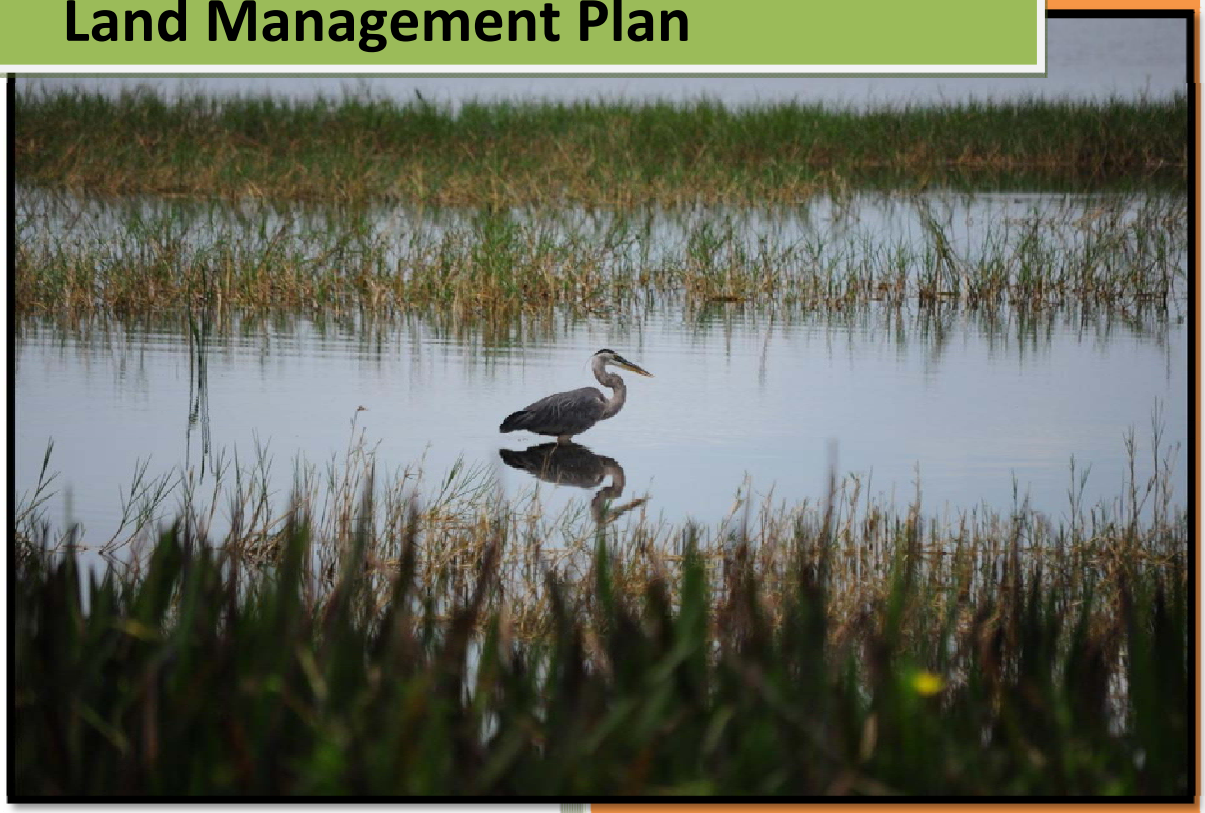
September 2012

Twin Oaks Conservation Area
Land Management Plan



Prepared for:
Osceola County Natural Resources

ESA

LAND MANAGEMENT PLAN
Twin Oaks Conservation Area, Osceola County

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LAND MANAGEMENT PLAN

Twin Oaks Conservation Area, Osceola County

1.0 INTRODUCTION

The ±399-acre Twin Oaks Conservation Area (TOCA) was purchased by Osceola County for the protection and enhancement of water resources, fish and wildlife habitats, and flood storage. In addition, the property will serve as an area for passive public recreation, to include: hiking, bird watching, fishing, opportunities for viewing wildlife, canoeing, natural and cultural resource education, and general aesthetic enjoyment of Osceola County's natural resources. This document provides recommendations for the initial Land Management of TOCA.

2.0 AREA OVERVIEW

The landscape of the TOCA is characterized by improved pastures, live oak hammocks, wet prairies, freshwater marshes, shrub wetlands, remnant cypress, levees and spoil areas, ditches and swales, and a portion of the Lake Tohopekaliga littoral shelf. For the past several decades the subject property and adjacent privately-owned lands have been primarily used for cattle grazing and sod production. The TOCA lies along the northeastern shoreline of Lake Tohopekaliga, and the immediate surrounding landscape is comprised of pastures, lightly wooded areas, and shrubby lands. Several medium density residential subdivisions lie within a one mile radius northwest, north, and east of the property. The TOCA is well situated to provide protection to the Lake Tohopekaliga floodplain and significant supporting wildlife habitat, while allowing for compatible public recreation. The property is wholly sited within the Osceola Plain physiographic region of Florida which supports several imperiled or rare ecological communities.

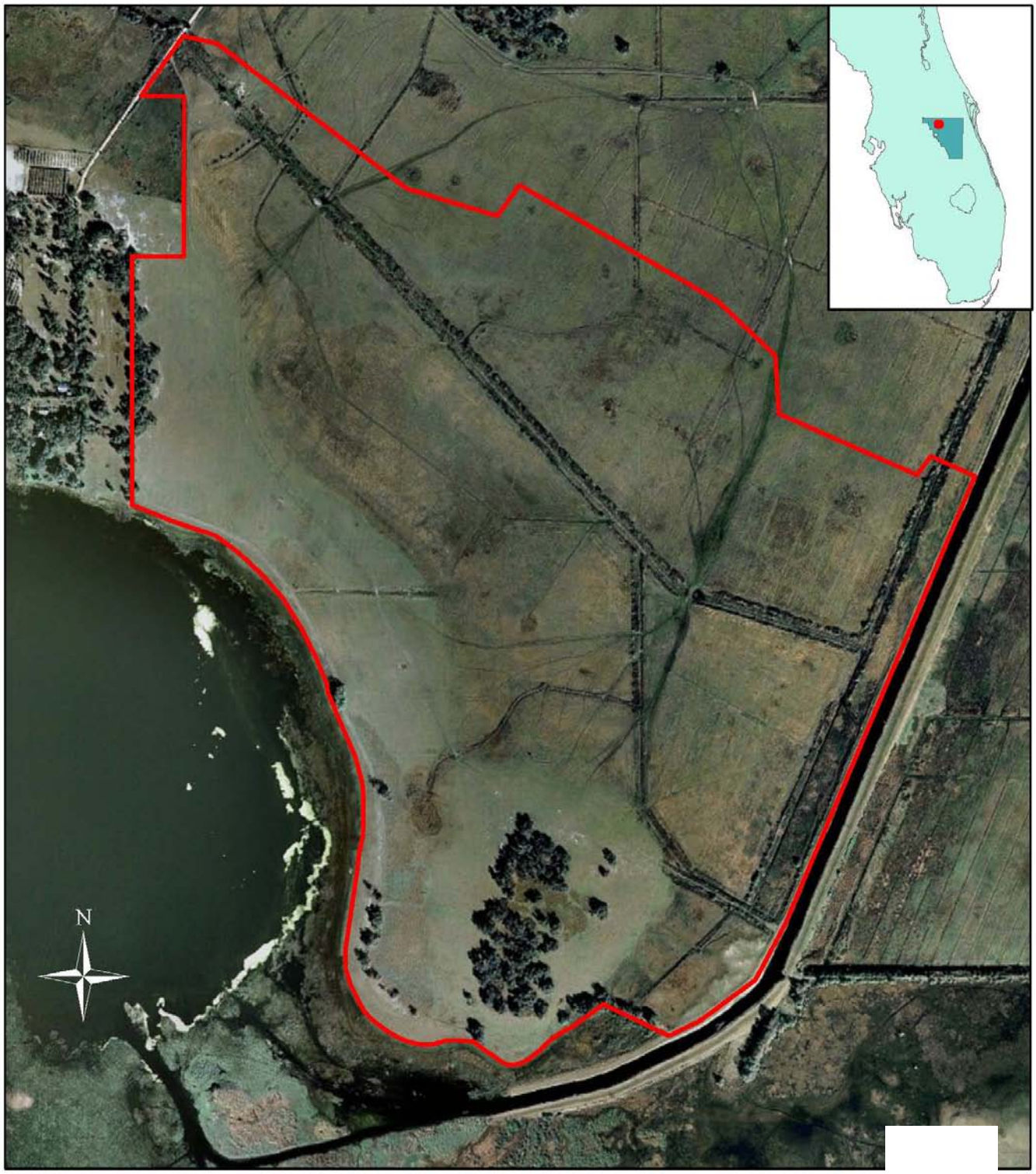
2.1 Location

TOCA is located on the northeastern shore of the northeastern lobe of Lake Tohopekaliga, southeast of Dick Island, and west of the South Florida Water Management District (SFWMD) Canal C-31. The property lies approximately one mile southwest of the Florida Turnpike, two miles southwest of US 192/SR 441, five miles southeast of Kissimmee, and three miles west of St. Cloud, in Sections 5, 6, 7 and 8; Township 26 South; Range 30 East, in Osceola County. Road access to the site currently exists through the south end of Macy Island Road; see **Map 1: 2010 Aerial** and **Map 2: Location and USGS Topographic Map**.

2.2 Acquisition

TOCA was a development of regional impact (DRI) known as the Tohoqua Legacy Park and formerly known as Mariners' Cove DRI, see excerpts and map from the Tohoqua Development Order, **Appendix I** (full review of the documents is available through the East Central Florida Regional Planning Council). Osceola County has purchased the ±399-acre property for the protection and enhancement of water resources, fish and wildlife habitat and flood storage. Additionally the property will provide passive public recreation. The seller of the property was Neptune Road Investments, LLC, 1570 Lake Baldwin Lane, Suite A, Orlando, Florida, 32814.

Map 1: 2010 Aerial Photograph



Twin Oaks CA Property Boundary

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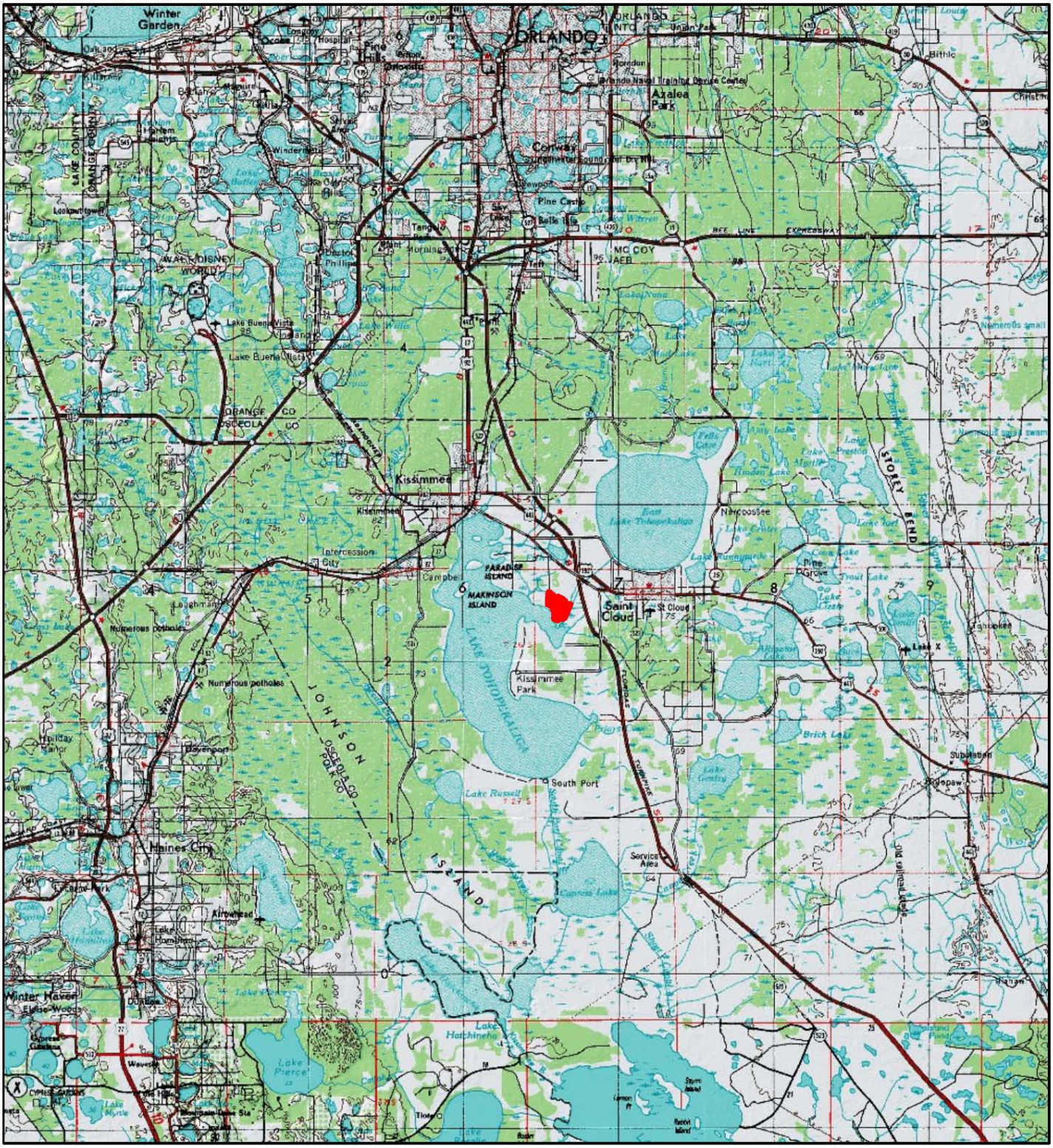
Map 2: General Location and USGS Topographic Map



Twin Oaks CA Property

2.3 Vegetative Communities

The land use and habitat types within the project area were assigned according to the dominant species for the most relevant vegetative stratum. Habitat types are based on the Florida Department of Transportation (FDOT) Florida Land Use, Cover and Forms Classification System (FLUCFCS, 1999). The land use and habitat boundaries were determined by interpretation of the aerial photographic signatures and verified through ground truthing; see **Map 3: TOCA FLUCFCS**. A summary of the major FLUCFCS types occurring on the TOCA, and a brief description of each, is provided below.

Improved Pastures (FLUCFCS Code 211)

This is the dominant and most extensive land use on the site, covering 256.1 acres; 64.2% of the area. The improved pastures on the property appear to cover historical dry prairie, wet prairie, and freshwater marsh areas. Historical aerial photographs confirm that portions of the pastures flood or become hydrologically saturated during wet season conditions. However, the numerous ditches throughout the property help to accelerate drainage. The pastures are for the most part well grazed, and dominant vegetation in these areas is most commonly comprised of bahiagrass (*Paspalum notatum*), with scattered clumps of broomsedge (*Andropogon virginicus*), dog fennel (*Eupatorium capillifolium*), thistle (*Cirsium spp*.), St. Johns wort (*Hypericum spp*.), soft rush (*Juncus effusus*), and wax myrtle (*Myrica cerifera*). In several locations throughout the pastures, tropical soda apple (*Solanum viarum*), a non-native invasive species, occurs.

Other Open Lands - Rural (FLUCFCS Code 260)

This land cover exists along the eastern property boundary, near the C-31 Canal, and in the northwestern corner. It comprises only a small portion of the property: 9.9 acres or 2.5% of the total area. The groundcover is dominated by pasture grasses (mostly bahiagrass) and various weeds. It appears that these areas may have been grazed in the past, but currently lie fallow.

Live Oak (FLUCFCS Code 427)

This land cover exists primarily as a mesic oak hammock surrounded by improved pasture, located in the southern portion of the site, and a narrow strip of oaks, that is part of a larger mesic hammock community lying immediately west of the property. This land cover occupies 14.9 acres, or 3.7% of the site. The canopy in this community is dominated by mature live oaks (*Quercus virginiana*) that exhibit prolific coverage by Spanish moss (*Tillandsia usneoides*). The understory and groundcover in this community is dominated by scattered cabbage palms (*Sabal palmetto*) and bahiagrass. Many of the oaks in the southern occurrence of this community have suffered windfall, but appear to have recovered, continuing to grow from the fallen or tilted trunks.

Streams and Waterways (FLUCFCS Code 510)

This land cover represents numerous agricultural drainage ditches of varying size that traverse the property. These ditches cover 33.3 acres, or 8.4% of the site. The ditches are mostly vegetated with a variety of grasses and rushes, including Cuban bulrush (*Scirpus cubensis*), shore rush (*Juncus marginatus*) and soft rush. In deeper areas the ditches also exhibit spatterdock (*Nuphar advena*), water hyacinth (*Eichornia crassipes*), and pickerelweed (*Pontederia cordata*). Vegetation along the ditch banks includes bahiagrass, thistle, blackberry (*Rubus argutus*), and wax myrtle.

Lakes (FLUCFCS Code 520)

The lakes land cover represents the littoral shoreline of Lake Tohopekaliga, and only occupies 1.5 acres, or 0.4% of the property. The lake's littoral shelf is well vegetated, and provides diverse habitat for a large variety of wildlife. Common vegetation in this community includes pickerelweed, duck potato (*Sagittaria lancifolia*), cattails (*Typha spp.*), smartweed (*Polygonum spp.*), water primrose (*Ludwigia spp.*), giant bulrush (*Scirpus californicus*), and Carolina willow (*Salix caroliniana*). In deeper water areas fragrant water lily (*Nymphaea odorata*) is present, while higher shoreline areas include soft rush and yellow-eyed-grass (*Xyris spp.*).

Freshwater Marshes (FLUCFCS Code 641)

This land cover exists as several depressional areas within the improved pastures and near the ditches. Although historically much more extensive, marshes currently occupy 10.3 acres, or 2.6% of the site. Common vegetation within the marsh communities includes meadow-beauty (*Rhexia spp.*), a variety of rushes (*Juncus spp.*), bushy broom grass (*Andropogon glomeratus*), pickerelweed, duck potato, pennywort (*Hydrocotyle spp.)*, smartweed, and maidencane (*Panicum hemitomon*).

Wet Prairies (FLUCFCS Code 643)

Wet prairie areas primarily exist in the north-central portion of the property, along several of the agricultural ditches. These areas were likely deep marshes prior to the site's drainage improvements. Currently wet prairie communities occupy 49.9 acres, or 12.5% of the property. The wet prairies, along with the marshes and lake littoral zone currently represent areas of the site's highest biodiversity. Accordingly, most of the wildlife observations occurred in these communities. The vegetation community in the wet prairies is very similar to the assemblage found in the site's marshes, and includes a variety of rushes, bushy broom grass, smartweed, and maidencane. In several wet prairie areas, evidence of crayfish (*Procambarus spp.*) use is present.

Spoils Areas & Dikes and Levees (FLUCFCS Codes 743 & 747)

To facilitate agricultural use of the property, a levee system was constructed along the site's shoreline with Lake Tohopekaliga and along the C-31 canal. This land cover includes the constructed levee and associated spoil areas, occupying 23.1 acres (5.8%) of the site. Common ground and shrub cover in these areas includes bahiagrass, broomsedge, blackberry, soft rush, yellow-eyed-grass, meadow-beauty, immature cabbage palms, winged sumac (*Rhus copallina*), and elderberry (*Sambucus spp.*). These areas also exhibit presence by the invasive tropical soda apple (*Solanum viarum*) and Chinese tallow tree (*Sapium sebiferum* L.). In a few spoil areas remnant cypress domes exist, although these small communities appear to be hydrologically stressed. The vegetation in these areas is similar to the rest of the spoil areas, with the addition of an open, bald cypress (*Taxodium distichum*) canopy.

The approximate acreages of the identified FLUCFCS areas on the TOCA parcel are summarized below.

Improved Pasture (211)	256.1
Other Open Land (260)	9.9
Live Oak (427)	14.9
Streams and Waterways (510)	33.3
Lakes (520)	1.5
Freshwater Marshes (641)	10.3

Wet Prairies (643)	49.9
Spoil Areas (743)	11.6
Dikes and Levees (747)	11.5
Total	399.0

2.4 Soils

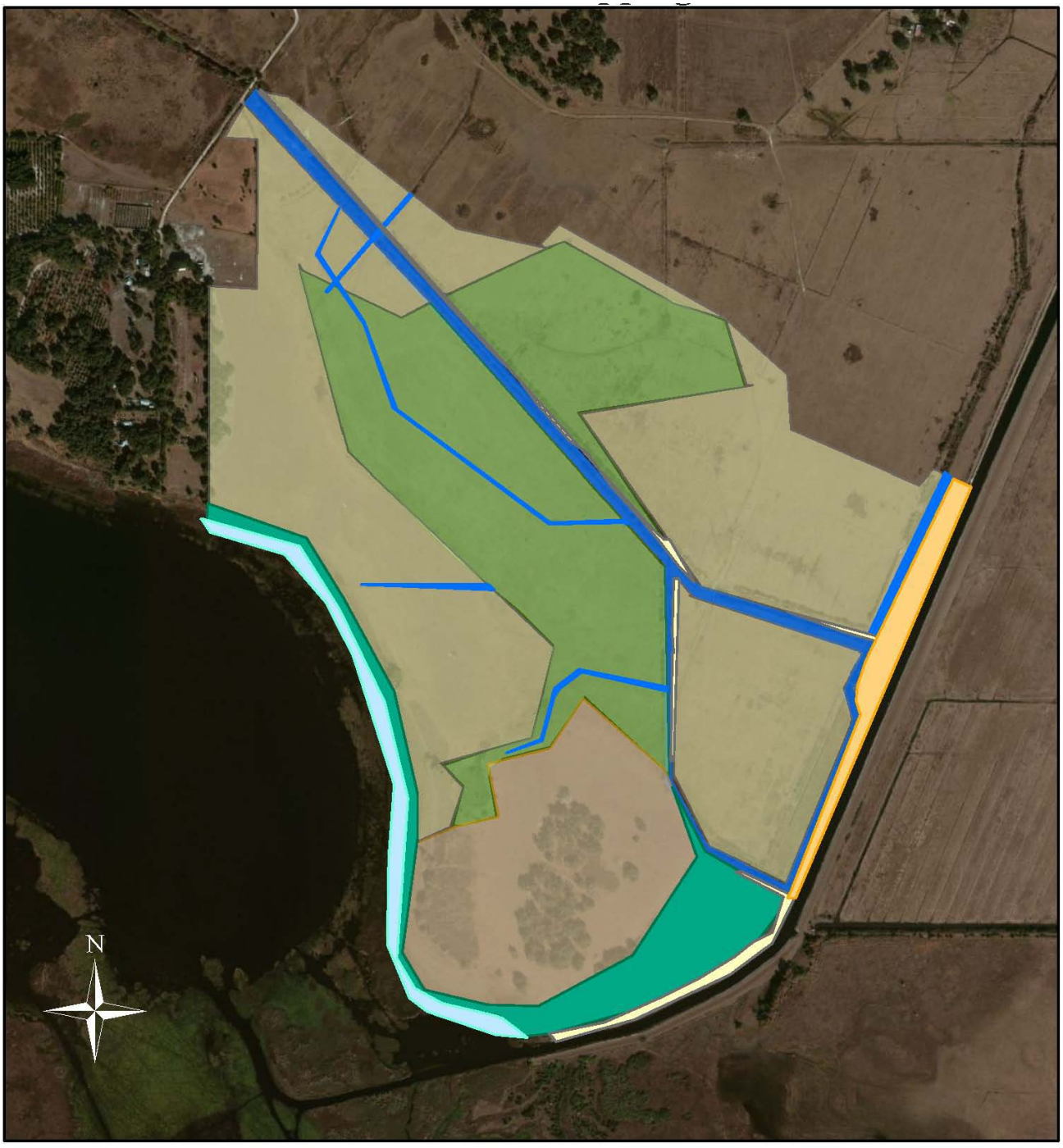
Ten (10) different soil map units (as identified by the NRCS Soil Survey for Osceola County Area publication, issued May 2011) are present within TOCA; see **Map 4: NRCS Soil Survey**. Seven of the map units meet NRCS hydric soil criteria. However, the property has been in agricultural use for many decades, and natural hydrology has been significantly altered, thus hydric soils boundaries would need to be verified by ground-truthing. A description of each map unit, hydrologic characteristics and associated ecosystems is detailed in **Appendix II**. Also included are descriptions of the expected vegetative communities for the soil type and what exists in the present condition. This information is derived from data included in the Soil Survey for Osceola County and by an examination of adjacent, natural communities with equivalent soils.

2.5 Topography and Hydrology

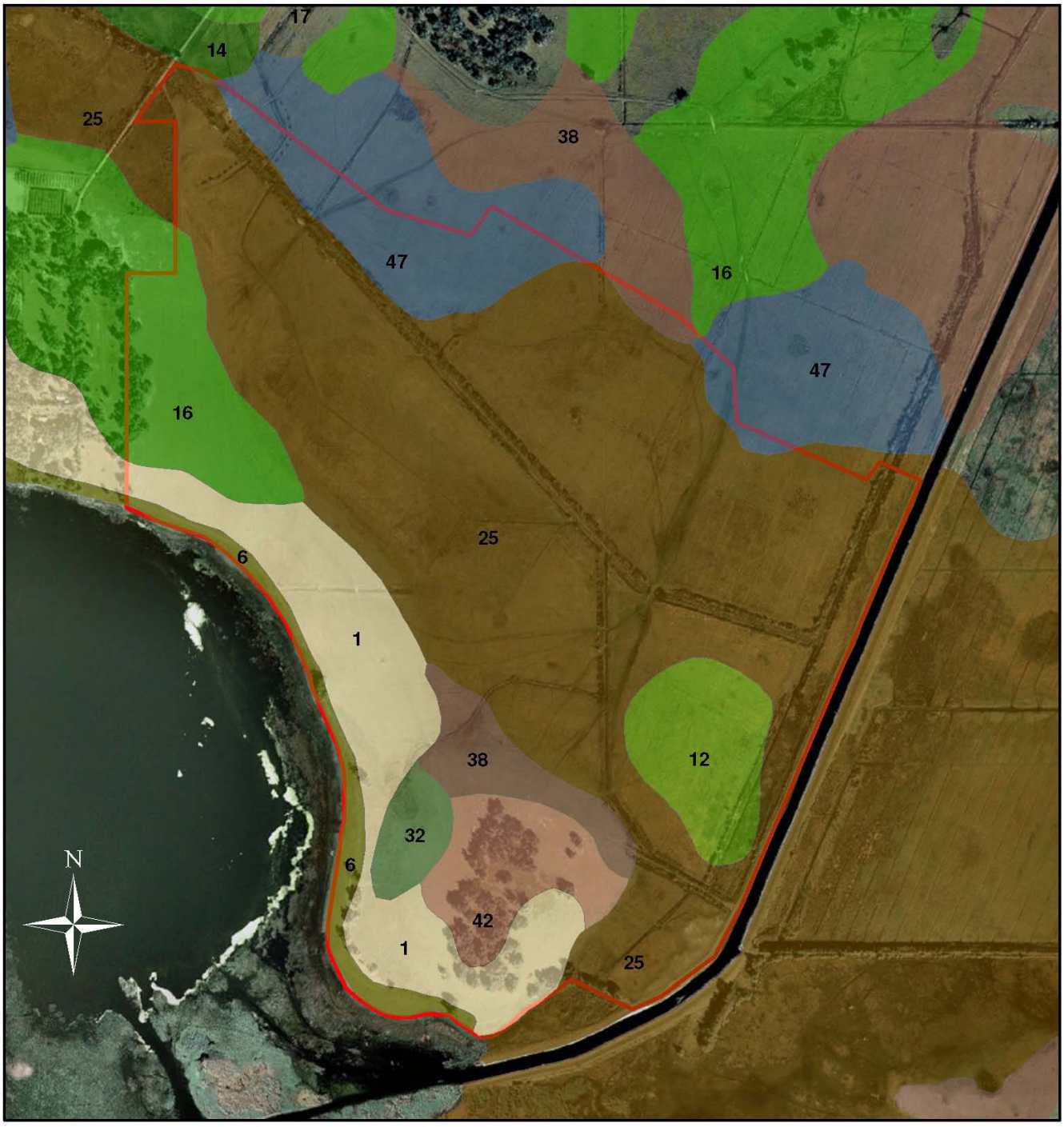
The topography of the property is generally flat, with the highest elevation at 63 feet NVGD, located at the live oak hammock in the southeast corner of the property; see **Map 2: USGS Topographic Map** and **Map 5: SFWMD Lake Tohopekaliga and Surrounding Watershed Boundaries**. A network of agricultural ditches and swales throughout the property collect surface water flows and facilitate site drainage to the east; into the SFWMD C-31 Canal.

TOCA is located within the Lake Tohopekaliga Watershed, which comprises a portion of the upper (northern) reach of the Kissimmee River Basin; see **Map 5: SFWMD Lake Tohopekaliga and Surrounding Watershed Boundaries**. Surface water flow in this 2,940 square-mile basin is generally to the south, into Lake Okeechobee. The basin is approximately 105 miles long, with a maximum width of 35 miles, and represents the largest source of surface water for Lake Okeechobee. The northern portion of the basin, termed the "Chain of Lakes", comprises numerous lakes, some of which have been interconnected by canals, in similar fashion to the C-31 canal connection between East Lake Tohopekaliga and Lake Tohopekaliga. The Chain of Lakes terminates at State Road 60, where the largest lake in the chain, Lake Kissimmee, flows south into the Kissimmee River. The southern portion of the basin includes the Lake Wales Ridge lakes, the Kissimmee River, and its tributary watersheds, including flow from the Lake Istokpoga Watershed.

Map 3: Florida Land Use Code, Forms and Classification (FLUCFCS)



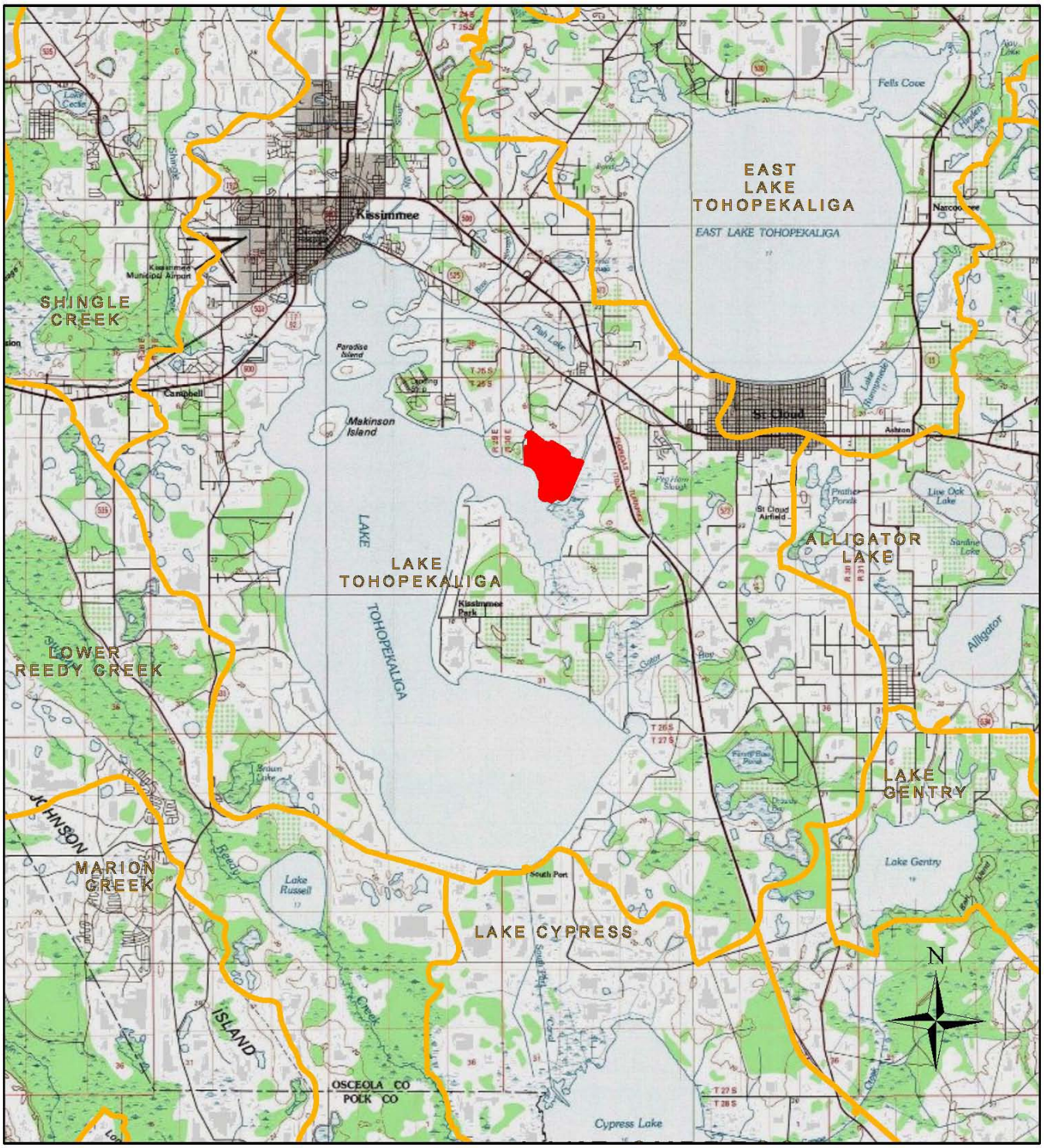
Map 4: NRCS Soil Survey



NRCS Soil Map Units
- 1 - Adamsville sand
- 6 - Basinger fine sand, depressional
- 12 - Floridana fine sand, depressional
- 14 - Holopaw fine sand
- 16 - Immokalee fine sand
- 25 - Nittaw muck
- 32 - Placid fine sand, depressional
- 38 - Riviera fine sand
- 42 - Smyrna fine sand
- 47 - Winder loamy fine sand

Twin Oaks CA Property Boundary

Map 5: SFWMD Lake Tohopekaliga and Surrounding Watersheds



2.6 Plant and Wildlife Species and Associated Habitats

To determine presence, or potential for presence, of species listed as protected by the Florida Department of Agriculture and Consumer Services (FDACS), Florida Fish and Wildlife Conservation Commission (FFWCC) and the U.S. Fish and Wildlife Service (USFWS), environmental consultants performed on-site quantitative surveys in accordance with FFWCC Wildlife Methodology Guidelines. These surveys were performed circa spring 2006, during the Tohoqua DRI application process.

Faunal Assemblages

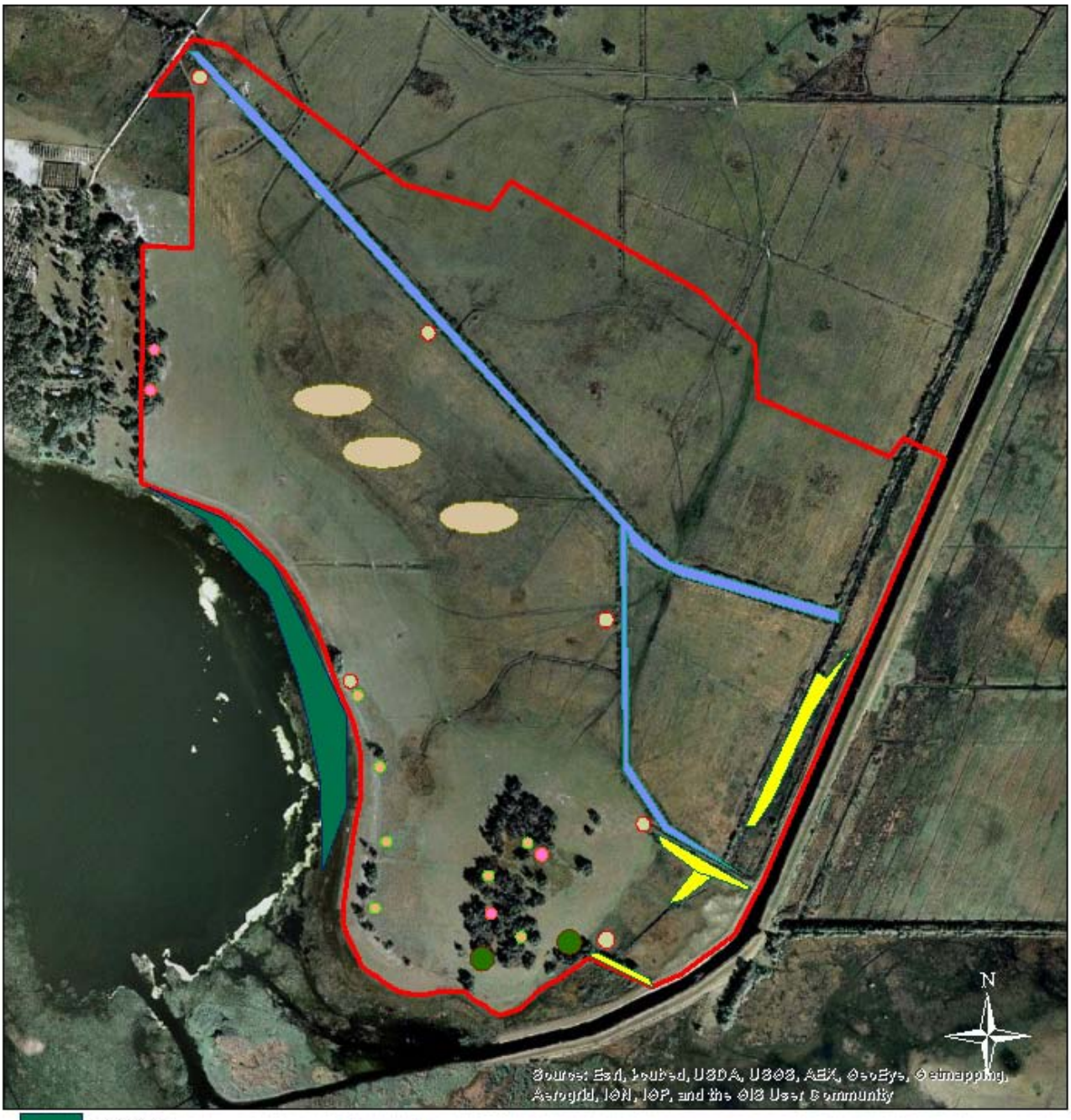
Twelve (12) animal species (10 avian, 1 reptile and 1 mammalian species) considered endangered, threatened, or of special concern, as protected by FWS and/or FFWCC, or identified as a rare species by Florida Natural Areas Inventory (FNAI) state tracking, were documented within the portion of the DRI that includes the TOCA (East Central Florida Regional Planning Council's June 18, 2008, Staff Report for the Tohoqua DRI), or observed during subsequent field surveys of the subject property (**Table 1**). Direct evidence or observations of non-listed wildlife species utilizing the property include 23 avian, 4 mammal, and 4 reptile/amphibian species (**Table 2** and **Table 3).**

Floral Assemblages

The site is largely comprised of, and actively maintained as improved pasture, dominated by Bahia grass. A floodplain marsh exists along the shoreline of Lake Tohopekaliga, and the central portion of the property contains pockets of disturbed, heavily grazed, and hydrologically impaired wet prairie and freshwater marsh. A heavily browsed live oak hammock exists near the southeastern portion of the property and is surrounded by pasture vegetation. No plant species listed as protected by FWS and/or FFWCC were documented to occur on site. In the post-restoration state, six target habitat communities have been selected for propagation and management. These include scrubby flatwoods, mesic flatwoods, mesic hammock, basin marsh, wet prairie and floodplain marsh. Details on these communities can be found in Section 3.4, Restoration and Enhancement Activities.

