

HI-OAKS, LLC
1065 Maitland Center Commons Blvd.
Suite 201
Maitland, FL 32751
(407) 644-6200 / (407) 721-6382

October 9, 2025

Via E-Mail Only

Office of Environmental Services
Division of State Lands
Florida Department of Environmental Protections
3900 Commonwealth Blvd.
Mail Station 140
Tallahassee, FL 32399-3000

RE: Florida Forever New Project Application
Hi-Oaks Ranch

Dear Sir or Madame:

Hi-Oaks, LLC, the owner of Hi-Oaks Ranch, is hereby submitting the attached New Project Application for consideration by the Board of Trustees for the Florida Forever program. We feel that this 669 +/- acre undeveloped property in Seminole County is perfect for acquisition by Florida Forever due to its location bordering the Econlockhatchee River, the Natural Areas contained within the site, and its abundant wetlands, in addition to its presence within the Florida Wildlife Corridor and connectivity to adjacent conservation lands. At the same time, this property is located in a highly developable location in Central Florida.

We have also submitted an application for consideration by the Seminole Forever program for acquisition and maintenance of the property. The Seminole Forever ARC committee gave Hi-Oaks Ranch the highest property score on the entire list for consideration by the Board of County Commissioners ("BCC"). Due to scheduling conflicts, the BCC is unable to place this application on its agenda until Tuesday, November 18, 2025. At that time, we anticipate that the BCC will authorize Seminole Forever to issue a letter of commitment to Florida Forever. We will provide that letter immediately upon its receipt.

Letter to Florida Department of Environmental Protections
October 9, 2025
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We very much appreciate your consideration of the enclosed application, and should you have any questions, please contact our Authorized Representatives as listed within the application.

Sincerely,

HI OAKS, LLC

A handwritten signature in blue ink that reads "Kenneth M. Clayton". The signature is fluid and cursive, with the first name "Kenneth" being more prominent.

Kenneth M. Clayton
President

cc: Craig H. Clayton, Vice President, Hi-Oaks, LLC
Daryl Carter, Authorized Representative
Jonathan Clayton, Authorized Representative
Linda Dodge, Executive Director

Florida Forever New Project Application



[Florida Forever](#) is the state's conservation and recreation lands acquisition program. To be considered for acquisition, a project must have a willing seller and be on the Florida Forever Priority List. The Florida Forever Priority List identifies projects that are suitable as a conservation property and meet the [Florida Forever Goals, Performance Measures and Criteria](#).

The Florida Forever Priority List is developed by the Acquisition and Restoration Council (ARC) and is approved by the Board of Trustees (BOT). The BOT must approve a project placed on the Florida Forever Priority List before it can be pursued for acquisition.

Proposed projects are prioritized and ranked in categories by ARC members in December, and the BOT approves the ARC-recommended [Florida Forever Priority List](#) in March, when a project is officially added to the list.

Applications for new Florida Forever projects are accepted by the Florida Department of Environmental Protection (DEP) two times per year, April 15 and Oct. 15. To propose a new project for the Florida Forever Priority List, submit this application along with the supporting documentation specified in Attachments A-C below in electronic format (PDF) to the email address below.

Please note that up to 18 copies may be requested. Maps should be in color and set to print no larger than 11 inches x 17 inches. Applicants may also consult the Florida Natural Areas Inventory [Florida Forever Conservation Data Viewer](#) to ensure proposed parcels are not already within an approved project boundary.

General Information

Proposed Florida Forever Project: Hi Oaks Ranch

Nearest City Oviedo County(ies) Seminole County

Sponsor/Affiliation Proposing Project: Hi-Oaks, LLC / Property Owner

Mailing Address: 1065 Maitland Ctr Commons Blvd. Street City Maitland State FL
ZIP 32751

Primary Phone: 407-875-2655 Email: KClayton@Clayton-McCulloh
LDodge@ClaytonRE.com

SUBMIT COMPLETED APPLICATIONS TO:

FloridaForever@FloridaDEP.gov

Or by mail to:

Office of Environmental Services
Division of State Lands
Florida Department of Environmental Protection
3900 Commonwealth Blvd., Mail Station 140
Tallahassee, FL 32399-3000
Phone: 850-245-2555

Learn more about [Florida Forever](#).

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Supporting documentation

Attachment A. Provide a general description (narrative) of the land proposed including:

- 1) A descriptive location of the proposed project with total acreage.
- 2) The general physical, natural resource, biological, hydrological, archaeological and historical characteristics of the project.
 - a. Does the property contain historic structures 50 years old or older? If so, provide a brief description, photograph(s) and location.
 - b. Does the property contain any improvements/facilities? If so, please describe.
- 3) Potential public recreation opportunities or other public uses.
- 4) Potential threats or development plans that could impact the value of the proposed project.
- 5) Local resolutions related to the potential public acquisition of the project (if applicable).
- 6) Details on how the project meets Florida Forever criteria [see [Chapter 259.105\(9\)](#) and (10), F.S.] and furthers the Florida Forever goals and performance measures [see [Chapter 259.105\(4\)](#), F.S.]. Refer to the [application addendum](#) on the DEP website.
- 7) Whether the project is proposed for fee simple or less-than-fee acquisition.
 - a. If a less-than-fee acquisition is proposed, include a brief description of the current uses of the property. Also include any known activities or property rights proposed to be acquired by the state and those proposed to be retained by the property owner.
 - b. If project is proposed for fee simple acquisition, include the proposed land manager and a management commitment letter from the agency/entity upon application submittal. Applications for fee simple projects may be delayed if a management commitment from the recommended agency/entity is not included.
- 8) Whether the project is on another state acquisition list? If so, which one?

Attachment B. Ownership and tax information must include:

- 1) One copy of the county property appraiser's property tax card for each parcel of land within the proposal. The tax card should include the following:
 - a. Tax parcel identification number.
 - b. Just or market tax assessed value and tax assessed value.
 - c. Owners' names and addresses.
 - d. Description and value of improvements.
 - e. Tax parcel acreage and its improvements.
 - f. Ad valorem taxes assessed on the property.
- 2) If multiple parcels are included in the project proposal, summarize in table format by county, parcel ID, owner, acres and tax assessed value.
- 3) A letter from each property owner confirming their willingness to sell or a statement from the applicant asserting that each owner has been contacted.

Attachment C. Maps and Aerial Photographs

- 1) Provide shapefiles for the proposed project that depict the project boundaries or show the property boundaries on U.S. Geological Survey (USGS) topographic quadrangle map. USGS topographic quadrangle maps can be obtained from DEP's [Land Boundary Information System](#) (LABINS) or the [U.S. Geological Survey](#).
- 2) Mark the boundaries of the proposed addition on county tax maps, overlain on aerials if available. If tax aerial overlays are not available, aerials or [Digital Orthophoto Quadrangle](#) (DOQs) and tax maps should be submitted. DEP's [Map Direct](#) can also be used to assist with developing aerial and tax maps.
- 3) Mark the boundaries of the proposal on Florida Department of Transportation [county highway maps](#).

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Authorized Representative

In accordance with the Florida Forever application process, the following individual is authorized as the primary point of contact for all matters concerning this application on behalf of the owner(s) and willing seller(s) of the real property described below, in Seminole _____ County, Florida.

Property/Project name: Hi-Oaks Ranch

Name/Affiliation of Authorized Representative: Darryl Carter and/or Jonathan Clayton

Mailing Address: Maury Carter & Assoc. 3333 S. Orange Ave., Ste 200, Orlando, FL 32806
Street City State ZIP

Primary Phone: 407-422-3144 Email: JClayton@MauryCarter.com

Property information DCarter@MauryCarter.com

Section 31,32 Township 21S Range 32 E
Lat/Long 28.617354, -81.138295

Acres 669.4 Acres

Parcel identification number(s):

<u>31-21-32-300-0020-0000</u>	<u>32-21-32-0030-0000</u>
<u>32-21-32-300-0050-0000</u>	<u>32-21-32-003A-0000</u>
<u>31-21-32-300-0010-0000</u>	<u>32-21-32-003Z-0000</u>

Landowner Information

Kenneth M. Clayton
Landowner Signature

10/10/2025
Date

Kenneth M. Clayton, President
Landowner Name (print)

Mailing Address: 1065 Maitland Center Commons Blvd., Ste 201, Maitland, FL 32751
Street City State ZIP

Primary Phone: 407-875-2655 Email: KClayton@Clayton-McCulloh.com
LDodge@ClaytonRE.com

Please note: The landowner's signature above is not intended to preclude any representative of the Department of Environmental Protection, Division of State Lands (DSL), from contacting the property owner(s) directly concerning the property.

This form is not intended to create or acknowledge an exclusive property listing agreement or any business relationship between the owner(s) of the property and the individual(s) named above. Owner understands that any commission or fee charged by the person named above in connection with the property is the sole responsibility of the landowner.

This authorization will remain in effect throughout the application process unless written notice of rescission by the owner(s) named above is received by the DSL.



Attachment A

1) A descriptive location of the proposed project with total acreage.

Hi-Oaks Ranch spans 669.4 acres in south-central Seminole County, positioned along the Seminole–Orange County line. It lies between the Econlockhatchee River to the west and Chuluota Road (County Road 419) to the east (Exhibit A).

The property consists of six parcels and includes roughly one mile of riverfront along the Econlockhatchee. Located just east of the County-owned Econ River Wilderness Area, it also borders a conservation area to the north that connects to additional protected lands managed by the St. Johns River Water Management District.

Hi-Oaks Ranch falls within Seminole County's Econ Protection Area. It is designated as a Priority 2 and 3 Strategic Habitat Conservation Area, primarily classified as Priority 3 within the Florida Ecological Greenway Network and is part of the Florida Wildlife Corridor (Exhibit B).

2) The general physical, natural resource, biological, hydrological, archaeological and historical characteristics of the project.

The Hi-Oaks Ranch property encompasses a mosaic of natural communities, with unimproved woodland pasture as the dominant habitat type, interspersed with ecologically valuable wetlands including basin swamps, dome swamps, cypress domes, marshes, and mixed hardwood swamps. The western boundary borders the Econlockhatchee River and contains a substantial tract of relatively intact bottomland forest, contributing to regional habitat connectivity and riparian corridor protection.

Historically, the site has supported timber operations, evidenced by scattered rows of planted pine, and has been used for cattle grazing across its pasture areas. Limited recreational use, including hunting and camping, has occurred in the past.

The eastern portion of the property contributes to medium groundwater recharge, enhancing its hydrological importance. Approximately 275 acres of wetlands appear largely undisturbed, aside from a single pond excavated for cattle use.

The property supports documented occurrences of several listed species, including the gopher tortoise (*Gopherus polyphemus*), American alligator (*Alligator mississippiensis*), Florida sandhill crane, (*Antigone canadensis pratensis*), and Sherman's fox squirrel (*Sciurus niger shermani*). Various wading birds utilize the wetlands seasonally, and the listed plant species garberia (*Garberia heterophylla*) was observed during site visits. There is also potential habitat for additional listed plant species, such as plume polypody (*Pecluma plumula*), indicating the site's broader conservation value.

a. Does the property contain historic structures 50 years old or older? If so, provide a brief description, photograph(s) and location.

- A Cultural Resource Assessment Study was conducted in March, 2018. There were no historic structures found on the property (Exhibit C).

b. Does the property contain any improvements/facilities? If so, please describe.



- A pavilion was constructed in 2010 that has a storage area and restroom attached at one end. The property also has a well, power lines running to the pavilion and trailers, a cleaning station, firing range, fences and gates.

3) Potential public recreation opportunities or other public uses.

The property's substantial acreage, river frontage, and existing network of dirt roads and trails present a unique opportunity to support a wide range of public recreation and environmental education programs. Potential uses may include horseback riding, off-road biking, hiking, birding, kayaking and canoeing, and camping. These activities can be complemented by structured environmental education initiatives such as guided nature hikes and interpretive programming, enhancing community engagement and stewardship of natural resources.

This multi-use potential aligns with regional goals for expanding access to outdoor recreation, promoting environmental literacy, and preserving ecologically significant landscapes.

4) Potential threats or development plans that could impact the value of the proposed project.

Over the past two decades, the Hi-Oaks property has repeatedly been under contract for residential development, often with multi-family and commercial components. Each time, buyers have withdrawn their applications for various reasons. However, the continued growth of Seminole County places increasing development pressure on this land.

Hi-Oaks is now surrounded by residential development on its northern and eastern boundaries, with additional growth planned to the south—most notably the Sustanee development—rendering the property a “hole in the donut.” While the current Future Land Use (FLU) designation allows one unit per five acres and places the property within the rural boundary, this does not preclude development under existing land use regulations (see Exhibit D).

Several factors make Hi-Oaks a prime candidate for future development:

- **Transportation Infrastructure Needs:** Extension of McCulloch Road along the southern boundary is needed to address traffic engineering challenges.
- **Strategic Location:** The property borders Orange County and lies just 1.8 miles from the University of Central Florida and 0.52 miles from Seminole State College.
- **Regional Growth Drivers:** Proximity to potential Research Park expansion, existing and approved developments (Sustanee and Grow), and significant frontage along CR 419, which has already been widened in Orange County.
- **Housing Demand:** Eastern Seminole County faces a pressing need for affordable housing.
- **Market Appeal:** The area is highly attractive to buyers due to the quality of the Seminole County school system and surrounding single-family communities.

Given these pressures, the property is highly vulnerable to development. Without proactive acquisition by Seminole County or a conservation-focused organization, Hi-Oaks will almost certainly be developed as available land in the region continues to diminish.

Preserving Hi-Oaks offers a rare opportunity to protect ecologically valuable land, maintain rural character, and provide public access to nature in a rapidly urbanizing area. Its conservation would

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serve as a strategic counterbalance to surrounding growth and support long-term regional planning goals.

5) Local resolutions related to the potential public acquisition of the project (if applicable).

The Hi-Oaks Ranch property has been identified as a top-priority acquisition by Seminole County's land conservation program, Seminole Forever. Following a comprehensive evaluation, the Acquisition and Restoration Committee (ARC), the program's advisory body, ranked the property at the highest level for strategic conservation value. This recommendation will be presented to Seminole County Board of County Commissioners for their consideration. The acquisition of this property reflects strong local government support and alignment with countywide preservation goals.

This designation underscores the property's ecological significance and its potential to advance regional conservation, recreation, and environmental education objectives.

6) Details on how the project meets Florida Forever criteria [see [Chapter 259.105](#)(9) and (10), F.S.] and furthers the Florida Forever goals and performance measures [see [Chapter 259.105](#)(4), F.S.]. Refer to the [application addendum](#) on the DEP website.



ADDENDUM

Goals and Performance Measures (Section 259.105(4) Florida Statutes)

Goal A: Enhance the coordination and completion of land acquisition projects, as measured by:

1. The number of acres acquired through the state's land acquisition programs that contribute to the enhancement of essential natural resources, ecosystem service parcels, and connecting linkage corridors as identified and developed by the best available scientific analysis;

The Hi-Oaks Ranch consists of approximately 669.4 acres within the western edge of the Florida Wildlife Corridor (Exhibit B) and identified as a corridor opportunity area.

The Florida Wildlife Corridor Act was passed in 2021 to encourage and promote investments in areas that protect and enhance the Florida Wildlife Corridor. It specifies that the Florida Wildlife Corridor is an existing physical, geographically defined area comprised of over 18 million acres, of which 10 million acres are protected conservation lands. The corridor is of critical importance to support the animals' ability to migrate to find mates, food, and shelter.

The Florida Ecological Greenways Network (FEGN) is a statewide database that identifies and prioritizes a functionally connected statewide ecological network of public and private conservation lands. The FEGN guides the Florida Office of Greenways and Trails (OGT) ecological greenway conservation efforts and promotes public awareness of the need for and benefits of a statewide ecological greenways network. It is the primary data layer used to inform the Florida Forever, Rural and Family Lands Protection Program and other state, federal, and regional land acquisition programs regarding the most important ecological corridors and intact landscapes across the state for protection of Florida's native wildlife, ecosystem services, and ecological resiliency. It is also the key layer providing the science foundation for the Florida Wildlife Corridor. The FEGN ranks sites with priorities 1-3. **The Hi-Oaks Ranch site is ranked Priority 3.**

2. The number of acres protected through the use of alternatives to fee simple acquisition; or N/A

• N/A

3. The number of shared acquisition projects among Florida Forever funding partners and partners with other funding sources, including local governments and the Federal Government.

- Potential partners may include Seminole County for the long-term management of the property.

Goal B: Increase the protection of Florida's biodiversity at the species, natural community, and landscape levels, as measured by:

1. The number of acres acquired of significant strategic habitat conservation areas;

- Based on the FNAI Standard Data Report 669.4 acres or 98% of the site meets this goal (Exhibit E, Florida Forever Measures Evaluation Table).

2. The number of acres acquired of highest priority conservation areas for Florida's rarest species;

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- Based on the FNAI Standard Data Report 669.4 acres or 97% of the site meets this goal (Exhibit E, Florida Forever Measures Evaluation Table).

3. The number of acres acquired of significant landscapes, landscape linkages, and conservation corridors, giving priority to completing linkages;

- Based on the FNAI Standard Data Report 669.4 acres or 86% of the site meets this goal (Exhibit E, Florida Forever Measures Evaluation Table).
- This property's 669.4 acres is connected on the west to the County-owned Econ River Wilderness Area (see Exhibit A).

4. The number of acres acquired of underrepresented native ecosystems;

- There is less than 1% scrub/scrubby flatwoods on this property.

5. The number of landscape-sized protection areas of at least 50,000 acres that exhibit a mosaic of predominantly intact or restorable natural communities established through new acquisition projects or augmentations to previous projects; or

- N/A

6. The percentage increase in the number of occurrences of imperiled species on publicly managed conservation areas.

- Based on the FNAI Standard Data Report only one FNAI tracked species occurs on the property, however, looking at the FNAI Element Occurrence Report, an on-site survey by Bio-Tech Consulting, Inc., and Seminole County staff observations, there are two animal species that are FNAI tracked that occur on the property (not including wading birds): gopher tortoise and Sherman's fox squirrel.
- The adjacent Econ River Wilderness Area has several listed species including gopher tortoise, Florida pine snake, sandhill crane, and, wood stork.

Goal C: Protect, restore, and maintain the quality and natural functions of land, water and wetland systems of the state, as measured by:

1. The number of acres of publicly owned land identified as needing restoration, enhancement, and management, acres undergoing restoration or enhancement, acres with restoration activities completed, and acres managed to maintain such restored or enhanced conditions; the number of acres which represent actual or potential imperiled species habitat; the number of acres which are available pursuant to a management plan to restore, enhance, repopulate, and manage imperiled species habitat; and the number of acres of imperiled species habitat managed, restored, enhanced, repopulated, or acquired;

- The main natural community is unimproved/woodland pasture, with wetlands such as basin and domed swamps scattered throughout the property (Exhibit F). The western portion of the property borders the Econlockhatchee River and has a large portion of relatively intact bottomland forest. Timbering activities have occurred on the property throughout the years, and there are scattered areas of planted pine trees in rows. Cattle grazing has also occurred throughout the pastures, and limited hunting and camping has been allowed on the property in the past as well. The eastern half of the property provides medium groundwater recharge. Most of the wetlands on-site do not appear to have any major hydrological disturbances, although at least one of the ponds was dug out for cattle.

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- The Seminole County Comprehensive Plan Element recognizes the “Econlockhatchee River Corridor Protection Zone” which includes: the main channels of the Big Econlockhatchee River and its tributaries. This property has approximately one-mile of waterfront along the Econlockhatchee River.
- Overall, there is very little wetland restoration required. Most of the restoration potential lies in the uplands.

2. The percentage of water segments that fully meet, partially meet, or do not meet their designated uses as reported in the Department of Environmental Protection's State Water Quality Assessment 305(b) Report;

- 100% meet designated uses

3. The percentage completion of targeted capital improvements in surface water improvement and management plans created under s. 373.453(2), regional or master stormwater management system plans, or other adopted restoration plans;

- N/A

4. The number of acres acquired that protect natural floodplain functions;

- Based on the FNAI Standard Data Report, 311 acres or 46% of this site meets this goal.

5. The number of acres acquired that protect surface waters of the state;

- Based on the FNAI Standard Data Report 99% of the site meets this goal (Exhibit E, Florida Forever Measures Evaluation Table).
- Acquisition of the proposed site would help preserve, and, provide filtration of runoff into the Econlockhatchee River.

6. The number of acres identified for acquisition to minimize damage from flooding and the percentage of those acres acquired;

Acquisition of the 669.4 acres would help preserve the natural sheet flow and stormwater attenuation that would minimize damage from flooding.

7. The number of acres acquired that protect fragile coastal resources;

- N/A

8. The number of acres of functional wetland systems protected;

- Based on the FNAI Standard Data Report, 346 acres or 52% of the site meets this goal (Exhibit E, Florida Forever Measures Evaluation Table)
- A total of 346 acres of onsite wetlands would be protected and/or restored to improve natural wetland function. (Exhibit E, Florida Forever Measures Evaluation Table)

9. The percentage of miles of critically eroding beaches contiguous with public lands that

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are restored or protected from further erosion;

- N/A

10. The percentage of public lakes and rivers in which invasive, nonnative aquatic plants are under maintenance control; or

- Due to the nature of the Econlockhatchee River in this area (continuous flow), there is very little nonnative aquatic plant presence or need for treatment.

11. The number of acres of public conservation lands in which upland invasive, exotic plants are under maintenance control.

- The Econ River Wilderness Area, located just west of Hi-Oaks Ranch, is currently undergoing active invasive species management. In contrast, Hi-Oaks Ranch contains very few invasive species beyond pasture grasses, making it a strong candidate for cost-effective ecological restoration. With minimal intervention, the property could be brought under maintenance control, supporting long-term habitat health and complementing adjacent conservation efforts.

Goal D: Ensure that sufficient quantities of water are available to meet the current and future needs of natural systems and the citizens of the state, as measured by:

1. The number of acres acquired which provide retention and storage of surface water in naturally occurring storage areas, such as lakes and wetlands, consistent with the maintenance of water resources or water supplies and consistent with district water supply plans;

- The property includes approximately 346 acres of wetlands that play a critical role in retaining and storing surface water before it flows into the Econlockhatchee River. This natural hydrological function directly supports the goals outlined in the St. Johns River Water Management District (SJRWMD) Water Supply Plan, which prioritizes groundwater recharge, the preservation of green infrastructure, and the reduction of impervious surfaces. Protecting these wetlands would contribute to regional water quality, flood mitigation, and long-term ecosystem resilience.

2. The quantity of water made available through the water resource development component of a district water supply plan for which a water management district is responsible; or

- N/A

3. The number of acres acquired of groundwater recharge areas critical to springs, sinks, aquifers, other natural systems, or water supply.

- Based on the FNAI Standard Data Report 100% of the site meets this goal.

Goal E: Increase natural resource-based public recreation or educational opportunities, as measured by:

1. The number of acres acquired that are available for natural resource-based public

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recreation or education;

- Nearly the entire 671-acre Hi-Oaks Ranch property is suitable for natural resource-based public recreation and environmental education. Its diverse landscape and minimal development make it an ideal setting for low-impact activities such as hiking, wildlife observation, interpretive programming, and outdoor learning. This broad suitability supports regional goals for expanding public access to nature while promoting conservation and stewardship.

2. The miles of trails that are available for public recreation, giving priority to those that provide significant connections including those that will assist in completing the Florida National Scenic Trail; or

- The full 671-acre Hi-Oaks Ranch property offers exceptional potential for the development of a comprehensive trail network. Its proximity to the Florida National Scenic Trail (FNST), located just east of the site, presents a unique opportunity to enhance regional connectivity. Establishing a trailhead and spur along County Road 419 would create a direct link to the FNST, expanding public access to outdoor recreation and supporting statewide trail infrastructure goals. This integration would also promote eco-tourism, environmental education, and non-motorized transportation options for the surrounding communities.

3. The number of new resource-based recreation facilities, by type, made available on public land.

- Hi-Oaks Ranch presents significant potential for expanding resource-based recreation infrastructure to serve the growing needs of the community. Proposed enhancements include traditional and equestrian camping areas, a off-road biking with a designated bike station, a pavilion equipped with picnic tables and barbecue facilities, additional restroom installations, and a fishing platform along the Econlockhatchee River. A pedestrian bridge over the river would further connect the site to the County-owned Econ River Wilderness Area to the west, creating a seamless recreational corridor and enhancing regional trail connectivity. These improvements would support low-impact public use, promote outdoor recreation, and foster environmental stewardship, aligning with local and state priorities for expanding access to nature and preserving ecologically valuable landscapes.

Goal F: Preserve significant archaeological or historic sites, as measured by:

1. The increase in the number of and percentage of historic and archaeological properties listed in the Florida Master Site File or National Register of Historic Places which are protected or preserved for public use; or

- There are no archeological or historical sites listed on the property (Exhibit I).

2. The increase in the number and percentage of historic and archaeological properties that are in state ownership.

- The Florida Master Site File does not currently list any historic or archeological sites on this property (Exhibit I).

Goal G: Increase the amount of forestland available for sustainable management of natural resources, as measured by:

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1. The number of acres acquired that are available for sustainable forest management;

- Approximately 300 acres of pasture within the 671-acre Hi-Oaks Ranch property are available for sustainable forest management. Historically, the site has been densely timbered and partially replanted with slash pine in the early 2000s. These existing conditions, combined with the property's scale and soil suitability, offer significant opportunity for expanded timber planting and long-term forest stewardship practices.

2. The number of acres of state-owned forestland managed for economic return in accordance with current best management practices;

- Approximately 300 acres of pastureland within the Hi-Oaks Ranch property are well-suited for reforestation through sustainable silvicultural practices. These areas offer a prime opportunity for timber establishment using methods that adhere to Florida's Best Management Practices (BMPs), promoting long-term forest health, soil conservation, and ecosystem resilience.

3. The number of acres of forestland acquired that will serve to maintain natural groundwater recharge functions; or

- Based on the FNAI Standard Data Report (Exhibit E) 60 acres or 12% of the site meets this goal.

4. The percentage and number of acres identified for restoration actually restored by reforestation.

- Currently, no areas of the property have undergone formal forest restoration. However, approximately 300 acres of pastureland are available for reforestation through appropriate silvicultural operations. These areas offer a strong opportunity for restoration using Florida's Best Management Practices (BMPs), supporting sustainable forest management, enhancing habitat connectivity, and contributing to long-term ecological resilience.

Goal H: Increase the amount of open space available in urban areas, as measured by:

1. The percentage of local governments that participate in land acquisition programs and acquire open space in urban cores; or

- 100%. Seminole County Board of County Commissioners approved the Seminole Forever Acquisition Program in 2023.
- The purpose of the program is:
 - o "The County commits to the acquisition and management of public lands provided for ecological protection, preservation, and recreation for the enjoyment of present and future citizens. As part of the efforts to maintain and uphold the County's natural character, the County commits to fund its own acquisition program, Seminole Forever. Seminole Forever aims to identify and acquire lands to protect its water resources, natural communities, wildlife and to provide additional greenspace and recreational opportunities as defined in the County's Park System Master Plan, whether through the addition of parks, community gardens, sustainable agriculture, or other lands for resource based passive recreation."

2. The percentage and number of acres of purchases of open space within urban service

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areas.

- The Seminole Forever Program recently completed its inaugural evaluation and scoring process for nominated conservation properties. Of the nine submissions reviewed, two were located within urban areas and were specifically identified as priority acquisition targets in Seminole County's Park System Master Plan. This alignment underscores the program's strategic approach to expanding public access to green space and advancing long-term recreational and conservation goals.

Goal I: Mitigate the effects of natural disasters and floods in developed areas, as measured by:

1. The number of acres acquired within a 100-year floodplain or a coastal high hazard area;

- While Hi-Oaks Ranch is located outside the designated urban area, a portion of the property lies within the 100-year floodplain. Protecting and preserving the natural floodplain capacity remains a critical priority, as it contributes to regional flood mitigation, water quality, and ecosystem resilience. Conservation of this area would support broader watershed management goals and align with local and state efforts to safeguard vulnerable hydrological systems.

2. The number of acres acquired or developed to serve dual functions as:

a. Flow ways or temporary water storage areas during flooding or high-water events, not including permanent reservoirs; and

- N/A

b. Greenways or open spaces available to the public for recreation;

- The full 671-acre Hi-Oaks Ranch property will be made accessible to the public for outdoor recreation. Its size and natural features support a wide range of resource-based activities, including hiking, wildlife observation, paddling, biking, and environmental education. This commitment to public access aligns with regional goals to expand recreational opportunities and connect communities to nature.

3. The number of acres that protect existing open spaces and natural buffer areas within a floodplain that also serve as natural flow ways or natural temporary water storage areas; and

- Approximately 311 acres protect existing open spaces and natural buffer areas within a floodplain along the Econlockhatchee River.

4. The percentage of the land acquired within the project boundary that creates additional open spaces, natural buffer areas, and greenways within a floodplain, while precluding rebuilding in areas that repeatedly flood. *Criteria* [Section 259.105(9) and (10), F.S.]

- Approximately 46% of the project boundary creates additional open spaces, natural buffer areas and greenways within a floodplain.

Criteria [Section 259.105(9) and (10), F.S.]



(9) The Acquisition and Restoration Council shall recommend rules for adoption by the board of trustees to competitively evaluate, select, and rank projects eligible for Florida Forever funds pursuant to paragraph (3)(b). In developing these proposed rules, the Acquisition and Restoration Council shall give weight to the following criteria:

(a) The project meets multiple goals described in subsection (4).

- Yes, see Addendum Goals, Performance Measures and Criteria.

(b) The project is part of an ongoing governmental effort to restore, protect, or develop land areas or water resources.

- The Hi-Oaks Ranch project is situated on the western edge of the Florida Wildlife Corridor and lies within Seminole County's designated Rural Charter Area—an area established to preserve the rural character of the county's eastern region. This location enhances the property's strategic conservation value by supporting landscape-scale connectivity, protecting rural open space, and reinforcing long-term planning efforts aimed at balancing growth with natural resource preservation.

(c) The project enhances or facilitates management of properties already under public ownership.

- Hi-Oaks Ranch is located just east of the Econ River Wilderness Area and serves as a critical ecological and recreational link to this protected landscape. The property also safeguards approximately one mile of the Econlockhatchee River, contributing to watershed protection, wildlife corridor connectivity, and public access to natural resources.
- The County currently oversees more than 7,300 acres of parks and natural lands and maintains over 130 miles of paved and wilderness trails. Its Parks and Recreation Department manages a robust system that includes 6 staffed parks, 25 unstaffed parks and trailheads, and 11 natural lands areas open for public use.

(d) The project has significant archaeological or historic value.

- A review of the Florida Master Site File confirms that no historic or archaeological sites are documented on the Hi-Oaks Ranch property. Additionally, a Cultural Resource Assessment Survey conducted in 2018 yielded similar findings, indicating no known cultural resources. These results suggest that the property is well-suited for conservation and public use without anticipated conflicts related to cultural or historical preservation.

(e) The project has funding sources that are identified and assured through at least the first 2 years of the project.

- This will be determined at the Seminole County Board of County Commissioners (Board) meeting when the list of Seminole Forever nominees will be presented to the Board for their consideration.

(f) The project contributes to the solution of water resource problems on a regional basis.

- N/A

**Florida Forever
New Project Application**



(g) The project has a significant portion of its land area in imminent danger of development, in imminent danger of losing its significant natural attributes or recreational open space, or in imminent danger of subdivision which would result in multiple ownership and make acquisition of the project costly or less likely to be accomplished.

- Over the past two decades, the Hi-Oaks Ranch property has repeatedly been under contract for residential development, including multi-family and commercial components. Each proposal was ultimately withdrawn for various reasons, but the pressure to develop remains strong. As Seminole County continues to experience rapid growth, Hi-Oaks Ranch faces increasing vulnerability to conversion. The property is currently surrounded by residential development on its northern and eastern boundaries, with additional development planned to the south—most notably the Sustanee and Grow projects in adjacent Orange County—rendering Hi-Oaks a critical “hole in the donut.”
- Although the property’s Future Land Use (FLU) designation allows one unit per five acres and lies within the County’s Rural Boundary Area, this designation does not preclude development under current zoning. (See Exhibit D – FLU.)
- Hi-Oaks Ranch is considered a prime candidate for development due to several factors:
 - The need to extend McCulloch Road along its southern boundary to address traffic engineering concerns.
 - Its location directly adjacent to the Seminole County/Orange County line.
 - Proximity to major institutions:
 - University of Central Florida (~1.8 miles), with potential for campus expansion and student housing.
 - Seminole State College (~0.52 miles).
 - Potential expansion of the Central Florida Research Park.
- High demand for affordable housing in eastern Seminole County.
- Significant frontage on CR 419 (Chuluota Road), which has already been widened to four lanes in Orange County, creating pressure for similar improvements in Seminole County.
- Surrounding single-family residential developments.
- The appeal of the area due to Seminole County’s highly rated public school system.

Given these pressures and the diminishing availability of undeveloped land in the region, Hi-Oaks Ranch is at high risk of being developed if not acquired for conservation. Securing this property would prevent fragmentation, preserve ecological integrity, and protect a vital green space in a rapidly urbanizing landscape.

(h) The project implements an element from a plan developed by an ecosystem management team.

- N/A

(i) The project is one of the components of the Everglades restoration effort.

- N/A

(j) The project may be purchased at 80 percent of appraised value.

- N/A

(k) The project may be acquired, in whole or in part, using alternatives to fee simple, including but not limited to, tax incentives, mitigation funds, or other revenues; the

**Florida Forever
New Project Application**



purchase of development rights, hunting rights, agricultural or silvicultural rights, or mineral rights; or obtaining conservation easements or flowage easements.

- N/A

(I) The project is a joint acquisition, either among public agencies, nonprofit organizations, or private entities, or by a public-private partnership.

- Seminole County's participation will be determined at a future Board of County Commissioners meeting.

(10) The Acquisition and Restoration Council shall give increased priority to those projects for which matching funds are available and to project elements previously identified on an acquisition list pursuant to this section that can be acquired at 80 percent or less of appraised value. The council shall also give increased priority to those projects where the state's land conservation plans overlap with the military's need to protect lands, water, and habitat to ensure the sustainability of military missions including:

(a) Protecting habitat on nonmilitary land for any species found on military land that is designated as threatened or endangered, or is a candidate for such designation under the Endangered Species Act or any Florida statute;

- N/A

(b) Protecting areas underlying low-level military air corridors or operating areas; and

- N/A

(c) Protecting areas identified as clear zones, accident potential zones, and air installation compatible use buffer zones delineated by our military partners, and for which federal or other funding is available to assist with the project.

- N/A

7. Whether the project is proposed for fee simple or less-than-fee acquisition.

(a) If a less-than-fee acquisition is proposed, include a brief description of the current uses of the property. Also include any known activities or property rights proposed to be acquired by the state and those proposed to be retained by the property owner.

- N/A

(b) If project is proposed for fee simple acquisition, include the proposed land manager and a management commitment letter from the agency/entity upon application submittal. Applications for fee simple projects may be delayed if a management commitment from the recommended agency/entity is not included.

The Hi-Oaks Ranch project is proposed for fee simple acquisition, with the long-term management to be determined at a Seminole County Board of County Commissioners meeting.



Attachment B

Ownership and tax information must include:

4) One copy of the county property appraiser's property tax card for each parcel of land within the proposal. The tax card should include the following:

- a. Tax parcel identification number.
- b. Just or market tax assessed value and tax assessed value.
- c. Owners' names and addresses.
- d. Description and value of improvements.
- e. Tax parcel acreage and its improvements.
- f. Ad valorem taxes assessed on the property.

- See Exhibit K: Hi-Oaks Ranch Tax Cards

5) If multiple parcels are included in the project proposal, summarize in table format by county, parcel ID, owner, acres, and tax assessed value.

County	Parcel ID	Owner	Grazing Acres	Assessed Value (After Ag Exemption)
Seminole	31-21-32-300-0020-0000	Hi-Oaks LLC	169.98	\$30,443
Seminole	32-21-32-300-0050-0000	Hi-Oaks LLC	216.60	\$34,338
Seminole	31-21-32-300-0010-0000	Hi-Oaks LLC	115.49	\$29,899
Seminole	32-21-32-300-0030-0000	Hi-Oaks LLC	143.04	\$23,299
Seminole	32-21-32-300-003Z-0000	Hi-Oaks LLC	15.34	\$3,180
Seminole	32-21-32-300-003A-0000	Hi-Oaks LLC	11.49	\$2,663

6) A letter from each property owner confirming their willingness to sell or a statement from the applicant asserting that each owner has been contacted.

Please see the following page for the signed letter from the property owner confirming their willingness to sell.

Hi-Oaks, LLC
1065 Maitland Center Commons Blvd.
Suite 201
Maitland, FL 32751
(407) 644-6200 (407) 721-6382

October 9, 2025

Office of Environmental Services
Division of State Lands
Florida Department of Environmental Protections
3900 Commonwealth Blvd.
Mail Station 140
Tallahassee, FL 32399-3000

RE: Florida Forever New Project Application
Hi-Oaks Ranch
Statement of Willingness to Sell

Dear Sir or Madame:

I, the undersigned, am the legal owner of the property described below and hereby express my desire to have my property considered for acquisition under the Florida Forever Program. I am willing to sell the property contingent upon reaching mutually agreeable terms with the State.

I understand that the sale of the property, if agreed upon, will be contingent upon:

1. Approval by the Board of Trustees for Florida Forever;
2. Completion of necessary appraisals, environmental assessments, and due diligence; and
3. Agreement on the purchase price and terms in a formal Purchase Agreement.

By submitting this form, I acknowledge that this is a non-binding expression of willingness to sell and does not obligate either party to proceed with the transaction. Either party may terminate discussions prior to entering into a formal Purchase Agreement without liability.

Property information:

Address: 2580 S. CR 419, Chuluota, FL 32766

Parcel Identification Numbers: 31-21-32-300-0020-0000 32-21-32-300-0030-0000
32-21-32-300-0050-0000 32-21-32-300-003A-0000
31-21-31-300-0010-0000 32-21-32-300-003Z-0000

I acknowledge that I am legal owner of the property described in this form and I am accurately representing a voluntary expression to sell as provided above.

Should you have any questions, please contact me at (407) 875-2655 or via email at kclayton@clayton-mcculloh.com or contact an Authorized Representative listed within the Application.

Sincerely,

HI-OAKS, LLC



Kenneth M. Clayton
President

cc: Craig H. Clayton, Vice President
Daryl Carter, Authorized Representative
Jonathan Clayton, Authorized Representative
Linda Dodge, Executive Director

Attachment B
Tax Cards (6)

Property Record Card



Parcel: 31-21-32-300-0020-0000
 Property Address:
 Owners: HI-OAKS LLC
 2025 Market Value \$3,478,000 Assessed Value \$30,443 Taxable Value \$30,443
 2024 Tax Bill \$314.58 Tax Savings with Exemptions \$7,935.61
 Grazing Land property has a lot size of 169.98 Acres

Parcel Location



Site View

Parcel Information

Parcel	31-21-32-300-0020-0000
Property Address	
Mailing Address	1065 MAITLAND CENTER COMMONS BLVD STE 201 MAITLAND, FL 32751-7437
Subdivision	
Tax District	G1:Agricultural
DOR Use Code	61:Grazing Land
Exemptions	None
AG Classification	Yes

Value Summary

	2025 Working Values	2024 Certified Values
Valuation Method	Cost/Market	Cost/Market
Number of Buildings	0	0
Depreciated Building Value	\$0	\$0
Depreciated Other Features	\$0	\$0
Land Value (Market)	\$3,478,000	\$798,400
Land Value Agriculture	\$30,443	\$30,443
Just/Market Value	\$3,478,000	\$798,400
Portability Adjustment	\$0	\$0
Save Our Homes Adjustment/Maximum Portability	\$0	\$0
Non-Hx 10% Cap (AMD 1)	\$0	\$0
P&G Adjustment	\$0	\$0
Assessed Value	\$30,443	\$30,443

2024 Certified Tax Summary

Tax Amount w/o Exemptions	\$8,250.19
Tax Bill Amount	\$314.58
Tax Savings with Exemptions	\$7,935.61

Owner(s)

Name - Ownership Type

HI-OAKS LLC

Note: Does NOT INCLUDE Non Ad Valorem Assessments

Wednesday, June 25, 2025

1/4

Legal Description

SEC 31 TWP 21S RGE 32E S 3/8 OF SEC E OF
ECONLOCKHATCHEE CREEK

Taxes

Taxing Authority	Assessed	Exempt Amount	Taxable
COUNTY GENERAL FUND	\$30,443	\$0	\$30,443
Schools	\$30,443	\$0	\$30,443
SJWM(Saint Johns Water Management)	\$30,443	\$0	\$30,443

Sales

Deed Type	Date	Sale Amount	Book / Page	Sale Type	Qualified?
QUIT CLAIM DEED	2/1/2006	\$100	06381/0555	Vacant	No
QUIT CLAIM DEED	4/1/2003	\$114,000	04786/1720	Vacant	No
QUIT CLAIM DEED	4/1/2003	\$6,500	04786/1716	Vacant	No
QUIT CLAIM DEED	4/1/2003	\$397,600	04786/1712	Vacant	No
QUIT CLAIM DEED	2/1/2000	\$632,800	03924/1466	Vacant	No
SPECIAL WARRANTY DEED	12/1/1999	\$702,800	03778/1390	Vacant	No
QUIT CLAIM DEED	12/1/1994	\$100	02863/0117	Vacant	No
WARRANTY DEED	3/1/1989	\$3,100,000	02052/1154	Vacant	No
WARRANTY DEED	5/1/1960	\$100	01369/1595	Vacant	No

Land

Units	Rate	Assessed	Market
8 Acres	\$22,500/Acre Market, \$100/Acre AG	\$800	\$180,000
39.50 Acres	\$22,500/Acre Market, \$225/Acre AG	\$8,888	\$888,750
39.50 Acres	\$22,500/Acre Market, \$120/Acre AG	\$4,740	\$888,750
67 Acres	\$22,500/Acre Market, \$45/Acre AG	\$3,015	\$1,507,500
26 Acres	\$500/Acre	\$13,000	\$13,000

Building Information	
#	
Use	
Year Built*	
Bed	
Bath	
Fixtures	
Base Area (ft²)	
Total Area (ft²)	
Constuction	
Replacement Cost	
Assessed	

Building

* Year Built = Actual / Effective

Permits				
Permit #	Description	Value	CO Date	Permit Date

Extra Features				
Description	Year Built	Units	Cost	Assessed

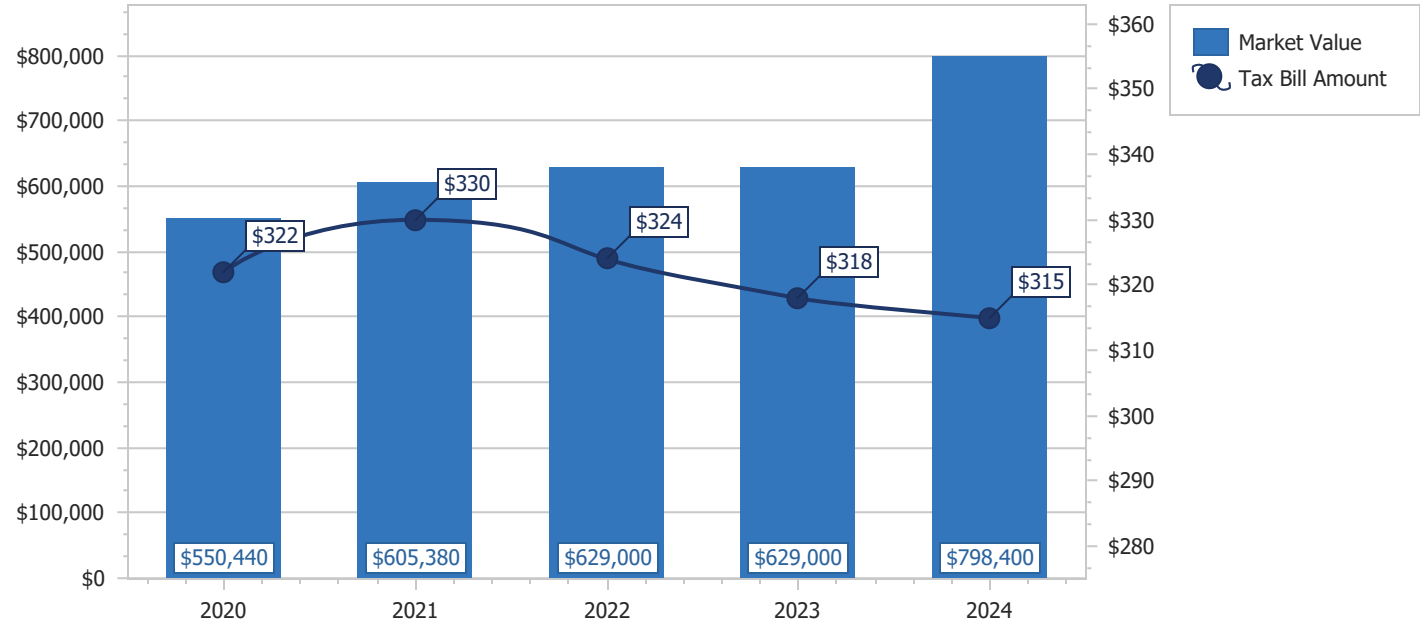
Zoning	
Zoning	A-5
Description	Rural-5Ac
Future Land Use	R5
Description	Rural-5

School Districts	
Elementary	Walker
Middle	Chiles
High	Hagerty

Political Representation	
Commissioner	District 1 - Bob Dallari
US Congress	District 7 - Cory Mills
State House	District 37 - Susan Plasencia
State Senate	District 10 - Jason Brodeur
Voting Precinct	Precinct 81

Utilities	
Fire Station #	Station: 43 Zone: 431
Power Company	FPL
Phone (Analog)	AT&T
Water	
Sewage	
Garbage Pickup	
Recycle	
Yard Waste	
Hauler #	

Property Value History



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Property Record Card



Parcel: 32-21-32-300-0030-0000
 Property Address:
 Owners: HI-OAKS LLC
 2025 Market Value \$3,037,500 Assessed Value \$23,299 Taxable Value \$23,299
 2024 Tax Bill \$240.76 Tax Savings with Exemptions \$6,873.79
 Grazing Land property has a lot size of 143.04 Acres

Parcel Location



Site View

Parcel Information

Parcel	32-21-32-300-0030-0000
Property Address	
Mailing Address	1065 MAITLAND CENTER COMMONS BLVD STE 201 MAITLAND, FL 32751-7437
Subdivision	
Tax District	G1:Agricultural
DOR Use Code	60:Grazing Land
Exemptions	None
AG Classification	Yes

Value Summary

	2025 Working Values	2024 Certified Values
Valuation Method	Cost/Market	Cost/Market
Number of Buildings	0	0
Depreciated Building Value	\$0	\$0
Depreciated Other Features	\$0	\$0
Land Value (Market)	\$3,037,500	\$688,500
Land Value Agriculture	\$23,299	\$23,299
Just/Market Value	\$3,037,500	\$688,500
Portability Adjustment	\$0	\$0
Save Our Homes Adjustment/Maximum Portability	\$0	\$0
Non-Hx 10% Cap (AMD 1)	\$0	\$0
P&G Adjustment	\$0	\$0
Assessed Value	\$23,299	\$23,299

2024 Certified Tax Summary

Tax Amount w/o Exemptions	\$7,114.55
Tax Bill Amount	\$240.76
Tax Savings with Exemptions	\$6,873.79

Owner(s)

Name - Ownership Type

HI-OAKS LLC

Note: Does NOT INCLUDE Non Ad Valorem Assessments

Wednesday, June 25, 2025

1/4

Legal Description

SEC 32 TWP 21S RGE 32E S 2/5 OF N 5/8 (LESS
E 1030 FT OF S 1/4 OF NE 1/4 & NE 1/4 OF NE
1/4 OF SE 1/4)

Taxes

Taxing Authority	Assessed	Exempt Amount	Taxable
COUNTY GENERAL FUND	\$23,299	\$0	\$23,299
Schools	\$23,299	\$0	\$23,299
SJWM(Saint Johns Water Management)	\$23,299	\$0	\$23,299

Sales

Deed Type	Date	Sale Amount	Book / Page	Sale Type	Qualified?
QUIT CLAIM DEED	2/1/2006	\$100	06381/0558	Vacant	No
QUIT CLAIM DEED	4/1/2003	\$114,000	04786/1720	Vacant	No
QUIT CLAIM DEED	4/1/2003	\$6,500	04786/1716	Vacant	No
QUIT CLAIM DEED	4/1/2003	\$397,600	04786/1712	Vacant	No
QUIT CLAIM DEED	2/1/2000	\$632,800	03924/1466	Vacant	No
SPECIAL WARRANTY DEED	12/1/1999	\$702,800	03778/1390	Vacant	No
QUIT CLAIM DEED	12/1/1994	\$100	02863/0114	Vacant	No
TRUSTEE DEED	7/1/1989	\$1,290,000	02087/1842	Vacant	No
QUIT CLAIM DEED	7/1/1989	\$100	02087/1840	Vacant	No
QUIT CLAIM DEED	1/1/1988	\$100	02031/0234	Vacant	No
WARRANTY DEED	8/1/1979	\$100	01236/1806	Vacant	No
WARRANTY DEED	1/1/1960	\$100	01369/1595	Vacant	No

Land

Units	Rate	Assessed	Market
28 Acres	\$22,500/Acre Market, \$178/Acre AG	\$4,984	\$630,000
75 Acres	\$22,500/Acre Market, \$225/Acre AG	\$16,875	\$1,687,500
32 Acres	\$22,500/Acre Market, \$45/Acre AG	\$1,440	\$720,000

Building Information	
#	
Use	
Year Built*	
Bed	
Bath	
Fixtures	
Base Area (ft²)	
Total Area (ft²)	
Constuction	
Replacement Cost	
Assessed	

Building

* Year Built = Actual / Effective

Permits				
Permit #	Description	Value	CO Date	Permit Date
02917	1672 ONONDAGO DR NOT SURE OF PARCEL NUMBER C/O 10-6-94	\$160,000	10/6/1994	4/1/1994

Extra Features				
Description	Year Built	Units	Cost	Assessed

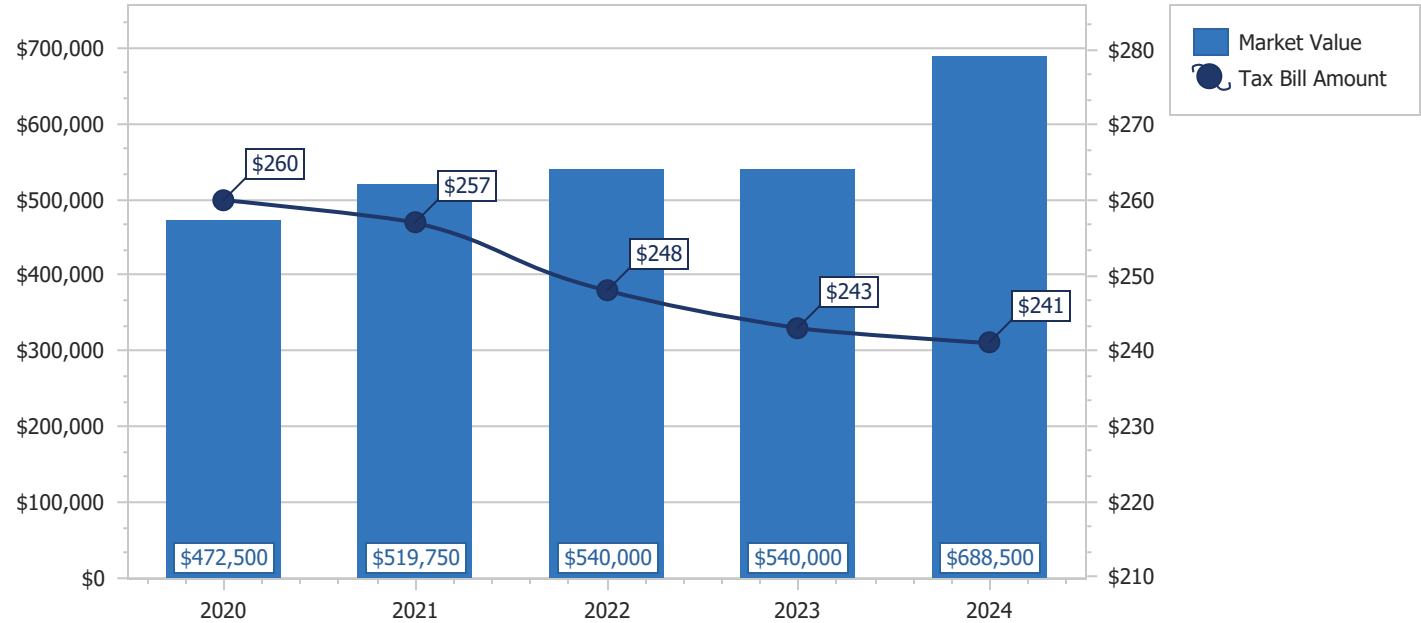
Zoning	
Zoning	A-5
Description	Rural-5Ac
Future Land Use	R5
Description	Rural-5

School Districts	
Elementary	Walker
Middle	Chiles
High	Hagerty

Political Representation	
Commissioner	District 1 - Bob Dallari
US Congress	District 7 - Cory Mills
State House	District 37 - Susan Plasencia
State Senate	District 10 - Jason Brodeur
Voting Precinct	Precinct 81

Utilities	
Fire Station #	Station: 43 Zone: 431
Power Company	FPL
Phone (Analog)	AT&T
Water	
Sewage	
Garbage Pickup	
Recycle	
Yard Waste	
Hauler #	

Property Value History



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Property Record Card



Parcel: 32-21-32-300-0050-0000
Property Address:
Owners: HI-OAKS LLC
2025 Market Value \$4,950,000 Assessed Value \$34,338 Taxable Value \$34,338
2024 Tax Bill \$354.83 Tax Savings with Exemptions \$11,239.24
Timberland property has a lot size of 216.60 Acres

Parcel Location



Site View

Parcel Information

Parcel	32-21-32-300-0050-0000
Property Address	
Mailing Address	1065 MAITLAND CENTER COMMONS BLVD STE 201 MAITLAND, FL 32751-7437
Subdivision	
Tax District	G1:Agricultural
DOR Use Code	55:Timberland
Exemptions	None
AG Classification	Yes

Value Summary

	2025 Working Values	2024 Certified Values
Valuation Method	Cost/Market	Cost/Market
Number of Buildings	0	0
Depreciated Building Value	\$0	\$0
Depreciated Other Features	\$0	\$0
Land Value (Market)	\$4,950,000	\$1,122,000
Land Value Agriculture	\$34,338	\$34,338
Just/Market Value	\$4,950,000	\$1,122,000
Portability Adjustment	\$0	\$0
Save Our Homes Adjustment/Maximum Portability	\$0	\$0
Non-Hx 10% Cap (AMD 1)	\$0	\$0
P&G Adjustment	\$0	\$0
Assessed Value	\$34,338	\$34,338

2024 Certified Tax Summary

Tax Amount w/o Exemptions	\$11,594.07
Tax Bill Amount	\$354.83
Tax Savings with Exemptions	\$11,239.24

Owner(s)

Name - Ownership Type

HI-OAKS LLC

Note: Does NOT INCLUDE Non Ad Valorem Assessments

Wednesday, June 25, 2025

1/4

Legal Description

SEC 32 TWP 21S RGE 32E S 3/8 (LESS S 20 CH
OF E 10 CH)

Taxes

Taxing Authority	Assessed	Exempt Amount	Taxable
COUNTY GENERAL FUND	\$34,338	\$0	\$34,338
Schools	\$34,338	\$0	\$34,338
SJWM(Saint Johns Water Management)	\$34,338	\$0	\$34,338

Sales

Deed Type	Date	Sale Amount	Book / Page	Sale Type	Qualified?
QUIT CLAIM DEED	2/1/2006	\$100	06381/0552	Vacant	No
QUIT CLAIM DEED	4/1/2003	\$114,000	04786/1720	Vacant	No
QUIT CLAIM DEED	4/1/2003	\$6,500	04786/1716	Vacant	No
QUIT CLAIM DEED	4/1/2003	\$397,600	04786/1712	Vacant	No
QUIT CLAIM DEED	2/1/2000	\$632,800	03924/1466	Vacant	No
SPECIAL WARRANTY DEED	12/1/1999	\$702,800	03778/1390	Vacant	No
QUIT CLAIM DEED	12/1/1994	\$100	02863/0117	Vacant	No
WARRANTY DEED	3/1/1989	\$3,100,000	02052/1154	Vacant	No
WARRANTY DEED	5/1/1960	\$100	01369/1595	Vacant	No

Land

Units	Rate	Assessed	Market
31 Acres	\$22,500/Acre Market, \$178/Acre AG	\$5,518	\$697,500
127 Acres	\$22,500/Acre Market, \$100/Acre AG	\$12,700	\$2,857,500
62 Acres	\$22,500/Acre Market, \$260/Acre AG	\$16,120	\$1,395,000

Building Information	
#	
Use	
Year Built*	
Bed	
Bath	
Fixtures	
Base Area (ft²)	
Total Area (ft²)	
Constuction	
Replacement Cost	
Assessed	

Building

* Year Built = Actual / Effective

Permits				
Permit #	Description	Value	CO Date	Permit Date

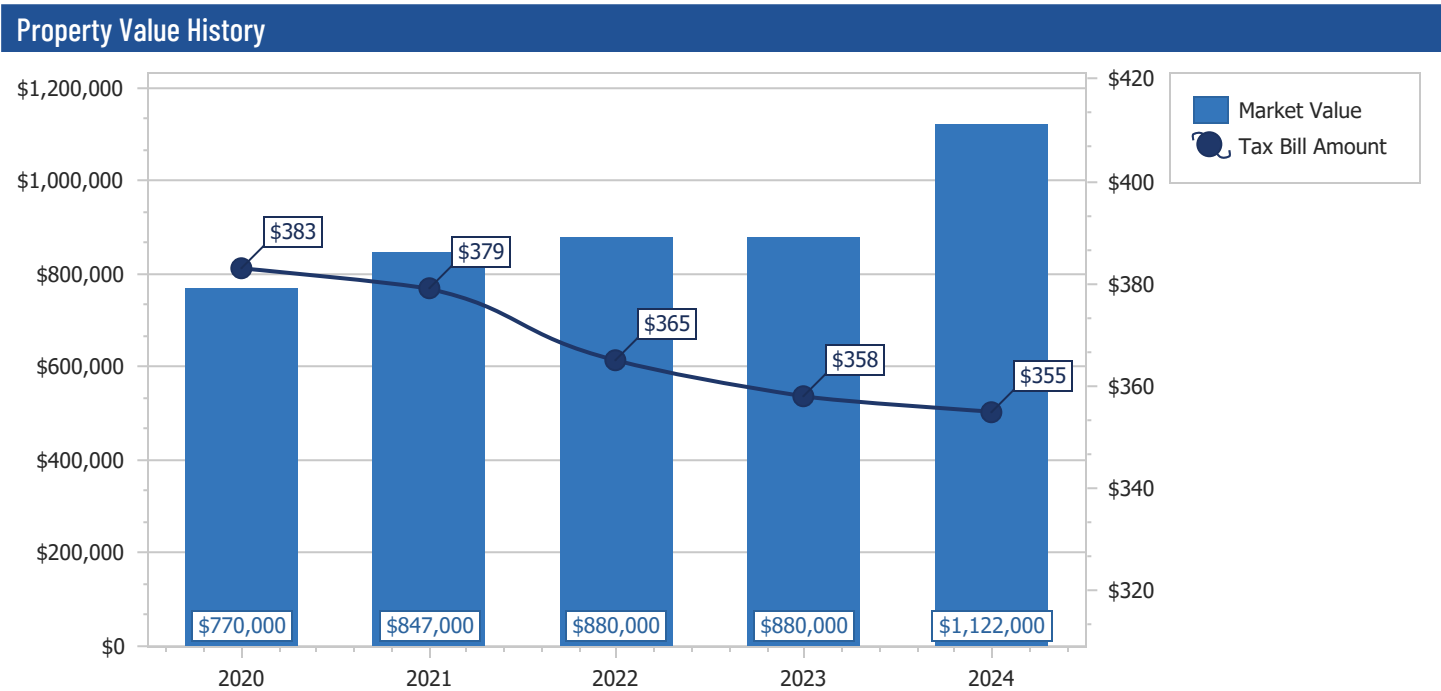
Extra Features				
Description	Year Built	Units	Cost	Assessed

Zoning	
Zoning	A-5
Description	Rural-5Ac
Future Land Use	R5
Description	Rural-5

School Districts	
Elementary	Walker
Middle	Chiles
High	Hagerty

Political Representation	
Commissioner	District 1 - Bob Dallari
US Congress	District 7 - Cory Mills
State House	District 37 - Susan Plasencia
State Senate	District 10 - Jason Brodeur
Voting Precinct	Precinct 81

Utilities	
Fire Station #	Station: 43 Zone: 431
Power Company	FPL
Phone (Analog)	AT&T
Water	
Sewage	
Garbage Pickup	
Recycle	
Yard Waste	
Hauler #	



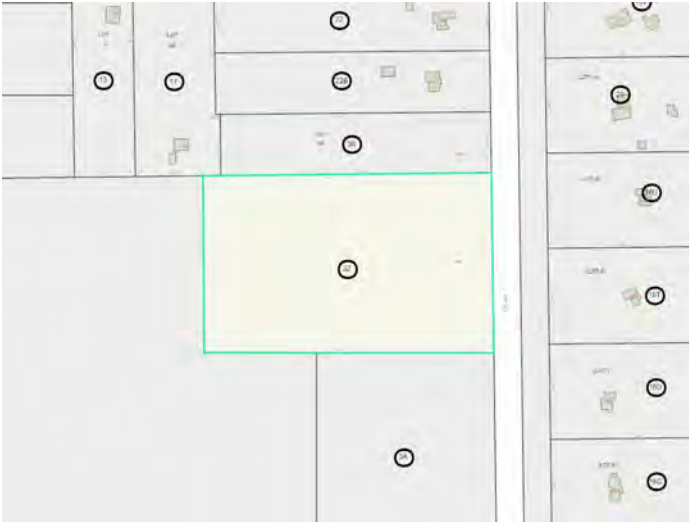
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Property Record Card



Parcel: 32-21-32-300-003Z-0000
 Property Address: S CR 419 CHULUOTA, FL 32766
 Owners: HI-OAKS LLC
 2025 Market Value \$337,500 Assessed Value \$3,180 Taxable Value \$3,180
 2024 Tax Bill \$32.09 Tax Savings with Exemptions \$687.11
 Grazing Land property has a lot size of 15.34 Acres

Parcel Location



Site View

Parcel Information

Parcel	32-21-32-300-003Z-0000
Property Address	S CR 419 CHULUOTA, FL 32766
Mailing Address	1065 MAITLAND CENTER COMMONS BLVD STE 201 MAITLAND, FL 32751-7437
Subdivision	
Tax District	G1:Agricultural
DOR Use Code	60:Grazing Land
Exemptions	None
AG Classification	Yes

