

# ENVIRONMENTAL RESOURCE ASSESSMENT

## Gainesville Regional Utilities Groundwater Recharge Wetland Park ( $\pm 76.22$ acres) Special Exception – Justification Report



### Gainesville Regional Utilities Groundwater Recharge Wetland Park–Alachua County, Florida

#### Development Location & Description:

3602 SW 122nd Street (Parker Road)  
Alachua County, Florida 32608  
Application & Justification for a Special Exception to Construct  
a Groundwater Recharge Facility and Passive Recreation Park  
Total Acreage =  $\pm 76.22$  acres

#### Parcel Location:

Parcel 1 (04433-000-000) = 63.67 acres  
Parcel 2 (04433-003-000) = 12.55 acres

#### Geographic Location:

Section 14, Township 10 South, Range 18 East  
Arredondo Grant, Arredondo USGS Quadrangle Map,  
Southwest Alachua County, Florida

#### *Applicant/Developer*

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**20 August 2020**



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 Development Services Division

**ENVIRONMENTAL RESOURCES ASSESSMENT CHECKLIST**

Pursuant to Alachua County Comprehensive Plan 2002, as amended, Conservation Open Space Element Policy 3.4.1, applications for land use change, zoning change, and development approval shall be required to submit an inventory of natural resource information. The inventory shall include site specific identification, analysis and mapping of each resource present on or adjacent to the site. The identification and analysis shall indicate information sources consulted.

**Natural Resources Checklist:**

Check "Yes" for each resource or resource characteristic identified and discuss and provide supporting material.  
 Check "N/A" for each resource or resource characteristic not present or otherwise relevant to the application.

- Yes  N/A  Surface Waters (ponds, lakes, streams, springs, etc.)
- Yes  N/A  Wetlands
- Yes  N/A  Surface Water or Wetland Buffers
- Yes  N/A  Floodplains (100-year)
- Yes  N/A  Special Area Study Resource Protection Areas (Cross Creek, Idylwild/Serenola, etc)
- Yes  N/A  Strategic Ecosystems (within or adjacent to mapped areas)
- Yes  N/A  Significant Habitat (biologically diverse natural areas)
- Yes  N/A  Listed Species/Listed Species Habitats (FNAI S1, S2, & S3; State or Federally E, T, SSC)
- Yes  N/A  Recreation/Conservation/Preservation Lands
- Yes  N/A  Significant Geological Features (caves, springs, sinkholes, etc.)
- Yes  N/A  High Aquifer Recharge Areas
- Yes  N/A  Wellfield Protection Areas
- Yes  N/A  Wells
- Yes  N/A  Soils
- Yes  N/A  Mineral Resource Areas
- Yes  N/A  Topography/Steep Slopes
- Yes  N/A  Historical and Paleontological Resources Not reviewed by ERC
- Yes  N/A  Hazardous Materials Storage Facilities
- Yes  N/A  Contamination (soil, surface water, ground water) Not reviewed by ERC

**SIGNED:** Peter M. Wallace      **PROJECT #** GRU GRW      **DATE:** 08/20/2020

For assistance please visit the Alachua County Environmental Protection Department (ACEPD) website at <http://www.alachuacounty.us/government/depts/epd/natural/devchecklist.aspx> or contact ACEPD at (352) 264-6800. (version 5/20/05)

Form revised on March 2007. Downloadable from: <http://growth-management.alachua.fl.us/formsdocs.php>

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## Introduction and Project Description

Ecosystem Research Corporation (ERC) was retained by CHW Professional Consultants and Gainesville Regional Utilities (GRU) to perform an Environmental Resource Assessment (ERA) and Listed Species Survey of a Project Site to be used for development of a Groundwater Recharge Facility (GRF) and Passive Recreation Park for City of Gainesville's GRU. The Project Site will consist of a series of man-made wetlands designed to renovate discharges of tertiary treated reclaimed water and resulting in an ultimate discharge to the Floridan aquifer through varying thicknesses of overlying sands. The GRF will receive treated overflows from the Kanapaha Water Reclamation Facility, which will increase the capacity for local and regional reuse within the area.

The Project Site is located along the western right-of-way (ROW) boundary of Parker Road with a designated physical address of 3602 SW 122nd Street, Gainesville, FL 32608. The Site lies north of Diamond Sports Park and south of Parker Place Subdivision (**Figure 1**). The Project Site totals **76.22** acres and comprises two (2) Alachua County tax parcels to include **04433-000-000** (**63.67** acres) and **04433-003-000** (**12.55** acres) (**Figure 2**). The Project Site Boundary, Topographic and Tree Survey is provided as **Attachment A, Sheets 1–16**. The cover sheet of the survey showing the Project Boundary and Site-Specific Survey information is provided as **Figure 3**. As defined within the Site-Specific Survey, tax parcel **04433-000-000** is designated as **Parcel 1** (O.R.B. 2623, Page 824) and parcel **04433-003-000** is described as **Parcel 2** (O.R.B. 4190, Page 218) (**Figure 3**). Both parcels are zoned A (Agricultural) and have a designated Future Land Use of RA (Rural/Agriculture). Both parcels are vacant and were historically used for agricultural use activities consisting of improved pasture and pine plantations. Much of the area currently consists of fallow land. An ERA is provided to describe the existing ecological conditions of the Project Site and to review the publicly available GIS data for the site. There are **NO** natural native plant communities that are not significantly disturbed that still exist within the boundaries of the Project Site.

## Environmental Resource Assessment Methodology

### Field Survey

A field survey of the Project Site was performed 7–8 April 2020 and 6–7 June 2020 to determine the general existing ecological condition of the area and determine if any listed plant or animal species or other environmental constraints were present within the boundaries of the Project Site or immediately adjacent habitat areas. The survey was performed by Peter M. Wallace, MS (Certified Gopher Tortoise Agent #GTA-14-00037A) and Robert A. Garren, MS (Certified Gopher Tortoise Agent #GTA-09-00057E) of Ecosystem Research Corporation. A survey of the Project Site was performed by repeatedly traversing the site with a series of pedestrian transects. Observations regarding plant species composition were recorded at **2,110** locations within the Project Site and adjacent areas. At each location, plant species, plant habitat type, observations of animal occurrences, and GPS position coordinates were recorded with a hand-held Garmin GPSmap 76CSx unit. Photographs were taken to document the general plant

communities, land uses, and historical activities present within the Project Site during the survey. Photographs that show the general physical appearance of the Project Site are contained within **Attachment B**.

## **Data Search**

To complement the data obtained from the field survey, GIS databases were queried to obtain site-specific information for the Project Site and surrounding areas. These databases include:

1. USGS Arredondo Quadrangle Map
2. USGS Arredondo Quad Closed Depressions Database
3. Physiographic Divisions of Florida
4. Surficial Geologic Formations of Florida
5. Alachua County 2001 LiDAR Topography (NAVD 88)
6. Alachua County 2001 TINs Elevation Surfaces (NAVD 88)
7. Natural Resource Conservation Service (NRCS) Soils
8. NRCS Soils Feature Point Database
9. Federal Emergency Management Agency (FEMA)
10. National Wetland Inventory (NWI) Database and Alachua County Composite Wetlands Database
11. Alachua County Aquifer Recharge Areas
12. Floridan Aquifer Drastic Vulnerability Areas within Alachua County
13. Alachua County Sinkholes and Stream-to-Sink GIS Coverage
14. Hydrologic Basins of Alachua County
15. Level IV Ecoregions of Florida
16. Florida Department of Environmental Protection Statewide Florida Land Use, Cover and Forms Classification Systems (FLUCCS)
17. Florida Game Commission Cooperative Florida Land Cover Classification System
18. Alachua County Strategic Ecosystems Overlay
19. KBN Ecological Inventory, KBN Golder & Associates (1996)
20. Alachua County Conservation Lands
21. Alachua County Historical Structures Database
22. Alachua County Hazardous Materials Monitoring Database
23. Alachua County Well/Wellfield Protection Areas
24. Florida Fish and Wildlife Conservation Commission (FWC) Eagle Nest Locator
25. FWC Water Bird and Wading Bird Rookery and Nest Sites Locator
26. United States Fish & Wildlife Service (FWS) Federally Listed Species Database
27. FWS Wood Stork Regulated Buffers Database



28. FWS Red-Cockaded Woodpecker Consultation Area and Observation Locations Database
29. FWS Scrub Jay Consultation Area, Habitat, and Observation Locations Database
30. Florida Fish and Wildlife Conservation Commission (FWC) 2016 Florida Black Bear Forage Range and Habitat Database and Bear Nuisance Report records
31. Florida Natural Areas Inventory (FNAI) Element Occurrence Database
32. Alachua County Champion Trees
33. State of Florida Biodiversity Hot-Spots

The field assessment and data review assessment performed for the Project Site addresses the specific requirement of the Alachua County Comprehensive Plan and Unified Land Development Regulations and Alachua County's Article II Countywide Wetlands Protection Code defined within Chapter 77 Water Quality Standards and Management Practices of the Alachua County Land Development Code. As part of this survey, the entire limits of the Project Site and the adjacent power line easement along the east perimeter of the site were evaluated. For the ERA described, the total Project Area as described on Figure 2 represents the entire holdings proposed for construction by the Applicant. Therefore, the Project Site represents the Resource Assessment Area (RAA) and the Planning Parcel evaluated in the field as part of this assessment.

