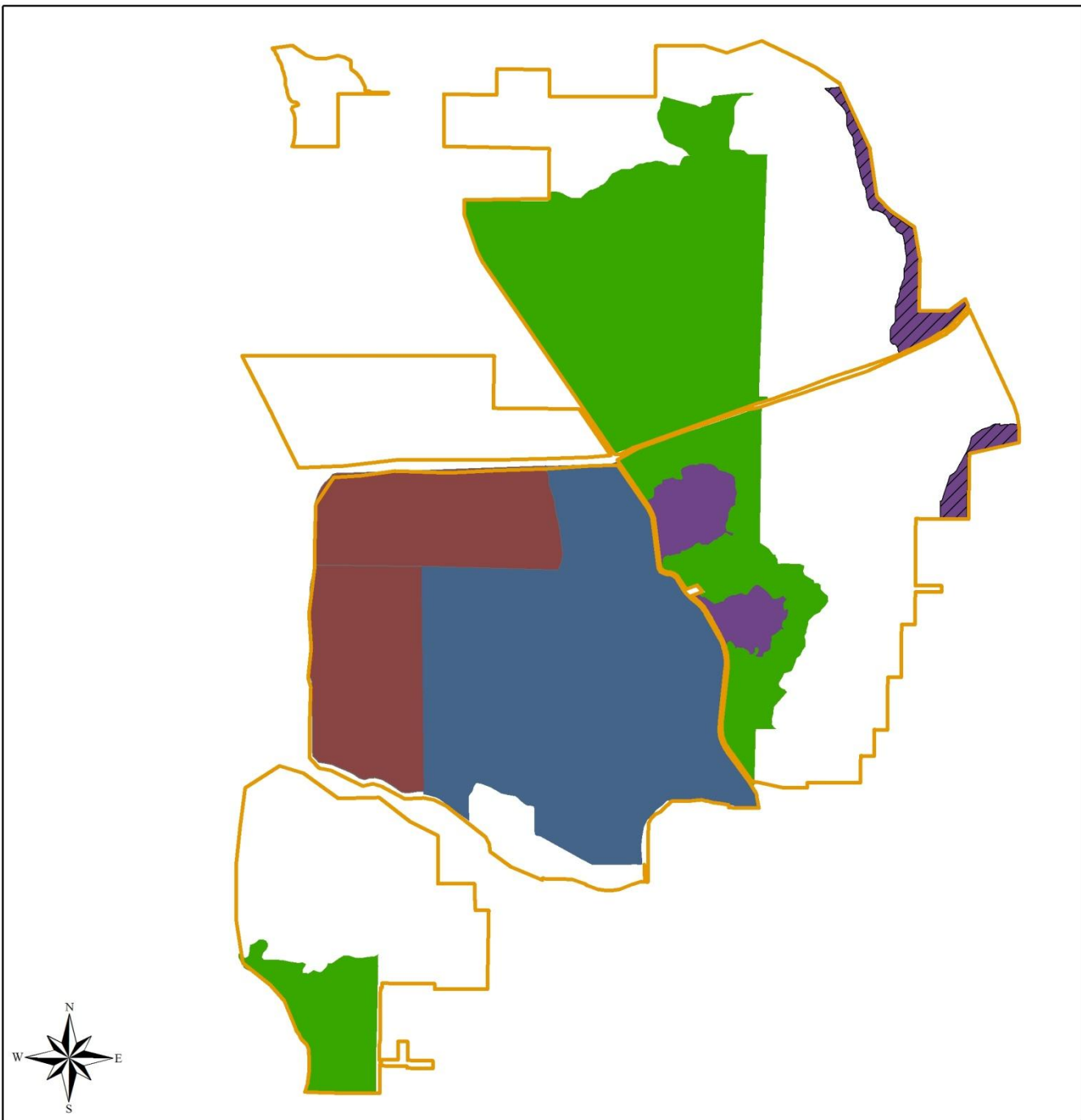
- Evaluate the potential to re-route pasture drainage runoff into Area 4.
- Evaluate the potential to conduct pine plantings in Area 5.
- Evaluate the potential to conduct sawgrass and spartina plantings in Area 6.

Fire Management

Fire is a vital factor in managing the character and composition of vegetation in many of the natural communities in Florida. The District's primary use of fire is to mimic natural fire regimes to encourage the amelioration of native pyric plant communities and dependant wildlife. Additionally, the application of fire aids in the reduction of fuels and minimizes the potential for catastrophic and damaging wildfires. Prescribed fire is an important tool for use in the restoration and maintenance of plant communities within the property. Since 2009, District staff implemented prescribed fire on 2,034 acres within the property. Figure 10 illustrates the prescribed fire history for the property since 2009.

Historically, the majority of fires occurring on what is now the Emerald Marsh Conservation Area would have been ignited by lightning during the growing season. Since the time of acquisition and as part of natural community restoration efforts on the property, the District has worked to return regular growing season burns to the property. The District will continue to implement growing season fires where possible, understanding that constraints in some areas such as high fuel loading, organic soils, and proximity to smoke sensitive areas may predicate the use of dormant season burning.

In addition to the presence of organic soils and other site specific limitations present on portions of the property, other limiting factors narrowing the window of opportunity for the application of



Emeralda Marsh Conservation Area

Figure 10 - Prescribed Fire History Map



0.75

Miles

Conservation Area

Burn History



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.

prescribed fire on the Emeraldal Marsh Conservation Area is the property's close proximity to critical smoke sensitive areas including CR 452, Emeraldal Island Road, residential areas, and the down drainage effects of nearby drainage ways and water bodies. Smoke management is a primary consideration and all burns will be conducted to minimize off-site impacts by maneuvering smoke plumes away from smoke sensitive areas and by ensuring adequate smoke dispersal. Smoke management concerns and smoke impact areas for the property are depicted in Figure 11.

While prescribed fire is a preferred tool for management, restoration, enhancement, and maintenance of natural communities within the Emeraldal Marsh Conservation Area, it will be necessary, at times, to implement alternative methods. The District may utilize management techniques such as selective herbicide treatments, silvicultural thinning, mowing, and roller chopping in combination with fire as part of an integrated approach to creating and maintaining desired conditions within the property.

All implementation of prescribed fire within the property will be conducted in accordance with the District's Draft Fire Management Plan, the Emeraldal Marsh Conservation Area Fire Management Plan (Addendum 3), and the annual burn plan for the property.

Fire Management Strategies

General Maintenance Activities

- Implement prescribed burning as described in the District's Fire Management Plan and the Emeraldal Marsh Conservation Area Fire Management Plan.

Specific Strategies

Recurrent

- Develop annual burn plans.
- Populate and maintain the fire management database.
- Conduct fireline maintenance.

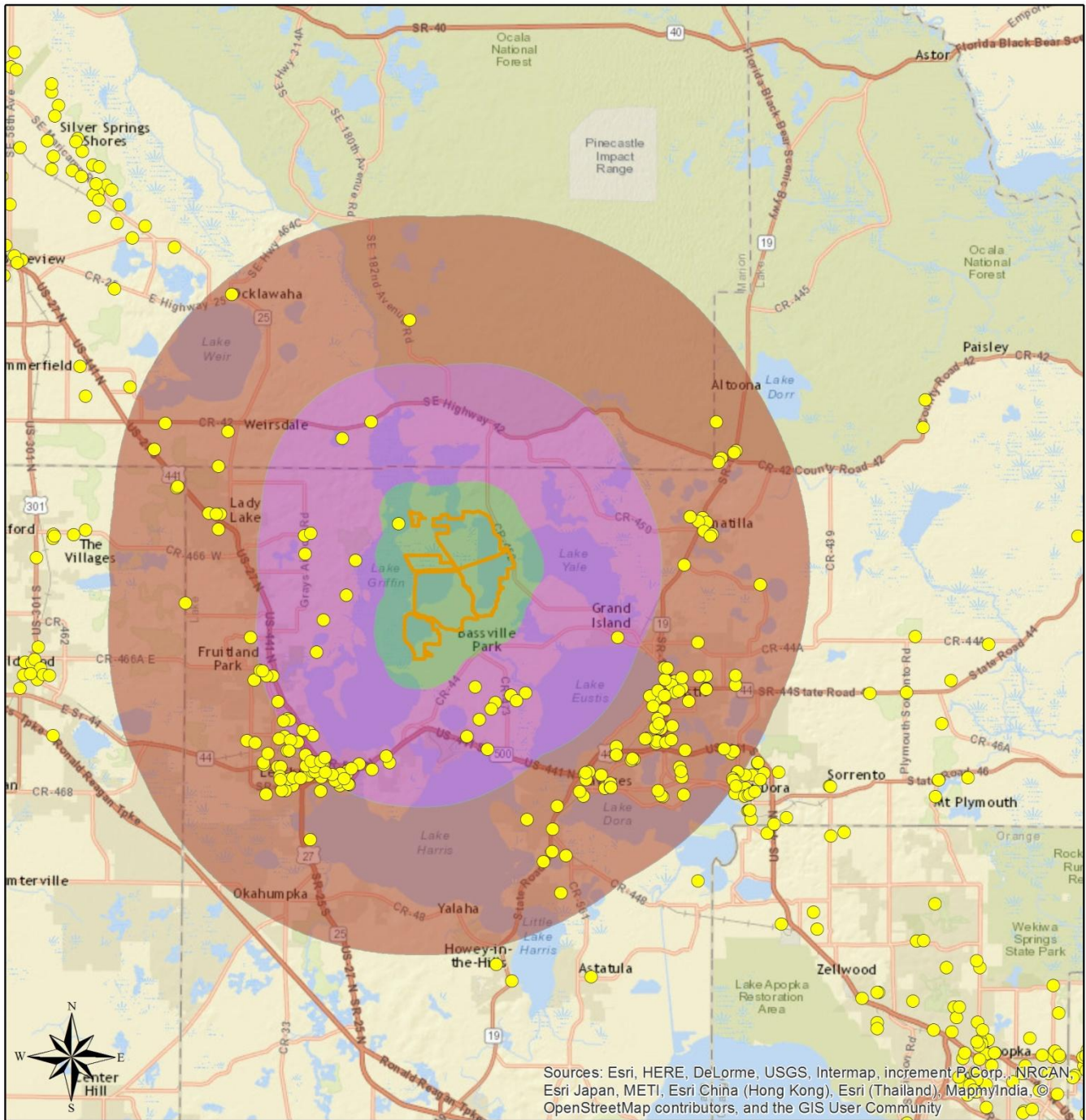
CULTURAL RESOURCES

A review of the Department of State, Division of Historical Resources (DHR) indicates that there are no known Florida Master Site File cultural sites within the property. There are several registered sites in close proximity to the Emeraldal Marsh Conservation Area. If District staff discover any sites, staff will document and report those sites to the DHR. Additionally, detrimental activities discovered on these sites will also be reported to the DHR and appropriate law enforcement agencies. Due to District and State policies, the location of the sites is not identified on public maps.