Value Summary

	2025 Working Values	2024 Certified Values
Valuation Method	Cost/Market	Cost/Market
Number of Buildings	0	0
Depreciated Building Value	\$0	\$0
Depreciated Other Features	\$0	\$0
Land Value (Market)	\$337,500	\$69,600
Land Value Agriculture	\$36,105	\$3,105
Just/Market Value	\$337,500	\$69,600
Portability Adjustment	\$0	\$0
Save Our Homes Adjustment/Maximum Portability	\$0	\$0
Non-Hx 10% Cap (AMD 1)	\$32,925	\$0
P&G Adjustment	\$0	\$0
Assessed Value	\$3,180	\$3,105

2024 Certified Tax Summary

Tax Amount w/o Exemptions	\$719.20
Tax Bill Amount	\$32.09
Tax Savings with Exemptions	\$687.11

Owner(s)

Name - Ownership Type

HI-OAKS LLC

Note: Does NOT INCLUDE Non Ad Valorem Assessments

Legal Description

SEC 32 TWP 21S RGE 32E E 1030 FT OF S 1/2
OF SE 1/4 OF NE 1/4

Taxes

Taxing Authority	Assessed	Exempt Amount	Taxable
COUNTY GENERAL FUND	\$3,180	\$0	\$3,180
Schools	\$36,105	\$0	\$36,105
SJWM(Saint Johns Water Management)	\$3,180	\$0	\$3,180

Sales

Deed Type	Date	Sale Amount	Book / Page	Sale Type	Qualified?
QUIT CLAIM DEED	2/1/2006	\$100	06381/0561	Vacant	No
QUIT CLAIM DEED	4/1/2003	\$114,000	04786/1720	Vacant	No
QUIT CLAIM DEED	4/1/2003	\$6,500	04786/1716	Vacant	No
QUIT CLAIM DEED	4/1/2003	\$397,600	04786/1712	Vacant	No
QUIT CLAIM DEED	2/1/2000	\$632,800	03924/1466	Vacant	No
SPECIAL WARRANTY DEED	12/1/1999	\$702,800	03778/1390	Vacant	No
QUIT CLAIM DEED	12/1/1994	\$100	02863/0114	Vacant	No
TRUSTEE DEED	7/1/1989	\$1,290,000	02087/1842	Vacant	No

Land

Units	Rate	Assessed	Market
7 Acres	\$22,500/Acre Market, \$225/Acre AG	\$1,575	\$157,500
6.50 Acres	\$22,500/Acre Market, \$120/Acre AG	\$780	\$146,250
1.50 Acres	\$22,500/Acre	\$33,750	\$33,750

Building Information	
#	
Use	
Year Built*	
Bed	
Bath	
Fixtures	
Base Area (ft²)	
Total Area (ft²)	
Constuction	
Replacement Cost	
Assessed	

Building

* Year Built = Actual / Effective

Permits				
Permit #	Description	Value	CO Date	Permit Date

Extra Features				
Description	Year Built	Units	Cost	Assessed

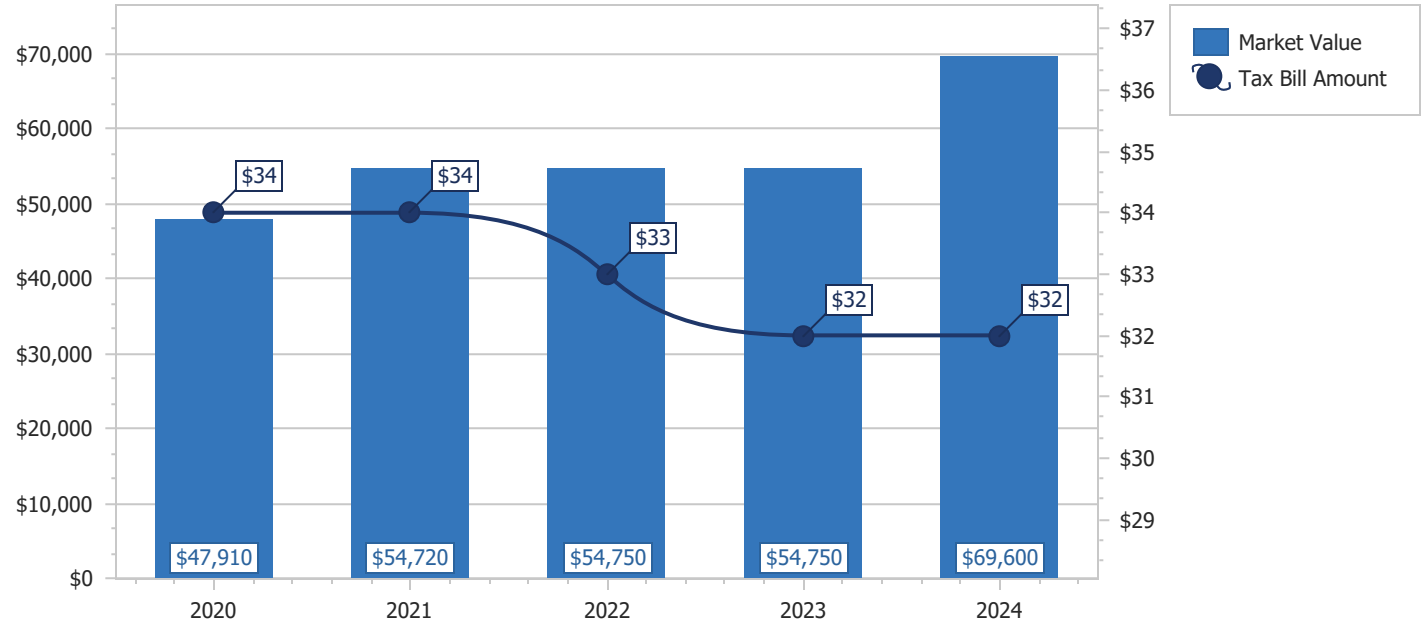
Zoning	
Zoning	A-5
Description	Rural-5Ac
Future Land Use	R5
Description	Rural-5

School Districts	
Elementary	Walker
Middle	Chiles
High	Hagerty

Political Representation	
Commissioner	District 1 - Bob Dallari
US Congress	District 7 - Cory Mills
State House	District 37 - Susan Plasencia
State Senate	District 10 - Jason Brodeur
Voting Precinct	Precinct 81

Utilities	
Fire Station #	Station: 43 Zone: 431
Power Company	FPL
Phone (Analog)	AT&T
Water	
Sewage	
Garbage Pickup	
Recycle	
Yard Waste	
Hauler #	

Property Value History



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Property Record Card



Parcel: 32-21-32-300-003A-0000
 Property Address:
 Owners: HI-OAKS LLC
 2025 Market Value \$192,000 Assessed Value \$2,663 Taxable Value \$2,663
 2024 Tax Bill \$27.52 Tax Savings with Exemptions \$428.18
 Grazing Land property has a lot size of 11.49 Acres

Parcel Location



Site View

Parcel Information

Parcel	32-21-32-300-003A-0000
Property Address	
Mailing Address	1065 MAITLAND CENTER COMMONS BLVD STE 201 MAITLAND, FL 32751-7437
Subdivision	
Tax District	G1:Agricultural
DOR Use Code	60:Grazing Land
Exemptions	None
AG Classification	Yes

Value Summary

	2025 Working Values	2024 Certified Values
Valuation Method	Cost/Market	Cost/Market
Number of Buildings	0	0
Depreciated Building Value	\$0	\$0
Depreciated Other Features	\$0	\$0
Land Value (Market)	\$192,000	\$44,100
Land Value Agriculture	\$2,663	\$2,663
Just/Market Value	\$192,000	\$44,100
Portability Adjustment	\$0	\$0
Save Our Homes Adjustment/Maximum Portability	\$0	\$0
Non-Hx 10% Cap (AMD 1)	\$0	\$0
P&G Adjustment	\$0	\$0
Assessed Value	\$2,663	\$2,663

2024 Certified Tax Summary

Tax Amount w/o Exemptions	\$455.70
Tax Bill Amount	\$27.52
Tax Savings with Exemptions	\$428.18

Owner(s)

Name - Ownership Type

HI-OAKS LLC

Note: Does NOT INCLUDE Non Ad Valorem Assessments

Legal Description

SEC 32 TWP 21S RGE 32E NE 1/4 OF NE 1/4 OF
SE 1/4

Taxes

Taxing Authority	Assessed	Exempt Amount	Taxable
COUNTY GENERAL FUND	\$2,663	\$0	\$2,663
Schools	\$2,663	\$0	\$2,663
SJWM(Saint Johns Water Management)	\$2,663	\$0	\$2,663

Sales

Deed Type	Date	Sale Amount	Book / Page	Sale Type	Qualified?
QUIT CLAIM DEED	2/1/2006	\$100	06381/0546	Vacant	No
QUIT CLAIM DEED	4/1/2003	\$114,000	04786/1720	Vacant	No
QUIT CLAIM DEED	4/1/2003	\$6,500	04786/1716	Vacant	No
QUIT CLAIM DEED	4/1/2003	\$397,600	04786/1712	Vacant	No
QUIT CLAIM DEED	2/1/2000	\$632,800	03924/1466	Vacant	No
SPECIAL WARRANTY DEED	12/1/1999	\$702,800	03778/1390	Vacant	No
WARRANTY DEED	7/1/1997	\$80,000	03284/1826	Vacant	No
QUIT CLAIM DEED	1/1/1990	\$100	02148/0350	Vacant	No
QUIT CLAIM DEED	6/1/1981	\$100	01365/1950	Vacant	No

Land

Units	Rate	Assessed	Market
8.50 Acres	\$22,500/Acre Market, \$225/Acre AG	\$1,913	\$191,250
1.50 Acres	\$500/Acre	\$750	\$750

Building Information	
#	
Use	
Year Built*	
Bed	
Bath	
Fixtures	
Base Area (ft²)	
Total Area (ft²)	
Constuction	
Replacement Cost	
Assessed	

Building

* Year Built = Actual / Effective

Permits				
Permit #	Description	Value	CO Date	Permit Date

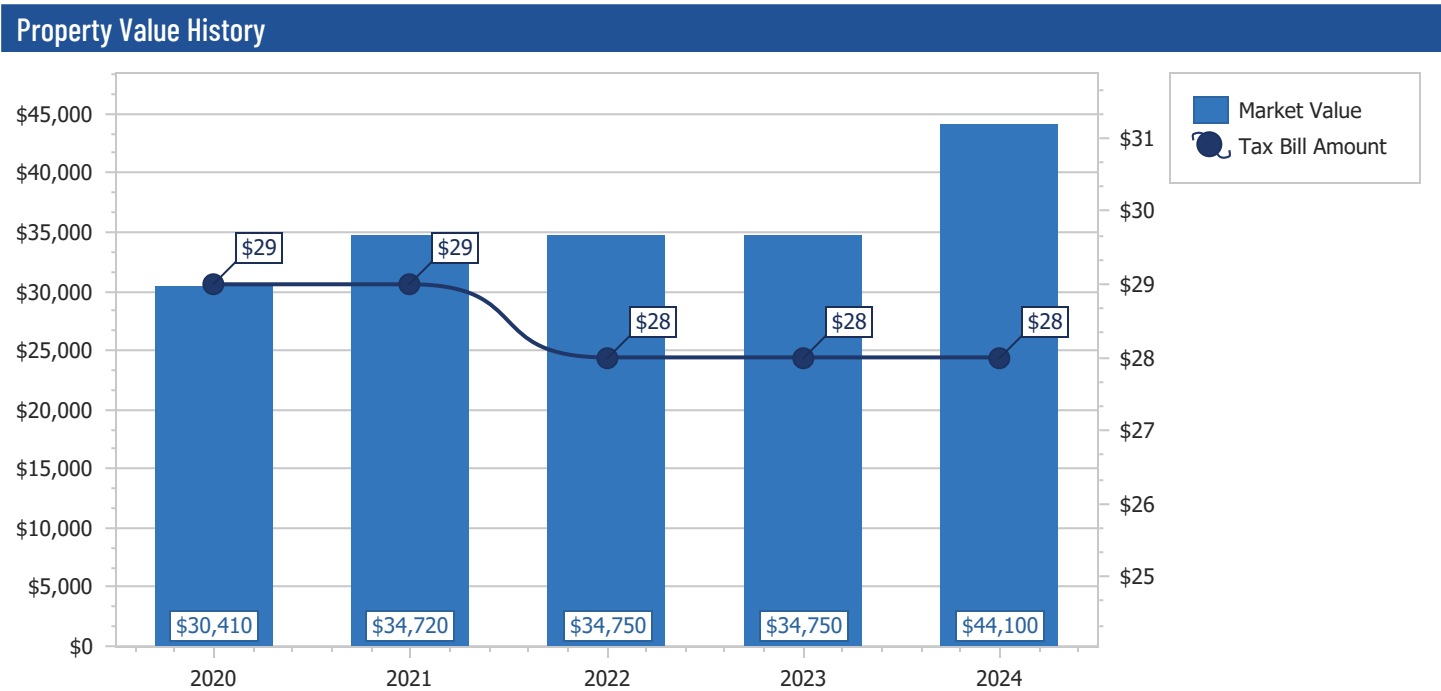
Extra Features				
Description	Year Built	Units	Cost	Assessed

Zoning	
Zoning	A-5
Description	Rural-5Ac
Future Land Use	R5
Description	Rural-5

School Districts	
Elementary	Walker
Middle	Chiles
High	Hagerty

Political Representation	
Commissioner	District 1 - Bob Dallari
US Congress	District 7 - Cory Mills
State House	District 37 - Susan Plasencia
State Senate	District 10 - Jason Brodeur
Voting Precinct	Precinct 81

Utilities	
Fire Station #	Station: 43 Zone: 431
Power Company	FPL
Phone (Analog)	AT&T
Water	
Sewage	
Garbage Pickup	
Recycle	
Yard Waste	
Hauler #	



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Property Record Card



Parcel: **31-21-32-300-0010-0000**
 Property Address:
 Owners: **HI-OAKS LLC**
 2025 Market Value \$1,920,000 Assessed Value \$29,899 Taxable Value \$29,899
 2024 Tax Bill \$308.96 Tax Savings with Exemptions \$4,355.95
 Grazing Land property has a lot size of 115.49 Acres

Parcel Location



Site View

Parcel Information

Parcel	31-21-32-300-0010-0000
Property Address	
Mailing Address	1065 MAITLAND CENTER COMMONS BLVD STE 201 MAITLAND, FL 32751-7437
Subdivision	
Tax District	G1:Agricultural
DOR Use Code	61:Grazing Land
Exemptions	None
AG Classification	Yes

Value Summary

	2025 Working Values	2024 Certified Values
Valuation Method	Cost/Market	Cost/Market
Number of Buildings	0	0
Depreciated Building Value	\$0	\$0
Depreciated Other Features	\$0	\$0
Land Value (Market)	\$1,920,000	\$451,440
Land Value Agriculture	\$29,899	\$29,899
Just/Market Value	\$1,920,000	\$451,440
Portability Adjustment	\$0	\$0
Save Our Homes Adjustment/Maximum Portability	\$0	\$0
Non-Hx 10% Cap (AMD 1)	\$0	\$0
P&G Adjustment	\$0	\$0
Assessed Value	\$29,899	\$29,899

2024 Certified Tax Summary

Tax Amount w/o Exemptions	\$4,664.91
Tax Bill Amount	\$308.96
Tax Savings with Exemptions	\$4,355.95

Owner(s)

Name - Ownership Type

HI-OAKS LLC

Note: Does NOT INCLUDE Non Ad Valorem Assessments

Legal Description

SEC 31 TWP 21S RGE 32E N 5/8 OF SEC ELY OF
RIVER (LESS N 3/5)

Taxes

Taxing Authority	Assessed	Exempt Amount	Taxable
COUNTY GENERAL FUND	\$29,899	\$0	\$29,899
Schools	\$29,899	\$0	\$29,899
SJWM(Saint Johns Water Management)	\$29,899	\$0	\$29,899

Sales

Deed Type	Date	Sale Amount	Book / Page	Sale Type	Qualified?
QUIT CLAIM DEED	2/1/2006	\$100	06381/0549	Vacant	No
QUIT CLAIM DEED	4/1/2003	\$114,000	04786/1720	Vacant	No
QUIT CLAIM DEED	4/1/2003	\$6,500	04786/1716	Vacant	No
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SPECIAL WARRANTY DEED	12/1/1999	\$702,800	03778/1390	Vacant	No
QUIT CLAIM DEED	12/1/1994	\$100	02863/0114	Vacant	No
TRUSTEE DEED	7/1/1989	\$1,290,000	02087/1842	Vacant	No
QUIT CLAIM DEED	1/1/1988	\$100	02031/0234	Vacant	No
WARRANTY DEED	8/1/1979	\$100	01236/1806	Vacant	No
WARRANTY DEED	3/1/1979	\$100	01214/1928	Vacant	No

Land

Units	Rate	Assessed	Market
13 Acres	\$22,500/Acre Market, \$100/Acre AG	\$1,300	\$292,500
17.20 Acres	\$22,500/Acre Market, \$225/Acre AG	\$3,870	\$387,000
17.20 Acres	\$22,500/Acre Market, \$120/Acre AG	\$2,064	\$387,000
37 Acres	\$22,500/Acre Market, \$45/Acre AG	\$1,665	\$832,500
42 Acres	\$500/Acre	\$21,000	\$21,000

Building Information	
#	
Use	
Year Built*	
Bed	
Bath	
Fixtures	
Base Area (ft²)	
Total Area (ft²)	
Constuction	
Replacement Cost	
Assessed	

Building

* Year Built = Actual / Effective

Permits				
Permit #	Description	Value	CO Date	Permit Date

Extra Features				
Description	Year Built	Units	Cost	Assessed

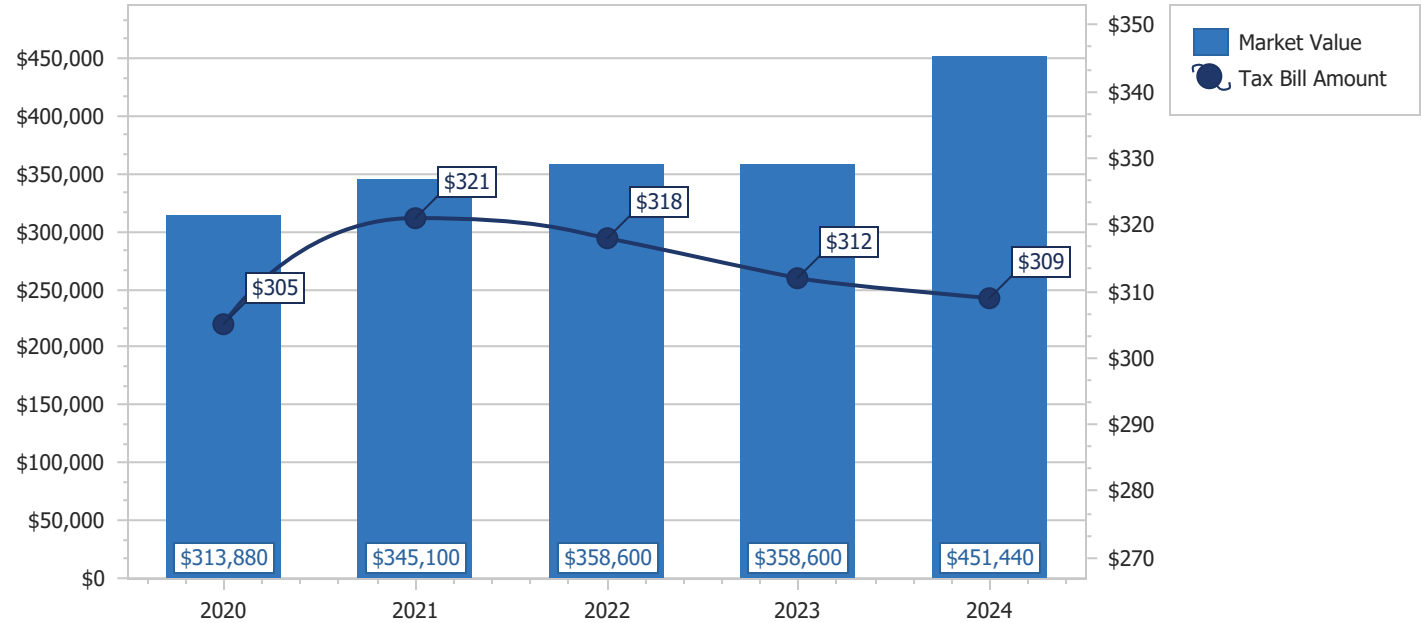
Zoning	
Zoning	A-5
Description	Rural-5Ac
Future Land Use	R5
Description	Rural-5

School Districts	
Elementary	Walker
Middle	Chiles
High	Hagerty

Political Representation	
Commissioner	District 1 - Bob Dallari
US Congress	District 7 - Cory Mills
State House	District 37 - Susan Plasencia
State Senate	District 10 - Jason Brodeur
Voting Precinct	Precinct 81

Utilities	
Fire Station #	Station: 43 Zone: 431
Power Company	FPL
Phone (Analog)	AT&T
Water	
Sewage	
Garbage Pickup	
Recycle	
Yard Waste	
Hauler #	

Property Value History



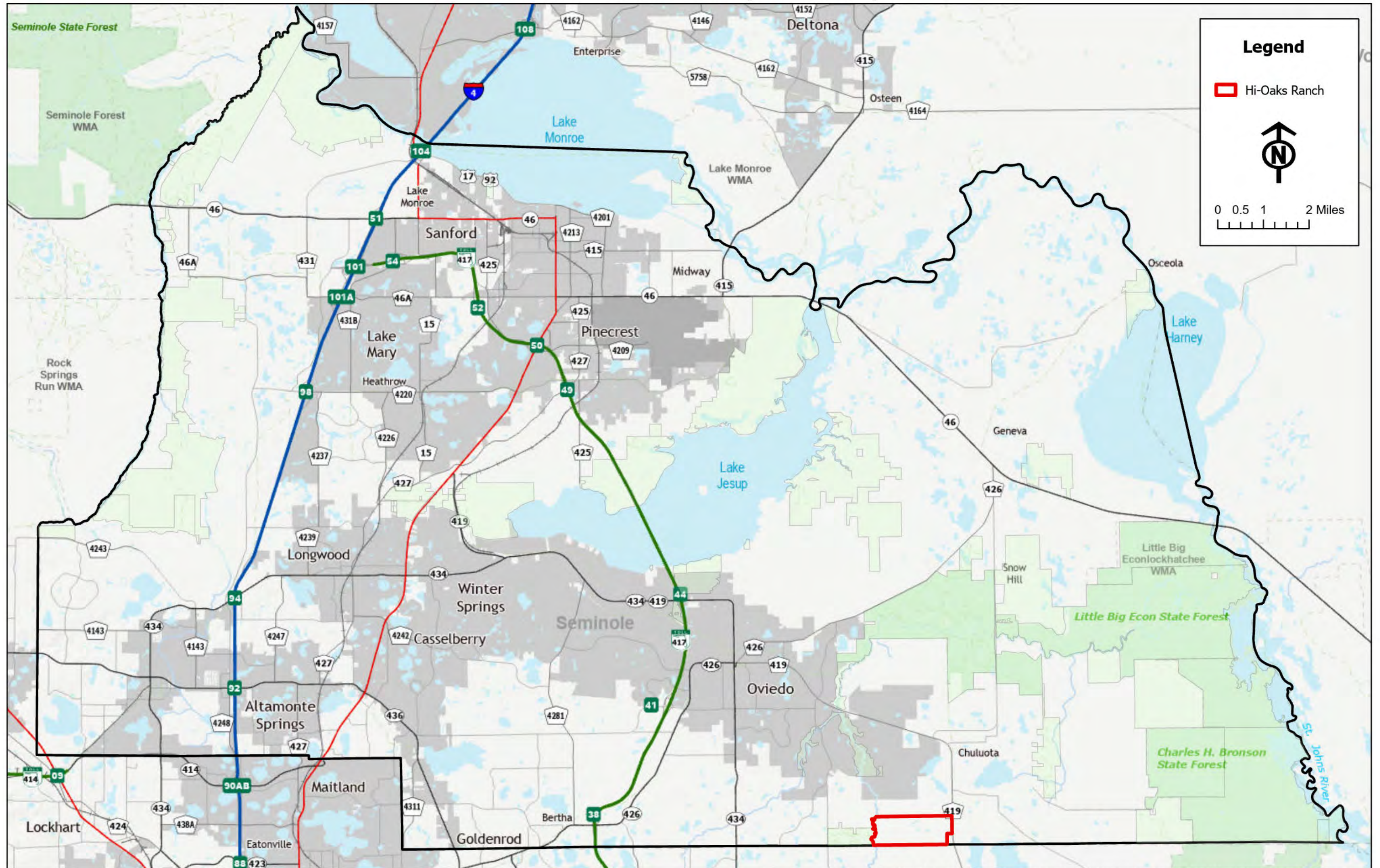
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**Florida Forever
New Project Application**



**Attachment C
Required Application Maps**

Hi-Oaks Ranch: County Roads Map



Hi-Oaks Ranch: Tax Parcel Map

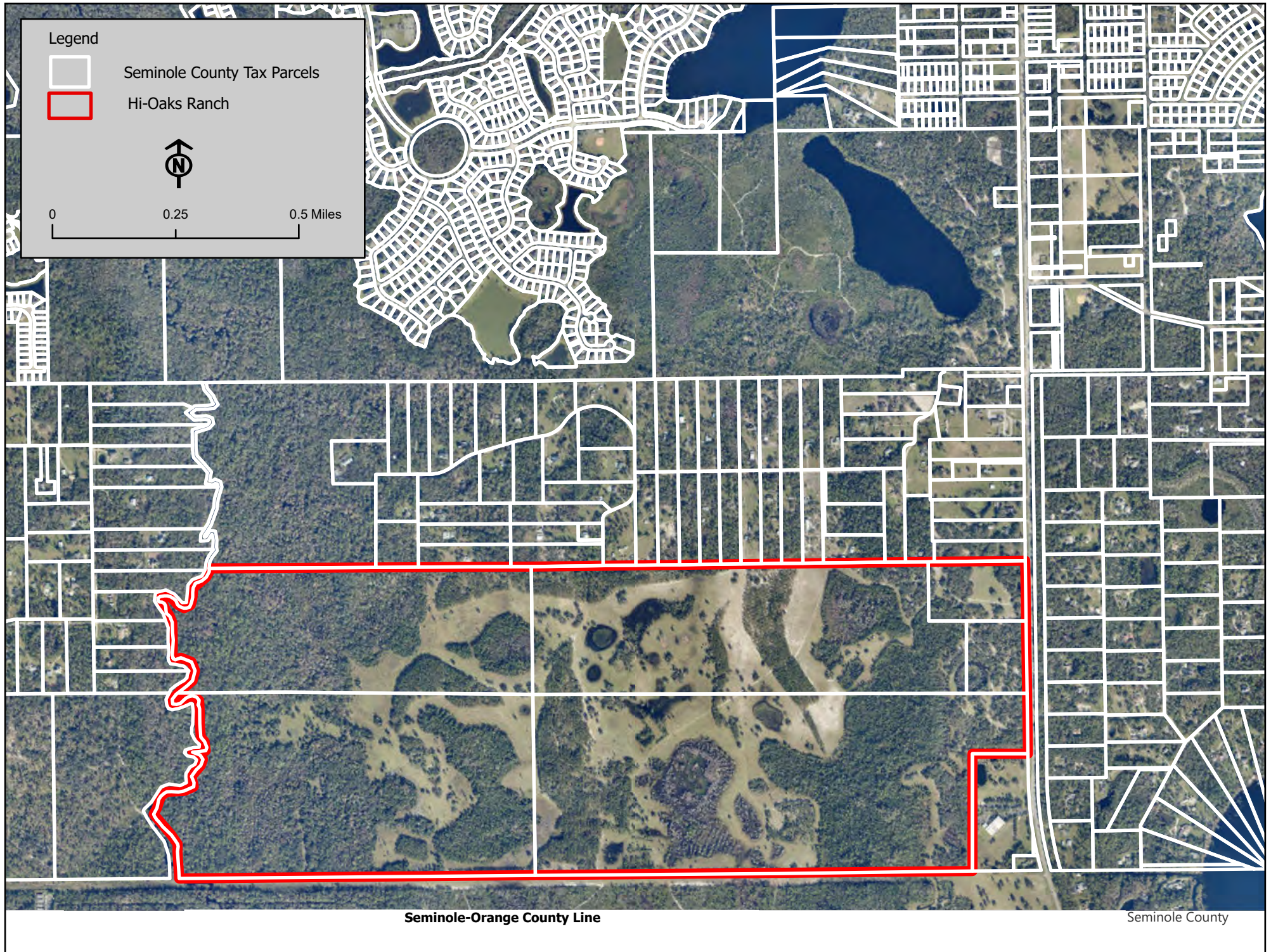
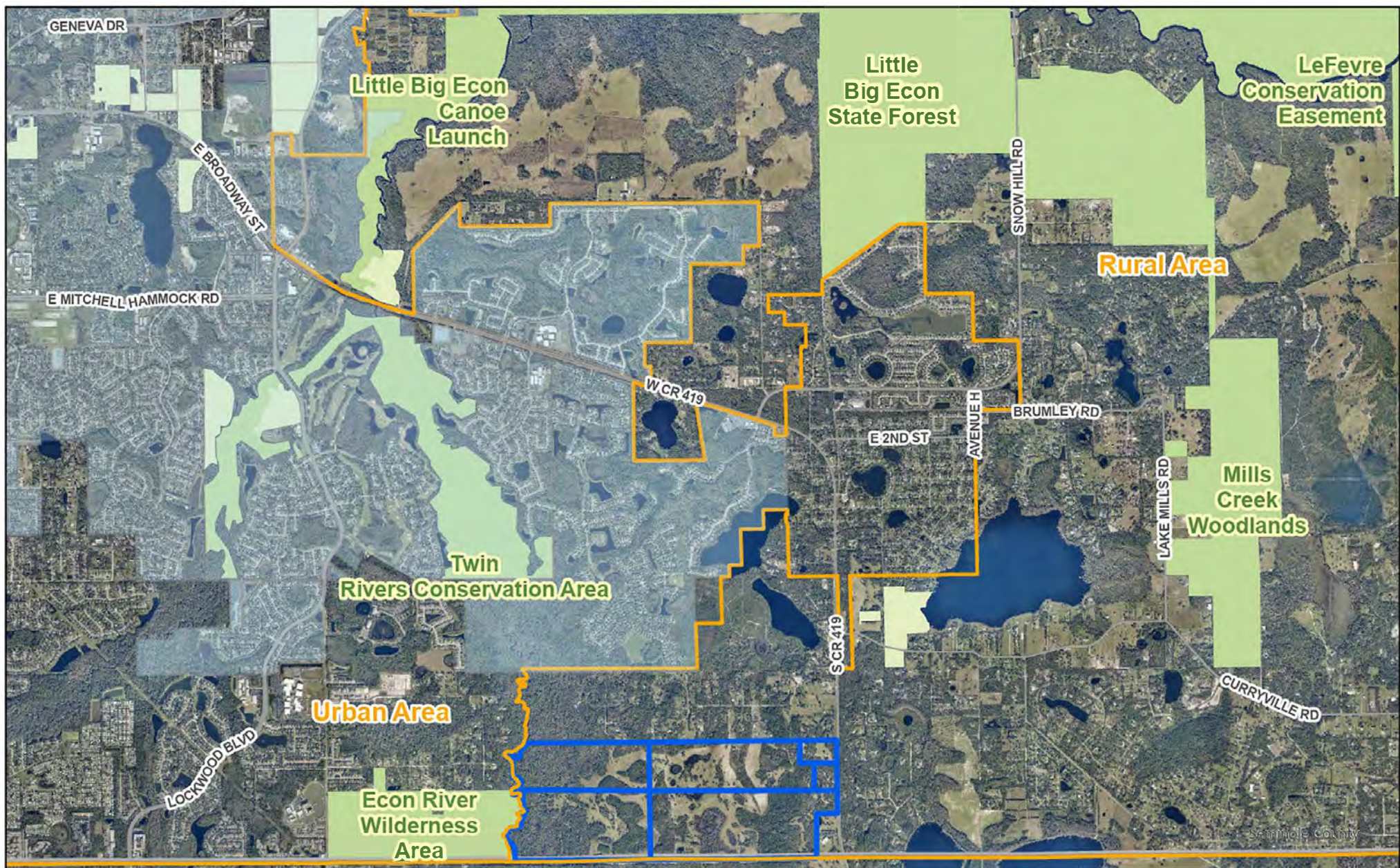


Exhibit A
Location Map

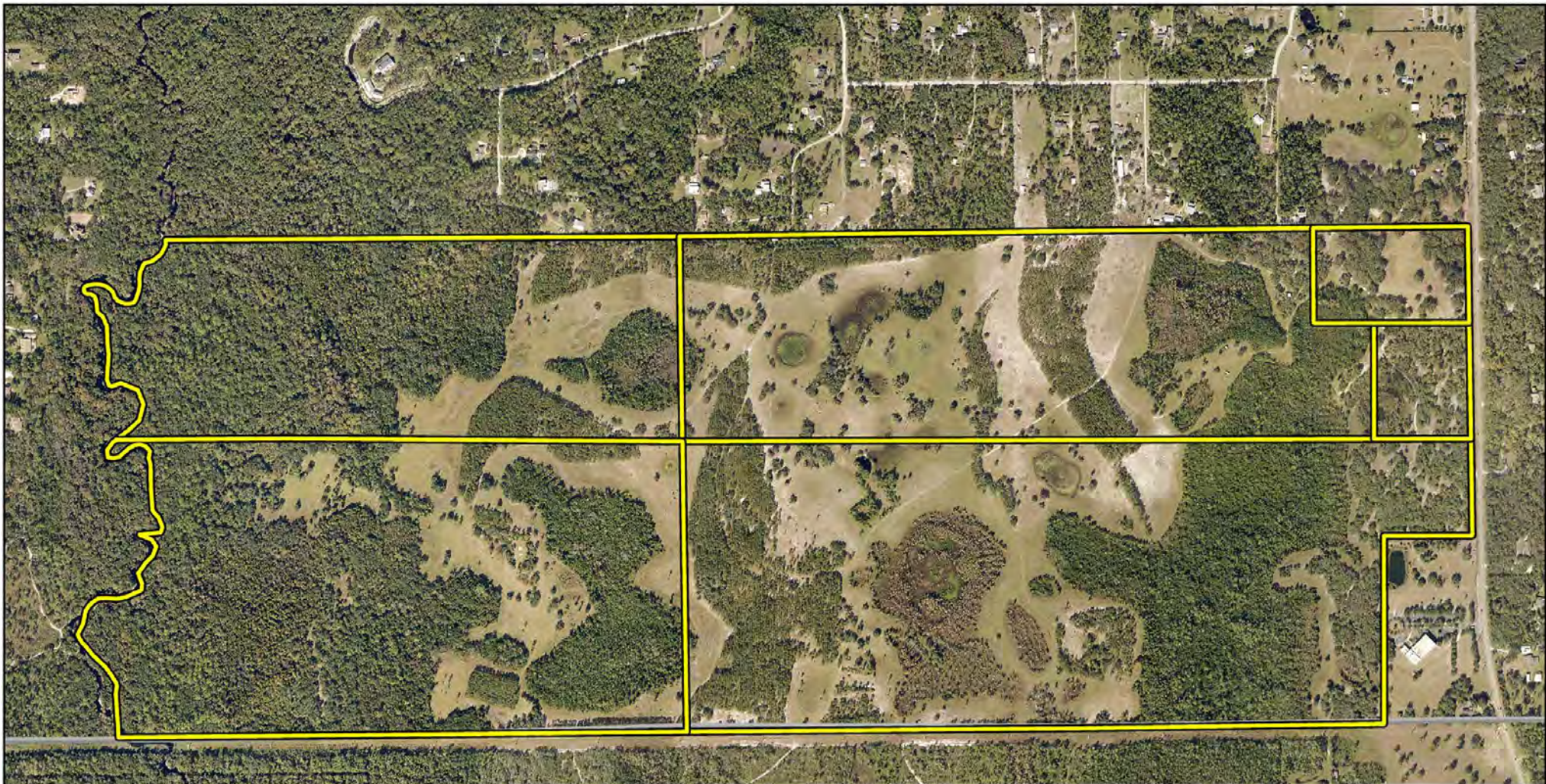


- Urban Rural Boundary
- Hi-Oaks Boundary
- Oviedo
- Parks
- Preserved Lands

**Florida Forever
Hi-Oaks Ranch
Exhibit A
Vicinity Map**



0 2
Miles



**Florida Forever Hi-Oaks Ranch
Exhibit A
Aerial Map**

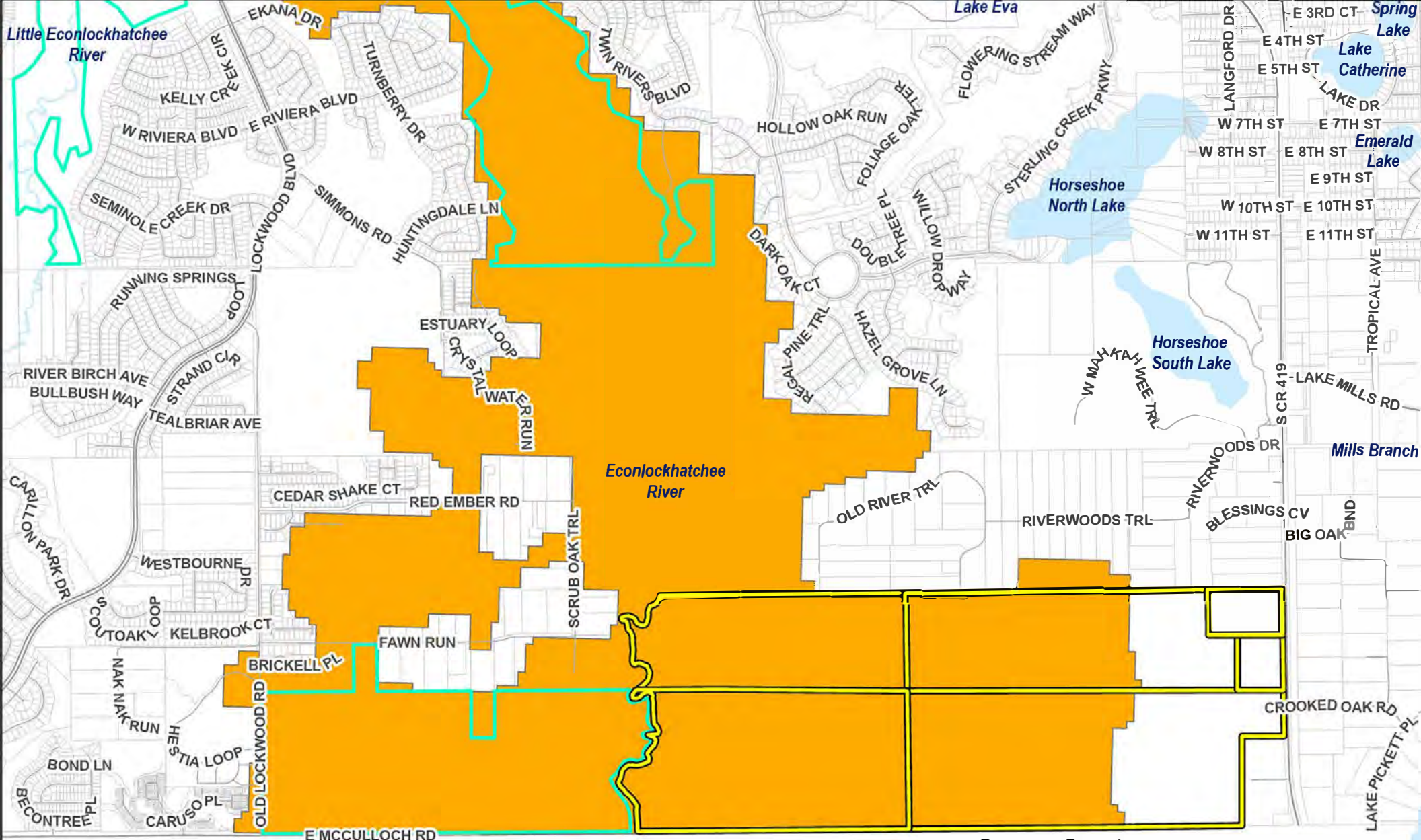


0 0.4 Miles

Date Saved: 2/10/2025 3:33 PM
Name: Seminole Forever Hi-Oaks LLC

Exhibit B

Florida Wildlife Corridor Map



Legend

-  Hi-Oaks Ranch Boundary
-  Conservation Lands
-  Florida Wildlife Corridor

Florida Forever
Exhibit B
Florida Wildlife Corridor

Orange County



0 0.13 0.25 0.5 Miles

A horizontal scale bar with markings for 0, 0.13, 0.25, and 0.5 miles.

Exhibit C

Reports Related to Potential Development

**CULTURAL RESOURCE ASSESSMENT SURVEY
OF CLAYTON HIGH OAKS PROPERTY,
SEMINOLE COUNTY, FLORIDA**

Prepared for:

**Bio-Tech Consulting, Inc.
3025 East South Street
Orlando, Florida 32803**

Prepared by:



Florida's First Choice in Cultural Resource Management

**Archaeological Consultants, Inc.
8110 Blaikie Court, Suite A
Sarasota, Florida 34240
(941) 379-6206**

March 2018

**CULTURAL RESOURCE ASSESSMENT SURVEY
OF CLAYTON HIGH OAKS PROPERTY,
SEMINOLE COUNTY, FLORIDA**

Prepared for:

**Bio-Tech Consulting, Inc.
3025 East South Street
Orlando, Florida 32803**

Prepared by:

**Archaeological Consultants, Inc.
8110 Blaikie Court, Suite A
Sarasota, Florida 34240**

**Marion Almy - Project Manager
Christine Newman - Project Archaeologist
Justin Winkler - Archaeologist**

March 2018

EXECUTIVE SUMMARY

Archaeological Consultants, Inc. (ACI) conducted a Cultural Resource Assessment Survey (CRAS) of the Clayton High Oaks property for Bio-Tech Consulting, Inc. The project Area of Potential Effect (APE) is approximately 671 acres in size and is located in south central Seminole County. It is situated on the Seminole/Orange County line, between the Econlockhatchee River on the west and Chuluota Road on the east.

The purpose of this investigation was to locate and identify any cultural resources within the project APE and to assess their significance in terms of eligibility for listing in the National Register of Historic Places (NRHP). As defined in 36 CFR Part § 800.16(d), the APE is the “geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist.” Based on the scale and nature of the activities, the project has a limited potential for any indirect (visual or audible) or cumulative effects outside the immediate footprint of construction. Therefore, because of the project type and location of the proposed work, the APE was limited to the footprint of proposed activities within the existing boundaries of the project. The archaeological and historical field surveys, completed in March 2018, were conducted as due diligence. All work was carried out in accordance with Section 106 of the National Historic Preservation Act of 1966, as amended, and its implementing regulations in 36 CFR Part 800: Protection of Historic Properties, and in conformity with the standards contained in the Florida Division of Historical Resource’s (FDHR) *Cultural Resource Management Standards and Operational Manual* (FDHR 2003). The resulting survey and report meets specifications in Chapter 1A-46, *Florida Administrative Code (FAC)*, and complies with Chapters 267 and 373, *Florida Statutes (FS)*, as well as Florida’s Coastal Management Program.

Archaeological background research, including a review of the Florida Master Site File (FMSF) and the NRHP indicated that no previously recorded archaeological sites are within the project APE, one site (8OR03533) is adjacent and to the south, and eight sites are recorded within one mile. A review of relevant site locational information for environmentally similar areas within Seminole County and the surrounding region indicated that the property was considered to have a varied potential for archaeological sites. ACI dug 383 shovel test pits. As a result, no evidence of site 8OR03533 was found within the APE, and no new archaeological sites were discovered as the result of field survey.

A review of the FMSF and the NRHP indicated that no previously recorded historic structures are located within the project APE or adjacent. A review of the historic United States Geographical Survey (USGS) quadrangle maps (USGS 1953a, 1953b) and historic aerial photographs (United States Department of Agriculture [USDA] 1940, 1947, 1957, 1980) did not show any structures within the project APE. Additionally, the Seminole County property appraiser’s website indicated that no structures were present on the property (Johnson 2018). As a result of field survey, no historic resources were identified or recorded in the APE.

Given the results of background research and field survey, it is the opinion of ACI that the development of the project APE will have no effect on any archaeological sites or historic resources that are listed, determined eligible, or which appear to be potentially eligible for listing in the NRHP within the project APE.

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1.0 INTRODUCTION

1.1 Project Description

Archaeological Consultants, Inc. (ACI) conducted a Cultural Resource Assessment Survey (CRAS) of the Clayton High Oaks Property for Bio-Tech Consulting, Inc. The project Area of Potential Effect (APE) is approximately 671 acres in size and is located in south central Seminole County. It is situated on the Seminole/Orange County line, between the Econlockhatchee River on the west and Chulota Road on the east (**Figure 1.1**).

1.2 Purpose

The purpose of this investigation was to locate and identify any cultural resources within the project APE and to assess their significance in terms of eligibility for listing in the National Register of Historic Places (NRHP). As defined in 36 CFR Part § 800.16(d), the APE is the “geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist.” Based on the scale and nature of the activities, the project has a limited potential for any indirect (visual or audible) or cumulative effects outside the immediate footprint of construction. Therefore, because of the project type and location of the proposed work, the APE was limited to the footprint of proposed activities within the existing boundaries of the project. The archaeological and historical field surveys, completed in March 2018, were conducted as due diligence. All work was carried out in accordance with Section 106 of the National Historic Preservation Act of 1966, as amended, and its implementing regulations in 36 CFR Part 800: Protection of Historic Properties, and in conformity with the standards contained in the Florida Division of Historical Resource’s (FDHR) *Cultural Resource Management Standards and Operational Manual* (FDHR 2003). The resulting survey and report meets specifications in Chapter 1A-46, *Florida Administrative Code (FAC)*, and complies with Chapters 267 and 373, *Florida Statutes (FS)*, as well as Florida’s Coastal Management Program.

Background research preceded the field investigations. Such work provided both an informed set of expectations concerning the kinds of cultural resources that might be anticipated to occur within the project APE, as well as a basis for evaluating any new sites discovered.

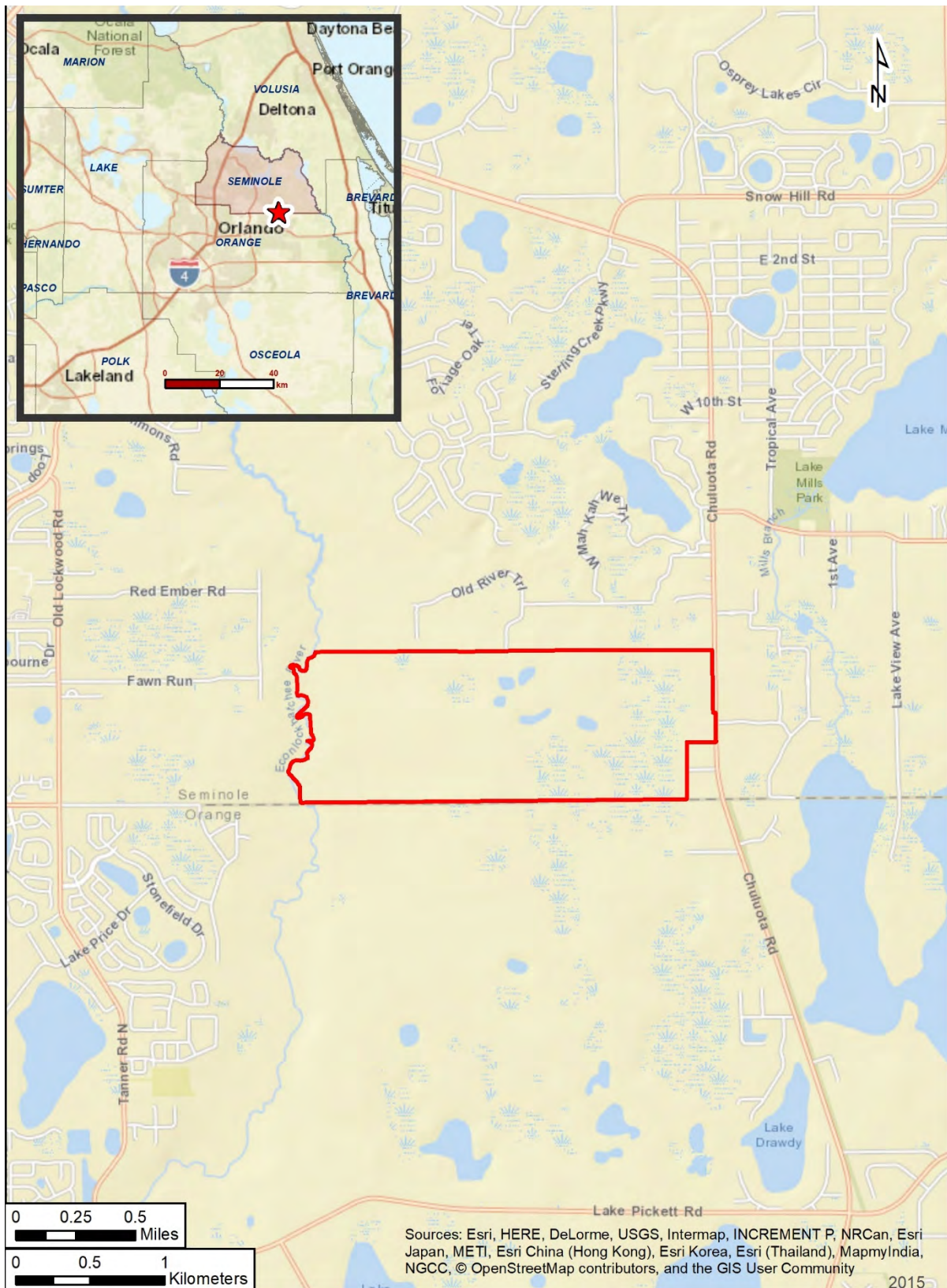


Figure 1.1. Location of the Clayton High Oaks project APE, Seminole County.

2.0 ENVIRONMENTAL SETTING

Environmental factors such as geology, topography, relative elevation, soils, vegetation, and water resources are important in determining where pre-colonial and historic period archaeological sites are likely to be located. These variables influenced what types of resources were available for utilization in a given area. This, in turn, influenced decisions regarding settlement location and land-use patterns. Because of the influence of the local environmental factors upon the pre-colonial period populations, a discussion of the effective environment is included.

2.1 Project Location

The Clayton High Oaks Property APE is located in Sections 31 and 32 of Township 21 South, Range 32 East (United States Geological Survey [USGS] Oviedo SW) (**Figure 2.1**). The Econlockhatchee River and associated wetland is located adjacent to the western boundary of the project APE and several additional wetlands can be found within the project APE, specifically in the eastern portion.

The topography of the project APE gently slopes westward toward the Econlockhatchee River. A broad hammock consisting of live oak, saw palmetto, and cabbage palm (**Photo 2.1**) extends east from the river into an area of improved pastureland with assorted wetlands (**Photo 2.2**). A cypress swamp is found in the eastern portion of the APE (**Photo 2.3**). A well drained scrub area, with live oak, occupies the eastern portion of the project and slash pine cultivation is found along the southern boundary (**Photo 2.4**). In addition to rows of planted slash pine, approximately 75% of the APE has been cleared for cattle pasture. As a result, the hydrology of the area has been altered. Other disturbances to the property include a small hunting camp within the northeastern portion of the APE.



Photo 2.1. Looking to the north at the conditions adjacent to the Econlockhatchee River.

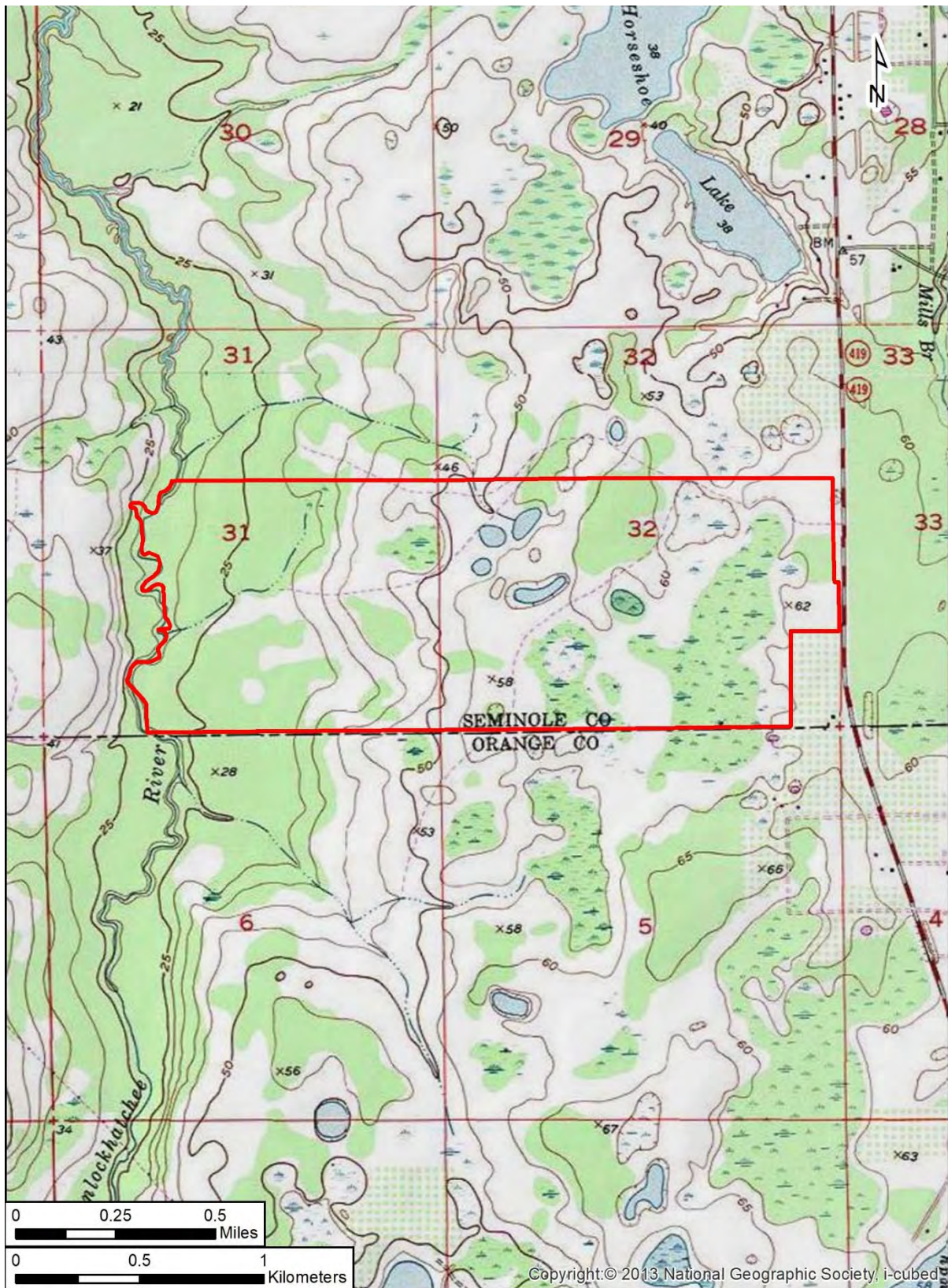


Figure 2.1. Environmental setting of the Clayton High Oaks Property APE.



Photo 2.2. Looking to the south at the typical pasture surrounding one of several wetlands found within the APE.



Photo 2.3. Looking to the north at the typical pasture bordering the cypress swamp found in the southeastern quarter of the project APE.



Photo 2.4. Looking to the west at the area of slash pine along the southern boundary.

2.2 Physiography and Geology

The project area is within the mid-peninsular geomorphic zone which is characterized by discontinuous highlands forming sub-parallel ridges separated by broad valleys that roughly parallel the coast (White 1970). More specifically, the project area is within the Osceola Plain (White 1970). The Plain is a broad, flat area of low, local relief. The area's surface lithology consists of shelly sand and clay as well as medium fine sands and silts (Scott 1978). Geologically, the area is underlain by undifferentiated soils of the Pleistocene and Holocene (Scott 1978, 2001; Scott et al. 2001). Historically, the majority of the APE was classified as pine flatwoods, but the eastern portion was cypress swamp forests (Davis 1967). Elevation of the project area is between 6 and 20 meters (m) (60 and 65 feet [ft]) above mean sea level (amsl).

2.3 Soils and Vegetation

The Clayton High Oaks Property APE is characterized by three soil association; Urban Land-Tavares-Millhopper, Myakka-EauGallie-Urban land, and Pompano-Nittaw-Basinger soil associations (U.S. Department of Agriculture [USDA] 1990). The Urban Land-Tavares-Millhopper association soils are generally nearly level to sloping areas of urban land and moderately well drained soils on low ridges adjacent to the flatwoods. Native vegetation supported by these soils consists of bluejack oak, turkey oak, live oak, and longleaf pine. The understory consist of creeping bluestem, indiangrass, grassleaf goldaster, and pineland threeawn (USDA 1990). The soils of the Myakka-EauGallie-Urban land association are nearly level, poorly drained soils of broad plains that have depressions and sloughs. The vegetation is slash pine with an understory of saw palmetto, grasses, and forbs. In the depressions and sloughs, cypress and hardwood occur. In the Pompano-Nittaw-Basinger association, the land is nearly level, poorly drained and very poorly drained mineral soils of broad freshwater plains, hardwood and

cypress swamps, and depressions. Magnolia, sweetgum, cypress, sweetbay, hickory, water oak, willow oak and laurel oak are typically found. The specific soil types found within the APE are listed in **Table 2.1** and shown in **Figure 2.2**.

Table 2.1. Soil type, drainage, and setting (USDA 1990, 2017).

Type	Drainage	Setting
Adamsville-Sparr fine sands	Somewhat poor	Low ridges on the uplands and low knolls on the flatwoods
Arents, 0-5%	Somewhat poor	Filled depressions, sloughs, marshes, and swamps
Basinger, Samsula, Hontoon soils, depressional	Very poor	Swamps and depressions
Brighton, Samsula, Sanibel mucks	Very poor	Depressions and marshes
EauGallie and Immokalee fine sands	Poor	Flatwoods
Immokalee sand	Poor	Flatwoods
Manatee, Floridana, Holopaw soils, frequently flooded	Very poor	Flood plains
Myakka, EauGallie fine sand	Poor	Broad plains on the flatwoods
Paola-St. Lucie sands, 0-5%	Excessive	Upland ridges
Pomello fine sand, 0-5%	Somewhat poor	Low ridges and knolls on the flatwoods
Pomello fine sand, occasionally flooded	Poor	Flood plains
Tavares-Millhopper fine sand, 0-5%	Moderately well	Low ridges and knolls on the uplands

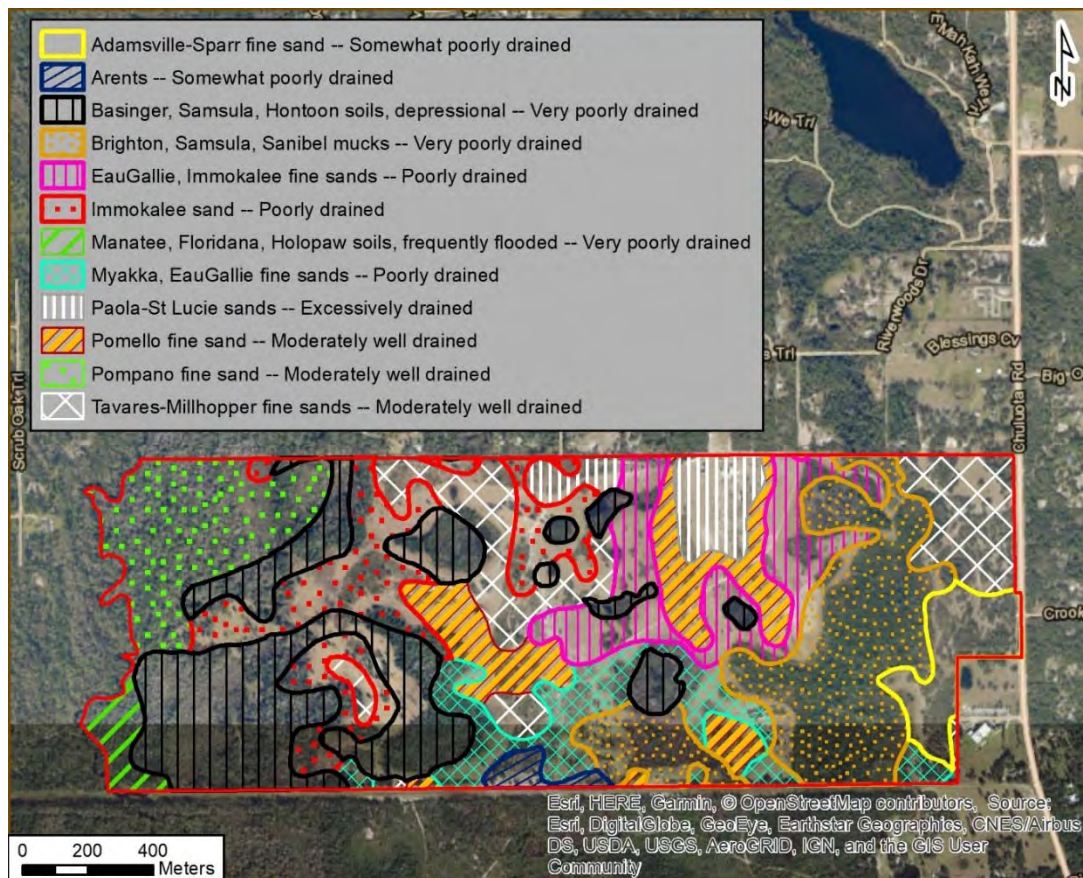


Figure 2.2. Soils located within the project APE.

2.4 Paleoenvironmental Considerations

The early environment of the region was different from that seen today. Sea levels were lower, the climate was arid, and fresh water was scarce. An understanding of human ecology during the earliest periods of human occupation in Florida cannot be based on observations of the modern environment because of changes in water availability, botanical communities, and faunal resources. Aboriginal inhabitants would have developed cultural adaptations in response to the environmental changes taking place, which were then reflected in settlement patterns, site types, artifact forms, and subsistence economies.

Due to arid conditions between 16,500 and 12,500 years ago, the perched water aquifer and potable water supplies were absent (Dunbar 1981:95). Palynological studies conducted in Florida and Georgia suggest that between 13,000 and 5000 years ago, this area was covered with an upland vegetation community of scrub oak and prairie (Watts 1969, 1971, 1975). However, the environment was not static. Evidence recovered from the inundated Page-Ladson Site in north Florida has clearly demonstrated that there were two periods of low water tables and dry climatic conditions and two episodes of elevated water tables and wet conditions (Dunbar 2006c).

