

HOOKS STREET ALTERNATIVE CORRIDOR EVALUATION

**From Hancock Road to
Hartle Road (CR 455)**

**Environmental
Assessment Report**

June 2021



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1.0 INTRODUCTION

METRO Consulting Group, LLC (METRO), on behalf of Lake County, is conducting an Alternative Corridor Evaluation for the Hooks Street Extension from Hancock Road to Hartle Road (CR 455). The Study Area is located in the City of Clermont, Lake County, FL. The project's purpose is to consider proposed alternative alignments for transportation improvements to connect Hooks Street at its existing Hancock Road terminus through the subject property to Hartle Road (CR 455), a distance of approximately 1.4 miles. **Figure 1** in **Appendix I** shows its location on a roadmap.

The Study Area is further described as being ±61.37 acres in size in Sections 26/27 of Township 22 South, Range 26 East. The project center is at Latitude 28° 32' 34.50" North, Longitude 81° 42' 43.00" West approximately. It lies adjacent to SR 50 and is mostly undeveloped. The Study Area consists of ten (10) parcels identified by the Lake County Property Appraiser with Parcel Identification Numbers 272226000200002300, 272226000200000502, 272226000100003100, 272226020300C00000, 272226020000D00000, 272226000100000200, 272226020200C00000, 092226110503900000, 092226110003900000, 092226110003800000, and three (3) un-numbered parcels in the public domain (**Appendix I, Figure 2**).

METRO conducted a qualitative, environmental assessment of the Study Area on October 7, 2020. The purpose of this assessment was to: 1) evaluate the onsite habitats, vegetative communities, and soils; 2) assess the presence and condition of jurisdictional wetlands and surface waters; 3) identify and document the presence of any state or federally protected wildlife species; 4) assess the presence and condition of cultural resources; and 5) outline agency permitting requirements associated with subject property's development. The findings reflect onsite conditions at the time of the investigation and do not preclude the possibility that conditions have.

2.0 DATA COLLECTION

Prior to inspecting the Study Area, published literature and publicly available GIS data layers were collected to review the site's topography, soils, wetlands/surface waters, vegetation, and anticipated or documented wildlife use or habitat both onsite and nearby.

The resources reviewed were:

- Aerial Photograph Basemaps from ESRI ArcGIS Online
- Bird's Eye Photographs from Microsoft Bing Maps
- Aerial Photographs from Google Earth (1995 – Present)
- University of Florida Digital Collection, Aerial Photography: Florida 1941, 1947, 1958, and 1974
- Lake County GIS Tax Parcels, 2018
- Florida State Historic Preservation Office (SHPO) GIS Resources, July 2019
- U.S. Department of Agriculture (USDA) Natural Resources Conservation Survey (NRCS) Web Soil Survey Custom Soil Report
- Florida Natural Areas Inventory (FNAI) – Species Occurrence Tracking List, Lake County
- United States Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPaC)

- USFWS National Wetlands Inventory (NWI) GIS Data
- Saint Johns River Water Management District (SJRWMD) Land Use GIS Data, 2014
- Florida’s Endangered and Threatened Species, December 2018, Florida Fish and Wildlife Conservation Commission (FFWCC)
- FFWCC, Eagle Nest Locator
- GIS shapefiles containing the following wildlife records:
 - FFWCC 2016 Bald Eagle Survey Results
 - FFWCC Breeding Bird Atlas
 - FFWCC Wildlife Consultation Areas
 - FFWCC Wildlife Observations – Listed Species
 - FFWCC ETDM Species Observations
 - FFWCC Rare – Imperiled Fish Habitat
 - FFWCC Wildlife Critical Habitat
 - FFWCC Wildlife Observation and Wildlife Habitat Database 1974 – 2015
 - FFWCC Scrub Jay Habitat and Occurrence Records (1992 – 1993)
 - University of Florida GeoPlan Center Florida Sand Skink and Blue-Tailed (Bluetail) Mole Skink Suitable Habitat – January 2013
 - University of Florida GeoPlan Center Species Observations, 1939 – 2013
 - USFWS Wildlife Habitat and Locations Database
 - USFWS IPaC Threatened and Endangered Species in Florida – 2018
 - USFWS Complete Species Current Range Boundaries for the State of Florida - June 2020
 - USFWS Wood Stork Nesting and Core Foraging Areas, 2008 – 2018

Additionally, letters requesting any pertinent environmental data regarding the Study Area were mailed to:

- Florida Department of Agricultural and Consumer Services (FDACS)
- Florida Department of Environmental Protection (FDEP)
- Florida Department of State (FDOS)
- Florida Division of Historical Resources, Florida Master Site File (FMSF)
- FFWCC
- FNAI
- Miccosukee Tribe
- National Oceanic and Atmospheric Administration (NOAA), National Marine Fisheries Service (NMFS)
- Seminole Tribe of Florida
- SJRWMD
- United States Army Corps of Engineers (USACOE)
- USFWS
- United States Forest Service (USFS)

Letters that elicited a return response can be found in **Appendix II**.

3.0 SITE CONDITIONS

METRO conducted a field inspection of the Study Area on October 7, 2020. **Figure 3** in **Appendix I** depicts its boundary superimposed atop a recent aerial photograph. The property was traversed using pedestrian transects. The inspection used visual and aural observations to verify the findings from the data collection, to identify any listed wildlife species, wildlife habitat, wetlands, or surface waters, and to map the onsite land uses and vegetative communities.

The xeric oak area described more in **Section 3.3** maintains characteristics of scrub habitat once prevalent across much of the Lake Wales Ridge. These types of habitats are now considered rare and imperiled, as are many of the plant and wildlife species that occupy them. The xeric oak habitat within the Study Area has been deprived of fire maintenance for an extended period and is surrounded on all sides by urban development. Still, it is on the Florida Forever Board of Trustees list as an “essential parcel remaining” for purchase. The findings of the data collection and survey are discussed in greater detail below. The FNAI report found in **Appendix II** also gives a portion of the Study Area the highest priority rating on its biodiversity resource index.

3.1 Historic Conditions

After reviewing the historic aerial photographs flown in 1941, 1948, 1958, and 1974 by the USDA and provided by the University of Florida, the site appears undeveloped through that period with increasing amounts of agriculture (row crops or citrus groves) and mining encroaching from all sides (**Appendix III**). The Old County Road 50, and precursors to SR 50, CR 455, and Hancock Road are present in 1941. No structures are seen in any of the photos. The remnant onsite sand mine began after 1958 and is in full operation by 1974.

In the 1941 photo, the Study Area is mostly natural vegetation with a small amount of agriculture on the east and west. By 1974, the Study Area is approximately half agriculture/mining and natural vegetation. Historically, the Study Area appears dominated by xeric scrub habitat seen in the remnant natural onsite cover with the increasing activity noted above (**Section 3.2**). One (1) small, isolated wetland is seen on all the photos and also indicated by the soils report.

3.2 Soils

Using the NRCS Web Soil Survey, a custom soil report was generated for the Study Area. **Figure 4 in Appendix I** exhibits the boundaries of all soil types as defined by the report. The report itself can be found in **Appendix IV**.

8 – Candler sand, 0 to 5 percent slopes is nearly level to gently sloping, excessively drained soil found on historic marine ridges of the central ridge (xeric uplands). The soil type generally consists of sand down to at least 80 inches. The water table is at a depth of more than 120 inches. Permeability is very rapid throughout the entire profile. It is not considered hydric.

9 – Candler sand, 5 to 12 percent slopes is a strongly or steeply sloping, excessively drained soil found on historic marine ridges of the central ridge (xeric uplands). This soil type generally consists of sand down to at least 80 inches. The water table is at a depth of more than 80 inches. Permeability is very rapid throughout the entire profile. It is not considered hydric.

10 – Candler sand, 12 to 40 percent slopes is a strongly or steeply sloping, excessively drained soil found on historic marine ridges of the central ridge (xeric uplands). This soil type generally consists of sand down to at least 80 inches. The water table is at a depth of more than 80 inches. Permeability is very rapid throughout the entire profile. It is not considered hydric.

21 – Lake sand, 0 to 5 percent slopes is nearly level to gently sloping, well-drained to excessively drained soil found on historic marine ridges of the central ridge (xeric uplands). This soil type generally consists of sand down to at least 80 inches. The water table is at a depth of more than 80 inches. Permeability is very rapid throughout the entire profile. It is not considered hydric.

22 – Lake sand, 5 to 12 percent slopes is a strongly or steeply sloping, excessively drained soil found on historic marine ridges of the central ridge (xeric uplands). This soil type generally consists of sand down to at least 80 inches. The water table is at a depth of more than 80 inches. Permeability is very rapid throughout the entire profile. It is not considered hydric.

33 – Ona-Ona, wet, fine sand, 0 to 2 percent slopes is nearly level, poorly drained soil that has a layer stained with organic matter just below the surface. These soils usually occur on the flatwoods atop historic marine terraces. This soil type generally consists of fine sand down to at least 80 inches. The water table is normally at a depth of 6 to 18 inches but could be deeper during drier periods. Permeability is moderately rapid in the weakly cemented organic layers and rapid in all other layers. It is not considered hydric. The water table of the “wet” portions of this soil type normally ranges from 0 to 18 inches. These areas are considered hydric.

45 – Tavares sand, 0 to 5 percent slopes is nearly level to gently sloping soil found on historic marine terraces (mesic uplands). It has a very dark grayish-brown sandy surface layer and sand down to at least 80 inches. The water table for this soil type is at a depth of 42 to 72 inches. It is rapidly permeable throughout the entire profile and is not considered hydric.

50 – Borrow Pits are disturbed soils resulting from ongoing or historic sand mining or other borrow operations. This soil type’s hydric rating is unranked.

99 – Water are areas covered 100 percent by water

3.3 Land Use Types and Vegetative Communities

The 2014 SJRWMD Land Use and Cover GIS data was reviewed as a reference for the field visit. During the qualitative review noted in **Section 1.0**, a Professional Wetland Scientist identified the FLUCFCS boundaries and whether any onsite wetlands or surface waters were present within the Study Area. The current land use and vegetative communities were classified in accordance with the *Florida Land Use Cover & Forms Classification System*, 1999 (FLUCFCS) and are described in more detail below. These boundaries were digitized using ArcGIS, and a map showing them can be found in **Appendix I, Figure 5**.

140 – Commercial and Services

These are mostly dry stormwater ponds that service the Senninger Irrigation development. They are mowed and maintained. A narrow, planted fringe of live oak (*Quercus virginiana*) is found along the northern edge.

192 – Inactive Land with street patterns but without structures

These are parcels associated with existing or planned development at the east and west of the Study Area. They have been mowed and maintained in preparation for future development and are dominated by early successional grasses and forbs such as Bahia grass (*Paspalum notatum*), Spanish needles (*Bidens alba*), bladderpod (*Sesbania vesicaria*), chalky bluestem (*Andropogon virginicus*), dog fennel (*Eupatorium capillifolium*), lantana (*Lantana camara*), ragweed (*Ambrosia artemisiifolia*), red top panicum (*Coleataenia rigidula*), sandbur (*Cenchrus* sp.), and Spanish daisy (*Helenium amara*). At the time of this report, some of the land contained within the Senninger development was being surveyed and prepared for construction.

411 – Pine Flatwoods

At the eastern edge of the Study Area are parcels covered by slash pine (*Pinus elliottii*) with a few live oak and sand live oak (*Quercus geminata*) and a typical understory of vegetation such as beautyberry (*Callicarpa americana*), bladderpod, lantana, muscadine (*Vitis* sp.), greenbrier (*Smilax* sp.), prickly pear cactus (*Opuntia stricta*), saw palmetto (*Serenoa repens*), and Spanish daisy. A small amount of cogon grass (*Imperata cylindrica*) was also present.

421 – Xeric Oak

The forested area north of the historic mine that is now a surface water and a small strip of land between the Waterbrooke and Senninger developments is dominated by live oak and other xeric oaks such as sand live oak. There are also a few longleaf pine (*Pinus palustris*), southern red cedar (*Juniperus silicicola*), and turkey oak (*Quercus laevis*) in the canopy. The understory is mostly saw palmetto and immature oaks. Other understory vegetation includes: winged sumac (*Rhus copallinum*) and common persimmon. Groundcover found here includes gopher apple (*Licania michauxii*), Lewton's milkwort (*Polygala lewtonii*), forked bluecurls (*Trichostema dichotomum*), blazing star (*Liatris* sp.), dayflower (*Commelina erecta*), Spanish daisy, and deer moss (*Cladonia* sp.). These areas are densely vegetated with some open sand interspersed. Non-native species such as cogon grass and caesarweed (*Urena lobata*) are also present.

427 – Live Oak

There is a remnant sinkhole in the middle of the slash pine area. It does not show any evidence of prolonged inundation and is dominated by live oak, laurel oak (*Quercus*

laurifolia) with an understory of beautyberry, Caesar weed, greenbrier, muscadine, and saw palmetto.

530 – Reservoirs

A surface water left over from historic sand mining is present in the middle of the Study Area. It is mostly open water with steep banks, a narrow fringe of cattail (*Typha latifolia*), and Peruvian primrose willow (*Ludwigia peruviana*).

814 – Roads and Highways

These are roads at the east and west terminus of the Study Area (Hancock Road and CR 455), as well as the road servicing Senninger Irrigation and the Waterbrooke housing development (Emil Jahna Road).

3.4 Wetlands and Surface Waters

There are no onsite jurisdictional wetlands. There is a surface water left over from the remnant mining operations. It is steep sided and permanently flooded, but the only vegetation is in a narrow fringe of non-native and nuisance plants as described in **Section 3.3**. The boundary of this waterbody (530 – Reservoir) can be seen in **Appendix I, Figure 5**.

3.5 Wildlife

The qualitative site review noted above also employed a Certified Wildlife Biologist to determine if any wildlife species using the property are listed as protected by the USFWS or the FFWWC, or if suitable habitat exists to support them. Prior to visiting the site, FNAI was contacted to determine whether there have been any documented, onsite sightings of Listed Species, whether there is any onsite critical habitat, or the potential for Listed Species or their habitat to exist (**Appendix II**). Using that report and the USFWS IPaC online tool, a resource list was generated to determine the presence or potential of any onsite Listed Species, critical habitats, migratory birds, federal facilities, fish hatcheries, or federally regulated wetlands (**Appendix V**).

The qualitative review used meandering transects to investigate all habitat types within the Study Area. It covered approximately 100% of the Study Area. Visual and aural cues were employed to determine the presence of any wildlife (e.g., tracks, scat, burrows, calls, etc.). **Table 1** shows a list of the species identified during the GIS evaluations, FNAI review, USFWS IPaC review, or any direct observations or evidence of a particular species.

Table 1: Existing or Potential Listed Species within the Hooks Street Extension Study Area

Common Name	Species	Status	Critical Habitat	Source
<u>Birds</u>				
Eastern black rail	<i>Laterallus jamaicensis</i>	Threatened (F)	None	IPaC
Everglade snail kite	<i>Rostrhamus sociabilis plumbeus</i>	Endangered (F) Endangered (S)	Outside	IPaC
Florida burrowing owl	<i>Athene cunicularia floridana</i>	Threatened (S)	None	FNAI
Florida sandhill crane	<i>Antigone canadensis pratensis</i>	Threatened (S)	None	FNAI
Florida scrub-jay	<i>Aphelocoma coerulescens</i>	Threatened(F)	None	IPaC
Wood stork	<i>Mycteria americana</i>	Threatened (F)	CFA	IPaC, FNAI
<u>Reptiles</u>				
Eastern indigo snake	<i>Drymarchon corais couperi</i>	Threatened (F)	None	IPaC, FNAI
Gopher tortoise	<i>Gopherus polyphemus</i>	Candidate (F) Threatened (S)	None	Observed
Sand skink	<i>Neoseps reynoldsi</i>	Threatened (F)	None	IPaC
Short-tailed snake	<i>Lampropeltis extenuata</i>	Threatened (S)	None	FNAI
<u>Flowering Plants</u>				
Britton's beargrass	<i>Nolina brittoniana</i>	Endangered (F) Endangered (S)	None	IPaC, FNAI
Florida bonamia	<i>Bonamia grandiflora</i>	Threatened (F) Endangered (S)	None	IPaC, FNAI
Lewton's polygala	<i>Polygala lewtonii</i>	Endangered (F) Endangered (S)	None	IPaC, FNAI
Pigeon wings	<i>Clitoria fragans</i>	Threatened (F) Endangered (S)	None	IPaC, FNAI
Pygmy fringe-tree	<i>Chionanthus pygmaeus</i>	Endangered (F) Endangered (S)	None	IPaC, FNAI

Scrub buckwheat	<i>Eriogonum longifolium</i>	Threatened (F) Endangered (S)	None	IPaC, FNAI
Scrub plum	<i>Prunus geniculata</i>	Endangered (F) Endangered (S)	None	IPaC, FNAI
Wide-leaf warea	<i>Warea amplexifolia</i>	Endangered (F) Endangered (S)	None	IPaC, FNAI

F- Federal, S- State

Other non-Listed species observed included cardinal (*Cardinalis cardinalis*), mockingbird (*Mimus polyglottos*), and red-shouldered hawk (*Buteo lineatus*).

The commercial and inactive land is maintained in an early-successional state and is unsuitable for any Listed Species other than gopher tortoise and its commensals. The xeric oak areas also contain gopher tortoise, and there is some open sand that could support sand skink, but the habitat is not ideal for that species as it is covered mostly by vegetation and rooting. No sinusoidal sand skink sign was observed. It is also not suitable for scrub jay because of the dense overstory and lack of fire maintenance. There are no wetlands and the only onsite surface water is too steep sided to allow wood stork, Everglade snail kite, or eastern black rail foraging or nesting.

Gopher tortoise was the only protected species of wildlife observed during the October 7, 2020, site inspection (**Appendix I, Figure 6**). Before development can commence, a permit must be obtained to relocate the onsite gopher tortoise population. **Section 5.6** of this report provides details about the gopher tortoise permitting process.

3.6 Flora

During the qualitative review conducted to determine the presence of wildlife, observations of any protected flora were also recorded. Lewton's milkwort was observed during the review, and according to the FNAI report found in **Appendix II**, Britton's beargrass, scrub plum, and wide-leaf warea have been observed on or adjacent to the Study Area previously. Several other plants listed in the FNAI report also have the potential to occur. Protected plants are not subject to regulatory scrutiny unless they are being sold or exploited commercially. There should be no further action from the state or federal governments regarding them, but a professional organization such as the Florida Native Plant Society may want to relocate any plants that could be impacted by the proposed project.

3.7 Cultural Resources

According to the SHPO GIS layer, there are no historic structures, bridges, cemeteries, or archaeological resource groups documented within the Study Area. Several previous cultural resource surveys have been conducted within and nearby the Study Area, but no resource groups were identified by these previous investigations. The only cultural resource identified nearby is an historic structure approximately 960 ft north of the Study Area's eastern terminus (**Figure 7**). This structure, labeled LA02623 (13640 Hartle Street), is a masonry block structure built in c.1951 and was determined ineligible for listing on the National Register of Historic Places. This structure should not affect the project's development. During the site investigation, attention was paid to the presence of any structures, cemeteries, middens, or other signs of historic or archaeological resources. None were observed.

3.8 Farmland

The NRCS conducted a farmland impact evaluation for the proposed project. According to the NRCS review and Farmland Conversion Impact Rating for Corridor Projects form found in **Appendix II**, the proposed project will not affect or convert any farmland within the Study Area. No farmland was observed during the field investigations. Regulation from the NRCS for the proposed project regarding farmland should not be necessary.

4.0 REGULATORY AGENCY PERMITTING

Agencies with regulatory authority of the Study Area include the FDEP, SJRWMD, and Lake County. There are no onsite, federally regulated wetlands, so permits from the USACOE are not required.

The Study Area is within the Lake Apopka Basin. It is further covered by the Upper Ocklawaha Basin and its Basin Management Action Plan (BMAP). As a result, development within the Study Area is subject to stricter County and State water quality regulations.

4.1 Florida Department of Environmental Protection

The Upper Ocklawaha BMAP regulates nutrient concentrations (total phosphorus) in the basin's surface waters in order to meet the Total Maximum Daily Loads (TMDL) required by the FDEP. The BMAP does not address all of the water quality issues in the basin but focuses on reducing total phosphorus (TP) discharges to surface waters that are identified as impaired. The BMAP documents management actions that have been or will be undertaken by local, regional, state, or private entities to reduce the amount of TP released into the basin. Reducing the discharges of TP into the basin will help achieve water quality standards and designated uses established by FDEP. FDEP has designated that the water quality of the Upper Ocklawaha River Basin should be suitable for recreational use and for the propagation and maintenance of a healthy, well-balanced population of fish and wildlife.

For new development projects seeking to obtain a SJRWMD Environmental Resource Permit (ERP) where existing ambient water quality does not meet state water quality standards, an applicant must demonstrate that the proposed activity will result in a net improvement in the parameters that do not meet water quality standards. Lake County has also codified ordinances to address development requirements that will help meet the TMDL standards. See the **Section 4.3** for additional information.

4.2 St. John's River Water Management District

The SJRWMD administers regulatory authority for proposed developments through the Statewide ERP program. Construction of the project will require an ERP application to be submitted to the SJRWMD for stormwater management and environmental regulatory review. The SJRWMD exerts regulatory jurisdiction over wetland and surface water areas. The Study Area does not contain any jurisdictional wetlands nor does the property abut any wetlands. It does contain a surface water created from a mining borrow area but impacts to it will not require wetland mitigation; therefore, the focus of the ERP application review will be on engineering and stormwater management issues. Once a final alignment is chosen, a modified version of this report should be sufficient for submittal to SJRWMD with the ERP application to address ecological issues.

4.3 Lake County

Lake County has land development regulations that outline important codes and “establish those resources or areas of a Development Site that must be protected from harmful effects of Development.” The Resource Protection ordinances outlined in Appendix E, Chapter VI of the General Ordinances of the County require protection of wetlands and waterbodies, natural upland communities, and Listed Species. A permit from the SJRWMD and USACOE is required when impacts to wetlands are proposed, and the County has some additional considerations prior to wetland impact approval (e.g., impacts are only approved to low-quality or isolated wetlands). They also require buffers around wetlands depending on their category and a 50-foot setback from any jurisdictional wetland boundary for structures. Wetland delineation is required and mitigation may be necessary for impacts to wetlands.

The County has protections in place for sensitive upland communities, but roadways approved by the Board of Commissioners are exempt. Because a portion of the project contains xeric uplands identified as an “essential parcel remaining” for purchase by the Florida Forever Board of Trustees, additional consideration may be given to the project by the County. If Listed Species or their habitat are proposed for impact, the County requires their protection and a management plan depending on the project size. The County defers regulatory authority to the appropriate wildlife agency (FFWCC or USFWS), and their approval is required prior to development.

As the Study Area does not contain any wetlands, there should be no regulatory action by the County in that regard. A permit from the FFWCC will be required for impacts to gopher tortoise (and their commensals) or their burrows prior to construction approval. A consultation or exemption will be required with the USFWS regarding sand skink, and the standard protection guidelines for indigo snake will also be necessary. See **Section 5.0** for more information about the regulatory requirements. This Environmental Assessment may be submitted to the County to satisfy the environmental review criteria of the project.

5.0 LISTED SPECIES REGULATIONS AND PERMITTING

A qualitative review of the Study Area determined whether any Listed Species inhabit the Study Area or whether the onsite habitat is potentially suitable for Listed Species. The METRO biologist determined that the Study Area has the potential for Listed Species to inhabit it. METRO biologists did not observe suitable habitat for any other Listed Species that have the potential to be found in the area than those discussed below.

A systematic survey was not conducted for gopher tortoise; however, during this site investigation, thirty (30) gopher tortoise (*Gopherus polyphemus*) burrows were encountered. The environmental constraints associated with the presence of this species are discussed in greater detail below (**Appendix I, Figure 6**). A Listed plant species, Lewton's milkwort, was observed, but no regulatory action is required for impacts to Listed plants unless they are being sold or exploited commercially. No additional Listed wildlife or plant species were observed within the Study Area during the site inspection; however, it should be noted that these findings reflect the site conditions at the time of the investigation and do not preclude Listed Species from inhabiting the project site in the future.

5.1 Bald Eagle

In addition to the onsite evaluation for wildlife, the FFWCC's 2016 Eagle Nest Shapefile was used to determine whether any documented eagle nests are located within or near the Study Area. According to the GIS data, there is one (1) documented eagle nest located

within three (3) miles of the Study Area. No eagles or eagle nests were documented or observed within the Study Area.

