Section 4(f)
Determination of Applicability

for the

Prepared for:

Seminole County Contract No.: PS-5738-10/JVP
Financial Project ID: 240216-4-28-01
Federal Aid Project No.: TCSP-045-U
ETDM No.: 4972

July 2015

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1.0 INTRODUCTION

Seminole County is conducting a Project Development and Environment (PD&E) Study for the widening of SR 46 from east of SR 415 to CR 426 in Seminole County, FL. In support of this PD&E Study, an evaluation of potential impacts to Section 4(f) properties is being performed.

The purpose of this package is to aid the Federal Highway Administration (FHWA) in determining the applicability of Section 4(f) to the Lake Jesup Conservation Area (LJCA). This Determination of Applicability (DOA) is prepared in compliance with 49 USC 303 and Part 2, Chapter 13 of the Florida Department of Transportation's (FDOT) *PD&E Manual*.

2.0 PROJECT DESCRIPTION

SR 46 is an east-west arterial highway that extends from US 441 in Mount Dora (Lake County) to US 1 in Mims (Brevard County). The limits of this PD&E Study are from east of SR 415 in unincorporated Seminole County to CR 426 in Geneva, FL, an unincorporated census-designated place (see Figure 1). SR 46 serves as a major evacuation route for residents of south Volusia and north Brevard Counties. The closest evacuation routes to SR 46 on I-95 are SR 44, 25 miles to the north and SR 50, eight miles to the south. Within the project limits, SR 46 is a two-lane rural principal arterial comprised of one 12-foot lane in each direction with six-foot shoulders (four-foot paved). Stormwater sheet flows off the roadway into roadside ditches (see Figure 2).

There is one bridge within the project limits (No. 770094), which spans Lake Jesup/St. Johns River. The bridge was built in 2009 and is 3,740 feet long. The bridge was built with the intent to add a second parallel bridge to the north along the original SR 46 alignment for the ultimate condition of a four-lane facility. The bridge typical section consists of one 12-foot travel lane in each direction and 10-foot shoulders (see Figure 3).

The existing roadway is centered within 100 feet of right-of-way. There is a 3,200 foot segment of SR 46 just west of the bridge with an additional 27 feet of right-of-way on the north side of the roadway. In addition, the existing right-of-way varies at both bridge approaches.

There are two signalized intersections within the project limits at SR 415 and at CR 426. SR 46 from Mellonville Road to east of SR 415 has been designed as a four-lane arterial and is in the right-of-way acquisition phase. The improvements maintain the full-width typical section for approximately 750 feet east of SR 415; therefore, this project does not propose any improvements to the signalized intersection of SR 46 with SR 415.

Figure 1 – Project Location Map

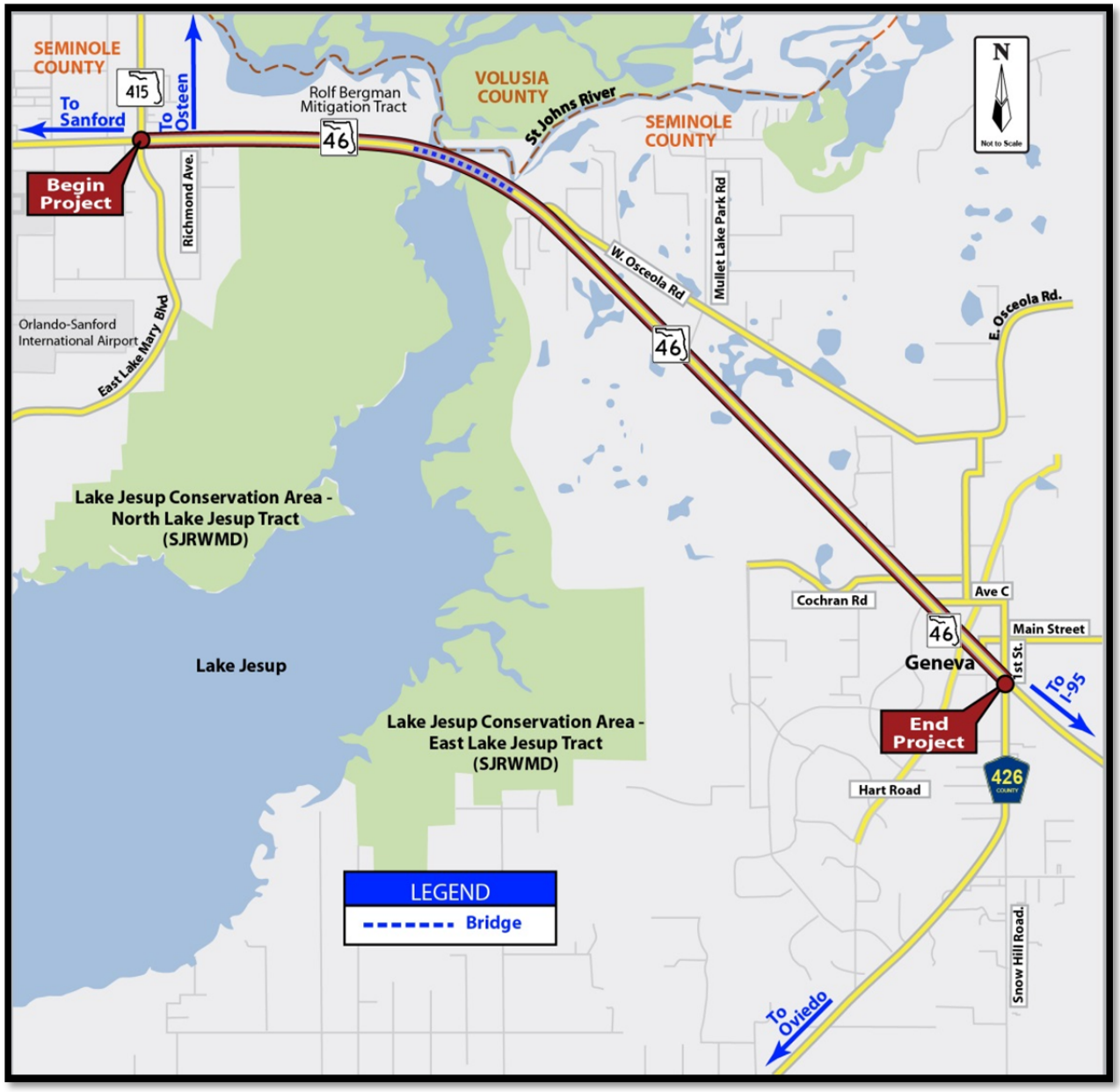


Figure 2 – Existing Typical Section

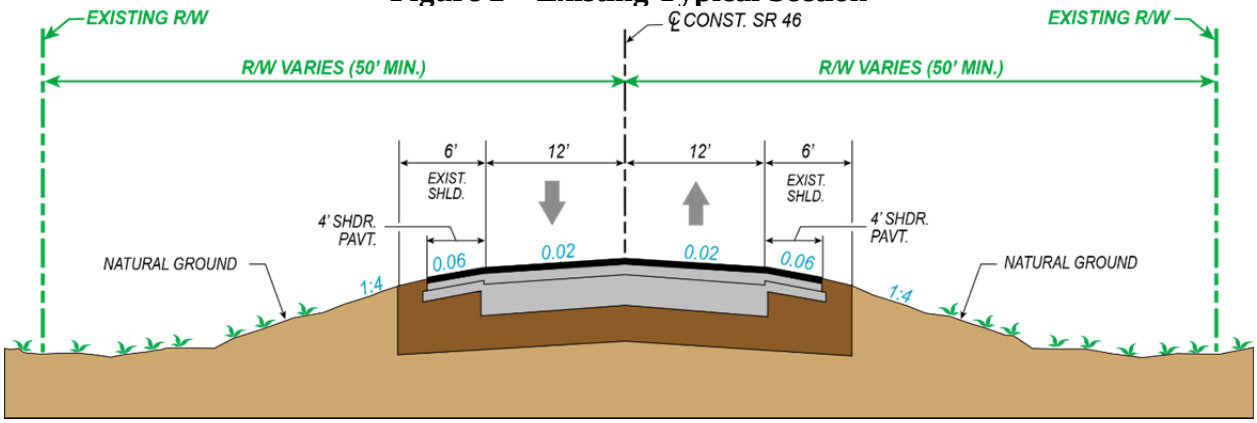
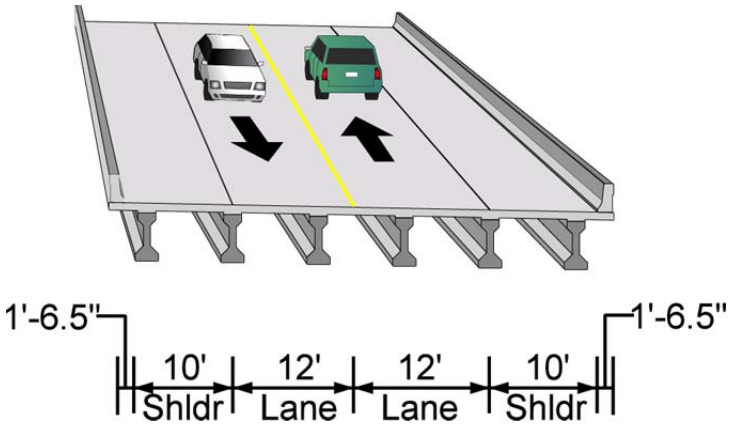


Figure 3 – Existing Bridge Typical Section



3.0 ALTERNATIVES CONSIDERED

3.1 No-Build Alternative

The No-Build Alternative provides no improvements to SR 46 within the project limits. Other planned and programmed roadway projects identified in Metroplan Orlando's Long Range Transportation Plan (LRTP) are assumed to be implemented. The absence of construction-related and short-term operational impacts associated with the Build Alternative is a benefit of the No-Build Alternative. Long-term benefits accrued from serving future traffic demands would not be realized with this alternative. Continued traffic growth on SR 46 will result in traffic volumes in excess of capacity, thereby increasing congestion. Distinct advantages and limitations associated with the No-Build Alternative are as follows:

Advantages

- No impedance to traffic flow during construction.
- No disruption to existing land uses because of construction activities.
- No right-of-way acquisition or relocations.
- No expenditure of funds for engineering design or construction.
- No impacts to the adjacent natural, physical, human and social environments.

Limitations

- Increase in traffic congestion and user cost associated with increased travel time due to excessive delay.
- Increase in carbon monoxide and other pollutants due to increased traffic congestion.
- Increase in maintenance costs due to roadway and structure deterioration.
- Increase in emergency vehicle response time.
- Increase in evacuation time during weather emergencies as a result of heavy congestion.
- Increase in crash potential because of increased congestion.
- Not compatible with the area's long range plans.
- No opportunity for potential additional mitigation to Lake Jesup/St. Johns River

The No-Build Alternative remains a viable alternative through the Public Hearing phase of the project.

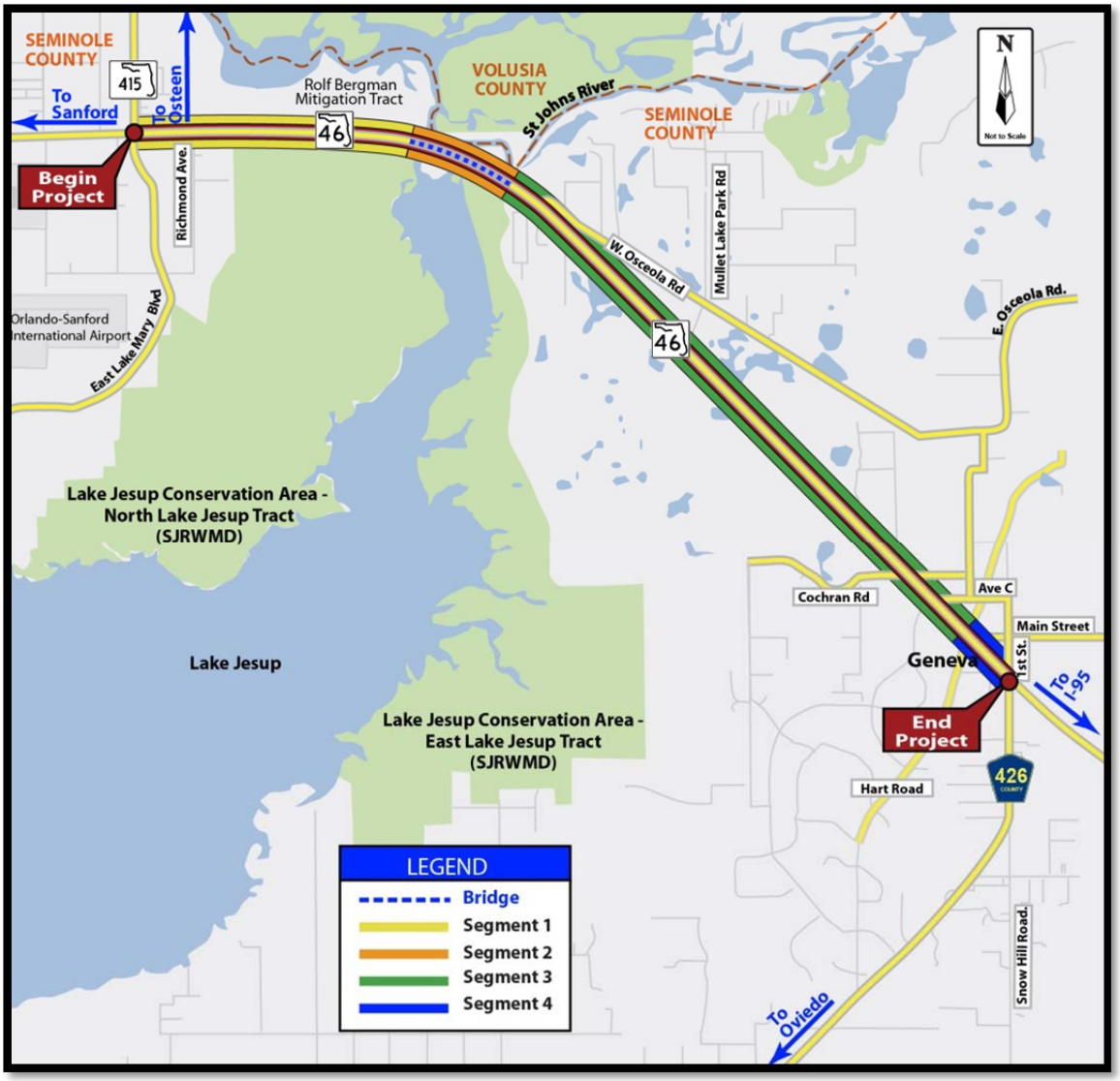
3.2 Build Alternatives

For the purposes of analyzing build alternatives, the project was split into four segments as follows:

- Segment 1 – SR 415 to the west end of the Lake Jesup/St. Johns River Bridge
- Segment 2 – The Lake Jesup/St. Johns River Bridge
- Segment 3 – The east end of the Lake Jesup/St. Johns River Bridge to Hart Road
- Segment 4 – Hart Road to CR 426

The project segments are shown on Figure 4.

Figure 4 – Project Segments

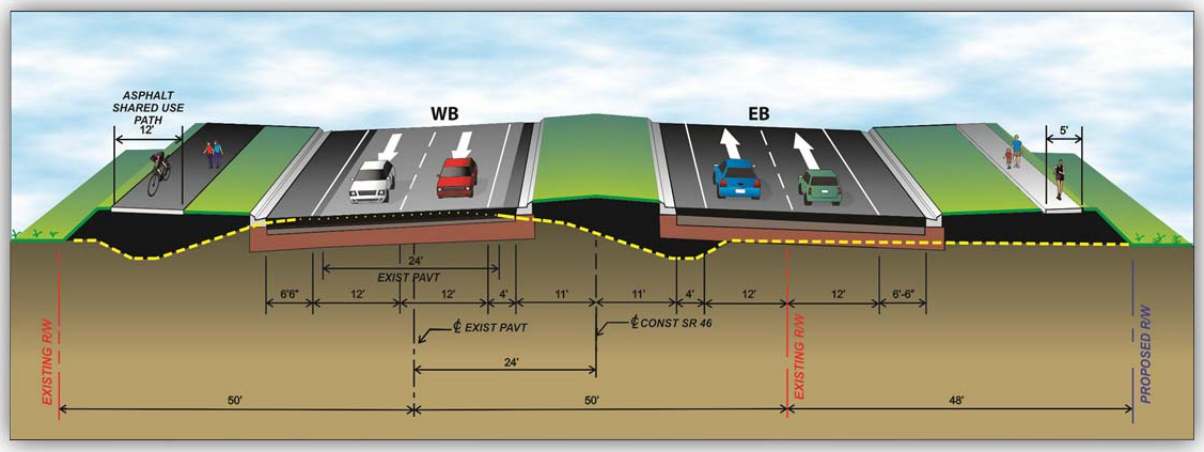


The proposed alternative consists of the following improvements for each segment:

Segment 1 improvements consist of widening the existing two-lane rural roadway to a four-lane suburban roadway section from SR 415 to the west end of the Lake Jesup Bridge. The proposed widening will occur primarily on the south side of SR 46 within this segment specifically to avoid the Bergmann Tract mitigation bank north of SR 46 in this segment. Initially, widening to the north is required at SR 415 to tie into the ongoing widening west of SR 415. Transitioning to the north just west of Old Geneva Road occurs to tie into the proposed new bridge on the north side of the existing bridge.

The proposed suburban typical section for this segment consists of two 12-foot travel lanes in each direction with four-foot inside shoulders and 6.5-foot outside shoulders. The travel lanes are separated by a 22-foot median. A 10-foot shared use path is proposed on the north side of the roadway. A five-foot sidewalk is proposed on the south side. The sidewalk and path are separated from the travel lanes by a grassed area in the border. The total width of the proposed right-of-way is 148 feet. The proposed typical section is illustrated in Figure 5.

Figure 5 – Suburban Typical Section – Widen to the South
SR 415 to the west end of Lake Jesup Bridge

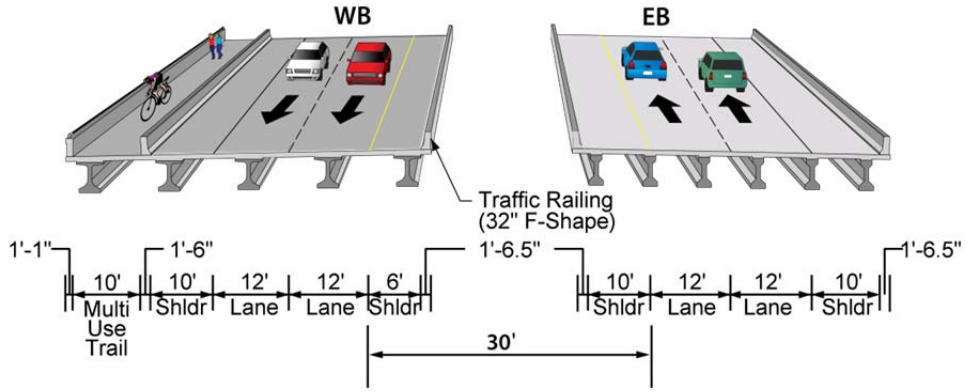


Segment 2 improvements consist of construction of a new, two-lane bridge over Lake Jesup, parallel to, and north of, the existing bridge. The proposed bridge would be of similar design and approximately the same length as the existing bridge. The existing bridge will provide the future eastbound lanes. The proposed westbound lanes will be constructed on the previous alignment of the old bridge and causeway that was removed after construction of the existing bridge. The proposed typical section for the parallel bridges is shown in Figure 6.

The proposed new bridge will provide two 12-foot westbound travel lanes, a 10-foot wide outside shoulder and 6-foot inside shoulder. In addition, a 10-foot wide barrier-separated shared use path will be provided on the new bridge. The existing bridge will be restriped to provide two 12-foot eastbound travel lanes with 10-foot shoulders on both sides.

The new bridge will be offset from the existing bridge approximately 11 feet to the north. As shown in Figure 6, the proposed typical section for the two bridges, this offset will provide a total of 30 feet between eastbound and west bound travel lanes. Accordingly, the proposed new bridge will align with the roadway typical sections at both bridge approaches.

Figure 6 –Bridge Typical Section



Segment 3 consists of the expansion of a two-lane rural roadway to a four-lane suburban roadway section from the east end of the Lake Jesup Bridge to Hart Road. Both the Suburban Widen to the South and Suburban Widen to the North typical sections will be used in Segment 3. Widening to the north or south varies within this segment to minimize impacts to the natural, physical and social environments. The combination of these typical sections for the Recommended Alternative is referred to as the "Suburban Best Fit Alternative" in the Preliminary Engineering Report prepared for this project. Both of these suburban typical sections require 148 feet of right-of-way and are illustrated in Figures 7 and 8.

Figure 7 – Suburban Typical Section – Widen to the South

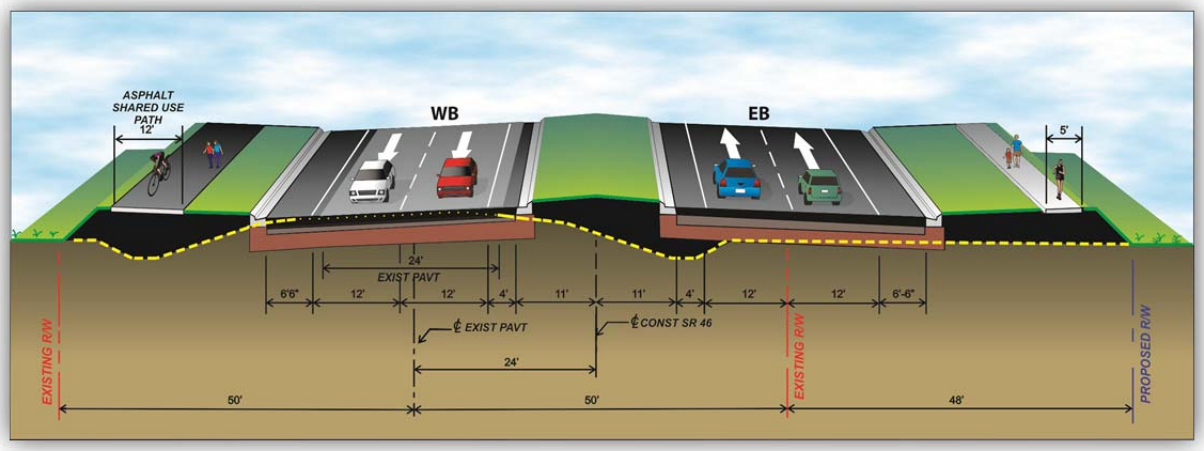
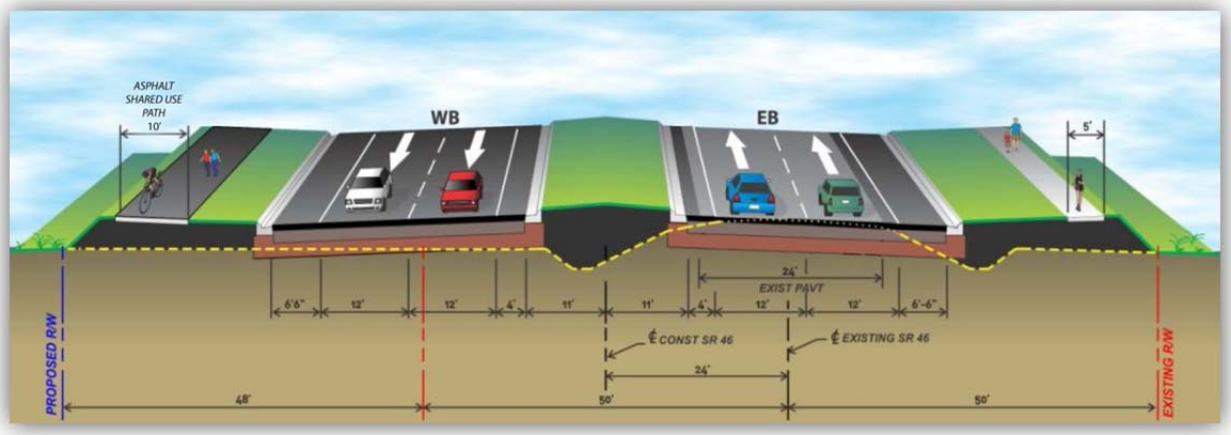
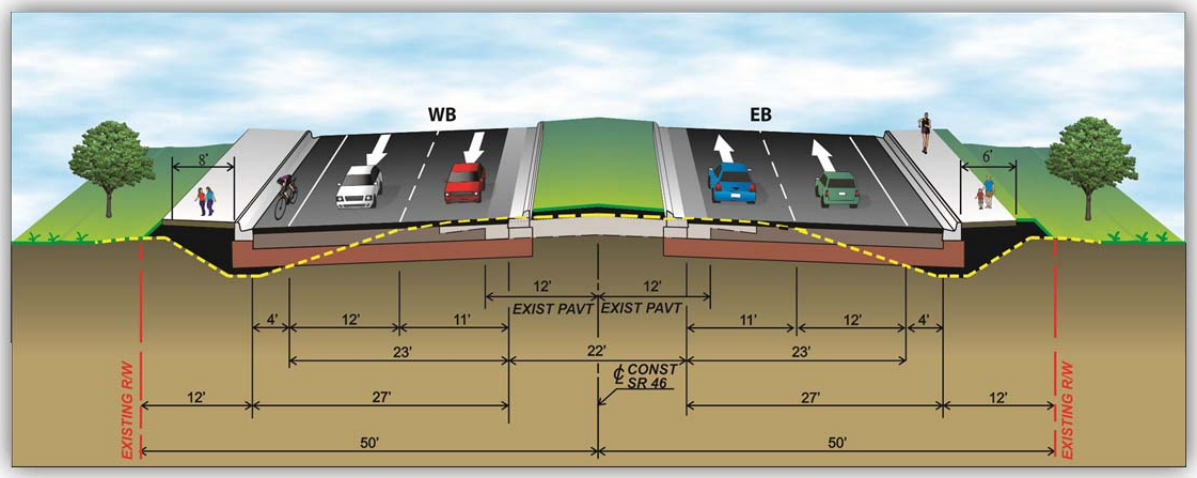


Figure 8 – Suburban Typical Section – Widen to the North



Segment 4 consists of the expansion of a two-lane rural roadway to a four-lane urban roadway segment between Hart Road and CR 426. The proposed urban section only requires 100 feet of right-of-way and is proposed in Segment 4 to minimize impacts to the commercial properties in downtown Geneva. Figure 9 illustrates the proposed urban typical section.

Figure 9 – Urban Typical Section – Centered Widening



The proposed urban typical section provides one 12-foot wide and one 11-foot wide lane in each direction separated by a 24-foot wide median. Four foot outside shoulders will be provided on both sides of the roadway. An eight-foot sidewalk is proposed on the north side of the road and a six-foot sidewalk is proposed on the south side.

4.0 POTENTIAL SECTION 4(f) RESOURCES

One potential Section 4(f) resource that may be impacted by the proposed improvements has been identified within the project corridor: the Lake Jesup Conservation Area (LJCA), which was created through the acquisition of 12 separate parcels of land. Following is a list of required information consistent with Part 2, Chapter 13 of the *PD&E Manual* for FHWA's formal Determination of Applicability. Additional information regarding the LJCA, including the Management Plan and ownership information, is included in Appendix A.

1. A detailed map or drawing of sufficient scale to identify the relationship of the alternatives to the property.

The LJCA is located around Lake Jesup in Seminole County, Florida. SR 46 forms a portion of the northern boundary of the LJCA as shown in Figure 10. The northern boundary of the North Lake Jesup tract of the LJCA is the south right of way line of SR 46 for approximately 1.3 miles from east of Richmond Avenue to the bridge over Lake Jesup/St. Johns River. The proposed improvements require an additional 48 feet of right-of way to widen SR 46 from four to six lanes. Conceptual design plans showing the proposed improvements through the LJCA are included in Appendix B.

2. Size and location of the affected property.

There are two large tracts under recorded conservation easements immediately adjacent to SR 46 between SR 415 and the bridge over Lake Jesup/St. Johns River; these include the Rolf Bergmann Mitigation Tract and the North Lake Jesup Tract (the portion of the North Lake Jesup Tract that borders SR 46 is formerly known as the Futch Property) of the LJCA. The Rolf Bergmann Mitigation Tract is adjacent to the north side of SR 46 and is a private mitigation bank. The North Lake Jesup Tract of the LJCA is on the south side of SR 46 and is publicly owned. Both tracts are located west of the bridge over Lake Jesup/St. Johns River.

The LJCA is divided into three different areas around Lake Jesup as shown in Figure 10. The entirety of the LJCA is comprised of 12 parcels totaling 6,220 acres (see Figure 11), with the former Futch Property comprising 1,990 acres as shown on the SJRWMD acquisition history map on Figure 11.

Figure 10 – Lake Jesup Conservation Area

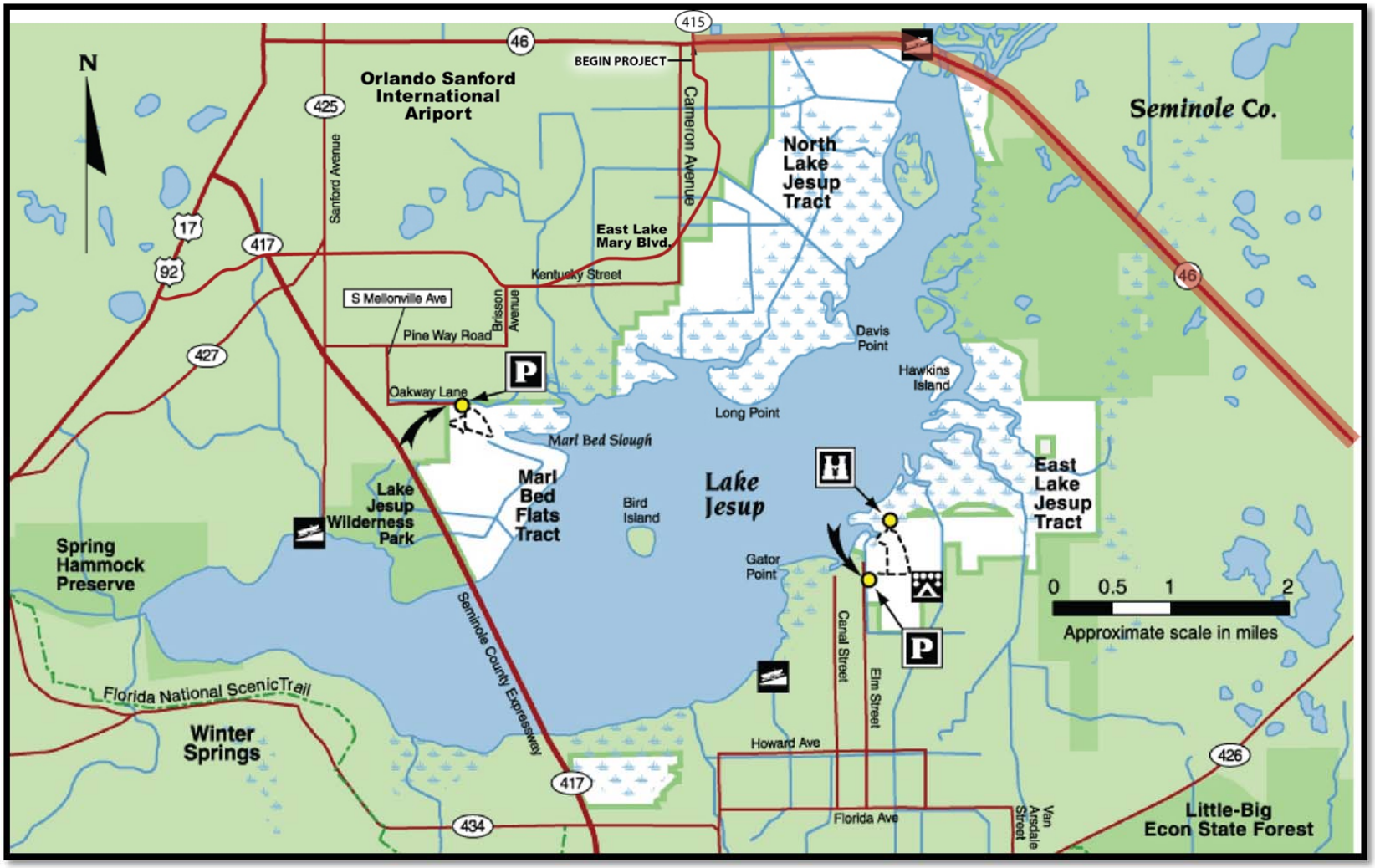
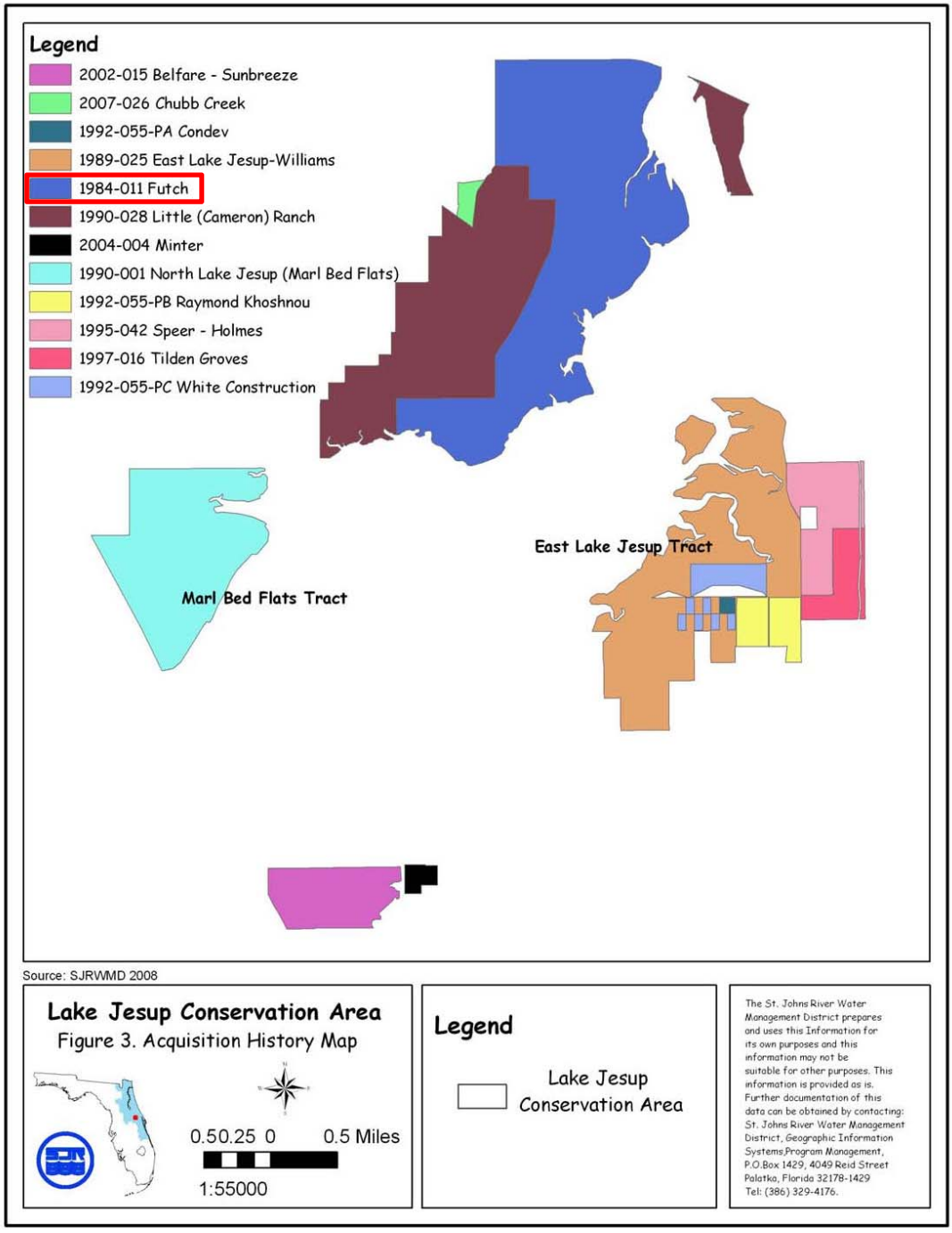


Figure 11 – LJCA Property Acquisition Map



SOURCE: Lake Jesup Conservation Area Land Management Plan – February 2008

3. Ownership and type of property.

In 1990, the Futch Property was conveyed to FDOT for use as a mitigation site for impacts to wetlands created by the construction of the Seminole Expressway (SR 417). As part of the regulatory permit for the construction of the project, FDEP holds a conservation easement over

the Futch Property. In 2000 this property was conveyed back SJRWMD with an endowment for management activities. SJRWMD monitors the success of the reforested wetlands in accordance with the Futch Restoration Plan.

The entire LJCA is available for passive recreation; however, the Futch property is intended for multiple uses and not designated, managed or planned for a specific recreational use. The LJCA is managed for the preservation of habitat and for general conservation purposes and the intent of the Futch Restoration Plan is to improve the water quality of Lake Jesup by reducing pollutant loadings and increasing hydraulic circulation. The Futch property is not designated by statute or identified in the official management plan as an area managed as a wildlife refuge.

4. Function of or available activities on the property

Initially, the North Lake Jesup Tract and the Marl Bed Flats Tract were purchased to meet legislative requirements established for mitigation of the Seminole Expressway (SR 417). As of January 2015, along with the East Lake Jesup Tract, these lands contribute to the enhancement and protection of water resources and increased flood protection and the protection of ecological functions and habitats in the Lake Jesup area. The Marl Bed Flats Tract was jointly acquired by SJRWMD and Seminole County, and the county's Wilderness Park with boat ramp is located on the southwest corner of this tract. The LJCA is mostly composed of floodplain wetlands and wooded hammocks. Limited recreational activities such as hiking, bicycling, wildlife viewing and primitive camping are permitted on restricted areas of the property. No designated recreational facilities will be impacted by the proposed improvements.

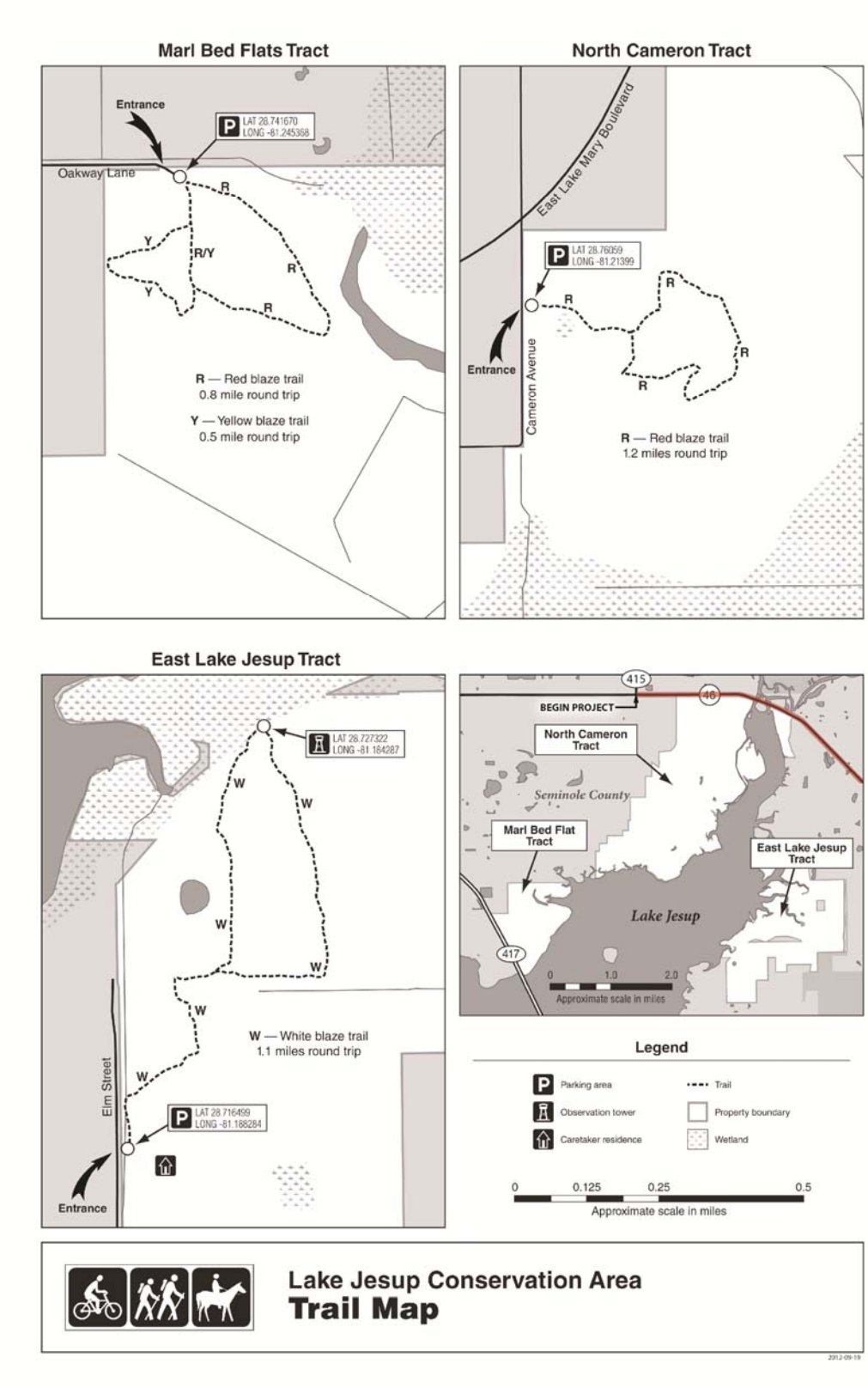
5. Description and location of all existing and planned facilities.