## **Results of Data Review**

### **Published Geographic, Hydrologic, Ecological, and Historical Data Review**

#### ***USGS Arredondo Quadrangle Map***

The Project Site lies within the geographic area defined by the USGS Arredondo Quadrangle map (**Figure 4**). The Project Site lies within Section 14, Township 10 South, and Range 18 East and within the historical Arredondo Grant. The USGS quad map shows that the Project Site lies along a relatively flat ridge between several large to small enclosed landscape depressions. The onsite and offsite closed depressions associated with the Project Site are shown on **Figure 5**. These closed depressions represent areas where surface waters would be contained within the depression. Many depressions in the area are underlain by erosional Hawthorn clays, which are generally discontinuous, may be at or close to the surface, and may perch rainwaters for varying periods of time. The depressions on the site are generally very subtle and difficult to see during routine pedestrian surveys. Site elevations shown on the USGS quad map range from 75 to 85 ft. There are significantly fewer surface depressions on this site compared to sites located to the south.

#### ***Geographic Setting***

Geologically, the physiographic sub-divisions where the Project Site is located are defined by the Haile Limestone Plain of the Ocala Uplift District (**Figure 6**). The near-

surface layer of the Ocala Limestone Formation in the Project Area is composed of the Crystal River Formation, which is defined as the upper unit of the Ocala group. The Haile Limestone Plain sub-division is a major component of the Western Valley physiographic division that occupies the western part of Alachua County. The Western Valley extends to the west to the Brooksville Ridge located within the extreme southwest area of the County. The Western Valley extends from an elevation of  $\pm 50$  ft in the west of the County to an elevation of 90–100 ft at the base of the Cody Scarp, which represents the west facing scarp of the Northern Highlands Marginal Zone. In this area, which extends from  $\pm 90$  ft to  $\pm 150$  ft, transition occurs to the Northern Highlands. Within this zone, the subsurface is dominated by the Hawthorn Formation, which consists of relatively dense impermeable clays. The Marginal Zone of the Northern Highlands is characterized by perforated clays, large well-defined sinkholes, and prominent stream-to-sink features. The general location where limerock soils as compared to Hawthorn clays defines the prominent subsurface geology is shown on **Figure 7**.

The Project Site is within the Western Valley Zone, which has irregular occurrences of surficial depositional clays and silts mixed with remnant irregular pinnacles of Hawthorn clays and Ocala Limestone. The surface is covered with a mosaic of large to small surface and subsurface limerock boulders. Pinnacles of limerock extend from the surface of the Crystal River Formation to the ground surface and are generally visible in the numerous sinkholes and depressions that occur throughout the area. Within the Western Valley, there is an absence of streams due to the irregular Hawthorn clays, and the groundwater table is typically represented by the limestone surface, which is the upper limit of the Floridan aquifer and occurs at an elevation of 40–50 ft in the Project Area.

### ***Alachua County LiDAR Topography and TINs Elevation Surfaces***

The Alachua County 2001 LiDAR Topography (NAVD 1988) is provided as **Figure 8**. The LiDAR shows elevation ranges extending from 73 ft in the southwest corner of the site to a high elevation of 85 ft on a ridge that extends through the west half of the Project Site from south to north. This ridge separates two troughs: one that slopes southeast and south to adjacent parcels and Parker Road and one that slopes southwest to a large offsite closed depression to a low elevation of  $\pm 68$  ft. This ridge remains relatively flat as it extends north off site for at least a distance of  $\pm 2,000$  ft.

The TINs elevation surface (3.0-ft intervals) for the Project Site and surrounding area is provided as **Figure 9**. The TINs coverage shows the depressions and ridges in the area along with very well-defined sinkhole depressions. The TINs coverage also shows a higher elevation ridge located  $\pm 1.0$  mile northeast of the Project Site. This area corresponds to the westward facing slope of the Cody Scarp associated with the San Felasco Hammock physiographic sub-division of the marginal zone of the Northern Highlands, which is underlain by Hawthorn clays as shown on Figures 6 and 7.

## NRCS Soils Mapping

The NRCS soils mapping unit coverage for the Project Site and surrounding area is provided as **Figure 10**. Based on the coverage, the Project Site is underlain by well-drained soils represented by three (3) mapping units (**Table 1**). Arredondo soils have an Argillic (clay) horizon that extends from 54 inches to greater than 86 inches below the surface. These soils will perch stormwaters for various periods and, where they occur on hilltops or slopes, will direct stormwater downhill to closed depressions that may percolate or perch water depending on the characteristics of the subsurface clays and whether they are present or absent. The Site is also covered with a Pedro–Jonesville Complex and a Jonesville–Cadillac mapping unit. Both mapping units have shallow subsurface clay lenses and have limerock at the surface or near the surface that extends through the profile depth. These surface soils make predictions of surface and subsurface hydrology extremely difficult.

For this project, GSE Engineering & Consulting, Inc. prepared a detailed subsurface geotechnical report that included soil borings and geotechnical investigations using Ground Penetrating Radar (GPR) and Electrical Resistivity Imaging (ERI) to determine the potential for sinkhole formation on the site and provide information regarding subsurface hydrology that will occur in response to reclaimed water application. They provide an in-depth discussion of the potential effects of water application to these offsite soils. The results are much too difficult to summarize in context with this ERA analysis. However, the subsurface conditions existing on site are, as expected, highly variable. In the context of this report, a general review of the local known geology/hydrology is offered as related to easily accessible GIS data sources with reference to soils and known locations of depressions and sinkholes.

The NRCS database that shows known locations of small wet depressional areas, sinkholes, rock outcrops, stony areas, and borrow pit and spoil areas is provided on **Figure 11**. Sinkholes as shown on this coverage should probably be best interpreted as variable landscape depressions and the icon does not represent depressions that are open to the Floridan aquifer. In general, this coverage shows a general paucity of surface features in and around the Project Site especially extending from Parker Road west and southwest several miles to CR-241.

**Table 1. Description of Soil Mapping Units within the Project Site.**

Mapping Unit No.	Mapping Unit Name	Drainage Class	Depth (in.) to Subsurface Layers	
			Clay	Limerock
3	Arredondo fine sand, 0–5% slopes	Well drained	54–86	—
42	Pedro–Jonesville Complex, 0–5% slopes	Well drained	12–33	17–(33)–80
46	Jonesville–Cadillac Complex, 0–5% slopes	Well drained	29–59	33–80

### **FEMA Flood Zone Map**

The FEMA coverage for the Project Site and surrounding area is shown on **Figure 12**. The mapped coverage shows that the locally occurring FEMA area designated as Zone “A” does **NOT** overlay the existing Project Site. Zone “A” areas near the Project Area are all located east of the Parker Road ROW.

### **National Wetlands Inventory (NWI) and Alachua County Composite Wetlands Database**

The NWI and Alachua County Composite Wetlands Coverage Database coverages are provided on **Figure 13**. Both coverages show erroneous coverages located west and south of the Project Site. These coverages overlay depressions and windrow areas covered with deciduous vegetation (especially hackberry [*Celtis laevigata* Willd.]) either on debris or within highly disturbed areas with clays near the surface. ERC has visited these areas on previous surveys. There are **NO** perched wetlands or surface waters within these areas.

### **High Aquifer Recharge Areas**

The Project Area shown in relation to the perforated and unconfined areas of the Floridan aquifer is shown on **Figure 14**. The Project Site is within the unconfined area of the Floridan aquifer where Pleio–Pleistocene sands overlay the Ocala Limestone group. Hawthorn erosional clays are present, but clay coverage is discontinuous allowing some flows through sand to occur directly to the aquifer. Within the perforated zone shown on Figure 14, the clays associated within the dense Hawthorn clay formation are perforated and pinnacles of limerock reach the surface. In those areas, sinkholes quite often form, and surface water steadily flows directly to the Floridan aquifer. The perforated zone that is, in part, associated with the western sloping face of the Hawthorn Formation (Cody Scarp) gives rise to a number of large stream-to-sink systems such as the Santa Fe River, Hogtown Creek, and Mill Creek, among others. Due to the general absence of continuous clay within the unconfined area (Western Valley Region) characteristic of the Project Site, streams do not form but sinkholes are numerous. In these areas, drastic vulnerability to detrimental surface inflows or runoff, precipitation, and other direct inflows occur (**Figure 15**). The locations of large known sinkholes and stream-to-sink systems in the region are shown on **Figure 16**, but this coverage does **NOT** by any means include all the features in the area.

### **Surface Water and Groundwater Drainage Basins**

The Project Site shown in relation to the delineated drainage basins within western Alachua County is shown on **Figure 17**. As defined, the site occurs within a Non-Contributing watershed in which **NO** streams occur or any subsurface confining layer is present that directs water flow to a known receiving waterbody. Subsurface groundwater flow models indicate that the Project Site lies in an area where the upper Floridan aquifer flows northwest from the Project Site toward the Santa Fe River within the Rum Island–

Gilchrist Blue Springshed. The Project Site lies east of the boundary where west flows would be expected to go to the Suwannee River (Upchurch et al. 2008<sup>1</sup>).

### **Ecological Setting of the Project Area Based on Published GIS Data**

The Level IV Ecoregions mapping designations for western Alachua County are provided on **Figure 18**. Within this coverage, the general plant community associations are defined as Central Florida Ridges and Uplands (75C). The Project Site is located east of the Brooksville Ridge that lies just west of Archer with Trail Ridge lying a substantial distance to the east. This ecological community has also been described as Upland Hardwood Hammocks (Community #11) as defined within the *26 Ecological Communities of Florida* (Soil Conservation Service). These communities are typically dominated by evergreen and deciduous hardwood species such as sand live oak (*Quercus geminata* Small), southern magnolia (*Magnolia grandiflora* L.), black cherry (*Prunus serotina* var. *serotina* Ehrh.), pignut hickory (*Carya glabra* [Mill.] Sweet), sweetgum (*Liquidambar styraciflua* L.), and others. Within this area of Alachua County, the vegetation may occupy a wide range of mesic to xeric habitats. Sandhills occur on excessively drained soil types, and longleaf pine (*Pinus palustris* Mill.)–wiregrass (*Aristida stricta* Michx.) mesic and xeric flatwoods typically occur on spodosols; however, plant communities in this area are somewhat atypical in that they occur on soils with surficial clays and surface and subsurface limerock within a mosaic of excessively drained soils.