The closest documented eagle nest, Nest ID# LA026, is approximately 3,000 feet north of the Study Area. This nest was last surveyed in 2016 and last documented as active in 2014 by the FFWWC. The associated management zones do not extend onto or near the Study Area; therefore, project development should not have any adverse impact on eagle breeding or nesting activities. No coordination with FFWWC or USFWS is anticipated for the presence of this species.

5.2 Eastern Black Rail

The eastern black rail is a small, secretive marsh bird listed as federally threatened. Eastern black rail can be found in tidally or non-tidally influenced marshes that range in salinity from salt to brackish to fresh. Along the Atlantic coast, eastern black rail habitat includes impounded and un-impounded salt and brackish marshes. Along portions of the Gulf Coast, eastern black rails can be found in higher elevation wetland zones with some shrubby vegetation. Impounded and un-impounded intermediate marshes (marshes closer to high elevation areas) also provide habitat for the subspecies. Eastern black rails are also known to use wet sedge meadows with dense cover or shallow wetlands often dominated by cattails. There is a narrow band of vegetation in the onsite surface water that contains cattail and non-native shrubs, but there is not enough to provide adequate cover and the steep sides of a remnant mining pit would not allow foraging. There are no other shallow wetlands that would support this species, and no further regulatory action for it should be required.

5.3 Eastern Indigo Snake

The eastern indigo is a federally listed snake and is the longest snake native to North America. It is an iconic and essential component of the now-rare southern longleaf pine forest and serves a critical function to balance the wildlife community, consuming a variety of small animals including both venomous and nonvenomous snakes. At over eight (8) feet long, the indigo snake often relies upon gopher tortoise burrows for shelter. The snake derives its name from the glossy, blue-black color of its scales above and its uniformly slate blue below. These snakes are not typically aggressive and will attempt to crawl away when disturbed. Though indigo snakes rarely bite, they should not be handled.

The eastern indigo snake occurs in a wide variety of terrestrial habitat types throughout Florida. Although they prefer uplands, they also utilize some wetlands and agricultural areas. Eastern indigo snakes will often seek shelter inside gopher tortoise burrows, as well as other below- and above-ground refugia such as other animal burrows, stumps, roots, and debris piles. When gopher tortoise burrows are present, the USFWS assumes the presence of eastern indigo snake and requires conditions before, during, and after construction.

Pre-construction activities

1. The applicant or designated agent will post educational posters in the construction office and throughout the construction site, including any access roads. The posters must be clearly visible to all construction staff. A sample poster is attached.
2. Prior to the onset of construction activities, the applicant/designated agent will conduct a meeting with all construction staff (annually for multi-year projects) to discuss identification of the snake, its protected status, what to do if a snake is

observed within the project area, and applicable penalties that may be imposed if state and/or federal regulations are violated. An educational brochure including color photographs of the snake will be given to each staff member in attendance, and additional copies will be provided to the construction superintendent to make available in the onsite construction office (a final brochure for Plan compliance, to be printed double-sided on 8.5" x 11" paper and then properly folded, is attached). Photos of eastern indigo snakes may be accessed on USFWS and/or FWC websites.

3. Construction staff will be informed that, in the event that an eastern indigo snake (live or dead) is observed on the project site during construction activities, all such activities are to cease until the established procedures are implemented according to the Plan, which includes notification of the appropriate USFWS Field Office. The contact information for the USFWS is provided on the referenced posters and brochures.

During construction activities

1. During initial site clearing activities, an onsite observer may be utilized to determine whether habitat conditions suggest a reasonable probability of an eastern indigo snake sighting. These conditions may include the discovery of snake sheds, tracks, lots of refugia and cavities present in the area of clearing activities, and the presence of gopher tortoises and burrows.
2. If an eastern indigo snake is discovered during gopher tortoise relocation activities (i.e., burrow excavation), the USFWS shall be contacted within one business day to obtain further guidance which may result in further project consultation.
3. Periodically during construction activities, the applicant's designated agent should visit the project area to observe the condition of the posters and Plan materials, replacing them as needed. Construction personnel should be reminded of the instructions (above) as to what is expected if any eastern indigo snakes are seen.

Post-construction activities

Whether or not eastern indigo snakes are observed during construction activities, a monitoring report should be submitted to the appropriate USFWS Field Office within 60 days of project completion. The report can be sent electronically to the appropriate USFWS e-mail address listed on page one of this Plan.

5.4 Everglade Snail Kite

Everglade snail kite is listed as endangered by the Federal government. Snail kites are similar in size to red-shouldered hawks. All snail kites have deep red eyes and a white rump patch similar to the northern harrier. Snail kites have a shorter, broader tail, and broader, more rounded wings than a harrier. 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.

They may perch at many different heights, from the ground to high up in trees. Snail kite may occur in nearly all the wetlands of central and southern Florida. They regularly occur in lake shallows along the shores and islands of many major central and southern Florida lakes. They also regularly occur in the expansive marshes of southern Florida. Everglade snail kite is highly mobile and may travel through most of the South Florida wetland systems during their lifetime. They can and will move from wetland to wetland throughout their range in Florida. Kites will generally stay in one area as long as they can find food (apple snails) but will seek another wetland with available food if foraging conditions decline.

Kites regularly perch while hunting and resting. Kite foraging habitat consists of relatively shallow wetland vegetation, either within extensive marsh systems or in lake littoral zones. Emergent vegetation, including spike rushes, maidencane, and bulrushes, are important components of habitat because they allow apple snails to occupy the area. Dense, thick vegetation is not optimal for snail kite foraging because kites cannot readily see apple snails to capture them, and if vegetation is too sparse, apple snails may not be able to survive or reproduce. Kites nest in a variety of vegetation types, including both woody vegetation such as willows, cypress, pond apple, and even exotic invasive species such as melaleuca. Kites usually nest over open water, and this helps protect nests from mammalian predators such as raccoons. Nests can be very well hidden or quite obvious. The height of a nest is usually about 1-3 meters above the water. Kites almost always nest in areas with good foraging habitat nearby, and most foraging occurs in marshes immediately surrounding the nest.

The only onsite surface water is a remnant mining pit with steep sides, no trees, and a narrow band of dense cattail and Peruvian primrose willow. The Study Area is within the snail kite consultation area, but not within known "critical habitat." It does not contain suitable snail kite habitat for apple snail production or snail kite foraging or nesting. No further regulatory action related to this species should be required for the proposed project.

5.5 Florida Burrowing Owl

The burrowing owl is a small bird that lives in open, treeless areas. It is listed as Threatened by the State. Burrowing owl spends most of its time on the ground, where its sandy brown plumage provides camouflage from potential predators. One of Florida's smallest owls, it averages nine inches in height with a wingspan of 21 inches. Burrowing owl lacks the ear tufts of the more familiar woodland owls. Bright yellow eyes and a white chin accent the face. Unusually long legs provide additional height for a better view from its typical ground-level perch.

Burrowing owl primarily subsists on insects; however, they will also feed on snakes, frogs, small lizards, birds, and rodents. The typical breeding season for the Florida burrowing owl is February 15 to July 10, though owls can breed earlier or later. Nesting occurs in burrows they dig in the ground. These burrows will be maintained and used again the following year. Burrowing owls are different than other owls as they are active during the day (diurnal) rather than at night (nocturnal) during breeding season. During the non-breeding season, they become more nocturnal. Burrowing owls inhabit open prairies in Florida that have very little understory (floor) vegetation. These areas include golf courses, airports, pastures, agriculture fields, and vacant lots.

Florida burrowing owls use a breeding burrow and often one (1) or more satellite burrows for the essential behaviors of breeding and sheltering. Florida burrowing owls usually dig their own burrows, which are typically five (5) to ten (10) feet long and can be excavated

by the owls in as little as two (2) days. Burrowing owls in Florida are known to use burrows year-round, for roosting during the winter and for raising young during the breeding season. Some owls leave their burrows for part of the year due to flooding from seasonal rains. Burrowing owls prefer sandy, well-drained areas with low vegetation height and good visibility around burrows. Average vegetation (e.g., grasses, forbs, shrubs) height less than five (5) inches is considered optimal near burrows. In urban areas, burrowing owls forage in vacant lots, yards, cemeteries, airports, golf courses, athletic fields, and other open areas. Given that burrows are typically five (5) to ten (10) feet long, most activities within ten (10) feet of a burrow can result in collapse of the burrow. Nests within thirty-three (33) feet of construction activity have significantly lower productivity. Burrow status is classified into categories of Potentially Occupied (Active or Inactive) and Abandoned.

FFWCC regulation requires a permit for incidental take of burrowing owl or their burrows. Incidental take refers to take that is incidental to, and not the purpose of, carrying out an otherwise lawful activity. This type of take is prohibited without an incidental take permit or other authorization. Impacts to burrows in the act of building a house or road is an example of incidental take. Disturbance near burrows during the breeding season can result in take via harassment by significantly disrupting breeding.

Take of burrowing owls includes any of the following:

1. Causing injury or death of burrowing owl adults, eggs, or young.
2. Collapsing a Potentially Occupied burrow or blocking the entrance of a Potentially Occupied burrow in a manner that prevents an owl from entering or exiting the burrow.
3. Disturbances within 10 feet of a Potentially Occupied burrow entrance at any time of year. Examples of this form of take include, but are not limited to, inserting objects or liquids into a burrow, impeding a burrowing owl's ability to take shelter in a burrow, or blocking visibility around the Potentially Occupied burrow by erecting structures or planting vegetation greater than 8 inches in height within 10 feet of the burrow.
4. Disturbances within 33 feet of a Potentially Occupied burrow entrance during the breeding season.
5. Intentionally and repeatedly forcing burrowing owls to fly or to exhibit signs of stress.
6. Capturing, handling, and collecting burrowing owls or eggs.
7. Use of a burrow scope within a Potentially Occupied burrow is expected to cause take.
8. Significant habitat modification – An activity that results in the loss of greater than 50% of the total foraging habitat within a 1,970-foot radius circle around a Potentially Occupied burrow may result in significant habitat modification by impairing the essential behavior of foraging. FWC staff will evaluate activities that meet this criterion on a case-by-case basis to determine if significant habitat modification is likely to occur.

Surveys are highly recommended in potential habitats to determine if burrowing owls are present and if an incidental take permit is needed to avoid unauthorized take. If conducted in accordance with the methodology described below and the species is not detected, no FFWCC review or coordination is needed.

Surveys are recommended during project planning and immediately prior to project activities and should be conducted along with any gopher tortoise surveys:

1. Project planning surveys during the early stages of a project identify burrowing owl burrows and aid in development of appropriate avoidance, minimization, and mitigation measures.
2. For small-scale projects (1 acre or less), surveys involve walking all potential burrowing owl habitat to record the number and location of Potentially Occupied and Abandoned burrows. Photos of each Potentially Occupied and Abandoned burrow should be included in permit applications.
3. For larger-scale projects (greater than 1 acre), parallel transects spaced no more than 50 feet apart and covering all potential habitat should be sufficient to detect and record the number and location of Potentially Occupied and Abandoned burrows, provided surveys are conducted on days with good visibility. Photos of each Potentially Occupied and Abandoned burrow should be included in permit applications. If operating vehicles in the survey area, surveyors must take care to remain greater than 10 feet from Potentially Occupied burrows.
4. Project planning surveys should cover 100% of the potential habitat on the project site. Additionally, surveys should include the area within thirty-three (33) feet of the project footprint to detect burrows that may be impacted by project activities in a manner that could result in take, even if the burrows occur on adjacent properties. If lawful access cannot be achieved to adjacent areas, surveys can be performed by visual inspection from the project boundary.
5. When evaluating applications for potential significant habitat modification, FWC staff will consider Potentially Occupied burrows that are either on site or within thirty-three (33) feet of the project boundary, so applicants are not expected to survey within 1,970 feet of the project boundary.
6. Project planning surveys should be conducted no more than ninety (90) days prior to submission of a permit application. Please note that this survey methodology does not require use of a burrow scope; use of a burrow scope in a Potentially Occupied burrow is considered take and is prohibited without a permit.
7. Pre-activity (pre-clearing or pre-construction) surveys are recommended in the active part of the project site (e.g., the area scheduled for clearing/grading) within 48 hours of project activities to identify burrows that may have been established after project planning surveys and to ensure no active nests (burrows with eggs or flightless young) are present. Pre-activity surveys are not necessary if project planning surveys did not detect burrows.

The Inactive Land (FLUCFCS 192) near the Senninger Irrigation development contains suitable habitat for burrowing owl. The remaining Inactive Land is not maintained as often and the vegetation is too tall for burrowing owl habitat. Surveys for gopher tortoise have been conducted previously for new construction planned by that company and burrowing

owl has not been observed; however, prior to the proposed project being constructed, a new survey for burrowing owl should be conducted according to the criteria above (assuming the suitable habitat is still present). To save time, surveys should be conducted in conjunction with the gopher tortoise survey recommended in **Section 5.8**.

5.6 Florida Sandhill Crane

Florida sandhill crane is listed by the State as Threatened. It is a long-legged, long-necked, gray, heron-like bird with a patch of bald, red skin on top of the head. Two subspecies of sandhill crane occur in Florida. The Florida sandhill crane (*G. c. pratensis*) numbering 4,000 to 5,000, is a non-migratory, year-round breeding resident. They are joined every winter by 25,000 migratory greater sandhill cranes (*G. c. tabida*), the larger of the two subspecies. The greater sandhill crane winters in Florida but nests in the Great Lakes region. Only the Florida sandhill crane is considered protected.

Resident sandhill cranes are usually seen in very small groups or pairs. They nest during late winter and spring on mats of vegetation about two feet in diameter, as well as in shallow water marshes or ponds, where they also forage and roost. Uplands directly adjacent to nesting marshes are vital for young sandhill cranes for the first several months until they are capable of flying.

Disturbances in and around wetlands with active nests can significantly impact nesting success. Humans approaching a nest location within 250 feet of a nest site can cause a crane to flush. Once flushed, parents may avoid the nest for 15 minutes to over 4 hours and some nests are abandoned altogether. Disturbances within 400 feet can interrupt nesting activity and even cause abandonment of the area, even if the birds do not flush.

Surveys are used to determine if Florida sandhill crane is nesting in an area or to confirm that the species are present. When surveys, conducted in accordance with the methodology described below, do not detect the species, no FWC review or coordination is needed; however, the Study Area does not contain any shallow marshes or ponds that would support crane foraging, nesting, or roosting, so no survey should be required for this project, and no further regulatory action concerning this species should be necessary.

5.7 Florida Scrub-Jay

The scrub-jay is a federally threatened, relict species of fire-dominated oak scrub habitat that occurs on well-drained sandy soils in peninsular Florida. Scrub-jays are extremely habitat-specific, sedentary, and territorial. Florida scrub-jays form family groups; fledglings remain with their parents in their natal territory as helpers. They are similar in size and shape to the blue jay (*Cyanocitta cristata*) but differ significantly in coloration. Unlike the blue jay, scrub-jays lack a crest.

The scrub-jay can be found in coastal and ridge scrub areas throughout central Florida. Suitable habitats for the scrub-jay are not only the more “classic” xeric oak scrub, scrubby pine flatwoods, scrubby coastal strand, and sand pine scrub, but also include (FLUCFCS code in parentheses) improved, unimproved, and woodland pastures (211-213); citrus groves (221); rangeland (310-330); pine flatwoods (441); longleaf pine xeric oak (412); sand pine (413); sand pine plantations (4411); forest regeneration areas (443); sand other than beaches (720); disturbed rural land in transition without positive indicators of intended activity (741); and disturbed burned areas (745). The presence of scrub oaks, no matter how sparsely distributed, is a key indicator of “scrub” habitat. There are three classes of scrub-jay habitat:

Type I – any upland plant community in which percent cover of the substrate by scrub oak species is 15 percent or more.

Type II – any plant community, not meeting the definition of type I habitat, in which one or more scrub oak species is represented.

Type III – any upland or seasonally dry wetland within 400 m (0.25 mi) of any area designated as Type I or II habitats.

The onsite xeric habitat has “succeeded” from a fire-dominated scrub oak community to a mature live oak community due to the lack of regular fire. There are no documented scrub-jay colonies onsite or nearby, and none were observed during the site investigation. Although there are small pockets of scrub oak still within the xeric oak area, the Study Area does not contain enough intact habitat that would support the immigration of any new colonies. No further regulatory action related to this species should be required for the proposed project.

5.8 Gopher Tortoise

Gopher tortoise was the only protected wildlife species observed within the Study Area during the site inspection. It is designated by the State of Florida as a Threatened species and a candidate for listing by the USFWS. Each burrow was captured using a geo-tagged photograph and categorized as potentially occupied, juvenile, or abandoned. A systematic survey was not conducted. The burrow location was documented using the GPS of an iPhone 8 Plus and the ArcGIS Collector application. (**Appendix I, Figure 6**). Please note that the accuracy of the GPS device is $\pm 6\text{m}$.

FFWWC regulations prohibit development within a 25-foot radius of any potentially occupied gopher tortoise burrow; however, FFWWC regulations allow for relocation of gopher tortoises from properties slated for development, following issuance of the appropriate permit. A permit must be obtained for the excavation and relocation of all burrows located within a 25' radius of the development footprint.

Based on the number of tortoise burrows documented, the project will require issuance of a “Conservation Permit” by the FFWWC. The Conservation Permit acquisition process requires submittal of an application to the FFWWC by a state-licensed Authorized Gopher Tortoise Agent. Survey results must be no older than ninety (90) days at the time of application. Permit issuance typically occurs within forty-five (45) to sixty (60) days following application submittal. Once issued, a Conservation Permit will be valid for a period of twelve (12) months.

Please note that the FWC will require completion of a 100% gopher tortoise survey within ninety (90) days prior to initiation of the relocation effort. Additionally, the FFWWC will not authorize initiation of the relocation effort until construction-level development plan approval has been issued for the project by the local governmental entity.

The gopher tortoise relocation process involves excavation of all onsite burrows by a backhoe operator that is experienced in gopher tortoise burrow excavation, under the supervision of a state-licensed Authorized Gopher Tortoise Agent. Tortoises must be relocated to an FFWWC-approved recipient site within 72 hours of being captured. It is highly recommended that mass grading of the site occurs immediately following completion of the relocation effort, in order to prevent recolonization of the site by this species. If mass grading is not practical, efforts can be taken to prevent recolonization through the installation of buried silt-fencing around the perimeter of the site. Please note

that relocation permitting can be conducted in phases, so as to be consistent with phased development plans.

Costs associated with gopher tortoise relocation include consulting fees to facilitate permit issuance, payment of a “Mitigation Fee” to the FWC, recipient site fees, and labor costs associated with the actual relocation effort.

5.9 Sand Skink

Sand skink is state- and federally designated as a Threatened species. It is a small, nearly legless lizard that spends its entire lifecycle beneath the surface of the sandy soils characteristic of Central Florida’s sandy ridges. Its presence on a property is detected by observing the sinusoidal tracks left in the sand due to the unique manner in which this species moves through the substrate. The Study Area is located within the Sand Skink Consultation Area established by USFWS for this species. Potentially suitable habitat for sand skink generally includes areas of land higher than eighty-two (82) feet above sea level with suitable sandy soil types.

According to the USFWS Sand Skinks and Blue-tailed Mole Skinks Survey Protocol Peninsular Florida (Protocol; 2012), any portions of a property lying within the Skink Consultation Area with the appropriate elevation and soil types must be subjected to a formal coverboard survey in order to demonstrate absence of this species. The USFWS assumes presence of sand skinks unless a formal coverboard survey fails to reveal sand skink activity. The protocol requires that coverboard surveys be conducted between March 1st and May 15th of a calendar year. To conduct the survey, coverboards are placed within suitable soil areas at a minimum density of 100 coverboards per hectare (40 per acre) and checked once weekly for underlying signs of sand skink activity over a period of four (4) weeks.

Exemption from the coverboard survey can be granted by USFWS if onsite conditions are not suitable for sand skinks. On October 7, 2020, a Certified Wildlife Biologist conducted a general ecological assessment survey of the Study Area. Pursuant to this review, it was determined that it does not contain much land for sand skink habitation due to dense vegetation and root coverage or prior excavation. No sinusoidal signs of sand skink were observed.

Prior to site development, it is recommended that a “technical assistance” request be submitted to USFWS requesting an exemption from sand skink survey requirements. The exemption request will include details of the existing conditions, with an explanation of why the site would qualify for an exemption. METRO would request a total exemption based on site conditions, but USFWS may still require a survey of some of the areas of the Study Area that appear to have open sand when viewed on aerial photography. It is anticipated that the USFWS will respond within two weeks of the technical assistance request. If a complete exemption is granted, no further coordination for this species would be required, and the response could be provided to other agencies to demonstrate compliance with sand skink regulations. If only a partial exemption is granted, a survey of the nonexempt areas would still be required.

5.10 Short-tailed Snake

The short-tailed snake (also called the short-tailed kingsnake) is listed as Threatened by the State. It is a small, slender fossorial (adapted to digging and living underground) snake. Its body is gray colored with fifty (50) to eighty (80) brown spots that are separated by yellow to red sections. This species has a small head that is indistinct from its body, smooth scales, and a tail that makes up less than 10% of the body.

Short-tailed snake primarily subsists on small smooth-scaled snakes, particularly crowned snake (*Tantilla relictata*), so the presence of those snakes is also key. Short-tailed snakes can be found primarily burrowed in sandy soils, particularly longleaf pine and xeric oak sandhills, but they may also be found in scrub and xeric hammock habitats. This species is endemic to Florida, as they can only be found from the Suwannee River south to Highlands County.

Alterations and destruction of xeric uplands seem to be the biggest threat to the short-tailed snake. The clear cutting of longleaf pine and turkey oak in their habitat is thought to seriously affect the short-tailed snake. Crowned snake is abundant in xeric habitats, and loss of this habitat affects its main food supply. Increased predation from red fire ants is also a potential threat to the short-tailed snake.

The State does not have any conservation or survey guidelines for this species. Since it is considered protected, taking of the snake is prohibited, so consultation with the FFWCC is required if the snake is found onsite. Neither short-tailed snake nor crowned snake were observed during the field investigation.

5.11 Wood Stork

Wood stork is a large, long-legged, federally listed wading bird. The plumage is white except for black primaries and secondaries and a short black tail. The head and neck are largely un-feathered and dark gray in color. The bill is black, thick at the base, and slightly decurved.

The wood stork is primarily associated with freshwater and estuarine habitats that are used for nesting, roosting, and foraging. Wood storks typically construct their nests in medium-to-tall trees that occur in stands located either in swamps or on islands surrounded by relatively broad expanses of open water. Successful colonies are those that have limited human disturbance and low exposure to land-based predators. Nesting colonies protected from land-based predators are characterized as those surrounded by large expanses of open water or where the nest trees are inundated at the onset of nesting and remain inundated throughout most of the breeding cycle. These colonies have water depths between 0.9 and 1.5 meters (3 and 5 feet) during the breeding season.

Optimal water regimes for the wood stork involve periods of flooding, during which prey (fish) populations increase, alternating with dryer periods, during which receding water levels concentrate fish at higher densities coinciding with the stork's nesting season. Wood storks have a unique feeding technique and require higher prey concentrations than other wading birds. They capture prey using a specialized technique known as grope-feeding or tacto-location. Feeding often occurs in water 6 to 10 inches deep, where a stork probes with the bill partly open. When a fish touches the bill, it quickly snaps shut. The average response time of this reflex is 25 milliseconds, making it one of the fastest reflexes known in vertebrates.

Wood storks occur in a wide variety of wetland habitats. Typical foraging sites for the wood stork include freshwater marshes and stock ponds, shallow, seasonally flooded roadside and agricultural ditches, narrow tidal creeks and shallow tidal pools, managed impoundments, and depressions in cypress heads and swamp sloughs. Because of their specialized feeding behavior, wood storks forage most effectively in shallow-water areas with highly concentrated prey. Optimal foraging conditions are characterized by water that is relatively calm, uncluttered by dense thickets of aquatic vegetation, with a water depth between 5 and 38 cm (5 and 15 inches), although wood storks may forage in other

wetlands. Ideally, preferred foraging wetlands would include a mosaic of emergent and shallow open-water areas.

The Study Area is at the edge of a core-foraging area; however, the only onsite surface water is a steep-sided remnant from a former mining operation. It is permanently flooded and has a narrow band of dense cattail and Peruvian primrose willow. It does not contain suitable wood stork foraging or nesting habitat, and no regulatory action should affect the proposed project; however, in the design phase, the USFWS Programmatic Wood Stork Effect Determination Key should be completed during the permitting process to obtain a “no effect” or “may affect but not likely to adversely affect” determination from the Service.