By 5000 years ago, a climatic event marking a brief return to Pleistocene climatic conditions induced a change toward more open vegetation. Southern pine forests replaced the oak savannahs. Extensive marshes and swamps developed along the coasts and subtropical hardwood forests became established along the southern tip of Florida (Delcourt and Delcourt 1981). Northern Florida saw an increase in oak species, grasses, and sedges (Carbone 1983). At Lake Annie, in south central Florida, pollen cores were dominated by wax myrtle and pine. The assemblage suggests that by this time, a forest dominated by longleaf pine along with cypress swamps and bayheads existed in the area (Watts 1971, 1975). About 5000 years ago, surface water was plentiful in karst terrains and the level of the Floridan aquifer rose to 1.5 m (5 ft) above present levels. With the establishment of warmer winters and cooler summers than in the preceding early Holocene, the fire-adapted pine communities prevailed. These depend on the high summer precipitation caused by the thunderstorms and the accompanying lightning strikes to spark the fires (Watts et al. 1996; Watts and Hansen 1994). The increased precipitation also resulted in the formation of the large swamp systems such as the Okefenokee and Everglades (Gleason and Stone 1994). After this time, modern floral, climatic, and environmental conditions began to be established.

3.0 CULTURAL CHRONOLOGY

A discussion of the regional culture history is included to provide a framework within which to examine the local archaeological and historical record. Archaeological and historic sites are not individual entities, but were once part of a dynamic cultural system. As a result, individual sites cannot be adequately examined or interpreted without reference to other sites and resources in the area. The culture history of an area (i.e. the archaeological region) outlines the sequence of archaeological and historical cultures through time. These are defined largely in geographical terms, but also reflect shared environmental and cultural traits. The APE is within the East and Central archaeological region Milanich (1994) (**Figure 3.1**). The Paleoindian, Archaic, Formative, and Mississippian stages have been defined based on material culture traits such as stone tool forms and ceramics, as well as subsistence, settlement, and burial patterns.

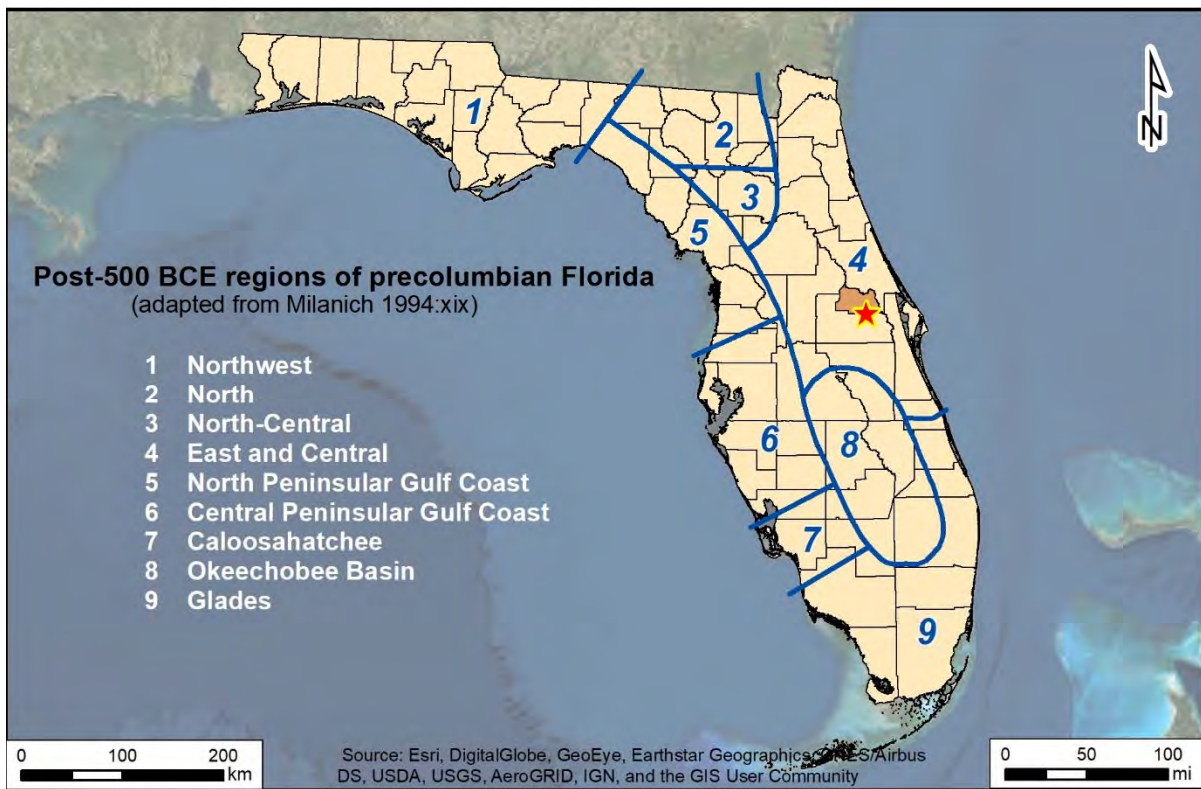


Figure 3.1. Florida Archaeological Regions.

The local history of the region is divided into four broad periods based initially upon the major governmental powers. The first period, Colonialism, occurred during the exploration and control of Florida by the Spanish and British from around 1513 until 1821. At that time, Florida became a territory of the U.S. and 21 years later became a State (Territorial and Statehood). The Civil War and Aftermath (1861-1899) period deals with the Civil War, the period of Reconstruction following the war, and the late 1800s, when the transportation systems were dramatically increased and development throughout the state expanded. The Twentieth Century period includes sub-periods defined by important historic events such as the World Wars, the Boom of the 1920s, and the Depression. Each of these periods evidenced differential development and utilization of the region, thus effecting the historic site distribution.

3.1 Paleoindian

The Paleoindian stage is the earliest known cultural manifestation in Florida, dating from roughly 12,000 to 7500 BCE (Before Common Era) (Milanich 1994). Archaeological evidence for Paleoindians consists primarily of scattered finds of diagnostic lanceolate-shaped projectile points. The Florida peninsula at this time was quite different than today. In general, the climate was cooler and drier with vegetation typified by xerophytic species with scrub oak, pine, open grassy prairies, and savannas (Milanich 1994:40). When human populations were arriving in Florida, the sea levels were still as much as 40 to 60 m (130-200 ft) below present levels and coastal regions of Florida extended miles beyond present-day shorelines (Faught 2004). Thus, many of these sites have been inundated (cf., Faught and Donoghue 1997).

The Paleoindian period has been sub-divided into three horizons based upon characteristic stone tool forms (Austin 2001). Traditionally, it is believed that the Clovis Horizon (10,500-9000 BCE) represents the initial occupation of Florida and is defined by the presence of the fluted Clovis points. These are more common in north Florida. However, recent work may indicate that Suwannee and Simpson points are contemporary with or predate Clovis (Dunbar 2006a; Stanford 1991).

The Suwannee Horizon (9000-8500 BCE) is the best known of the three Paleoindian horizons. The lanceolate-shaped, unfluted Simpson and Suwannee projectile points are diagnostic of this time (Bullen 1975; Daniel and Wisenbaker 1987; Purdy 1981). The Suwannee tool kit includes a variety of scrapers, adzes, spokeshaves, unifacially retouched flakes, and blade-like flakes as well as bone and ivory foreshafts, pins, awls, daggers, anvils, and abraders (Austin 2001:23).

Following the Suwannee Horizon is the Late Paleoindian Horizon (8500-8000 BCE). The smaller Tallahassee, Santa Fe, and Beaver Lake points have traditionally been attributed to this horizon (Milanich 1994). However, many of these points have been recovered stratigraphically from late Archaic and early Woodland period components and thus, may not date to this time period at all (Austin 2001; Farr 2006). Florida notched or pseudo-notched points, including the Union, Greenbriar, and Hardaway-like points, may represent late Paleoindian types, but these types have not been recovered from datable contexts and their temporal placement remains uncertain (Dunbar 2006a:410).

Archaeologists hypothesize that Paleoindians lived in migratory bands and subsisted by gathering and hunting, including the now-extinct Pleistocene megafauna. It is likely that these nomadic hunters traveled between permanent and semi-permanent sources of water, such as artesian springs, exploiting the available resources. These watering holes would have attracted the animals, thus providing food and drink. In addition to being tethered to water sources, most of the Paleoindian sites are close to good quality lithic resources. The settlement pattern consisted of the establishment of semi-permanent habitation areas and the movement of the resources from their sources of procurement to the residential locale by specialized task groups (Austin 2001:25).

Although the Paleoindian period is generally considered to have been cooler and drier, there were major variations in the inland water tables resulting from large-scale environmental fluctuations. There are two major theories as to why most Paleoindian materials have been recovered from inundated sites. The Oasis theory posits that due to low water tables and scarcity of potable water, the Paleoindians, and the game animals upon which they depended, clustered around the few available water holes that were associated with sinkholes (Neill 1964). Whereas, others believe that the Paleoindians gathered around river-crossings to ambush the large Pleistocene animals as they crossed the rivers (Waller 1970). This implies periods of elevated water levels. Based on the research along the Aucilla and Wacissa Rivers, it appears that both theories are correct, depending upon what the local environmental conditions were at that time (Dunbar 2006b). During the wetter periods, populations

became more dispersed because the water resources were abundant and the animals they relied on could roam over a wider range.

Some of the information about this period has been derived from the underwater excavations at two inland spring sites in Sarasota County: Little Salt Spring and Warm Mineral Springs (Clausen et al. 1979). Excavation at the Harney Flats Site in Hillsborough County has provided a rich body of data concerning Paleoindian life ways. Analysis indicates that this site was used as a quarry-related base camp with special use activity areas (Daniel and Wisenbaker 1987). It has been suggested that Paleoindian settlement may not have been related as much to seasonal changes as generally postulated for the succeeding Archaic period, but instead movement was related to the scheduling of tool-kit replacement, social needs, and the availability of water, among other factors (Daniel and Wisenbaker 1987:175). Investigations along the Aucilla and Wacissa Rivers, as well as other sites within the north Florida rivers, have provided important information on the Paleoindian period and how the aborigines adapted to their environmental setting (Webb 2006). Studies of the Pleistocene faunal remains from these sites clearly demonstrate the importance of these animals not for food alone, but as the raw material for their bone tool industry (Dunbar and Webb 1996).

3.2 Archaic

Climatic changes occurred, resulting in the disappearance of the Pleistocene megafauna and the demise of the Paleoindian culture. The disappearance of the mammoths and mastodons resulted in a reduction of open grazing lands, and thus, the subsequent disappearance of grazers such as horse, bison, and camels. With the reduction of open habitat, the herd animals were replaced by the more solitary, woodland browser: the white-tailed deer (Dunbar 2006a:426). The intertwined data of megafauna extinction and cultural change suggests a rapid and significant disruption in both the faunal and floral assemblages. The Bolen people represent the first culture adapted to the Holocene environment (Carter and Dunbar 2006). Theirs included a more specialized toolkit and the introduction of chipped-stone woodworking implements.

Due to a lack of controlled excavations and the poor preservation of organic materials in the upland sites, our knowledge of the Early Archaic artifact assemblage is limited (Carter and Dunbar 2006; Milanich 1994). Discoveries at several sites indicate that bone and wood tools were used (Clausen et al. 1979; Doran 2002; Webb 2006). The archaeological record suggests a diffuse, yet well-scheduled, pattern of exploiting both coastal and interior resources. Since water sources were more numerous and larger than previously, the Early Archaic peoples could sustain larger populations, occupy sites for longer periods, and perform activities that required longer occupation at a specific locale (Milanich 1994:67).

During the Middle Archaic, wetter conditions prevailed, sea levels began to rise, and pine forests and swamps began to emerge (Watts et al. 1996). The climate was changed to one of more pronounced seasonality with warmer summers and colder winters and by 4000 BCE the climate became essentially the same as that of today (Watts et al. 1996:29). Miller (1998:68) suggests that when sea levels reached their current positions, the St. Johns River changed its riverine characteristics to become similar to a lake in the upper reaches and estuarine in the lower reaches. This allowed for the development of a wide resource base. Settlement became focused within coastal and riverine locales (Milanich 1994:64). The Mount Taylor period has been identified for the period 5000-2000 BCE (Milanich 1994). Subsistence was based on hunting, fishing, shellfish collecting, and plant gathering. Sites are generally located along the Atlantic coast, the upper reaches of the St. Johns River, and the Ocklawaha and Wekiva Rivers (Ste. Claire 1990; Weisman 1993; Wheeler et al. 2000). The theory that Archaic populations practiced a seasonal migration pattern between the interior and the coast has been

called into question as investigations have confirmed year-round occupation of some sites (Russo 1992, 1996b; Russo et al. 1993; Russo and Ste. Claire 1992; Ste. Claire 1990).

The archaeobotanical research at the Groves' Orange Midden and the Lake Monroe Outlet Midden confirms an environment similar to today (ACI/Janus Research 2001; Newsom 1994; Purdy 1994b). Most of the botanical remains were from wetland species common along the lake margin, river swamp, and backwaters. Upland species were also utilized. Middens of mystery snail, apple snail, and mussel provide evidence of occupation and resource exploitation along the rivers of east and central Florida (Cumbaa 1976; Ellis et al. 1994; Fryman et al. 1978).

Mount Taylor sites include large base camps, smaller special-use campsites, burial areas, and extensive shell middens. The artifact inventory of the Mt. Taylor people includes stone projectile points, tools, and microliths, as well as tools and decorative items of shell, bone, and wood (ACI/Janus Research 2001; Purdy 1994a; Wheeler and McGee 1994a, 1994b). The large stemmed projectile points, especially the Newnan type, are diagnostic of this time. Other common point types include Hillsborough, Levy, Putnam, Alachua, and Marion (Bullen 1975). Silicified coral was more prevalent as a raw material (Milanich 1994) and thermal alteration of the stone became common (Ste. Claire 1987). Numerous shell and bone items indicate contact with coast.

One of the most interesting aspects of the Mount Taylor culture is evidence for mass burial interments in specially prepared areas within shell middens (Milanich and Fairbanks 1980). Such burials were found at Tick Island along the St. Johns River (Aten 1999; Bullen 1962; Jahn and Bullen 1978). Milanich (1994:81) suggests that Early and Middle Archaic peoples used aquatic environments for burial. The Early Archaic Windover Site contained primary and flexed burials within a peat pond. These were held in place with wooden stakes and the interments included grave goods such as textiles and worked bone, shell, and wood (Doran 2002). The Gauthier cemetery, situated on a palm island within a slough between a pond and Lake Poinsett, contained primary and flexed burials (Carr and Jones 1981; Sigler-Eisenberg 1984b).

Interior sites (away from the major rivers and/or coast) include the smaller lithic and ceramic scatter campsites that were most likely used for hunting or served as special use extractive sites for such activities as gathering nuts or other botanical materials (Ste. Claire 1989, 1990). The Tomoka Site is a complex of nine mounds and a surrounding village midden located near the confluence of the Tomoka and Halifax River. Occupants utilized estuarine and coastal resources as evidenced by the midden of coquina and oysters. No ceramics have been recovered from this site (Douglass 1882; Piatek 1992, 1994). The burial mound is one of the earliest in Florida (Piatek 1994). Russo (1996a:284) suggests that Florida's Archaic burial mounds were not the precursors to the extensive burial mound use seen in the more recent past, rather, they were short-lived, dead-end traditions.

Evidence from the Groves' Orange Midden indicates contact, either physically or through trade, with the Tampa Bay and possibly the Suwannee River valley areas (Purdy 1994a). The occupants of the Lake Monroe Outlet Midden obtained most of their chert from Ocala limestone (ACI/Janus Research 2001). More specifically, the materials were attributed to the Gainesville, Ocala, Lake Panasoffkee East, and West quarry clusters (Endonino 2007). Other evidence of trade can be seen in the use of soapstone, which was imported from north central Georgia, South Carolina, and Virginia (Yates 2000). Soapstone transportation most likely occurred via canoe, and evidence for canoe usage is well documented (Newsom and Purdy 1990; Purdy 1988; Wheeler et al. 2003).

By about 2000 BCE, fired clay pottery was introduced in Florida. The first ceramic types, tempered with fiber (Spanish moss or palmetto), are referred to as the Orange series. It was originally believed that the ceramics lacked decoration until about 1650 BCE when they were decorated with

geometric designs and punctations. Recent research, however, has called the entire Orange chronology into question (Sassaman 2003). Based on a series of AMS dates on soot from Orange Incised sherds from the middle St. Johns Valley and from radiocarbon dates on oyster and charcoal in association with Orange ceramics near the mouth of the river, all the various Orange ceramic types occur within the time span of roughly 2150-1650 BCE. In addition, research by Cordell (2004) has documented the presence of sponge spicules in the Orange ceramic paste (the diagnostic trait of St. Johns wares) which suggest that the St. Johns ceramic tradition extends back to the beginning of ceramic use in the region (Sassaman 2003:11). The projectile point assemblage was the same, with the addition of the Clay, Culbreath, and Lafayette types (Bullen 1975).

There is little difference between Middle/Late Archaic and Orange populations except that there are more Orange sites and the density of sites is higher. Orange settlements were primarily located near wetland locales. The abundance of resources located in and near the wetlands permitted larger settlements. The adaptation to this environment allowed for a wider variety of resources to be exploited and greater variability in settlement patterns. Shellfish, fish, and other food sources were now available from coastal and freshwater wetlands resulting in an increase in population size.

Bridging the end of the Archaic and the beginning of the Formative stage is the Transitional period (1200 to 500 BCE), which was characterized by increased regionalism, population growth, and socio-cultural complexity (Bullen 1959, 1970). The diffusion of culture traits, resulting from the movements of small groups of people, led to the spread of several ceramic and tool traditions (Bullen 1959). The major changes in post-Transitional cultures cannot be attributed to environmental changes but rather the result of social, political, religious, and technological innovations introduced from elsewhere in the eastern U.S. (Miller 1998:76).

3.3 Formative

The period from about 500 BCE until 750 CE (Common Era) in this area is referred to as St. Johns I, which has been divided into three sub-periods: St. Johns I (500 BCE-100 CE), St. Johns Ia (100-500 CE), and St. Johns Ib (500-750 CE) based on characteristic ceramic types (Milanich 1994:247). There are regional variants of this tradition: the St. Marys to the north and the Indian River to the south. The St. Marys Region is located at the mouth of the St. Johns and extends northward into Georgia (Russo 1992). Sites in this area contain a mixture of Georgia ceramics as well as St. Johns ceramics. At the southern end is the Indian River Region, which was first defined by Rouse (1951). There is a higher prevalence of sand-tempered wares in this region. Malabar I is coeval with St. Johns I. Malabar II occurs at the same time as St. Johns.

Settlement patterns during this time were virtually the same as that seen for the earlier periods, i.e. along the coastal estuaries and larger rivers. The Twin Mounds Site faunal analysis suggests that there was a slight decrease in the dependence on freshwater shellfish during the St. Johns periods as opposed to the preceding Orange period (Weisman 1993). Based on that analysis, there was an increase in the use of reptilian resources. There was also a tremendous increase in the number of archaeological sites during this time. An apparent trend from St. Johns I through Ib times was a population shift into the northern part of the St. Johns River valley, possibly due to the need for more arable land (Milanich and Fairbanks 1980:158).

Village wares were almost all St. Johns Plain throughout this period. St. Johns Incised is associated with the Early St. Johns I period. Deptford and Swift Creek pottery or copies are occasionally present in St. Johns I and Ia periods. St. Johns Cordmarked ceramics are associated with the St. Johns Ia period while Dunns Creek Red is associated with the St. Johns Ia and Ib periods. In her analysis of

the ceramics from Edgewater Landing, Cordell (Russo et al. 1989:68) notes that through time, St. Johns Plain ceramics become sandier due to increased use of quartz sand as an aplastic agent.

Evidence of the continuous use of burial mounds begins at this time. Many of the burials were found in large central pits, probably the result of secondary interments. Some changes in the burial practices include the possible use of log tombs during the St. Johns Ia period as well as inclusion of Hopewellian-Yent complex exotic trade items (Milanich 1994:261). Much of the information on St. Johns I period burial practices have been obtained from the Ross Hammock Site in Volusia County (Bullen et al. 1967). This site complex consists of two large burial mounds and an extensive village midden located on the west shore of Mosquito Lagoon (Bullen et al. 1967:16). The Benton Mound dates to the St. Johns Ia period (Miller 1994). Other ceremonial activities associated with these sites include the “killing” of ceramic pots.

Year-round occupation of the coast and along the rivers occurred with special use-activity sites located in other locales and short-term campsites on the coast as well. Excavations at the Sligh and Lake Jessup South sites suggest that they served as villages or long-term encampments (Dickinson and Wayne 1996; Wayne and Dickinson 1993). The wide variety of tools and abundance of ceramics suggests a relatively sedentary group. Hunting, food preparation, and tool making were common site activities. The site pattern consists of small, probably individual household midden deposits with structural evidence limited to arcs of shallow post holes, often shell-filled, and fire pits (Dickinson and Wayne 1996:108). The Hontoon Island site has provided a wealth of data due to the preservation of many classes of artifacts within the inundated midden deposits. Evidence of an extensive wood-working tradition is noted by the numerous carved items recovered from the river as well as the debitage remaining from the carving activities (Purdy 1987). The faunal and botanical analyses suggested that the site was occupied on a year round basis and that most of the resources were collected within 5-10 (kilometers (km) (3-6 mi) of the site (Newsom 1987; Wing and McKean 1987).

The survey of the Edgewater Landing tract recorded several shell midden deposits that date to this period (Johnson and Ste. Claire 1988). Excavations conducted at two of the sites indicated occupation during the St. Johns Ia and St. Johns Ib periods. Both sites were characterized as short-term camps established to harvest oysters and hardshell clams. The sites were occupied irregularly throughout the year, but contained evidence indicating that the sites were utilized during all seasons of the year (Russo et al. 1989). The Seminole Rest Site is a large quahog clam-processing center located along Mosquito Lagoon (Horvath 1995). The faunal analysis indicated that the site was used throughout the year, but did not appear to be occupied on a year-round basis (Quitmyer 1995). Although located along the lagoon’s shore, fish made up only a small portion of the diet, less than 15%, and mammals even less (Kozuch 1995).

3.4 Mississippian

The St. Johns II period has been divided into three sub-periods: St. Johns IIa (750-1050 CE), St. Johns IIb (1050-1513 CE), and St. Johns IIc (1513-1565 CE). These periods are marked by the presence of St. Johns Check Stamped pottery. St. Johns II carries on the tradition and is marked only by the introduction of check-stamped pottery (Goggin 1952:70). Occupation of riverine and coastal shell middens continued, although Miller (1998:80) notes that there is a relative increase in the number of non-riverine and non-coastal sites, perhaps as the result of locating sites in more agriculturally suited locales. Such sites are quite numerous, suggesting an increase in population.

Hunting and gathering remained important but the dependence upon cultivated crops such as maize, squash, and gourds increased in some areas. The use of gourds as domesticates is still being

studied as there is no evidence for cultivation even though gourds and squashes have been around for thousands of years prior to this period (Newsom et al. 1993). In the upper St. Johns basin, the practice of horticulture was not adopted because the wetland ecology and subsistence strategies were different (Russo 1984; Sigler-Eisenberg 1984a; Sigler-Eisenberg et al. 1985). At the Gauthier Site, fish and aquatic turtles were the primary subsistence items, with relatively little reliance upon terrestrial game or freshwater shellfish (Sigler-Eisenberg 1984b).

There was an increase in the number and size of villages during the St. Johns IIa period suggesting population expansion. A ranked society may have evolved as evidenced by the differential burial customs. No longer were all people interred in burial mounds. Deagan (1978:109) notes that around 1000 CE a population shift from the more southern and southwestern areas into the northern areas is evidenced by changes in relative frequencies of burial mounds in the areas over time. Excavations of several burial mounds revealed a new pattern in that the burials were placed on their backs with their heads or feet pointing toward the mound center (Jennings et al. 1957; Willey 1954).

The St. Johns IIb period (ca. 900-1250/1300 CE) is characterized by the adoption of some Mississippian traits into the ceremonial system as well as the presence of St. Johns Simple Stamped ceramics. The Mississippian lifestyle, however, never became dominant, possibly because the soils were not suitable for full agricultural pursuits. A more complex socio-political organization is suggested by the presence of platform mounds at the ceremonial centers: Mill Cove Complex near the mouth of the St. Johns River and Mt. Royal just north of Lake George (Ashley 2012). Copper beads and ornaments, as well as greenstone celts, have been recovered from several sites, indicating contact with the Mississippian world. Mt. Royal has been considered a center of dispersal in the marine shell trade due to the tremendous quality of unmodified whelk shells recovered from the mound (Ashley 2005). By around 1300 CE, influence from the Mississippian world waned, probably due to the fall and abandonment of the Macon Plateau to the north and the disruption of the existing interaction networks. At this time, the major sites were apparently abandoned and the St. Johns II people moved further south, up the St. Johns River. However, within two centuries, the introduction of corn farming and the shift from long-distance trading to territorial raiding created the volatile landscape that was encountered by the Europeans when they first arrived (Ashley 2012:125).

The St. Johns IIc period is marked by the introduction of European artifacts in some of the mounds. Three Native American ethnic groups were known to inhabit east central Florida at the time of Spanish contact: the Ais, the Mayaca, and the Jororo. The Ais lived along the Atlantic Coast and were closely involved with the Spanish. They inhabited the coastal strand and Indian River areas at this time. They apparently mixed indigenous hunting/gathering/fishing economy with the salvaging of Spanish shipwrecks (Milanich 1995:64-65). The Mayaca occupied eastern Lake, western Volusia, and Seminole counties. The Jororo occupied the area of Orange and Seminole Counties, extending southward into Polk and Highlands Counties (Milanich 1995:63). They pursued a hunting-gathering-fishing economy (Newsom 1987). Although these Indians apparently continued the St. Johns tradition, they did not share the same Timucuan language as the St. Johns people further north (Milanich 1995).

3.5 Colonialism

The cultural traditions of the native Floridians ended with the advent of European expeditions to the New World. The initial events, authorized by the Spanish Crown in the 1500s, ushered in devastating European contact. After Ponce de Leon's 1513 landing in northeast Florida, Spanish explorations were confined along the west coast of Florida and European contact along the east coast was left to a few shipwrecked sailors from treasure ships that sailed through the Straits of Florida on their way to Spain. Cape Canaveral was a landmark for these explorers and sailors. The French

established Fort Caroline, near today's Jacksonville, to promote their interests in the New World. The need to protect the treasure galleons led Spain to remove the French from the region. Pedro Menéndez de Avilés led the Spanish fleet in its conquest of Fort Caroline and the destruction of the French.

During Spain's first period of occupancy (1565-1763), it failed to establish permanent settlements in the project area. Located on the fringe of Spanish activity centered in St. Augustine, Orange County was too far removed for Spain to exert political control (Milanich and Fairbanks 1980). Missionization of the Jororo and Mayaca began in the late 1600s, and in 1728 Joseph de Bullones wrote to the king that the Jororo were "gone" (Hann 2003:132). Evidence of European contact with the Jororo is seen at the Philip and Goodnow mounds where glass beads and iron scissors have been recovered (Milanich 1995). Due to the attempts of the Spanish military and missionaries to alter the traditional lifeways, by the end of the seventeenth century these aboriginal populations were virtually extinct.

The area that now constitutes the state of Florida was ceded to England in 1763 after two centuries of Spanish possession. England governed Florida until 1783 when the Treaty of Paris returned Florida to Spain; however, Spanish influence was nominal during this second period of ownership. Prior to the American colonial settlement of Florida, remnants of the Creek Nation and other Indian groups from Alabama, Georgia, and South Carolina moved into Florida and began to repopulate the vacuum created by the decimation of the aboriginal inhabitants. The Seminoles, as these migrating groups of Indians became known, formed at various times, loose confederacies for mutual protection against the new American Nation to the north (Tebeau 1980:72).

3.6 Territorial and Statehood

The bloody conflict between the Americans and the Seminoles over Florida first came to a head in 1818, and was subsequently known as the First Seminole War. In 1821, Florida became a U.S. Territory due to the war and the Adams-Onís Treaty. Andrew Jackson, named provisional governor, divided the territory into St. Johns and Escambia Counties. St. Johns County included the lands lying east of the Suwannee River. In the first territorial census (1825), 5077 people were reported within St. Johns County, and by 1830, that number had risen to 8956 (Tebeau 1980:134).

Even though the First Seminole War was fought in north Florida, the Treaty of Moultrie Creek in 1823, at the end of the war, was to affect the settlement of all of Florida. The Seminoles relinquished their claim to the whole peninsula in return for an approximately four million acre reservation south of Ocala and north of Charlotte Harbor (Mahon 1985). The reservation was found to be nearly barren, with poor soils, few good hammocks, and frequently covered with water during the rainy season (Knetsch 2008:8). The treaty never satisfied the Indians or the Anglo-Americans. The inadequacy of the reservation and desperate situation of the Seminoles living there, plus the mounting demand of the Anglo-Americans for their removal, soon produced another conflict.

By 1835, the Second Seminole War was underway. Mosquito County, created in 1824, encompassed present-day Osceola, Lake, Orange, Seminole, Brevard, and Volusia Counties as well as parts of several other counties. Mosquito County was sparsely occupied with mostly sugar plantations along the rivers near the coast. In 1835, the Territory's legislative council established the county seat at John Bunch's plantation in New Smyrna. However, before the first session could be held, the threat of Indian attacks forced the county government to move to St. Augustine, the seat of St. Johns County, for safety. During the war, court was held concurrently with that for St. Johns County (Robison and Andrews 1995).

During the Second Seminole War, Fort Mellon, located near present-day Sanford, was the principal military installation in east central Florida. The area around Lake “Ahapopka” (now Apopka) became a refuge for the Indian groups headed by Chief Osuchee (Tebeau 1980). Military and civilian suppliers passed through the region traveling to reach Seminole villages and an increasing number of military fortifications. The lands around Lake Tohopekaliga were a Seminole stronghold during the war. Here, the Seminoles kept their cattle and retreated into the cypress swamp west of the lake at the approach of soldiers (Mahon 1985; Sprague 1964). Tohopekaliga means “Fort Site,” and the lake was so named because the islands within it housed the forts and stockades of the Seminoles. In January 1837, General Jesup’s men encountered the Seminoles near the “Great Cypress Swamp” and drove them into dense swamp. On January 28, the army moved forward and occupied a strong position on Tohope-ka-liga Lake where several hundred head of cattle were confiscated by Jesup (Sprague 1964:258).

The Second Seminole War lasted until 1842 when the federal government decided to end the conflict by withdrawing troops from Florida. Some of the battle-weary Seminoles were persuaded to emigrate west where the federal government had set aside land for a reservation. However, those who were adamant about remaining were allowed to do so but were pushed further south into the Everglades and Big Cypress Swamp, which became the last Seminole stronghold (Tebeau 1980).

The war had a deleterious effect on new settlement in Florida. To encourage settlement in the middle portion of the territory after the war, the Armed Occupation Act of 1842 offered settlers 160 acres of land at no cost, provided they built a house, cleared five acres, planted crops, and resided on the land for five years. Any head of a family or single man over 18 years of age and able to bear arms, was eligible to receive a homestead (Covington 1961). This act, plus the end of the war, created a small wave of immigration by Anglo-American pioneers to central Florida. Although the act was supposed to bring in new settlers to Florida, only a third of those who were issued permits arrived in Florida after the Act went into effect (Knetsch 2008:241). Most of these immigrants were Anglo-American farmers and cattle ranchers, or “crackers,” from the southeastern U.S. (Gaby 1993).

In 1843, Henry Washington surveyed the exterior lines and in 1847, J.R. Richards surveyed the subdivision lines of Township 21 South, Range 32 East. Washington described the general project area as 3rd rate pine, flat pine and cypress swamp, pine and saw palmetto, and level 3rd rate pine land (State of Florida 1843:677-688, 685) and Richards described it as 3rd rate pine (State of Florida 1847:28, 39-41). The 1848 *Plat* does not show any forts, trails, or homesteads within or adjacent to the project APE (**Figure 3.2**). It does; however, show today’s Econlockhatchee River running adjacent to the project APE (State of Florida 1848).

At the end of the Second Seminole War, the Florida Legislature relocated the county seat from its safe haven in St. Augustine to Enterprise, now in Volusia County. In 1845, the Union admitted the State of Florida with Tallahassee as the state capital. In the same year, due to the thriving citrus industry, Mosquito County was renamed Orange County with a population in the 1850 census numbering 466 residents. At the same time, the Legislature moved the county seat to Mellonville, but in 1856 relocated it to the community, which became Orlando (Hebel 1955:2). Much of the early development occurred along the coast or inland waterways. Cities such as Enterprise, Sanford, and New Smyrna developed along waterways such as the St. Johns, Halifax, and Indian Rivers. The rivers were heavily used transporting residents, goods, and crops from the 1850s until the advent of the railroad (Hebel 1955). Prior to the Civil War, the cotton, cattle, and sugar industries thrived while the developing citrus, turpentine, and logging industries were in their infancy.

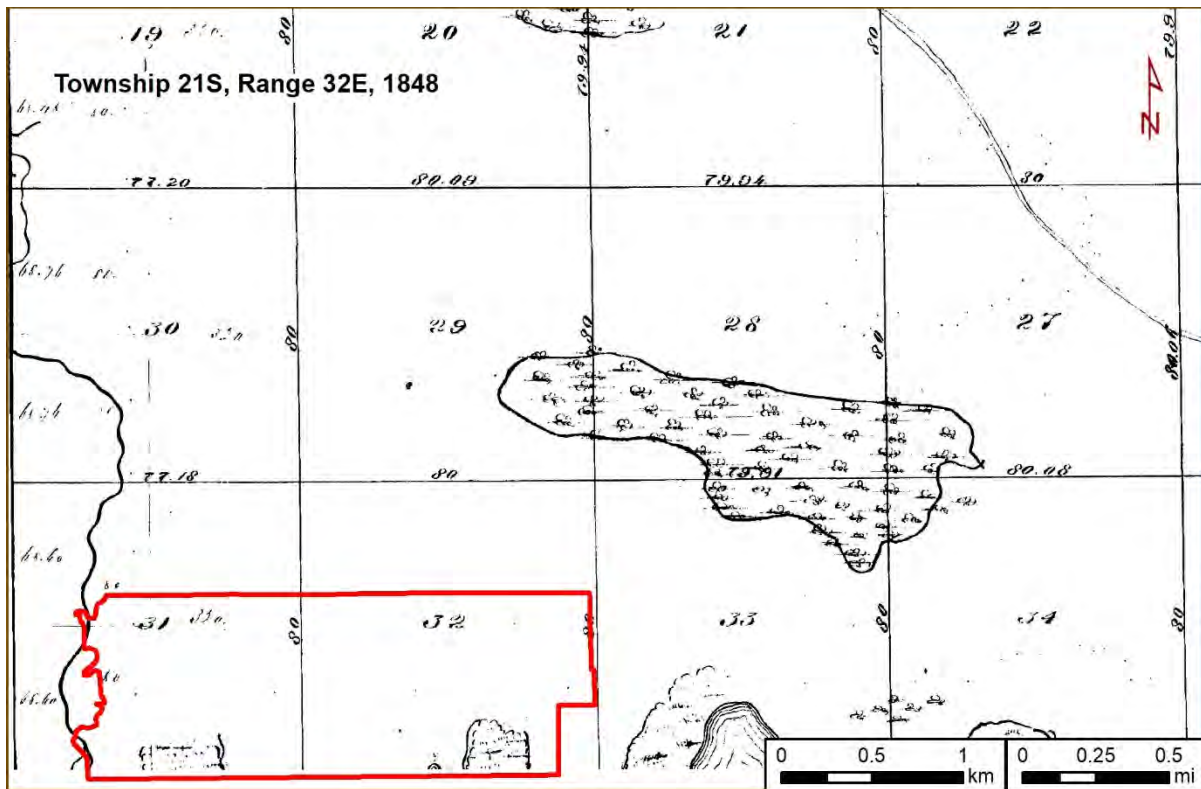


Figure 3.2. 1848 Plat of project APE.

Throughout the intervening years between the Second and Third Seminole Wars, tensions erupted periodically between settlers and Seminoles. The desire to remove all Seminoles from Florida and to recapture all former slaves became national policy. As a result, 10 military forts were established in Orange County by 1846. These included: Fort Butler near the south end of Lake George; Fort Kingsbury at the northeast end of Lake George; Fort Mellon on the south bank of Lake Monroe; Fort Lane on the west side of Lake Harney; Fort Maitland, Fort Gatlin, Fort Christmas, and Fort Taylor to the west of Lake Winder; Fort McNeal west of Lake Poinsett; and Fort Ann on the Halifax River (Blackman 1927:19).

In December 1855, the Third Seminole War started as a result of pressure placed on the Indians remaining in Florida to move to the West (Covington 1982). The war originated in present-day Collier County when Seminole Chief Billy Bowlegs and 30 warriors launched a retaliatory attack upon an army camp, killing four soldiers and wounding four others. This hostile action renewed state and federal interest in the final removal of the Seminoles from Florida. As a result, several regional military posts were established (Tebeau 1966).

Military action was not decisive during the war; therefore, in 1858 the U.S. Government resorted to monetary persuasion to induce the remaining Seminoles to move west. Many accepted and on May 4, 1858, the ship *Grey Cloud* set sail from Fort Myers with 123 Seminoles; 41 captives and a Seminole woman guide were added to the group at Egmont Key. On May 8, 1858, the Third Seminole War was declared officially over (Covington 1982:78-80). Between the end of the Third Seminole War and the beginning of the Civil War, settlers continued to arrive in the area, attracted by its rich soil, mild climate, and homesteading opportunities.

3.7 Civil War and Aftermath

In 1861, Florida followed South Carolina's lead and seceded from the Union as a prelude to the Civil War. Florida had much at stake in this war as evidenced in a report released from Tallahassee in June of 1861. It listed the value of land in Florida as \$35,127,721 and the value of slaves at \$29,024,513 (Dunn 1989:59). Even though the coast of Florida experienced a naval blockade during the war, the interior of the state saw very little military action. One of the major contributions of the state to the war effort was in the supplying of beef to the Confederate Government. The blockade along the coast made it very difficult to ship cattle from Florida to Cuba. Therefore, the ranchers from Florida herded their cattle to Charleston, South Carolina and sold them to the Confederate Government. The Confederate Government estimated that three-fourths of the cattle that Florida supplied to the Confederacy came from Brevard and Manatee Counties (Shofner 1995:72). The war lasted until 1865.

At the close of the Civil War, the first commercial citrus grove was planted near present-day Orlando by W. H. Holden. His produce was hauled via the St. Johns River to present day Sanford and continued by boat to Charleston (Federal Writers' Project [FWP] 1939:224). In 1871, General Henry R. Sanford purchased 12,000 acres near Mellonville. He brought in hundreds of workers to clear the land and plant citrus. Sanford's goal was to establish a city as large as Jacksonville and bring prosperity to the upper St. Johns region. Sanford even sent an agent to Sweden to recruit workers who were guaranteed passage and expenses in exchange for one year of work. Because of this arrangement, Sanford was accused of operating a form of slavery and many of the workers ran away. Other Swedes, however, fulfilled their contracts and were given a five-acre grove (FWP 1939:360).

Immediately following the war, the South underwent a period of "Reconstruction" to prepare the Confederate States for readmission to the Union. The program was administered by the U.S. Congress, and on July 25, 1868, Florida returned to the Union (Tebeau 1980:251). By 1870, the county population had risen from 987 in 1860 to 2,195 (Kendrick 1976:150). The war stimulated growth in Florida in two ways. Many Southerners sought new homes to escape the unrest in the neighboring ex-Confederate states, and the war brought prosperity to a large number of Northerners who sought vacation homes in warmer climates. The Homestead Acts of 1866 and 1876 provided additional incentive for settlers to come to the area. The Act of 1866 gave Union-loyal African-Americans and southerners the opportunity to receive 80-acre tracts in Florida and the other four public land states. Former Confederates, however, were ineligible to receive homesteads until the Act of 1876 (Tebeau 1980:266, 294). Beginning about 1870, many settlers began to buy the land on which they had homesteaded for so many years in anticipation of the coming railroad (Hetherington 1980:86). Both Oviedo, located north of the project APE, and Chuluota, located to the east, were settled after the Civil War. By March 13, 1879, the Oviedo post office had been established (Seminole County Government 2015) and in 1898, a one room school house was established in the town of Chuluota (Chuluota Community Association 2017).

By 1881, the State of Florida faced a financial crisis involving a title to public lands. On the eve of the Civil War, land had been pledged by the Internal Improvement Fund to underwrite railroad bonds. After the War, when the railroads failed, the land reverted to the State. Almost \$1 million was needed by the state to pay off the principal and accumulated interest on the debt, thereby giving clear title. Hamilton Disston contracted with the State of Florida in two large land deals: the Disston Drainage Contract and the Disston Land Purchase. The drainage contract stipulated that Disston and his associates would drain and reclaim all overflow lands south of present-day Orlando and east of the Peace River in exchange for one-half the acreage that could be reclaimed and made fit for cultivation. They agreed to purchase Internal Improvement Fund Lands at \$0.25 an acre to satisfy the indebtedness of the fund. A contract was signed on June 1, 1881 for the sale of four million acres for the sum of \$1 million, the estimated debt owed by the Improvement Fund. All of Section 31 and a portion of Section 32 within the APE was

deeded to the Florida Land and Improvement Company, one of Disston's companies, in 1883 and the western quarter of Section 32 was deeded to S.B. McLin in 1876. (State of Florida n.d.:48).

During 1881 and 1882, channels were dug between numerous lake systems and the Kissimmee River (Tebeau 1980:279). The Atlantic and Gulf Coast Canal and Okeechobee Land Company was responsible for connecting Lake Okeechobee with the Gulf of Mexico by dredging a channel to the Caloosahatchee River. Disston and his associates received 1,652,711 acres of land under the contract, although they probably never permanently drained more than 50,000 acres (Tebeau 1980:280). Drainage operations began and the Florida Land and Improvement Company and Kissimmee Land Company were formed to help fulfill the drainage contract (Hetherington 1980:6).

Disston changed Florida from a wilderness of swamps, heat, and mosquitoes into an area ripe for investment. This enabled Henry B. Plant to move forward with his plans to open the west coast of Florida with a railroad-steamship operation called the Jacksonville, Tampa & Key West Railway. Through the Plant Investment Company, he bought up defunct rail lines such as the Silver Springs, Ocala & Gulf Railroad, Florida Transit and Peninsular Railroad, South Florida Railroad, and Florida Southern Railroad to establish his operation (Harner 1973:18-23; Mann 1983:68). In 1902, Henry Plant sold all of his Florida holdings to the Atlantic Coast Line, which would become the backbone of the southeast (Mann 1983:68).

3.8 Twentieth Century

At the turn-of-the-century, Florida's history was marked by the outbreak of the Spanish-American War in 1898. As Florida is the closest state to Cuba, American troops were stationed and deployed from the state's coastal cities. Harbors in Tampa, Pensacola, and Key West were improved as more ships were launched with troops and supplies. "The Splendid Little War" was short in duration, but evidence of the conflict remained in the form of improved harbors, expanded railroads, and military installations (George 1990).

In 1904, Governor Broward initiated significant reforms in Florida's politics. Several of his major issues included the Everglades drainage project, railroad regulation, and the construction of roads. During this time, railroads were constructed throughout the state and automobile use became more prevalent. Improved transportation in the state opened the lines to export Florida's agricultural and industrial products (George 1990). As various products such as fruits and vegetables were leaving the state, people were arriving. Some entered as new residents and others as tourists. Between 1900 and 1910, the state population increased from 528,542 to 752,619.

Thousands of miles of railroad tracks were laid by the Florida East Coast (FEC), Seaboard Air Line (SAL), and Atlantic Coast Line (ACL) railways. While agriculture, especially the citrus industry, had become the backbone of Florida's economy, manufacturing and industry began growing during the beginning of the century. Fertilizer production, boat building, and lumber and timber products were strong secondary industries (Weaver et al. 1996:3). In Seminole County, which was formed from portions of Orange and Volusia Counties in 1913, vegetables had replaced citrus as the key crop. Clay pipes fed from underground artesian wells kept fields well irrigated. By 1909, Sanford had established itself as the largest vegetable shipping center in the U.S. and had received the nickname, "Celery City" (Sanford Historic Preservation Board 2005). Celery growing was very profitable and farmers built large homes on the outskirts of Sanford.

The United States entered into World War I in 1917. Wartime activity required the development of several training facilities in the state, and protecting the coastlines was a priority at this

time. Although the conflict only lasted until November 1918, the economy was boosted greatly by the war. For example, the war brought industrialization to port cities such as Tampa and Jacksonville, where shipbuilding accelerated. These cities also functioned as supply depots and embarkation points. An indirect economic benefit of the war was an increase in agricultural production for central Florida since beef, vegetables, and cotton were in great demand (George 1990).

While Florida industrialization and agriculture flourished, immigration and housing development slowed during the war. Tourism increased because of the war in Europe, which forced Americans to vacation domestically. Tycoons such as Henry Flagler and Henry Plant were building the hotels and railroads for people desiring winter vacations in sunny Florida. These magnates took an interest in the improvements and promotion of Florida in an effort to bring in more tourist dollars, however small rural communities felt little effect from the increase in tourism.

After World War I, Florida experienced unprecedented growth. Many people relocated to Florida during the war; some came to work in wartime industries while others were stationed in the state as soldiers. Bank deposits increased, real estate companies opened in many cities, and state and county road systems expanded quickly. Earlier land reclamation projects created thousands of new acres of land to be developed. Real estate activity increased steadily after the war's end and drove up property values. Prices on lots were inflated to appear more enticing to out-of-state buyers. Every city and town in Florida had new subdivisions platted and lots were selling and reselling for quick profits. Southeast Florida, including cities such as Miami and Palm Beach, experienced the most activity, although the boom affected most communities in central and southern Florida (Weaver et al. 1996:3).

Road building became a statewide concern as it shifted from a local to a state function. A state highway association, established in Orlando in 1917, sponsored the development of an improved highway system. These roads made even remote areas of the state accessible and allowed the boom to spread. The Dixie Highway, constructed between 1915 and the early 1930s by Carl Fisher, encouraged travelers to come south to Florida (Harner 1973:63) and it became a significant route for travelers through the state (Blackman 1927:28; Shofner 1982:155). Florida's legislative prohibition on income and inheritance taxes also encouraged more people to move into the state.

The Boom Period began to decline in the mid-1920s, when the Florida East Coast Railway placed an embargo on freight shipments to South Florida. Ports and rail terminals were overflowing with unused building materials. In addition, northern newspapers published reports of fraudulent land deals in Florida. In 1926 and 1928, two hurricanes hit southeast Florida, killing hundreds of people and destroying thousands of buildings. The collapse of the real estate market and the subsequent hurricane damage effectively ended the boom. The 1929 Mediterranean fruit fly infestation that devastated citrus groves throughout the state only worsened the recession (Weaver et al. 1996:4).

By the time the stock market collapsed in 1929, Floridians were already accustomed to economic depression. Construction activity had halted and industry dramatically declined. Subdivisions platted several years earlier remained empty and buildings stood on lots partially-finished and vacant (Weaver et al. 1996). However, the relatively small amount of real estate activity in rural citrus and vegetable-growing towns in the central part of the state somewhat mitigated the effects of the real estate market collapse (Shofner 1982; Tebeau 1980).

The Depression affected most areas of the state's economy. Between 1929 and 1933, 148 state and national banks collapsed, more than half of the state's teachers were owed back pay, and a quarter of the residents were receiving public relief (George 1990). New building and development in the Boom Period's subdivisions for the most part ceased. Beef and citrus production declined, manufacturing slowed, and development projects were stopped. Even the railroad industry felt the pressures of the

1930s, and had to reduce service and let go some personnel. In addition, the increasing use of the automobile lessened the demand for travel by rail.

As a result of hard economic times, President Franklin D. Roosevelt initiated several national relief programs including the Works Progress Administration (WPA) and the Civilian Conservation Corps (CCC). The WPA provided jobs for professional workers and laborers, who constructed or improved many roads, public buildings, parks, and airports in Florida. The CCC improved and preserved forests, parks, and agricultural lands (Shofner 1987). A cross-Florida sea-level canal was proposed to create federal jobs in the area, but was rejected by many farmers in the area who feared salt water would seep into their fields and kill crops (Historic Property Associates [HPA] 1995).

From the end of the Great Depression until after the close of the post-war era, Florida's history was inextricably bound with World War II and its aftermath. It became one of the nation's major training grounds for the various military branches including the Army, Navy, and Air Force. Prior to this time, tourism had been the state's major industry. However, it was brought to a halt as tourist and civilian facilities, such as hotels and private homes, were placed into wartime service. The influx of thousands of service personnel and their families increased industrial and agricultural production, and introduced these residents to the warm weather and tropical beauty of Florida.

The U.S. Navy established an aviation-training base east of Sanford that helped save the bankrupt community in 1943. This increased demand for agricultural products as well as the railway use. Railroads once again profited, since service personnel, military goods, and materials needed to be transported. However, airplanes were now becoming the new form of transportation, and Florida became a major airline destination. The highway system was also being expanded at this time. The State Road Department constructed 1,560 miles (mi) of highway during the war era (George 1990). The 1956 Highway Act initiated a plan for 41,500 mi of interstate highway throughout the country. Interstate 4 (I-4), which was constructed in the late-1950s and early-1960s, was part of the plan. Completed in 1965, it passed through downtown Orlando, connecting Tampa to Daytona.

At the conclusion of World War II, Florida's economy was almost fully recovered. Tourism quickly rebounded and once again became a major source of the state's economy. Additionally, former military personnel found the local climate amenable and remained in Florida permanently after the war. These new residents greatly increased the population in the 1940s (George 1990). I-4 served as the beltway across central Florida, providing access to both coasts and many tourist attractions. After Walt Disney World opened in 1971, growth and development along I-4 and Seminole County exploded. Cities in this area have experienced large growth in recent years due to their proximity to the metropolitan Orlando area. Between 1980 and 1990, the population of Seminole County increased 60%, and from 2000 to 2010, it increased 27%. The estimated population in 2017 was 454,757 with an increase of 7.6% since 2010. In 2017, the largest employers in Seminole County were in the trade transportation, and utilities sector (21.6%) and professional and business services (18.1%) (Enterprise Florida 2018).

3.9 Project Area Specifics

A review of historic USDA aerial photographs and USGS quadrangle maps from 1940 to 1980 indicate that the project APE has experienced little change since the 1940s, although timber has been harvested within the past decade and perhaps earlier (Google Earth 2018, USDA 1940, 1947, 1957, 1980; USGS 1953a, 1953b) (**Figure 3.3**). Several access roads cross the property, but it appears that no structures have been built within the APE. A review of the Seminole County property appraiser's website confirms the lack of structures within the APE (Johnson 2018).

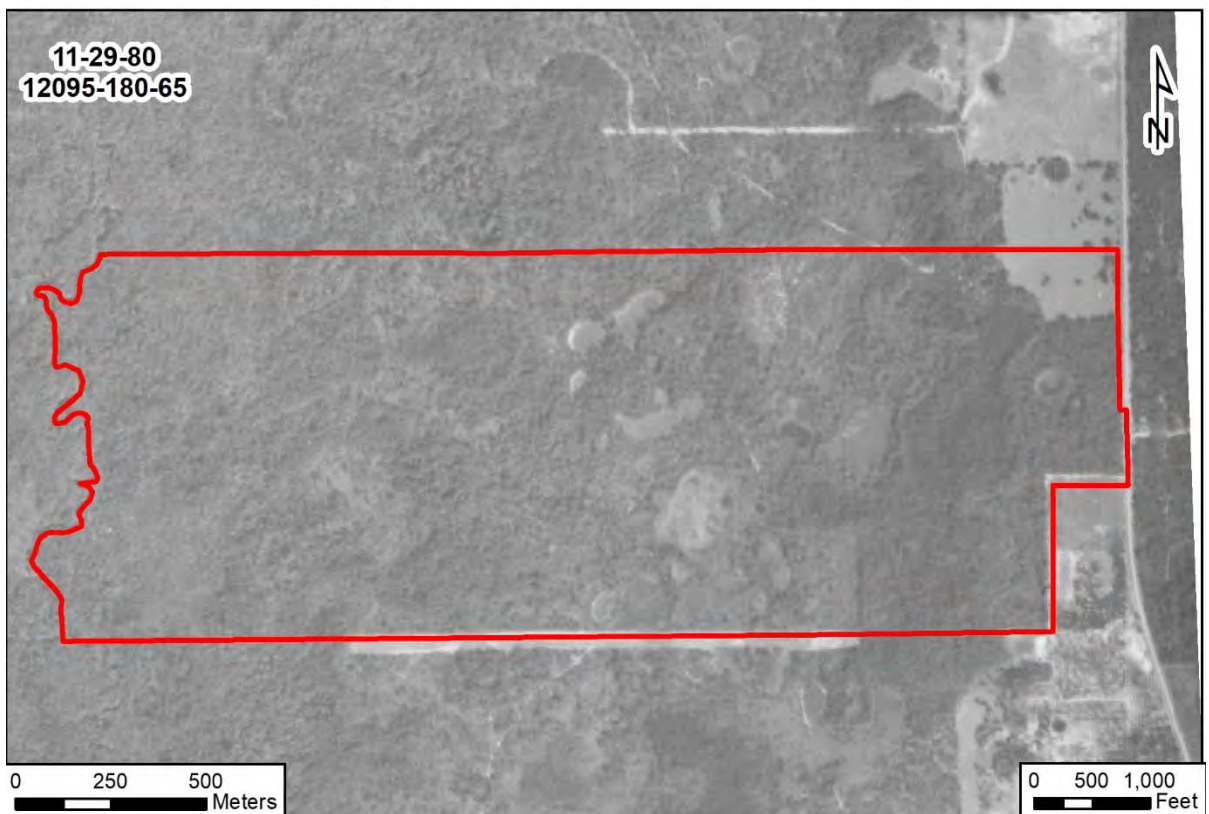
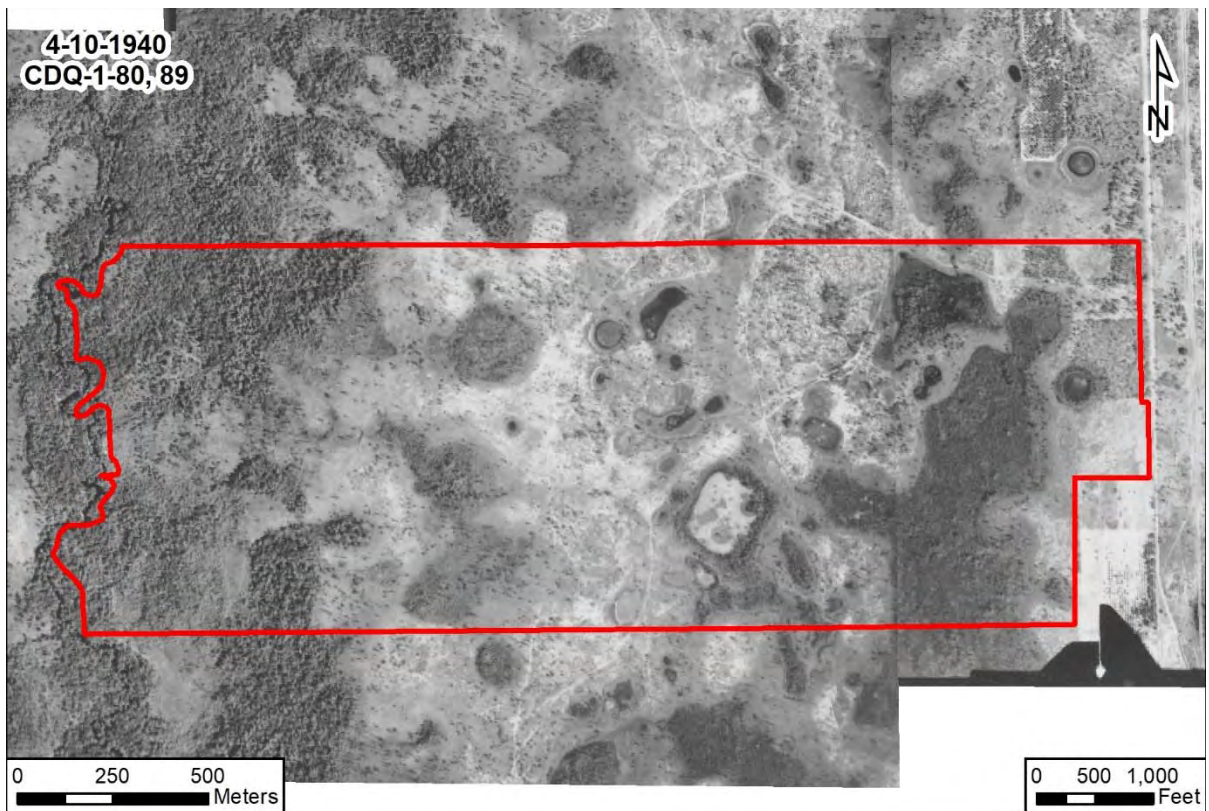


Figure 3.3. 1940 and 1980 aerial photographs of the Clayton High Oaks Property area.

4.0 RESEARCH CONSIDERATIONS AND METHODS

4.1 Background Research and Literature Review

A review of archaeological and historical literature, records and other documents and data pertaining to the project area was conducted. The focus of this research was to ascertain the types of cultural resources known in the project area and vicinity, their temporal/cultural affiliations, site location information, and other relevant data. This included a review of sites listed in the NRHP, the Florida Master Site File (FMSF), cultural resource survey reports, published books and articles, unpublished manuscripts, maps, and interviews. The FMSF information in this report was obtained January 2018, which is the most recent edition. However, according to FMSF staff, input may be a month or more behind receipt of reports and site files. Current landowner, Brant Clayton, was interviewed and reported he had not seen any artifacts since taking ownership of the property in the early 1980s (Clayton 2018).

4.1.1 Archaeological Considerations

Background research revealed that no sites have been recorded within the project APE, one site (8OR03533) is adjacent and to the south, and eight sites have been recorded within two miles (**Figure 4.1, Table 4.1**). Three of the sites, 8OR03504 (Stonemeade P.D.), 8SE01649 (Old Lockwood), and 8SE01685 (Adios Al), are represented by single artifacts and today are considered artifact occurrences (AO). Four sites, 8SE03533 (No name), 8OR09830 (Pickles'), 8SE01683 (Live Oak), and 8SE01684 (Stanford Development), are artifact scatters; site 8SE01148 (Mill's Lake 1) is a lithic scatter with a single bone fragment; and site 8SE01176 (Mill's Lake 2) is debris from a 19th century structure. Site 8OR03404 was found during a survey of the Stonemeade P.D project (Janus Research/Piper Archaeology 1992), 8OR03533 and 8OR09830 during a survey of the Rybolt Ranch property (Endonimo et al. 2008), 8SE01148 and 8SE01176 during a Seminole County survey (Ellis et al. 1994); and 8SE01649 was reported by a property owner (Penders 1995). Sites 8SE01683, 8SE01684, and 8SE01685 were found during a survey of the Live Oak Plantation property (Stokes et al 1997). The two sites found during the Seminole County survey (8SE01148 and 8SE01176) have not been evaluated by the State Historic Preservation Officer (SHPO), and the rest of the sites are considered ineligible for listing in the NRHP by the SHPO (FMSF).

In addition to the surveys noted above, several other surveys have been conducted proximate to the project APE. These include surveys for development projects (ACI 2014, 2016; Austin and Ballo 1987; Carty 2007; Estabrook 1991), proposed cellular towers (Ambrosino 2003; Baxter 2000; Carlson 2000; Johnson 1991; Mikell 2011; Williams and Bazzill 2013; Stewart 2001), a transmission line (Bellomo 1993), and a county historic and architectural resources study (Laurie 1994). As a result of these surveys, no sites were found within the project APE.

Based on these data, combined with more regional archaeological syntheses (Austin and Layman 1989; Ellis et al. 1994; Johnson and Basinet 1995), the project area and surrounding lands have been the scene of human activity for more than 8000 years. As archaeologists have long realized, aboriginal populations did not select their habitation sites and special use activity areas in a random fashion. Rather, many environmental factors had a direct influence upon site location selection. Among these variables are soil drainage, distance to freshwater, relative topography, and proximity to food and other resources including stone and clay. In general, comparative site location data indicate a pattern of site distribution favoring the relatively better-drained terrain relative to the surrounding terrain and near a permanent or semi-permanent source of potable water including rivers, creeks, and freshwater marshes. Upland sites well removed from potable water are rare. In the pine flatwoods, sites tend to be

Figure 4.1. Location of archaeological sites within one mile of the Clayton High Oaks Property APE.



Table 4.1. Previously recorded archaeological sites in the general vicinity of the project area.

Site No.	Site Name	Site Type	Culture	Recorder	SHPO
8OR03504	Stonemeade P.D.	Single artifact	Prehistoric	Janus Research/Piper Archaeology 1992	Ineligible, AO
8OR03533	No name	Artifact scatter	Prehistoric, 20 th C	Endonino et al. 2008	Ineligible
8OR09830	Pickles'	Artifact scatter	Middle Archaic, St. Johns	Endonino et al. 2008	Ineligible
8SE01148	Mill's Lake 1	Lithic scatter with faunal	Archaic	Ellis et al. 1994	Not evaluated
8SE01176	Mill's Lake 2	Structural remains, historic refuse, artifact scatter	19 th C	Ellis et al. 1994	Not evaluated
8SE01649	Old Lockwood Road	Single artifact	Archaic	Penders 1995	AO
8SE01683	Live Oak	Artifact scatter	St. Johns	Stokes et al. 1997	Ineligible
8SE01684	Stanford Development	Artifact scatter	Orange, St. Johns	Stokes et al. 1997	Ineligible
8SE01685	Adios Al	Single artifact	St. Johns	Stokes et al. 1997	AO

Given these known patterns of aboriginal settlement, the project area was considered to have a varied probability for archaeological site occurrence. The area adjacent to site 8OR03533 was considered to have a high probability. In general, the areas of better drained soils with a higher elevation were considered to have a moderate probability, while the areas of low elevation with poorly drained or very poorly drained soils were considered to have a low probability. Research suggests that the most likely type of aboriginal site would be a lithic and/or artifact scatter. Background research suggested a low potential for the discovery of historic (50 years of age or older) archaeological sites within the project area, although artifacts related to turpentine or pine cultivation activity may be present.

4.1.2 Historical Considerations

A review of the FMSF and the NRHP indicated no previously recorded historic resources within the project APE. Additionally, a review of relevant quadrangle maps (USGS 1953a, 1953b), historic aerial photographs (USDA 1940, 1947, 1957, 1980), and the Seminole County property appraiser data (Johnson 2018) indicated no potential for historic resources within the project APE.

4.2 Field Methodology

The FDHR's Module Three, *Guidelines for Use by Historic Professionals*, indicates that the first stage of archaeological field survey is a reconnaissance of the project area to "ground truth," or ascertain the validity of the predictive model (FDHR 2003). During this part of the survey, the researcher assesses whether the initial predictive model needs adjustment based on disturbance or conditions such as constructed features (i.e., parking lots, buildings, etc.), underground utilities, landscape alterations (i.e., ditches and swales, mined land, dredged and filled land, agricultural fields), or other constraints that may affect the archaeological potential. Additionally, these Guidelines indicate that non-systematic "judgmental" testing may be appropriate in urbanized environments where

pavement, utilities, and constructed features make systematic testing unfeasible; in geographically restricted areas such as proposed pond sites; or within project areas that have limited high and moderate probability zones, but where a larger subsurface testing sample may be desired. While predictive models are useful in determining preliminary testing strategies in a broad context, it is understood that testing intervals may be altered due to conditions encountered by the field crew at the time of survey.