Several nuisance and/or exotic pest plants were identified within the subject property. Coverage by such vegetation is approximately 30 percent of entire project area. This estimated coverage includes only highly invasive or noxious vegetation as listed by the Florida Exotic Pest Plant Council (FLEPPC), Florida Department of Agriculture and Consumer Services (FDACS) or the United States Department of Agriculture. It does not include all non-native vegetation, such as widespread improved pasture grasses, but does include managed species such as tropical soda apple, Chinese tallow, camphor tree and water hyacinth. In addition, torpedo grass (Panicum repens) is prevalent throughout the site in both upland and wetland areas. **Table 4**, provides a detailed list of nuisance and exotic plants observed and their associated ranking by FLEPPCS, FDACS and USDA. The locations of observed exotic and nuisance plant species other than torpedo grass are shown on **Map 6: Nuisance and Exotic Vegetation**. Torpedo grass was not included in the map due to its prevalence across all portions of the site.

Map 6: Exotic and Nuisance Vegetation Locations



- Hydrilla
- Wright's Nutrush
- Peruvian Primrosewillow
- Tropical Soda Apple
- Chinese Tallow
- Camphor
- Lantana
- Water Hyacinth
- Twin Oaks Property Boundary

2.7 Historical, Cultural and Archaeological Resources

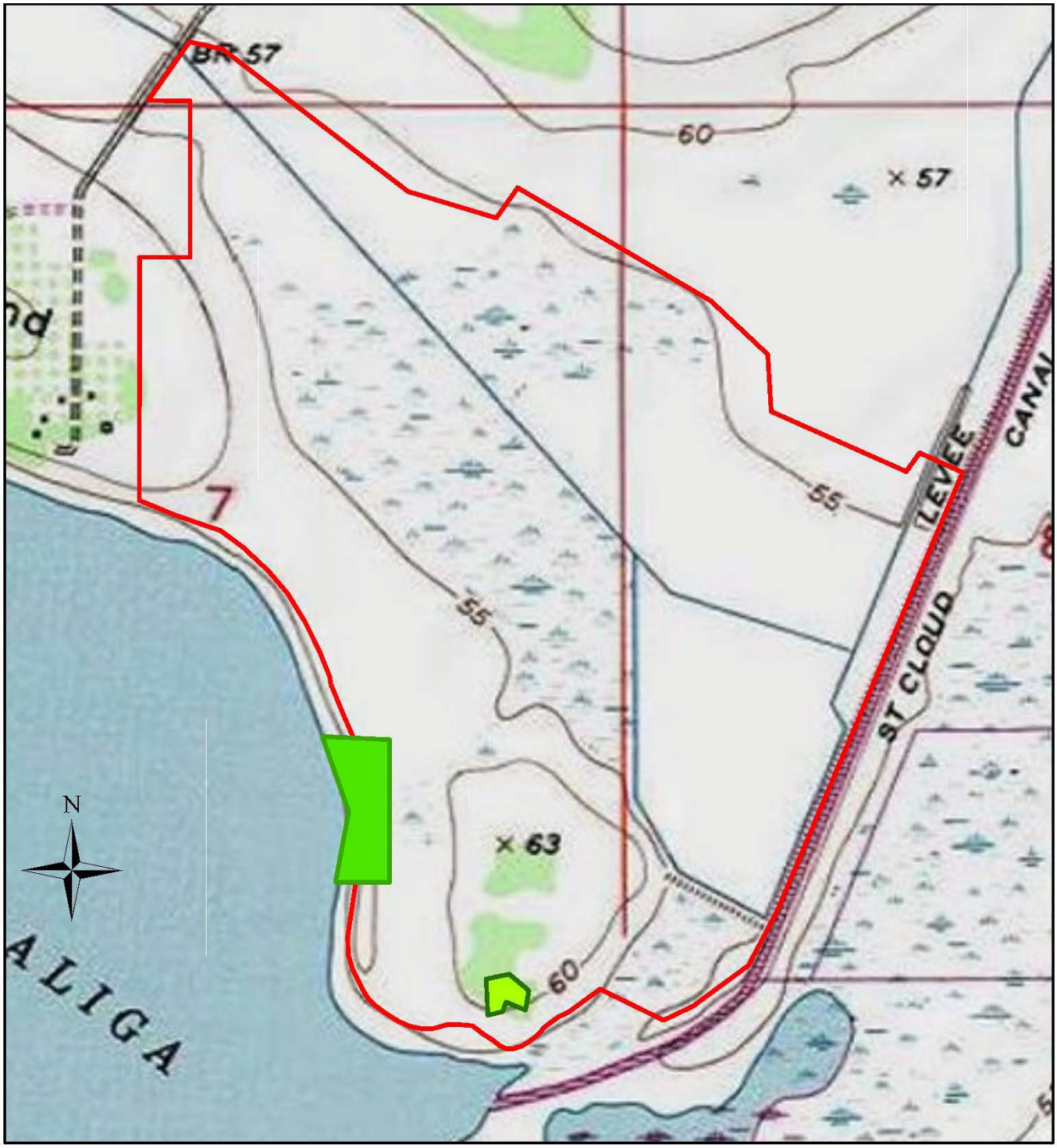
TOCA was once part of the Heart Bar Ranch, which was known for Brahman cattle, and started by Henry O. Partin circa 1920. At that time, Mr. Partin converted the native land to improved pastures for cattle grazing, and it has since then remained in agriculture use. In addition to pastureland, local residents report that sugarcane was grown in the late 19th century. The use of the property for crop farming for some period is supported by the extensive ditch rows throughout the central wet prairie/marsh pasture area. Presently, the property continues to be utilized primarily as pastureland.

A Cultural Resources Survey was conducted for the Tohoqua DRI. The survey was conducted by SouthArc, Inc., during November 2004. The following are excerpts from the Cultural Resources Survey, summarizing the results of the investigation;

> *"A review of the Florida Master Site File SHAPE data base showed no historic structures or National Register listings within the project tract. No archaeological or historical sites were identified as being located within the project area (FMSF 2004). The survey resulted in location of two isolated artifact occurrences, two small archaeological sites, 80s2390 and 80s2391, and one historic structure, 80s2392. The Willet-Up-a-Tree site, 80s2390, consisted of a thin scatter of lithic flakes recovered from four test units at the edge of an oak hammock. The Partin site, 80s2391, consisted of a mix of prehistoric and early 20th century artifacts recovered from three test units. The prehistoric artifacts consisted of one lithic flake and 18 St. Johns ceramics. The ceramics all came from the same unit, suggesting breakage of a single vessel. Historic materials consisted of amethyst glass, clear bottle glass and unidentified metal fragments. No features were associated with the artifacts.*
>
> *The limited nature of the sites indicate that they do not have the potential to yield data which would address regional or local research questions on prehistoric or historic land use. Their value lies in the information they provide on-site distribution patterns in this area. The isolated artifact occurrences consisted of ironstone fragments which are probably related to the ongoing agricultural usage of the property; neither find was assigned a site number. The Red House, 80s2392, is a single-story gable-roofed frame house which was reportedly moved to the property in the 1950s from a nearby airbase according to a local resident (Partin, personal communication, 2004). The house is a standard form with alterations. It has no distinctive architectural features or historic associations."*

The locations of the referenced archaeological sites are provided on **Map 7: Historical, Cultural and Archaeological Resources**. The complete survey can be found in the **Cultural Resources Survey, Appendix III**.

Map 7: Historical, Cultural and Archeological Resources

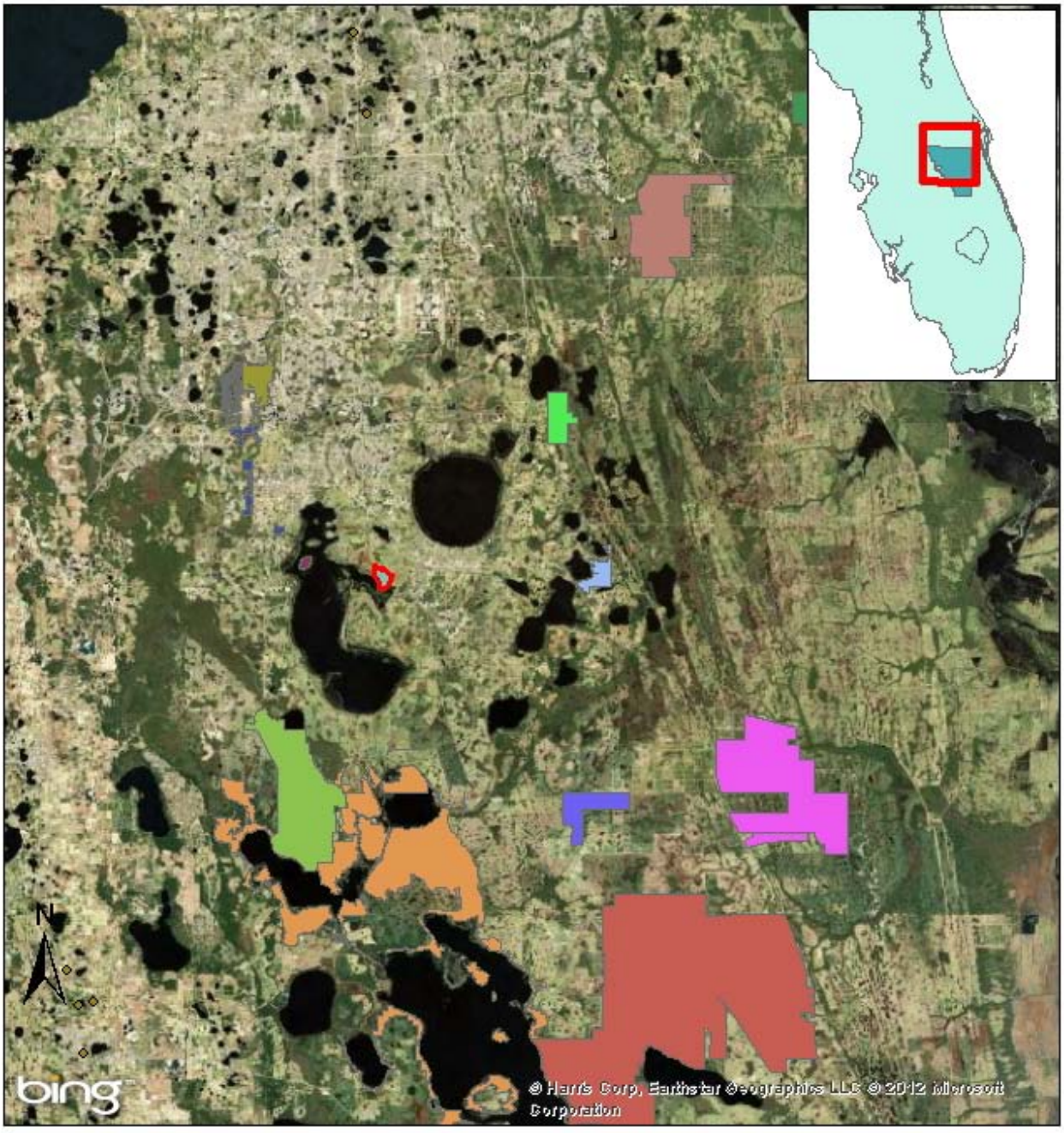


The Partin Site; 8Os2391; Archaeological Site

Lithic Scatter; 8Os25; Archaeological Site

Twin Oaks CA Property Boundary

Map 8: Public Lands Locations



- Proposed Twin Oaks CA
- Disney Wilderness Preserve
- Hal Scott Regional Preserve and Park
- Holopaw State Forest
- Camp Lonesome Conservation Area
- Triple N Ranch Wildlife Management Area
- Three Lakes Wildlife Management Area
- Split Oak Forest Mitigation Park
- Shingle Creek Regional Park
- Shingle Creek
- Osceola National Forest
- Orlando Wetlands Park
- Makinson Island Conservation Area
- Lake Runnymede Conservation Area
- Lake Lizzie Conservation Area
- Kissimmee Chain of Lakes

2.8 Regional Significance

TOCA provides flood prevention and natural resource protection for the surrounding area. Additional flood storage will be obtained by the proposed removal of the conveyance features on the property and the restoration of the historical wetland communities within the interior. The property provides habitats for many fish and wildlife species, including listed species such as the Southern bald eagle, Florida sandhill crane, Everglades snail kite and wood stork. These and many other listed and non-listed species were observed utilizing the site during field investigations. Suitable habitat for other listed species, such as Audubon's crested caracara occurs on-site, in addition to significant stopover habitat for migratory birds.

The lake is a popular sport fishing destination in Florida and a popular site for eco-tourism. Several certified, record-sized large-mouth bass have been produced from the lake over the years. FWC currently lists Lake Tohopekaliga as one of the top fishing locations in Florida for bass, crappie and sunfish (bream) species. The protection and enhancements to the shoreline of Lake Tohopekaliga along the property boundary will preserve and enhance the existing sport fishery of the lake.

In addition to the benefits to fish, wildlife and natural resources, TOCA will serve as a significant public land resource that will assist in providing greater acreage of public lands in the area. In addition, the property will serve as a link for future acquisitions in the watershed and County (**Map 8: Public Lands Locations**).

3.0 LAND MANAGEMENT GOALS AND OBJECTIVES

The County's purpose in acquiring the property includes 3 primary goals;

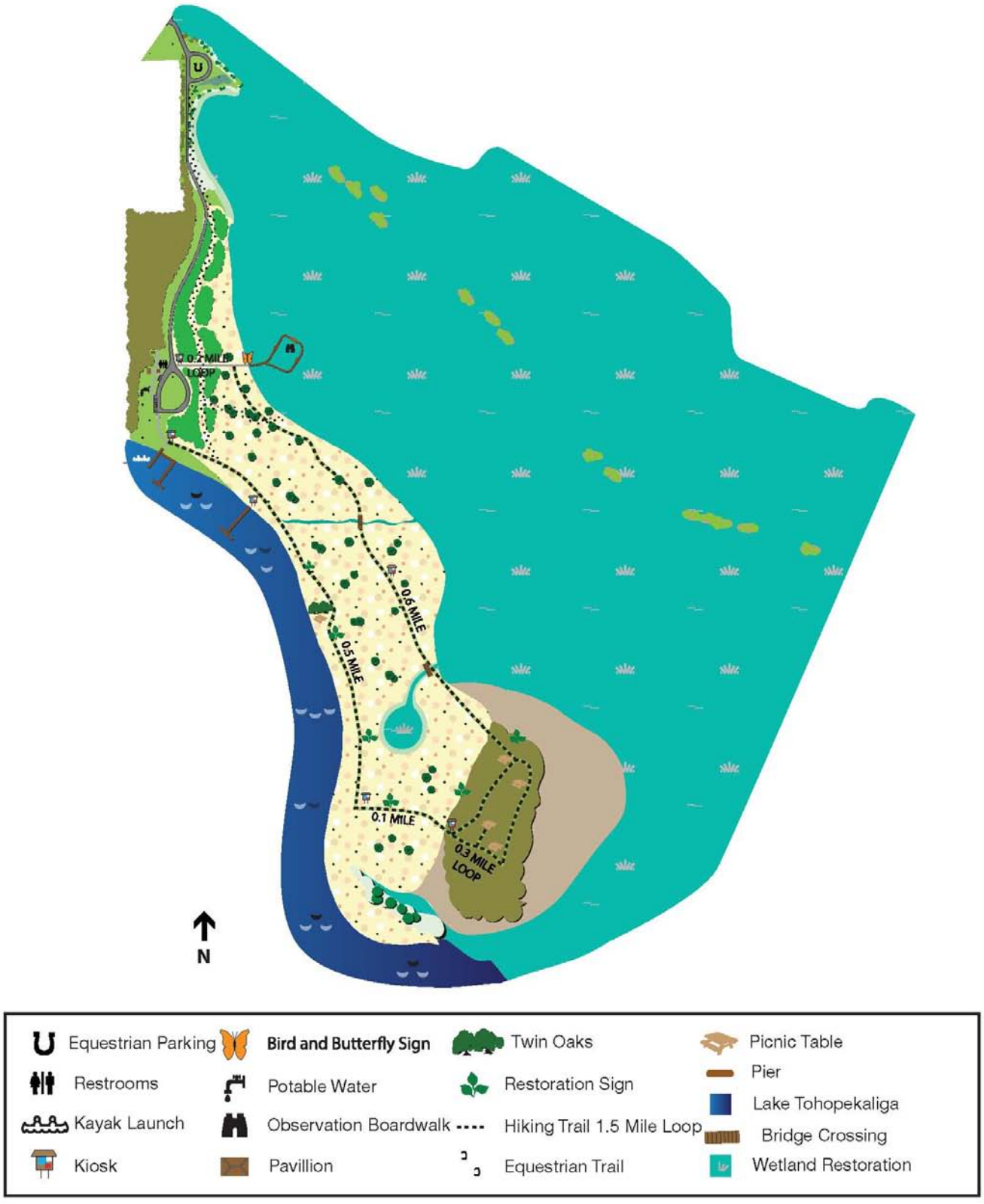
1) Local area flood storage and natural resource protection;
2) Restoration, enhancement and maintenance of aquatic, wetland and upland habitats to support fish and other wildlife; and
3) Support for passive public recreation and educational opportunities.

To best facilitate the integration of these three goals, the land management strategy will be scheduled into three phases, the goals and objectives of each phase to be discussed independently;

- Phase I: Public Access, Basic Facilities and Upland Restoration
- Phase II: Wetland Restoration and Enhanced Facilities
- Phase III: Perpetual Management and Maintenance of Natural Areas and Facilities

Figure 1: Park Facility Design and General Habitats, provides a depiction of the location of the various park facilities and amenities for recreational enjoyment. Also depicted are the locations of the general habitat types that will be present in the post-restoration state.

Figure 1: Park Facility Design and General Habitats



3.1 Phase I - Public Access, Basic Facilities and Initiation of Restoration Activities

Phase I will allow for public access to the park and provide opportunities for shore-based fishing, hiking and picnicking along the shoreline of Lake Tohopekaliga. Phase I will include the hydrologic design and permitting required to initiate restoration of the site's large central wetland. In Phase I, only the upland community types will be actively planted and managed. An exception will be the southern portion of the property where cypress trees will be planted to augment an existing cypress community in that area. All other wetland restoration activities will commence in Phase II, after cattle have been removed from the property and the areas allowed to re-vegetate with an improved hydrologic regime.

There are three primary goals for Phase I:

1. **Provide for Public Access**: Design, permit and install public access roads, parking areas, Phase I pier and associated amenities; compost toilet, potable water, picnic tables, pavilions, signs, education kiosks, trail markers, pedestrian/equestrian trail safety measures (see Exhibit I).
2. **Wetland Restoration Permitting**: Permit the restoration and enhancement plan for the wetland restoration areas.
3. **Upland Restoration**: Initiate upland restoration plantings and restoration efforts.

Goal 1: Provide for Public Access

Objectives

NO.	OBJECTIVE DETAILS	COMPLETION DATE
1.	Draft access road & parking area design for state and local permit approval	YEAR 1
2.	Coordinate with regulatory agencies and submit permit application for access road, parking areas, pavilions (2) with stabilized access, two (2) fishing piers, and associated drainage areas	YEAR 1
3	Construct access road, parking areas, Phase I fishing pier and associated infrastructure	YEAR 1
4.	Install/construct pavilions, stabilize access and install compost toilet, per regulatory and local permit requirements	YEAR 1
5.	Install trail markers, information and educational signs/kiosks through Phase I limits	YEAR 1
6.	Construct perimeter fencing, remove cattle from property.	YEAR 1

Goal 2: Wetland restoration permitting

Objectives

NO.	OBJECTIVE DETAILS	COMPLETION DATE
1.	Identify target restoration habitat community types with details on community structures and identify the boundaries of such areas in real space	YEAR 1-2
2.	Coordinate with regulatory agencies and obtain permit for ditch blocks and wetland restoration/enhancement plan	YEAR 2

Goal 3: Upland restoration

Objectives

NO.	OBJECTIVE DETAILS	COMPLETION DATE
1.	Install visual buffers around access road entrance between adjacent homeowner property and roadway	YEAR 1
2.	Debris removal within ditch and surrounding areas near entrance road	YEAR 1
3.	Initiate flatwoods (scrubby/mesic) restoration planting plan	YEAR 1
4.	Initiate cypress plantings at southern portion of site	YEAR 1
5.	Begin exotic/nuisance plant removal and maintenance	YEAR 1

3.2 Phase II - Wetland Restoration and Enhanced Facilities

The goal of Phase II is to implement the wetland restoration and enhancement component of the master restoration plan, and to provide additional recreational opportunities and facilities to the public. Hydrologic restoration will occur at the beginning of Phase II and will include installation of the culverts / ditch blocks permitted in Phase I. Natural recruitment of desirable wetland will be supplemented with plantings as detailed in the Phase I planting plan and permit(s). Once the plantings have been established, an accessible boardwalk will be designed to provide TOCA visitors with added wildlife viewing opportunities within the central wetland.

There are four primary goals for Phase II:

1. **Enhanced Public Recreation**: Expand recreational opportunities with additional facilities for shore-based fishing, installation of a canoe/kayak launch, expansion of the trail.
2. **Wetland Restoration**: Initiate restoration of the large central wetland through installation of culverts and ditch blocks and wetland plantings.
3. **Boardwalk Design**: Identify placement and design for restoration boardwalk that maximizes public wildlife viewing. Secure contractor to construct boardwalk facility and associated access improvement(s).

4. **Maintenance and Management**: Commence maintenance and management program in upland and wetland habitats to promote plant species diversity and encourage wildlife utilization.

Goal 1: Enhanced Public Recreation

Objectives

NO.	OBJECTIVE DETAILS	COMPLETION DATE
1.	Construct second fishing pier	YEAR 2
2.	Install kayak/canoe launch facility	YEAR 2
3.	Install trail markers and kiosks on trail along wetland restoration area	YEAR 2
4.	Open entire trail to public access	YEAR 3

Goal 2: Wetland Restoration

Objectives

NO.	OBJECTIVE DETAILS	COMPLETION DATE
1.	Install ditch blocks and begin hydrologic monitoring	YEAR 2
2.	Initiate wetland restoration planting plan	YEAR 2

Goal 3: Boardwalk Design

Objectives

NO.	OBJECTIVE DETAILS	COMPLETION DATE
1.	Identify best placement for boardwalk within and adjacent to central wetland	YEAR 2
2.	Secure contractor to design/construct boardwalk and stabilized access (ADA compliant)	YEAR 3

Goal 4: Maintenance and Management

Objectives

NO.	OBJECTIVE DETAILS	COMPLETION DATE
1.	Maintain upland and wetland community structure to provide for plant diversity and habitat for the Southern bald eagle, Everglades snail kite, Audubon's crested caracara, Florida sandhill crane, and other wildlife.	YEAR 2+
2.	Implement exotic/nuisance plant removal and maintenance plan	YEAR 2+
3.	Maintain coordination with the Florida Fish and Wildlife Conservation Commission and local partners and recreation user groups	YEAR 2+
4.	Maintain public use facilities/amenities	YEAR 2+

3.3 Phase III: Perpetual Management

Phase III includes the long-term management actions required to enhance and maintain onsite habitats and public use and access. There are three primary goals associated with this long-term management:

1. **Natural Area Maintenance and Management:** Manage natural communities and modified habitats to protect and enhance water, floral, and faunal resources.
2. **Public Use:** Provide safe, resource-based public use opportunities and education.
3. **Facilities:** Maintain TOCA infrastructure and facilities.

Goal 1: Natural Area Maintenance and Management

Objectives

NO.	OBJECTIVE DETAILS	COMPLETION DATE
1.	Implement a prescribed fire/vegetation management program	YEAR 3+
2.	Implement exotic/nuisance plant removal and maintenance plan	YEAR 3+
3.	Implement a monitoring/evaluation program for the restored/planted habitats	YEAR 3+
4.	Maintain public use facilities/amenities	YEAR 3+

Goal 2: Provide Safe, Resource Based Public Use and Education

Objectives

NO.	OBJECTIVE DETAILS	COMPLETION DATE
1.	Review site security and access	YEAR 3+
2.	Document public use of TOCA and use adaptive management to address additional facility / amenity needs	YEAR 3+
3.	Routinely update and maintain information kiosks	YEAR 2+

Goal 3: Maintain TOCA Infrastructure and Amenities

Objectives

NO.	OBJECTIVE DETAILS	COMPLETION DATE
1.	Maintain internal access road and parking facilities	YEAR 3+
2.	Monitor and maintain trails and firebreaks	YEAR 3+
3.	Maintain and update (as needed) facilities and amenities	YEAR 3+

3.4 Restoration and Enhancement Activities;

Identification of probable natural ecosystems that existed on the Twin Oaks property prior to conversion to farmland was performed forensically, utilizing historical aerial imagery and literature research. Selection of target communities for the Twin Oaks Conservation Area was determined by integrating this data with careful evaluation of existing reference lands. Specifically examined were publicly managed land areas comprised of similar NRCS soil map units, landscape position and morphology, hydrologic regimes, and historical land use. Existing land use adjacent to the reference sites was also considered. Five public land areas (Kissimmee Prairie Preserve State Park, Prairie Lakes Unit of Three Lakes Wildlife Management Area, Triple N Ranch Wildlife Management Area, Split Oak Forest Mitigation Park, and Orlando Wetlands Park) were included in the evaluation process. These areas are identified on Map 8: Public Lands Locations (page 14).

Several appropriate habitat types were identified by the aforementioned method. Determination of target communities was accomplished through evaluation of those habitats that would provide maximum, self-sustaining ecosystem support for the fish and wildlife of Lake Tohopekaliga, while maintaining compatibility with the passive recreation and education opportunities desired by Osceola County. These target communities are described in this section, with more detail on the restoration and management of each habitat type provided in Section 4.0. The descriptions are generally derived from the Florida Natural Areas Inventory - Guide to the Natural Communities of Florida: 2010 Edition. **Figure 2: Habitat Restoration Plan** and **Figure 3: Habitat Restoration Cross Sections**, depict general post-restoration plans and incorporation of the park amenities/facilities with the target habitats across the TOCA.

Target Community 1: Mesic Hammock (Phase I Restoration)

Mesic hammocks are a well-developed evergreen hardwood forest on soils that are rarely inundated. This community currently exists at the southeastern tip of the TOCA property, though it is in a highly disturbed state from cattle browsing. In the natural state, the canopy is typically closed and dominated by oaks. Epiphytes on live oaks and cabbage palms are a characteristic feature of mesic hammocks and include Spanish moss (*Tillandsia usneoides*) and other air-plants (*Tillandsia* spp.) and epiphytic ferns such as resurrection fern (*Pleopeltis polypodioides* var. *michauxiana).*

Target Community 2: Scrubby Flatwoods (Phase I Restoration)

Scrubby flatwoods have an open canopy of widely spaced pine trees and a low, shrubby understory. For the TOCA, this habitat will serve as a physical and visual barrier between the parking areas and entrance road and the restored natural portions of the remainder of the property.

Target Community 3: Mesic Flatwoods (Phase I Restoration)

Mesic flatwoods is characterized by an open canopy of tall pines and a dense, low ground layer of low shrubs, grasses, and forbs. Longleaf pine is the principal natural canopy tree in northern and Central Florida. Mesic flatwoods were once one of the most widespread natural communities in Florida. This

Figure 2: Habitat Restoration Plan

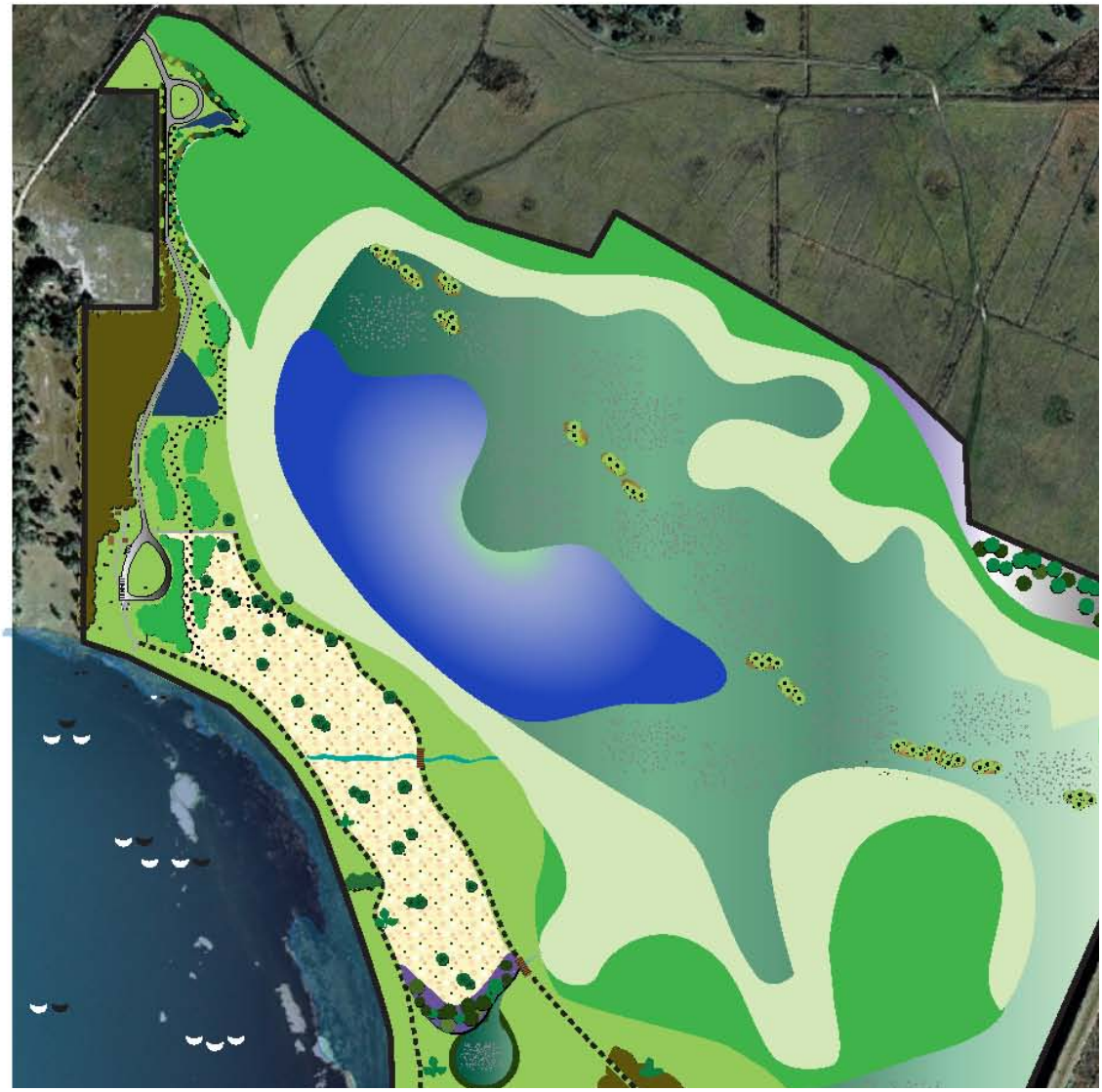


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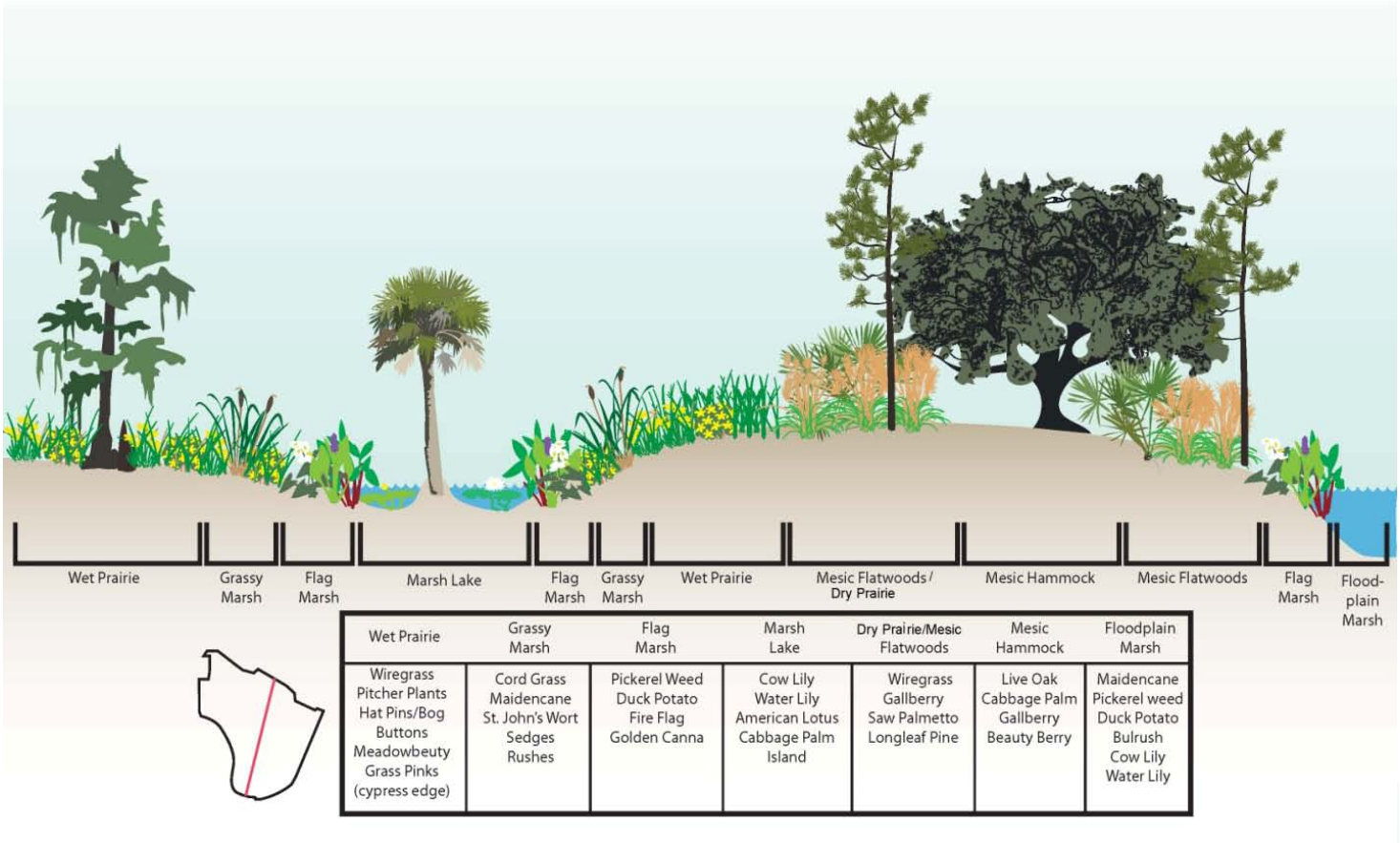
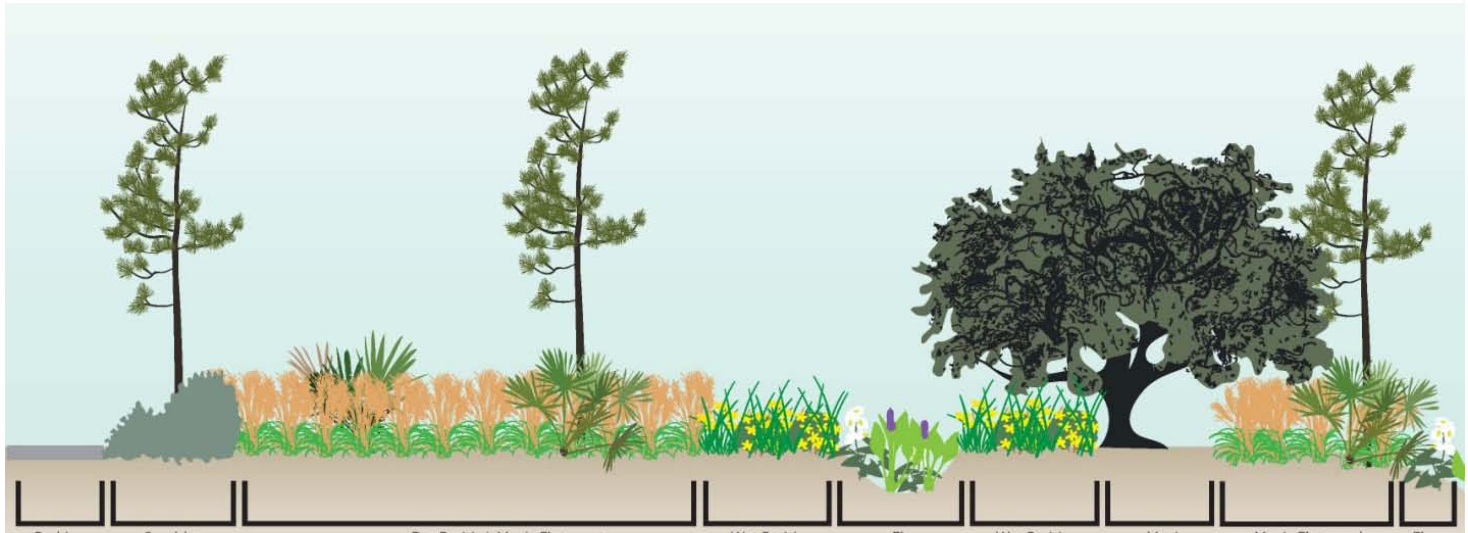
Figure 3: Habitat Restoration Cross-Sections



Wet Prairie	Grassy Marsh	Flag Marsh	Marsh Lake	Dry Prairie/Mesic Flatwoods	Mesic Hammock	Floodplain Marsh
Wiregrass Pitcher Plants Hat Pins/Bog Buttons Meadowbeuty Grass Pinks (cypress edge)	Cord Grass Maidencane St. John's Wort Sedges Rushes	Pickerel Weed Duck Potato Fire Flag Golden Canna	Cow Lily Water Lily American Lotus Cabbage Palm Island	Wiregrass Gallberry Saw Palmetto Longleaf Pine	Live Oak Cabbage Palm Gallberry Beauty Berry	Maidencane Pickerel weed Duck Potato Bulrush Cow Lily Water Lily



Scrubby Flatwoods	Dry Prairie \ Mesic Flatwoods	Wet Prairie	Flag Marsh	Mesic Hammock
Wax Myrtle Palmetto Salt Bush Gallberry	Wiregrass Gallberry Saw Palmetto Longleaf Pine	Wiregrass Pitcher Plants Hat Pins/ Bog Buttons Meadowberry Grass Pinks	Pickerel Weed Duck Potato Fire Flag Golden Canna	Live Oak Cabbage Palm Saw Palmetto Beauty Berry

habitat is able to withstand the stress of soil saturation or inundation during the wet part of the year, as well as dry conditions at other times. This resilience makes mesic flatwoods very suitable for the central upland portion of TOCA, an area that transitions into wetland communities to the north and south.

