Natural Resources Evaluation

Florida's Turnpike Enterprise

Widen Western Beltway (SR 429)
Project Development and Environment (PD&E) Study
From North of I-4/SR 429 Interchange to Seidel Road
Orange and Osceola Counties, Florida

Financial Management Number: 446164-1-22-01
ETDM Number: 14446

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EXECUTIVE SUMMARY

The Florida Department of Transportation (FDOT), Florida's Turnpike Enterprise (FTE), is conducting a Project Development and Environment (PD&E) Study for the Western Beltway (State Road (SR) 429)) from north of Interstate 4 (I-4) in Osceola County to the Seidel Road interchange in Orange County, a distance of approximately 10 miles. The Western Beltway (SR 429) is part of a limited-access, tolled beltway around Orlando, and is part of the overall Florida's Turnpike system of tolled expressways. Improvements being evaluated include widening from two to four lanes in each direction, incorporating interchange modifications and safety improvements along Western Beltway (SR 429), adding or upgrading Intelligent Transportation Systems (ITS), and adding a potential new interchange location at an extension of Livingston Road. An adjacent project, the Poinciana Parkway Extension PD&E Study (Financial Project Identification Number [FPID] 446581-1) from County Road (CR) 532 to north of the I-4/SR 429 interchange will also evaluate improvements along Western Beltway (SR 429) from the I-4 interchange to north of Sinclair Road. If Poinciana Parkway Extension moves forward, the widening of Western Beltway (SR 429) will begin north of Sinclair Road. However, in order to maintain independent utility, if the Poinciana Parkway Extension does not move forward, the Western Beltway (SR 429) widening would continue south of Sinclair Road to the I-4 interchange.

Five (5) build alternatives were evaluated as potential options as part of this PD&E Study. The Preferred Alternative includes widening the Western Beltway (SR 429) from four (4) to eight (8) lanes from I-4 to north of Seidel Road, operational improvements at the existing interchanges, and converting the toll plazas to electronic toll sites. In addition, the Sinclair Road interchange includes new traffic signals at the northbound on-ramp from Connector Road, a new T-Ramp interchange at the extension of Livingston Road, and a new traffic signal at each ramp terminal at Seidel Road. From north of I-4 to Seidel Road the proposed typical section consists of four (4) lanes with southbound and northbound Collector-Distributor (CD) systems to provide the connections from I-4 to Sinclair Road. North of the Sinclair Road interchange the northbound and southbound CD systems merge with the Western Beltway (SR 429) main lanes and connect with the proposed eight (8) lane expansion of Western Beltway (SR 429) extending northward.

In accordance with Presidential Executive Order 11990, Federal Highway Administration (FHWA) Technical Advisory T6640.8A, Section 7(c) of the Endangered Species Act (ESA) of 1973 (ESA, P.L. 93-205), and FDOT's *Project Development and Environment Manual*, Part 2, Chapters 9 (July 1, 2020) and 16 (July 1, 2020), a Wetlands Evaluation and Protected Species and Habitat Assessment was conducted for the proposed improvements along Western Beltway (SR 429). The project was screened through the Efficient Transportation Decision Making (ETDM) Environmental Screening Tool (EST) and the programming screen was published January 8, 2021 (ETDM #14446 - https://etdmpub.fla-etat.org/est/).

This Natural Resource Evaluation (NRE) was prepared as part of the PD&E study. This report reviews the potential impacts to wetland systems and federal- and state-protected species, summarizes the results of these assessments, and identifies measures to avoid, minimize and mitigate for any potential impacts. A summary of the analysis of potential project impacts for the proposed improvements to Western Beltway (SR 429) is presented below.

Protected Species and Habitat

The project study area was evaluated for potential occurrences of federal- and state-listed plant and animal species in accordance with Section 7 of the ESA of 1973, as amended, and Chapters 5B-40 and 68A-27 of the F.A.C. The evaluation included coordination with the Florida Natural Areas Inventory (FNAI) literature review, database searches, and field assessments of the project study area to identify the potential occurrence of protected species and/or presence of federal-designated critical habitat. Field evaluations of the project study area and adjacent habitats and general wildlife surveys were conducted by project biologists on September 27, 2021 and January 12, 2022.