### **Florida Land Use, Cover and Forms (FLUCCS) Classification System and FWC Cooperative Land Cover Classification**

The FLUCCS classification provided by the Florida Department of Environmental Protection (DEP) for the Project Site and surrounding areas is provided as **Figure 19** and the FWC Cooperative Land Cover Map is provided on **Figure 20**. Both coverages divided the site into approximately the same three (3) polygon coverages. The coverages are defined differently, but the areas mapped are similar. The polygons are described in **Table 2**, as follows:

**Table 2. Florida Land Use, Cover and Forms Classification System and FWC Cooperative Land Cover Classification Designations for the Project Site and Surrounding Area.**

FLUCCS	Category	FWC	Category
4300	Wetland Mixed Forests	1110	Upland Hardwood Forest
2100	Cropland and Pastureland	1830	Rural
4400	Tree Plantations	18333	Tree Plantations

<sup>1</sup> *Springsheds of the Santa Fe River Basin*, Sam B. Upchurch, Ph.D., P.G.; Jian Chen P. G., and Crystal R. Cain, SDII Global Corporation, Tampa, Florida, 9 May 2008.

The two coverages are not specific, and both described the fencerow or windrow sand live oaks (*Quercus geminata* Small) and laurel oaks (*Quercus hemisphaerica* Bartr.) that occur on site as Upland Mixed Forest and Upland Hardwood Forest. The slash pine (*Pinus elliottii* Engelm.) plantation that occurs on the south side of the parcel is referred to as Tree Plantation by both coverages. The central pasture with scattered oaks and pines is referred to as Cropland and Pastureland by FLUCCS and Rural within the Cooperative Classification system. The plant community coverage observed during the field survey is discussed within the Results section of this report.

### **Strategic Ecosystem Overlay Coverage**

The Alachua County Strategic Ecosystem Overlay coverage for the Project Site and surrounding areas is provided as **Figure 21**. The coverage shows that the Hickory Sink Strategic Ecosystem is located around the south and west areas of the Project Site. The coverage does **NOT** overlay the Project Site and is **NOT** contiguous to any site boundary. There are **NO** natural systems remaining within the Project Site and there are **NO** Listed Species or Significant Habitats that would be defined as Strategic Ecosystem Resources. For information purposes, the mapped plant community coverage provided by KBN Golder (1996) for the Strategic Ecosystem defines the entire polygon monotypically as Mesic Uplands (**Figure 22**). This mapping designation does **NOT** accurately describe the mosaic of plant community types that occur within this area. This certainly indicates that minimal effort was expended for mapping of this large acreage of land.

### **Alachua County Conservation Lands**

The Alachua County Conservation Areas that occur in the vicinity of the Project Site are shown on **Figure 23**. In general, these are small-acreage easement and conservation areas that do **NOT** connect to or provide little possibility for corridor connections to the Project Site.

### **Alachua County Historic Structures Database**

The Historic Listed Houses and Structures that occur within the vicinity of the Project Site are shown on **Figure 24**. There are **NO** structures within the Project Site; however, the house on the parcel immediately to the north is defined within the database.

### **Alachua County Hazardous Materials Storage Facilities**

The Hazardous Materials Storage Facilities currently monitored by Alachua County are shown on **Figure 25**. There are **NO** monitored facilities within or adjacent to the Project Site.

### **Alachua County Well and Wellfield Protection Area Database**

The Wells and Wellfield Protection Areas within the Alachua County database are provided on **Figure 26**. Currently, there are **NO** known Wells or Wellfield Protection

Areas that would be affected by the Proposed Project. A site survey was **NOT** performed on the residential parcel located to the north of the Project Site. It is likely that a private residential supply well is at the east end of this parcel. There is also a possibility that a public supply well exists within the Diamond Sports Park located to the south; however, this was not investigated as part of the assessment.

## **Published Listed Species Occurrence Data**

### **Summary Information Regarding Threatened & Endangered Species in Florida**

There are several agencies that have been delegated the authority to protect and preserve the threatened and endangered flora and fauna that occur within the State of Florida. The United States Fish and Wildlife Service (USFWS) maintains a list of species afforded special protection by the *Endangered Species Act of 1973 (16 U.S.C. 1531)*. The list is published in the *List of Endangered and Threatened Wildlife and Plants, 50 CFR 17.11-12*. The Florida Fish and Wildlife Conservation Commission maintains a list of the protected animals occurring within the state by authority of the *Florida Endangered and Threatened Species Act of 1977 (Section 372.072, Florida Statutes [FS])* and *Chapter 68A-27, Florida Administrative Code (FAC), Rules Relating to Endangered and Threatened Species*. The specific policy of the Florida Endangered and Threatened Species Act of 1977 is declared as follows:

**Subsection 2: Declaration of Policy**—The Legislature recognizes that the State of Florida harbors a wide diversity of fish and wildlife and that it is the policy of this state to conserve and wisely manage these resources, with particular attention to those species defined by the Florida Fish and Wildlife Conservation Commission, the Department of Environmental Protection, or the U.S. Department of Interior, or successor agencies, as being endangered or threatened. As Florida has more endangered and threatened species than any other continental state, it is the intent of the Legislature to provide for research and management to conserve and protect these species as a natural resource.

The list of threatened and endangered animals protected by these laws is published in *Section 68-27.003, .004, and .005, FAC*. The regulation of listed marine animals was historically delegated to the Florida Department of Natural Resources (FDNR); however, has since been reorganized into the Florida Department of Environmental Protection. The *Preservation of Native Flora of Florida Act (Sections 581.185, 581.186 [in part] and 581.201, FS)* passed in 1978 declares a public policy of the State of Florida regarding native flora, as follows:

**Subsection 1: Legislative Declaration**—The Legislature finds and declares that it shall be the public policy of this state to: provide recognition of those plant species native to the state that are endangered, threatened, or commercially exploited; protect the native flora from unlawful harvesting on both public and privately owned lands; provide an orderly and controlled procedure for restricted harvesting of native flora from the wild, thus preventing wanton exploitation or destruction of native plant populations; encourage the propagation of native species of flora; and provide the people of this state with the information

necessary to legally harvest native plants so as to ultimately transplant those plants with the greatest possible chance of survival.

To this end, the Florida Department of Agriculture and Consumer Services (FDACS) regulates the threatened and endangered plant species occurring within the state. As specifically authorized by **Chapter 5B-40, Preservation of Native Flora of Florida, FAC**, the **Regulated Plant Index** is published in **Section 5B-40.0055**. The Game Commission periodically releases a publication that summarizes animal species regulated by the Florida Fish and Wildlife Conservation Commission and the USFWS. The publication is titled *Florida's Endangered Species, Threatened Species, and Species of Special Concern*. The federal lists of plants and animals are published in **50CFR 17.11-12** and the list of Florida's federally listed plant species is also published by the Florida Division of Forestry.

Alachua County, by authority of **Article 3, Significant Plant and Wildlife Habitat**, and **Article 4, Listed Plant and Animal Species Habitat**, of the Unified Land Development Code (ULDC) regulates development in habitats where listed species occur or could potentially occur. Provisions within Articles 3 and 4 allow the County to require that up to 25% of the upland portion may be required to be protected and set aside as primary conservation areas. Areas protected under Articles 3 and 4 are designated as Conservation Management Areas and are further regulated via rules outlined in **Article 17, Conservation Management Areas (ULDC)** and potentially require that the property owner establish a conservation easement for the specific areas within the parcel. The owner is further responsible for development of a management plan and perpetual management of the area.

The City of Gainesville via provisions of **Sections 30-8.12(C)(11) and 30-8.11(E)** (2-February-2019) has adopted the County's template for listed species protection and provides protection of listed species and listed species habitats. Protective mechanisms include provision of Conservation Management Areas with associated management plans as described in **Section 30-8.14**, LDC. Neither the County's nor the City's land development codes describes the protections warranted for individual species or habitats. These protections are defined on a case-by-case basis often in cooperation with the responsible federal or state regulatory entity.

Several other lists of the endangered and threatened fauna and flora are maintained for the State of Florida. The Florida Natural Areas Inventory (FNAI) maintains a list that summarizes the status and distribution of both plant and animal species and natural communities within Florida. The FNAI is managed by The Nature Conservancy in cooperation with DEP. The lists compiled by the FNAI contain many species that do not occur on the State or Federal lists. The FNAI list as compiled is not subjected to the time-consuming administrative process required for listing for State and Federal protection. Therefore, these lists often reflect the up-to-date true status of species that may be in



immediate peril. The FNAI species that are not State or Federally listed are not given legal protection.

An inventory of the statewide distribution of potentially threatened and endangered species was initiated in 1973 by the Florida Committee on Rare and Endangered Plants and Animals (FCREPA). The group published a several-volume series that contains detailed descriptions, distributions, and academic evaluations of species considered to be in peril. The FCREPA list contains many species in addition to the State and Federal lists; however, these additional species are afforded no legal protection. The FCREPA series offers the best compiled review of the biology of the imperiled biota of Florida to date. Beginning in 1986, revisions of the FCREPA volumes were initiated and continue to date.