Target Community 4: Dry Prairie (Phase I Restoration)

Dry prairie is a Florida endemic community of low shrubs and grasses historically occupying vast, level expanses in the Osceola and Okeechobee Plains. Currently, it is one of the rarest community types in all of Florida. The predominant herb is wiregrass along with broomsedge, bluestem threeawn and Indian grasses. Shrubs are interspersed in the landscape and include saw palmetto, dwarf live oak, fetterbush and blueberry. Communities often associated with dry prairie include scrubby flatwoods, shallow marshes, mesic hammocks, wet prairies and mesic flatwoods. The rarity of the community type and the natural historical integration with the other selected target communities make dry prairie an ideal component for integration onto TOCA.

Target Community 5: Basin Marsh (Phase II Restoration)

Basin marshes are highly variable herbaceous wetland communities typically found in isolated depressions on the landscape. They are also abundant around the shorelines of lakes with fluctuating water levels or within the depressions of ephemeral lakes. During the normal wet season they will often be inundated from rainfall, surface water run-off or seasonal high water table elevations. This Basin Marsh community type is appropriate for the central portion of the site, in areas topographically at or below 53' National Geodetic Vertical Datum (NGVD) and includes Marsh Lake, Flag Marsh, and Grassy Marsh sub-communities. Basin marshes are high in diversity of invertebrates and amphibians. These areas are also highly utilized by birds, fish and other wildlife for foraging, nesting and breeding grounds. Wading birds are common, making basin marsh an excellent attraction for avid birders. To further enhance the habitat for birds at TOCA, the restoration of the Basin Marsh sub-communities includes Cabbage Palm Islands designed to provide roosting and potentially nesting habitat for a variety of bird species.

Target Community 6: Wet Prairie (Phase II Restoration)

Wet prairie is an herbaceous community found on saturated soils of sloping areas, between other wetlands and wet or mesic flatwoods. They are typically dominated by dense groundcover of wiregrass and a variety of attractive flowering herbs, grasses, sedges and rushes. In the wetter areas, carnivorous plants like pitcher plants and sundews are also common. This vegetative assemblage attracts a wide variety of insects which, in turn, attracts a large assortment of birds, reptiles and amphibians that prey upon them. General usage by these and other wildlife species for forage, cover, nesting, and breeding is high.

Target Community 7: Floodplain Marsh (Phase II Restoration)

Floodplain marshes occur along river or lake floodplains and are comprised of grassy, herbaceous and shrubby vegetation. There are a variety of different vegetative assemblages that occur within floodplain marshes that provide suitable habitat for diverse wildlife species. Floodplain marsh in general provides filtration, protecting associated rivers and lakes from eutrophication (nutrient enrichment). This habitat

type is endangered in Florida, where much of it has been degraded through drainage alterations and land reclamation for agricultural uses. Such man-made activities have impacted the health and abundance of this ecosystem in the Kissimmee River basin. This community currently exists long the lakeshore of Lake Tohopekaliga, though much of it is in a highly disturbed state from cattle browsing and historic land management activities.

Target Community 8: Cypress Swamp (Phase I and Phase II Restoration)

Though rarer throughout the State, cypress swamp habitats are historically the predominant swamp type in Osceola County. This community often occurs along rivers and lake margins and may be interspersed throughout other communities such as flatwoods and sloughs. This community tends to be poorly drained, with water at or above ground level for a good portion of the year. Bald cypress is the dominant tree and is often the only plant which occurs in significant numbers. Where present, other vegetation may include ferns, buttonbush, Southern waxmyrtle, sphagnum moss, and Tillandsia. The submerged or saturated condition of the soil and general absence of fire in natural cypress swamps reduces competition and keeps the community from successional change to swamp hardwood / bayhead community.

4.0 RESOURCE PROTECTION AND MANAGEMENT

4.1 Security

Goals and Objectives

The fundamental goal is to maintain effective security for park patrons, natural resources, fish and other wildlife with an emphasis on threatened or endangered species.

To meet this goal, the following objectives have been identified:

1. Conduct biannual inspection of fence, gates, locks, and signage;
2. Collaborate regularly with law enforcement to maintain and enhance security;
3. Consider private contractor or off-duty law enforcement to supplement security needs;
4. Replace and/or repair fence, gates, locks, and signage as needed;
5. Document security problems to foster solutions and provide ongoing data for law enforcement;
6. Report harassment of protected species to FFWCC.

Security concerns within the conservation area include illegal motorized vehicle access, dumping, vandalism of gates, fences, and conservation signage, and poaching. The County, primarily through boundary/internal signage, boundary fencing, and periodic patrols by County staff, Osceola County Sheriff's Office (OCSO), FFWCC, and/or contractors will administer security for the property.

Consistent with the mission of Osceola County Natural Resources, resource-based recreation will be encouraged insofar as it does not conflict with County code, state and/or federal law, or site-specific restrictions to protect natural resources and listed species. Because of the public access to shore-based fishing at the site, coordination with FFWCC wildlife officers will be important. FFWCC officers provide protection to residents and visitors who enjoy Florida's natural resources, while enforcing resource protection and boating safety laws in the woods and on the waters of the state. FFWCC officers

have full police powers and statewide jurisdiction. The officers are cross-deputized to enforce federal marine fisheries and wildlife laws, thus ensuring state and federal consistency in resource-protection efforts. The following site-specific security measures will be implemented at TOCA to protect on-site natural, cultural, water resource, and recreational resources;

Boundary Fencing/Signage/Gates

Adequate fencing occurs along the southern (along the C-31 canal) and portions of the western boundaries. Four (4)-strand barbwire fencing will be installed on the eastern/northeastern boundary, with posts placed every 12-15 feet; hog wire or field fencing may also be considered to protect wading bird/listed species habitat. Boundary signage will be posted every 500 feet along the boundary, as well as on corner posts, designated points of access, and areas that are subject to illegal entry. Sign language will contain clear, enforceable language and referenced County code or State statute to aid in enforcement. "H" style fence bracing will be placed at approximately quarter-mile intervals to strengthen and stabilize. No additional fencing is anticipated for the western/southwestern boundary along the Lake Toho shoreline.

Fence line and gate maintenance will be comprised of periodic/semi-annual review for fence integrity and signage replacement; it will also provide an opportunity to inspect for unauthorized access or activity and vandalism along the project perimeter. Additionally, fence lines will be maintained as firebreaks through chemical and/or mechanical (mowing) means, annually or semi-annually. Gates and locks can be routinely inspected and maintained with usage and repaired/replaced as necessary. Gates and mutually shared combinations/keys (with SFWMD) are recommended for the south/C-31 and east fence lines for management and operational access.

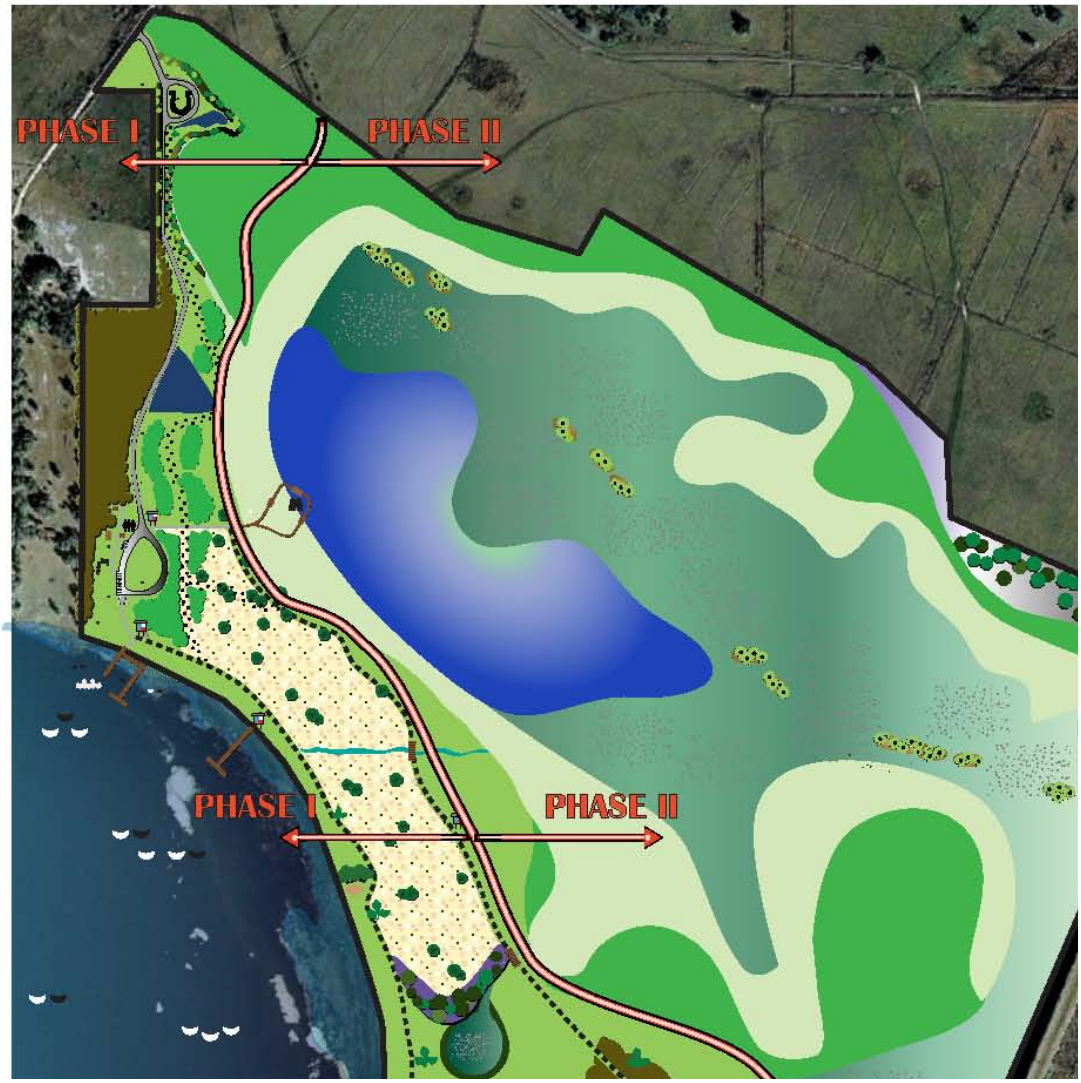
Law Enforcement

Law enforcement will be administered primarily by the Osceola County Sheriff's Office, but also periodically by FFWCC as appropriate. As a lakefront park, enforcement will occur landward and waterward. Law enforcement may vary according to restoration strategy, extent of sovereign and submerged (state) lands, presence of protected species, and on-site recreation. It is recommended that patrols be adaptive to adjust to periods of high use and/or high likelihood of violations, to curtail incompatible behavior. A cooperative agreement with FFWCC for management and/or contractual patrols may be explored.

4.2 Restoration

As described in Section 3.0 (Land Management Goals and Objectives), habitat restoration of the TOCA is separated into two phases which are depicted in **Figure 4: Phasing Plan**. Phase I will include upland restoration with some localized wetland restoration, while Phase II will involve restoration of the large central wetland area. The Phase I restoration plan is detailed in this section, while the Phase II plan is discussed conceptually at this time, due to the implementation schedule. Photographs depicting the existing conditions (Pre-Restoration) and the restored condition (Post-Restoration) are included in **Appendix IV** and **Appendix V**, respectively.

Figure 4: Phasing Plan



4.2.1 *Phase I Restoration Plan:*

To prepare TOCA for public opening, enhancement of several of the natural areas onsite will facilitate access and enjoyment of the initial amenities. The Phase I restoration and enhancement activities are listed below and depicted in **Figure 5: Phase I Planting Plan**:

1) **Visual Buffer**: Plant native species around access road, parking lot, and along adjacent homeowner properties, to create visual buffer;
2) **Habitat Restoration**: Plant characteristic species in target basin swamp, mesic flatwoods and mesic hammock communities.
3) **Debris Removal**: Remove structural debris and trash from all Phase 1 areas;
4) **Forest Management**: Trim trees in mesic hammock area as needed for safety, access, and aesthetics; collect and mulch all tree debris and spread over upland areas;
5) **Noxious Species Control**: Eradicate exotic species and control nuisance species in restoration areas

1) Visual Buffer

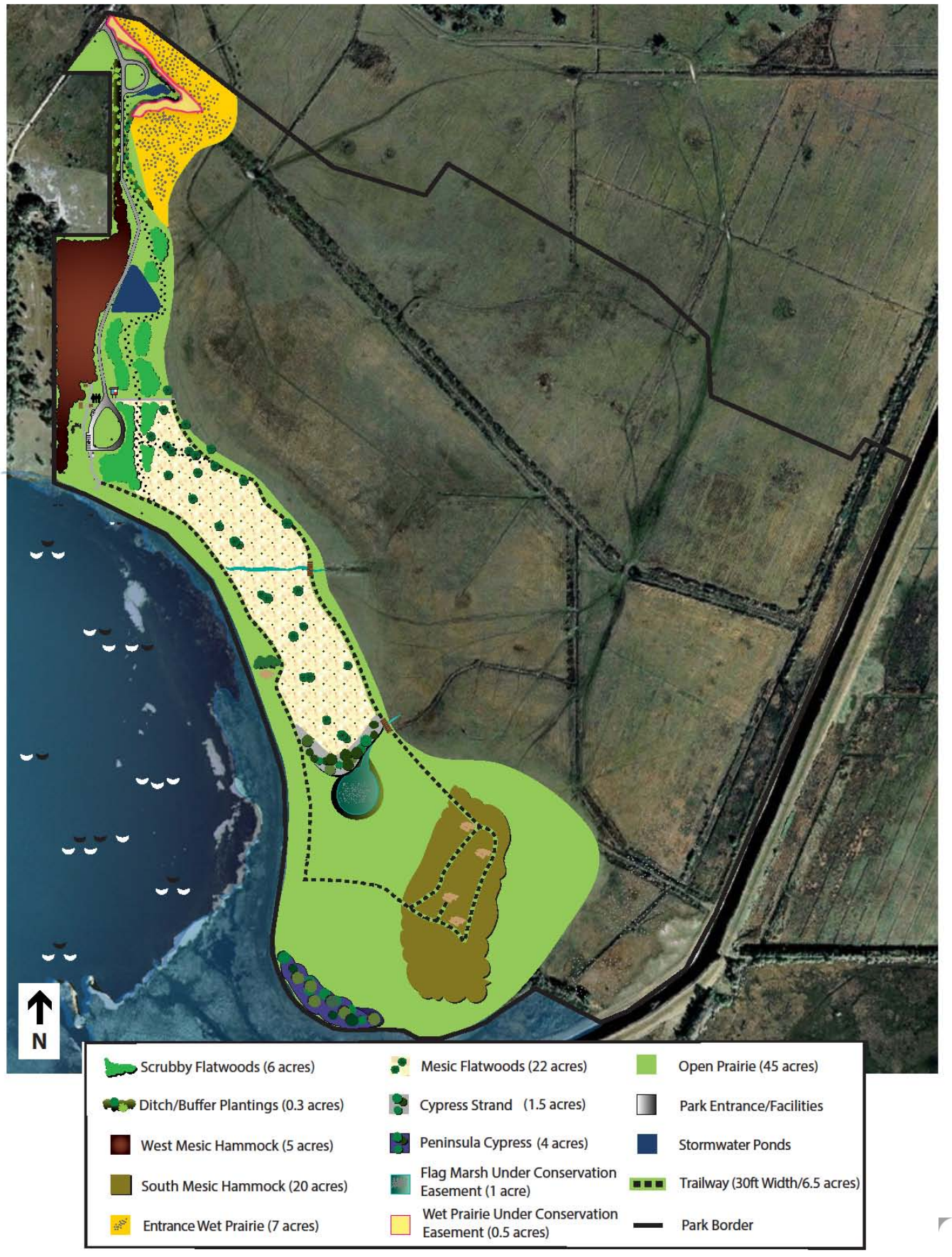
The mesic hammock area west of the entrance road and the scrubby flatwoods community along the east side of the entrance road and parking area will be planted with target community species to create a visual barrier between the road and the neighboring property to the west and the restoration areas on the rest of the property to the east.

West Mesic Hammock (Target Community Type 1)

The 5-acre mesic hammock area west of the entrance road will be planted to expand and enhance the native community and its visual buffer function between the park and the neighboring property. This restoration area lies adjacent to a remnant mesic hammock area, and currently contains a number of mature live oak trees. The additional plantings to accomplish this native community restoration and visual buffer enhancement will be approximately 6 acres. The proposed plantings include:

Species	**Size**	**Density/Pattern**	**Total Number**
Live Oak	3-7G	Intermittent / Scattered	75
Cabbage Palm	3-7G	Scattered / Clustered	50
Southern Magnolia	3G	Scattered	100
Gallberry	3G	Clustered	1,000
Buttonbush	3G	Clustered	500

Figure 5: Phase I Planting Plan



Scrubby Flatwoods (Target Community Type 2)

The 6-acre visual barrier between the entrance road and parking lot, and the restoration areas to the east, will be planted as a scrubby flatwoods community. Currently the area is comprised of Bahia pasture, with no significant trees or other appropriate native vegetation. For this visual buffer area, slash pine was selected due to its faster growth rate, especially during the first 5 to 10 years. The proposed plantings consist of the following:

Species	Size	Density/Pattern	Total Number
Slash Pine	3-7G	Scattered	200
Wax Myrtle	3G	Scattered	200
Saw Palmetto	3G	Clustered	1,000
Gallberry	3G	Clustered	1,000
Broomsedge or Little Bluestem	1G	Clustered	1,500
Wiregrass	1G	Clustered	4,000

2) Habitat Restoration

The Phase I Restoration Plan will target native community restoration plantings for the cypress swamp, mesic flatwoods and mesic hammock in the southwestern and southern portions of TOCA, along and near Lake Tohopekaliga.

Entrance Road Wet Prairie (Target Community Type 6)

The expansive historic wet prairie is located east of the entrance road and extends along the northern property line of the TOCA. While the majority of wet prairie restoration will occur post-hydrologic improvement in Phase II, a small area just east of the entrance road is proposed to be planted in Phase I. Due to both minor wetland impacts associated with permitting the roadway / access improvements and the desire to create visual interest at the park entrance, up to 7 acres of wet prairie will be planted along the entrance road. A portion of this area (~0.5 ac) will be placed under Conservation Easement pursuant to permit conditions associated with the access road permit from SFWMD. Currently this area is an improved pasture, dominated by Bahia grass, with sparse and scattered shrubs and clumps of broomgrass.

To facilitate restoration of native groundcover, specific and targeted plantings will be installed to shade and out-compete the Bahia grass over time. The proposed plantings include:

Species	Size	Density/Pattern	Total Number
Tickseeds (*Coreopsis*)	Seed / 1G	Scattered	2,000
Beaksedge (*Rhynchospora* sp.)	1G	Scattered	1,500
St Johns Wort (*Hypericum* sp.)	3G	20'OC (109/acre)/Clustered	550

Soft rush (*Juncus* sp.)	1G	20'OC (109/acre)/Clustered	1,500
Wiregrass	1G/Plugs	Clustered	2,000

Mesic Flatwoods (Target Community Type 3)

The 22-acre mesic flatwoods restoration area is located in the central upland area of the property, along Lake Tohopekaliga. This area will include the proposed trail(s) and will be an important component of the overall site restoration. Currently this portion of the site is an improved pasture, dominated by Bahia grass, with sparse and scattered shrubs and clumps of broomgrass and a variety of nuisance species.

To facilitate restoration of native groundcover, specific and targeted plantings will be installed to shade and out-compete the Bahia grass over time. Furthermore, although longleaf pine is the primary pine tree species of choice for the TOCA, based on plant nursery inventories some substitution of slash pine may be required. The proposed plantings include:

Species	Size	Density/Pattern	Total Number
Longleaf Pine*	3-7G	(25/acre)/Scattered	550
Slash Pine*	3-7G	(10/acre)/Scattered	220
Cabbage Palm	3-7G	Clustered	125
Saw Palmetto	1-3G	avg 15' OC / Clustered	4,500
Gallberry	1-3G	Scattered/Clustered	3,500
Tickseed	1G	Scattered/Clustered	3,500
Blanket Flower	1G	Scattered/Clustered	2,500
Wiregrass	1G/Plugs	avg 6'OC / Clustered	26,400

* Slash pines may be substituted for < 25% of longleaf pines if longleaf is not available in sufficient quantities

Cypress Swamp (Target Community Type 8)

The cypress swamp restoration associated with Phase I is concentrated in two locations for a total of ~5.5 acres. The first location is between the central mesic flatwood and the dry prairie/unchanged land surrounding the southeastern oak hammock. This 1.5 acre area presently contains some remnant cypress in addition to an upland cut ditch that connects that area to an existing depressional marsh. The second cypress restoration area within Phase I is approximately 4 acres in size and is located at the southern tip of the property, along Lake Tohopekaliga. Together, these areas will provide additional habitat for the bald eagles and osprey that currently use the site and encourage roosting and nesting of additional bird species. Plantings include:

Species	Size	Density/Pattern	Total Number
Bald Cypress	3-7G	avg 25' OC / Clustered	385
Buttonbush	3G	Scattered	200
Cinnamon fern	1-3G	Scattered	500

Basin Marsh (Target Community Type 5)

Adjacent to the 1.5 ac cypress area mentioned above, an ~1 acre basin marsh located between the trail segments within the center of the upland portion of the site will be enhanced as part of Phase I. Recent rainfall and removal of cattle from the site have allowed this small depressional area to revegetate naturally with only minor coverage by nuisance and exotic vegetation such as cattail and torpedo grass. As part of the mitigation for the access improvements (SFWMD permit) and to enhance the area for use by fish and wildlife, the habitat within this area will be improved through both plantings and nuisance species management. Snail kites have been observed foraging within this marsh area, though perch / loafing substrate is noticeably lacking. In support of snail kite foraging, shrubby vegetation will be planted and nuisance species will be controlled within the marsh. Additionally, due to mitigation requirements in the SFWMD permit, the ~1 acre marsh will be placed under Conservation Easement. Plantings include:

Species	Size	Density/Pattern	Total Number
Carolina Willow	3G	Scattered	40
Buttonbush	3G	Scattered	40

Mesic / Oak Hammock (Target Community Type 1)

The 15-acre (approximate) oak hammock restoration area is located in the southeastern portion of the property. The area is currently vegetated primarily with mature oaks, but a number of trees are damaged or downed due to past storm events. To restore the area, tree debris removal and nuisance vegetation maintenance will be enhanced with native plantings to include:

Species	Size	Density/Pattern	Total Number
Live Oak*	3-7G	Scattered	500
Longleaf Pine*	3-7G	Scattered	500
Cabbage Palm	3-7G	Scattered	250
Southern Magnolia	3G	Scattered	200
Saw Palmetto	3G	Scattered	500
Gallberry	3G	Clustered	500
Beauty Berry	3G	Clustered	750

Open Lands (Dry Prairie) and Ditch / Marsh

In addition to the habitats detailed above, the Phase I boundaries also include a small flag marsh with a linear (remnant ditch) freshwater marsh area and several areas depicted as open unchanged lands. While the wetland and ditch areas are expected to recover naturally, some enhancement plantings may be added to facilitate restoration. For the open lands, the cost to fully vegetate the areas would be extremely costly and would not significantly improve the value the areas provide

to fish and wildlife. As such, those open areas will be managed as Dry Prairie communities with a focus on fire management and nuisance species control instead of plantings.

3) Debris Removal

Structural debris (primarily consisting of broken culvert pipes, concrete, and associated debris within and along the ditches); a variety of domestic trash previously dumped on the site will be removed during Phase I restoration, prior to planting. All structural debris and trash will be removed from the site, and legally disposed at an appropriate facility. Vegetative debris will be removed from the public access areas and either removed from site or burned onsite if conditions allow. Where possible, native tree debris of substantial size may be utilized as substrate within the Phase II wetland restoration area.

4) Forest Management

The mesic hammock area currently contains a large number of mature live oak trees; however, many of the trees have died or have been severely damaged due to windfall. There is extensive tree debris (fallen trees and branches) throughout the area. The trees in the mesic hammock area will be evaluated for their viability. Dead and severely damaged trees will be removed, fallen branches will be collected, and branches will be trimmed, as necessary for safety, accessibility, and aesthetics. Vegetation debris will be mulched on-site and dispersed evenly throughout the hammock area.

5) Noxious Species Control

During site evaluation, numerous exotic and nuisance species were observed on the TOCA property. Management of TOCA will require implementation of a Nuisance/Exotic Species Management Plan (NEMP) to assure the restoration efforts are successful and sustainable, and that the highest quality habitats can be achieved. This NEMP is discussed in detail in Section 4.7 Exotic and Nuisance Species Control.

The following table lists these exotic and nuisance species, their FLEPPC/FDACS/USDA ranking and the communities in which they were observed:

Scientific Name	Common Name	FLEPPC/FDACS/USDA Ranking	Community	Phase 1
Alternanthera philoxeroides	Alligator weed	II/P/None	Floodplain Marsh	Yes
Cinnamomum camphora	Camphor tree	I/None/None	Mesic Flatwoods Mesic Hammock	Yes Yes
Eichhornia crassipes	Water-hyacinth	I/P/N	Floodplain Marsh	Yes
Hydrilla verticillata	Hydrilla	I/P/N	Marsh Lake	No
Lantana camara	Lantana, shrub verbena	I/None/None	Mesic Hammock	Yes
Ludwigia peruviana	Peruvian primrose willow	I/None/None	Floodplain Marsh	Yes
Panicum repens	Torpedo grass	I/None/None	Floodplain Marsh	Yes
Salvinia minima	Water spangles	I/P/None	Floodplain Marsh Ditches	Yes No
Sapium sebiferum	Chinese tallow tree	I/None/None	Mesic Flatwoods Mesic Hammock	Yes Yes

Schinus terebinthifolius	Brazilian pepper	I/P/None	Flag Marsh Ditches	No No
Scleria lacustris	Wright's nutrush	I/None/None	Flag Marsh Ditches	No No
Solanum viarum	Tropical soda apple	I/NW/N	Mesic Flatwoods Mesic Hammock	Yes Yes
Urena lobata	Caesar weed	I/None/None	Mesic Flatwoods	Yes

FLEPPC Rank:

I = Displace native plants, alter community structures or functions, hybridize with natives

II = Very abundant/frequent but do not alter communities to extent shown by Cat. I

FDACS Rank: Prohibited (P), Noxious Weed (NW)

USDA Rank: Noxious Weed (N)

4.2.2 Phase II Restoration

Restoration Alternatives

When the TOCA was acquired by Osceola County, the Interim Management Plan identified a variety of potential options for restoration of the site. Among the options considered was the potential use of the site for mitigation to offset wetland impacts incurred elsewhere in the County. The mitigation scenario included three separate alternatives: 1) permitted wetlands mitigation bank, 2) permitted Regional Offsite Mitigation Area (ROMA), and 3) third-party mitigation (permittee-responsible) for County funded projects (i.e. road construction). In the analysis conducted for the IMP, the mitigation bank alternative had the most significant cost considerations, followed closely by the ROMA alternative. Additionally, while the most attractive benefit of permitting the TOCA site as a mitigation bank or ROMA was the potential for revenue to offset restoration and long term management costs associated with the property, there were several challenges identified that required further consideration during this planning effort. Some of those considerations included:

1) Substantial upfront costs to implement the type of restoration plan that would be required to permit a mitigation bank
2) Challenge of implementation timeframes / permit conditions related to public agency procurement processes
3) Availability of financial assurance mechanisms for Department of the Army, Corps of Engineering (ACOE) and/or South Florida Water Management District (SFWMD) permits
4) Strict permit conditions for long-term management, monitoring and reporting

While those considerations were important to consider at the time, since the IMP was drafted, new legislation has been approved that alters the viability of using the site as a mitigation bank. The new legislation modifies 373.4135 Florida Statues (F.S.) Section 4 Mitigation banks and offsite regional mitigation as follows:

> *(b) Notwithstanding the provisions of this section, a governmental entity may not create or provide mitigation for a project other than its own unless the governmental entity uses land that was not previously purchased for conservation and unless the governmental entity provides the same financial assurances as required for mitigation banks permitted under s. 373.4136.*

Because TOCA was purchased using conservation funds, this legislation makes TOCA ineligible for use as a public mitigation bank or ROMA leaving only mitigation for other County projects as a viable option.

In order for the County to use the Phase II restoration area at TOCA as mitigation for other County-funded projects, the timing of those projects would need to coincide with the restoration implementation timing and the herbaceous wetland impacts would need to occur within the Lake Tohopekaliga mitigation basin. Approximately 200 acres of the site would be available as potential mitigation and includes restoration of improved wet pasture to habitats including grassy marsh, flag marsh, and marsh lake. Preliminary Uniform Mitigation Assessment Method (UMAM) analyses of the potential mitigation value of this area conducted for the IMP estimated that this area could generate between 20 and 40 UMAM credits. The total number of credits would vary based upon the number of potential projects that would be using the site as mitigation. The more "pieces' the overall mitigation plan is divided into, the fewer total credits could be achieved. Less mitigation value would be available if a large number of projects with small impact acreages were proposed to be mitigated at TOCA as opposed to one or two larger projects. Multiple projects would also require much greater permitting coordination and therefore the total financial benefit to the County would be reduced.

Understanding that some of the primary goals of the Environmental Lands Conservation Program are:

> *"to manage acquired environmentally significant lands with the primary objectives of maintaining and preserving their natural resource values, and providing appropriate resource and nature-based recreational and educational opportunities, including development of trails, and areas suitable for fishing, wildlife study, canoeing, camping, kayaking and other resource based opportunities, by employing management techniques that are most appropriate for each native community so that our natural heritage may be preserved and appreciated by and for present and future generations;*
>
> *"To have the acquired sites available, with minimal risk to the environmental integrity of the site, to educate the general public about the uniqueness and importance of the County's subtropical ecosystems and natural communities"*

The restoration of TOCA will provide the citizens of Osceola County with unique resource and habitat based recreation and educational opportunities, thereby meeting the primary goals of the property's acquisition. It will be a determination of the County and the ECLP as to whether portions of the restoration area can ultimately be used as mitigation.

Conclusion: While using components of the wetland restoration as mitigation for specific County projects remains a possibility, with no specific projects identified at this time, the County will proceed with the planning, permitting, and restoration design as an independent habitat restoration project. The areas within Phase I will be permitted prior to park opening and any mitigation required for wetland impacts associated with those facilities will be accommodated within that phase. Permitting for the Phase II restoration project(s) will commence upon County authorization and portions could be available as "in kind" herbaceous wetland mitigation for other County projects within the Lake Tohopekaliga drainage basin if such projects are defined and in permitting concurrently with the Phase II restoration for TOCA.

The County could achieve the greatest mitigation value from the restoration by selecting a project or few projects to be mitigated at TOCA that require significant herbaceous wetland mitigation.

Phase II Wetland Restoration

Due to complicated site hydrology, which is affected by a series of ditches and offsite hydraulic drawdown (pumping), a comprehensive engineering model is required to evaluate the future condition of the restored wetland area. This modeling will allow the County to better predict the hydrology and inundation throughout the wetland area and will provide the basis for the ultimate restoration plan. Presently, this modeling effort is underway, along with a vegetative restoration plan for this area. Once complete, the wetland restoration model will be used to develop a detailed restoration planting plan and the appropriate permits will be obtained from the SFWMD and the ACOE. Once permitted, the restoration of the wetland can begin. Without a detailed planting plan at this point, the following section depicts the target community types and the conceptual plan for the Phase II restoration activities.

Basin Marsh (Target Community Type 5)

Basin marshes are highly variable herbaceous wetland communities typically found in isolated depressions on the landscape. The central portion of the TOCA consists of low lying lands with organic soils and hydrophytic vegetation in the current condition. In addition to off-site surface water diversion from agricultural pumping stations, this area is laced with drainage and conveyance ditches that reduce the natural hydroperiod. In the post-restoration state, ditch blocks will be constructed at strategic points along the ditch system, permitting water to stage and inundate the area in the wet season to an elevation of approximately 53' NGVD.

The area below the 53' NGVD has quite variable topography and areas of deep ditching. This will result in a dynamic wetland marsh community with clear zonation between natural vegetative communities along topographic changes. From the deepest areas to the shallowest, the vegetative composition will progress from open water to emergent vegetation to grassy areas. As there will be habitat variability in this area, the following section discusses the Basin Marsh sub-communities by zonation.

Sub-community 1: **Marsh Lake**

The Marsh Lake community will be shallow to deep, open water areas during the wet season within the expanse of the Basin Marsh system. Floating or floating-leaved vegetation may be present. Anticipated species include:

- Plant-like algae (*Nitella sp*, and *Chara sp*.)
- Duck weeds (*Spirodela polyrhiza, Lemna valdiviana*)
- White waterlily (*Nymphaea odorata*)
- American lotus (*Nelumbo lutea*)
- Spatterdock (*Nuphar lutea*)
- Softstem bulrush (*Scirpus tabernaemontani*)

This community is not persistent, however and in the dry season emergent vegetation, forbs and grasses may colonize as water levels permit. During drought periods, exposed marsh beds may be

dominated by weedy species such as southern amaranth (*Amaranthus australis*) and dog fennel (*Eupatorium capillifolium).*

Sub-community 2: **Flag Marsh**

The Flag Marsh community is an assemblage of emergent vegetation characterized by large, broad-leaved herbaceous plants with showy flowers or large seed heads. They will be dominated by:

- Pickerelweed (*Pontederia cordata*)
- Duck potato (*Sagittaria latifolia*)
- Golden canna (*Canna flacida*)
- Fire flag (*Thalia geniculata*)
- Softstem bulrush (*Scirpus tabernaemontani*)

Other species may include large grasses and rushes. On the subject property, swamp rosemallow (*Hibiscus grandiflora*) and soft rush (*Juncus effuses*) is also observed within this community type. The spoil mounds within the proposed Flag Marsh footprint will removed of nuisance vegetation and replanted with cabbage palms (*Sabal palmetto*) to provide cabbage palm "islands" to add diversity to the marsh landscape and offer nesting, roosting and cover opportunities for birds and other wildlife.
As they do not require constant inundation, these Flag Marsh communities often persist through the dry season. Die-back may occur in periods of severe drought. Seed bank sources within established Flag Marsh communities remain viable for many seasons so re-establishment is typical once hydro-patterns normalize. In the present condition, this vegetative community can be found in isolated pockets within the proposed restoration area and along the Floodplain of Lake Tohopekaliga.