Per the *Protected Species and Habitat Assessment*, 32 federally-listed species and 25 state-listed species have been reviewed for the potential to occur within the Western Beltway (SR 429) study area. The project is not within any US Fish and Wildlife Service (USFWS) designated critical habitat. An effect determination was made for each of these federal- and state-listed species based on an analysis of the potential impacts of the proposed project on each species. Based on evaluation of collected data and field reviews, the federal- and state-listed species listed in **Tables ES-1**, **Table ES-2**, and **Table ES-3** below have been reviewed for the potential to occur within or adjacent to the project study area.

Table ES-1 Federal Protected Species Effect Determinations

Project Impact Determination	Federal Listed Species
"No effect"	***Flora***
	Avon Park rabbit-bells (*Crotalaria avonensis*)
	Beautiful pawpaw (*Deeringothamnus pulchellus*)
	Britton's beargrass (*Nolina brittoniana*)
	Carter's warea (*Warea carteri*)
	Clasping warea (*Warea amplexifolia*)
	Florida blazing star (*Liatris ohlingerae*)
	Florida bonamia (*Bonamia grandiflora*)
	Florida jointweed (*Polygonella basiramia*)
	Garrett's scrub balm (*Dicerandra christmanii*)
	Highlands scrub hypericum (*Hypericum cumulicola*)
	Lewton's polygala (*Polygala lewtonii*)
	Papery nailwort (*Paronychia chartacea ssp. Chartacea*)
	Perforate reindeer lichen (*Cladonia perforata*)
	Pygmy fringe tree (*Chionanthus pygmaeus*)
	Scrub buckwheat (*Eriogonum longifolium var. gnaphalifolium*)
	Scrub lupine (*Lupinus aridorum*)
	Scrub mint (*Dicerandra frutescens*)
	Scrub pigeon-wing (*Clitoria fragrans*)
	Scrub plum (*Prunus geniculata*)
	Short-leaved rosemary (*Conradina brevifolia*)

	Small's jointweed (*Polygonella myriophylla*)
	Fauna
	Crested caracara (*Caracara cheriway*)
	Florida grasshopper sparrow (*Ammodramus savannarum floridanus*)
	Florida scrub-jay (*Aphelocoma coerulescens*)
	Everglade snail kite (*Rostrhamus sociabilis*)
	Red-cockaded woodpecker (*Picoides borealis*)
"May affect, but is not likely to adversely affect"	***Fauna***
	American alligator (*Alligator mississippiensis*)
	Blue-tailed mole skink (*Plestiodon egregius lividus*)
	Eastern indigo snake (*Drymarchon couperi*)
	Sand skink (*Plestiodon reynoldsi*)
	Wood stork (*Mycteria americana*)

Table ES-2 State Protected Species Effect Determinations

Project Impact Determination	State Listed Species
"No effect anticipated"	***Flora***
	Ashe's savory (*Calamintha ashei*)
	Celestial lily (*Nemastylis floridana*)
	Chapman's sedge (*Carex chapmanii*)
	Cutthroat grass (*Panicum abscissum*)
	Florida beargrass (*Nolina atopocarpa*)
	Florida spiny-pod (*Matelea floridana*)
	Florida willow (*Salix floridana*)
	Giant orchid (*Pteroglossaspis ecristata*)
	Hartwrightia (*Hartwrightia floridana*)
	Incised groove-bur (*Agrimonia incisa*)
	Many-flowered grass-pink (*Calopogon multiflorus*)
	Nodding pinweed (*Lechea cernua*)
	Piedmont jointgrass (*Coelorachis tuberculosa*)
	Pine pinweed (*Lechea divaricata*)
	Pine-woods bluestem (*Andropogon arctatus*)
	Sand butterfly pea (*Centrosema arenicola*)
	Scrub bluestem (*Schizachyrium niveum*)
	Star anise (*Illicium parviflorum*)
"No adverse effect anticipated"	***Fauna***
	Gopher tortoise (*Gopherus polyphemus*)
	Florida pine snake (*Pituophis melanoleucus mugitus*)
	Florida burrowing owl (*Athene cunicularia floridana*)
	Little blue heron (*Egretta caerulea*)
	Tricolored heron (*Egretta tricolor*)
	Roseate spoonbill (*Platalea ajaja*)
	Florida sandhill crane (*Grus canadensis pratensis*)
	Southeastern American kestrel (*Falco sparverius paulus*)