Recreational activities that are available in the LJCA include hiking, biking, horseback riding and wildlife viewing. Multi-use trails, camping and an observation tower are located on the East Lake Jesup Tract and there are also multi-use trails at the Marl Bed Flats Tract and the Cameron Tract (see Figure 10). While the Cameron Tract is part of the North Lake Jesup Tract, it is west of and adjacent to the Futch Property. FDEP holds a conservation easement only on the Futch property. There are no available active recreational activities on the Futch Property and no additional recreational facilities are planned for the future.

6. Access and usage.

There is no designated access to the former Futch Property and no available active public uses, although the property is available for passive recreational use. Designated public uses on the LJCA are shown on Figure 12, and are not located on the Futch property. There are no existing or planned active recreational uses on the Futch property. Access to public uses on the LJCA in

Figure 12 – Public Uses in the LJCA



the area of the direct impact from the proposed SR 46 improvements are located well south of SR 46. Trailhead access for the two short (0.8 miles and 0.5 miles) hiking trails in the North Cameron Tract is on Cameron Avenue, which intersects with SR 46 just west of SR 415. The trailhead is approximately 1.8 miles south of SR 46.

There is no access from the SR 46 project area to the public activities available in the Marl Bed Flats Tract or the East Lake Jesup Tract.

7. Relationship to other similarly used lands in the vicinity.

SJRWMD owns and maintains approximately 700,000 acres of land in its 18-county service area. The main purpose of land acquisition and management is to protect and preserve water resources; however, these lands protect plant and wildlife habitat and provide areas for public recreation and environmental education. Most district property is open to the public for activities that are compatible with conservation.

The Rolf Bergman Mitigation Tract is located north of SR 46 across from the LJCA and is a private mitigation bank. Like the LJCA, it is of regional ecological significance due to its location and hydrologic importance to the St. Johns River and the Lake Jesup watershed and floodplain.

8. Applicable clause affecting the ownership, such as lease, easement, covenants, restrictions, or conditions, including forfeiture.

FDEP owns a conservation easement over the Futch Property.

9. Unusual characteristics of the property that either reduce or enhance the value of all or part of the property.

The site is primarily wetlands and floodplains associated with Lake Jesup and the St. Johns River. The area that is proposed to be acquired for the widening of SR 46 lies within the 100-year floodplain and is classified as mixed wetland hardwoods.

10. Statement of significance from the official who has jurisdiction over the property. The significance is on the entire property and not of the proposed use.

A statement of significance from SJRWMD is attached as Appendix C for reference. The letter states that the area proposed to be acquired will not adversely affect the activities, features and conservation attributes for which the LJCA was purchased and is managed. Further, no constructed features that function primarily for recreational use will be impacted by the proposed improvements.

11. Whenever a potential constructive use is identified include a description of the attributes or features of the property which may be sensitive to proximity impacts along with a discussion and evaluation of project activities which may result in proximity impacts to the resource.

There are no constructive uses anticipated as part of the proposed improvements to SR 46. The proposed improvements to SR 46 would have a direct impact to the northern perimeter of the LJCA. The nearest designated active public use is approximately 1.8 miles south of SR 46 and would not have any proximity effects due to the widening of SR 46.

5.0 CONCLUSION

One potential Section 4(f) resource was identified within the project corridor that will be subject to direct impacts as part of the proposed improvements. However, while the entirety of the LJCA is available for passive recreational use, the tract that is proposed for acquisition has no designated public access or active uses as defined by 49 USC 303 and Part 2, Chapter 13 of the *PD&E Manual*; therefore, Section 4(f) does not apply.

APPENDIX A
Lake Jesup Conservation Area Overview
Lake Jesup Conservation Area Management Plan

St. Johns River Water Management District

floridaswater.com

Lake Jesup Conservation Area

Size:

6,220 acres, divided into three different areas around Lake Jesup.

Location:

Lake Jesup is in Seminole County, south of Sanford and north of Oviedo.

Description:

Initially, the North Lake Jesup Tract and the Marl Bed Flats Tract were purchased to meet legislative requirements established for mitigation of the Seminole County portion of the Eastern Beltway. Now, along with the East Lake Jesup Tract, these lands contribute to the enhancement and protection of water resources and increased flood protection and the protection of ecological functions and habitats in the Lake Jesup area. The Marl Bed Flats Tract was jointly acquired with Seminole County, and the county's Wilderness Park with boat ramp is located on the southwest corner of this tract. Lake Jesup is mostly composed of floodplain wetlands and wooded hammocks.

Wildlife viewing:

There are many eagles, ospreys, hawks and alligators around the shores of Lake Jesup, as well as numerous egrets, ibis and great blue herons. The restoration of natural systems will improve the habitat and feeding areas for a wide variety of waterfowl.

Recreational activities:

1. Hiking, bicycling, horseback riding, wildlife viewing and primitive camping at designated sites.
2. Boating and canoeing opportunities are available on Lake Jesup and the St. Johns River; however, there are no launches located in the area.

Restrictions:

1. Motorized vehicles are not permitted.

Access:

To Marl Bed Flats Tract: From State Road (SR) 46, approximately four miles east of U.S. 17, turn south on Cameron Avenue, west on Kentucky Street, south on Bison Avenue, west on Pine Way Road, south on South Mellonville Avenue and east on Oakway Lane to the parking area. To East Lake Jesup Tract: From SR 426, turn north on Van Arsdale Street, west on Florida Avenue and north on Elm Street to the parking area.

For more information:

Call the District's Bureau of Land Management at (386) 329-4404.

St. Johns River Water Management District
4049 Reid Street, Palatka, FL 32177
(800) 725-5922

Lake Jesup Conservation Area
Land Management Plan

Middle St. Johns River Basin
Seminole County

Approved by St. Johns River Water Management District Governing Board
February 2008

Lake Jesup Conservation Area

Land Management Plan Summary

Management Area Size: 6,220 acres
Date of Acquisition: Parcels were acquired beginning in 1990 with the Futch Parcel and Little Cameron Ranch. Parcels have since been purchased or acquired using mitigation dollars.
Date of Plan: February 2008
Basin: Middle St. Johns **Basin Planning Unit:** Lake Jesup

Location: Seminole County, south of State Road 46, bordering Lake Jesup in four (4) separate sections.

Funding Sources: Seminole County Expressway Authority, Florida Department of Transportation, Save Our Rivers/BOND 85, Preservation 2000, ad valorem taxes, Florida Forever, Seminole County, additional mitigation dollars.

Management Partners: The District is the lead manager of LJCA. Seminole County Soil and Water Conservation District manages a cattle lease for the District on the Cameron Ranch and Futch tracts.

Key Resource Issues:

Resource Management Issues:

- **RESTORATION –** The District will continue monitoring Futch property restoration including the planted forested wetland area. The District will also monitor areas where levees have been removed on the Futch, Little Cameron, and Marl Bed Flats tracts.
- **WATER RESOURCES** – The District has worked with many agencies to create the *Lake Jesup Interagency Water Quality and Habitat Restoration Strategy*, 2008, for Lake restoration plans to assist in meeting the TMDLs set for the Lake.
- **FIRE MANAGEMENT** – Due to the location of the LJCA parcels and their proximity to an airport and major roadways, the use of prescribed burning at LJCA will continue to be evaluated and implemented where feasible.
- **FOREST MANAGEMENT** – Due to the upcoming AquaFiber Technologies Corporation lease, a portion of the 20 acre planted pine area at East Lake Jesup will be harvested to install a wetland treatment system for the Lake. Cabbage palm harvesting is also being conducted by the cattle lessee to restore the wet prairie, floodplain marsh, and maintain grazing habitat at the Futch and Cameron Ranch parcels, which also maintains grazing habitat.
- **INVASIVE SPECIES** – Chinese tallow, Brazilian pepper, Chinaberry, camphor, Mexican petunia, cogon grass, tropical soda apple, caesar weed, African red hibiscus, bahia grass, Bermuda grass, and Japanese climbing fern are being treated and are currently under control at a maintenance level. Native invasive species such as cattail and saltbush are also being treated and under control at a maintenance level. Feral hogs are trapped on the property.

- **WILDLIFE** – The site provides habitat for both fish and wildlife, including species such as the wood stork (*Mycteria Americana*), bald eagle (*Haliaeetus leucocephalus*), Florida sandhill crane (*Grus canadensis*), and American alligator (*Alligator mississipiensis*).
- **CULTURAL AND ARCHAEOLOGICAL RESOURCES** – A review of the Department of State, Division of Historical Resources indicates two (2) registered cultural sites within the conservation area. If any additional sites are located, District staff will document and report the sites to the Division of Historical Resources.

Key Land Use/Recreation Issues:
Hiking, biking, horseback riding, and wildlife viewing can all be enjoyed at the Conservation Area.

Land Use Management Issues:

- **ACCESS** – LJCA can be accessed through the East Lake Jesup Tract off Elm Street. The access has multi-use trails, a kiosk with information about the property, and an observation tower. The property can also be accessed through the Marlbed Flats tract, which has a parking area and multi-use trails. The public can access the Cameron Ranch property by contacting the District's Land Management Department.
- **RECREATION USE** – Multi-use trails, an observation tower, and a group campsite are located on the East Lake Jesup Tract. Multi-use trails are also located on the Marlbed Flats tract.
- **SECURITY** – Maintenance of the fence lines and replacement of boundary signs is ongoing. The District will continue to coordinate with Seminole County Sheriff's Office, FWC law enforcement, and a private security firm, for any potential security needs.

Administration:

- **ACQUISITION** – The District may consider purchasing parcels near LJCA that become available that will aid in the conservation of water resources in the Lake Jesup subbasin.
- **COOPERATIVE AGREEMENTS** – The District has an agreement with Seminole County, which enabled the County to install the Cameron Avenue Stormwater Park on the Little Cameron Ranch Tract. The District has a second agreement with Seminole County Soil and Water Conservation District to manage a cattle lease on the Futch and Cameron Ranch parcels. These agreements will be evaluated as they come up for renewal.
- **LEASES, EASEMENTS, SPECIAL USE AUTHORIZATIONS, AND CONCESSIONS**- The Florida Department of Environmental Protection holds a conservation easement on the Futch tract. The District has a Special Use Authorization (SUA) with Hurricane Outward Bound School for camping at the East Lake Jesup and Marl Bed Flats tracts and a cattle lease at the Marl Bed Flats Tract. The District holds a hog trapping SUA on the Cameron and Futch parcels and the East Lake Jesup tract. The District also holds a SUA for palm frond

harvesting from the Cameron Ranch and Futch parcels, Marlbed Flats parcels, and East Lake Jesup parcels. The District will soon finalize negotiations for a lease with AquaFiber Technologies Corporation to filter lake water. These contracts will be evaluated as they come up for renewal.

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INTRODUCTION

This management plan provides guidelines for land management activities to be implemented within the Lake Jesup Conservation Area (LJCA) over the next five years. This is a revision of the land management plan approved in July of 2001.

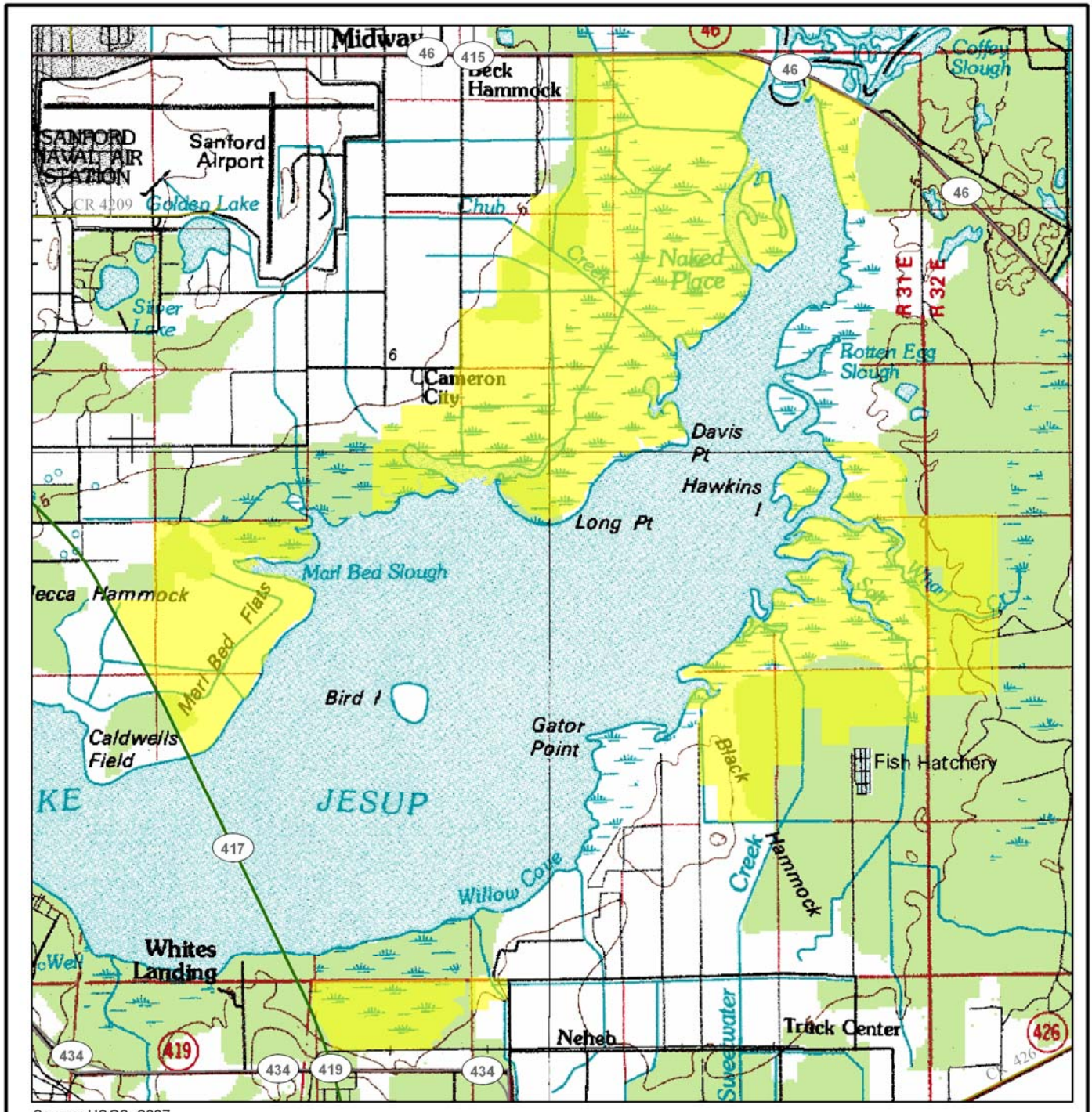
LJCA is comprised of approximately 6,220 acres and is located in north central Seminole County bordering Lake Jesup in four (4) separate sections. The property is located five (5) miles north of the Orlando metropolitan area, south of State Road (SR) 46, and ten (10) miles southeast of Sanford (Figure 1). The property is found in Sections 1-3, 10, 11, 13, 15, 16, 19, 20, 23-26, & 29, Township 20 south, and Range 31 east.

Lake Jesup and its floodplain cover a range of 11,000 to 16,000 acres dependent upon lake stage. LJCA protects approximately 10 miles of shoreline along Lake Jesup in four (4) separate parcels and is located in the St. Johns River Middle Basin. LJCA contains predominantly disturbed floodplain marsh (mostly improved pasture) and hydric hammock. There are depression marshes scattered around the Conservation Area, upland mixed forest, a created forested wetland and a 20-acre area of planted pine.

In 1990, the Futch property, located adjacent to the Cameron Tract, was conveyed to the Florida Department of Transportation (DOT) to use as a mitigation site for impacts to wetlands created by the construction of the Seminole County portion of the Eastern Beltway. As part of the regulatory permit for the construction of the project, the Department of Environmental Protection holds a conservation easement (Appendix A) over the 1,700-acre Futch property. In 2000, this property was conveyed back to the District with an endowment for management activities. The District is required to monitor the success of the reforested wetlands according to the Futch Restoration Plan (Appendix B).

Plans to restore Lake Jesup include rebuilding the State Road 46 Bridge to increase the span or remove the causeway, reducing stormwater runoff, and filtering lake water. The District continues to sample for water quality at many sites within the lake. An intergovernmental agreement allowed Seminole County to complete a stormwater project at Cameron Avenue within District property reducing the amount of stormwater runoff that enters the lake. The County has also constructed the Navy Canal stormwater area to capture additional stormwater before being released into the lake. An upcoming lease with AquaFiber Technologies Corporation will allow them to filter lake water for phosphorus removal. A Surface Water Improvement Plan (SWIM) was created in 2002 for the Middle Basin and the District is currently working on the *Lake Jesup Interagency Water Quality and Habitat Restoration Strategy*, 2008, for lake restoration (Appendix C).

The District has an intergovernmental management agreement with Seminole County Soil and Water Conservation District allowing the management of cattle leases at LJCA with the District receiving a percentage of the fee. The associated cattle lessee has completed cabbage palm harvesting on the Futch parcel as a habitat/grazing enhancement



Source: USGS, 2007

Lake Jesup Conservation Area

Figure 1. Location Map

0.50.25 0 0.5 Miles

1:55000

Legend

Lake Jesup Conservation Area

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Author:tmashour, Source:G:\MGMT PLANS\Lake Jesup\2007\Lake Jesup Maps\Figure 1. Location Map.mxd, Time:7/23/2007 2:08:42 PM

project in partial lieu of lease fee. The cattle lease was expanded to include the Futch Parcel in 2006.

LJCA was acquired by the District to protect and enhance the water resources, to protect ecological functions and habitat in the Lake Jesup area, for flood protection, and initially to meet legislative requirements established for mitigation of the Seminole County portion of the Eastern Beltway.

LAND MANAGEMENT GOALS

The District's purpose for acquiring this property is directly related to protecting important water resources and ecological functions. The property was identified as a priority in the District's Five Year Land Acquisition Plan. The property was specifically acquired for water resource conservation, plant community and hydrologic restoration where feasible, and natural resource management and protection. Environmental goals include re-establishment of the natural hydrologic regime, restoration of wetland communities and water quality improvements. The land management goals for the Middle Basin and LJCA are:

Goals:

I. To preserve the natural floodplain for flood protection.

II. Restore and maintain natural hydrologic regimes and water quality.

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

IV. Protect archaeological and cultural resources.

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

CONSERVATION AREA OVERVIEW

Lake Jesup is located in the Middle St. Johns River Basin. Major basin issues include flood protection, water supply, natural ecosystem protection, and water quality. A large, shallow lake near the center of Seminole County, Lake Jesup is connected to the St. Johns River by an outlet channel that is constricted by the State Road 46 Bridge and causeway. The lake is surrounded by sprawling urban development and receives runoff from Orlando, Winter Park, Casselberry, Oviedo, Winter Springs and Maitland as well as agricultural runoff from adjacent farms. The lake is hypereutrophic and nearly devoid of submerged aquatic vegetation (SJRWMD 2002). There are excessive phosphorus and nitrogen concentrations, extensive organic muck deposits, and a declining fish

population. Lake Jesup continues to be the most polluted lake directly connected to the St. Johns River.

In order to address the problems in Lake Jesup, the Florida Legislature enacted the Lake Jesup Restoration Act in 1994. This act provided for a sixteen-member local citizens advisory team, the Friends of Lake Jesup, and involved feasibility studies and demonstration projects for implementation of selected restoration methods. Since 1994, the issues behind lake problems have been identified, a circulation model and a water and nutrient budget have been created, and levees have been removed from the Marlbed flats, Cameron and Futch parcels to restore local hydrologic regimes.

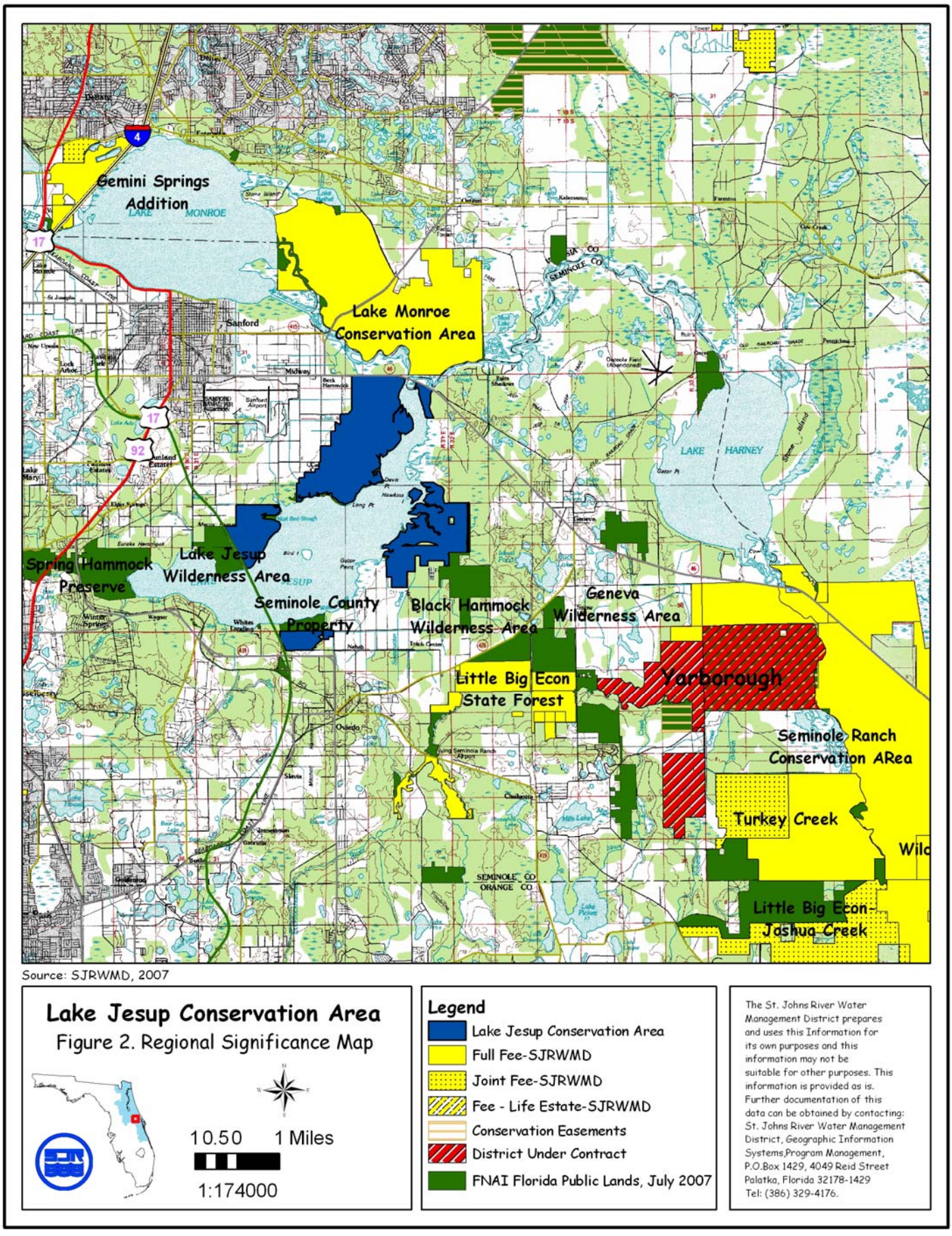
In 2002, the Middle Basin was designated a Surface Water Improvement and Management (SWIM) priority and a SWIM Management Plan was created. The plan outlines strategies for restoration and protection, defines research and feasibility studies needed in the basin, and identifies potential funding sources.

Currently, the *Lake Jesup Interagency Water Quality and Habitat Restoration Strategy*, 2008, (Appendix C) has been drafted to identify adaptive management options to help restore the lake. Many state and local agencies and entities, including the District, will coordinate to recommend and implement restoration strategies.

Regional Significance

The Middle St. Johns River Basin encompasses Volusia, Orange, Seminole and Lake Counties as well as a portion of Osceola County. The major water bodies within this basin include the Econlockhatchee River, Deep Creek, Wekiva River, and Lakes Harney, Monroe, and Jesup. LJCA is an important component in the protection of Lake Jesup and the Middle St. Johns River Basin. Preserving and protecting the water resources is a priority in the Middle Basin. In addition to protecting part of the shoreline surrounding Lake Jesup, there are many opportunities for a wide variety of compatible resource-based educational and recreational activities.

In addition to LJCA, there are several Conservation Areas throughout the Lake Jesup Subbasin managed by various governmental agencies (Figure 2). These include Spring Hammock Preserve (1,505 acres), Lake Jesup Wilderness Area (481 acres), Seminole County- County Road 415 Property (184 acres), Black Hammock Wilderness Area (710 acres) and Geneva Wilderness Area (180 acres) each managed by Seminole County.



Source: SJRWMD, 2007

Lake Jesup Conservation Area

Figure 2. Regional Significance Map

10.50 1 Miles

1:174000

Legend

- Lake Jesup Conservation Area
- Full Fee-SJRWMD
- Joint Fee-SJRWMD
- Fee - Life Estate-SJRWMD
- Conservation Easements
- District Under Contract
- FNAI Florida Public Lands, July 2007

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Author:tmashour, Source:G:\MGMT PLANS\Lake Jesup\2007\Lake Jesup Maps\Figure 2. Regional Significance Map.mxd, Time:7/23/2007 2:18:30 PM

Properties not included in the Lake Jesup Subbasin, but located nearby in the Middle Basin, include the Pineloch Tract (470 acres) and the Little Big Econ State Forest (3,983 acres) including the Joshua Creek Tract (2,699 acres), both managed by the Division of Forestry; Salt Lake Wildlife Management Area (5,056 acres) managed by FWC; and Seminole Ranch Conservation Area (29,228 acres), Gemini Springs Addition (947 acres), Lake Monroe Conservation Area (7,390 acres), and Buck Lake Conservation Area (9,948 acres) each owned and managed by the District. The District recently closed on Turkey Creek-Lee Ranch, which will be added to the Little Big Econ State Forest and will be managed by the Division of Forestry (6,000 acres). The District has a contract with the Yarborough family to purchase property that will be added to the Little Big Econ State Forest and will be managed by the Division of Forestry (5,710 acres). In this transaction, the District will also purchase the rest of the rights to the Yarborough Conservation Easement.

Acquisition History

LJCA is comprised of 12 parcels totaling 6,220 acres (Figure 3). The purchase of these properties is consistent with the goals and objectives set for the Middle St. Johns River Basin and the District's Five Year Land Acquisition Plan. The objectives for acquisition in this basin are (1) flood control and protection of the floodplain, (2) restoration and enhancement of wetland habitat, (3) water quality improvement, and (4) improved public access and recreational opportunities.

The following properties were purchased by the District using funding sources as noted and were incorporated into the management area as they were acquired:

(1984-011)- Futch

This parcel totals 1,700 acres and was purchased on August 21, 1990, full fee by the District, for $1,357,721.28 with Save Our Rivers funding. The District was then reimbursed Seminole County Expressway Authority through the Florida Department of Transportation for mitigation for the southern connector of the Central Florida Beltway project.

(1990-028) – Little (Cameron) Ranch

This parcel totals 1,194 acres and was purchased on December 5, 1990, full fee by the District, for $1,100,000. Ad valorem tax dollars paid for this purchase.

(1992-055-PA) – Condev

This 10-acre parcel was acquired by the District for mitigation on April 1, 1993. The parcel was valued at $8,330 and is an inholding within the East Lake Jesup-Williams Tract.

(1992-055-PB) – Raymond Khoshnou

This 128-acre parcel was acquired by the District for mitigation on April 1, 1993. The parcel was valued at $117,460 and is an inholding within the East Lake Jesup-Williams Tract.

(1990-001) – North Lake Jesup (Marlbed Flats)

This parcel totals 787.77 acres and was purchased on March 3, 1994, full fee by the District, for $555,000. Mitigation dollars from Florida Department of Transportation paid for $294,185 while Preservation 2000 paid for $260,815. On April 4, 2006, the District transferred out 0.23 acres to Seminole County for public use of the District's Marl Bed Flats tract.

(1992-055-PC) – White Construction

This 145-acre parcel was acquired by the District for mitigation on March 2, 1995. The parcel was valued at $60,500 and is an inholding within the East Lake Jesup-Williams Tract.

(1989-025) –East Lake Jesup -Williams

This parcel totals 1,214 acres and was purchased on May 31, 1996, full fee by the District, for $741,000. Funding for this acquisition came from Preservation 2000.

(1995-042) – Speer-Holmes

This parcel totals 236.02 acres and was purchased on July 15, 1997, full fee by the District, for $409,063.98. Mitigation dollars and Preservation 2000 funded this purchase. This parcel is part of the East Lake Jesup tract.

(1997-016) - Tilden Groves

This parcel totals 498.84 acres and was purchased on August 22, 2000 in partnership with Seminole County for $865,375. The District originally purchased the entire parcel and then sold 75% (374.13 acres) to Seminole County for $649,213 with a conservation easement in favor of the District. This funding was mitigation for the Sanford Airport Authority. The District funded 25% (124.71 acres) of the property with Preservation 2000 funds for $216,250. The 25% owned by the District is part of the East Lake Jesup tract. The 75% owned by Seminole County is managed as part of Black Hammock Wilderness Area (Figure 2).

(2002-015) – Belfare-Sunbreeze

This 251.37-acre parcel was acquired by the District for mitigation on June 12, 2002. The parcel was valued at $251,373 and is found at the southern tip of Lake Jesup.

(2004-004) – Minter

This 28.90-acre parcel was acquired for a stormwater park to be deeded to and constructed by Seminole County. The parcel was acquired on January 12, 2005 for a purchase price of $1,820,000. Funding was provided by Florida Forever. The county has not yet acquired funding for stormwater park construction and has not yet entered into an agreement with the District for this project. The property is being mowed by the county in the meantime.

(2007-026) – Chubb Creek

This parcel totals 26.25 acres and was acquired by the District for mitigation for the Orlando/Sanford International Airport Authority expansion on June 29, 2007. The parcel is valued at $925,570. The parcel borders Little Cameron Ranch.

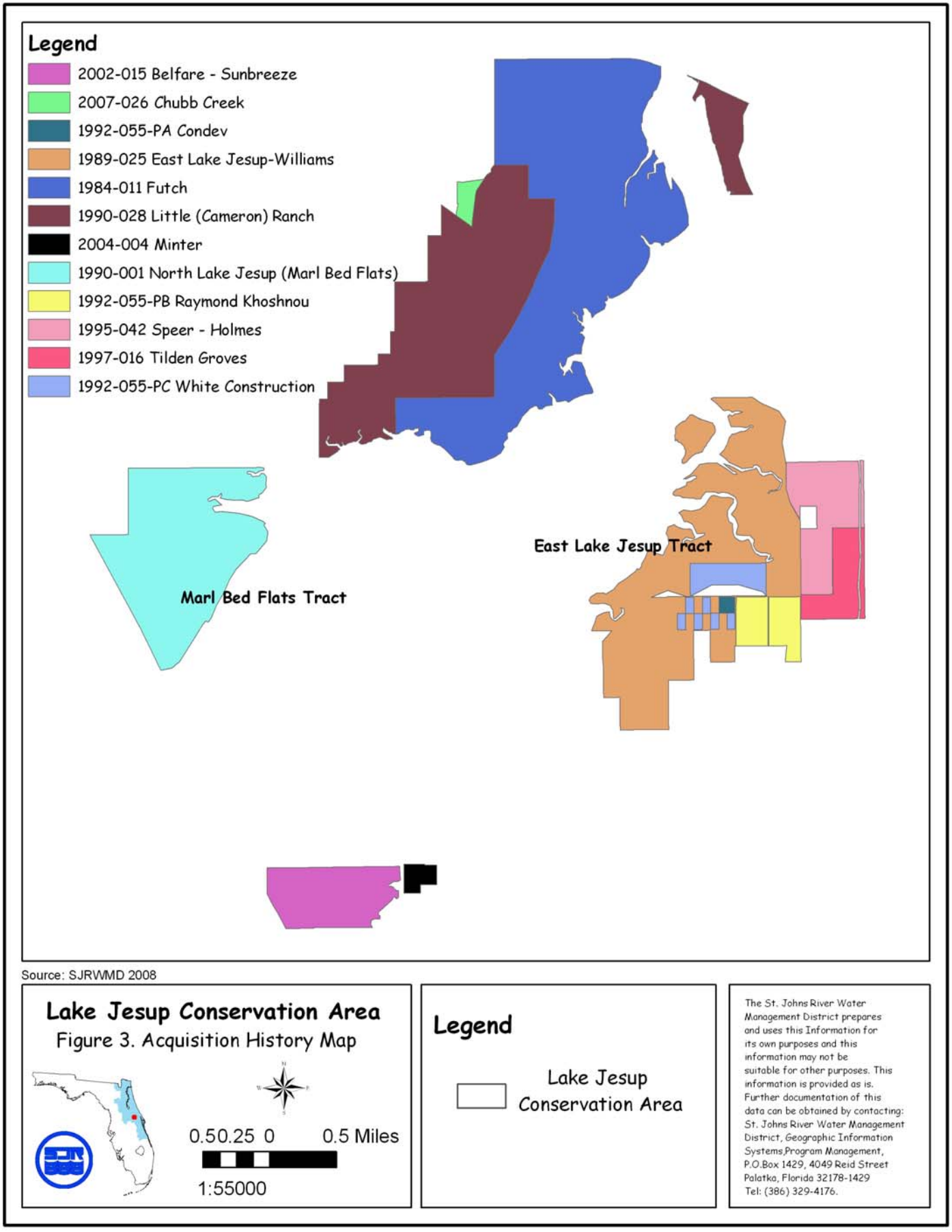

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Table 1. LJCA Acquisition History

Acquired	Parcel #	Parcel Name	Acreage	Total Price	SJRWMD Price	Funding Source	Comments
8/21/1990	1984-011	Futch	1,700	$1,357,721.28	$0	SOR/BOND 85, Eastern Beltway funding from Seminole County Expressway Authority through FDOT	This parcel was purchased by DOT to be used as a mitigation site for the building of the Eastern Beltway, SR 417; it was deeded to the District 11/29/2000.
5/31/1996	1989-025	East Lake Jesup - Williams	1,214	$741,000	$741,000	Preservation 2000	
3/3/1994	1990-001	North Lake Jesup (Marl Bed Flats)	787.77	$555,000	$260,815	FDOT Mitigation dollars, Preservation 2000	$294,185 mitigation dollars from DOT to purchase 295 acres. On 4/4/2006, the District transferred out 0.23 acres to Seminole County for public use of the District's Marl Bed Flats tract.
12/5/1990	1990-028	Little (Cameron) Ranch	1,194	$1,100,000	$1,100,000	ad valorem	
4/1/1993	1992-055-PA	Condev	10	$0	$0	Mitigation	Mitigation $8,330 inholding within East Lake Jesup-Williams.
4/1/1993	1992-055-PB	Raymond Khoshnou	128	$0	$0	Mitigation	Mitigation $117,460 inholding within East Lake Jesup-Williams.
3/2/1995	1992-055-PC	White Construction	145	$0	$0	Mitigation	Mitigation $60,500 inholding within East Lake Jesup-Williams.
7/15/1997	1995-042	Speer-Holmes	236.02	$409,063.98	$409,063.98	Mitigation funding, Preservation 2000	
8/22/2000	1997-016	Tilden Groves	498.84	$865,375	$216,250	Preservation 2000, Seminole County	25% of total parcel District 100%, remaining sold to Seminole County fee (374.13 acres) with conservation easement in favor of District for Sanford Airport Authority mitigation.
6/12/2002	2002-015	Belfare-Sunbreeze	251.37	$0	$0	Mitigation	Mitigation $251,373 from Sunbreeze, Inc.
1/12/2005	2004-004	Minter	28.90	$1,820,000	$1,820,000	Florida Forever	Purchased for stormwater park to be deeded to Seminole County.
6/29/2007	2007-026	Chubb Creek	26.25	$0	$0	Mitigation	Mitigation $925,570 for Orlando/Sanford International Airport Authority.

Zoning

According to the Seminole County Vision 2020 Comprehensive Plan, LJCA is designated as Conservation. Conservation is designated to regulate development and preserve environmentally sensitive areas where not only wetlands are important, but also floodplains. The overlay includes the extent of floodplains and wetlands in Seminole County. This information is based on the most recent data provided by the District. Allowable zoning includes A-1 at Little Cameron Ranch and Marl Bed Flats where minimum lot size must be one (1) acre and A-10 at East Lake Jesup and the southern parcel where minimum lot size must be at least 10 acres.

History

LJCA lies within the East Florida or St. Johns archaeological cultural area, 2500 B.P. – A.D. 1565, (Stewart 1982). This region runs from below Cape Canaveral to the St. Marys River. Its main physiographic features are the Atlantic coast, the lagoon system, and the drainage of the St. Johns River. Archaeological finds in the area include the distinctive St. Johns pottery, the adoption of mound construction for burial, evidence of increased sedentary behavior (i.e., permanent villages), and increased agricultural production, including corn. Central and east Florida sustained very similar aboriginal cultures.

There is evidence of early human inhabitants around the many small seepage springs that are found throughout the surrounding shoreline of Lake Jesup. Pottery shards and shell middens are commonly found throughout the area.

Evidence of more extensive use of the area dates to the Orange and Transitional Period peoples (5000-2000 B.P.) and more importantly to the peoples of the St. Johns I Period (500-800 A.D.). It appears that several areas along the St. Johns River were used extensively during this period. A pattern of small St. Johns I sand and shell mounds suggests a system of base camps on the St. Johns River, with numerous temporary hunting/gathering camps. Use of the area apparently declined during the St. Johns II period (980-1500 A.D.), and there is no evidence of occupation from the St. Augustine period.

William Bartram traveled the St. Johns River in 1765-1775 and returned with tales of alligator attacks and descriptions of plant and animal life in the lakes and the river. In 1837, Lieutenant R. H. Peyton explored Lake Jesup and camped at Bird Island where he described a pristine area with many wading bird rookeries.

At the turn of the 20th century, steamboats journeyed from the river into the lake, taking passengers to at least four busy landing areas. During this period, the lake was still clear with some tannin from the river, similar to most of the lakes associated with the St. Johns River. There were two small connections to the river whereby Lake Jesup would be flushed out periodically, retaining high oxygen content in the water and creating optimum habitat for aquatic plants and animals (Bellville 2000).

However, several activities over the years have all led to the extremely degraded condition of the lake: a navigational canal called "Government Cut," which was constructed in the 1930s by the U.S. Army Corps of Engineers and the State Road 46 causeway built in the1950s resulted in constricting the lake's connection with the river. Decades of poorly treated sewage, leakage from septic tanks, and fertilizers from local farms caused heavy phosphorus loading in the lake. Finally, in the 1990's the construction of the Seminole County portion of the Eastern Beltway bisected the lake, possibly reducing lake circulation, and increased stormwater runoff. The introduction of non-native plant and animal species has exacerbated the situation at Lake Jesup.

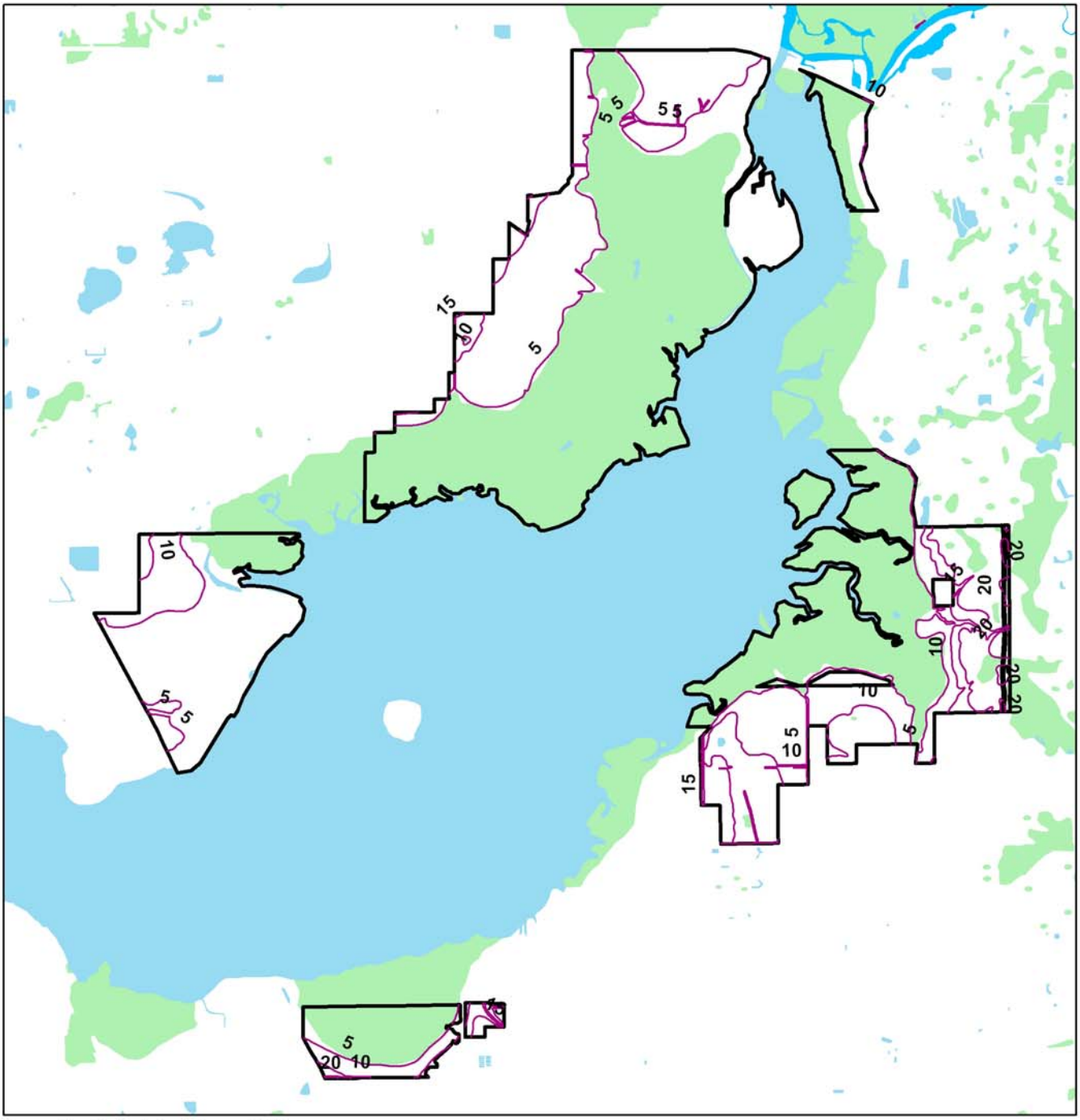
NATURAL RESOURCES OVERVIEW

Topography and Hydrology

According to the Guide to the Physiographic Divisions of Florida, LJCA is part of the Central Lake District Florida Physiographic Division (Figure 4). Within the Division, the Marl Bed Flats, Cameron (Little) Ranch and Futch, and East Lake Jesup tracts are part of the St. Johns Offset subdivision, which is a portion of the St. Johns River Valley that is very ancient. It is partially filled with Pleistocene estuarine deposits. The Eocene limestone is very near the surface and solution has contributed to the development of the broad valley. Flatwoods occur on the Pleistocene terraces and a river swamp forest, generally with many cabbage palms, occurs on the floodplain.