Sub-community 3: **Grassy Marsh**

The Grassy Marsh community will be located on the more shallow depths of the Basin Marsh and is typically characterized by:

- Maidencane (*Panicum hemitomon)*
- Sand cordgrass (*Spartina bakeri*)
- Smartweeds (*Polygonum spp.*)
- Sweetscent (*Pluchea odorata*)
- St. John's Worts (*Hypericum spp*.)
- Lemon bacopa (*Bacopa caroliniana*).

Some of the grassy species, such as cord grass and maidencane and can tolerate significant inundation, however, and it is not uncommon to see stands in the deeper areas of the marsh. Shrub species like Carolina willow (*Salix caroliniana*), buttonbush (*Cephalanthus occidentalis*), elderberry (*Sambucus canadensis*), and wax myrtle (*Myrica cerifera*) often recruit in the shallow zone or upon hummocks, or spots of high elevation within the deeper pools, and are sources of beneficial forage, nesting and refugia areas, provided they do not proliferate to monocultures.

Management Considerations: Natural fires probably occasionally burned basin marshes at the end of the dry season. Dense sawgrass and maidencane marshes will burn even when there is standing water. Frequency of fire varies depending on the hydrology of the marsh and its exposure to fire from

surrounding areas. Natural seasonal and longer-term fluctuations in water level are important for maintaining the diversity of marsh vegetation. If the water level is artificially stabilized, species such as cattail that can tolerate long periods of inundation will tend to dominate. Stabilized water levels, along with increased nutrient levels from agricultural runoff, can result in the invasion of exotics, such as water hyacinth (Eichhornia crassipes) and Cuban bulrush (Oxycaryum cubensis) *(Adapted from FNAI - Guide to the Natural Communities of Florida: 2010).*

Wet Prairie (Target Community Type 6)

Wet prairie is an herbaceous community found on saturated soils of sloping areas between other wetlands and wet or mesic flatwoods. In the post restoration state, this community type will flank the basin marsh areas and serve as the transitional habitat between marsh and mesic flatwoods. Portions of the wet prairie community at the northeast corner will be planted with cypress trees as a visual vegetative barrier against the adjacent urban landscape. This will be an aesthetic benefit to park-goers and additional areas of nesting and roosting habitat for birds and other wildlife.

Characteristic vegetation suitable for the Twin Oaks Conservation areas includes, but is not limited to:

- Wiregrass ((*Aristida stricta* var. *beyrichiana*)
- Hairawn muhly (*Muhlenbergia sericea*)
- Blue maidencane (*Amphicarpum muhlenbergianum*)
- Beak-sedges (*Rhynchospora spp*.)
- St. John's Worts (*Hypericum spp.)*
- Pipeworts (*Eriocaulon spp*.)
- Grass pinks (*Calopogon* spp.)
- Meadowbeauties (*Rhexia spp.)*
- Rose Gentians (*Sabatia spp.)*
- Tickseeds *(Coreopsis spp.)*
- Common pitcher plant (*Sarracenia minor*)
- Sundews (*Drosera* spp.)

Many rare plants endemic to Florida are found in wet prairie and are suitable for planting within Twin Oaks Conservation area to promote species sustainability. These include:

- Florida Hartwright (*Hartwrightia floridana*)
- *Helianthus carnosus*
- *Panicum abscissum*

Management Considerations: Natural fires enter wet prairie from surrounding pinelands and burn through them when they are dry enough to carry fire. It is estimated that a natural fire return interval of 2-3 years where wet prairie vegetation is adjacent to mesic/wet flatwoods is typical. In the absence of fire, shrubs and trees invade and shade out the herbaceous species. Fire stimulates flowering in many wet prairie herbs, including two of the dominant grasses, wiregrass and cutthroat grass. Wet prairies are sensitive to slight physical alterations to the soil surface which can permanently alter the hydrology. This

includes soil rutting within the prairies caused by trampling, vehicles, plowed fire lanes, or other heavy equipment damage, placing roads and ditches near the prairies and hog rooting. These disturbances can cause major changes in species composition that require expensive restoration to repair *(Adapted from FNAI - Guide to the Natural Communities of Florida: 2010).*

Floodplain Marsh (Target Community Type 7)

Floodplain marshes occur along river or lake floodplains and are comprised of grassy, herbaceous and shrubby vegetation. This community currently exists long the lakeshore of Lake Tohopekaliga, though much of it is in a highly disturbed state from cattle browsing and historic land management activities. Characteristic vegetation suitable for the Twin Oaks Conservation areas includes, but is not limited to:

- Plant-like algae (*Nitella sp*, and *Chara sp*.)
- White waterlily (*Nymphaea odorata*)
- American lotus (*Nelumbo lutea*)
- Spatterdock (*Nuphar lutea*)
- Softstem bulrush (*Scirpus tabernaemontani*)
- Pickerelweed (*Pontederia cordata*)
- Duck potato (*Sagittaria latifolia*)
- Golden canna (*Canna flacida*)
- Fire flag (*Thalia geniculata*)
- Maidencane (*Panicum hemitomon)*
- Sand cordgrass (*Spartina bakeri*)

Shrub species like Carolina willow (*Salix caroliniana*), buttonbush (*Cephalanthus occidentalis*), elderberry (*Sambucus canadensis*), and wax myrtle (*Myrica cerifera*) may recruit in the shallow zone or upon hummocks, or spots of high elevation within the deeper pools, and are sources of beneficial forage, nesting and refugia areas, provided they do not proliferate to monocultures.

Management Considerations: Similar to basin marshes, natural fires probably occasionally burned portions of floodplain marshes at the end of the dry season. Natural seasonal and longer-term fluctuations in water level are important for maintaining the diversity of marsh vegetation. If the water level is artificially stabilized, species such as cattail that can tolerate long periods of inundation will tend to dominate. Stabilized water levels, along with increased nutrient levels from agricultural runoff, can result in the invasion of exotics, such as water hyacinth (Eichhornia crassipes) and Cuban bulrush (Oxycaryum cubensis) *(Adapted from FNAI - Guide to the Natural Communities of Florida: 2010).*

4.3 Fire Management

Goals and Objectives

The fundamental goals of the fire management plan are:

1. Reduce wildfire hazards posed to local residents, adjacent communities and natural areas.
2. Use prescribed fire to maintain and enhance natural communities, diversity, fuel loads, listed species habitat, control exotic/nuisance species.

3. Abide by historical regimes, but consider other human factors in the wildland-urban interface; adjust management strategies/regimes as necessary.

To meet these goals, the following objectives have been identified:

1. Use mechanical (e.g. mowing) and chemical means in lieu of fire to maintain low-growing herbaceous ecosystems and control woody species;
2. Protect listed species nest sites/habitat and avoid fire in a given unit if listed species nest sites or critical habitat occur within;
3. Consult with appropriate agencies for listed species planning, particularly for Everglade snail kite (*Rostrhamus sociabilis plumbeus*), American wood stork (*Mycteria americana*) and Audubon's crested caracara (*Polyborus plancus audubonii*), if nesting or rookeries are observed on-site;
4. Maintain woody species below ten (10) percent areal coverage, but maintain small amounts, particularly in deeper pockets, to provide roosting/nesting habitat for wading birds;
5. Develop a prescribed fire burn plan for each burn unit, should prescribed be approved as a management activity;
6. Notify/educate adjacent landowners/public about program and periodically for upcoming burns;
7. Conduct prescribed fire during the peak growing season (May – July) as conditions dictate and with exceptions below (avoidance of nesting listed species);
8. Develop burn units and firelines based on final restoration design;
9. Develop prescribed fire database.

Prescribed fire is one of the most important abiotic forces in Florida's ecosystems. Benefits of prescribed fire include perpetuation of fire-dependent natural communities and species, disease control, nutrient cycling, and fuel reduction and resultant wildfire risk reduction. Before applied to TOCA, major on-site conditions or constraints would be assessed: fuel loads/continuity, hydrological conditions, adjoining restoration status, upcoming public events, and listed species presence.

Listed species habitat would be fostered through prescribed fire, primarily marsh and prairie habitat for wading birds, Florida sandhill crane (*Grus canadensis pratensis*) and Everglades snail kite. Before conducting a prescribed burn, Osceola County staff or an approved contractor/fire partner should survey for listed species nest sites through meandering transects in wet prairie/freshwater marsh habitat. Depending on hydrological and fuel conditions, fire may carry through/under nest sites and potentially disrupt nesting behavior or cause chick mortality. If occupied nest sites are observed, prescribed fire in that burn unit should be postponed until the chicks fledge and can fly away. Additionally, to prevent flare-ups and tree mortality, fuel loads under documented nest trees should be managed through mowing, chemical control, or hand removal during the non-nesting season.

Given the wildland-urban interface and close proximity to cities, smoke management is another constraint for prescribed fire. Coordination with Florida Forest Service (FFS) for anticipated prescribed fire would facilitate the burning process. OCP staff and/or an approved contractor should work closely with FFS to discuss smoke placement and Smoke Sensitive Areas (SSAs). Significant SSAs in the vicinity include:

- Kissimmee – northwest, 5.0+/- miles;
- St. Cloud – east, 2.0 +/- miles;
- Kissimmee Airport – northwest, 6.0 miles;

- Orlando International Airport (OIA) – north, 11.5 miles;
- Canoe Creek Road – east, 1.5 miles;
- Florida's Turnpike – east, 1.0 miles;
- Highway 441 – north/northwest, 2-3 miles.

Fortunately, nearly all fire-dependent habitats within TOCA are herbaceous and therefore will produce minimal downwind smoke impacts and smoldering potential (if conducted under appropriate conditions). Fire will also be facilitated through inter-agency cooperation/notification with adjacent managing entities including SFWMD, FFWCC and Osceola County Fire Rescue (OCFR). Additionally, all adjacent property owners should be notified in advance and the day of the fire. All concerns, particularly human health and animal welfare, should be addressed before the fire is conducted. Finally, park closure should be conducted during all prescribed fires to reduce risk and potential interference.

Monitoring for pre- and post-fire effects should be conducted to measure fire success. Simple photo-points could be established to visually evaluate fire effects over time. Other data should also be collected such observed wildlife, fuel consumption, ambient fire conditions/weather, hydrological conditions, acreage, partners, ecological goals, etc. Data should be kept in spreadsheet or geo-database format, depending on available resources.

TOCA Recommended Fire Regimes (derived from FNAI)

COMMUNITY TYPE	ACRES	BURN REGIME
Cabbage Palm Islands	~1	Infrequent
Dry Prairie	15	1 – 2 years
Floodplain Marsh	15	As needed*
Freshwater Marsh	230	As needed*
Mesic Flatwoods	75	2 – 4 years
Mesic Hammock	30	Infrequent/rare
Scrubby Flatwoods	5	5 – 15 years
Wet Prairie	40	2 – 3 years

(*As needed for control of woody species; low intensity with seasonal precautions for nesting wildlife; fall and winter burns preferred.)

4.4 Forest Management

Goals and Objectives

The fundamental goals of forest management are to maintain healthy forest density and structure and preserve and promote forest habitats for associated wildlife.

To meet these goals on TOCA, the following objectives have been identified;

1. Protect mature oak, cypress, and pine (i.e. >12 inch d.b.h.);
2. Document and protect known nesting/roosting trees for listed species;
3. Restore native canopy as appropriate;
4. Plant canopy specimen to balance aesthetics with natural canopy diversity in structure, age, density, and species;
5. Inspect canopy species annually for possible pruning, disease, and safety considerations;
6. Avoid prescribed fire in newly planted areas, allowing several years for tree establishment;
7. GPS listed species nest trees and restrict human activity as dictated by law/regulations.

TOCA is dominated by herbaceous natural communities, and forest management will have a diminished role. Still, approximately 110 acres of TOCA are forested, including mature mesic hammock, and proposed mesic and scrubby flatwoods natural communities. Old growth live oaks in the mesic hammock should be examined periodically by an arborist/forester for health to ensure longevity and protect patrons from hazardous dead/dying limbs.

The proposed mesic and scrubby flatwoods will be dominated by longleaf pine (*Pinus palustris*). Longleaf pine should be planted for long-term/future nest trees for bald eagle. Phase I plantings include longleaf, slash pine (*Pinus elliottii*), as well as cypress (*Taxodium spp*.), thus ensuring significant long-term canopy coverage and additional nesting opportunities within TOCA. Phase II will be dominated by herbaceous marsh, but will have scattered cypress and cabbage palm (*Sabal palmetto*) that may provide additional nest trees for bald eagle and Audubon's crested caracara.

Forestry management practices often include the implementation of prescribed fire to maintain desirable stand densities, allowing sufficient light to penetrate the herbaceous layer and preserve the primary source of productivity in many natural systems. Prescribed fire also results in a diverse age class within canopy species – assuring multi-generational propagation and canopy stand viability. In the absence of fire, Desired Future Conditions (DFCs) for forested ecosystems can be attained through ecologically sensitive equipment (low-ground pressure harvesters) and qualified supervision to achieve goals – community-specific basal area, stem densities, varied structure, species composition/diversity (as appropriate), and snag ecology. Pine-dominated restoration areas will need many decades to mature and therefore exceed the scope and applicability of this LMP. Planting densities in Phase I will be based primarily on aesthetics; plant palettes will be dominated by species typically associated with on-site soil series and like mature natural communities. Still, all planted canopy specimens will provide increased structure, aesthetics, and potential habitat for nesting/resting/perching, shade, and carbon sequestration.

4.5 Water Resources

TOCA is located within the SFWMD Lake Tohopekaliga Basin and Kissimmee River Watershed, directly west of the C-31 canal and northeast of Lake Tohopekaliga. The site is hydrologically connected to Lake

Tohopekaliga via an extensive ditch system, which draws down the surface and groundwater at the site via a pump, located at the ditch-lake interface approximately 4,700 feet west of TOCA. Based on available research, the pumps are controlled by the property on which they reside. They are used for agricultural purposes and are turned on/off on an as-needed basis. Review and discussions with SFWMD staff indicate these pumps are not currently regulated due to their age and no data is available concerning these pumps.

Due to the location of TOCA, the water levels onsite are influenced by several factors. The extensive ditch/pump system located both on- and off-site have a direct influence on the surface and groundwater drawdown at the site as well as the levels of the C-31 canal and Lake Tohopekaliga. As indicated above, little information is known regarding the pumps other than they are operated based on water levels at the property to west of the conservation area. However, based on field observations of the site and the associated pump/ditch system, surface waters are being expedited offsite in the depressional areas due to the historic ditching and interim operation of the associated pump. Additionally, the ditches and pumps depress the groundwater table and historic seasonal high water levels.

The C-31 canal connects Lake Tohopekaliga to East Lake Tohopekaliga to the northeast. The water levels of these lakes are regulated between 52 feet NGVD to 55 feet NGVD for Lake Tohopekaliga and between 55 feet NGVD to 58 feet NGVD for East Lake Tohopekaliga. The regulated water levels of these water bodies have a lateral influence on the groundwater at the site, potentially drawing down the water table during low surface water elevation regulation cycles.

In an effort to restore the hydrology at TOCA while being in compliance with SFWMD regulations regarding pre/post water level and flow requirements, a comprehensive engineering design model is being developed. The intent of the restoration efforts is to restore the hydrology to the maximum extent possible, to maximize both water storage and water treatments. This hydrologic restoration will improve the water quality as well as re-create a diverse wetland habitat for both flora and fauna that will be sustainable given the site limitations resulting from the pumps and influences of the adjacent water bodies.

Another influence in water quality is livestock currently maintained at TOCA. This can adversely impact nutrient loads in surface water runoff as well as impact vegetation. With the restoration efforts, the cattle will be removed reducing the nutrient loads and increasing the water quality at the site.

4.6 Wildlife and Listed Species

A primary objective in the stewardship of Twin Oaks Conservation Area is to promote and maintain healthy fish and wildlife populations. Wildlife management will be directed toward production of native species diversity consistent with the biological community types present. Wildlife and listed species management will be accomplished by:

- Performing land management activities that maintain and/or improve native wildlife habitat;
- Conducting specific management beneficial to protected species;
- Conducting wildlife inventories through the FFWCC in areas where management activities have the potential to impact listed species;

- Following management guidelines for listed species protection as determined by the *Multi-species Recovery Plan for the Threatened and Endangered Species of South Florida, Volume 1*, (U.S. Fish and Wildlife Service. 1998) and its amendments;
- Reducing non-native wildlife species populations where appropriate;
- Maintaining a master file of confirmed and potential wildlife species;
- Cooperating with the FFWCC and USFWS on wildlife management issues, including wildlife inventories and evaluating management actions.

Rare, Threatened and Endangered Species

Several listed wildlife species are present or have been observed historically within the subject property. Impacts to these species from planned land management and recreational activities are of special concern. Activities that might jeopardize the well being of these species may be altered or cancelled. Land management activities including prescribed burning, hydrologic restoration, or exotic vegetation eradication improve natural environmental characteristics that benefit listed species as well as a variety of other indigenous wildlife. Management emphasis concerning rare and/or listed wildlife species within TOCA will be concentrated on the following species;

- American wood stork (*Mycteria americana*)
- Audobon's Crested Caracara (Caracara cheriway audubonii)
- Everglades snail kite (*Rostrhamus sociabilis plumbeus*)
- Florida sandhill crane (*Grus Canadensis pratensis*)
- Southern bald eagle (*Haliaeetus leucocephalus*)

American Wood Stork - *Threatened*

Wood storks were observed flying over or foraging within the TOCA boundary during the spring/summer of 2012. However, no wood stork colonies are located within, or immediately adjacent to the subject property. Of particular foraging use for wood storks in the pre-restoration state are the extensive farm rows of ditches and ephemeral pools within the interior of the site that experience fluctuating water levels. Aquatic vertebrates and invertebrates occupying these shallow surface waters create attractive feeding areas for wood storks and other wading birds. In the post-restoration state, these areas will be replaced by larger, high-functioning natural wetland systems that will support a greater abundance of food sources for wood storks. At the southern tip of the property, relict cypress trees remain and in the post-restoration state will be augmented with additional cypress plantings. Similar cypress "strand" plantings will occur in the northeast corner of the property site as well. When mature, these areas will provide potential roost or nest sites for the species.

Current regulations restrict human activity within 100 meters of any documented wood stork colony 24 hours a day, between February 15 and August 15. Closure dates established in the rule were determined based on the breeding and nesting season, and sought to provide a temporal buffer to permit wood storks to enter the creek earlier and begin nest building, as well as to allow chicks extra time to successfully fledge. Should wood storks develop a rookery within TOCA these required measures, or the most current regulations and management guidelines, will be strictly followed.

Audobon's Crested Caracara - *Threatened*

At this time, there is no evidence of nesting, foraging or other utilization of caracara within TOCA. During habitat restoration activities or in the post-restoration state, it is possible that the property may become a desirable nesting or foraging habitat for the species. Therefore, in the event that caracara should nest within or immediately adjacent to TOCA, the identified guidelines for protection and management of the species (as described by USFWS) will be enacted onsite. Specifically,

1. Two buffer zones will be established around every active caracara nest;

   A. Primary Protection Zone - 985 ft (300 meter) radius. The purpose of this buffer zone is to protect caracara from direct disturbance that may affect the fate of nesting. Personnel, pedestrians, horses, bicycles, vehicles, airboats, helicopters, other equipment and activity must stay outside of these areas at all times when caracara breeding activity is occurring (nesting season November to April). Caracaras are most sensitive to disturbance during nest building, incubation, and early nestling
   stages (first 3 to 4 weeks). There are additional conservation measures during this time to minimize impacts to the caracara. Additionally, the nest tree and other trees in the zone will be protected/maintained. This includes dead trees that are used for perching and roosting. It should be noted that nest and the nest tree are protected year-round by both Federal and State law and removal or other means of physical damage is prohibited. Ground vegetation will also be maintained to provide cover for fledglings as they learn to fly.

   B. Secondary Protection Zones – 4, 920 ft (1,500 meter) radius. This buffer zone is intended to maintain and protect habitat conditions around each nest to allow the nest to succeed. This zone is generally defined as the foraging territory in which the nest site is located. This secondary zone is used by caracaras for the collection of nest material, roosting, and feeding. Conservation measures for this zone are directed at maintaining the foraging capacity of the area, essentially maintaining grasslands and wetlands that are necessary for caracara foraging. Passive recreational activities (hiking, bird watching, fishing, camping, picnicking, etc) and routine land management operations (excluding the use of prescribed fire, application of caustic chemicals, pesticides or herbicides) are permitted.

Everglades Snail Kite - *Endangered*

On June 11, 2012, a male snail kite was observed foraging within the littoral area of Lake Tohopekaliga, immediately adjacent to the southwestern property boundary. The kite was observed successfully capturing a giant apple snail (*Pomacea maculata*) from the mats of hydrilla that exist along the lakeshore. Although no active nests were observed on the subject property, the floodplain marsh and littoral wetland areas within and adjacent to Lake Tohopekaliga provide excellent foraging, breeding and nesting opportunities for the snail kite. In the post-restoration condition, the interior marsh community will also supply additional suitable refuge and foraging locations for kites.

Should snail kites nest within the subject property, during or after restoration, the following conservation measures (directly adapted from *USFWS Snail Kite Management Guidelines*) will be implemented;

1. USFWS an FFWCC will be provided notification of nest sites during the nesting season (generally December 1 to July 31, but including all periods when active nests are known), Locations of all known snail kite nests, including maps and coordinates of nest sites, kite protection buffers, and priority kite management zones will be provided by the land manager.

2. Two buffer zones will be established around every active snail kite nest. This includes all nests reported and any unreported nest that is encountered during other activities. These buffer zones will be in effect from when kites begin nest building through the time when breeding activity is no longer observed at the site. Buffer zones may remain in place past the time when fledglings leave the area if adult kites continue to show breeding activity, including courtship, in the general area.

   A. No-entry Buffer Zones - A 500-foot (ft) (~150 meter) radius no-entry buffer zone will be established around all active nests that are discovered. The purpose of this buffer zone is to protect kites from direct disturbance that may affect the fate of nesting. Personnel, pedestrians, horses, bicycles, vehicles, airboats, helicopters, other equipment and activity must stay outside of these areas at all times when kite breeding activity is occurring.

   B. Limited Activity Buffer Zones - A 1,640 ft (500 meter) radius limited-activity buffer zone will be established around all active kite nests. This buffer zone is intended to maintain and protect foraging opportunities and habitat conditions around each nest to allow the nest to succeed. The goal is to maintain habitat conditions for the entire nesting period similar to those that were present when the birds selected the site. Personnel, pedestrians, horses, bicycles, vehicles, airboats, helicopters, other equipment and activity must stay outside of this buffer when possible, and activity within the buffer should be limited to the minimum time necessary to complete appropriate management activities.

      i. Only management activities that are expected to maintain or improve the existing kite foraging and nesting habitat within these areas will occur while there is evidence of kite breeding activity;

      ii. Exotic and invasive plant control efforts, including water hyacinth, water lettuce, hydrilla and similar invasive species that may rapidly encroach on native vegetation communities may be treated within limited-activity buffer zones during kite breeding, so long as treatments are not expected to result in impacts to vegetation species that contribute to snail kite and apple snail habitat.

      iii. Herbicide or other land management activities expected to result in changes > 10 percent in the cover or occurrence of native vegetation species including spike rushes, bulrushes, maidencane and other emergent vegetation will be avoided.

      iv. Treatments of invasive and undesirable woody plants, cattails, tussocks, and other similar vegetation will not occur within these buffer zones during kite nesting.

3. Priority Kite Management Areas: At the end of each nesting season, primary kite nesting areas will be delineated based on the current year's nest locations and nesting in the previous 10 years (as applicable). The locations of these areas will be provided to agency representatives soon after the end of the kite breeding season (July), and represent areas where resource management activities are likely to be limited due to kite nesting activity. Proposed management actions will incorporate pre-treatment kite surveys, or avoiding all together these areas during the early part of the following breeding season (from January 1 to May 31) when kites are selecting nesting sites. These also represent the areas where proactive management for snail kite foraging habitat may be most beneficial.

Florida Sandhill Crane - *Threatened*

Two breeding pairs were observed on TOCA during the spring/summer months of 2012. One pair was observed in the interior wetland community with a hatchling chick on June 16, 2012. This would indicate at least one an active nest site within the Twin Oaks property boundary. In general, the habitat conditions even in the pre-restoration condition on the subject property are very good for the breeding and nesting requirements of the species.

The following management guidelines will be implemented for TOCA to protect the species and conserve existing breeding, nesting and foraging habitats, as recommended by the USFWS;

1. Known nests will be protected by a 400 foot buffer to reduce the likelihood of disturbance by human activities.
2. Seasonality of human operated wetland management activities will avoid flooding existing nests or detrimentally impacting foraging habitat.
3. Prescribed burning will be used (see Section 4.3; Fire Management) to maintain upland habitats in suitable conditions for use by Florida sandhill cranes.
4. Burning will be conducted outside of the nesting season and after the young are able to sustain flight.

Southern Bald Eagle - *Managed*

USFWS removed the bald eagle from the list of threatened and endangered species under the Endangered Species Act in 2007. However, eagles, their nests, or eggs are still afforded protection from hunting, killing, selling or otherwise harming by the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act, both of which expressly prohibit those activities. Since, de-listing, USFWS has developed categorical guidelines to minimize human disturbance to roosting, nesting and foraging sites of bald eagles. Activities proposed within TOCA are encompassed in Category F (Non-motorized recreation and human entry; hiking, camping, fishing, hunting, birdwatching, kayaking, canoeing) of the *USFWS National Bald Eagle Management Guidelines*.

The bald eagle is an extensive user of the habitats found within and surrounding Twin Oaks Conservation Area. Lake Tohopekaliga provides an excellent foraging area and hosts many ideal nesting areas. On every field investigation of the subject property one or more bald eagles has been observed, perched in the same location (dead live oak near southern tip of the property), foraging within the lake, or flying/soaring in the vicinity. Although there are no current nesting locations on site, due to the intensive use of the

southern portion of the subject property by the bald eagles for roosting and foraging, and the potential for nest development, measures consistent with USFWS management guidelines will be implemented to lessen human disturbance in the area:

1. A 330-foot no-access protection buffer around the preferred bald eagle roosting location (dead live oak at south tip of property) will be demarcated throughout the year (Note: no buffer is currently required around nest sites outside the breeding season, per management guidelines).
2. Potentially disruptive activities (hiking, camping, fishing, birdwatching, kayaking, canoeing) will be restricted in the eagles' direct flight path between the roost sites and important foraging areas.
3. Long-term and permanent water-dependent facilities, such as kayak ramps and fishing piers have been located more than 1000 feet from the known eagle roost tree and associated foraging areas.
4. Existing or potential roosting and nesting sites will be protected and preserved by retaining mature trees and old growth stands (see Section 4.4: Forest Management).
5. Should nests be constructed, and should such nests be blown from trees or otherwise destroyed by stochastic events, these areas will continue to be protected in the absence of the nest for up to three (3) complete breeding seasons (as many eagles will rebuild the nest and reoccupy the site).
6. Feeding bald eagles will be prohibited. This includes exclusion of fish cleaning activities within the conservation area as an unintentional source of artificial feeding.
7. Pesticides, herbicides, fertilizers and other chemicals will be used only in accordance with federal and state laws.

4.7 Exotic and Nuisance Species Control

Goals and Objectives

The fundamental goal of the plan is to maintain natural community diversity, structure, function, and extent, through ongoing exotic plant and animal species control.

In effort to meet this goal, the following objectives have been identified:

1. Maintain areal coverage of exotic species below acceptable thresholds;
2. Document location and extent of exotic occurrence;
3. Treat exotic/nuisance species with methods that are sensitive to listed species, water resources, and native vegetation;
4. Use preventive measures, if applicable (i.e. hog fencing), particularly for restoration areas;
5. Minimize spread of exotic seeds through reasonable decontamination procedures for staff and contractors;
6. Conduct quarterly inspections of the project perimeter (areas of high infestation likelihood);
7. Conduct biannual meandering surveys through the remainder of the project;
8. GPS new infestations/occurrences and record in geo-database;
9. Maintain GIS/geo-database for all exotic species occurrence and treatment;
10. Control and treat exotic occurrences quickly to prevent spread, ecological disruption, and reduce maintenance costs;
11. Prioritize Category I exotics for treatment, and Category II species as funding allows;
12. Monitor treatment success to determine effectiveness and need for re-treatment;
13. Conduct outreach to adjacent landowners to assist with exotic species control, particularly for Category I exotics and feral hog control, propagule pressure, and yard waste;

14. Decontaminate OCP vehicles and clothing if they contact exotic propagules;
15. Continue cattle grazing until restoration or other vegetation management is implemented;
16. Mow hammocks as necessary to maintain openness;
17. Post signage prohibiting the release of exotic animals on the property.

Invasive exotic plant control will be necessary to preserve, enhance, or restore natural communities. Exotic species infestations will be prioritized for treatment, depending on funding availability and species' aggressiveness. Data collected by OCP/contractors or ongoing site investigations may be compiled in a Geographical Information System (GIS) relational database that could include species name, FLEPPC category, treatment date and method(s), chemical usage, GPS location, infestation extent, and cost. Pre- and post-treatment data and monitoring are important to determine the success of exotic control; site specific photography functions well and is cost-effective.

Known exotic infestations and isolated occurrences include the species noted in **Table 4**. Chemical control will typically be the primary means of control, but other methods (mechanical, fire, hand removal, seed collection) may be used at the discretion OCP staff. Treatment method will be driven by its effectiveness and efficiency to control the infestation, given ambient conditions and infestation response.

Currently, the two (2) greatest threats to site biodiversity and ongoing restoration are feral hog (*Sus scrofa*) and torpedo grass (*Panicum repens*), both observed on-site. Currently, hog damage appears to be minimal, and torpedo grass appears to be limited to ditches and the lake fringe. Feral hog damage will be monitored, and hog fencing may be considered to exclude hogs from proposed restoration areas. Additionally, hog trapping and other control methods may be used to pressure and reduce local populations.

Torpedo grass extent may expand following cattle removal and hydrological restoration. Monitoring of its extent and response to restoration is critical to long-term success. All localized infestations will be assessed for adjacent native species pressure/densities and, with minimal non-target damage, will be aggressively treated. Subsequent follow-up treatment at six- (6) to eight- (8) week intervals during the growing season will be implemented. If torpedo grass becomes significantly more extensive, dense native plantings may be considered to increase native competition. Torpedo grass along the shore of Lake Toho appears to be stabilized and has dense native competition. Because of widespread torpedo grass along the Lake Toho shoreline, treatments in the lake will proceed at an incremental basis to evaluate effectiveness. Test plots incorporating chemical treatment and dense plantings may be established and expanded, if successful.

In addition to feral hog, other observed exotic animal species include the giant apple snail, brown anole (*Anolis sagrei*) and Cuban tree frog (*Osteopilus septentrionalis*). Relative to Category I exotic flora and feral hog damage, these species are not typically problematic and therefore will be monitored as site conditions, local populations, science, and industry standards dictate.

Decontamination and monitoring protocols will be contingent upon potential on-/off-site contamination and infestation treatment. All staff and contractor vehicles travelling through known exotic infestations shall be required to pressure wash/remove mud, vegetation, and seeds from the vehicles before and after entering TOCA. To the extent practical, vehicles should avoid on-site torpedo grass infestations to reduce

the spread of seeds. Monitoring of known infestations and project boundaries will occur biannually. New infestations and recent treatments will be monitored monthly until treatment success is established.

Other vegetation management may include pasture grass maintenance in the improved areas and periodic removal of deadfall of limbs from the mature oaks. Grassy areas (e.g. mesic hammock) will be mowed several times per year to maintain open, aesthetically pleasing views of the project and the lake. Snags and standing dead limbs will be left in place, provided they do not present a safety hazard to park patrons. Deadfall will be removed as necessary.

Finally, consistent with the TDFR, woody vegetation management through chemical control or other means will be used to maintain open, herbaceous natural communities and generally facilitate listed species nesting and foraging, especially in lieu of periodic fire.

While Phase I and Phase II will have specific species and treatment schedule detail, the NEMP will employ adaptive management to assure the species targeted are accurate and that treatment frequency is sufficient to maintain restoration and habitat quality goals.

The following summarizes the exotic and nuisance vegetation in Phase I, and proposed actions:

Scientific Name	Common Name	Community	Extent of Impact	Proposed Action
Alternanthera philoxeroides	Alligator weed	Floodplain Marsh	Minimal	Occurrence in ditches, minimal in floodplain marsh. No action at this time. Monitor species.
Cinnamomum camphora	Camphor tree	Mesic Flatwoods Mesic Hammock	Moderate	Trees and seedlings will be treated with herbicide. Foliar application for seedlings and basal or cut-stump application for mature.
Eichhornia crassipes	Water-hyacinth	Floodplain Marsh	Minimal	Occurrence in ditches, minimal in the floodplain marsh area. No action at this time. Monitor species.
Lantana camara	Lantana, shrub verbena	Mesic Hammock	Moderate	Individuals will be mowed or cut, and the stumps will be treated with herbicide.
Ludwigia peruviana	Peruvian primrose willow	Floodplain Marsh	Minimal	This species primarily occurs in the SE portion of the floodplain marsh. No immediate action. Monitor species.
Panicum repens	Torpedo grass	Floodplain Marsh	Moderate	This species occurs in the near-shore area of the floodplain marsh. Treatment will be conducted as necessary during low water stages, if the torpedograss coverage is expanding or aggressively

				overtaking non-nuisance vegetation. Monitor species.
Salvinia minima	Water spangles	Floodplain Marsh	Minimal	Occurrence in ditches, minimally in floodplain marsh. No action at this time. Monitor species.
Sapium sebiferum	Chinese tallow tree	Mesic Flatwoods Mesic Hammock	Moderate	Trees will be cut and stumps chemically treated for eradication.
Solanum viarum	Tropical soda apple (TSA)	Mesic Flatwoods Mesic Hammock	Moderate	Clumps in numerous locations in the pastures and near the mesic hammock. To prevent further spread, where found, repeated mowing and herbicide treatment required.
Urena lobata	Caesar weed	Mesic Flatwoods	Moderate	Individuals treated with suitable herbicide.
Dioscorea bulbifera	Air potato	Mesic Hammock; southwest fenceline	Minimal	Individuals treated with suitable herbicide.
Schinus terebinthifolius	Brazilian pepper	Wet prairie; Mesic Hammock	Minimal	Trees will be cut and stumps chemically treated for eradication.
Macfadyena unguis-cati	Cat's-claw vine	Mesic Hammock	Minimal	Individuals treated with suitable herbicide.
Melia azederach	Chinaberry	Mesic Hammock	Minimal	Individuals treated with suitable herbicide.

4.8 Imperiled Natural Communities

There are three different imperiled or rare natural community habitats as identified by the Florida Natural Areas Inventory (FNAI), that will be restored, managed and preserved within TOCA: wet prairie, dry prairie and scrubby flatwoods. These native community types were at one time prevalent within the Osceola Plain but due to silvicultural, agricultural and urbanization activities most have now been degraded or fragmented by timbering, overgrazing, pasture conversion, draining, filling, fire exclusion or lost to residential and commercial developments.

Wet prairies are an important ecosystem in peninsular Florida and are home to 3 endemic species found only in this region of the state: *Hartwrightia floridana* (Florida Hartwright), *Helianthus carnosus* (flatwoods sunflower), and *Panicum abscissum* (cutthroat grass). This community is often the intermediate landscape between wetland communities and upland areas such as dry prairie, scrub, mesic flatwoods and scrubby flatwoods. As these upland habitats become developed, converted or altered, the wet prairie communities associated with them also suffer degradation (see Section 4.2. for complete descriptions of this community and associated rare plants and animals).

Dry prairie is a habitat endemic to the state of Florida, restricted mainly to interior central, south-central and west-central peninsular areas. Prairie types in other states do not share the same soil characteristics,

hydrology or vegetative structure as Florida dry prairie, making the landscape quite rare. It is one of the three most endangered community types in central peninsular Florida (see Section 4.2. for complete descriptions of this community and rare plants and animals associated).

Like dry prairie, scrubby flatwoods is one of the three most endangered community types in peninsular Florida. Although not completely endemic, the extent of this ecosystem is largely confined to the state. Six rare plant and four rare animal species are supported by this habitat (see Section 4.2. for complete descriptions of this community and rare plants and animals associated).

In the post-restoration state; TOCA will host over 40 acres of wet prairie habitat, 15 acres of dry prairie habitat and 5 acres of scrubby flatwoods habitat. These communities will be integrated within other native ecosystems types to reflect the historical habitat mosaic that likely occurred within the area. This will provide maximal support to the fish and other wildlife that utilize these areas for life history requirements and provide educational and aesthetical benefits to the community.

4.9 Historical, Cultural and Archeological Resources

Although there are two known archeological sites within TOCA, no activities such as earthwork or construction of facilities or amenities will occur within or immediately adjacent to these areas (see Section 2.7 and **Appendix III** for a detailed account of archeological resources within TOCA). Public education regarding the regional and local historical significance of the TOCA property and the cultural and archeological artifacts associated with the site will be provided to park guests through informational kiosks and park brochures.