Table ES-3 Other Species of Concern Effect Determinations

Project Impact Determination	Additional Protected Species
No impacts to primary or secondary buffer zones	Bald eagle (*Haliaeetus leucocephalus*)

Wetlands

For the purposes of this document, wetlands are defined as per 62.340 Florida Administrative Code (F.A.C.) and Section 373.019 (27), Florida Statutes (F.S.). Surface waters are defined as open water bodies or streams/waterways.

The No-Build Alternative would result in no impacts to wetlands or surface waters. Although unavoidable wetland impacts will occur as a result of the proposed build alternatives, these wetlands are located adjacent to, and/or within, the existing roadway right of way (ROW) and were previously disturbed by urban development, roadway construction, maintenance activities, and the invasion of nuisance and exotic species. Wetlands to be impacted by the proposed improvements include mixed forested wetlands and freshwater marshes located at the proposed Livingston Road traffic interchange and surface waters impacted consist of reservoirs (**Table ES-4**). Conservation easements are also present within the Preferred Alternative. Impacts resulting from the Preferred Alternative include 5.19 acres of wetlands and 6.73 acres of surface waters. There are 1.89 acres of wetland conservation easements within the Preferred Alternative. A description of land use, dominant vegetation, soil types, and other pertinent remarks regarding these communities is provided in subsequent sections of this report. The Uniform Mitigation Assessment Methodology (UMAM) analysis was performed on representative wetland impact areas. Construction of the Preferred Alternative results in an estimated loss of 3.84 functional units.

Wetland impacts which will result from the construction of this project will be mitigated pursuant to Section 373.4137, F.S., to satisfy all mitigation requirements of Part IV of Chapter 373, F.S., and 33 U.S.C. §1344. Compensatory mitigation for this project will be completed through the use available credits at a private mitigation bank and any other mitigation options that satisfy state and federal requirements.

Final determination of jurisdictional boundaries, in addition to mitigation requirements, will be coordinated between FTE and permitting agencies during the final design phase of the project. The results of this PD&E Study indicate there are no practicable alternatives to the proposed impacts due to the need for a roadway widening to reduce traffic congestion and safety considerations. In accordance with Presidential Executive Order 11990, the FTE has undertaken all actions to minimize the destruction, loss or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands in carrying out the agency's responsibilities. The FTE has determined that there is no practicable alternative to construction impacts occurring in wetlands. The proposed project will have no significant short-term or long-term adverse impacts to wetlands because any unavoidable impacts to wetlands will be mitigated to achieve no net loss of wetland function. Furthermore, all wetland impacts have been avoided and minimized to the greatest extent possible and have been limited to those areas which are required to meet minimum safety requirements.

Table ES-4 Wetland and Surface Water Acreages within the Preferred Alternative

Representative Wetlands	FLUCFCS Classification	FLUCFCS Description	USFWS Classification	Preferred Alternative Impact Acreage
WL 01	6300	Wetland Forested Mixed	PFO1/3	3.05
WL Conservation Easements	6300	Wetland Forested Mixed	PFO1/3	1.89
WL 02	6410	Freshwater Marshes	PEM1C	0.25
SW 01	530	Reservoir	PUBHx	6.73
			Total Wetland Impacts	**5.19**
			Total Surface Water Impacts	**6.73**
			Total Impacts	**11.92**

[1] UMAM scores have not been approved by permitting agencies and are subject to change during the permitting process.
PFO1/3: Palustrine, Forested, Broad-leaved Deciduous, Broad-leaved Evergreen
PEM1C: Palustrine, Emergent, Persistent, Seasonally Flooded
PUBHx: Palustrine, Unconsolidated Bottom, Permanently Flooded, excavated

Essential Fish Habitat

The proposed project is not located within or near any coastal resources and will not involve Essential Fish Habitat as none exists within the project study area. This was confirmed by the National Marine Fisheries Service (NMFS) in the ETDM comments.