To aid in review of the imperiled species that occur in Florida and the State and Federal Regulations that govern their management, these publications are available:

- Endangered and Threatened Species Act of Florida, Chapter 372.072, FS
- Rules Relating to Endangered and Threatened Species, Chapter 68A-27, FAC
- The Preservation of Native Flora of Florida, Chapter 581.185, FS
- Preservation of Native Flora of Florida, Chapter 5B-40, FAC
- Florida's Endangered and Threatened Species, December 2018

### ***Eagle Nest Locator and Wading and Waterbird Rookery Databases***

- American bald eagle (FNAI G5/S3)

The results of the query of the Eagle Nest Locator Database and Water and Wading Bird Rookery Sites Database are provided on **Figure 27**. The results show that there are **NO** nests or rookeries within several miles of the Project Site. Construction of the site will **NOT** disturb any primary or secondary protective buffers for these features. The Project, when completed, will provide enhanced forage habitat for both eagles and wading birds.

### ***Federally Listed Species Occurrence Range Database***

#### **Federally Listed Bird Species**

- Wood stork (Federally Threatened; FNAI G4/S2)
- Red-cockaded Woodpecker (Federally Endangered; FNAI G3/S2)
- Florida Scrub-Jay (Federally Threatened; FNAI G2/S2)

The known existing and historical ranges of federally listed bird species to include the Wood Stork, Florida Scrub-Jay, and Red-cockaded Woodpecker in relation to the Project Site are shown on **Figure 28**. There are **NO** onsite wetland habitats that support foraging or nesting of wood storks that will be affected by the proposed Project. There are **NO** onsite flatwoods that would provide foraging or nesting habitat for the red-cockaded woodpecker or scrub habitats to support nesting of scrub-jays. The Project Site lies

outside the Historical Regulated Forage Buffer for the River Styx Wood Stork colony (**Figure 29**). However, this colony is no longer active and is considered extirpated. Since there are **NO** wetlands or surface waters on site that will be impacted by the Project, wood stork use of the area is minimal and is restricted generally to created Stormwater Management Facilities associated with development of adjacent sites. Creation of wetlands on the site will provide wood stork habitat where none currently exists.

Red-cockaded woodpeckers require well-managed, fire-maintained old growth pine flatwoods habitats for nesting and forage. In addition, relatively large expanses of this habitat type are required to support a breeding population. Red-cockaded woodpeckers require large mature trees with red heart fungus within the heartwood as a requirement for successful nesting. There are large pine trees in the area that may provide a suitable nesting area; however, the habitat to support this species, which is typically very specific, **DOES NOT** occur within the Project boundary or adjacent areas. Both the data from the FWS Observation Database and the FNAI Element Occurrence Tracking List indicate **NO** red-cockaded woodpeckers have been observed on the Project Site or in this area of the County. The existing FWS red-cockaded woodpecker occurrence observations are shown in relation to the Project Site on **Figure 30**. These data show that the current range of red-cockaded woodpeckers lies considerable distance from the Project Site.

The Scrub-Jay Consultation Area along with delineated habitats and known observation locations is provided as **Figure 31**. The observations provided refer to studies performed from a 1992–1993 statewide survey. With respect to the Project Site, the closest historical known location lies within the Cedar Key Scrub located  $\pm 70$  miles from the Project Site. There is **NO** scrub jay habitat on the Project Site and the Project will **NOT** adversely affect any scrub-jay roosting or nesting habitat.

### **Federally Listed Reptile Species**

- Eastern indigo snake (Federally Threatened, FNAI G3/S3)
- Gopher tortoise (Federally Listed as Candidate Species, State Threatened, FNAI G3/S3)

The Project Site is within the historical and extant distribution range of the Eastern Indigo Snake (**Figure 32**). The indigo snake inhabits a broad range of habitats in Florida but prefers gopher tortoise burrows or pocket gopher burrows within xeric habitats. There is **NO** natural native Xeric habitat within the Project Site with all remaining Xeric areas within and adjacent to the Project Area being significantly disturbed, and the native habitat type no longer exists. There are numerous gopher tortoise and pocket gopher burrows that occur on the Project Site. These burrows are often used by indigo snakes resident in an area or by transient visitors. There is a likelihood that indigo snakes may exist within the Project Area. Both parcels will require gopher tortoise relocations for development to occur. It is possible indigo snakes will be encountered in the burrows at the time of relocation. It is also possible that indigo snakes may be encountered in any area within the Project Site on the ground surface; therefore, the site should be developed

consistent with the *Standard Protection Measures for the Eastern Indigo Snake* (USFWS August 13, 2013).

### **Black Bear Forage Range**

The general forage range of the Florida Black Bear (FNAI G5T4/S4) in and around the Project Site is provided on **Figure 33**. Within the area, due to the large areas of undeveloped habitats in the area, encounters with black bears would be considered as occasional to common. Areas where nuisance encounters with black bears have been reported are shown on Figure 33. Several nuisance reports are shown for the general Project Area and one report is located north and adjacent to the Project Area. On the Project Site, it is likely that chance encounters with transient black bears may occur but there is **NO** black bear habitat or activity that would be adversely affected by this project. The occurrence of black bears in the area may be limited by the lack of surface water in and around the Project Site. Once wetlands are created, black bear forage habitat in the area will be enhanced.

### **Additional Imperiled Species**

There are several other imperiled species that may have been historically present within the Project Site and adjacent areas or may be potentially present. However, the habitat requirements for many of these species no longer exist in the area. These species are listed, as follows:

- **Eastern Diamondback Rattlesnake (*Crotales adamantiums*) (FNAI G4/S3):** The eastern diamondback rattlesnake is found throughout Florida and generally may occur anywhere on the Project Site, especially within gopher tortoise burrows.
- **Short-tailed Snake (*Stilosoma extenuatum*) (State Threatened, FNAI G3/S3):** The short-tailed snake inhabits xeric habitats, primarily Longleaf Pine-Turkey Oak Sandhills. The Project Site does have xeric habitat types. It is unlikely this species occurs on site or that a population can be sustained on site given the present and past land management practices. The species has been documented in the area (FNAI database) but the snakes live primarily underground and are difficult to census.
- **Little Blue Heron (*Egretta caerulea*) (State Threatened, FNAI G5/S4):** There are **NO** wading bird habitats within the site but there is a high probability of widespread use of the adjacent wet stormwater ponds by this species. The Project will create habitat for this species.
- **Florida Sandhill Crane (*Grus canadensis pratensis*) (State Threatened, FNAI G5T2/S2):** Sandhill cranes are seen frequently around lakes and wetlands in residential areas or roadside areas with maintained yard grass perimeters. There is nesting habitat for this species in the regional area but not on the site. The Project will create forage habitat for this species and possibly nesting habitat.

- **Florida Pine Snake (*Pituophis melanoleucus mugitus*) (State Threatened, FNAI G4/S3):** The pine snake is a rare inhabitant of xeric communities. There are no preferred natural habitat types for this species remaining on site. However, areas of the site have a population of gopher tortoise and pocket gopher burrows. Pine snakes prefer pocket gopher burrows and, less frequently, gopher tortoise burrows for refuge. Although not reported on site or previously within adjacent developed areas, snakes may use the pocket gopher and gopher tortoise burrows even though suitable habitat is generally absent.
- **Sherman's Fox Squirrel (*Sciurus niger shermani*) (State Species of Special Concern, FNAI G5T5/S3):** The fox squirrel typically occupies xeric areas frequently burned and that have numerous mature oaks and pines distributed throughout the habitat. They can also inhabit residential yards with large oaks and pines. They will move to avoid the direct impacts of development. Fox squirrels occur on sites located south and west of the Project Site. None were seen during the site survey.
- **Striped Newt (*Notophthalmus perstriatus*) (FNAI G2G3/S2) and Gopher Frog (*Rana capito*) (FNAI G3/S3):** The striped newt and gopher frog are xeric-adapted species that typically inhabit scrubby flatwoods, sandhill, and scrub habitats. These species are commonly associated with gopher tortoise habitat and are frequently found within burrows. Both species depend on ephemeral, isolated wetlands for breeding and reproduction. These species are extremely sensitive to the impacts that are cosmopolitan in this area, which include extensive soil disturbance, fire suppression, road construction, and disturbance of gopher tortoise burrows. It is unlikely these species occur on site due to the absence of ephemeral wetlands on the site or in adjacent areas.
- **Southern Hognose Snake (*Heterodon simus*) (FNAI G2/S2S3):** The primary habitat for the southern hognose snake is Sandhill and sandy soil, open hammocks and scrub. These habitat types minimally occur in areas surrounding the Project Site. This species has not been reported for the immediate area of the site and it is unlikely that a breeding population is present near the proposed development.
- **Eastern Indigo Snake (*Drymarchon couperi*) (Federally Threatened, FNAI G3/S3):** The Eastern Indigo Snake occurs in a wide variety of habitats and especially is present in areas with extensive gopher tortoise populations. The snake is extremely difficult to census, so for site development it is assumed that the species is present. There are federally mandated precautions to be employed during construction on any site where Eastern Indigo Snakes are potentially present. These precautions are discussed within the *Standard Protection Measures for the Eastern Indigo Snake* (USFWS August 13, 2013).
- **Southeastern American Kestrel (*Falco sparverius paulus*) (State Threatened, FNAI G5T4/S3):** The Southeastern American Kestrel is a State-listed species that requires a permit to take a nesting location and has a 450-ft Protective No

Disturbance Buffer from nesting locations. The kestrel is reported from several areas adjacent to the Project. Onsite habitats provide dead snags and oldfield forage area for this species. While kestrels potentially use the site, none were seen during the site surveys.