6.0 SUMMARY

METRO evaluated the Hooks Street Extension Study Area using publicly available data and onsite field investigations to assess its habitats, vegetative communities, and cultural resources, and to identify and document the presence of any state- or federally protected wildlife species or their habitat. The Study Area is composed of six (6) upland habitat types and one (1) surface water. There were no jurisdictional wetlands identified. A portion of the Study Area is within a larger parcel of xeric upland considered an “essential parcel remaining” for purchase by the Florida Forever Board of Trustees.

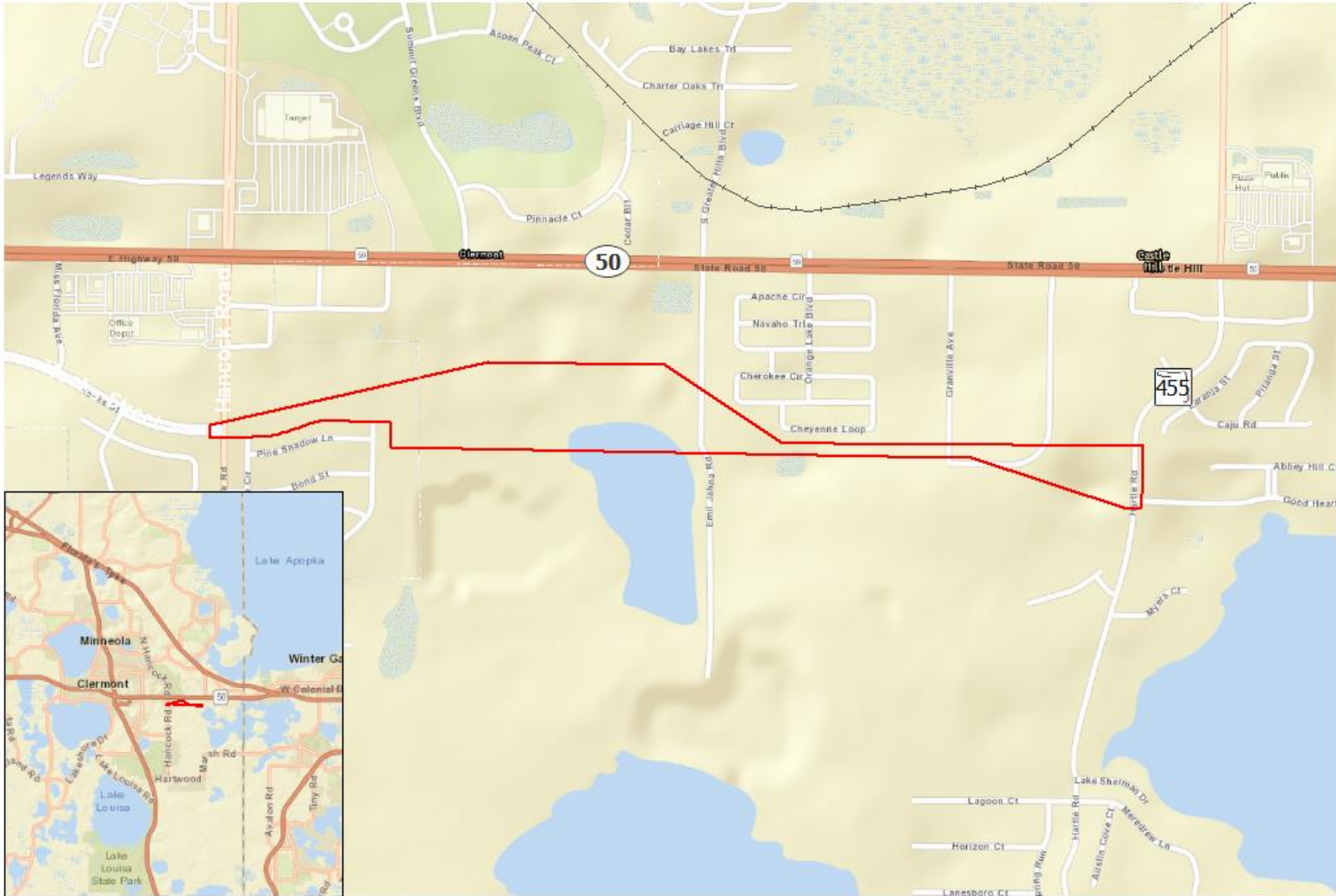
The site inspection resulted in documentation of the gopher tortoise within the project limits. Prior to initiation of any land clearing or development, it will be necessary to obtain a permit from the FWC to authorize the relation of gopher tortoises. The FWC will require a comprehensive, 100% survey for tortoises to be conducted prior to initiation of tortoise relocation. During the gopher tortoise survey, an inspection for burrowing owl or their burrows should also be conducted.

It is recommended that technical assistance with USFWS be initiated to request a sand skink exemption. It is possible that an exemption will be granted for most or all of the property that meets the survey requirements due to the presence of densely rooted vegetation, dense leaf litter and mass-grading activities that have previously occurred on the property. The programmatic wood stork key should also be completed and submitted to the Service for a determination.

No other environmental concerns were identified or are expected for the Study Area. This assessment does not constitute a Phase I Environmental Site Assessment, Cultural Resources Assessment Survey, or systematic wildlife survey(s), and this report makes no representation as to the presence or absence of hazardous materials, cultural resources, or Listed Species. These results reflect onsite conditions at the time of the investigation and do not preclude the possibility of Listed Species using or inhabiting the site in the future.

7.0 APPENDICES

Appendix I - Figures



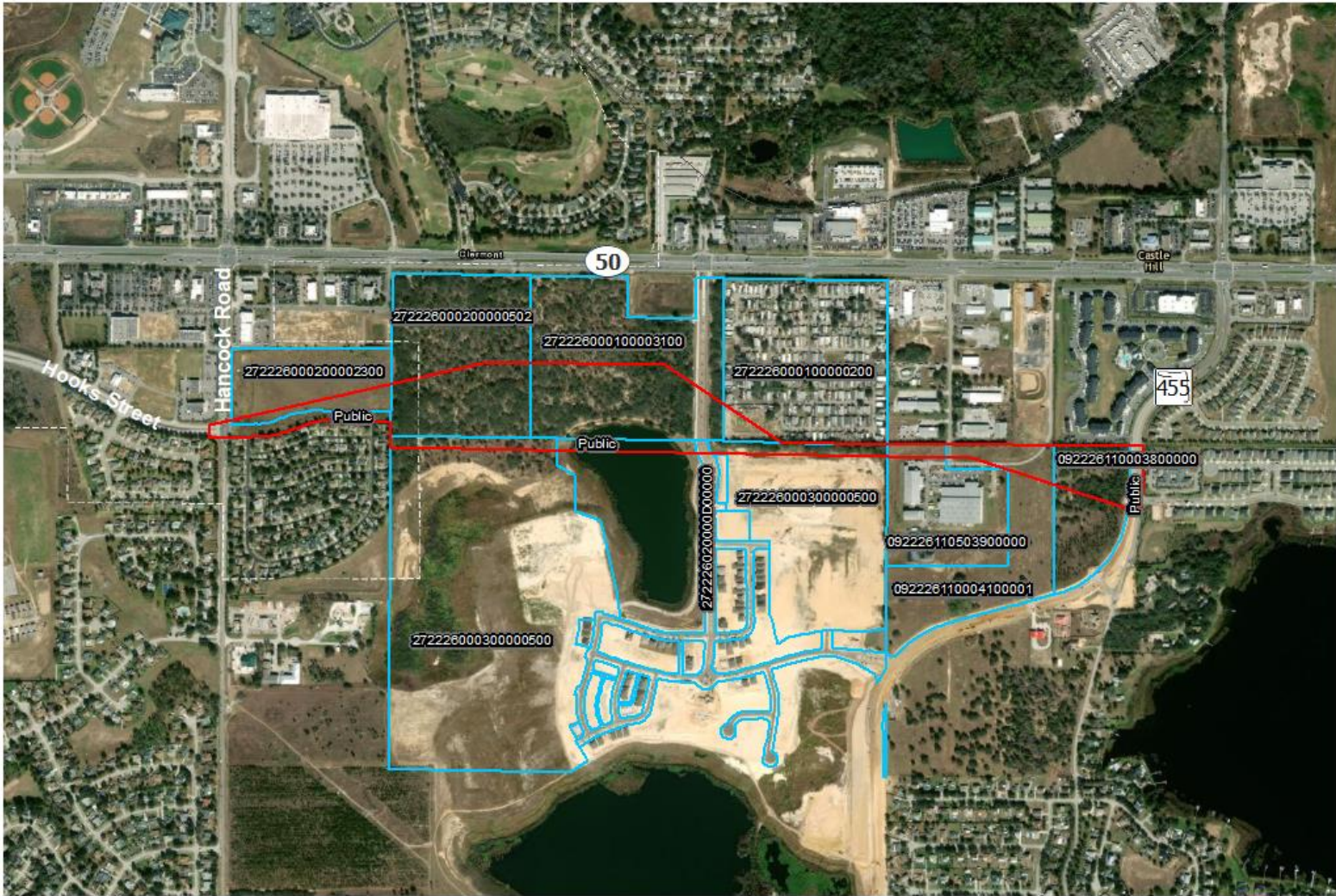
Location Map
 Metro Consulting Group, LLC
 Hooks Street RSQ #20-0906
 From Hancock Road to CR 455, Lake County, Florida

Legend
 Study Area

FIGURE:
1
 1 inch = 1,000 feet
 MetroCG Proj. No. 20-01
 File Name: Location_Map.mxd
 Date: September 8, 2020



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Tax Parcel Map
 Metro Consulting Group, LLC
 Hooks Street RSQ #20-0906
 From Hancock Road to CR 455, Lake County, Florida

Legend
 Study Area
 Tax Parcels

FIGURE: 2
 1 inch = 1,000 feet
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 File Name: Parcel_Map.mxd
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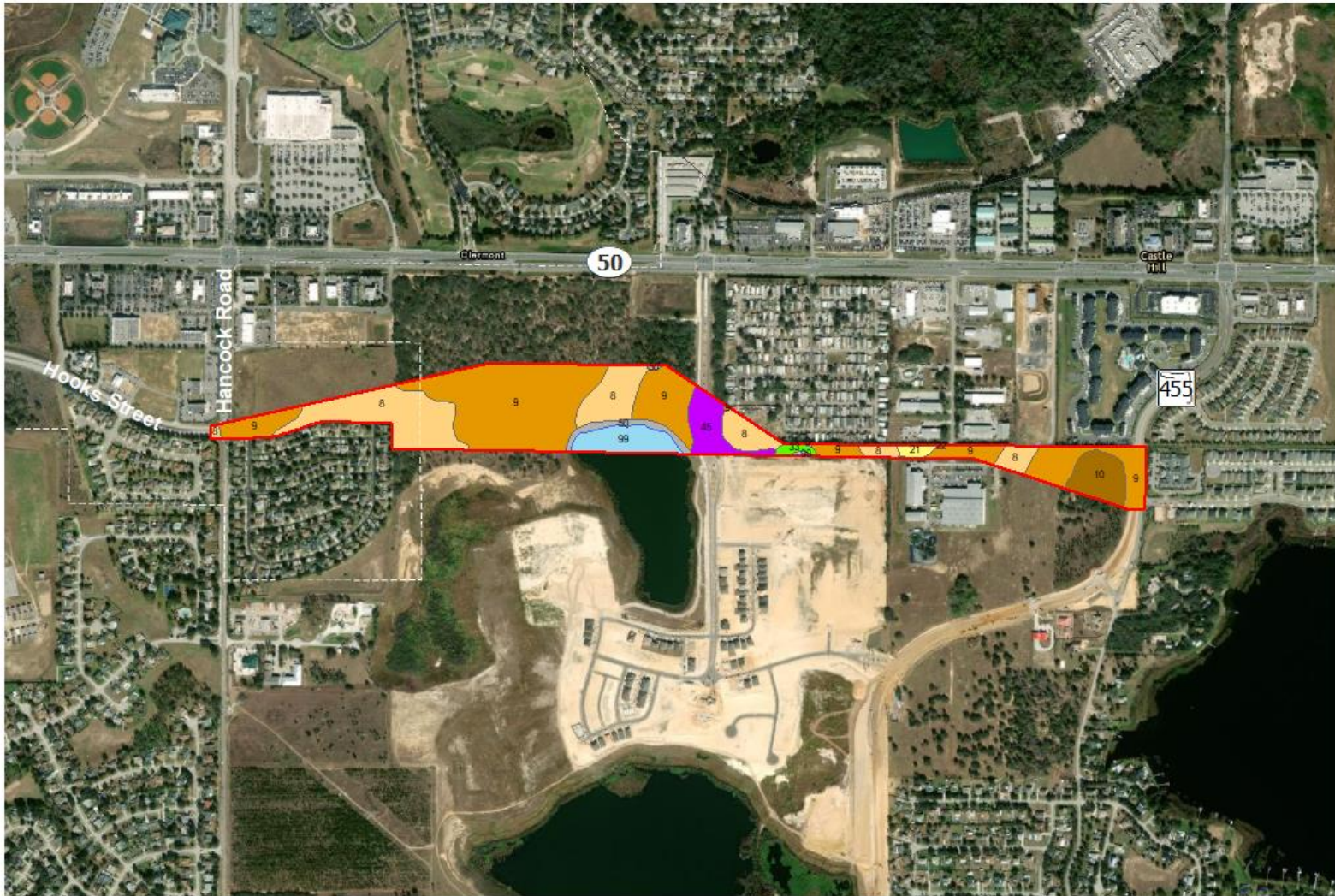
Aerial Photograph
 Metro Consulting Group, LLC
 Hooks Street RSQ #20-0906
 From Hancock Road to CR 455, Lake County, Florida

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Legend
 Study Area

 **FIGURE:**
3
 1 inch = 1,000 feet
 MetroCG Proj. No. 20-01
 File Name: Aerial_Photo.mxd
 Date: September 8, 2020





Soils Map
 Metro Consulting Group, LLC
 Hooks Street RSQ #20-0906
 From Hancock Road to CR 455, Lake County, Florida

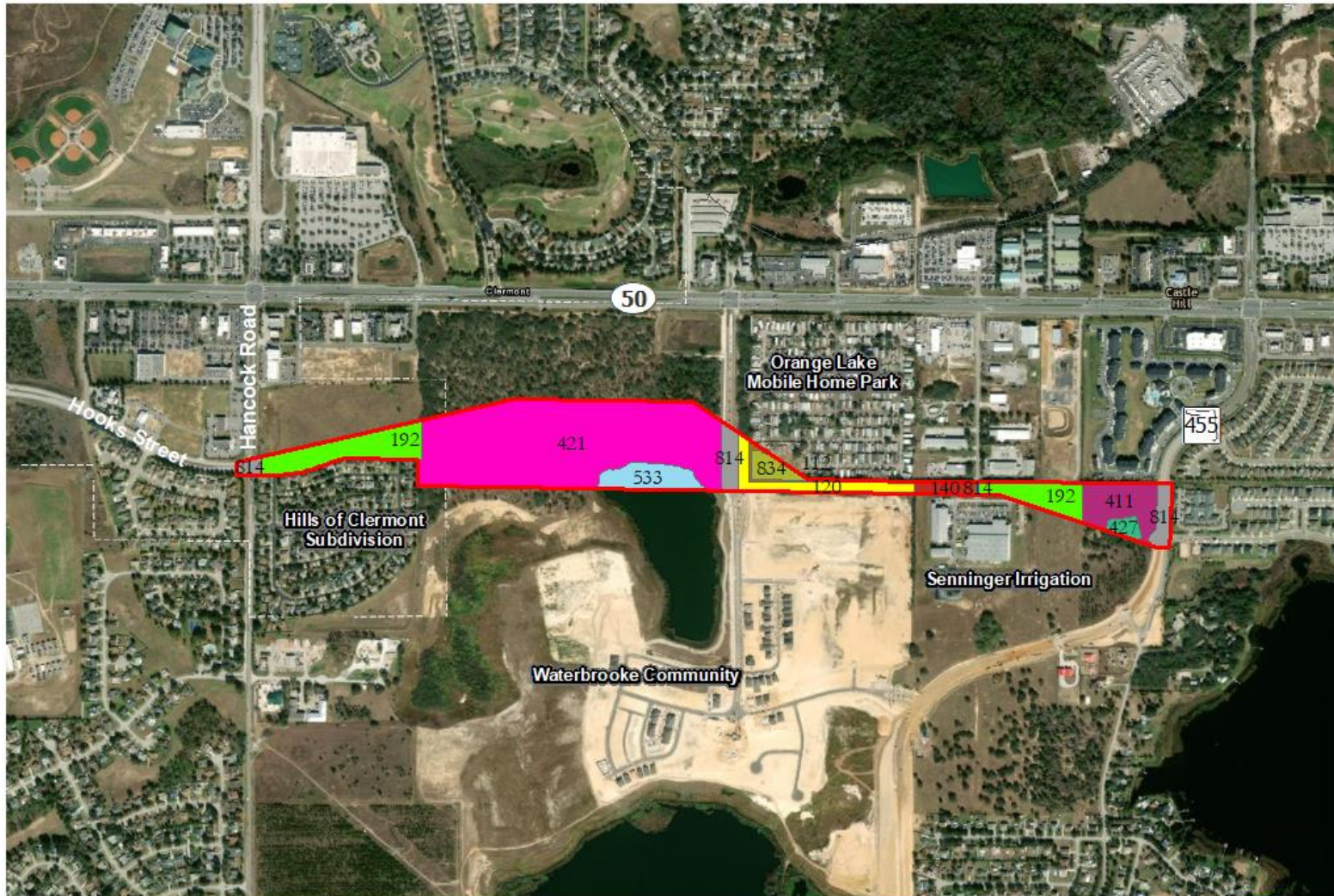
- Legend**
- Study Area
 - Soil Type**
 - 8, Candler Sand, 0% to 5% slopes
 - 9, Candler Sand, 5% to 12% slopes
 - 10, Candler Sand, 12% to 40% slopes
 - 21, Lake Sand, 0% to 5% slopes
 - 22, Lake Sand, 5% to 12% slopes
 - 31, Oco, Oco, w/ fine sand, 0% to 2% slopes
 - 45, Fawnes sand, 0% to 5% slopes
 - 50, Barrow Pkts
 - 99, Water

FIGURE:
4
 1 inch = 1,000 feet

MetroCG Proj. No. 20-01
 File Name: Soils_Map.mxd
 Date: September 8, 2020



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FLUCFCS Map
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 Hooks Street RSQ #20-0906
 From Hancock Road to CR 455, Lake County, Florida

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Legend

Study Area

FLUCFCS Code

- 112-Mobile Home Units
- 120-Residential, Medium Density
- 140-Commercial and Services
- 192-Inactive Land with street pattern but without structures
- 411-Pine Flatwoods

- 421-Xeric Oak
- 427-Live Oak
- 533-Reservoirs >10ac but <100ac
- 814-Roads and Highways
- 834-Sewage Treatment



1 inch = 1,000 feet

FIGURE:

5

MetroCG Proj. No. 20-01
 File Name: FLUCFCS_Map.mxd
 Date: September 8, 2020





Gopher Tortoise Burrows
 Metro Consulting Group, LLC
 Hooks Street RSQ #20-0906
 From Hancock Road to CR 455, Lake County, Florida

Legend

- Study Area
- ◆ GT Burrow



FIGURE:

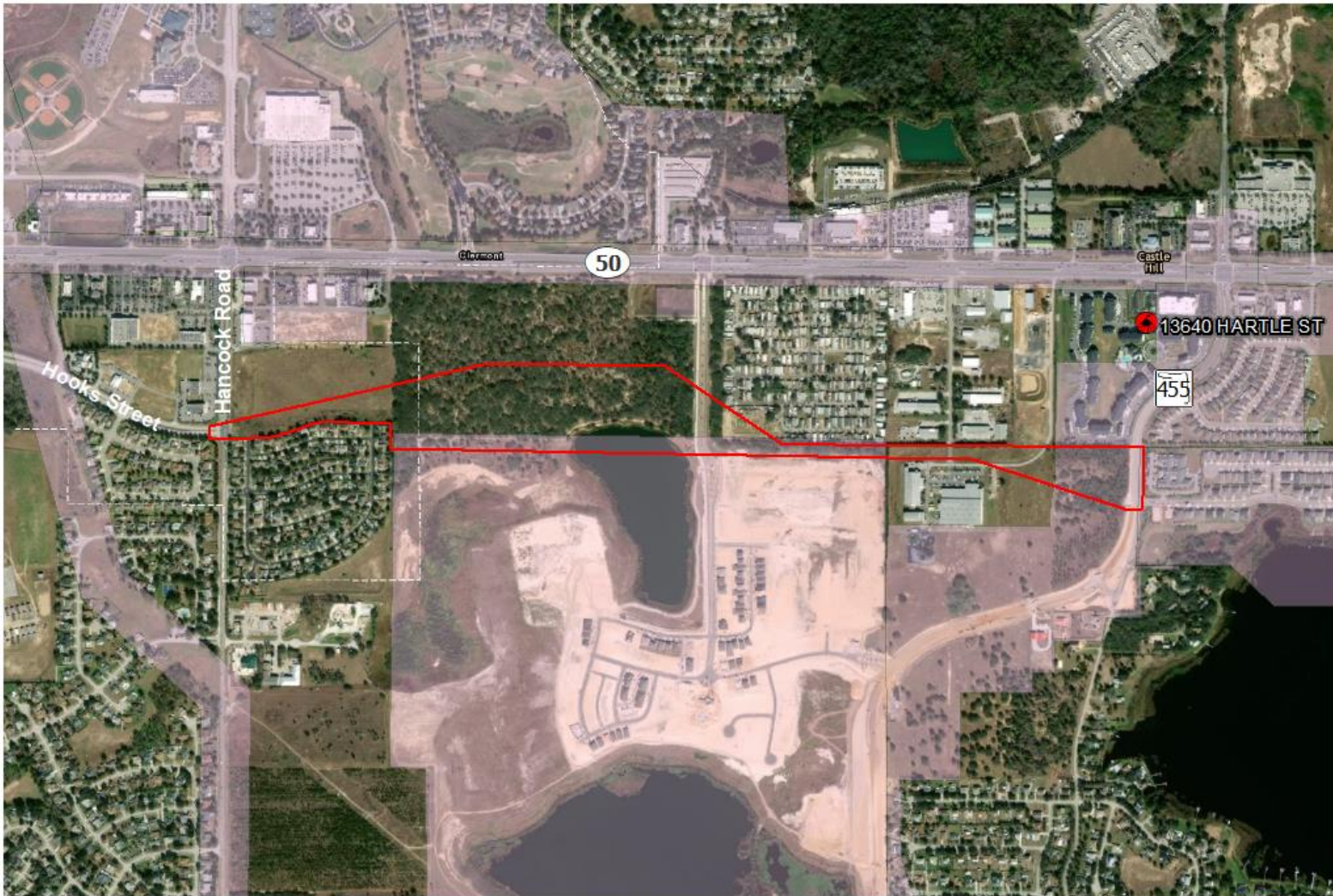
6

1 inch = 1,000 feet

MetroCG Proj. No. 20-01
 File Name: Gopher_Tortoise_Burrow_Map.mxd
 Date: September 15, 2020



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Cultural Resources
 Metro Consulting Group, LLC
 Hooks Street RSQ #20-0906
 From Hancock Road to CR 455, Lake County, Florida

MetroCG, LLC | 604 Courtyard St., Suite 140, Orlando, FL 32804 | Tel: 407.960.3973 | www.metrocgllc.com
NO WARRANTY: THE INFORMATION PROVIDED IN THIS DOCUMENT IS FOR INFORMATION ONLY AND MAY BE SUBJECT TO CHANGE BASED ON SOME OF THE RELEVANT CIRCUMSTANCES AND SPECIFIC BUILDING PRODUCT INFORMATION.

Legend

- Historical Structure
- Study Area
- Previous Survey

7
 1 inch = 1,000 feet

MetroCG Proj. No. 20-01
 File Name: Cultural_Resources.mxd
 Date: September 18, 2020

FIGURE:
7



Appendix II – Letters



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Bill Eggers
Metro Consulting Group, LLC
604 Courtland St., Suite 140
Orlando, FL 32804

October 20, 2020

Dear Mr. Eggers,

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: Lake County Hooks Street Alternative Corridor Evaluation
Date Received: 10/16/2020
Location: Lake County

Based on the information available, this site appears to be located on or very near a significant region of scrub habitat, a natural community in decline that provides important habitat for several rare species within a small area.

Element Occurrences

A search of our maps and database indicates that we currently have many 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.