5.0 LAND USE MANAGEMENT

5.1 Public Access

There is a single point of public vehicular access which is located along Macy Island Road. The access through the property will be restricted to a single 25 ft wide stabilized, unpaved roadway. Two public parking areas will be located at the terminus of the interior road. Passive recreation amenities, including two pavilions, will be located near the parking areas. An informational kiosk will be located near the parking area to identify amenities and provide direction to the trailhead. There is currently one (1) gate providing management access to the property off Macy Island Road. The gate will require regular monitoring for maintenance and/or repair needs from normal wear and tear and vandalism.

Several unimproved interior management roads traverse the conservation area, some of which will be incorporated into the multiuse trail system. The roads have limited stabilization and some have associated ditches. Maintenance for these roads will be limited to mowing and occasional grading. Roads that also double as firelines are subject to harrowing or disking as needed to facilitate fire management needs.

Roads serving as part of the “loop” trail system will be clearly marked to identify the trail. Access to the trail will be limited to a single location adjacent to the parking area. The entrance to the trail will have signage and information on trail length and points of interest to inform the public users. This access point will have an entrance feature that will be designed to restrict vehicular or all-terrain vehicle (ATV) access. Use of the trail will be limited to non-motorized public access.

Access Maintenance and Management Strategies

- Maintain parking area, signs, gates, roads, and trails.
- Clearly identify trailhead
- Monitor and replace trail markers (as required)

5.2 Recreation and Access Management

Osceola County Government has taken steps to preserve the natural beauty of the county and to ensure that there will be natural lands and water resources for future generations. The Environmental Lands Conservation Program was created to acquire and manage environmentally significant lands with a voter-endorsed ad valorem funding source. This property tax enables the program to issue bonds for the purchase of land for water resource protection, wildlife habitat, public green space and resource-based passive recreation. Dispersed recreation activities generally require large tracts of land with some level of isolation. This type of recreation blends well with the TOCA, which provides numerous opportunities for passive recreation in a manner harmonious with the site's natural resources.

The conservation area will include a trailhead with designated parking areas, informational kiosks, two piers to facilitate shore based fishing, a canoe/kayak launch, picnic facilities, and access to the land using trails that in some cases will also serve as access/management roads, or firelines. TOCA will support numerous public recreational opportunities. The opportunities include hiking, fishing, canoeing, picnicking, equestrian activities, and wildlife viewing. Approximately 1.5 miles of marked trails will be available for recreation within the conservation area. The parking/pavilion area of the site will also include a composting restroom facility, barbecue grills, a potable water source, and Americans with Disabilities Act (ADA) compliant parking and access. The facilities will be maintained either by the County or through a County managed service contract.

Recreational Use Management Strategies

- Maintain parking area, kiosks, and trail.
- Maintain current information in recreation guide, trail guides, kiosk, and County website.
- Maintain fishing piers and kayak launch.

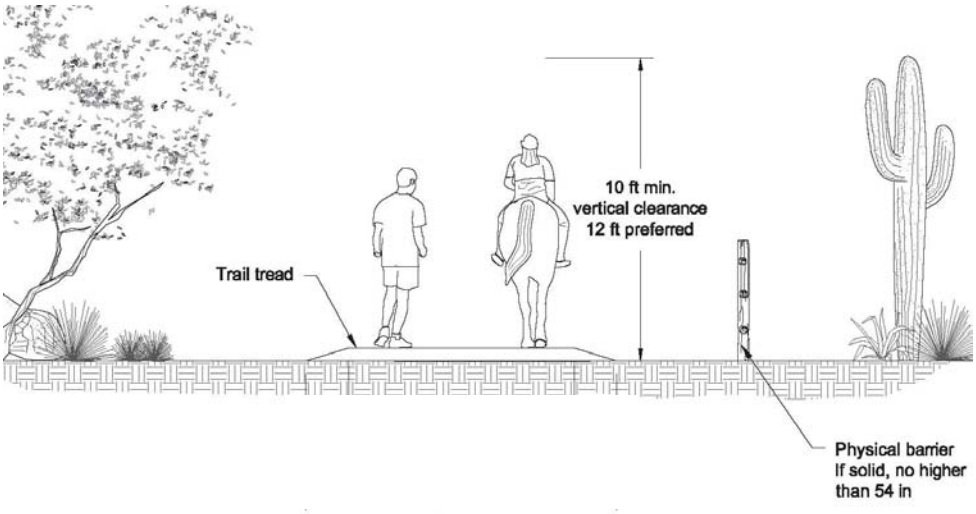
5.3 Trail Maintenance

Trails and trailheads will be maintained by the County, either directly or through a trail maintenance contract. Since the majority of the trails will use existing roads through the site, maintenance requirements will be minimal. Trail safety guidelines, as recommended by the Federal Highway Administration (FHWA) will be effected to provide safe use of mixed trails by equestrians, hikers and bicyclists (**Figure 6: Trail Safety and Design**).

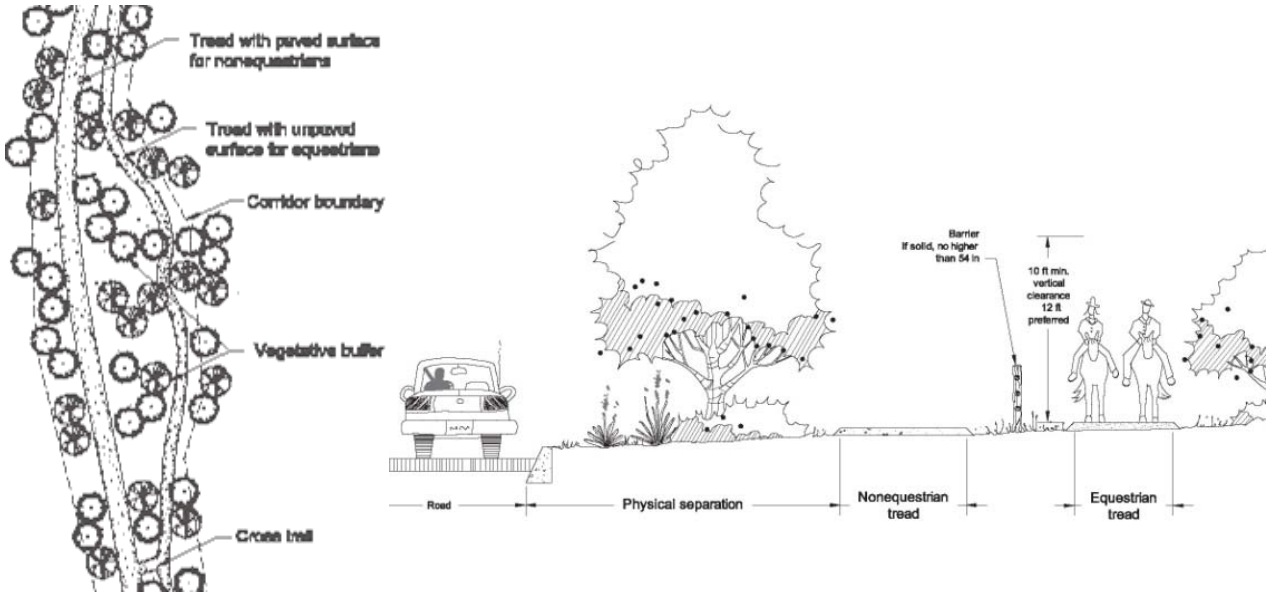
FIGURE 6: Trail Safety and Design

The trail system within TOCA will be designed to provide safe use by hikers, bicyclists and equestrians, as is described in the publication "*Equestrian Design Guidebook for Trails, Trailheads, and Campgrounds,"* created and distributed by the United States Department of Agriculture, Forest Service. The figures below are excerpts from this document and illustrate some of the trail design and safety measures that will be implemented, as possible given site constraints, on the TOCA property.

- Mixed-Use trails will support two "lanes" when possible, approximately 10 feet in total width, to provide safe passing for riders and pedestrians. The "physical: barriers on TOCA will be comprised of shrubby or woody native vegetation.



- Where trail use is discrete between user types (equestrians vs. non-equestrians) or the equestrian trail is sited adjacent to a road, physical barriers between trails and roadways will be implemented.



Trail Maintenance and Management Strategies

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

5.4 Restrictions

Security concerns include illegal motorized vehicle access, dumping, vandalism of gates and fences, and poaching. The County, primarily in coordination with FFWCC and local law enforcement, will administer law enforcement for the property.

5.5 Agreements

In accordance with County Ordinance, the Environmental Land Conservation Program's Management Sub-Fund may receive monies in the form of Federal, State, or other governmental grants, allocations or appropriations, as well as foundation or private grants and donations, for management of lands acquired through this Program or otherwise approved for management. Disbursements from the Management Sub-Fund may be to carry out the management of land acquired pursuant to the Program. As such, the County will seek grants and other funding partnerships to defray restoration costs and to enhance the management and public value of the land. A list of some of the potential alternate funding opportunities is included in **Appendix VI** of this document.

6.0 RULES AND REGULATIONS

The rule that governs the use of this property is set forth in Osceola County Ordinance Part II, Chapter 16 Parks and Recreation. Activities proposed would be subject to relevant Florida Statutes and rules of Chapter 40-4, Florida Administrative Code, Environmental Resource Permits, regulated in this location by the SFWMD, and Section 404 of the Clean Water Act, regulated by the Department of the Army, Corps of Engineers (ACOE). Any impacts, alterations or habitat restoration for listed species would require coordination with the FFWCC and the USFWS. Finally, any activities proposed or immediately adjacent historical or archeological resources within the site will require coordination with the Division of Historical Resources (DHR), Florida Department of State.

7.0 SCHEDULE OF IMPLEMENTATION

The schedule of implementation for LMP actions is included in this section. The majority of actions will occur within years 1 to 3, with a transition from implementation to maintenance in Year 3. The schedule includes management actions through Year 10, and is intended to be updated and refined at the beginning of each year. Year 1 is intended to reflect actions required in calendar year 2012. Year 2 commences January 2013. Graphics depicting the proposed management actions and the implementation timeline are included in **Appendix VII**.

YEAR	MANAGEMENT ACTION	COMPLETION
1	Install perimeter fence	October 2012
	Remove cattle / terminate cattle lease	October 2012
	Secure access improvement permits / pier permit	September 2012
	Construct access road	November 2012
	Install visual buffer plantings along access road	December 2012
	Install trail markers for lakeside and hammock trail segments	December 2012
	Install trailhead signage and access restrictors (posts)	December 2012
	Install upland plantings along trail	December 2012
	Secure benches, picnic tables, compost toilet, pavilions	December 2012
	Remove debris from site	October 2012
2	Secure permit for wetland restoration /boardwalk	March 2013
	Construct fishing pier #1	March 2013
	Install ditch block(s)/hydrologic restoration	May 2013
	Install wetland plantings	November 2013
	Construct pier #2 and kayak launch	July 2013
	Open expanded trail segment(s) – “marsh trail”	December 2013
	Nuisance species maintenance	Quarterly
	Secure permit(s) and install potable well near pavilions	March 2013
3	Nuisance species maintenance	Quarterly
	Trail maintenance	As needed
	Fence /gate maintenance	As needed
	Construct boardwalk and access improvements	2014
4	Implement prescribed fire program	2015
	Nuisance species maintenance	Quarterly
YEAR	**MANAGEMENT ACTION**	**COMPLETION**
4 cont.	Trail maintenance	As needed
	Fence /gate maintenance	As needed
	Facilities maintenance (signage, piers, toilets, etc.)	As needed
5	Nuisance species maintenance	Quarterly
	Trail maintenance	As needed
	Fence /gate maintenance	As needed
	Facilities maintenance (signage, piers, toilets, etc.)	As needed
	Dry prairie prescribed fire	2016
6	Nuisance species maintenance	Semi-annually
	Trail maintenance	As needed
	Fence /gate maintenance	As needed
	Facilities maintenance (signage, piers, toilets, etc.)	As needed
	Mesic flatwoods prescribed fire	2017
	Wet prairie prescribed fire	2017
7	Nuisance species maintenance	Semi-annually
	Trail maintenance	As needed

7 (cont.)	Fence /gate maintenance	As needed
	Facilities maintenance (signage, piers, toilets, etc.)	As needed
	Dry prairie prescribed fire	2018
8	Nuisance species maintenance	Semi-annually
	Trail maintenance	As needed
	Fence /gate maintenance	As needed
	Facilities maintenance (signage, piers, toilets, etc.)	As needed
9	Nuisance species maintenance	Semi-annually
	Trail maintenance	As needed
	Fence /gate maintenance	As needed
	Facilities maintenance (signage, piers, toilets, etc.)	As needed
	Wet prairie prescribed fire	2019
	Dry prairie prescribed fire	2020
10	Nuisance species maintenance	Semi-annually
	Trail maintenance	As needed
	Fence /gate maintenance	As needed
	Facilities maintenance (signage, piers, toilets, etc.)	As needed
	Mesic flatwoods prescribed fire	2020

8.0 BUDGETARY CONSIDERATIONS

The budgetary considerations for the implementation and management of the TOCA represent a significant investment by Osceola County. This investment was acknowledged when the property was acquired and a preliminary budget for the improvements was included in the Interim Management Plan for the site. Those cost estimates have been updated to reflect the management actions in this LMP and are included in the table in **Appendix VIII**.

9.0 REFERENCES

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TABLES

Table I: Observed Listed Wildlife Species

Scientific Name	Common Name	Listed Status		
		Federal	State	FNAI
Alligator mississippiensis	American Alligator	TSA	M	
Aramus guarauna	Limpkin		SSC	S3
Egretta caerulea	Little Blue Heron		SSC	
Egretta thula	Snowy Egret		SSC	S3
Egretta tricolor	Tri-colored Heron		SSC	
Elanoides forficatus	Swallow-tailed Kite			S2
Eudocimus albus	White Ibis		SSC	
Grus canadensis pratensis	Florida Sandhill Crane		T	S2/S3
Haliaeetus leucocephalus	Southern Bald Eagle	DL	M	S3
Mycteria americana	Wood Stork	E	E	S2
Plegadis falcinellus	Glossy Ibis			S3
Rostrhamus sociabilis plumbeus	Everglades Snail Kite	E	E	S2
Sciurus niger shermani	Sherman's Fox Squirrel		SSC	S3

FWC/USFWS Rank:

DL = Delisted due to recovery
M = Managed Species
TSA= Threatened Due to Similarity of Appearance
SSC = Species of Special Concern
T = Threatened
E = Endangered

FNAI Rare Species Ranking:

S1 = Critically imperiled in Florida, less than 1,000 individuals, vulnerable to extinction
S2 = Critically imperiled in Florida, less than 3,000 individuals, vulnerable to extinction
S3 = Very rare or found locally in restricted range, less than 10, 000 individuals

Table II: Observed Non-Listed Species

Avian

Scientific Name	Common Name
Agelaius phoeniceus	Red-winged blackbird
Anhinga anhinga	Anhinga
Ardea alba	Great egret
Ardea herodias	Great blue heron
Bubulcus ibis	Cattle egret
Buteo jamaicensis	Red-tailed hawk
Cathartes aura	Turkey vulture
Charadrius vociferus	Killdeer
Colinus virginianus spp.	Bobwhite quail
Coragyps atratus	Black vulture
Corvus brachyrhynchos	American crow
Corvus ossifragus	Fish crow
Fulica americana	American coot
Gallinago gallinago	Common snipe
Gallinula chloropus	Common moorhen
Meleagris gallopavo	Wild turkey
Mimus polyglottos	Northern mockingbird
Pipilo erythrophthalmus	Eastern towhee
Porphyrula martinica	Purple gallinule
Quiscalus major	Boat-tailed grackle
Quiscalus quiscula	Common grackle
Strix varia	Barred Owl
Sturnella magna	Eastern meadowlark
Tringa flavipes	Lesser Yellowlegs
Zenaida macroura	Mourning dove

(Table II Continued)

Mammal

Scientific Name	Common Name
Didelphis virginiana	Virginia opossum
Procyon Lotor	Raccoon
Sciurus carolinensis	Eastern grey squirrel

Reptiles and Amphibians

Scientific Name	Common Name
Hyla cinerea	Green treefrog
Pseudemys floridana spp.	Peninsula cooter
Rana grylio	Pig Frog
Rana sphenocephala utricularia	Southern Leopard frog

Table III: Lake Tohopekaliga Fish Species;

species either observed during field investigations (*), reported to occur by FWC or local fishermen (+), or expected to occur due presence in connected waters.

Scientific Name	Common Name
Ameiurus nebulosus	Brown bullhead +
Amia calva	Bowfin +
Dorosoma cepediamum	Gizzard shad +
Dorosoma petenense	Threadfin shad +
Erimyzon sucetta	Lake chubsucker
Esox niger	Chain pickerel +
Fundulus seminolis	Seminole killifish *
Gambusia holbrooki	Eastern mosquitofish *
Ictalurus punctatus	Channel catfish +
Lepomis auritus	Redbreast sunfish +
Lepomis gulosus	Warmouth+
Lepomis macrochirus	Bluegill *+
Lepomis microlophus	Redear sunfish+
Lepomis punctatus	Spotted sunfish+
Lepisosteus oculatus	Spotted gar *
Lepisosteus osseus	Longnose gar +
Lepisosteus platyrhincus	Florida gar +
Micropterus salmoides floridanus	Largemouth bass *+
Notemigonus crysoleucas	Golden shiner +
Poecilia latipinna	Sailfin molly *
Pomoxis nigromaculatus	Black crappie +
Strongylura spp.	Needlefish +

Table IV: Exotic or nuisance plants observed at TOCA

Scientific Name	Common Name	FLEPPC	FDACS	USDA
Alternanthera philoxeroides	alligator weed	II	P	
Cinnamomum camphora	camphor tree	I		
Eichhornia crassipes	water-hyacinth	I	P	N
Hydrilla verticillata	hydrilla	I	P	N
Lantana camara	lantana, shrub verbena	I		
Ludwigia peruviana	Peruvian primrosewillow	I		
Panicum repens	torpedo grass	I		
Salvinia minima	water spangles	I	P	
Sapium sebiferum	Chinese tallow tree	I		
Schinus terebinthifolius	Brazilian pepper	I	P	
Scleria lacustris	Wright's nutrush	I		
Solanum viarum	tropical soda apple	I	NW	N
Urena lobata	Caesar's weed	I		

FLEPPC Rank:

I = displace native plants, alter community structures or functions, hybridize with natives

II = very abundant/frequent but do not alter native communities to extent shown by Cat. I

FDACS Rank:

P = Prohibited

NW = Noxious Weed

USDA Rank:

N = Noxious Weed

APPENDIX I

Tohoqua DRI Maps

Osceola County Planning Commission

July 31, 2008

ITEM NUMBER

DRI 06-0011
ECFRPC DRI #5389

Applicant
Newland Communities and Regional Development 192, LLC

Type of Application
Application for a Development of Regional Impact

Location
South of Neptune Road, west of Ronald Reagan Turnpike and the C-31 Canal, north of Goblet's Cove (Lake Tohopekaliga) and east of Macy Island Road

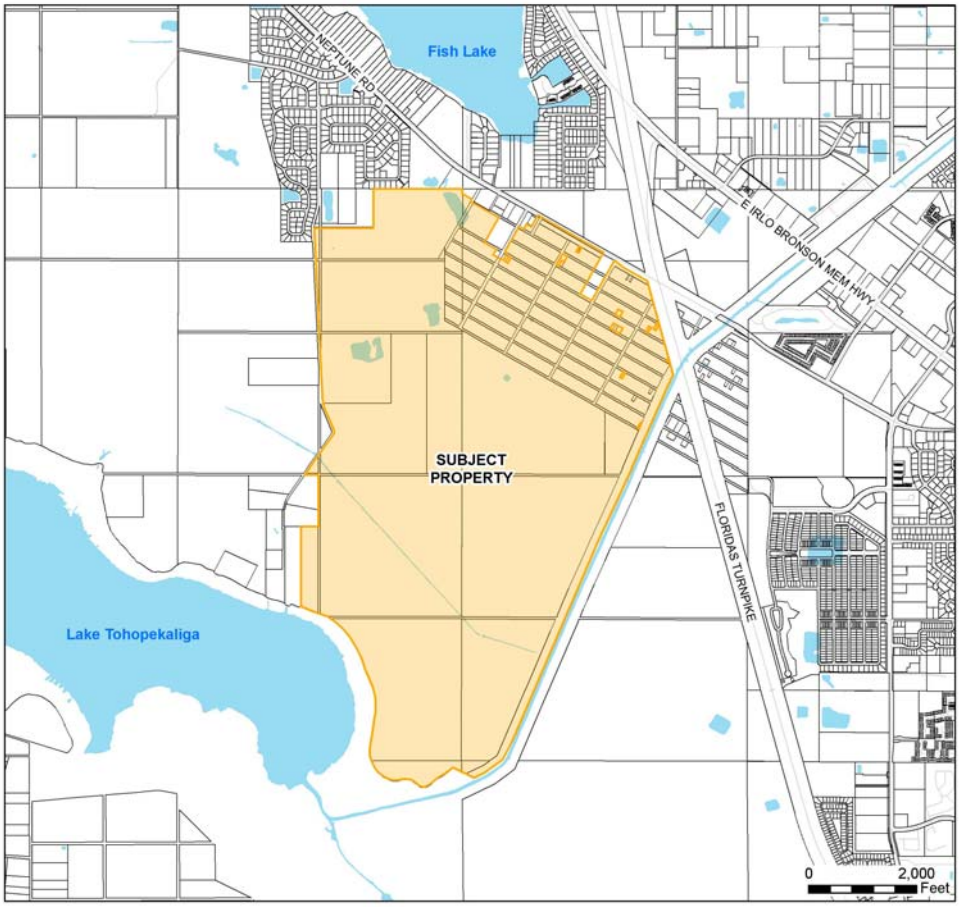
Commission Districts

District 4, Ken Smith

Requested Action
Approve DRI06-0011 and the subsequent Development Order.

Recommendation
Approval subject to provisions of Development Order.

Project Planners
R. Wayne Bennett, AICP
Michelle Beamon



Item Summary

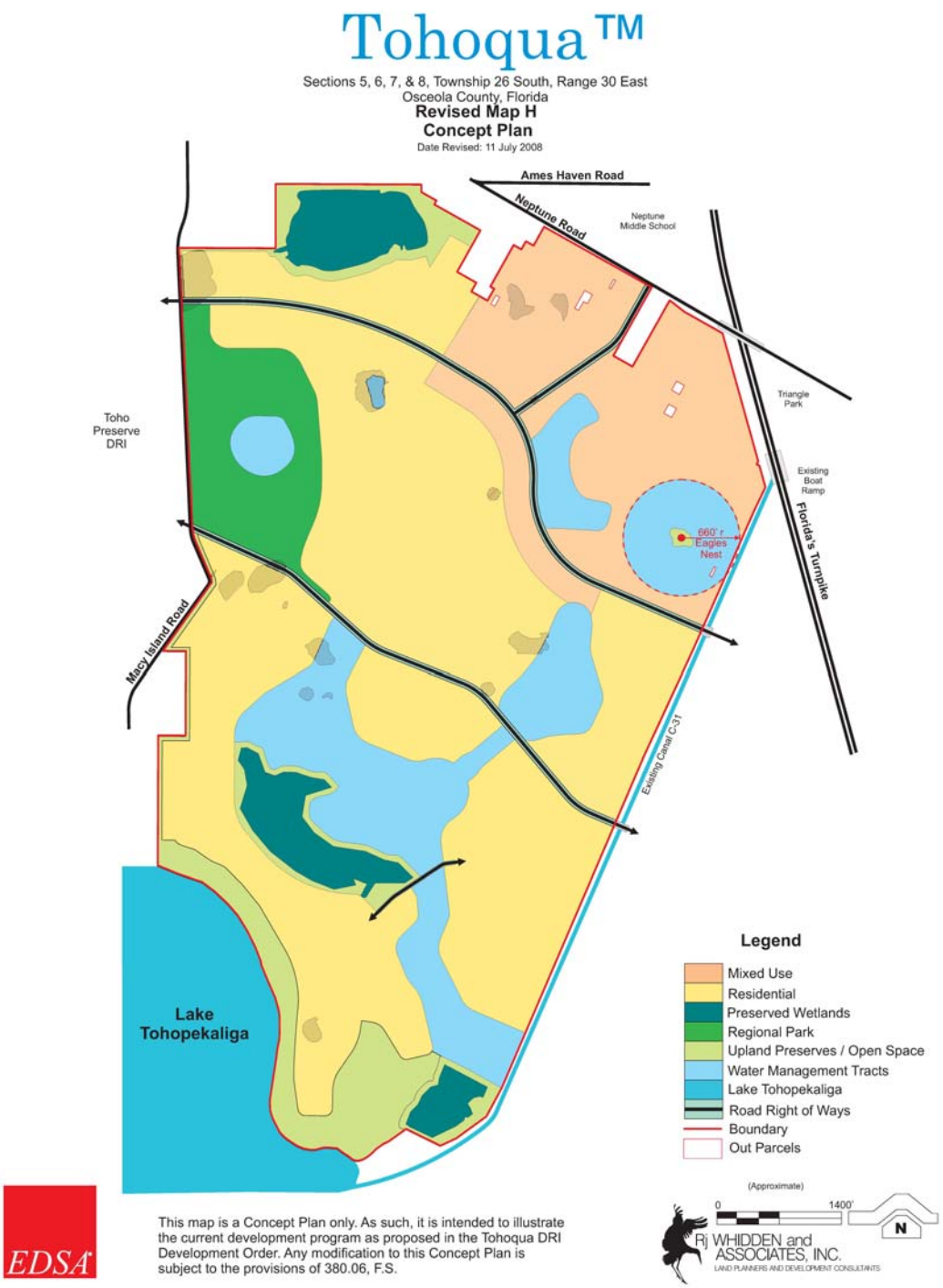
Project Description

The applicant has proposed the Tohoqua (fka. Mariners Cove) Development of Regional Impact (DRI).

The proposed development includes: a maximum of 3,220 mixed residential units a maximum of 150,000 square feet of retail/services and office use, 30,000 square feet of institutional/civic uses, and up to 300 hospitality suites. The project also features park and recreation areas, pedestrian/bike trails, preserves and conservation areas, a regional drainage and flood control facility, a community center, public services, an elementary school, new road networking, a transit corridor, a boat ramp and an internal lake system with private docks.

A total project size of approximately 1,185 acres.

Exhibit B
Master Plan / DRI Map "H"



APPENDIX II

Soil Descriptions

1 - Adamsville sand

This map component is on rises of marine terraces on coastal plains. The parent material consists of sandy marine deposits. Slopes range from 0 to 2 percent. Depth to a root-restrictive layer is greater than 60 inches. The natural drainage class is somewhat poorly drained. Water movement in the most restrictive layer is high. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at a depth of 33 inches in months June through November. The content of organic matter in the surface horizon is about 1 percent. This soil does not meet hydric criteria.

This soil is typically associated with Upland Hardwood Hammock ecological communities comprised of a mixture of hardwood species; hophornbeam *(Ostrya virginiana),* hickory *(Carya* spp.), red maple *(Acer rubrum*), sweetgum *(Liquidambar styraciflua),* live oak*,* laurel oak *(Quercus laurifolia)* and water oak *(Quercus nigra)*. On the subject property in the present condition, the vegetation correlated with this soil type is comprised of live oak canopy and a sparse understory of forbs and grasses where the canopy is present. The adjacent areas are comprised of herbaceous communities, predominantly improved pasture, and includes some native grasses such as broomgrasses (*Andropogon spp.*), thistle.

6 - Basinger fine sand, depressional

This map component is in depressions on marine terraces on coastal plains. The parent material consists of sandy marine deposits. Slopes range from 0 to 2 percent. Depth to a root-restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is very high. This soil is not flooded but is frequently ponded. A seasonal zone of water saturation is at the surface in months June through December. The content of organic matter in the surface horizon is about 1percent. This soil meets hydric criteria.

This soil is often associated with freshwater marsh communities and this expected community type is observed in the present condition. On the subject property the vegetation correlated with this soil type is the littoral marsh located along the shoreline of Lake Tohopekaliga. The community includes pickerelweed *(Pontederia cordata*), duck potato *(Sagittaria sp.),* soft rush *(Juncus effuses),* cattail *(Typha spp.)*, bulrush (*Scirpus spp.*) and various other sedges, grasses, rushes and forbs.

12 - Floridana fine sand, depressional

This map component is in depressions on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Slopes range from 0 to 2 percent. Depth to a root-restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is moderately low. This soil is not flooded but is frequently ponded. A seasonal zone of water saturation is at the surface in months June through December. The content of organic matter in the surface horizon is about 11 percent. This soil meets hydric criteria.

This soil is often associated with freshwater marsh communities and this expected community type is observed in the present condition, though several nuisance species have established colonies in this area. On the subject property the vegetation correlated with this soil type is a freshwater marsh and shrubby wetland community adjacent to the C-31 canal. The community includes pickerelweed , duck potato, soft rush, cattail, bulrush and swamp hibiscus (*Hibiscus grandiflorus*). Carolina willow *(Salix caroliniana)* and primrose-willow *(Ludwigia* spp.) are abundant and stand in monoculture in some areas.

14 - Holopaw fine sand

This map component is on marine terraces on coastal plains, typically in drainageways and on flats. The parent material consists of sandy and loamy marine deposits. Slopes range from 0 to 2 percent. Depth to a root-restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is high. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at a depth of 6 inches in months June through November. The content of organic matter in the surface horizon is about 3 percent. This soil meets hydric criteria.

This soil is typically associated with Upland Hardwood Hammock ecological communities comprised of a mixture of hardwood species, such as hophornbeam,, hickory, red maple, sweetgum, live oak, laurel oak and water oak. The understory may include beauty berry (*Calicarpa americana*), switchgrass *(Panicum virgatum),* woodoats *(Chasmanthium spp.)* and broomgrasses. On the subject property in the present condition, the vegetation correlated with this soil type is comprised of forbs and grasses. The predominant ecological community is improved pasture.

16 - Immokalee fine sand

This map component is in flatwoods on marine terraces on coastal plains. The parent material consists of sandy marine deposits. Slopes range from 0 to 2 percent. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately high. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at a depth of 12 inches in months June through September. The content of organic matter in the surface horizon is about 2 percent. This soil does not meet hydric criteria.

This soil is typically associated with flatwoods on nearly level, poorly drained, coarse textured soils that typically have a spodic horizon. In natural areas, the vegetative community may consist of scattered slash pine (*Pinus elliotti*) or loblolly pine (*Pinus taeda*). In places, longleaf pine is common. The plant community includes a shrubby understory of saw palmetto, gallberry, and other woody plants. The primary vegetation community consists mainly of creeping bluestem, purple bluestem *(Andropogon glomeratus* var. *glaucopsis),* or South Florida bluestem (also known as Florida little bluestem, *Schizachyrium rhizomatum)* in the wetter areas and lopsided indiangrass.

On the subject property in the present condition, the vegetation correlated with this soil type is comprised of forbs and grasses. The predominant ecological community is improved pasture.

25 - Nitttaw muck

This map component is in depressions on marine terraces on coastal plains. The parent material consists of clayey marine deposits. Slopes range from 0 to 2 percent. Depth to a root-restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is moderately low. This soil is occasionally flooded. It is frequently ponded. A seasonal zone of water saturation is at the surface in all months. The content of organic matter in the surface horizon is about 55 percent. This soil meets hydric criteria.

This soil is often associated with freshwater marsh communities and this expected community type is observed in the present condition. On the subject property the vegetation correlated with this soil type is the littoral marsh located along the shoreline of Lake Tohopekaliga. The community includes

pickerelweed *(Pontederia cordata*), duck potato *(Sagittaria sp.),* soft rush *(Juncus effuses),* cattail *(Typha spp.)*, bulrush (*Scirpus spp.*) and various other sedges, grasses, rushes and forbs.

32 - Placid fine sand, depressional

This map component is in depressions on marine terraces on coastal plains. The parent material consists of sandy marine deposits. Slopes range from 0 to 1 percent. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is high. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at the surface in months June through December. The content of organic matter in the surface horizon is about 3 percent. This soil meets hydric criteria.

This soil is often associated with freshwater marsh communities and this expected community type is observed in the present condition. On the subject property the vegetation correlated with this soil type is the littoral marsh located along the shoreline of Lake Tohopekaliga. The community includes pickerelweed, duck potato *(Sagittaria sp.),* soft rush , cattail *(Typha spp.)*, bulrush (*Scirpus spp.*) and various other sedges, grasses, rushes and forbs.

38 - Riviera fine sand

This map component is on flats on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Slopes range from 0 to 2percent. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at a depth of 6inches in the months of June through November. The content of organic matter in the surface horizon is about 1 percent. This soil meets hydric criteria.

This soil is often associated with wetland hardwood hammock communities comprised of hornbeam, laurel oak, live oak, water oak and scattered cabbage palms, red maple, sweetgum, and cypress *(Taxodium* spp.). Herbaceous vegetation may include woodoats, eastern gamagrass *(Tripsacum dactyloides),*switchgrass, purple bluestem, maidencane and little blue maidencane. On the subject property the vegetation associated with this soils type is comprised highly of hydrophytic sedges, rushes and grasses. Black gum (*Nyssa sylvatica* var *biflora*) and bald cypress trees can be found along adjacent to the mapped limits. A small herbaceous wetland comprised of pickerelweed, duck potato, soft rush and smartweed (*Polygonum spp.*) is also located along the mapped soil unit boundary.

42 - Smyrna fine sand

This map component is on flats on marine terraces on coastal plains. The parent material consists of sandy marine deposits. Slopes range from 0 to 2 percent. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately high. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at a depth of 12 inches in months June through September. The content of organic matter in the surface horizon is about 4 percent. This soil does not meet hydric criteria.

This soil is typically associated with flatwoods on nearly level, poorly drained, coarse textured soils that typically have a spodic horizon. In natural areas, the vegetative community may consist of scattered slash

pine or loblolly pine trees. In places, longleaf pine is common. The plant community includes a shrubby understory of saw palmetto, gallberry, and other woody plants. The primary vegetation community consists mainly of creeping bluestem, purple bluestem *(Andropogon glomeratus* var. *glaucopsis),* or South Florida bluestem (also known as Florida little bluestem, *Schizachyrium rhizomatum)* in the wetter areas and lopsided indiangrass.

On the subject property in the present condition, the vegetation correlated with this soil type is comprised of forbs and grasses. The predominant ecological community is improved pasture.

47 - Winder loamy fine sand

This map component is on flats on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Slopes range from 0 to 2 percent. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately low. This soil is frequently flooded. It is not ponded. A seasonal zone of water saturation is at a depth of 6 inches in months June through November. The content of organic matter in the surface horizon is about 4 percent. This soil meets hydric criteria.

This soil is typically associated with flatwoods on nearly level, poorly drained, coarse textured soils that typically have a spodic horizon. In natural areas, the vegetative community may consist of scattered slash pine or loblolly pine trees. In places, longleaf pine is common. The plant community includes a shrubby understory of saw palmetto, gallberry, and other woody plants. The primary vegetation community consists mainly of bluestem, or South Florida bluestem, also known as Florida little bluestem, in the wetter areas and lopsided indiangrass.

On the subject property, the vegetation correlated with this soil type is pasture grasses and areas of wet prairie. The predominant ecological community is improved pasture

APPENDIX III

Cultural Resource Survey

Florida Master Site File

Survey Log Sheet

Electronic Version 1.1.0

Survey # 11079
Entry Date 1/17/2005

IDENTIFICATION AND BIBLIOGRAPHIC INFORMATION

Survey Project (name and project phase) Butler Ridge/Partin #2--Phase I

Report Title (exactly as on title page) Cultural Resources Survey, Butler Ridge--Partin #2, Osceola County, Florida

Report Author (last name first)

>> Wayne, Lucy B.

Publication Date (year) 2004 Total Number of Pages in Report (not including site forms) 38

Publication Information (use the style of American Antiquity) Dickinson, Martin F. and Lucy B. Wayne. 2004. Cultural Resources Survey, Butler Ridge--Partin #2, Osceola County, Florida. SouthArc, Inc., Gainesville, FL.

Supervisor(s) of Fieldwork (whether or not the same as author(s); last name first; add state for cities outside of Florida)

Name: >> Dickinson, Martin F.;Southarc Inc, Gainesville;
Organization: Southarc Inc, Gainesville >>
City: >>

Key Words/Phrases

>> Lake Tohopekaliga

Survey Sponsors (corporation, government unit, or person who is directly paying for fieldwork)

Name: Regional Development/192 LLC
Address/Phone: 11507 N. Shore Golf Club Blvd., Orlando, FL 32832 (407)423-9861
Organization:

Recorder Name (last name first) Wayne, Lucy B. Date Log Sheet Completed 1/17/2005
Is this survey or project a continuation of a previous project? NO If yes, list previous survey #(s)

MAPPING

County(s)

>> Osceola

USGS 7.5' Series Map(s)

Map Name ST. CLOUD SOUTH Publication Date >> ST. CLOUD SOUTH;1970

DESCRIPTION OF SURVEY AREA

Dates for Fieldwork: Start 11/16/2004 End 11/18/2004 Total Area Surveyed (fill in one) hectares 1184.7 acres
Number of Distinct Tracts or Areas Surveyed 1
If Project is a Corridor, Complete the Following (fill in one for each): Corridor Width: 0 meters 0 feet
Corridor Length: 0 kilometers 0 miles

ATTACH PLOT OF SURVEY AREA ON PHOTOCOPIES OF USGS 1:24,000 MAP(S)

Survey #

Survey Log Sheet

RESEARCH AND FIELD METHODS

Types of Survey (select as many as apply)

>> Architectural

Other, Unlisted Survey Types (describe):

Preliminary Research Methods (select as many as apply)

>> Aerial photography

Archaeological Methods (describe the proportion of sites at which method was used, select as many methods as apply)

Method Used	Proportion	
Screened shovel,1/4"	Method Used 50-90%	>> Screened shovel,1/4";Method Used 50-90%

Historical Architectural Methods (describe the proportion of properties at which method was used, select as many methods as apply)

Method Used	Proportion	
Windshield	Method Used 90-100%	>> Windshield;Method Used 90-100%

Notes on Field Methods (e.g., scope, intensity, procedures) 25, 50, 100-m intervals, 50x50x100 cm units, 1/4" screen

SURVEY RESULTS (cultural resources recorded)

Site Significance Evaluated? YES

Site Counts: Previously Recorded Sites 0 Newly Recorded Sites 3

Previously Recorded Site #s with Site File Update Forms (List site #'s without "8")

Newly Recorded Site #s (Make sure all are originals and not updates. List site #'s without "8") OS2390, 2391, 2392

Type of Site Form Used: >> SmartForm-Structure

******* MASTER SITE FILE USE ONLY ******

FMSF Staffer:

Electronic Form Used:

Origin of Survey Report: >>

1A-32 Permit #

Type of Document (select as many as apply)

>>

Other Document Type:

*Note: Do NOT plot document types marked with an asterisk

Document Destination:

Plotability(1):

Plotability(2):

CRAT # 2005832

MS# 0

Supplementary Printout

> **Report Author (last name first)**

Dickinson, Martin F.
Wayne, Lucy B.