Also within the Central Lake District Florida Physiographic Division, the Belfare Sunbreeze parcel is part of the Casselberry-Oviedo-Geneva-Chuluota Hills subdivision. This subdivision consists of isolated residual hills all less than 95 feet in elevation separated by terraced flatwoods and river swamps.

The LJCA hydrology is illustrated in Figure 5. The Lake Jesup watershed encompasses 80,000 acres and is dominated by three marine terraces, the Talbot, Pamlico, and Silver bluffs. Lake Jesup's hydraulic residence time is 100 days, an order of magnitude greater than that of nearby lakes Harney and Monroe (Brezonik et al. 1976). Its three major tributaries, Soldier, Gee, and Howell creeks, received wastewater effluent until the early 1980's (Hand et al. 1990). Nutrient enrichment from these tributary borne effluents is still a significant problem in the lake. In addition, urban runoff, agriculture, and silviculture activities create a significant nonpoint source nutrient load (Steward 1984). Its shallowness probably stimulates nutrient cycling within Lake Jesup.



Source: Florida Geological Survey, 2003

Lake Jesup Conservation Area

Figure 4. Topography Map

0.50.25 0 0.5 Miles

1:55000

Legend

Lake Jesup Conservation Area

Lake Jesup Elevation

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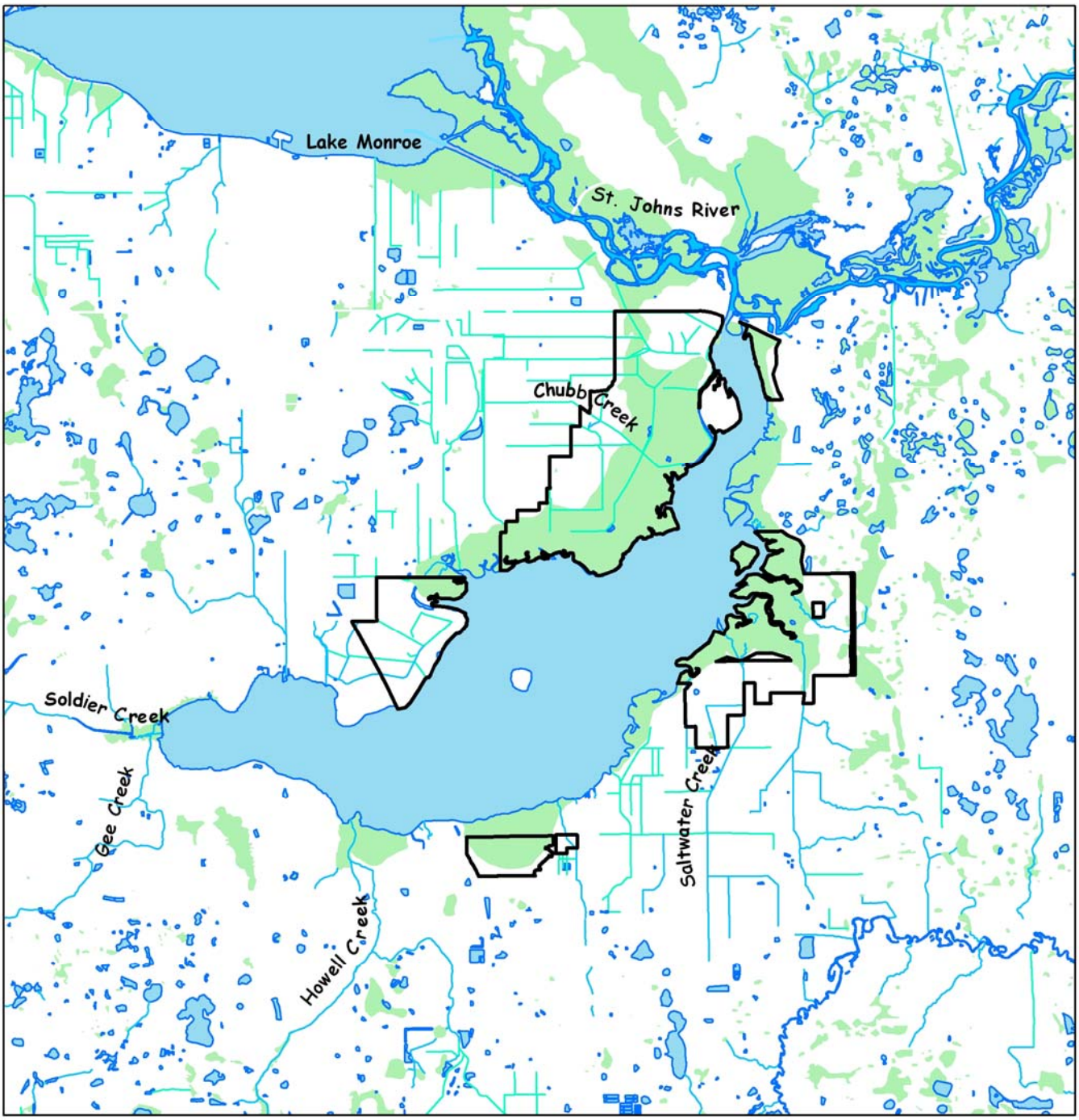
Author:tmashour, Source:G:\MGMT PLANS\Lake Jesup\2007\Lake Jesup Maps\Figure 2. Regional Significance Map.mxd, Time:7/23/2007 2:18:30 PM



Source: USGS, 2003

Lake Jesup Conservation Area

Figure 5. Hydrology Map

1 0.5 0 1 Miles

1:100000

Legend

- Lake Jesup Conservation Area
- Marsh, Wetland, Swamp
- Lake or Pond
- Shoreline
- Streams
- Ditch or Canal

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Author:tmashour, Source:G:\MGMT PLANS\Lake Jesup\2007\Lake Jesup Maps\Figure 2. Regional Significance Map.mxd, Time:7/23/2007 2:18:30 PM

Wildlife

This conservation area provides habitat for both fish and wildlife, including species such as the wood stork (*Mycteria Americana*), bald eagle (*Haliaeetus leucocephalus*), Florida sandhill crane (*Grus canadensis*), and American alligator (*Alligator mississipiensis*). Observational data is recorded by District staff (Appendix D).

Natural Communities

There is a variety of natural communities within LJCA. The most dominant of these plant communities are wet prairie, floodplain marsh, and hydric hammock. Other plant communities include floodplain forest, wet flatwoods, and upland mixed forest (Figure 6). A significant amount of the conservation area has been disturbed by past agricultural activities. Significant restoration has occurred through the removal of levees as well as the removal of dense cabbage palm encroachment in an effort to reconnect floodplain to the lake.

Historically, the area around Lake Jesup was a mosaic of floodplain marsh, wet prairie with interspersed depressional wetlands, hydric hammock, and wet flatwoods. Floodplain marsh and wet prairie were the dominant plant communities. Due to agricultural activities in the past century, which included ditching and diking around the lake, exotic grasses for cattle grazing have replaced most of the wet prairie species. In addition, due to the change in the hydrology of the area, many isolated wetlands and their associated wet prairie communities were converted into pastures or succeeded into hydric hammock (Figure 6b). Fire exclusion has also played a role in changing the landscape.

Information pertaining to the natural communities at LJCA was derived from personal observations by District staff. Natural communities have been characterized using descriptions published in the Florida Natural Areas Inventory's *Guide to the Natural Communities of Florida*.

Wet Prairie (2,067 acres, 37%)

Wet prairie is characterized as a treeless plain with a sparse to dense ground cover of grasses and herbs typically including wiregrass, toothache grass, maidencane, spikerush, and beakrush. The majority of the wet prairie is found in the Cameron, Futch, and Marl Bed Flats tracts. Whereas these tracts contain pasture grass species, these areas are reverting to wet prairie and the associated native species. Levees previously separated the marsh from the wet prairie in order to facilitate the maintenance of pastures. These levees have been removed allowing for a longer hydroperiod in the pastures and the return of wet prairie plant species.

Floodplain Marsh (1,704 acres, 31%)

Floodplain marshes are wetlands of herbaceous vegetation and low shrubs that occur in river floodplains and are maintained by a regime of fire and water. Floodplain marsh at LJCA has been severely altered by agricultural activities. What remains is

improved pasture that is slowly succeeding into floodplain marsh interspersed with hydric hammocks and depression marshes. There are approximately 1,704 acres of floodplain marsh remaining at LJCA. The species composition of the floodplain marsh includes common reed (*Phragmites australis*), broadleaf cattail (*Typha latifolia*), swamp rosemallow (*Hibiscus grandiflorus*), bladderpod/rattlebox (*Sesbania* sp.), bahia grass (*Paspalum* notatum), Carolina willow (*Salix caroliniana*), saltbush (*Baccharis halimifolia*), sand cordgrass (*Spartina bakeri*), giant bulrush (*Scirpus californicus*), Bermudagrass (*Cynodon dactylon*), panic grass (*Panicum hemitomon*), common ragweed (*Ambrosia artemisiifolia*), grassleaf lettuce (*Lactuca graminifolia*), pickerelweed (*Pontederia cordata*) and smartweed (*Polygonum* sp.). This community is fire dependent and requires burning on a two to five year burn cycle.

Around 10.5 acres are found in shrub swamp or floodplain marsh that is in the process of succeeding to floodplain swamp due to lack of fire or change in hydrologic regime. This area is dominated by woody vegetation less than 20 feet tall occurring in estuarine or palustrine systems. This acreage is found on the Marl Bed Flats tract within the floodplain marsh area. It is found to be expanding from the 1984 aerial imagery.

Hydric Hammock (972 acres, 17%)
Hydric hammock is well-developed hardwood and cabbage palm forest with an understory community often dominated by palms and ferns. It is maintained by a hydrologic regime. Hydric hammock is the second largest plant community at LJCA, comprising approximately 972 acres. This is a climax community and has replaced a portion of the wet flatwoods and wet prairie in this area due to hydrological alterations and fire suppression. The plant community composition includes species such as cabbage palm (*Sabal palmetto*), live oak (*Quercus virginiana*), sweetgum (*Liquidamber styraciflua*), black gum (*Nyssa silvatica* var. *sylvatica*), red cedar (*Juniperus virginiana*), water oak (*Quercus nigra*), black cherry *(Prunus serotina* var. *serotina*), persimmon (*Diospyros virginiana*) pignut hickory (*Carya glabra*), hackberry (*Celtis laevigata*), Carolina willow (*Salix caroliniana*), bald cypress (*Taxodium distichum*), wax myrtle (*Myrica cerifera*) Carolina wild petunia (*Ruellia caroliniensis*), Virginia buttonweed *(Diodia virginiana*) basketgrass (*Oplismenus hirtellus*), foxtail (*Setaria* sp.), elderberry (*Sambucus canadensis*), beautybush (*Callicarpa americana*) smartweed (*Polygonum* sp.), American pokeweed (*Phytolacca americana*), and yellow Jessamine (*Gelsemium sempervirens*). This plant community is not fire dependent; however, fire prevents this community from invading the adjacent fire-type communities.

A few prairie hammocks remain on the north side of the lake. They encompass approximately 8 acres of the property and have been disturbed by cattle activities. Cabbage palms, red cedar, and laurel oaks are the main tree species in this community. The ground cover consists of grasses, sedges and small forbs sparsely scattered with areas of bare ground and leaf litter. On the North Lake Jesup Tract, the native ground cover in these hammocks has been displaced by Mexican petunia (*Ruellia brittoniana*), which is a non-native or exotic plant.

Floodplain Swamp (383 acres, 7%)

Most of the new Belfare-Sunbreeze parcel and areas on the edges of the floodplain marsh on the Marl Bed Flats and Cameron and Futch tracts are found in floodplain forest. This community occurs on flooded soils along stream channels and in low spots and oxbows within river floodplains. The dominant trees are typically buttressed hydrophytic trees such as cypress and tupelo.

Upland Mixed Forest (296 acres, 5.3%)
A relatively small area of LJCA is in upland mixed forest. This community is characterized as a well-developed, closed canopy of forest on rolling hills. The main species found in this community at LJCA are live oaks (*Querecus virginiana*), cabbage palm, and pine. This is a climax community. These may be areas that have not been burned for several years and may include some open pasture.

Forest Regeneration (18 acres, 0.32%)

There is a small ruderal area at the entrance of the East Lake Jesup Tract that historically consisted of wet flatwoods or wet prairie. In an effort to restore this area, District staff planted slash pine (*Pinus elliotti*), which was one of the dominant overstory species in the past. The AquaFiber Technologies Corporation lease to filter lake water will require the harvest of 10 acres of the pine and may expand to take out all pine in this area based on the success of the lake filtering project.

Dome Swamp (14 acres, 0.25%)

A small area of dome swamp is found on the East Lake Jesup tract on the border of the floodplain marsh and hydric hammock communities. This regularly inundated wetland occurs as a circular dome and is typically strongly dominated by pond cypress.

Scrub (3 acres, 0.06%)

A small area of the eastern boundary of East Lake Jesup is found in scrub habitat. This community is xeric and typically consists of clumped patches of low growing oaks interspersed with bare areas of white sand.

Depression Marsh (9 acres, 0.16%)

Depression marshes are shallow, usually rounded depressions in sand substrate with herbaceous vegetation. The isolated depression marshes found at LJCA were historically more prevalent than they are today. Fifty years ago, they were associated with wet prairies; however, today they exist as cattle disturbed depressional wetlands surrounded by pasture that is succeeding to floodplain marsh. There are only approximately 9 acres of these wetlands remaining at this conservation area. The species that comprise this plant community are black gum (*Nyssa silvatica* var. *silvatica*), sweetgum (*Liquidamber styraciflua*), live oak (*Quercus virginiana*), persimmon (*Diospyros virginiana*), cabbage palm (*Sabal palmetto*), red cedar (*Juniperus virginiana*), Carolina willow (*Salix caroliniana*), lemon bacopa (*Bacopa caroliniana*), Virginia dayflower (*Commelina virginica*), soft rush (*Juncus effusus*), blue flag iris (*Iris hexagona*), lizard's tail (*Saururus cernuus*), elderberry (*Sambucus canadensis*), false daisy (*Eclipta prostrata*), pokeweed (*Phytolacca americana*), West Indian chickweed (*Drymaria cordata*) and Spanish moss (*Tillandsia usneoides*). Fire is

important to maintaining this community type by restricting invasion of shrubs and trees and the formation of peat.

Ruderal (84 acres, 1.5%)

A small amount of woodland pasture is found on the Minter property that will be a future stormwater park. This is an area of pasture, live oaks, and cabbage palm that will be excavated to install stormwater ponds. Around 8 acres of LJCA is found in improved pasture. These areas are found in the uplands on the Marl Bed Flats and East Lake Jesup tracts. The Cameron, Futch, and Marl Bed Flats tracts contain former pastures that are reverting to the original wet prairie. Levees previously separated the marsh from the wet prairie in order to facilitate the maintenance of pastures. These levees have been removed allowing for a longer hydroperiod in the pastures and the return of wet prairie plant species.

Citrus (7 acres, 0.12%)

A small area of citrus is found on the Minter property. This was a former use of the property and the trees are projected to be removed upon construction of the stormwater park.

Due to past and present agriculture uses, the floodplain marsh and wet prairie communities on Marl Bed Flats and the Cameron and Futch Tracts remain as improved pasture interspersed with floodplain marsh species. Cattle are used as an interim management tool to prevent woody species such as wax myrtle (*Myrica cerifera*) and saltbush, from invading the marsh. Currently there are cattle leases on the Marl Bed Flats, Cameron, and Futch Tracts. When the technology for restoring floodplains planted with Bahia grass is developed, the District will evaluate the need for restoration.

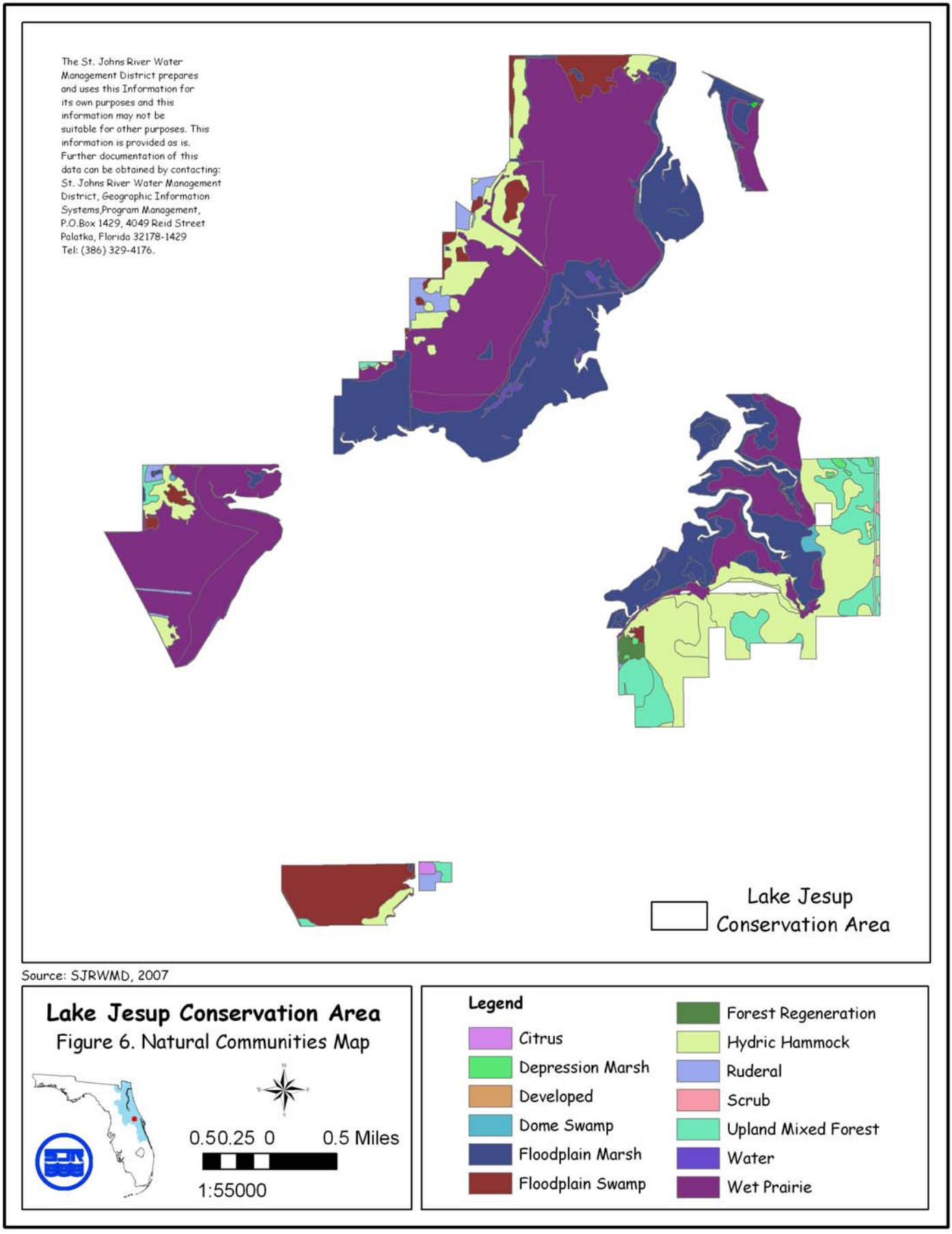
Many non-native exotic and native invasive plant species are found on the property. The list includes Chinese tallow, Brazilian pepper, Chinaberry, camphor, Mexican petunia, cogon grass, tropical soda apple, caesar weed, African red hibiscus, bahia grass, Bermuda grass, Japanese climbing fern, cattail, and saltbush. Most of these species are spread by birds and are now under maintenance control.

Soils

According to data produced from the county soil survey, 15 different soil types have been identified at LJCA (Figure 7). The United States Department of Agriculture, Soil Conservation Service, was used to gather soil information about the soil types and produce the following descriptions of the dominant soil types found on the property.

Basinger- Basinger soils are very deep, very poorly drained, rapidly permeable soils in depressions, poorly defined drainage ways, and floodplains. Formed in thick beds of sandy marine sediments. Slopes range from 0-2%. Natural vegetation consists of wax myrtle, St. Johns wort, maidencane, pineland threeawn, cypress, slash pine, longleaf pine, pond pine, and other water tolerant plants.

Canova – Canova soils are very deep, very poorly drained, moderately slowly permeable soils in depressions in freshwater swamps and marshes. These soils formed in loamy marine sediments. Slopes range from 0-1%. Vegetation in these soils is typically dominated by reeds, sedges, sawgrass, lilies, scattered cypress, maple, gum, bay, and myrtle.



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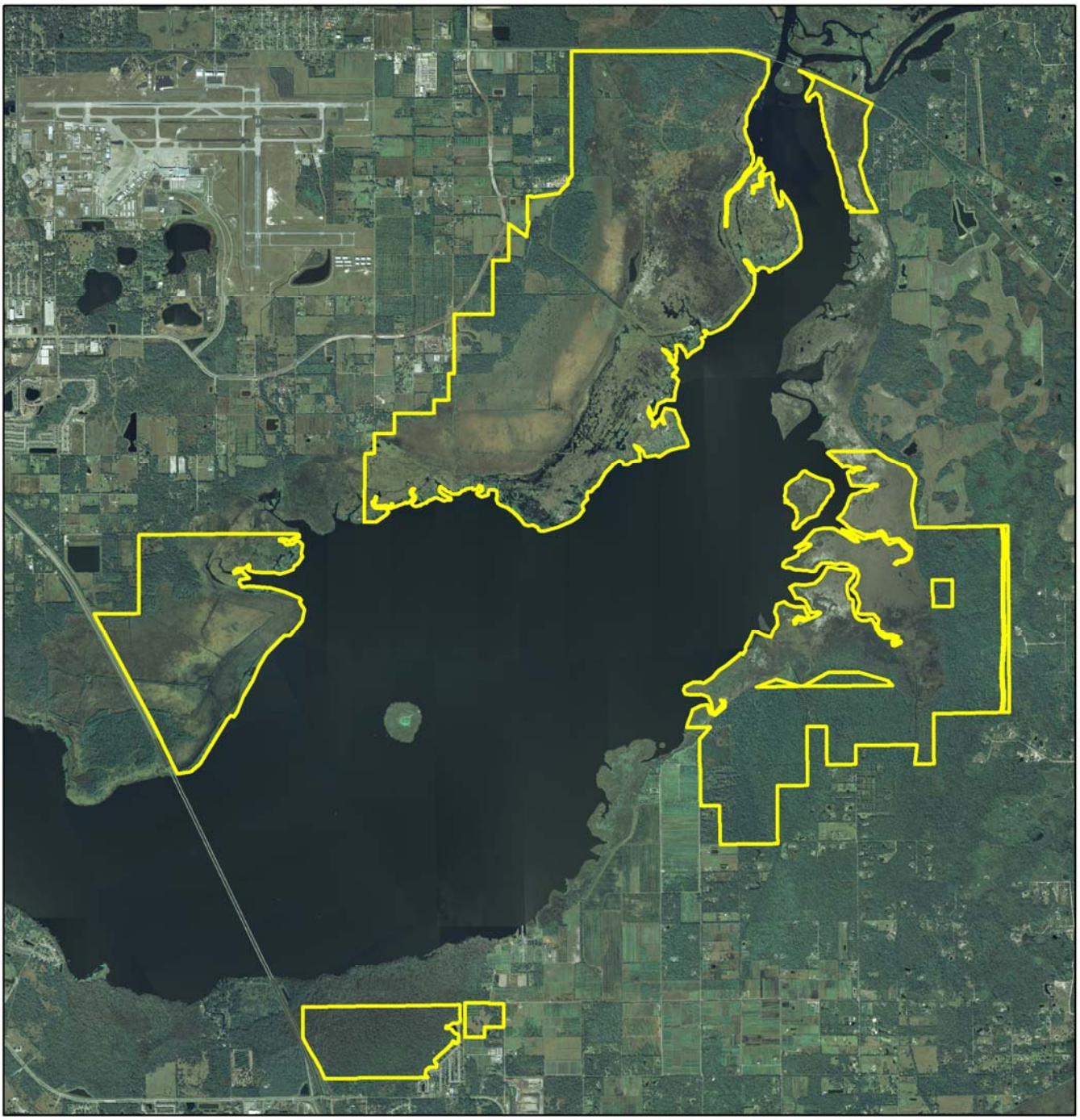

Source: Seminole County, 2006

Lake Jesup Conservation Area

Figure 7. Aerial Imagery Map

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Lake Jesup Conservation Area

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Author:tmashour, Source:G:\MGMT PLANS\Lake Jesup\2007\Lake Jesup Maps\Figure 2. Regional Significance Map.mxd, Time:7/23/2007 2:18:30 PM

Eaugallie – Eaugallie soils are deep or very deep, poorly or very poorly drained, slowly permeable soils in flats, sloughs, or depressional areas. Slopes range from 0-2%. They formed in sandy and loamy marine sediments in peninsular Florida. Natural vegetation typically consists of longleaf pine, slash pine, and palmetto. The understory vegetation includes inkberry, southern bayberry, and pineland threeawn.

Felda- Felda soils are found on the Econlockhatchee River at HSRPP. These soils are very deep, poorly drained, and very poorly drained, moderately permeable soils in drainage ways, sloughs and depressions, and on floodplains and low flats. They formed in stratified, unconsolidated marine sands and clays. Slopes range from 0-1%. Natural vegetation consists of cypress, wax myrtle, pond pine, slash pine, cabbage palm, pineland threeawn, and various grasses, vines, and shrubs.

Gator – Gator soils are very poorly drained organic soils that formed in moderately thick beds of hydrophytic plant remains overlying beds of loamy and sandy marine sediments. They are found in depressions and on floodplains. Slopes are less than one percent. Native vegetation typically consists of cordgrass, sawgrass, maidencane, willow, dogwood, or swamp vegetation including bald cypress, sweetgum, red maple and American hornbeam.

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

Manatee – Manatee soils consist of very deep, very poorly drained, moderately permeable soils in depressions, broad drainage ways, and on floodplains. They formed in sandy and loamy marine sediments. Slope is usually 1-2%. Natural vegetation typically consists of red maple, gum, cabbage palm, and cypress. Treeless areas are covered by pickerelweed, sedge, maidencane, sawgrass, cutgrass bluestem, panicum, cinnamon fern, sand cordgrass, St. Johns wort, and other perennial grasses.

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

Nittaw – Nittaw soils consist of very poorly drained, slowly permeable soils that formed in thick deposits of clayey sediments of marine origin. These soils are in well-defined drainage ways, broad, nearly level swamps, and marshes of central and southern peninsular Florida. Native vegetation is typically a mix of hardwoods including bald cypress, red maple, sweetgum, and hickory with an understory of wax myrtle,

greenbrier, wild grape, cabbage palm, and a few shade and water tolerant forbs and grasses.

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

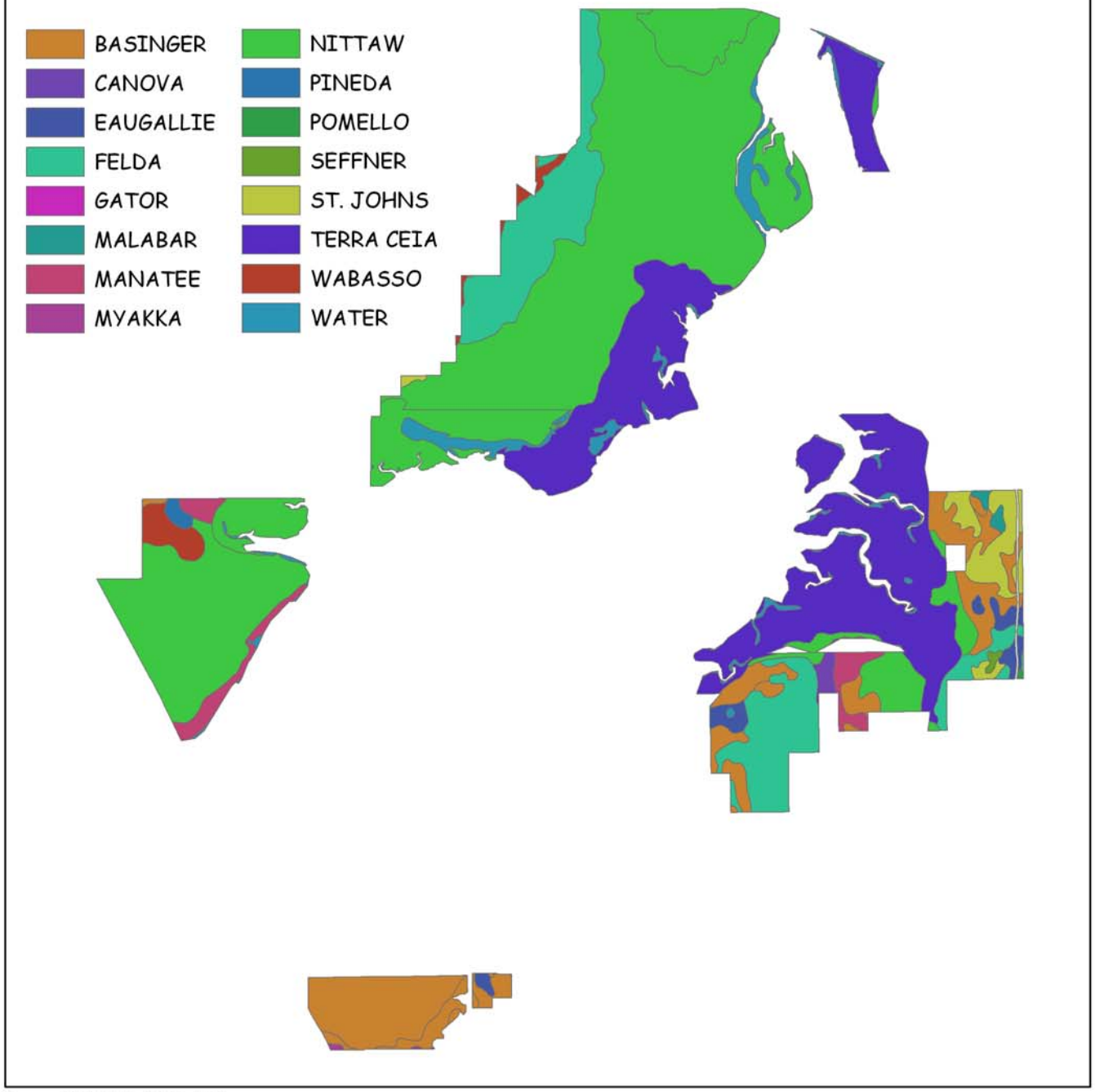
Pomello- Very deep, moderately well to somewhat poorly drained soils that are sandy to depths of more than 80 inches. Pomello soils were formed in sandy marine sediments in the flatwoods areas of peninsular Florida. Slopes range from 0-5%. Native vegetation is dominated by scrub oak, dwarf live oak, saw palmetto, longleaf pine, slash pine, and pineland threeawn.

Seffner – Seffner soils are very deep, somewhat poorly drained, rapidly permeable soils on the rims of depressions and on lower lying flats and knolls in the lower coastal plain of south Florida. They formed in sandy marine sediments. Slopes range from 0-2%. Natural vegetation in these soils typically consists of longleaf pine, laurel oak, and water oak with an understory of saw palmetto, pineland threeawn, Indian grass, bluestem grasses and several panicums.

St. Johns- Consists of very deep, very poorly drained, moderately permeable soils on broad flats and depressional areas of the lower coastal plain. They formed in marine sediments. Slopes range from 0-5%. Principal vegetation of the forested areas is longleaf pine, slash pine, and pond pine with an undergrowth of saw palmetto, gallberry, wax myrtle, huckleberry and pineland threeawn.

Terra Ceia – Terra Ceia soils consist of very deep, very poorly drained organic soils that formed from nonwoody fibrous hydrophytic plant remains. They occur mostly in nearly level freshwater marshes and occasionally on river floodplains and in tidal swamps or flats. Natural vegetation in these soils typically consists of sawgrass, lilies, sedges, reeds, maidencane, and other aquatic plants. Wooded areas include cypress, black gum, cabbage palm, Carolina ash, loblolly bay, red maple, sweetbay, and pond pine.

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



Source: SJRWMD, NRCS, 2001

Lake Jesup Conservation Area

Figure 8. Soils Map

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Lake Jesup Conservation Area

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Author:tmashour, Source:G:\MGMT PLANS\Lake Jesup\2007\Lake Jesup Maps\Figure 2. Regional Significance Map.mxd, Time:7/23/2007 2:18:30 PM

PAST MANAGEMENT SUMMARY

This section is necessary for management plan revisions. Outline all strategies in previous plan and summarize progress.

Security
2001 Plan Strategy: Maintain signage, fences, and gates.
Status: Signage, fences, and gates have been maintained.
2001 Plan Strategy: Continue coordinating with FWC, local law enforcement, and private security firm.
Status: The District continues to coordinate with the Seminole County Sheriff's Office, FWC officers, and a private security firm in order to better secure LJCA.

Restoration
2001 Plan Strategy: Continue implementation of restoration plans contained in the Futch property restoration plan.
Status: The District continues to treat invasive and exotic plants at the Futch property, water quality continues to be sampled, a LJCA Land Management Plan has been developed, and restoration has been monitored.
2001 Plan Strategy: Continue monitoring the Futch restoration site.
Status: The Futch restoration site has been monitored along with the forested wetland restoration area of the property.
2001 Plan Strategy: Continue to cooperate with FWC regarding the spoil deposition project.
Status: FWC will not be completing the spoil deposition project at LJCA at this time.
2001 Plan Strategy: Monitor progress of projects designed to reduce phosphorus loading in Lake Jesup.
Status: The District continues to sample water quality at strategic locations at LJCA.
2001 Plan Strategy: Continue maintenance management of invasive and exotic species, as needed.
Status: Exotic species treatment is ongoing at LJCA. Exotic species at LJCA include Chinese tallow, Brazilian pepper, Chinaberry, camphor, Mexican petunia, cogon grass, tropical soda apple, caesar weed, African red hibiscus, bahia grass, Bermuda grass, and Japanese climbing fern are being treated and are currently under control at a maintenance level. These species are under maintenance control and are treated when necessary. Cattail and saltbush, invasive native species, are also under maintenance control at the Conservation Area. Feral hogs are trapped on the property.

Fire Management
2001 Plan: Implement prescribed burning where feasible.
Status: The District will continue to evaluate the use of fire at LJCA. Due to the airport directly west of the Lake as well as the highway systems near and across the Lake, the correct weather and winds will be necessary. Burn zones for Marl Bed Flats and East Lake Jesup have been created.

Forest Management
2001 Plan Strategy: Evaluate selective harvesting in the future for this area.
Status: Due to the District entering into the lease with AquaFiber Technologies Corporation to treat Lake Jesup water, most of the planted pine area will be harvested to accommodate the project.

Water Resources
2001 Plan Strategy: Monitor progress of the "Lake Jesup Management Plan."
Status: The District's Division of Project Management worked with Seminole County in an agreement to install stormwater ponds at the end of Cameron Avenue on District property. The County also installed the Navy Canal stormwater pond as a mitigation project. The District has also purchased parcels to deed to Seminole County to create additional stormwater parks. The County is in the process of finding funding for these additional stormwater properties. The District is working towards completing the *Lake Jesup Interagency Water Quality Restoration Strategy*, 2008, document to address restoration issues and strategies for Lake Jesup.
2001 Plan Strategy: Continue to work with FWC on spoil deposition site.
Status: The Interagency Agreement was signed in September 2001, however FWC will not be completing the spoil deposition project at this time and this agreement is inactive.

Listed Species
2001 Plan Strategy: Continue to maintain and build upon species list.
Status: Species lists are added to as species are documented on the property.

Exotic Species
2001 Plan Strategy: Monitor and continue to treat exotic and invasive vegetation.
Status: Exotic species treatment is ongoing at LJCA. Exotic species at LJCA include Chinese tallow, Brazilian pepper, chinaberry, camphor, Mexican petunia, cogon grass, tropical soda apple, Brazilian pepper, Caesar weed, African red hibiscus, bahia grass, Bermuda grass, and Japanese climbing fern. These species are under maintenance control and are treated when necessary. Cattail and saltbush, invasive native species, are also under maintenance control at the Conservation Area.
2001 Plan Strategy: Monitor for hog damage and take appropriate action when necessary.
Status: The District continues to monitor for hog damage at LJCA.
2001 Plan Strategy: Maintain hog removal contract as needed.
Status: A contracted hog trapper aids in controlling the population of feral hogs. United States Department of Agriculture is contracted on an as needed basis for hog trapping services.

Access
2001 Plan Strategy: Continue regular maintenance on access areas.
Status: Parking area, signage, roads, crossings, trails, and interior gates have been maintained.
2001 Plan Strategy: Maintain signs and kiosks within the area.

Status: Signs and kiosks within the area have been maintained.

Recreation
2001 Plan Strategy: Continue regular maintenance on trails, campsites, and the observation tower.
Status: Roads, marked multi-use trails, campsites, and the observation tower have been maintained. The observation tower has been repaired after recent vandalism.

Cultural Resources
2001 Plan Strategy: Coordinate with the Florida Division of Historical Resources and take action to reduce any potential disturbance of any sites identified.
Status: District land management activities and construction that may affect these resources are coordinated with the Florida Division of Historical Resources to reduce any potential disturbance of identified sites.

Environmental Education
2001 Plan Strategy: Evaluate potential for developing environmental education opportunities on the property.
Status: The District offers many environmental education programs that are offered in the form of workshops, online information and materials, or by requesting speakers or specific programs.

Cooperative Agreements
2001 Plan Strategy: Maintain agreements to assist with the management and maintenance of LJCA.
Status: Agreements at LJCA have been maintained.

IMPLEMENTATION

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

RESOURCE PROTECTION AND MANAGEMENT

Restoration

The Futch property, which holds the DEP conservation easement, has been restored by DOT for mitigation for the Seminole County portion of the eastern beltway, has been, and continues to be monitored by the District since 2000.

The Marl Bed Flats Tract had the entire perimeter dike removed. The Cameron Tract had 3000 feet of levee removed. FWC and DEP pushed in 2.9 miles of levee into the adjacent canal on the Futch tract in 2001.

The District utilizes grazing as a management tool at LJCA. Many of the District's acquisitions contained unimproved pasture. The technology for restoring these sites to a natural community is in its infancy stage, and the cost associated is extremely high. Therefore, the District relies on cattle to maintain the area and prevent woody shrubs

from invading. When the technology is developed for restoring these pastures and is cost effective, the District will reevaluate the necessity of cattle. Cattle leases are found on Marlbed Flats and the Cameron and Futch parcels. The current cattle lessee at the Cameron and Futch Tracts has removed encroaching cabbage palm and other woody shrubs to improve wet prairie habitat as well as to develop cattle forage.

Restoration Strategies

- Continue monitoring Futch property enhancement
- Continue to evaluate cattle leases on the property

Water Resource Protection

Since the draft *Lake Jesup Management Plan,* 2001, the District continues to sample for water quality at many sites within Lake Jesup. An intergovernmental agreement allowed Seminole County to complete a stormwater project at Cameron Avenue within District property introducing the retention of flows to Lake Jesup, thereby improving the quality of the stormwater discharge. The County also completed the Navy Canal stormwater pond, which also collects stormwater before running into the lake. The District also purchased properties that will be deeded to Seminole County for Lake Jesup stormwater treatment sites, which will be completed as funding becomes available.

In 2002, the Middle Basin was added to the priority list and a Surface Water Improvement Management Plan was created, which includes Lake Jesup. This plan outlines the needs for the basin, where funding will come from, and identifies projects to improve water quality.