Cultural Resource Protection Strategies

General Maintenance and Management Strategies

- Identify and report any new sites.



Emerald Marsh Conservation Area
Figure 11 - Smoke Management Map



5.5
 Miles

- Conservation Area
- Schools and Healthcare Facilities
- Smoke Management Radii**
- 1 mile
- 5 miles
- 10 miles

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LAND USE MANAGEMENT

Access

Four public parking areas are available providing recreational access to the property. An informational kiosk is located near the parking area trailheads. The parking areas are located along Emeraldal Island Road. Boating is available within the property and vehicular access to a self-guided interpretive drive is seasonally available.

There are currently 35 gates providing management access to and across the property. These gates are monitored regularly for maintenance and/or repair needs from normal wear and tear and vandalism. In an effort to expedite emergency responses and to assist law enforcement and fire rescue in locating individuals in the event of an emergency, twelve 911 addresses have been issued at certain parking areas and access points to the property. Table 3 includes the 911 addresses for the Emeraldal Marsh Conservation Area.

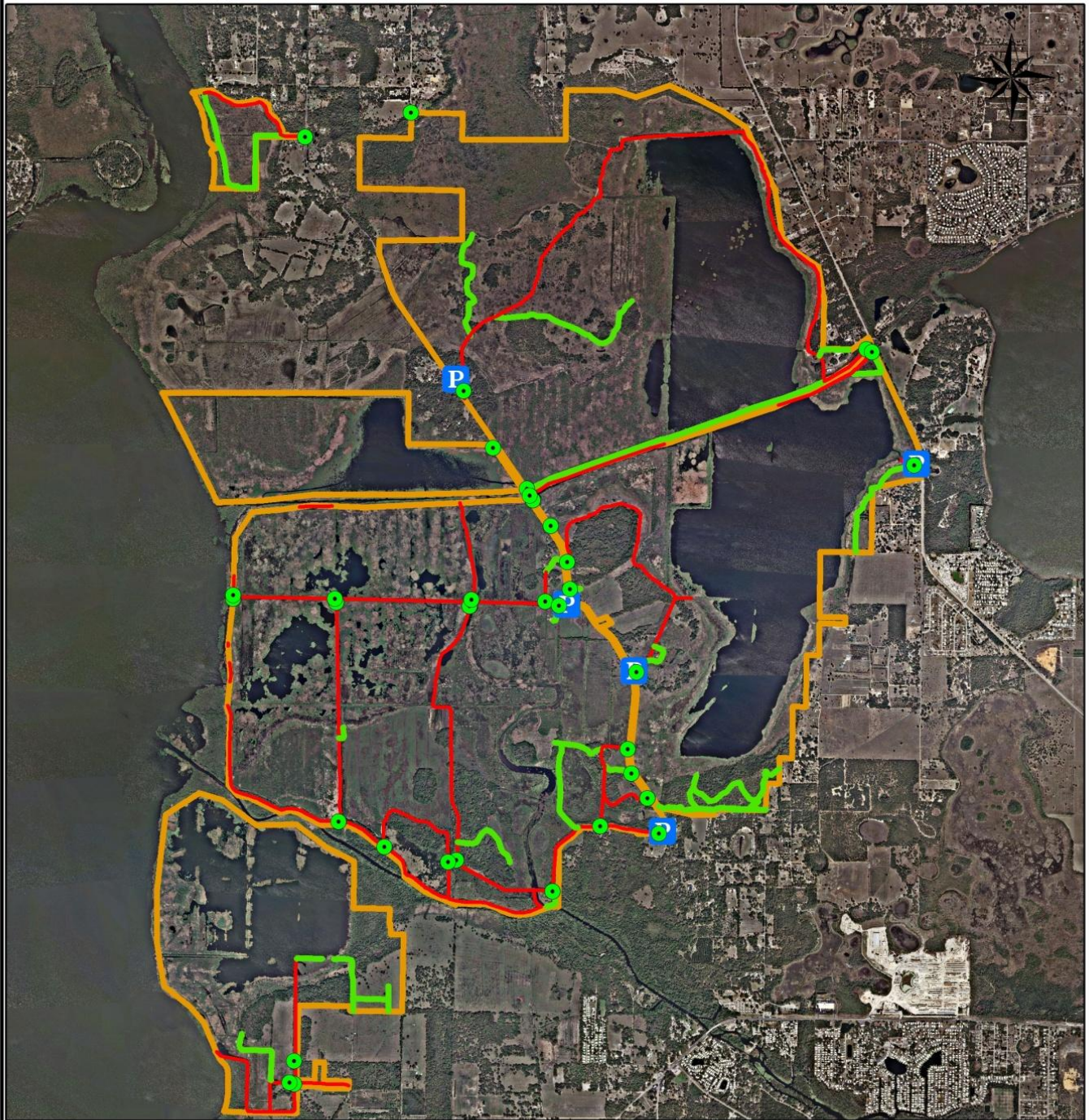
Table 3 – 911 Addresses

911 Address	Location/Description
40400Bridle Path Lane	North end of property
40245 Emeraldal Island Road	Northernmost Emeraldal Island Road Gate
39139 CR 452	North Yale Griffin Canal
39121 CR 452	South Yale Griffin Canal
3900 Emeraldal Island Road	North Emeraldal Island Road Parking Area Gate
38735 CR 452	CR 452 Gate
38550 Emeraldal Island Road	North Yale Griffin Canal
38514 Emeraldal Island Road	Gate North of Residence
38151 Emeraldal Island Road	Security Residence Gate
37620 Emeraldal Island Road	Central Emeraldal Island Road Parking Area Gate
36915 Emeraldal Island Road	South Emeraldal Island Road Parking Area Gate
35651 N. Treasure Island Road	Area 4 Gate

Approximately 30 miles of interior management roads traverse the property, some of which are also utilized as trails. In order to manage road maintenance, the District utilizes a road classification system. This system includes the following classifications:

- A. Paved Road – Any road that is paved in nature.
- B. Primary Road – Any road that requires routine maintenance of any kind.
- C. Secondary Road – Any road that does not require routine maintenance; only periodic or no maintenance.

All roads within the conservation area are classified as either a Type B – Primary Road or Type C – Secondary Road. District staff will update the roads database to reflect changes to the road network within the property area as necessary. Roads will be regularly inspected and receive maintenance and repair as necessary and may be subject to closure during these times. Portions of the road network within the property will be removed as part of the reconnection project. Figure 12 depicts the current locations of the parking areas, roads, and gates on the property.



Emeralda Marsh Conservation Area
Figure 12 -Roads Map



0.8
 Miles

Conservation Area

Gates

Parking Areas

Road Class

B

C

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.

Access Strategies

General Maintenance and Management Strategies

- Maintain parking areas, signs, gates, road, and trail.

Specific Strategies

Recurrent

- Update roads, gates, and firelines in the land management database as maintenance, repair, or creation of new roads or trails occurs.

Short-term planning horizon (1-5 years)

- Portions of road network and gates within the property will be removed as part of the reconnection project.

Recreation

The primary objective of the District's Recreation Management Program is to facilitate resource-based recreational activities on District lands. An aspect in developing the District's Recreation Program is not to compete with other local recreational opportunities, but rather complement what they may already have in place by filling an outdoor recreation niche through dispersed recreation opportunities. Dispersed recreation activities generally require large tracts of land with some level of isolation. This type of recreation blends well with most District conservation areas, providing numerous opportunities for passive recreation, which also provides solitude and challenge.

Recreational opportunities within the Emeralda Marsh Conservation Area include dispersed resource-based activities such as hiking, bicycling, wildlife viewing, fishing, equestrian activities, canoeing, and seasonal hunting opportunities. While the dispersed recreation model is typical of most District conservation lands, the Emeralda Marsh Conservation Area also includes a scenic interpretive wildlife drive and boating opportunities. Recreation amenities include designated parking areas with trailheads, wildlife-viewing platform, and two boat ramps.

The trailheads include entrance signs and information kiosks, and access to the property by trails routed using interior roads and firelines that are maintained for access and land management purposes. With the exception of the interpretive wildlife drive, trails are predominantly for hiking, off-road bicycling, and horseback riding.

Recreational improvements and considerations for the Emeralda Marsh Conservation Area include:

- **Trails** – Interior roads and levees are accessible and open for recreational use. The District may close trails or portions of trails to accomplish land management activities or when conditions pose a public safety concern. Horseback riding is only permitted in the Bull Hammock Area of Area 6 located north of the Yale Griffin Canal and east of Emeralda Island Road.

- **Interpretive Wildlife Drive** – This 4.3-mile one-way drive is accessed from the southernmost parking area off Emerald Island Road. This is a self-guided tour with seven key points of interest, providing opportunities to view the conservation area and observe wildlife. The self-guided interpretive wildlife drive is open Fridays, Saturdays, and Sundays between the third weekend in February through the end of May and between the hours of 8AM and 5PM. Gates are locked outside these days and hours. Off road vehicles, (including motorcycles, and all-terrain or track vehicles) are not permitted on the property. During the scope of this plan, the interpretive wildlife drive will be rerouted to facilitate the internal reconnection of Area 3.
- **Wildlife Viewing Platform** – When the wildlife drive is relocated, a new platform will be installed.
- **Kiosks** – Kiosks are located at the public access points and provide information, which includes maps, trail brochures, and interpretive displays.
- **Camping** – There are currently no designated camp or group campsites within the conservation area. The former security residence site in Area 3 will be developed into a group campsite during the scope of this plan.
- **Boat Ramp** – A boat ramp is accessible from Hwy 452 and the Yale-Griffin Canal levee into Area 5. The Goose Prairie boat ramp located off Hwy 452 was closed in 2013 as water levels were not sufficient to maintain the ramp. Subsequently, the parking area associated with this boat ramp was also closed as it was no longer necessary. Two additional boat ramps are planned as part of the Area 3 reconnection plan.
- **Public Hunting** – The Emerald Marsh Conservation Area is a designated Public Small Game Hunting Area. Hunting opportunities within the conservation area fall under the jurisdiction of and is administered by FWC.