> **Key Word/Phrase Describing Survey**

Lake Tohopekaliga

> **County Surveyed**

Osceola

> **USGS 7.5 Map for Surveyed Area: Name/Latest Revision Date**

ST. CLOUD NORTH;1970
ST. CLOUD SOUTH;1970

> **Types of Survey**

Archaeological
Architectural

> **Preliminary Method Used**

FMSF property/resource search
FMSF previous survey search
Literature search
Examined local property records
Public lands surveys records
Aerial photography

> **Archaeological Method Used/Percent**

Controlled surface collection;Method Used 50-90%
Screened shovel.1/4";Method Used 50-90%

> **Architectural Method Used/Percent**

Windshield;Method Used 90-100%

> **Type of document:**

> **Fieldwork Supervisor (Name[last,1st]/Org./City)**

Dickinson, Martin F.;Southarc Inc, Gainesville;

> **Site Form Used**

SmartForm-Archaeology
SmartForm-Structure

> **Origin of Survey Report**

FLORIDA DEPARTMENT OF STATE
Glenda E. Hood
Secretary of State
DIVISION OF HISTORICAL RESOURCES

Ms. Lucy B. Wayne, Ph.D.
SouthArc, Inc.
3700 N.W. 91st Street, Suite D300
Gainesville, FL 32606-7307

June 1, 2005

Re: DHR Project File No. 2005-832C / Additional Information Received by DHR: May 25, 2005
Cultural Resources Survey Butler Ridge – Partin #2 Osceola County, Florida

Dear Dr. Wayne:

Our office received and reviewed the above referenced survey report in accordance with this agency's responsibilities under Section 380.06, *Florida Statutes*, for assessment of possible adverse impact to cultural resources (any prehistoric or historic district, site, building, structure, or object) listed, or eligible for listing, in the *National Register of Historic Places (NRHP)*, or otherwise of historical, architectural or archaeological value.

In November 2004, SouthArc, Inc. conducted an archaeological and historical survey of the Butler Ridge – Partin #2 on behalf of Regional Development/192 LLC. One previously recorded, two previously unrecorded archaeological sites, and one historic structure were identified within the project area during the investigation.

8OS25, a lithic scatter, was listed within the project area. SouthArc, Inc. was unable to relocate 8OS25 during investigation of the project area. It is the opinion of SouthArc, Inc. that 8OS25 was destroyed by prior dredging activities.

The Willet-Up-a-Tree site (8OS2390), a low-density lithic scatter, was identified within the project area. Due to low research potential and the lack of intact features or cultural strata, it is the opinion of SouthArc, Inc. that 8OS2390 does not appear eligible for listing in the *NRHP*.

The Partin site (8OS2391), a prehistoric and historic artifact scatter, was identified within the project area. Due to low research potential and the lack of intact features or cultural strata, it is the opinion of SouthArc, Inc. that 8OS2391 does not appear eligible for listing in the *NRHP*.

The Red House (8OS2392), a side-gable frame structure, was identified within the project area. Due to a lack of architectural distinction or historical association, relating to its relocation, it is the opinion of SouthArc, Inc. that 8OS2392 does not appear eligible for listing in the *NRHP*.

It is the opinion of SouthArc, Inc. that the proposed development will have no effect on cultural resources listed or eligible for listing in the *NRHP*, or otherwise of historical, architectural or archaeological value. SouthArc, Inc. recommends no further investigation of the subject parcel.

Based on the information provided, our office concurs with these determinations and finds the submitted report complete and sufficient in accordance with Chapter 1A-46, *Florida Administrative Code*.

If you have any questions concerning our comments, please contact Claire Nanfro, Historic Sites Specialist, by phone at (850) 245-6333, or by electronic mail at cenanfro@dos.state.fl.us. Your continued interest in protecting Florida's historic properties is appreciated.

Sincerely,

Laura A. Kammerer

for Frederick P. Gaske, Director, and
State Historic Preservation Officer

FLORIDA DEPARTMENT OF STATE
Glenda E. Hood
Secretary of State
DIVISION OF HISTORICAL RESOURCES

Ms. Lucy B. Wayne, Ph.D.
SouthArc, Inc.
3700 N.W. 91st Street, Suite D300
Gainesville, FL 32606-7307

March 24, 2005

Re: DHR Project File No. 2005-832**B** / Additional Information Received by DHR: February 24, 2005
Cultural Resources Survey Butler Ridge – Partin #2 Osceola County, Florida

Dear Dr. Wayne:

Our office received and reviewed the above referenced survey report in accordance with this agency's responsibilities under Section 380.06, *Florida Statutes*, for assessment of possible adverse impact to cultural resources (any prehistoric or historic district, site, building, structure, or object) listed, or eligible for listing, in the *National Register of Historic Places (NRHP)*, or otherwise of historical, architectural or archaeological value.

This office received the additional information regarding 8OS25. SouthArc, Inc. was unable to relocate 8OS25 during investigation of the project area. It is the opinion of SouthArc, Inc. that 8OS25 was destroyed by prior dredging activities and as such does not appear eligible for listing in the *NRHP*.

In addition to the information provided on 8OS25, this office requires:

- **An Update Archaeological Site Form.** Please submit an Archaeological Site Form with the present site evaluation, Version 2.2, this form may be found online at http://dhr.dos.state.fl.us/msf/index.html.

Thank you for responding quickly to this unusual circumstance. Our office was notified of this discrepancy by the Florida Master Site File while the report was being entered into the data base. As such, based on the information provided, our office concurs with these determinations and finds the submitted report complete and sufficient in accordance with Chapter 1A-46, *Florida Administrative Code*.

If you have any questions concerning our comments, please contact Claire Nanfro, Historic Sites Specialist, by phone at (850) 245-6333, or by electronic mail at cenanfro@dos.state.fl.us. Your continued interest in protecting Florida's historic properties is appreciated.

Sincerely,

Laura A. Kammerer

for Frederick P. Gaske, Director, and
State Historic Preservation Officer

500 S. Bronough Street • Tallahassee, FL 32399-0250 • http://www.flheritage.com

☐ Director's Office (850) 245-6300 • FAX: 245-6436
☐ Archaeological Research (850) 245-6444 • FAX: 245-6436
☑ Historic Preservation (850) 245-6333 • FAX: 245-6437
☐ Historical Museums (850) 245-6400 • FAX: 245-6433

☐ Southeast Regional Office (954) 467-4990 • FAX: 467-4991
☐ Northeast Regional Office (904) 825-5045 • FAX: 825-5044
☐ Central Florida Regional Office (813) 272-3843 • FAX: 272-2340

FLORIDA DEPARTMENT OF STATE
Glenda E. Hood
Secretary of State
DIVISION OF HISTORICAL RESOURCES

Ms. Lucy B. Wayne, Ph.D.
SouthArc, Inc.
3700 N.W. 91st Street, Suite D300
Gainesville, FL 32606-7307

March 9, 2005

Re: DHR Project File No. 2005-832 / Additional Information Received by DHR: February 24, 2005
Cultural Resources Survey Butler Ridge – Partin #2 Osceola County, Florida

Dear Dr. Wayne:

Our office received and reviewed the above referenced survey report in accordance with this agency's responsibilities under Section 380.06, *Florida Statutes*, for assessment of possible adverse impact to cultural resources (any prehistoric or historic district, site, building, structure, or object) listed, or eligible for listing, in the *National Register of Historic Places (NRHP)*, or otherwise of historical, architectural or archaeological value.

In November 2004, SouthArc, Inc. conducted an archaeological and historical survey of the Butler Ridge – Partin #2 on behalf of Regional Development/192 LLC. Two previously unrecorded archaeological sites and one historic structure were identified within the project area during the investigation.

The Willet-Up-a-Tree site (8OS2390), a low-density lithic scatter, was identified within the project area. Due to low research potential and the lack of intact features or cultural strata, it is the opinion of SouthArc, Inc. that 8OS2390 does not appear eligible for listing in the *NRHP*.

The Partin site (8OS2391), a prehistoric and historic artifact scatter, was identified within the project area. Due to low research potential and the lack of intact features or cultural strata, it is the opinion of SouthArc, Inc. that 8OS2391 does not appear eligible for listing in the *NRHP*.

The Red House (8OS2392), a side-gable frame structure, was identified within the project area. Due to a lack of architectural distinction or historical association, relating to its relocation, it is the opinion of SouthArc, Inc. that 8OS2392 does not appear eligible for listing in the *NRHP*.

It is the opinion of SouthArc, Inc. that the proposed development will have no effect on cultural resources listed or eligible for listing in the *NRHP*, or otherwise of historical, architectural or archaeological value. SouthArc, Inc. recommends no further investigation of the subject parcel.

Based on the information provided, our office concurs with these determinations and finds the submitted report complete and sufficient in accordance with Chapter 1A-46, *Florida Administrative Code*.

If you have any questions concerning our comments, please contact Claire Nanfro, Historic Sites Specialist, by phone at (850) 245-6333, or by electronic mail at cenanfro@dos.state.fl.us. Your continued interest in protecting Florida's historic properties is appreciated.

Sincerely,

Laura A. Kammerer

for Frederick P. Gaske, Director, and
State Historic Preservation Officer

CULTURAL RESOURCES SURVEY
BUTLER RIDGE--PARTIN #2
OSCEOLA COUNTY, FLORIDA

Prepared for

REGIONAL DEVELOPMENT/192 LLC
11507 North Shore Golf Club Boulevard
Orlando, FL 32832
(407)423-9861

Prepared by:
Martin F. Dickinson, RPA
and Lucy B. Wayne, Ph.D., RPA
SOUTHARC, INC
3700 NW 91st Street, Suite D300
Gainesville, Florida 32606
352-372-2633

December 16, 2004
156-04-03

SouthArc, Inc.

Specializing in Archaeological/Historical Services

Members Register of Professional Archaeologists (RPA)

American Cultural Resources Association (ACRA)

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INTRODUCTION

Regional Development/192 is planning to develop a 1,184.7-acre tract of land known as Butler Ridge/Partin #2 in northwestern Osceola County, north and east of Lake Tohopekaliga (Figure 1). The scale of the development required that it be reviewed as a Development of Regional Impact (DRI)., SouthArc, Inc. of Gainesville was contacted by Rj Whidden & Associates to complete the cultural resource survey for the property. The survey was to comply with Chapter 1A-46, *Florida Administrative Code* and Chapters 267 and 373 *Florida Statutes*, Florida's Coastal Management Program, and implementing regulations for possible impact to historic properties listed, or eligible for listing, in the *National Register of Historic Places*. The survey was conducted during November, 2004 under the direction of Martin F. Dickinson, RPA and Jamie Anderson Waters, RPA. Analysis and documentation were completed by Lucy B. Wayne, Ph.D., RPA.

Background research was conducted through the Florida Master Site Files (FMSF), Florida Department of Environmental Protection (DEP) land survey document search, aerial photographs, and maps. From this background research SouthArc developed a systematic surface reconnaissance and subsurface survey of the project area. The purpose of the survey was to identify and assess the significance of potential cultural resources within the property.

Based on this review and an evaluation of environmental conditions within the property, it was determined that overall there was a low potential for archaeological sites due to the poor drainage characteristics of the property. Much of the property was originally marsh until drainage canals were excavated in the late 19th century. The archaeologists felt the areas with the best potential were the edges of the original uplands and the area along the edge of Lake Tohopekaliga. The archaeological survey was stratified based on this evaluation. No testing was conducted within the portion of the property which was formerly marsh, and a series of east-west transects with units at 100-meter intervals was placed across the low potential area. Testing in the former upland edges was conducted at 25 and 50-meter intervals, as was the area along the lake edge. Test interval was reduced to 25 meters to bound sites.

A review of the Florida Master Site File *SHAPE* data base showed no historic structures or *National Register* listings within the project tract. No archaeological or historical sites were identified as being located within the project area (FMSF 2004). The survey resulted in location of two isolated artifact occurrences, two small archaeological sites, 8Os2390 and 8Os2391, and one historic structure, 8Os2392. The Willet-Up-a-Tree site, 8Os2390, consisted of a thin scatter of lithic flakes recovered from four test units at the edge of an oak hammock. The Partin site, 8Os2391, consisted of a mix of prehistoric and early 20th century artifacts recovered from three test units. The prehistoric artifacts consisted of one lithic flake and 18 St. Johns ceramics. The ceramics all came from the same unit, suggesting breakage of a single vessel. Historic materials consisted of amethyst glass, clear bottle glass and unidentified metal fragments. No features were associated with the artifacts.

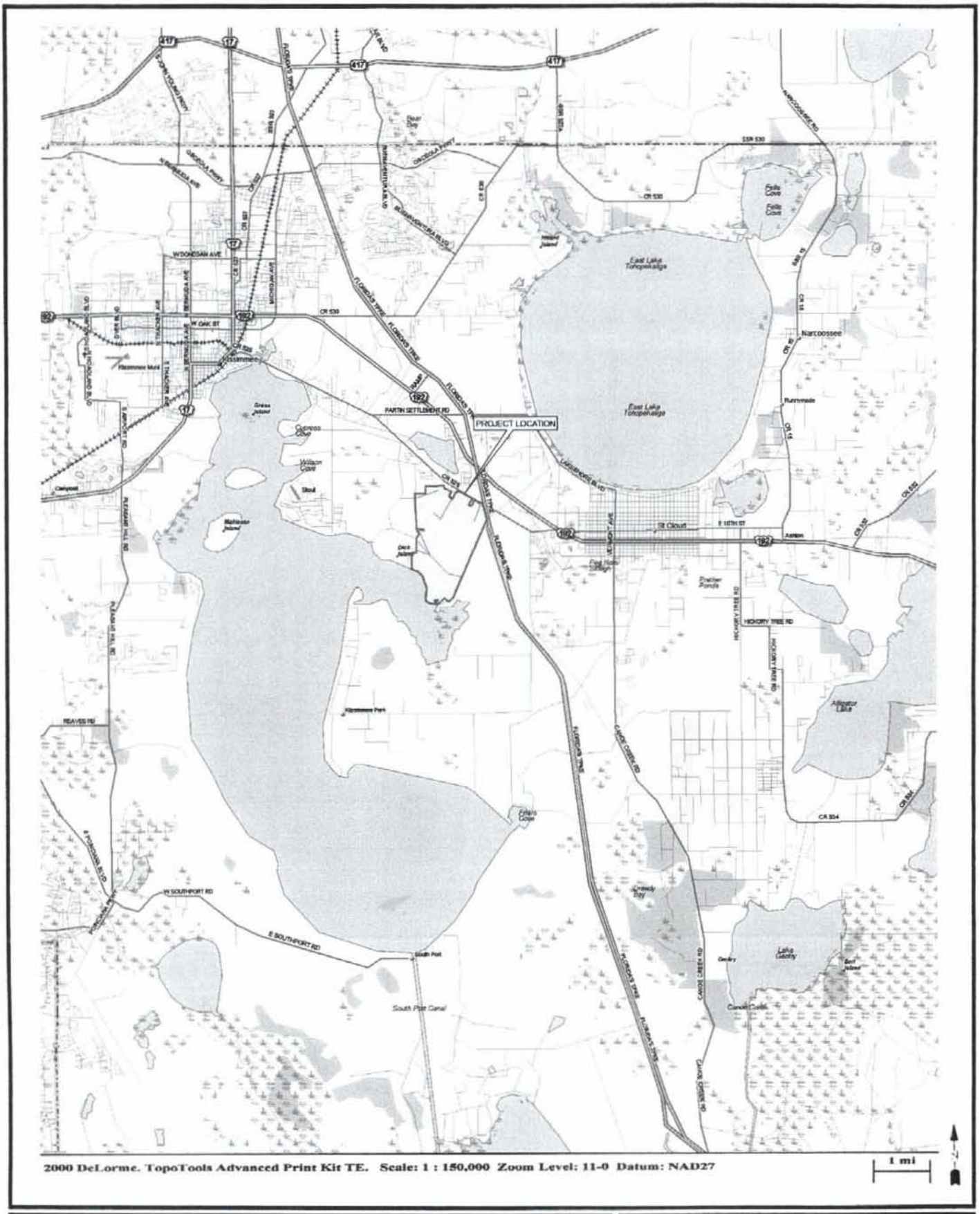

FIGURE 1. PROJECT LOCATION, BUTLER RIDGE, OSCEOLA COUNTY, FLORIDA

SOURCE: DELORME 2000

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The limited nature of the sites indicate that they do not have the potential to yield data which would address regional or local research questions on prehistoric or historic land use. Their value lies in the information they provide on site distribution patterns in this area. The isolated artifact occurrences consisted of ironstone fragments which are probably related to the ongoing agricultural usage of the property; neither find was assigned a site number. The Red House, 8Os2392, is a single-story gable-roofed frame house which was reportedly moved to the property in the 1950s from a nearby airbase according to a local resident (Partin, personal communication, 2004). The house is a standard form with alterations. It has no distinctive architectural features or historic associations. The project historian was unable to determine whether the house actually came from an airbase, or if so, what airbase that would have been. The most likely locations for a base would be either Kissimmee or St. Cloud. It seems unlikely that such mediocre structure would have been moved the distance required to reach either of those communities.

The soils in the project tract are poorly drained, with much of the property likely flooded during the wetter summer months. The property is located adjacent to Lake Tohopekaliga, a large freshwater source; however, the project tract has limited areas of higher elevation and better drained soils adjacent to the present or former lake shore. For this reason the project archaeologists believe that the property was not an area of significant prehistoric occupation.

In the opinion of the project archaeologists and architectural historian, development of the Butler Ridge/Partin #2 property will not impact significant archaeological or historic resources which may be eligible for the *National Register*. No further research is recommended.

PHYSICAL SETTING

Butler Ridge/Partin #2 is located in northwestern Osceola county, west of the city of St. Cloud (Figure 2). The project tract is bordered by County Road (CR) 525 on the northeast, the St. Cloud Canal on the east and southeast, Lake Tohopekaliga on the southwest and an unnamed road on the west. Another canal bisects the property approximately 600 meters northeast of the lake. The property encompasses 1,184.7 acres located in Sections 5, 6, 7 and 8 of Township 26 South, Range 30 East of Osceola County (Figure 2).

The project area lies within the Kissimmee Valley portion of the Eastern Flatwoods District physiographic division. The Kissimmee Valley is described as "seasonally flooded low-lands of river swamp and grassland prairies largely underlain by silty sand; a lagoonal deposit" (Brooks 1981:4). The elevations in this area are generally greater than 50 feet above sea level (Brooks 1981).

Butler Ridge slopes down to the southeast and south from a high point in the northwest corner. Elevations range from 75 feet at the high point down to 50 feet at the lake edge. Drainage is into Lake Tohopekaliga at the south end of the project tract (Figure 2). Lake Tohopekaliga and Fish Lake to the north are the closest permanent water sources.

The Eastern Flatwoods District contains a number of species of pine as well as intermittent hardwood hammocks. The lowest elevations contain pine flatwoods with an understory of grasses as well as open grassy or wet prairies (Abrahamson and Hartnett 1990). Within the project tract live oak and cabbage palm hammocks are confined to the high area in the northwest corner and a small area at the south end of the property (Figure 3). The balance of the property consists of open grassy prairies.

Both hammock areas are in reasonable proximity to water resources. The northwest area would have been at the edge of the wetlands prior to modern drainage. The area at the south end is adjacent to the lake. The lake served as the major deep, freshwater source in the area. Marshes, defined as, "wetlands dominated by herbaceous plants rooted in and generally emergent from shallow water that stands at or above the ground surface for much of the year" (Kushlan 1990: 324), would have existed throughout most of the south half of the tract prior to construction of the drainage canals. Both the marshes and Lake Tohopekaliga provide habitat for migratory birds, reptiles, amphibians and a large number of fish species, making them a valuable resource for those living in the area.

The northern half of the Butler Ridge tract is located in the Smyrna-Myakka-Immokalee soils association of poorly drained sands. The southern half lies within the Riviera-Vero association of poorly drained sands over loams. The majority of the property is in poorly to very poorly drained soils (Figure 4 and Table 1). The poorly drained soils primarily support flatwoods, while the very poorly drained soils support marshes and swamps. The two areas of highest elevation also

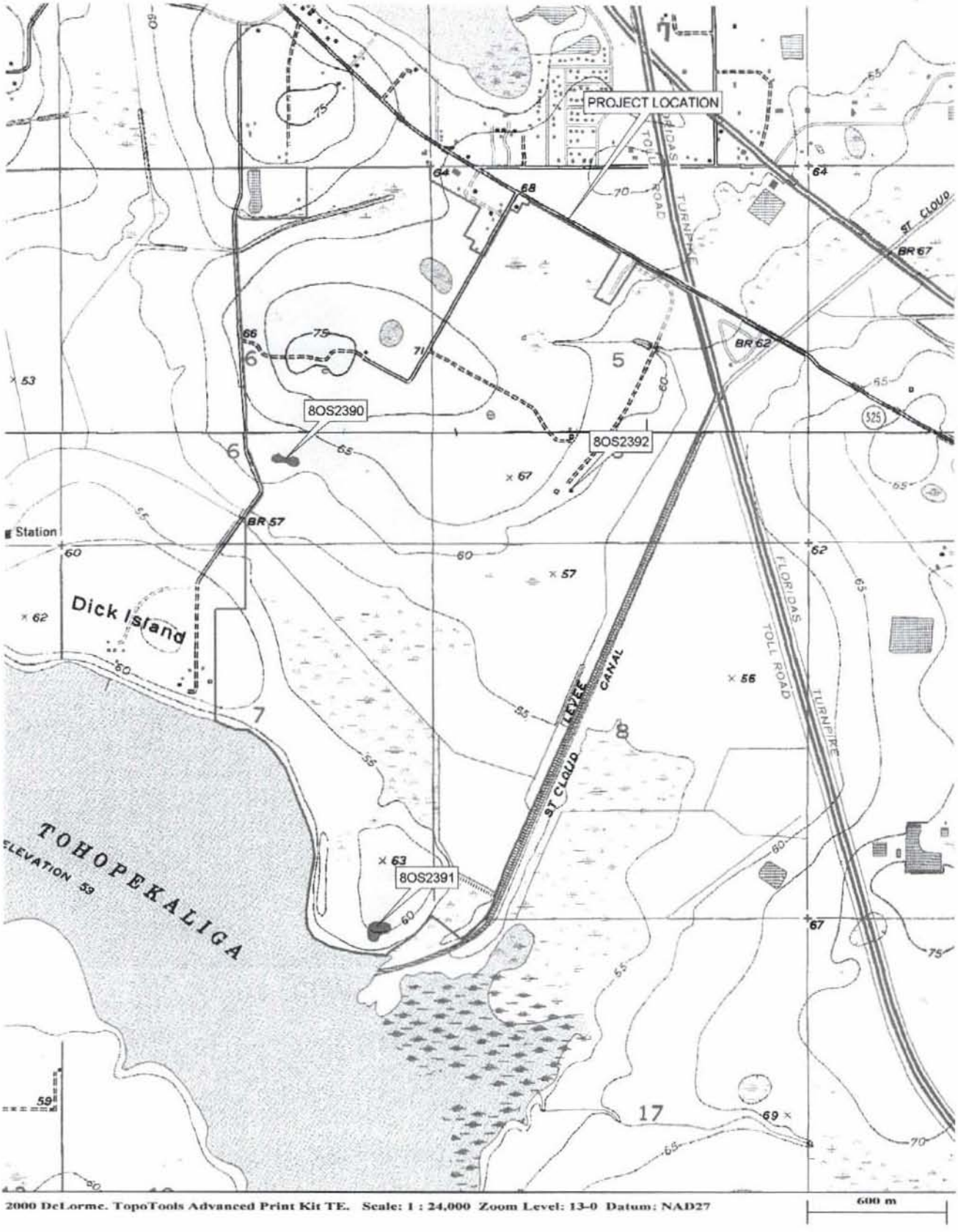

FIGURE 2. TOPOGRAPHIC MAP, BUTLER RIDGE, OSCEOLA COUNTY, FLORIDA

SOURCES: DELORME 2000; USGS 1970a, b

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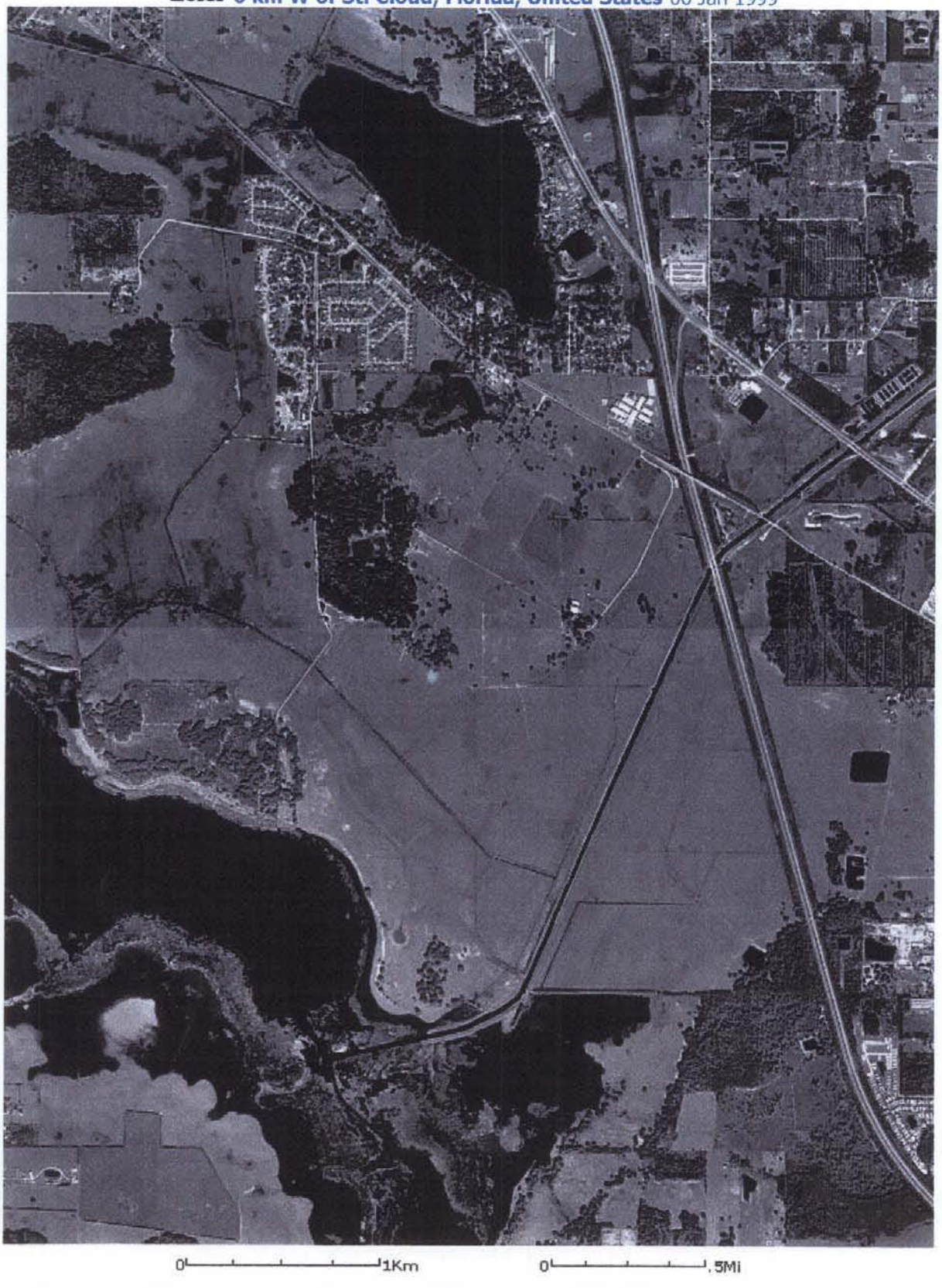

FIGURE 3. AERIAL PHOTOGRAPH, BUTLER RIDGE, OSCEOLA COUNTY, FLORIDA

SOURCE: USGS 1999

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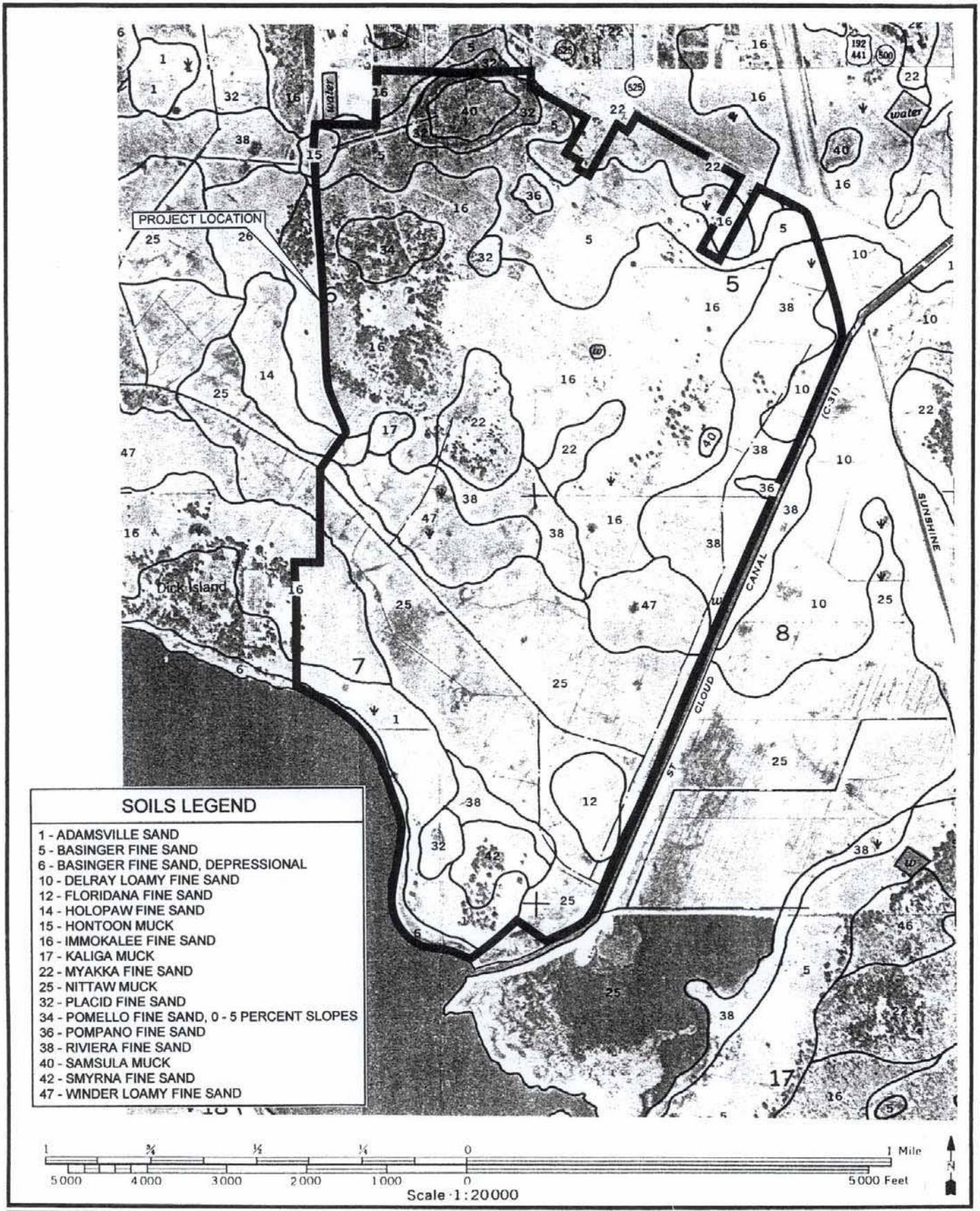

FIGURE 4. SOILS MAP, BUTLER RIDGE, OSCEOLA COUNTY, FLORIDA

SOURCE: USDA 1979

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have the best soil drainage characteristics. The area in the northwest contains moderately well drained Pomello sand, 0 to 5% slope. This soil is considered a transitional soil with scattered pines and sand live oak thickets. The area in the south contains Adamsville sand, a somewhat poorly drained soil which supports live oak hammocks (USDA 1979).

The Partin family initially settled in the Kissimmee-St. Cloud area in the 1830s; however this area was not settled until the end of the 19th century or the early 20th century. Historically the tract has been used for cattle pasture (Figure 5), although the current resident reports that sugarcane was grown in the late 19th century after ditching and drainage occurred to expand the area of agriculturally useful land. This resident reported that the Partins acquired the property in the 1930s. He said additional ditching occurred in the 1940s and that the berm along the lake edge has been repeatedly modified. Within the past year, muck from the lack has been added to the pastures (Partin, personal communication 2004). The project area continues to be used primarily for cattle (Figures 3 and 6).

Table 1. Summary of Soil Types, Butler Ridge/Partin #2, Osceola County, Florida

Type	Drainage and Location	Dominant Vegetation
Pomello fine sand 0 to 5% slope	Moderately well drained transitional areas	Scattered sand pines, longleaf and slash pine, sand live oak thickets, few sawpalmetto, grasses
Adamsville sand	Somewhat poorly drained ridges and knolls	Live oaks with laurel and water oaks, longleaf and slash pine, sawpalmetto, sumac, American beautyberry, greenbriers, Virginia creeper, wild grape and blackberry
Basinger fine sand Immokalee fine sand Myakka fine sand Smyrna fine sand	Poorly drained flatwoods	Longleaf and slash pine, sawpalmetto, inkberry, fetterbush, running oak and grasses
Riviera fine sand	Poorly drained flats	Dense cabbage palms, scattered pine
Winder loamy fine sand	Poorly drained flats	Cabbage palms, scattered longleaf and slash pine, few water oak, sawpalmetto, waxmyrtle, inkberry, American beautyberry
Basinger fine sand, depressional	Poorly drained depressions	Water-tolerant grasses and shrubs (swamp)
Pompano fine sand	Poorly drained depressions	Grasses, scattered longleaf pine, sawpalmetto, waxmyrtle
Holopaw fine sand	Poorly drained drainageways	Cabbage palms, scattered longleaf and slash pine, few water oaks, sawpalmetto, waxmyrtle, inkberry, American beautyberry, grasses
Delray loamy fine sand Floridana fine sand Placid fine sand	Very poorly drained depressions	Maidencane, sand cordgrass, pickerelweed, giant cutgrass, waxmyrtle, sedges, rushes
Hontoon muck Kaliga muck Samsula muck	Very poorly drained marshes	Sawgrass, maidencane, cattails, giant cutgrass, arrowheads, sedges. Thick willow, elderberry and buttonbush in some areas. Forested wetlands of cypress, red maple, loblolly bay, black tupelo and sweetgum in other areas.
Nittaw muck	Very poorly drained swamps	Forested wetlands of baldcypress, red maple, redbay, sweetbay, sweetgum, tupelo, water hickory, water oak, buttonbush, greenbrier, waxmyrtle, switchcane, smartweed, wild grape, lizard's tail and sedges

SOURCE: USDA 1979

FIGURE 5. 1951 AERIAL PHOTOGRAPH, BUTLER RIDGE, OSCEOLA COUNTY, FLORIDA

SOURCE: USDA 1951

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LOOKING NORTHWEST FROM SOUTH END OF PROPERTY

LOOKING NORTH INTO 8OS2391

FIGURE 6. REPRESENTATIVE PHOTOGRAPHS, BUTLER RIDGE, OSCEOLA COUNTY, FLORIDA

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CULTURAL HISTORY

The Kissimmee Chain of Lakes lies within the Okeechobee Basin cultural region. However, it is at the northern limit of this region at its interface with the East and Central Lakes region of the St. Johns River basin (Milanich and Fairbanks 1980). As a result, it is probably heavily influenced by the traditions of the East and Central Lakes Region.

The Okeechobee Basin extends from Cypress Lake on the north to south of Lake Okeechobee, and encompasses the Kissimmee River. The area's geography is defined by Lake Okeechobee and the Kissimmee Chain of Lakes. The culture is identified primarily as Belle Glade, named for a site excavated in the 1930s (Milanich 1994; Willey 1949; Sears 1967). Very little research has been conducted in the northern portion of this region as opposed to the Lake Okeechobee portion. The East and Central Lakes region is essentially defined by the St. Johns River Basin and the Atlantic Coastal area. This may be the best documented archaeological region in Florida. It was the site of some of the earliest systematic archaeology and has been extensively studied in the past 70 years (Milanich and Fairbanks 1980). Although the majority of this research has focused on the river itself and the coastal areas, it is believed that the cultural sequences for the Central Lake District are very similar. Cultural differences between these regions do not become apparent until the middle to late prehistoric periods.