Archaeological field survey methods consisted of surface reconnaissance combined with systematic and judgmental subsurface testing. Shovel tests were placed at 25 m (82 ft) intervals in an area adjacent to 8OR03533, at 50 m (164 ft) intervals in the areas of better drained soils (moderately well drained and somewhat poorly drained) with higher elevation, 100 m (328 ft) intervals in areas of low probability, and judgmentally across the remainder of the project area. Shovel tests were circular and measured approximately 50 centimeter (cm) (20 inches [in]) in diameter by at least 1 m (3.3 ft) in depth unless precluded by groundwater intrusion. All soil removed from the shovel tests was screened through a 0.64 cm (0.25 in) mesh hardware cloth to maximize the recovery of artifacts. The locations of all shovel tests were plotted on the aerial map, and following the recording of relevant data such as stratigraphic profile and artifact finds, all shovel tests were refilled.

Historic field methodology consisted of a survey of the project APE to determine the location of all historic properties believed to be 50 years of age or older, and to ascertain if any resources within the project APE could be eligible for listing in the NRHP. If found, an in-depth study of each identified historic resource would have been conducted, photographs taken, and the information needed for the completion of FMSF forms gathered. In addition to architectural descriptions, each historic resource would have been reviewed to assess style, historic context, condition, and potential NRHP eligibility.

4.3 Laboratory Methods and Curation

No artifacts were recovered, and thus, no laboratory analysis was needed. All project-related records, including maps, field notes, and photos, will be maintained at ACI in Sarasota (P18022) unless the client requests otherwise.

4.4 Unexpected Discoveries

If human burial sites such as Indian mounds, lost historic and pre-colonial cemeteries, or other unmarked burials or associated artifacts were found, then the provisions and guidelines set forth in Chapter 872.05, *FS* (Offenses Concerning Dead Bodies and Graves) were to be followed. However, it was not anticipated that such sites would be found during this survey.

5.0 RESULTS AND CONCLUSIONS

5.1 Archaeological Survey Results

Archaeological field survey included both surface reconnaissance and the excavation of 383 shovel tests within the APE (**Figure 5.1**). Of these, 18 were placed at 25 m (82 ft), 308 at 50 m (164 ft) intervals, 28 at 100 m (328 ft), and 29 were placed judgmentally. The 18 tests placed at 25 m (82 ft) intervals were adjacent to the location of site 8OR03533 and in an area with similar characteristics. The tests placed at 50 m (164 ft) intervals were spread across the property in areas of moderate probability (better drained soils, higher elevation, nearby freshwater source) and the 100 m (328 ft) interval tests were placed in areas of low probability (very poorly drained soils). The judgmental tests were placed in areas of very low probability and across the remainder of the property to insure sufficient coverage. A reasonable and good faith effort was made per the regulations laid out in 36 CFR § 800.4(b) (1) (Advisory Council on Historic Preservation n.d.) to test all areas of the project APE; however, some areas were not tested due to standing water. No artifacts were recovered from any of the shovel tests and no artifacts were noted on the surface. Thus, no archaeological sites are located within the APE.

The basic soil profile varied depending on environmental condition. In the upland pasture area, the stratigraphy was 0 to 20 centimeters below surface (cmbs) (0 to 8 in) of gray sand followed by 20 to 100 cmbs (8 to 39 in) of light brown sand and in the lowland pasture, the stratigraphy was 0 to 100 cmbs (0 to 30 in) of grayish brown sand. In the slash pine area, the stratigraphy was 0 to 20 cmbs (0 to 8 in) of gray sand followed by 20 to 100 cmbs (8 to 39 in) of light gray sand and in the scrub area, it was 0 to 20 cmbs (0 to 8 in) of light gray sand followed by 20 to 100 cmbs (8 to 39 in) of light brown sand. The stratigraphy found in the hammock area was 0 to 20 cmbs (0 to 8 in) of dark gray sand, 20 to 60 cmbs (8 to 24 in) of light gray sand, 60 to 80 cmbs (24 to 31 in) of dark brown hard pan, followed by 80 to 100 cmbs (31 to 39 in) of light brown sandy loam.

5.2 Historical /Architectural Survey Results

The historical/architectural resource survey indicated an absence of historic resources (50 years of age or older) within the project APE. Thus, no historic resources which are listed, determined eligible, or appear to be considered potentially eligible for listing in the NRHP are located within the project APE.

5.3 Conclusions

Based on background research and field survey, it is the opinion of ACI archaeologists that development of the APE will not impact any resource listed, determined eligible, or which appear to be eligible for listing in the NRHP. No additional work is recommended.

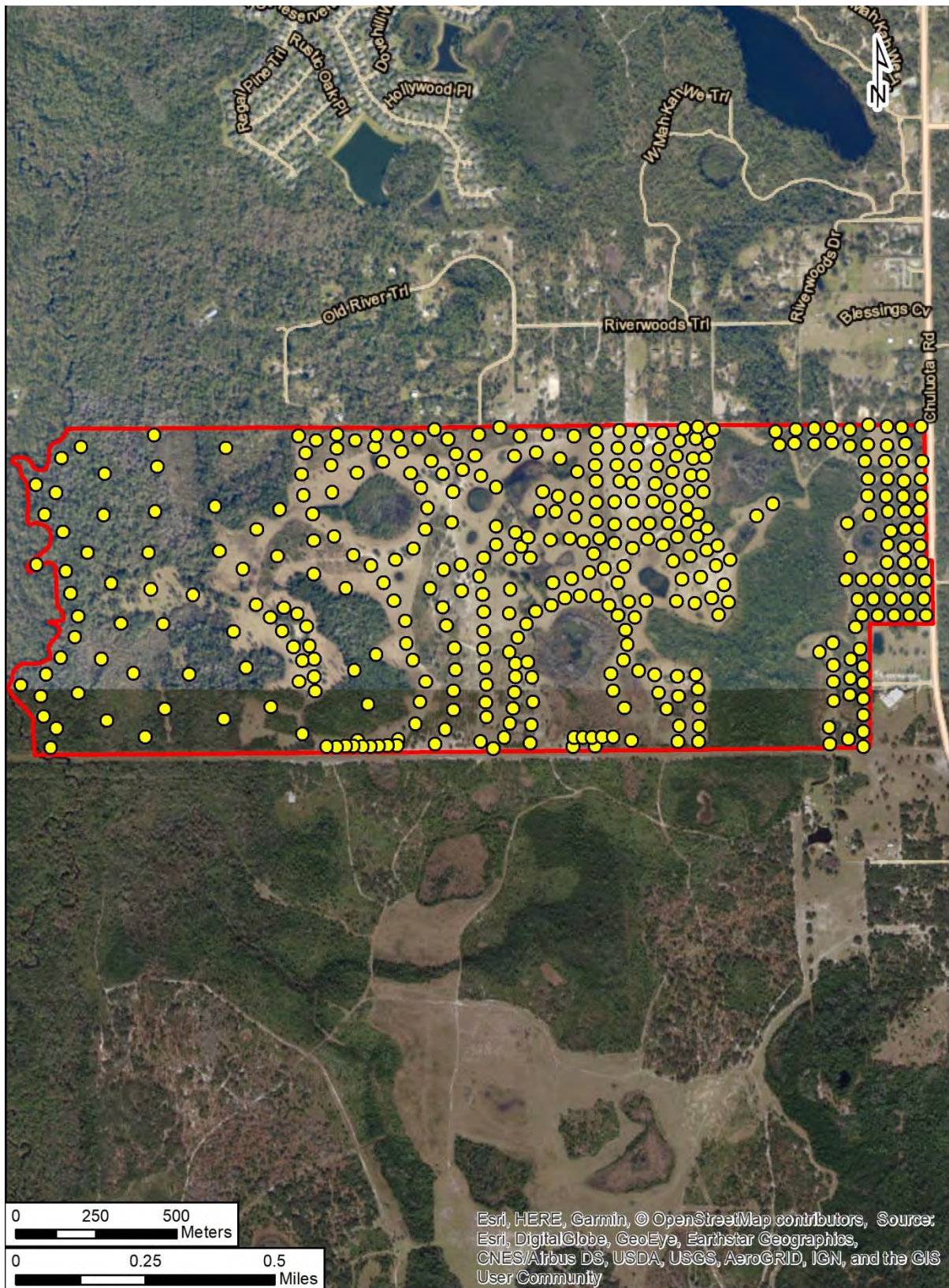


Figure 5.1. Location of the shovel tests within the Clayton High Oaks Property APE.

6.0 LITERATURE CITED

Advisory Council on Historic Preservation

- n.d. Meeting the “Reasonable and Good Faith” Identification Standard in Section 106 Review. Accessed at http://www.achp.gov/docs/reasonable_good_faith_identification.pdf.

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APPENDIX A: Survey Log

Ent D (FMSF only) _____



Survey Log Sheet

Florida Master Site File
Version 4.1 1/07

Survey # (FMSF only) _____

Consult *Guide to the Survey Log Sheet* for detailed instructions.

Identification and Bibliographic Information

Survey Project (name and project phase) Harborview Road (CR 776) Ponds, Phase I

Report Title (exactly as on title page) Cultural Resource Assessment Survey Technical Memorandum, Proposed Pond Sites, Harborview Road (CR 776) PD&E Study from Melbourne Street to I-75, Charlotte County, Florida; FPID No.: 434965-1-22-01

Report Authors (as on title page, last names first) 1. ACI 3. _____
2. _____ 4. _____

Publication Date (year) 2018 Total Number of Pages in Report (count text, figures, tables, not site forms) 19

Publication Information (Give series, number in series, publisher and city. For article or chapter, cite page numbers. Use the style of *American Antiquity*.)
P17049A, ACI, Sarasota

Supervisors of Fieldwork (even if same as author) Names Marion Almy

Affiliation of Fieldworkers: Organization Archaeological Consultants Inc City Sarasota

Key Words/Phrases (Don't use county name, or common words like *archaeology, structure, survey, architecture, etc.*)

1. Harborview Road 3. _____ 5. _____ 7. _____
2. Peace River 4. _____ 6. _____ 8. _____

Survey Sponsors (corporation, government unit, organization or person directly funding fieldwork)

Name _____ Organization Florida Dept of Transportation - District 1

Address/Phone/E-mail 801 North Broadway Ave., Bartow, FL 33830

Recorder of Log Sheet Marion Almy Date Log Sheet Completed 3-26-2018

Is this survey or project a continuation of a previous project? ☒ No ☐ Yes: Previous survey #s (FMSF only)

Mapping

Counties (List each one in which field survey was done; attach additional sheet if necessary)

1. Charlotte 3. _____ 5. _____
2. _____ 4. _____ 6. _____

USGS 1:24,000 Map Names/Year of Latest Revision (attach additional sheet if necessary)

1. Name PUNTA GORDA Year 1957 4. Name _____ Year _____
2. Name _____ Year _____ 5. Name _____ Year _____
3. Name _____ Year _____ 6. Name _____ Year _____

Description of Survey Area

Dates for Fieldwork: Start 3-15-2018 End 3-16-2018 Total Area Surveyed (fill in one) _____ hectares 30 acres

Number of Distinct Tracts or Areas Surveyed 7

If Corridor (fill in one for each) Width: _____ meters _____ feet Length: _____ kilometers _____ miles

Research and Field Methods

Types of Survey (check all that apply): ☒ archaeological ☒ architectural ☒ historical/archival ☐ underwater
☐ damage assessment ☐ monitoring report ☐ other(describe): _____

Scope/Intensity/Procedures background research, systematic & judgmental subsurface testing, 1 m deep, 50
cm diameter, 6.4 mm mesh screen; all sterile

Preliminary Methods (check as many as apply to the project as a whole)

☐ Florida Archives (Gray Building) ☐ library research- *local public* ☒ local property or tax records ☒ other historic maps
☐ Florida Photo Archives (Gray Building) ☐ library-special collection - *nonlocal* ☐ newspaper files ☒ soils maps or data
☒ Site File property search ☒ Public Lands Survey (maps at DEP) ☒ literature search ☒ windshield survey
☒ Site File survey search ☐ local informant(s) ☒ Sanborn Insurance maps ☒ aerial photography
☐ other (describe): _____

Archaeological Methods (check as many as apply to the project as a whole)

☐ Check here if **NO** archaeological methods were used.
☐ surface collection, controlled ☐ shovel test-other screen size ☐ block excavation (at least 2x2 m)
☐ surface collection, uncontrolled ☐ water screen ☐ soil resistivity
☒ shovel test-1/4" screen ☐ posthole tests ☐ magnetometer
☐ shovel test-1/8" screen ☐ auger tests ☐ side scan sonar
☐ shovel test 1/16" screen ☐ coring ☒ pedestrian survey
☐ shovel test-unscreened ☐ test excavation (at least 1x2 m) ☐ unknown
☐ other (describe): _____

Historical/Architectural Methods (check as many as apply to the project as a whole)

☐ Check here if **NO** historical/architectural methods were used.
☐ building permits ☐ demolition permits ☐ neighbor interview ☐ subdivision maps
☐ commercial permits ☒ exposed ground inspected ☐ occupant interview ☐ tax records
☐ interior documentation ☒ local property records ☐ occupation permits ☐ unknown
☐ other (describe): _____

Survey Results (cultural resources recorded)

Site Significance Evaluated? ☒ Yes ☐ No

Count of Previously Recorded Sites 3 Count of Newly Recorded Sites 2

Previously Recorded Site #'s with Site File Update Forms (List site #'s without "8". Attach additional pages if necessary.) CH01906, CH01338,
CH02053

Newly Recorded Site #'s (Are all originals and not updates? List site #'s without "8". Attach additional pages if necessary.) CH02741, CH02742

Site Forms Used: ☐ Site File Paper Form ☐ Site File Electronic Recording Form

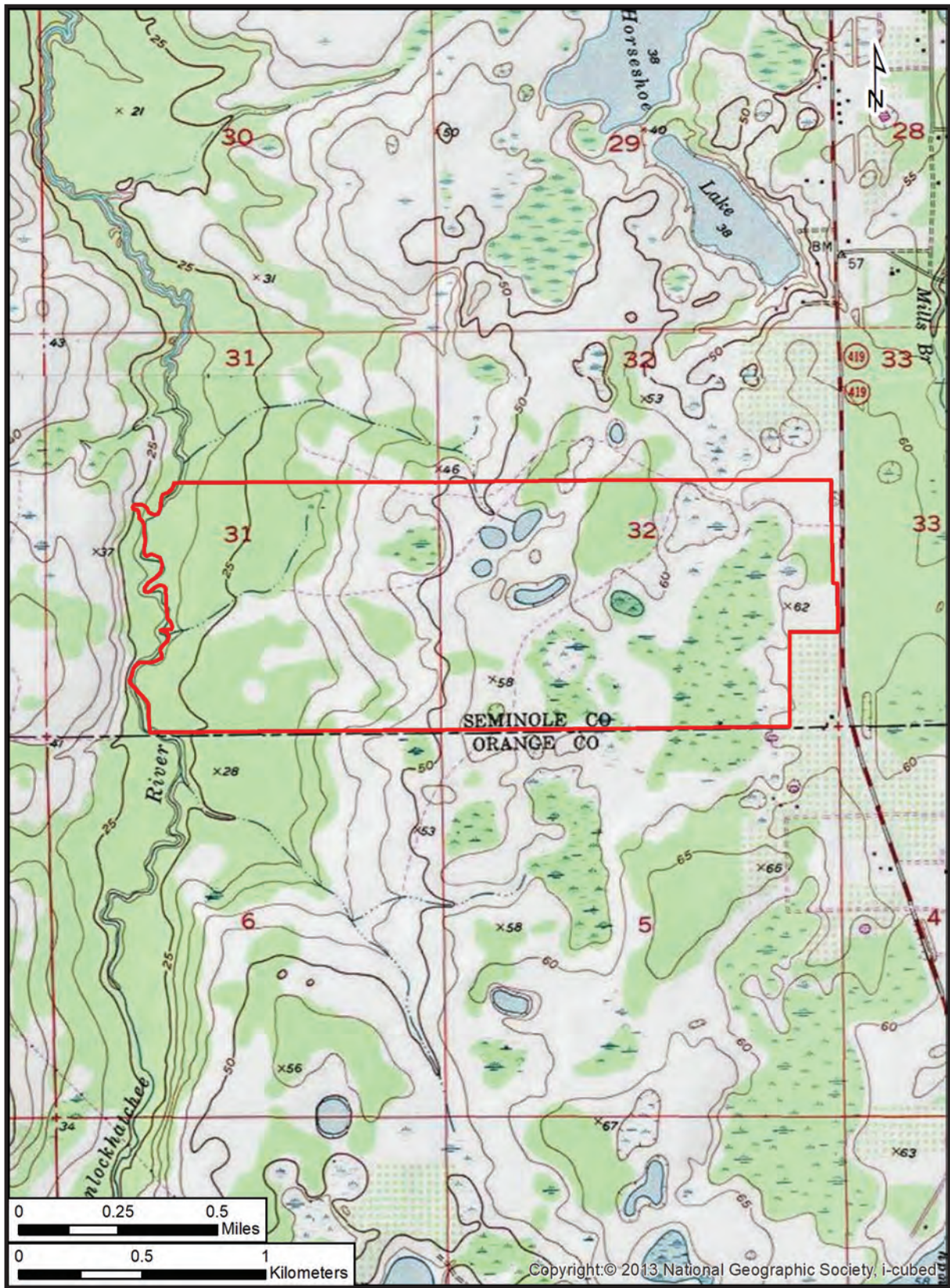
*****REQUIRED: ATTACH PLOT OF SURVEY AREA ON PHOTOCOPY OF USGS 1:24,000 MAP(S)*****

SHPO USE ONLY

SHPO USE ONLY

SHPO USE ONLY

Origin of Report: ☐ 872 ☐ CARL ☐ UW ☐ 1A32 # _____ ☐ Academic ☐ Contract ☐ Avocational
☐ Grant Project # _____ ☐ Compliance Review: CRAT # _____
Type of Document: ☐ Archaeological Survey ☐ Historical/Architectural Survey ☐ Marine Survey ☐ Cell Tower CRAS ☐ Monitoring Report
☐ Overview ☐ Excavation Report ☐ Multi-Site Excavation Report ☐ Structure Detailed Report ☐ Library, Hist. or Archival Doc
☐ MPS ☐ MRA ☐ TG ☐ Other: _____
Document Destination: _____ Plotability: _____



Clayton-High Oaks Property
Township 21 South, Range 32 East, Sections 31 and 32
USGS Oviedo SW
Seminole County



April 24, 2018

Christopher Dorworth
River Cross Land Company, LLC
1520 Whistable Court
Heathrow, FL 32746

Proj: RiverCross Site – Seminole County, Florida
Sections 31 & 32, Township 21 South, Range 32 East
(BTC File #579-18)
Re: Environmental Assessment

Dear Mr. Dorworth:

During March and April of 2018, Bio-Tech Consulting Inc. (BTC) conducted an environmental assessment of the approximately 672-acre RiverCross site. This site is located on the west side of Chuluota Road, approximately 1 mile north of Lake Pickett Road, within Sections 31 & 32, Township 21 South, Range 32 East, Seminole County, Florida (Figures 1, 2 and 3). The environmental assessment included the following elements:

- **review of general site topography;**
- **review of soil types mapped within the site boundaries;**
- **evaluation of land use types/vegetative communities present;**
- **field review for occurrence of protected flora and fauna; and,**
- **review of development constraints.**

TOPOGRAPHY

Based upon review of the USGS Topographic Map (Oviedo SW Quad, Figure 3), the on-site elevations range from 20-feet to 62-feet NGVD. Overall, the subject site elevations decrease from east to west towards the on-site wetlands associated with the Econlockhatchee River.

Orlando: Main Office
3025 East South Street
Orlando, FL 32803

Vero Beach Office
4445 N A1A
Suite 221
Vero Beach, FL 32963

Jacksonville Office
1157 Beach Boulevard
Jacksonville Beach, FL 32250

Tampa Office
6011 Benjamin Road
Suite 101 B
Tampa, FL 33634

Key West Office
1107 Key Plaza
Suite 259
Key West, FL 33040

Aquatic & Land
Management Operations
3825 Rouse Road
Orlando, FL 32817

407.894.5969
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407.894.5970 fax

SOILS

According to the Soil Survey of Seminole County, Florida, prepared by the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS), twelve (12) soil types occur within the subject property boundaries (Figure 4). These soil types include the following:

- **Adamsville-Sparr fine sands (#2)**
- **Arents, 0 to 5 percent slopes (#3)**
- **Basinger, Samsula and Hontoon soils, depressional (#10)**
- **Eaugallie and Immokalee fine sands (#13)**
- **Immokalee sand (#16)**
- **Brighton, Samsula and Sanibel mucks (#17)**
- **Manatee, Floridana and Holopaw soils, frequently flooded (#19)**
- **Myakka and Eaugallie fine sands (#20)**
- **Paola-St. Lucie sands, 0 to 5 percent slopes (#24)**
- **Pomello fine sand, 0 to 5 percent slopes (#27)**
- **Pompano fine sand, occasionally flooded (#28)**
- **Tavares-Millhopper fine sands, 0 to 5 percent slopes (#31)**

Adamsville-Sparr fine sand (#2) is a nearly level, somewhat poorly drained soils on low ridges on the uplands and low knolls on the flatwoods. Typically the surface layer of this soil type is grayish brown fine sand about 4 inches thick. In most years, the seasonal high water table for this soil type is at a depth of 12 to 36 inches for up to 6 months. The permeability of Adamsville soil is rapid. The permeability of Sparr soil is rapid in the surface and subsurface layers and is slow or moderately slow in the subsoil.

Arents, 0 to 5 percent slopes (#3) consists of material dug from several areas that have different kinds of soils. This fill material is the result of earthmoving operations. This material is used to fill such areas as sloughs, marshes, shallow depressions, swamps and other low-lying areas above their natural ground levels, for use in land leveling operations, or as a final cover for sanitary landfills. Typically the surface layer of this soil type is 30 to 50 inches thick. It is very dark gray, dark gray, dark grayish brown, and yellowish brown fine sand or sand mixed with discontinuous strata of grayish brown and light brownish gray loamy material. The high water table for this soil type varies with the amount of fill material and artificial drainage within any mapped area. In most years, the high water table is at a depth of 24 to 36 inches for 2 to 4 months. The permeability of this soil type is moderately rapid or rapid.

Basinger, Samsula and Hontoon soils, depressional (#10) are nearly level, very poorly drained soils found in swamps and depressions. Typically the surface layer of Basinger soil consists of very dark gray mucky fine sand about 6 inches thick. Typically the surface layer of Samsula soil is muck about 30 inches thick. Typically the surface layer of Hontoon soil consists of dark reddish brown muck about 18 inches thick. During most years, the undrained areas of the soils in this map unit are ponded for 6 to 9 months or more. The permeability of this soil unit is rapid.

EauGallie and Immokalee fine sands (#13) are nearly level, poorly drained soils on broad plains on the flatwoods. During most years, the soils in this map unit have a seasonal high water table within 12 inches of the surface for 1 to 4 months. The permeability of EauGallie soil is rapid in the surface and subsurface layers, moderate or moderately rapid in the sandy part of the subsoil, and moderately slow in the loamy part of the subsoil. The permeability of Immokalee soil is rapid in the surface and subsurface layers and moderate in the subsoil.

Immokalee sand (#16) is a nearly level, poorly drained soil found on broad plains on the flatwoods. Typically this soil type has a surface layer of dark gray sand about 6 inches thick. During most years, this soil has a seasonal high water table within 12 inches of the surface for 1 to 4 months. The permeability of this soil type is rapid in the surface and subsurface layers and in the substratum and is moderate in the subsoil.

Brighton, Samsula, and Sanibel mucks (#17) are nearly level and very poorly drained. These soils are in depressions and freshwater marshes and swamps. Undrained areas are ponded. The slopes are dominantly less than 1 percent. Undrained areas of the soils in this map unit are ponded for 6 to 9 months or more, except during extended dry periods. The permeability of Brighton, Samsula, and Sanibel soils is rapid. The available water capacity is very high in the organic materials of these soils and is moderate to low in the sandy underlying material. The natural fertility and content of organic matter in these soils are very high.

Manatee, Floridana and Holopaw soils, frequently flooded (#19) are nearly level and are very poorly drained soils. These soils are on flood plains and are frequently flooded for long periods following prolonged, high intensity rains. Typically, these soils have a surface layer of black mucky fine sand in the upper part. In most years, the soils in this map unit have a seasonal high water table within 12 inches of the surface for 6 to 9 months. The permeability is rapid or moderately rapid in the surface and subsurface layers and very slow to moderate in the subsoil and substratum. The available water capacity is low to high in the surface layer of these soils and moderate to low in the subsurface layer, subsoil and substratum.

Myakka and EauGallie fine sands (#20) are nearly level, poorly drained soils found on broad plains on the flatwoods. Typically the surface layer of Myakka soil consists of black fine sand about 5 inches thick. Typically the surface layer of EauGallie soil consists of dark gray fine sand about 5 inches thick. During most years the seasonal high table for this soil type is within 12 inches of the surface for 1 to 4 months. The permeability of Myakka soil is rapid in the surface and subsurface layers and in the substratum and moderate or moderately rapid in the subsoil. The permeability of EauGallie soil is rapid in the surface and subsurface layers, moderate or moderately rapid in the sandy part of the subsoil and moderately slow in the loamy part of the subsoil.

Paola-St. Lucie sands, 0 to 5 percent slopes (#24) are nearly level to gently sloping, excessively drained soils on upland ridges. Typically the surface layer of Paola soil consists of dark gray sand about 3 inches thick. Typically the surface layer of St. Lucie soil consists of dark gray sand about 2 inches thick. The soils in this mapping unit have a seasonal high water table at a depth of 80 inches or more. The permeability of these soils is very rapid.

Pomello fine sand, 0 to 5 percent slopes (#27) is a nearly level to gently sloping, moderately well drained soils found on low ridges and knolls on the flatwoods. Typically the surface layer of this soil type is light gray fine sand about 2 inches thick. In most years, the seasonal high water table for this soil type is at a depth of 36 to 60 inches for 1 to 4 months. The permeability of this soil type is very rapid in the surface and subsurface layers, moderately rapid in the subsoil, and rapid in the substratum.

Pompano fine sand, occasionally flooded (#28) is a nearly level, poorly drained soils found on the flood plains. Areas mapped with this soil unit are occasionally flooded following prolonged high intensity rains. During most years, this soil has a seasonal high water table within 12 inches of the surface for 2 to 6 months. The permeability of this soil type is rapid.

Tavares-Millhopper fine sands, 0 to 5 percent slopes (#31) are nearly level to gently sloping, moderately well drained soils found on low ridges and knolls on the uplands. Typically the surface layer of Tavares soil consists of very dark grayish brown fine sand about 6 inches thick. Typically the surface layer of Millhopper soil consists of gray fine sand about 7 inches thick. The soils in this map unit have a seasonal high table at a depth of 36 to 60 inches for 2 to 6 months. The permeability of Tavares soil is rapid or very rapid. The permeability of Millhopper soil is rapid in the surface and subsurface layers and moderately slow in the subsoil.

The Florida Association of Environmental Soil Scientists (FAESS) considers Basinger, Samsula and Hontoon soils, depressional (#10), Brighton, Samsula and Sanibel mucks (#17), Manatee, Floridana and Holopaw soils, frequently flooded (#19), Pompano fine sand, occasionally flooded (#28) to be hydric soil types. This Association also considers hydric inclusions present in EauGallie and Immokalee fine sands (#13), Immokalee sand (#16), Myakka and EauGallie fine sands (#20) to be hydric. This information can be found in the Hydric Soils of Florida Handbook, Third Edition, March 2000.

LAND USE TYPES/VEGETATIVE COMMUNITIES

The subject site currently supports twelve (12) land use types/vegetative communities. The upland land use types/vegetative communities on the site are classified as Improved Pasture (211), Woodland Pasture (213), Pine Flatwoods (411), Temperate Hardwoods (425), and Coniferous Plantation (441). The wetland/surface water land use types/vegetative communities on the site are classified as Reservoir (530), Bay Swamp (611), Stream and Lake Swamps (615), Willows and Elderberry (618), Cypress (621), Wetland Forested Mixed (630), and Freshwater Marsh (641). These areas were mapped using the Florida Land Use, Cover and Forms Classification System, Level III (FLUCCS, FDOT, 1999) (Figure 5). The following provides a brief description of the land use types/vegetative communities identified on the site:

Uplands:

211 Improved Pasture

A majority of the uplands associated with the subject site are consistent with the Improved Pasture (211) FLUCFCS classification. Bahiagrass (*Paspalum notatum*) is the dominant vegetative species identified within this community type, with scattered slash pine (*Pinus elliotii*) and loblolly bay (*Gordonia lasianthus*).

213 Woodland Pasture

The eastern portion of the subject site consists of a grazed area with large stands of natural trees and contains trailers and structures associated with a hunting camp. This area is consistent with the Woodland Pasture (213) FLUCFCS classification. Vegetative species identified within this community type include live oak (*Quercus virginiana*), laurel oak (*Quercus laurifolia*), southern red cedar (*Juniperus virginiana*), cabbage palm (*Sabal palmetto*), sand pine (*Pinus clausa*),

turkey oak (*Quercus laevis*), sand live oak (*Quercus geminata*), bahiagrass (*Paspalum notatum*), bermudagrass (*Cynodon dactylon*), pricklypear (*Opuntia humifusa*), broomsedge (*Andropogon virginicus*), blackberry (*Rubus* sp.), American beautyberry (*Callicarpa americana*), wiregrass (*Aristida stricta*), tropical soda apple (*Solanum viarum*), and bracken fern (*Pteridium aquilinum*).

425 Temperate Hardwoods

A majority of the uplands in the western portion of the site are consistent with the Temperate Hardwoods (425) FLUCFCS classification. Vegetative species identified within this community include live oak (*Quercus virginiana*), cabbage palm (*Sabal palmetto*), laurel oak (*Quercus laurifolia*), slash pine (*Pinus elliottii*), sweetgum (*Liquidambar styraciflua*), American beautyberry (*Callicarpa americana*), wax myrtle (*Myrica cerifera*), greenbriar (*Smilax* sp.), and saw palmetto (*Serenoa repens*).

441 Coniferous Plantations

The scattered areas of planted pine trees throughout the site are consistent with the Coniferous Plantations (441) FLUCFCS classification. Vegetative species identified within this community include slash pine (*Pinus elliottii*), bahiagrass (*Paspalum notatum*), bermudagrass (*Cynodon dactylon*), dog fennel (*Eupatorium capillifolium*), muscadine (*Vitis rotundifolia*), pricklypear (*Opuntia humifusa*), beggarticks (*Bidens alba*), broomsedge (*Andropogon virginicus*), blackberry (*Rubus* sp.), American beautyberry (*Callicarpa americana*), and saw palmetto (*Serenoa repens*).

411 Pine Flatwoods

The subject site contains several areas of communities consistent with the Pine Flatwoods (411) FLUCFCS classification. Vegetative species identified within this community include slash pine (*Pinus elliottii*), saw palmetto (*Serenoa repens*), wiregrass (*Aristida stricta*), gopher apple (*Licania michauxii*), gallberry (*Ilex glabra*), and bracken fern (*Pteridium aquilinum*).

Wetland/Surface Waters

530 Reservoir

The central portion of the site contains an excavated cattle pond that is consistent with the Reservoir (530) FLUCFCS classification. No vegetative species were identified within the cattle pond.

611 Bay Swamp

Several forested systems throughout the site dominated by loblolly bay (*Gordonia lasianthus*) are consistent with the Bay Swamp (611) FLUCFCS classification. Other vegetative species identified within this community include fetterbush (*Lyonia lucida*), spikerush (*Eleocharis* sp.), marsh pennywort (*Hydrocotyle umbellata*), marsh fern (*Thelypteris palustris*), cinnamon fern (*Osmunda cinnamomea*), royal fern (*Osmunda regalis*), lizard's tail (*Saururus cernuus*), water hyssop (*Bacopa monnieri*), wax myrtle (*Morella cerifera*), smartweed (*Polygonum punctatum*), bog button (*Lachnocaulon anceps*), and spadeleaf (*Centella asiatica*).

615 Stream and Lake Swamps

The wetland systems contiguous with the Econlockhatchee River are consistent with the Stream and Lake Swamps (615) FLUCFCS classification. Vegetative species identified within this community includes laurel oak (*Quercus laurifolia*), cabbage palm (*Sabal palmetto*), sweetgum (*Liquidambar styraciflua*), bald cypress (*Taxodium distichum*), loblolly bay (*Gordonia lasianthus*), cinnamon fern (*Osmunda cinnamomea*), lizard's tail (*Saururus cernuus*), spadeleaf (*Centella asiatica*), poison ivy (*Toxicodendron radicans*), and marsh pennywort (*Hydrocotyle umbellata*).

618 Willows and Elderberry

A small isolated wetland system located in the northeastern corner of the project site is consistent with the Willows and Elderberry (618) FLUCFCS classification. This dominant vegetative species identified within this system is Carolina willow (*Salix caroliniana*).

621 Cypress

Several of the forested systems throughout the subject site are dominated by a canopy of bald cypress trees (*Taxodium distichum*). These wetland areas are consistent with the Cypress (621) FLUCFCS classification. Other vegetative species identified within this community includes Carolina willow (*Salix caroliniana*), pickerelweed (*Pontederia cordata*), spikerush (*Eleocharis* sp.), marsh pennywort (*Hydrocotyle umbellata*), cinnamon fern (*Osmunda cinnamomea*), royal fern (*Osmunda regalis*), lizard's tail (*Saururus cernuus*), buttonbush (*Cephalanthus occidentalis*), wax myrtle (*Morella cerifera*), smartweed (*Polygonum punctatum*), and old world climbing fern (*Lygodium microphyllum*).

630 Wetland Forested Mixed

The remaining forested wetland systems located throughout the site consist of a mix of canopy species. These wetlands are consistent with the Wetland Forested Mixed (630) FLUCFCS classification. Vegetative species identified within this community include loblolly bay (*Gordonia lasianthus*), bald cypress (*Taxodium distichum*), dahoon holly (*Ilex cassine*), spikerush (*Eleocharis* sp.), marsh pennywort (*Hydrocotyle umbellata*), cinnamon fern (*Osmunda cinnamomea*), royal fern (*Osmunda regalis*), lizard's tail (*Saururus cernuus*), wax myrtle (*Morella cerifera*), smartweed (*Polygonum punctatum*), old world climbing fern (*Lygodium microphyllum*), fetterbush (*Lyonia lucida*), and saw palmetto (*Serenoa repens*).

641 Freshwater Marsh

Several non-forested wetland systems located throughout the site are consistent with the Freshwater Marsh (641) FLUCFCS classification. Vegetative species identified within this community includes water-lilies (*Nymphaea odorata*), pickerelweed (*Pontederia cordata*), spikerush (*Eleocharis* sp.), arrowhead (*Sagittaria lancifolia*), torpedograss (*Panicum repens*), marsh pennywort (*Hydrocotyle umbellata*), spatterdock (*Nuphar advena*), maidencane (*Panicum hemitomon*), soft rush (*Juncus effusus*), smartweed (*Polygonum punctatum*), bog button (*Lachnocaulon anceps*), yelloweyed grass (*Xyris caroliniana*), St. Johns wort (*Hypericum fasciculatum*), spadeleaf (*Centella asiatica*), and beakrush (*Rhynchospora baldwinii*).

PROTECTED SPECIES

Using methodologies outlined in the Florida's Fragile Wildlife (Wood, 2001); Measuring and Monitoring Biological Diversity Standard Methods for Mammals (Wilson, et al., 1996); and Florida Fish and Wildlife Conservation Commission's Gopher Tortoise Permitting Guidelines (April 2008 – revised January 2017); an assessment for “listed” floral and faunal species was conducted at the during March and April of 2018. This assessment, which covered approximately 100% of the subject site's developable area, included both direct observations and indirect evidence, such as tracks, burrows, tree markings and vocalizations that indicated the presence of species observed. The assessment focused on species that are “listed” by the FFWCC's Official Lists - Florida's Endangered Species, Threatened Species and Species of Special Concern (May 2017) that have the potential to occur in Seminole County.

No plant species “listed” by federal agencies was identified on the subject site during the assessments conducted. However, two (2) species identified are listed as “commercially exploited” by the Florida Department of Agriculture and Consumer Services (FDACS). The harvesting of these species, cinnamon fern (*Osmunda cinnamomea*) and royal fern (*Osmunda regalis*), for commercial gain is not permitted. However, the listing of these species poses no restrictions towards the development of the subject property. The following is a list of those wildlife species identified during the evaluation of the site:

Reptiles and Amphibians:

American alligator (*Alligator mississippiensis*)

American toad (*Anaxyrus americanus*)

black racer (*Coluber constrictor*)

brown anole (*Norops sagrei*)

coachwhip (*Masticophis flagellum*)

common snapping turtle (*Chelydra serpentina*)

eastern coral snake (*Micrurus fulvius*)

eastern diamondback rattlesnake (*Crotalus adamanteus*)

eastern fence lizard (*Sceloporus undulatus*)

Florida softshell turtle (*Apalone ferox*)

green anole (*Anolis carolinensis*)

green treefrog (*Hyla cinerea*)

gopher tortoise (*Gopherus polyphemus*)

six-lined racerunner (*Cnemidophorus sexlineatus*)

Birds:

Barred Owl (*Strix varia*)
Black Vulture (*Coragyps atratus*)
Blue Jay (*Cyanocitta cristata*)
Blue-winged teal (*Anas discors*)
Carolina Wren (*Thryothorus ludovicianus*)
Cattle Egret (*Bubulcus ibis*)
Downy Woodpecker (*Picoides pubescens*)
Eastern Phoebe (*Sayornis phoebe*)
Florida Sandhill Crane (*Grus canadensis pratensis*)
Great Blue Heron (*Ardea herodias*)
Great Egret (*Ardea alba*)
Hooded Merganser (*Lophodytes cucullatus*)
Little Blue Heron (*Egretta caerulea*)
Mourning Dove (*Zenaida macroura*)
Mottled duck (*Anas fulvigula*)
Northern Bobwhite (*Colinus virginianus*)
Northern Mockingbird (*Mimus polyglottos*)
Pileated Woodpecker (*Hylatomus pileatus*)
Red-shouldered Hawk (*Buteo lineatus*)
Swallow-tailed Kite (*Elanoides forficatus*)
White Ibis (*Eudocimus albus*)
Wild Turkey (*Melegris gallopavo*)
Wood Duck (*Aix sponsa*)

Mammals:

common raccoon (*Procyon lotor*)
coyote (*Canis latrans*)
eastern gray squirrel (*Sciurus carolinensi*)
gray fox (*Urocyon cinereoargenteus*)
Sherman's fox squirrel (*Sciurus niger shermani*)
nine-banded armadillo (*Dasypus novemcinctus*)
Virginia opossum (*Didelphis virginiana*)
white-tailed deer (*Odocoileus virginianus*)
wild boar (*Sus scrofa*)

Six (6) of the above identified species, American alligator (*Alligator mississippiensis*), gopher tortoise (*Gopherus polyphemus*), Florida Sandhill Crane (*Grus canadensis pratensis*), Little Blue Heron (*Egretta caerulea*), White Ibis (*Eudocimus albus*), and Sherman's fox squirrel (*Sciurus niger shermani*) are listed in the FFWCC's Official Lists - Florida's Endangered Species, Threatened Species and Species of Special Concern (May 2017). The following provides a brief description of these species as it relates to development of the property.

American Alligator (*Alligator mississippiensis*)

Federally Threatened "Due to Similarity of Appearance" by USFWS

Due to strict conservation measures and extensive research, the American alligator is no longer endangered except in scattered areas of its range. However, the American alligator is listed as threatened on the U.S. Endangered Species List because it is very similar in appearance to the American crocodile (*Crocodylus acutus*), which is endangered.

Gopher Tortoise (*Gopherus polyphemus*)

State Listed as "Threatened" by FFWCC

Currently the gopher tortoise (*Gopherus polyphemus*) is classified as a "Category 2 Candidate Species" by USFWS, and as of September 2007 is now classified as "Threatened" by FFWCC, and as "Threatened" by FCREPA. The basis of the "Threatened" classification by the FFWCC for the gopher tortoise is due to habitat loss and destruction of burrows.

Gopher tortoises are commonly found in areas with well-drained soils associated with the pine flatwoods, pastures and abandoned orange groves. Several other protected species known to occur in Orange County have a possibility of occurring in this area, as they are gopher tortoise commensal species. These species include the eastern indigo snake (*Drymarchon corais couperi*), Florida mouse (*Peromyscus floridanus*) and the gopher frog (*Rana capito*). However, none of these species were observed during the survey conducted.

The FFWCC provides three (3) options for developers that have gopher tortoises on their property. These options include: 1) avoidance (i.e., 25-foot buffer around burrow), 2) preservation of habitat, and 3) off-site relocation. As such, resolution of the gopher tortoise issue will need to be permitted through FFWCC prior to any construction activities.

The subject property was surveyed for the existence of gopher tortoises through the use of pedestrian transects. The survey covered approximately 100% of the suitable habitat present within the subject property boundaries. One hundred eighty-five (185) gopher tortoise burrows were observed during a survey of the subject site. Based on one hundred eighty-five (185) potentially occupied burrows, it is estimated that approximately one hundred fourteen (114) may be occupied by a tortoise. This number is based on the factored occupation rate of 0.614 (*Auffenburg-Franz*). Therefore, for the purpose of estimating costs associated with the subject project, as many as one hundred fourteen (114) gopher tortoises are estimated to occupy these burrows.

Based on the tortoise population that exists within the site and the expected development plan for the property, there is only one potential option for resolving the gopher tortoise issue. This option is off-site relocation and would require that any tortoise within 25 feet of proposed construction activities be relocated off-site to an approved recipient site. For the estimated one hundred fourteen (114) gopher tortoise burrows, the estimated cost of off-site relocation is approximately \$170,000.00 for the subject site; depending on the available recipient site at the time of permitting and the actual number of tortoises relocated. This cost includes permitting, excavation with a qualified biologist/FFWCC “authorized agent” and the recipient site fees.

Independent to the costs associated with gopher tortoise relocations (i.e., recipient site fees, excavation, silt fencing, transportation costs, etc.), FWC will be assessing a \$210.00 fee for the first five (5) gopher tortoises and \$315.00 per tortoise fee for all remaining on-site tortoises. Based on the estimated tortoises, the subject development site would be required to pay a one time mitigation fee of \$34,545.00, paid to FWC prior to obtaining any permit (i.e., off-site relocation permits). This FWC mitigation fee requirement began after April 2009.

Florida Sandhill Crane (*Grus canadensis pratensis*)

State Listed as “Threatened” by FFWCC

The Florida Sandhill Crane is a subspecies of Sandhill Crane that occurs exclusively and is resident to Florida (Stys 1997). Of the six (6) subspecies of Sandhill Crane, the Greater Sandhill Crane (*Grus canadensis tabida*) is the only other subspecies of Sandhill Crane that occurs regularly in Florida (Stys 1997). This subspecies is a winter migrant, arriving in Florida during late fall (October/November) and leaving in late February (Stys 1997). Since the Florida Sandhill Crane and Greater Sandhill Crane cannot be distinguished from one another in the field, Stys (1997) recommends conducting surveys between May and September to validate the

presence of this protected species. Due to the time of year this survey was conducted (April-June), it can be assumed that the observed cranes were the State listed subspecies.

Several adult cranes were observed foraging throughout the pasture areas of the site and four (4) nests were found within a freshwater marsh system located in the north-central portion of the subject site. Three (3) of the nests appear to be abandoned and one (1) of the nests was active with eggs and an adult crane present at the time of the survey. The FFWCC typically requires a 400-foot buffer around nests in order to prevent nest disturbance and potential nest abandonment. Since cranes do not re-use the same nest year after year this 400-foot buffer is only temporary during the nesting season (i.e., anytime from January through June).

Sherman's Fox Squirrel (*Sciurus niger shermani*)

State Listed as "Species of Special Concern"

The Sherman's fox squirrel (*Sciurus niger shermani*) is classified as a Species of Special Concern "SSC" by the state of Florida. The basis of the state listing the Sherman's fox squirrel as SSC is habitat loss and a general lack of information on the distribution, abundance and ecology of the species. This species commonly occurs in fire-maintained longleaf pine turkey oak sand hills, pine flatwoods and associated bottomland habitat. Typically, green space, open space, and tree ordinances are sufficient to maintain squirrel populations in post-development. There are no development restrictions associated with the Sherman's fox squirrel.

Little Blue Heron (*Egretta caerulea*) & White Ibis (*Eudocimus albus*)

State Listed as "Species of Special Concern" by FFWCC

For the purposes of this report, two (2) species of 'wading bird' have been consolidated into one (1) group. Each is listed in the state of Florida as a "Species of Special Concern" due to historically aggressive hunting practices and habitat loss. Currently, the majority of wading bird habitat tends to be federally protected wetlands under the 'Clean Water Act' and the Florida's 'Wetland Resource Permitting Program.'

Several Little Blue Herons and White Ibis were observed foraging within the on-site freshwater marshes and pasture areas. These species are listed as colonial nesting birds. There is no protection requirement for these species unless they are observed nesting on the site. No nesting was observed during the wildlife survey conducted.

In addition to the on-site evaluation for “listed” species, BTC conducted a review for any FFWCC recorded wading bird rookeries on or in the vicinity of the subject site. This review revealed one no wading bird rookeries, located within one (1) mile of the subject site.

Bald Eagle (*Haliaeetus leucocephalus*)

State protected by F.A.C. 68A-16.002 and federally protected by both the Migratory Bird Treaty Act (1918) and the Bald and Golden Eagle Protection Act (1940)

In August of 2007, the US Fish and Wildlife Service (USFWS) removed the Bald Eagle from the list of federally endangered and threatened species. Additionally, the Bald Eagle was removed from FFWCC’s imperiled species list in April of 2008. Although the Bald Eagle is no longer protected under the Endangered Species Act, it is still protected under the Bald and Golden Eagle Protection Act, the Migratory Bird Treaty Act, and FFWCC’s Bald Eagle rule (Florida Administrative Code 68A-16.002 Bald Eagle (*Haliaeetus Leucocephalus*)).

In May of 2007, the USFWS issued the National Bald Eagle Management Guidelines. In April of 2008, the FFWCC adopted a new Bald Eagle Management Plan that was written to closely follow the federal guidelines. Under FFWCC’s new management plans, buffer zones are recommended based on the nature and magnitude of the project or activity. The recommended protective buffer zone is 660 feet or less from the nest tree, depending on what activities or structures are already near the nest. A FFWCC Eagle permit is not needed for any activity occurring outside of the 660-foot buffer zone. No activities are permitted within 330 feet of a nest during the nesting season, October 1 through May 15 or when eagles are present at the nest.

In addition to the on-site evaluation for “listed” species, BTC conducted a review for any FFWCC recorded Bald Eagle nests on or in the vicinity of the subject site. This review revealed no Bald Eagle nests, through the 2016-2017 nesting season, within one (1.0) mile of the subject site (see attached Bald Eagle Nest Data). Therefore, there will be no development constraints in regards to Bald Eagle nests unless a new nest is constructed on or adjacent to the subject site.

Wood Stork (*Mycteria Americana*)

Federally Listed as “Endangered” by USFWS

The subject site is shown to be located within a Wood Stork Nesting Colony Core Foraging Area. The Wood Stork (*Mycteria Americana*) is listed as “Endangered” by both the FFWCC and the USFWS. Wood storks are large, long-legged wading birds, about 45 inches tall, with a wingspan of 60 to 65 inches. Their plumage is white except for black primaries and secondaries and a short black tail. The head and neck are largely unfeathered and dark gray in color. The bill is black, thick at the base, and slightly decurved. Wood Storks are birds of freshwater and estuarine wetlands, primarily nesting in cypress or mangrove swamps. They feed in freshwater marshes, narrow tidal creeks, or flooded tidal pools as well as roadside ditches. Particularly attractive feeding sites are depressions in marshes or swamps where fish become concentrated during periods of falling water levels.

Based on our review of available databases, there is no record of a Wood Stork rookery on the project site or within close proximity. The USFWS and the U.S. Army Corps of Engineers require that any impacts to on-site ditches and/or wetlands, which would eliminate a portion of the wood stork foraging habitat, be either mitigated through the purchase of mitigation credits or recreated elsewhere on-site so that there would be no net loss of wood stork foraging habitat.

Indigo Snake (*Drymarchon couperi*)

Federally Listed as “Threatened” by USFWS

The indigo snake (*Drymarchon couperi*) is a federally threatened species. The basis for this listing was a result of dramatic population declines caused by over-collecting for the domestic and international pet trade as well as mortalities caused by rattlesnake collectors who gassed gopher tortoise burrows to collect snakes. Since its listing, habitat loss and fragmentation by residential and commercial expansion have become much more significant threats to the eastern indigo snake. This species is widely distributed throughout central and south Florida and primarily occurs in sandhills habitat in northern Florida and southern Georgia.

No indigo snakes were observed within the subject site during the cursory survey conducted by BTC. Since the subject site contains an abundance of gopher tortoise burrows and the expected project will impact over 25 acres of xeric habitat, the USFWS may require a formal survey of the subject site. The survey can be accomplished from October 1st thru April 30 for a minimum of five (5) surveys with 2 days of optimal weather (overnight low temperature above 60° F). Indigo snake mitigation may be purchased in lieu of conducting the indigo snake survey.

USFWS CONSULTATION AREAS

The USFWS has established “consultation areas” for certain listed species. Generally, these consultation areas only become an issue if USFWS consultation is required, which is usually associated with permitting through the U.S. Army Corps of Engineers (USACOE). The reader should be aware that species presence and need for additional review are often determined to be unnecessary early in the permit review process due to lack of appropriate habitat or other conditions. However, the USFWS makes the final determination.

Consultation areas are typically very regional in size, often spanning multiple counties where the species in question is known to exist. Consultation areas by themselves do not indicate the presence of a listed species. They only indicate an area where there is a potential for a listed species to occur and that additional review might be necessary to confirm or rule-out the presence of the species. The additional review typically includes the application of species-specific criteria to rule-out or confirm the presence of the species in question. Such criteria might consist of a simple review for critical habitat types. In other cases, the review might include the need for species-specific surveys using established methodologies that have been approved by the USFWS.

Audubon’s Crested Caracara (*Polyborus plancus audubonii*)

Federally Listed as “Threatened” by USFWS

The subject site falls within the USFWS Consultation Area for the species, Audubon’s Crested Caracara (*Polyborus plancus audubonii*). Currently the Audubon’s Crested Caracara is listed as threatened by the USFWS due primarily to habitat loss. The Audubon’s Crested Caracara commonly occurs in dry or wet prairie areas with scattered cabbage palms, lightly wooded areas with saw palmetto, scrub oaks and cypress. The Caracara also uses improved or semi-improved pasture with seasonal wetlands. Audubon’s Crested Caracaras construct new nests each season, often in the same tree as the previous year.

No Audubon's Crested Caracaras were observed on-site during the survey conducted by BTC. The subject site does contain improved pasture and lightly wooded areas with seasonal wetlands, however the pasture areas do not contain cabbage palms suitable as nesting habitat for the Audubon's Crested Caracara. If consultation on the project is initiated, the USFWS may require a formal survey. A formal survey consists of one survey session every two (2) weeks for a three (3)-hour session. Surveys must be start no later than January 10th and continue through April 30.

Everglade Snail Kite (*Rostrhamus sociabilis plumbeus*)

Federally Listed as "Endangered"

The subject site falls within the USFWS Consultation Area for the Snail Kite. Currently the Everglade Snail Kite is listed as "Endangered" by the USFWS. Everglade Snail Kites are similar in size to Red-shouldered Hawks. All Everglade Snail Kites have deep red eyes and a white rump patch. Males are slate gray, and females and juveniles vary in amounts of white, light brown, and dark brown, but the females always have white on their chin. Kites vocalize mainly during courtship and nesting. They may occur in nearly all of the wetlands of central and southern Florida. They regularly occur in lake shallows along the shores and islands of many major lakes, including Lakes Okeechobee, Kissimmee, Tohopekaliga (Toho) and East Toho. They also regularly occur in the expansive marshes of southern Florida such as Water Conservation Areas 1, 2, and 3, Everglades National Park, the upper St. John's River marshes and Grassy Waters Preserve.

No Everglade Snail Kites or nests were observed on-site during the survey conducted by BTC. The subject site does not contain shallow vegetated edges of lakes to provide foraging and nesting opportunities for this species. No further action should be required pertaining to the Everglade Snail Kite.

Florida Scrub-Jay (*Aphelocoma coerulescens*)

Federally Listed as "Threatened"

The subject site falls within the USFWS Consultation Area for the Florida Scrub-Jay. Currently the Florida Scrub-Jay is listed as "Threatened" by the USFWS. Florida Scrub Jays are largely restricted to scattered, often small and isolated patches of sand pine scrub, xeric oak, scrubby flatwoods, and scrubby coastal stands in peninsular Florida (Woolfenden 1978a, Fitzpatrick et al. 1991). They avoid wetlands and forests, including canopied sand pine stands. Optimal Scrub-Jay habitat is dominated by shrubby scrub, live oaks, myrtle oaks, or scrub oaks from 1 to 3 m (3

to 10 ft.) tall, covering 50 to 90 % the area; bare ground or sparse vegetation less than 15 cm (6 in) tall covering 10 to 50% of the area; and scattered trees with no more than 20% canopy cover (Fitzpatrick et al. 1991).

No Florida Scrub-Jays were observed within the subject site and no suitable habitat for this species exists within the project boundaries. No further action should be required pertaining to the Florida Scrub-Jay.

Red Cockaded Woodpecker (*Picoides borealis*)

Federally Listed as “Endangered” by USFWS

The Red Cockaded Woodpecker is a federally listed endangered species. The basis for the listing is loss and degradation of suitable habitat. This species is commonly found in open park-like pine forests maintained by periodic fire, such as mature long-leaf pine ecosystems.

The subject site does contain large old growth pines. However, these pines are located within the dense forested Temperate Hardwoods community along the Econlockhatchee River and would not provide suitable habitat for this species. Red Cockaded Woodpeckers are now only found in isolated and known environments and, as such, are not predicted to become an issue with regards to development of the subject site.

ENVIRONMENTAL CONSTRAINTS

The extent of the on-site wetlands/surface waters were delineated by BTC in accordance with local, state and federal guidelines (Figure 8). The flag locations will need to be reviewed and approved by the various regulatory agencies during the permitting process. An application for a Formal Wetland Determination was submitted to the St Johns River Water Management District (SJRWMD) in April 2018 to verify the wetland flags. The Formal Wetland Determination is binding for five (5) years. The subject site is located within the Econlockhatchee River Nested basin.

Seminole County

The Seminole County Comprehensive Plan Element recognizes the “Econlockhatchee River Corridor Protection Zone” (Zone) which includes: the main channels of the Big Econlockhatchee River and its tributaries. The following ordinance provisions regarding the classification of the Zone are required to be met by Seminole County:

The Zone is defined by all property located within the first 1,100 feet landward as measured from stream’s edge of the main channels of the Big Econlockhatchee River and Little Econlockhatchee River within the “Econ Protection Area”; all property located within 550 feet landward as measured from the stream’s edge of the tributaries of the Big Econlockhatchee River within the “Econ Protection Area”, and 50 feet of uplands property that is landward of the landward edge of the wetlands abutting the main channels of the Big Econlockhatchee River and its tributaries within the afore mentioned “Econ Protection Area”.

Development activities shall not be permitted within the 550-foot development restriction zone of stream’s edge within the Zone except for the creation of wetlands and passive recreational uses, when an applicant can demonstrate that such passive recreational uses shall not adversely affect aquatic and wetland dependent wildlife; the habitat of an endangered species, a threatened species or a species of special concern; water quality, hydrology or quantity; groundwater tables or surface water levels.

Development within the Econlockhatchee River Basin as a whole shall ensure the protection of floodplain, wetlands and critical native upland habitat; encroachment (fill) proposed to be placed or deposited within the 100 year floodplain as identified by the Federal Emergency Management Administration must comply with all applicable Federal and County regulations.

All proposed development within 2,000 feet of the stream’s edge of the Big Econlockhatchee River and its tributaries shall submit, as part of the development application information, a statement from a qualified archaeological consultant describing the potential for archaeological resources to occur on the project site. If, in the opinion of the consultant, such resources are likely to occur, a professional archaeological survey shall be submitted as a part of the development application provided to the County. If significant resources are found to be present, the County shall consult with the appropriate State authorities for guidance as to whether excavation is desired by such authorities, and shall otherwise direct that resources shall be preserved as a part of the open space preserved on the site.

Many of these ordinance provisions apply to the RiverCross site due to the fact that the Econlockhatchee River flows through the western extents of the site. Additionally it has been determined that the wetland system located on the eastern region of the site is connected to the river and will require 50-foot upland buffers.

St. Johns River Water Management District

An Environmental Resource Permit (ERP) will be required through the St. Johns River Water Management District (SJRWMD) for all wetland and/or other surface water impacts (both direct and secondary) in association with the proposed development. Impacts to the project's wetland and/or other surface water communities would be permittable by SJRWMD as long as the issues of elimination and reduction of wetland impacts have been addressed and as long as the mitigation offered is sufficient to offset the functional losses incurred via the proposed impacts. The western portion of the subject site's wetlands are hydrologically connected to the Econlockhatchee River. Per subsection 13.4.3(a)(1)(2)(3), ERP, A.H. Volume II:

The applicant must provide reasonable assurance that the construction, alteration, operation, maintenance, removal or abandonment of a system within the following designated Riparian Habitat Protection Zone will not adversely affect the abundance, diversity, food sources or habitat (including its use to satisfy nesting, breeding and resting needs) of aquatic or wetland dependent species:

- 1. The wetlands contiguous with the Econlockhatchee River and the following tributaries: Little Econlockhatchee River north of University Boulevard, Mills Creek, Silcox Branch (branch of Mills Creek), Mills Branch (branch of Mills Creek), Long Branch, Hart Branch, Cowpen Branch, Green Branch, Turkey Creek, Little Creek, and Fourmile Creek;*
- 2. The uplands which are within 50 feet landward of the landward extent of the wetlands above.*
- 3. The uplands which are within 550 feet landward of the stream's edge as defined, for the purpose of this subsection, as the waterward extent of the forested wetlands abutting the Econlockhatchee River and the*

above named tributaries. In the absence of forested wetlands abutting these streams, the stream's edge shall be defined, for the purpose of this subsection, as the mean annual surface water elevation of the stream; however, if hydrologic records are unavailable, the landward extent of the herbaceous emergent wetland vegetation growing in these streams shall be considered to be the stream's edge.

Based on the above, the SJRWMD will require a 50-foot Riparian Habitat Protection Zone (RHPZ) to extend landward of the project's wetland systems that are considered hydrologically connected to the Econlockhatchee River. Additionally, the SJRWMD will require a 550-foot RHPZ to extend landward of the defined stream's edge for project's wetland systems that are considered contiguous or abutting the Econlockhatchee River. It should be noted that impacts to the 50-foot or 550-ft RHPZ will require appropriate mitigation similar to that of wetland impacts.

US Army Corps of Engineers

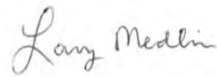
The wetlands in the western portion of the site will be considered Corps jurisdictional. A Jurisdictional Determination (JD) will be required to verify the limits of Corps jurisdictional wetlands within the remaining portions of the subject site. As with the District, it is anticipated that all impacts to the project's wetlands and/or other surface water communities would be permissible by the USACOE as long as the issues of elimination and reduction of wetland impacts have been addressed and as long as the mitigation offered is sufficient to offset the functional losses incurred via the proposed impacts. The ACOE does not accept on-site preservation as mitigation for wetland impacts. All ACOE impacts will be required to be off-set by purchase of credits from an approved mitigation bank.

Cultural Resource Assessment Survey (2018)

In March of 2018, Archaeological Consultants, Inc. (ACI) conducted a Cultural Resource Assessment Survey (CRAS) of the RiverCross site. Based on the results of the survey, it is the opinion of ACI that development of the project will have no effect on any archaeological sites or historic resources that are listed, determined eligible, or which appear to be potentially eligible for listing in the National Register of Historic Places (NRHP).

The environmental limitations as described in this document are based on observations and technical information available on the date of the on-site evaluation. Costs are only estimates based upon available information and anticipated permitting requirements and related services. This report is for general planning purposes only. The limits of any on-site wetlands/surface waters can only be determined and verified through field delineation and/or on-site review by the pertinent regulatory agencies. The wildlife surveys conducted within the subject property boundaries do not preclude the potential for any listed species, as noted on Table 1 (attached), currently or in the future. Should you have any questions or require any additional information, please do not hesitate to contact our office at (407) 894-5969. Thank you.