Today, the District has worked with many local governments and state agencies to create the *Lake Jesup Interagency Water Quality and Habitat Restoration Strategy,* 2008, for lake restoration. The general restoration goal is to meet or exceed all Class III water quality standards and re-establish a healthy aquatic ecosystem in Lake Jesup. A Total Maximum Daily Load (TMDL) has been established for Lake Jesup that is required to be maintained. Projects to reduce the nutrient loading including fertilizer and reclaimed water use outreach, creating alternative treatment technology for Howell Creek/Bear Gully and 6-Mile Creek/Sanford Canal, completing chemical nutrient removal for Soldier/Gee Creek, and doing a Marsh Diversion at Salt, Sweetwater, and Wharf creeks, and to continue monitoring water quality. The plan also calls for a study at Lake Jesup to model its nutrient cycling in lake sediments, entering into a lease with AquaFiber Technologies Corporation to treat the lake through algae filtration, conducting a floating wetlands treatment project, and harvesting phragmites to remove phosphorus.

Water Resources Strategies

- Maintain the TMDLs for *Lake Jesup by completing and following the Lake Jesup Interagency Water Quality and Habitat Restoration Strategy*, 2008.

Fire Management

Fire is a significant factor controlling the character of vegetation in Florida. The District's primary use of prescribed fire is to mimic the natural fire regime in order to maintain and manage vegetation patterns and succession. The use of fire is important for wildlife, management, restoration of ecosystems, and for controlling fuel levels.

Whereas LJCA has many fire dependent communities, due to the location of the LJCA parcels within wildland/urban interface, prescribed burning is limited. Limiting factors include the State Road 46 Bridge, the Eastern Beltway, the Sanford Airport, and surrounding development. To the extent practicable, the District will use prescribed fire to maintain the natural communities requiring fire. However, when necessary, other methods, including mowing, roller chopping, herbicide, and grazing management, will be utilized in place of prescribed burning. These alternative strategies will be emphasized in areas where fire cannot be applied at all or when the required prescribed burning weather conditions are defined within such a narrow parameter that they are infrequently met. Fire suppression will be dealt with aggressively because of the same wildland/urban interface issues. Smoke from wildfires or lingering muck fires can pose a real threat to highway safety, therefore prescribed burning will only be utilized during optimal conditions. Fire management zones have been created at Marl Bed Flats and East Lake Jesup (Figure 8).

Fire Management Strategies

- Continue to evaluate the use of prescribed burning at LJCA and implement where feasible.

Forest Management

LJCA is predominantly hydric hammock and floodplain marsh with areas of upland mixed forest. On the East Lake Jesup Tract, a 20-acre pasture was planted with slash pine since the site historically supported a wet flatwoods pine system in the area. Due to the upcoming AquaFiber Technologies Corporation lease, an initial 10-acre area will be harvested to install a wetland treatment system for the Lake. A second phase of the project may necessitate the harvest of the remaining site. Cabbage palm harvesting is also being conducted to improve the wet prairie habitat at the Futch and Cameron Ranch parcels. In the event the District plans to replant within the scope of this plan, replanting may require herbicide as a necessary part of site preparation.

Forest Management Strategies

- Monitor slash pine harvest and cabbage palm harvest at LJCA.

Wildlife

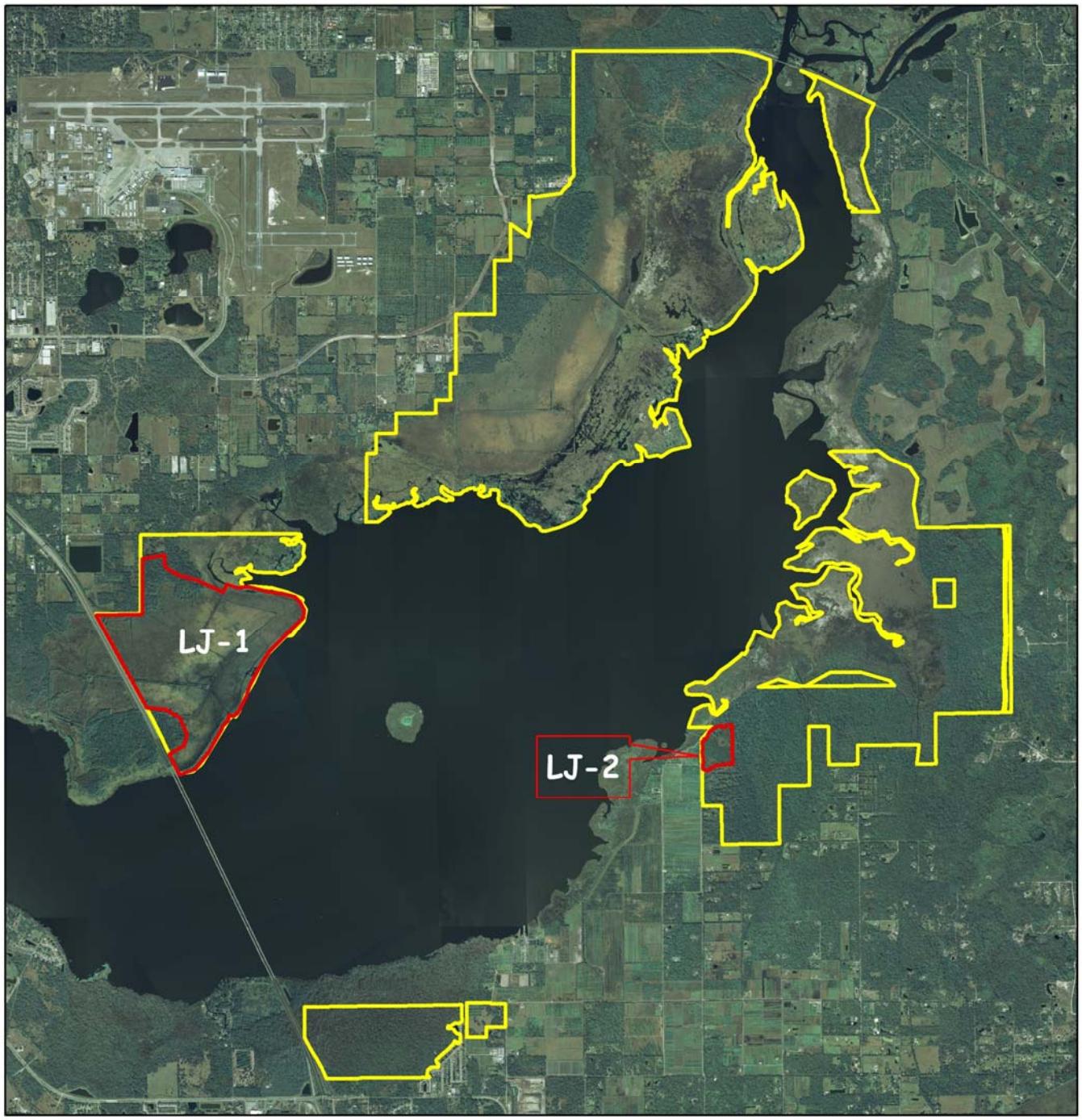
Certain ecological communities and listed species require additional management measures for protection. Identifying those resources requiring special attention and monitoring are integral parts of sound land management. Species lists for this property are being expanded. Observations by District staff indicate that the site provides habitat for a wide variety of both fish and wildlife, including species such as the wood stork

(*Mycteria Americana*), bald eagle (*Haliaeetus leucocephalus*), Florida sandhill crane (*Grus canadensis*), and American alligator (*Alligator mississipiensis*) (Appendix D). A conservation line has been established and posted on the Cameron Ranch Futch, and Marl Bed Flats parcels, which follows the old levee, along with portions of the East Lake Jesup parcels. There is no hunting west of this line.

There are two LJCA project areas included in the District's Avian Protection Plan (APP). The Cameron Stormwater Park project site was a medium risk level site. The construction project followed Construction Zone Best Management Practices and contained project equipment within the project site to minimize damage to surrounding forested wetlands. The Lake Jesup Stormwater Park project site at Cassel Creek is a low risk level. This property is currently managed by Seminole County and will be deeded to the county when funding becomes available for the project. At the time the project is deeded to the county, the property will no longer be part of the APP. The District, however, will request the county to minimize construction activities during the primary nesting season. The Futch property, or 3,387 acres, is also included in the APP.

Wildlife Strategies

- Continue to implement special protection measures and management strategies for listed species and communities.



Source: SJRWMD, 2007; Seminole County Imagery, 2006

Lake Jesup Conservation Area

Figure 9. Fire Management Units Map

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Lake Jesup Conservation Area

Fire Management Units

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Author:tmashour, Source:G:\MGMT PLANS\Lake Jesup\2007\Lake Jesup Maps\Figure 2. Regional Significance Map.mxd, Time:7/23/2007 2:18:30 PM

Exotic Species

Several exotic species are found at LJCA including Chinese tallow (*Sapium sebiferum*), Brazilian pepper (*Schinus terebinthifolius*), Chinaberry (*Melia azedarach*), camphor (*Cinnamomum camphora*), Mexican petunia (*Ruellia brittoniana),* cogon grass (*Imperata cylindrical*), tropical soda apple (*Solanum viarum*), Caesar weed (*Urena lobata*), African red hibiscus, bahia grass (*Paspalum notatum*), Bermuda grass (*Cynodon dactylon*), and Japanese climbing fern (*Lygodium japonicum*). LJCA is part of the District's invasive plant management program. Exotic species control is necessary to prevent proliferation of exotic and nuisance species and vital to maintaining ecological integrity of natural communities. Although it is unlikely that staff will completely eradicate invasive plant populations in the Conservation Area, populations are being held at a "maintenance" level. At this level, the property is regularly monitored, and herbicide treatments are applied as necessary in order to keep the populations from spreading.

Feral hogs are a problem in the Conservation Area and a hog-trapping program has been implemented at the properties. United States Department of Agriculture may also be contracted to trap feral hogs at the conservation area.

Exotic Species Strategies

- Continue to monitor for invasive species and treat as necessary.
- Continue to administer the feral hog-trapping program.

Cultural Resources Protection

A review of the Department of State, Division of Historical Resources indicates two (2) registered cultural sites within the conservation area. If any additional sites are located, District staff will document and report the sites to the Division of Historical Resources. District land management activities that may affect these resources will be evaluated and modified to reduce any potential disturbance of identified sites. Due to District and State policy, the location of the sites is not identified on public maps.

Cultural Resources Strategies

- Protect known cultural resources.
- Identify and report any new sites to Florida Division of Historical Resources.

LAND USE MANAGEMENT

Access

LJCA can be accessed through the East Lake Jesup Tract off Elm Street. The access has a kiosk, and multi-use trails. The Elm Street parking area is currently closed to vehicular traffic due to frequent acts of vandalism. The gate has a walk through for hiking access. Additional Elm Street access can be accommodated by permit for group camping. LJCA can also be accessed through the Marl Bed Flats tract off Oakway Lane. This access has a parking area and multi-use trails.

The Cameron Avenue entrance is closed due to the operation of the stormwater ponds. Seminole County will reopen and manage this access site when funding for trails becomes available. Upon completion of the stormwater park trails, the District will assess the Cameron Ranch parcel for trail enhancement and additional connections. Until the stormwater park is completed, groups may call the District to coordinate access to the Cameron Tract.

In order to manage District road maintenance, roads at LJCA have been identified and classified (Figure 10). Roads will be repaired as necessary and may be subject to closure during these times.

Access Strategies

- Continue regular maintenance on trail systems and interior road systems.
- Maintain trailhead-parking area, which includes entrance sign and kiosk.
- Coordinate with Seminole County for the reopening of the Cameron Avenue access.

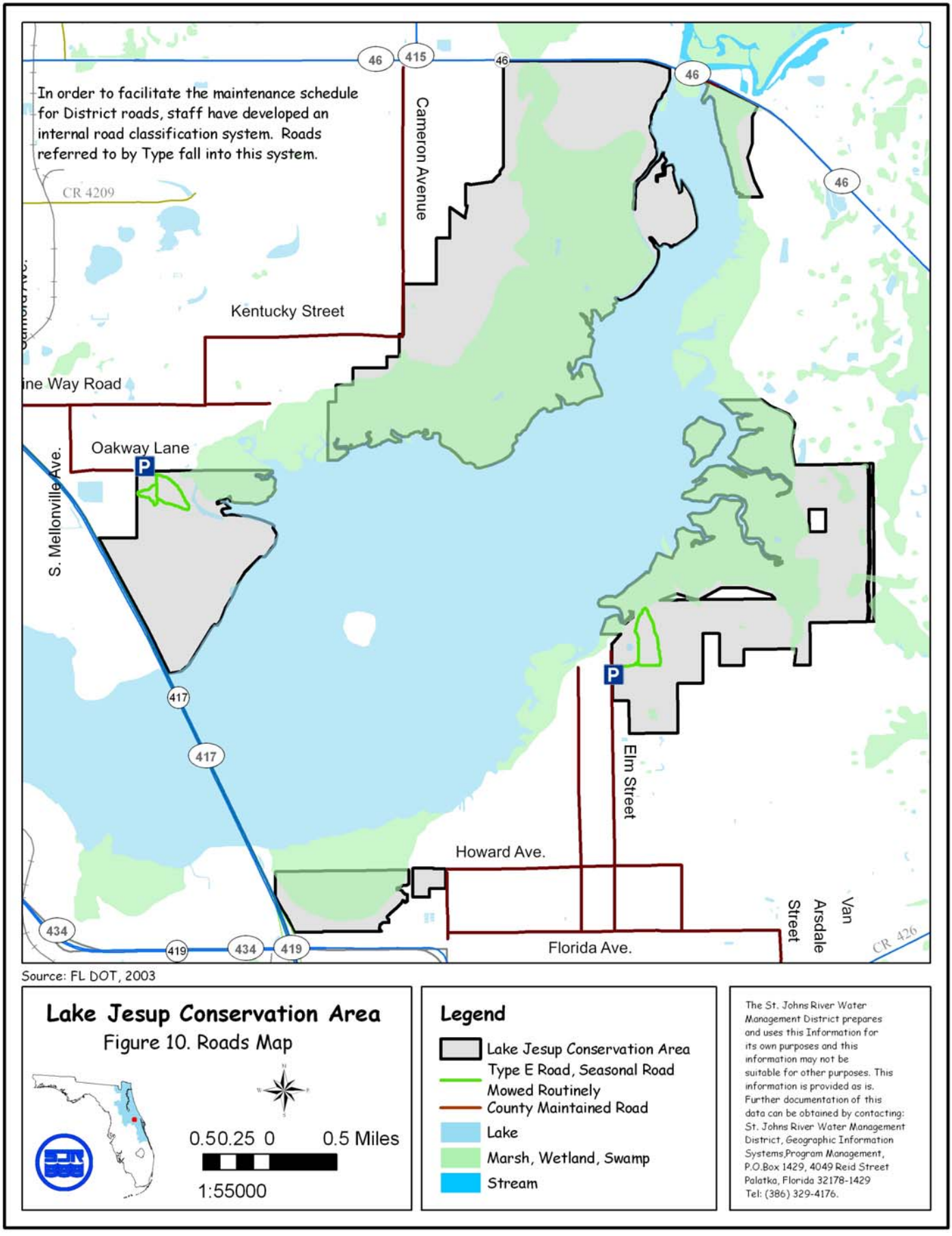
Recreation

The District offers multiple recreational opportunities at the East Lake Jesup Tract and the Marl Bed Flats Tract (Figure 10). Hiking, biking, horseback riding, and wildlife viewing can be enjoyed at these parcels. Multi-use trails, camping, and an observation tower are located at the East Lake Jesup site, which overlooks the lake. Multi-use trails are also found at the Marl Bed Flats tract.

A group campsite is located on the East Lake Jesup site. Group camping is for groups of seven or more people. Group campsites require a reservation and permit from the District; campers must call at least seven days in advance. No fees are required. To obtain a permit for camping, campers may contact the District's Division of Land Management. The property is included in the District's *Recreation Guide to District Lands* located at www.sjrwmd.com.

Trails at the Marl Bed Flats tract are currently being monitored due to acts of vandalism and will be evaluated to determine whether the property will continue to be open for public access. Seminole County stormwater park plans at Little Cameron Ranch include hiking, biking and equestrian trails and may include restrooms. At the time the Cameron Ranch access area is reopened, Marl Bed Flats will be evaluated to determine whether the access point is viable to remain open.

A conservation line has been established and posted on the Cameron Ranch Futch, and Marl Bed Flats parcels, which follows the old levee, along with portions of the East Lake Jesup parcels. There is no hunting west of this line.



Source: FL DOT, 2003

Lake Jesup Conservation Area

Figure 10. Roads Map

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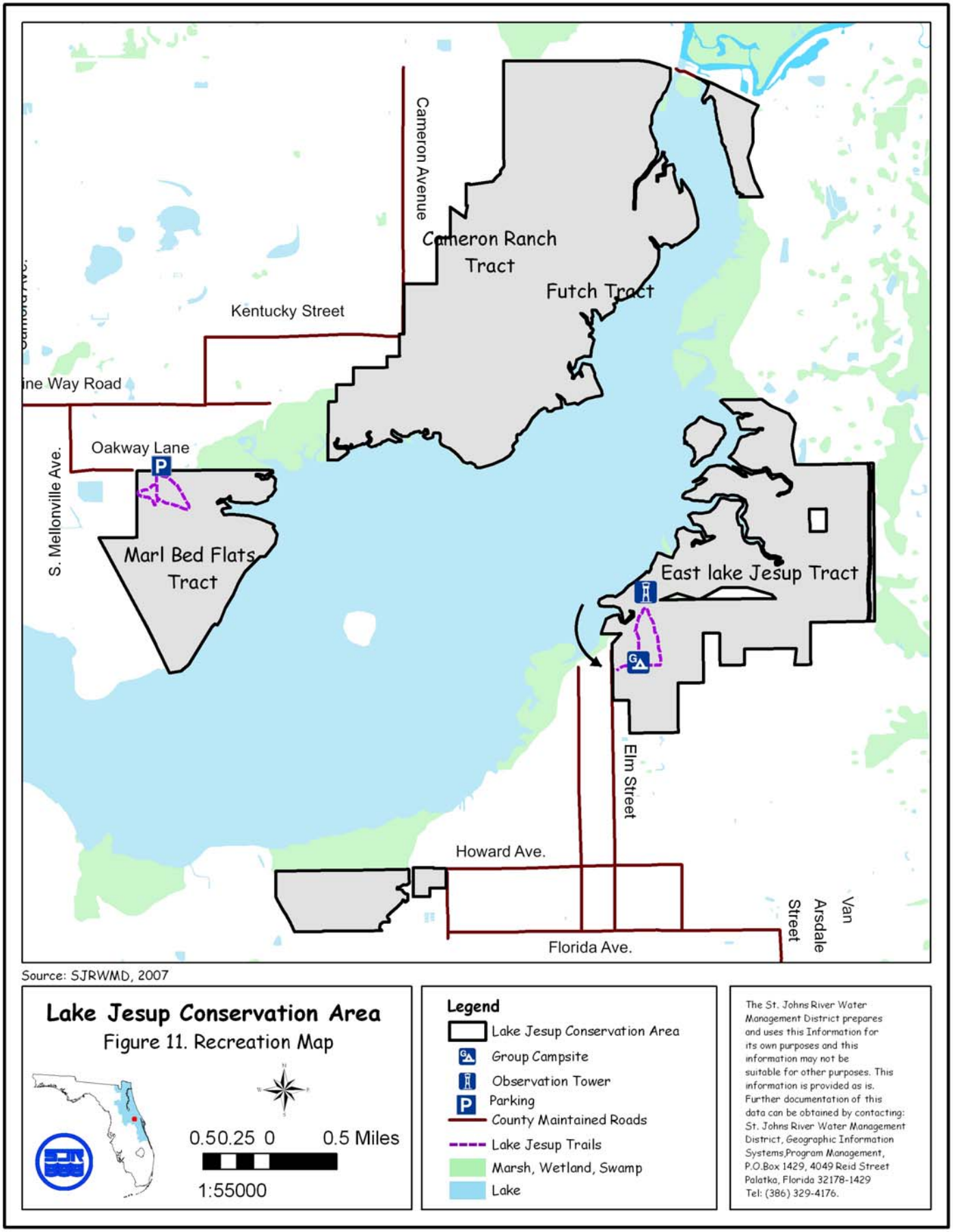
Legend

- Lake Jesup Conservation Area
- Type E Road, Seasonal Road Mowed Routinely
- County Maintained Road
- Lake
- Marsh, Wetland, Swamp
- Stream

Author:tmashour, Source:G:\MGMT PLANS\Lake Jesup\2007\Lake Jesup Maps\Figure 2. Regional Significance Map.mxd, Time:7/23/2007 2:18:30 PM



Author:tmashour, Source:G:\MGMT PLANS\Lake Jesup\2007\Lake Jesup Maps\Figure 2. Regional Significance Map.mxd, Time:7/23/2007 2:18:30 PM

Recreation Strategies

- Continue regular maintenance on interior roads, marked multi-use trails and corresponding trail brochure.
- Maintain parking area, entrance sign and informational kiosk.
- Maintain group camping area and observation tower.

Environmental Education

The District offers many environmental education programs in the form of workshops, online materials, or by requesting speakers or specific programs. New programs include the Great Water Odyssey and Project Wet Workshops. The Great Water Odyssey is an interactive, multidisciplinary educational experience available free of charge to educators in the District. Project Wet is a program designed to teach educators about water resources and is based on FCAT standards. Project Wet Workshops are offered at various times during the year in many counties, including Seminole County. Implementing a Legacy Program for this conservation area will be re-evaluated in the future.

Environmental Education Strategies

- Continue to offer District environmental education programs.
- Continue to evaluate the implementation of a Legacy Program at LJCA.

Security

The property was posted soon after the original survey work was completed. Fencing has been erected where possible and gates are located at key access sites. Maintenance of the fence lines and replacement of boundary signs is ongoing. The District will continue to coordinate with Seminole County Sheriff's Office, FWC law enforcement, and a private firm under contract by the District for any potential security needs.

Security Strategies

- Maintain signage, fences, and gates.
- Continue coordinating with Seminole County Sheriff's Office, FWC law enforcement, and a private security firm for any potential security needs.

ADMINISTRATION

Acquisition

The District may consider purchasing parcels near LJCA that become available that will aid in the conservation of water resources in the Lake Jesup subbasin.

Acquisition Strategies

- Continue to pursue those parcels that will aid in the conservation of the Lake Jesup subbasin.

Cooperative Agreements

In accordance with District Policy #90-16, the District promotes entering into agreements with other agencies and private parties for cooperation and coordination 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.

The District has a cooperative agreement with Seminole County Soil and Water Conservation District for cattle lease management. This agreement is based on Chapter 97-164, Laws of Florida, F.S. Section 373.59, requiring water management districts to first consider using local soil and water conservation districts as lead managers for lands leased back for agriculture purposes. The Soil and Water Conservation District is currently managing a lease for the District on the Cameron and Futch tracts.

The District has a cooperative agreement with Seminole County to build the Cameron Avenue Stormwater Park. The agreement includes the provision of a fenced parking area that should accommodate horse trailers and include a cattle gate for public access. Seminole County will be lead manager for the project site and regularly patrol and mow the site. The site shall have multiple use hiking trails on the perimeter of the ponds.

The District has an intergovernmental management agreement with FWC signed in 2001 to place dredge spoil material on the Cameron/Little Ranch Parcel. This agreement is inactive.

Table 2. Cooperative Agreements at LJCA

Agreement #	**Agency/ Individual**	**Begin**	**Term**	**Acres**	**Expiration**
Intergovernmental Management Agreement #69	Seminole County Soil and Water Conservation District	October 1998	3 years	Cameron Ranch 1194 acres, Futch 960 acres	2001, then autorenewal every five years
Cooperative Agreement #68	Seminole County Cameron Stormwater Park	April 26, 2004	Autorenewal in 25 year increments after 2054	21 acres of Little Cameron Ranch	April 26, 2054
Intergovernmental Agreement #386 (Inactive)	FWC	September 2001	5 years	1,194, Little (Cameron) Ranch	October 2006, Autorenewal in 5 year increments

Cooperative Easements Strategies

- Maintain agreements to assist with the management and maintenance of LJCA.

Leases, Easements, Special Use Authorizations, and Concessions

According to District policy #83-01, Leasing Lands for Cattle Grazing and District policy #84-02 Special Use Authorizations, the District is authorized to enter into cattle leases and special use authorizations on District land. The following are additional agreements found associated with LJCA.

The District is finalizing a lease with AquaFiber Technologies Corporation on the East Lake Jesup Tract that will create an algae filtering facility to filter lake water for phosphorus removal.

There is a conservation easement on the Futch parcel as held by DEP put in place in 1991 (Agreement #413, Land Resources System (LRS) database).

The District has a cattle lease on the Marl Bed Flats Tract at LJCA (Agreement #240, LRS). The lessee must remove cattle when water is up to the 3-foot water elevation. Cattle may return when water is at 2.9 feet or below for 10 consecutive days.

The District has a Special Use Authorization to cut and harvest palm fronds cut manually by hand, using hand tools (Agreement #179, LRS). The areas approved for harvest include the Marl Bed Flats parcel, the Cameron/Little Ranch and Futch parcels and the East Lake Jesup parcel.

The District has a Special Use Authorization with Hurricane Island Outward Bound School for solo campsites for students, trailblazing, and campsite construction and Maintenance (Agreement #83, LRS). The authorization is for Buck Lake Conservation Area as well as LJCA. The group may utilize the East Lake Jesup and Marl Bed Flats tracts.

The District has a Special Use Authorization for hog trapping on the Futch/Cameron parcels (SUA #342). The agreement is for five (5) years.

The District has a Special Use Authorization to trap hogs on the East Jesup parcel as well as the Empire Cattle property at Gemini Springs Addition (SUA #425).

Leases, Easements, Special Use Authorizations, and Concessions

- Continue to evaluate Leases, Easements and Special Use Authorization at LJCA.

Table 3. Easements and Special Use Authorizations at LJCA*

Agreement #	Agency/Individual	Begin	Expiration	Term
SUA #83	Hurricane Island Outward Bound School	September 23, 2004	September 22, 2005	Autorenewal for four (4) one (1) year terms terminating on September 22, 2009
Lease # 240, Cattle	Crescent TS Cattle Company	September 13, 2000	September 12, 2001	Autorenewal from year to year subject to termination
SUA # 179, Palmetto Harvesting	Mr. Ralph Higginbotham	November 1, 2005	April 30, 2005	Auto renewal for 4 six month terms with final expiration April 30, 2009
SUA # 342, Hog Trapping	Mr. James LeFils	February, 2008	January, 2009	Auto renewal for 4 one year terms with final expiration January 31, 2013
SUA # 425, Hog Trapping	Mr. Patrick Trevison	January 1, 2008	December 31, 2008	Auto renewal for 4 one year terms with final expiration December 31, 2012
Agreement #413, Easement	DEP	October 4, 1991	Perpetuity	Perpetual
	AquaFiber Technologies Corporation	Pending		

*Lessees are those present at the time of approval of the land management plan.

Leases, Easements, and Special Use Authorizations Strategies

- Continue to evaluate leases, easements, and special use authorizations at LJCA.

IMPLEMENTATION CHART

TASK	RESPONSIBLE LEAD	DUE DATE	COOPERATORS
RESOURCE PROTECTION AND MANAGEMENT			
Water Resources			
Maintain the TMDLs for Lake Jesup by completing and following the "Lake Jesup Interagency Water Quality and Habitat Restoration Strategy."	DWR	Ongoing	DLM
Fire Management			
Continue to evaluate the use of prescribed burning at LJCA and implement where feasible.	DLM	Ongoing	DOF
Forest Management			
Monitor slash pine harvest and cabbage palm harvest at LJCA.	DLM	Ongoing	DWR
Listed Species			
Continue to implement special protection measures and management strategies for listed species and communities.	DLM	Ongoing	DES, DPM
Exotic Species			
Continue to monitor for invasive species and treat as necessary.	DLM	Ongoing	
Continue to administer the feral hog-trapping program.	DLM	Ongoing	USDA
Cultural Resources			
Protect known cultural resources.	DLM	Ongoing	FDHR
Identify and report any new sites to Florida Division of Historical Resources.	DLM	Ongoing	FDHR
LAND USE MANAGEMENT			
Access			
Continue regular maintenance on trail system and interior road system.	DLM	Ongoing	DPW
Maintain trailhead-parking area, which includes entrance sign and kiosk.	DLM	Ongoing	
Recreation			
Continue regular maintenance on interior	DLM	Ongoing	DPW

TASK	RESPONSIBLE LEAD	DUE DATE	COOPERATORS
roads, marked multi-use trails and corresponding trail brochure.			
Maintain group camping area and observation tower.	DLM	Ongoing	
Environmental Education			
Continue to offer District environmental education programs.	OC	Ongoing	DLM
Continue to evaluate the implementation of a Legacy Program at LJCA.	OC	Ongoing	DLM
Security			
Maintain signage, fences, and gates.	DLM	Ongoing	
Continue coordinating with Seminole County Sheriff's Office and a private security firm for any potential security needs.	DLM	Ongoing	FWC, private security firm, SCSO
ADMINISTRATION			
Acquisition			
Continue to pursue those parcels that will aid in the conservation of the Lake Jesup subbasin.	DLA	Ongoing	
Cooperative Agreements			
Maintain agreements to assist with the management and maintenance of LJCA.	DLM	Ongoing	
Leases, Easements, and Concessions			
Continue to evaluate Leases, Easements and Special Use Authorization at LJCA	DLM		

KEY

DLA	Division of Land Acquisition
DLM	Division of Land Management
DOF	Florida Division of Forestry
DPM	Division of Project Management
DPW	Division of Public Works
DWR	Division of Water Resources
ES	Division of Environmental Sciences
FDHR	Florida Division of Historical Resources
FWC	Florida Fish and Wildlife Conservation Commission
OC	Office of Communication
SCSO	Seminole County Sheriff's Office
USDA	United States Department of Agriculture

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APPENDIX A: FUTCH FDEP CONSERVATION EASEMENT

MARYANNE MORSE
CLERK OF CIRCUIT COURT
SEMINOLE COUNTY, FL.

RECORDED & VERIFIED

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SEMINOLE CO. FL.

CONSERVATION EASEMENT

STATE OF FLORIDA

COUNTY OF SEMINOLE

KNOW ALL PERSONS BY THESE PRESENTS THAT in consideration for the issuance of State of Florida Department of Environmental Regulation Permit Nos. 591723289 and 591733339 to the Seminole County Expressway Authority on March 29, 1991, and May 31, 1991, respectively, the Florida Department of Transportation (Grantor) has granted to the State of Florida Department of Environmental Regulation, 2600 Blair Stone Road, Tallahassee, Florida (Grantee), a Conservation Easement in accordance with Section 704.06, Florida Statutes, in and over the real property in Seminole County, Florida, as set forth in the legal descriptions attached hereto as Exhibit "A" and Exhibit "B".

As used herein, the term "Grantor" shall include any successor or assignee of the Grantor, and the term "Grantee" shall include any successor or assignee of the Grantee.

It is the purpose and intent of this Conservation Easement to assure that the subject lands (with the exception of included wetlands which are to be enhanced or created as specified in the afore-mentioned permits) will be retained and maintained forever predominantly in the natural vegetative and hydrologic condition existing at the time of execution of this Conservation Easement. The included wetlands which are to be enhanced or created shall be maintained forever in the enhanced or created conditions required

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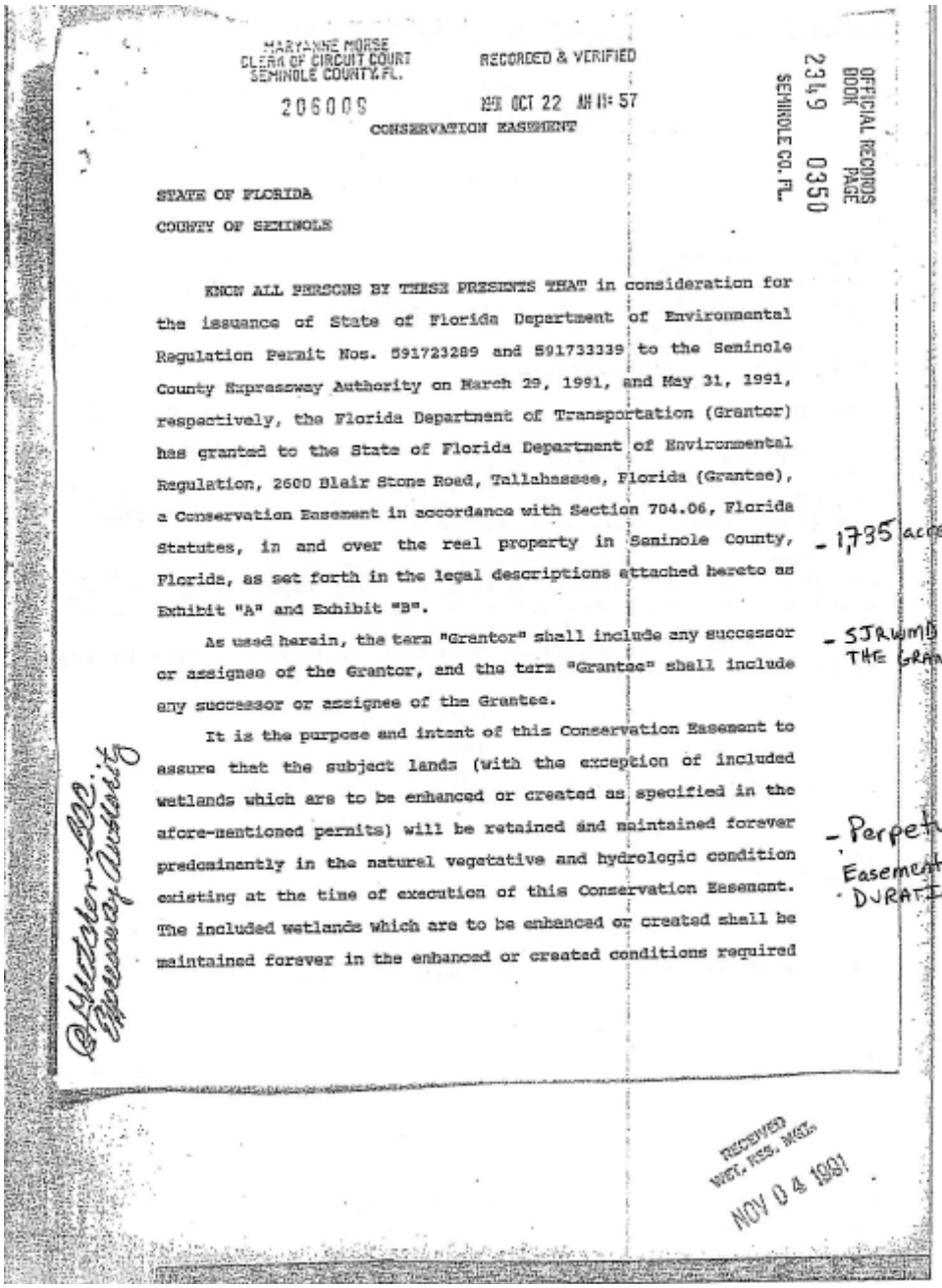

MARYANNE MORSE
CLERK OF CIRCUIT COURT
SEMINOLE COUNTY, FL.

RECORDED & VERIFIED

206009

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CONSERVATION EASEMENT

OFFICIAL RECORDS BOOK 2349 PAGE 0350 SEMINOLE CO. FL.

STATE OF FLORIDA

COUNTY OF SEMINOLE

KNOW ALL PERSONS BY THESE PRESENTS THAT in consideration for the issuance of State of Florida Department of Environmental Regulation Permit Nos. 591723289 and 591733339 to the Seminole County Expressway Authority on March 29, 1991, and May 31, 1991, respectively, the Florida Department of Transportation (Grantor) has granted to the State of Florida Department of Environmental Regulation, 2600 Blair Stone Road, Tallahassee, Florida (Grantee), a Conservation Easement in accordance with Section 704.06, Florida Statutes, in and over the real property in Seminole County, Florida, as set forth in the legal descriptions attached hereto as Exhibit "A" and Exhibit "B".

- 1,735 acres

As used herein, the term "Grantor" shall include any successor or assignee of the Grantor, and the term "Grantee" shall include any successor or assignee of the Grantee.

- SJRWMD NOW THE GRANTOR

It is the purpose and intent of this Conservation Easement to assure that the subject lands (with the exception of included wetlands which are to be enhanced or created as specified in the afore-mentioned permits) will be retained and maintained forever predominantly in the natural vegetative and hydrologic condition existing at the time of execution of this Conservation Easement. The included wetlands which are to be enhanced or created shall be maintained forever in the enhanced or created conditions required

- Perpetuity Easement - DURATION

@ Hutcher-Lee Boulevard Authority

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by the afore-mentioned permits.

Except for such specific activities as authorized pursuant to Department of Environmental Regulation Permit Nos. 591723289 and 591733339 and as may be proposed in writing by the St. Johns River Water Management District and approved in writing by the Grantee including but not limited to creation, enhancement and maintenance of wetlands as specified mitigation in said permit, the following activities are prohibited on the property subject to this Conservation Easement:

1. Construction or placing of buildings, roads, signs, billboards or other advertising, utilities, or other structures on or above the ground;

2. Dumping or placing of soil or other substances or material as landfill, or dumping or placing of trash, waste, or unsightly or offensive materials;

3. Removal or destruction of trees, shrubs, or other vegetation; with the exception of nuisance and exotic plant species as may be required by Grantee;

4. Excavation, dredging, or removal of loam, peat, gravel, soil, rock or other material substance in such matter as to affect the surface;

5. Surface use except for purposes that permit the land or water area to remain predominantly in its natural condition;

6. Activities detrimental to drainage, flood control, water conservation, erosion control, soil conservation, or fish and wildlife habitat preservation;

7. Acts or uses detrimental to such afore-mentioned

OFFICIAL RECORDS BOOK 2349 PAGE 0351 SEMINOLE CO. FL.

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retention and maintenance of land or water areas; and

8. Acts or uses detrimental to the preservation of any features or aspects of the property having historical, archaeological or cultural significance.

It is understood that the granting of this Conservation Easement entitles the Grantee or its authorized representatives to enter the above-described land in a reasonable manner and reasonable times to assure compliance.

The Grantor, on behalf of itself and its successors or assigns, hereby agrees to bear all costs and liability relating to the operation and maintenance of the lands subject to this Conservation Easement in the natural vegetative and hydrologic condition existing at the time of execution of this Conservation Easement, including the maintenance of enhanced or created wetlands in the vegetative and hydrologic condition required in the aforementioned permits, and Grantor does hereby indemnify and hold harmless the Grantee from same. The Conservation Easement hereby granted and the obligation to retain and maintain the land forever predominantly in the vegetative and hydrologic condition as herein specified shall run with the land and shall be binding upon the Grantor and its successors and assigns, and shall inure to the benefit of the Grantee and its successors and assigns.

The terms and conditions of this Conservation Easement may be enforced by the Grantee by injunctive relief and other appropriate available remedies, and Grantor consents that venue for such enforcement actions shall lie exclusively in the Circuit Court for the Second Judicial Circuit, in Leon County, Florida. In any

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BOOK 2349 PAGE 0352
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enforcement action in which the Grantee prevails, Grantee shall be entitled to recover the cost of restoring the land to the natural vegetative and hydrologic condition existing at the time of execution of this Conservation Easement or to the vegetative and hydrologic condition required by the afore-mentioned permit. These remedies are in addition to any other remedy, fine or penalty which may be applicable under Chapter 403, Florida Statutes.

Any forbearance on behalf of the Grantee to exercise its rights in the event of the failure of Grantor to comply with the provision of this Conservation Easement shall not be deemed or construed to be a waiver of the Grantee's rights hereunder in the event of any subsequent failure of the Grantor to comply.

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BOOK 2349 PAGE 0353
SEMINOLE CO. FLA.

IN WITNESS WHEREOF, Grantor has hereunto set Grantor's hand and seal on this 4th day of October, 1991.

Signed, sealed and delivered
in the presence of:

WITNESS

GRANTOR

OFFICIAL RECORDS
BOOK 1349 PAGE 0354
SEMINOLE CO. FL.

ACKNOWLEDGEMENT

This foregoing instrument was acknowledged before me this 4th October 1991 (date) by James L. O... (name of officer or agent), Chairman, Board of Directors (title of officer or agent) of Dept. of Transportation (name of corporation), a Florida (state or place of incorporation) corporation, on behalf of the corporation.