The following paragraphs summarize the current understanding of the cultural traditions represented in the Okeechobee Basin and the East and Central Lakes regions, based on the archaeological studies to date. Dates for the Native American periods are based on those of Milanich (1994):

Pre-ceramic Paleoindian and Archaic	10,000-2,000 B.C.
Ceramic Late Archaic	2,000-1,000 B.C.
Okeechobee Basin	
Belle Glade I	1,000 B.C.-A.D. 200
Belle Glade II	A.D. 200- 800
Belle Glade III	A.D. 800-1400
Belle Glade IV	A.D. 1400-1700
East and Central Lakes	
St. Johns I	500 B.C.- A.D. 750
St. Johns II	A.D. 750-1565
Seminole	A.D. 1715-1842

The periods following European contact in the 16th century are also considered to be the historic periods.

Preceramic

The Preceramic period of this region is poorly documented and little known. Preceramic sites are located along the coast, particularly the Paleo and Early Archaic coast lines which are now many kilometers east and west of the present coasts (Griffin 1988). The Paleo environment of South Florida was much drier than today. Watts (1975, 1980) notes that it was unsuitable for human habitation, consisting of an area of high winds and shifting dunes (Griffin 1988).

Paleoindian Period (10,000 to 7,500 B.C.)

In the traditional view of Paleoindians they are generally described as migratory hunters of the now extinct megafauna such as the mammoth and giant ground sloth. During this period, Florida was much cooler and drier, with the shorelines extending many miles further out to sea from the present coasts as a result of lower sea levels. Outside of the Nalcrest site, most of the Paleoindian sites are located along the coast or are probably inundated (Faught, personal communication 2000). Faught (personal communication 2000) believes that Paleoindians migrated along the coast, explaining the lack of sites in the interior of South-Central Florida. It is believed that these Indians lived in small bands or family groups which followed the migrations of the megafauna on which they depended (Milanich and Fairbanks 1980). The majority of the known inland sites in Florida have been interpreted as "kill sites" located at springs or river crossings where the animals congregated (Milanich and Fairbanks 1980). Dunbar and Waller (1983) have also tied Paleoindian inland site distribution to access to karst outcroppings or deposits.

Paleoindian sites are identified by the presence of the distinctive fluted, lanceolate projectile points such as the Suwannee, Simpson and Clovis (Milanich and Fairbanks 1980). Late Paleoindian, or perhaps Early Archaic sites are marked by the presence of Santa Fe, Tallahassee, Dalton, Greenbriar, Bolen and Hardaway points as well as microlith assemblages (Bullen 1975; Milanich and Fairbanks 1980). The only known Paleoindian site in this region is the Nalcrest site on Lake Weohyakapka in Polk County. The Nalcrest site is "unique" in Florida in that no other site yielded the amount or variety of microlithic tools and cores (Milanich 1994:58)

Archaic Tradition (7,500 to 1,000 B.C.)

The long Archaic Tradition is usually subdivided into three periods, Early, Middle, and Late Archaic, based on changes in the artifact assemblage and site patterns. These changes may have been closely related to the changing environmental conditions of the time. The environment during the Archaic gradually became more like that of today, with warmer, moister conditions and a rise in sea level to near present heights. The megafauna of the Paleoindian period were either extinct or shifted their range to the north, leaving fauna typical of present-day Florida. This change began gradually during the Early Archaic and stabilized by the Late Archaic. As a result, the Middle to Late Archaic is "marked by major differences in settlement pattern, subsistence strategies, and population size" (Miller 1992:100). No Archaic sites have been identified within this region with

the exception of an Archaic component at Nalcrest. Sites identified along the coast are centered near bays and river mouths.

The Archaic Indians have traditionally been described as hunter-gatherers who, of necessity due to the environmental changes, exploited a wider range of resources than their predecessors. They were believed to migrate seasonally, although they were thought to have been somewhat more sedentary than Paleoindians (Torp 1991). Milanich and Fairbanks (1980) indicated a pattern of occupation of lowland villages near water sources from fall to spring, with dispersal for upland hunting in the summer. Archaic sites are characterized by a wide range of tools made from stone, shell, bone, and wood. The lithics from this tradition appear to be more crudely made than the finely crafted Paleoindian points; however, they display a greater variety of forms. The distinctive projectile points for the Archaic are the category of large, stemmed types identified as Florida Archaic Stemmed points (Milanich and Fairbanks 1980).

Early Archaic (7,500 to 5,000 B.C.)

Both Stewart (1992) and Miller (1992) indicate that there is little evidence of Early Archaic occupation in the region with the exception of the Nalcrest site which yielded Archaic points as well as Paleoindian tools (Milanich 1994). In addition, Miller states that the rapidly rising sea level of this time would have inhibited coastal occupation because "the interface between land and sea was an extremely dynamic environment" which could not yet support significant subsistence resources (Miller 1992:101). Griffin (1988) reiterates Widmer (1983) and Watts (1975) in that the region may have been abandoned due to an increase in arid conditions during the Early Archaic.

The diagnostic artifacts for the Early Archaic are stemmed points such as Arredondos, Hamiltons and Kirk Serrated (Bullen 1975). Other artifacts believed to be used during this period include bipointed bone points, barbed bone points, fish hooks, atlatl (spear-thrower) weights, and socketed antler handles (Milanich and Fairbanks 1980). The discovery of a cemetery at the Windover site near Titusville indicates the beginning of burial ceremonialism, although midden burial with little regard for burial patterns is also known (Goggin 1952).

Middle Archaic (5,000 to 3,000 B.C.)

By the Middle Archaic the environment had generally stabilized at present conditions, although it was probably still somewhat drier than today (Stewart 1992). According to Miller (1992), the rise in sea level by this period, coupled with climatic changes, would have resulted in the appearance of artesian springs, as well as the beginnings of the coastal estuarine habitats. The southern portion of the St. Johns Basin was "a system of connected lakes within a broad channel and an even broader flood plain" (Miller 1992:101). This environmental change provided an increased variety of subsistence resources ideal for the hunting-gathering patterns of the Archaic.

No Middle Archaic sites are known in the region. Sites continue to be based along the coasts and inland in North Central Florida. Subsistence in other areas continued to be based on migratory

hunting and gathering, although an increasingly wider variety of resources were exploited. Sites of this period are marked by the presence of large stemmed Newnan projectile points, drilled stone beads, and atlatl weights, as well as a variety of other lithic tools and debitage. Studies also indicate that thermal alteration of lithics peaked during the Middle Archaic (Milanich 1994). Both shell and non-shell sites are known, while burial sites such as the Gauthier site indicate increasing ceremonialism (Ste. Claire 1990).

Late Archaic (3,000 to 2,000 B.C.)

The Preceramic Late Archaic period is still poorly documented within South-Central Florida. This period marks a major change in settlement patterns and strategies of environmental exploitation, as well as a probable population increase (Miller 1992). Settlement focused on intensive exploitation of freshwater shellfish. Stabilization of the ocean shoreline also led to establishment of coastal estuaries with extensive oyster and coquina beds (Miller 1992).

In addition to shell, middens contain bone from a variety of mammals, reptiles, birds and fish. Hearths are indicated by areas of fused crushed shell with evidence of burning. Artifacts include Archaic stemmed points, steatite bannerstones (atlatl weights), other lithic tools and debitage (waste flakes), and bone and shell tools, particularly whelk gouges, bone awls or pins, bone points, and utilized antler. Midden burial continued to be utilized (Goggin 1952), but mass interments are also known at Tick Island and a site excavated by C. B. Moore (Milanich and Fairbanks 1980).

Ceramic Periods

The ceramic periods began during the Late Archaic. These periods mark an increase in regional diversification. As previously noted, although the Kissimmee Lakes area falls within the Okeechobee Basin cultural region of the Ceramic periods, it was also probably influenced by the St. Johns Tradition of the adjacent East and Central Lakes region.

Ceramic Late Archaic Orange (2,000 to 1,000 B.C.)

The Late Archaic Orange period marks the first appearance of ceramics in Florida, although few sites have been identified in South Florida. These early ceramics were primarily slab construction, tempered with plant fibers. Decoration included incising and punctation. Other than the ceramics, the artifact assemblage for this period is quite similar to the preceding Preceramic Late Archaic period and includes Archaic stemmed points, drilled and incised turtle carapaces, and lithic tools, particularly knives and scrapers. Evidence of the use of basketry and mats has been identified from impressions on pottery (Milanich and Fairbanks 1980).

Previous research on this period postulated a subsistence pattern of central-based occupation of the St. Johns River Basin with cold weather migration in small groups to the coast to exploit coquina, or to the interior uplands for hunting (Milanich and Fairbanks 1980). Recent research by Hale (1984) and Russo (1988a; 1988b; 1986; Russo *et al.* 1989; Russo and Ste. Claire 1992) indicate

that this may not be an accurate interpretation. Their studies indicate that both the river basin and the coast may have been occupied year-round by separate semi-nomadic groups which focused on intensive exploitation of their immediate environments, rather than moving between the two areas (Russo and Ste. Claire 1992).

Inland sites focused on freshwater shellfish as well as hunting and gathering of birds, reptiles, mammals, and plant foods. Miller (1992) believes that the large increase in the number of sites in Florida, which can be attributed to the Orange period, is a result of both the successful adaptation of this culture to the rich environment, and a rapid population growth which could be supported by the increased resource base.

Belle Glade and St. Johns Traditions (1,000 B.C.- A.D. 1715)

The Okeechobee Basin is dominated by what has been called the Belle Glade culture, named after the excavation of the Belle Glade site in Palm Beach County (Milanich 1994). The Okeechobee Basin developed possibly the most complex society in the South Florida region, basing their lifestyle on a specialized adaptation to the savannahs and hammocks in the region (Milanich and Fairbanks 1980). Sears (1982) theorized that South Florida was settled by populations from South America bringing their adaptation to savannah environments and fiber tempered pottery. The Belle Glade culture is known to extend to Lake Kissimmee, with Belle Glade pottery recovered near Lake Hatchineha.

The work conducted by William Sears in the 1960s has provided the basis for our knowledge of the Belle Glade culture (Milanich 1994). Belle Glade sites are characterized by the presence of various forms of earthworks including mounds, ponds, borrow pits, ditches, canals, linear and annular embankments, and some peculiar geometric shapes. The chronology for the period is based on Sears' excavations at Fort Center. The primary pottery type is an undecorated type known as Glades Plain. Some examples contain sand tempering while others contain fiber-tempering (Milanich 1994; Sears 1982).

Though the Kissimmee Chain of Lakes region falls within the Okeechobee Basin, it is close enough to the East and Central Lakes region that the St. Johns culture becomes relevant and warrants discussion. Goggin neatly summarizes the St. Johns Tradition as "a pottery using, mound building, semi-sedentary complex probably with agriculture" (Goggin 1952:68). It is divided into two archaeological periods and several subperiods based on ceramic and cultural changes, and is noted for its chalky ware ceramics. The presence of mound burial indicates an increasingly complex society, probably based on chiefdoms. It also implies a rather sedentary existence with larger populations to provide the necessary labor for such construction. Goggin describes the tradition as one of "constant trade and interchange with neighboring northern and western cultures" in which traits were briefly adapted but the society's basic conservatism prevented their long-term integration into the cultural pattern of the Tradition (Goggin 1952:70).

Belle Glade I (1,000 B.C.- A.D. 200)

Sears (1982) identified Belle Glade I as small populations of 100 or fewer persons. The Belle Glade people constructed mounds, ditches and other earthworks near creeks. Mounds were constructed as shell middens, as well as for housing and ceremonial purposes. Subsistence relied on every edible species with the exception of birds. The most significant species were turtle and fish (Sears 1982). Maize was also grown in ditched fields (Milanich 1994). Radiocarbon dates plot the maize samples as early as 450 B.C. Milanich and Fairbanks (1980) feel that this advancement in horticulture was the primary reason for the population shift from the coast inland. House mounds, while typically built on higher ground, were constructed in floodplains. Sears (1982) suggests that this was to take advantage of turtle and fish resources.

The tool assemblage consisted of chert tools, including three main point styles: small triangular projectile points, Hernando-like basally notched, and triangular blade, stemmed Archaic-like points. Most of the chert points were imported whole from the north. The predominant food source, turtle, could easily be caught with cane or hardwood points (Sears 1982). Other lithic tools include knives, abraders, sharpening stones and food grinders. Shell tools were common, brought in from the coast, and include celts, adzes, gouges, picks, and hammers. Plain fiber tempered pottery was the dominant form in the early part of the period, giving way to quartz tempering and pottery with freshwater sponge spicules in the paste like St. Johns wares (Milanich 1994).

Belle Glade II (A.D. 200-800)

Period II is defined by two major changes, site orientation and ceramics. The primary change in the site orientation was the construction of charnel houses and a focus on the ceremonial centers. The charnel houses were created for preparation of the deceased for burial. This complex consisted of a low platform mound, an artificially dug pond, a dense midden across the pond from the mound and a surrounding earthwork. A wood platform was built on the pond with the platform posts notably carved with a variety of animal effigies (Sears 1982).

The ceramic assemblage change is identified by the disappearance of fiber-tempered pottery and the increase in Belle Glade Plain wares distinguished by a smooth or scraped surface. Subsistence changed little except for an increase in production of maize, still grown in the circular ditched fields (Milanich 1994; Sears 1982). Further evidence supports the burning of lime for making dried, stored corn palatable (Sears 1982).

St. Johns I (500 B.C.-A.D. 750)

The St. Johns I period chronologically coincides with the Belle Glade I and II periods. The St. Johns I period is defined by the beginning of mound burials in the form of low sand mounds which may be truncated cones or merely low rises from 4 to 12 feet in height. Mounds may be single or in groups of intersecting mounds; secondary bundle burials are the most common form, but primary burials and cremations are also present. Most of the mounds contain less than 25 burials,

although as many as 100 have been found. The few burial goods consist primarily of "killed" vessels with a hole in the base; the hole may be present before or after firing of the vessel (Goggin 1952).

Goggin (1952) believed that there was shift in occupation during this period from the upper to the lower St. Johns, and that there was a decrease in occupation of the coast, although he noted that this perception may have been due to a lack of site documentation rather than an actual settlement shift. Sites consist of both village middens and burial mounds, often in close association. Middens frequently take on a horseshoe or annular shape (Goggin 1952). Milanich and Fairbanks (1980) postulated that the increased occupation of the lower St. Johns during this period was a result of population increase.

The St. Johns I period has been subdivided into St. Johns I, Ia and Ib based on changes in the ceramic assemblages. Although the period is dominated by the presence of St. Johns Plain ceramics, St. Johns I (500 B.C.-A.D. 100) sites may contain Dunns Creek Red slipped ceramics as well as Deptford wares from the northwest part of Florida. St. Johns Ia (A.D. 100-500) sites have evidence of the Green Point ceremonial complex of the northwest coast in burial mounds, as well as Dunns Creek Red, Deptford, Swift Creek and Weeden Island ceramics. These other wares suggest interaction with the cultural groups to the northwest and along the Gulf Coast. St. Johns Ib (A.D. 500-750) shows a marked increase in Weeden Island influences from the northwest, although St. Johns Plain wares continue to dominate (Goggin 1952; Milanich and Fairbanks 1980).

Belle Glade III (A.D. 800-1400)

Period III is identified by the collapse of the charnel house system. Milanich (1994) notes that this is specific to the Fort Center site and that the ceremonial focus of the site may have moved to another location. No change in settlement patterns or subsistence is evident. Belle Glade Plain continued to be the dominant ceramic type (Milanich 1994; Sears 1982).

St. Johns II (A.D. 750-1565)

St. Johns II is the contemporary period from the East and Central Lakes region. During this period, coastal occupation for the exploitation of oysters became vital to the culture's subsistence pattern. Milanich and Fairbanks (1980) theorized winter occupation of the coast, with spring to summer inland occupation for agriculture. They cite the massive shell middens of this period as evidence of the importance of this resources. St. Johns II sites consist of both shell mounds and shell "fields." Sand burial mounds are often large domed, conical or truncated cones, sometimes with associated earthworks. Both primary and secondary burials are present, but there are few burial goods. Late mounds contain evidence of European contact in the form of artifacts and primary burials in the Christian pattern of east-facing extended burial with crossed arms (Goggin 1952).

The distinguishing artifact for the St. Johns II period is check stamped pottery. Like the previous period, St. Johns II has been divided into three subperiods based on changes in the artifact assemblage. Sites from these periods continue to contain artifacts from cultures located to the west

and south, including Weeden Island, Belle Glade, Fort Walton and Safety Harbor. St. Johns IIa (A.D. 750-1050) is marked by an increase in the use of burial mounds as well as the presence of St. Johns Check Stamped ceramics. This period may also have marked the appearance of horticulture in the subsistence pattern. St. Johns IIb (A.D. 1050-1513) sites begin to display Mississippian influences with the appearance of ceremonial mounds and Southeastern Ceremonial Cult motifs and copper items. Fort Walton and Safety Harbor ceramics are sometimes present on sites from this period. Based on ethnographic accounts from the initial European contact and settlement, the St. Johns Indians were organized as hereditary chiefdoms and priesthoods (Milanich and Fairbanks 1980). St. Johns IIc (A.D. 1513-1565) is the final prehistoric stage in Florida during which full European contact occurred. Although St. Johns Check Stamped ceramics and burial mounds were still present, European artifacts began to appear in the sites and mound burial decreased (Goggin 1952). The population suffered severe reductions as a result of the introduction of European diseases.

Belle Glade IV (A.D. 1400-1715)

Period IV is identified by an increase in earthwork construction and house mounds. Its chronology is based on radiocarbon dates from Fort Center. Further dating is based on the presence of Spanish objects or objects of reworked Spanish metal. Earthwork construction is dominated by linear, raised earthen embankments up to 600 feet long, with circular house mounds at one end. Maize was still a common food source. Agricultural techniques improved, including earthworks designed to prevent erosion and increase soil fertility (Sears 1982).

The ceramic assemblage is dominated by the increase in Belle Glade Plain and sand tempered plain. Ceremonial objects, possibly symbols or badges of rank, have been found within burial mounds (Sears 1982). These badges help support the theory that the Belle Glade peoples, particularly at Fort Center, had been subsumed into the 16th and 17th century Calusa empire (Sears 1982).

At the time of European contact, the Indians of the study area were probably the Jororo (Milanich 1995). Due to the difficult access to the interior of the peninsula, this area was little known by the Spaniards. It wasn't until the late 17th century that an attempt was made to establish missions in the hinterlands. A 1696 rebellion demonstrated the difficulties encountered in trying to convert the Indians of the region to Catholicism. Spanish accounts describe these Indians as hunter-gatherers who relied heavily on fishing and wild plants. Their language was described as being distinct from that of the coastal and St. Johns River basin Timucuans (Milanich 1995).

European contact would result in the virtual destruction of the Native American population of Florida within a hundred year period, primarily through the introduction of new diseases. Native ways of life were altered through the introduction of European goods and agricultural practices. Religious practices were largely supplanted by the introduction of Catholicism through the mission system. Ceramics of the coastal region also reflect European influences, particularly in their shapes (Milanich and Fairbanks 1980).

Seminole Period (A.D. 1715 to present)

After the decimation of the native Indians, the Spaniards encouraged the Creek Indians to move into northern Florida during the period described by Fairbanks (1978) as Colonization, 1716-1763. Once in Florida, they became known as the Seminoles from the Spanish word *cimarrones* (wild ones). The Creeks (Seminoles) in Florida appear to have abandoned the Creek town pattern with its central square in favor of a more dispersed pattern of separate farmsteads. This may reflect their increasing dependence on exploitation of the cattle herds introduced by the Spaniards. Seminole sites in North Florida are marked by the presence of Chattahoochee Brushed ceramics as well as European trade goods. Although the Seminole traded with the Spaniards, there was little additional contact and apparently no attempt to reintroduce the mission system.

Fairbanks (1978) characterizes the period from 1763 to 1790 as Separation. The British acquisition of Florida in 1763 led to a well-defined Indian policy which centered on increasing attempts to control the Indians. The Indians, in turn, extended their isolation from their homeland to an attempt at isolation from the British. This isolation was accompanied by increasing hostility towards the British. At the same time, the Seminole were harboring runaway slaves from Georgia and the Carolinas, which promoted their distrust of white settlers as well as hostility on the part of those settlers. The British did establish a number of trading posts among the Seminole, thus increasing the presence of European goods on Indian sites.

The third Seminole period is characterized as Resistance and Removal, 1790-1840 (Fairbanks 1978). This was the period of the First and Second Seminole Wars. After the Spaniards regained Florida, they allowed the British and Americans to continue to trade with the Seminoles. Perhaps as a result of increasing frontier tensions, Seminole sites became even more dispersed. After the Creek Indian War, large numbers of Indians migrated to Florida, increasing the Seminole population. At the same time, American settlers continued to move into the same areas, resulting in greater friction between the two groups. This led to the First Seminole War of 1818. Although this war was rather limited and brief, it did influence the cession of Florida to the United States in 1819. The 1823 Treaty of Moultrie Creek attempted to confine the Seminole to the area south of Ocala extending south into the Kissimmee/Lake Tohopekaliga region to just north of the Peace River. This led to the Seminole presence in the Central Lakes area of Florida, but also to further friction between the two groups. Much of the information about Seminole Indian sites of this period is based on references to "old Indian fields" and abandoned towns on later Second Seminole War period records and land survey maps of the 1840s.

The new Seminole reservation area did not offer the same resource base as the area previously occupied. At the same time, the increased friction between Indians and American settlers had resulted in reduced access to trade goods. In 1835, this friction erupted into the Second Seminole War (Fairbanks 1978). At the time of the war, the project area lay within a Seminole stronghold where the Indians retreated into the swamps at the approach of soldiers. The minor fortification known as Fort Gardner, built by Colonel Zachary Taylor, lies along the Kissimmee

River just south of Lake Hatchineha. Fort Gardner became the staging point for the largest battle of the war (Mahon 1985)

The end of the Second Seminole War brought the fourth stage of the Seminole Period, Withdrawal, 1840-1880 (Fairbanks 1978). At this time, the Seminoles who remained in Florida withdrew into the reaches of the Everglades of South Florida, leaving North and Central Florida open to American settlement. The Armed Occupation Act, offering homestead rights to settlers, led to an increased movement of settlers into the state.

Historic Settlement (1842 to present)

This part of Florida was settled relatively late in the 19th century. Prior to the Second Seminole War the presence of the Indians and the reservation deterred Euro-American settlement. After the war ended, the Armed Occupation Act of 1842 opened the area to homesteaders, but the act had little effect in the project area. A few scattered ranches were located in the Kissimmee area by 1850, but Osceola County's oldest permanent settlement was not established until 1878 at Whittier east of Lake Marian. By 1880, Kissimmee was a trading post with a population of less than 100 residents (Estabrook 1989; Moore-Wilson 1935). Osceola County was created from Orange County in 1887. At about the same time, the railroad was built from Tampa to Kissimmee, leading to the growth of small towns along the line, including Loughman and Davenport in northeastern Polk County and Intercession City in Osceola County. The economy of the region during this period was based on cattle, citrus and lumber (Estabrook 1989).

The original land surveys of the late 1840s show no settlement within the project tract. Two trails are shown, one running north-south roughly along the eastern boundary of Sections 6 and 8, and one running east-west just below the south boundaries of Section 5 and 6. The field notes mention another "Indian trail" between the two ponds at the northern end of the boundary between Sections 5 and 6. The survey map and notes show that the majority of the project area was in wet prairies; only the northeastern part of Section 6 and the northwestern part of Section 5 are shown as uplands. The field notes for the lake edge also mention the hammock at the tip of Section 7 (Whitner 1844).

State land records show that the property was originally deeded by the state between 1873 and 1892. The majority of the project tract was deeded to either the Atlantic & Gulf Coast Canal & Okeechobee Land Company or the Plant Investment Company (FDEP 2004). Both of these companies drained large areas in the hopes of promoting settlement. The southwest quarter of the southwest quarter of Section 5 was deeded to James B. Partin in 1892. William H. Macey acquired Lots 1, 2 and 5 in Section 7 in 1873 and 1874. H. C. Parsons acquired the southeast quarter of Section 8 (outside the project area) in 1882 (FDEP 2004). As far as could be determined, only the Partin family ever settled the tract.

The Partin family originally arrived in Florida in the 1830s and established a homestead near the project area shortly after. Cattle raising has been the main economic activity engaged in by the

Partins during the 19th and 20th centuries (Akerman 1976). Today, numerous branches of the Partin family still live and own extensive property in Osceola County, including the Henry Partin family which owns the project tract.

With the establishment of Disney World and the numerous attractions in its vicinity, the Osceola County area near the theme parks has experienced tremendous growth in recent years, both in terms of support facilities for the attractions and as residential communities.

METHODS

The project methodology can be divided into three major tasks: (1) background research, (2) field survey, and (3) analysis and documentation. All project tasks followed the guidelines of FDHR.

Background Research

Background research was designed to develop a cultural history for the project area and to determine whether there were any previously known archaeological or historic sites in proximity to the project tract. This information helped define the potential for site location within the property, which in turn was utilized to design the field survey.

Background research included examination of both old and current aerial photographs, soils maps and topographic quadrangle maps. The Florida Master Site File (FMSF), GIS *SHAPE* file data was searched for previously identified sites or surveys. Additionally local and regional historic information was also reviewed. The Florida Department of Environmental Protection (FDEP) LABINS website was utilized to obtain copies of the original 19th century land surveyor's notes and maps as well as land ownership records for the area. Mike Partin, resident of the property, was interviewed concerning the historic structures.

Topographic maps showed that the project area is a relatively flat savannah floodplain with scattered hammocks and rises, and overall poor drainage. The soils maps were used to identify medium to high potential soils located within the project area, based on drainage characteristics and habitats. This information was then combined with old and modern aerial photographs to locate characteristic vegetation markers, predominately live oak hammocks. The historic aerials were further used to identify manmade changes to the landscape, and to locate any potential historic homestead sites.

Field Survey

Test unit interval and transect placement were designed to provide at least minimal testing of all represented environmental zones within the property. However, previous experience and existing information indicates that typical Native American settlement patterns in this region are in areas in close proximity to a freshwater source, primarily the lake, and in areas of higher, drier soils. Areas more distant from the lake would have a low to medium potential for prehistoric cultural resources, depending on soil drainage characteristics, natural vegetation cover and proximity to wetlands. In general the flatwoods and prairie environment which dominates the project tract is considered to be a low potential area for both prehistoric and historic occupation due to their limited resource base and poor drainage characteristics.

Subsurface testing was stratified based on the assessment of site potential and background research. FDHR guidelines provide for 25 or 50-meter interval testing in high or medium potential areas, with judgmental testing of low potential areas. Although the intent was to locate sites, lower probability areas were tested to give a comparative sample to justify the testing pattern. The vast majority of the property is in poorly to very poorly drained soils. Reconnaissance testing in these low probability areas was conducted every 100 meters along three transects 1,000 meters apart running east-west across the property. Test units were designated by northing and easting coordinates (Figure 6).

Live oak and cabbage palm hammocks and pine stands are located in the higher elevations found in the central western portion of the property and at the southern tip at the lake. Subsurface testing focused on the best soil types for habitation, specifically those containing live oak hammocks and drier soils. In areas determined to be of medium probability tests were placed at 50-meter intervals. All positive units were bounded at 25-meter intervals where possible (Figure 7).

Test excavations consisted of approximately 50 centimeter (cm)-square test units, excavated to a depth of one meter where possible, and screened through ¼-inch hardware cloth. Field notes recorded unit location, soil stratigraphy, presence/absence of artifacts, dominant vegetation, and proximity to cultural or natural features. Shovel test units were supplemented by surface inspection, which was conducted between transects and units and during walkovers of the property by the project team.

Potential historic structures were documented with notes and photographs for evaluation by the architectural historian.

Analysis and Documentation

Field samples were collected and identified by provenience, assigned a field specimen number and returned to SouthArc's laboratory for processing. The samples were gently washed over ¼-inch hardware cloth and air-dried. Samples were sorted by material, identified and catalogued based on accepted regional and historic typologies. All materials were both counted and weighed.

The balance of the project analysis consisted of correlation of field observations with the background information and artifact data. Florida Master Site File forms were completed for the historic structures and resource group; they are included as an appendix to this document. All recovered artifacts and project documentation are curated at SouthArc, pending identification of a permanent facility.

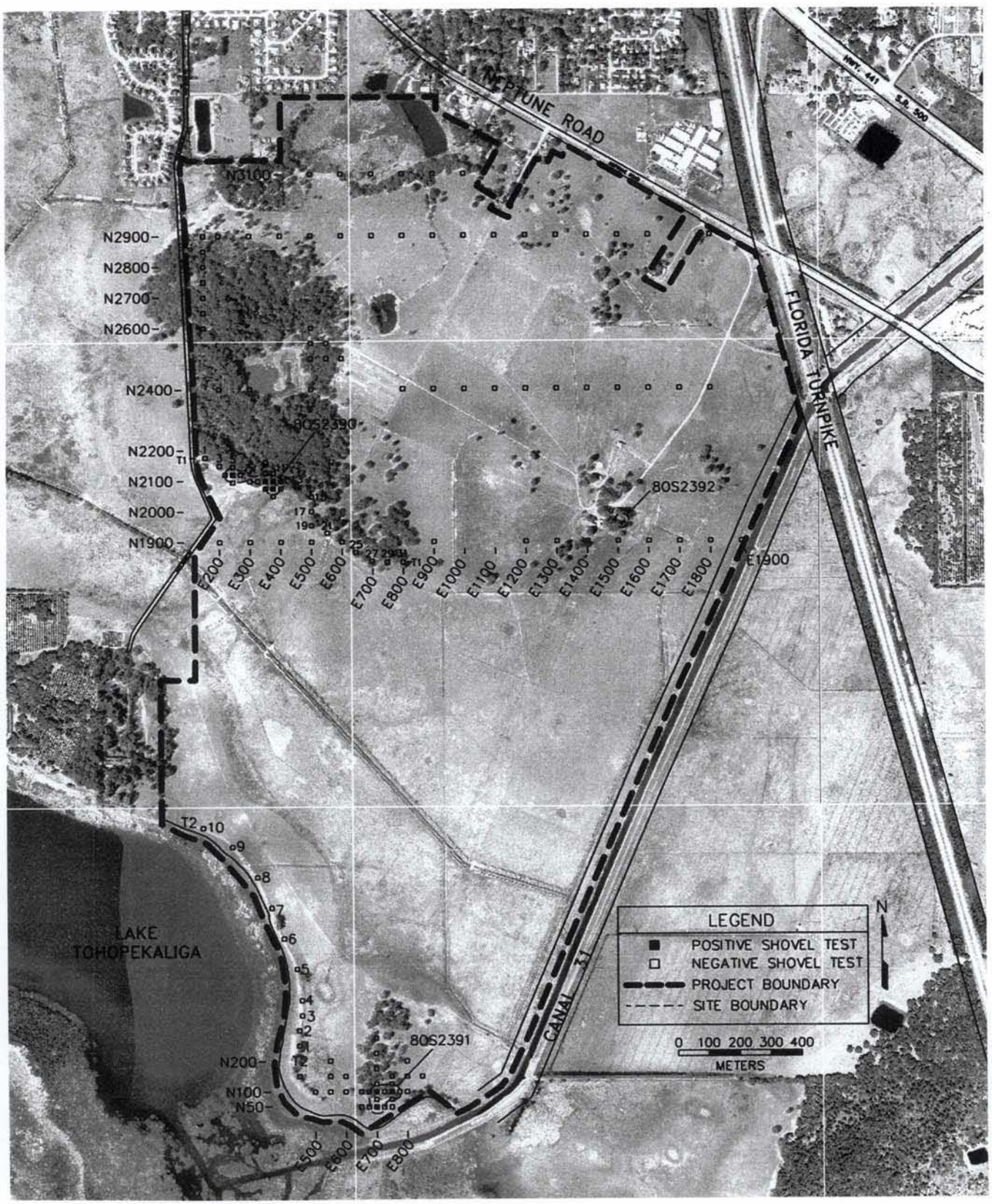

FIGURE 7. TEST UNIT MAP, BUTLER RIDGE, OSCEOLA COUNTY, FLORIDA

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RESULTS AND RECOMMENDATIONS

A check of the Florida Master Site File records indicated that there are no archaeological or historical sites within the project tract (FMSF 2004). One site, Kamikaze Kow, 8Os1844, was identified to the north of the project area just north of Fish Lake. This site was described as having 20th century, Late Archaic, Orange period and St. Johns IIa components. Recent land use activities have extensively impacted the tract. Aerial photographs taken in 1951 (Figure 5) indicate that the property had been used as drained pasture as evidenced by the presence of several drainage canals transversing the property. The Partin family said that the property was used for sugarcane in the late 19th century, which led to excavation of smaller lateral ditches. The Partins periodically spread lake muck on their pastures, most recently this year. The berm along the shoreline of Lake Tohopekaliga has been extensively altered through time, both by removal of portions of it and by increasing its height (Partin, personal communication, 2004). A test unit placed in the berm confirmed the presence of layers of fill consisting primarily of lake muck (Figure 8). The alteration of the land around the lake through ditching and draining has been common throughout the historic period as a means to stabilize lake levels, with the most recent dredging having been completed during the spring of 2004. It was this recent dredging activity that resulted in the creation of the many small islands that now dot Lake Tohopekaliga (Partin, personal communication, 2004).

Tested soils in the project area were mostly dark gray over light grey or light brown sand in areas of higher elevation. The soils in the lower elevations consisted of a black to very dark grey muck over light grey sand. These soil profiles combined with the original land survey records (Whitner 1844) confirm that prior to the drainage, two-thirds of the property was wet prairie.

The survey identified two archaeological sites, 8Os2390 and 8Os2391, and one historic structure, 8Os2392 (Figures 2 and 7). In addition, two plain ironstone fragments were found on the surface, but these were located in separate parts of the property with no other associated cultural material. One fragment was recovered from the west side of the entry road and the other was found northeast of test unit N2550 E500. As a result they were classified as isolated occurrences and no site numbers were assigned. They are undoubtedly related to the long-term agricultural usage of the property.

Willet-Up-a-Tree Site, 8Os2390

This site was identified at the southern edge of the hammock along the south end of the original upland edge (Figures 2, 7 and 8). The site consisted of five pieces of lithic debitage recovered from four test units. The debitage consisted of small thermally altered flakes consistent with tool maintenance activity (Table 2). No features or cultural strata were identified within the site. 8Os2390 is probably a hunting-related activity site, possibly dating to the Middle Archaic period based on the dominance of thermal alteration. It is unlikely to yield information which would address regional or local research questions.

TRANSECT 2, SHOVEL TEST 7, BERM FILL PROFILE

LOOKING NORTH INTO 8OS2390

FIGURE 8. BERM TEST UNIT AND 8OS2390, BUTLER RIDGE, OSCEOLA COUNTY, FLORIDA

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Table 2. Summary of Artifacts, Willet-up-a-Tree Site, 8Os2390, Osceola County, Florida

FS #	Location	Artifact	Count	Weight (g)
7	Transect 1 Test 5 Level 3, 50-70 cmbs	Flake, chert, complete, nondecortication, thermally altered (broken in 2 pieces in field)	1	3.2
8	Transect 1 Test 9 Level 2, 30-50 cmbs	Flake, chert, unidentified, nondecortication, thermally altered	1	0.2
9	N2100 E375 Level 4, 70-100 cmbs	Flake, chert, complete, nondecortication, thermally altered	1	>0.1
		Flake, chert, medial, nondecortication, thermally altered	1	0.5
10	N2075 E375 Level 4, 70-100 cmbs	Flake, chert, distal, nondecortication, thermally altered	1	1.7
TOTALS			**5**	**5.7**

Partin Site, 8Os2391

The Partin site was located in the small hammock at the southern tip of the property (Figures 2, 7 and 9). This site consisted of three positive test units which yielded both historic and prehistoric artifacts (Table 3). The historic material consisted of bottle glass, primarily from a single bottle, and unidentifiable metal fragments. Based on the presence of amethyst glass, this material is consistent with late 19th to early 20th century activity in this area. The prehistoric material consisted of a single lithic flake and 14 eroded St. Johns sherds. Since the sherds were found in a single unit, they probably came from one pot. The prehistoric material indicates a short-term campsite, probably to exploit the resources of the hammock and nearby lake. No features or cultural strata were associated with the recovered artifacts. In fact most of the St. Johns sherds were recovered from the same level (Level 1) as historic material, indicating disturbed stratigraphy. The site is unlikely to yield data which could address regional or local research questions.