Additionally, access to Area 7 is limited due to narrow levee widths. District staff will evaluate opportunities to improve public access to this area within the scope of this plan.

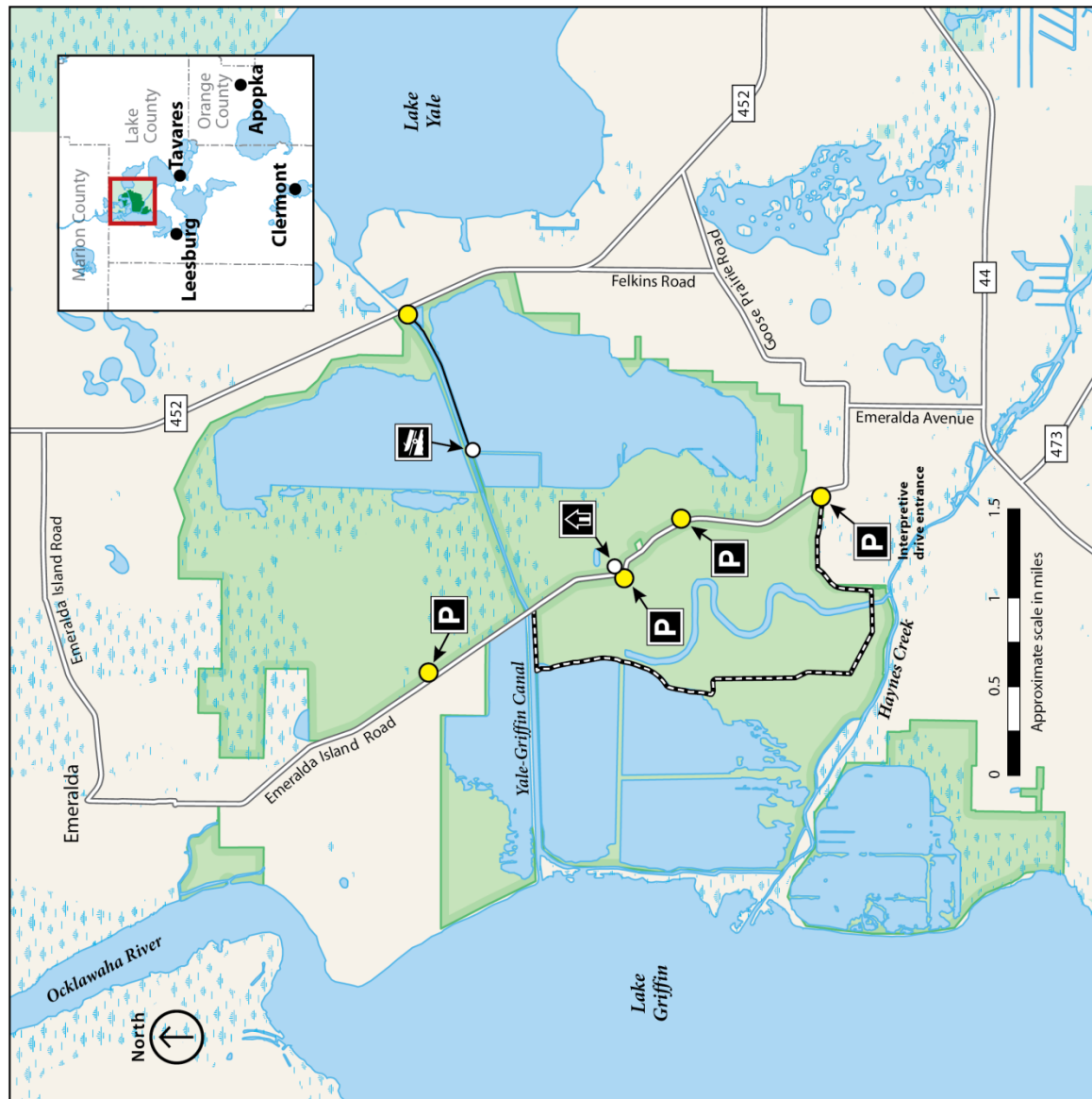
The targeted maintenance schedule for trails and campsites includes:

- Mowing grassy trails and road edges four (4) times yearly.
- Trail blazing, trimming of overhanging branches, and tree removal along trails as needed.
- Monthly trailhead maintenance.

Current recreational amenities are included in Figure 13 and Figure 14 depicts information associated with the Public Small Game Hunting Area.

Any improvements will be incorporated into the next edition of the District's [Recreation Guide to District Lands](#), which can be viewed online at www.SJRWMD.com.

Figure 13 – Recreation Map



Emeralda Marsh

Conservation Area

Legend

	Access/entry to property		Property
	Parking area		Observation platform
	Security residence		Boat launch
	Handicapped access		Trail
	Interpretive drive		Road/trail

Activities allowed

- Wildlife viewing
- Hiking
- Fishing
- Horseback riding
- Bicycling
- Paddling
- Boating
- Seasonal hunting

Notice: Public Small Game Hunting Area.
Hunt season caution.

This map is not intended for navigational purposes; it provides only the general location of each area.



St. Johns River
Water Management District
floridaswater.com/recreation

2015-2016
Hunting
Season

Emeralda Marsh Public Small Game Hunting Area

Regulations Summary and Area Map
July 1, 2015 - June 30, 2016

A cooperative public small game hunting area

St. Johns River Water
Management District

Florida Fish and Wildlife
Conservation Commission

MyFWC.com

Legend

- Management Area
- Closed to Hunting and Fishing
- Water
- Boat Ramp
- Boat Launch
- Horse Trailer Parking
- Parking
- Kiosk
- Gate
- Paved Road
- Improved Road
- Trail
- Canal

Area 1

Area 2

Area 3

Area 4

Area 5

Area 6

Area 7

EMERALDA MARSH
PUBLIC SMALL GAME HUNTING AREA
6,476 acres
Lake County

Note: Parking in front of this gate is no longer allowed. You can only access Area 4 by boat from Haines Creek or Lake Griffin.

Scale: 0 0.5 1 Miles

Recreation Strategies

General Maintenance and Management Strategies

- Maintain parking areas, kiosks, and trails.
- Maintain current information in recreation guide, trail guides, kiosk, and District website.
- Continue Coordination with FWC to administer the Public Small Game Hunting Area.

Specific Strategies

Recurrent

- Mow recreational trails four times each year.
- Mow/maintain parking areas.
- Conduct trail blazing and trimming maintenance.

Short-term planning horizon (1-5 years)

- Evaluate establishment of marked trail system in Area 5.
- Relocate the Interpretive Wildlife Drive prior to the reconnection of Area 3 to Lake Griffin.
- Install a new platform on rerouted interpretive wildlife drive.
- Develop former security residence site in Area 3 into a group campground.
- Improve access road to Area 7 to provide better public access.

Environmental Education

The District continues to look for opportunities to collaborate with local schools and organizations to encourage the use of District lands for environmental education. Opportunities vary by school district and the needs of the community. The District will offer staff expertise and support, along with the use of District lands, to continue fostering an appreciation for and stewardship of water resources.

Environmental Education Strategies

General Maintenance Strategies

- Continue to offer environmental education opportunities subject to staff and budget availabilities.

Security

Security concerns within Emerald Marsh Conservation Area include illegal motorized vehicle access, dumping, vandalism of gates, fences, and conservation signage, and poaching. The District, primarily through a contract security firm as well as coordination with FWC, local law enforcement, and an onsite security resident, administers security and law enforcement for the property.

Security Strategies

General Maintenance and Management Strategies

- Coordinate with local law enforcement and FWC for security needs.
- Maintain contract with private security firm.
- Coordinate with security resident.
- Maintain fences, gates, and conservation signage.

Specific Strategies

Recurrent

- Develop monthly, prioritized security needs and provide to contracted security firm.
- Conduct biennial boundary line posting.

ADMINISTRATION

Real Estate Administration

There are no anticipated acquisitions associated with the Emerald Marsh Conservation Area in the next ten years. The District may pursue acquisition of small parcels or easements that may improve access for management purposes.

Through the land assessment process, the District has identified the following parcels (see Figure 4) for potential surplus.

- A 38-acre portion of the John P. Wilkerson Parcel (LA 1995-012-P1) – This area is identified for sale or exchange.
- A 28-acre portion of the Lowrie Brown Investment Company Parcel (LA1989-028-P1) – This area is identified for sale with an accompanying conservation easement.

Real Estate Administration Strategies

General Maintenance and Management Strategies

- Evaluate adjacent properties for potential acquisition.

Short-term Planning Horizon (1-5 years)

- Refine boundary and parcel data information and map layers.

Cooperative Agreements, Leases, Easements, and Special Use Authorization

In accordance with District Policy #90-16, the District promotes entering into agreements with other agencies and private parties for cooperation and coordination of management of the District's lands. These cooperative agreements serve to protect the District's water management interests and to enhance the management and public value of the land. Table 4 details the agreements and SUAs in effect during the writing of this plan.

Public use on Area 5 will be limited during the scope of this plan to facilitate activities associated with the Sungro lease listed below. Information relative to public use in this area will be posted as needed on the District's website.