Cathy V. Goodman
Notary Public
State of Florida

My commission expires:

Notary Public, State of Florida
My Commission Expires Jan. 28, 1994
Bonded thru RICHARD Ins. Agency

Prepared by:

Seminole County Expressway Authority
1101 East First Street
Sanford, Florida 32771

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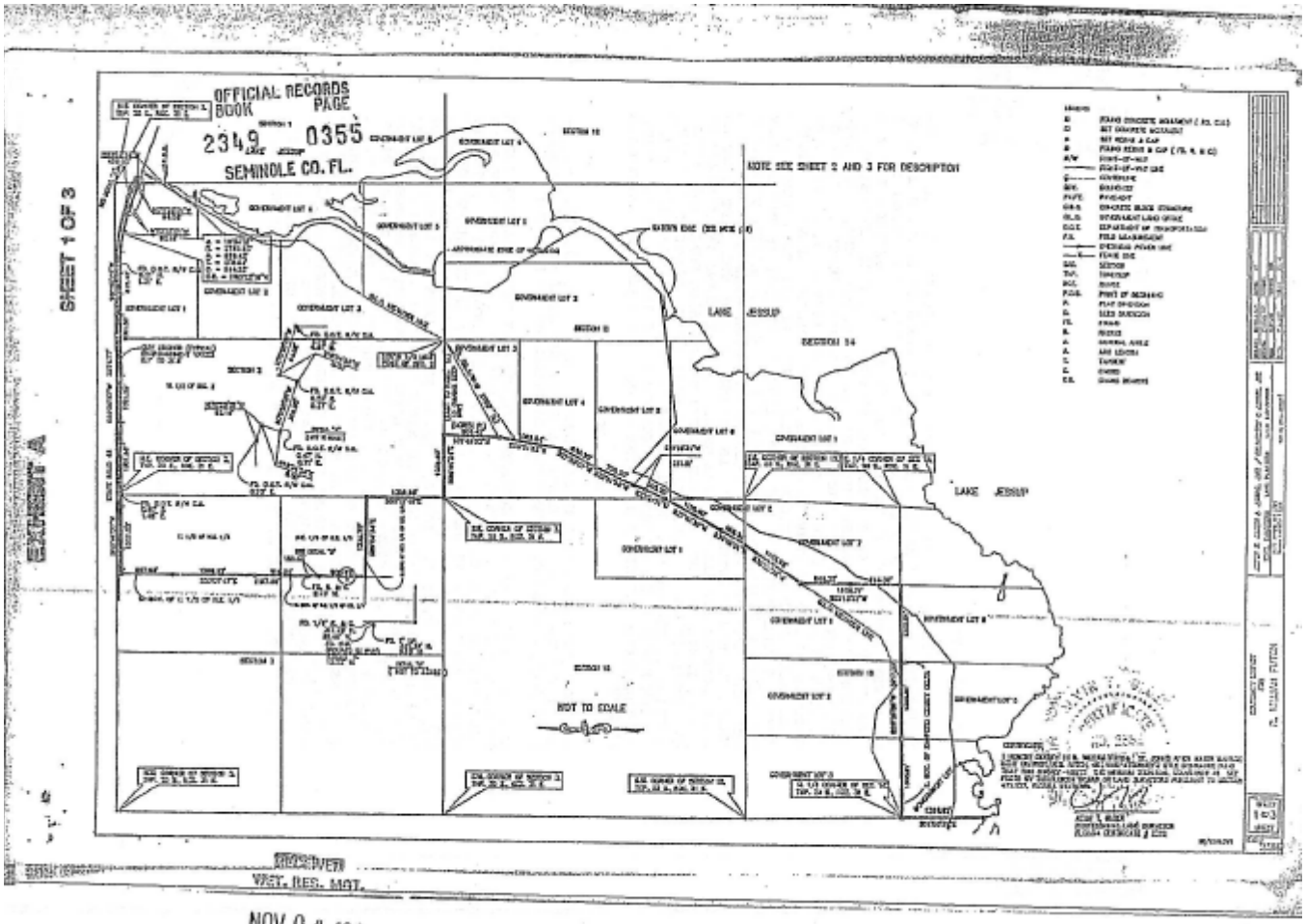
Legal Review: 10/4/91

By: Attorney - DOT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SHEET 1 OF 3
EXHIBIT A
NOTE SEE SHEET 2 AND 3 FOR DESCRIPTION
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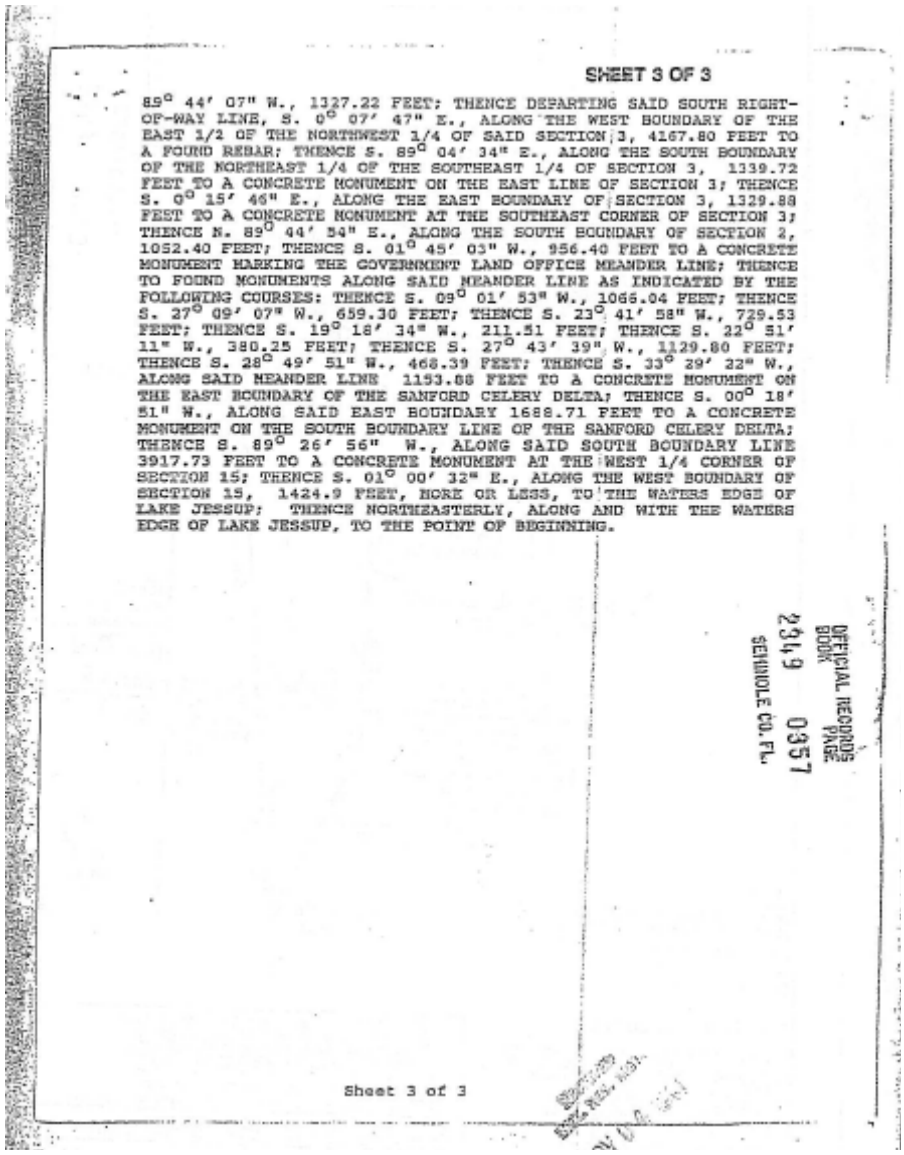
DESCRIPTION:

ALL OF LOTS 1, 2, AND 3, AND WEST 1/2 OF SECTION 2, ALL UNSURVEYED PORTION OF SECTION 2, OR LOTS 4 AND 5 OF SECTION 2; EAST 1/2 OF N.E. 1/4 AND N.E. 1/4 OF S.E. 1/4 OF SECTION 3, ALL UNSURVEYED PORTION OF SECTION 10, OR LOT 2 OF SECTION 10; ALL UNSURVEYED PORTION OF SECTION 11, OR LOTS 1-6, BOTH INCLUSIVE, OF SECTION 11; LOT 4 OF SECTION 12; ALL UNSURVEYED PORTION OF SECTION 14, OR LOT 1, OF SECTION 14; ALL UNSURVEYED PORTION OF SECTION 15 NOT IN SANFORD CELERY DELTA, OR LOTS 4, 5, 6, AND 7 OF SECTION 15 NOT IN SANFORD CELERY DELTA; BEGINNING AT THE SOUTH HALF MILE POST OF SECTION 2, RUN SOUTH 60 1/2 DEG. WEST 2108 FEET,; THENCE NORTH TO THE SOUTH LINE OF SECTION 2; THENCE EAST TO POINT OF BEGINNING, IT BEING THE INTENTION HEREBY TO CONVEY ALL THE SURVEYED PART OF SECTION 11 WHICH LIES EAST OF FENCE WHICH IS NOW LOCATED ABOUT 15 CHAINS EAST OF THE WEST LINE OF SAID SECTION 11; ALL OF ABOVE DESCRIBED LAND BEING IN TOWNSHIP 20 SOUTH, RANGE 31 EAST, SUBJECT TO EXISTING PUBLIC ROADS AND UTILITY RIGHT-OF-WAYS. LESS ALL THAT PART OF GOVERNMENT LOT 1 OF SECTION 2, TOWNSHIP 20 SOUTH, RANGE 31 EAST LYING AND BEING NORTH OF THE NORTH RIGHT OF WAY LINE OF NEW STATE ROAD NO 46 AND SOUTH OF THE SOUTH RIGHT OF WAY LINE OF OLD STATE ROAD NO 46(GENEVEA AVENUE).

ALSO KNOWN AS

A PARCEL OF LAND LYING IN SECTIONS 2, 3, 10, 11, 12, 14, AND 15, TOWNSHIP 20 SOUTH, RANGE 31 EAST, SEMINOLE COUNTY FLORIDA, SAID PARCEL BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT A 4" X 4" CONCRETE MONUMENT AT THE NORTHEAST CORNER OF SAID SECTION 2; THENCE S. 00° 52' 44" E., ALONG THE EAST BOUNDARY OF SAID SECTION 2, 850.7 FEET, MORE OR LESS, TO THE WATERS EDGE OF LAKE JESSUP, AND THE POINT OF BEGINNING OF THE HEREIN DESCRIBED PARCEL; THENCE N. 0° 52' 44" W., ALONG THE EAST BOUNDARY OF SAID SECTION 2, 453.02 FEET, MORE OR LESS, TO THE SOUTHERLY RIGHT-OF-WAY LINE OF STATE ROAD 46; THENCE N. 70° 25' 01" W., ALONG SAID RIGHT-OF-WAY LINE, 64.58 FEET; THENCE S. 19° 34' 59" W., 5.00 FEET; THENCE N. 70° 25' 01" W., 300.00 FEET; THENCE N. 19° 34' 59" E., 5.00 FEET; THENCE N. 70° 25' 01" W., 92.16 FEET TO THE POINT OF CURVATURE OF A TANGENT CURVE, CONCAVE SOUTHWESTERLY, HAVING AS ITS ELEMENTS A CENTRAL ANGLE OF 19° 54' 31" AND A RADIUS OF 2789.93 FEET; THENCE NORTHWESTERLY, ALONG AND WITH THE ARC OF SAID CURVE, 969.42 FEET; THENCE S. 89° 40' 29" W., ALONG THE SOUTHERLY RIGHT-OF-WAY LINE OF STATE ROAD 46, 612.42 FEET; THENCE S. 89° 38' 27" W., 3274.77 FEET; THENCE S.



SHEET 3 OF 3

89° 44' 07" W., 1327.22 FEET; THENCE DEPARTING SAID SOUTH RIGHT-OF-WAY LINE, S. 0° 07' 47" E., ALONG THE WEST BOUNDARY OF THE EAST 1/2 OF THE NORTHWEST 1/4 OF SAID SECTION 3, 4167.80 FEET TO A FOUND REBAR; THENCE S. 89° 04' 34" E., ALONG THE SOUTH BOUNDARY OF THE NORTHEAST 1/4 OF THE SOUTHEAST 1/4 OF SECTION 3, 1339.72 FEET TO A CONCRETE MONUMENT ON THE EAST LINE OF SECTION 3; THENCE S. 0° 15' 46" E., ALONG THE EAST BOUNDARY OF SECTION 3, 1329.88 FEET TO A CONCRETE MONUMENT AT THE SOUTHEAST CORNER OF SECTION 3; THENCE N. 89° 44' 54" E., ALONG THE SOUTH BOUNDARY OF SECTION 2, 1052.40 FEET; THENCE S. 01° 45' 03" W., 956.40 FEET TO A CONCRETE MONUMENT MARKING THE GOVERNMENT LAND OFFICE MEANDER LINE; THENCE TO FOUND MONUMENTS ALONG SAID MEANDER LINE AS INDICATED BY THE FOLLOWING COURSES: THENCE S. 09° 01' 53" W., 1066.04 FEET; THENCE S. 27° 09' 07" W., 659.30 FEET; THENCE S. 23° 41' 58" W., 729.53 FEET; THENCE S. 19° 18' 34" W., 211.51 FEET; THENCE S. 22° 51' 11" W., 380.25 FEET; THENCE S. 27° 43' 39" W., 1129.80 FEET; THENCE S. 28° 49' 51" W., 468.39 FEET; THENCE S. 33° 29' 22" W., ALONG SAID MEANDER LINE 1153.88 FEET TO A CONCRETE MONUMENT ON THE EAST BOUNDARY OF THE SANFORD CELERY DELTA; THENCE S. 00° 18' 51" W., ALONG SAID EAST BOUNDARY 1688.71 FEET TO A CONCRETE MONUMENT ON THE SOUTH BOUNDARY LINE OF THE SANFORD CELERY DELTA; THENCE S. 89° 26' 56" W., ALONG SAID SOUTH BOUNDARY LINE 3917.73 FEET TO A CONCRETE MONUMENT AT THE WEST 1/4 CORNER OF SECTION 15; THENCE S. 01° 00' 32" E., ALONG THE WEST BOUNDARY OF SECTION 15, 1424.9 FEET, MORE OR LESS, TO THE WATERS EDGE OF LAKE JESSUP; THENCE NORTHEASTERLY, ALONG AND WITH THE WATERS EDGE OF LAKE JESSUP, TO THE POINT OF BEGINNING.

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Sheet 3 of 3

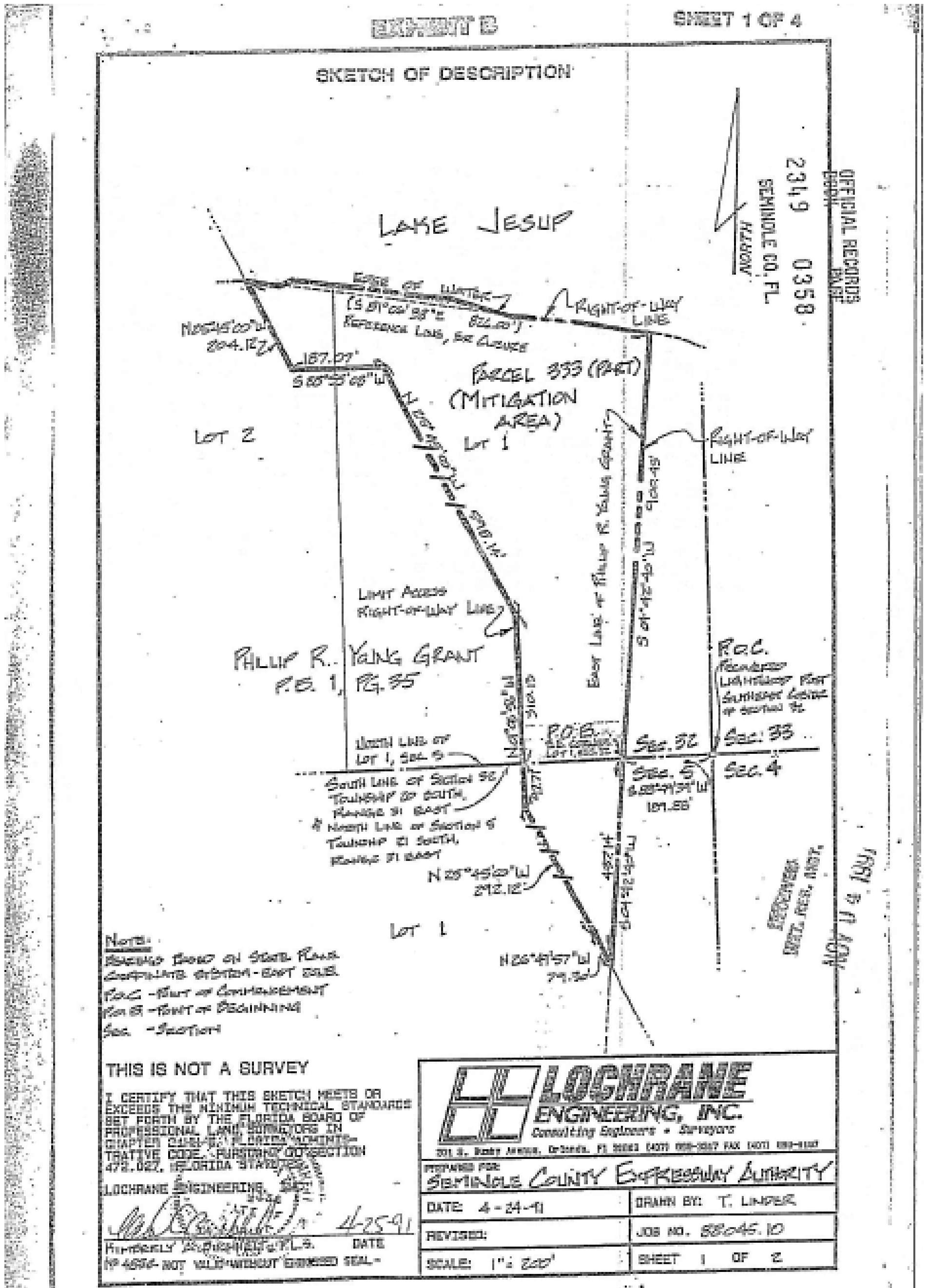
EXHIBIT B
SHEET 1 OF 4
SKETCH OF DESCRIPTION
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2349 0358
SEMINOLE CO. FL.
NORTH
LAKE JESUP
EDGE OF WATER
RIGHT-OF-WAY LINE
PARCEL 333 (PART) (MITIGATION AREA)
LOT 2
LOT 1
LIMIT ACCESS RIGHT-OF-WAY LINE
PHILLIP R. YOUNG GRANT P.B. 1, PG. 35
P.O.B.
P.O.C.
SEC. 32
SEC. 33
SEC. 5
SEC. 4
N 25°45'00"W 292.12'
N 26°41'57"W
THIS IS NOT A SURVEY
LOCHRANE ENGINEERING, INC.
Consulting Engineers • Surveyors
PREPARED FOR: SEMINOLE COUNTY EXPRESSWAY AUTHORITY
DATE: 4-24-91
DRAWN BY: T. LINDER
REVISED:
JOB NO. 88045.10
SCALE: 1" = 200'
SHEET 1 OF 2

PARCEL 333 (PART, MITIGATION AREA)

A PART OF LOT 1, SECTION 5, TOWNSHIP 21 SOUTH, RANGE 31 EAST, AND A PART OF LOTS 1 AND 2, SECTION 32, TOWNSHIP 20 SOUTH, RANGE 31 EAST, OF THE PHILLIP R. YOUNG GRANT, ACCORDING TO THE PLAT THEREOF AS RECORDED IN PLAT BOOK 1, PAGE 35 OF THE PUBLIC RECORDS OF SEMINOLE COUNTY, FLORIDA, AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCE AT A LIGHTWOOD POST MARKING THE SOUTHEAST CORNER OF SAID SECTION 32, TOWNSHIP 20 SOUTH, RANGE 31 EAST; THENCE RUN SOUTH 88°09'39" WEST ALONG THE SOUTH LINE OF SAID SECTION 32 A DISTANCE OF 189.88 FEET TO THE SOUTHEAST CORNER OF SAID LOT 1, SECTION 32 AND A POINT ON THE EAST LINE OF SAID PHILLIP R. YOUNG GRANT FOR A POINT OF BEGINNING; THENCE DEPARTING SAID SOUTH LINE RUN SOUTH 04°42'40" WEST ALONG SAID EAST LINE A DISTANCE OF 437.14 FEET; THENCE DEPARTING SAID EAST LINE RUN NORTH 26°49'57" WEST A DISTANCE OF 79.30 FEET; THENCE RUN NORTH 25°45'00" WEST A DISTANCE OF 292.12 FEET; THENCE RUN NORTH 01°06'56" WEST A DISTANCE OF 97.71 FEET TO A POINT ON THE NORTH LINE OF SAID LOT 1, SECTION 5, AND THE SOUTH LINE OF SAID LOT 1, SECTION 32; THENCE DEPARTING SAID LINE CONTINUE NORTH 01°06'56" WEST A DISTANCE OF 310.13 FEET; THENCE RUN NORTH 25°45'00" WEST A DISTANCE OF 598.14 FEET; THENCE RUN SOUTH 88°55'08" WEST A DISTANCE OF 187.07 FEET; THENCE RUN NORTH 25°45'00" WEST A DISTANCE OF 204.12 FEET TO A POINT ON THE EDGE OF WATER OF LAKE JESUP; THENCE RUN EASTERLY ALONG SAID EDGE OF WATER TO A POINT ON THE EAST LINE OF SAID PHILLIP R. YOUNG GRANT; THENCE DEPARTING SAID EDGE OF WATER RUN SOUTH 04°42'40" WEST ALONG SAID EAST LINE A DISTANCE OF 900.43 FEET TO THE POINT OF BEGINNING.

CONTAINING 9.464 ACRES, MORE OR LESS.

OFFICIAL RECORDS BOOK 2349 PAGE 0359 SEMINOLE CO. FL.

RECEIVED WET. RES. MGT. NOV 04 1997

LOCHRANE ENGINEERING, INC.
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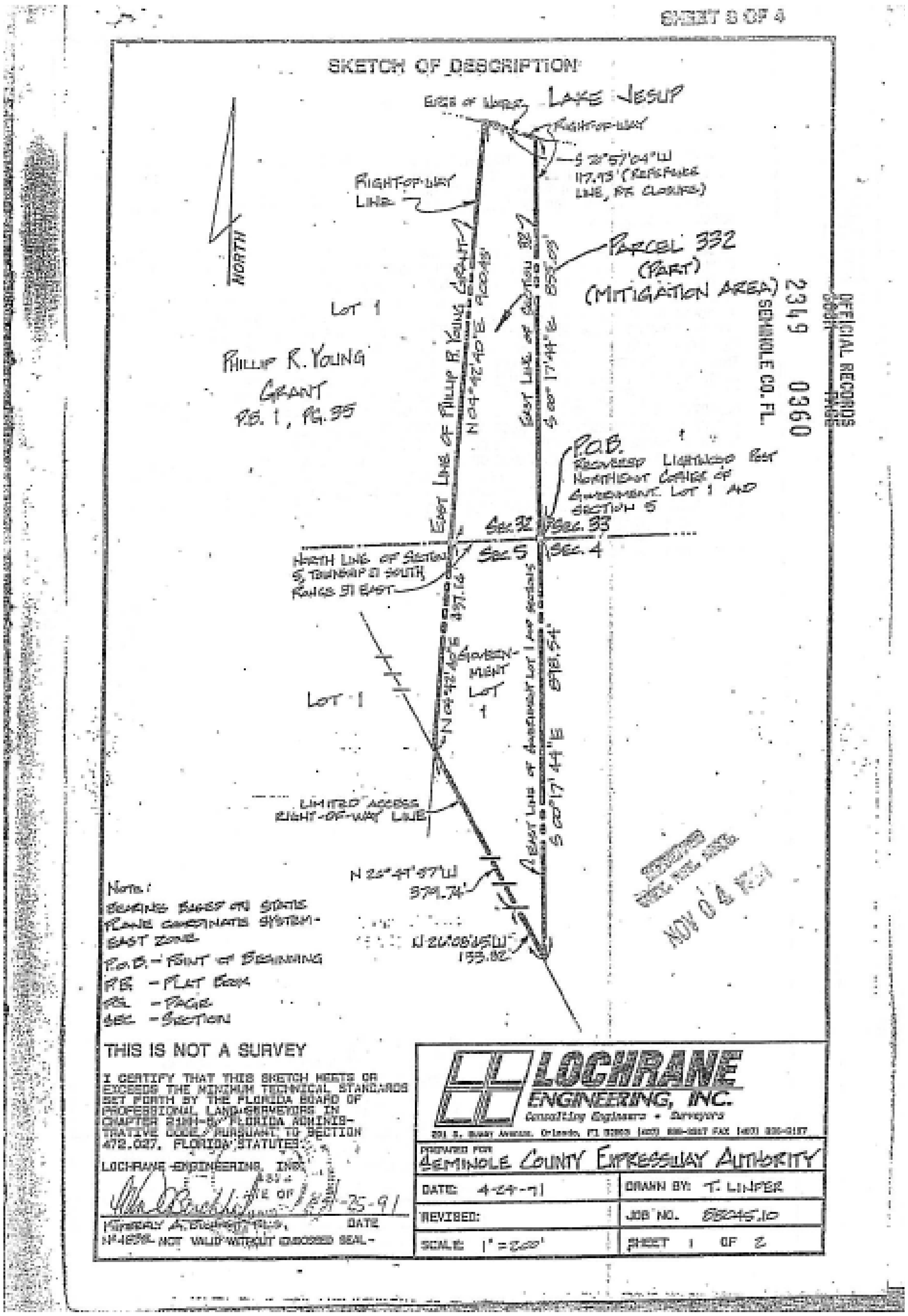
PREPARED FOR: SEMINOLE COUNTY EXPRESSWAY AUTHORITY	
DATE: 4-24-91	DRAWN BY: T. LINDER
REVISED:	JOB NO. 88345.10
SCALE: N/A.	SHEET 2 OF 2


SHEET 8 OF 4
SKETCH OF DESCRIPTION
LAKE JESUP
RIGHT-OF-WAY LINE
PARCEL 332 (PART) (MITIGATION AREA)
LOT 1
PHILLIP R. YOUNG GRANT PB. 1, PG. 35
EAST LINE OF PHILLIP R. YOUNG GRANT
EAST LINE OF SECTION 32
P.O.B.
SEC. 32
SEC. 33
SEC. 5
SEC. 4
NORTH LINE OF SECTION 5, TOWNSHIP 21 SOUTH, RANGE 31 EAST
GOVERNMENT LOT 1
LIMITED ACCESS RIGHT-OF-WAY LINE
N 25°41'57"W 579.74'
N 26°08'15"W 135.82'
NORTH
OFFICIAL RECORDS BOOK 2349 PAGE 0360 SEMINOLE CO. FL.
NOTE:
P.O.B. - POINT OF BEGINNING
PB - PLAT BOOK
PG - PAGE
SEC - SECTION
THIS IS NOT A SURVEY
I CERTIFY THAT THIS SKETCH MEETS OR EXCEEDS THE MINIMUM TECHNICAL STANDARDS SET FORTH BY THE FLORIDA BOARD OF PROFESSIONAL LAND SURVEYORS IN CHAPTER 21HH-6, FLORIDA ADMINISTRATIVE CODE, PURSUANT TO SECTION 472.027, FLORIDA STATUTES.
LOCHRANE ENGINEERING, INC.
DATE
NOT VALID WITHOUT EMBOSSED SEAL
LOCHRANE ENGINEERING, INC.
Consulting Engineers • Surveyors
PREPARED FOR
SEMINOLE COUNTY EXPRESSWAY AUTHORITY
DATE: 4-24-91
DRAWN BY: T. LINFER
REVISED:
JOB NO. 88045.10
SCALE: 1" = 200'
SHEET 1 OF 2

PARCEL 332 (PART, MITIGATION AREA)

A PART OF GOVERNMENT LOT 1, SECTION 5, TOWNSHIP 21 SOUTH, RANGE 31 EAST, AND ALL OF FRACTIONAL SECTION 32, TOWNSHIP 20 SOUTH, RANGE 31 EAST, SEMINOLE COUNTY, FLORIDA, LYING SOUTH OF LAKE JESSUP AND EAST OF THE PHILLIP R. YOUNG GRANT ACCORDING TO THE PLAT THEREOF AS RECORDED IN PLAT BOOK 1, PAGE 35 OF THE PUBLIC RECORDS OF SEMINOLE COUNTY, FLORIDA, AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGIN AT A LIGHTWOOD POST MARKING THE NORTHEAST CORNER OF SAID GOVERNMENT LOT 1 AND SAID SECTION 5; THENCE RUN SOUTH 00°17'44" EAST ALONG THE EAST LINE OF SAID GOVERNMENT LOT 1 AND SAID SECTION 5 A DISTANCE OF 898.54 FEET; THENCE DEPARTING SAID EAST LINE RUN NORTH 26°08'45" WEST A DISTANCE OF 133.82 FEET; THENCE RUN NORTH 26°49'57" WEST A DISTANCE OF 379.74 FEET TO A POINT ON THE EAST LINE OF SAID PHILLIP R. YOUNG GRANT; THENCE RUN NORTH 04°42'40" EAST ALONG SAID EAST LINE A DISTANCE OF 437.14 FEET TO A POINT ON THE NORTH LINE OF SAID GOVERNMENT LOT 1 AND SAID SECTION 5; THENCE CONTINUE NORTH 04°42'40" EAST ALONG SAID EAST LINE A DISTANCE OF 900.43 FEET TO A POINT ON THE EDGE OF WATER OF LAKE JESUP; THENCE RUN EASTERLY ALONG SAID EDGE OF WATER TO A POINT ON THE EAST LINE OF SAID SECTION 32; THENCE DEPARTING SAID EDGE OF WATER RUN SOUTH 00°17'44" EAST ALONG SAID EAST LINE A DISTANCE OF 865.03 FEET TO THE POINT OF BEGINNING.

CONTAINING 6.336 ACRES, MORE OR LESS.

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CLERK OF CIRCUIT COURT
SEMINOLE COUNTY, FLORIDA
BY _____
DEPUTY CLERK
SANDRA SMITH

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201 S. Orange Avenue, Orlando, FL 32801 (407) 839-3187 FAX (407) 839-3187

PREPARED FOR: SEMINOLE COUNTY EXPRESSWAY AUTHORITY	
DATE: 4-24-91	DRAWN BY: T. LINBE
REVISED:	JOB NO. 88046.10
SCALE: N/A	SHEET 2 OF 2

APPENDIX B: FUTCH RESTORATION PLAN

RESTORATION PLAN

FUTCH PROPERTY

Middle St. Johns River Basin, Seminole County

Draft: January 12, 2001

INTRODUCTION

This document provides a plan for restoration activities at the 1,735-acre Futch property, located on the northern shore of Lake Jesup in Seminole County (Figure 1). The Futch property was acquired by the St. Johns River Water Management District (District) in August 1990, and then sold to the Florida Department of Transportation (DOT) in May 1991 to be used as mitigation for wetland impacts associated with construction of the 18-mile Seminole Expressway. In November 2000 mitigation responsibilities and property ownership were transferred from DOT to the District in conjunction with a conservation easement and an endowment for active management and ongoing maintenance of the tract. Mitigation responsibilities are outlined in a DEP Permit Modification signed by the District on May 10, 2000. Although the DOT initiated and completed significant restoration actions, additional restoration is needed at this site. The conservation easement was established October 4, 1991 and is held by the Florida Department of Environmental Protection.

The property is primarily wet prairie and freshwater marsh that was an overflow area in the historical flood plain of Lake Jesup and the St. Johns River (Figure 2). Prior to the 1940s alterations to the marsh were limited to ditches crossing the property from agricultural lands west of the site, fill from a causeway supporting State Road 46, and impacts from free ranging cattle. After the 1940s, approximately 18,000 feet of levee / ditch system were constructed to separate the site from Lake Jesup, so that water levels on 760 acres could be controlled for cattle and agriculture (Figure 3).

Current land cover and associated acreages are identified in the following table.

Cover Type	Acreage	Cover Type	Acreage
Freshwater Marsh	811	Canal / Ditch	5
Emergent Aquatic	27	Cabbage Palm Hammock	30
Wet Prairie	532	Live Oak Hammock	42
Wetland Forest	121	Rangeland	128
Cypress Forest	23	Levee / Berm	16

Altered hydrology and management for cattle created an environment suitable to the establishment of nuisance plant species. Cattails are problematic where flocculent material has accumulated in some ditches and canals. These nutrient enriched wet areas also contribute to decreased water

quality in Lake Jesup. A woody shrub, saltbush, is problematic over a 75 acre area, where dewatering, an absence of fire, and extensive grazing removed most other native ground cover. There is also a moderate infestation of non-native invasive plants such as Chinese tallow, Brazilian pepper, chinaberry, and camphor. These species have been found on levees and ditch spoil sites throughout the property.

RESTORATION OVERVIEW

Restoration has been gaining public and political support in the Lake Jesup area during the last decade. As knowledge and management of the lake has increased so has cooperation between Federal, state and local agencies to improve water quality by reducing pollutant loadings and increasing hydraulic circulation in Lake Jesup. A notable example of this is the 1994 Lake Jesup Act that provided for the creation of a 16-member advisory team with mandates for feasibility studies, demonstration projects and implementation of restoration and management recommendations throughout the lake. The District's goals for restoring the Futch property are consistent with other agency actions in the Lake Jesup area. These goals include enhanced hydrologic connections between Lake Jesup and the adjacent marsh; achieving maintenance level control of exotic plants and nuisance native plants; restoring seasonal fire regimes; re-establishing natural communities; and removing unnecessary levees, roads, ditches and fencing.

Solutions to larger water quality issues in Lake Jesup may involve actions at the Futch property. The USACOE and the DOT are involved in the redesign of the SR 46 causeway, bridge and channel openings to the lake based on analysis of hydrodymamic modeling, sediment analysis and other hydrologic reports. Decisions by these agencies are unlikely to be reached in the near future. Other actions are identified in the Draft Lake Jesup Management Plan, which calls for strategic shoreline dredging at six locations to increase habitat quality in the lake. One of the sites is a 100-m wide strip parallel to the southern shore of the Futch property where flocculent material has accumulated. Dredging would remove the top 35 cm in a 38.5-acre area. The Draft Management Plan also guides local governments in identifying sites to retrofit stormwater retention / detention facilities.

DOT began mitigation / restoration efforts in 1991 with the removal of all cattle from the property. This was followed by wetland rehydration that involved scraping 1,000' of levee into an adjacent canal, excavating 7 levee breeches, and plugging drainage ditches and canals and blocking swales. DOT created 140 acres of forested wetland by planting and irrigating until approximately 285 trees per acre were established over the 140 acres. DOT also initiated herbicide treatments to numerous exotic and nuisance plant species and contracted for chopping with limited herbicide applications to approximately 40 acres of saltbush.

THE FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION (FFWCC) HAS ENTERED INTO A SPECIAL USE AGREEMENT WITH THE DISTRICT TO REMOVE MOST OF THE REMAINING 15,000 FEET OF LEVEE. THIS WORK BEGAN IN JANUARY 2001 USING FUNDS PROVIDED BY FFWCC.

RESTORATION APPROACH

The DEP Permit Modification signed by the District on May 10, 2000 includes the following management requirements:

- Implement an invasive plant management program,
- Attain less than 10% coverage of cattails within 100 feet of either side of the former berm,
- The District must implement a performance based monitoring plan,
- Document all activities in an annual report, which will include aerial photography of the site obtained during the report period,
- Develop and implement a long-term management plan.

Management of invasive exotic plants has already been initiated for the entire property by the District's Invasive Plant Program and will continue in perpetuity to provide maintenance level control of these species. Monitoring and treatment of exotic species is an on-going process that has thus far targeted Chinese tallow and Brazilian pepper. The District's Invasive Plant Program and will also control cattails as required. (2 People x 4 weeks for $11,000)

The DOT completed rigorous monitoring of their restoration efforts and summarized this in annual reports from 1994 through 1999. The District will build on that baseline work and fulfill the performance monitoring requirements by continuing photo monitoring at the stations already established by DOT. These photographs will be taken annually and included with aerial photography in the required report.

Areas dominated by saltbush will be treated as needed until these wetland areas have been restored. A sight inspection on January 19, 2001, identified thirty-five (35) acres of high marsh that are completely covered by 6 to 7 feet tall saltbush (Figure 3 and Photo 1). To allow recovery of herbaceous species, saltbush in this area will be chopped then followed 6 months later by a high mowing. An additional twenty (20) acres that were chopped and treated with herbicide by DOT will be planted with marsh species from adjacent sites as conditions allow (Photo 2). These areas will be monitored and may need to be mowed every 3-5 years unless hydrology and burning regimes are able to control saltbush as planned.

Approximately 18,250 feet of internal ditches could be filled (5 acres). These ditches are isolated from offsite drainage by a perimeter levee (Figure 3). It is estimated that this would require

moving between 20,000 to 25,000 cubic yards of spoil adjacent to the ditches. Portions of the spoil would also need to be grubbed prior to moving.

Fire as a management tool is being evaluated, and will be implemented to the extent possible. The District land manager has identified burn zones and target burn windows for the appropriate natural communities. Proximity to SR 46 and the Sanford Airport may limit the use of this option for certain portions of the site, in which case physical removal of certain species may be needed to produce the same restorative effects.

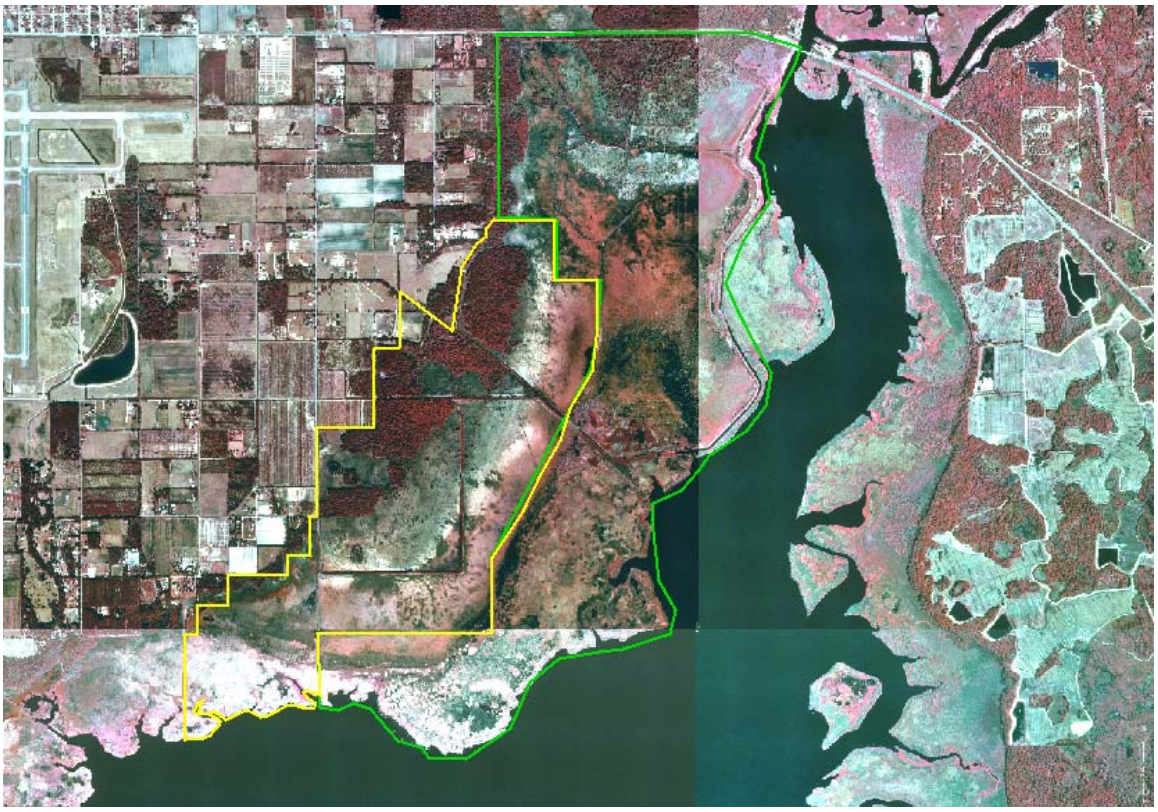


Figure 1. Futch property boundary on a 1995 DOQ.

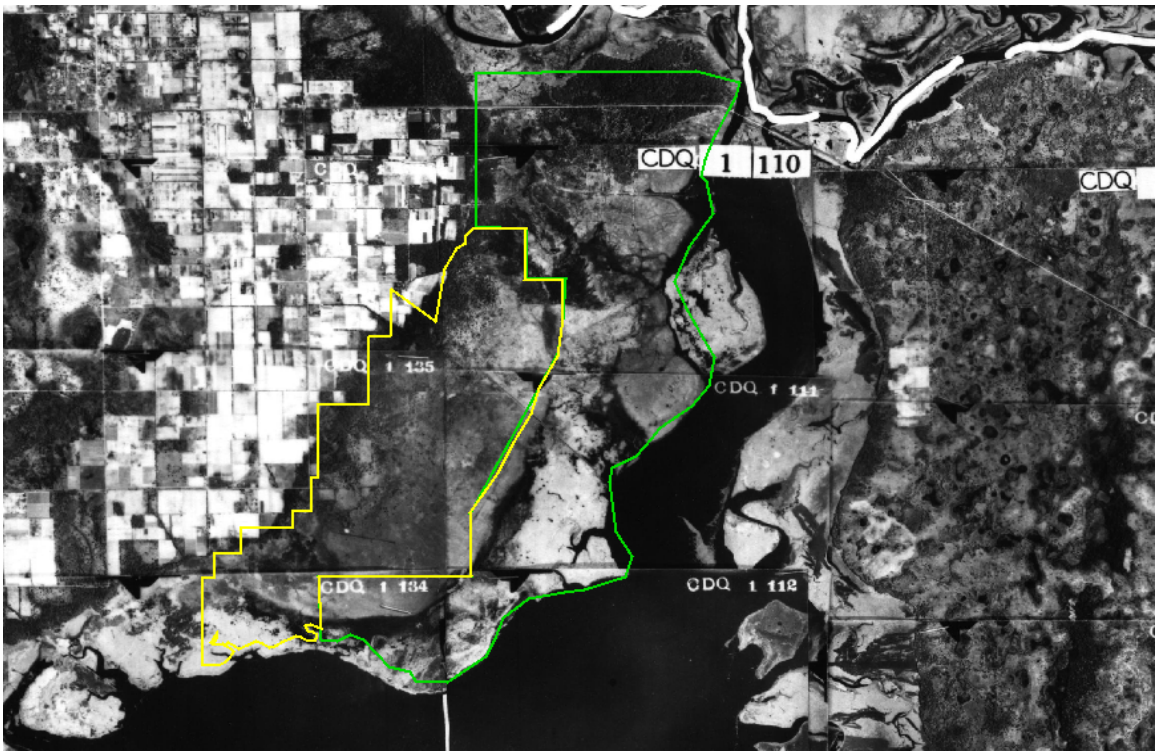


Figure 2. Historic 1943 aerial photo of the Futch property.