Table 3. Summary of Artifacts, Partin Site, 8Os2391, Osceola County, Florida

FS#	Location	Artifact	Count	Weight (g)
3	N50 E700 Level 2, 30-50 cmbs	Flake, chert, complete, nondecortication, thermally altered	1	1.5
4	N100 E700 Level 1, 0-30 cmbs	Bottle glass, amethyst, large base impressed with "BOLDT"	11	489.2
5	N100 E750 Level 1, 0-30 cmbs	Ceramics, St. Johns with sand, eroded	14	18.5
		Bottle glass, clear canning jar	9	28.9
		Iron fragments, unidentifiable	3	3.7
6	N700 E750 Level 2, 30-50 cmbs	Ceramics, St. Johns with sand, eroded	4	4.9
TOTALS			**42**	**546.7**

LOOIKING WEST INTO 8OS2391

8OS2392, SOUTH AND EAST FACADES

FIGURE 9. 8OS2391 AND 8OS2392, BUTLER RIDGE, OSCEOLA COUNTY, FLORIDA

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Red House, 8Os2392

A small house located at the Partin homestead was reportedly moved onto the property in the 1950s from a nearby airbase (Partin, personal communication, 2004). If it was from an airbase, it probably dates to the 1940s. However, SouthArc was unable to confirm this story. It seems likely that the nearest bases would have been in either Kissimmee or St. Cloud--distances of five or 2.5 miles away respectively. This seems like a long distance to move what is basically a small, mediocre structure. The house is a side-gable frame structure on piers with an addition on one end (Figure 9). There are full-width front and rear porches with shed roofs. All of the roofing is 5V metal, with the porch roofs supported by 4 x 4 posts. The house has a central brick chimney and 1-over-1 sash windows. The siding is rolled red brick-patterned asphalt siding, while the ornamentation is limited to contrasting paint on the door and window frames. The central door is flanked by single windows. The siding replaces what was probably clapboard originally. The house lacks integrity of location, design, setting and materials. It has been moved from its original location, has an addition, has gone from a setting at an airbase to a rural pasture, and the siding has been replaced. Due to these changes, it has also lost integrity of feeling and association. Taken in conjunction with the common form and lack of distinctive features or historic associations, this means that the house does not possess the criteria for significance.

Conclusions and Recommendations

The dominance of the flatwoods and wet prairie environments, combined with the poorly drained soils would have been unattractive to Native Americans for occupational purposes, except possibly in the small hammock areas. The area may have been utilized for hunting, as it would have been fairly attractive to game. The property was utilized consistently during the 20th century by the Partin family, primarily for cattle. The identified archaeological sites are consistent with hunting activity and briefly occupied campsites during the prehistoric period. The historic material represents casual discards associated with the long-term agricultural use of the land. The sites have a very limited artifact assemblage and lack features or cultural strata. They do not have the potential to yield data to address either prehistoric or historic research questions.

The identified historic structure is a standard form with no particular architectural distinction or historic associations. It has undergone a number of changes which significantly impact its integrity of location, setting, design, materials, feeling and association.

In the opinion of the project archaeologists, development of this tract will not impact any significant archaeological or historical resources which are listed on or eligible for the *National Register*. We recommend that no further research be required prior to development.

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UNANTICIPATED DISCOVERIES AND FLORIDA LAW

Due to the local nature of land use decisions, historic preservation laws are predominately enforced by state and local governments. The Florida legislature has enacted laws pertaining to unmarked human burials, intending that "all human burials and human skeletal remains be accorded equal treatment and respect based upon common human dignity without reference to ethnic origin, cultural background, or religious affiliation."[1] This section discusses some of the laws which may apply in the event that certain unanticipated discoveries are encountered.

Applicable Florida Law

The mandates of Florida Statutes (Chapter 872, *Offenses Concerning Dead Bodies And Graves*) apply when human skeletal remains, human burial, or associated burial artifacts have been or are discovered "upon or within any public or private land in the state, including submerged lands."[2] An "unmarked human burial"[3] is statutorily defined as:

- "any human skeletal remains or associated burial artifacts", or
- "any location, including any burial mound or earthen or shell monument, where human skeletal remains or associated burial artifacts are discovered or believed to exist on the basis of archaeological or historical evidence, excluding any burial marked or previously marked by a tomb, monument, gravestone, or other structure or thing placed or designed as a memorial of the dead."

Duty to Immediately Cease Activity

Upon discovery of an unmarked human burial, other than during an archaeological excavation authorized by the state or an educational institution, "all activity that may disturb the unmarked human burial shall cease immediately, and the district medical examiner shall be notified. Such activity shall not resume unless specifically authorized by the district medical examiner or the State Archaeologist."[4] Thus, when an unmarked human burial is encountered, the contractor must notify the district medical examiner and cease all work in the vicinity, and should protect the area from further spoliation. SouthArc recommends covering the find with plastic sheeting or tarps, marking the location, and preventing further disturbances to the immediate area. Such discoveries should be immediately reported to SouthArc at (352) 372-2633). SouthArc will respond to such calls and initiate the necessary actions to comply with Chapter 872.

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[1] FLA STAT. § 872.05 (1) (Unmarked Human Burials; Legislative Intent) 2002.
[2] *Id.* (stating "This section applies to all human burials, human skeletal remains, and associated burial artifacts not otherwise protected under chapter 497 or other state law").
[3] *Id.* § 2(f).
[4] *Id.* § 2(b) (providing the "District medical examiner is a person appointed under F.S. § 406.06, §406.15, or §406.17"; and § 2(e), stating "State Archaeologist" means the person employed by the Division of Historical Resources of the Florida Department of State pursuant to §267.031(6)).

Duty to Notify Authorities

Florida law imposes a mandatory duty to notify local law enforcement authorities of site disturbance. "Any person who knows or has reason to know that an unmarked human burial is being unlawfully disturbed, destroyed, defaced, mutilated, removed, excavated, or exposed shall immediately notify the local law enforcement agency with jurisdiction in the area where the unmarked human burial is located."[5] Upon inspection, "any law enforcement agency that finds evidence that an unmarked human burial has been unlawfully disturbed shall notify the district medical examiner."[6]

Procedures Following the Discovery of an Unmarked Human Burial

Jurisdiction and duties of the district medical examiner (DME) are described at §872.05 (4)(a). Note: this section does not apply to an archaeological excavation authorized by the state or an educational institution.[7] Initially, the DME shall assume jurisdiction over, and responsibility for, such unmarked human burial if he or she"

- determines that the unmarked human burial may be involved in a legal investigation, or
- represents the burial of an individual who has been dead less than 75 years

After receiving notification of the unmarked human burial, the DME has 30 days to determine if he or she shall maintain jurisdiction or refer the matter to the State Archaeologist. If the unmarked human burial is determined not to be involved in a legal investigation and represents the burial of an individual who has been dead 75 years or more, the DME will notify the State Archaeologist.

Duties of the State Archaeologist

Upon receiving notice from the DME, the Division of Historical Resources of the Department of State ("Division") may assume jurisdiction over and responsibility for the unmarked human burial pursuant to §872.05(6).[8] This process is typically to initiate efforts to properly protect the burial, human skeletal remains, and associated burial artifacts. If the Division assumes jurisdiction, "the State Archaeologist shall consult a human skeletal analyst who shall report within 15 days as to the cultural and biological characteristics of the human skeletal remains and where such burial or remains should be held prior to a final disposition."[9]

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[5] *Id.* (3)(a).

[6] *Id.* (3)(b).

[7] See §872.05 (5) (Discovery of an Unmarked Human Burial During an Archaeological Excavation).

[8] *Id.* (6)

[9] *Id.* (4)(c).

The State Archaeologist must make "reasonable efforts to identify and locate persons who can establish direct kinship, tribal, community, or ethnic relationships with the individual or individuals whose remains constitute the unmarked human burial."[10] If possible, he or she "shall consult with the closest related family member or recognized community leaders, if a community or ethnic relationship is established, in determining the proper disposition of the remains found in the unmarked human burial."[11]

Ownership of A Historical, Archaeological, or Significant Unmarked Human Burial

The State Archaeologist is required to determine whether the unmarked human burial is historically, archaeologically, or scientifically significant. If the burial is deemed significant, re-interment may not occur until the remains have been examined by a human skeletal analyst designated thereby. Frequently, no links to family or the community can be identified. Under Florida law, this occurs when the State Archaeologist "is unable to establish a kinship, tribal, community, or ethnic relationship with the unmarked human burial, determine the proper disposition of the burial and consult with persons with relevant experience, including:

(1) a human skeletal analyst,
(2) two Native American members of current state tribes recommended by the Governor's Council on Indian Affairs, Inc., if the remains are those of a Native American,
(3) two representatives of related community or ethnic groups if the remains are not those of a Native American, or
(4) an individual who has special knowledge or experience regarding the particular type of the unmarked human burial."[12]

If the State Archaeologist finds that an unmarked human burial is historically, archaeologically, or scientifically significant and if the parties (listed above) with whom he or she is required under §872.05(6)(c) to consult agree, the human skeletal remains, and the associated burial artifacts, shall belong to the State of Florida. The title thereto will be vested in the Division.

SouthArc's Scope of Work

SouthArc will provide coordination with state and local agencies, including the Division. We will work with property owners and contractors to alleviate construction delays or alterations resulting from such discoveries. Typically, construction is temporarily shifted to areas away from the find while an assessment is conducted. Depending upon results of the assessment however, project redesign, and/or provisions for reburial, may be required.

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[10] *Id.* (6)(b).
[11] *Id.*
[12] *Id.* (6)(c).

Should the remains be classified as archaeologically or scientifically significant, SouthArc will negotiate a Scope of Work or a Management Plan with the State Archaeologist. A Management Plan may include disinterment, or preservation in place. If disinterment is selected, SouthArc will work with a physical anthropologist to carefully remove the remains for forensic examination. Following completion of the forensic investigation, a Management Report will be provided to facilitate decisions regarding whether site development activities may proceed in the vicinity of the discovery. The Management Report will also include all relevant correspondence between SouthArc, the District Medical Examiner, the State Archaeologist, and other agencies involved in the project.

When forensic and management analyses are completed, SouthArc will prepare a draft report to the client for review and approval. Florida Master Site File forms will be completed and updated as needed. In compliance with Florida law, SouthArc will submit a Final Report to the State Archaeologist.[13]

[13] *Id.* (7) (providing "The archaeologist and human skeletal analyst involved in the archaeological excavation and scientific analysis of an unmarked human burial shall submit a written report of archaeological and scientific findings as well as a summary of such findings, in terms that may be understood by laypersons, to the State Archaeologist within 2 years after completion of an excavation. The division shall publish the summary within 1 year after its receipt and shall make such report available upon request.").

APPENDIX IV

Pre-Restoration Photographs

1. Central area of TOCA along main ditch looking east

2. Southwest lake edge (remnant cypress strand) looking northeast

3. North edge of southern oak hammock looking south

4. West side of “Twin Oaks” trees looking east

5. Northwest corner (near east shore of Lake Toho) of TOCA looking southeast

6. Northwest edge (along east shore of Lake Toho) of TOCA looking northeast

APPENDIX V

Representative Habitat Photographs;
Post-Restoration Goals

Figure 1: Reference Photograph No. 1 for Marsh Lake sub-community anticipated on TOCA

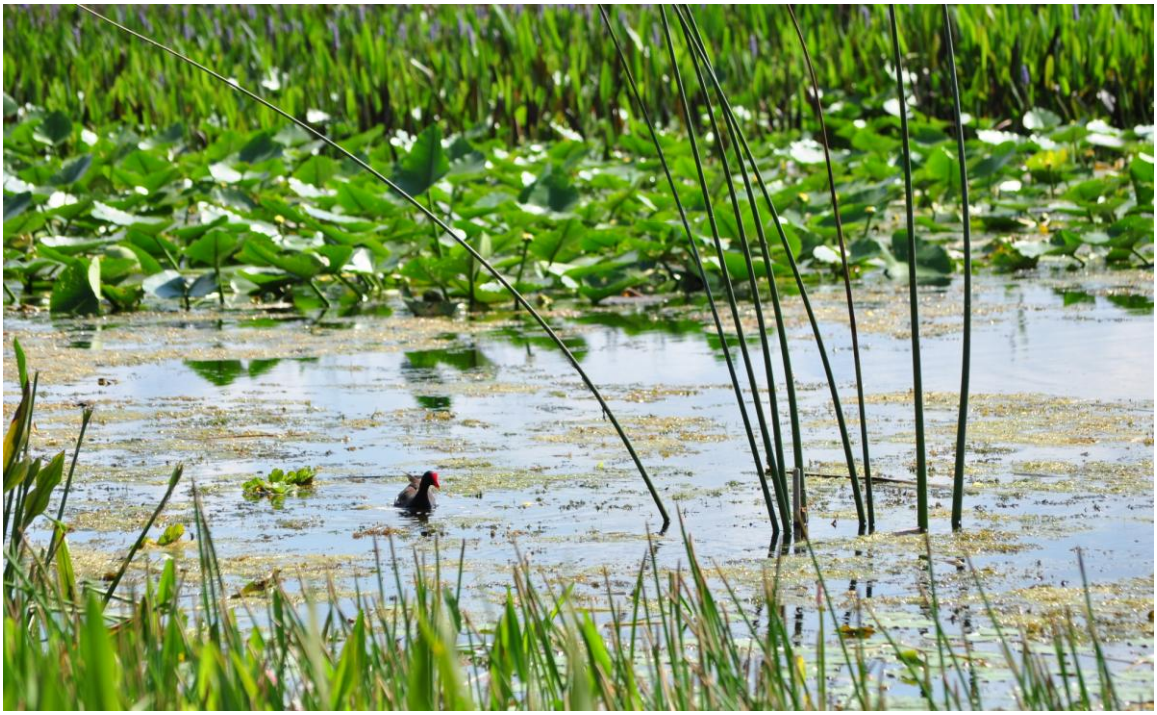

Figure 2: Reference Photograph No. 2 for Marsh Lake sub-community anticipated on TOCA

Figure 3: Reference Photograph No. 1 for Flag Marsh sub-community anticipated on TOCA

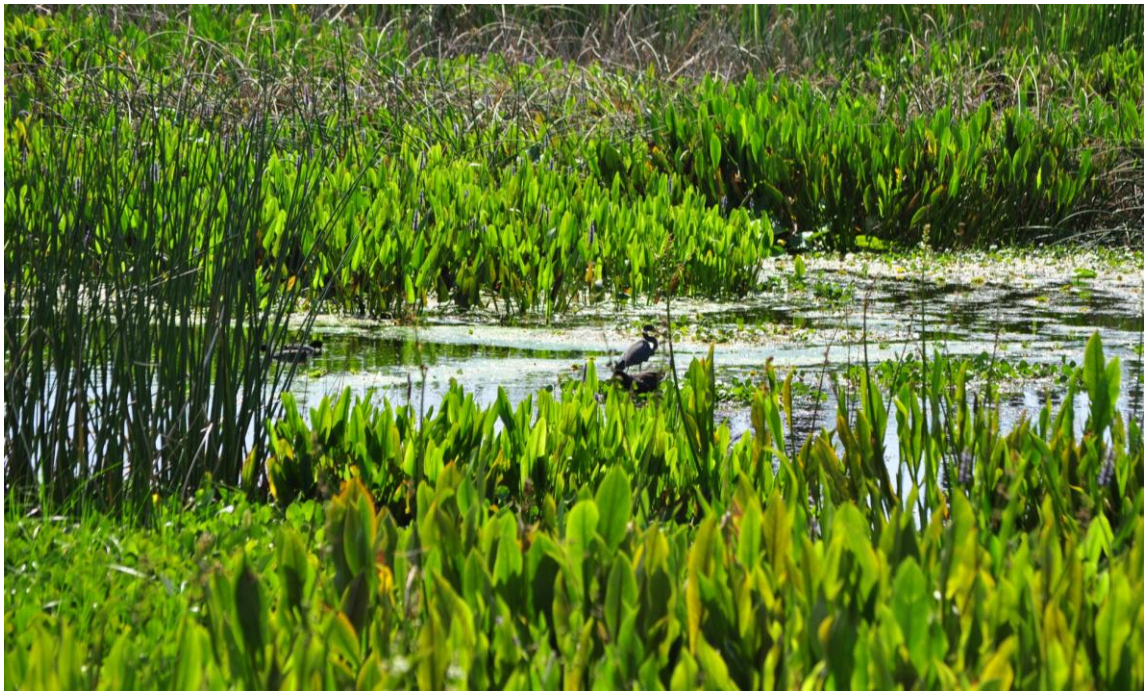

Figure 4: Reference Photograph No. 2 for Flag Marsh sub-community anticipated on TOCA

Figure 5: Reference Photograph No. 1 for Grassy Marsh sub-community anticipated on TOCA

Figure 6: Reference Photograph No. 2 for Grassy Marsh sub-community anticipated on TOCA

Figure 7: Reference Photograph Wet Prairie community anticipated on TOCA

Figure 8: Reference Photograph Wet Prairie with Cypress community anticipated on TOCA

Figure 8: Reference Photograph Mesic Flatwoods community anticipated on TOCA

Figure 9: Reference Photograph Mesic Hammock community anticipated on TOCA

Figure 10: Reference Photograph Scrubby Flatwoods community anticipated on TOCA

Figure 11: Reference Photograph Floodplain Marsh community anticipated on TOCA

APPENDIX VI

Potential Alternative Funding Sources

Potential Sources for Supplemental/Alternative Funding

*This list is not exhaustive

Fish and Wildlife Service Funds

Program Name	Eligible Activities	Funding Limit	Source of Aid	Submittal Deadlines (2012)
NAWCA (standard)	Conservation of wetlands and wetland-dependent fish & wildlife	$75,000 - $1,000,000	Federal	March 2 July 27
NAWCA (small grants)	Wetland acquisition, creation, enhancement, & restoration	$75,000	Federal	October 25
Wildlife Restoration Grants	Projects that restore and manage wildlife populations, provide public access to wildlife resources and teach safety to hunters	Variable	Federal	Variable
Sport Fish Restoration Grants	Support for projects that restore and manage fish populations used for sport fishing	Variable	Federal	Variable

Weblinks to program information:
NAWCA: http://www.fws.gov/birdhabitat/Grants/NAWCA/index.shtm

NOAA Administered Funds

Program Name	Eligible Activities	Funding Limit	Source of Aid	Submittal Deadlines (2012)
FishAmerica	Restore and protect fisheries habitat	$5,000 - $50,000	Federal	April 30

Weblinks to program information:
NOAA: http://www.fishamerica.org/grants.html

Environmental Protection Agency Funds

Program Name	Eligible Activities	Funding Limit	Source of Aid	Submittal Deadlines (2012)
Watershed Program Development Grant	TMDLs and nonpoint source priorities	$30,000 - $180,000	Federal	varies

Weblinks to program information:
EPA: http://water.epa.gov/grants_funding/twg/initiative_index.cfm

National Fish and Wildlife Foundation Administered Funds

Program Name	Eligible Activities	Funding Limit	Source of Aid	Submittal Deadlines (2012)
Keystone Initiatives	Conservation of fish, wildlife, plants,, including invasive sp. control, enhancing delivery or ecosystem services in ag systems	$50,000 - $300,000	Federal and Non-Federal	June 1
Five-Star Restoration Grant Program	Wetland, riparian, and coastal habitat restoration	$10,000 - $40,000	Federal and Non-Federal	February 15
Native Plant Conservation Initiative	Conservation of native plants	$5,000 - $40,000	Federal and Non-Federal	May 25
Pulling Together Initiative	Prevent, manage, & eradicate invasive and noxious plants	$10,000 - $100,000	Federal	May 18

Weblinks to program information:
http://www.nfwf.org/AM/Template.cfm?Section=Charter_Programs_List&Template=/TaggedPage/TaggedPageDisplay.cfm&TPLID=61&ContentID=13554

Florida Fish and Wildlife Conservation Commission Funds

Program Name	Eligible Activities	Funding Limit	Source of Aid	Submittal Deadlines (2012)
State Wildlife Grant	Conservation projects that benefit Florida's wildlife and their habitat	$10,000 - $400,000	State	October 5
Florida Boating Improvement Program	Grants to county governments to improve recreational boating related activities for the general public	Variable	State	Variable
Native Plant Conservation Initiative	Conservation of native plants	Variable	Federal and Non-Federal	Variable

Weblinks to program information:
FWC: http://myfwc.com/conservation/special-initiatives/fwli/grant/

Florida Department of Environmental Protection Administered Funds

Program Name	Eligible Activities	Funding Limit	Source of Aid	Submittal Deadlines (2012)
Florida Recreation Development Assistance Program	Grants with to local governments to acquire or develop land for public outdoor recreation	Variable	State	September 28
Land and Water Conservation Fund	Funds to local governments to acquire or develop land for outdoor recreation purposes	Variable	State	Variable

Weblinks to program information:
http://www.dep.state.fl.us/parks/OIRS/default.htm

Education Partnerships/Cooperation Possibilities:
*This list is not exhaustive

The Great Florida Birding and Wildlife Trail (GFBWT)

This is a program of the Florida Fish and Wildlife Conservation Commission, supported in part by the Florida Department of Transportation and the Wildlife Foundation of Florida. This self-guided highway trail connects and unifies nearly 500 birding and wildlife viewing sites throughout Florida. Modeled after the successful Great Texas Coastal Birding Trail, this ambitious project features detailed guide booklets, a mobile device application, and special highway signs identifying GFBWT sites. Guide booklets contain site descriptions, directions, and maps showcasing the wonderful birding and wildlife watching opportunities in Florida. The Trail is possible thanks to dozens of federal, state, and local government agencies, non-governmental organizations and private landowners.

New GFBWT sites can be nominated by any individual or group. Landowners may also nominate their own lands. A steering committee meets to review the nominated sites and to make the final selection. The committee is comprised of representatives from the Florida Fish & Wildlife Conservation Commission, Florida Department of Environmental Protection, US Fish and Wildlife Service, Audubon, and Florida's tourism industry. The nomination process for each section of the trail will be reopened periodically (as funding permits) so that new sites may be included. The next statewide selection will be conducted, tentatively, during 2013 or 2014. www.floridabirdingtrail.com

Imperiled Butterfly Conservation and Management (IBCM)

Led by the Florida Museum of Natural History's McGuire Center for Lepidoptera and Biodiversity at the University of Florida and the Butterfly Conservation Initiative, IBCM is a broad partnership that also involves the several museums and zoos throughout the US as well as Fairchild Tropical Botanic Garden in Miami, FL and the University of Florida IFAS Department of Entomology and Nematology.

Education Partnerships/Cooperation Possibilities:

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IBCM was funded by a grant from Institute of Museum and Library Services 21st Century Museum professionals program. The Institute works at the national level and in coordination with state and local organizations to sustain heritage, culture, and knowledge; enhance learning and innovation; and support professional development, www.imls.gov.

Florida Wildflower Foundation - *La Florida*, "Land of Flowers," Community Grants

Program offers micro -grants to purchase native wildflower plants or seeds. Projects include demonstration gardens, community beautification and roadside plantings. Up to 16 grants are available in counties that have passed a Wildflower Resolution (Osceola County not currently listed). www.flawildflowers.org

APPENDIX VII

LMP Implementation Exhibits

APPENDIX VIII

Budgetary Considerations

Construction and Implementation Cost Estimates:

	Units	Year 1 Quantity Phase 1	Year 1 Cost Phase 1	Year 2 Quantity Phase 2	Year 2 Cost Phase 2
Construction & Structures					
Permitting	*N/A*	*N/A*	**$95,000.00**	*N/A*	**$155,000.00**
Construction Monitoring	*avg $90 / per hour*	*180hr*	**$16,200.00**	*140 hr*	**$12,600.00**
Road Construction	*bid based*	*bid based*	**$100,000.00**	*N/A*	**N/A**
Trail Installation - Grading	*bid based*	*1 mile*	**$5,000.00**	*2 mile*	**$7,500.00**
Gate Installation	*$250 per gate*	*3.00*	**$750.00**	*2.00*	**$500.00**
Fence Installation	*$0.75 per lf*	*6000 lf*	**$4,500.00**	*0.00*	**$0.00**
LWC Installation	*$30 per lf*	*0.00*	**$0.00**	*100 lf*	**$3,000.00**
Hydrologic Restoration (ditch block, weir, culverts)	*engineer estimate*	*0.00*	**$0.00**	*n/a*	**$50,000.00**
Debris Removal	*total cost*	*30 acres*	**$40,000.00**	*10 ac*	**$10,000.00**
Sign Installation	*$500 per sign*	*6 signs / kiosks*	**$3,000.00**	*4 signs / kiosks*	**$2,000.00**
Bench Installation	*$400 per bench*	*6 benches*	**$2,400.00**	*4 benches*	**$1,600.00**
Compost toilet	*$30,000 per unit*	*1 unit*	**$30,000.00**	*1 unit*	**$30,000.00**
Pavillion (constructed in-house)	*$5,000 to $7,500*	*1 10'x20', 1 20'x40'*	**$14,000.00**	*0.00*	**$0.00**
Picnic Table	*$400 per table*	*10.00*	**$4,000.00**	*6.00*	**$2,400.00**
Pier installation	*$40 / sf*	*3000 ft sq*	**$120,000.00**	*4200 ft sq*	**$168,000.00**
Kayak Launch	*unit price*	*0.00*	**$0.00**	*1 unit*	**$15,000.00**
Boardwalk Installation (wetland area)	*$40/ sf*	*0.00*	**$0.00**	*6000.00*	**$240,000.00**
Total			**$434,850.00**		**$697,600.00**
Planting					
Tree Cost - Installed	*$25 per 3-7 gallon*	*3155.00*	**$78,875.00**	*2500.00*	**$62,500.00**
Shrub Cost - Installed	*$7 per 3 gallon*	*14200.00*	**$99,400.00**	*10000.00*	**$70,000.00**
Herbaceous - Installed	*$4 per 1 gallon plant*	*45400.00*	**$181,600.00**	*30000.00*	**$120,000.00**
Total			**$359,875.00**		**$252,500.00**
Vegetative, Wildlife & Hydrologic Monitoring and Reporting					
Monitoring Equipment Staff Guage / Piezometer	*$500 per item*	*0.00*	**$0.00**	*6.00*	**$3,000.00**
Well Install / Survey	*$1000 per item*	*0.00*	**$0.00**	*6.00*	**$6,000.00**
Establish Vegetation Monitoring / Photo Stations	*unit price*	*1 event*	**$2,500.00**	*1 event*	**$2,500.00**
Field Work - Monitoring	*$85 per hour*	*48.00*	**$4,080.00**	*60.00*	**$5,100.00**
Data Analysis & Reporting	*$85 per hour*	*16.00*	**1,360.00**	*40.00*	**$3,400.00**
Total			**$7,940.00**		**$17,000.00**
Nuisance, Exotic and Inappropriate Species Control					
Inspection and N/E Control (includes chemicals, retreat)	*$250 per acre*	*120 acres*	**$30,000.00**	*399 acres*	**$99,750.00**
Nuisance Fauna (Hogs, etc.)	*$75 / hr*	*40.00*	**$3,000.00**	*40.00*	**$3,000.00**
Total			**$33,000.00**		**$102,750.00**
Burn Management					
Fire line Construction	*0.20 / f t*	*11000 lf*	**$2,200.00**	*0.10 / ft*	**$2,200.00**
Fire line Maintenance	*0.1 / ft*	*11000 lf*	**$2,200.00**	*11000 lf*	**$2,200.00**
Mobilization	*$250 / day*	*N/A*	**$750.00**	*per burn day*	**$750.00**
Total			**$5,150.00**		**$5,150.00**
Administrative Costs					
Project Management	*$85 per hour*	*120 hours*	**$10,200.00**	*120.00*	**$10,200.00**
Other Administrative Costs	*$65 per hour*	*80 hours*	**$5,200.00**	*80 hours*	**$5,200.00**
Total			**$15,400.00**		**$15,400.00**
Total cost			**$856,215.00**		**$1,090,400.00**
Total @110%			**$941,836.50**		**$1,199,440.00**

Post Construction Management Cost Estimates:

		Cost	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Structure & Earthwork Maintenance										
Trail Maintenance	*$0.75 / linear ft*		**$11,000.00**	**$11,000.00**	**$11,000.00**	**$11,000.00**	**$11,000.00**	**$11,000.00**	**$11,000.00**	**$11,000.00**
Road Maintenance - Grading	*$0.55 / linear ft*		**$8,800.00**	**$8,800.00**	**$8,800.00**	**$8,800.00**	**$8,800.00**	**$8,800.00**	**$8,800.00**	**$8,800.00**
Fence / Gate Maintenance	*$0.10 / linear ft*		**$250.00**	**$250.00**	**$250.00**	**$250.00**	**$250.00**	**$250.00**	**$250.00**	**$250.00**
LWC Maintenance	*$20 / linear ft*		**$500.00**	**$500.00**	**$500.00**	**$500.00**	**$500.00**	**$500.00**	**$500.00**	**$500.00**
Weir / Structure / Ditch plug Maintenance	*varies*		**$500.00**	**$500.00**	**$1,500.00**	**$500.00**	**$500.00**	**$500.00**	**$1,500.00**	**$500.00**
Facility Maintenance	*estimate*		**$1,200.00**	**$1,200.00**	**$1,200.00**	**$1,200.00**	**$1,200.00**	**$1,200.00**	**$1,200.00**	**$1,200.00**
Sign Maintenance / Replacement			**$200.00**	**$200.00**	**$200.00**	**$200.00**	**$200.00**	**$200.00**	**$200.00**	**$200.00**
Total			**$22,450.00**	**$22,450.00**	**$23,450.00**	**$22,450.00**	**$22,450.00**	**$22,450.00**	**$23,450.00**	**$22,450.00**
Vegetative, Wildlife & Hydrologic Monitoring and Reporting (Perpetual)										
Monitoring Equipment Maintenance Cost	*per unit*		**$250.00**	**$250.00**	**$250.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**
Monitoring - Field Work	*$90 / hr*		**$4,320.00**	**$4,320.00**	**$4,320.00**	**$2,160.00**	**$2,160.00**	**$2,160.00**	**$2,160.00**	**$2,160.00**
Data Analysis & Reporting	*$90 / hr*		**$2,160.00**	**$2,160.00**	**$2,160.00**	**$1,080.00**	**$1,080.00**	**$1,080.00**	**$1,080.00**	**$1,080.00**
Total			**$6,730.00**	**$6,730.00**	**$6,730.00**	**$3,240.00**	**$3,240.00**	**$3,240.00**	**$3,240.00**	**$3,240.00**
Nuisance, Exotic, Inappropriate Species Control			**quarterly**	**quarterly**	**quarterly**	**semi-annually**	**semi-annually**	**semi-annually**	**semi-annually**	**semi-annually**
Inspection, Chemicals and Application	*$50 per acre / event*		**$79,800.00**	**$79,800.00**	**$79,800.00**	**$39,990.00**	**$39,990.00**	**$39,990.00**	**$39,990.00**	**$39,990.00**
Nuisance Fauna (Hogs, etc.)										
Total			**$79,800.00**	**$79,800.00**	**$79,800.00**	**$39,990.00**	**$39,990.00**	**$39,990.00**	**$39,990.00**	**$39,990.00**
Burn Management					**Mesic Flatwood (75 ac)**					**Mesic Flatwood (75 ac)**
Rx Fire scehdule dependent upon fire conditions and vegetation growth			**No RX Fire**	**No RX Fire**	**Wet Prairie (40 ac) Dry Prairie (15 ac)**	**No RX Fire**	**Wet Prairie (40 ac) Dry Prairie (15 ac)**	**No RX Fire**	**No RX Fire**	**Wet Prairie (40 ac) Dry Prairie (15 ac)**
Burning	*$65 per acre*		**$975.00**	**$0.00**	**$8,450.00**	**$0.00**	**$3,575.00**	**$0.00**	**$0.00**	**$8,450.00**
Fire line Maintenance (2 x / yr)	*0.10 lf*		**$2,200.00**	**$2,200.00**	**$2,200.00**	**$2,200.00**	**$2,200.00**	**$2,200.00**	**$2,200.00**	**$2,200.00**
Fire Line Mobilization	*$250 per event*									
Total			**$3,175.00**	**$2,200.00**	**$10,650.00**	**$2,200.00**	**$5,775.00**	**$2,200.00**	**$2,200.00**	**$10,650.00**
Administrative Costs										
Consulting										
Other Administrative Costs										
Total			**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**
Total annual cost			**$112,155.00**	**$111,180.00**	**$120,630.00**	**$67,880.00**	**$71,455.00**	**$67,880.00**	**$68,880.00**	**$76,330.00**

APPENDIX IX
Public Charrette Details

Twin Oaks Public Charette Sign-In

Name	Affilliation	Address	Phone No.	Email
Marty Mann	FWC	Scotty's Road Kissimmee	321-624-6080	Martymann@myfwc.com
Dana Sussmann	FFS	8431 S. OBT Orlando 32809	407-251-2353	dana.sussmann@freshfromflorida.com
Michael Harford	BDCC			
Eleanor C Foster	UF/IFAS Extension	1921 Kissimmee Valley Lane Kissimmee, FL 34744	321-697-3000	efoe@osceola.org
Art Heiter		5075 Greenwich Rd Kiss 34746	407-4605427	artheiter@hotmail.com
Abby Horner	Resident	2120 Macy Island Rd.	407-414-3113	abby@gohorner.com
Shawn Hindle	HWA	400 W. Oak St. Kiss. 34741	407-847-9433	SHINDLE@HANSONWATER.COM
Amy Walker	Resident	715 Ill Ave St Cloud 34769	407414-2319	amyswalker02@gmail.com

Thursday July 12, 2012 5:00 – 7:00 p.m.

Twin Oaks Public Charette Sign-In

Name	Affilliation	Address	Phone No.	Email
Jenny Welch	Audubon Pine Lily FNPS	3203 St Augustine Ct Kiss. Fl 34746	407-847-2488	mwelch@cfl.rr.com
Kattya Graham	Audubon Pine Lily FNPS	2529 S. Stewart St. Kissimmee FL. 34746	4077389480	kattyagraham@gmail.com
Jane Adams	Parks & Rec	700 Adriane Park Cir Kissimmee FL 3474	407-973-9259	marthajaneadams@gmail.com
SANDY WEBB	AUDUBON FNPS	2660 ANN AVENUE KISSIMMEE	407 847-8810	SLWEBB3ZEIT@gmail.com
Jennifer Kirk	resident	800 Kentucky Ave St. Cloud FL	407-414-1814	jkruegerkirk@aol.com

Thursday July 12, 2012 5:00 – 7:00 p.m.

Native fruit trees to attract more birds
Well defined wildlife viewing areas.
Hackberry.

Will there be future trails?

Want a trail that is for hikers only.
No horses, no bicycles.
hikers do NOT need a trail 8-12 feet wide
hikers want a natural narrow trail
horses scare the birds away
Will ALL invasive species be removed
from Land? Camphor, tallow, etc.

I want the littoral zone of lake left
with native vegetation.

Signage: A generic sign for
Butterflies + Birds → NOT GOOD

I would like to see signs showing
most common birds + butterflies
+ native plants to be seen.

Recycle garbage cans + for fishing line

Garbage Can with Lids that can
NOT be removed by wildlife.

Benches

native plants but EDIBLE NATIVE as well. Think:

Community Orchard

~~[illegible]~~

It doesn't have to be a formal design, but something that blends with the different habitats, along the trail.

- Include recycling bins for plastic & aluminum. & Trash bins That are wildlife proof.
- Include WELL DEFINED Wildlife Observation stations/kiosks. in every different habitat w/clear signage & information about That habitat's species.

ESA

- For such a small area, does there really NEED to be equestrian traffic?
- Please keep the trails rounded – no sharp corners like on the S. end.
- As soon as the picnic area on the south side is open, you need a restroom! (Or the place will soon be trashed & smell bad.)
- Please leave littoral zone plants alone
- Will all invasives be re

ESA

- A separate trail for hikers ONLY should be seriously considered into the initial restoration work.
- I suggest repurposing the bolding material shown in the pictures (concrete) as URBANITE (reused concrete slab pieces) for a teaching space near the camping area (the space mentioned as a gathering place for scout groups & such).
- Consider looking into using permaculture principles & techiques to make use of the extense ditch, and find an alternative to having to fill it up.
- For the new plantings I

- Signage needs to be specific (as possible). People knows its a bird — what kind of bird?
- People need recycling cans for plastics, pisklin and aluminum cans.
- Boom boxes should be excluded. — Radios, too.
- Scaring wildlife (deliberately (partying — booze, etc) should be excluded.
- Need good diversity of trees and shrubs (food & shelter)
- Dogs need to be on leashes.
- Benches along trail.

Julie Sullivan

From: Sussmann, Dana [Dana.Sussmann@freshfromflorida.com]
Sent: Monday, July 23, 2012 3:35 PM
To: Julie Sullivan
Subject: Twin Oaks

I attended the 7/12 meeting where you presented the proposed plans for the Twin Oaks property. While the overall concept seems well thought out, I had a few comments I wanted to submit.

The plan has hikers and horseback riders sharing the same trail. I don't think this is a good mix and wanted to second a suggestion made by Eleanor Foerste, Naturalist with Osceola County Cooperative Extension Service. She proposed beginning to mow a separate trail for hikers which would essentially follow the same route as the road used by horseback riders. This would eliminate any conflicts caused by trail sharing. I think horseback riders should be required to "pick up" after their horses given the location of this park within the urban service boundary and the high number of people who will likely visit the park.

I don't know how you prevent airboats from getting too close to shore, disturbing the quiet of the park, and interfering with canoes and kayaks which launch there. These are two users which also aren't a good mix and a concerted effort should be made to keep airboats well away from this area.

I was surprised to hear that the pumps which control water levels would still be in use. I would like to see as much done as possible to reduce the need to artificially control water levels and promote natural water flow.

Providing multiple recreational opportunities at Twin Oaks is a good thing and may lessen some of the concern about the high cost to purchase and prepare the site for people to use. Spending more than $11million dollars for 1.5 miles of trail, a picnic area, fishing piers and wildlife viewing area may seem far too expensive to many Osceola County residents.

Thank you for considering my comments.

Sincerely,

Dana

Dana Sussmann
Senior Forester
Florida Forest Service

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