Table 4 – Agreements, Easements, and SUA Table

Agreement Number	Type	Agreement Name	Term
611	Residence	Beard, Jared	-----
1091	Lease	Brinson Malcolm Apiary	1 year with 4 annual renewals expiring in 2020
1008	Intergovernmental	Cooperative Agreement with FWC for WMA's and PSGHA's	2034
292	Intergovernmental	Emeralda Marsh Lowrie Brown Public Access MOA with FWC	-----
1096	SUA	FDEP Sinkhole Project	2016
	Lease	Sungro	
-----	Revenue Agreement	Alligator Egg Harvest	-----

Cooperative Agreements, Leases, Easements, and Special Use Authorizations Strategies

General Maintenance and Management Strategies

- Administer easements, agreements, leases, and SUAs.

IMPLEMENTATION CHART

Emeralda Marsh Conservation Area – Management Implementation Chart

TASK	RECURRENT	1-5 YEARS	5-10 YEARS	LEAD (COOPERATOR)
RESOURCE PROTECTION AND MANAGEMENT				
Water Resources				
<i>General Maintenance</i>				
Conduct maintenance and incidental or emergency repair of water management structures as necessary.	---	---	---	BLR
Maintain water management structures database and incorporate maintenance, repair, and any new structures.	-----	-----	-----	BLR, BOP
Manage water levels for protection and enhancement of aquatic and wetland habitat.	-----	-----	-----	BWR, BWRI, DPC, BLR, (BOP)
Manage discharges, including treatment with alum if necessary, to meet TMDL targets for total phosphorus discharges to Lake Griffin.	-----	-----	-----	BWR, DPC, (BOP)
Monitor water quality within EMCA areas and in discharges to surrounding ambient waters.	-----	-----	-----	BWRI, (BWR)
Monitor water levels within EMCA management areas.	-----	-----	-----	BWRI, (BWR)
<i>Recurrent</i>				
Visually inspect roads, trails, low water crossings, bridges, and culverts for erosion problems and maintenance and repair needs.	Annually	-----	-----	BLR, BOP
Conduct aerial and ground surveys to monitor waterfowl usage and habitat development.	As Required	-----	-----	BWRI, BLR
Continue to monitor fish samples from Area 7 as need is indicated.	-----	2020	-----	BWR (DOH)
<i>Short-term Planning Horizon</i>				
Conduct repairs and replacements to road structures as needed.	-----	As required	-----	BLR, BOP
Implement Phase I of the Area 3 reconnection project.	-----	2016	-----	DPC, BOP
Implement Phase II of the Area 3 reconnection project.	-----	2017	-----	BWR, DPC, BOP
Implement construction of boat launches and associated infrastructure by 2019.	-----	2019	-----	DPC, BOP
Relocate and open wildlife drive.	-----	2020	-----	BLR, BOP

Floral and Faunal				
<i>General Maintenance</i>				
Collect species occurrence data and incorporate into the land management biological database.	---	---	---	BWR, BLR
Conduct management activities in a manner consistent with relative rules, regulations, guidelines, and species management plans and in a manner that provides maximum protection for listed, rare, sensitive, or otherwise desirable species.	---	---	---	BLR
Continue appropriate treatment of exotic vegetation.	----	----	----	BLR
Conduct feral hog removal activities as need is indicated.	----	----	----	BLR, BRS
Continue treatment of Carolina willow and other shrubs and woody species to augment restoration activities within the floodplain marsh system.	----	----	----	BLR
Continue treatment of floating vegetation mats to achieve restoration objectives and maintain access.	----	----	----	BLR
Continue to support the bird survey efforts of volunteers through maintenance of an SUA.	----	----	----	BLR, BRS
Increase effort to control aquatic species.	----	----	----	BLR
<i>Short-term Planning Horizon</i>				
Manage Alligator Egg Harvest Agreement.	----	2017	----	BLR, BRS
Evaluate expansion of alligator egg harvest area.	----	2017	----	BLR
Fire Management				
<i>General Maintenance</i>				
Implement prescribed burning as described in the District's Fire Management Plan and the Emerald Marsh Conservation Area Fire Management Plan.	---	---	---	BLR
<i>Recurrent</i>				
Develop annual burn plans.	Annually by September 30 th .	----	----	BLR
Populate and maintain fire management database.	Annually by September 30 th .	----	----	BLR (BRS)

Conduct fireline maintenance.	Biannually Spring and Fall	-----	-----	BLR
Natural Community Management				
<i>General Maintenance</i>				
Conduct visual monitoring and forest management activities as necessary in response to disease, insect infestation, or wind damage.	-----	-----	-----	BLR
<i>Recurrent</i>				
Conduct invasive exotic plant management activities as needed to support restoration and management goals.	-----	-----	-----	BLR
<i>Short-term planning horizon</i>				
Coordinate with neighboring land owner to establish firelines along the southern portions of Area 1.	-----	2017	-----	BLR, BRS
Evaluate the feasibility of coordinating with neighboring landowners to establish access to Area 2.	-----	2017	-----	BLR, BRS
Conduct spartina, sawgrass, and wet flatwoods plantings in Area 3.	-----	2019	-----	BLR
Conduct hardwood plantings in Area 4.	-----	2020	-----	BLR
Construct fireline along the northern boundary of Area 6.	-----	2020	-----	BLR
<i>Long-term planning horizon</i>				
Evaluate the potential to re-route pasture drainage runoff into Area 4.	-----	2020	-----	BWR, BLR
Evaluate the potential to conduct pine plantings in Area 5.	-----	-----	2021	BLR
Evaluate the potential to conduct sawgrass and spartina plantings in Area 6.	-----	-----	2021	BLR
Cultural Resource Protection				
<i>General Maintenance</i>				
Identify and report any new sites.	---	---	---	BLR BOP, BRS (DHR)
Access				
<i>General Maintenance</i>				
Maintain parking areas, signs, gates, roads, and trails.	---	---	---	BLR
<i>Recurrent</i>				
Update roads, gates, and firelines in the land management database as maintenance, repair, or creation	Annually by September 30th	-----	----	BLR (BRS)

of new roads or trails occurs				
<i>Short-term planning horizon</i>				
Portions of road network within the property will be removed as part of the reconnection project.	-----	2020	-----	BLR, BOP
Recreation				
<i>General Maintenance</i>				
Maintain parking areas, kiosks, and trails.	---	---	---	BLR
Maintain current information in recreation guide, trail guides, kiosk, and District website.	---	---	---	BLR, (FWC, BRS, OC)
<i>Recurrent</i>				
Mow recreational trails.	Quarterly			BLR
Mow/maintain parking areas.	Bimonthly	-----	-----	BLR
Mow/maintain campsite.	Monthly	-----	-----	BLR
Conduct trail blazing and trimming maintenance.	Annually by December 31 st .	-----	-----	BLR
<i>Short-term planning horizon</i>				
Relocate the Interpretive Wildlife Drive prior to the reconnection of Area 3 to Lake Griffin.	-----	2016	-----	BLR, BOP
Install a new platform on rerouted interpretive wildlife drive.	-----	2017	-----	BLR, BOP
Develop a group campsite in Area 3.	-----	2018	-----	BLR
Improve access road to Area 7 to provide better public access.	-----	2020	-----	BLR, BOP
Environmental Education				
<i>General Maintenance</i>				
Continue to offer educational opportunities if possible and subject to staff and budget availability.	-----	-----	-----	OC (BLR)
Security				
<i>General Maintenance</i>				
Coordinate with local law enforcement and FWC for security needs.	---	---	---	BLR FWC, County
Maintain contract with private security firm.	---	---	---	BLR(BRS)
Coordinate with security resident.	-----	-----	-----	BLR
Maintain fences, gates, and signage.	-----	-----	-----	BLR
<i>Recurrent</i>				

Develop monthly, prioritized security needs and provide to contracted security firm.	Monthly	-----	-----	BLR
Conduct biennial boundary posting maintenance.	2016, 2018, 2020, 2022	-----	-----	BLR
Real Estate Administration				
<i>General Maintenance</i>				
Evaluate adjacent properties for potential acquisition.	---	---	---	BRS (BLR)
<i>Short-term Planning Horizon</i>				
Refine boundary and parcel data information and map layers	-----	2020	-----	BRS
Cooperative Agreements, Leases, Easements, and Special Use Authorizations				
<i>General Maintenance</i>				
Administer easements, agreements, leases, and SUAs	-----	-----	-----	BLR (BRS)

IMPLEMENTATION CHART KEY

BLR – Bureau of Land Resources

BOP – Bureau of Operations and Maintenance

BWR – Bureau of Water Resources

BWRI – Bureau of Water Resource Information

BRS – Bureau of Real Estate Services

DHR – Division of Historical Resources

DPC – District Projects and Construction

DOH – Department of Health

FWC – Florida Fish and Wildlife Conservation Commission

OC – Office of Communications

County – Lake County

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ADDENDUM 1 – SOILS

The following soil series descriptions are taken directly from the USDA-NRCS using the online query tool. As of the writing of this plan, the query tool may be located at <https://soilseries.sc.egov.usda.gov/osdnamequery.asp>.

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.

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 blue jack oak, turkey oak, post oak, live oak, and longleaf pine with a sparse understory of indiagrass, chalky bluestem, pineland threeawn, hairy panicum, and other annual forbs.

The Cassia series consists of very deep, somewhat poorly drained, moderately rapid permeable soils on low ridges and knolls that are slightly higher than the adjacent flatwoods. The native vegetation supported by this series generally consists of scattered slash pine, longleaf pine, and saw palmetto.

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.

The Felda series consists of very deep, poorly drained and very poorly drained, moderately permeable soils in drainage ways, 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 drainage ways, 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.

The Immokalee series 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.

The Martel series consists of very deep, very poorly drained, very slowly permeable soils in depressions and sloughs of central Florida. They formed in clayey marine sediments. The native vegetation is dominated by cypress, sweetgum, pond pine, and water tupelo.

The Martel series consists of very deep, very poorly drained, very slowly permeable soils in depressions and sloughs of central Florida. They formed in clayey marine sediments. The native vegetation is dominated by cypress, sweetgum, pond pine, and water tupelo.

The Oklawaha 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 black gum and used for range, wildlife habitat, or water storage areas.

The Placid series consists of very deep, very poorly drained, rapidly permeable soils on low flats, depressions, poorly defined drainage ways on uplands, and flood plains on the Lower Coastal Plain. They formed in sandy marine sediments. Natural vegetation consists of pond pine, bay, cypress, gum, pickerel weed, and coarse grasses.