Federally Listed Species

Our data indicate federally listed species are present on or very near this site, specifically Britton's Beargrass (*Nolina brittoniana*), scrub plum (*Prunus geniculata*), Lewton's polygala (*Polygala lewtonii*), scrub buckwheat (*Eriogonum longifolium* var. *gnaphalifolium*) and potentially clasping warea (*Warea amplexifolia*) (see enclosed map and tables for details). This statement should not be interpreted as a legal determination of presence or absence of federally listed species on a property.



Florida Resources
and Environmental
Analysis Center

Institute of Science
and Public Affairs

The Florida State University

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.

Tracking Florida's Biodiversity

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.

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 <http://www.fnai.org/clip.cfm> .

Land Acquisition Projects

This site appears to be located within the Lake Wales Ridge Ecosystem Florida Forever BOT Project - Warea Archipelago - Castle Hill, which is part of the State of Florida's Conservation and Recreation Lands land acquisition program. For more information on this Florida Forever Project, contact the Florida Department of Environmental Protection, Division of State Lands.

Florida Forever Board of Trustees (BOT) projects are proposed and acquired through the Florida Department of Environmental Protection, Division of State Lands. The state has no specific land management authority over these lands until they are purchased.

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/trackinglist.cfm 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. An invoice will be mailed separately. If I can be of further assistance, please contact me at (850) 224-8207 or at kbrinegar@fnai.fsu.edu.

Sincerely,

Kerri Brinegar

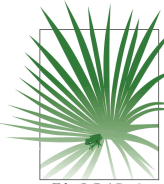
Kerri Brinegar
GIS / Data Services

Encl

Lake County Hooks Street Alternative Corridor Evaluation

Site boundaries are approximate.

Lake County

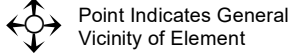


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Element Occurrences

- Animals
- Plants
- Communities
- Other
- Data Sensitive



● U.S. Fish & Wildlife Service
Scrub Jay Survey 1992-96

Conservation Lands

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



Land Acquisition Projects

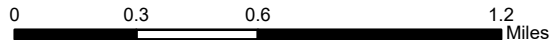
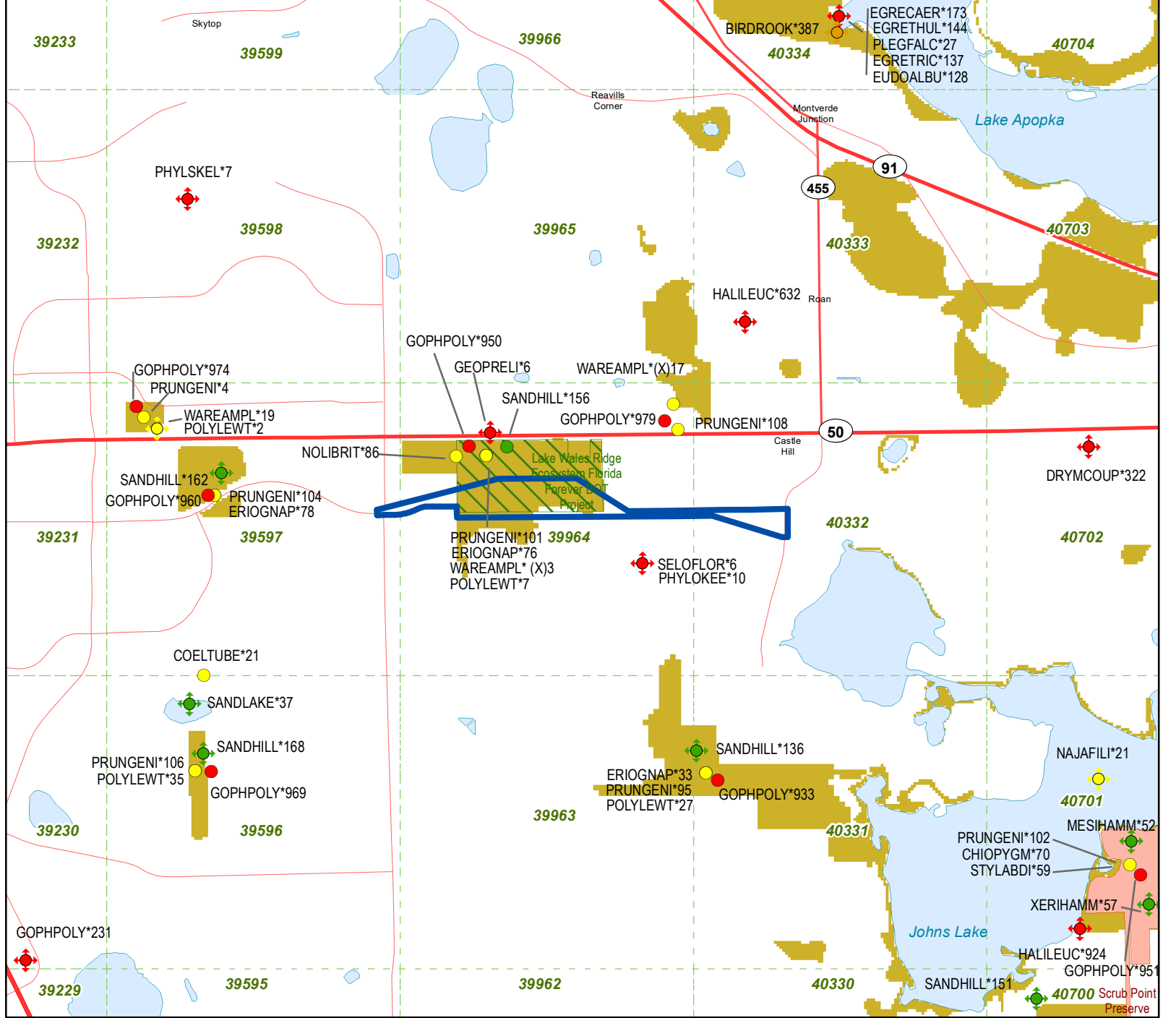
- Florida Forever
- Board of Trustees Projects

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

- County Boundary
- Roads
- Water

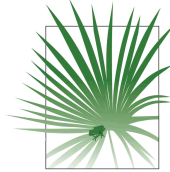
NOTE

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.



Map produced by KAB
10/20/2020

Lake County Hooks Street Alternative Corridor Evaluation



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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

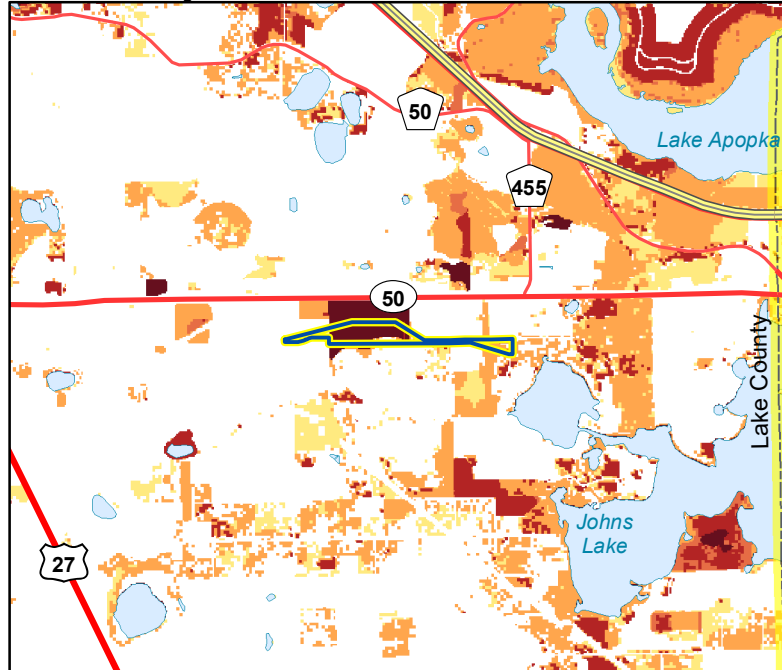
Aggregated CLIP Priorities

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

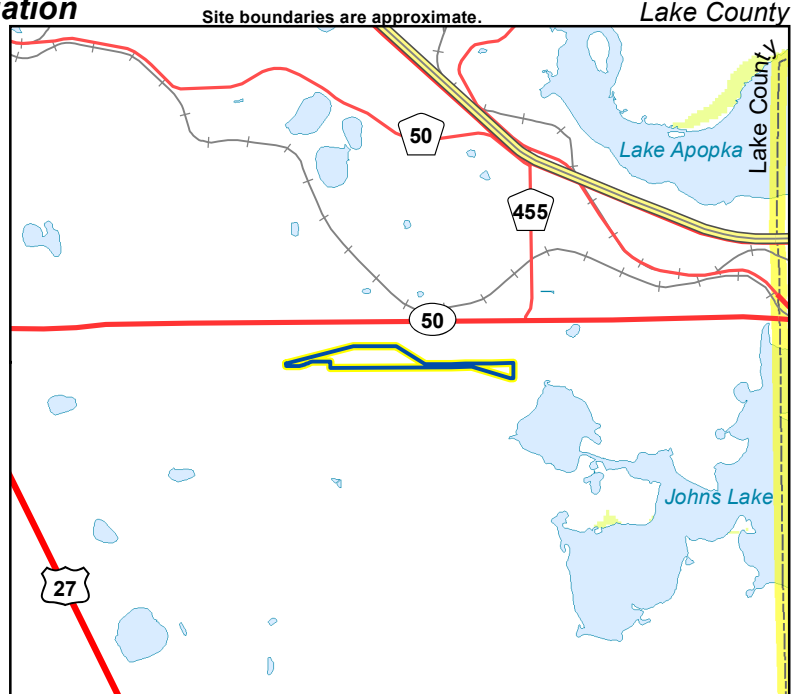
Site Boundary

Map should not be interpreted without accompanying documents.

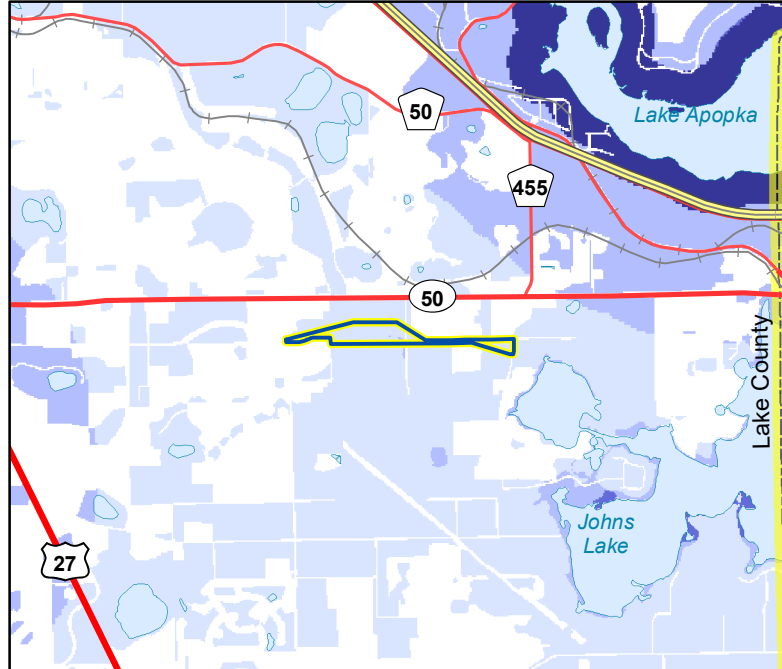
Critical Lands and Waters Identification Project (CLIP) is a cooperative effort between the FSU Florida Natural Areas Inventory, UF Center for Landscape Conservation Planning, and FL Fish & Wildlife Conservation Commission, with additional funding from FL Dept of Environmental Protection and US Fish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



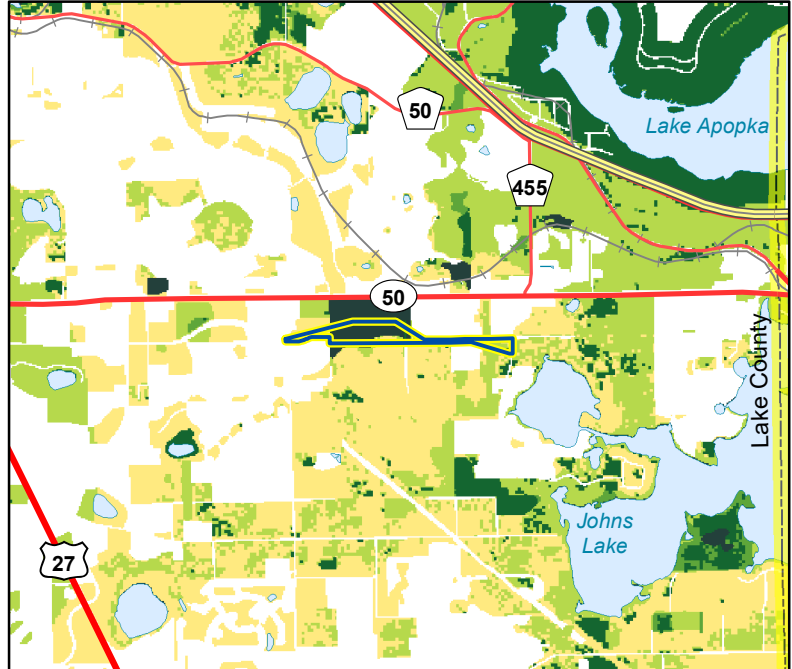
CLIP Biodiversity Resource Priorities



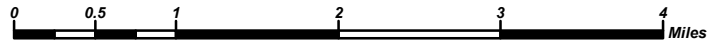
CLIP Landscape Resource Priorities



CLIP Surface Water Resource Priorities



CLIP Aggregated Resource Priorities





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Map Label	Scientific Name	Common Name	Global State Federal State Observation				Date	Description	EO Comments
			Rank	Rank	Status	Listing			
BIRDROOK*387	Bird Rookery		G5	SNR	N	N	1994-09-25	Colony site is two islands in marsh; habitat surrounding colony is marsh grass and water; nesting substrate is red maples and wax myrtle over water (U82NES01). Reese (1994): Early successional grounded islands surrounded by a bay of an inland lake; dominated by Acer rubrum var. trilobum (local) -Gordonia lasianthus (local)/Sambucus canadensis/Colocasia esculenta-Pontederia cordata-Sagittaria lancifolia-Ipomea alba.	Multi-species rookery, 11 species. 101-250 birds 1976-06, 101-250 birds 1977-04 (ground check), 251-500 birds 1977-05, 11-100 birds 1978-05, >1,000 birds 1978-06, >1,000 birds 1987-06-16, >1,000 birds 1988-06-23. Great Egret present on all surveydates except 1978-05; Snowy Egret present 1976, 1977, 1978-06, 1988; Little Blue Heron present 1977, 1978, 1988; Tricolored Heron present 1977-04, 1988; White Ibis present 1977-04, 1987, 1988; Glossy Ibis present 1977-04, 1987, 1988; Cattle Egret present on all surveydates; Great Blue Heron present 1976, 1977-04, 1978-05, 1987, 1988; Green-backed Heron present 1977-04; Double-crested Cormorant present 1977-04, 1987, 1988; Anhinga present 1976, 1977, 1988. Reese (1994): Many hundreds of colonial nesting birds present in 5-94 (aerial survey). Dozens of Anhinga, great egret, and snowy egret 9-25-94, probably other spp. nest at site.
COELTUBE*21	<i>Coelorachis tuberculosa</i>	Piedmont jointgrass	G3	S3	N	T	1994-08-16	ALONG A MOIST SHORE JUST ABOVE WATER LEVELS IN AN UPLAND SANDHILL LAKE AND EXTENDING INTO A SHALLOWLY INUNDATED ZONE. GREY HIGH ORGANIC SAND. ASSOCIATED FLORA: PRESENT: EUPATORIUM LEPTOPHYLLUM, CENTELLA ASIATICA, (JUNCUS SCIRPOIDES?), HYPERICUM REDUCTUM.	A FEW THOUSAND (?) INDIVIDUALS.
DRYMCOUP*322	<i>Drymarchon couperi</i>	Eastern Indigo Snake	G3	S2?	T	FT	1960	No general description given	1960: indigo observed by Bill Thacker in 1960 (Moler interview of B. Thacker, 1981-12) (U82MOL01FLUS).
EGRECAER*173	<i>Egretta caerulea</i>	Little Blue Heron	G5	S4	N	ST	1988-06-23	Colony site is two islands in marsh; habitat surrounding colony is marsh grass and water; nesting substrate is red maples and wax myrtle over water (U82NES01).	Species present 1977-04, 1977-05, 1978-05, 1978-06 (6-25 nesting pairs 1977-1978--U82NES01), and 1988-06-23. Not observed 1976-06 and 1987-06-16.



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Map Label	Scientific Name	Common Name	Global State Federal State Observation				Date	Description	EO Comments
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EGRETHUL*144	<i>Egretta thula</i>	Snowy Egret	G5	S3	N	N	1988-06-23	Colony site is two islands in marsh; habitat surrounding colony is marsh grass and water; nesting substrate is red maples and wax myrtle over water (U82NES01).	Species present 1976-06, 1977-04, 1977-05, 1978-06 (2-75 nesting pairs 1976-1978--U82NES01), and 1988-06-23. Not observed 1978-05 and 1987-06-16.
EGRETRIC*137	<i>Egretta tricolor</i>	Tricolored Heron	G5	S4	N	ST	1988-06-23	Colony site is two islands in marsh; habitat surrounding colony is marsh grass and water; nesting substrate is red maples and wax myrtle over water (U82NES01).	Species present 1977-04 (6 nesting pairs-U82NES01) and 1988-06-23. Not observed 1976-06, 1977-05, 1978-05, 1978-06, and 1987-06-16.
ERIOGNAP*33	<i>Eriogonum longifolium</i> var. <i>gnaphalifolium</i>	scrub buckwheat	G4T3	S3	T	E	1994-09-28	REESE (1994): A QUERCUS GEMINATA-QUERCUS LAEVIS-QUERCUS INCANA/SERENOA REPENS/ARISTIDA BEYRICHIANA-RHYNCHELYTRUM REPENS DOMINATED SANDHILL SUCCESSIONAL TO XERIC HAMMOCK ON E AND W. SURROUNDED BY LARGE RESIDENTIAL LOTS TO S AND CLEARED LAND TO N. CHICARDI (1991): SANDHILL-SCRUB.	CHICARDI (1991): APPROX. 20 PLANTS OVER 20 AC. REESE (1994): FIVE VEGETATIVE AND FOUR FLOWERING PLANTS NOTED IN A CIRCULAR RECONNAISSANCE SURVEY THROUGH SITE. ASSOCIATED FLORA: COMMON: LICANIA MICHAUXII, BULBOSTYLIS CILIATIFOLIA, RHYNCHELYTRUM REPENS; OCCASIONAL; PTERIDIUM AQUILINUM; PRESENT: QUERCUS INCANA, OPUNTIA HUMULS, SMILAX AURICULATA.



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ERIOGNAP*76	<i>Eriogonum longifolium</i> var. <i>gnaphalifolium</i>	scrub buckwheat	G4T3	S3	T	E	1998-10-14	1998-04-03: Site is highest at W end and slopes down to the E. Vegetation in generally very open and allows for easy walking. Occasional older mature <i>Pinus palustris</i> are widely spaced. <i>Quercus laevis</i> dominate the canopy along with patches of <i>Quercus geminata</i> (20-25 ft tall and up to 6 inches dbh) which are approaching xeric hammock status. <i>Serenoa repens</i> and <i>Quercus geminata</i> are the dominant shrubs. The diverse and well developed groundcover includes <i>Aristida stricta</i> , <i>Eupatorium compositifolium</i> , <i>Pityopsis graminifolia</i> , <i>Polygonella robusta</i> , <i>Pteridium aquilinum</i> , <i>Selaginella arenicola</i> , and <i>Stipa avenaciodes</i> . Listed species are <i>Eriogonum longifolium</i> var. <i>gnaphalifolium</i> , <i>Nolina brittoniana</i> , <i>Polygala lewtonii</i> , <i>Prunus geniculata</i> , <i>Warea amplexifolia</i> , and <i>Gopherus polyphemus</i> . Yellow sand is exposed in many openings (F98SCH26FLUS).	1998-10-23: Occasional, plants in flower (F98SCH26FLUS). 1998-04-03: Occasional and scattered throughout site. More than 50 plants observed in incomplete census, ranging from seedlings to mature plants with old flower stalks (F98SCH26FLUS). 1997-10-23: Occasional, scattered throughout sandhill, plants in flower (F97SCH41FLUS). 1994-08-10: Common. Reconnaissance survey tally: 33 non-flowering, 3 past flowered, 116 flowering plants (U95REE01FLUS).



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ERIOGNAP*78	<i>Eriogonum longifolium</i> var. <i>gnaphalifolium</i>	scrub buckwheat	G4T3	S3	T	E	1994-09-27	A SANDHILL IN A ROLLING, HILLY TOPOGRAPHY DOMINATED BY QUERCUS LAEVIS-PINUS PALUSTRIS/SMILAX AURICULATA/ARISTIDA BEYRICHIANA-RHYNCHELYTRUM REPENS-PITYOPSIS GRAMINIFOLIA. SURROUNDED BY ABANDONED CITRUS GROVES DOMINATED BY LANTANA CAMARA/PANICUM MAXIMUM. pH 5.3 YELLOW ASTATULA SERIES SAND. ASSOCIATED FLORA: ABUNDANT: PITYOPSIS GRAMINIFOLIA, RHYNCHELYTRUM REPENS; COMMON: SELAGINELLA ARENICOLA, ARISTIDA BEYRICHIANA.	5-22-94: OCCASIONAL ACROSS SANDHILL IN MANY OF THE PRIME HABITATS (GOPHER TORTOISE DISTURBANCES). 9-27-94: EIGHT FLOWERING, ONE PAST FLOWERING, AND 1 VEGETATIVE INDIVIDUAL SEEN.
EUDOALBU*128	<i>Eudocimus albus</i>	White Ibis	G5	S4	N	N	1988-06-23	Colony site is two islands in marsh; habitat surrounding colony is marsh grass and water; nesting substrate is red maples and wax myrtle over water (U82NES01).	Species present 1977-04 (2 nesting pairs-U82NES01), 1987-06-16, and 1988-06-23. Not observed 1976-06, 1977-05, 1978-05, and 1978-06.
GEOPRELI*6	<i>Geopsammodius relictillus</i>	Relictual Tiny Sand-loving Scarab	G2G3	S2S3	N	N	2003-05-20	2003-05-20: No description given (A06SKE01FLUS).	2003-05-20: Fifty-six specimens were collected. 1999-05-01: Four specimens were collected. 1998-06-08: Nine specimens were collected (A06SKE01FLUS).
GOPHPOLY*231	<i>Gopherus polyphemus</i>	Gopher Tortoise	G3	S3	C	ST	1981-06	No general description given	1981-06: Species occurrence noted here in Diemer's unpublished map set (U86DIE01FLUS).
GOPHPOLY*933	<i>Gopherus polyphemus</i>	Gopher Tortoise	G3	S3	C	ST	1994-09-28	A Quercus geminata-Q. laevis-Q. incana/Serenoa repens/Aristida beyrichiana-Rhynchelytrum repens dominated sandhill successional to xeric hammock on east and west. Surrounded by large residential lots to south and cleared land to north.	1994-09-28: Ten active burrows noted in a circular reconnaissance survey through the sandhill (F94REE01FLUS).



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GOPHPOLY*950	<i>Gopherus polyphemus</i>	Gopher Tortoise	G3	S3	C	ST	1998-10-14	1998-04-03: Site is highest at W end and slopes down to the E. Vegetation in generally very open and allows for easy walking. Occasional older mature Pinus palustris are widely spaced. Quercus laevis dominate the canopy along with patches of Quercus geminata (20-25 ft tall and up to 6 inches dbh) which are approaching xeric hammock status. Serenoa repens and Quercus geminata are the dominant shrubs. The diverse and well developed groundcover includes Aristida stricta, Eupatorium compositifolium, Pityopsis graminifolia, Polygonella robusta, Pteridium aquilinum, Selaginella arenicola, and Stipa avenaciodes. Listed species are Eriogonum longifolium var. gnaphalifolium, Nolina brittoniana, Polygala lewtonii, Prunus geniculata, Warea amplexifolia, and Gopherus polyphemus. Yellow sand is exposed in many openings (F98SCH26FLUS).	1998-10-14: Occasional- six active burrows observed during brief pedestrian survey (F98SCH26FLUS). 1997-10-23: 10 active burrows seen during pedestrian survey over part of the site. Two adult male tortoises were observed together. Their carapaces were yellowish in color with the outer scales flaking off. One individual was upside down and thrashing his legs. Once I turned him over he quickly dashed down a nearby burrow (F97SCH41FLUS). 1994-08-10: 11 active burrows based on a reconnaissance survey (U95REE01FLUS).
GOPHPOLY*960	<i>Gopherus polyphemus</i>	Gopher Tortoise	G3	S3	C	ST	1994-09-27	A sandhill in a rolling, hilly topography dominated by Quercus laevis-Pinus palustris/Smilax auriculata/Aristida beyrichiana-Rhynchelytrum repens-Pityopsis graminifolia. Surrounded by abandoned citrus groves dominated by Lantana camara/Panicum maximum.	PERHAPS A DOZEN ACTIVE BURROWS, WITH SOME VERY LARGE TORTOISES. DOES NOT INCLUDE THE FEW BURROWS OBSERVED IN THE LANTANA DOMINATED ABANDONED CITRUS GROVES THAT SURROUND THE SITE.