### **Results Obtained from Florida Natural Areas Inventory (FNAI) Element Occurrence Database**

The results obtained from the FNAI Element Occurrence database are provided on **Figure 34**. Of the species discussed above, the FNAI database indicates that occurrences of the short-tailed snake, Florida pine snake, eastern indigo snake, and southeastern American kestrel have been reported near the Project. Most of these species live underground and are very difficult to census. It is possible they occur on site, but it is not probable since the site does not have the areal extent or quality of habitat that supports any of these species for sustained population longevity.

### **Champion Trees**

The locations of Florida Champion Trees documented for Alachua County are provided on **Figure 35**. The data indicates that **NO** champion trees have been reported for the area. Based on the Site-Specific Survey, Topographic, and Tree Survey provided as **Attachment A**, there are a number of large sand live oak trees that occur along the western perimeter fence line of the site. These are some of the largest trees seen in this area of the County.

### **Biodiversity Hot Spots**

The general distribution and probability of Biodiversity Hot Spots are shown on **Figure 36**. In this coverage, most data points are single species occurrence records and predicted total species occurrences is based on habitat and observed species. The Project Site lies within a mapped polygon area where biodiversity is considered normal background levels.

### **Results of Field Survey**

The general results of the field survey are provided on **Figure 37**. On these figures the GPS locations where site-specific data were recorded are shown as categorized with respect to the general type of data recorded. The GPS icons on Figure 37 represent data collected at **2,110** locations within the Project Site. The general existing conditions found on the Proposed Project Site are shown in **Attachment B (Photos B-1 through B-12)** as referenced to photo stations provided on **Figure B-1**. The common and botanical names of all plant species encountered during the survey are provided in **Table 3**. Listed species surveys to include gopher tortoise surveys were performed in all areas where GPS icons are shown on Figure 37.

## Plant Communities Occurring within the Project Site

From the GPS field survey data, a plant community map was constructed for the Project Site and is provided as **Figure 38**. In general, all plant community types are disturbed and are the result of past extensive agricultural and silvicultural management. The site was historically cleared for pasture and improved with planting of Bahiagrass (*Paspalum notatum* Flugge). Most recently, significant alteration to the groundcover on the site occurred between 1995 and 1999. Planting of slash pine (*Pinus elliottii* Engelm.) within a plantation occurred circa 2004 extending in a 400-ft-wide band along the entire south perimeter of the site. The site was maintained as improved pasture with scattered pine and hardwoods until 2018 when the pasture was allowed to go fallow with unmowed grasses, herbs, shrubs, and briars. A brief description of the onsite definable disturbed habitats is provided below.

### Bahiagrass-Oldfield

The largest area of the Project Site is covered with an historical Improved Pasture. The area has a groundcover dominated by Bahiagrass (*Paspalum notatum* Flugge) and other pasture grasses. Slash pine (*Pinus elliottii* Engelm.), black cherry (*Prunus serotina* var. *serotina* Ehrh.), sweetgum (*Liquidambar styraciflua* L.), laurel oak (*Quercus hemisphaerica* Bartr.), sand live oak (*Quercus geminata* Small), and very large southern red oak (*Quercus falcata* Michx.) are common in this habitat. Typical groundcover species are yard grasses and Oldfield ruderal species to include Bahiagrass (*Paspalum notatum* Flugge), Bermudagrass (*Cynodon dactylon* [L.] Pers.), centipedegrass (*Eremochloa ophiuroides* [Munro] Hack.), and St. Augustinegrass (*Stenotaphrum secundatum* [Walter] Kuntze). Areas within the habitat that are unmowed are dominated by a host of oldfield species to include beggarticks (*Bidens alba* [L.] DC.), common ragweed (*Ambrosia artemisiifolia* L.), dog fennel (*Eupatorium capillifolium* [Lam.] Small), dwarf horseweed (*Conyza canadensis* [L.] Cronq.), and poorman's pepper (*Lepidium virginicum* L.).

### Successional Oaks and Hardwoods

Successional Oak and Hardwood areas occur adjacent to the fencerows and are dominated by laurel oak (*Quercus hemisphaerica* Bartr.), slash pine (*Pinus elliottii* Engelm.), occasional longleaf pine (*Pinus palustris* Mill.), black cherry (*Prunus serotina* var. *serotina* Ehrh.), sand live oak (*Quercus geminata* Small), and hackberry (*Celtis laevigata* Willd.). The Successional Oaks and Hardwoods habitats typically have developed on historical Sandhill areas. These areas have a lack of herbaceous understory species and woody species are dominant in the groundcover to include the saplings of canopy species and vines such as greenbrier (*Smilax bona-nox* L.), wild sarsaparilla (*Smilax glauca* Walt), yellow jessamine (*Gelsemium sempervirens* [L.] J. St. Hil.), earleaf greenbrier (*Smilax auriculata* Walter), and trumpet creeper (*Campsis radicans* [L.] Seemann ex Bureau). Shrubs include beautybush (*Callicarpa americana* L.), sea myrtle (*Baccharis halimifolia* L.), wax myrtle (*Morella cerifera* [L.] Small), and cabbage palm (*Sabal palmetto* [Walter] Lodd. ex Schult. & Schult. f.).

### **Oaks–Mixed Hardwoods–Mixed Shrubs and Vines–Successional**

Primarily along the boundaries of the site where continued maintenance of the historical pasture was discontinued, shrubs, vines, and briars are the dominant groundcover. Common species include flatwoods plum (*Prunus umbellata* Elliott), Hercules'-club (*Zanthoxylum clava-herculis* L.), greenbrier (*Smilax bona-nox* L.), earleaf greenbrier (*Smilax auriculata* Walter), wild sarsaparilla (*Smilax glauca* Walt), sand blackberry (*Rubus cuneifolius* Pursh), muscadine (*Vitis rotundifolia* Michx.), summer grape (*Vitis aestivalis* Michx.), and Virginia creeper (*Parthenocissus quinquefolia* [L.] Planch.). These areas are impassable to pedestrian survey and are characterized by seedlings and root sprouts of existing canopy trees present in the area. In the small polygon area mapped for this habitat, a mix of laurel oak (*Quercus hemisphaerica* Bartr.), sand live oak (*Quercus geminata* Small), and small slash pine (*Pinus elliottii* Engelm.) was present.

### **Slash Pine Plantation–Bahia grass–Oldfield**

A Slash Pine Plantation was planted circa 2004 within a 400-ft–wind band extending north from the south property line. The plantation extends along the entire perimeter of the site. The pines are generally small caliper, ranging in size from 6 to 8 inches. The area appears to have been an historical Sandhill habitat and hydrologic conditions are best described as Xeric. Some historical sandhill groundcover species are present to include Florida greeneyes (*Berlandiera subacaulis* [Nutt.] Nutt.), pinweed (*Lechea divaricata* Shuttlew ex Britt.), camphorweed (*Heterotheca subaxillaris* [Lam.] Britt. & Rusby), maypop (*Passiflora incarnata* L.), bluejack oak (*Quercus incana* Bartr.), earleaf greenbrier (*Smilax auriculata* Walter), sparkleberry (*Vaccinium arboreum* Marshall), yankeeweed (*Eupatorium compositifolium* Walter), largeroot morning-glory (*Ipomoea macrorhiza* Michx.), pinebarren frostweed (*Crocantemum corymbosum* [Michx.] Britton), and several others.

### **Oak–Mixed Hardwoods–Bahia grass**

This plant community was historically dominated by Bahia grass (*Paspalum notatum* Flugge) and was managed as Improved Pasture. In recent years the canopy cover of laurel oak (*Quercus hemisphaerica* Bartr.), sand live oak (*Quercus geminata* Small), hackberry (*Celtis laevigata* Willd.), black cherry (*Prunus serotina* var. *serotina* Ehrh.), slash pine (*Pinus elliottii* Engelm.), and southern red oak (*Quercus falcata* Michx.) has closed and effectively shaded out the groundcover pasture grass and ruderal herbs. In these areas, groundcover under the canopy is sparse and leaf litter is abundant on the surface.

### **Surveys for Listed Plant and Animal Species**

Surveys for Listed Species were performed in all areas where GPS icons are shown on Figure 37. There were **NO** listed plant species encountered during the field surveys. Specific attention was given to the possible occurrence of woodland poppymallow (*Callirhoe papaver* [Cav.] A. Gray) and trailing milkvine (*Matelea pubiflora* [Decne.]

Woodson), which are present on adjacent sites. However, **NO** individuals of these species were seen.

Gopher tortoise burrow locations were recorded in all areas where pedestrian travel was performed. The locations of all gopher tortoise burrows encountered during the survey are defined on **Figure 39**. The numbers shown indicate the number of the GPS data station established in the field. In the areas where gopher tortoises are shown, a final 100% survey will be required. The burrow nomenclature and burrow activity are provided as **Table 4**. In general, thirty-two (32) burrows were located on the survey area. Although the survey methodology performed on site was extensive and far greater than the generally required 15–20% coverage, the survey was not a 100% survey. Therefore, a 100% survey will be required prior to development of the site and a relocation permit will be required from the Game Commission. It is unlikely that enough space is available to provide for onsite relocation of tortoises. In addition, a significant volume of water will be applied to the site, which, in all probability, will raise the water table on site, at least in local areas. The lack of available space for relocation and potential changes in hydrology will have to be evaluated during the gopher tortoise permitting process.

## Summary

In summary, the proposed Project will have **NO** adverse impacts on any Regulated Natural Resources. There are **NO** wetlands that will be affected by the development. There are **NO** natural native habitats remaining within the Project Area and **NO** impacts to listed species are likely to occur. Gopher tortoises will have to be relocated. A 100% gopher tortoise survey will be required, and a relocation permit is needed to develop the gopher tortoise habitats. The Project as proposed will have minimal impacts on the natural environment and will provide habitat for a host of listed bird species and habitat for aquatic and wetland-dependent species that generally do not occur in the area at this time.