Regards,

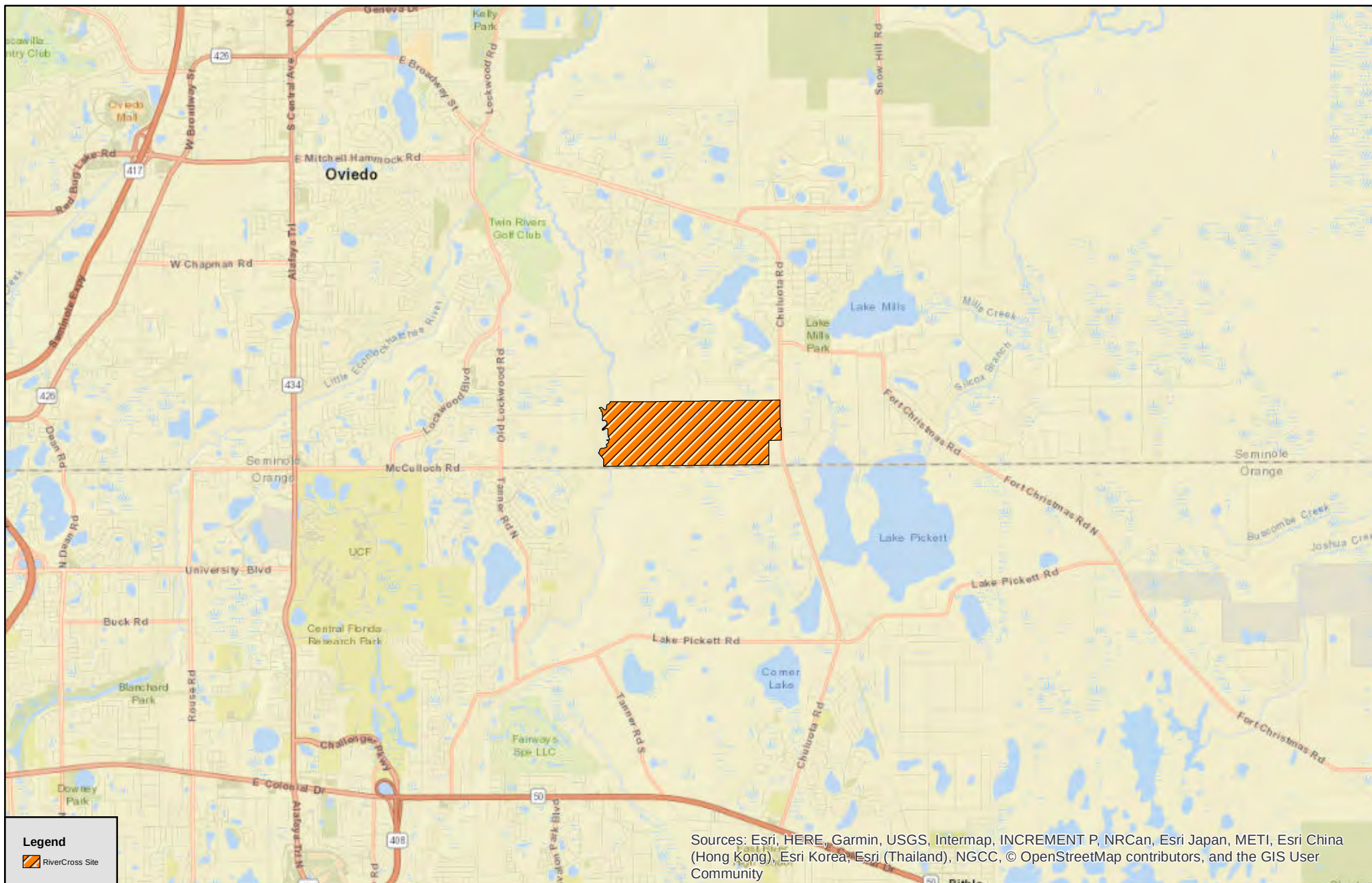


Larry Medlin
Project Manager

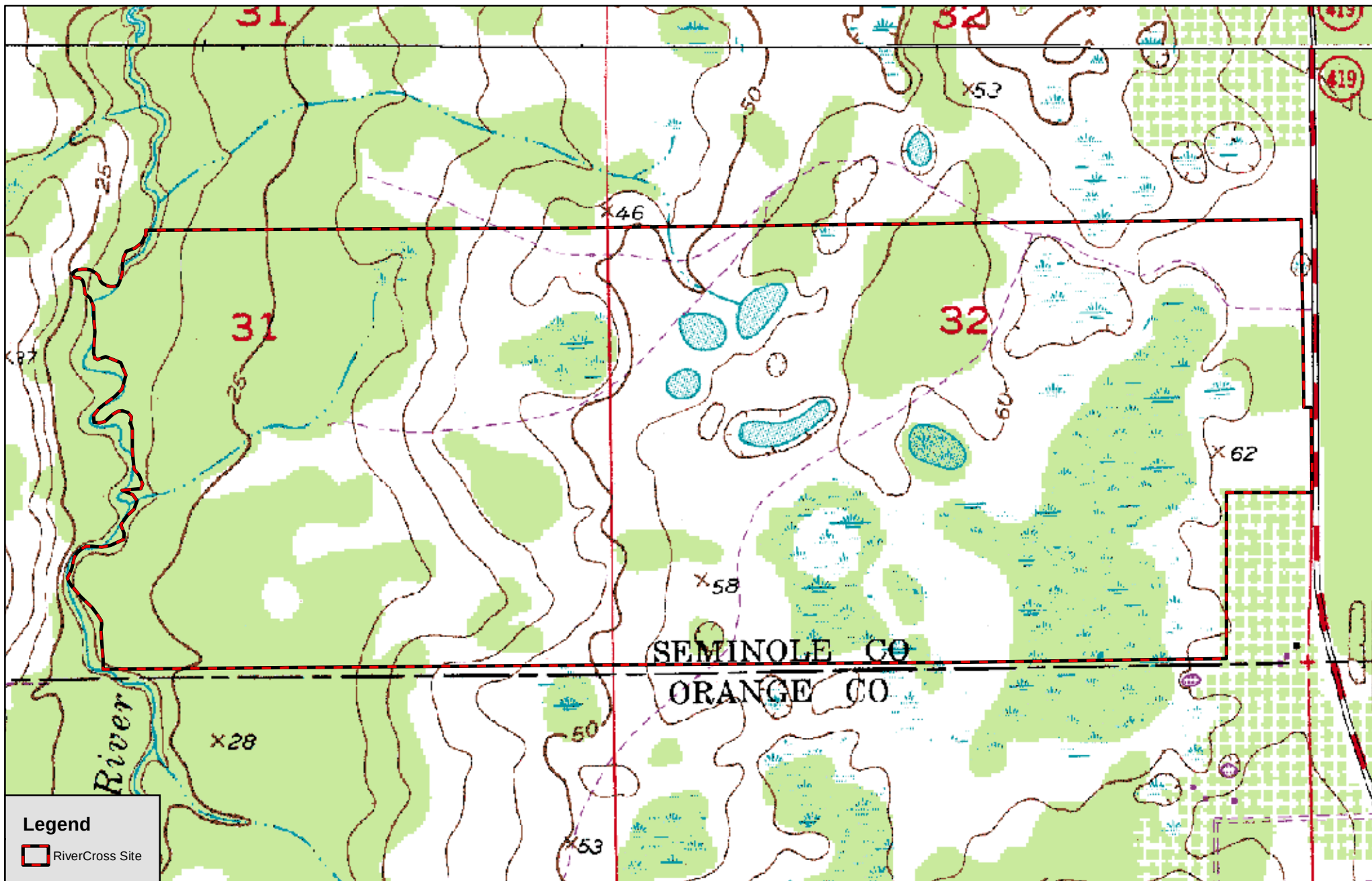


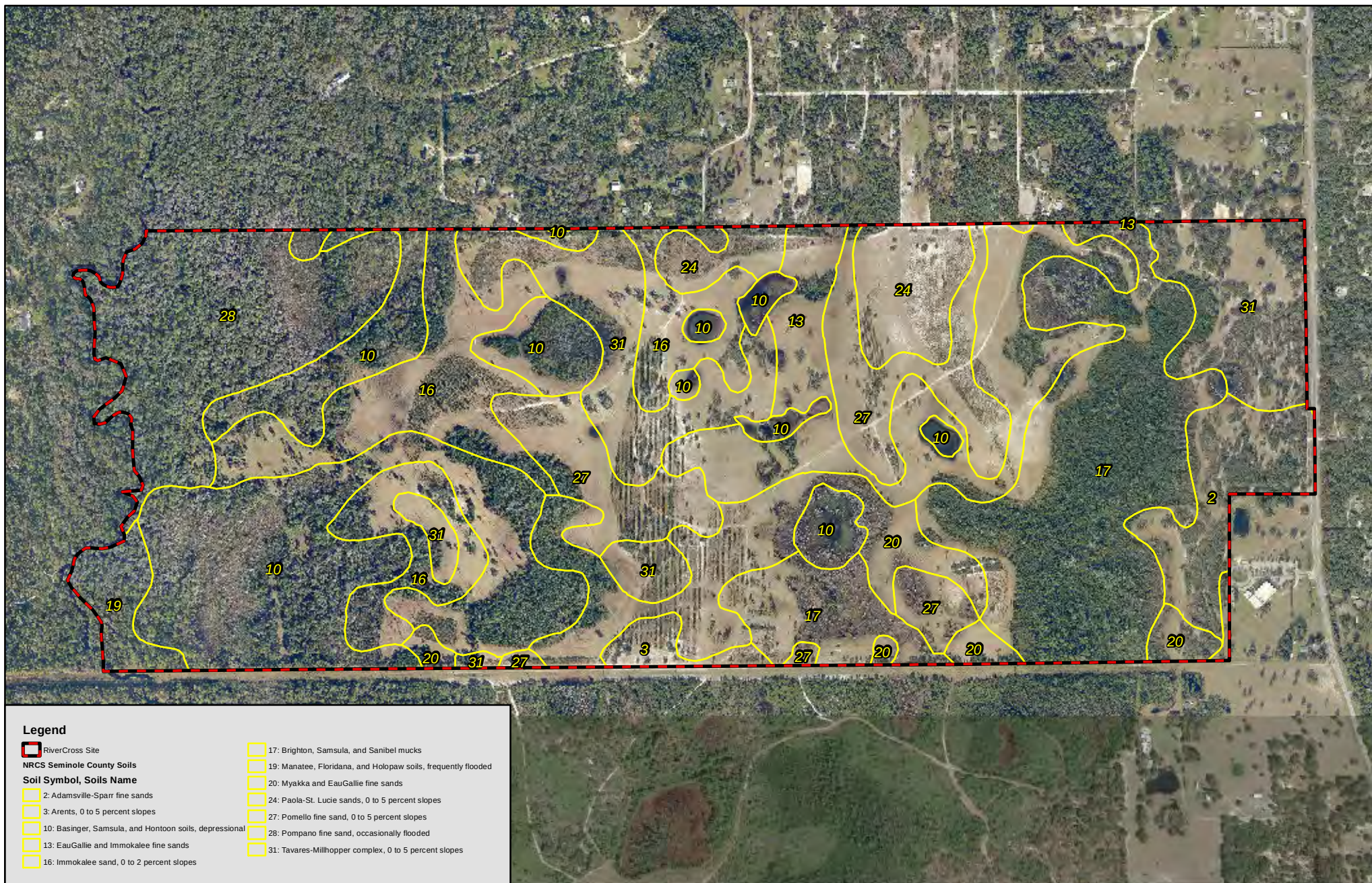
Jay Baker
Director

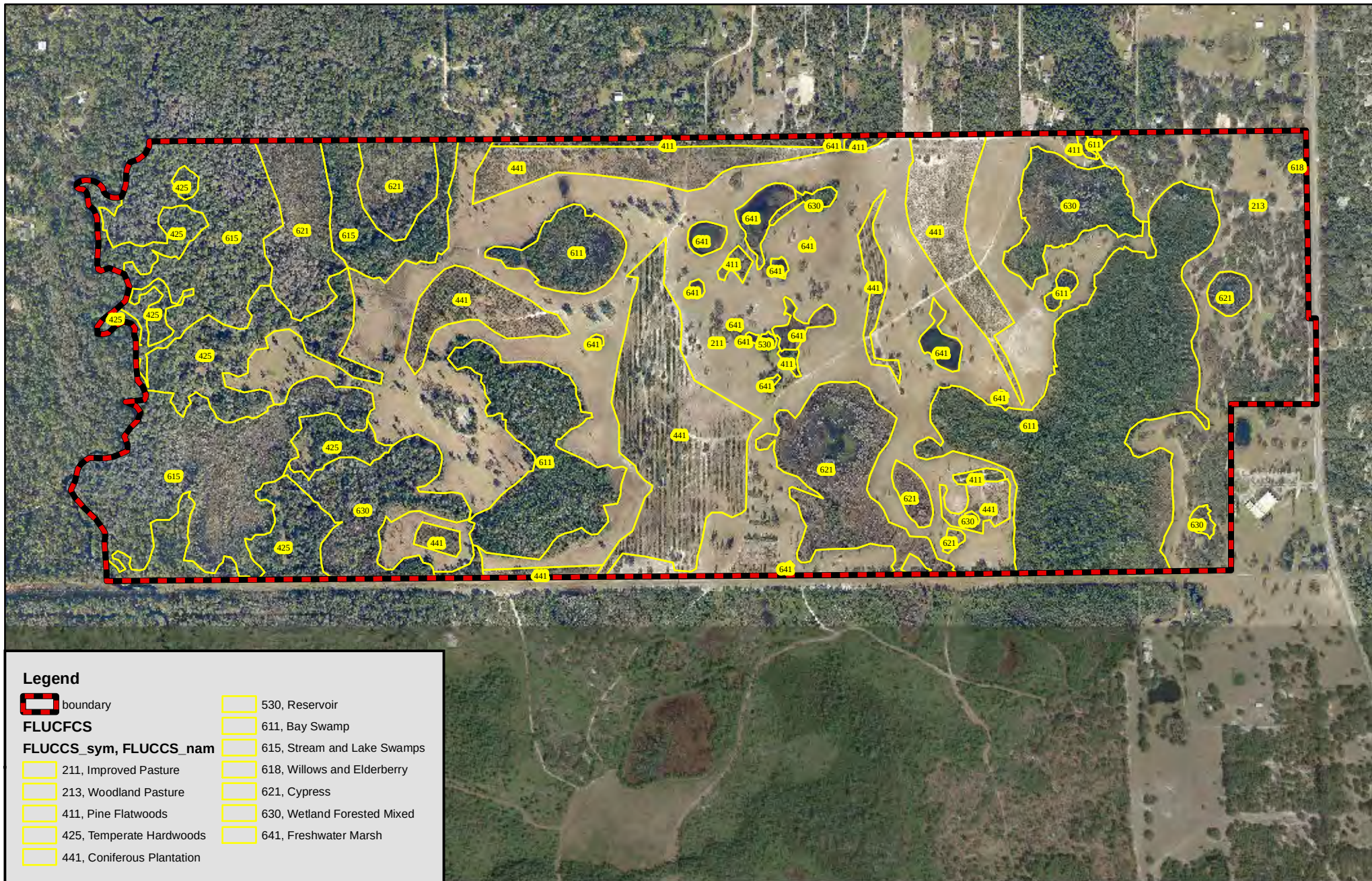
attachments











RiverCross Site
Seminole County, Florida
Figure 5
FLUCFCS Map

0 405 810 1,620 2,430 3,240 Feet



Project #: 579-18
Produced By: LPM
Date: 4/23/2018

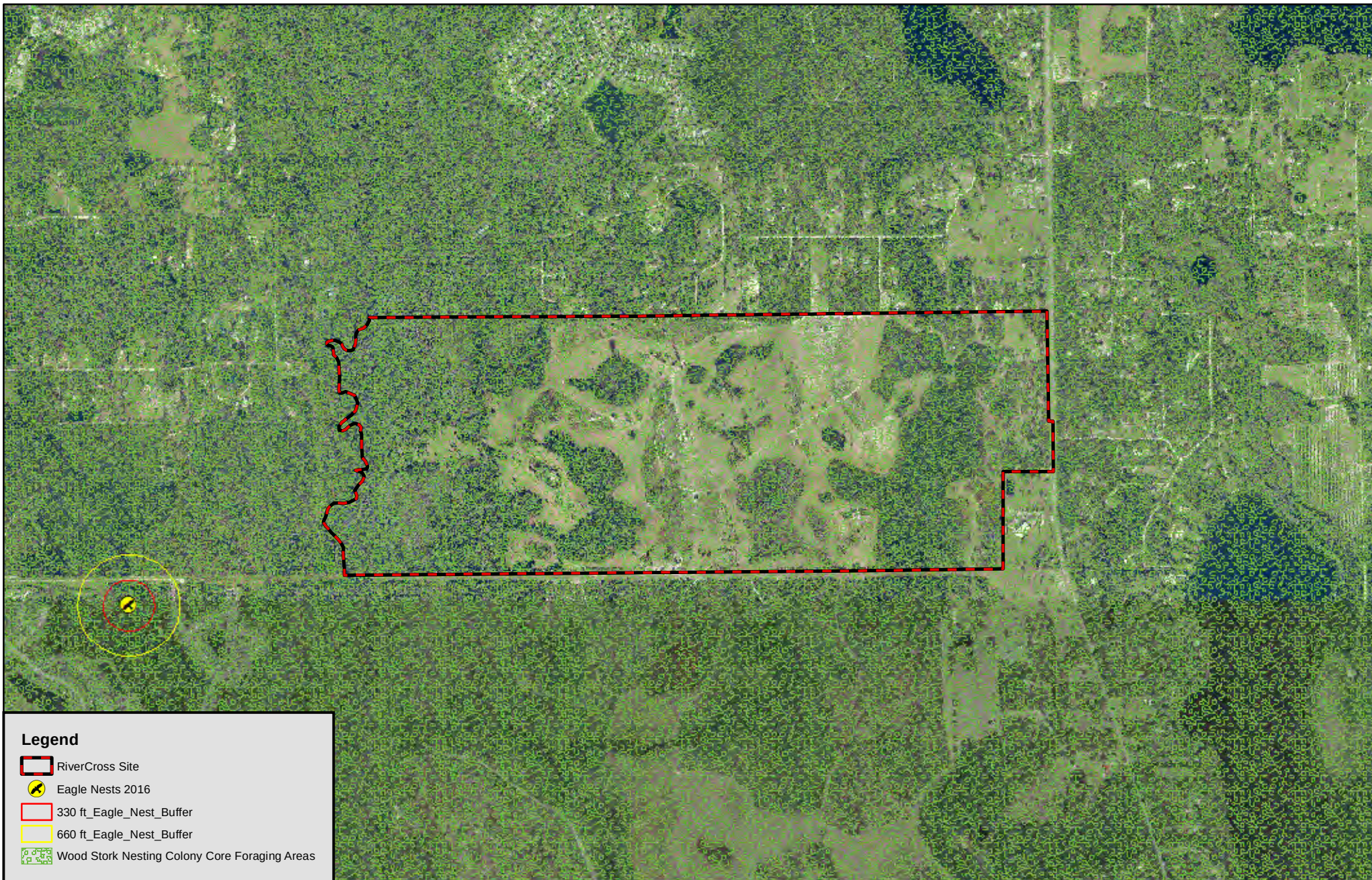


Legend

-  RiverCross Site
-  Fox Squirrel_sighting
-  gt_burrows
-  sandhillcrane_nests

0 350 700 1,400 2,100 2,800 Feet

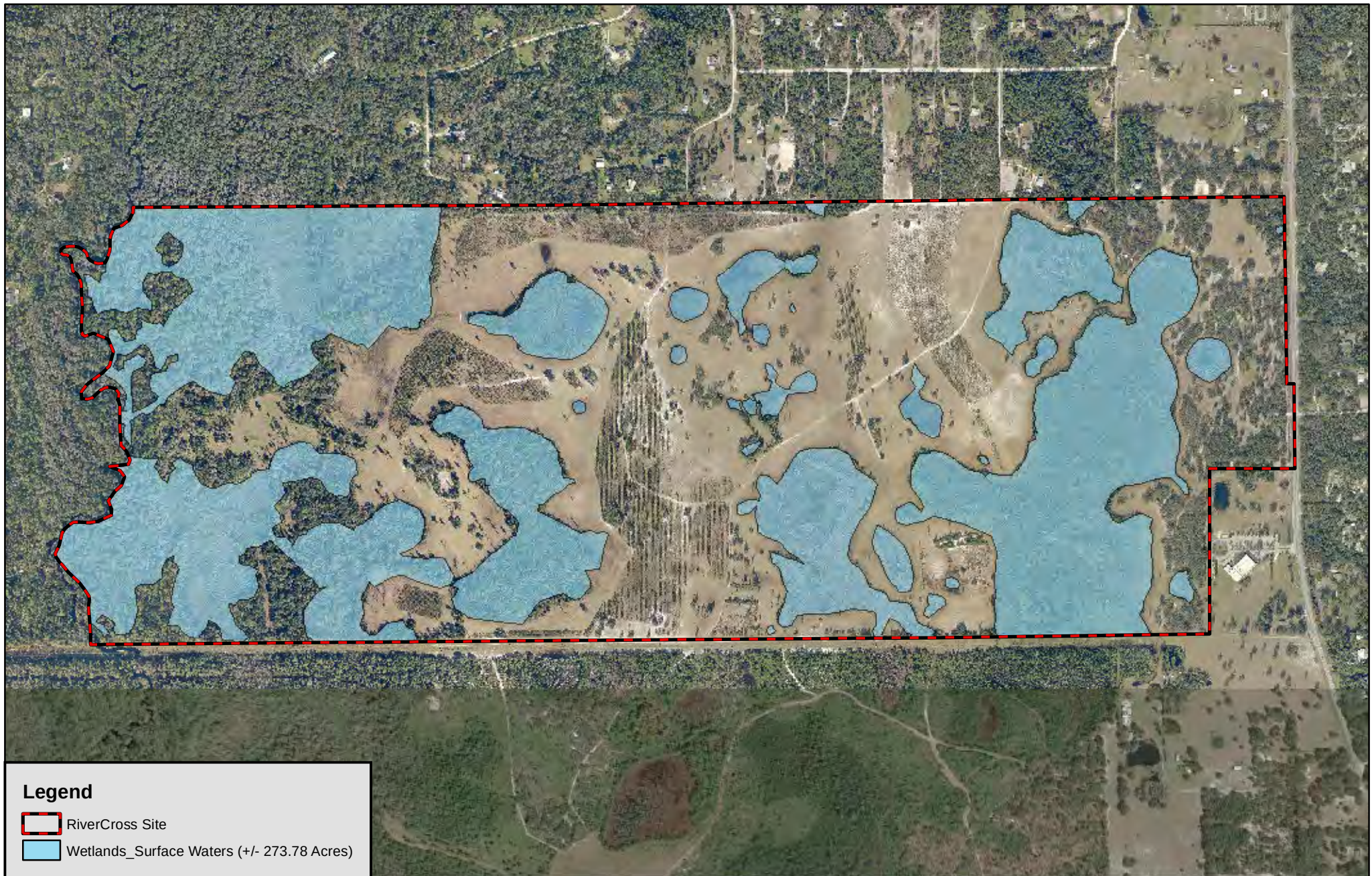


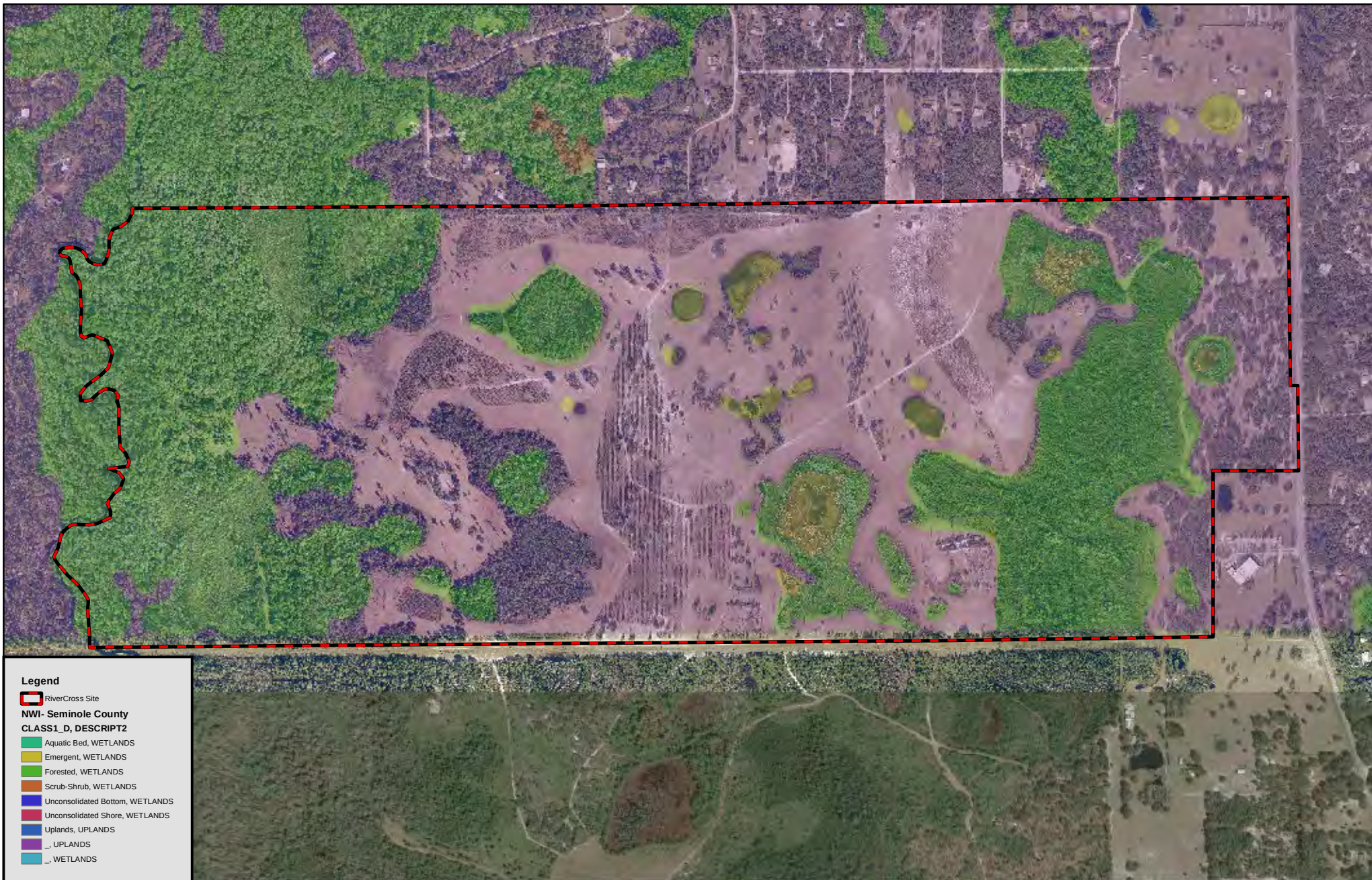


Legend

-  RiverCross Site
-  Eagle Nests 2016
-  330 ft_Eagle_Nest_Buffer
-  660 ft_Eagle_Nest_Buffer
-  Wood Stork Nesting Colony Core Foraging Areas







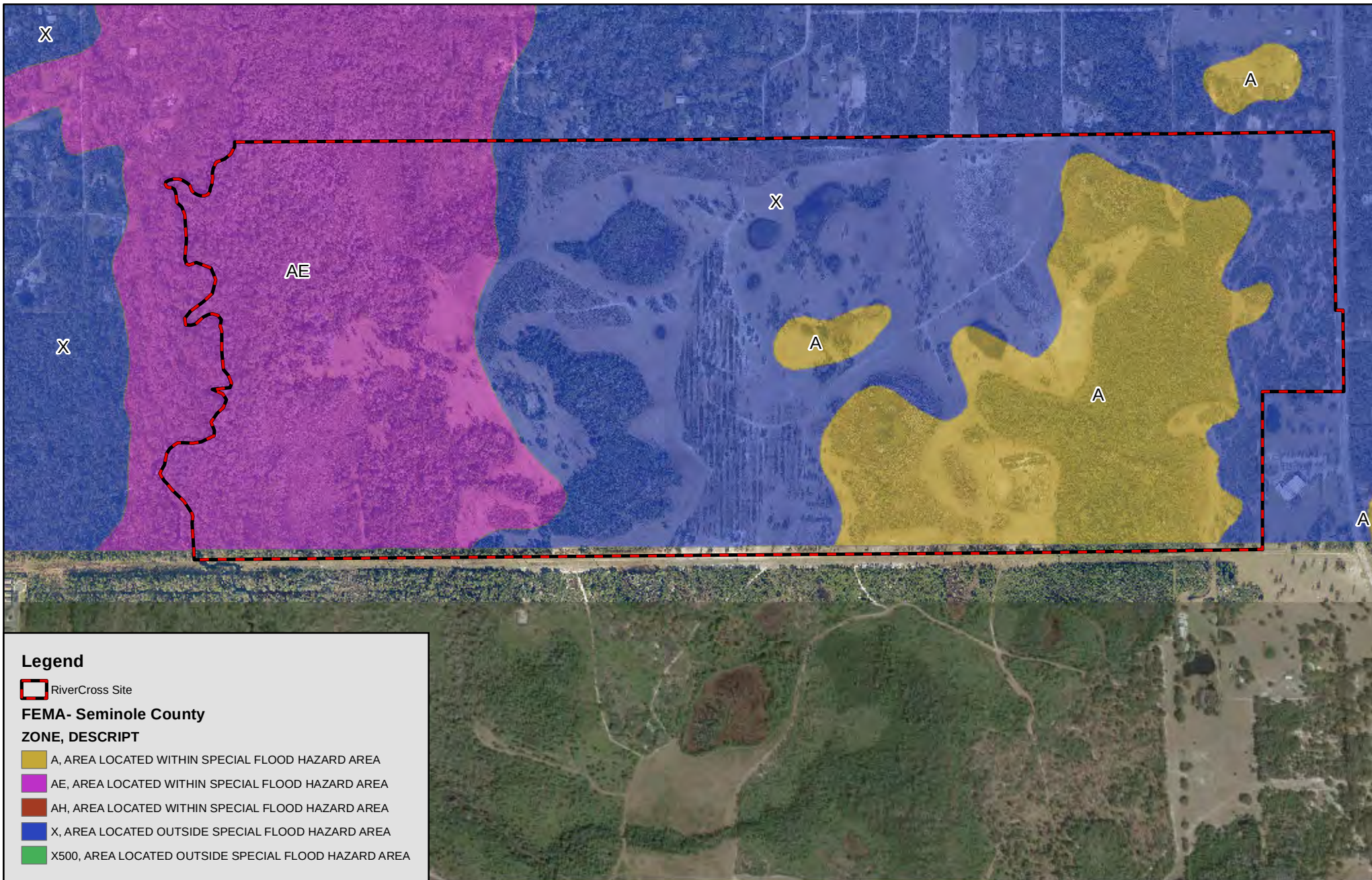




Table 1:	Potentially Occuring Listed Wildlife and Plant Species in Seminole County, Florida		
Scientific Name	Common Name	Federal Status	State Status
<u>FISH</u>			
<i>Pteronotropis welaka</i>	bluenose shiner	N	ST
<u>REPTILES</u>			
<i>Alligator mississippiensis</i>	American alligator	SAT	FT(S/A)
<i>Drymarchon corais couperi</i>	Eastern indigo snake	LT	FT
<i>Gopherus polyphemus</i>	gopher tortoise	C	ST
<i>Lampropeltis extenuata</i>	short-tailed snake	N	ST
<i>Pituophis melanoleucus mugitus</i>	Florida pine snake	N	SSC
<u>BIRDS</u>			
<i>Aphelocoma coerulescens</i>	Florida scrub-jay	LT	FT
<i>Egretta caerulea</i>	little blue heron	N	ST
<i>Egretta tricolor</i>	tricolored heron	N	ST
<i>Falco sparverius paulus</i>	southeastern American kestrel	N	ST
<i>Grus canadensis pratensis</i>	Florida sandhill crane	N	ST
<i>Haliaeetus leucocephalus</i>	bald eagle	N	**
<i>Mycteria americana</i>	wood stork	LT	FT
<i>Pandion haliaetus</i>	osprey	N	SCC*
<u>MAMMALS</u>			
<i>Puma concolor coryi</i>	Florida Panther	LE	FE
<i>Sciurus niger shermani</i>	Sherman's fox squirrel	N	SSC
<i>Trichechus manatus</i>	West Indian manatee	LE	FE
<u>PLANTS</u>			
<i>Carex chapmanii</i>	Chapman's Sedge	N	T
<i>Centrosema arenicola</i>	Sand Butterfly Pea	N	E
<i>Cucurbita okeechobeensis</i>	Okeechobee Gourd	LE	E
<i>Dennstaedtia bipinnata</i>	hay scented fern	N	E
<i>Illicium parviflorum</i>	star anise	N	E
<i>Lechea cernua</i>	nodding pinweed	N	T
<i>Nolina atopocarpa</i>	Florida Beargrass	N	T
<i>Ophioglossum palmatum</i>	Hand Fern	N	E
<i>Pecluma plumula</i>	Plume Polypody	N	E
<i>Pteroglossaspis ecristata</i>	Giant Orchid	N	T
<i>Pycnanthemum floridanum</i>	Florida Mountain-mint	N	T
<i>Salix floridana</i>	Florida willow	N	E

FEDERAL LEGAL STATUS

LE-Endangered: species in danger of extinction throughout all or a significant portion of its range.

LT-Threatened: species likely to become Endangered within the foreseeable future throughout all or a significant portion of its range.

SAT-Endangered due to similarity of appearance to a species which is federally listed such that enforcement personnel have difficulty in attempting to differentiate between the listed and unlisted species.

C-Candidate species for which federal listing agencies have sufficient information on biological vulnerability and threats to support proposing to list the species as Endangered or Threatened.

XN-Non-essential experimental population.

N-Not currently listed, nor currently being considered for listing as Endangered or Threatened.

STATE LEGAL STATUS - ANIMALS

- FE**- Listed as Endangered Species at the Federal level by the U. S. Fish and Wildlife Service
- FT**- Listed as Threatened Species at the Federal level by the U. S. Fish and Wildlife Service
- FXN**- Federal listed as an experimental population in Florida
- FT(S/A)**- Federal Threatened due to similarity of appearance
- ST**- State population listed as Threatened by the FFWCC. Defined as a species, subspecies, or isolated population which is acutely vulnerable to environmental alteration, declining in number at a rapid rate, or whose range or habitat is decreasing in area at a rapid rate and as a consequence is destined or very likely to become an endangered species within the foreseeable future.
- SSC**-Listed as Species of Special Concern by the FFWCC. Defined as a population which warrants special protection, recognition, or consideration because it has an inherent significant vulnerability to habitat modification, environmental alteration, human disturbance, or substantial human exploitation which, in the foreseeable future, may result in its becoming a threatened species. (SSC* for Pandion haliaetus (Osprey) indicates that this status applies in Monroe county only.)
- N**-Not currently listed, nor currently being considered for listing.

*** State protected by F.A.C. 68A-16.002 and federally protected by both the Migratory Bird Treaty Act (1918) and the Bald and Golden Eagle Protection Act (1940)*

STATE LEGAL STATUS - PLANTS

- E**-Endangered: species of plants native to Florida that are in imminent danger of extinction within the state, the survival of which is unlikely if the causes of a decline in the number of plants continue; includes all species determined to be endangered or threatened pursuant to the U.S. Endangered Species Act.
- T**-Threatened: species native to the state that are in rapid decline in the number of plants within the state, but which have not so decreased in number as to cause them to be Endangered.
- N**-Not currently listed, nor currently being considered for listing.



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[FWC Home](#) : [Wildlife & Habitats](#) : [Managed Species](#) : [Bald Eagle Management](#) : [Eagle Nest Locator](#)

Eagle Nest Locator

Welcome to the Florida Fish and Wildlife Conservation Commission Bald Eagle Nest Locator. The search features below may be used to locate FWC documented bald eagle nesting territories and to view their locations in map and spreadsheet form.

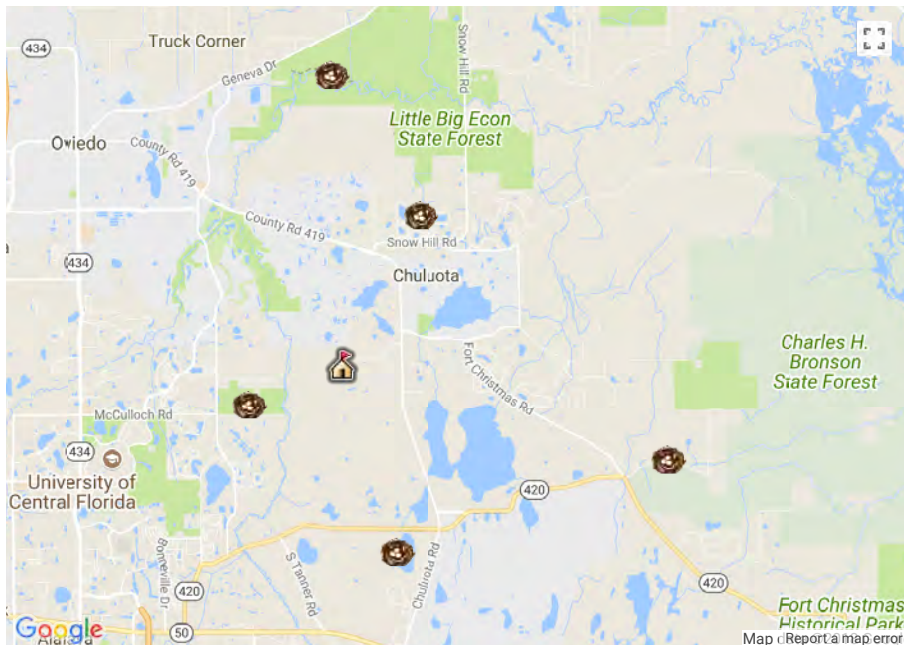
New Survey Protocol: In 2008 the statewide bald eagle nesting territory survey protocol changed. Here is the [map showing what counties are being surveyed](#) during the 2015-2016 breeding season. The protocol change reduces annual statewide survey effort and increases the amount of information gained from the nests that are visited during the survey season. Nest productivity is now determined for a sub-sample of the nests that are surveyed annually. Nest activity and productivity information are critical to determining if the goals and objectives of the Bald Eagle Management Plan are being met.

Attention: The information contained within this database is current through the 2016-2017 nesting season; nests were surveyed by FWC from November 2016 to April 2017. Accuracy of the nest locations is estimated to be within 0.1 miles of the true location. Not all eagle nests in Florida have been documented by FWC. Non-documented nests receive the same level of protections as FWC documented nests.

Locate Nests By:

Nest Map:

5 nests were found that meet the search criteria.



Bald Eagle Nest Data Search Results:

Results per page: 20 ▼

	Nest ID	County	Latitude	Longitude	Known Active	Last Survey	Distance
View History	OR036	Orange	28 36.67	81 10.00	2016	2016	1.43
View History	OR064	Orange	28 35.96	81 03.87	2014	2016	4.98
View History	OR074	Orange	28 34.77	81 07.85	2014	2014	2.73
View History	SE053	Seminole	28 39.10	81 07.50	2001	2014	2.65
View History	SE085	Seminole	28 40.88	81 08.80	2014	2014	4.43

Page 1 of 1



Preliminary Geotechnical
Engineering Report
River Cross Development
Seminole County, Florida
S&ME Project No. 527118014

PREPARED FOR:

River Cross Land Company, LLC
1520 Whitstable Court
Heathrow, Florida 32746

PREPARED BY:

S&ME, Inc.
1615 Edgewater Drive, Suite 200
Orlando, Florida 32804

April 11, 2018



April 11, 2018

River Cross Land Company, LLC
1520 Whitstable Court
Heathrow, Florida 32746

Attention: Mr. Christopher Dorworth

Reference: **Preliminary Geotechnical Engineering Report**
River Cross Development
Seminole County, Florida
S&ME Project No. 527118014
Florida Certificate of Authorization No. 6712

Dear Mr. Dorworth:

S&ME, Inc. (S&ME) has completed a limited subsurface exploration and preliminary geotechnical engineering evaluation for the proposed River Cross Development in Seminole County, Florida. Our services were provided pursuant to S&ME's proposal, as authorized by you. The purposes of our services for this phase of the project were to explore the subsurface conditions at the property, to provide preliminary geotechnical engineering assessments of the suitability of the property for the planned development from a geotechnical engineering standpoint, and to provide preliminary recommendations for site preparation and foundation support. This report presents our understanding of the project, discussions about the property and the encountered subsurface conditions, and our conclusions and preliminary recommendations.

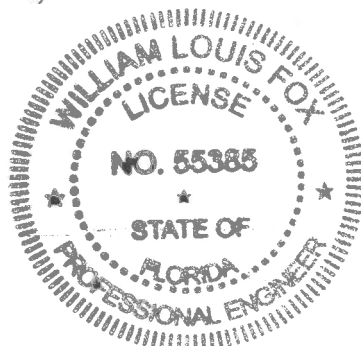
S&ME appreciates the opportunity to be of service to River Cross Land Company, LLC. Please contact us if you have any questions.

Sincerely,

S&ME, Inc.

A handwritten signature in black ink that reads "William L. Fox".

William L. Fox, P.E.
Senior Engineer
Florida License No. 55385



A handwritten signature in black ink that reads "Angela S. Musselwhite".

Angela S. Musselwhite, P.E.
Vice President/Principal Engineer
Florida License No. 62254



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Appendices

Appendix I – Figures, Soil Boring Logs, and Probe Results

Appendix II – Field and Laboratory Testing Procedures



1.0 Project Information

We understand that the proposed mixed-use development will consist of single-family residential parcels, multi-family residential parcels, and commercial parcels on approximately 675 acres of undeveloped property in southeastern Seminole County, Florida. New infrastructure will include paved interior roadways, buried underground utilities and piping, and stormwater management ponds.

Plans for the proposed development depicting the final locations, configurations, and details of proposed features were not available at this early stage of design. In addition, neither structural loading information nor site grading plans were available. For purposes of our preliminary assessments, we assumed that the commercial parcels would be developed with two-story to four-story buildings. Individual column loads were assumed to be on the order of 50 to 150 kips and wall loads were assumed to be on the order of 1 to 3 kips per lineal foot (klf). Floor loads were assumed to be less than 150 pounds per square foot (psf). We also assumed that no more than 3 feet of fill would be needed to raise the commercial building areas and roadways to final grade(s).

2.0 Scope of Services and Report Format

The scope of services presented in this proposal is intended to provide general information about the encountered subsurface conditions and their suitability for the planned development. This scope of services is not adequate to provide final geotechnical engineering recommendations for site development and design. In addition, our scope of services does not include providing recommendations for foundation support of residential parcels. Additional geotechnical explorations and evaluations will be needed prior to final design in order to provide recommendations for site development and design. It is noted that additional project information and additional explorations may reveal subsurface conditions that could change our preliminary assessments.

The following report sections present a discussion of the observed site conditions, the field exploration and laboratory testing programs, and our corresponding conclusions and preliminary recommendations. Figures and boring logs are provided in Appendix I. Summaries of the field and laboratory testing procedures are presented in Appendix II.

3.0 Site Description

We conducted a site visit to prepare for the field exploration program and to observe existing field conditions. The subject property is on the western side of County Road 419 (Chuluota Road) in southeastern Seminole County, Florida. The approximate location of the property is depicted on the Site Location Map, Figure 1 in Appendix I. At the time of our exploration, the property was composed of open pasture land and isolated wetlands. Pastures were open, nearly-level grassed fields. Ground cover on the open fields consisted of poorly-maintained grass turf and weeds. Wetland areas were densely wooded and vegetated. Most contained standing water of varying depths.



4.0 Review of Available Information

4.1 Seminole County Soil Survey

Based on the Soil Survey of Seminole County, Florida, prepared by the U.S. Department of Agriculture Natural Resource Conservation Service (formerly the Soil Conservation Service), the property is underlain by sandy soils, depressional soils, organic soils, and soils that are frequently flooded. Sandy soils were mapped on "upland" areas throughout the central portion of the property. These map units were identified as "Adamsville-Sparr fine sands", "EauGallie and Immokalee fine sands", "Immokalee sand", "Myakka and EauGallie fine sands", "Paola-St. Lucie fine sands", "Pomello fine sands" and "Tavares-Millhopper complex". These sandy soils are found on flatwoods, ridges, and knolls on marine terraces. These soils reportedly are nearly level to level and very poorly drained to moderately drained. On the eastern and northern portions of the property, depths to groundwater are typically about 2 to 6 feet beneath the natural ground surface for most of the year. On the central and western portions of the property, groundwater depths are typically within 18 inches of the natural ground surface.

Areas of depressional soils and organic soils were mapped near the southwestern portion of the property, along the eastern portion of the property, and sporadically throughout the central portion of the property. These map units were identified as "Basinger, Samsula, and Hontoon soils", and "Brighton, Samsula, and Sanibel muck". These soils reportedly are found in shallow depressions, are nearly level and very poorly drained, and have groundwater levels near the natural ground surface most of the year. In these areas, groundwater levels can rise above the natural ground surface for short periods during the rainy season.

Areas of soils that are reportedly frequently flooded were mapped along the western part of the property near the Econlockhatchee River. These map units were identified as "Manatee, Floridana, and Holopaw soils" and "Pompano fine sand". These soils reportedly are found on flood plains on marine terraces, are nearly level and poorly drained, and have groundwater levels near the natural ground surface most of the year. In these areas, groundwater levels can rise above the natural ground surface for extended periods during the rainy season.

4.2 U.S.G.S Publications

Based on review of the Oviedo SW U.S.G.S. Topographic Map, the ground surface appears to slope gradually from about Elevation +60 feet NGVD 29 (El. +60) on the eastern part of the property to about El. +20 on the western part near the Econlockhatchee River. Isolated low areas and areas of water were shown on the map near the central part of the property. Broad, low areas were shown on the western part of the property near the Econlockhatchee River and on the eastern part of the property near County Road 419. The locations of these low areas and areas of water appear to coincide with the areas of depressional soils, organic soils, and frequently flooded soils identified by the Soil Survey.

Based on a review of the "Potentiometric Surface of the Upper Floridan Aquifer in the St. Johns River Water Management District and Vicinity" map published by the USGS, the potentiometric surface elevation of the Upper Floridan Aquifer appears to be between approximate El. +10 and El. +20 feet



NGVD 29. As mentioned, project site elevations range from approximately El. +60 to El. +20. Therefore, artesian conditions may be encountered near the Econlockhatchee River.

The U.S.G.S map entitled "Sinkhole Type, Development, and Distribution in Florida" was reviewed. This map shows four broad areas, labeled as Area I, Area II, Area III, and Area IV. Each area has varying probabilities for sinkhole development based on geologic conditions. The subject property is located in a part of Florida mapped as Area II, which was identified as: "an area where few sinkholes have the potential to develop."

5.0 Exploration and Testing Programs

5.1 Field Exploration

Suggested locations and depths for soil borings and suggested "muck probe" locations were provided to us by Mr. Luke Classon of Appian Engineering. These locations were staked in the field by S&ME using estimates of distance from existing features shown on readily available aerial imagery. Some locations were offset from the planned locations because of access constraints including dense vegetation, soft ground conditions, and/or standing water. Approximate field test locations are shown on the Field Test Location Plan, Figure 2 in Appendix I.

The field exploration was conducted between February 21 and March 21, 2018 and consisted of drilling Standard Penetration Test (SPT) borings and auger borings and performing manual probes. Borings B-1 through B-29 were drilled to a depth of 25 feet below the existing ground surface. Each test borehole was advanced by track-mounted drilling equipment using a combination of split-spoon soil sampling and mud-rotary drilling methods. Standard penetration testing was performed at 24-inch intervals in the upper 10 feet, then at a 5-foot interval thereafter. Soil sampling and testing were conducted in general accordance with ASTM D1586. Sampler penetration resistance and soils recovered in each sampler were logged by the field crew. The results of the SPT borings are presented on the Soil Test Boring Logs in Appendix I.

Manual probes and/or hand auger borings were performed at 40 test locations. The purpose of these shallow tests were to explore the depths and nature of surficial soft/loose soils at accessible locations near suggested muck probe locations and to obtain shallow soil stratigraphy. At each of the 37 probe test locations we pushed 13 probes, one at the center then three on about 10-ft centers in each direction (generally north, south, east, and west) from the center. At 19 of these locations, we also drilled a shallow (≤ 4 ft) hand auger boring near the center probe location. Three additional hand auger borings (without probes) were drilled at locations designated as HAB-9, HAB-12, and HAB-15. Probing consisted of pushing a steel probe into the ground until practical refusal to penetration was encountered. At each probe location, the depth of standing water and the thicknesses of surficial organic soils and/or loose/soft sands were measured and recorded. The data from these tests, presented on the Hand Auger Boring Logs and Probe Results sheets in Appendix I, includes depth of standing water, "muck," and sand encountered by each probe, as well as the soil types encountered by the hand auger borings. Auger drilling and sampling were conducted in general accordance with ASTM D1452.



Representative soil samples obtained from the borings were sealed in clean, airtight containers for transport to our office for further classification and examination. The depths to subsurface water were measured in each borehole. The boreholes were backfilled with accumulated soil cuttings at the completion of drilling and sampling.

5.2 Laboratory Testing

Soil samples obtained during the field exploration were packaged and transported to our office for further examination and classification by a geotechnical engineer in order to confirm the field descriptions of the various soil strata. Recovered soil samples were classified visually in general accordance with the Unified Soil Classification System (ASTM D2488). Representative samples were selected for laboratory testing to aid in soil classification and to further define the engineering properties of the soils. The laboratory program included tests for percent fines, organic content, Atterberg limits, and natural moisture content. Laboratory test results are presented on the soil boring logs in Appendix I at the depth of the individually tested soil sample.

6.0 Subsurface Conditions

The stratigraphy, soil types and groundwater levels described below are based on the results of the borings and laboratory testing. Unified Soil Classification System group names and group symbols were used for soil classification. Descriptions below are general. Detailed subsurface characteristics at each boring location are shown on the boring logs in Appendix I.

A surficial layer of grass turf about 4 to 6 inches thick was encountered at most test boring locations. Silty sands (SM) with varying amounts of organic matter and organic clays (OH) were encountered uppermost at the locations of B-23, B-24, B-25, B-27, and B-28. Beneath the grass turf and organic soils, the predominant soil types encountered in the borings were very loose to dense fine sands (SP), slightly silty sands (SP-SM), silty sands (SM), and clayey sands (SC) that extended to depths near 20 to 25 feet. SPT N-values ranged from 3 blows per foot (bpf) to 46 bpf. Most N-values were between 10 bpf and 30 bpf. Results of percent fines tests conducted on these sands ranged from about 2% to 27%.

Firm to very stiff clay (CH) was encountered lowermost at several test boring locations. SPT N-values recorded in these clays ranged from 6 bpf to 16 bpf. The result of a percent fines test conducted on a sample of clay obtained from B-7 was 94%. Additional testing indicated a moisture content of 48%, a liquid limit of 94, and a plasticity index of 68.

Peat (Pt), organic clays, and silty sands with organic matter (identified at probe locations as "muck") were encountered uppermost at several of the probe and hand auger boring locations. These soils extended from the ground surface to depths of about 1 foot to 3 feet. At probe locations, muck thicknesses tended to range from 6 inches (or less) to about 3 feet. As an exception, muck thicknesses on the order of 144 inches were measured in probes performed near HAB-19. Sandy soils were encountered beneath the surficial organic soils.



At the time of our exploration, subsurface water was encountered at depths of about 1 foot to 5 feet below the existing ground surface at the test boring locations. Subsurface water was encountered from the ground surface to depths near 5 feet at most of the probe and hand auger boring locations. Standing water about a foot deep was measured at some probe locations. Subsurface water levels will fluctuate due to seasonal changes in precipitation amounts and with development and construction activity in the area. The water levels presented in this report were measured at the time of our exploration.

The above subsurface descriptions are of a highly generalized nature to highlight the major subsurface stratification features and material characteristics. The boring logs included in Appendix I should be reviewed for specific information. The transition between materials will be more or less gradual than indicated and may be abrupt. Information on actual subsurface conditions exists only at the specific boring locations and is relevant to the time the exploration was performed. Subsurface variations may occur between boring locations, and should be expected.

7.0 Conclusions and Preliminary Recommendations

7.1 General

The following report sections present our preliminary geotechnical engineering recommendations for site preparation and foundation support. The conclusions and recommendations presented in this report are based on the preceding project information and the results of the limited field exploration and laboratory testing programs conducted to date. Actual subsurface conditions will vary between or away from the test locations.

Our preliminary assessments are based on a limited amount of subsurface information obtained to date and our current understanding of the planned development. During review of these recommendations, it should be noted that, as with any site, unexpected subsurface conditions may be encountered. Because of natural variations in depth, composition and consistency of soils, unsuitable materials and other soil types not encountered by the borings will likely exist between boring locations, and should be anticipated.

7.2 Preliminary Geotechnical Engineering Considerations

Our preliminary assessments indicate that, from a geotechnical engineering standpoint, the property is adaptable for the planned development. Based on the results of the subsurface information obtained to date, the major geotechnical considerations associated with the planned development of this property are the presence of organic soils and the shallow groundwater depths.

Organic soils were encountered at several of borings and probe locations. These deleterious materials were encountered from the ground surface to depths between 1 foot and about 5 feet, and as deep as 12 feet at the location of HAB-19. Organic soils are likely present and may extend to greater depths at unexplored locations. Additional explorations are recommended to explore the presence of organic soils at other locations. Buildings and roadways supported on organic soils have the potential for greater than



normal total and differential settlements. As a result, organic soils should be removed in their entirety from beneath buildings and roadways. If not removed, then an alternative foundation system or some form of ground modification (i.e., preloading or surcharging) should be used.

As mentioned, subsurface water was encountered at depths of about 1 foot to 5 feet below the existing ground surface at the test boring locations. Most of these locations were on upland portions of the property. Subsurface water was encountered from the ground surface to depths near 5 feet at most of the probe and hand auger boring locations, most of which were in low-lying areas. Standing water about a foot deep was measured at some probe locations. The shallow groundwater depths will influence site grading to the extent that adequate separation is maintained between the bottoms of planned roadways and the seasonal high water levels. Excavations and below-grade construction should be conducted "in the dry." Based on the encountered groundwater depths, some form of dewatering will be needed to facilitate excavation, as well as backfill and compaction of excavations.

7.3 Typical Seasonal High Groundwater Level

The typical seasonal high groundwater level each year is the level in the August through September period at the end of the rainy season during a year of average (normal) rainfall. The seasonal high groundwater level is also affected by a number of other factors. The drainage characteristics of the soils; the land surface elevation; relief points such as lakes, rivers, and swamps; and distance to relief points are some of the more important factors influencing the seasonal high groundwater level.

Based on the results of the borings, our observations of the property, and on information presented in the Soil Survey of Seminole County, Florida, the seasonal high groundwater level is preliminarily estimated to be about 1 foot above the encountered subsurface water levels at the test boring locations. We anticipate that these preliminarily estimates may vary by +/- 6 inches. Higher groundwater levels, as well as standing water in low areas, should be expected after periods of heavy and/or prolonged rainfall events. Additional explorations should be performed and/or temporary piezometers should be installed on property to monitor groundwater levels during the rainy and dry seasons to provide design-level seasonal high groundwater estimates.

7.4 Assessment of Encountered Soils

The exploration indicates the presence of fine sands, slightly silty sands, silty sands, and clayey sands. Within the upper 10 feet in the test borings, these soils exhibited mostly low to moderate, but occasionally high, resistance to penetration testing. Conventional construction equipment should be capable of readily excavating these soils.

Based on the soils encountered in our borings, it is our opinion that the on-site fine sands and slightly silty sands are generally suitable for reuse as structural fill with proper placement and moisture control. The encountered fine sands and slightly silty sands can be readily excavated, placed, and compacted to form roadway embankments. With proper placement and moisture control, these soils should densify using conventional compaction equipment. Copious amounts of water will likely be needed to facilitate compaction of soils obtained from excavations above the groundwater level, while soils obtained below the groundwater level will likely require time to dry before reuse as fill.



The silty sands and clayey sands can be reused as fill and backfill, but will be more difficult to place, moisture condition, and compact. Silty sands and clayey sands, if reused, should not be placed near the ground surface in greenspace areas.

Organic soils should not be reused as fill or backfill. These deleterious soils should be disposed of off site or spread on greenspace areas.

7.5 Preliminary Site Preparation Recommendations

Site preparation should begin with drainage improvements to drain ponded water, lower groundwater levels, and handle stormwater runoff during construction. Proper site preparation will include removing all unsuitable surface materials (grass turf, roots, and other vegetation), as well as all unsuitable organic materials from beneath proposed buildings. Site preparation will also include densifying subgrade foundation surfaces to compress loose surface soils, as well as subgrade soils disturbed by other site preparation procedures, thereby creating a more uniform and less yielding soil mass.

Site preparation for the new roadways should consist of clearing and grubbing vegetation and roots, stripping organic-laden soils, and undercutting unsuitable surface soils. Following surface stripping and grubbing, exposed subgrade soils should be uniformly and thoroughly compacted prior to placing fill to form the embankments. Fill soils placed to build the roadway embankments also should be uniformly and thoroughly compacted until the desired elevations have been reached. Embankment side slopes should be as flat as possible to reduce the potential for stability issues.

7.6 Foundation Design Considerations for Commercial Buildings

Assuming proper site preparation is performed, we anticipate that lightly-loaded commercial buildings can be supported on shallow foundations designed for allowable soil bearing pressures between 2,000 and 2,500 pounds per square foot (psf) with predicted total settlements of 1 inch or less. Actual structural loading, site grading, and parcel-specific geotechnical information should be obtained prior to final design so that settlement analyses can be based on actual proposed conditions.

7.7 Pavement Design Considerations

The results of our preliminary exploration indicate that the encountered soils, if prepared properly, are suitable for supporting both flexible and rigid pavements for new roadways. The near-surface sands will need to be stabilized and compacted for construction of roadway subgrades. Adequate separation between the seasonal high groundwater level and bottom of base will need to be maintained. For preliminary planning purposes, we recommend a minimum separation of 24 inches.

7.8 Stormwater Pond Design Considerations

Based on the encountered soil types and groundwater levels, the property appears to be most adaptive to wet detention stormwater ponds. The uppermost soils encountered were mostly fine sand and sand with silt. Although no permeability testing was conducted, we anticipate that these near-surface sands are likely free draining. Due to inherently lower permeability rates of soils having high fines contents, the silty



sands and clayey sands will likely restrict the downward flow of water. The soils should be considered aquitards.

Wet detention ponds should be excavated to depths that will limit the growth of aquatic vegetation. Pond side slopes may not be stable if excavated into or underlain by weak or organic soils. Pond side slopes should be evaluated for stability. In general, pond side slopes should be as flat as possible to reduce the potential for stability issues.

8.0 Limitations

This report has been prepared in accordance with generally accepted geotechnical engineering practice for specific application to this project. The conclusions and preliminary recommendations contained in this report are based on applicable standards of our practice in this geographic area at the time this report was prepared. No other representation or warranty, either express or implied, is made.

We relied on project information given to us to develop scope of services and our conclusions and preliminary recommendations. If project information described in this report is not accurate, or if it changes during project development, we should be notified of the changes so that we can modify our recommendations based on this additional information, if necessary.

Our conclusions and preliminary recommendations are based on limited data from a field exploration program. Subsurface conditions can vary widely between explored locations. Some variations may not become evident until construction. If conditions are encountered which appear different than those described in our report, we should be notified. This report should not be construed to represent subsurface conditions for the entire property. Soil samples that were not altered by laboratory testing will be retained for 60 days from the date of this report and then will be discarded.

Unless specifically noted otherwise, our field exploration program did not include an assessment of regulatory compliance, environmental conditions or pollutants, or the presence of any biological materials (mold, fungi, and bacteria). If there is a concern about these items, other studies should be performed. S&ME can provide a proposal and perform these services, if requested.

Appendices

Appendix I – Figures, Soil Boring Logs, and Probe Results

Figure 1 –Site Location Map

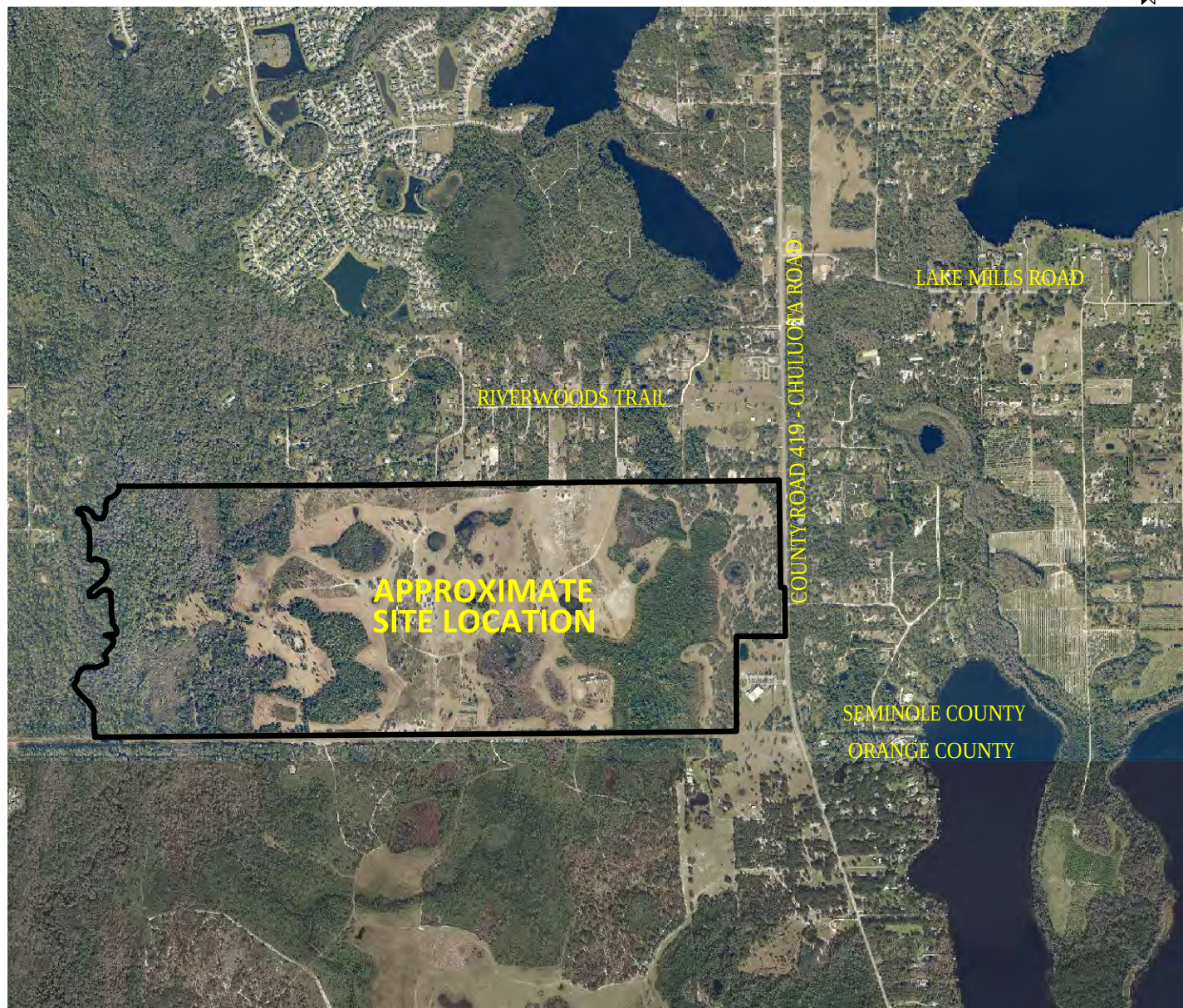
Figure 2 - Field Test Location Plan

Legend to Soil Classification and Symbols

Soil Test Boring Logs

Hand Auger Boring Logs with Probe Results

Probe Results



SITE LOCATION MAP

RIVERCROSS DEVELOPMENT
SEMINOLE COUNTY, FLORIDA

SCALE:
NOT TO SCALE
DATE:
03/07/2018
PROJECT NUMBER
527118014

FIGURE NO.

1

LEGEND TO SOIL CLASSIFICATION AND SYMBOLS

SOIL TYPES

(Shown in Graphic Log)



Fill



Asphalt



Concrete



Topsoil



Gravel



Sand



Silt



Clay



Organic



Silty Sand



Clayey Sand



Sandy Silt



Clayey Silt



Sandy Clay



Silty Clay



Partially Weathered Rock



Cored Rock

WATER LEVELS

(Shown in Water Level Column)

▽ = Water Level At Termination of Boring

▼ = Water Level Taken After 24 Hours

◄ = Loss of Drilling Water

HC = Hole Cave

CONSISTENCY OF COHESIVE SOILS

CONSISTENCY

Very Soft

Soft

Firm

Stiff

Very Stiff

Hard

Very Hard

STD. PENETRATION RESISTANCE BLOWS/FOOT

0 to 2

3 to 4

5 to 8

9 to 15

16 to 30

31 to 50

Over 50

RELATIVE DENSITY OF COHESIONLESS SOILS

RELATIVE DENSITY

Very Loose

Loose

Medium Dense

Dense

Very Dense

STD. PENETRATION RESISTANCE BLOWS/FOOT

0 to 4

5 to 10

11 to 30

31 to 50

Over 50

SAMPLER TYPES

(Shown in Samples Column)

Shelby Tube



Split Spoon



Rock Core



No Recovery

TERMS

Standard Penetration Resistance - The Number of Blows of 140 lb. Hammer Falling 30 in. Required to Drive 1.4 in. I.D. Split Spoon Sampler 1 Foot. As Specified in ASTM D-1586.