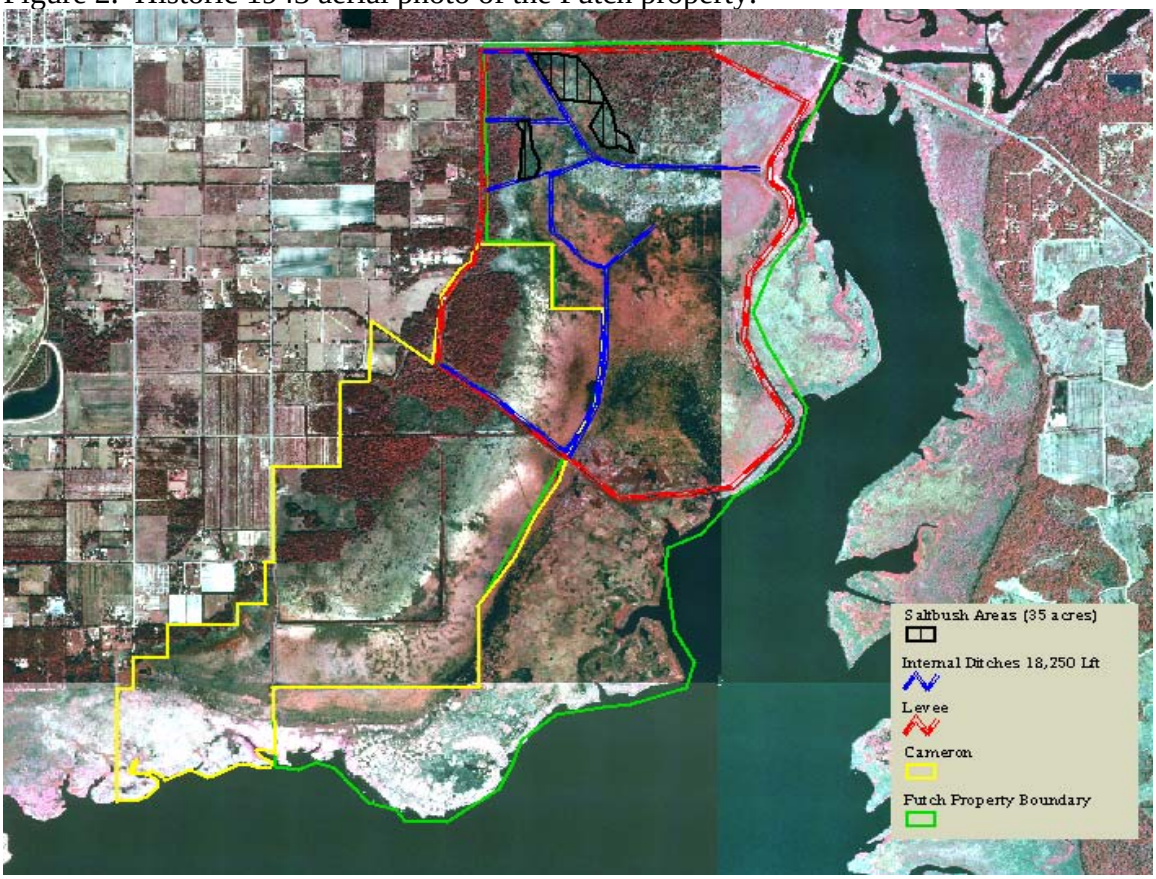


FIGURE 3. PROPOSED RESTORATION ACTIONS AT THE FUTCH PROPERTY.

Photo 1. A dense stand of saltbush 6 to 7 feet tall at the Futch property.

Photo 2. Area chopped and treated with herbicide at the Futch property.

Photo 3. Shallow ditch and palms growing in adjacent spoil pile at the Futch property.

APPENDIX C: LAKE RESTORATION STRATEGY 2008

Lake Jesup Interagency Restoration Strategy

THIS DOCUMENT WAS PREPARED BY THE FOLLOWING STAFF FROM EACH AGENCY (LISTED IN ALPHABETIC ORDER):

SJRWMD, DEPARTMENT OF WATER RESOURCES

Mary Brabham, Senior Program Manager, Middle SJR Basin (MSJRB)
Sherry Brandt-Williams, Environmental Scientist, MSJRB, Environmental Sciences
Mike Cullum, Director, Engineering
Regina Lovings-Morse, Project Manager, MSJRB
Ed Lowe, Director, Environmental Sciences
Erich Marzolf, Technical Program Manager, MSJRB/OCB, Environmental Sciences
Dave Watt, Assistant Director, Engineering
Tom Ziegler, Senior Professional Engineer, Engineering

FWC

ED HAYES, BIOLOGICAL SCIENTIST III

Lawson Snyder**,** Section Leader, Aquatic Habitat Conservation & Restoration Section

FDEP
Barbara Bess, Ecosystem Management Coordinator, DEP Central District
Fred Calder, Watershed Planning and Coordination Administrator, DEP Tallahassee
Chris Ferraro, Water Resource Administrator, DEP Central District
Jennifer Gihring, Environmental Consultant, DEP Tallahassee

PARTICIPANTS LISTED BELOW HAVE DEMONSTRATED SCIENTIFIC, FINANCIAL, AND POLITICAL SUPPORT FOR THIS STRATEGY AND ARE COMMITTED TO MOVING FORWARD. PROJECT DETAILS WERE DEVELOPED IN CLOSE COOPERATION WITH LOCAL GOVERNMENTS IN THE LAKE JESUP WATERSHED AND THE FRIENDS OF LAKE JESUP. : SEMINOLE COUNTY SOIL AND WATER CONSERVATION SERVICE, SIERRA CLUB CENTRAL FLORIDA CHAPTER (CECILIA HEIGHT, VICE CHAIR), FRIENDS OF JESUP (ROBERT KING, PRESIDENT), SEMINOLE COUNTY, ORANGE COUNTY, CITY OF WINTER SPRINGS, CITY OF OVIEDO, CITY OF SANFORD, CITY OF WINTER PARK,

CITY OF ORLANDO, CITY OF MAITLAND, CITY OF LAKE MARY, CITY OF CASSELBERRY, CITY OF LONGWOOD, CITY OF ALTAMONTE SPRINGS.

LAKE JESUP INTERAGENCY RESTORATION STRATEGY

Lake Jesup is a hydrologically complex system with a large urbanized watershed and a long history of abuse and neglect. Separate, but parallel, approaches were reviewed by state agencies to address both external nutrient loading and in-lake habitat needs, including large-scale dredging of in-lake organic sediments. However, more accurate assessments of the financial commitment required for large-scale dredging of in-lake organic sediments returned large project costs and resulted in indefinite postponement of this dredging project. Recognition of the need for a single interagency strategy with appropriately timed funding has emerged, and a multi-faceted strategy based on synthesis of the expanding knowledge base for Lake Jesup has been developed to address the restoration issues associated with returning Lake Jesup to Class III standards.

The Florida Department of Environmental Protection (FDEP), Florida Fish and Wildlife Conservation Commission (FWC), and St. Johns River Water Management District (SJRWMD) fully endorse moving ahead with a strategy to address the excessive external nutrient loading and in-lake nutrient concentration components even though uncertainties and concerns exist about in-lake organic sediments and their ultimate impact on full lake restoration. This document outlines an updated strategy that has been designed to meet restoration goals, provides a timetable for implementation, specifies agency responsibilities, and identifies specific restoration milestones to be used to trigger implementation of additional work as necessary. The recommended restoration approach emphasizes external nutrient load reduction to address nutrient impairment. This strategy is fiscally responsible because the use of regional projects provides the best dollar per pound of nutrient removal possible and appropriate timing of projects so that funding spent once does not need to be spent again to achieve the same goal.

This seven step strategy employs adaptive management; the application of scientific principles to implement a course of action, testing of assumptions, learning from outcomes, and use of that learning to redefine future action. This approach facilitates the application of ever-improving science in the restoration process. Monitoring will occur throughout the process to evaluate project effectiveness and provide a sound basis for adaptive management. Ongoing monitoring will also help track success of the restoration strategy itself. Through adaptive management based on the evaluation of results, it is anticipated that Lake Jesup can meet Class III water quality standards and support healthy, fish and wildlife habitats and populations. Phase 1 activities are required components of this strategy and will be directed by FDEP and SJRWMD staff. Phase 2 activities will be implemented on an as-needed basis depending on the results of Phase 1 activities.

Phase 1

1. Develop the Basin Management Action Plan (BMAP)
2. Reduce external nutrient loads
3. Reduce nutrients in the lake water column

Phase 2, implemented as necessary

4. Implement projects to further improve water clarity
5. Implement projects to increase native vegetation and control exotic species

6. Implement projects to establish healthy fish and wildlife habitat and populations

Throughout the Restoration Process

7. Monitor water quality

As a result of strategy implementation, we expect to see the following changes in Lake Jesup:

1) Reduced external nutrient loads (nitrogen and phosphorus)
2) Reduced water column phosphorus and nitrogen concentrations
3) Increased water clarity through reduction in phytoplankton abundance and turbidity
4) Increased coverage of native submerged and emergent vegetation
5) Improvements in fish and wildlife habitats and populations

Changes in these five measurable goals will be used to direct adaptive management actions and evaluate the success of the Lake Jesup Interagency Restoration Strategy.

Need for the Interagency Restoration Strategy

A Total Maximum Daily Load (TMDL) has been established for Lake Jesup, and the Basin Management Action Plan (BMAP) process is underway to identify pollutant sources and define nutrient load allocations and required load reductions over the next year. At the same time, competition for lands needed for treatment processes is increasing, available local government revenue for stormwater management is decreasing, and access to restoration funds through state agencies is becoming more competitive. This strategy will help state agencies and local governments pool their resources to work more efficiently and effectively.

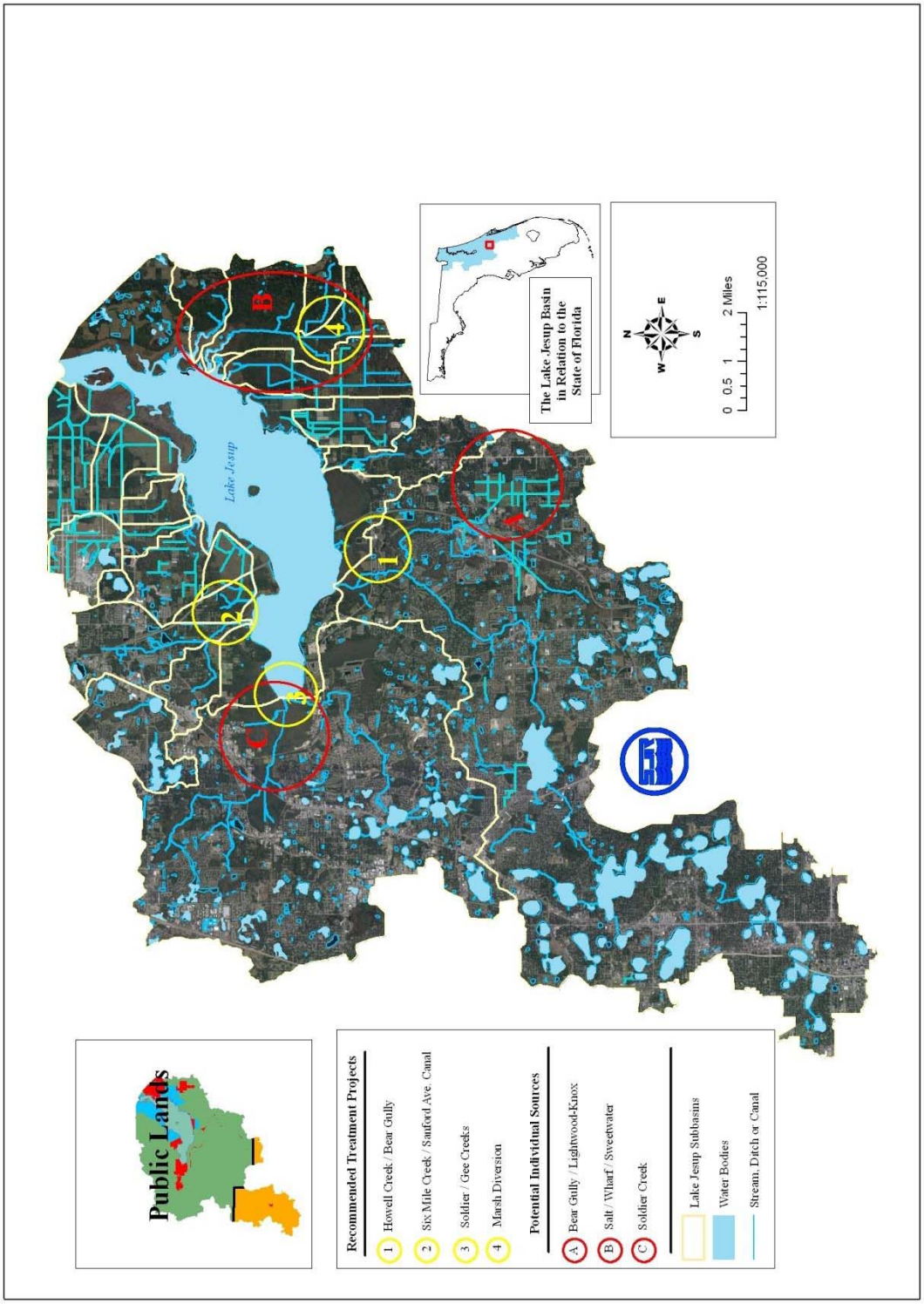
A quantitative measure of this fiscal responsibility is calculation of the cost per pound of excess phosphorus removed from the Lake Jesup basin. Calculations provided in this strategy demonstrate the significant cost efficiency that can be gained through implementation of cooperative projects.

Document Organization

This Interagency Restoration Strategy begins with a commitment to speed up the BMAP process for Lake Jesup. It also provides recommendations for using multi-jurisdictional regional treatment projects intended to reduce nutrient loading to Lake Jesup, both from a quantitative and easily monitored perspective as well as cost. This strategy further commits to implementing in-lake projects to accelerate water clarity and revegetation once external loads are reduced, should nutrient load reductions or in-lake responses be insufficient.

The seven restoration steps are discussed in greater detail in the rest of this document. The conceptual approach to each step is discussed as well as a brief description of the site-specific action recommended for implementing the step. A summary of recommendations, costs and timing is provided in tables following this narrative, and full details of the restoration strategies are provided in the appendices.

Figure 1. Areas of interest in the Lake Jesup basin, indicating general location of recommended treatment projects and potential individual sources of high nutrient concentration runoff.



PHASE I

1. ***Develop the Basin Management Action Plan (BMAP).***

Lake Jesup is impaired by high levels of total nitrogen (TN), total phosphorus (TP), and unionized ammonia (FDEP, Verified Impaired Waters). The first step in restoration of the lake is the reduction of external loading rates (kg/y) of nitrogen and phosphorus. In order to restore water quality, FDEP has determined that the mean in-lake concentration of TP should not exceed 0.096 mg/L and the mean in-lake concentration of TN should not exceed 1.320 mg/L. Presently, mean concentrations are 0.167 mg/L and 2.400 mg/L for TP and TN, respectively. Reducing mean concentrations to the target levels will require substantial reductions in external loading rates of nitrogen and phosphorus. FDEP has determined that the Total Maximum Daily Load (TMDL) for phosphorus loading should not exceed 20,900 kg/yr and nitrogen loading should not exceed 272,400 kg/yr. A summary table of TMDL components is provided in Appendix 1. As part of the TMDL process, FDEP is working on the BMAP that will allocate the total allowable loads of nutrients among the local governments. The participating agencies fully support this effort and agree that it is an integral part of meeting the restoration goal for the lake. The success of all other activities will depend on successfully reducing excess external nutrient loading.

The BMAP is currently under development. The Lake Jesup, Crane Strand, Crane Strand Drain, and Long Branch BMAP Working Group is developing the BMAP, with guidance from FDEP. The primary purpose of the BMAP is to document responsibilities for external load reductions (i.e. allocations) and projects that will be implemented to achieve those reductions. Projects include structural BMPs, non-structural BMPs, ordinances and policies, and multi-jurisdictional efforts. The Working Group will make decisions regarding what projects to include, with support from DEP.

Key steps that have been completed to-date include technical analyses to refine TMDL calculations, compilation of project information from stakeholders, discussion of key programs that affect the BMAP (e.g. SJRWMD enhanced ERP rules, Department of Agriculture and Consumer Services proposed turf fertilizer rule changes), and initial discussions about allocation strategies. The Working Group began detailed discussions about allocation strategies in July 2007. Uncertainty regarding the role and magnitude of in-lake nutrient recycling has had a significant impact on the BMAP process. It is highly unlikely that the science will be mature enough to provide resolution of these unknowns on the BMAP timeframe, but, while stakeholders are pursuing a consensus position regarding how to address in-lake processes in the BMAP, all agree on the need to reduce external loads, and consequently these uncertainties will not delay the first round of reduction allocations.

2. *IMPLEMENT REDUCTION OF EXTERNAL TOTAL PHOSPHORUS (TP).*

Phosphorus loading follows a variety of paths, some of which are essentially unmanageable (for example rainfall directly onto the lake). However the majority of the loading to Lake Jesup occurs via routes and in forms that can be managed. Most of the excess nutrient loading comes from the surface water flowing into the lake from several tributaries. The largest excess nutrient loads come from Howell, Gee, and Soldier creeks, all of which flow into the western portion of Lake Jesup. Within the water column, phosphorus cycles between a variety of chemical forms, which have differences in both their availability to algae and treatability. The

majority of the phosphorus in the tributary loads is in the manageable form of soluble reactive phosphorus (primarily phosphate [PO_4], similar in form to fertilizer), which is a form both highly available to algae and highly treatable. Thus, the largest portion of the external load is in an easily treated form. The challenge is that this easily treated load is distributed between multiple separate tributaries, most of which are flowing through urbanized areas where available land for treatment is scarce. In addition, the loading is the result of both highly variable flows and concentrations. The SJRWMD will investigate potential land acquisition and/or use agreements in key areas along tributaries where treatment sites might be constructed.

Prior to 1983, Lake Jesup received marginally treated wastewater discharge from Lake Howell via Howell Creek and six other wastewater facilities. The average phosphorus concentration from 1966 to 1981 in Lake Jesup was 0.45 mg/L. Following the diversion of effluent from wastewater treatment plants in 1983 the in-lake TP declined and by 1985 averaged 0.17 mg/L, a concentration similar to the current conditions. Ultimately these reductions were not large enough to drive in-lake concentrations sufficiently low to restore the lake. However, the rapid and substantial water quality improvement resulting from significant load reductions in the past indicates that Jesup should respond favorably to further nutrient load reductions despite being a shallow lake with high levels of soft sediment.

Reduction of the external phosphorus load is expected to cause a proportionate decline in water column phosphorus concentrations. As phosphorus concentrations decline, so should the abundance of phytoplankton and suspended particulate matter. If the reduction of algal particles and other suspended particulate matter in the water column is large enough, the increase in the water's transparency will allow light to reach almost 65% of the bottom in this shallow lake. As light availability increases, submerged vegetation can colonize areas with suitable substrate and increase in coverage. These plants play a vital role in providing desirable habitat for fish and wildlife and reducing the recycling of sediment-derived and water column nutrients.

Because nitrogen fixation appears to be a significant nitrogen source to Lake Jesup, and because nitrogen fixation typically occurs in freshwater areas with high phosphorus concentrations, the primary focus for nutrient load reduction into Jesup will be, initially, phosphorus. Results from FDEP's watershed model, SJRWMD's HSPF watershed load model (Jia 2007) and water quality data indicate that between 18 and 20 metric tons (MT) TP/yr come into the lake from surface water runoff. HSPF model results also show that even with all currently legislated BMPs for new development and retrofits for old development where possible, watershed nutrient loads will continue to increase. Consequently, innovative treatment techniques will need to be implemented. The challenge will be to determine the most effective locations and techniques, balancing cost and load reduction.

These recommended techniques are offered to stakeholders in the Jesup basin who have an obligation to reduce their loading by the allotment designated in the BMAP process (Step 1). The three agencies are using this document to demonstrate their commitment to improve Lake Jesup's water quality and habitat significantly; however, they do not own allocation obligations within this particular basin. Consequently, the municipalities and counties will ultimately need to choose and fund their reduction strategies. Regional treatment projects are often the most efficient use of taxpayer's money because larger treatment facilities often provide the lowest per unit costs. Further, these recommended projects may receive higher consideration for competitive state and federal funding because of the larger number of stakeholders that will receive a benefit and the combined support of three state agencies.

Recommended strategies:

1. Pursue fertilizer regulation and build an outreach program to provide information on this regulation, its benefits and alternatives to fertilizer applications. Include components related to the nutrient content of reclaimed water and how excess use, especially with additional fertilizer, leads to excess nutrient runoff. Present these in a multi-faceted outreach program reemphasizing other BMPs for residential and commercial lawn care. Provide support for the Seminole County Soil and Water Conservation District in their effort to obtain state and federal funding for implementing this outreach program. Support local government entities in pursuing more stringent fertilizer reduction ordinances. Eliminating phosphorus use from residential turf areas would reduce TP loading from three to six MT/yr. A limited TV and school campaign targeted at the Jesup basin population could cost as little as $400,000/yr (see Appendix 2), or about $30/lb of phosphorus not entering the lake.
2. Identify nutrient loading coming from a single identifiable sources. Five tributaries to Lake Jesup exhibit steep increases in TP loading from side canals or creeks at junctions close to the lake. If this increased load is coming from individual sources, FDEP and SJRWMD should collaborate with the appropriate MS4 permittees and other appropriate agencies to assist these polluters with increasing their onsite treatment prior to design and construction of regional treatment projects.
3. Pursue large-scale regional treatment projects where phosphorus removal is most cost effective. Rather than individual municipalities attempting to initiate expensive treatment projects on small scales with questionable benefits to Lake Jesup, funding and planning efforts should be optimized by allowing interested stakeholders to contribute to regional treatment projects and receive BMAP allocation credit, regardless of their location in the basin. Further, sole use of traditional stormwater treatment areas and other traditional BMPs will not achieve the reduction in external loading required to meet restoration goals. Consequently, more intensive treatment options will need to be considered and these come with greater operating and maintenance (O&M) costs. Costs will always occur on an annual basis and can be expected to increase annually. After consideration of Lake Jesup's specific loading attributes, the following four site-specific recommendations are considered to be the most effective load reduction projects.

   Acquire land in the Howell Creek basin near or on the shore of Lake Jesup and install an enhanced natural treatment system. Howell Creek delivers about 45% of the total basin phosphorus load (Jia 2007). Treatment in this area (See Figure 1) would reduce TP loading from four to six MT TP/yr and cost between $73 and $150 per pound of phosphorus load reduction.

   Install an off-line chemical amendment system such as alum on Soldier creek near Lake Jesup if a single identifiable source is not located. Treatment at this location would remove about 1.5 MT TP/yr at an estimated cost $300 per pound of phosphorus load reduction, depending upon alum costs over the next twenty years.

   Acquire land in the Six-Mile Creek basin and install an enhanced natural treatment system. Potential removal of phosphorus is estimated between 0.5 and one MT/yr and the estimated cost per pound phosphorus removed per year is between $73 and $500.

Acquire land on the Potential Acquisition List near Salt and Sweetwater Creeks and construct a serpentine marsh diversion if a single source cannot be identified. This marsh diversion would remove between one and two MT TP/yr and would cost in the range of $147 and $190 per pound phosphorus removed, not including removal and disposal.

3. Remove nutrients stored in the lake water column.

Full achievement of load reductions will take years and, following external load reductions, it could take years for the lake to meet habitat and fish goals. In order to hasten achievement of end goals, the agencies support evaluation of projects to remove phosphorus that is recycled into the water column. At average lake stage and using the 10-year phosphorus concentration average, Lake Jesup has about 18MT phosphorus in the water column. There is uncertainty as to whether the large store of phosphorus in the lake sediments results in a long-term net increase in the water column. Sedimentary phosphorus will be evaluated from a recycling perspective to determine if it does or does not appreciably contribute to the high density of phytoplankton. Results will help direct additional activities under the adaptive management process. Some options that may be tested include the installation of floating treatment wetlands, harvesting of plants from the lake, and other phosphorus removal or inactivation technologies. It is anticipated that water column phosphorus will decrease as external loads are reduced, and these in-lake treatment facilities should be considered temporary as long as the external nutrient loads are sufficiently reduced.

Potential strategies:

1. Complete preliminary studies and pilot projects that can lead to rapid implementation of in-lake nutrient reduction following external load reduction.
    - **SJRWMD will conduct a sediment nutrient cycling study to quantify annual sediment nutrient budget.**
    - Assess efficacy of SJRWMD pilot Pay-For-performance project in reduction of water column phosphorus. SJRWMD has already committed to funding a pilot project to test removal of phosphorus with a biological filter. Two and a half million dollars are presently allocated for this project. A project description is provided in Appendix 3.

2. If necessary, fund temporary in-lake installations such as floating wetlands. These systems operate similarly to the Lake Apopka Marsh Flow-Way in that nutrient enriched water is pumped into a treatment area then recirculated back to the lake as treated water. However, floating wetlands are smaller scale, harvested and operated using solar power. Recommended locations within the lake are indicated in Figure 1 and additional information about options is in Appendix 3. Current estimates indicate that removal of 2 or more MT/yr of phosphorus would cost between $300 and $400 per pound and would cover about 0.2% (22 acres) of the lake.

3. Examine other methods for removal of phosphorus storages in the water column, such as harvesting *Phragmites* spp. Rough estimates of aerial extent indicate that about two MT/yr of phosphorus could be removed through plant uptake and aboveground harvest at a cost of about $49 per pound. These studies will examine sources of phosphorus uptake and effect on adjacent water quality as well as technical feasibility of methods.

PHASE 2

4. If necessary, implement more projects to improve water clarity

If monitoring data indicate that water clarity does not sufficiently respond to excess nutrients load reductions, other measures should be taken to enhance water clarity. Floating wetland filters could be used to remove suspended particles. Dredging of surficial sediments and SAV planting may also play a role in increasing water clarity if monitoring data indicate that resuspension of sediments maintains high levels of suspended particles in the water column.

Recommended strategies:

1. Study feasibility of using floating wetlands as suspended solids filter devices (see Step 3 above).
2. Support targeted dredging in areas not responding to load reductions. Evaluate various dewatering approaches, including relatively new and rapid on-site sediment dewatering with transport off-site as dredging occurs to avoid the negative impacts of impoundments in and near wetlands. Initial sediment analysis indicates there are no contaminant issues and sediments are therefore candidates for any land application, including agriculture, as a soil amendment.
3. Support redirection of reuse water from Sanford's Site 10 (currently used by the City of Sanford for disposal of excess reuse water and sludge) to other sites outside the basin currently using potable water for irrigation. Then purchase Site 10 for use as a staging area for dewatering and sediment transport off-site or, as a spoil site for conventional sediment disposal if rapid on-site dewatering is determined to be infeasible or cost prohibitive, both to be followed by habitat restoration.

5. If necessary, implement projects to increase native vegetation and control exotic species

If water clarity improves but native vegetation fails to expand, then projects should be implemented to increase recolonization of the lake by native plants. Dredging of sediments may be necessary to provide a better substrate for vegetation. Planting of native species also may be necessary. Increased water clarity could also allow an expansion of undesirable exotic species, such as hydrilla. It will be essential to monitor exotic species as water clarity improves. If these species begin to colonize, control activities should be implemented immediately.

Because this action step is several years in the future and not expected to be necessary, no detailed plan is developed at this time.

6. If necessary, implement projects to establish healthy, fish and wildlife habitat and populations

If native vegetation has expanded and habitat has become suitable, it is expected that fish and wildlife populations will respond favorably. If deemed necessary, additional habitat enhancement actions will be taken. Because this action step is several years in the future and not expected to be necessary, no detailed plan is developed at this time.

PHASE 1 and 2

7. Monitor water quality, vegetation, and fish populations.

Successful implementation of this action plan will require monitoring of the lake throughout the life of the restoration effort. Adjustments will be made if the water quality, vegetation and fisheries fail to respond as expected to restoration activities. Additional monitoring data may be required to address the source(s) of in-lake nutrients should their concentrations persist following external load reductions. Additionally, sources of turbidity or suspended solids may require identification should water clarity fail to improve.

Recommended strategies:

1. Complete District sediment study measuring nutrient recycling in Lake Jesup and two other Middle Basin lakes. This multi-year study will begin sampling in March 2008 and will cost about $350K for three lakes.

2. Continue current water quality monitoring. Both ambient and storm event water quality monitoring in Lake Jesup and several tributaries are ongoing, long-term projects conducted by both SJRWMD and Seminole County. Seminole County also has two continuous YSI data loggers, deployed at each end of the lake measuring DO, turbidity, conductance and chlorophyll every half-hour.

3. FDEP will conduct surficial groundwater monitoring on the lake side of the Black Hammock and Site 10 areas to determine the actual quality and quantity of the surficial groundwater discharging to the lake.

4. Continue monitoring submerged aquatic vegetation populations (SAV) every 2 years, quantifying changes from baseline study conducted in July 2007 with Seminole County as the lead agency collaborating with FWC, FDEP and SJRWMD.

5. Continue current yearly monitoring of fish population by FWC.

OTHER PROJECTS

Dredging Prior to River Reconnection at State Road 46

This plan recognizes the significant contribution of other projects that will result in improvements to Lake Jesup. These efforts include a project already planned by the Florida Department of Transportation to re-engineer the connection of the lake with the St. Johns River in conjunction with replacing the State Road 46 causeway. This project would be implemented to both replace the causeway and enhance exchange between the river and lake. This work is being done in conjunction with the US Army Corps of Engineers and their 1135 restoration project examining the opportunity to reduce the environmental impacts from changes made to the historic river channel decades ago. Strategic dredging in the northern neck of the lake may be required for navigation during periods of low water, to reduce downstream export of resuspended sediments and/or improve sediment conditions for submerged aquatic vegetation.

PROJECT SUMMARY AND COSTS

Table 1: Reduce External Nutrient Loading - Project Framework for Lake Jesup Phosphorus Reduction						
Project	**Estimated Cost/lb TP Removed[1]**	**Potential MT TP Removed per year**	**Land Costs**	**Capital**	**Annual O&M**	**Estimated Time to Start-up**
Fertilizer and reclaimed water use outreach[2]	$30	3[3]		No Capital	$500,000 (not done every year)	18 months
Howell Creek/Bear Gully, ATT[4]	$73 - $150	4 - 6	≤ $19,200,000	$5,000,000 - $6,000,000	$115,000 - $154,000	2 years after land purchase
Soldier/Gee Creek, chemical[5]	$300	1.5	$829,000	$1,750,000[6]	$813,000	2 years
6-Mile Creek/Sanford Canal, ATT[7]	$73 - $500	0.5 – 1.5	≤ $1,270,000	$1,000,000 - $1,730,000	$40,000 - $50,000	2 years after land purchase
Salt/Wharf/Sweetwater, Marsh diversion[8]	$147 - $190	1 - 2	≤ $2,000,000	$7,000,000 - $13,400,000	No O&M $0	1 month after land acquisition and permitting

[1] Amortized over a 20-year project life.
[2] The Seminole County Soil and Water Conservation District has accepted responsibility for this component and will be devising a strategy and concomitant costs as they apply for their 319 grant.
[3] After rule implementation, potential reductions in other listed projects will be lower than presented in this table.
[4] Cost projections based upon Sano, D., et.al., 2005; Hydromentia, 2005; Kadlec and Walker, 2004.
[5] Naleway, Robert, 2007, personal communication March 27, 2007 concerning alum costs and applications.
[6] Costs are highly dependent upon future increases in alum costs.
[7] Cost projections based upon Sano, D., et.al., 2005; Hydromentia, 2005; Kadlec and Walker, 2004.
[8] The EPA website http://firehole.humboldt.edu/wetland/twdb.html ; CH2MHill, 2007.

Table 2: Reduce Nutrients Stored in the Lake Water Column						
Project	**Estimated Cost/lb TP Removed**	**Potential MT TP Removed per year**	**Land Costs**	**Capital**	**Annual O&M**	**Estimated Time to Start-up**
Study: Nutrient Cycling in Sediments	NA	NA	$0	$350,000	NA	Early 2008
Pilot Pay-for-Performance Project[9]	$227[10]	1	$0	NA	NA	Fall 2008
Floating wetlands, 0.2% lake surface area coverage[11]	$300 - $400	≥ 2	$0	$2,500,000 - $4,000,000	$250,000 - $500,000	3 months after permitting
Phragmites Harvest[12]	$49	2	$0	$0[13]	$100,000 - $962,000	Immediately

[9] SJRWMD Contract SK47316
[10] Ibid, Reflects negotiated price, (five years), but might not reflect 20 year cost or removal rate
[11] Nakamura, et.al., 1997; Kadlec and Knight, 1996; Boutwell, J., 2002.
[12] Meuleman et al., 2000; Karunaratne, 2002; Asaeda et al., 2006; McEnroe, 1992; Oroville EWG-74 2004.
[13] All harvest costs are based on contractors absorbing all related capital costs.

TIMELINE FOR ACTION PLAN

Milestone	BMAP alloca-tions; projects priorit-ized	Fertilizer Rule; Land purchase; Project design; Permitting	Con-struc-tion begins	External load reduced by 9 MT/yr	In-lake TP reduced to 0.094 mg/L	TMDL revisited in 2nd round; TP reduced another 5MT/yr	In-lake TP reduced to <0.07 mg/L	In-lake TDS < 250 mg/L	SAV > 15%	SAV > 40%
Action Step	**FY08**	**FY09**	**FY10**	**FY11**	**FY12**	**FY13**	**FY14**	**FY15**	**FY16**	**FY17**
Develop the Basin Management Action Plan (BMAP)	**X**	**X**								
Reduce external phosphorus loads		**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**
Remove nutrients stored in the lake water column						**X**	**X**	**X**	**X**	**X**
If necessary, implement projects to further improve water clarity								**X**	**X**	**X**
If necessary, implement projects to increase native vegetation, control exotic species and enhance sport fish populations										**X**
Monitor water	**WQ, F, V**	**WQ, F**	**WQ, F**	**WQ, F**	**WQ, F,**	**WQ, V, F**	**WQ, F,**	**WQ,**	**WQ,**	**WQ,**

quality, vegetation, and fish populations					**V**		**V**	**F, V**	**F, V**	**F, V**

RESPONSIBILITY

Action Step	FDEP	FWC	SJRWMD
Develop the Basin Management Action Plan (BMAP)	**X**		
Reduce external phosphorus loads	**X**		**X**
Remove nutrients (phosphorus and nitrogen) stored in the lake water column	**X**		**X**
If necessary, implement projects to further improve water clarity	**X**		**X**
If necessary, implement projects to increase native vegetation and control exotic species	**X**	**X**	**X**
If necessary, implement projects to enhance sport fish populations		**X**	
Monitor water quality, vegetation, and fish populations	**X**	**X**	**X**

APPENDICES

Appendix 1. Develop the Basin Management Action Plan (BMAP)

Table 1A.1 Summary of loads used to determine the annual Total Maximum Daily Loads (TMDLs) and reduction goals for Lake Jesup (FDEP 2006).

FDEP TMDL Report	Loads in metric tons		1995-2003					
	TN: Target Concentration 1.32 mg/l				TP: Target Concentration 0.094 mg/l			
	Current	Background	TMDL (annual)	Reduction	Current	Background	TMDL (annual)	Reduction
Surface	129.9	121.1	99.7	30.2	14	5.6	7.5	6.5
Baseflow	10.4	14.3	10.4	0	3.3	4.6	3.3	0
Septic Tanks	19.7		12	7.7	2.7		1.2	1.5
Groundwater	3.4	3.4	3.4	0	0.6	0.6	0.6	0
Atmospheric	39	39	39	0	3.1	3	3.1	0
River	99.9	68.8	68.8	31.1	5.1	3.5	3	2.1
N2 Fixation	270.8		14	256.8				
Reported Total	**553.9**	**246.6**	**247.3**	**306.6**	**28.8**	**16.9**	**19**	**9.8**
Actual Total	**573.1**			**325.8**				

BMAP management actions are being developed by the Lake Jesup, Crane Strand, Crane Strand Drain, and Long Branch Basin Working Group.

Appendix 2. Implement reduction of external total phosphorus (TP) loads

Support for pursuing external phosphorus reduction without similar TN reductions:
Substantial nitrogen fixation indicated by single event sampling in Jesup, August 2006 (Tomasko, PBS&J, Seminole County Contract) and follow-up testing in progress since then (Scinto, FIU, SJRWMD Contract SK42812). These studies are supported by water quality data indicating dominance of Cyanophyta genus known to be nitrogen fixers.

Recommended strategies:

1. Pursue fertilizer regulation and build an outreach program to provide information on this regulation, its benefits and alternatives to fertilizer applications. Include components related to the nutrient content of reclaimed water and how excess use and use with additional fertilizer leads to excess nutrients in runoff. Present these in a multi-faceted outreach program reemphasizing other BMPs for residential and commercial lawn care. Provide support for the Seminole County Soil and Water Conservation District in their effort to obtain state and federal funding for implementing this outreach program. Support local government entities in pursuing more stringent fertilizer reduction ordinances.

A new rule eliminating phosphorus in typical lawn fertilizer is under development in Florida using restricted labeling as the mechanism for phosphorus removal. This ruling would apply to fertilizer sellers supplying residential consumers and commercial lawn care businesses. A reduction of phosphates in residential fertilizer applications in the Jesup basin could result in a load reduction of approximately six MT TP/yr into Lake Jesup, but the rule has been weakened as comments from the industry are incorporated. An outreach program explaining the benefits of TP reduction in the watershed and implementation of local ordinances aimed at reducing fertilizer should be pursued. A similar program should be directed at developments using reclaimed water for lawn irrigation. Reclaimed water has extremely high phosphorus concentrations (~0.5 to > 5 mg/L TP) and is extensively used in some areas of the Jesup basin. Applications of one inch two times a week in areas with reclaimed water have a potential runoff of approximately five MT TP/yr (Table 2A.1; see Figure 2A.1 for reuse areas in Jesup's basin). Recommended applications should be reevaluated and consumers educated about potential overuse.

Table 2A.1 Estimate of amount of TP available for runoff into Lake Jesup using SJRWMD estimates of 2006 reuse areas

Reuse acres in Jesup basin	5942	acres
Recommended reuse application	1.5	inches/wk
TP applied	24 - 238	MT/yr
Potential TP runoff	5 - 50	MT/yr

The Seminole County Soil and Water Conservation District has accepted responsibility for this component and will be devising a strategy and concomitant costs as they apply

for funding. This coordinated effort would provide reductions that could be applied to allocations in the same way that larger scale tributary treatment projects serve as regional treatment projects.

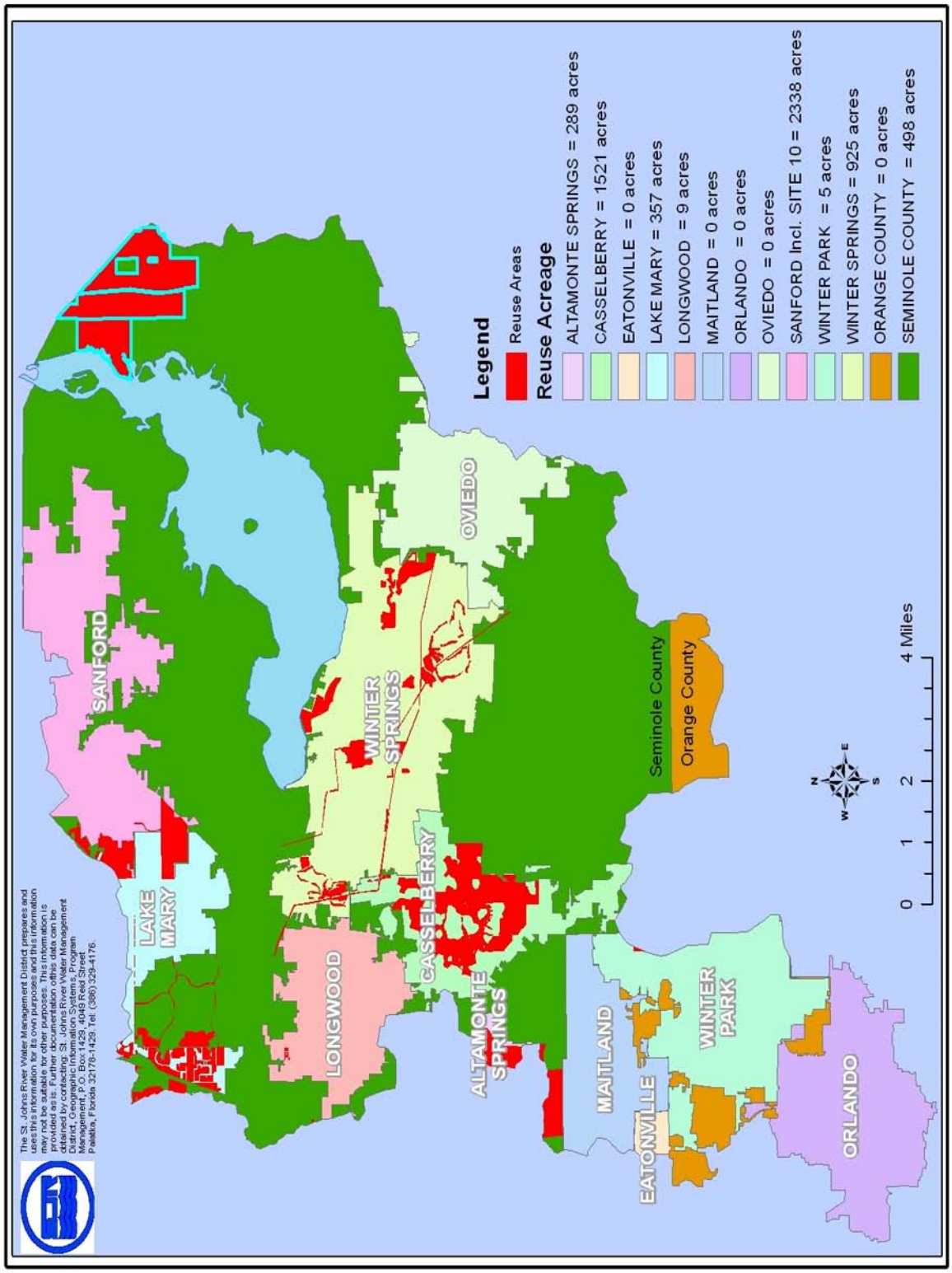


Figure 2A.1. Acreage and location of reuse areas with the Lke Jesup basin (SJRWMD 2007). Allocations to individual entities determined using FGDL coverages from 2006.