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GOPHPOLY*969	<i>Gopherus polyphemus</i>	Gopher Tortoise	G3	S3	C	ST	1984-08-16	1984-08-16: a small, open remnant sandhill dominated by <i>Quercus laevis</i> - <i>Quercus virginiana</i> (local on lower slopes) <i>Smilax auriculata</i> - <i>Serenoa repens</i> / <i>Rhynchelytrum repens</i> - <i>Aristida beyrichiana</i> - <i>Tillandsia usneoides</i> . Surrounded by abandoned citrus groves and a small upland sandhill lake. Pronounced edge effects and excessive past logging. pH 6.2 Yellow <i>Astatula</i> series sand (PNDREE04FLUS).	Five active burrows (PNDREE04FLUS).
GOPHPOLY*974	<i>Gopherus polyphemus</i>	Gopher Tortoise	G3	S3	C	ST	1994-09-27	A DEGRADED SANDHILL HABITAT WHICH IS VERY OPEN AND HAS SCATTERED <i>QUERCIS LAEVIS</i> AND <i>Q. INCANA</i> WITH AN HETEROGENOUS UNDERSTORY OF <i>PITYOPSIS GRAMINIFOLIA</i> , <i>ARISTIDA BEYRICHIANA</i> , <i>RHYNCHELYTRUM REPENS</i> , <i>OPUNTIA HUMULIS</i> , <i>EUPATORIUM COMPOSITIFOLIUM</i> , <i>AXONOPUS FURCATUS</i> , <i>SMILAX AURICULATA</i> . OCCUPIES A MODERATLY SLOPING, NW-FACING HILLSIDE THAT WAS HISTORICALLY BRUSHHOGGED AND PROBABLY PASTURED. SURROUNDED BY ABANDONED ORANGE GROVES ON THE W, N, AND E, AND GRADED LAND AND A RADIO TOWER SITE TO THE NORTH. pH 5.3 YELLOW <i>ASTATULA</i> SERIES SAND.	TWO ACTIVE BURROWS SEEN IN EXTENSIVE SURVEY OF MORE NATURAL AREAS OF THE SITE. MORE BURROWS MAY BE PRESENT IN THE ABANDONED GROVES SURROUNDING SITE.



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GOPHPOLY*979	<i>Gopherus polyphemus</i>	Gopher Tortoise	G3	S3	C	ST	1994-09-29	A REGENERATING SANDHILL WHICH IS EARLY SUCCESSIONAL FOLLOWING A LAND CLEARING. pH 5.4 YELLOW ASTATULA SERIES SAND. ASSOCIATED FLORA: EUPATORIUM COMPOSITOFLIUM, QUERCUS LAEVIS, RHYNCHELYTRUM REPENS, OPUNTIA HUMIFUSA, DIOSPYROS VIRGINIANA.	THREE ACTIVE BURROWS SEEN IN A RECONNAISSANCE SURVEY.
HALILEUC*632	<i>Haliaeetus leucocephalus</i>	Bald Eagle	G5	S3	N	N	2003	No general description given	Nest status 1995-2003: Continuously active. (U03FWC01FLUS). Previous data (note different format) NEST; 1995: PRODUCED 3 YOUNG; 1994: ACTIVE, PRODUCED 0 YOUNG; 1993: PRODUCED 1 YOUNG; 1992: PRODUCED 1 YOUNG; 1991: ACTIVE, PRODUCTIVITY UNKNOWN. 1991/06/24: J.A. Hovis, GFC. John White reports new nest this year (1990-91) -- successful (U97GFC02FLUS).
NAJAFILI*21	<i>Najas filifolia</i>	narrowleaf naiad	G3	S2	N	T	2007	Lacustrine	Species present (U18DEP01FLUS)

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NOLIBRIT*86	<i>Nolina brittoniana</i>	Britton's beargrass	G3	S3	E	E	1997-10-23	1998-04-03: Site is highest at W end and slopes down to the E. Vegetation in generally very open and allows for easy walking. Occasional older mature <i>Pinus palustris</i> are widely spaced. <i>Quercus laevis</i> dominate the canopy along with patches of <i>Quercus geminata</i> (20-25 ft tall and up to 6 inches dbh) which are approaching xeric hammock status. <i>Serenoa repens</i> and <i>Quercus geminata</i> are the dominant shrubs. The diverse and well developed groundcover includes <i>Aristida stricta</i> , <i>Eupatorium compositifolium</i> , <i>Pityopsis graminifolia</i> , <i>Polygonella robusta</i> , <i>Pteridium aquilinum</i> , <i>Selaginella arenicola</i> , and <i>Stipa avenaciodes</i> . Listed species are <i>Eriogonum longifolium</i> var. <i>gnaphalifolium</i> , <i>Nolina brittoniana</i> , <i>Polygala lewtonii</i> , <i>Prunus geniculata</i> , <i>Warea amplexifolia</i> , and <i>Gopherus polyphemus</i> . Yellow sand is exposed in many openings (F98SCH26FLUS).	1997-10-23: Rare- over 30 plants of various sizes in one small area located in the SW4 NW4 SE4 NW4 of Section 27. This location is about 50 ft NE of the NE corner of an abandoned citrus grove. The plants grow in the edge of a <i>Quercus geminata</i> (20-25 ft tall) thicket. Old flower stalks are on 5 plants (F97SCH41FLUS). 1994-08-10: Approximately 40 non-flowering and 8 past flowering plants in a single 20 ft X 10 ft area (U95REE01FLUS).
PHYLOKEE*10	<i>Phyllophaga okeechobea</i>	Diurnal Scrub June Beetle	G2	S2	N	N	1961-04-18	1961-04-18: No description given (B89WOO01FLUS).	1961-04-18: One specimen was collected in a <i>Citrus</i> sp. plant by W.P.Henderson (B89WOO01FLUS).
PHYLSKEL*7	<i>Phyllophaga skelleyi</i>	Skelley's June Beetle	G2	S2	N	N	1956-03-14	1956-03-14: No description given (B89WOO01FLUS).	1956-03-14: One specimen was collected by H.A. Denmark at a light (B89WOO01FLUS).
PLEGFALC*27	<i>Plegadis falcinellus</i>	Glossy Ibis	G5	S3	N	N	1988-06-23	Colony site is two islands in marsh; habitat surrounding colony is marsh grass and water; nesting substrate is red maples and wax myrtle over water (U82NES01).	Species present 1977-04 (10 nesting pairs--U82NES01), 1987-06-16, and 1988-06-23. Not observed 1976-06, 1977-05, 1978-05, and 1978-06.



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POLYLEWT*2	<i>Polygala lewtonii</i>	Lewton's polygala	G2	S2	E	E	2009	1981-82: VARIETY OF HABITATS: DISTURBED SANDHILL, DRY OAK WOODS, UNDISTURBED (RELATIVELY) SANDHILL. 1994: NO RELATIVELY UNDISTURBED SANDHILL SEEN IN AREA THAT THIS EOR COVERS (PNDREE04).	Known from both sites in 1982 but not found in 1994 in the northern site. Eleven plants observed in flower in 2009 at site located 0.65 mile east of US 27 on north side of SR 50. 2011 aerial shows northernmost site with about 5 acres of disturbed sandhill and southern site with a four lane road through the middle; some very disturbed sandhill on either side of road (F12FNA02FLUS).
POLYLEWT*27	<i>Polygala lewtonii</i>	Lewton's polygala	G2	S2	E	E	1994-09-28	A QUERCUS GEMINATA-QUERCUS LAEVIS-QUERCUS INCANA/SERENOA REPENS/ARISTIDA BEYRICHIANA-RHYNCHELYTRUM REPENS DOMINATED SANDHILL SUCCESSIONAL TO XERIC HAMMOCK ON E AND W. SURROUNDED BY LARGE RESIDENTIAL LOTS TO S AND CLEARED LAND TO NORTH. CHICARDI (1991): SANDHILL-SCRUB.	20017 aerial photography shows habitat remains intact (PNDSCH03FLUS). 2011 aerial photography shows 66-acre block of extant xeric hammock/former sandhill and still has open areas (F12FNA02FLUS). 2009: No plants seen from edge of site by Bok Tower Gardens staff. 1994: Reese found the plant rare, unlike Chicardi in 1991 who described there being several hundred.
POLYLEWT*35	<i>Polygala lewtonii</i>	Lewton's polygala	G2	S2	E	E	1994-11-07	A SMALL, OPEN, REMNANT SANDHILL DOMINATED BY QUERCUS LAEVIS-QUERCUS VIRGINIANA (LOCAL ON LOWER SLOPES)/SMILAX AURICULATA-SERENOA REPENS/RHYNCHELYTRUM REPENS-ARISTIDA BEYRICHIANA-TILLANDSIA USNEOIDES. SURROUNDED BY ABANDONED CITRUS GROVES AND A SMALL UPLAND SANDHILL LAKE. PRONOUNCED EDGE EFFECTS AND EXCESSIVE PAST LOGGING. pH 5.0 TO 6.2 YELLOW ASTATULS SERIES SAND.	2017 aerial photography shows disturbed habitat remains intact (PNDSCH03FLUS). 2011 aerial photography: ca. 10 acre strip of very disturbed sandhill; overgrown but open patches (F12FNA02FLUS). Not seen by Bok Tower Gardens staff in 2009 (U18PET02FLUS). Reese documented 9 plants 1994-11-07 (F94REE01FLUS).



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POLYLEWT*7	<i>Polygala lewtonii</i>	Lewton's polygala	G2	S2	E	E	2009	1998-04-03: Site is highest at west end and slopes down to the east. Vegetation is generally very open and allows for easy walking. Occasional older mature <i>Pinus palustris</i> are widely spaced. <i>Quercus laevis</i> dominate the subcanopy along with patches of <i>Quercus geminata</i> (20-25 ft tall and up to 6 inches dbh) which are approaching xeric hammock status. <i>Serenoa repens</i> and <i>Quercus geminata</i> are the dominant shrubs. The diverse and well developed groundcover includes <i>Aristida stricta</i> , <i>Eupatorium compositifolium</i> , <i>Pityopsis graminifolia</i> , <i>Polygonella robusta</i> , <i>Pteridium aquilinum</i> , <i>Selaginella arenicola</i> , and <i>Stipa avenacioides</i> . Listed species are <i>Eriogonum longifolium</i> var. <i>gnaphalifolium</i> , <i>Nolina brittoniana</i> , <i>Polygala lewtonii</i> , <i>Prunus geniculata</i> , <i>Warea amplexifolia</i> , and <i>Gopherus polyphemus</i> . Yellow sand is exposed in many openings (F98SCH26FLUS).	Small but viable population on small oasis of undeveloped sandhill. Plants observed from 1981 to 2009. 2011 aerial photography shows 72 acre sandhill island in sea of development (F12FNA02FLUS). 2009: More than 100 plants observed, most in flower. 1998-04-03: More than 40 plants observed, most in flower, widespread over site in areas of bare yellow sand (F98SCH26FLUS). 1997-10-23: Rare- ca 35 plants observed during incomplete census. No flowers. Many at E end just W of retention pond and between two large pines (F97SCH41FLUS).



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PRUNGENI*101	<i>Prunus geniculata</i>	scrub plum	G3	S3	E	E	1998-10-14	1998-04-03: Site is highest at W end and slopes down to the E. Vegetation in generally very open and allows for easy walking. Occasional older mature Pinus palustris are widely spaced. Quercus laevis dominate the canopy along with patches of Quercus geminata (20-25 ft tall and up to 6 inches dbh) which are approaching xeric hammock status. Serenoa repens and Quercus geminata are the dominant shrubs. The diverse and well developed groundcover includes Aristida stricta, Eupatorium compositifolium, Pityopsis graminifolia, Polygonella robusta, Pteridium aquilinum, Selaginella arenicola, and Stipa avenaciodes. Listed species are Eriogonum longifolium var. gnaphalifolium, Nolina brittoniana, Polygala lewtonii, Prunus geniculata, Warea amplexifolia, and Gopherus polyphemus. Yellow sand is exposed in many openings (F98SCH26FLUS).	1998-04-03: Common shrub throughout the site. Over 200 plants observed, ranging from young seedlings (1 ft tall) to mature plants (averaging 2-3 ft tall). Heavy fruit set on many plants (F98SCH26FLUS). 1994-08-10: Common and dominant in the shrub strata, too many shrubs to count, perhaps many hundreds, generally 2 ft high and in vegetative condition (U95REE01FLUS).



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PRUNGENI*104	<i>Prunus geniculata</i>	scrub plum	G3	S3	E	E	1994-09-27	2004-09-20: Site intact, posted no trespassing (U04COX02FLUS). 1994-09-27: A SANDHILL IN A ROLLING, HILLY TOPOGRAPHY DOMINATED BY QUERCUS LAEVIS-PINUS PALUSTRIS/SMILAX AURICULATA/ARISTIDA BEYRICHIANA-RHYNCHELYTRUM REPENS-PITYOPSIS GRAMINIFOLIA. SURROUNDED BY ABANDONED CITRUS GROVES DOMINATED BY LANTANA CAMARA/PANICUM MAXIMUM. pH 5.3 YELLOW ASTATULS SERIES SAND. ASSOCIATED FLORA: TILLANDSIA USNEOIDES, QUERCUS GEMINATA, ARISTIDA BEYRICHIANA, ANDROPOGON SP., AESCHYNOMENE VISCIDULA, QUERCUS LAEVIS, PITYOPSIS GRAMINIFOLIA, RICHARDIA BRASILENSIS, RHYNCHELYTRUM REPENS, LIATRIS SP. (U95REE01FLUS).	5-22-94: 3 PLANTS TOTAL. 9-27-94: 3 PLANTS SEEN.



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PRUNGENI*106	<i>Prunus geniculata</i>	scrub plum	G3	S3	E	E	1994-08-16	2004-09-20: site reported as developed by U04COX01FLUS but 2004 aerial shows as natural (PNDJOH01FLUS). 1994-08-16: A SMALL, OPEN, REMNANT SANDHILL DOMINATED BY QUERCUS LAEVIS-QUERCUS VIRGINIANA (LOCAL ON LOWER SLOPES)/SMILAX AURICULATA-SERENOA REPENS/RHYCHELYTRUM REPENS-ARISTIDA BEYRICHIANA-TILLANDSIA USNEOIDES. SURROUNDED BY ABANDONED CITRUS GROVES AND A SMALL UPLAND SANDHILL LAKE. PRONOUNCED EDGE EFFECTS AND EXCESSIVE PAST LOGGING. pH 6.2 YELLOW ASTATULA SERIES SAND. ASSOCIATED FLORA: DOMINATE: SMILAX AURICULATA, RHYNCHELYTRUM REPENS; COMMON: ARISTIDA BEYRICHIANA; OCCASIONAL: QUERCUS LAEVIS, Q. VIRGINIANA, PITYOPSIS GRAMINIFOLIA, ANDROPOGON TERNARIUS; RARE: OPUNTIA HUMIFUSA, SERENOA REPENS (U95REE01FLUS)..	1994-08-16: SIXTEEN PLANTS, ALL VEGETATIVE (U95REE01FLUS).
PRUNGENI*108	<i>Prunus geniculata</i>	scrub plum	G3	S3	E	E	1994-09-29	1994-09-29: A REGENERATING SANDHILL WHICH IS EARLY SUCCESSIONAL FOLLOWING A LAND CLEARING. pH 5.4 YELLOW ASTATULA SERIES SAND. ASSOCIATED FLORA: EUPATORIUM COMPOSITIFOLIUM, QUERCUS LAEVIS, RHYNCHELYTRUM REPENS, OPUNTIA HUMIFUSA, DIOSPYROS VIRGINIANA (U95REE01FLUS).	ONE SHRUB - DYING OFF - SEEN IN A RECONNAISSANCE SURVEY.



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PRUNGENI*4	<i>Prunus geniculata</i>	scrub plum	G3	S3	E	E	2004-09-20	1982-82: HIGHLY DISTURBED SANDHILL COMMUNITY--HAS BEEN BUSHHOGGED. NO PINUS PALUSTRIS REMAINING. SURROUNDED BY ORANGE GROVES (F82COO08). 1994: A DEGRADED SANDHILL HABITAT WHICH IS VERY OPEN AND HAS SCATTERED QUERCUS LAEVIS AND Q. INCANA WITH AN HETEROGENOUS UNDERSTORY OF PITYOPSIS GRAMINIFOLIA, ARISTIDA BEYRICHIANA, RHYNCHELYTRUM REPENS, OPUNTIA HUMULIS, EUPATORIUM COMPOSITIFOLIUM, AXONOPUS FURCATUS, SMILAX AURICULATA. OCCUPIES A MODERATELY SLOPING, NW-FACING HILLSIDE THAT WAS HISTORICALLY BUSHHOGGED AND PROBABLY PASTURED. SURROUNDED BY ABANDONED ORANGE GROVES ON THE W, N, AND E, AND GRADED LAND AND A RADIO TOWER SITE TO THE NORTH (PNDREE04).	2004-09-20: 2 plants found 3 to 4 feet high and wide on the north mid-section of site (U04COX02FLUS). 1994-09-27:NO LIVE SHRUB SEEN, TWO DEAD SHRUBS PRESENT (PNDREE04). 1981-82: A FEW INDIVIDUALS; APPEAR HEALTHY, BUT HAVE BEEN DAMAGED IN THE PAST BY BUSHHOG (F82COO08).



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PRUNGENI*95	<i>Prunus geniculata</i>	scrub plum	G3	S3	E	E	1994-09-28	2004-09-20: SITE NOT ACCESSED BUT APPEARS NATURAL FROM PERIPHERY (U04COX02FLUS). REESE (1994): A QUERCUS GEMINATA-QUERCUS LAEVIS-QUERCUS INCANA/SERENOA REPENS/ARISTIDA BEYRICHIANA-RHYNCHELYTRUM REPENS DOMINATED SANDHILL SUCCESSIONAL TO XERIC HAMMOCK ON E AND W. SURROUNDED BY LARGE RESIDENTIAL LOTS TO S AND CLEARED LAND TO NORTH. CHICARDI (1991): SANDHILL-SCRUB.	1994-09-28: ONLY TWO SHRUBS SEEN IN A CIRCULAR RECONNAISSANCE SURVEY AROUND THE AVAILABLE HABITAT. ASSOCIATED FLORA: SORGHASTRUM SECUNDUM, ARISTIDA PURPURESCENS VAR. TENUISPICA, QUERCUS LAEVIS, PTERIDIUM AQUILINUM, QUERCUS INCANA, TILLANDSIA RECURVATA, SMILAX AURICULATA (U95REE01FLUS). 1991-02-26: 30-40 TREES OVER 20 ACRES (F91CHI03FLUS).
SANDHILL*136	Sandhill		G3	S2	N	N	2004	A QUERCUS GEMINATA-QUERCUS LAEVIS-QUERCUS INCANA/SERENOA REPENS/ARISTIDA BEYRICHIANA-RHYNCHELYTRUM REPENS DOMINATED SANDHILL SUCCESSIONAL TO QUERCUS GEMINATA DOMINATED XERIC HAMMOCK ON E AND W. SURROUNDED BY LARGE RESIDENTIAL LOTS TO S AND CLEARED LAND TO N.	2004: Update to last obs date was based on interpretation of aerial photography (previous value was 1994-09-28) (U05FNA02FLUS). 14.8" (46 YRS. OLD) PINUS PALUSTRIS, 8" QUERCUS GEMINATA. EVEN-AGED GROWTH FOLLOWING PROBABLE CLEAR-CUTTING. ASSOC. FLORA: DOMINANT: ARISTIDA BEYRICHIANA, RHYNCHELYTRUM REPENS, QUERCUS GEMINATA; ABUNDANT: POLYGONELLA ROBUSTA, QUERCUS INCANA, Q. LAEVIS, Q. MYRTIFOLIA; COMMON: ARISTIDA PURPURASCENS, BALDUINA ANGUSTIFOLIA, LIATRIS TENUIFOLIA VAR. QUADRIFLORA, LICANIA MICHAUXII, OPUNTIA HUMIFUSA, PITYOPSIS GRAMINIFOLIA, SISYRINCHIUM XEROPHYLLUM, SMILAX AURICULATA, TILLANDSIA USENOIDES.



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SANDHILL*156	Sandhill		G3	S2	N	N	1998-10-14	1998-04-03: Long narrow strip of sandhill next to busy and rapidly developing SR 50 corridor. A now dry depression marsh is at the SE corner with many Juniperus silicicola. A drain has been dug to the S to the large lake created by sand mining. Xeric hammock occurs as a narrow band at the E end along the road to the sand mine. The site is bordered by roads on the N, E, and W, and by an active sand mine and abandoned citrus grove on the S. New residential subdivisions are under construction nearby (F98SCH26FLUS).	1998-04-03: Site is highest at W end and slopes down to the E. Vegetation in generally very open and allows for easy walking. Few older mature Pinus palustris are widely spaced. Quercus laevis dominate the canopy along with patches of Quercus geminata (20-25 ft tall and up to 6 inches dbh) which are approaching xeric hammock status. Serenoa repens and Quercus geminata are the dominant shrubs. The diverse and well developed groundcover includes Aristida stricta, Eupatorium compositifolium, Pityopsis graminifolia, Polygonella robusta, Pteridium aquilinum, Selaginella arenicola, and Stipa avenaciodes. Listed species are Eriogonum longifolium var. gnaphalifolium, Nolina brittoniana, Polygala lewtonii, Prunus geniculata, Warea amplexifolia, and Gopherus polyphemus. Yellow sand is exposed in many openings (F98SCH26FLUS). 1994-08-12: An open sandhill in a rolling sandy ridge topography dominated by Quercus laevis-Pinus palustris/Quercus geminata-Prunus geniculata-Serenoa repens/Aristida beyrichiana-Licania michauxiior Pityopsis graminifolia-Selaginella arenicola. Yellow pH 4.6 Astatula Series sand. Young canopy composed of <=12 inch occasional to common Pinus palustris and <=9 inch dominant Quercus laevis. Associated flora: Abundant- Opuntia humifusa; Common- Aeschynomene viscidula (local), Chamaecrista fasciculata, Cnidoscopus stimulosus, Dalea feayi, Eriogonum longifolium var. gnaphalifolium, Hypericum tetrapetalum, Pediomelum canescens, Polygonella robusta, Polanisia tenuifolia, Rhynchelytrum repens (locally abundant), Smilax auriculata, Tillandsia usneoides (U95REE01FLUS).



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SANDHILL*162	Sandhill		G3	S2	N	N	2004	A sandhill in a rolling, hilly topography dominated by Quercus laevis-Pinus palustris/Smilax auriculata/Aristida beyrichiana (local)-Rhynchelytrum repens (local)-Pityopsis graminifolia. Surrounded by abandoned citrus groves dominated by Lantana camara/Panicum maximum.	2004: Update to last obs date was based on interpretation of aerial photography (previous value was 1994-09-27) (U05FNA02FLUS). pH 5.3 yellow Astatula series sand. Quercus laevis 6.5-10" d.b.h.; Pinus palustris 8", 43 yrs. old. Associated flora: Dominant: Selaginella arenicola; Abundant: Polygonella gracilis, Serenoa repens, Opuntia humifusa, Liatris tenuifolia var. quadriflora; Common: Aeschynomene viscidula, Aristida purpurascens var. tenuispica, Balduina angustifolia, Chapmannia floridana, Cyperus retrorus, Dalea feayi, Lantana camara, Rhynchosia cinerea, Tilandsia usneoides, Quercus geminata (local).
SANDHILL*168	Sandhill		G3	S2	N	N	2004	A SMALL, OPEN, REMNANT SANDHILL DOMINATED BY QUERCUS LAEVIS-QUERCUS VIRGINIANA (LOCAL ON LOWER SLOPES)/SMILAX AURICULATA-SERENOA REPENS/RHYCHELYTRUM REPENS-ARISTIDA BEYRICHIANA-TILLANDSIA USNEOIDES. SURROUNDED BY ABANDONED CITRUS GROVES AND A SMALL UPLAND SANDHILL LAKE. PRONOUNCED EDGE EFFECTS AND EXCESSIVE PAST LOGGING.	2004: Update to last obs date was based on interpretation of aerial photography (previous value was 1994-11-07) (U05FNA02FLUS). pH 5.0-6.2 YELLOW ASTATULA SERIES SAND. ASSOCIATED FLORA: DOMINANT: RHYNCHELYTRUM REPENS, ARISTIDA BEYRICHIANA, QUERCUS VIRGINIANA (LOCAL); ABUNDANT: SMILAX AURICULATA (LOCAL), TILANDSIA USNEOIDES; COMMON: QUERCUS LAEVIS, GALACTIA REGULARIS, TILANDSIA RECURVATA, RICHARDIA BRASILENSIS, OPUNTIA HUMUFISA, LICHANIA MICHAUXII, PITYOPSIS GRAMINIFOLIA, SERENOA REPENS, LIATRIS TENUIFOLIA VAR. QUADRIFLORA, ANDROPOGON TERNARIUS, STYLOSANTHES BIFLORA.