REC - Total Length of Rock Recovered in the Core Barrel Divided by the Total Length of the Core Run Times 100%.

RQD - Total Length of Sound Rock Segments Recovered that are Longer Than or Equal to 4" (mechanical breaks excluded) Divided by the Total Length of the Core Run Times 100%.



PROJECT: River Cross Development Seminole County, Florida S&ME Project No. 527118014				BORING LOG B-1											
DATE DRILLED: 2/16/18		ELEVATION: N/A			NOTES: -200 = Percent passing #200 sieve										
DRILL RIG: CME 45		BORING DEPTH: 25.0 ft													
DRILLER: Reliable Field Services		WATER LEVEL: 2.3 feet ATD													
HAMMER TYPE: Safety		LOGGED BY: W. Fox													
SAMPLING METHOD: Split spoon					NORTHING: N/A		EASTING: N/A								
DRILLING METHOD: Mud Rotary															
DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT / CORE DATA			STANDARD PENETRATION TEST DATA (blows/ft) / REMARKS				N VALUE	
							1st 6in / RUN #	2nd 6in / REC	3rd 6in / RQD		10	20	30	60/80	
		6 inches grass turf			SS-1		2	3	3						6
		<u>SLIGHTLY SILTY SAND (SP-SM)</u> loose, dark yellowish brown, fine, (-200=5.9%) - - - Medium dense, pale brown			SS-2		7	6	8						14
5		- - - Brown			SS-3		5	6	5						11
					SS-4		5	6	6						12
					SS-5		5	9	7						16
10		<u>CLAYEY SAND (SC)</u> medium dense, grayish brown, fine													
		<u>SLIGHTLY SILTY SAND (SP-SM)</u> medium dense, dark brown, fine			SS-6		7	7	9						16
15															
		<u>CLAYEY SAND (SC)</u> medium dense, light gray, fine			SS-7		9	9	10						19
20															
		<u>SAND (SP)</u> medium dense, white, fine			SS-8		4	7	7						14
25		Boring terminated at 25 ft Backfilled with cuttings upon completion Target Depth													

NOTES:

1. THIS LOG IS ONLY A PORTION OF A REPORT PREPARED FOR THE NAMED PROJECT AND MUST ONLY BE USED TOGETHER WITH THAT REPORT.
2. BORING, SAMPLING AND PENETRATION TEST DATA IN GENERAL ACCORDANCE WITH ASTM D-1586.
3. STRATIFICATION AND GROUNDWATER DEPTHS ARE NOT EXACT.
4. WATER LEVEL IS AT TIME OF EXPLORATION AND WILL VARY.



PROJECT: River Cross Development Seminole County, Florida S&ME Project No. 527118014				BORING LOG B-2								
DATE DRILLED: 2/16/18		ELEVATION: N/A		NOTES:								
DRILL RIG: CME 45		BORING DEPTH: 25.0 ft										
DRILLER: Reliable Field Services		WATER LEVEL: 5 feet ATD										
HAMMER TYPE: Safety		LOGGED BY: W. Fox										
SAMPLING METHOD: Split spoon				NORTHING: N/A		EASTING: N/A						
DRILLING METHOD: Mud Rotary												
DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT / CORE DATA 1st 6in / RUN # 2nd 6in / REC 3rd 6in / RQD	STANDARD PENETRATION TEST DATA (blows/ft) / REMARKS				N VALUE
		6 inch grass turf			SS-1		2 2 3					5
		SAND (SP) loose, light brown, fine - - - Medium dense, very pale brown			SS-2		3 6 6					12
5		- - - Light brown			SS-3		5 6 5					11
					SS-4		5 6 6					12
		- - - Light gray			SS-5		7 9 9					18
10												
		SLIGHTLY SILTY SAND (SP-SM) medium dense, dark yellowish brown, fine			SS-6		8 10 13					23
15												
		- - - Light gray			SS-7		6 7 6					13
20												
		- - - Very pale brown			SS-8		8 9 9					18
25		Boring terminated at 25 ft Backfilled with cuttings upon completion Target Depth										

NOTES:

1. THIS LOG IS ONLY A PORTION OF A REPORT PREPARED FOR THE NAMED PROJECT AND MUST ONLY BE USED TOGETHER WITH THAT REPORT.
2. BORING, SAMPLING AND PENETRATION TEST DATA IN GENERAL ACCORDANCE WITH ASTM D-1586.
3. STRATIFICATION AND GROUNDWATER DEPTHS ARE NOT EXACT.
4. WATER LEVEL IS AT TIME OF EXPLORATION AND WILL VARY.



PROJECT: River Cross Development Seminole County, Florida S&ME Project No. 527118014					BORING LOG B-3						
DATE DRILLED: 2/16/18			ELEVATION: N/A			NOTES:					
DRILL RIG: CME 45			BORING DEPTH: 25.0 ft								
DRILLER: Reliable Field Services			WATER LEVEL: 5 feet ATD								
HAMMER TYPE: Safety			LOGGED BY: W. Fox								
SAMPLING METHOD: Split spoon						NORTHING: N/A		EASTING: N/A			
DRILLING METHOD: Mud Rotary											
DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT / CORE DATA 1st 6in / RUN # 2nd 6in / REC 3rd 6in / RQD			STANDARD PENETRATION TEST DATA (blows/ft) / REMARKS	N VALUE
		6 inches grass turf			SS-1		2	2	4		6
		<u>SAND (SP)</u> loose, white, fine - - - Medium dense			SS-2		9	9	5		14
5		- - - Very pale brown	▽		SS-3		5	6	5		11
		<u>SLIGHTLY SILTY SAND (SP-SM)</u> grayish brown, fine			SS-4		6	9	10		19
10					SS-5		9	10	11		21
15		- - - Yellowish brown			SS-6		4	4	5		9
20		- - - Very light gray			SS-7		6	7	7		14
25		Boring terminated at 25 ft Backfilled with cuttings upon completion Target Depth			SS-8		8	8	9		17

NOTES:

- THIS LOG IS ONLY A PORTION OF A REPORT PREPARED FOR THE NAMED PROJECT AND MUST ONLY BE USED TOGETHER WITH THAT REPORT.
- BORING, SAMPLING AND PENETRATION TEST DATA IN GENERAL ACCORDANCE WITH ASTM D-1586.
- STRATIFICATION AND GROUNDWATER DEPTHS ARE NOT EXACT.
- WATER LEVEL IS AT TIME OF EXPLORATION AND WILL VARY.

Page 1 of 1



PROJECT: River Cross Development Seminole County, Florida S&ME Project No. 527118014					BORING LOG B-4						
DATE DRILLED: 2/15/18			ELEVATION: N/A			NOTES:					
DRILL RIG: CME 45			BORING DEPTH: 25.0 ft								
DRILLER: Reliable Field Services			WATER LEVEL: 5 feet ATD								
HAMMER TYPE: Safety			LOGGED BY: W. Fox								
SAMPLING METHOD: Split spoon						NORTHING: N/A		EASTING: N/A			
DRILLING METHOD: Mud Rotary											
DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT / CORE DATA			STANDARD PENETRATION TEST DATA (blows/ft) / REMARKS	N VALUE
							1st 6in / RUN #	2nd 6in / REC	3rd 6in / RQD	10 20 30 60 80	
		6 inches grass turf			SS-1		1	2	2		4
		SAND (SP) loose, white, fine - - - Medium dense			SS-2		3	5	5		10
5		- - - Light gray			SS-3		4	5	6		11
		- - - White			SS-4		5	6	6		12
10					SS-5		6	6	9		15
15		SILTY SAND (SM) medium dense, black, fine, trace cementation			SS-6		8	9	10		19
20		SLIGHTLY SILTY SAND (SP-SM) loose, dark brown, fine			SS-7		4	5	4		9
25		- - - Medium dense, brown			SS-8		6	9	9		18
		Boring terminated at 25 ft Backfilled with cuttings upon completion Target Depth									

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3. STRATIFICATION AND GROUNDWATER DEPTHS ARE NOT EXACT.
4. WATER LEVEL IS AT TIME OF EXPLORATION AND WILL VARY.



PROJECT: River Cross Development Seminole County, Florida S&ME Project No. 527118014				BORING LOG B-5					
DATE DRILLED: 3/5/18		ELEVATION: N/A		NOTES:					
DRILL RIG: CME 45		BORING DEPTH: 25.0 ft							
DRILLER: Reliable Field Services		WATER LEVEL: 5 feet ATD							
HAMMER TYPE: Safety		LOGGED BY: W. Fox							
SAMPLING METHOD: Split spoon				NORTHING: N/A		EASTING: N/A			
DRILLING METHOD: Mud Rotary									
DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT / CORE DATA 1st 6in / RUN # 2nd 6in / REC 3rd 6in / RQD	STANDARD PENETRATION TEST DATA (blows/ft) / REMARKS 10 20 30 60 80	N VALUE
		6 inches grass turf			SS-1		2 1 2		3
		SAND (SP) very loose, light gray, fine - - - Medium dense, white			SS-2		3 5 6		11
5		SILTY SAND (SM) loose, very pale brown, fine - - - Very loose			SS-3		7 3 2		5
		- - - Loose			SS-4		2 1 1		2
10					SS-5		2 2 3		5
		SLIGHTLY SILTY SAND (SP-SM) medium dense, light greenish gray, fine			SS-6		7 9 12		21
15									
		SAND (SP) medium dense, very light gray, fine			SS-7		15 15 15		30
20									
		CLAYEY SAND (SC) loose, greenish gray, fine			SS-8		3 4 4		8
25		Boring terminated at 25 ft Backfilled with cuttings upon completion Target Depth							

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PROJECT: River Cross Development Seminole County, Florida S&ME Project No. 527118014					BORING LOG B-6										
DATE DRILLED: 2/16/18			ELEVATION: N/A			NOTES: -200 = Percent passing #200 sieve									
DRILL RIG: CME 45			BORING DEPTH: 25.0 ft												
DRILLER: Reliable Field Services			WATER LEVEL: 2 feet ATD												
HAMMER TYPE: Safety			LOGGED BY: W. Fox												
SAMPLING METHOD: Split spoon						NORTHING: N/A		EASTING: N/A							
DRILLING METHOD: Mud Rotary															
DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT / CORE DATA 1st 6in / RUN # 2nd 6in / REC 3rd 6in / RQD			STANDARD PENETRATION TEST DATA (blows/ft) / REMARKS 10 20 30 60 80					N VALUE
		6 inches grass turf			SS-1		2	2	3						5
		<u>SLIGHTLY SILTY SAND (SP-SM)</u> loose, brown, fine - - - Medium dense, pale brown			SS-2		4	5	6						11
5		- - - Light gray			SS-3		5	5	5						10
					SS-4		5	6	5						11
					SS-5		6	7	7						14
10		<u>CLAYEY SAND (SC)</u> medium dense, gray, fine													
		- - - (-200=27%)			SS-6		7	8	9						17
15															
					SS-7		9	9	9						18
20															
					SS-8		9	7	9						16
25		Boring terminated at 25 ft Backfilled with cuttings upon completion Target Depth													

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PROJECT: River Cross Development Seminole County, Florida S&ME Project No. 527118014				BORING LOG B-7					
DATE DRILLED: 2/26/18		ELEVATION: N/A			NOTES: -200 = Percent passing #200 sieve MC = Moisture content LL = Liquid limit PI = Plasticity index				
DRILL RIG: CME 45		BORING DEPTH: 25.0 ft							
DRILLER: Reliable Field Services		WATER LEVEL: 4.5 feet ATD							
HAMMER TYPE: Safety		LOGGED BY: W. Fox							
SAMPLING METHOD: Split spoon					NORTHING: N/A		EASTING: N/A		
DRILLING METHOD: Mud Rotary									
DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT / CORE DATA 1st 6in / RUN # 2nd 6in / REC 3rd 6in / RQD	STANDARD PENETRATION TEST DATA (blows/ft) / REMARKS 10 20 30 60 80	N VALUE
		6 inches grass turf			SS-1		1 2 2		4
		SAND (SP) loose, grayish brown, fine - - - Medium dense, very pale brown			SS-2		4 5 6		11
5		SLIGHTLY SILTY SAND (SP-SM) loose, yellowish brown, fine - - - Medium dense			SS-3		5 4 4		8
					SS-4		5 4 6		10
10					SS-5		5 6 6		12
15		CLAY (CH) stiff, blueish gray, (-200=94%, MC=48%, LL=94, PI=68)			SS-6		5 7 6		13
20		SLIGHTLY SILTY SAND (SP-SM) dense, light gray, fine			SS-7		8 12 19		31
25		- - - Medium dense			SS-8		7 9 11		20
		Boring terminated at 25 ft Backfilled with cuttings upon completion Target Depth							

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PROJECT: River Cross Development Seminole County, Florida S&ME Project No. 527118014				BORING LOG B-8								
DATE DRILLED: 2/26/18		ELEVATION: N/A		NOTES:								
DRILL RIG: CME 45		BORING DEPTH: 25.0 ft										
DRILLER: Reliable Field Services		WATER LEVEL: 5 feet ATD										
HAMMER TYPE: Safety		LOGGED BY: W. Fox										
SAMPLING METHOD: Split spoon				NORTHING: N/A		EASTING: N/A						
DRILLING METHOD: Mud Rotary												
DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT / CORE DATA 1st 6in / RUN # 2nd 6in / REC 3rd 6in / RQD	STANDARD PENETRATION TEST DATA (blows/ft) / REMARKS				N VALUE
		6 inches grass turf	▽		SS-1	◆	2 4 6		10			10
		<u>SAND (SP)</u> medium dense, pale brown, fine - - - Very pale brown			SS-2	◆	7 6 5					11
5		- - - Loose			SS-3	◆	6 4 3					7
		<u>SLIGHTLY SILTY SAND (SP-SM)</u> loose, brown, fine			SS-4	◆	3 2 2					4
		<u>SILTY SAND (SM)</u> loose, dark brown, fine			SS-5	◆	3 2 3					5
10												
		<u>SLIGHTLY SILTY SAND (SP-SM)</u> medium dense, light gray, fine			SS-6	◆	8 12 15					27
15												
		<u>CLAY (CH)</u> stiff, light greenish gray		SS-7	◆	4 5 4					9	
20												
		<u>SLIGHTLY SILTY SAND (SP-SM)</u> dense, gray, fine		SS-8	◆	14 15 17					32	
25		Boring terminated at 25 ft Backfilled with cuttings upon completion Target Depth										

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PROJECT: River Cross Development Seminole County, Florida S&ME Project No. 527118014					BORING LOG B-9						
DATE DRILLED: 3/2/18			ELEVATION: N/A			NOTES:					
DRILL RIG: CME 45			BORING DEPTH: 25.0 ft								
DRILLER: Reliable Field Services			WATER LEVEL: 4 feet ATD								
HAMMER TYPE: Safety			LOGGED BY: W. Fox								
SAMPLING METHOD: Split spoon						NORTHING: N/A		EASTING: N/A			
DRILLING METHOD: Mud Rotary											
DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT / CORE DATA 1st 6in / RUN # 2nd 6in / REC 3rd 6in / RQD			STANDARD PENETRATION TEST DATA (blows/ft) / REMARKS	N VALUE
		4 inches grass turf			SS-1		2	3	2		5
		SLIGHTLY SILTY SAND (SP-SM) loose, dark brown, fine			SS-2		3	2	3		5
5		SAND (SP) loose, white, fine			SS-3		2	2	3		5
		- - - Light gray			SS-4		3	4	4		8
			SS-5		4	4	4		8		
10						SS-6		2	3	5	
15		SLIGHTLY SILTY SAND (SP-SM) medium dense, very pale brown, fine			SS-7		3	4	8		12
20					SS-8		10	12	15		27
25		Boring terminated at 25 ft Backfilled with cuttings upon completion Target Depth									

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PROJECT: River Cross Development Seminole County, Florida S&ME Project No. 527118014				BORING LOG B-10					
DATE DRILLED: 3/2/18		ELEVATION: N/A			NOTES: -200 = Percent passing #200 sieve				
DRILL RIG: CME 45		BORING DEPTH: 25.0 ft							
DRILLER: Reliable Field Services		WATER LEVEL: 4 feet ATD							
HAMMER TYPE: Safety		LOGGED BY: W. Fox							
SAMPLING METHOD: Split spoon					NORTHING: N/A		EASTING: N/A		
DRILLING METHOD: Mud Rotary									
DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT / CORE DATA 1st 6in / RUN # 2nd 6in / REC 3rd 6in / RQD	STANDARD PENETRATION TEST DATA (blows/ft) / REMARKS	N VALUE
		4 inches grass turf			SS-1		3 4 4		8
		<u>SAND (SP)</u> loose, white, fine - - - Medium dense			SS-2		4 7 8		15
5					SS-3		5 7 7		14
		- - - (-200=3.8%)			SS-4		6 7 8		15
		- - - Pale brown			SS-5		8 9 9		18
10									
		<u>SLIGHTLY SILTY SAND (SP-SM)</u> medium dense, dark yellowish brown, fine			SS-6		10 10 13		23
15									
		- - - Dense, yellowish brown			SS-7		12 16 19		35
20									
		- - - Light gray			SS-8		10 14 21		35
25		Boring terminated at 25 ft Backfilled with cuttings upon completion Target Depth							

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PROJECT: River Cross Development Seminole County, Florida S&ME Project No. 527118014				BORING LOG B-11					
DATE DRILLED: 3/5/18		ELEVATION: N/A			NOTES: -200 = Percent passing #200 sieve				
DRILL RIG: CME 45		BORING DEPTH: 25.0 ft							
DRILLER: Reliable Field Services		WATER LEVEL: 4 feet ATD							
HAMMER TYPE: Safety		LOGGED BY: W. Fox							
SAMPLING METHOD: Split spoon					NORTHING: N/A		EASTING: N/A		
DRILLING METHOD: Mud Rotary									
DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT / CORE DATA 1st 6in / RUN # 2nd 6in / REC 3rd 6in / RQD	STANDARD PENETRATION TEST DATA (blows/ft) / REMARKS 10 20 30 60 80	N VALUE
		4 inches grass turf			SS-1		2 2 1		3
		SAND (SP) very loose, gray, fine			SS-2		2 3 2		5
5		SILTY SAND (SM) loose, gray, fine, -200=24%			SS-3		2 2 2		4
		SAND (SP) loose, very pale brown, fine - - - Very loose			SS-4		2 1 1		2
		- - - Loose			SS-5		1 2 2		4
10									
		- - - Medium dense			SS-6		8 9 11		20
15									
		SILTY SAND (SM) medium dense, light greenish gray, fine			SS-7		9 12 14		26
20									
		CLAY (CH) very stiff, greenish gray, few to little shell fragments			SS-8		3 6 10		16
25		Boring terminated at 25 ft Backfilled with cuttings upon completion Target Depth							

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PROJECT: River Cross Development Seminole County, Florida S&ME Project No. 527118014				BORING LOG B-12					
DATE DRILLED: 3/2/18		ELEVATION: N/A		NOTES:					
DRILL RIG: CME 45		BORING DEPTH: 25.0 ft							
DRILLER: Reliable Field Services		WATER LEVEL: 3.5 feet ATD							
HAMMER TYPE: Safety		LOGGED BY: W. Fox							
SAMPLING METHOD: Split spoon				NORTHING: N/A		EASTING: N/A			
DRILLING METHOD: Mud Rotary									
DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT / CORE DATA 1st 6in / RUN # 2nd 6in / REC 3rd 6in / RQD	STANDARD PENETRATION TEST DATA (blows/ft) / REMARKS	N VALUE
		4 inches grass turf			SS-1		3 4 4		8
		<u>SAND (SP)</u> loose, very pale brown, fine - - - Medium dense			SS-2		4 5 7		12
5		- - - Loose			SS-3		4 3 3		6
		<u>SLIGHTLY SILTY SAND (SP-SM)</u> loose, grayish brown, fine - - - Medium dense, pale brown			SS-4		3 3 4		7
10					SS-5		3 5 8		13
		<u>SILTY SAND (SM)</u> medium dense, gray, fine			SS-6		5 6 5		11
15									
		<u>SAND (SP)</u> medium dense, yellow, fine			SS-7		6 8 11		19
20									
		<u>CLAY (CH)</u> firm, greenish gray			SS-8		4 3 4		7
25		Boring terminated at 25 ft Backfilled with cuttings upon completion Target Depth							

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PROJECT: River Cross Development Seminole County, Florida S&ME Project No. 527118014				BORING LOG B-13					
DATE DRILLED: 3/5/18		ELEVATION: N/A			NOTES:				
DRILL RIG: CME 45		BORING DEPTH: 25.0 ft							
DRILLER: Reliable Field Services		WATER LEVEL: 5.5 feet ATD							
HAMMER TYPE: Safety		LOGGED BY: W. Fox							
SAMPLING METHOD: Split spoon					NORTHING: N/A		EASTING: N/A		
DRILLING METHOD: Mud Rotary									
DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT / CORE DATA 1st 6in / RUN # 2nd 6in / REC 3rd 6in / RQD	STANDARD PENETRATION TEST DATA (blows/ft) / REMARKS	N VALUE
		4 inches grass turf			SS-1		2 3 5		8
		SAND (SP) loose, white, fine - - - Medium dense			SS-2		6 9 8		17
5					SS-3		8 8 8		16
		- - - Pale brown			SS-4		8 9 10		19
		SLIGHTLY SILTY SAND (SP-SM) medium dense, dark brown, fine			SS-5		8 10 12		22
10									
		- - - Dense, very dark brown			SS-6		10 13 19		32
15									
		- - - Medium dense, dark brown			SS-7		8 10 12		22
20									
		SILTY SAND (SM) medium dense, pale brown, fine			SS-8		8 10 10		20
25		Boring terminated at 25 ft Backfilled with cuttings upon completion Target Depth							

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PROJECT: River Cross Development Seminole County, Florida S&ME Project No. 527118014				BORING LOG B-14					
DATE DRILLED: 3/5/18		ELEVATION: N/A			NOTES: -200 = Percent passing #200 sieve				
DRILL RIG: CME 45		BORING DEPTH: 25.0 ft							
DRILLER: Reliable Field Services		WATER LEVEL: 5 feet ATD							
HAMMER TYPE: Safety		LOGGED BY: W. Fox							
SAMPLING METHOD: Split spoon					NORTHING: N/A		EASTING: N/A		
DRILLING METHOD: Mud Rotary									
DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT / CORE DATA 1st 6in / RUN # 2nd 6in / REC 3rd 6in / RQD	STANDARD PENETRATION TEST DATA (blows/ft) / REMARKS 10 20 30 60 80	N VALUE
		3 inches grass turf			SS-1		3 2 2		4
		SAND (SP) loose, yellow, fine - - - Medium dense, white			SS-2		4 5 7		12
5		- - - Very pale brown			SS-3		6 6 7		13
		SILTY SAND (SM) loose, very pale brown, fine (-200=17%)			SS-4		4 4 3		7
10					SS-5		2 2 3		5
		- - - Medium dense, white			SS-6		3 5 10		15
15									
		- - - Less silty			SS-7		9 11 13		24
20									
		CLAYEY SAND (SC) loose, mottled gray and yellowish brown, fine			SS-8		3 4 3		7
25		Boring terminated at 25 ft Backfilled with cuttings upon completion Target Depth							

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PROJECT: River Cross Development Seminole County, Florida S&ME Project No. 527118014				BORING LOG B-15					
DATE DRILLED: 3/5/18		ELEVATION: N/A		NOTES:					
DRILL RIG: CME 45		BORING DEPTH: 25.0 ft							
DRILLER: Reliable Field Services		WATER LEVEL: 5.5 feet ATD							
HAMMER TYPE: Safety		LOGGED BY: W. Fox							
SAMPLING METHOD: Split spoon				NORTHING: N/A		EASTING: N/A			
DRILLING METHOD: Mud Rotary									
DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT / CORE DATA 1st 6in / RUN # 2nd 6in / REC 3rd 6in / RQD	STANDARD PENETRATION TEST DATA (blows/ft) / REMARKS	N VALUE
		3 inches grass turf			SS-1		3 2 3		5
		<u>SAND (SP)</u> loose, very pale brown, fine - - - Medium dense, white			SS-2		6 7 8		15
5					SS-3		7 7 8		15
		<u>CLAYEY SAND (SC)</u> medium dense, yellow, fine - - - Mottled gray and yellowish brown			SS-4		6 6 5		11
10					SS-5		5 6 7		13
		<u>SLIGHTLY SILTY SAND (SP-SM)</u> loose, light gray, fine			SS-6		3 4 4		8
15									
		- - - Medium dense			SS-7		4 5 6		11
20									
		- - - White			SS-8		4 7 3		10
25		Boring terminated at 25 ft Backfilled with cuttings upon completion Target Depth							

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PROJECT: River Cross Development Seminole County, Florida S&ME Project No. 527118014					BORING LOG B-16							
DATE DRILLED: 3/21/18			ELEVATION: N/A			NOTES:						
DRILL RIG: CME 45			BORING DEPTH: 25.0 ft									
DRILLER: Reliable Field Services			WATER LEVEL: 3 feet ATD									
HAMMER TYPE: Safety			LOGGED BY: W. Fox									
SAMPLING METHOD: Split spoon						NORTHING: N/A		EASTING: N/A				
DRILLING METHOD: Mud Rotary												
DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT / CORE DATA 1st 6in / RUN # 2nd 6in / REC 3rd 6in / RQD			STANDARD PENETRATION TEST DATA (blows/ft) / REMARKS	N VALUE	
		<u>SLIGHTLY SILTY SAND (SP-SM)</u> loose, dark grayish brown, fine, mixed with gravel up to 1-inch size	▽		SS-1	◆	2	4	5	10 20 30 60 80	9	
					SS-2	◆	3	6	7		13	
					SS-3	◆	6	7	8		15	
					SS-4	◆	8	10	9		19	
					SS-5	◆	7	6	8		14	
5	◆◆◆	<u>SAND SAND (SM)</u> medium dense, very dark brown, fine, organic stained										
		<u>SLIGHTLY SILTY SAND (SP-SM)</u> medium dense, dark brown, fine - - - Dark grayish brown										
10	◆◆◆											
		<u>SAND (SP)</u> medium dense, very pale brown, fine			SS-6	◆	9	11	15		26	
15	◆◆◆											
		<u>SLIGHTLY SILTY SAND (SP-SM)</u> medium dense, light gray, fine			SS-7	◆	14	15	12		27	
20	◆◆◆											
		- - - Dense, grayish brown			SS-8	◆	18	21	23		44	
25		Boring terminated at 25 ft Backfilled with cuttings upon completion Target Depth										

NOTES:

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3. STRATIFICATION AND GROUNDWATER DEPTHS ARE NOT EXACT.
4. WATER LEVEL IS AT TIME OF EXPLORATION AND WILL VARY.



PROJECT: River Cross Development Seminole County, Florida S&ME Project No. 527118014				BORING LOG B-17					
DATE DRILLED: 2/26/18		ELEVATION: N/A			NOTES:				
DRILL RIG: CME 45		BORING DEPTH: 25.0 ft							
DRILLER: Reliable Field Services		WATER LEVEL: 5 feet ATD							
HAMMER TYPE: Safety		LOGGED BY: W. Fox							
SAMPLING METHOD: Split spoon					NORTHING: N/A		EASTING: N/A		
DRILLING METHOD: Mud Rotary									
DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT / CORE DATA 1st 6in / RUN # 2nd 6in / REC 3rd 6in / RQD	STANDARD PENETRATION TEST DATA (blows/ft) / REMARKS	N VALUE
		3 inches grass turf			SS-1		1 2 2		4
		SAND (SP) loose, very pale brown, fine			SS-2		3 4 5		9
5		SLIGHTLY SILTY SAND (SP-SM) loose, grayish brown, fine	▽		SS-3		4 5 3		8
		- - - Medium dense, dark grayish brown			SS-4		4 5 6		11
		- - - Very dark grayish brown			SS-5		5 6 7		13
10									
		- - - Brown			SS-6		7 8 8		16
15									
		- - - Dense			SS-7		9 14 17		31
20									
		CLAY (CL) stiff, greenish gray, with light gray sand seams			SS-8		12 8 7		15
25		Boring terminated at 25 ft Backfilled with cuttings upon completion Target Depth							

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Page 1 of 1



PROJECT: River Cross Development Seminole County, Florida S&ME Project No. 527118014				BORING LOG B-18					
DATE DRILLED: 3/2/18		ELEVATION: N/A			NOTES: -200 = Percent passing #200 sieve				
DRILL RIG: CME 45		BORING DEPTH: 25.0 ft							
DRILLER: Reliable Field Services		WATER LEVEL: 5 feet ATD							
HAMMER TYPE: Safety		LOGGED BY: W. Fox							
SAMPLING METHOD: Split spoon					NORTHING: N/A		EASTING: N/A		
DRILLING METHOD: Mud Rotary									
DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT / CORE DATA 1st 6in / RUN # 2nd 6in / REC 3rd 6in / RQD	STANDARD PENETRATION TEST DATA (blows/ft) / REMARKS	N VALUE
		3 inches grass turf			SS-1		2 3 3		6
		SAND (SP) loose, white, fine - - - Medium dense, (-200=2.5%)			SS-2		4 7 8		15
5		- - - Loose			SS-3		5 3 5		8
		SLIGHTLY SILTY SAND (SP-SM) medium dense, dark yellowish brown, fine			SS-4		7 8 10		18
10					SS-5		8 10 10		20
15		- - - Dense, pale brown			SS-6		8 17 21		38
20		SILTY SAND (SM) medium dense, pale brown, fine			SS-7		6 8 10		18
25		- - - Dense, less silty			SS-8		12 15 21		36
		Boring terminated at 25 ft Backfilled with cuttings upon completion Target Depth							

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PROJECT: River Cross Development Seminole County, Florida S&ME Project No. 527118014				BORING LOG B-19					
DATE DRILLED: 3/2/18		ELEVATION: N/A		NOTES:					
DRILL RIG: CME 45		BORING DEPTH: 25.0 ft							
DRILLER: Reliable Field Services		WATER LEVEL: 3.5 feet ATD							
HAMMER TYPE: Safety		LOGGED BY: W. Fox							
SAMPLING METHOD: Split spoon				NORTHING: N/A		EASTING: N/A			
DRILLING METHOD: Mud Rotary									
DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT / CORE DATA 1st 6in / RUN # 2nd 6in / REC 3rd 6in / RQD	STANDARD PENETRATION TEST DATA (blows/ft) / REMARKS 10 20 30 60 80	N VALUE
		3 inches grass turf			SS-1		2 2 2		4
		SLIGHTLY SILTY SAND (SP-SM) loose, very dark brown, fine, organic stained			SS-2		3 5 8		13
5		SAND (SP) medium dense, yellowish brown, fine			SS-3		9 10 10		20
					SS-4		10 11 12		23
		SLIGHTLY SILTY SAND (SP-SM) medium dense, pale brown, fine			SS-5		12 13 17		30
10									
		SAND (SP) medium dense, white, fine			SS-6		5 6 8		14
15									
		- - - Very light gray			SS-7		6 7 7		14
20									
		CLAY (CH) stiff, blueish gray			SS-8		2 3 4		7
25		Boring terminated at 25 ft Backfilled with cuttings upon completion Target Depth							

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PROJECT: River Cross Development Seminole County, Florida S&ME Project No. 527118014				BORING LOG B-20					
DATE DRILLED: 3/5/18		ELEVATION: N/A			NOTES: -200 = Percent passing #200 sieve				
DRILL RIG: CME 45		BORING DEPTH: 25.0 ft							
DRILLER: Reliable Field Services		WATER LEVEL: 2 feet ATD							
HAMMER TYPE: Safety		LOGGED BY: W. Fox							
SAMPLING METHOD: Split spoon					NORTHING: N/A		EASTING: N/A		
DRILLING METHOD: Mud Rotary									
DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT / CORE DATA 1st 6in / RUN # 2nd 6in / REC 3rd 6in / RQD	STANDARD PENETRATION TEST DATA (blows/ft) / REMARKS 10 20 30 60 80	N VALUE
		3 inches grass turf			SS-1		3 2 2		4
		<u>SLIGHTLY SILTY SAND (SP-SM)</u> loose, yellowish brown, fine			SS-2		2 2 3		5
5					SS-3		2 3 3		6
		- - - Dark yellowish brown			SS-4		2 3 4		7
		- - - Medium dense			SS-5		5 6 6		12
10									
		<u>SAND (SP)</u> medium dense, very light brown, fine			SS-6		7 6 6		12
15		- - - (-200=1.6%)							
		- - - White			SS-7		8 8 9		17
20									
		<u>CLAY (CH)</u> firm, blueish gray			SS-8		4 3 4		7
25									
		Boring terminated at 25 ft Backfilled with cuttings upon completion Target Depth							

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PROJECT: River Cross Development Seminole County, Florida S&ME Project No. 527118014				BORING LOG B-21					
DATE DRILLED: 3/6/18		ELEVATION: N/A		NOTES:					
DRILL RIG: CME 45		BORING DEPTH: 25.0 ft							
DRILLER: Reliable Field Services		WATER LEVEL: 3.5 feet ATD							
HAMMER TYPE: Safety		LOGGED BY: W. Fox							
SAMPLING METHOD: Split spoon				NORTHING: N/A		EASTING: N/A			
DRILLING METHOD: Mud Rotary									
DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT / CORE DATA 1st 6in / RUN # 2nd 6in / REC 3rd 6in / RQD	STANDARD PENETRATION TEST DATA (blows/ft) / REMARKS 10 20 30 60 80	N VALUE
		3 inches grass turf			SS-1		2 3 5		8
		SLIGHTLY SILTY SAND (SP-SM) loose, very dark brown, fine, organic stained			SS-2		8 10 12		22
5		SLIGHTLY SILTY SAND (SP-SM) medium dense, dark yellowish brown, fine			SS-3		6 4 3		7
		--- Loose			SS-4		3 2 3		5
					SS-5		3 3 2		5
10									
		--- Medium dense, light gray			SS-6		5 6 7		13
20					SS-7		8 8 11		19
		CLAY (CH) firm, greenish gray			SS-8		4 4 4		8
25		Boring terminated at 25 ft Backfilled with cuttings upon completion Target Depth							

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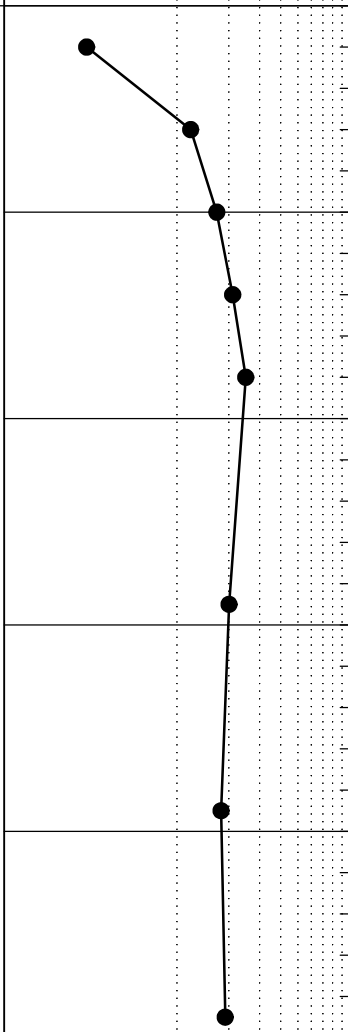


PROJECT: River Cross Development Seminole County, Florida S&ME Project No. 527118014				BORING LOG B-22					
DATE DRILLED: 2/16/18		ELEVATION: N/A			NOTES: -200 = Percent passing #200 sieve				
DRILL RIG: CME 45		BORING DEPTH: 25.0 ft							
DRILLER: Reliable Field Services		WATER LEVEL: 2 feet ATD							
HAMMER TYPE: Safety		LOGGED BY: W. Fox							
SAMPLING METHOD: Split spoon					NORTHING: N/A		EASTING: N/A		
DRILLING METHOD: Mud Rotary									
DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT / CORE DATA 1st 6in / RUN # 2nd 6in / REC 3rd 6in / RQD	STANDARD PENETRATION TEST DATA (blows/ft) / REMARKS 10 20 30 60 80	N VALUE
		3 inches grass turf			SS-1		2 2 2		4
		SAND (SP) loose, gray, fine - - - Brownish yellow, (-200=2.9%)			SS-2		3 4 5		9
5		SLIGHTLY SILTY SAND (SP-SM) loose, brown, fine			SS-3		5 5 4		9
					SS-4		4 5 4		9
10					SS-5		4 5 5		10
					SS-6		5 5 5		10
15					SS-7		9 10 9		19
20		CLAYEY SAND (SC) medium dense, pale brown, fine			SS-8		10 14 14		28
		SLIGHTLY SILTY SAND (SP-SM) medium dense, pale brown, fine							
25		Boring terminated at 25 ft Backfilled with cuttings upon completion Target Depth							

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PROJECT: River Cross Development Seminole County, Florida S&ME Project No. 527118014					BORING LOG B-23						
DATE DRILLED: 2/16/18			ELEVATION: N/A			NOTES:					
DRILL RIG: CME 45			BORING DEPTH: 25.0 ft								
DRILLER: Reliable Field Services			WATER LEVEL: 1 foot ATD								
HAMMER TYPE: Safety			LOGGED BY: W. Fox								
SAMPLING METHOD: Split spoon						NORTHING: N/A		EASTING: N/A			
DRILLING METHOD: Mud Rotary											
DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT / CORE DATA 1st 6in / RUN # 2nd 6in / REC 3rd 6in / RQD			STANDARD PENETRATION TEST DATA (blows/ft) / REMARKS	N VALUE
		<u>SILTY SAND (SM)</u> very loose, black, fine, with organic matter	▽		SS-1	◆	1	1	2		3
		<u>SLIGHTLY SILTY SAND (SP-SM)</u> medium dense, gray, fine - - - Dark brown			SS-2	◆	4	5	7		12
5					SS-3	◆	7	8	9		17
					SS-4	◆	9	10	11		21
10					SS-5	◆	10	12	13		25
		<u>SLIGHTLY CLAYEY SAND (SP-SC)</u> medium dense, light gray, fine			SS-6	◀▶	9	10	10		20
15											
		<u>CLAYEY SAND (SC)</u> medium dense, pale brown, fine			SS-7	◀▶	9	9	9		18
20											
		- - - Less clayey			SS-8	◀▶	9	9	10		19
25		Boring terminated at 25 ft Backfilled with cuttings upon completion Target Depth									

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PROJECT: River Cross Development Seminole County, Florida S&ME Project No. 527118014				BORING LOG B-24								
DATE DRILLED: 3/6/18		ELEVATION: N/A		NOTES:								
DRILL RIG: CME 45		BORING DEPTH: 25.0 ft										
DRILLER: Reliable Field Services		WATER LEVEL: At ground surface										
HAMMER TYPE: Safety		LOGGED BY: W. Fox										
SAMPLING METHOD: Split spoon				NORTHING: N/A		EASTING: N/A						
DRILLING METHOD: Mud Rotary												
DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT / CORE DATA 1st 6in / RUN # 2nd 6in / REC 3rd 6in / RQD	STANDARD PENETRATION TEST DATA (blows/ft) / REMARKS 1020306080				N VALUE
		CLAY (OH) very soft, black, organic			SS-1		1WOHWOH					WOH
					SS-2		1WOHWOH					WOH
5		CLAY (CH) very soft, blueish gray			SS-3		1WOHWOH					WOH
		SLIGHTLY SILTY SAND (SP-SM) very loose, gray, fine - - - Pale brown			SS-4		112					3
					SS-5		121					3
10												
		SAND SAND (SM) loose, very dark gray, fine, trace organic matter			SS-6		233					6
15												
		SLIGHTLY SILTY SAND (SP-SM) medium dense, grayish brown, fine			SS-7		8810					18
20												
		SILTY SAND (SM) very dark brown, fine, trace organic matter			SS-8		101215					27
25		Boring terminated at 25 ft Backfilled with cuttings upon completion Target Depth										

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PROJECT: River Cross Development Seminole County, Florida S&ME Project No. 527118014					BORING LOG B-25						
DATE DRILLED: 2/26/18			ELEVATION: N/A			NOTES: OC = Organic content MC = Moisture content					
DRILL RIG: CME 45			BORING DEPTH: 25.0 ft								
DRILLER: Reliable Field Services			WATER LEVEL: 5.5 feet ATD								
HAMMER TYPE: Safety			LOGGED BY: W. Fox								
SAMPLING METHOD: Split spoon						NORTHING: N/A		EASTING: N/A			
DRILLING METHOD: Mud Rotary											
DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT / CORE DATA 1st 6in / RUN # 2nd 6in / REC 3rd 6in / RQD			STANDARD PENETRATION TEST DATA (blows/ft) / REMARKS	N VALUE
		SILTY SAND (SM) loose, black, fine, trace organic matter (OC=4.8%, MC=2.5%)	▽		SS-1	◆	2	2	3	●	5
		CLAYEY SAND (SC) medium dense, very pale brown, fine - - - Brownish gray			SS-2	◆	7	9	7	●	16
5		SILTY SAND (SM) medium dense, dark brown, fine - - - Brown			SS-3	◆	5	6	5	●	11
					SS-4	◆	8	7	3	●	10
					SS-5	◆	5	6	7	●	13
10											
		- - - Very dense, pale brown, less silty			SS-6	◆	22	28	34	●	62
15											
		CLAYEY SAND (SC) very dense, blueish gray, fine		SS-7	◆	8	22	29	●	51	
20											
		SILTY SAND (SM) very dense, pale brown, fine		SS-8	◆	15	22	30	●	52	
25		Boring terminated at 25 ft Backfilled with cuttings upon completion Target Depth									

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PROJECT: River Cross Development Seminole County, Florida S&ME Project No. 527118014				BORING LOG B-26					
DATE DRILLED: 2/26/18		ELEVATION: N/A			NOTES:				
DRILL RIG: CME 45		BORING DEPTH: 25.0 ft							
DRILLER: Reliable Field Services		WATER LEVEL: 3 feet ATD							
HAMMER TYPE: Safety		LOGGED BY: W. Fox							
SAMPLING METHOD: Split spoon					NORTHING: N/A		EASTING: N/A		
DRILLING METHOD: Mud Rotary									
DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT / CORE DATA 1st 6in / RUN # 2nd 6in / REC 3rd 6in / RQD	STANDARD PENETRATION TEST DATA (blows/ft) / REMARKS	N VALUE
		SILTY SAND (SM) loose, black, fine, trace organic matter			SS-1		2 3 6		9
		SAND (SP) medium dense, light gray, fine			SS-2		5 6 7		13
5		SILTY SAND (SM) medium dense, very dark brown, fine, trace organic matter			SS-3		10 8 9		17
		CLAYEY SAND (SC) medium dense, yellowish brown, fine			SS-4		8 7 6		13
10					SS-5		5 6 8		14
		SLIGHTLY SILTY SAND (SP-SM) medium dense, brown, fine			SS-6		12 14 15		29
15									
		CLAY (CH) firm, blueish gray			SS-7		3 3 3		6
20									
		CLAYEY SAND (SC) medium dense, light greenish gray, fine			SS-8		9 10 13		23
25		Boring terminated at 25 ft Backfilled with cuttings upon completion Target Depth							

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PROJECT: River Cross Development Seminole County, Florida S&ME Project No. 527118014				BORING LOG B-27						
DATE DRILLED: 3/2/18		ELEVATION: N/A			NOTES: OC = Organic content MC = Moisture content					
DRILL RIG: CME 45		BORING DEPTH: 25.0 ft								
DRILLER: Reliable Field Services		WATER LEVEL: 3 feet ATD								
HAMMER TYPE: Safety		LOGGED BY: W. Fox								
SAMPLING METHOD: Split spoon					NORTHING: N/A		EASTING: N/A			
DRILLING METHOD: Mud Rotary										
DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT / CORE DATA 1st 6in / RUN # 2nd 6in / REC 3rd 6in / RQD	STANDARD PENETRATION TEST DATA (blows/ft) / REMARKS 10 20 30 60 80	N VALUE	
		<u>SILTY SAND (SM)</u> very loose, very dark gray, fine, trace organic matter (OC=4.5%, MC=28%)	▽		SS-1	◆	1 1 2	●	3	
		<u>SLIGHTLY SILTY SAND (SP-SM)</u> loose, yellowish brown, fine			SS-2	◆	2 3 2	●	5	
5		- - - Pale brown			SS-3	◆	3 3 4	●	7	
		- - - Dark brown, trace organic matter			SS-4	◆	4 4 4	●	8	
		- - - Brown			SS-5	◆	4 5 5	●	10	
10										
		<u>SAND (SP)</u> medium dense, white, fine			SS-6	◆	10 11 13	●	24	
15										
		<u>SLIGHTLY SILTY SAND (SP-SM)</u> medium dense, very pale brown, fine		SS-7	◆	6 7 7	●	14		
20										
					SS-8	◆	10 11 11	●	22	
25		Boring terminated at 25 ft Backfilled with cuttings upon completion Target Depth								

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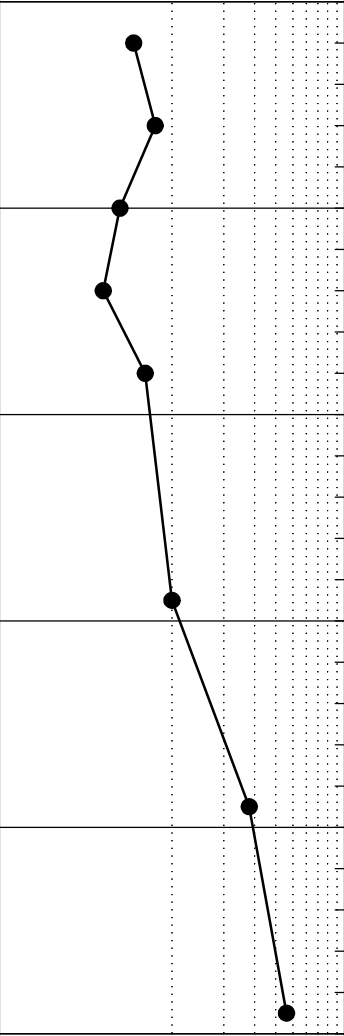


PROJECT: River Cross Development Seminole County, Florida S&ME Project No. 527118014					BORING LOG B-28						
DATE DRILLED: 3/2/18			ELEVATION: N/A			NOTES:					
DRILL RIG: CME 45			BORING DEPTH: 25.0 ft								
DRILLER: Reliable Field Services			WATER LEVEL: 3.5 feet ATD								
HAMMER TYPE: Safety			LOGGED BY: W. Fox								
SAMPLING METHOD: Split spoon						NORTHING: N/A		EASTING: N/A			
DRILLING METHOD: Mud Rotary											
DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT / CORE DATA 1st 6in / RUN # 2nd 6in / REC 3rd 6in / RQD			STANDARD PENETRATION TEST DATA (blows/ft) / REMARKS 10 20 30 60 80	N VALUE
5		SILTY SAND (SM) loose, black, fine, with organic matter			SS-1		1	2	2		4
		SS-2				2	2	2	4		
		SS-3				2	3	3	6		
		SS-4				5	6	6	12		
		SS-5				9	10	15	25		
15		--- Pale brown			SS-6		6	6	7		13
		--- Very pale brown			SS-7		6	7	7		14
25		SILTY SAND (SM) loose, white, fine			SS-8		2	3	4		7
		Boring terminated at 25 ft Backfilled with cuttings upon completion Target Depth									

NOTES:

1. THIS LOG IS ONLY A PORTION OF A REPORT PREPARED FOR THE NAMED PROJECT AND MUST ONLY BE USED TOGETHER WITH THAT REPORT.
2. BORING, SAMPLING AND PENETRATION TEST DATA IN GENERAL ACCORDANCE WITH ASTM D-1586.
3. STRATIFICATION AND GROUNDWATER DEPTHS ARE NOT EXACT.
4. WATER LEVEL IS AT TIME OF EXPLORATION AND WILL VARY.



PROJECT: River Cross Development Seminole County, Florida S&ME Project No. 527118014					BORING LOG B-29						
DATE DRILLED: 3/5/18			ELEVATION: N/A			NOTES:					
DRILL RIG: CME 45			BORING DEPTH: 25.0 ft								
DRILLER: Reliable Field Services			WATER LEVEL: 1.5 feet ATD								
HAMMER TYPE: Safety			LOGGED BY: W. Fox								
SAMPLING METHOD: Split spoon						NORTHING: N/A		EASTING: N/A			
DRILLING METHOD: Mud Rotary											
DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT / CORE DATA			STANDARD PENETRATION TEST DATA (blows/ft) / REMARKS	N VALUE
		<u>SLIGHTLY SILTY SAND (SP-SM)</u> loose, dark brown, fine			SS-1		2	2	4		6
		- - - Yellowish brown			SS-2		3	4	4		8
5					SS-3		4	3	2		5
					SS-4		2	2	2		4
					SS-5		2	3	4		7
10											
		- - - Very pale brown			SS-6		5	5	5		10
15											
		<u>SAND (SP)</u> medium dense, very pale brown, fine			SS-7		10	12	16		28
20											
		- - - Dense			SS-8		16	21	25		46
25		Boring terminated at 25 ft Backfilled with cuttings upon completion Target Depth									

NOTES:

1. THIS LOG IS ONLY A PORTION OF A REPORT PREPARED FOR THE NAMED PROJECT AND MUST ONLY BE USED TOGETHER WITH THAT REPORT.
2. BORING, SAMPLING AND PENETRATION TEST DATA IN GENERAL ACCORDANCE WITH ASTM D-1586.
3. STRATIFICATION AND GROUNDWATER DEPTHS ARE NOT EXACT.
4. WATER LEVEL IS AT TIME OF EXPLORATION AND WILL VARY.



PROJECT: River Cross Development Seminole County, Florida 527118014		HAND AUGER BORING LOG: HAB-1	
DATE STARTED: 3/1/18		DATE FINISHED: 3/1/18	
NOTES:			
SAMPLING METHOD: Hand auger		PERFORMED BY: Reliable Field Services	
WATER LEVEL: 3 inches ATD			

Depth (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION (feet)	WATER LEVEL
1	▬▬▬▬▬▬	PEAT (PT) dark reddish brown, sandy, fibrous		▽
2	▬▬▬▬▬▬	SLIGHTLY SILTY SAND (SP-SM) dark grayish brown, fine		
3	▬▬▬▬▬▬	--- Dark yellowish brown		
4	▬▬▬▬▬▬	--- Grayish brown		
5	▬▬▬▬▬▬	--- Very dark brown		
6	▬▬▬▬▬▬			
7	▬▬▬▬▬▬	Boring terminated at 7 ft Backfilled with cuttings upon completion Target Depth		

MANUAL PROBE RESULTS (P-1/HAB-1 AT CENTER)

LEGEND:

0	STANDING WATER
12	MUCK THICKNESS
12	SAND THICKNESS
24	TOTAL PROBE DEPTH

NOTES:

1. ALL DIMENSIONS ARE IN INCHES.
2. SPACING BETWEEN PROBE LOCATIONS IS APPROXIMATELY 10'

PROJECT: River Cross Development Seminole County, Florida 527118014		HAND AUGER BORING LOG: HAB-2			
DATE STARTED: 3/1/18		DATE FINISHED: 3/1/18			
SAMPLING METHOD: Hand auger		PERFORMED BY: Reliable Field Services			
WATER LEVEL: 2 feet ATD		NOTES:			
Depth (feet)	GRAPHIC LOG			MATERIAL DESCRIPTION	ELEVATION (feet)
1	0 4 4 8			SILTY SAND (SM) black, fine, with organic matter SLIGHTLY SILTY SAND (SP-SM) dark gray, fine --- Dark brown --- Yellowish brown	-
2	0 6 6 12				-
3	0 6 6 12				-
4	0 6 6 12		-		
5	0 6 6 12		-		
6	0 6 6 12	SAND (SP) light brown, fine	-		
7	0 6 6 12	Boring terminated at 7 ft Backfilled with cuttings upon completion Target Depth	-		

MANUAL PROBE RESULTS (P-2/HAB-2 AT CENTER)

W

0	0	0
6	6	6
6	6	12
12	12	18

0
6
6
12

N

0	4	4	8
0	6	6	12

0	4	4	8
0	6	6	12

E

0	0	0
6	6	6
6	6	6
12	12	12

S

0	6 6 12
0	6 6 12

0	6 6 12
0	6 6 12

LEGEND:

	STANDING WATER
	MUCK THICKNESS
	SAND THICKNESS
	TOTAL PROBE DEPTH

NOTES:

1. ALL DIMENSIONS ARE IN INCHES.
2. SPACING BETWEEN PROBE LOCATIONS IS APPROXIMATELY 10'

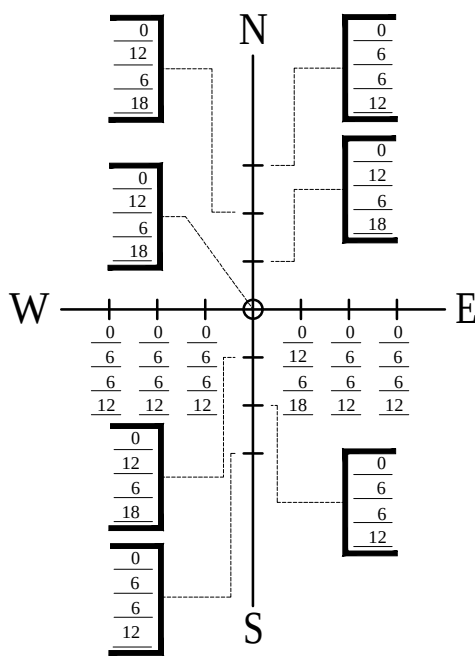
PROJECT: River Cross Development Seminole County, Florida 527118014		HAND AUGER BORING LOG: HAB-7	
DATE STARTED: 3/1/18		DATE FINISHED: 3/1/18	
NOTES:			
SAMPLING METHOD: Hand auger		PERFORMED BY: Reliable Field Services	
WATER LEVEL: 1.5 feet ATD			

Depth (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION (feet)	WATER LEVEL
1		PEAT (PT) dark reddish brown, sandy, fibrous		
2		SLIGHTLY SILTY SAND (SP-SM) gray, fine		
3		- - - Dark yellowish brown		
4				
5		- - - Light grayish brown		
6		Boring terminated at 6 ft Backfilled with cuttings upon completion Target Depth		

MANUAL PROBE RESULTS (P-7/HAB-7 AT CENTER)

LEGEND:

0	STANDING WATER
12	MUCK THICKNESS
12	SAND THICKNESS
24	TOTAL PROBE DEPTH



NOTES:

1. ALL DIMENSIONS ARE IN INCHES.
2. SPACING BETWEEN PROBE LOCATIONS IS APPROXIMATELY 10'

PROJECT: River Cross Development Seminole County, Florida 527118014		HAND AUGER BORING LOG: HAB-8	
DATE STARTED: 3/1/18		DATE FINISHED: 3/1/18	
NOTES:			
SAMPLING METHOD: Hand auger		PERFORMED BY: Reliable Field Services	
WATER LEVEL: 2.5 feet ATD			

Depth (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION (feet)	WATER LEVEL
1		SLIGHTLY SILTY SAND (SP-SM) brown, fine		-
2		--- Yellowish brown		-
3		--- Brownish gray		-
4		CLAYEY SAND (SC) gray, fine		-
5		Boring terminated at 5 ft Backfilled with cuttings upon completion Target Depth		-

MANUAL PROBE RESULTS (P-8/HAB-8 AT CENTER)

LEGEND:

0	STANDING WATER
12	MUCK THICKNESS
12	SAND THICKNESS
24	TOTAL PROBE DEPTH

NOTES:

1. ALL DIMENSIONS ARE IN INCHES.
2. SPACING BETWEEN PROBE LOCATIONS IS APPROXIMATELY 10'

PROJECT: River Cross Development Seminole County, Florida 527118014		HAND AUGER BORING LOG: HAB-9	
DATE STARTED: 3/1/18		DATE FINISHED: 3/1/18	
SAMPLING METHOD: Hand auger		PERFORMED BY: Reliable Field Services	
WATER LEVEL: 6 feet ATD			
Depth (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION (feet)
1		SLIGHTLY SILTY SAND (SP-SM) dark gray, fine - - - Gray	-
2		SILTY SAND (SM) dark reddish brown, fine, with organic matter	-
3		SILTY SAND (SM) yellowish brown, fine	-
4			-
5		- - - Trace cementation	-
6			▽
Boring terminated at 6.5 ft Backfilled with cuttings upon completion Target Depth			

PROJECT: River Cross Development Seminole County, Florida 527118014		HAND AUGER BORING LOG: HAB-10			
DATE STARTED: 3/1/18		DATE FINISHED: 3/1/18			
SAMPLING METHOD: Hand auger		PERFORMED BY: Reliable Field Services			
WATER LEVEL: At ground Surface		NOTES:			
Depth (feet)	GRAPHIC LOG			MATERIAL DESCRIPTION	ELEVATION (feet)
1	[Pattern: Horizontal lines]			<u>PEAT (PT)</u> dark yellowish brown, sandy, fibrous	▽
2	[Pattern: Dotted]			<u>SILTY SAND (SM)</u> dark gray, fine, with organic matter	-
3	[Pattern: Dotted]			<u>SLIGHTLY SILTY SAND (SP-SM)</u> pale brown, fine	-
4	[Pattern: Dotted]	- - - Dark gray	-		
5	[Pattern: Dotted]	Boring terminated at 5 ft Backfilled with cuttings upon completion Target Depth	-		

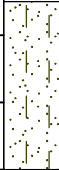
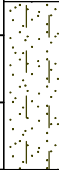
MANUAL PROBE RESULTS (P-10/HAB-10 AT CENTER)

LEGEND:

0	STANDING WATER
12	MUCK THICKNESS
12	SAND THICKNESS
24	TOTAL PROBE DEPTH

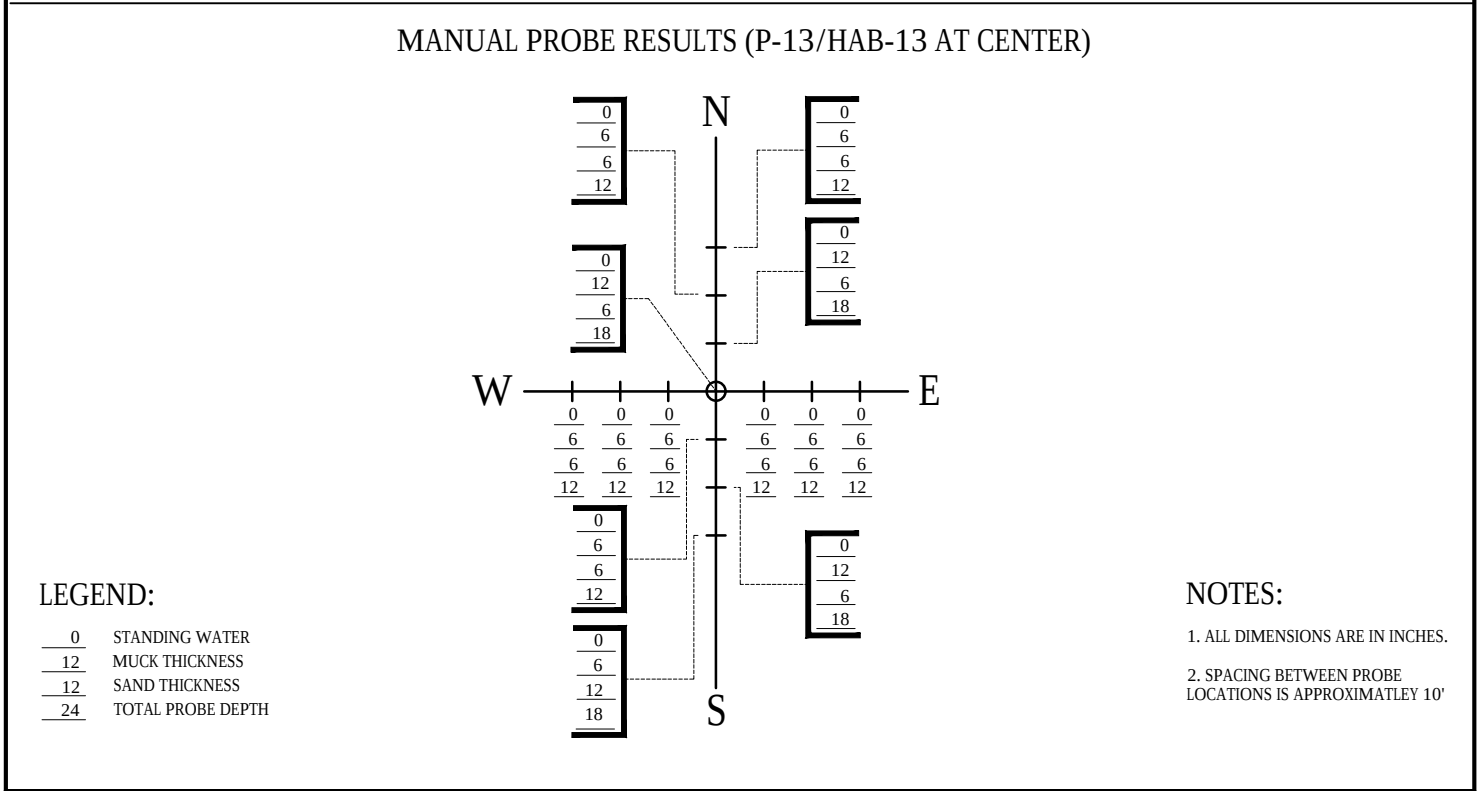
NOTES:

1. ALL DIMENSIONS ARE IN INCHES.
2. SPACING BETWEEN PROBE LOCATIONS IS APPROXIMATELY 10'

PROJECT: River Cross Development Seminole County, Florida 527118014		HAND AUGER BORING LOG: HAB-12		
DATE STARTED: 3/1/18		DATE FINISHED: 3/1/18		
SAMPLING METHOD: Hand auger		PERFORMED BY: Reliable Field Services		
WATER LEVEL: 5 feet ATD				
Depth (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION (feet)	WATER LEVEL
1		<u>SAND (SP)</u> light gray, fine - - - Very pale brown		-
2		- - - Brown		-
3		<u>SLIGHTLY SILTY SAND (SP-SM)</u> yellowish brown, fine		-
4		Boring terminated at 6 ft Backfilled with cuttings upon completion Target Depth		-
5				-
6				-

PROJECT: River Cross Development Seminole County, Florida 527118014		HAND AUGER BORING LOG: HAB-13	
DATE STARTED: 3/1/18		DATE FINISHED: 3/1/18	
SAMPLING METHOD: Hand auger		PERFORMED BY: Reliable Field Services	
WATER LEVEL: 0.5 feet ATD		NOTES: OC = Organic content MC = Moisture content	