These efforts should be combined with other proven outreach venues to create a comprehensive multi-faceted media program. At a cost of about $400,000/yr for an advertising campaign targeted at the Jesup basin population (Table 2A.2), the cost per pound of phosphorus not entering the system could be as low as $30 per year. Further, this cost is short-term, only needed until the population has changed their fertilizer habits or used up their old stock.

Table 2A.2. 2005 population in the Lake Jesup watershed and an estimated cost to complete a single year of education about the benefits of TP reduction in fertilizer (US Census 2000 and US Census Update 2005).

Population	Households	Mail Campaign[1]	School Program[2]	Cable TV Ads[3]	Total Cost
271034	104244	$104,244	$243,930	$16,200	$364K

1. $1/household;

2. 18% population school age, $5.00 per child;

3. $54/min; 1 month campaign January, 60 30-sec spots 2/night, 10 stations

2. Identify nutrient loading coming from a single identifiable source.

Five tributaries to Lake Jesup exhibit steep increases in TP loading from side canals or creeks at junctions close to the lake (Circles A,B and C on Figure 1). If this increased load is coming from individual sources, FDEP and SJRWMD should collaborate with FDACS and the appropriate MS4 permittees to assist these polluters to increase their onsite treatment prior to design and construction of regional treatment projects. Preliminary water quality monitoring demonstrates that almost 65% of the Howell Creek TP load comes from the Bear Gully Creek and Lightwood-Knox Canal (Figure 1, Circle A). Similar increases occur in Soldier Creek somewhere between the Seminole County ball fields and the lake (Figure 1, Circle C).

We still need to conduct a study to determine the source of extremely high concentrations in three ephemeral creeks on the southern shore - Sweetwater/Salt/Wharf Creeks. We will then recommend the most feasible option: 1) chemically amend or physically remove excess nutrients from isolated sites, or 2) increase stormwater residence time by rechanneling flow through a constructed serpentine creek bed in the floodplains of one or more of the creeks. These tributaries flow through floodplain already owned by the District or on the potential acquisition list (see Figure 1 Circle B for location, Figure 2.2 in Appendix 2 for conceptual design and #3 below for description), but may require additional acquisition to insure the channels are above the 100 yr floodplain. This marsh diversion would remove between one and two MT TP/yr and would cost between $147 and $190 per pound phosphorus removed.

3. Pursue large-scale regional treatment projects where phosphorus removal is most cost effective.

Lake Jesup has thirteen tributaries all of which have a relatively high orthophosphate (PO_4) concentration (see Table 2A.3). Capturing phosphorus loads at this level (>50% of phosphorus) is the easiest and most cost effective lake treatment because orthophosphates are more chemically and biologically available than organic

phosphorus and treatable with simpler processes. Rather than individual municipalities attempting to initiate expensive treatment projects on small scales with questionable benefits to Lake Jesup, funding and planning efforts should be optimized by allowing interested stakeholders to contribute to regional treatment projects regardless of their location in the basin. After consideration of Lake Jesup's specific loading attributes, the following five site-specific recommendations are considered to be the most effective projects for load reductions at the lowest relative cost. Not all of these tributaries have significant flow year round, which is an integral component in most treatment processes, but several have periods of high flow during which significant load reductions are possible. In addition, locating such facilities adjacent to the lake creates the opportunity to treat lake water during periods of low flow, thus reducing in-lake concentrations, this combination providing almost all of the phosphorus reduction required by the TMDL.

Table 2A.3. Estimated loads from Jesup's main tributaries, demonstrating that Howell, Soldier and Gee Creeks have the highest water and TP loads and that all the tributaries have a high percentage orthophosphate. Water quality data – ambient MSJRB network, SJRWMD; HSPF discharge estimates from Jia (2007)

Tributary	Avg TP mg/l Ambient Data	HSPF Estimates ac-ft	Calculated TP MT/yr	Percent PO_4
Howell Creek	0.138	57451	9.8	51
Soldier Creek	0.149	11237	2.1	72
Gee Creek	0.118	11873	1.7	62
Sanford Canal	0.179	5506	1.2	63
Solary Canal	0.500	1775	1.1	82
Salt Creek	0.229	3171	0.9	53
Sweetwater Creek	0.375	1809	0.8	77
Chub Creek	0.595	1012	0.7	0.47
Black Sweetwater Creek	0.364	1159	0.5	NA
Navy Creek	0.062	5506	0.4	NA

Land Acquisition and Pilot Projects: Howell Creek; Soldier/Gee Creek; Six-Mile Creek;

There are four tributaries to Lake Jesup that deliver enough phosphorus and stormwater/baseflow to warrant treatment systems. Unfortunately these systems are in urban areas where land is scarce and highly priced. Alternative Treatment Technologies (ATTs) optimize total phosphorus removal through innovative treatment trains (chemical and natural), typically require a smaller footprint than more traditional stormwater treatment areas (STAs) and can be customized for unique features of the

specific water body. The savings in land costs from a smaller process footprint offset the added expense of a managed process in this basin where land costs more than $100,000/acre.

One of these tributaries, Howell Creek, delivers about 45% of the total watershed non-point source phosphorus load. The flood plain of this creek, next to the new city center for Winter Springs, is currently for sale but upland in the parcels is limited. Purchasing this floodplain, with both wetlands and sufficient upland for treatment sites, between Hwy 434 and the south side of the lake (Circle 1 on Figure 1), would keep future development from increasing the phosphorus loads and seeking permits to use wetlands, and would provide a base for an ATT. We estimate that treatment of 70% of Howell Creeks phosphorus load will require approximately 36 acres and will cost between $73 and $150 per pound phosphorus removed (capital and land amortized over 20 years, see Table 2A.4).

Table 2A.4. Cost estimate for a harvested periphyton system to reduce TP in Howell Creek before it drains into Lake Jesup

Data for IFAS process sized for 0.150 mg/l TP influent, 100 MGD (Sano et al 2005), 2003 $		
Capital costs for 56 acre facility	$6,730,883	
Replacement costs (required at 10 yrs)	$1,035,561	
Cost per acre without real estate (1.5% of capital)	$115,514	
O&M costs 50 years net present 2003 $	$8,974,847	
O&M -Cost per year per acre	$3,205	
Removal capacity per acre, 50 year total	18,356	lb TP
Per acre per year	367	lb TP

Costs projected for 6 MT/yr TP removed using IFAS numbers, 2008 $		
Howell Creek: 0.140 mg/l TP; 51 MGD; similar in concentration and flow, assume linear scale-up		
Minimum upland required for treatment area 6 MT	36	acres
6MT - Capital costs without land, with replacement costs	$5,293,636	
O&M costs for 20 year lifespan	$2,757,953	
Cost for 36 acres Jesup basin land	$19,200,000	
Total capital costs w/land	$24,169,629	
Total 20 yr costs	$27,251,588	
Cost per pound TP removed	$123	

Bear Gully Creek and Canal, a long stream stretch draining part of the Howell Creek basin, drains into Howell Creek just south of the lake. The Lightwood-Knox Canal is a tributary to Bear Gully (Circle A on Figure 1). It has been investigated as a potential source to be treated separately prior to convergence with Howell Creek, and current

water quality data provides evidence that part of the Bear Creek/ Lightwood-Knox Canal load is related to agriculture that could be managed better on-site.

Two other tributaries would benefit from similar treatment: Six-Mile and Soldier creeks (Circle 2 and 3 respectively, Figure 1). Soldier Creek and another tributary, Gee Creek, converge in a forested floodplain on Seminole County property but there is not enough upland nearby to treat both creeks simultaneously. Soldier Creek has the higher phosphorus loading. Soldier Creek, with limited acreage, will require chemical treatment rather than periphyton. Treatment at this location would remove about 1.5 MT TP per year at an estimated cost of $300 per pound based upon current projections for increased alum costs (See Table 2A.5 for cost analysis).

Six-Mile Creek drains a wetland used for disposal of sewage in the past, converges with Sanford Ave Canal and drains directly into the lake. More data need to be collected for this system, but the potential removal of phosphorus is estimated between one half and one and one half MT per year and will require about 12 acres. The estimated cost per pound phosphorus removed per year is between $73 and $500.

Marsh Diversion: Sweetwater/Salt/Wharf Creeks

There are several tributaries on the southeast shore of Jesup that have high concentrations of phosphorus and loading that can be considerable during rain events, but are ephemeral or lake dominated the remainder of the year (Circles B & 4, Figure 1). Tributary systems with these characteristics are usually not candidates for cost-effective active treatment processes. However, these tributaries drain a large area of tree farms and ornamental nurseries, most with irrigation systems draining into roadside canals and swales leading into these tributaries and potential abandoned agricultural fields with residual fertilizer and contaminants. All of these tributaries flow through floodplain already owned by the District just prior to entering the lake.

Before recommending a treatment strategy, a study of potential sources should be completed evaluating nutrient concentrations from current agricultural operations and testing abandoned agriculture fields for residual phosphorus. Depending upon source identification, DACS could assist in identifying primary sources in the BMAP process and gain agreement from contributors to improve on-site retention. If residual phosphorus is the source, we recommend removal of nutrient rich soil or enhancing the treatment efficiency of these wetlands to increase their phosphorus removal rate. The current channels are straight and through wetlands. By rechanneling flow through a serpentine creek bed, increasing residence time and uptake (see Circle 4 on Figure 1 for location, Figure 2A.2 for conceptual design), 35 to 100 acres of the wetland would remove about 2MT TP/yr and would cost between $147 and $190 per pound phosphorus removed assuming only excavation costs with no additional O&M costs (Table 2A.6). The channel would be considered a one-time construction project and allowed to fill in naturally as treatment requirements decrease.

Table 2A.5 Cost estimate for use of alum to treat Soldier Creek discharge into Lake Jesup

Soldier Creek		
Soldier Creek Data		
Highest storm event monitored 2.86" rain, 7,512,449 cubic feet discharge (CDM 2004)		
Average flow rate	11237	acre-ft/yr, HSPF model (Jia 2007)
Alum Data		
Cost per gallon alum	$0.51	2008 cost[14]
Dosing rate	0.00812	gpm alum per cfs influent, dosing rate of 1 mg/L[15]
Alum, using 15mg/l dose[16]	1.89	gpm alum[17]
O&M/yr +	$862,175	
Capital[18]	$1,750,000	

Holding Pond Data		
volume 1st inch rain	2,626,730	ft3/in
detention area, 8 ft depth	328,373	ft2
	7.5	acres

[14] Naleway 2007, no jar tests completed for Lake Jesup, using information from Lake Apopka
[15] Ibid
[16] Ibid
[17] Ibid
[18] Calculated value based upon constructing a raised, square, 7.5 acre pond

Table 2A.6. Cost estimates for marsh diversion excavation

Ambient Creek Data			
Creek (subbasin # from Jia 2007)	Wharf (34)	Salt (35)	Sweetwater (36)
Water acre-ft/yr (Jia 2007)	800	3171	1809
TP concentration, ambient, long term	0.6	0.229	0.375
seasonal load, kg	592	896	837
load kg/d	1.6	2.5	2.3
load kg/day assuming all in wet season 4 months	4.87	7.36	6.88
Estimated TP removal, kg/yr	523	622	680

Estimated Marsh Diversion Costs		
Estimate Treatment Area		
TP effluent concentration mg/l = 0.4083*kg TP/ha/day - 0.0504 from TP efficiency curve generated by USEPA (2000)		
Assume desired effluent concentration 0.05 mg/l		
Required area = 2.47{0.4083 load TP (kg/d)}/{0.07(mg/l)+0.0504}		
Excavation Estimates		
Design load (annual load)	19	kg/day TP
Seasonal load area	160	acres
Cubic yards serpentine trench, 2 ft deep		
Seasonal load	619,656	yd^3
Excavation cost[19]		
Seasonal load	$9,821,541	
Assume natural recruitment (no planting costs)		
Potential mitigation costs		
160 acres impacted wetlands	$8,268,000	
Cost per pound TP removed		
20 yr TP removal	80,442	lb
Cost/lb TP Annual load	$147	
Cost/lb TP Seasonal load w/mitigation	$156	

[19] Does not include off-site disposal

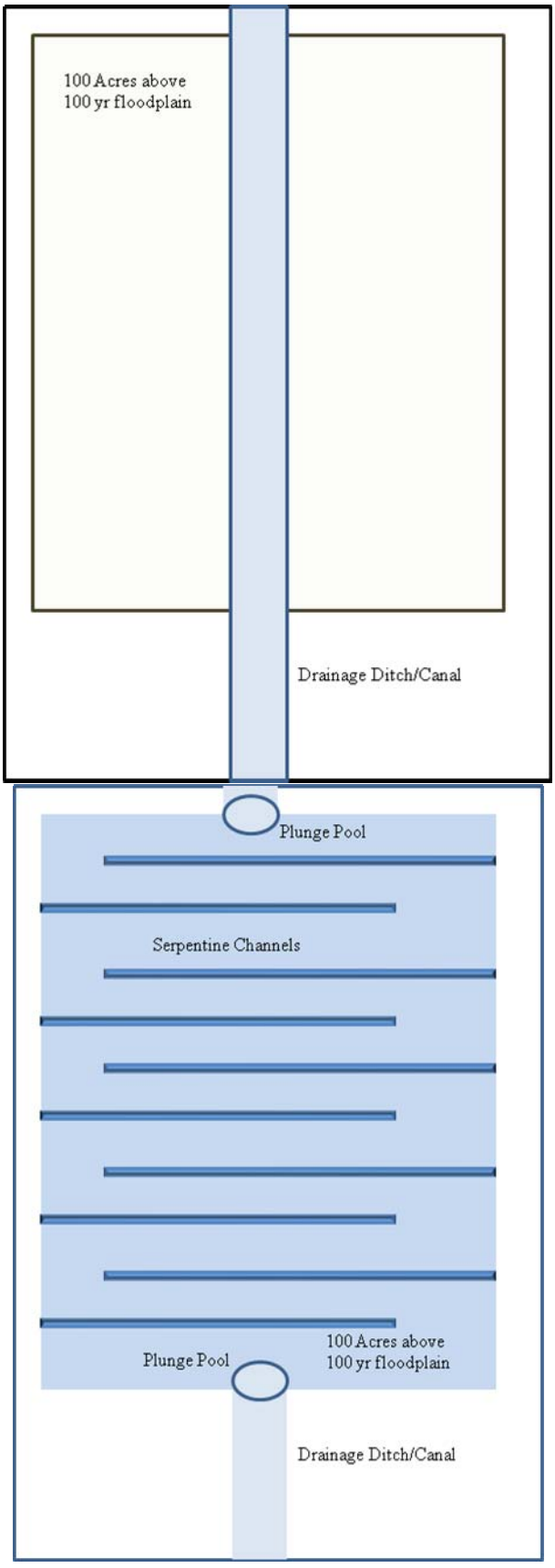

100 Acres above
100 yr floodplain
Drainage Ditch/Canal
Plunge Pool
Serpentine Channels
100 Acres above
100 yr floodplain
Plunge Pool
Drainage Ditch/Canal

Figure 2A2. Conceptual diagram for marsh diversion project: serpentine berms are constructed to direct flow into a large area than the original straight drainage channel. Treatment is obtained through increased residence time

Appendix 3. Remove nutrients stored in the lake water column

Assess efficacy of SJRWMD pilot Pay-For-performance project in reduction of water column phosphorus.

SJRWMD is pursuing evidence that advanced treatment technologies (ATT) such as biological filters and chemical amendments, alone or in combination, can cost-effectively remove TP and restore water quality in Lake Jesup. Results from ATT projects in Florida suggest that they can result in substantial improvements in water quality with minimum land requirements. However, these projects treated phosphorus concentrations higher than typical for Lake Jesup and its tributaries, and little data currently exists for successful operation of ATTs beyond one year. Operational problems have been reported in published pilot studies of biological ATTs, with corresponding drops in TP removal rate. Chemical amendments have also shown problems with long-term operation.

Because such technologies have not been successfully demonstrated on large hypereutrophic lakes such as Lake Jesup in highly developed basins, nor for extended time periods, SJRWMD is reluctant to expend funds for capital costs (including land) or technology development and refinement. The District is therefore offering an alternative method for funding of this project: Pay-for-Performance, and the pilot scale project has been awarded to AquaFiber, Inc., Winter Park, Florida.

The purpose of this project is to demonstrate that an ATT can effectively remove a minimum of one MT TP/yr for a minimum of five consecutive years using a process that can be scaled up for higher levels of removal using a footprint smaller than typical stormwater treatment areas while still being cost effective. Removal of TP is expected to begin by Fall 2008.

Fund temporary in-lake installations such as floating wetlands

Floating treatment plants were pioneered by John Todd with Ocean Arks International (now with John Todd Ecological Design, Inc.) and called Restorers^{R} or floating Living Machines^{R} (Figure 3A.1). These systems are similar to the principal behind the Lake Apopka Marsh Flow- Way, where water is pumped into a wetland or aquatic system, cleaned through natural removal processes, and then returned to the lake with nutrients at an acceptable concentration for improved water quality. However, floating treatment areas are actively managed, do not require a land base and are powered by solar energy. Work on alternatives has been completed in Florida by DB Environmental, Inc. and in South Carolina by Maryland Aquatics. Several areas have been identified that would benefit from floating wetlands and an area of 25 acres would remove about four MT phosphorus from the water column at a cost of about $300 per pound phosphorus removed (estimate derived from Boutwell 2002, Kadlec & Knight 1996). At average lake stage and using the 10-year phosphorus concentration average, Lake Jesup has

Figure 3A.1. Lake restoration systems from John Todd Ecological Design, Inc.

about 18MT phosphorus in the water column, which will decrease in volume and concentration as external loads are reduced.

Complete a feasibility study on harvesting *Phragmites* sp. as phosphorus removal mechanism

Unlike other lakes in the Middle Basin, Jesup has an extensive stand of *Phragmites* sp. (Figure 3A.2) and the aerial extent appears to be increasing. While *Phragmites* is not the optimum emergent vegetation for use in treatment of nutrient rich water, they have been successfully used in many wastewater treatment wetlands in Europe and Africa and have been studied for nutrient uptake in eutrophic rivers and lakes (USEPA 2000, Karunaratne and Asaeda 2002, Meuleman et al 2002, Grace 2003, Kao et al 2003, Vymazal 2004). *Phragmites* grows at the boundary between marsh and lake and is the last treatment option for non-point source runoff into the lake from the watershed as well as a perimeter treatment of lake water. This native but invasive vegetation might be a feasible alternative for phosphorus removal, eliminating the need for spraying and the concomitant problems from the sudden organic load to the marsh and lake from decomposing biomass. Using the aerial extent in Jesup in 2004 and average uptake rates and harvest costs from the literature indicates that more than two MT TP/yr could be removed from Jesup non-point loads at a cost of about $49 per pound including disposal costs if no agricultural concern wants the feed supplement. Harvesting of *Phragmites* will open access to marsh areas during periods of high water increasing areas for fishing.

Figure 3A.2: Stand of *Phragmites* SP on Jesup's shore

Appendix 4. If necessary, implement more projects to improve water clarity

Support dredging in areas not responding to load reductions, but use rapid dewatering and sludge removal over a period of several years rather than 20 to 25 year impoundment of high quality wetlands.

Using data from a sediment-coring project completed by Cable et al. (1996), Dames & Moore (2000) estimated that the total volume of soft sediments in 1996 was about 100M cubic yards (Table 4A.1). Analysis of sediments completed by Battelle (2004) for SJRWMD found all excess nutrients concentrations to be far below regulations in Part 503 land application limits. Further, in excess of 100 repeated applications on a single area would be required to exceed cumulative excess nutrients load rates. Consequently, all of the lake sediments are therefore candidates for any land application, including agriculture, as a soil amendment.

This point is significant because it creates potential disposal areas that may not require impoundments in wetlands and that may be far enough from the lake to eliminate runoff without high transport costs. New dewatering technologies with improved drying times and increasing demand for lake sediments as soil amendments should be used to determine the rate at which targeted areas are dredged so that no wetlands are impacted, with this dredging viewed as ongoing long-term lake maintenance.

Lake sediments (in their dried state) should be checked for pH as some have proven to be quite acidic. This would not preclude their use as soil amendments, but might require liming.

Table 4A.1: Estimated volumes of soft sediment in different areas of Lake Jesup

Soft Sediment Volumes, 1996	
Whole lake	1.02E+08 yd3
Top 35 cm	9.90E+06 yd3
Northern neck	1.58E+06 yd3
Southern central region	4.17E+06 yd3

(Dames & Moore, 2000 using Cable et al. 1996)

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Appendix 5. Letters of Support

SIERRA CLUB
FOUNDED 1892

CENTRAL FLORIDA GROUP

P.O. Box 941692, Maitland, FL 32794-1692

September 12, 2007

Dr. Sherry Brandt-Williams
Regina Lovings-Morse
St. John's River Water Management District
4047 Reid St.
Palatka, FL 32178-1429

RE: Lake Jesup Interagency Water Quality and Habitat Restoration Strategy

Dear Dr. Brandt-Williams and Ms. Lovings-Morse

The Sierra Club, Central Florida Group, has been an active participant of the Friends of Lake Jesup for more than a decade. We are grateful for this opportunity to offer comments on this proposed restoration strategy document.

Sierra Club acknowledges the commitment of all the agencies and entities who pledged to come together to formulate a working plan for the improvement of the Lake Jesup Basin. We applaud the spirit of cooperation of all parties to protect and enhance water quality for a healthy and vibrant Lake Jesup Basin.

Sierra Club would like to offer our support for a number of key elements of the plan, including the following: active land acquisition plans within the basin, including but not limited to areas connected to Soldier Creek and Six Mile Creek; the proposed floating wetlands proposal; future dredging programs and off-site removal of the sediment that will benefit Jesup's lake bottom and water quality; the purchase of Site 10; aggressive reductions of the nutrient loadings into the Lake Jesup Basin, especially of phosphorus

and nitrogen; increasing propagation of native vegetation and reduction of exotics and removal of the nutrients that flow into the Lake Jesup Basin.

While we are aware that there are a number of budgetary concerns that are under consideration, we respectfully support significant target level reductions of nutrient loadings at the earliest possible time period. We support efforts to actively engage all residents and all governmental entities in order to significantly reduce their contribution to the nutrient loading into and ecological degradation of the Lake Jesup Basin. We encourage a proactive and aggressive land acquisition program since it is one of the best strategies to help preserve the ecology of the Lake Jesup Basin while helping to implement this management plan.

On behalf of the Executive Committee of the Sierra Club of Central Florida, we wish to extend our approval of the vision of the Lake Jesup Interagency Water Quality and Habitat Restoration Strategy Plan. We welcome any communication with us should you have any questions or comments.

Sincerely,

Cecilia Height, Vice Chair, Lake Jesup Issue Chair (407) 657-9582

Marge Holt, Conservation Chair (407) 679-6759

Sierra Club, Central Florida Group

APPENDIX D: SPECIES LISTS

PLANTS

GENUS	SPECIES	COMMON NAME	FDACS	USFWS	CITES	FNAI
Ambrosia	*artemisiifolia*	Common ragweed				
Ampelopsis	*arborea*	Pepper vine				
Aristida	*patula*	Tall threeawn				
Baccharis	*halimifolia*	Groundsel tree/Sea myrtle				
Bacopa	*caroliniana*	Blue hyssop				
Bidens	*alba*	Begger-ticks				
Callicarpa	*americana*	Beautyberry				
Carya	*glabra*	Pignut hickory				
Celtis	*laevigata*	Hackberry				
Cephalanthus	*occidentalis*	Buttonbush				
Cinnamomum	*camphora*	Camphor-tree *				
Colocasia	*esculentum*	Wild taro *				
Commelina	*virginica*	Virginia dayflower				
Conyza	*canadensis*	Dwarf horseweed				
Crotalaria	*pallida*	---------- *				
Cynodon	*dactylon*	Bermudagrass *				
Diodia	*virginiana*	Buttonweed				
Diospyros	*virginiana*	Persimmon				
Drymaria	*cordata*	West Indian chickweed				
Eclipta	*prostrata*					
Elephantopus	*carolinianus*	Elephant's-foot				
Epidendrum	*conopseum*	Green-fly orchid	CE		II	
Erythrina	*herbacea*	Coralbean				
Eupatorium	*capillifolium*	Dog fennel				
Galactia	*elliottii*	Milk pea				
Gelsemium	*sempervirens*	Yellow jessamine				
Hibiscus	*coccineus*	Red hibiscus				
Hibiscus	*grandiflorus*	Swamp hibiscus				
Ipomoea	*pes-caprae*	Railroad-vine				
Iris	*hexagona*	Prairie iris				
Juncus	*effusus*	Soft rush				
Juniperus	*virginiana*	Southern red cedar				
Lactuca	*graminifolia*	----------				
Lantana	*camara*	Shrub verbena *				
Lippia	*alba*	Frog-fruit; Carpetweed				
Liquidambar	*styraciflua*	Sweetgum				
Mimosa	*quadrivalvis var. angustata*	Sensitive brier				
Mimosa	*quadrivalvis var. floridana*	Florida sensitive brier				
Mimosa	*strigillosa*	Mimosa				
Myrica	*cerifera*	Wax myrtle				
Neptunia	*pubescens*	Small-headed yellow-puff				

Nyssa	*sylvatica var. sylvatica*	Blackgum
Panicum	*hemitomon*	Maidencane
Parthenocissus	*quinquefolia*	Virginia creeper
Paspalum	*notatum*	Bahiagrass *
Phlebodium	*aureum*	Golden polypody
Phragmites	*australis*	Common reed
Phyla	*nodiflora*	Frogfruit
Phytolacca	*americana*	Pokeberry; Pokeweed
Pinus	*elliottii*	Slash pine
Plantago	*virginica*	Southern plantain
Pleopeltis	*polypodioides*	Resurrection fern
Polygonum	*densiflorum*	
Polygonum	*hydropiperoides*	Mild water-pepper
Polygonum	*pensylvanicum*	Pennsylvania smartwed
Prunus	*serotina*	Wild cherry
Quercus	*nigra*	Water oak
Quercus	*virginiana*	Live oak
Rhexia	*lutea*	Yellow meadowbeauty
Rhus	*copallina*	Winged sumac
Rhynchospora	*latifolia*	Giant white-top sedge
Rudbeckia	*hirta*	Black-eyed susan
Sabal	*palmetto*	Cabbage palm
Salix	*caroliniana*	Carolina willow
Sambucus	*canadensis*	Elderberry
Sapium	*sebiferum*	Chinese tallow tree *
Saururus	*cernuus*	Lizard's-tail
Schinus	*terebinthifolius*	Brazilian pepper *
Schrankia	*microphylla*	Sensitive briar
Scirpus	*californicus*	Giant bulrush
Scirpus	*cubensis*	Cuban bulrush *
Serenoa	*repens*	Saw palmetto
Setaria	*parviflora*	Knotroot foxtail
Sida	*acuta*	Broomweed
Smilax	*bona-nox*	Greenbrier; Catbrier
Smilax	*laurifolia*	Catbrier
Solanum	*capsicoides*	Soda apple
Solanum	*carolinense*	Horse-nettle
Solanum	*viarum*	Tropical soda apple*
Solanum	*viarum*	Tropical soda apple *
Spartina	*bakeri*	Sand cordgrass
Sporobolus	*indicus*	Smutgrass *
Taxodium	*ascendens*	Pond cypress
Tillandsia	*usneoides*	Spanish moss
Toxicodendron	*radicans*	Poison ivy
Typha	*latifolia*	Common cattail
Ulmus	*americana*	American elm

Urena	*lobata*	Caesar-weed *
Verbena	*brasiliensis*	---------- *
Verbesina	*virginica*	Frostweed
Vitis	*munsoniana*	Southern fox grape
Xanthium	*strumarium*	Cocklebur
Youngia	*japonica*	Youngia *

*** Indicates a Non-Native Species**

Wunderlin 1998

Birds Recorded at the Lake Jesup Conservation Area

ANSERIFORMES
- ANATIDAE
  - Dendrocygninae
    - Fulvous Whistling-Duck *(Dendrocygna bicolor)*
  - Anserinae
    - Snow Goose *(Chen caerulescens)*
    - Canada Goose *(Branta canadensis)*
  - Anatinae
    - Wood Duck *(Aix sponsa)*
    - Mottled Duck *(Anas fulvigula)*
    - Blue-winged Teal *(Anas discors)*
    - Northern Shoveler *(Anas clypeata)*
    - Northern Pintail *(Anas acuta)*
    - Green-winged Teal *(Anas crecca)*
    - Canvasback *(Aythya valisneria)*
    - Ring-necked Duck *(Aythya collaris)*
    - Greater Scaup *(Aythya marila)*
    - Lesser Scaup *(Aythya affinis)*
    - Bufflehead *(Bucephala albeola)*
    - Hooded Merganser *(Lophodytes cucullatus)*
    - Red-breasted Merganser *(Mergus serrator)*
    - Ruddy Duck *(Oxyura jamaicensis)*

GALLIFORMES
- PHASIANIDAE
  - Meleagridinae
    - Wild Turkey *(Meleagris gallopavo)*
- ODONTOPHORIDAE
  - Northern Bobwhite *(Colinus virginianus)*

PODICIPEDIFORMES
- PODICIPEDIDAE
  - Pied-billed Grebe *(Podilymbus podiceps)*
  - Horned Grebe *(Podiceps auritus)*

PELECANIFORMES
- PELECANIDAE
  - American White Pelican *(Pelecanus erythrorhynchos)*
  - Brown Pelican *(Pelecanus occidentalis)*

PHALACROCORACIDAE
Double-crested Cormorant *(Phalacrocorax auritus)*
ANHINGIDAE
Anhinga *(Anhinga anhinga)*
CICONIIFORMES
ARDEIDAE
American Bittern *(Botaurus lentiginosus)*
Least Bittern *(Ixobrychus exilis)*
Great Blue Heron *(Ardea herodias)*
Great Egret *(Ardea alba)*
Snowy Egret *(Egretta thula)*
Little Blue Heron *(Egretta caerulea)*
Tricolored Heron *(Egretta tricolor)*
Cattle Egret *(Bubulcus ibis)*
Green Heron *(Butorides virescens)*
Black-crowned Night-Heron *(Nycticorax nycticorax)*
Yellow-crowned Night-Heron *(Nyctanassa violacea)*
THRESKIORNITHIDAE
Threskiornithinae
White Ibis *(Eudocimus albus)*
Glossy Ibis *(Plegadis falcinellus)*
Plataleinae
Roseate Spoonbill *(Platalea ajaja)*
CICONIIDAE
Wood Stork *(Mycteria americana)*
FALCONIFORMES
CATHARTIDAE
Black Vulture *(Coragyps atratus)*
Turkey Vulture *(Cathartes aura)*
ACCIPITRIDAE
Pandioninae
Osprey *(Pandion haliaetus)*
Accipitrinae
Swallow-tailed Kite *(Elanoides forficatus)*
Snail Kite *(Rostrhamus sociabilis)*
Bald Eagle *(Haliaeetus leucocephalus)*
Northern Harrier *(Circus cyaneus)*
Sharp-shinned Hawk *(Accipiter striatus)*
Cooper's Hawk *(Accipiter cooperii)*
Red-shouldered Hawk *(Buteo lineatus)*
Short-tailed Hawk *(Buteo brachyurus)*
Red-tailed Hawk *(Buteo jamaicensis)*
FALCONIDAE
Caracarinae
Crested Caracara *(Caracara cheriway)*
Falconinae
American Kestrel *(Falco sparverius)*
Merlin *(Falco columbarius)*
Peregrine Falcon *(Falco peregrinus)*

GRUIFORMES
- RALLIDAE
  - Black Rail *(Laterallus jamaicensis)*
  - King Rail *(Rallus elegans)*
  - Virginia Rail *(Rallus limicola)*
  - Sora *(Porzana carolina)*
  - Purple Gallinule *(Porphyrio martinica)*
  - Common Moorhen *(Gallinula chloropus)*
  - American Coot *(Fulica americana)*
- ARAMIDAE
  - Limpkin *(Aramus guarauna)*
- GRUIDAE
  - Gruinae
    - Sandhill Crane *(Grus canadensis)*

CHARADRIIFORMES
- CHARADRIIDAE
  - Charadriinae
    - Black-bellied Plover *(Pluvialis squatarola)*
    - American Golden-Plover *(Pluvialis dominica)*
    - Semipalmated Plover *(Charadrius semipalmatus)*
    - Killdeer *(Charadrius vociferus)*
- RECURVIROSTRIDAE
  - Black-necked Stilt *(Himantopus mexicanus)*
  - American Avocet *(Recurvirostra americana)*
- SCOLOPACIDAE
  - Scolopacinae
    - Spotted Sandpiper *(Actitis macularius)*
    - Solitary Sandpiper *(Tringa solitaria)*
    - Greater Yellowlegs *(Tringa melanoleuca)*
    - Lesser Yellowlegs *(Tringa flavipes)*
    - Semipalmated Sandpiper *(Calidris pusilla)*
    - Western Sandpiper *(Calidris mauri)*
    - Least Sandpiper *(Calidris minutilla)*
    - Pectoral Sandpiper *(Calidris melanotos)*
    - Dunlin *(Calidris alpina)*
    - Stilt Sandpiper *(Calidris himantopus)*
    - Short-billed Dowitcher *(Limnodromus griseus)*
    - Long-billed Dowitcher *(Limnodromus scolopaceus)*
    - Wilson’s Snipe *(Gallinago delicata)*
    - American Woodcock *(Scolopax minor)*
- LARIDAE
  - Larinae
    - Laughing Gull *(Larus atricilla)*
    - Little Gull *(Larus minutus)*
    - Bonaparte's Gull *(Larus philadelphia)*
    - Ring-billed Gull *(Larus delawarensis)*
    - Herring Gull *(Larus argentatus)*
  - Sterninae

Least Tern *(Sternula antillarum)*
Caspian Tern *(Hydroprogne caspia)*
Black Tern *(Chlidonias niger)*
Forster's Tern *(Sterna forsteri)*
Sandwich Tern *(Thalasseus sandvicensis)*

COLUMBIFORMES
- COLUMBIDAE
  - Rock Pigeon *(Columba livia)*
  - Eurasian Collared-Dove *(Streptopelia decaocto)*
  - Mourning Dove *(Zenaida macroura)*
  - Common Ground-Dove *(Columbina passerina)*

CUCULIFORMES
- CUCULIDAE
  - Cuculinae
    - Yellow-billed Cuckoo *(Coccyzus americanus)*

STRIGIFORMES
- TYTONIDAE
  - Barn Owl *(Tyto alba)*
- STRIGIDAE
  - Eastern Screech-Owl *(Megascops asio)*
  - Great Horned Owl *(Bubo virginianus)*
  - Barred Owl *(Strix varia)*

CAPRIMULGIFORMES
- CAPRIMULGIDAE
  - Chordeilinae
    - Common Nighthawk *(Chordeiles minor)*
  - Caprimulginae
    - Chuck-will's-widow *(Caprimulgus carolinensis)*
    - Whip-poor-will *(Caprimulgus vociferus)*

APODIFORMES
- APODIDAE
  - Chaeturinae
    - Chimney Swift *(Chaetura pelagica)*
- TROCHILIDAE
  - Trochilinae
    - Ruby-throated Hummingbird *(Archilochus colubris)*

CORACIIFORMES
- ALCEDINIDAE
  - Cerylinae
    - Belted Kingfisher *(Megaceryle alcyon)*

PICIFORMES
- PICIDAE
  - Picinae
    - Red-bellied Woodpecker *(Melanerpes carolinus)*
    - Yellow-bellied Sapsucker *(Sphyrapicus varius)*
    - Downy Woodpecker *(Picoides pubescens)*
    - Hairy Woodpecker *(Picoides villosus)*
    - Northern Flicker *(Colaptes auratus)*
    - Pileated Woodpecker *(Dryocopus pileatus)*

PASSERIFORMES
- TYRANNIDAE
  - Fluvicolinae
    - Acadian Flycatcher *(Empidonax virescens)*
    - Eastern Phoebe *(Sayornis phoebe)*
    - Vermilion Flycatcher *(Pyrocephalus rubinus)*
  - Tyranninae
    - Ash-throated Flycatcher *(Myiarchus cinerascens)*
    - Great Crested Flycatcher *(Myiarchus crinitus)*
    - Brown-crested Flycatcher *(Myiarchus tyrannulus)*
    - Eastern Kingbird *(Tyrannus tyrannus)*
- LANIIDAE
  - Loggerhead Shrike *(Lanius ludovicianus)*
- VIREONIDAE
  - White-eyed Vireo *(Vireo griseus)*
  - Yellow-throated Vireo *(Vireo flavifrons)*
  - Blue-headed Vireo *(Vireo solitarius)*
  - Red-eyed Vireo *(Vireo olivaceus)*
- CORVIDAE
  - Blue Jay *(Cyanocitta cristata)*
  - American Crow *(Corvus brachyrhynchos)*
  - Fish Crow *(Corvus ossifragus)*
- HIRUNDINIDAE
  - Hirundininae
    - Purple Martin *(Progne subis)*
    - Tree Swallow *(Tachycineta bicolor)*
    - Northern Rough-winged Swallow *(Stelgidopteryx serripennis)*
    - Bank Swallow *(Riparia riparia)*
    - Barn Swallow *(Hirundo rustica)*
- PARIDAE
  - Carolina Chickadee *(Poecile carolinensis)*
  - Tufted Titmouse *(Baeolophus bicolor)*
- SITTIDAE
  - Sittinae
    - Brown-headed Nuthatch *(Sitta pusilla)*
- TROGLODYTIDAE
  - Carolina Wren *(Thryothorus ludovicianus)*
  - House Wren *(Troglodytes aedon)*
  - Sedge Wren *(Cistothorus platensis)*
  - Marsh Wren *(Cistothorus palustris)*
- REGULIDAE
  - Ruby-crowned Kinglet *(Regulus calendula)*
- SYLVIIDAE
  - Polioptilinae
    - Blue-gray Gnatcatcher *(Polioptila caerulea)*
- TURDIDAE
  - Eastern Bluebird *(Sialia sialis)*
  - Veery *(Catharus fuscescens)*
  - Swainson's Thrush *(Catharus ustulatus)*

Hermit Thrush *(Catharus guttatus)*
American Robin *(Turdus migratorius)*

MIMIDAE

Gray Catbird *(Dumetella carolinensis)*
Northern Mockingbird *(Mimus polyglottos)*
Brown Thrasher *(Toxostoma rufum)*

STURNIDAE

European Starling *(Sturnus vulgaris)*

MOTACILLIDAE

American Pipit *(Anthus rubescens)*

BOMBYCILLIDAE

Cedar Waxwing *(Bombycilla cedrorum)*

PARULIDAE

Tennessee Warbler *(Vermivora peregrina)*
Orange-crowned Warbler *(Vermivora celata)*
Northern Parula *(Parula americana)*
Yellow Warbler *(Dendroica petechia)*
Chestnut-sided Warbler *(Dendroica pensylvanica)*
Magnolia Warbler *(Dendroica magnolia)*
Cape May Warbler *(Dendroica tigrina)*
Black-throated Blue Warbler *(Dendroica caerulescens)*
Yellow-rumped Warbler *(Dendroica coronata)*
Yellow-throated Warbler *(Dendroica dominica)*
Pine Warbler *(Dendroica pinus)*
Prairie Warbler *(Dendroica discolor)*
Palm Warbler *(Dendroica palmarum)*
Bay-breasted Warbler *(Dendroica castanea)*
Blackpoll Warbler *(Dendroica striata)*
Black-and-white Warbler *(Mniotilta varia)*
American Redstart *(Setophaga ruticilla)*
Worm-eating Warbler *(Helmitheros vermivora)*
Ovenbird *(Seiurus aurocapilla)*
Northern Waterthrush *(Seiurus noveboracensis)*
Louisiana Waterthrush *(Seiurus motacilla)*
Common Yellowthroat *(Geothlypis trichas)*

THRAUPIDAE

Summer Tanager *(Piranga rubra)*

EMBERIZIDAE

Eastern Towhee *(Pipilo erythrophthalmus)*
Field Sparrow *(Spizella pusilla)*
Vesper Sparrow *(Pooecetes gramineus)*
Savannah Sparrow *(Passerculus sandwichensis)*
Grasshopper Sparrow *(Ammodramus savannarum)*
Henslow's Sparrow *(Ammodramus henslowii)*
Le Conte's Sparrow *(Ammodramus leconteii)*
Song Sparrow *(Melospiza melodia)*
Lincoln's Sparrow *(Melospiza lincolnii)*
Swamp Sparrow *(Melospiza georgiana)*
White-crowned Sparrow *(Zonotrichia leucophrys)*