1.0 INTRODUCTION

The FTE is conducting a PD&E Study to evaluate the proposed widening of Western Beltway (SR 429) from north of I-4 to Seidel Road as depicted in **Figure 1-1 Project Location Map**.

In accordance with Presidential Executive Order 11990, Federal Highway Administration (FHWA) Technical Advisory T6640.8A, Section 7(c) of the Endangered Species Act (ESA) of 1973 (ESA, P.L. 93-205), and the Florida Department of Transportation (FDOT) *Project Development and Environment (PD&E) Manual*, Part 2, Chapters 9 (July 1, 2020) and 16 (July 1, 2020), a Wetlands Evaluation and Protected Species and Habitat Assessment were conducted for the proposed widening of Western Beltway (SR 429). The project was screened through the Efficient Transportation Decision Making (ETDM) Environmental Screening Tool (EST) and the programming screen was published January 8, 2021 (ETDM #14446 - https://etdmpub.fla-etat.org/est/).

This Natural Resource Evaluation (NRE) is prepared as part of this PD&E study. This report reviews the potential impacts to wetland systems and federal- and state-protected species, summarizes the results of these assessments, and identifies measures to avoid, minimize and mitigate for any potential impacts.

The purpose of this PD&E study is to evaluate engineering and environmental data and document information that will aid in determining the type, preliminary design and location of the proposed improvements. The study is being conducted to meet the requirements of the National Environmental Policy Act (NEPA) and other related federal and state laws, rules and regulations.