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.

The Placid series consists of very deep, very poorly drained, rapidly permeable soils on low flats, depressions, poorly defined drainage ways on uplands, and flood plains on the Lower Coastal Plain. They formed in sandy marine sediments. Natural vegetation consists of pond pine, bay, cypress, gum, pickerel weed, and coarse grasses.

The Placid series consists of very deep, very poorly drained, rapidly permeable soils on low flats, depressions, poorly defined drainage ways on uplands, and flood plains on the Lower Coastal Plain. They formed in sandy marine sediments. Natural vegetation consists of pond pine, bay, cypress, gum, pickerel weed, and coarse grasses.

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. 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.

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.



Soil Type

- Anclothe fine sand
- Arents
- Candler sand
- Cassia sand
- Emeraldal fine sand
- Everglades muckl
- Felda fine sand
- Immokalee sand
- Lake sand
- Martel sandy clay loam
- Myakka and Placid sand
- Myakka sand
- Oklawaha muck
- Placid and Myakka sands
- Placid sand
- Pomello sand
- Pompano sand
- Sparr san
- Tavares sand
- Wauchula sand

Emeralda Marsh Conservation Area

Addendum 1 - Soils Map



0.75
Miles

- Conservation Area
- Water

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ADDENDUM 2 – SPECIES RANKING DEFINITIONS

FNAI GLOBAL RANKING

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.

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).

FNAI STATE RANKING

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.

STATE LEGAL STATUS

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.

FEDERAL LEGAL STATUS

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.

FDACS

C Commercially exploited.

ADDENDUM 3 – FIRE MANAGEMENT PLAN

Emeralda Marsh Conservation Area

FIRE MANAGEMENT PLAN

PREPARED BY

**ST. JOHNS RIVER WATER MANAGEMENT DISTRICT
DIVISION OF LAND RESOURCES**

Emeralda Marsh Conservation Area

Fire Management Plan

Lake County, Florida

The District Fire Management Plan provides general fire management information relative to policy, procedure, and reporting. This document provides the guidelines for the implementation of prescribed fire activities on the Emeralda Marsh Conservation Area (Conservation Area).

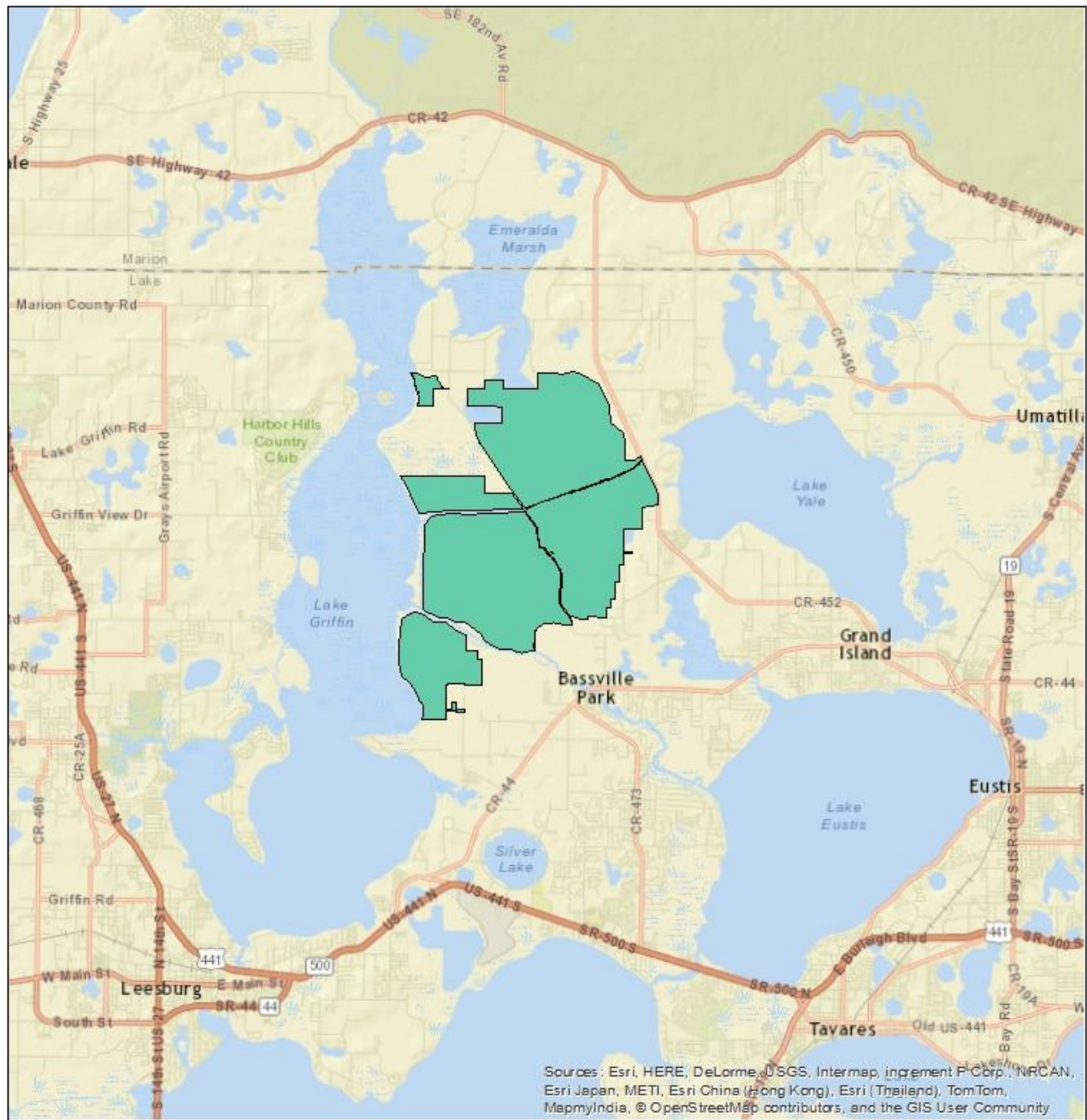
Introduction and Objectives

The Conservation Area covers approximately 6,577 acres in Lake County, south of County Road 42, west of County Road 452, and north of County Road 44. This Conservation Area is located in numerous sections of Township 8 South and Range 25 East. The property is located along the eastern edge of Lake Griffin, portions of Haines Creek, and the Ocklawaha River. Figure 1 depicts the general location of the Conservation Area.

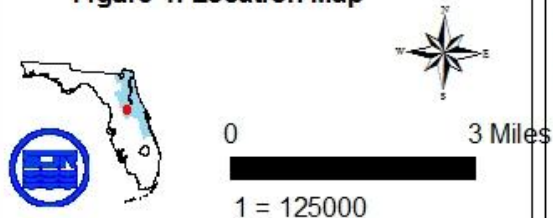
Historically, fires have played a vital role in the shaping and maintenance of many of the natural communities in Florida. As such, most vegetative communities and associated wildlife are fire adapted and in many instances fire dependant. Conversely, the exclusion of fire from an area allows for successional changes within the natural community. Fire exclusion leads to the excessive accumulation of fuel loads, which increases the risk for catastrophic wildfires. The goals for the implementation of fire management activities within the Conservation Area include:

- Reduction of fuel loads through the application of dormant season burns to decrease potential risk of damaging wildfires
- Reintroduction of growing season burns to encourage the perpetuation of native fire adapted ground cover species
- Mitigation of smoke management issues
- Restoration and maintenance of a mosaic of natural plant communities and ecological diversity
- Maintenance and restoration of ecotonal areas

The achievement of these goals requires that the Conservation Area be partitioned into manageable burn units prior to the application of prescribed fire within those units. The following sections summarize the considerations necessary for the safe and effective use of prescribed fire as a land management tool within the Conservation Area.



Emeralda Marsh Conservation Area
Figure 1. Location Map



 **Boundary**

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Fire Return Interval

The general frequency to which fire returns to a community type under natural conditions is termed its fire return interval. Some communities require frequent pyric disturbances to perpetuate themselves while others are not fire adapted and subsequently do not require fire to maintain their characteristics. Table 1 and the following discussion of native plant communities occurring on the Conservation Area and optimal fire return intervals was characterized in part using information from the Florida Natural Areas Inventory's *Guide to the Natural Communities of Florida*.

Table 1.

Community Type	Fire Return Interval*
Floodplain Swamp	This is not a fire-adapted community. Ecotonal areas burn in conjunction with adjacent pyric communities.
Wet Prairie	2-4 Years
Floodplain Marsh	1-5 Years
Hydric Hammock	Typically not maintained with fire; infrequent fires. Ecotonal areas burn with adjacent pyric communities.
Wet Flatwoods	1-10 years.
Mesic Flatwoods	2-10 years.
Scrubby Flatwoods	5-15 years. Return intervals on the Conservation Area may be longer during restoration and enhancement activities.

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

The above referenced fire return intervals relate to high quality natural communities. The fire return interval within degraded systems is variable. Prescribed fire will be applied as necessary to achieve restoration and management goals.

Floodplain marsh and wet prairie natural communities encompass the largest land area within the conservation area. Residual effects of agricultural uses prior to public ownership include large areas dominated by exotic and offsite species. Particularly problematic to fire management activities is the heavy encroachment of these areas by native shrubs such as Carolina willow, wax myrtle, and saltbush. In addition to the application of prescribed fire, site conditions within these areas will require other management actions including mechanical and herbicide treatments.

Mesic, scrubby, and wet flatwoods community types found within the conservation area are located along the margins of the floodplain marsh and wet prairie communities. Shrub and groundcover components include a coverage of herbaceous and shrub components including some wiregrass and saw palmetto and will contribute to the spread of fire. In most areas of mesic flatwoods, the shrub layer will be the primary carrier of fire. Within the scrubby flatwoods the contiguous shrub layer which includes oaks and saw palmetto are the primary carrier of fire. In areas where these communities are embedded within floodplain marsh or wet prairie-dominated fire management units, fire will be applied at the frequency required by the dominant community type.