CARDINALIDAE
- Northern Cardinal *(Cardinalis cardinalis)*
- Blue Grosbeak *(Passerina caerulea)*
- Indigo Bunting *(Passerina cyanea)*
- Painted Bunting *(Passerina ciris)*

ICTERIDAE
- Bobolink *(Dolichonyx oryzivorus)*
- Red-winged Blackbird *(Agelaius phoeniceus)*
- Eastern Meadowlark *(Sturnella magna)*
- Common Grackle *(Quiscalus quiscula)*
- Boat-tailed Grackle *(Quiscalus major)*
- Brown-headed Cowbird *(Molothrus ater)*
- Baltimore Oriole *(Icterus galbula)*

FRINGILLIDAE
- Carduelinae
  - American Goldfinch *(Carduelis tristis)*

Butterflies Recorded at the Lake Jesup Conservation Area

PAPILIONIDAE
- Zebra Swallowtail (Eurytides marcellus)
- Black Swallowtail (Papilio polyxenes)
- Giant Swallowtail (Heraclides cresphontes)
- Eastern Tiger Swallowtail (Pterourus glaucus)
- Spicebush Swallowtail (Pterourus troilus)
- Palamedes Swallowtail (Pterourus palamedes)

PIERIDAE
- Pierinae
  - Great Southern White (Ascia monuste)
- Coliadinae
  - Orange Sulphur (Colias eurytheme)
  - Cloudless Sulphur (Phoebis sennae)
  - Orange-barred Sulphur (Phoebis philea)
  - Barred Yellow (Eurema daira)
  - Little Yellow (Eurema lisa)
  - Sleepy Orange (Eurema nicippe)
  - Dainty Sulphur (Nathalis iole)

LYCAENIDAE
- Theclinae
  - White M Hairstreak (Parrhasius m-album)
  - Gray Hairstreak (Strymon melinus)
  - Red-banded Hairstreak (Calycopis cecrops)
- Polyommatinae
  - Ceraunus Blue (Hemiargus ceraunus)

NYMPHALIDAE
- Heliconiinae
  - Gulf Fritillary (Agraulis vanillae)

- Zebra Heliconian (Heliconius charitonius)
  - Nymphalinae
    - Phaon Crescent (Phyciodes phaon)
    - Pearl Crescent (Phyciodes tharos)
    - Question Mark (Polygonia interrogationis)
    - American Lady (Vanessa virginiensis)
    - Red Admiral (Vanessa atalanta)
    - Common Buckeye (Junonia coenia)
    - White Peacock (Anartia jatrophae)
  - Limenitidinae
    - Viceroy (Limenitis archippus)
  - Apaturinae
    - Hackberry Emperor (Asterocampa celtis)
    - Tawny Emperor (Asterocampa clyton)
  - Satyrinae
    - Carolina Satyr (Hermeuptychia sosybius)
  - Danainae
    - Monarch (Danaus plexippus)
    - Queen (Danaus gilippus)
- HESPERIIDAE
  - Pyrginae
    - Silver-spotted Skipper (Epargyreus clarus)
    - Long-tailed Skipper (Urbanus proteus)
    - Dorantes Longtail (Urbanus dorantes)
    - Northern Cloudywing (Thorybes pylades)
    - Horace's Duskywing (Erynnis horatius)
    - Zarucco Duskywing (Erynnis zarucco)
    - White Checkered-Skipper (Pyrgus albescens)
    - Tropical Checkered-Skipper (Pyrgus oileus)
  - Hesperiinae
    - Clouded Skipper (Lerema accius)
    - Least Skipper (Ancyloxypha numitor)
    - Southern Skipperling (Copaeodes minimus)
    - Fiery Skipper (Hylephila phyleus)
    - Whirlabout (Polites vibex)
    - Southern Broken-Dash (Wallengrenia otho)
    - Delaware Skipper (Atrytone logan)
    - Byssus Skipper (Problema byssus)
    - Dun Skippper (Euphyes vestris)
    - Monk (Asbolis capucinus)
    - Eufala Skipper (Lerodea eufala)
    - Twin-spot Skipper (Oligoria maculata)
    - Brazilian Skipper (Calpodes ethlius)
    - Ocola Skipper (Panoquina ocola)

Amphibians Recorded at the Lake Jesup Conservation Area

ANURA
- BUFONIDAE
  - Southern Toad *(Bufo terrestris)*
- HYLIDAE
  - Florida Cricket Frog *(Acris gryllus dorsalis)*
  - Green Treefrog *(Hyla cinerea)*
  - Squirrel Treefrog *(Hyla squirella)*
  - Little Grass Frog *(Psudacris ocularis)*
- MICROHYLIDAE
  - Eastern Narrow-mouthed Toad *(Gastrophryne carolinensis)*
- RANIDAE
  - Bullfrog *(Rana catesbeiana)*
  - Pig Frog *(Rana grylio)*
  - Southern Leopard Frog *(Rana sphenocephala)*

Reptiles Recorded at the Lake Jesup Conservation Area

CROCODYLIA
- ALLIGATORIDAE
  - American Alligator *(Alligator mississippiensis)*

TESTUDINES
- CHELYDRIDAE
  - Florida Snapping Turtle *(Chelydra serpentina osceola)*
- KINOSTERNIDAE
  - Florida Mud Turtle *(Kinosternon subrubrum steindachneri)*
- EMYDIDAE
  - Florida Box Turtle *(Terrapene carolina bauri)*
  - Peninsula Cooter *(Pseudemys floridana peninsularis)*
  - Florida Redbelly Turtle *(Pseudemys nelsoni)*

SQUAMATA
- LACERTILIA
  - POLYCHRIDAE
    - Green Anole *(Anolis carolinensis)*
    - Cuban Brown Anole *(Anolis sagrei sagrei)*
  - SCINCIDAE
    - Ground Skink *(Scincella lateralis)*
    - Southeastern Five-lined Skink *(Eumeces inexpectatus)*
- SERPENTES
  - COLUBRIDAE
    - Eastern Garter Snake *(Thamnophis sirtalis sirtalis)*
    - Peninsula Ribbon Snake *(Thamnophis sauritus sackenii)*
    - Southern Black Racer *(Coluber constrictor priapus)*
  - VIPERIDAE

Florida Cottonmouth *(Agkistrodon piscivorus conanti)*
Dusky Pygmy Rattlesnake *(Sistrurus miliarius barbouri)*
Eastern Diamondback Rattlesnake *(Crotalus adamanteus)*

Reptiles Recorded at the Lake Jesup Conservation Area

MARSUPALIA
- DIDELPHIDAE
  - Virginia opossum *(Didelphis virginia)*

INSECTIVORA
- TALPIDAE
  - Eastern Mole *(Scalopus aquaticus)*

XENARTHRA
- DASYPODIDAE
  - Nine-banded Armadillo *(Dasypus novemcinctus)*

LAGOMORPHA
- LEPORIDAE
  - Marsh Rabbit *(Sylvilagus palustris)*

RODENTIA
- SCIURIDAE
  - Eastern Gray Squirrel *(Sciurus carolinensis)*
  - Sherman's Fox Squirrel *(Sciurus niger shermani)*
- MURIDAE
  - Hispid Cotton Rat *(Sigmodon hispidus)*

CARNIVORA
- CANIDAE
  - Coyote *(Canis latrans)*
- PROCYONIDAE
  - Raccoon *(Procyon lotor)*
- MUSTELIDAE
  - River Otter *(Lutra canadensis)*
- FELIDAE
  - Bobcat *(Lynx rufus)*

SIRENIA
- TRICHECHIDAE
  - West Indian Manatee *(Trichechus manatus)*

ATRIODACTYLA
- SUIDAE
  - Pig *(Sus scrofa)*
- CERVIDAE
  - White-tailed Deer *(Odocoileus virginianus)*

Insects

Anismorpha	*buprestoides*	Palmetto walking stick

Argiope	*aurantia*	Garden spider
Chrysops	*sp.*	Deer fly
Gasteracantha	*cancriformis*	Crab-like spiny orb spider
Phebis	*sennae*	Cloudless sulphur
Romalea	*microptera*	Southeastern lubber

APPENDIX B
Conceptual Design Plans within LJCA

COMPONENTS OF CONTRACT PLANS SET

CONCEPTUAL DESIGN PLANS

A DETAILED INDEX APPEARS ON THE KEY SHEET OF EACH COMPONENT

INDEX OF ROADWAY PLANS

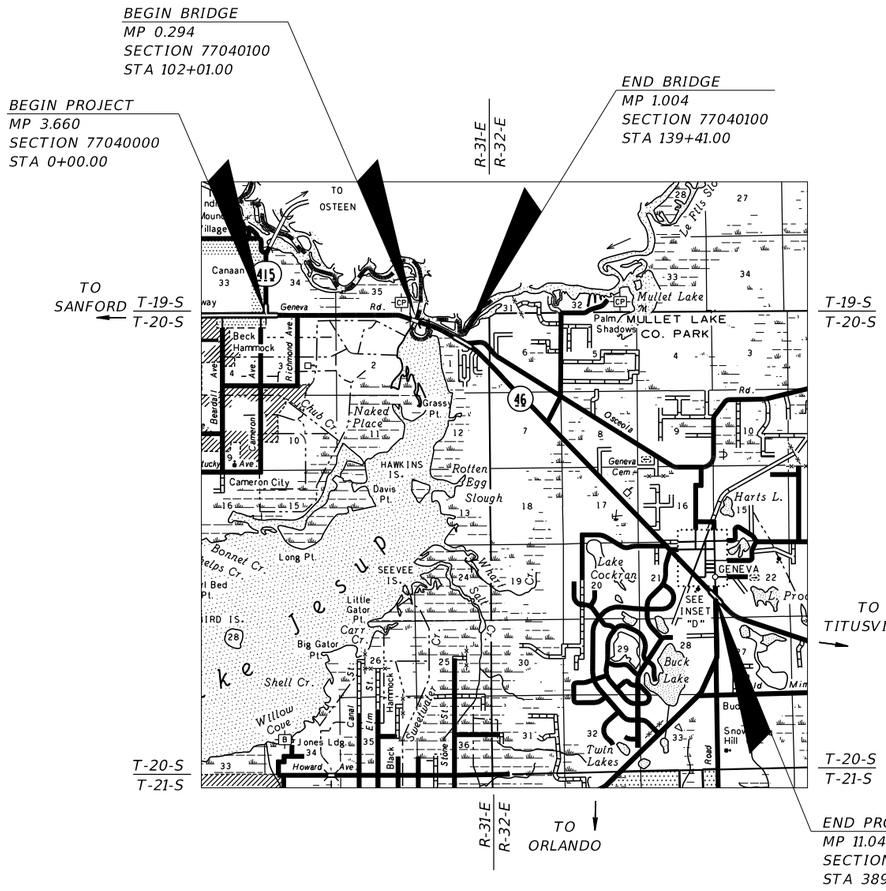
CONCEPTUAL DESIGN PLANS

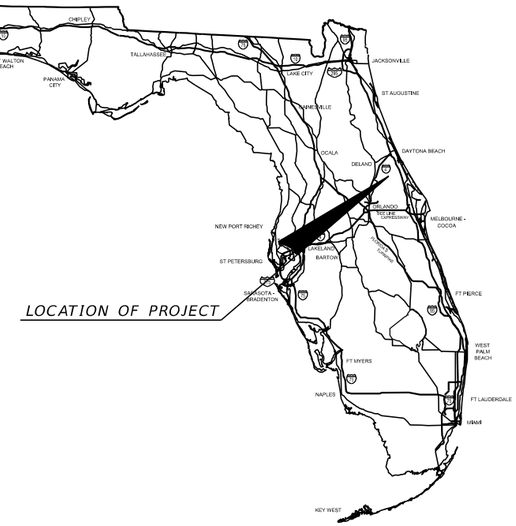
FINANCIAL PROJECT ID 240216-4-28-01

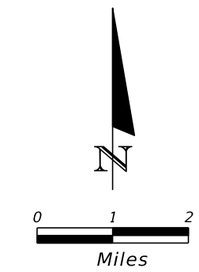
SEMINOLE COUNTY CONTRACT NO. PS-5738-10/JVP

SEMINOLE COUNTY (77040)

STATE ROAD NO. 46







PLANS PREPARED BY:

URS CORPORATION
315 E. ROBINSON STREET, SUITE 245
ORLANDO, FL 32801-1949
PH (407) 422-0353 FAX (407) 423-2695
CERTIFICATE OF AUTHORIZATION NO. 000002
VENDOR NO. F592087895002

NOTE: THE SCALE OF THESE PLANS MAY HAVE CHANGED DUE TO REPRODUCTION.

LENGTH OF PROJECT

	LINEAR FEET	MILES
ROADWAY	35,203.29	6.67
BRIDGES	3,740.00	0.71
NET LENGTH OF PROJECT	38,943.29	7.38
EXCEPTIONS	0.00	0.00
GROSS LENGTH OF PROJECT	38,943.29	7.38

KEY SHEET REVISIONS

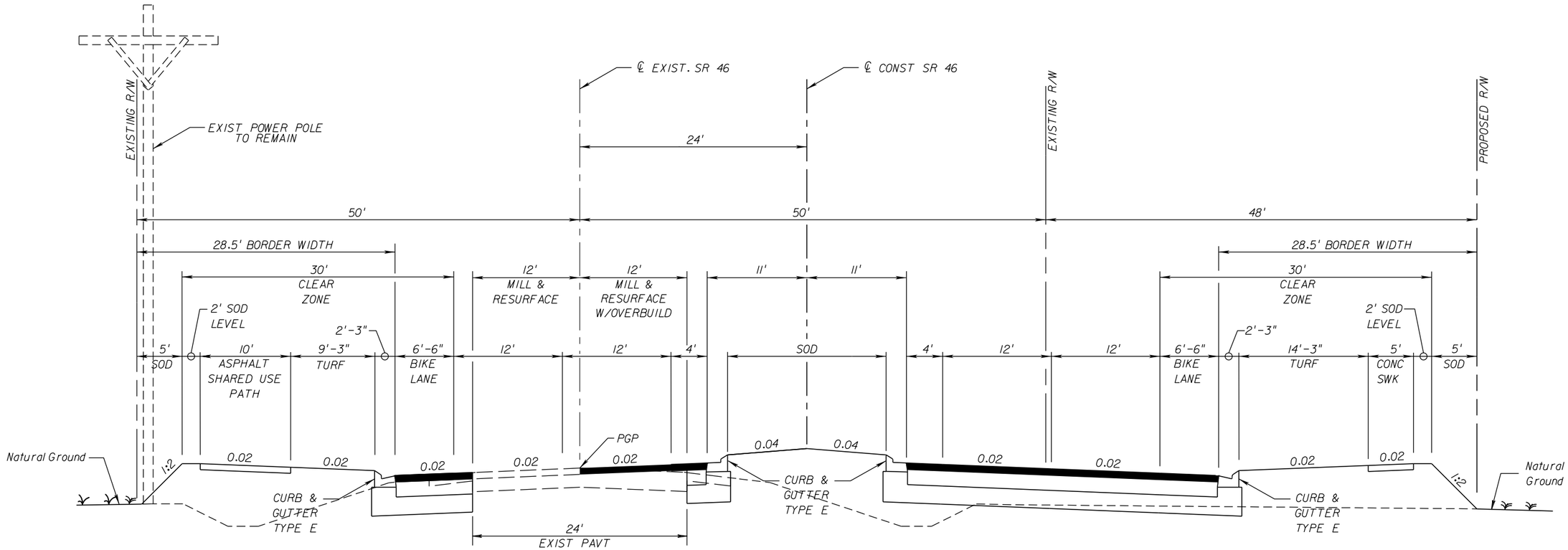
DATE	DESCRIPTION

SEMINOLE COUNTY PROJECT MANAGER: SHAD SMITH, P.E.

ROADWAY PLANS
ENGINEER OF RECORD: CHRISTOPHER RIZZOLO, P.E.

P.E. NO.: 54078

FISCAL YEAR	SHEET NO.
	1



55 MPH

FROM STA 7+13.36 (EAST OF SR 415) TO STA 58+91.69

FROM STA 158+15.32 (EAST OF ST. JOHNS RIVER BRIDGE)

TO STA 339+00 (COCHRAN ROAD)*

* - WHERE WIDENING OCCURS TO THE SOUTH

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

CHRISTOPHER RIZZOLO, P.E.
P.E. LICENSE NO. 54078
URS CORPORATION
315 E. ROBINSON STREET, SUITE 245
ORLANDO, FL 32801-1949
PH (407) 422-0353 FAX (407) 423-2695
CERTIFICATE OF AUTHORIZATION NO. 000002

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 46	SEMINOLE	240216-4-28-01

SUBURBAN TYPICAL SECTION USE EXISTING FOR WESTBOUND LANES

SHEET NO. 2

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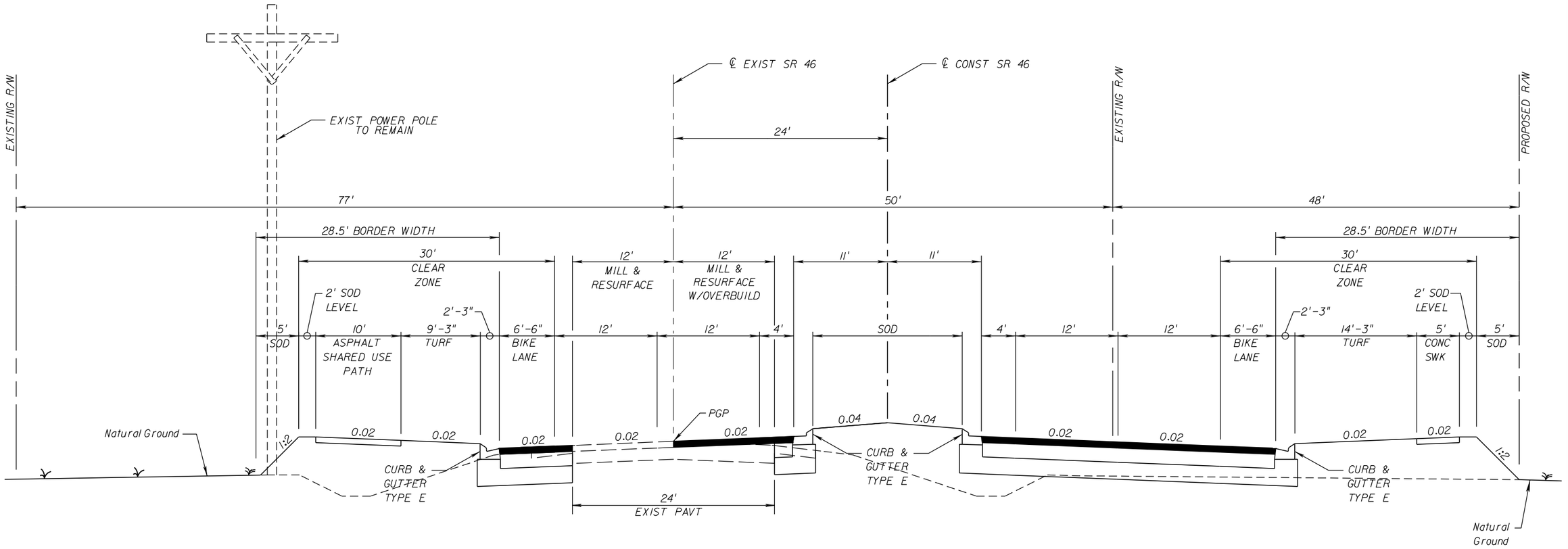

55 MPH
FROM STA 58+91.69 TO STA 83+44.20
(WEST OF ST. JOHNS RIVER BRIDGE)

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

CHRISTOPHER RIZZOLO, P.E.
P.E. LICENSE NO. 54078
URS CORPORATION
315 E. ROBINSON STREET, SUITE 245
ORLANDO, FL 32801-1949
PH (407) 422-0353 FAX (407) 423-2695
CERTIFICATE OF AUTHORIZATION NO. 000002

Stewart-Cooper Construction

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 46	SEMINOLE	240216-4-28-01

SUBURBAN TYPICAL SECTION USE EXISTING FOR WESTBOUND LANES

SHEET NO. 3

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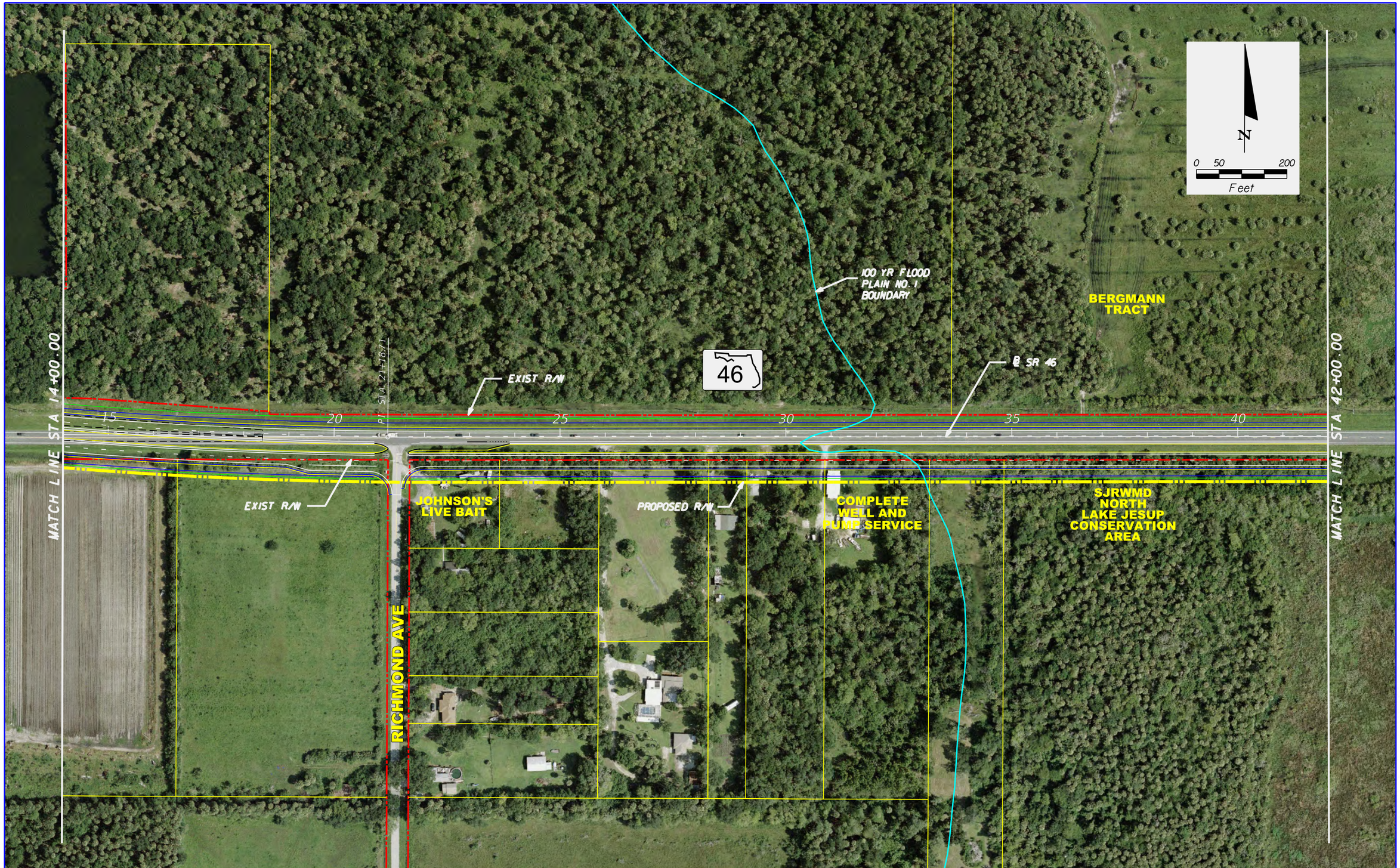

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

CHRISTOPHER RIZZOLO, P.E.
P.E. LICENSE NO. 54078
URS CORPORATION
315 E. ROBINSON STREET, SUITE 245
ORLANDO, FL 32801-1949
PH (407) 422-0353 FAX (407) 423-2695
CERTIFICATE OF AUTHORIZATION NO. 000002

SEMINOLE COUNTY
FLORIDA'S NATURAL CHOICE

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 46	SEMINOLE	240216-4-28-01

PLAN SR 46 WEST SUBURBAN WIDEN SOUTH PREFERRED ALTERNATIVE

SHEET NO. 10

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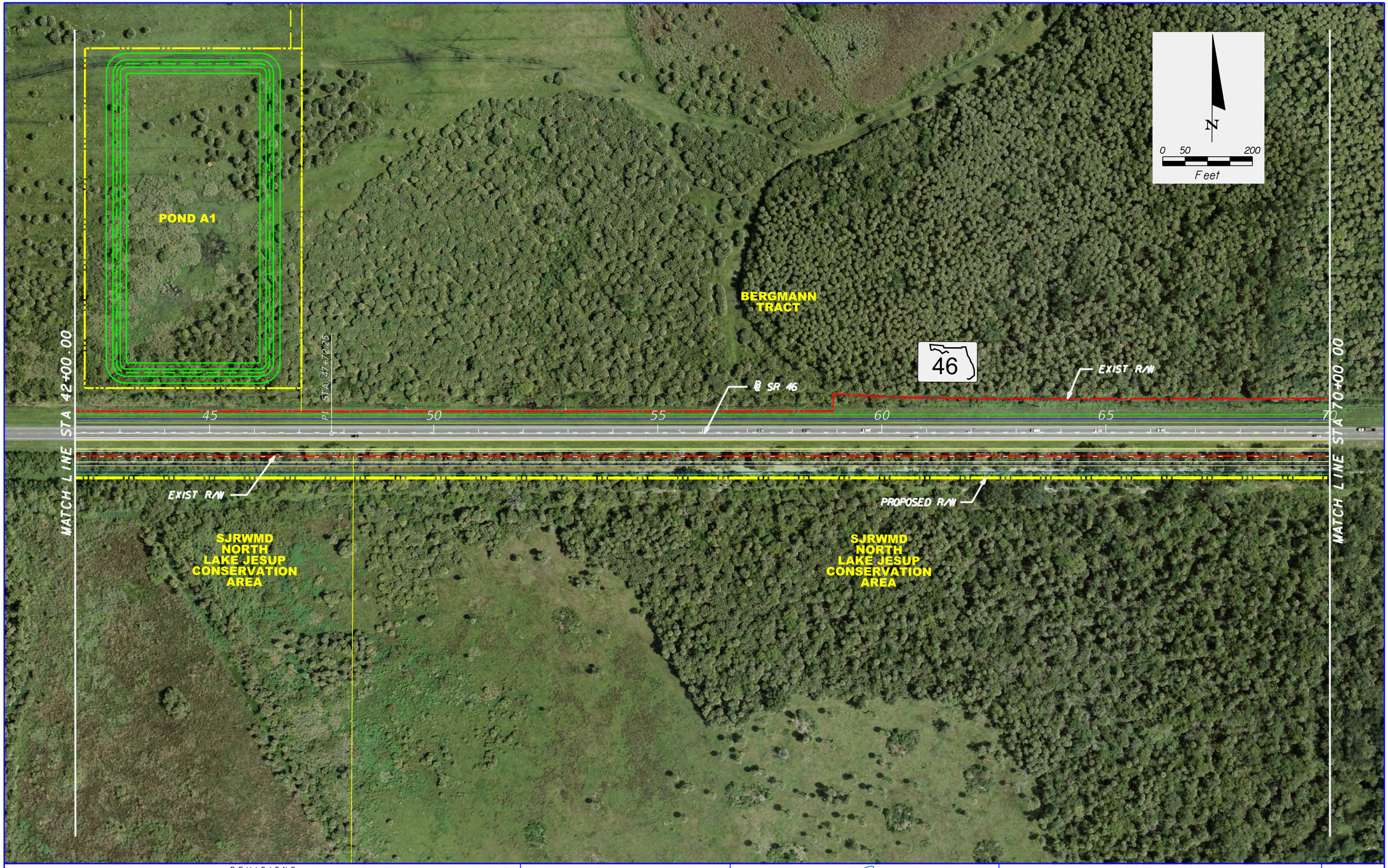

REVISIONS

DATE	DESCRIPTION	DATE	DESCRIPTION

CHRISTOPHER RIZZOLO, P.E.
P.E. LICENSE NO. 54078
URS CORPORATION
315 E. ROBINSON STREET, SUITE 245
ORLANDO, FL 32801-1949
PH (407) 422-0353 FAX (407) 423-2695
CERTIFICATE OF AUTHORIZATION NO. 000002

SEMINOLE COUNTY
FLORIDA'S NATURAL CHOICE

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 46	SEMINOLE	240216-4-28-01

PLAN SR 46 WEST SUBURBAN WIDEN SOUTH PREFERRED ALTERNATIVE

SHEET NO. 11

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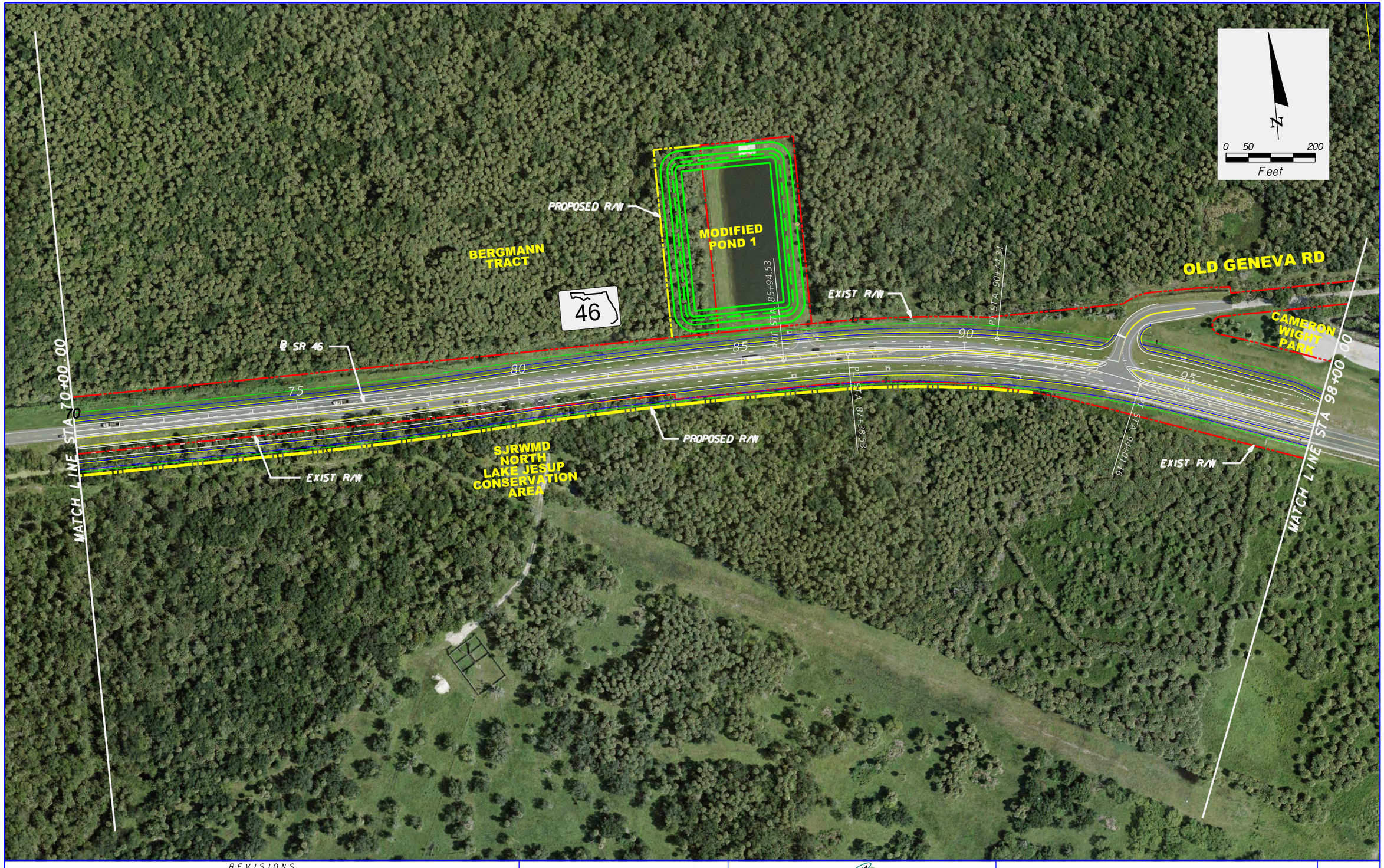

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

CHRISTOPHER RIZZOLO, P.E.
P.E. LICENSE NO. 54078
URS CORPORATION
315 E. ROBINSON STREET, SUITE 245
ORLANDO, FL 32801-1949
PH (407) 422-0353 FAX (407) 423-2695
CERTIFICATE OF AUTHORIZATION NO. 000002

SEMINOLE COUNTY
FLORIDA'S NATURAL CHOICE

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 46	SEMINOLE	240216-4-28-01

PLAN SR 46 WEST SUBURBAN WIDEN SOUTH PREFERRED ALTERNATIVE

SHEET NO. 12

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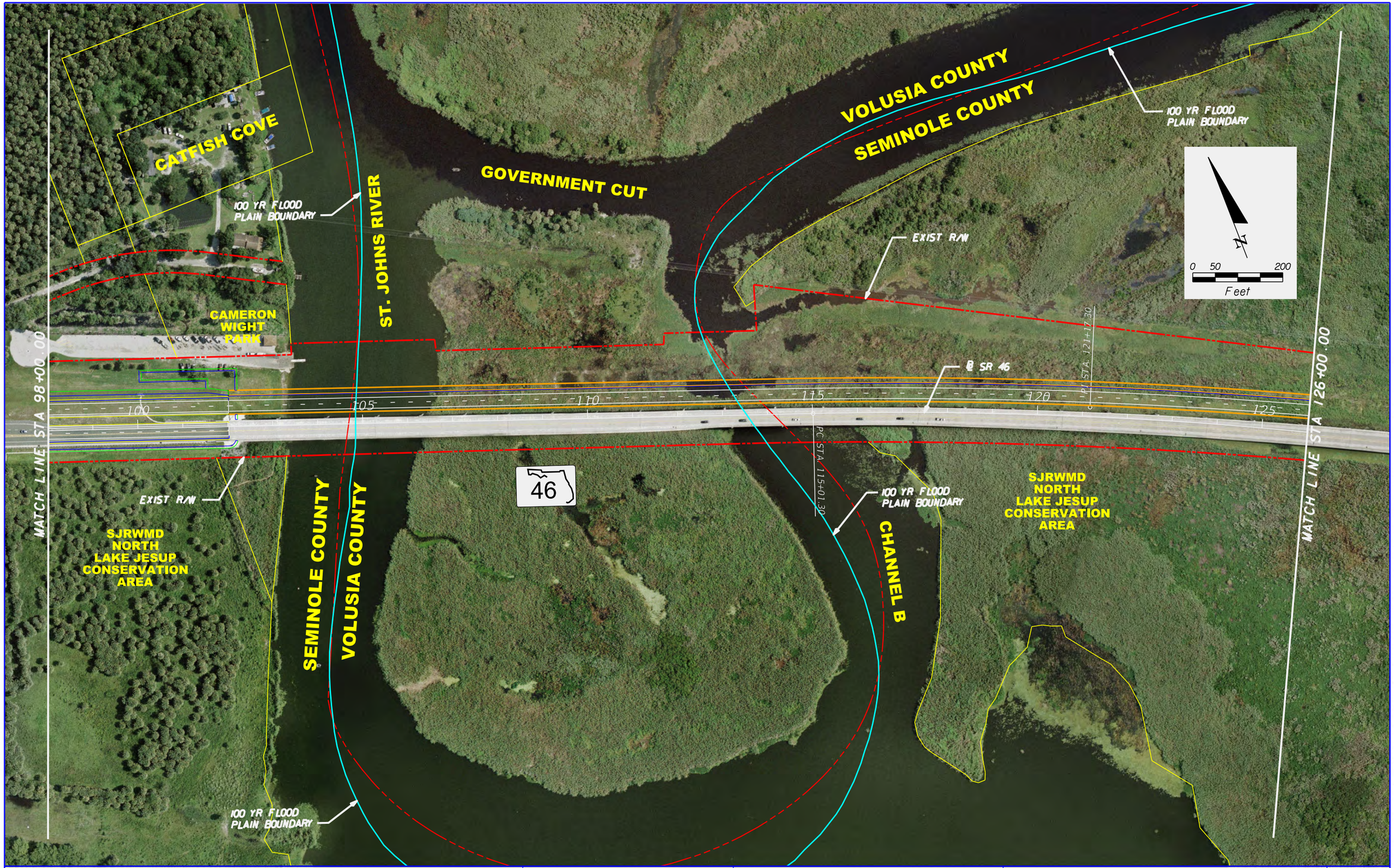

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

CHRISTOPHER RIZZOLO, P.E.
P.E. LICENSE NO. 54078
URS CORPORATION
315 E. ROBINSON STREET, SUITE 245
ORLANDO, FL 32801-1949
PH (407) 422-0353 FAX (407) 423-2695
CERTIFICATE OF AUTHORIZATION NO. 000002

SEMINOLE COUNTY
FLORIDA'S NATURAL CHOICE

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 46	SEMINOLE	240216-4-28-01

PLAN SR 46 WEST SUBURBAN WIDEN NORTH PREFERRED ALTERNATIVE

SHEET NO. 13

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VOLUSIA COUNTY
SEMINOLE COUNTY
ST. JOHNS RIVER
100 YR FLOOD PLAIN BOUNDARY
100 YR FLOOD PLAIN BOUNDARY
100 YR FLOOD PLAIN BOUNDARY
N
0 50 200
Feet
COMP POND 2
MODIFIED POND 2
EXIST R/W
PROPOSED R/W
W OSCEOLA RD
EXIST R/W
EXIST R/W
46
SR 46
MATCH LINE STA 126+00.00
MATCH LINE STA 154+00.00
PT STA 127+31.42
PC STA 143+17.67
SWAMP LN
GLEKK CIR
SJRWMD NORTH LAKE JESUP CONSERVATION AREA

LEGEND:

- PAVEMENT TO BE REMOVED
- EXIST R/W LINE
- PROPOSED R/W LINE
- PROPERTY LINE
- RETENTION AREA

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

CHRISTOPHER RIZZOLO, P.E.
P.E. LICENSE NO. 54078
URS CORPORATION
315 E. ROBINSON STREET, SUITE 245
ORLANDO, FL 32801-1949
PH (407) 422-0353 FAX (407) 423-2695
CERTIFICATE OF AUTHORIZATION NO. 000002

SEMINOLE COUNTY
FLORIDA'S NATURAL CHOICE

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 46	SEMINOLE	240216-4-28-01

PLAN SR 46 EAST SUBURBAN WIDEN NORTH PREFERRED ALTERNATIVE

SHEET NO. 14

glen_dvorovy 1/27/2014 3:19:29 PM I:\Projects\2722145 SR46 PDE\roadway\plan\suburban\planrd8.dgn

APPENDIX C
Lake Jesup Conservation Area Statement of Significance

St. Johns River
Water Management District
Hans G. Tanzler III, Executive Director

4049 Reid Street • P.O. Box 1429 • Palatka, FL 32178-1429 • (386) 329-4500
On the Internet at floridaswater.com.

December 2, 2014

Chris Rizzolo, P.E.
URS Corporation
315 E. Robinson St., Ste. 245
Orlando, FL 32801

Dear Mr. Rizzolo:

This letter is in response to your email requesting a letter including a statement of significance to the Lake Jesup Conservation Area (LJCA) resulting from the proposed widening of SR 46 from SR 415 to CR 426 in Seminole County, Florida. Please realize this letter reflects the District's proprietary interest only, and in no way affects our regulatory responsibility.

I need to point out that the Futch parcel within the Lake Jesup Conservation Area was acquired as mitigation for impacts resulting from the construction of the Seminole County Expressway, so any impacts to the parcel, which includes the footprint of the proposed widening of SR 46, will need to consider the previous mitigation.

Your email dated 11/21/2014, indicates that the pond for basin A has been relocated from the south side of SR 46 to the north side, thereby minimizing the impacts to the LJCA. The remaining impacts to the LJCA are the minimum necessary to facilitate widening an existing corridor. Therefore, the St Johns River Water Management District has determined that the project will not adversely affect the activities, features, and conservation attributes for which the property was purchased and is managed.

With over 5,592 acres of property, the LJCA is managed for a variety of uses. These uses include cattle grazing, silviculture, and a range of recreation and conservation goals with varying degrees of intensity throughout the property.

While the entire LJCA property is available for passive recreation, the area proposed for incorporation into the SR 46 widening project is intended for multiple uses and not designated, managed or planned for a specific recreational use. Further, the LJCA property is managed for the preservation of habitat and for general conservation purposes. However, the area proposed for incorporation into the SR 46 project is not designated by statute or identified in the official management plan as an area managed as a wildlife refuge.

There are no constructed features that function primarily for recreational use being impacted by the proposed widening.

I hope that this letter answers your concerns. If you have any questions, please contact me at (386) 329-4399.

Sincerely,

Steven R. Miller, Director
Division of Land Management

c: Robert Christianson
Ray Bunton
William Bossuot
Travis Richardson