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SANDLAKE*37	Sandhill upland lake		G3	S2	N	N	2004	No general description given	2004: Update to last obs date was based on interpretation of aerial photography (previous value was 1994-11-07) (U05FNA02FLUS). A SMALL, PERMANENT WATER, SAND-BOTTOM, CLEAR WATER, BASIN LAKE IN A LOW AREA OF A ROLLING SANDHILL TOPOGRAPHY. MORE OR LESS CONNECTED TO A NARROW REMNANT MESIC HARDWOOD FOREST AND SANDHILL REMNANT. HYDRIC GREY SAND WITH ORGANIC LAYERS. ASSOCIATED FLORA: PRESENT: EUPATORIUM LEPTOPHYLLUM, CENTELLA ASIATICA, JUNCUS (SCIRPOIDEA?), HYPERICUM REDUCTUM, POLYGALA SETACEA, COELORACHIS TUBERCULOSA, SABATIA GRANDIFLORA, DIOSPYROS VIRGINIANA, LACHNOCAULON MINUS, LUDWEGIA SUFFRITICOSA, ANDROPOGON GLOMERATA VAR. HIRSUITUS, PANICUM HEMITOMOM.
SELOFLOR*6	<i>Selonodon floridensis</i>	Florida Cebrionid Beetle	G2G4	S2S4	N	N	1969-05-02	1969-05-02: No description given (B99GAL01FLUS).	1969-05-02: One male and one female specimen were collected (B99GAL01FLUS).



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FNAI ELEMENT OCCURRENCE REPORT on or near
Lake County Hooks Street Alternative Corridor Evaluation

Map Label	Scientific Name	Common Name	Global State Federal State Observation				Date	Description	EO Comments
			Rank	Rank	Status	Listing			
URSUFLO ^r *95	<i>Ursus americanus floridanus</i>	Florida Black Bear	G5T4	S4	N	N	2016	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.
WAREAMPL* (X)17	<i>Warea amplexifolia</i>	clasping warea	G1	S1	E	E	1994-09-29	A regenerating sandhill which is early successional following a land clearing. Warea is at the base and lower slopes of a railroad embankment which crosses this sandhill. Ph 5.4 yellow Astatula series sand. Associated flora: Sorghastrum subsecundum, Rhynchosia cinerea, Quercus geminata, Q. laevis, Conyza canadensis, Eupatorium compositifolium, Solidago odorata var. chapmanii, Polygonella robusta, Stillingia sylvatica, Opuntia humifusa, Oxalis sp., Galactea elliottii, Lantana camara, Cyperus retrorsus, Diospyros virginiana, Berlandaria subcaulis, Cenchrus gracillimus.	Site developed based on the 2015 aerials. In 1994, 27 plants (75% flowering, 25% past flowering).



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			Rank	Rank	Status	Listing			
WAREAMPL* (X)3	<i>Warea amplexifolia</i>	clasping warea	G1	S1	E	E	1997-10-23	1998-04-03: Site is highest at W end and slopes down to the E. Vegetation in generally very open and allows for easy walking. Occasional older mature Pinus palustris are widely spaced. Quercus laevis dominate the canopy along with patches of Quercus geminata (20-25 ft tall and up to 6 inches dbh) which are approaching xeric hammock status. Serenoa repens and Quercus geminata are the dominant shrubs. The diverse and well developed groundcover includes Aristida stricta, Eupatorium compositifolium, Pityopsis graminifolia, Polygonella robusta, Pteridium aquilinum, Selaginella arenicola, and Stipa avenaciodes. Listed species are Eriogonum longifolium var. gnaphalifolium, Nolina brittoniana, Polygala lewtonii, Prunus geniculata, Warea amplexifolia, and Gopherus polyphemus. Yellow sand is exposed in many openings (F98SCH26FLUS). 1994-08-10: An open sandhill in a rolling sandy ridge topography dominated by Quercus laevis-Pinus palustris/Quercus geminata-Prunus geniculata-Serenoa repens/Aristida beyrichiana-Licania michauxii or Pityopsis graminifolia-Selaginella arenicola. pH 4.6 yellow Astatula series sand. Surrounded by roads to north, east, and west, and by a sand mine and abandoned citrus grove to south (U95REE01FLUS). 1979-09: Pinus palustris-Quercus laevis woods on well-drained "white"	Extirpated (reported by USFWS). None found in 1998 brief survey, only 2 plants found in 1997 survey, noted as present in 1994 and a population of ~700 in 1979.



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WAREAMPL*19	<i>Warea amplexifolia</i>	clasping warea	G1	S1	E	E	2008	<p>sand. Surrounded by orange groves. Also along a disturbed railroad grade nearby (U80OES51FLUS).</p> <p>1994-09-28: in a hilly sandhill and sandhill depression lake landscape which has undergone major land contour changes due to road construction; 35% of population occurs within a remnant sandhill; 65% of population occupies open lands (PNDREE04FLUS).</p>	In 2008, 19 plants observed in 2 discrete areas, the third area none observed and site overgrown with invasive non-native species. In 1994 a total of 597 plants (364, 24, and 209 plants in the three discrete areas).



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Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Listing
Matrix Unit ID: 39597					
Documented					
<i>Eriogonum longifolium</i> var. <i>gnaphalifolium</i>	scrub buckwheat	G4T3	S3	T	E
<i>Geopsammadius relictillus</i>	Relictual Tiny Sand-loving Scarab	G2G3	S2S3	N	N
<i>Gopherus polyphemus</i>	Gopher Tortoise	G3	S3	C	ST
<i>Polygala lewtonii</i>	Lewton's polygala	G2	S2	E	E
<i>Prunus geniculata</i>	scrub plum	G3	S3	E	E
Sandhill		G3	S2	N	N
<i>Warea amplexifolia</i>	clasping warea	G1	S1	E	E
Likely					
<i>Coelorachis tuberculosa</i>	Piedmont jointgrass	G3	S3	N	T
Sandhill upland lake		G3	S2	N	N
Upland hardwood forest		G5	S3	N	N
Potential					
<i>Agrimonia incisa</i>	incised groove-bur	G3	S2	N	T
<i>Antigone canadensis pratensis</i>	Florida Sandhill Crane	G5T2	S2	N	ST
<i>Athene cunicularia floridana</i>	Florida Burrowing Owl	G4T3	S3	N	ST
<i>Bonamia grandiflora</i>	Florida bonamia	G3	S3	T	E
<i>Calamintha ashei</i>	Ashe's savory	G3	S3	N	T
<i>Calopogon multiflorus</i>	many-flowered grass-pink	G2G3	S2S3	N	T
<i>Centrosema arenicola</i>	sand butterfly pea	G2Q	S2	N	E
<i>Chionanthus pygmaeus</i>	pygmy fringe tree	G2G3	S2S3	E	E
<i>Clitoria fragrans</i>	scrub pigeon-wing	G2	S2	T	E
<i>Coleataenia abscissa</i>	cutthroatgrass	G3	S3	N	E
<i>Conradina brevifolia</i>	short-leaved rosemary	G2Q	S2	E	E
<i>Drymarchon couperi</i>	Eastern Indigo Snake	G3	S3	T	FT
<i>Hartwrightia floridana</i>	hartwrightia	G2	S2	N	T
<i>Heterodon simus</i>	Southern Hognose Snake	G2	S2S3	N	N
<i>Lampropeltis extenuata</i>	Short-tailed Snake	G3	S3	N	ST
<i>Lechea cernua</i>	nodding pinweed	G3	S3	N	T
<i>Liatris ohlingerae</i>	Florida blazing star	G2	S2	E	E
<i>Lithobates capito</i>	Gopher Frog	G3	S3	N	N
<i>Matelea floridana</i>	Florida spiny-pod	G2	S2	N	E
<i>Mustela frenata peninsulae</i>	Florida Long-tailed Weasel	G5T3?	S3?	N	N
<i>Myotis austroriparius</i>	Southeastern Bat	G4	S3	N	N
<i>Nemastylis floridana</i>	celestial lily	G2	S2	N	E
<i>Neofiber alleni</i>	Round-tailed Muskrat	G2	S2	N	N
<i>Nolina brittoniana</i>	Britton's beargrass	G3	S3	E	E
<i>Notophthalmus perstriatus</i>	Striped Newt	G2G3	S2	N	N
<i>Paronychia chartacea</i> var. <i>chartacea</i>	paper-like nailwort	G3T3	S3	T	E
<i>Peucaea aestivalis</i>	Bachman's Sparrow	G3	S3	N	N
<i>Phyllophaga okeechobeae</i>	Diurnal Scrub June Beetle	G2	S2	N	N
<i>Phyllophaga skelleyi</i>	Skelley's June Beetle	G2	S2	N	N
<i>Podomys floridanus</i>	Florida Mouse	G3	S3	N	N
<i>Polygonella myriophylla</i>	Small's jointweed	G3	S3	E	E
<i>Pteroglossaspis ecristata</i>	giant orchid	G2G3	S2	N	T
<i>Salix floridana</i>	Florida willow	G2	S2	N	E

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<i>Sciurus niger niger</i>	Southeastern Fox Squirrel	G5T5	S3	N	N
<i>Selonodon floridensis</i>	Florida Cebrionid Beetle	G2G4	S2S4	N	N
<i>Spigelia loganioides</i>	pinkroot	G2Q	S2	N	E
<i>Ursus americanus floridanus</i>	Florida Black Bear	G5T4	S4	N	N
<i>Warea carteri</i>	Carter's warea	G1	S1	E	E
Matrix Unit ID: 39964					
Documented					
<i>Eriogonum longifolium</i> var. <i>gnaphalifolium</i>	scrub buckwheat	G4T3	S3	T	E
<i>Gopherus polyphemus</i>	Gopher Tortoise	G3	S3	C	ST
<i>Nolina brittoniana</i>	Britton's beargrass	G3	S3	E	E
<i>Polygala lewtonii</i>	Lewton's polygala	G2	S2	E	E
<i>Prunus geniculata</i>	scrub plum	G3	S3	E	E
Sandhill		G3	S2	N	N
Documented-Historic					
<i>Warea amplexifolia</i>	clasping warea	G1	S1	E	E
Likely					
<i>Geopsammodius relictillus</i>	Relictual Tiny Sand-loving Scarab	G2G3	S2S3	N	N
Scrub		G2	S2	N	N
Potential					
<i>Agrimonia incisa</i>	incised groove-bur	G3	S2	N	T
<i>Antigone canadensis pratensis</i>	Florida Sandhill Crane	G5T2	S2	N	ST
<i>Athene cunicularia floridana</i>	Florida Burrowing Owl	G4T3	S3	N	ST
<i>Bonamia grandiflora</i>	Florida bonamia	G3	S3	T	E
<i>Calamintha ashei</i>	Ashe's savory	G3	S3	N	T
<i>Calopogon multiflorus</i>	many-flowered grass-pink	G2G3	S2S3	N	T
<i>Centrosema arenicola</i>	sand butterfly pea	G2Q	S2	N	E
<i>Chionanthus pygmaeus</i>	pygmy fringe tree	G2G3	S2S3	E	E
<i>Clitoria fragrans</i>	scrub pigeon-wing	G2	S2	T	E
<i>Coelorachis tuberculosa</i>	Piedmont jointgrass	G3	S3	N	T
<i>Coleataenia abscissa</i>	cutthroatgrass	G3	S3	N	E
<i>Drymarchon couperi</i>	Eastern Indigo Snake	G3	S3	T	FT
<i>Gymnopogon chapmanianus</i>	Chapman's skeletongrass	G3	S3	N	N
<i>Hartwrightia floridana</i>	hartwrightia	G2	S2	N	T
<i>Heterodon simus</i>	Southern Hognose Snake	G2	S2S3	N	N
<i>Lampropeltis extenuata</i>	Short-tailed Snake	G3	S3	N	ST
<i>Lechea cernua</i>	nodding pinweed	G3	S3	N	T
<i>Liatris ohlingerae</i>	Florida blazing star	G2	S2	E	E
<i>Lithobates capito</i>	Gopher Frog	G3	S3	N	N
<i>Lupinus aridorum</i>	scrub lupine	G3T1	S1	E	E
<i>Matelea floridana</i>	Florida spiny-pod	G2	S2	N	E
<i>Mustela frenata peninsulae</i>	Florida Long-tailed Weasel	G5T3?	S3?	N	N
<i>Nemastylis floridana</i>	celestial lily	G2	S2	N	E
<i>Neofiber alleni</i>	Round-tailed Muskrat	G2	S2	N	N
<i>Notophthalmus perstriatus</i>	Striped Newt	G2G3	S2	N	N
<i>Paronychia chartacea</i> var. <i>chartacea</i>	paper-like nailwort	G3T3	S3	T	E

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<i>Peucaea aestivalis</i>	Bachman's Sparrow	G3	S3	N	N
<i>Phyllophaga okeechobea</i>	Diurnal Scrub June Beetle	G2	S2	N	N
<i>Phyllophaga skelleyi</i>	Skelley's June Beetle	G2	S2	N	N
<i>Podomys floridanus</i>	Florida Mouse	G3	S3	N	N
<i>Polygonella myriophylla</i>	Small's jointweed	G3	S3	E	E
<i>Pteroglossaspis ecristata</i>	giant orchid	G2G3	S2	N	T
<i>Salix floridana</i>	Florida willow	G2	S2	N	E
<i>Sciurus niger niger</i>	Southeastern Fox Squirrel	G5T5	S3	N	N
<i>Selonodon floridensis</i>	Florida Cebrionid Beetle	G2G4	S2S4	N	N
<i>Spigelia loganioides</i>	pinkroot	G2Q	S2	N	E
<i>Ursus americanus floridanus</i>	Florida Black Bear	G5T4	S4	N	N
<i>Warea carteri</i>	Carter's warea	G1	S1	E	E

Matrix Unit ID: 40332

Likely

<i>Mycteria americana</i>	Wood Stork	G4	S2	T	FT
<i>Prunus geniculata</i>	scrub plum	G3	S3	E	E
Sandhill upland lake		G3	S2	N	N
Upland hardwood forest		G5	S3	N	N
<i>Warea amplexifolia</i>	clasping warea	G1	S1	E	E

Potential

<i>Agrimonia incisa</i>	incised groove-bur	G3	S2	N	T
<i>Antigone canadensis pratensis</i>	Florida Sandhill Crane	G5T2	S2	N	ST
<i>Arnoglossum diversifolium</i>	variable-leaved Indian-plantain	G2	S2	N	T
<i>Athene cunicularia floridana</i>	Florida Burrowing Owl	G4T3	S3	N	ST
<i>Bonamia grandiflora</i>	Florida bonamia	G3	S3	T	E
<i>Calamintha ashei</i>	Ashe's savory	G3	S3	N	T
<i>Calopogon multiflorus</i>	many-flowered grass-pink	G2G3	S2S3	N	T
<i>Centrosema arenicola</i>	sand butterfly pea	G2Q	S2	N	E
<i>Chionanthus pygmaeus</i>	pygmy fringe tree	G2G3	S2S3	E	E
<i>Clitoria fragrans</i>	scrub pigeon-wing	G2	S2	T	E
<i>Coelorachis tuberculosa</i>	Piedmont jointgrass	G3	S3	N	T
<i>Coleataenia abscissa</i>	cutthroatgrass	G3	S3	N	E
<i>Drymarchon couperi</i>	Eastern Indigo Snake	G3	S3	T	FT
<i>Dryobates borealis</i>	Red-cockaded Woodpecker	G3	S2	E	FE
<i>Eriogonum longifolium var. gnaphalifolium</i>	scrub buckwheat	G4T3	S3	T	E
<i>Gopherus polyphemus</i>	Gopher Tortoise	G3	S3	C	ST
<i>Gymnopogon chapmanianus</i>	Chapman's skeletongrass	G3	S3	N	N
<i>Hartwrightia floridana</i>	hartwrightia	G2	S2	N	T
<i>Heterodon simus</i>	Southern Hognose Snake	G2	S2S3	N	N
<i>Illicium parviflorum</i>	star anise	G2	S2	N	E
<i>Lampropeltis extenuata</i>	Short-tailed Snake	G3	S3	N	ST
<i>Lechea cernua</i>	nodding pinweed	G3	S3	N	T
<i>Liatris ohlingerae</i>	Florida blazing star	G2	S2	E	E
<i>Lithobates capito</i>	Gopher Frog	G3	S3	N	N
<i>Lupinus aridorum</i>	scrub lupine	G3T1	S1	E	E
<i>Matelea floridana</i>	Florida spiny-pod	G2	S2	N	E
<i>Mustela frenata peninsulae</i>	Florida Long-tailed Weasel	G5T3?	S3?	N	N

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<i>Myotis austroriparius</i>	Southeastern Bat	G4	S3	N	N
<i>Nemastylis floridana</i>	celestial lily	G2	S2	N	E
<i>Neofiber alleni</i>	Round-tailed Muskrat	G2	S2	N	N
<i>Nolina brittoniana</i>	Britton's beargrass	G3	S3	E	E
<i>Notophthalmus perstriatus</i>	Striped Newt	G2G3	S2	N	N
<i>Paronychia chartacea</i> var. <i>chartacea</i>	paper-like nailwort	G3T3	S3	T	E
<i>Peucaea aestivalis</i>	Bachman's Sparrow	G3	S3	N	N
<i>Phyllophaga okeechobea</i>	Diurnal Scrub June Beetle	G2	S2	N	N
<i>Phyllophaga skelleyi</i>	Skelley's June Beetle	G2	S2	N	N
<i>Podomys floridanus</i>	Florida Mouse	G3	S3	N	N
<i>Polygala lewtonii</i>	Lewton's polygala	G2	S2	E	E
<i>Polygonella myriophylla</i>	Small's jointweed	G3	S3	E	E
<i>Pteroglossaspis ecristata</i>	giant orchid	G2G3	S2	N	T
<i>Salix floridana</i>	Florida willow	G2	S2	N	E
<i>Sceloporus woodi</i>	Florida Scrub Lizard	G2G3	S2S3	N	N
<i>Sciurus niger niger</i>	Southeastern Fox Squirrel	G5T5	S3	N	N
<i>Selonodon floridensis</i>	Florida Cebrioid Beetle	G2G4	S2S4	N	N
<i>Spigelia loganioides</i>	pinkroot	G2Q	S2	N	E
<i>Ursus americanus floridanus</i>	Florida Black Bear	G5T4	S4	N	N
<i>Warea carteri</i>	Carter's warea	G1	S1	E	E

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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 = Partial status: some but not all of the species' infraspecific taxa have federal

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.

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 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: <http://www.doacs.state.fl.us/pi/>.

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.

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.

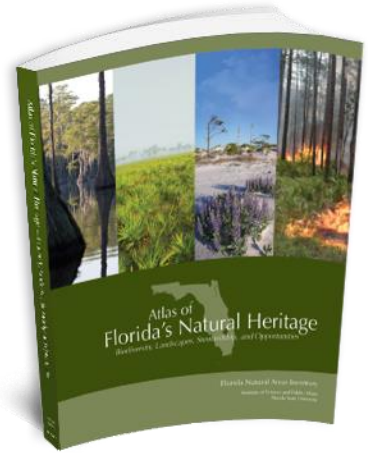
The rank of X is assigned to EOs for which there is documented destruction of habitat or environment, or persuasive evidence of eradication based on adequate survey (i.e., thorough or repeated survey efforts by one or more experienced observers at times and under conditions appropriate for the Element 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.



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and



Hooks Street Alternative Corridor Evaluation

Greene, Sean <Sean.Greene@MyFWC.com>

Thu 10/15/2020 11:52 AM

To: Bill Eggers <william.eggers@metrocgllc.com>

Hi Bill,

Thanks for taking the time to talk to me about this project today.

Following your request, Florida Fish and Wildlife staff performed a GIS analysis of the project site to identify any potential listed species concerns for the proposed construction. At this time, our primary species of concern is the gopher tortoise given the suitable habitat onsite and the number of relocation permits that we have issued nearby. During our call, you were able to confirm their presence onsite and indicated that you would advise the County on pursuing a relocation permit prior to construction.

If the County does select this site for the proposed corridor, they can refer to the FWC's Gopher Tortoise Permitting Guidelines (Revised January 2017) (<http://www.myfwc.com/license/wildlife/gopher-tortoise-permits/>) for survey methodology and permitting guidance prior to any development activity. Specifically, the permitting guidelines include methods for avoiding impacts as well as options and state requirements for minimizing, mitigating, and permitting potential impacts of the proposed activities. If you or the County have any questions regarding gopher tortoise permitting, please contact Samantha Cobble by phone at (352) 620-7351 or at Samantha.Cobble@MyFWC.com.

Thank you,

Sean Greene
Land Use Planning Biologist
Florida Fish and Wildlife Conservation Commission
14495 Harllee Road
Palmetto, FL 34221

Cell: (386) 406-0814



**Florida Fish and Wildlife
Conservation Commission**

MyFWC.com

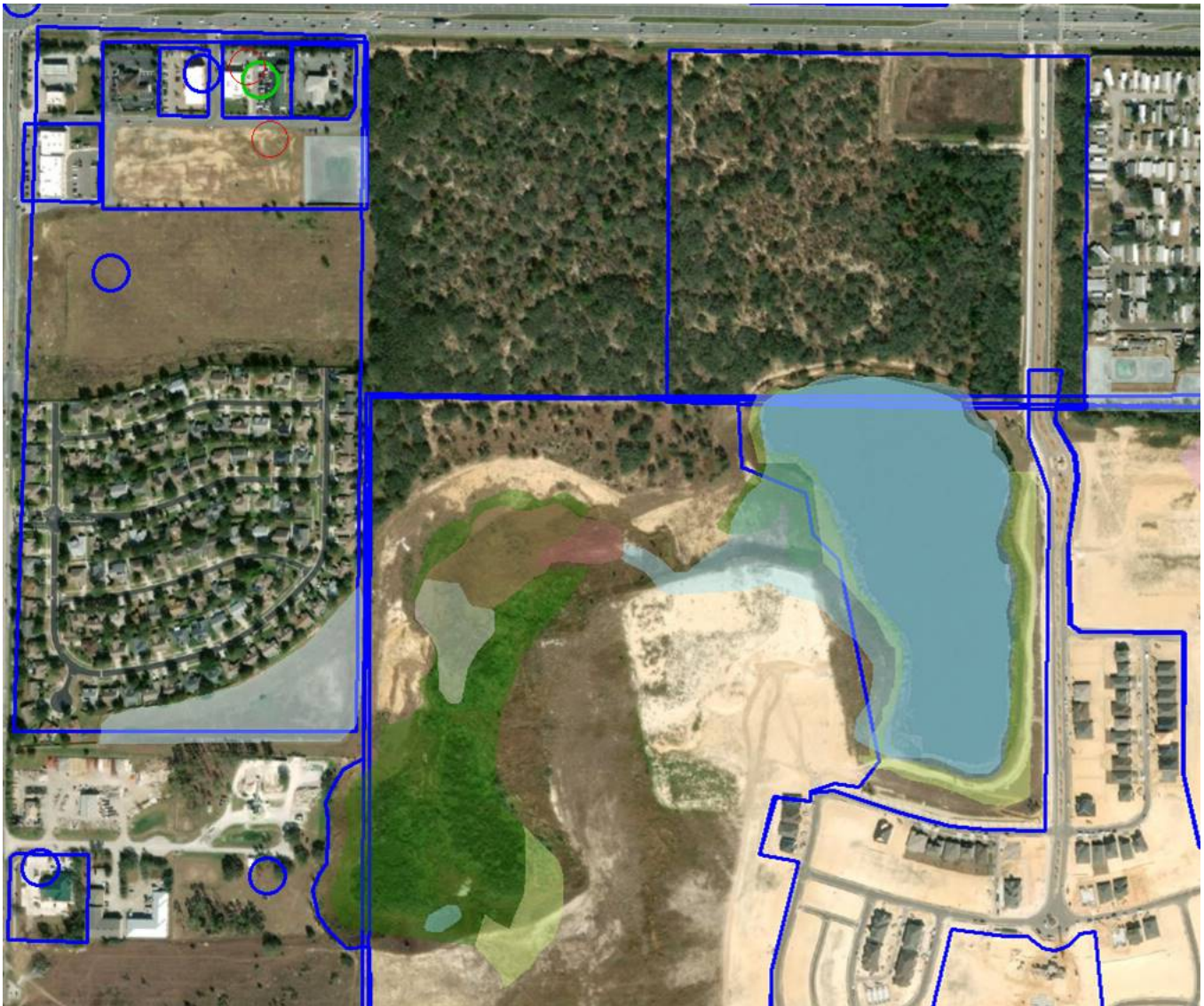
Subject: RE: Received Mail - Hooks Street Alternative Corridor
Date: Wednesday, September 16, 2020 at 1:42:12 PM Eastern Daylight Time
From: Sophie Wild
To: Bill Eggers
Attachments: image004.gif, image001.jpg, image005.jpg

Good Afternoon Bill,

I am reviewing your request regarding the Hook Street Alternative Corridor. After reviewing the project site on ArcMap and Google Earth aeriels, it appears there are wetlands and surface waters within the site. Below I have attached an aerial showing an approximation of wetlands within the site. The wetlands and surface waters are denoted by the light blue, green, pink, and brown shading on the aerial below. The second aerial with the royal blue lines show various District permits project areas. I can provide you with the permit numbers if you would like.