Seasonality and Type of Fire

Historically, most fires in Florida occurred in what is commonly referred to as the “growing season.” The growing season usually spans from mid March through August. Fires during the spring and early summer months generally have significant ecological benefits as most fire-adapted flora is perpetuated by fire. Mimicking lightning ignited natural fires by implementing prescribed fire during the growing season provides benefits to natural systems by controlling shrub layers and encouraging diversity in groundcover species.

Dormant season burns, conducted from mid November through the mid March, are less intense than growing season burns and are a desirable alternative when igniting fire in areas with elongated or absent fire return intervals and excessive fuel loads. In these areas, dormant season burning will help minimize safety and smoke management risks. District staff anticipates the transition to growing season burns to occur only after a sufficient reduction of fuel levels.

In many cases, fire management units with similar fire management needs may be burned simultaneously, either with crews igniting the areas by hand from the ground, or with the aid of aircraft. Aerial ignition allows District staff to ignite fire management units more quickly, resulting in a faster burnout. In an area with a large mosaic of unavailable fuels, fire can be applied easily to all portions of the unit. With ground based crews this sometimes is infeasible or impossible and may pose a safety issue. An aerial burn safety plan (Exhibit 1) will accompany the individual burn prescriptions and be onsite and on the ground the day of any aerial burn.

Wildfire Policy

In the event of a wildfire, if conditions permit, suppression strategies will utilize existing fuel breaks to contain the wildfire. These fuel breaks may include previously burned areas, existing roads, trails, and firelines, and wetlands and other water bodies. This is only possible, with the agreement of local fire rescue, FFS, District staff, and when all of the following conditions are met:

- 1) Fuels within the area have been managed
- 2) No extreme weather conditions are present or expected
- 3) There are no other wildfires that may require action
- 4) There are sufficient resources available to manage the fire to containment
- 5) The fire and the resulting smoke will not impact neighbors or smoke sensitive areas

If any of these conditions are not met, direct suppression action will be taken.

As soon as possible following a fire in which firelines are plowed, a plan for fireline rehabilitation shall be developed and implemented.

Persons discovering arson or wildfires on the Conservation Area should report them to the Florida Department of Agriculture and Consumer Services, Division of Forestry (FFS), the St. Johns River Water Management District, or by dialing 911.

Post Burn Reports

Burn reports must be completed after each controlled burn or wildfire. These reports include detailed information regarding the acreage, natural communities, staff and equipment hours, and contractor hours. The timely completion of these reports is necessary for the compilation of information relative to the entire District burn program. Additionally, these reports provide a documented account of site-specific conditions, which are helpful in the planning of future burns.

Regional staff are developing methodologies to conduct post burn monitoring. This monitoring will help determine if burn objectives are met and will aid in the planning of future prescribed fires.

Smoke Management

A significant challenge to the implementation of any prescribed burn program is smoke management. As surrounding areas become increasingly urbanized, this problem will increase in magnitude, as there become fewer acceptable places to maneuver a smoke column from a prescribed fire. Since acquisition, many of the fire management units within the Conservation Area have received multiple applications of prescribed fire which have effectively reduced fuel loads, which in turn eases smoke management concerns. While the Conservation Area has manageable fuel loads and has an acceptable smoke shed in which to place a smoke column from a prescribed fire, there are smoke sensitive areas that surround the Conservation Area and may affect the smoke management of each burn unit. Smoke management is a limiting factor in the application of prescribed fire within the Conservation Area. Figure 2 illustrates smoke sensitive

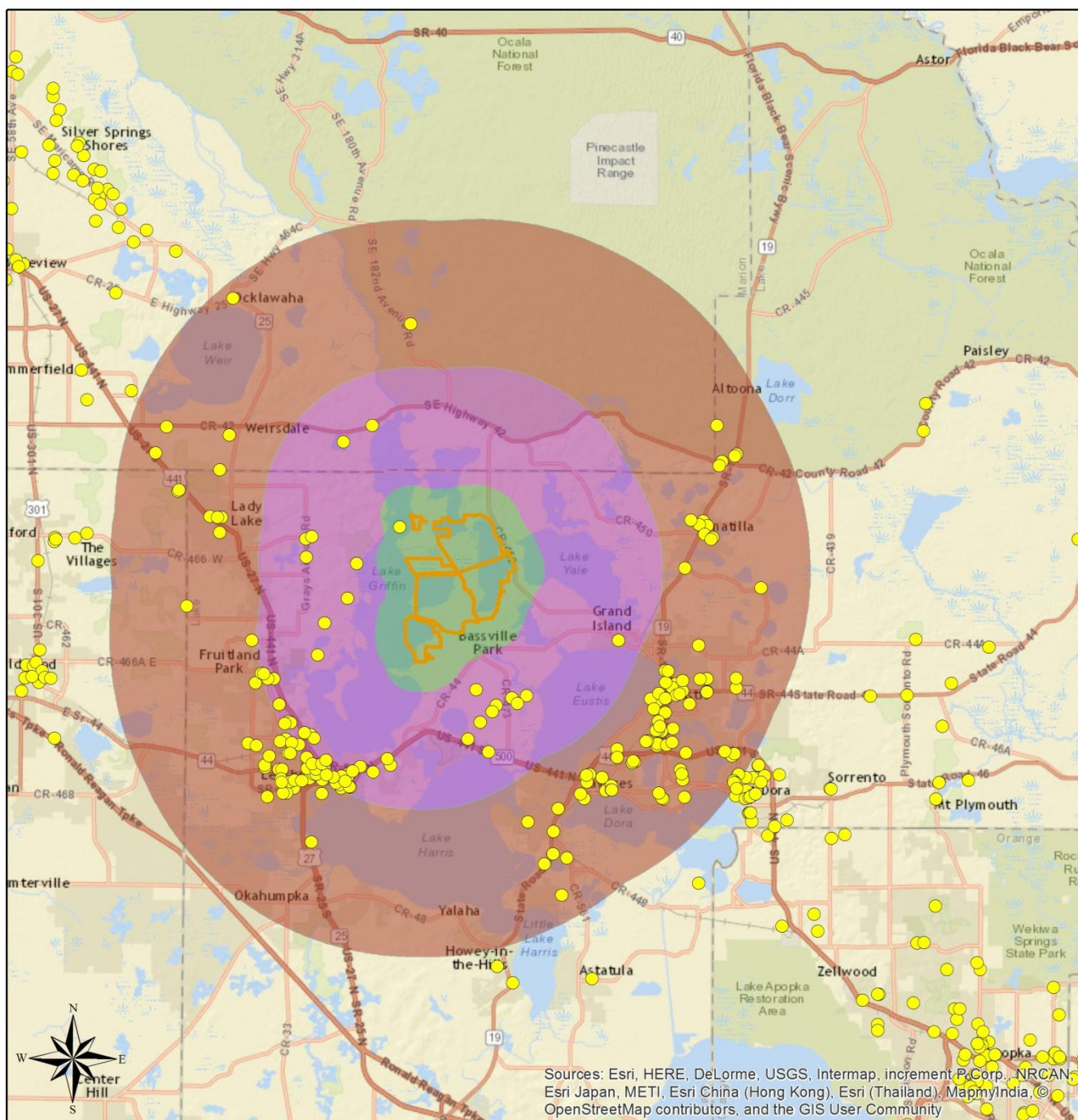
areas in relation to the Conservation Area. As development increases in the area, fire management will become more difficult. Increasing daily traffic on County Road 42, County Road 452, North County Road 44 and other local roads will further hinder the District's ability to implement prescribed burns at the appropriate fire return intervals within the Conservation Area.

A smoke screening process will be completed with each prescription, before an authorization is obtained from the FFS. A fire weather forecast is obtained and evaluated for suitable burning conditions and smoke management objectives. A wind direction is chosen that will transport smoke away from urbanized areas and/or impact these smoke sensitive areas in the least possible way. When possible, the smoke plume from burns should be directed back through the Conservation Area. Smoke can then mix and loft into the atmosphere over uninhabited or rural land adequately enough to minimize off-site impacts.

On burn day, the ability of smoke to mix and disperse into the atmosphere should be good. Dispersion indices should be above 35. Dispersions of greater than 69 will only be selected if other weather and/or site conditions mitigate the potential for extreme fire behavior. Forecast mixing heights should be above 1700ft. Transport winds should be at least 9 mph to effectively minimize residual smoke. Lower transport wind speeds can be utilized if dispersion index and mixing heights are above average. Burns will be conducted with a carefully plotted wind direction to limit and/or eliminate negative impacts from smoke to neighbors and urbanized areas.

Herbicide and Mechanical Treatments

Short and long-term weather conditions and urban interface issues are important considerations when implementing a prescribed fire program. Weather conditions such as extended droughts or insurmountable smoke management issues due to increased urbanization may require the District to manage natural systems using herbicide or mechanical methods. A variety of methods including mowing, roller chopping, and herbicide applications may be incorporated as alternatives to prescribed fire.