**Table 3. Plant species recorded at the GRU Groundwater Recharge Wetland Park Site, Alachua County, during field surveys on 7–8 April and 6–7 June 2020.**

Species Code	Scientific Name	Common Name	USFWS <sup>1</sup> Classif.	FDEP <sup>2</sup> Classif.	Floristic <sup>3</sup> Classif.
ALB JUL	<i>Albizia julibrissin</i> Durazz.	Mimosa	NL	UPL	EW
AMB ART	<i>Ambrosia artemisiifolia</i> L.	Common ragweed	FACU	UPL	NW
AND GCP	<i>Andropogon glomeratus</i> (Walt.) BSP var. <i>glaucopsis</i> (Ell.) Mohr	Purple bluestem	FACW+	FACW	NP
AND VIR	<i>Andropogon virginicus</i> L. var. <i>virginicus</i>	Broomsedge	FAC-	FAC	NP
ASC AMP	<i>Asclepias amplexicaulis</i> Sm.	Clasping milkweed	NL	UPL	NC
ASI ANG	<i>Asimina angustifolia</i> Raf.	Slimleaf pawpaw	NL	UPL	NC
ASI PYG	<i>Asimina pygmaea</i> (Bartr.) Dunal	Dwarf pawpaw	FACU	UPL	NC
BER SUB	<i>Berlandiera subacaulis</i> (Nutt.) Nutt.	Florida greeneyes	NL	UPL	NC
BID ALB	<i>Bidens alba</i> (L.) DC.	Beggarticks	NL	UPL	NW
CAL AME	<i>Callicarpa americana</i> L.	Beautybush	FACU-	UPL	NC
CAM RAD	<i>Campsis radicans</i> (L.) Seemann ex Bureau	Trumpet creeper	FAC	---	NC
CAR GLA	<i>Carya glabra</i> (Mill.) Sweet	Pignut hickory	FACU	UPL	NC
CEL LAE	<i>Celtis laevigata</i> Willd.	Hackberry	FACW	FACW	NC
CEN SPI	<i>Cenchrus spinifex</i> Cav.	Coastal sandbur	NL	UPL	NW
CER CAN	<i>Cercis canadensis</i> L.	Eastern redbud	FACU	UPL	NC
CHE AMB	<i>Chenopodium ambrosioides</i> L.	Mexican tea	FACU	UPL	EW
CIR HOR	<i>Cirsium horridulum</i> Michx.	Yellow thistle	FAC+	UPL	NP
CIR NUT	<i>Cirsium nuttallii</i> DC	Nuttall's thistle	FAC	FACW	NP
CLA EVA	<i>Cladina evansii</i> (Abbayes) Hale & Culb.	Evans' reindeer lichen	---	---	NC
CLE RET	<i>Clematis reticulata</i> Walter	Netleaf leather-flower	NL	---	NC
CNI STI	<i>Cnidioscolus stimulosus</i> (Michx.) Engelm. & A. Gray	Tread-softly	NL	UPL	NC
CRA UNI	<i>Crataegus uniflora</i> Munchh.	Dwarf hawthorn	NL	UPL	NC
CRO COR	<i>Crocanthemum corymbosum</i> (Michx.) Britton	Pinebarren frostweed	NL	UPL	NC
CRO ROT	<i>Crotalaria rotundifolia</i> (Walt.) Gmel.	Rabbit-bells	FACU	UPL	NC
DES PIN	<i>Descurainia pinnata</i> (Walter) Britton	Western tansymustard	NL	UPL	NW
DIC ACI	<i>Dichantheium aciculare</i> (Desvaux ex Poiret) Gould & Clark	Needle-leaf witchgrass	FACU	UPL	NP

## Gainesville Regional Utilities Groundwater Recharge Wetland Park, Alachua County, Florida

Species Code	Scientific Name	Common Name	USFWS <sup>1</sup> Classif.	FDEP <sup>2</sup> Classif.	Floristic <sup>3</sup> Classif.
DIC CAR	<i>Dichondra caroliniensis</i> Michx.	Pony-foot	FACW-	FAC	NP
DIO VRG	<i>Diospyros virginiana</i> L.	Common persimmon	FAC	FAC	NC
DIS DIS	<i>Distimake dissectus</i> (Jacq.) A.R. Simoes & Staples	Noyau vine	FACU	---	NC
EDR UNI	<i>Edrastima uniflora</i> (L.) Raf	Clustered mille grains	FACW	FACW	NC
ERA SP.	<i>Eragrostis</i> sp. (sterile)	Lovegrass	---	FAC	---
ERE OPH	<i>Eremochloa ophiuroides</i> (Munro) Hack.	Centipedegrass	NL	UPL	EA
ERI STR	<i>Erigeron strigosus</i> Muhl.	Daisy fleabane	FAC	UPL	NC
EUP CAP	<i>Eupatorium capillifolium</i> (Lam.) Small	Dog fennel	FACU	FAC	NW
EUP COM	<i>Eupatorium compositifolium</i> Walter	Yankee weed	FAC-	FAC	NP
EUS PET	<i>Eustachys petraea</i> (Sw.) Desv.	Pinewoods fingergrass	FACU-	UPL	NP
GAL PIL	<i>Galium pilosum</i> Aiton	Hairy bedstraw	NL	UPL	NC
GAM ANT	<i>Gamochaeta antillana</i> (Urb.) Anderb.	Caribbean purple everlasting	NL	UPL	NW
GAM PUR	<i>Gamochaeta purpurea</i> (L.) Cabrera	Spoonleaf purple everlasting	NL	UPL	NW
GEL SEM	<i>Gelsemium sempervirens</i> (L.) J. St. Hil.	Yellow jessamine	FAC	---	NC
HET SUB	<i>Heterotheca subaxillaris</i> (Lam.) Britt. & Rusby	Camphorweed	FACU-	UPL	NW
HIE MEG	<i>Hieracium megacephalon</i> Nash	Coastalplain hawkweed	NL	UPL	NC
HYD UMB	<i>Hydrocotyle umbellata</i> L.	Manyflower marshpennywort	OBL	FACW	NP
HYP HYP	<i>Hypericum hypericoides</i> (L.) Crantz	St. Andrew's-cross	FAC	FAC	NC
ILE VOM	<i>Ilex vomitoria</i> Aiton	Yaupon	FAC	FAC	NC
IND HIR	<i>Indigofera hirsuta</i> Harv.	Hairy indigo	NL	UPL	EW
IPO cf. MAC	<i>Ipomoea macrorhiza</i> Michx. (sterile)	Largeroot morning-glory	NL	---	NC
JUN VIR	<i>Juniperus virginiana</i> L.	Red cedar	FACU-	UPL	NC
LEC DIV	<i>Lechea divaricata</i> Shuttlew ex Britt.	Pinweed	NL	UPL	NC
LES HIR	<i>Lespedeza hirta</i> (L.) Hornem.	Hairy lespedeza	NL	UPL	NC
LON SEM	<i>Lonicera sempervirens</i> L.	Coral honeysuckle	FAC	---	NC
OEN SIM	<i>Oenothera simulans</i> (Small) W.L. Wagner & Hoch	Southern beeblossom	NL	UPL	NP
OPL SET	<i>Oplismenus setarius</i> (Lam.) Roem. & Schult.	Woodsgrass	FACU+	FAC	NC
OPU HUM	<i>Opuntia humifusa</i> (Raf.) Raf.	Prickly-pear cactus	NL	UPL	NC

## Gainesville Regional Utilities Groundwater Recharge Wetland Park, Alachua County, Florida

Species Code	Scientific Name	Common Name	USFWS <sup>1</sup> Classif.	FDEP <sup>2</sup> Classif.	Floristic <sup>3</sup> Classif.
OXA COR	<i>Oxalis corniculata</i> L.	Common yellow woodsorrel	FACU	UPL	NW
PAR QUI	<i>Parthenocissus quinquefolia</i> (L.) Planch.	Virginia creeper	FAC	---	NC
PAS NOT	<i>Paspalum notatum</i> Flugge	Bahiagrass	FACU+	UPL	EA
PAS SAU	<i>Paspalum notatum</i> Flugge var. <i>saurae</i> Parodi	Argentine bahia	FACU	UPL	EA
PAS SET	<i>Paspalum setaceum</i> Michx.	Thin paspalum	FAC	FAC	NP
PAS INC	<i>Passiflora incarnata</i> L.	Maypop	NL	---	NC
PER BOR	<i>Persea borbonia</i> var. <i>borbonia</i> (L.) Spreng.	Red bay	FACW	UPL	NC
PHY ARE	<i>Physalis arenicola</i> Kearney	Pubescent ground cherry	NL	UPL	NC
PHY AME	<i>Phytolacca americana</i> L.	American pokeweed	FACU+	UPL	NW
PIN ELL	<i>Pinus elliottii</i> Engelm.	Slash pine	FACW	UPL	NC
PIN PAL	<i>Pinus palustris</i> Mill.	Longleaf pine	FACU+	UPL	NC
PLE POL	<i>Pleopeltis polypodioides</i> (L.) E.G. Andrews & Windham	Resurrection fern	NL	UPL	NC
PRU CAR	<i>Prunus caroliniana</i> (Mill.) Aiton	Carolina laurelcherry	NL	UPL	NC
PRU SER	<i>Prunus serotina</i> var. <i>serotina</i> Ehrh.	Black cherry	FACU	UPL	NC
PTE AQU	<i>Pteridium aquilinum</i> (L.) Kuhn. var. <i>pseudocaudatum</i> (Clute) Clute ex. A. Heller	Tailed bracken	FACU	UPL	NC
PYR CAR	<i>Pyrrhopappus carolinianus</i> (Walter) DC.	Carolina desertchicory	NL	UPL	NW
QUE FAL	<i>Quercus falcata</i> Michx.	Southern red oak	FACU-	UPL	NC
QUE GEM	<i>Quercus geminata</i> Small	Sand live oak	NL	UPL	NC
QUE HEM	<i>Quercus hemisphaerica</i> Bartr.	Laurel oak	NL	UPL	NC
QUE INC	<i>Quercus incana</i> Bartr.	Bluejack oak	NL	UPL	NC
QUE NIG	<i>Quercus nigra</i> L.	Water oak	FAC	FACW	NC
QUE VIR	<i>Quercus virginiana</i> Mill.	Live oak	FACU+	UPL	NC
RAN NIT	<i>Ranunculus hispidus</i> Michx. var. <i>nitidus</i> (Chapm.) T. Duncan	Bristly buttercup	FAC	FACW	NC
RHA CAR	<i>Rhamnus caroliniana</i> Walter	Carolina buckthorn	FACU	UPL	NC
RHU COP	<i>Rhus copallinum</i> L.	Winged sumac	NI	UPL	NC
RHYN cf. MIC	<i>Rhynchosia</i> cf. <i>michauxii</i> Vail (sterile)	One-leaf rhynchosia	NL	UPL	NC
RUB CUN	<i>Rubus cuneifolius</i> Pursh	Sand blackberry	FACU	---	NP
RUM HAS	<i>Rumex hastatulus</i> Baldw.	Hastate-leaved dock	FAC-	FACW	NW