Please let me know any other information I can help you find!





Thanks,
Sophie

Sophie Wild

Regulatory Scientist II

Division of Regulatory Services

St. Johns River Water Management District

Maitland Service Center

601 South Lake Destiny Road, Suite 200 • Maitland, FL 32751

Office: (407) 659-4885

Cell: (386) 643-8033

Email: swild@sjrwmd.com

Website: www.sjrwmd.com

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**FARMLAND CONVERSION IMPACT RATING
FOR CORRIDOR TYPE PROJECTS**

PART I (To be completed by Federal Agency)	3. Date of Land Evaluation Request	4. Sheet 1 of _____
---	------------------------------------	---------------------

1. Name of Project	5. Federal Agency Involved
--------------------	----------------------------

2. Type of Project	6. County and State
--------------------	---------------------

PART II (To be completed by NRCS)	1. Date Request Received by NRCS	2. Person Completing Form
--	----------------------------------	---------------------------

3. Does the corridor contain prime, unique statewide or local important farmland? (If no, the FPPA does not apply - Do not complete additional parts of this form). YES <input type="checkbox"/> NO <input type="checkbox"/>	4. Acres Irrigated Average Farm Size
---	--

5. Major Crop(s)	6. Farmable Land in Government Jurisdiction Acres: _____ %	7. Amount of Farmland As Defined in FPPA Acres: _____ %
------------------	---	--

8. Name Of Land Evaluation System Used	9. Name of Local Site Assessment System	10. Date Land Evaluation Returned by NRCS
--	---	---

PART III (To be completed by Federal Agency)	Alternative Corridor For Segment			
---	---	--	--	--

	Corridor A	Corridor B	Corridor C	Corridor D
--	------------	------------	------------	------------

A. Total Acres To Be Converted Directly				
---	--	--	--	--

B. Total Acres To Be Converted Indirectly, Or To Receive Services				
---	--	--	--	--

C. Total Acres In Corridor				
----------------------------	--	--	--	--

PART IV (To be completed by NRCS) Land Evaluation Information				
--	--	--	--	--

A. Total Acres Prime And Unique Farmland				
--	--	--	--	--

B. Total Acres Statewide And Local Important Farmland				
---	--	--	--	--

C. Percentage Of Farmland in County Or Local Govt. Unit To Be Converted				
---	--	--	--	--

D. Percentage Of Farmland in Govt. Jurisdiction With Same Or Higher Relative Value				
--	--	--	--	--

PART V (To be completed by NRCS) Land Evaluation Information Criterion Relative value of Farmland to Be Serviced or Converted (Scale of 0 - 100 Points)				
--	--	--	--	--

PART VI (To be completed by Federal Agency) Corridor Assessment Criteria (These criteria are explained in 7 CFR 658.5(c))	Maximum Points			
--	----------------	--	--	--

1. Area in Nonurban Use	15			
-------------------------	----	--	--	--

2. Perimeter in Nonurban Use	10			
------------------------------	----	--	--	--

3. Percent Of Corridor Being Farmed	20			
-------------------------------------	----	--	--	--

4. Protection Provided By State And Local Government	20			
--	----	--	--	--

5. Size of Present Farm Unit Compared To Average	10			
--	----	--	--	--

6. Creation Of Nonfarmable Farmland	25			
-------------------------------------	----	--	--	--

7. Availability Of Farm Support Services	5			
--	---	--	--	--

8. On-Farm Investments	20			
------------------------	----	--	--	--

9. Effects Of Conversion On Farm Support Services	25			
---	----	--	--	--

10. Compatibility With Existing Agricultural Use	10			
--	----	--	--	--

TOTAL CORRIDOR ASSESSMENT POINTS	160			
----------------------------------	-----	--	--	--

PART VII (To be completed by Federal Agency)				
---	--	--	--	--

Relative Value Of Farmland (From Part V)	100			
--	-----	--	--	--

Total Corridor Assessment (From Part VI above or a local site assessment)	160			
---	-----	--	--	--

TOTAL POINTS (Total of above 2 lines)	260			
--	------------	--	--	--

1. Corridor Selected:	2. Total Acres of Farmlands to be Converted by Project:	3. Date Of Selection:	4. Was A Local Site Assessment Used? YES <input type="checkbox"/> NO <input type="checkbox"/>
-----------------------	---	-----------------------	--

5. Reason For Selection:

Signature of Person Completing this Part:	DATE
---	------

NOTE: Complete a form for each segment with more than one Alternate Corridor

CORRIDOR - TYPE SITE ASSESSMENT CRITERIA

The following criteria are to be used for projects that have a linear or corridor - type site configuration connecting two distant points, and crossing several different tracts of land. These include utility lines, highways, railroads, stream improvements, and flood control systems. Federal agencies are to assess the suitability of each corridor - type site or design alternative for protection as farmland along with the land evaluation information.

(1) How much land is in nonurban use within a radius of 1.0 mile from where the project is intended?

More than 90 percent - 15 points
90 to 20 percent - 14 to 1 point(s)
Less than 20 percent - 0 points

(2) How much of the perimeter of the site borders on land in nonurban use?

More than 90 percent - 10 points
90 to 20 percent - 9 to 1 point(s)
Less than 20 percent - 0 points

(3) How much of the site has been farmed (managed for a scheduled harvest or timber activity) more than five of the last 10 years?

More than 90 percent - 20 points
90 to 20 percent - 19 to 1 point(s)
Less than 20 percent - 0 points

(4) Is the site subject to state or unit of local government policies or programs to protect farmland or covered by private programs to protect farmland?

Site is protected - 20 points
Site is not protected - 0 points

(5) Is the farm unit(s) containing the site (before the project) as large as the average - size farming unit in the County ?

(Average farm sizes in each county are available from the NRCS field offices in each state. Data are from the latest available Census of Agriculture, Acreage or Farm Units in Operation with \$1,000 or more in sales.)
As large or larger - 10 points
Below average - deduct 1 point for each 5 percent below the average, down to 0 points if 50 percent or more below average - 9 to 0 points

(6) If the site is chosen for the project, how much of the remaining land on the farm will become non-farmable because of interference with land patterns?

Acreage equal to more than 25 percent of acres directly converted by the project - 25 points
Acreage equal to between 25 and 5 percent of the acres directly converted by the project - 1 to 24 point(s)
Acreage equal to less than 5 percent of the acres directly converted by the project - 0 points

(7) Does the site have available adequate supply of farm support services and markets, i.e., farm suppliers, equipment dealers, processing and storage facilities and farmer's markets?

All required services are available - 5 points
Some required services are available - 4 to 1 point(s)
No required services are available - 0 points

(8) Does the site have substantial and well-maintained on-farm investments such as barns, other storage building, fruit trees and vines, field terraces, drainage, irrigation, waterways, or other soil and water conservation measures?

High amount of on-farm investment - 20 points
Moderate amount of on-farm investment - 19 to 1 point(s)
No on-farm investment - 0 points

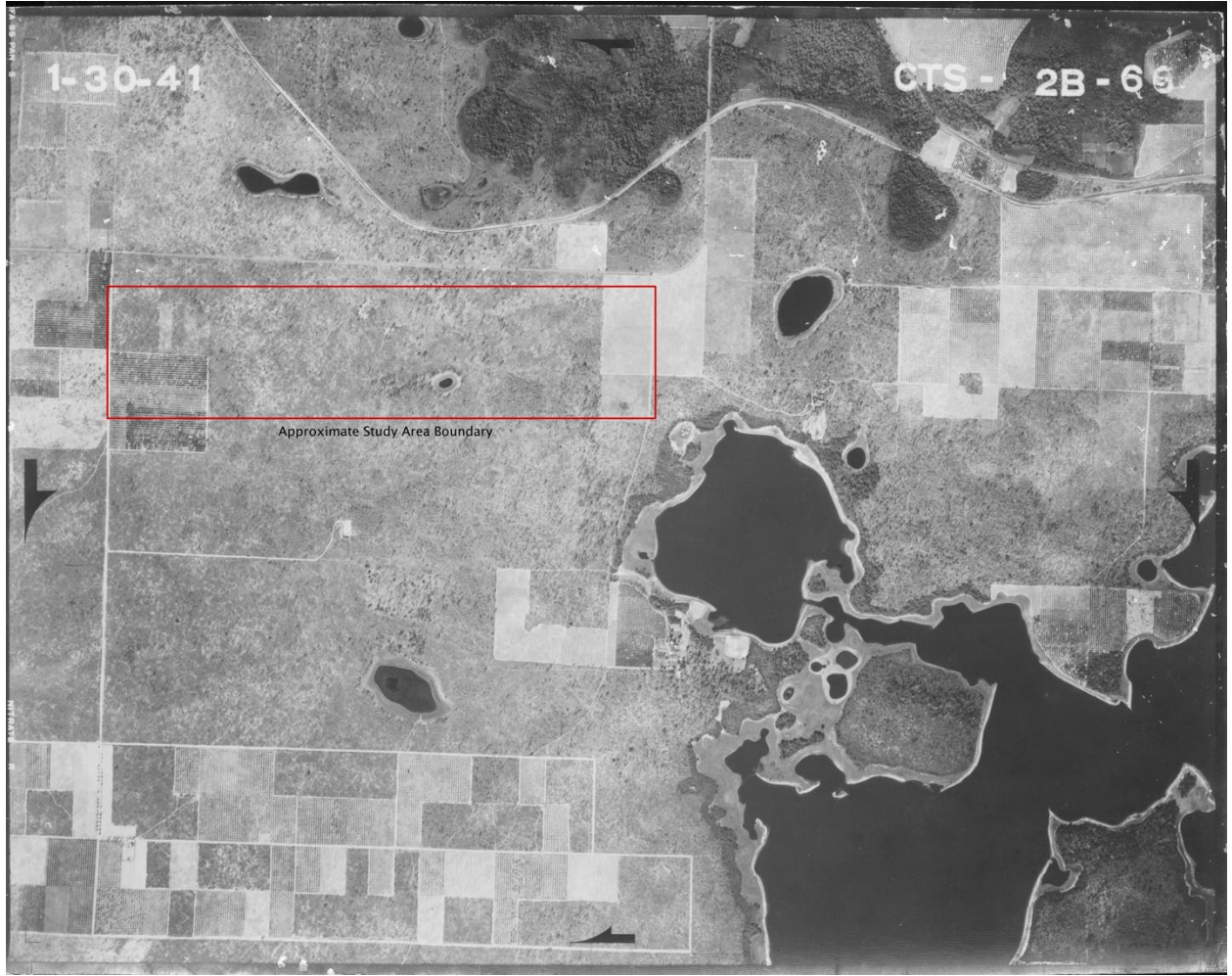
(9) Would the project at this site, by converting farmland to nonagricultural use, reduce the demand for farm support services so as to jeopardize the continued existence of these support services and thus, the viability of the farms remaining in the area?

Substantial reduction in demand for support services if the site is converted - 25 points
Some reduction in demand for support services if the site is converted - 1 to 24 point(s)
No significant reduction in demand for support services if the site is converted - 0 points

(10) Is the kind and intensity of the proposed use of the site sufficiently incompatible with agriculture that it is likely to contribute to the eventual conversion of surrounding farmland to nonagricultural use?

Proposed project is incompatible to existing agricultural use of surrounding farmland - 10 points
Proposed project is tolerable to existing agricultural use of surrounding farmland - 9 to 1 point(s)
Proposed project is fully compatible with existing agricultural use of surrounding farmland - 0 points

Appendix IV – Historic Aerial Photographs



FEB 24 1947

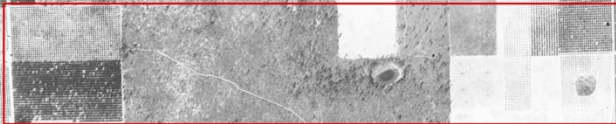
CTS-6D-27



Approximate Study Area Boundary

1-11-58

GTS-2V-185



Approximate Study Area Boundary





Appendix IV – NRCS Web Soil Survey Report



United States
Department of
Agriculture

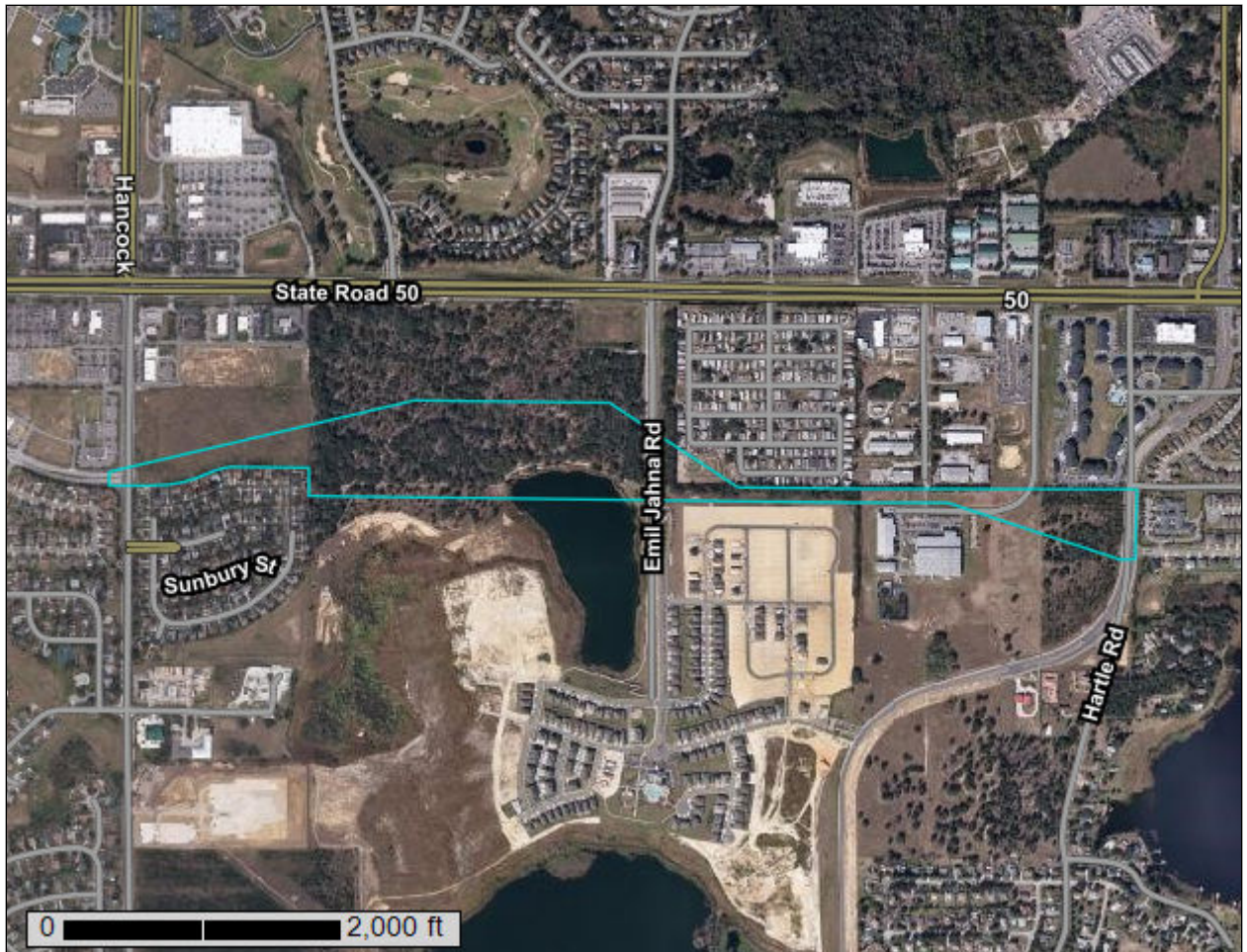
NRCS

Natural
Resources
Conservation
Service

A product of the National
Cooperative Soil Survey,
a joint effort of the United
States Department of
Agriculture and other
Federal agencies, State
agencies including the
Agricultural Experiment
Stations, and local
participants

Custom Soil Resource Report for Lake County Area, Florida

Hooks Street ACE



Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<https://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

Custom Soil Resource Report

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

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identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report Soil Map



Soil Map may not be valid at this scale.



Map Scale: 1:12,400 if printed on A landscape (11" x 8.5") sheet.


0 150 300 600 900 Meters

0 500 1000 2000 3000 Feet

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 17N WGS84


MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)




















Soils







 Soil Map Unit Polygons

 Soil Map Unit Lines


 Soil Map Unit Points

Special Point Features






-  Blowout
-  Borrow Pit
-  Clay Spot
-  Closed Depression
-  Gravel Pit
-  Gravelly Spot
-  Landfill
-  Lava Flow
-  Marsh or swamp
-  Mine or Quarry
-  Miscellaneous Water
-  Perennial Water
-  Rock Outcrop
-  Saline Spot
-  Sandy Spot
-  Severely Eroded Spot
-  Sinkhole
-  Slide or Slip
-  Sodic Spot

-  Spoil Area
-  Stony Spot
-  Very Stony Spot
-  Wet Spot
-  Other
-  Special Line Features


Water Features

 Streams and Canals

Transportation

-  Rails
-  Interstate Highways
-  US Routes
-  Major Roads
-  Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL:
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Lake County Area, Florida
 Survey Area Data: Version 20, Jun 8, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jan 28, 2020—Feb 4, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
8	Candler sand, 0 to 5 percent slopes	17.3	28.2%
9	Candler sand, 5 to 12 percent slopes	31.1	50.7%
10	Candler sand, 12 to 40 percent slopes	3.4	5.6%
21	Lake sand, 0 to 5 percent slopes	0.6	0.9%
22	Lake sand, 5 to 12 percent slopes	0.0	0.0%
33	Ona-Ona, wet, fine sand, 0 to 2 percent slopes	0.5	0.9%
45	Tavares sand, 0 to 5 percent slopes	3.4	5.5%
50	Borrow Pits	1.3	2.2%
99	Water	3.7	6.0%
Totals for Area of Interest		61.4	100.0%

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas

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are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Lake County Area, Florida

8—Candler sand, 0 to 5 percent slopes

Map Unit Setting

National map unit symbol: 2t3z1
Elevation: 10 to 260 feet
Mean annual precipitation: 47 to 56 inches
Mean annual air temperature: 68 to 77 degrees F
Frost-free period: 280 to 365 days
Farmland classification: Farmland of unique importance

Map Unit Composition

Candler and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Candler

Setting

Landform: Ridges on marine terraces, knolls on marine terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Interfluve, side slope, tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Eolian deposits and/or sandy and loamy marine deposits

Typical profile

A - 0 to 6 inches: sand
E - 6 to 63 inches: sand
E and Bt - 63 to 80 inches: sand

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water capacity: Very low (about 2.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Forage suitability group: Sandy soils on ridges and dunes of xeric uplands (G154XB111FL), Sandy soils on ridges and dunes of xeric uplands (G155XB111FL)
Other vegetative classification: Sandy soils on ridges and dunes of xeric uplands (G154XB111FL), Longleaf Pine-Turkey Oak Hills (R154XY002FL), Longleaf

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Pine-Turkey Oak Hills (R155XY002FL), Sandy soils on ridges and dunes of xeric uplands (G155XB111FL)
Hydric soil rating: No

Minor Components

Millhopper

Percent of map unit: 5 percent
Landform: Ridges on marine terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on rises, knolls, and ridges of mesic uplands (G154XB121FL), Longleaf Pine-Turkey Oak Hills (R154XY002FL)
Hydric soil rating: No

Tavares

Percent of map unit: 5 percent
Landform: Ridges on marine terraces
Landform position (two-dimensional): Toeslope, footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex, concave
Across-slope shape: Linear
Other vegetative classification: Sandy soils on rises, knolls, and ridges of mesic uplands (G154XB121FL), Longleaf Pine-Turkey Oak Hills (R154XY002FL)
Hydric soil rating: No

9—Candler sand, 5 to 12 percent slopes

Map Unit Setting

National map unit symbol: 2w0q4
Elevation: 30 to 160 feet
Mean annual precipitation: 44 to 56 inches
Mean annual air temperature: 68 to 75 degrees F
Frost-free period: 290 to 365 days
Farmland classification: Farmland of unique importance

Map Unit Composition

Candler and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Candler

Setting

Landform: Ridges on marine terraces, knolls on marine terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Interfluve, side slope, tread
Down-slope shape: Convex, linear

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Across-slope shape: Convex

Parent material: Eolian deposits and/or sandy and loamy marine deposits

Typical profile

A - 0 to 5 inches: sand

E - 5 to 67 inches: sand

E and Bt - 67 to 80 inches: sand

Properties and qualities

Slope: 5 to 12 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Excessively drained

Runoff class: Very low

Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Sodium adsorption ratio, maximum: 4.0

Available water capacity: Very low (about 2.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6s

Hydrologic Soil Group: A

Forage suitability group: Sandy soils on strongly sloping to steep side slopes of xeric uplands (G154XB113FL)

Other vegetative classification: Sandy soils on strongly sloping to steep side slopes of xeric uplands (G154XB113FL), Sand Pine Scrub (R154XY001FL), Longleaf Pine-Turkey Oak Hills (R154XY002FL)

Hydric soil rating: No

Minor Components

Apopka

Percent of map unit: 6 percent

Landform: Ridges on marine terraces, knolls on marine terraces

Landform position (three-dimensional): Interfluve, side slope

Down-slope shape: Convex, linear

Across-slope shape: Linear, convex

Other vegetative classification: Sandy soils on strongly sloping to steep side slopes of xeric uplands (G154XB113FL)

Hydric soil rating: No

Kendrick

Percent of map unit: 5 percent

Landform: Ridges on marine terraces

Landform position (three-dimensional): Interfluve, side slope

Down-slope shape: Convex, linear

Across-slope shape: Linear, convex

Other vegetative classification: Sandy over loamy soils on knolls and ridges of mesic uplands (G154XB211FL), Longleaf Pine-Turkey Oak Hills (R154XY002FL)

Hydric soil rating: No

Adamsville

Percent of map unit: 3 percent
Landform: Rises on marine terraces, knolls on marine terraces
Landform position (three-dimensional): Interfluve, talf
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Other vegetative classification: Sandy soils on rises and knolls of mesic uplands
(G154XB131FL)
Hydric soil rating: No

Pompano

Percent of map unit: 1 percent
Landform: Flats on marine terraces
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear
Across-slope shape: Linear, convex
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands
(G154XB141FL)
Hydric soil rating: Yes

10—Candler sand, 12 to 40 percent slopes

Map Unit Setting

National map unit symbol: 1nrvg
Elevation: 40 to 150 feet
Mean annual precipitation: 46 to 54 inches
Mean annual air temperature: 68 to 75 degrees F
Frost-free period: 340 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Candler and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Candler

Setting

Landform: Hills on marine terraces, ridges on marine terraces
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Eolian or sandy marine deposits

Typical profile

A - 0 to 3 inches: sand
E - 3 to 67 inches: sand
E and Bt - 67 to 80 inches: sand