Emeralda Marsh Conservation Area
Figure 2 - Smoke Management Map



5.5
 Miles

 Conservation Area

 Schools and Healthcare Facilities

Smoke Management Radii

 1 mile
 5 miles
 10 miles

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Legal Considerations

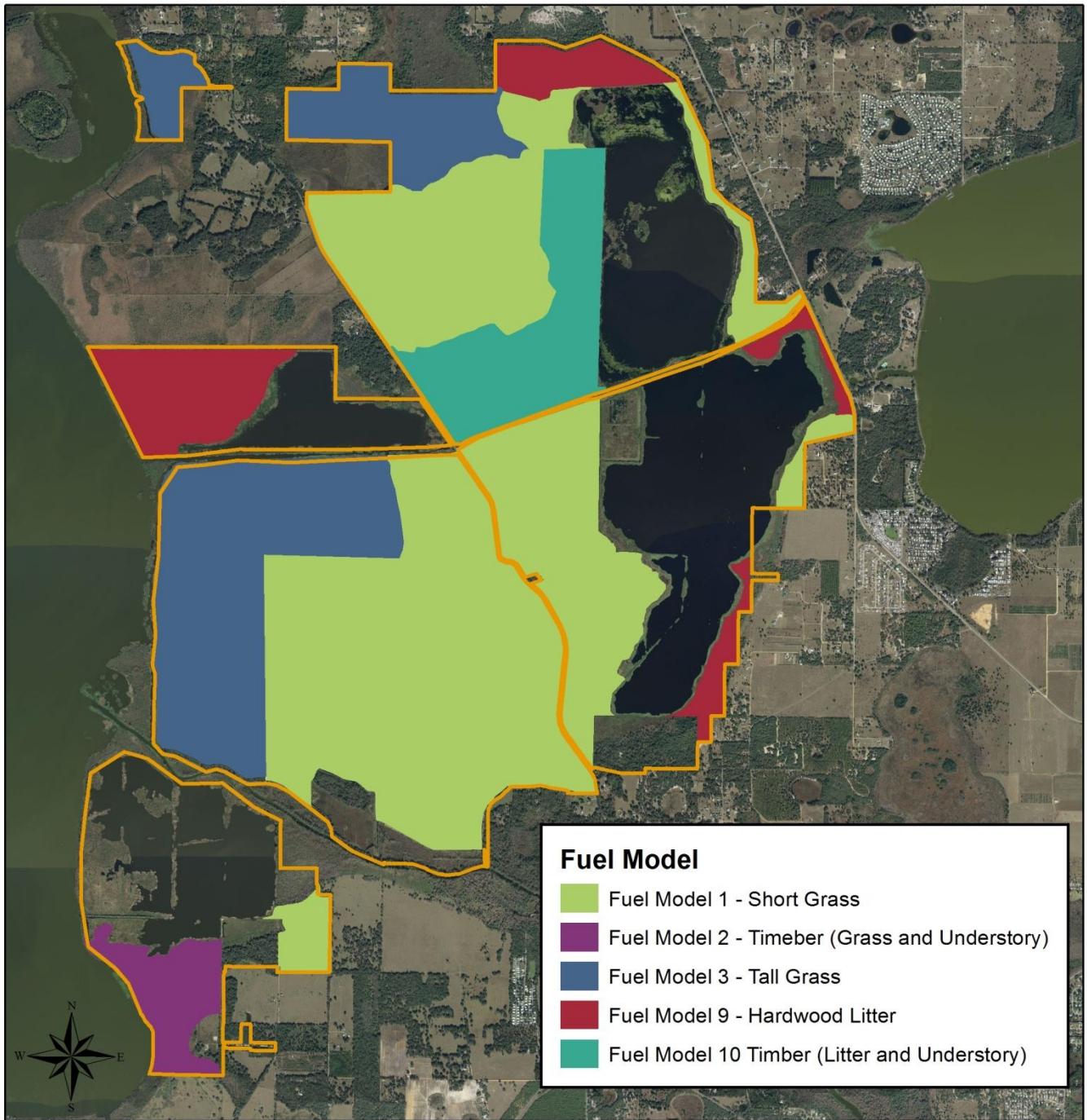
Only burn managers certified by FFS will approve the unit prescriptions and must be on site while the burn is being conducted. Certified burn managers adhering to the requirements of F.S. 590.026 are protected from liability for damage or injury caused by fire or resulting smoke, unless negligence is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

Fire Management Units

Fire management units (FMUs) have been delineated on the Conservation Area. Where logical, the District used existing roads and trails and natural breaks such as wetlands and water bodies to delineate fire management units. Occasionally, multiple fire management units with similar fire needs will be burned simultaneously and these delineations provide a break in fuels so that staff may burn smaller areas than initially planned if needed.

Ideally, District staff would thoroughly address and describe each fire management unit in terms of its fire management needs. Though all units within the bounds of the Conservation Area are somewhat different, all can be categorized into one of several fuel model (FM) descriptions. The thirteen standard fuel models (as described in Hal E. Anderson's *Aids to Determining Fuel Models For Estimating Fire Behavior*) were used as a basis for this categorization. The factors considered in determining each FM are amount, composition and arrangement of available fuels within units, predicted fire behavior within each unit (under conditions acceptable to implement a prescribed burn), and resources necessary to regain management of a fire in extenuating circumstances. District staff anticipates the change of vegetative assemblages over time due to growth and/or restoration and understand that fuel characteristics, models, and resulting fire behavior will also change.

Below is a brief description of each fuel model occurring within the FMUs currently delineated and the associated natural communities. A detailed description of each individual fire management unit and its associated objectives will be included in the individual prescriptions. Some fire management units within the Conservation Area contain multiple FMs. In these instances, the designated FM is dominant in coverage. Figure 3 illustrates the FM associated with individual fire management units.



Emeralda Marsh Conservation Area

Figure 3 - Fuel Model Map



0.75
Miles

 Conservation Area

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Fuel Models

Fuel Model 1 - Short Grass

In areas classified as a fuel model 1, groundcover is typically comprised of low and generally contiguous grasses with few trees and shrubs. Fires occurring in this fuel model are surface fires that tend to move rapidly, particularly when herbaceous components are cured.

Fuel Model 2 - Timber (Grass and Understory)

Vegetation in areas classified as a fuel model 2 typically includes a fine, nearly contiguous fine herbaceous groundcover layer. Litter from the open canopy of timber and shrubs contributes to the spread and intensity of fires in these systems, which is primarily carried as a surface fire through the groundcover. Thick stands of pine or clumps of shrubs in areas may contribute to more intense fire behavior.

Fuel Model 3 - Tall Grass

Areas classified as a fuel exhibit the most intense fire behavior of all the grass group models. Fires within this model are surface fires that spread quickly through tall grasses. In these areas, winds will drive fire through the upper reaches of the grasses and may perpetuate the spread of fire across areas of standing water

.

Fuel Model 9 - Hardwood Litter

Fires in areas classified as a fuel model 9 are carried through the surface litter. These areas are often closed stands of pine or oak. Fires in this environment are often lower intensity and predictable; however, high winds and/or a low relative humidity may increase fire behavior.

Fuel Model 10 – Timber (Litter and Understory)

Fires in areas classified as a fuel model 10 are often more intense than those in fuel model 9 due to the heavier accumulations of leaf litter and a significant concentration and coverage of larger dead wood. Crowning, torching, and spotting are more likely in this fuel model and may create difficulties with control.

Exhibit 1
Aerial Burn Safety Plan
Emeralda Marsh 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. **IGNITION MACHINE 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.

Helispots	Latitude	N 28 53' 53.3 Carrot Barn Pasture
	Longitude	W 81 47'31.4
	Latitude	N 28 54'08.9 Airstrip Levee
	Longitude	W 81 48'01.9

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 911**
2. Notify Lake County Fire and Rescue 352-383-1200
3. Notify Lake County Sheriff's Office 352- 343-2101
4. Assume responsibility of the Rescue Operation.
5. Notify NTSB 305-957-4610 OR 404-462-1666
6. 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.

Level I Trauma Center

1. ORMC Air Services– Orlando 321-841-5111 or 800-895-4615

FLORIDA FOREST SERVICE

1. Withlacoochee Dispatch 352-754-6757

NTSB

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

ADDENDUM 4 – SPECIES LISTS

Plants

<i>Acer rubrum</i>	Southern Red Maple
<i>Alternanthea philoxeroides</i>	Alligator-weed
<i>Amaranthus australis</i>	Southern Water Hemp
<i>Ambrosia artemisiifolia</i>	Common Ragweed
<i>Baccharis halimifolia</i>	Saltbush
<i>Bidens bipinnata</i>	Spanish Needles
<i>Buchnera americana</i>	Blueheart
<i>Callicarpa americana</i>	Beautyberry
<i>Campsis radicans</i>	Trumpet-vine
<i>Canna flaccida</i>	Golden Canna
<i>Celtis laevigata</i>	Hackberry
<i>Centella asiatica</i>	Spade Leaf
<i>Chenopodium ambrosioides</i>	Mexican Tea
<i>Cicuta maculata</i>	Water Hemlock
<i>Colocasia esculentum</i>	Wild Taro *
<i>Commelina diffusa</i>	Common Day-flower
<i>Cornus foemina</i>	Swamp Dogwood
<i>Desmodium incanum</i>	Creeping Beggarweed
<i>Duchesnea indica</i>	Mock Strawberry *
<i>Emilia fosbergii</i>	Florida tasselflower *
<i>Epidendrum conopseum</i>	Green Fly Orchid
<i>Eupatorium capillifolium</i>	Dog Fennel
<i>Galactia regularis</i>	Eastern Milkpea
<i>Habenaria spp.</i>	Wild Orchid
<i>Heliotropium angiospermum</i>	Scorpion-tail
<i>Hyptis verticillata</i>	Bushmint
<i>Ilex cassine</i>	Dahoon Holly
<i>Juniperus silicicola</i>	Southern Red Cedar
<i>Kosteletzkya virginica</i>	Saltmarsh Mallow
<i>Lantana camara</i>	Shrub Verbena *
<i>Limnobia spongia</i>	Frog's Bit
<i>Magnolia grandiflora</i>	Southern Magnolia
<i>Magnolia virginiana</i>	Sweetbay Magnolia
<i>Melanthera nivea</i>	Snow Squarestem
<i>Melilotus albus</i>	White Sweet Clover *
<i>Nymphaea odorata</i>	White Waterlily
<i>Osmunda cinnamomea</i>	Cinnamon Fern
<i>Parthenocissus quinquefolia</i>	Virginia Creeper
<i>Paspalum notatum</i>	Bahiagrass *

<i>Peltandra sagittifolia</i>	Spoonflower
<i>Persea palustris</i>	Swamp Bay
<i>Phragmites australis</i>	Common Reed
<i>Phyllanthus urinaria</i>	Chamber Bitter *
<i>Phytolacca americana</i>	Pokeberry; Pokeweed
<i>Pinus elliotii</i>	Slash Pine
<i>Pinus palustris</i>	Longleaf
<i>Pinus taeda</i>	Loblolly
<i>Pluchea odorata</i>	Saltmarsh Fleabane
<i>Poinsettia cyathophora</i>	Painted-leaf
<i>Pontederia cordata</i>	Pickernelweed
<i>Quercus laurifolia</i>	Laurel Oak
<i>Quercus virginiana</i>	Live Oak
<i>Sabal palmetto</i>	Cabbage Palm
<i>Sagittaria lancifolia</i>	Arrowhead
<i>Sagittaria latifolia</i>	Common Arrowhead
<i>Salix caroliniana</i>	Carolina Willow
<i>Sambucus canadensis</i>	Elderberry
<i>Sapium sebiferum</i>	Chinese Tallow Tree *
<i>Saururus cernuus</i>	Lizard's-tail
<i>Scirpus californicus</i>	Giant Bulrush
<i>Serenoa repens</i>	Saw Palmetto
<i>Smilax laurifolia</i>	Catbrier
<i>Tillandsia spp.</i>	Spanish Moss
<i>Typha latifolia</i>	Common Cattail
<i>Vaccinium corymbosum</i>	Highbush Blueberry
<i>Verbesina virginica</i>	Frostweed
<i>Vitis aestivalis</i>	Summer Grape