Depth (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION (feet)	WATER LEVEL
1	▬▬▬▬▬▬	PEAT (PT) dark yellowish brown, fibrous, (OC=83%, MC=436%)		▽
2	••••••••	SAND (SP) gray to light gray, fine		-
3	••••••••	SLIGHTLY SILTY SAND (SP-SM) brown to dark brown, fine		-
4				-
5				-
6		Boring terminated at 6 ft Backfilled with cuttings upon completion Target Depth		



PROJECT: River Cross Development Seminole County, Florida 527118014		HAND AUGER BORING LOG: HAB-15	
DATE STARTED: 3/1/18		DATE FINISHED: 3/1/18	
SAMPLING METHOD: Hand auger		PERFORMED BY: Reliable Field Services	
WATER LEVEL: 4 feet ATD			
Depth (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION (feet)
1		<u>PEAT (PT)</u> dark yellowish brown, sandy, fibrous	-
2		<u>SILTY SAND (SM)</u> very dark gray, fine, with organic matter	-
3		<u>SLIGHTLY SILTY SAND (SP-SM)</u> dark brown to dark yellowish brown, fine	-
4			▽
5		<u>CLAYEY SAND (SC)</u> grayish brown, fine	-
6		Boring terminated at 6 ft Backfilled with cuttings upon completion Target Depth	-

PROJECT: River Cross Development Seminole County, Florida 527118014		HAND AUGER BORING LOG: HAB-17	
DATE STARTED: 3/1/18		DATE FINISHED: 3/1/18	
NOTES:			
SAMPLING METHOD: Hand auger		PERFORMED BY: Reliable Field Services	
WATER LEVEL: 1 foot ATD			

Depth (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION (feet)	WATER LEVEL
1	[Symbol: Orange dots]	<u>SILTY SAND (SM)</u> very dark gray, fine, with organic matter		▽
2	[Symbol: Green dots]	<u>SLIGHTLY SILTY SAND (SP-SM)</u> light brown to brown, fine		-
3				-
4				-
5				-
6		Boring terminated at 6 ft Backfilled with cuttings upon completion Target Depth		

MANUAL PROBE RESULTS (P-17/HAB-17 AT CENTER)

LEGEND:

0	STANDING WATER
12	MUCK THICKNESS
12	SAND THICKNESS
24	TOTAL PROBE DEPTH

NOTES:

1. ALL DIMENSIONS ARE IN INCHES.
2. SPACING BETWEEN PROBE LOCATIONS IS APPROXIMATELY 10'

PROJECT: River Cross Development Seminole County, Florida 527118014		HAND AUGER BORING LOG: HAB-18	
DATE STARTED: 3/8/18		DATE FINISHED: 3/8/18	
NOTES:			
SAMPLING METHOD: Hand auger		PERFORMED BY: Reliable Field Services	
WATER LEVEL: 2 feet ATD			

Depth (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION (feet)	WATER LEVEL
1		CLAY (OH) very dark gray, organic		-
2				▽
3				-
4		SLIGHTLY SILTY SAND (SP-SM) grayish brown, fine		-
5				-
6		SILTY SAND (SM) dark gray, fine		-
7		Boring terminated at 7 ft Backfilled with cuttings upon completion Target Depth		-

MANUAL PROBE RESULTS (P-18/HAB-18 AT CENTER)

LEGEND:

0	STANDING WATER
12	MUCK THICKNESS
12	SAND THICKNESS
24	TOTAL PROBE DEPTH

NOTES:

1. ALL DIMENSIONS ARE IN INCHES.
2. SPACING BETWEEN PROBE LOCATIONS IS APPROXIMATELY 10'

PROJECT: River Cross Development Seminole County, Florida 527118014		HAND AUGER BORING LOG: HAB-19	
DATE STARTED: 3/8/18		DATE FINISHED: 3/8/18	
NOTES:			
SAMPLING METHOD: Hand auger		PERFORMED BY: Reliable Field Services	
WATER LEVEL: 2 feet ATD			

Depth (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION (feet)	WATER LEVEL
1		CLAY (OH) very dark brown, organic		-
2				▽
3				-
4		SLIGHTLY SILTY SAND (SP-SM) grayish brown, fine		-
5				-
6				-
7				-
Boring terminated at 7 ft Backfilled with cuttings upon completion Target Depth				

MANUAL PROBE RESULTS (P-19/HAB-19 APPROXIMATELY 50' NORTH OF CENTER)

LEGEND:

0	STANDING WATER
12	MUCK THICKNESS
12	SAND THICKNESS
24	TOTAL PROBE DEPTH

NOTES:

1. ALL DIMENSIONS ARE IN INCHES.
2. SPACING BETWEEN PROBE LOCATIONS IS APPROXIMATELY 10'

PROJECT: River Cross Development Seminole County, Florida 527118014		HAND AUGER BORING LOG: HAB-22	
DATE STARTED: 3/8/18		DATE FINISHED: 3/8/18	
NOTES:			
SAMPLING METHOD: Hand auger		PERFORMED BY: Reliable Field Services	
WATER LEVEL: 2 feet ATD			

Depth (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION (feet)	WATER LEVEL
1	[Symbol: Dotted pattern]	SILTY SAND (SM) black, fine, with organic matter SLIGHTLY SILTY SAND (SP-SM) dark gray, fine		-
2	[Symbol: Dotted pattern]	--- Brown to dark brown		▽
3	[Symbol: Dotted pattern]			-
4	[Symbol: Dotted pattern]	--- Very light brown to brown		-
5	[Symbol: Dotted pattern]	--- Very dark brown		-
6	[Symbol: Dotted pattern]			-
7	[Symbol: Dotted pattern]	Boring terminated at 7 ft Backfilled with cuttings upon completion Target Depth		-

MANUAL PROBE RESULTS (P-22/HAB-22 AT CENTER)

LEGEND:

0	STANDING WATER
12	MUCK THICKNESS
12	SAND THICKNESS
24	TOTAL PROBE DEPTH

NOTES:

1. ALL DIMENSIONS ARE IN INCHES.
2. SPACING BETWEEN PROBE LOCATIONS IS APPROXIMATELY 10'

PROJECT: River Cross Development Seminole County, Florida 527118014		HAND AUGER BORING LOG: HAB-24	
DATE STARTED: 3/8/18		DATE FINISHED: 3/8/18	
NOTES:			
SAMPLING METHOD: Hand auger		PERFORMED BY: Reliable Field Services	
WATER LEVEL: At ground surface			

Depth (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION (feet)	WATER LEVEL
1		CLAY (OH) black, organic		-
2				-
3				-
4		SLIGHTLY SILTY SAND (SP-SM) pale brown, fine		-
5				-
6				-
7				-
Boring terminated at 7 ft Backfilled with cuttings upon completion Target Depth				

MANUAL PROBE RESULTS (P-24/HAB-24 AT CENTER)

LEGEND:

0	STANDING WATER
12	MUCK THICKNESS
12	SAND THICKNESS
24	TOTAL PROBE DEPTH

NOTES:

1. ALL DIMENSIONS ARE IN INCHES.
2. SPACING BETWEEN PROBE LOCATIONS IS APPROXIMATELY 10'

PROJECT: River Cross Development Seminole County, Florida 527118014		HAND AUGER BORING LOG: HAB-26				
DATE STARTED: 2/16/18		DATE FINISHED: 2/16/18				
SAMPLING METHOD: Hand auger		PERFORMED BY: Reliable Field Services				
WATER LEVEL: 0.5 feet ATD		NOTES:				
Depth (feet)	GRAPHIC LOG			MATERIAL DESCRIPTION	ELEVATION (feet)	WATER LEVEL
1	CLAY (OH) black, organic					▽
2	SLIGHTLY SILTY SAND (SP-SM) dark brown to dark grayish brown, fine					-
3						-
4		Boring terminated at 4 ft Backfilled with cuttings upon completion Target Depth		-		

MANUAL PROBE RESULTS (P-26/HAB-26 AT CENTER)

LEGEND:

0	STANDING WATER
12	MUCK THICKNESS
12	SAND THICKNESS
24	TOTAL PROBE DEPTH

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NOTES:

1. ALL DIMENSIONS ARE IN INCHES.
2. SPACING BETWEEN PROBE LOCATIONS IS APPROXIMATELY 10'

PROJECT: River Cross Development Seminole County, Florida 527118014		HAND AUGER BORING LOG: HAB-28				
DATE STARTED: 2/16/18		DATE FINISHED: 2/16/18				
SAMPLING METHOD: Hand auger		PERFORMED BY: Reliable Field Services				
WATER LEVEL: 0.5 feet ATD		NOTES:				
Depth (feet)	GRAPHIC LOG			MATERIAL DESCRIPTION	ELEVATION (feet)	WATER LEVEL
1				CLAY (OH) black, organic		▽
2				SLIGHTLY SILTY SAND (SP-SM) dark gray, fine		-
3						-
4		Boring terminated at 4 ft Backfilled with cuttings upon completion Target Depth			-	

MANUAL PROBE RESULTS (P-28/HAB-28 AT CENTER)

LEGEND:

0	STANDING WATER
12	MUCK THICKNESS
12	SAND THICKNESS
24	TOTAL PROBE DEPTH

NOTES:

1. ALL DIMENSIONS ARE IN INCHES.
2. SPACING BETWEEN PROBE LOCATIONS IS APPROXIMATELY 10'

PROJECT: River Cross Development Seminole County, Florida 527118014		HAND AUGER BORING LOG: HAB-32	
DATE STARTED: 2/16/18		DATE FINISHED: 2/16/18	
SAMPLING METHOD: Hand auger		PERFORMED BY: Reliable Field Services	
WATER LEVEL: 3 inches ATD		NOTES: OC = Organic content MC = Moisture content	

Depth (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION (feet)	WATER LEVEL
1		<u>SILTY SAND (SM)</u> black, fine, trace organic matter (OC=4.6%, MC=27%)		
2		<u>SLIGHTLY SILTY SAND (SP-SM)</u> grayish brown, fine		-
3		- - - Dark brown		-
4		Boring terminated at 4 ft Backfilled with cuttings upon completion Target Depth		-

MANUAL PROBE RESULTS (P-32/HAB-32 AT CENTER)

LEGEND:

0	STANDING WATER
12	MUCK THICKNESS
12	SAND THICKNESS
24	TOTAL PROBE DEPTH

NOTES:

1. ALL DIMENSIONS ARE IN INCHES.
2. SPACING BETWEEN PROBE LOCATIONS IS APPROXIMATELY 10'

PROJECT: River Cross Development Seminole County, Florida 527118014		HAND AUGER BORING LOG: HAB-33	
DATE STARTED: 2/16/18		DATE FINISHED: 2/16/18	
NOTES:			
SAMPLING METHOD: Hand auger		PERFORMED BY: Reliable Field Services	
WATER LEVEL: 3 inches ATD			

Depth (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION (feet)	WATER LEVEL
1	[Orange dots pattern]	<u>SAND SAND (SM)</u> black, fine, with organic matter		▽
2	[Black dots pattern]	<u>SLIGHTLY SILTY SAND (SP-SM)</u> grayish brown, fine		-
3	[Black dots pattern]			-
4	[Black dots pattern]			-
5	[Black dots pattern]	Boring terminated at 5 ft Backfilled with cuttings upon completion Target Depth		-

MANUAL PROBE RESULTS (P-33/HAB-33 AT CENTER)

LEGEND:

0	STANDING WATER
12	MUCK THICKNESS
12	SAND THICKNESS
24	TOTAL PROBE DEPTH

NOTES:
1. ALL DIMENSIONS ARE IN INCHES.
2. SPACING BETWEEN PROBE LOCATIONS IS APPROXIMATELY 10'

PROJECT: River Cross Development Seminole County, Florida 527118014		HAND AUGER BORING LOG: HAB-35	
DATE STARTED: 2/16/18		DATE FINISHED: 2/16/18	
SAMPLING METHOD: Hand auger		PERFORMED BY: Reliable Field Services	
WATER LEVEL: 0.5 feet ATD		NOTES: OC = Organic content MC = Moisture content	

Depth (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION (feet)	WATER LEVEL
1	[Pattern: Horizontal lines]	PEAT (PT) black, sandy, fibrous (OC=56%, MC=206%)		▽
2	[Pattern: Dotted]	SLIGHTLY SILTY SAND (SP-SM) brownish gray, fine		-
3	[Pattern: Dotted]			-
4	[Pattern: Dotted]			-
5	[Pattern: Dotted]	--- Pale brown Boring terminated at 5 ft Backfilled with cuttings upon completion Target Depth		-

MANUAL PROBE RESULTS (P-35/HAB-35 AT CENTER)

LEGEND:

0	STANDING WATER
12	MUCK THICKNESS
12	SAND THICKNESS
24	TOTAL PROBE DEPTH

NOTES:

1. ALL DIMENSIONS ARE IN INCHES.
2. SPACING BETWEEN PROBE LOCATIONS IS APPROXIMATELY 10'

PROJECT: River Cross Development Seminole County, Florida 527118014		HAND AUGER BORING LOG: HAB-37	
DATE STARTED: 2/16/18		DATE FINISHED: 2/16/18	
SAMPLING METHOD: Hand auger		PERFORMED BY: Reliable Field Services	
WATER LEVEL: 0.5 feet ATD		NOTES: OC = Organic content MC = Moisture content	

Depth (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION (feet)	WATER LEVEL
1		<u>CLAY (OH)</u> black, organic, (OC=24%, MC=126%)		▽
2		<u>SILTY SAND (SM)</u> black, fine, trace organic matter		-
3		<u>SLIGHTLY SILTY SAND (SP-SM)</u> very dark brown, fine		-
4		Boring terminated at 4 ft Backfilled with cuttings upon completion Target Depth		-

MANUAL PROBE RESULTS (P-37/HAB-37 AT CENTER)

LEGEND:

0	STANDING WATER
12	MUCK THICKNESS
12	SAND THICKNESS
24	TOTAL PROBE DEPTH

NOTES:

1. ALL DIMENSIONS ARE IN INCHES.
2. SPACING BETWEEN PROBE LOCATIONS IS APPROXIMATELY 10'

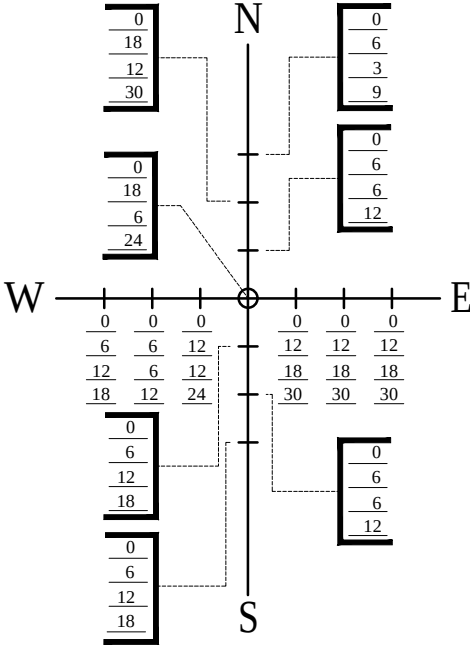
PROJECT: River Cross Development Seminole County, Florida 527118014		HAND AUGER BORING LOG: HAB-39	
DATE STARTED: 2/15/18		DATE FINISHED: 2/15/18	
SAMPLING METHOD: Hand auger		PERFORMED BY: Reliable Field Services	
WATER LEVEL: 3 inches ATD		NOTES: OC = Organic content MC = Moisture content	

Depth (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION (feet)	WATER LEVEL
1		<u>SILTY SAND (SM)</u> black, fine, trace organic matter (OC=3.4%, MC=42%)		▽
2		<u>SLIGHTLY SILTY SAND (SP-SM)</u> very dark brown, fine		-
3		--- Brown		-
4		Boring terminated at 4 ft Backfilled with cuttings upon completion Target Depth		-

MANUAL PROBE RESULTS (P-39/HAB-39 AT CENTER)

LEGEND:

0	STANDING WATER
12	MUCK THICKNESS
12	SAND THICKNESS
24	TOTAL PROBE DEPTH



NOTES:

1. ALL DIMENSIONS ARE IN INCHES.
2. SPACING BETWEEN PROBE LOCATIONS IS APPROXIMATELY 10'



SCALE:

NOT TO SCALE

DATE:

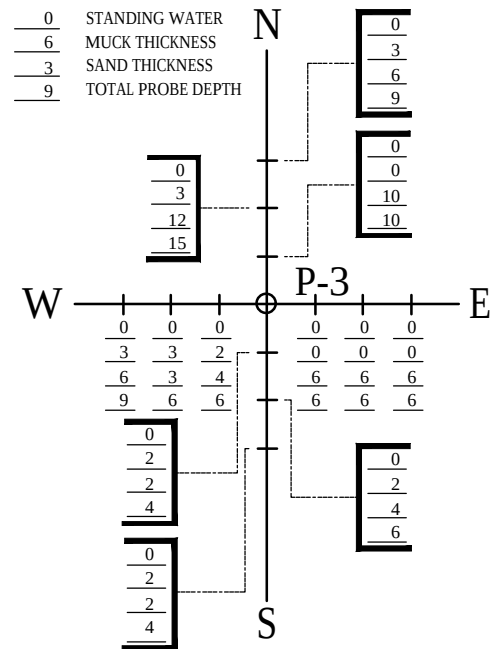
04/08/2018

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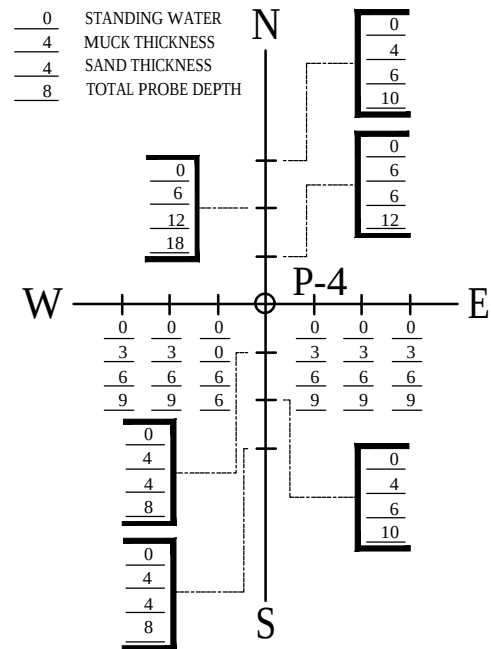
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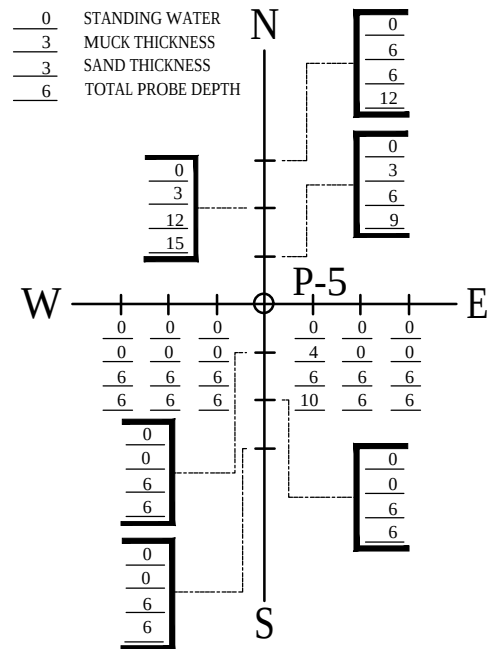
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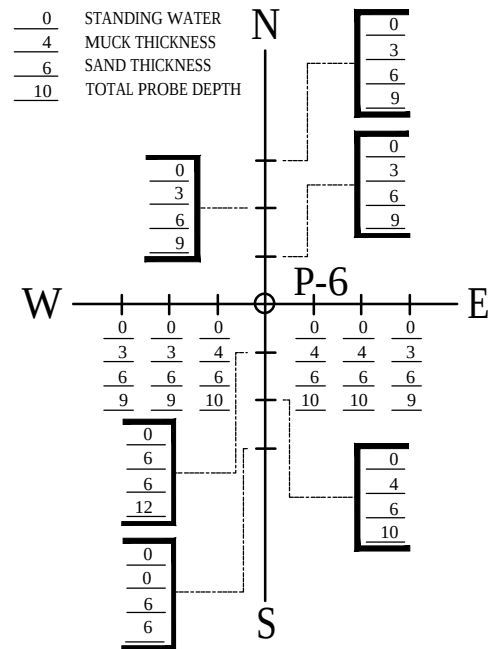
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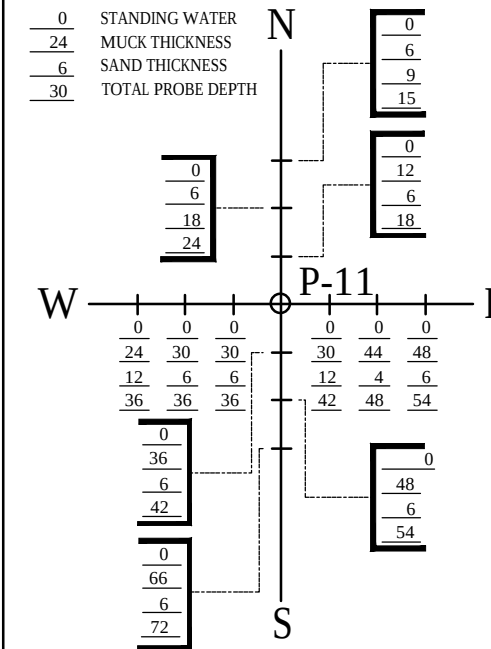
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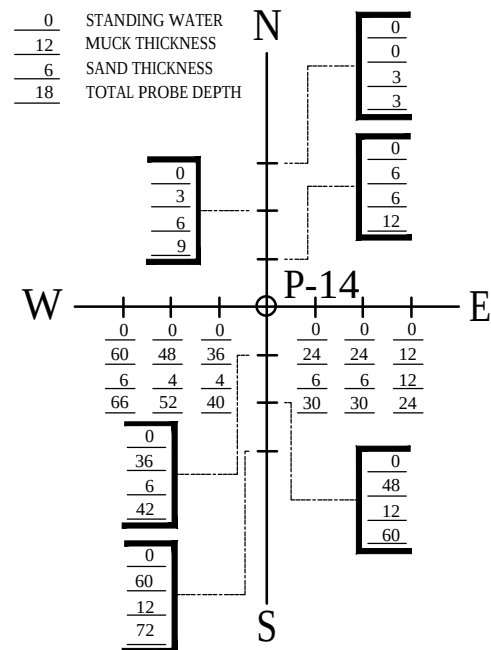
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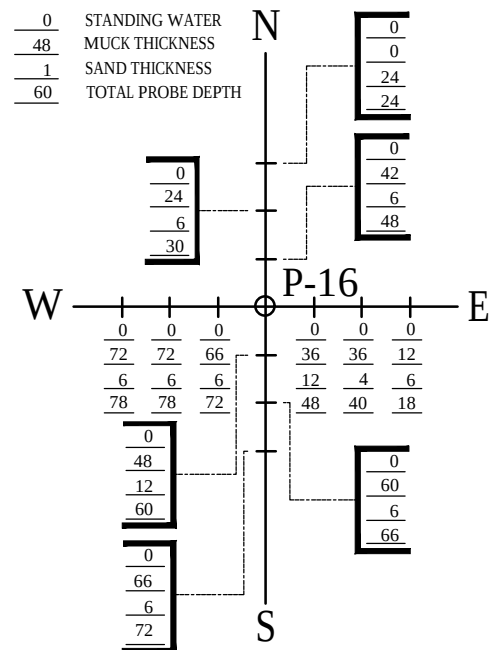
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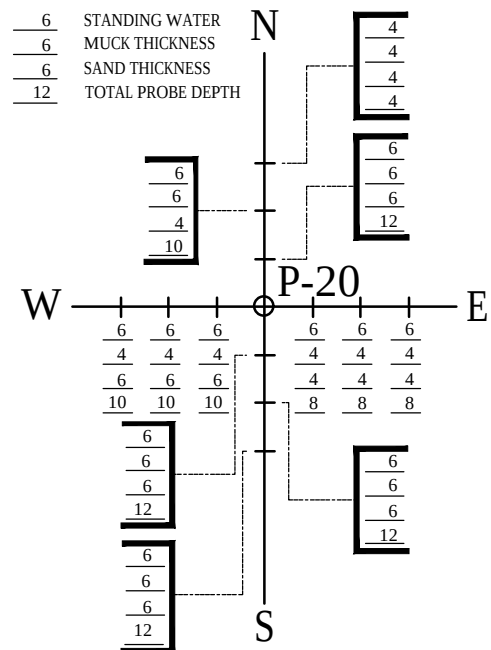
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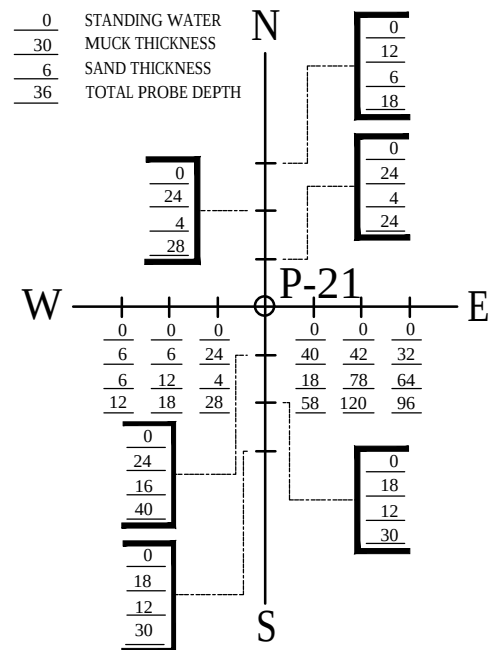
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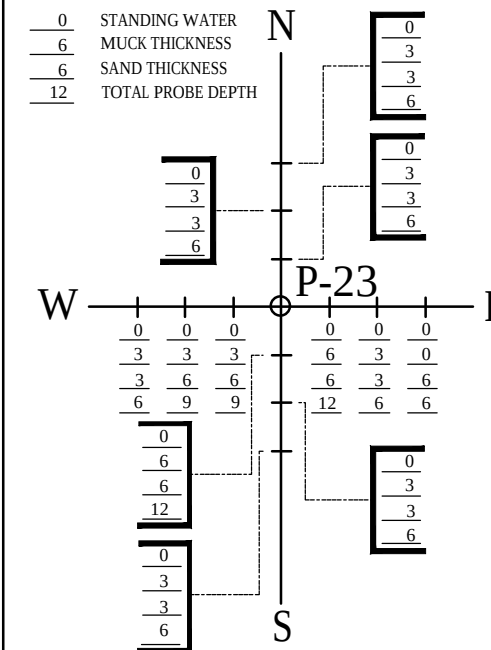
P-20



P-21



P-23





PROBE RESULTS

RIVER CROSS DEVELOPMENT
SEMINOLE COUNTY, FLORIDA

SCALE:

NOT TO SCALE

DATE:

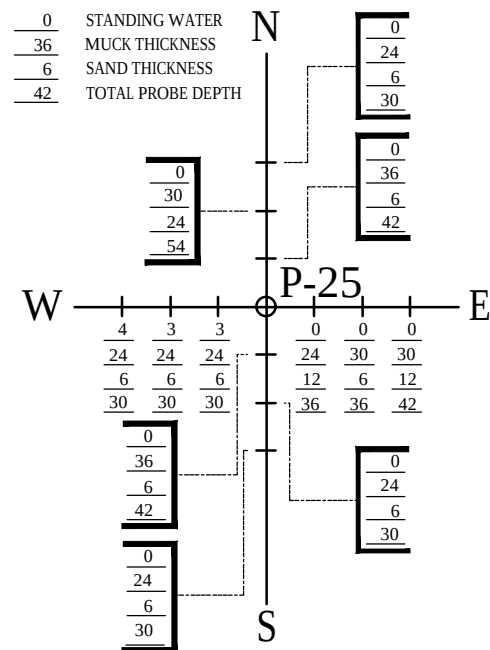
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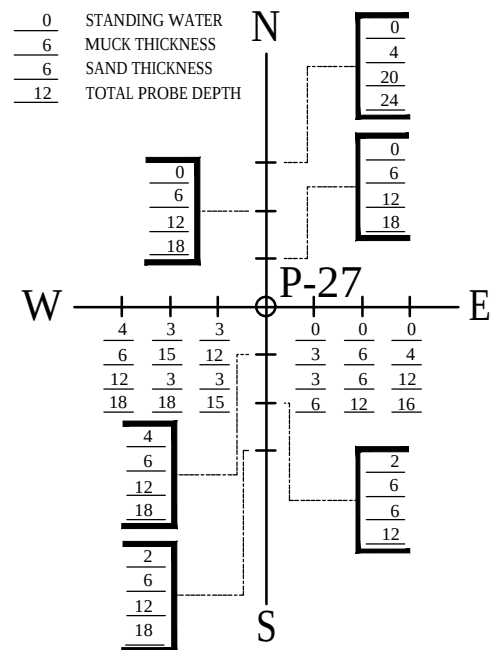
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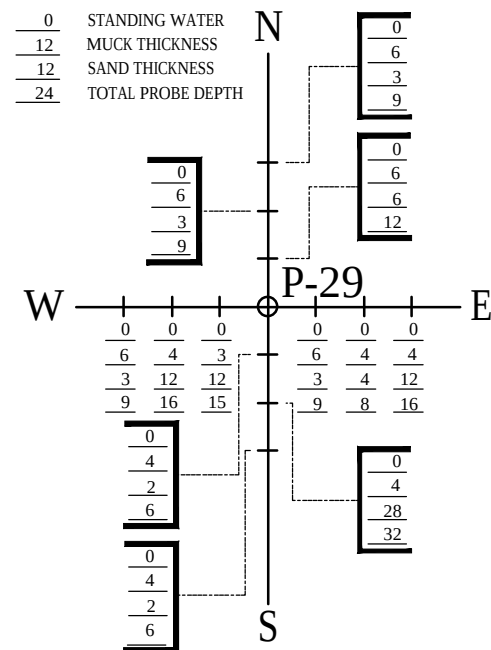
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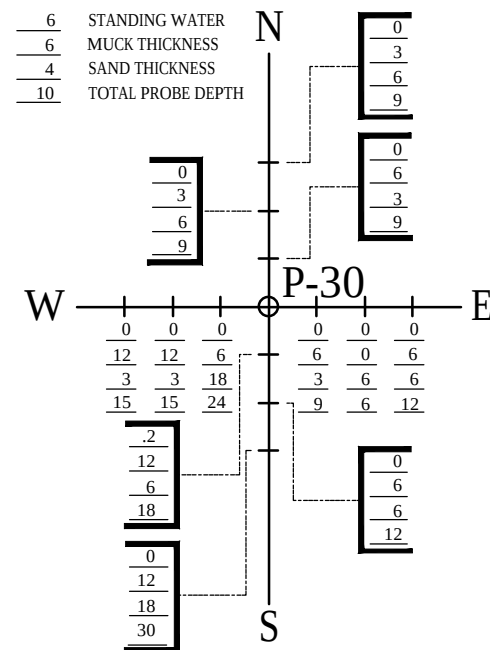
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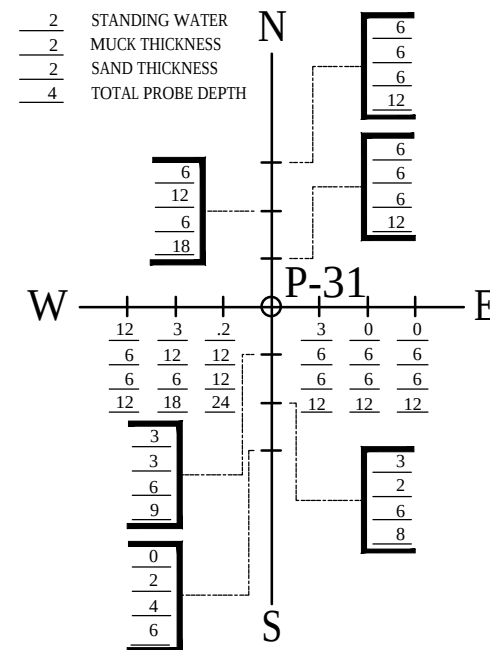
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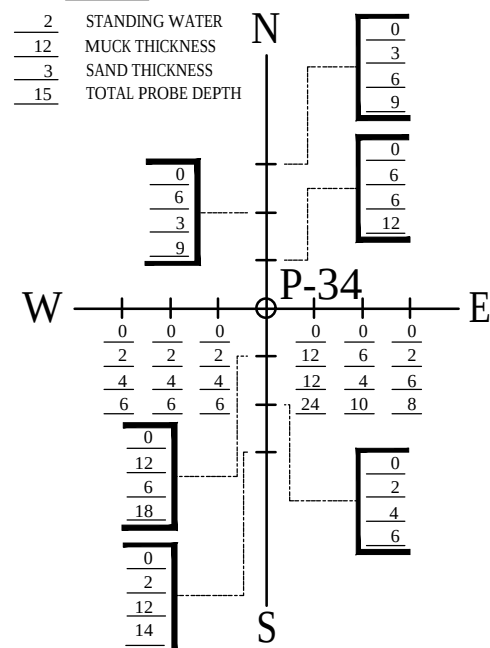
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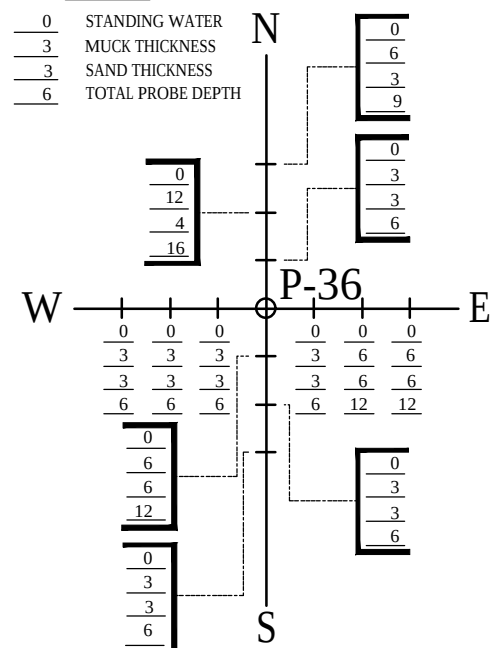
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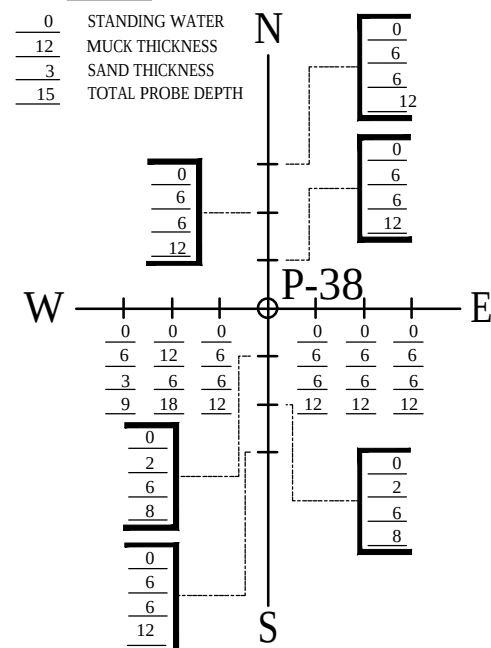
P-34



P-36



P-38



Appendix II – Field and Laboratory Testing Procedures

FIELD AND LABORATORY TESTING PROCEDURES

Soil Test Boring Procedures (ASTM D1586)

The borings were advanced by a rotary drilling process which utilized a viscous bentonite drilling fluid to flush the cuttings and stabilize the hole. At regular intervals, the drilling tools were withdrawn and soil samples obtained with a standard 1¾-inch inside diameter, 2-inch outside diameter, split tube sampler in general accordance with ASTM D1586 "Standard Test Method for Penetration Test and Split Barrel Sampling of Soils".

The sampler was initially seated 6 inches to penetrate any loose cuttings then driven an additional foot to 1½ feet with blows of a 140-pound hammer falling 30 inches. The number of hammer blows required to drive the sampler the foot increment after the 6-inch seating blows was recorded and is designated as the standard penetration resistance, N-value. Penetration resistance is an index to the soil's strength and density.

The samples were classified in the field by an engineering technician as they were obtained. Representative portions of each soil sample were then sealed in containers and transported to our laboratory. The samples were examined by a geotechnical engineer to visually check the field classification. Boring data, including sampling intervals, penetration resistance N-values, soil classifications, and groundwater level are presented on the Soil Profiles.

Auger Boring Procedures (ASTM D1452)

The hand auger borings were performed in general accordance with ASTM D1452. A 6-inch-long bucket was manually advanced into the soil in approximate 6-inch intervals. The soil was removed from the auger hole at each interval and the samples were classified in the field by an engineering technician as they were obtained. Representative portions of each soil sample were then sealed in containers and transported to our laboratory. The samples were examined by a geotechnical engineer to visually check the field classification.

Determination of Soils Finer than No. 200 Sieve (ASTM D1140)

The clay and silt content of granular soils affects their physical properties such as strength, permeability, and compressibility. Selected granular soil (sand or gravel) samples were tested to determine the percent, by dry weight, of soil particles finer than the No. 200 sieve (silt and clay size particles) in general accordance with procedures outlined in the ASTM D1140 "Standard Test Methods for Determining the Amount of Material Finer than 75-µm (No. 200) Sieve in Soils by Washing". Soil particles finer than 75 microns were flushed through a No. 200 sieve using water. The coarse materials retained on the No. 200 sieve were dried to obtain their dry weight. The dry weight of materials retained on the No. 200 sieve was compared to the dry weight of the total test specimen. The difference in weight, expressed as a percentage of the pre wash weight, is designated as the percentage of "fines" (silt and clay size particles).

Atterberg Limits Determination (ASTM D4318)

Representative samples were subjected to Atterberg limits testing to determine the soil's plasticity characteristics. The plasticity index (PI) is the range of moisture content through which the soil deforms as a plastic material. It is bracketed by the liquid limit (LL) and the plastic limit (PL). The liquid limit is the moisture content at which the soil becomes wet enough to flow as a viscous fluid. To determine the liquid limit, a soil specimen is first washed through a No. 40 sieve. The materials finer than the No. 40 sieve are retained and dried until the soil is in a viscous fluid state. A portion of this soil is then placed in a brass cup of standardized dimensions. A groove is cut through the middle of the soil specimen with a grooving tool of standard dimensions. The cup is attached to a

cam that lifts the cup 10 mm, and then allows the cup to fall onto a hard rubber base. The cam is rotated until the two halves of the soil specimen come in contact at the bottom of the groove for a distance of $\frac{1}{2}$ inch. The number of blows required to achieve this $\frac{1}{2}$ -inch contact is recorded, and part of the specimen is subjected to a moisture content determination. The remainder of the specimen is allowed to air dry for a short time, and the grooving process and cam action repeated. This testing sequence is repeated until more than 25 blows are required to achieve the required groove contact. After the number of blows vs. moisture content for the various test points are plotted on arithmetic graph paper, the moisture content corresponding to 25 blows is designated the liquid limit. The plastic limit (PL) is the lowest moisture content at which the soil is sufficiently plastic to be manually rolled into threads $\frac{1}{8}$ inch in diameter. The plastic limit is determined by taking a part of soil remaining from the liquid limit test, and repeatedly rolling, kneading, and air drying it until the soil breaks into threads about $\frac{1}{8}$ inch in diameter and $\frac{3}{8}$ inch long. The moisture content of these soil threads is then determined, and is designated the plastic limit.

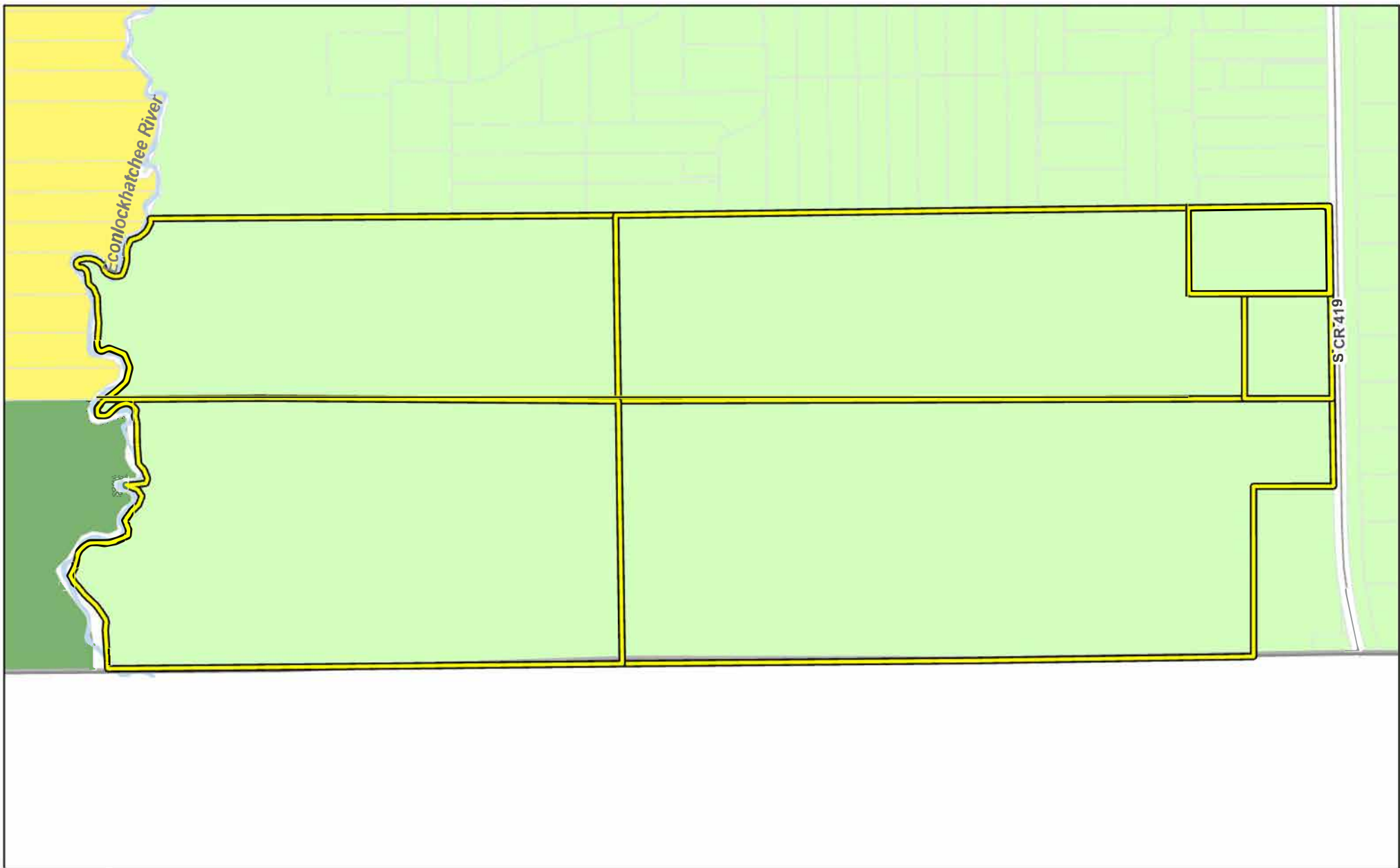
Determination of Organic Content (ASTM D2974)

This test method evaluates the moisture content, ash content, and organic matter in peats and other organic soils, such as organic clay, silt, sand, and "muck" in accordance with ASTM D 2974. The organic content measurement is performed by placing a sample of soil in a low-temperature oven. The soil is then dried (as described above) to measure the initial moisture content. The soil is then transferred to a high-temperature kiln, which burns off the organic materials. The organic content is then calculated as the ratio of the weight loss to the dry weight of the soil measured from the low temperature oven; it is expressed as a percent.

Determination of Natural Moisture Content (ASTM D2216)

The natural moisture content was determined using the test procedures outlined in ASTM D2216. The moisture content is defined as the ratio, expressed as a percentage, of the weight of water in a given amount of soil to the weight of the solid particles.

Exhibit D
FLU Map



Florida Forever
Exhibit D
Hi-Oaks Ranch
FLU Map

- LDR
- PML
- R5



0 0.4 Miles

Exhibit E

FNAI Reports



1018 Thomasville Road
Suite 200-C
Tallahassee, FL 32303
850-224-8207
fax 850-681-9364
www.fnai.org

Ron Chicone, Jr
Seminole County
3485 N. County Road 426
Geneva, FL 32732

September 11, 2025

Dear Mr. Chicone,

Thank you for requesting information from the Florida Natural Areas Inventory (FNAI). At your request we have produced the following report for your project area.

The purpose of this Standard Data Report is to provide objective scientific information on natural resources located in the vicinity of a site of interest, in order to inform those involved in project planning and evaluation. This Report makes no determination of the suitability of a proposed project for this location, or the potential impacts of the project on natural resources in the area.

Project: Hi-Oaks Ranch
Date Received: 9/8/2025
Location: Seminole County

Element Occurrences

A search of our maps and database indicates that we currently have several element occurrences mapped in the vicinity of the study area (see enclosed map and element occurrence table). Please be advised that a lack of element occurrences in the FNAI database is not a sufficient indication of the absence of rare or endangered species on a site.

The element occurrences data layer includes occurrences of rare species and natural communities. The map legend indicates that some element occurrences occur in the general vicinity of the label point. This may be due to lack of precision of the source data, or an element that occurs over an extended area (such as a wide ranging species or large natural community). For animals and plants, element occurrences generally refer to more than a casual sighting; they usually indicate a viable population of the species. Note that some element occurrences represent historically documented observations which may no longer be extant. Extirpated element occurrences will be marked with an 'X' following the occurrence label on the enclosed map.

Likely and Potential Rare Species

In addition to documented occurrences, other rare species and natural communities may be identified on or near the site based on habitat models and species range models (see enclosed Biodiversity Matrix Report). These species should be taken into consideration in field surveys, land management, and impact avoidance and mitigation.

FNAI habitat models indicate areas, which based on land cover type, offer suitable habitat for one or more rare species that is known to occur in the vicinity. Habitat models have been developed for approximately 300 of the rarest species tracked by the Inventory, including all federally listed species.



Florida Resources
and Environmental
Analysis Center

Institute of Science
and Public Affairs

The Florida State University

Tracking Florida's Biodiversity

FNAI species range models indicate areas that are within the known or predicted range of a species, based on climate variables, soils, vegetation, and/or slope. Species range models have been developed for approximately 340 species, including all federally listed species.

The FNAI Biodiversity Matrix Geodatabase compiles Documented, Likely, and Potential species and natural communities for each square mile Matrix Unit statewide.

CLIP

The enclosed map shows natural resource conservation priorities based on the Critical Lands and Waters Identification Project. CLIP is based on many of the same natural resource data developed for the Florida Forever Conservation Needs Assessment, but provides an overall picture of conservation priorities across different resource categories, including biodiversity, landscapes, surface waters, and aggregated CLIP priorities (that combine the individual resource categories). CLIP is also based primarily on remote sensed data and is not intended to be the definitive authority on natural resources on a site.

For more information on CLIP, visit <https://www.fnai.org/services/clip>.

Managed Areas

Portions of the site appear to be located adjacent to the Econ River Wilderness Area, managed by the Seminole County.

The Managed Areas data layer shows public and privately managed conservation lands throughout the state. Federal, state, local, and privately managed conservation lands are included.

The Inventory always recommends that professionals familiar with Florida's flora and fauna conduct a site-specific survey to determine the current presence or absence of rare, threatened, or endangered species.

Please visit www.fnai.org/species-communities/tracking-main for county or statewide element occurrence distributions and links to more element information.

The database maintained by the Florida Natural Areas Inventory is the single most comprehensive source of information available on the locations of rare species and other significant ecological resources. However, the data are not always based on comprehensive or site-specific field surveys. Therefore this information should not be regarded as a final statement on the biological resources of the site being considered, nor should it be substituted for on-site surveys. Inventory data are designed for the purposes of conservation planning and scientific research, and are not intended for use as the primary criteria for regulatory decisions.

Information provided by this database may not be published without prior written notification to the Florida Natural Areas Inventory, and the Inventory must be credited as an information source in these publications. **The maps contain sensitive environmental information, please do not distribute or publish without prior consent from FNAI.** FNAI data may not be resold for profit.

Thank you for your use of FNAI services. If I can be of further assistance, please contact me at (850) 224-8207 or at kbrinegar@fnai.fsu.edu.

Sincerely,

Kerri Brinegar

Kerri Brinegar
GIS / Data Services

Encl



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Florida Natural Areas Inventory

Element Occurrences

- Animals
- Plants
- Communities
- Other
- Data Sensitive



Point Indicates General
Vicinity of Element

Conservation Lands

- Federal
- State
- Local
- Private
- State Aquatic Preserves

Land Acquisition Projects

- Florida Forever
- Board of Trustees Projects

- FNAI Rare Species
Habitat
- FNAI Biodiversity Matrix
Square Mile Units

- County Boundary

- Roads

- Water

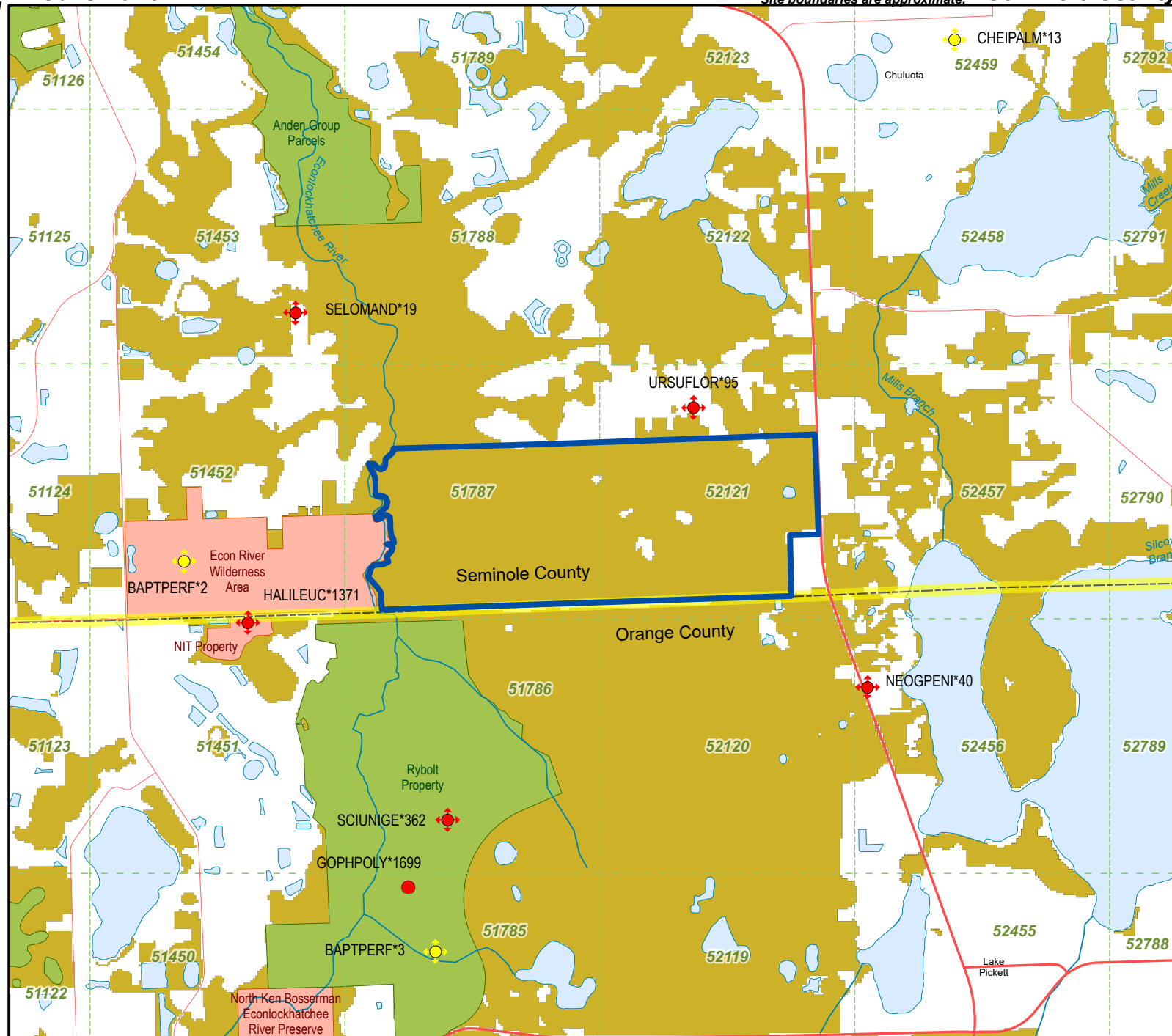
NOTE

This map contains environmentally
sensitive information. Please do not
distribute or publish without prior
consent from FNAI. Map should not
be interpreted without accompanying
documents.

Hi-Oaks Ranch

Site boundaries are approximate.

Seminole County



Map produced by KAB
9/11/2025



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Florida
Natural Areas
Inventory

CLIP v4.0 Resource Priorities

Biodiversity Resource Category

- Priority 1 - highest
- Priority 2
- Priority 3
- Priority 4
- Priority 5

Landscape Resource Category

- Priority 1 - highest
- Priority 2
- Priority 3
- Priority 4
- Priority 5

Surface Water Resource Category

- Priority 1 - highest
- Priority 2
- Priority 3
- Priority 4
- Priority 5

Aggregated CLIP Priorities

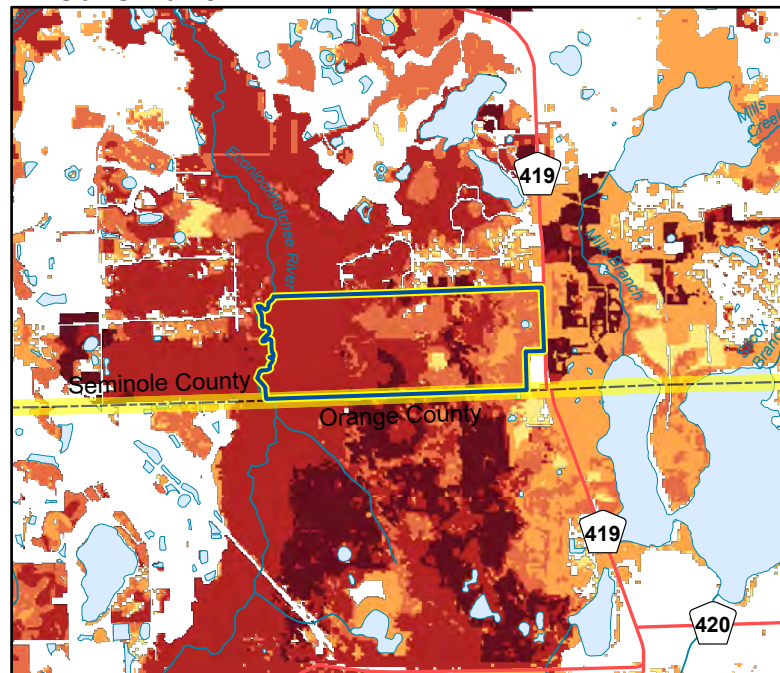
- Priority 1 - highest
- Priority 2
- Priority 3
- Priority 4
- Priority 5

Site Boundary

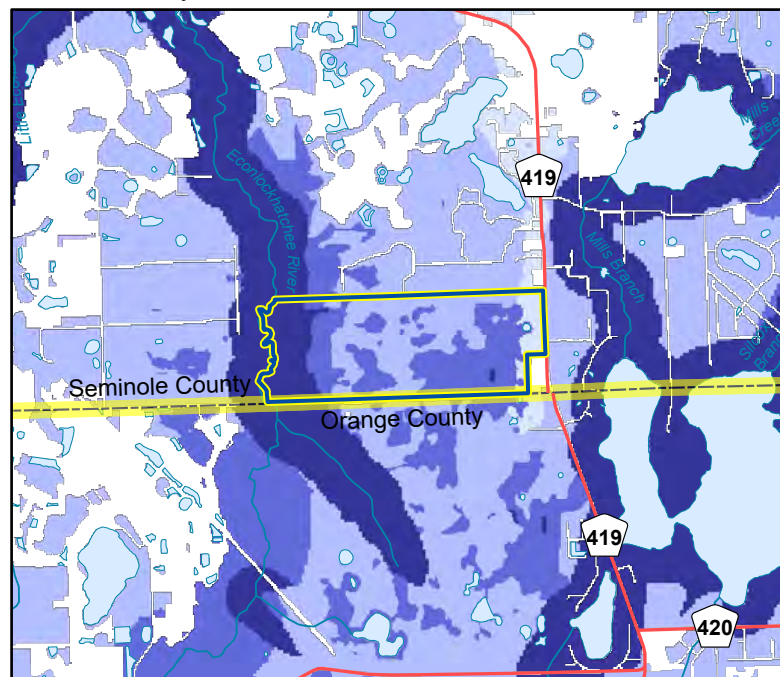
Map should not be interpreted without
accompanying documents.

Critical Lands and Waters Identification Project
(CLIP) is a cooperative effort between the FSU
Florida Natural Areas Inventory, UF Center for
Landscape Conservation Planning, and FL Fish &
Wildlife Conservation Commission, with additional
funding from FL Dept of Environmental Protection and
US Fish & Wildlife Service.

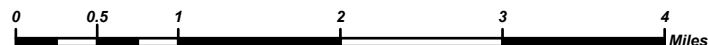
Hi-Oaks Ranch



CLIP Biodiversity Resource Priorities

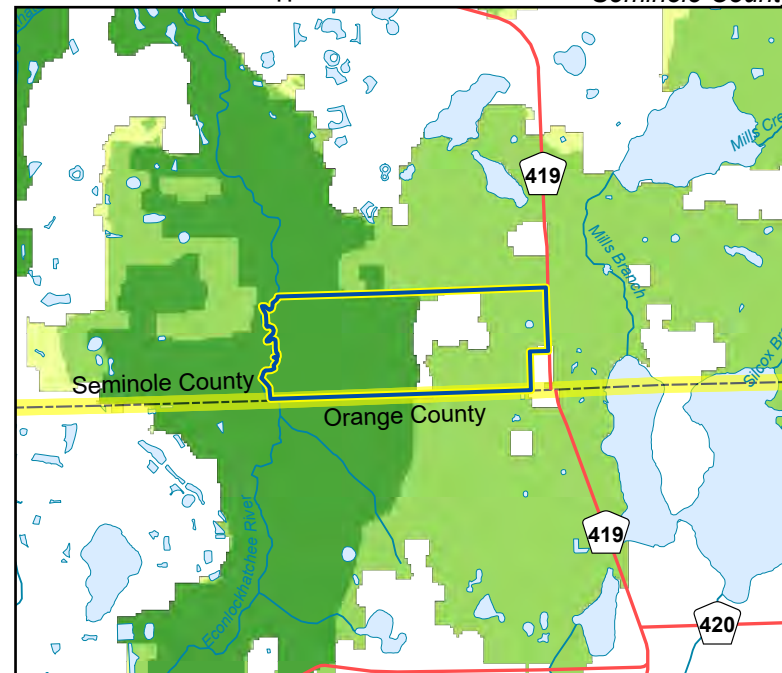


CLIP Surface Water Resource Priorities

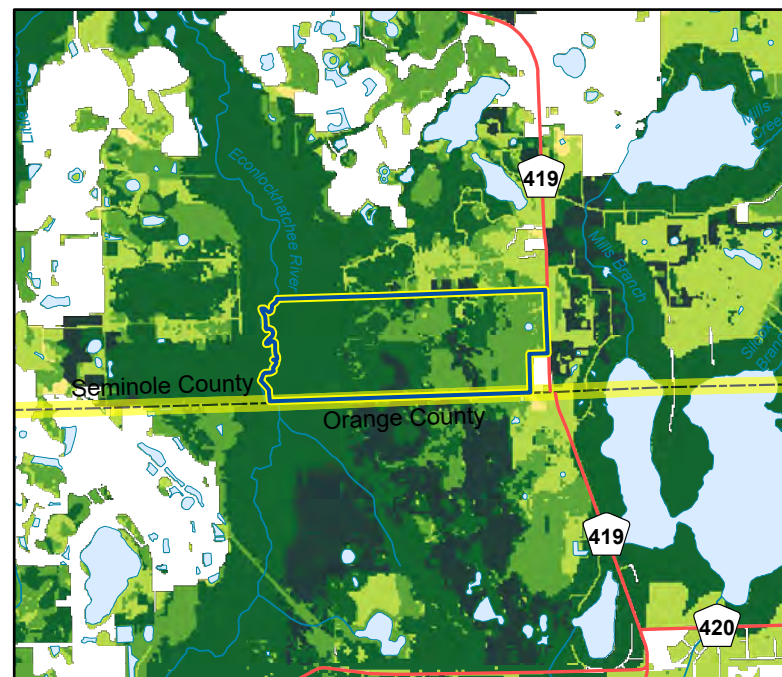


Site boundaries are approximate.

Seminole County



CLIP Landscape Resource Priorities



CLIP Aggregated Resource Priorities

Map produced by KAB
9/11/2025



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FNAI ELEMENT OCCURRENCE REPORT on or near *Hi-Oaks Ranch*



<i>Map Label</i>	<i>Scientific Name</i>	<i>Common Name</i>	<i>Global Rank</i>	<i>State Rank</i>	<i>Federal Status</i>	<i>State Listing</i>	<i>Observation Date</i>	<i>Description</i>	<i>EO Comments</i>
BAPTPERF*2	<i>Baptisia perfoliata</i>	catbells	G4?	S2	N	N	2023-10-16	None given	The populations represents 22 areas where the species was observed and documented with a photograph.
BAPTPERF*3	<i>Baptisia perfoliata</i>	catbells	G4?	S2	N	N	2023-09-17	None given	The species has been seen at 18 different locations within the occurrence and documented with a photograph.
CHEIPALM*13	<i>Cheiroglossa palmata</i>	hand fern	G4	S3	N	E	1940-11-25	CHULUOTA	1940-11-25; LEAF FRAGMENTS
GOPHPOLY*1699	<i>Gopherus polyphemus</i>	Gopher Tortoise	G3	S3	N	ST	2021-01-04	Unimproved/woodland pasture bordered by mixed hardwood coniferous swamps and rural open land.	One adult tortoise photographed (U23INA03FLUS).
HALILEUC*1371	<i>Haliaeetus leucocephalus</i>	Bald Eagle	G5	S3	N	N	2003	2005-07-12: Source does not provide a description.	Nest status: Active, 2003, 2002, 2001, 2000, 1999 (U03FWC01FLUS).
NEOGPENI*40	<i>Neogale frenata peninsulae</i>	Florida Long-tailed Weasel	G5T3?	S3?	N	N	1975-07-31	1975-07-31: Mostly orange groves but with several small lakes, cypress domes, and swamps (U97GFC02FLUS).	1975-07-31: R.C. Bradley - Skin. Univ. Central Fla. No. PWS-7602.
SCIUNIGE*362	<i>Sciurus niger niger</i>	Southeastern Fox Squirrel	G5T5	S3	N	N	2022-03-20	None given.	One adult was photographed in 2020 and another in 2022 (U23INA13FLUS).
SELOMAND*19	<i>Selonodon mandibularis</i>	Large-Jawed Cebrionid Beetle	G2G4	S2S4	N	N	1963-05-20	1963-05-20: No description given (B99GAL01FLUS).	1963-05-20: This female specimen was collected in a ligustrum trap and deposited at FSCA (B99GAL01FLUS).