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Properties and qualities

Slope: 12 to 40 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water capacity: Very low (about 2.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: A
Forage suitability group: Sandy soils on strongly sloping to steep side slopes of xeric uplands (G154XB113FL)
Other vegetative classification: Sandy soils on strongly sloping to steep side slopes of xeric uplands (G154XB113FL), Sand Pine Scrub (R154XY001FL)
Hydric soil rating: No

Minor Components

Kendrick

Percent of map unit: 5 percent
Landform: Ridges on marine terraces
Landform position (three-dimensional): Interfluve, side slope
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy over loamy soils on knolls and ridges of mesic uplands (G154XB211FL), Longleaf Pine-Turkey Oak Hills (R154XY002FL)
Hydric soil rating: No

Apopka

Percent of map unit: 5 percent
Landform: Ridges on marine terraces, knolls on marine terraces
Landform position (three-dimensional): Interfluve, side slope
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on strongly sloping to steep side slopes of xeric uplands (G154XB113FL), Longleaf Pine-Turkey Oak Hills (R154XY002FL)
Hydric soil rating: No

21—Lake sand, 0 to 5 percent slopes

Map Unit Setting

National map unit symbol: 1qt6g
Elevation: 30 to 300 feet
Mean annual precipitation: 46 to 54 inches
Mean annual air temperature: 68 to 75 degrees F
Frost-free period: 340 to 365 days
Farmland classification: Farmland of unique importance

Map Unit Composition

Lake and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Lake

Setting

Landform: Ridges, hills, marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Eolian deposits or sandy fluvial or marine deposits

Typical profile

A - 0 to 7 inches: sand
C - 7 to 80 inches: sand

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Very high (19.98 to 50.02 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water capacity: Low (about 3.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Forage suitability group: Sandy soils on ridges and dunes of xeric uplands (G154XB111FL)
Other vegetative classification: Sandy soils on ridges and dunes of xeric uplands (G154XB111FL), Longleaf Pine-Turkey Oak Hills (R154XY002FL)

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Hydric soil rating: No

Minor Components

Astatula

Percent of map unit: 10 percent

Landform: Ridges on marine terraces, hills on marine terraces

Landform position (three-dimensional): Interfluve, side slope

Down-slope shape: Convex

Across-slope shape: Convex

Other vegetative classification: Sandy soils on ridges and dunes of xeric uplands (G154XB111FL), Sand Pine Scrub (R154XY001FL)

Hydric soil rating: No

Apopka

Percent of map unit: 10 percent

Landform: Ridges on marine terraces, knolls on marine terraces

Landform position (three-dimensional): Interfluve, side slope

Down-slope shape: Convex

Across-slope shape: Linear

Other vegetative classification: Sandy soils on ridges and dunes of xeric uplands (G154XB111FL), Longleaf Pine-Turkey Oak Hills (R154XY002FL)

Hydric soil rating: No

22—Lake sand, 5 to 12 percent slopes

Map Unit Setting

National map unit symbol: 1nrvv

Elevation: 40 to 300 feet

Mean annual precipitation: 46 to 54 inches

Mean annual air temperature: 68 to 75 degrees F

Frost-free period: 340 to 365 days

Farmland classification: Not prime farmland

Map Unit Composition

Lake and similar soils: 90 percent

Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Lake

Setting

Landform: Ridges, hills, marine terraces

Landform position (three-dimensional): Interfluve, side slope

Down-slope shape: Convex

Across-slope shape: Linear

Parent material: Eolian deposits or sandy fluvial or marine deposits

Typical profile

A - 0 to 5 inches: sand

C - 5 to 80 inches: sand

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Properties and qualities

Slope: 5 to 12 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Very high (19.98 to 50.02 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water capacity: Low (about 3.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A
Forage suitability group: Sandy soils on strongly sloping to steep side slopes of xeric uplands (G154XB113FL)
Other vegetative classification: Sandy soils on strongly sloping to steep side slopes of xeric uplands (G154XB113FL), Longleaf Pine-Turkey Oak Hills (R154XY002FL)
Hydric soil rating: No

Minor Components

Lake, 0 to 5 percent

Percent of map unit: 5 percent
Landform: Ridges, hills, marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on ridges and dunes of xeric uplands (G154XB111FL), Longleaf Pine-Turkey Oak Hills (R154XY002FL)
Hydric soil rating: No

Apopka

Percent of map unit: 5 percent
Landform: Ridges on marine terraces, knolls on marine terraces
Landform position (three-dimensional): Interfluve, side slope
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on strongly sloping to steep side slopes of xeric uplands (G154XB113FL), Longleaf Pine-Turkey Oak Hills (R154XY002FL)
Hydric soil rating: No

33—Ona-Ona, wet, fine sand, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2w4gx
Elevation: 10 to 130 feet
Mean annual precipitation: 46 to 56 inches
Mean annual air temperature: 66 to 77 degrees F
Frost-free period: 325 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Ona and similar soils: 75 percent
Ona, wet, and similar soils: 12 percent
Minor components: 13 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ona

Setting

Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy marine deposits

Typical profile

A - 0 to 9 inches: fine sand
Bh - 9 to 16 inches: fine sand
C - 16 to 80 inches: fine sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high
(0.57 to 1.98 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water capacity: Low (about 4.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: B/D
Forage suitability group: Sandy soils on flats of mesic or hydric lowlands
(G155XB141FL)

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Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands
(G155XB141FL)
Hydric soil rating: No

Description of Ona, Wet

Setting

Landform: Sloughs on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy marine deposits

Typical profile

A - 0 to 9 inches: fine sand
Bh - 9 to 16 inches: fine sand
C - 16 to 80 inches: fine sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high
(0.57 to 1.98 in/hr)
Depth to water table: About 0 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water capacity: Low (about 4.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: B/D
Forage suitability group: Sandy soils on flats of mesic or hydric lowlands
(G155XB141FL)
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands
(G155XB141FL)
Hydric soil rating: Yes

Minor Components

Myakka

Percent of map unit: 5 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands
(G155XB141FL), South Florida Flatwoods (R155XY003FL)
Hydric soil rating: No

Basinger, hydric

Percent of map unit: 4 percent
Landform: Drainageways on marine terraces

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Landform position (three-dimensional): Tread, dip
Down-slope shape: Linear, concave
Across-slope shape: Linear, concave
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), Slough (R155XY011FL)
Hydric soil rating: Yes

Immokalee

Percent of map unit: 4 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Tread, tal
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), South Florida Flatwoods (R155XY003FL)
Hydric soil rating: No

45—Tavares sand, 0 to 5 percent slopes

Map Unit Setting

National map unit symbol: 2v173
Elevation: 0 to 180 feet
Mean annual precipitation: 44 to 56 inches
Mean annual air temperature: 68 to 75 degrees F
Frost-free period: 300 to 365 days
Farmland classification: Farmland of unique importance

Map Unit Composition

Tavares and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Tavares

Setting

Landform: Flats on marine terraces, ridges on marine terraces, knolls on marine terraces
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Interflue, base slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Eolian or sandy marine deposits

Typical profile

A - 0 to 7 inches: sand
C - 7 to 80 inches: sand

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches

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Drainage class: Moderately well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 50.02 in/hr)
Depth to water table: About 42 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water capacity: Very low (about 1.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A
Forage suitability group: Sandy soils on rises, knolls, and ridges of mesic uplands (G154XB121FL)
Other vegetative classification: Sandy soils on rises, knolls, and ridges of mesic uplands (G154XB121FL), Longleaf Pine-Turkey Oak Hills (R154XY002FL)
Hydric soil rating: No

Minor Components

Apopka

Percent of map unit: 6 percent
Landform: Knolls on marine terraces, ridges on marine terraces
Landform position (two-dimensional): Shoulder, summit, footslope
Landform position (three-dimensional): Nose slope, side slope, crest
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on ridges and dunes of xeric uplands (G154XB111FL), Longleaf Pine-Turkey Oak Hills (R154XY002FL)
Hydric soil rating: No

Candler

Percent of map unit: 4 percent
Landform: Ridges on marine terraces, knolls on marine terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Interfluve, side slope, tread
Down-slope shape: Convex
Across-slope shape: Convex
Other vegetative classification: Sandy soils on ridges and dunes of xeric uplands (G154XB111FL), Longleaf Pine-Turkey Oak Hills (R154XY002FL), Longleaf Pine-Turkey Oak Hills (R155XY002FL), Sandy soils on ridges and dunes of xeric uplands (G155XB111FL)
Hydric soil rating: No

Adamsville

Percent of map unit: 3 percent
Landform: Knolls on flatwoods, rises on flatwoods
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve, rise, talf
Down-slope shape: Convex
Across-slope shape: Linear

Custom Soil Resource Report

Other vegetative classification: Sandy soils on rises and knolls of mesic uplands (G155XB131FL), Upland Hardwood Hammock (R155XY008FL), Upland Hardwood Hammock (R154XY008FL)

Hydric soil rating: No

Zolfo

Percent of map unit: 2 percent

Landform: Flats on marine terraces

Landform position (two-dimensional): Footslope

Landform position (three-dimensional): Talf

Down-slope shape: Convex

Across-slope shape: Linear

Other vegetative classification: Sandy soils on rises and knolls of mesic uplands (G154XB131FL)

Hydric soil rating: No

50—Borrow Pits

Map Unit Setting

National map unit symbol: 1v082

Mean annual precipitation: 46 to 54 inches

Mean annual air temperature: 68 to 75 degrees F

Frost-free period: 340 to 365 days

Farmland classification: Not prime farmland

Map Unit Composition

Borrow pits: 70 percent

Minor components: 30 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Borrow Pits

Setting

Landform: Marine terraces

Landform position (three-dimensional): Dip

Down-slope shape: Concave

Across-slope shape: Concave

Parent material: Altered marine deposits

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 8

Forage suitability group: Forage suitability group not assigned (G154XB999FL)

Other vegetative classification: Forage suitability group not assigned (G154XB999FL)

Hydric soil rating: Unranked

Minor Components

Aquents

Percent of map unit: 30 percent

Custom Soil Resource Report

Landform: Depressions

Other vegetative classification: Forage suitability group not assigned
(G154XB999FL)

Hydric soil rating: Yes

99—Water

Map Unit Composition

Water: 100 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Water

Interpretive groups

Land capability classification (irrigated): None specified

Forage suitability group: Forage suitability group not assigned (G154XB999FL)

Other vegetative classification: Forage suitability group not assigned
(G154XB999FL)

Hydric soil rating: Unranked

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- United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. <http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084>

Custom Soil Resource Report

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf

Appendix V – USFWS IPaC Report

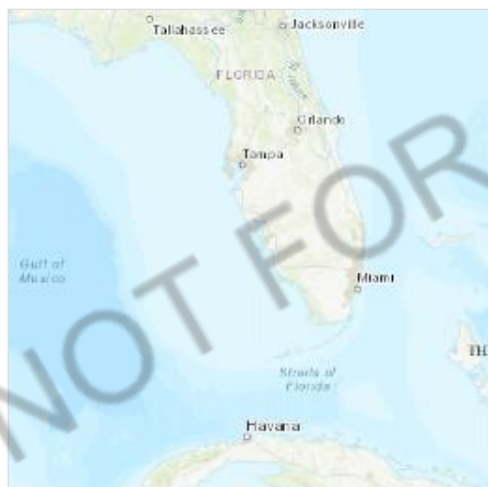
IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Lake County, Florida



Local office

North Florida Ecological Services Field Office

☎ (904) 731-3336

📅 (904) 731-3045

7915 Baymeadows Way, Suite 200
Jacksonville, FL 32256-7517

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population, even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species¹ and their critical habitats are managed by the [Ecological Services Program](#) of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries²).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact [NOAA Fisheries](#) for [species under their jurisdiction](#).

1. Species listed under the [Endangered Species Act](#) are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the [listing status page](#) for more information.
2. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Birds

NAME	STATUS
------	--------

Eastern Black Rail <i>Laterallus jamaicensis</i> ssp. <i>jamaicensis</i> No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/10477	Proposed Threatened
Everglade Snail Kite <i>Rostrhamus sociabilis plumbeus</i> There is final critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/7713	Endangered
Florida Scrub-jay <i>Aphelocoma coerulescens</i> No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/6174	Threatened
Wood Stork <i>Mycteria americana</i> No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/8477	Threatened

Reptiles

NAME	STATUS
Eastern Indigo Snake <i>Drymarchon corais couperi</i> No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/646	Threatened
Gopher Tortoise <i>Gopherus polyphemus</i> No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/6994	Candidate
Sand Skink <i>Neoseps reynoldsi</i> No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/4094	Threatened

Flowering Plants

NAME	STATUS
Britton's Beargrass <i>Nolina brittoniana</i> No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/4460	Endangered
Florida Bonamia <i>Bonamia grandiflora</i> No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/2230	Threatened

Lewton's Polygala <i>Polygala lewtonii</i>	Endangered
No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/6688	
Papery Whitlow-wort <i>Paronychia chartacea</i>	Threatened
No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/1465	
Pigeon Wings <i>Clitoria fragrans</i>	Threatened
No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/991	
Pygmy Fringe-tree <i>Chionanthus pygmaeus</i>	Endangered
No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/1084	
Scrub Buckwheat <i>Eriogonum longifolium</i> var. <i>gnaphalifolium</i>	Threatened
No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/5940	
Scrub Plum <i>Prunus geniculata</i>	Endangered
No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/2238	
Wide-leaf Warea <i>Warea amplexifolia</i>	Endangered
No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/412	

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act¹ and the Bald and Golden Eagle Protection Act².

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described [below](#).

1. The [Migratory Birds Treaty Act](#) of 1918.
2. The [Bald and Golden Eagle Protection Act](#) of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern <http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php>
- Measures for avoiding and minimizing impacts to birds <http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php>
- Nationwide conservation measures for birds <http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf>

The birds listed below are birds of particular concern either because they occur on the [USFWS Birds of Conservation Concern](#) (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ [below](#). This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the [E-bird data mapping tool](#) (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found [below](#).

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)
American Kestrel <i>Falco sparverius paulus</i> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds Apr 1 to Aug 31

<p>Bald Eagle <i>Haliaeetus leucocephalus</i> This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626</p>	Breeds Sep 1 to Jul 31
<p>Bonaparte's Gull <i>Chroicocephalus philadelphia</i> This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.</p>	Breeds elsewhere
<p>Brown Pelican <i>Pelecanus occidentalis</i> This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/6034</p>	Breeds Jan 15 to Sep 30
<p>Common Ground-dove <i>Columbina passerina exigua</i> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA</p>	Breeds Feb 1 to Dec 31
<p>Double-crested Cormorant <i>phalacrocorax auritus</i> This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/3478</p>	Breeds Apr 20 to Aug 31
<p>Herring Gull <i>Larus argentatus</i> This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.</p>	Breeds Apr 20 to Aug 31
<p>Limpkin <i>Aramus guarauna</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.</p>	Breeds Jan 15 to Aug 31
<p>Prairie Warbler <i>Dendroica discolor</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.</p>	Breeds May 1 to Jul 31
<p>Prothonotary Warbler <i>Protonotaria citrea</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.</p>	Breeds Apr 1 to Jul 31

Ring-billed Gull *Larus delawarensis*

Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.

Swallow-tailed Kite *Elanoides forficatus*

Breeds Mar 10 to Jun 30

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

<https://ecos.fws.gov/ecp/species/8938>

Yellow Warbler *Dendroica petechia gundlachi*

Breeds May 20 to Aug 10

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is $0.25/0.25 = 1$; at week 20 it is $0.05/0.25 = 0.2$.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (■)

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)

Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

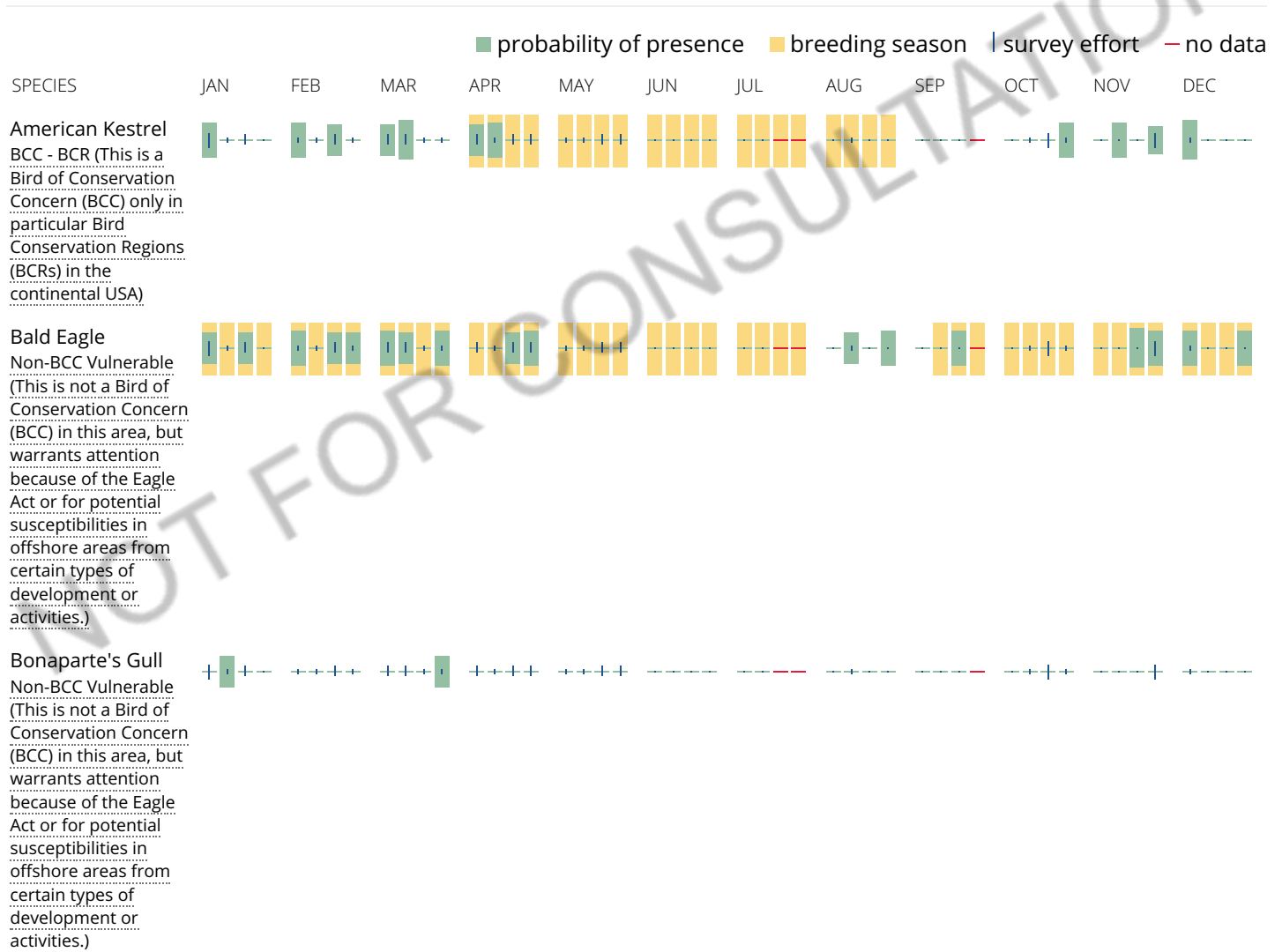
To see a bar's survey effort range, simply hover your mouse cursor over the bar.

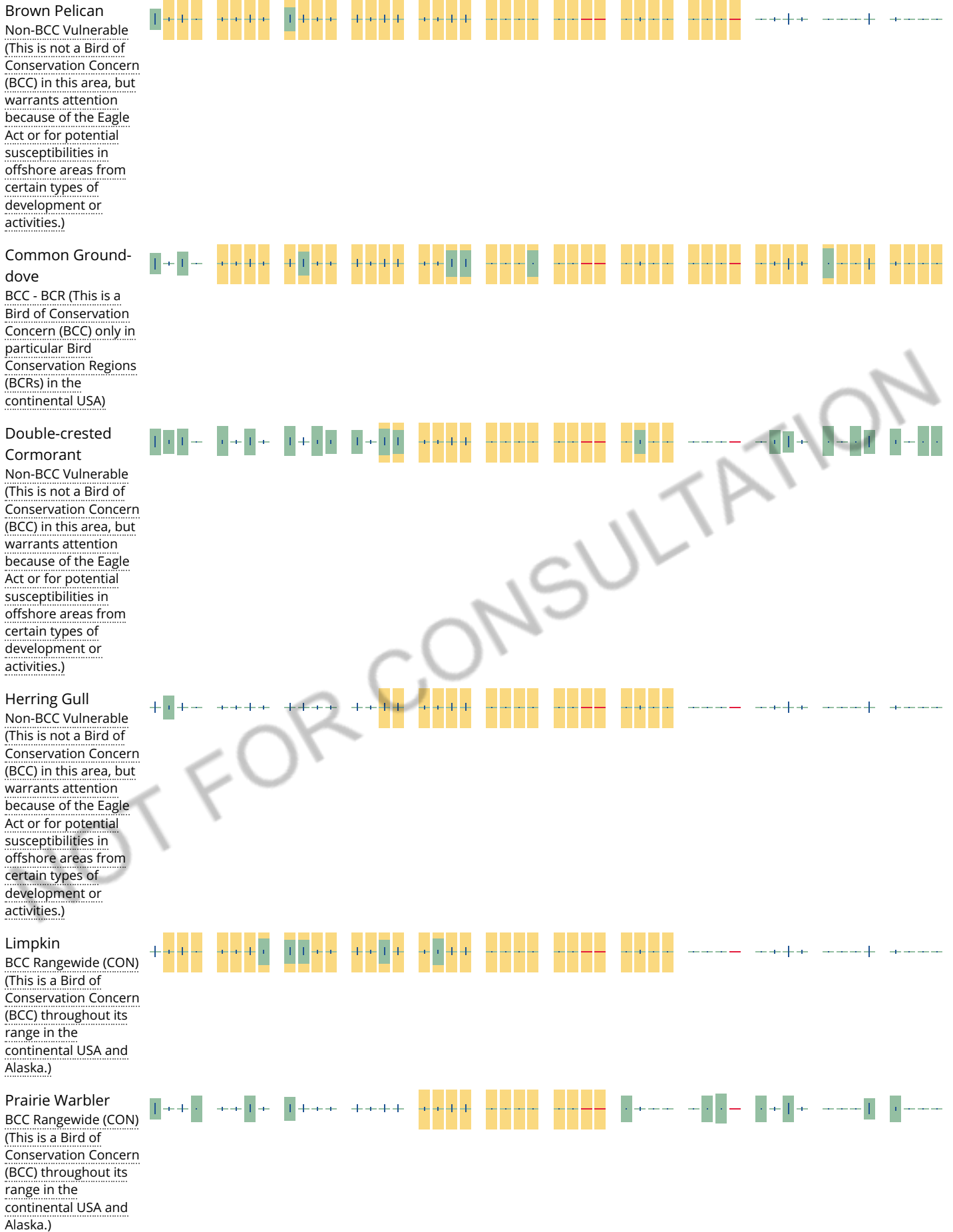
No Data (-)

A week is marked as having no data if there were no survey events for that week.

Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.







Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

[Nationwide Conservation Measures](#) describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. [Additional measures](#) and/or [permits](#) may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS [Birds of Conservation Concern \(BCC\)](#) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the [Avian Knowledge Network \(AKN\)](#). The AKN data is based on a growing collection of [survey, banding, and citizen science datasets](#) and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle ([Eagle Act](#) requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the [AKN Phenology Tool](#).

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the [Avian Knowledge Network \(AKN\)](#). This data is derived from a growing collection of [survey, banding, and citizen science datasets](#).

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: [The Cornell Lab of Ornithology All About Birds Bird Guide](#), or (if you are unsuccessful in locating the bird of interest there), the [Cornell Lab of Ornithology Neotropical Birds guide](#). If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are [Birds of Conservation Concern](#) (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the [Eagle Act](#) requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the [Northeast Ocean Data Portal](#). The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the [NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf](#) project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the [Diving Bird Study](#) and the [nanotag studies](#) or contact [Caleb Spiegel](#) or [Pam Loring](#).

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to [obtain a permit](#) to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the [National Wildlife Refuge](#) system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

Impacts to [NWI wetlands](#) and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local [U.S. Army Corps of Engineers District](#).

WETLAND INFORMATION IS NOT AVAILABLE AT THIS TIME

This can happen when the National Wetlands Inventory (NWI) map service is unavailable, or for very large projects that intersect many wetland areas. Try again, or visit the [NWI map](#) to view wetlands at this location.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tubercid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.