**Gainesville Regional Utilities Groundwater Recharge Wetland Park, Alachua County, Florida**

Species Code	Scientific Name	Common Name	USFWS <sup>1</sup> Classif.	FDEP <sup>2</sup> Classif.	Floristic <sup>3</sup> Classif.
SAB PAL	<i>Sabal palmetto</i> (Walter) Lodd. ex Schult. & Schult. f.	Cabbage palm	FAC	FAC	NC
SER REP	<i>Serenoa repens</i> (Bartr.) Small	Saw palmetto	FACU	UPL	NC
SID RHO	<i>Sida rhombifolia</i> L.	Cuban jute	FACU	UPL	NW
SIL ANT	<i>Silene antirrhina</i> L.	Sleepy catchfly	NL	UPL	NC
SMI AUR	<i>Smilax auriculata</i> Walter	Earleaf greenbrier	FACU	---	NC
SMI BON	<i>Smilax bona-nox</i> L.	Greenbrier	FAC	---	NC
SMI GLA	<i>Smilax glauca</i> Walt.	Wild sarsaparilla	FAC	---	NC
SOL LEA	<i>Solidago leavenworthii</i> Torr. & A.Gray	Leavenworth's goldenrod	FAC+	FACW	NC
SPE DIV	<i>Spermolepis divaricata</i> (Walter) Raf.	Roughfruit scaleseed	FAC-	UPL	NP
SPH OBT	<i>Sphenopholis obtusata</i> (Michx.) Scribn.	Prairie wedgescale	FAC+	UPL	NC
THE KUN	<i>Thelypteris kunthii</i> (Desv.) C.V. Morton	Southern shield fern	FACW	FACW	NC
TRI SEB	<i>Triadica sebifera</i> (L.) Small	Popcorn tree	FAC	FAC	EA
TRI DIC	<i>Trichostema dichotomum</i> L.	Forked bluecurls	NL	UPL	NC
TRI FLA	<i>Tridens flavus</i> var. <i>flavus</i> (L.) Hitchc.	Tall redtop	FACU	UPL	NC
TRI PUR	<i>Triplasis purpurea</i> (Walter) Chapm.	Purple sandgrass	NL	UPL	NP
Unknown vine	Unknown vine	---	---	---	---
VAC ARB	<i>Vaccinium arboreum</i> Marshall	Sparkleberry	FACU	UPL	NC
VAC STA	<i>Vaccinium stamineum</i> L.	Deerberry	FACU	UPL	NC
VER VRG	<i>Verbascum virgatum</i> Stokes	Wand mullein	NL	UPL	EW
VER HAL	<i>Verbena halei</i> Small	Texas vervain	FACU-	UPL	NP
VIT AES	<i>Vitis aestivalis</i> Michx.	Summer grape	FAC-	---	NC
VIT ROT	<i>Vitis rotundifolia</i> Michx.	Muscadine	FAC	---	NP
ZAN CLA	<i>Zanthoxylum clava-herculis</i> L.	Hercules'-club	FAC	UPL	NC

<sup>1</sup> USFWS (United States Fish and Wildlife Service) Classifications: OBL = obligate wetland species; FACW = facultative wetland species; FAC = facultative species (neither wetland nor upland); UPL = upland species; NL = not listed in the federal list; NI = non-indicator species

<sup>2</sup> FDEP (Florida Department of Environmental Protection) Classifications: OBL = obligate wetland species; FACW = facultative wetland species; FAC = facultative species (neither wetland nor upland); UPL = upland species; "----" = vine (non-indicator species)

<sup>3</sup> Floristic Classifications (a measure of relative desirability): NC = Native Characteristic species (highly desirable); NP = Native Pioneer species (highly desirable); NW = Native Weedy species (slightly desirable); EW = Exotic Weedy species (undesirable); EA = Exotic Aggressive species (very undesirable)

**Table 4. Gopher Tortoise Nomenclature and Burrow Status for the Project Site.**

GPS Location*	Latitude	Longitude	Status
18	29.62062598000	-82.47806266000	Potentially Occupied
82	29.62243061000	-82.48048930000	Potentially Occupied
128	29.62203733000	-82.48035301000	Potentially Occupied
165	29.62102915000	-82.48015109000	Potentially Occupied
198	29.62093594000	-82.47927913000	Potentially Occupied
231	29.62256463000	-82.47913227000	Potentially Occupied
251	29.62199810000	-82.47979243000	Potentially Occupied
257	29.62192509000	-82.47944433000	Potentially Occupied
314	29.61958235000	-82.47921995000	Potentially Occupied
331	29.62012969000	-82.47948113000	Potentially Occupied
355	29.61967933000	-82.47970627000	Potentially Occupied
462	29.62156861000	-82.47851009000	Potentially Occupied
465	29.62144565000	-82.47827363000	Potentially Occupied
489	29.62063604000	-82.47811999000	Potentially Occupied
495	29.62128229000	-82.47797331000	Potentially Occupied
507	29.62216423000	-82.47851453000	Potentially Occupied
527	29.62187145000	-82.47716378000	Potentially Occupied
620	29.62040805000	-82.47453698000	Potentially Occupied
657	29.61965946000	-82.47582989000	Potentially Occupied
665	29.61976684000	-82.47640614000	Potentially Occupied
688	29.61970674000	-82.47820373000	Potentially Occupied
699	29.62020060000	-82.47847597000	Potentially Occupied
717	29.62029473000	-82.47719890000	Potentially Occupied
719	29.62030839000	-82.47728297000	Potentially Occupied
729	29.62008158000	-82.47642048000	Potentially Occupied
732	29.62013916000	-82.47629299000	Potentially Occupied
754	29.62025701000	-82.47497845000	Potentially Occupied
767	29.62022591000	-82.47420539000	Potentially Occupied
769	29.62016548000	-82.47422903000	Potentially Occupied
1016	29.62205535000	-82.47649834000	Potentially Occupied
1579	29.62177766000	-82.47745673000	Potentially Occupied
1588	29.62245123000	-82.47816894000	Potentially Occupied

\* GPS locations are as referenced on Figure 39.