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FNAI ELEMENT OCCURRENCE REPORT on or near

Hi-Oaks Ranch



Map Label	Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Listing	Observation Date	Description	EO Comments
URSUFLOR*95	<i>Ursus americanus floridanus</i>	Florida Black Bear	G5T4	S4	N	N	2020-11-19	Large area of pine plantation, mesic and wet flatwoods, and dome and basin swamps; Largely private commercial timberland, nurseries, and small neighborhoods; public lands are dominated by pine plantation but also have flatwoods interspersed with dome swamps and patches of scrub; Large area of sand pine and oak scrub, mesic flatwoods, sandhill, depression marshes and hardwood swamps, pine plantation; regular harvesting of sand pine (U05SIM01FLUS).	2002: 1,025-1,539 bears estimated in the primary ranges in the Ocala-St. John's region. Part of a larger population that includes Okefenokee Swamp National Wildlife Refuge in Georgia (U05SIM01FLUS). 2014: 1,198 bears estimated in the Ocala-St. John's region and 495 estimated in the Osceola region (A16HUM01FLUS). 2016: polygons created to show where bears are considered 'Abundant' and 'Common' (U16FWC01FLUS) Primary is the FWC-designated core area that represents breeding range and contains documented evidence of reproduction or female bears within available habitat, and Secondary is the FWC-designated area where bears occur within available habitat but outside primary bear range (evidence of bears without documented evidence of reproduction) (U12FWC02FLUS, U05SIM01FLUS). These boundaries are based on decades of bear observations, roadkill distribution, nuisance bear locations, and bear research projects. For detailed location data contact the FWC.



Florida
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Florida Natural Areas Inventory

Biodiversity Matrix Report



Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Listing
Matrix Unit ID: 51787					
Documented					
<i>Ursus americanus floridanus</i>	Florida Black Bear	G5T4	S4	N	N
Likely					
<i>Antigone canadensis pratensis</i>	Florida Sandhill Crane	G5T2	S2	N	ST
Mesic flatwoods		G4	S4	N	N
<i>Neogale frenata peninsulae</i>	Florida Long-tailed Weasel	G5T3?	S3?	N	N
Potential					
<i>Aphelocoma coerulescens</i>	Florida Scrub-Jay	G2	S2	T	FT
<i>Calopogon multiflorus</i>	many-flowered grass-pink	G2G3	S2S3	N	T
<i>Carex chapmanii</i>	Chapman's sedge	G3	S3	N	T
<i>Centrosema arenicola</i>	sand butterfly pea	G2Q	S2	N	E
<i>Coleataenia abscissa</i>	cutthroatgrass	G3	S3	N	E
<i>Conradina grandiflora</i>	large-flowered rosemary	G3	S3	N	T
<i>Corynorhinus rafinesquii</i>	Rafinesque's Big-eared Bat	G3G4	S1	N	N
<i>Deeringothamnus pulchellus</i>	beautiful pawpaw	G2	S2	E	E
<i>Drymarchon couperi</i>	Eastern Indigo Snake	G3	S2?	T	FT
<i>Gopherus polyphemus</i>	Gopher Tortoise	G3	S3	N	ST
<i>Hartwrightia floridana</i>	Florida hartwrightia	G2G3	S2S3	UR	T
<i>Heterodon simus</i>	Southern Hognose Snake	G2	S2S3	N	N
<i>Illicium parviflorum</i>	star anise	G2	S2	N	E
<i>Lechea cernua</i>	nodding pinweed	G3	S3	N	T
<i>Lithobates capito</i>	Gopher Frog	G2G3	S3	UR	N
<i>Matelea floridana</i>	Florida spiny-pod	G2	S2	N	E
<i>Nemastylis floridana</i>	celestial lily	G3	S3	N	E
<i>Nolina atopocarpa</i>	Florida beargrass	G3	S3	N	T
<i>Notophthalmus perstriatus</i>	Striped Newt	G2G3	S2	N	ST
<i>Peucaea aestivalis</i>	Bachman's Sparrow	G3	S3	N	N
<i>Peromyscus floridanus</i>	Florida Mouse	G3	S3	N	N
<i>Salix floridana</i>	Florida willow	G2G3	S2S3	UR	E
<i>Sciurus niger niger</i>	Southeastern Fox Squirrel	G5T5	S3	N	N
<i>Selonodon mandibularis</i>	Large-Jawed Cebionid Beetle	G2G4	S2S4	N	N
<i>Warea carteri</i>	Carter's warea	G1	S1	E	E

Matrix Unit ID: 52121

Documented

<i>Ursus americanus floridanus</i>	Florida Black Bear	G5T4	S4	N	N
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Likely

<i>Antigone canadensis pratensis</i>	Florida Sandhill Crane	G5T2	S2	N	ST
Mesic flatwoods		G4	S4	N	N
<i>Neogale frenata peninsulae</i>	Florida Long-tailed Weasel	G5T3?	S3?	N	N
Scrub		G2	S2	N	N

Potential

<i>Aphelocoma coerulescens</i>	Florida Scrub-Jay	G2	S2	T	FT
--------------------------------	-------------------	----	----	---	----

Definitions: Documented - Rare species and natural communities documented on or near this site.

Documented-Historic - Rare species and natural communities documented, but not observed/reported within the last twenty years.

Likely - Rare species and natural communities likely to occur on this site based on suitable habitat and/or known occurrences in the vicinity.

Potential - This site lies within the known or predicted range of the species listed.



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Tallahassee, FL 32303
(850) 224-8207
www.fnai.org

Florida
Natural Areas
Inventory

Florida Natural Areas Inventory

Biodiversity Matrix Report



Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Listing
<i>Athene cunicularia floridana</i>	Florida Burrowing Owl	G4T3	S3	N	ST
<i>Calopogon multiflorus</i>	many-flowered grass-pink	G2G3	S2S3	N	T
<i>Carex chapmanii</i>	Chapman's sedge	G3	S3	N	T
<i>Centrosema arenicola</i>	sand butterfly pea	G2Q	S2	N	E
<i>Coleataenia abscissa</i>	cutthroatgrass	G3	S3	N	E
<i>Conradina grandiflora</i>	large-flowered rosemary	G3	S3	N	T
<i>Deeringothamnus pulchellus</i>	beautiful pawpaw	G2	S2	E	E
<i>Drymarchon couperi</i>	Eastern Indigo Snake	G3	S2?	T	FT
<i>Gopherus polyphemus</i>	Gopher Tortoise	G3	S3	N	ST
<i>Hartwrightia floridana</i>	Florida hartwrightia	G2G3	S2S3	UR	T
<i>Heterodon simus</i>	Southern Hognose Snake	G2	S2S3	N	N
<i>Lechea cernua</i>	nodding pinweed	G3	S3	N	T
<i>Lithobates capito</i>	Gopher Frog	G2G3	S3	UR	N
<i>Matelea floridana</i>	Florida spiny-pod	G2	S2	N	E
<i>Nemastylis floridana</i>	celestial lily	G3	S3	N	E
<i>Nolina atopocarpa</i>	Florida beargrass	G3	S3	N	T
<i>Notophthalmus perstriatus</i>	Striped Newt	G2G3	S2	N	ST
<i>Peucaea aestivalis</i>	Bachman's Sparrow	G3	S3	N	N
<i>Peromyscus floridanus</i>	Florida Mouse	G3	S3	N	N
<i>Salix floridana</i>	Florida willow	G2G3	S2S3	UR	E
<i>Sciurus niger niger</i>	Southeastern Fox Squirrel	G5T5	S3	N	N
<i>Selonodon mandibularis</i>	Large-Jawed Cebionid Beetle	G2G4	S2S4	N	N
<i>Warea carteri</i>	Carter's warea	G1	S1	E	E

Definitions: Documented - Rare species and natural communities documented on or near this site.

Documented-Historic - Rare species and natural communities documented, but not observed/reported within the last twenty years.

Likely - Rare species and natural communities likely to occur on this site based on suitable habitat and/or known occurrences in the vicinity.

Potential - This site lies within the known or predicted range of the species listed.

Elements and Element Occurrences

An **element** is any exemplary or rare component of the natural environment, such as a species, natural community, bird rookery, spring, sinkhole, cave, or other ecological feature.

An **element occurrence (EO)** is an area of land and/or water in which a species or natural community is, or was, present. An EO should have practical conservation value for the Element as evidenced by potential continued (or historical) presence and/or regular recurrence at a given location.

Element Ranking and Legal Status

Using a ranking system developed by NatureServe and the Natural Heritage Program Network, the Florida Natural Areas Inventory assigns two ranks for each element. The global rank is based on an element's worldwide status; the state rank is based on the status of the element in Florida. Element ranks are based on many factors, the most important ones being estimated number of Element Occurrences (EOs), estimated abundance (number of individuals for species; area for natural communities), geographic range, estimated number of adequately protected EOs, relative threat of destruction, and ecological fragility.

FNAI GLOBAL ELEMENT RANK

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

FNAI STATE ELEMENT RANK

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

FEDERAL LEGAL STATUS

Legal status information provided by FNAI for information only. For official definitions and lists of protected species, consult the relevant federal agency.

Definitions derived from U.S. Endangered Species Act of 1973, Sec. 3. Note that the federal status given by FNAI refers only to Florida populations and that federal status may differ elsewhere.

C = Candidate species for which federal listing agencies have sufficient information on biological vulnerability and threats to support proposing to list the species as Endangered or Threatened.

E = Endangered: species in danger of extinction throughout all or a significant portion of its range.

E, T = Species currently listed endangered in a portion of its range but only listed as threatened in other areas

E, PDL = Species currently listed endangered but has been proposed for delisting.

E, PT = Species currently listed endangered but has been proposed for listing as threatened.

E, XN = Species currently listed endangered but tracked population is a non-essential experimental population.

T = Threatened: species likely to become Endangered within the foreseeable future throughout all or a significant portion of its range.

PE = Species proposed for listing as endangered.

PS = - An infraspecific taxon or population has federal status but the entire species does not - status is in only a portion of the species range.

PT = Species proposed for listing as threatened.

SAT = Treated as threatened due to similarity of appearance to a species which is federally listed such that enforcement personnel have difficulty in attempting to differentiate between the listed and unlisted species.

SC = Not currently listed, but considered a "species of concern" to USFWS.

DL = Delisted.

UR = Under review.

STATE LEGAL STATUS

Provided by FNAI for information only. For official definitions and lists of protected species, consult the relevant state agency.

Animals: Definitions derived from "Florida's Endangered Species and Species of Special Concern, Official Lists" published by Florida Fish and Wildlife Conservation Commission, 1 August 1997, and subsequent updates.

C = Candidate for listing at the Federal level by the U. S. Fish and Wildlife Service

FE = Listed as Endangered Species at the Federal level by the U. S. Fish and Wildlife Service

FT = Listed as Threatened Species at the Federal level by the U. S. Fish and Wildlife Service

FXN = Federal listed as an experimental population in Florida

FT(S/A) = Federal Threatened due to similarity of appearance

ST = State population listed as Threatened by the FFWCC. Defined as a species, subspecies, or isolated population which is acutely vulnerable to environmental alteration, declining in number at a rapid rate, or whose range or habitat is decreasing in area at a rapid rate and as a consequence is destined or very likely to become an endangered species within the foreseeable future.

SSC = Listed as Species of Special Concern by the FFWCC. Defined as a population which warrants special protection, recognition, or consideration because it has an inherent significant vulnerability to habitat modification, environmental alteration, human disturbance, or substantial human exploitation which, in the foreseeable future, may result in its becoming a threatened species. (SSC* for *Pandion haliaetus* (Osprey) indicates that this status applies in Monroe county only.)

N = Not currently listed, nor currently being considered for listing.

Plants: Definitions derived from Sections 581.011, 581.185 and 581.185(2), Florida Statutes, and the Preservation of Native Flora of Florida Act, 5B-40.001. FNAI does not track all state-regulated plant species; for a complete list of state-regulated plant species, call Florida Division of Plant Industry, 352-372-3505 or see: <https://www.flrules.org/gateway/ChapterHome.asp?Chapter=5B-40>.

E = Endangered: species of plants native to Florida that are in imminent danger of extinction within the state, the survival of which is unlikely if the causes of a decline in the number of plants continue; includes all species determined to be endangered or threatened pursuant to the U.S. Endangered Species Act.

T = Threatened: species native to the state that are in rapid decline in the number of plants within the state, but which have not so decreased in number as to cause them to be Endangered.

CE = Commercially exploited: species native to the state which are subject to being removed in significant numbers from native habitats in the state and sold or transported for sale.

N = Not currently listed, nor currently being considered for listing.

Element Occurrence Ranking

FNAI ranks of quality of the element occurrence in terms of its viability (EORANK). Viability is estimated using a combination of factors that contribute to continued survival of the element at the location. Among these are the size of the EO, general condition of the EO at the site, and the conditions of the landscape surrounding the EO (e.g. an immediate threat to an EO by local development pressure could lower an EO rank).

A = Excellent estimated viability
A? = Possibly excellent estimated viability
AB = Excellent or good estimated viability
AC = Excellent, good, or fair estimated viability
B = Good estimated viability
B? = Possibly good estimated viability
BC = Good or fair estimated viability
BD = Good, fair, or poor estimated viability
C = Fair estimated viability
C? = Possibly fair estimated viability
CD = Fair or poor estimated viability
D = Poor estimated viability
D? = Possibly poor estimated viability
E = Verified extant (viability not assessed)
F = Failed to find
H = Historical
NR = Not ranked, a placeholder when an EO is not (yet) ranked.
U = Unrankable
X = Extirpated

*For additional detail on the above ranks see: <http://www.natureserve.org/explorer/eorankguide.htm>

FNAI also uses the following EO ranks:

H? = Possibly historical
F? = Possibly failed to find
X? = Possibly extirpated

The following offers further explanation of the H and X ranks as they are used by FNAI:

The rank of H is used when there is a lack of recent field information verifying the continued existence of an EO, such as (a) when an EO is based only on historical collections data; or (b) when an EO was ranked A, B, C, D, or E at one time and is later, without field survey work, considered to be possibly extirpated due to general habitat loss or degradation of the environment in the area. This definition of the H rank is dependent on an interpretation of what constitutes "recent" field information. Generally, if there is no known survey of an EO within the last 20 to 40 years, it should be assigned an H rank. While these time frames represent suggested maximum limits, the actual time period for historical EOs may vary according to the biology of the element and the specific landscape context of each occurrence (including anthropogenic alteration of the environment). Thus, an H rank may be assigned to an EO before the maximum time frames have lapsed. Occurrences that have not been surveyed for periods exceeding these time frames should not be ranked A, B, C, or D. The higher maximum limit for plants and communities (i.e., ranging from 20 to 40 years) is based upon the assumption that occurrences of these elements generally have the potential to persist at a given location for longer periods of time. This greater potential is a reflection of plant biology and community dynamics. However, landscape factors must also be considered. Thus, areas with more anthropogenic impacts on the environment (e.g., development) will be at the lower end of the range, and less-impacted areas will be at the higher end.

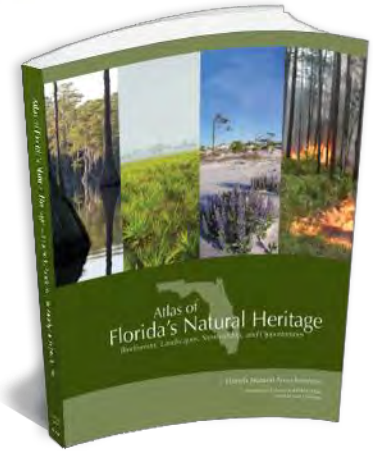
The rank of X is assigned to EOs for which there is documented destruction of habitat or environment, or persuasive evidence of eradication based on adequate survey (i.e., thorough or repeated survey efforts by one or more experienced observers at times and under conditions appropriate for the Element at that location).



Atlas of Florida's Natural Heritage

Biodiversity, Landscapes, Stewardship, and Opportunities

The Florida Natural Areas Inventory is pleased to announce the publication of the ***Atlas of Florida's Natural Heritage: Biodiversity, Landscapes, Stewardship, and Opportunities***. This high-quality, full-color *Atlas* is sure to become a standard reference for anyone involved in the conservation, management, study, or enjoyment of Florida's rich natural resources. We hope the *Atlas* will inspire, educate, and raise awareness of and interest in biodiversity and conservation issues.



Learn more about the Atlas, view sample pages and order your copy today at:
<https://www.fnai.org/publications/atlas-natural-heritage>

Check out our various web maps and
GIS data options here:

<https://geodata.fnai.org/>

and



Hi-Oaks Ranch: Florida Forever Measures Evaluation 20250911

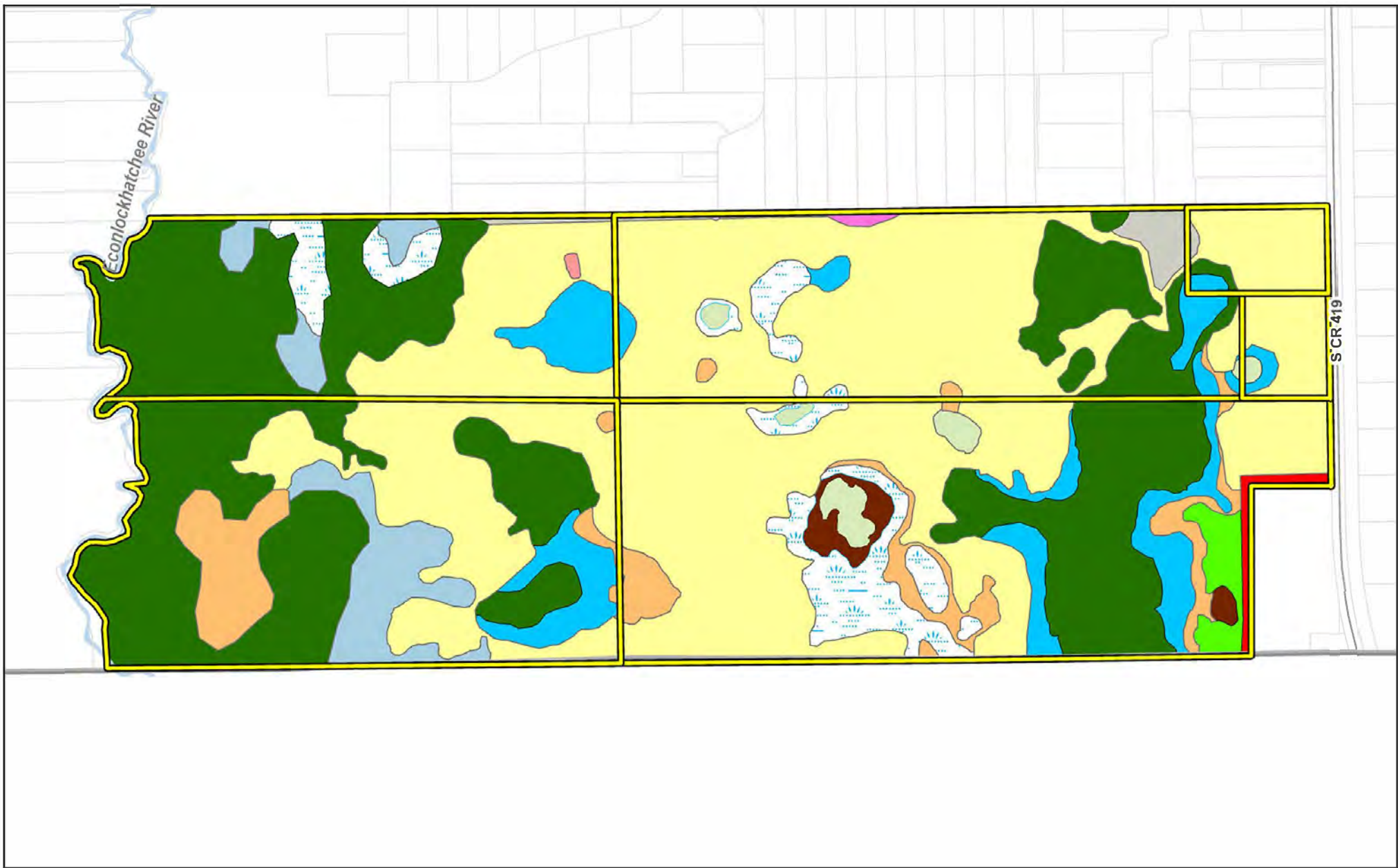
GIS ACRES = 671

MEASURES	Resource Acres ^a	% of project
B1: Strategic Habitat Conservation Areas		
Priority 1	0	0%
Priority 2	575	86%
Priority 3	84	13%
Priority 4	0	0%
Priority 5	1	< 1%
Total Acres	660	98%
B2: FNAI Habitat Conservation Priorities		
Priority 1	0	0%
Priority 2	0	0%
Priority 3	0	0%
Priority 4	0	0%
Priority 5	412	61%
Priority 6	240	36%
Total Acres	652	97%
B3: Ecological Greenways		
Priority 1	0	0%
Priority 2	0	0%
Priority 3	513	77%
Priority 4	0	0%
Priority 5	60	9%
Total Acres	573	86%
B4: Under-represented Natural Communities		
Upland Glade (G1)	0	0%
Pine Rockland (G1)	0	0%
Scrub and Scrubby Flatwoods (G2)	1	< 1%
Rockland Hammock (G2)	0	0%
Dry Prairie (G2)	0	0%
Seepage Slope (G2)	0	0%
Sandhill (G3)	0	0%
Sandhill Upland Lake (G3)	0	0%
Upland Pine (G3)	0	0%
Mesic/Wet Flatwoods (G4)	0	0%
Upland Hardwood Forest (G5)	0	0%
Total Acres	1	0%
B6: Occurrences of FNAI Tracked Species		
G1	0	
G2	0	
G3	0	
G4	1	
G5	0	
Total	1	
C4: Natural Floodplain Function		
Priority 1	0	0%
Priority 2	159	24%
Priority 3	146	22%
Priority 4	6	< 1%
Priority 5	0	0%
Priority 6	0	0%
Total Acres	311	46%

MEASURES (continued)	Resource Acres ^a	% of project
C5: Surface Water Protection		
Priority 1	0	0%
Priority 2	81	12%
Priority 3	0	0%
Priority 4	384	57%
Priority 5	119	18%
Priority 6	83	12%
Priority 7	0	0%
Total Acres	666	99%
C7: Fragile Coastal Resources		
Fragile Coastal Uplands	0	0%
Imperiled Coastal Lakes	0	0%
Coastal Wetlands	0	0%
Total Acres	0	0%
C8: Functional Wetlands		
Priority 1	0	0%
Priority 2	148	22%
Priority 3	190	28%
Priority 4	8	1%
Priority 5	0	0%
Priority 6	0	0%
Total Acres	346	52%
D3: Aquifer Recharge		
Priority 1	12	2%
Priority 2	148	22%
Priority 3	479	71%
Priority 4	32	5%
Priority 5	0	0%
Priority 6	0	0%
Total Acres	671	100%
E2: Recreational Trails (miles)		
(prioritized trail opportunities from Office of Greenways and Trails & Univ. Florida)		
Land Trail Priorities	0.0	
Land Trail Opportunities	3.1	
Total Miles	3.1	
F2: Arch. & Historical Sites (number)		0 sites
G1: Sustainable Forestry		
Priority 1	0	0%
Priority 2	0	0%
Priority 3	0	0%
Priority 4	0.4	< 1%
Priority 5	1	< 1%
Total Acres	1	0%
G3: Forestland for Recharge		80 12%

^aAcres of each resource in the project and percentage of project represented by each resource are listed except where noted. This analysis converts site boundary into pixels, which causes slight differences from GIS acres; this effect is most noticeable on small sites.

Exhibit F
Land Cover Map



Florida Forever Exhibit F Hi-Oaks Ranch FNAI Map

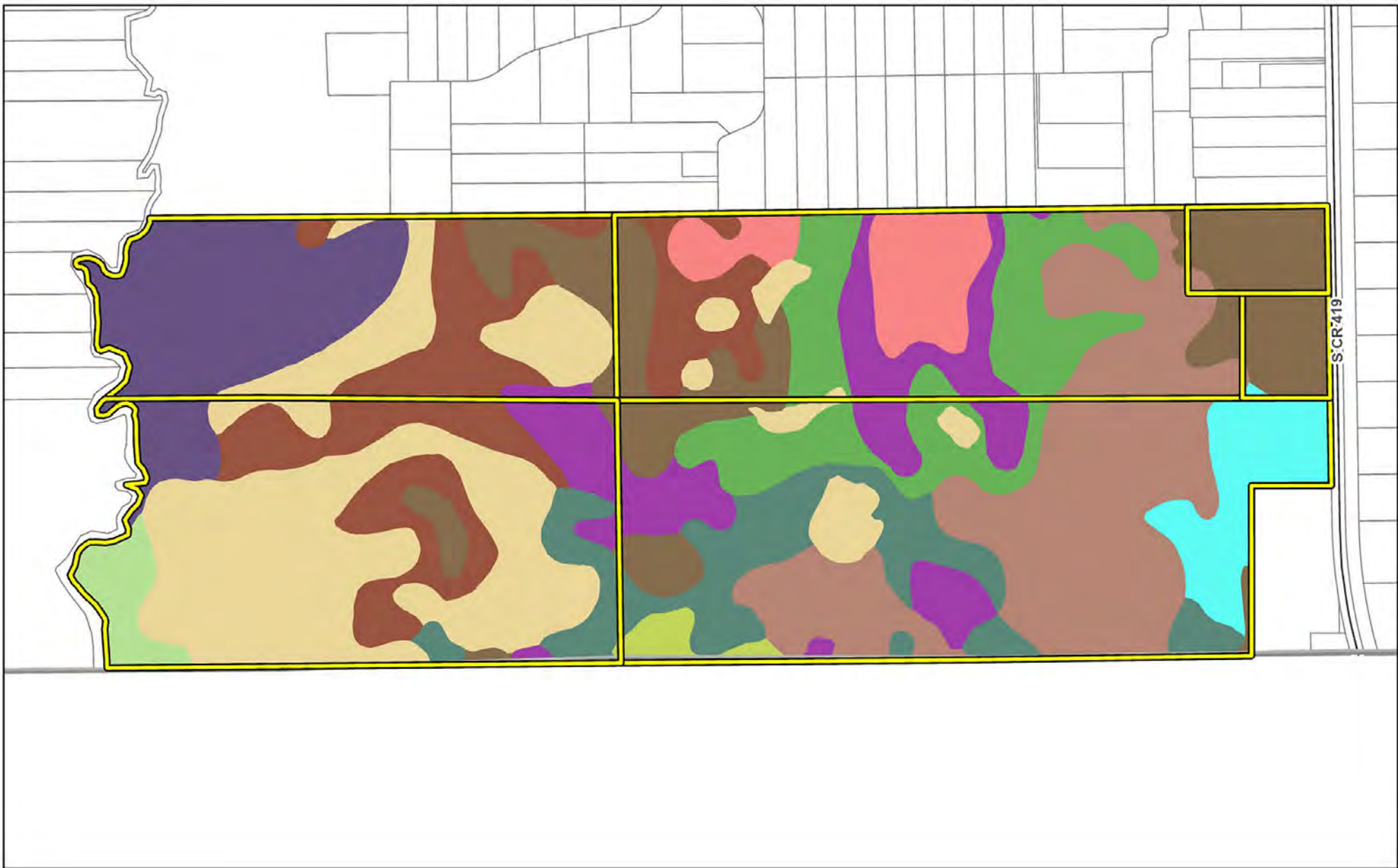
- | | | |
|--------------------------------------|----------------------------------|-----------------------------|
| Cypress | Mixed Hardwood Coniferous Swamps | Scrubby Flatwoods |
| Floating/Emergent Aquatic Vegetation | Mixed Hardwood-Coniferous | Transportation |
| Improved Pasture | Mixed Scrub-Shrub Wetland | Unimproved/Woodland Pasture |
| Institutional | Mixed Wetland Hardwoods | Utilities |
| Marshes | Residential, Low Density | Wet Prairie |
| Mesic Flatwoods | Rural Open | |



0 0.4 Miles

Date Saved: 2/10/2025 3:33 PM
Name: Seminole Forever Hi-Oaks LLC

Exhibit G
Soils Map



Florida Forever Exhibit G Hi-Oaks Ranch Soils Map

- Adamsville-Sparr fine sands
- Arents, 0 to 5 percent slopes
- Basinger, Samsula, and Hontoon soils, depressional
- Brighton, Samsula, and Sanibel mucks
- EauGallie and Immokalee fine sands
- Immokalee sand, 0 to 2 percent slopes

- Manatee, Floridana, and Holopaw soils, frequently flooded
- Myakka and EauGallie fine sands
- Paola-St. Lucie sands, 0 to 5 percent slopes
- Pomello fine sand, 0 to 5 percent slopes
- Pompano fine sand, occasionally flooded
- Tavares-Millhopper complex, 0 to 5 percent slopes

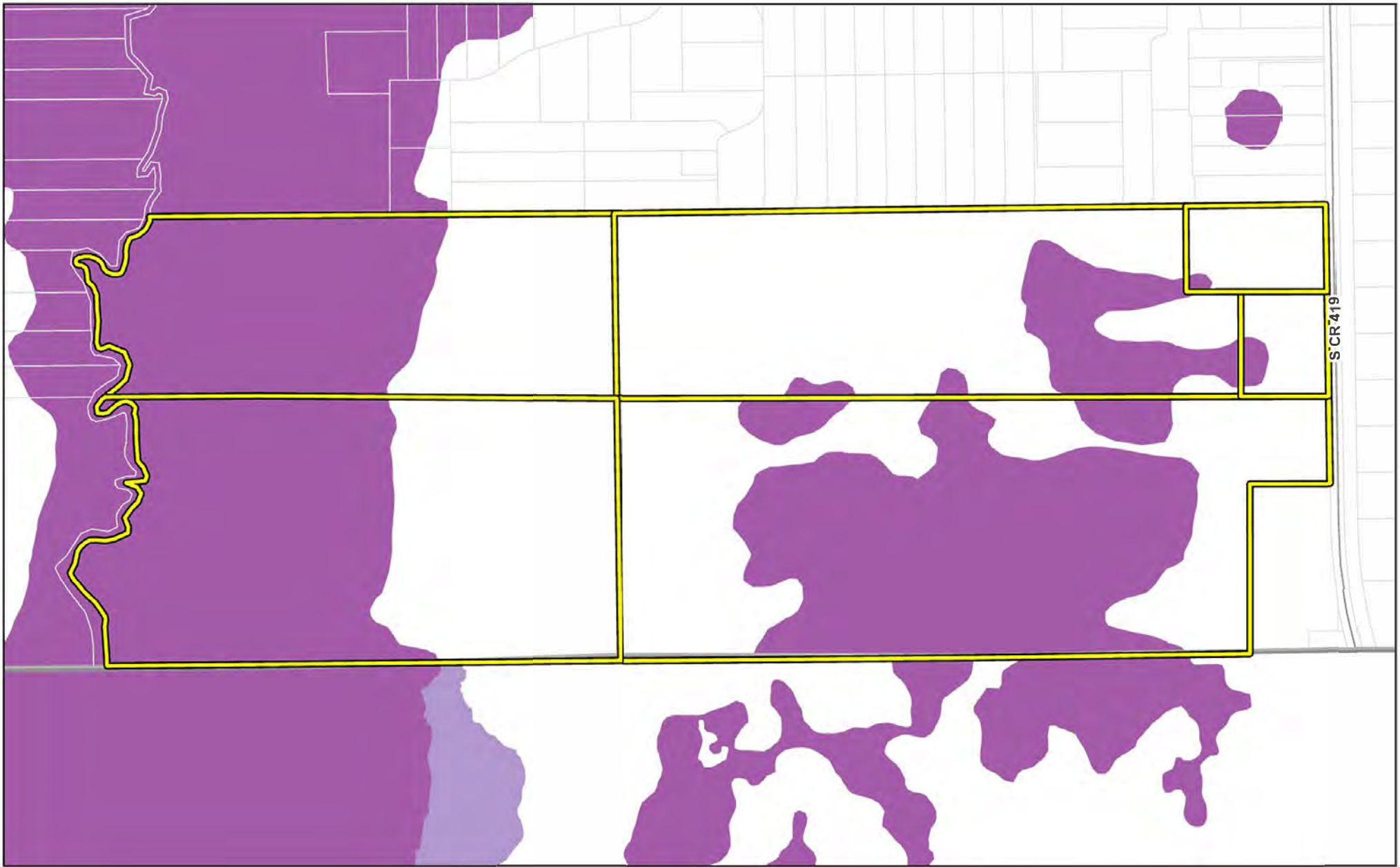


0

 0.4
Miles

Date Saved: 2/10/2025 3:33 PM
Name: Seminole Forever Hi-Oaks LLC

Exhibit H
Flood Zone Map



Flood Hazard Zones (FEMA)

-  0.2% Annual Chance Flood Hazard
-  1% Annual Chance Flood Hazard

Florida Forever Exhibit H Hi-Oaks Ranch 100-Year Floodplain Map



0  0.4 Miles

Exhibit I

Florida Master Site File Report

**Legend**

- Hi-Oaks Ranch
- FloridaSites
- HistoricalBridges
- HistoricalCemeteries
- ResourceGroups
- FloridaStructures

570 285 0 570 Meters





Total=6

Manuscript Roster

MS#	Title	Publication Information	Year
27108	Cultural Resource Assessment Survey, The Exchange, Seminole County, Florida	S&ME, Inc., Columbia, South Carolina, prepared for River Cross Land Company, LLC	2020
25048	Cultural Resource Assessment Survey of Clayton High Oaks Property, Seminole County, Florida	P18022. Archaeological Consultants Inc., prepared for Bio-Tech Consulting, Inc.	2018
25344	ultural Resource Assessment Survey Technical Memorandum, Proposed Pond Sites, Harborview Road (CR 776) PD&E Study from Melbourne Street to I-75, Charlotte County, Florida; FPID No.: 434965-1-22-01	P17049A, Archaeological Consultants Inc, Sarasota. Prepared for Florida Department of Transportation - District 1	2018
8025	An Archaeological and Historical Survey of the Proposed Lockwood Tower Location in Orange County, Florida	PANAMERICAN CONSULTANTS, INC., TAMPA. Submitted to EPAC ENVIRONMENTAL SERVICES, INC.	2000
3889	Cultural Resources Study of Seminole County, Florida: Historic and Architectural Resources, Volume II	Laurie, Murray, Gainesville. Submitted to the Division of Historical Resources, Bureau of Archaeological Research, Tallahassee.	1994
3630	Cultural Resource Assessment Survey of a Portion of the Proposed Poinsett-Sanford 230 kV Transmission Line to Chuluota, Orange County, Florida	Janus Research/Piper Archaeology, St. Petersburg. Submitted to KBN Engineering and Applied Sciences, Inc., Gainesville.	1993

Exhibit J

Commitment Letter

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Exhibit K

Photos



A black metal sign hangs from a thick wooden beam. The sign features the words "HIGH OAKS RANCH" in a stylized, arched font. Below the arch is a large, circular logo containing the letter "C". The sign is suspended by four chains. The background is a clear blue sky with green trees visible on the sides.

HIGH OAKS RANCH

C

Hi-Oaks Ranch





Hi-Oaks Ranch





Appendix A

Management Prospectus

Management Prospectus

Hi Oaks Ranch - Florida Forever Program

Introduction

Hi-Oaks Ranch is an approximately 669.4 acre candidate for addition to the Florida Forever Program as a Fee-Simple acquisition. This potential acquisition provides positive impact on the Econlockhatchee River due to having approximately one mile of shoreline along the Econlockhatchee River, being located within the Big Econlockhatchee Drainage Basin, within the Econlockhatchee River Corridor Protection Zone, and it is located on the western boundary of the Florida Wildlife Corridor within the "Corridor Opportunity Area." It also provides connectivity to adjacent conservation lands, preservation of natural habitats, and opportunities for compatible passive recreation.

This Management Prospectus is not a complete land management plan for the project site; it serves as the framework for a more detailed and developed management plan as required upon acquisition.

Purpose and Scope

The purpose of this acquisition is to preserve and or to protect the resources onsite with emphasis on the connectivity to the Florida Wildlife Corridor and neighboring county and state lands. Compatible passive recreation to the public will be incorporated if feasible. There are six parcels within the scope of the project site proposed for acquisition with an assessed value of \$123,822.

Parcel #	Zoning	Owner	Acres	Market Value
31-21-32-300-0010-0000	A-5	Hi-Oaks LLC	115.49	\$1,920,000
31-21-32-300-0020-0000	A-5	Hi-Oaks LLC	169.98	\$3,478,000
32-21-32-300-0030-0000	A-5	Hi-Oaks LLC	143.04	\$3,037,500
32-21-32-300-0050-0000	A-5	Hi-Oaks LLC	216.60	\$4,950,000
32-21-32-300-003Z-0000	A-5	Hi-Oaks LLC	15.34	\$337,500
32-21-32-300-003A-0000	A-5	Hi-Oaks LLC	11.49	\$192,000

Information gathered from Seminole County Property Appraisers, <https://scpafl.org/>

Site Description

The Hi-Oaks Ranch property is located along the south boundary of Seminole county, southeast of Oviedo and west of County Road 419. The property is comprised of six parcels totaling approximately 669.4 acres with the Econlockhatchee River as it's west boundary and across the river from Seminole County's Econ River Wilderness Area. The Hi-Oaks Ranch is a key site to expand existing public lands within Seminole County and add to the protection of the Florida Wildlife Corridor along the Econlockhatchee River.

There are twelve Florida Natural Areas Inventory land cover types and twelve soil types on the property. The main natural community is unimproved/woodland pasture, with wetlands such as basin and dome swamps scattered throughout the property. The western portion of the property borders the Econlockhatchee River and has a large portion of relatively intact bottomland forest. Timbering activities have occurred on the property throughout the years, and there are scattered areas of planted pine trees in rows. Cattle grazing has also occurred throughout the pastures, and limited hunting and camping has been allowed on the property in the past as well. Upland, hydric and wetlands soil types occur on the property and include Adamsville-Sparr fine sands, Arents, Basinger, EauGallie, and Pompano fine sand.

The eastern half of the property provides medium groundwater recharge. Most of the wetlands on-site do not appear to have any major hydrological disturbances, although at least one of the ponds was excavated for the benefit of cattle.

Listed species that inhabit the property include the gopher tortoise, American alligator, Florida sandhill crane, and Sherman's fox squirrel. Various wading birds also intermittently use the property, and garberia, a listed plant species, was observed during the site visit. There is some potential for other listed plant species to be found on the site, such as plume polypody.

Habitat for wildlife species has been somewhat impacted by the agricultural improvements to the site. The Florida Fish and Wildlife Conservation Commission (FWC) identifies the site as within a foraging area associated with a known rookery of the Wood Stork. Gopher tortoises have been confirmed throughout the property. A variety of wildlife will benefit from a restoration of the habitats and hydrology of this site. Prescribed burning would be reintroduced into the planted pine areas that still have some native plant cover.

The Big and Little Econ River basins comprise about 56 square miles in the eastern half of Seminole county. Beginning in Osceola County the Econlockhatchee River stretches 54.5 miles northward through Orange County and into Seminole County where it finally empties into the St. Johns River.

A more detailed analysis of the property will be completed post-acquisition and provided in a standard ten-year management plan.

1. Management Goals

The following goals and objectives were identified by Seminole County's Natural Lands Program staff and are consistent with the Natural Lands Program policy guidelines:

- To preserve, maintain, enhance and restore natural communities and wildlife habitat
- To protect and sustain populations of threatened and endangered species
- To allow restoration of the wetland systems
- To provide connectivity to adjacent conservation lands
- To provide appropriate nature-based recreation that offers public enjoyment of the site without damaging the unique natural habitats
- To periodically review, evaluate and modify the management of the property

The Hi-Oaks Ranch project is proposed for fee simple acquisition. Management responsibilities for the property will be presented to the Seminole County Board of County Commissioners for formal consideration at a future date.

2. Intensity of Management

The conditions which will affect the intensity of management will be directly related to the goals for the site. A full assessment will need to be conducted to determine the condition of natural resources described above and extent of restoration feasible at the site. Implementation of compatible based recreation will also affect the intensity of management. This will be included in the site assessment and incorporated into the ten-year management plan.

3. Estimate of the Revenue Generating Potential

Typical revenue generating programs include camping, as well as educational and outdoor recreational activities. The appropriate generation of revenue from this site will be evaluated in the management planning process and will be included in the ten-year management plan.

4. Timetable for Implementation

Once acquisition is completed, a detailed site assessment will be conducted, and the management planning process will be initiated. As the plan is created, securing the site and low impact accessibility improvements will begin. Any extensive site improvements for restoration or allowing for public access will not be initiated until the final management plan is approved.

5. Potential Multiple-Use Activities

The primary objective will be to protect the resources on-site while providing access and compatible passive recreation opportunities to the public. The site's potential activities could be hiking, environmental education, wildlife viewing, bicycling, equestrian activities and camping. Recreation and education activities will be evaluated so as not to degrade the natural resources and not alter natural habitats. Observation areas may include educational signage describing the importance of the site, mainly its ecological value to the Econlockhatchee River and the Florida Wildlife Corridor. Other potential facilities listed below, will require a full site assessment to determine the extent of feasibility and will be discussed in the ten-year management plan.

A preliminary list of improvements may include:

- Parking area
- Trailhead with information kiosk
- Nature viewing areas
- Interpretive signs
- Paddling access points
- Multi-use trails
- Equestrian facility
- Youth Conservation Center

The Following prohibitions or incompatible uses are proposed as part of this prospectus and may be included in the final management plan:

- No clear cutting of trees, other than non-native species, is allowed without prior written approval of the State of Florida or as included in the management plan.
- No major land alterations may be done without prior written approval of the State of Florida or as included in the management plan.
- No generation, storage, treatment or discharge of hazardous, toxic materials or chemicals are allowed on the property.
- No improvements or physical alterations are allowed without the State's written permission until a management plan is approved (except those necessary for security and maintenance of the property).

6. Provisions for protecting existing infrastructure

The site protection starts with effective monitoring and planning strategies. The primary access point located on County Road 419 is already fenced and gated. A proper assessment will be conducted to determine if and where additional fences should be constructed to protect the resources. Any fences constructed will do so in a manner which encourages ecological connectivity to the other conservation lands. Through partnerships with local law enforcement and FWC, the site will be monitored regularly for signs of undesirable activities and resource degradation. Any evidence of illegal dumping will be reported, and actions taken to reduce the likelihood of illegal dumping. Any evidence of dumping that has the possibility to contaminate the groundwater resources will be reported and mitigated upon discovery. The site will also be monitored for trespassers and unauthorized access on a regular basis. Boundary signs will be created and installed with any applicable restrictions clearly listed and contact information for those seeking authorized access.

7. Expenses and Financial Support

Initial cost to develop the site are estimated to be \$159,750. Included in these costs are improving site security, invasive plant treatments and site maintenance.

A preliminary estimate for expenditures during the first year is as follows:

Site Security (fencing/gate repair, boundary signs)	\$3,000
Invasive Plant Management.....	\$16,750
Demolition and Removal of Old Structures	\$10,000
Site Maintenance.....	\$110,000
Access improvements (roads, water crossings).....	\$20,000
Total	\$159,750

Additional costs may occur. Other supplemental funding sources such as grants, cooperative-assistance funding, and in-kind contributions could supplement the proposed budget.

8. Staff

Staffing will be determined at a later date.



Figure 1
Hi-Oaks Ranch
2024 Aerial



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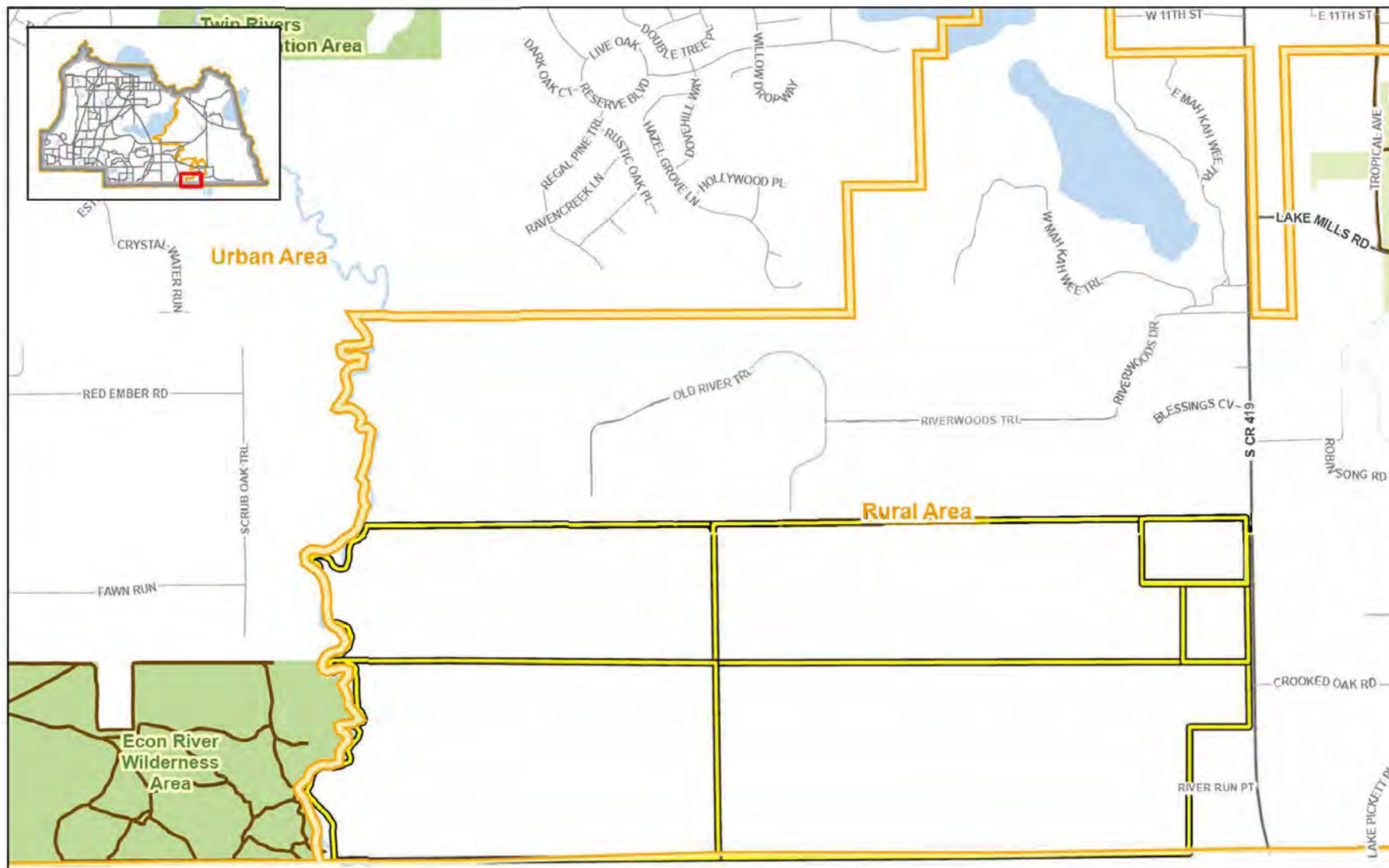


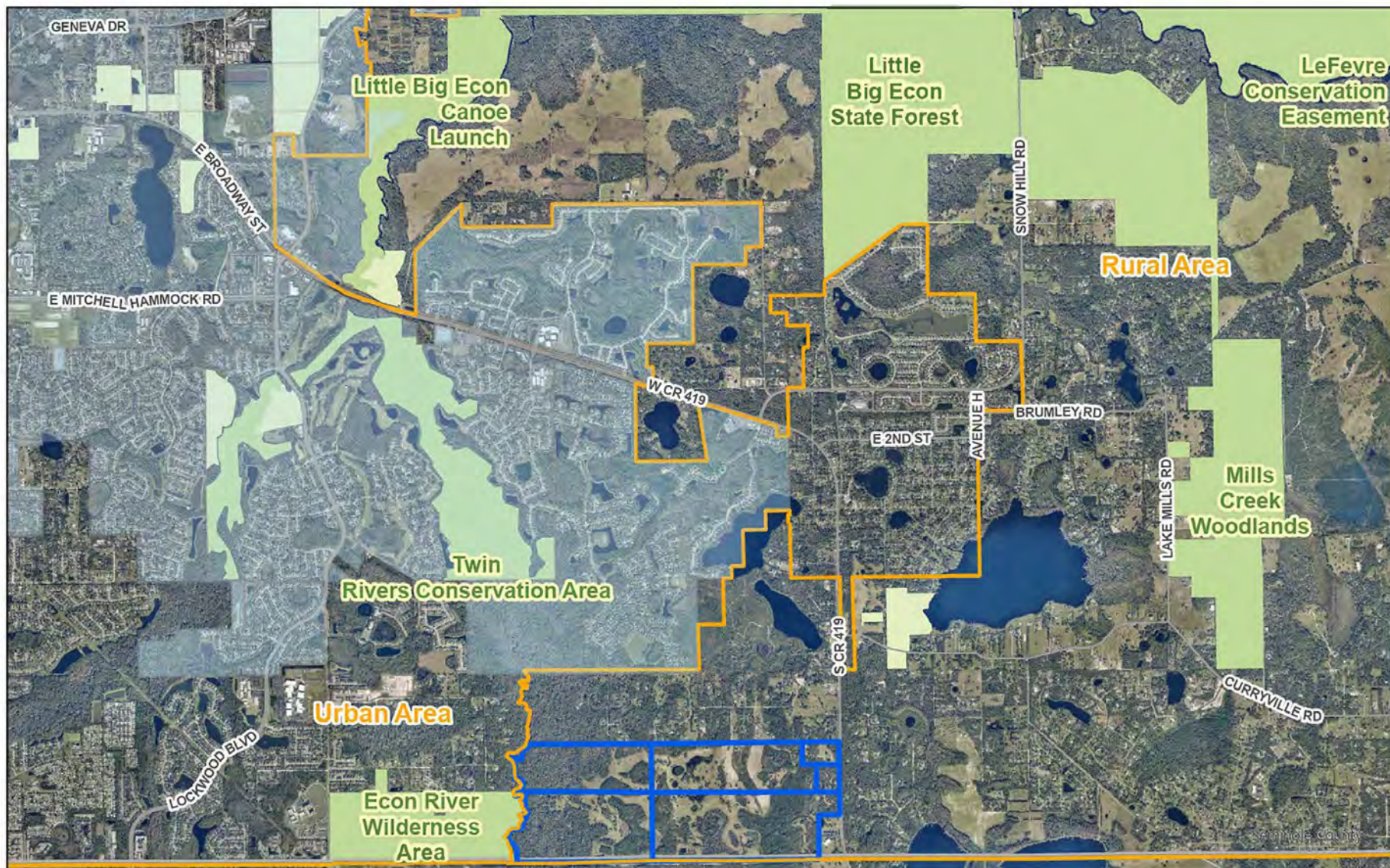
Figure 2
Hi-Oaks Ranch
Location Map

-  County Boundary
-  Trails
-  Parks
-  Preserved Lands
-  Urban Rural Boundary



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- Urban Rural Boundary
- Hi-Oaks Boundary
- Oviedo
- Parks
- Preserved Lands

Figure 3
Hi-Oaks Ranch
Surrounding Conservation Lands



0 2
Miles

FNAI Community	Acres
Cypress	5.5
Floating/Emergent Aquatic Vegetation	6.7
Improved Pasture	0.2
Institutional	3.3
Marshes	34.3
Mesic Flatwoods	0

FNAI Community	Acres
Mixed Hardwood-Coniferous	6.4
Mixed Hardwood Coniferous Swamps	201.7
Mixed Scrub-Shrub Wetland	41.3
Mixed Wetland Hardwoods	25.7
Residential, Low Density	7.7
Rural Open	0.4

FNAI Community	Acres
Scrubby Flatwoods	1
Transportation	0.1
Unimproved/Woodland Pasture	303.5
Utilities	1.6
Wet Prairie	32.1

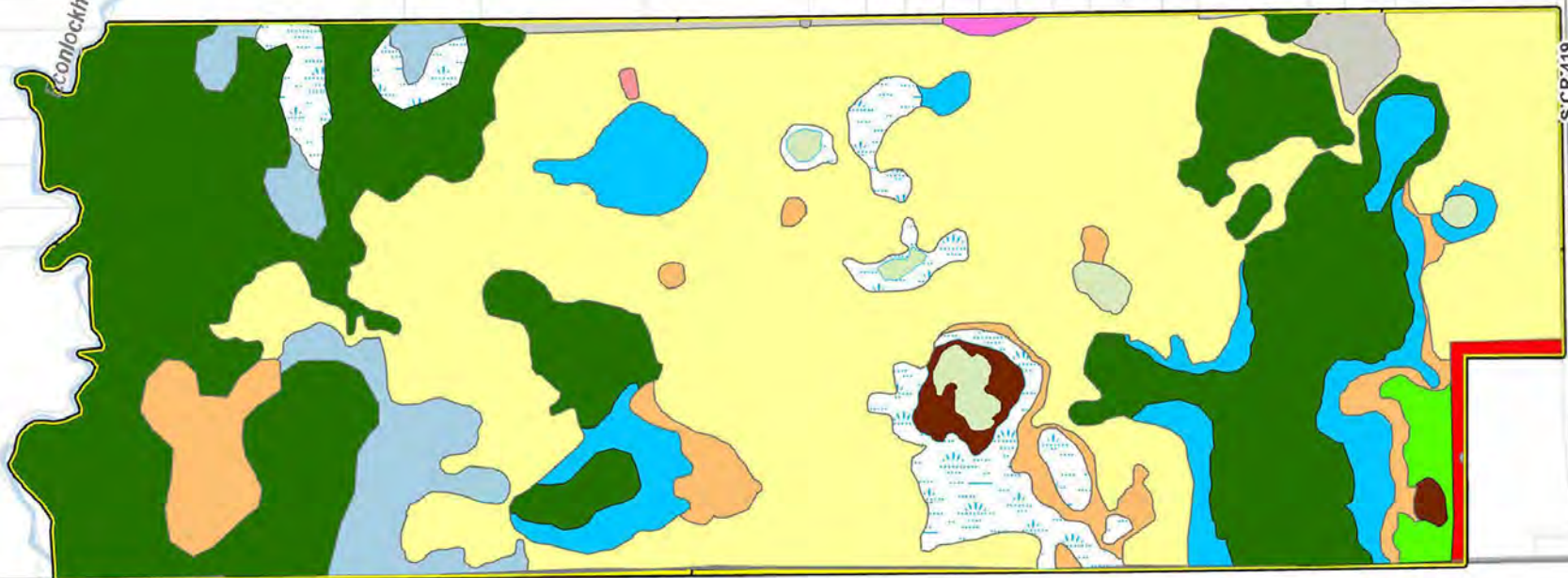


Figure 4
Hi-Oaks Ranch
Natural Communities



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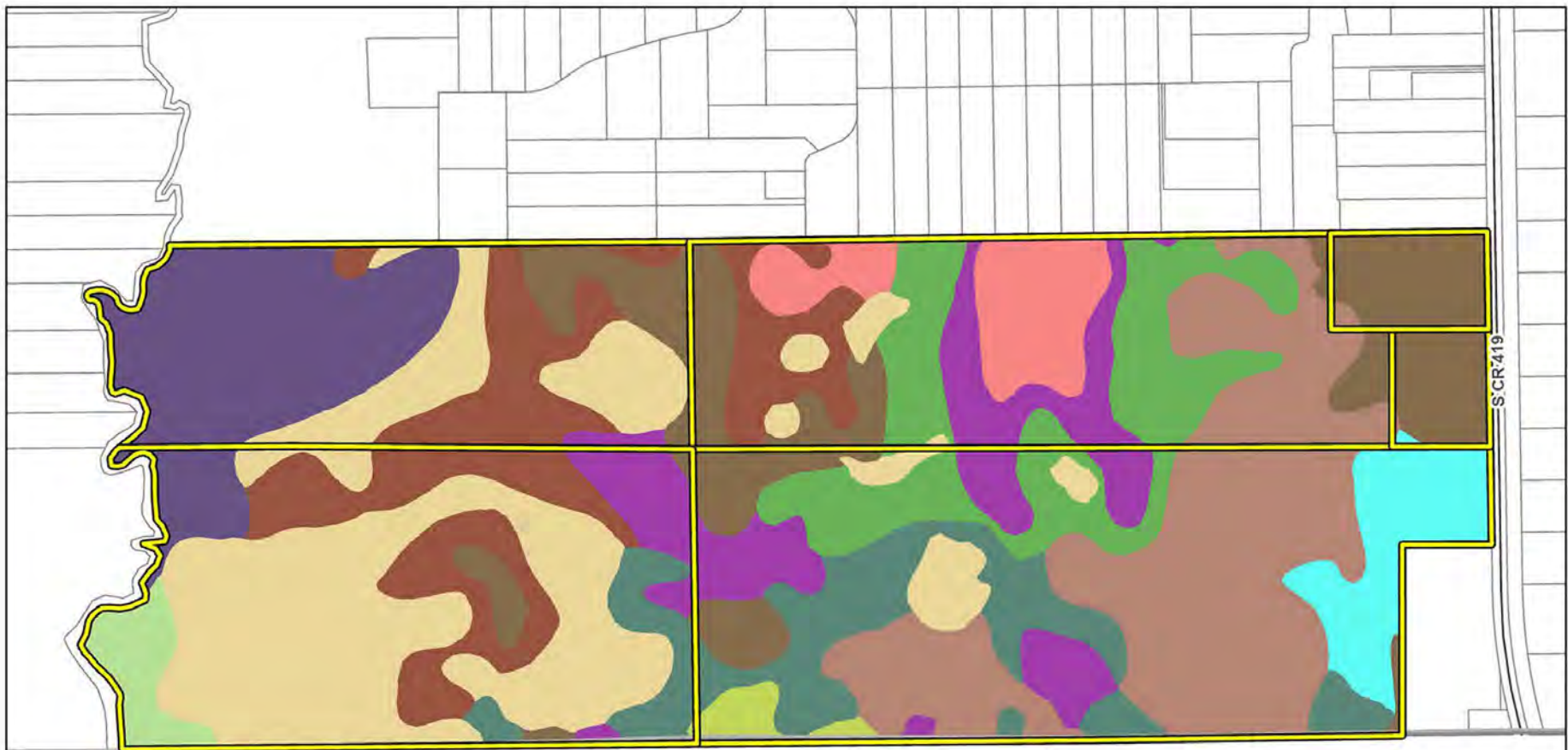


Figure 5
Hi-Oaks Ranch
Soils Types

- | | |
|--|---|
| Adamsville-Sparr fine sands | Manatee, Floridana, and Holopaw soils, frequently flooded |
| Arents, 0 to 5 percent slopes | Myakka and EauGallie fine sands |
| Basinger, Samsula, and Hontoon soils, depressional | Paola-St. Lucie sands, 0 to 5 percent slopes |
| Brighton, Samsula, and Sanibel mucks | Pomello fine sand, 0 to 5 percent slopes |
| EauGallie and Immokalee fine sands | Pompano fine sand, occasionally flooded |
| Immokalee sand, 0 to 2 percent slopes | Tavares-Millhopper complex, 0 to 5 percent slopes |



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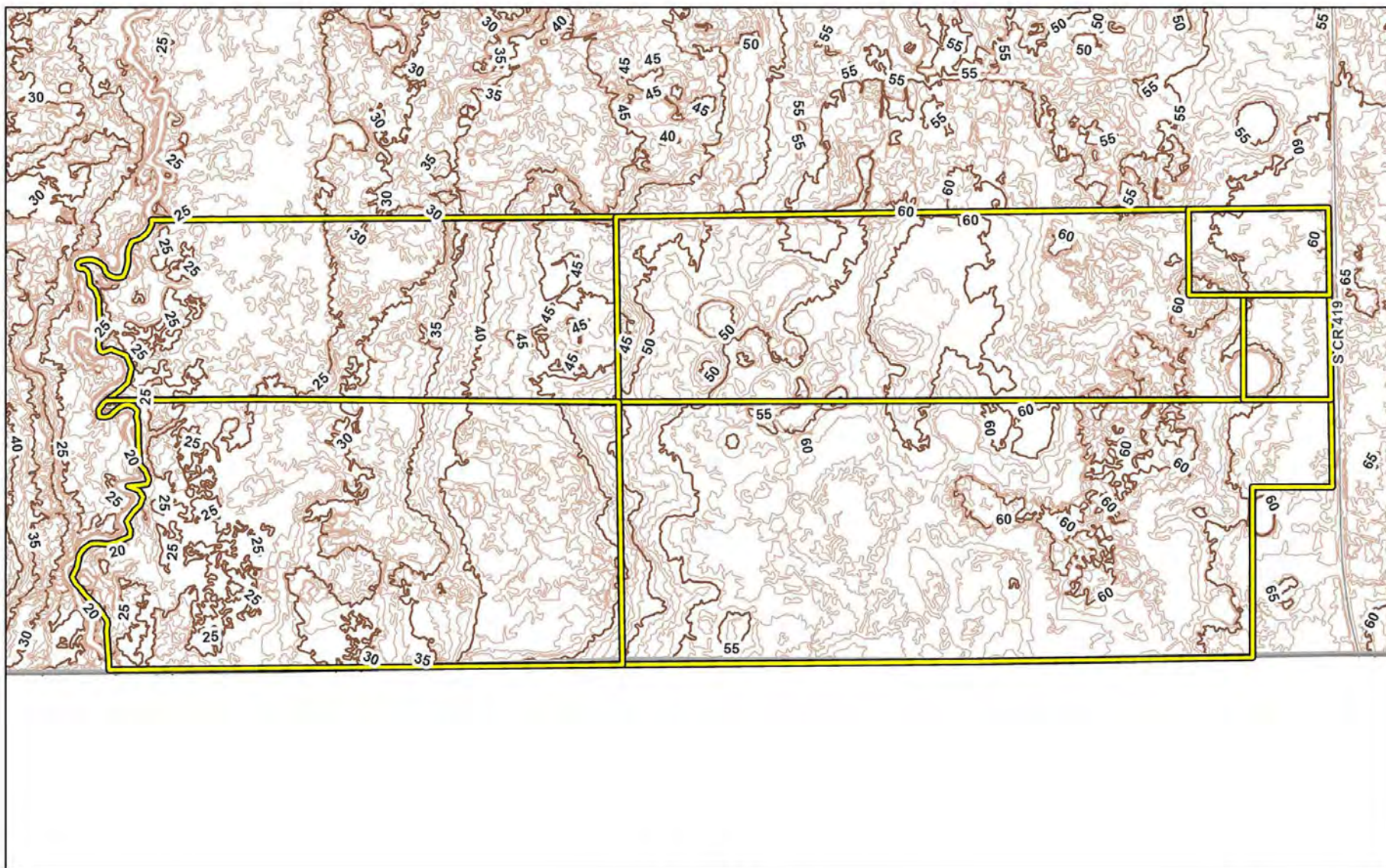


Figure 6
Hi-Oaks Ranch
Contours

Contours

- 5ft interval
- 1ft interval



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