Reptiles and Amphibians

<i>Agkistrodon piscovorus conanti</i>	Florida Cottonmouth
<i>Alligator mississippiensis</i>	American Alligator
<i>Anaxyrus terrestris</i>	Southern Toad
<i>Anolis carolinensis</i>	Green Anole
<i>Anolis sagreii</i>	Cuban Brown Anole
<i>Apalone ferox</i>	Florida Softshell Turtle
<i>Chelydra serpentina osceola</i>	Florida Snapping Turtle
<i>Coluber constrictor priapus</i>	Southern Black Racer
<i>Crotalus adamanteus</i>	Eastern Diamondback Rattlesnake

Eleutherodactylus planirostris
Gastrophryne carolinensis
Gopherus polyphemus
Hyla cinerea
Hyla squirella
Kinosternon baurii
Lithobates grylio
Lithobates sphenoccephalus
Nerodia floridana
Nerodia erythrogaster flavigaster
Nerodia fasciata fasciata
Nerodia taxispilota
Notophthalmus viridescens
piaropicola
Opheodrys aestivus aestivus
Pantherophis alleghaniensis
Pantherophis guttatus
Plestiodon inexpectatus
Plestiodon laticeps
Regina alleni
Scincella lateralis
Sistrurus miliaris barbouri
Sternotherus odoratus
Terrapene carolina bauri
Thamnophis sauritus saceknii
Thamnophis sitalis sirtalis

Greenhouse Frog
 Eastern Narrowmouth Toad
 Florida Gopher Tortoise
 Green Tree Frog
 Squirrel Tree Frog
 Striped Mud Turtle
 Pig Frog
 Southern Leopard Frog
 Florida Green Water Snake
 Yellow-bellied Water Snake
 Florida Banded Water Snake
 Brown Water Snake
 Peninsula Newt

 Northern Rough Green Snake
 Yellow Rat Snake
 Corn Snake
 Southeastern Five-lined Skink
 Broadhead Skink
 Striped Crayfish Snake
 Ground Skink
 Dusky Pigmy Rattlesnake
 Eastern Musk Turtle
 Florida Box Turtle
 Peninsula Ribbon Snake
 Eastern Garter Snake

Mammals

Canis latrans
Dasypus novemcinctus
Didelphis virginiana
Lutra canadensis
Lynx rufus
Odocoileus virginianus
Procyon lotor
Sciurus carolinensis
Sigmodon hispidus
Sus scrofa
Sylvilagus palustris
Ursus americanus floridanus

Coyote *
 Nine-banded Armadillo *
 Virginia opossum
 River Otter
 Bobcat
 White-tailed Deer
 Raccoon
 Grey Squirrel
 Hispid Cotton Rat
 Feral Hog*
 Marsh Rabbit
 Florida Black Bear

Fish

<i>Ameriurus catus</i>	White Catfish
<i>Ameiurus natalis</i>	Yellow Bullhead
<i>Ameiurus nebulosus</i>	Brown Bullhead
<i>Amiacalva</i>	Bowfin
<i>Dorosoma cepedianum</i>	Gizzard Shad
<i>Dorosoma petenense</i>	Threadfin Shad
<i>Erimyzon sucetta</i>	Lake Chubsucker
<i>Gambusia affinis</i>	Mosquitofish
<i>Heterandria formosa</i>	Least Killifish
<i>Lepisosteus osseus</i>	Longnose Gar
<i>Lepisosteus platyrhincus</i>	Florida Gar
<i>Lepomis gulosus</i>	Warmouth
<i>Lepomis macrochirus</i>	Bluegill
<i>Lepomis microlophus</i>	Redear Sunfish
<i>Lucania goodei</i>	Bluefin Killifish
<i>Micropterus salmoides</i>	Largemouth Bass
<i>Notemigonus crysoleucas</i>	Golden Shiner
<i>Oreochromis aurea</i>	Blue Tilapia*
<i>Poecilia latipinna</i>	Sailfin Molly
<i>Pomoxis nigromaculatus</i>	Black Crappie

Birds

Ducks, Geese, and Waterfowl	Cattle Egret
Black-bellied Whistling-Duck	Green Heron
Fulvous Whistling-Duck	Black-crowned Night-Heron
Gadwall	Yellow-crowned Night-Heron
American Wigeon	Great Egret
Mottled Duck	Ibises and Spoonbills
Blue-winged Teal	White Ibis
Northern Shoveler	Glossy Ibis
Northern Pintail	White-faced Ibis
Green-winged Teal	Roseate Spoonbill
Canvasback	New World Vultures
Redhead	Black Vulture
Lesser Scaup	Turkey Vulture
Ruddy Duck	Ospreys
Mallard	Osprey
Red-breasted Merganser	Hawks, Eagles, and Kites
Show Goose	Bald Eagle
Bufflehead	Swallow-tailed Kite
New World Quail	Snail Kite
Northern Bobwhite Quail	Golden Eagle
Pheasants, Grouse, and Allies	Northern Harrier
Wild Turkey	Sharp-shinned Hawk
Grebes	Cooper's Hawk
Pied-billed Grebe	Red-shouldered Hawk
Storks	Broad-winged Hawk
Wood Stork	Short-tailed Hawk
Cormorants and Shags	Red-tailed Hawk
Double-crested Cormorant	Rough-legged Hawk
Anhingas	Rails, Gallinules, and Coots
Anhinga	King Rail
Pelicans	Virginia Rail
American White Pelican	Black Rail
Brown Pelican	Sora
Hérons, Egrets, and Bitterns	Purple Gallinule
American Bittern	Common Gallinule
Least Bittern	American Coot
Great Blue Heron	Limpkin
Snowy Egret	Limpkin
Little Blue Heron	Cranes
Tricolored Heron	Sandhill Crane

Stilts and Avocets	Eastern-Screech-Owl
Black-necked Stilt	Great Horned Owl
American Avocet	Barred Owl
Plover and Lapwings	Swifts
Semipalmated Plover	Chimney Swift
Killdeer	Hummingbirds
Nightjars	Ruby-throated Hummingbird
Common Nighthawk	Kingfishers
Chuck-will's Widow	Belted Kingfisher
Sandpipers and Allies	Woodpecker
Spotted Sandpiper	Red-bellied Woodpecker
Solitary Sandpiper	Yellow-bellied Woodpecker
Greater Yellowlegs	Downy Woodpecker
Stilt Sandpiper	Northern Flicker
Dunlin	Pileated Woodpecker
Least Sandpiper	Falcons and Caracaras
Western Sandpiper	American Kestrel
Short-billed Sandpiper	Merlin
Long-billed Dowitcher	Peregrine Falcon
Short-billed Dowitcher	Tyrant Flycatchers
Wilson's Snipe	Eastern Wood-Pewee
Gulls, Terns, and Skimmers	Acadian Flycatcher
Bonaparte's Gull	Least Flycatcher
Laughing Gull	Ash-throated Flycatcher
Ring-billed Gull	Great Crested Flycatcher
Caspian Gull	Eastern Kingbird
Black Tern	Shrikes
Forester's Tern	Loggerhead Shrike
Royal Tern	Vireos, Shrike-Babble Erpornis
Pigeons and Doves	White-eyed Vireo
Rock Pigeon	Yellow-throated Vireo
Eurasian Collard-Dove	Blue-headed Vireo
Common Ground-Dove	Red-eyed Vireo
White-winged Dove	Crows, Jays, and Magpies
Mourning Dove	Blue Jay
Cuckoos	American Crow
Yellow-billed Cuckoo	Fish Crow
Barn-Owl	Swallows
Barn Owl	Northern Rough-winged Swallow
Owls	Purple Martin

Tree Swallow	Orange-crowned Warbler
Bank Swallow	Nashville Warbler
Barn Swallow	Connecticut Warbler
Cliff Swallow	Common Yellowthroat
Tits, Chickadees, and Titmice	Hooded Warbler
Carolina Chickadee	American Redstart
Tufted Titmouse	Cerulean Warbler
Wrens	Northern Parula
House Wren	Cape May Warbler
Sedge Wren	Magnolia Warbler
Marsh Wren	Blackburnian Warbler
Carolina Wren	Yellow Warbler
Gnatcatchers	Blackpoll Warbler
Blue-gray Gnatcatcher	Black-throated Blue Warbler
Kinglets	Palm Warbler
Golden-crowned Kinglet	Pine Warbler
Ruby-crowned Kinglet	Yellow-rumped Warbler
Thrushes and Allies	Yellow-throated Warbler
Eastern Bluebird	Prairie Warbler
Veery	Yellow breasted Chat
Swainson's Thrush	Buntings and New World Sparrows
Hermit Thrush	Eastern Towhee
American Robin	Chipping Sparrow
Mockingbirds and Thrashers	Field Sparrow
Gray Catbird	Vesper Sparrow
Brown Thrasher	Savannah Sparrow
Northern Mockingbird	Grasshopper Sparrow
Starlings	Song Sparrow
European Starling	Lincoln's Sparrow
Waxwings	Swamp Sparrow
Cedar Waxwing	White-throated Sparrow
New World Warblers	White-crowned Sparrow
Ovenbird	Cardinals and Allies
Louisiana Waterthrush	Scarlet Tanager
Northern Waterthrush	Northern Cardinal
Blue-winged Warbler	Rose-breasted Grosbeak
Black-and-White Warbler	Blue Grosbeak
Prothonotary Warbler	Lazuli Bunting
Swainson's Warbler	Indigo Bunting
Tennessee Warbler	Painted Bunting