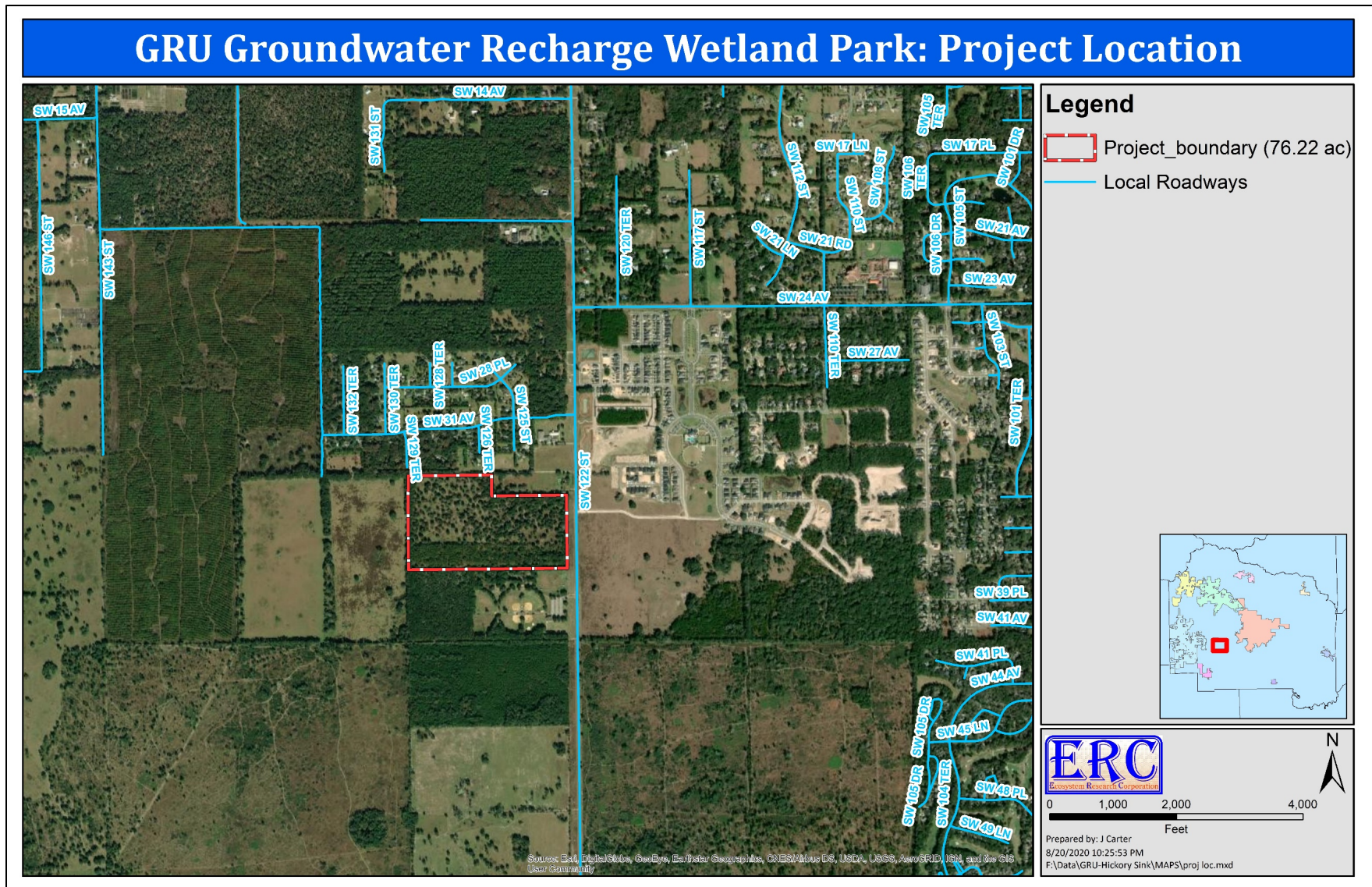


Figure 1. Project location map showing the Project Site in relation to local access roads.



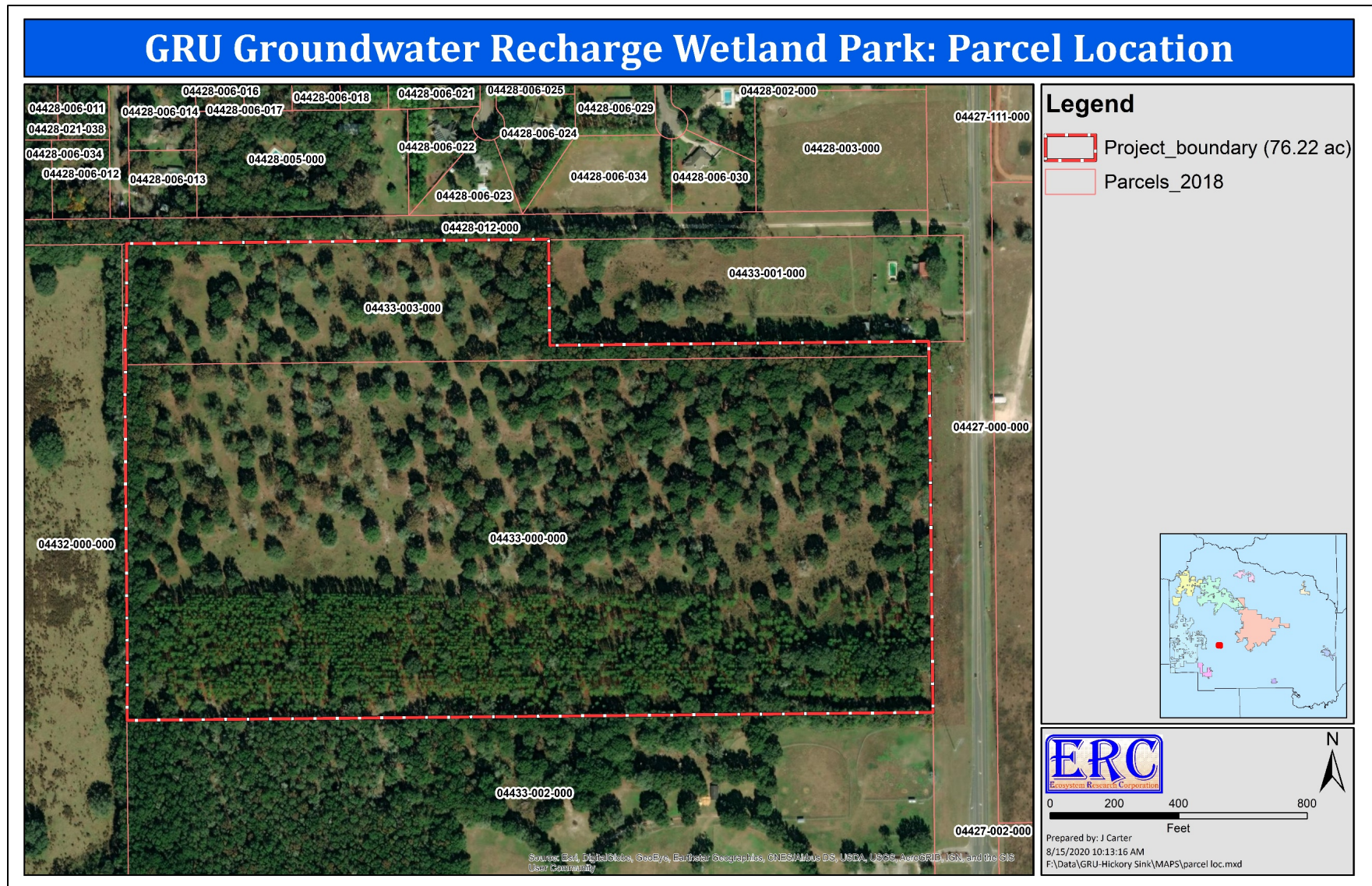


Figure 2. Alachua County Parcels shown in relation to the Project Site.

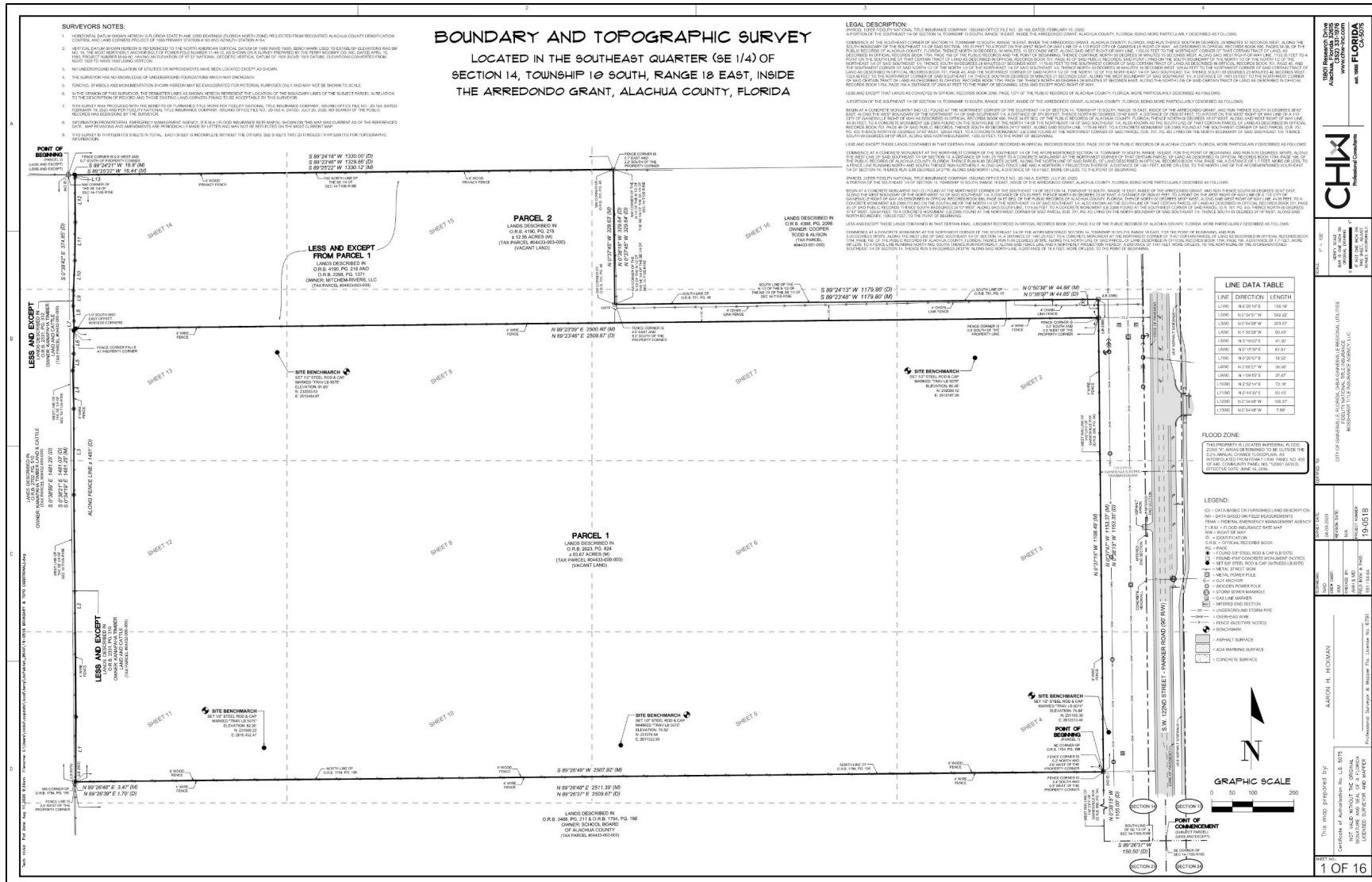


Figure 3. Boundary and topographic survey of the Project Site.