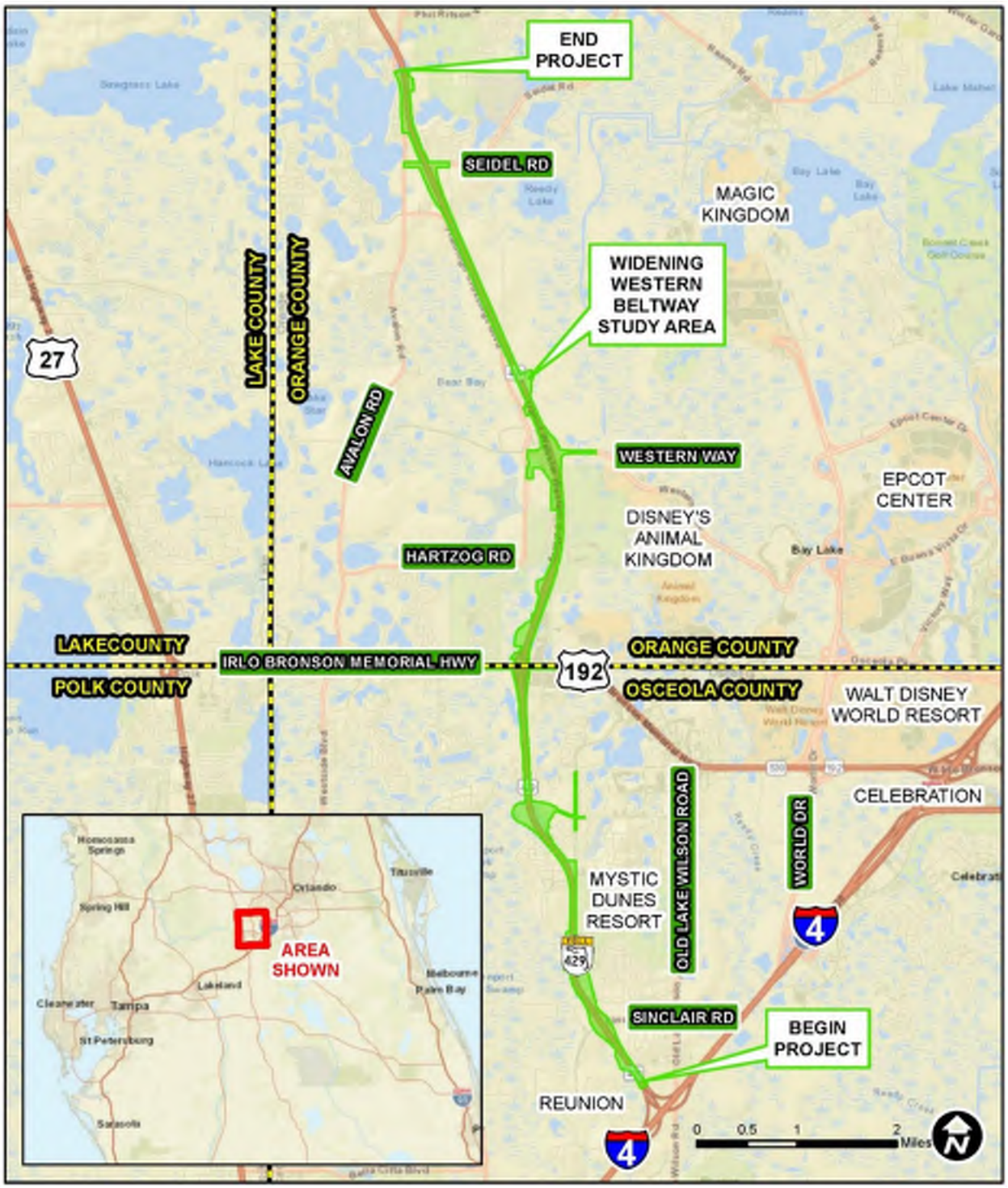

Figure 1-1 Project Location Map

2.0 PROJECT DESCRIPTION

The FDOT, FTE is evaluating improvements to the Western Beltway (SR 429) from north of I-4 in Osceola County to the Seidel Road interchange in Orange County, a distance of approximately 10 miles. Western Beltway (SR 429) is part of a limited-access, tolled beltway around Orlando, and is part of the overall Florida's Turnpike system of tolled expressways. Improvements being evaluated include widening from two to four lanes in each direction, incorporating interchange modifications and safety improvements along Western Beltway (SR 429), adding or upgrading Intelligent Transportation Systems (ITS), and adding a potential new interchange location at an extension of Livingston Road. An adjacent project, the Poinciana Parkway Extension PD&E Study (Financial Project Identification Number [FPID] 446581-1) from County Road (CR) 532 to north of the I-4/Western Beltway (SR 429) interchange will also evaluate improvements along Western Beltway (SR 429) from the I-4 interchange to north of Sinclair Road. If Poinciana Parkway Extension moves forward, the widening of Western Beltway (SR 429) will match that project north of Sinclair Road. In order to maintain independent utility, should the Poinciana Parkway Extension not move forward, the Western Beltway (SR 429) widening would continue south of Sinclair Road to the I-4 interchange.

2.1 Purpose and Need

The purpose of this project is to increase capacity and improve safety along Western Beltway (SR 429) from north of I-4 to Seidel Road to accommodate future travel demands.

2.1.1 Transportation Demand

The FTE Florida Traffic Trends Report, July 2019, indicates that traffic volumes on the segment of Western Beltway (SR 429) from I-4 to Seidel Road has experienced a 12.5% annual growth rate between 2008 and 2018. According to growth projections, annual growth rates are anticipated to continue at a rate of 4% to 9% annually leading to increased travel demand necessitating capacity improvements.

2.1.2 Capacity

Between 2014 and 2018, there were 161 crashes within the study limits between the I-4 ramps and Seidel Road interchanges. The estimated economic crash cost is about $33.0 million dollars over 5 years. Congestion is a major contributing factor to these crashes, and increasing congestion is expected to lead to an increase in crashes. Additional capacity is needed to accommodate safe weaving and merging between Western Beltway (SR 429) and I-4.

2.1.3 Safety

Between 2014 and 2018, there were 161 crashes within the study limits between the I-4 ramps and Seidel Road interchanges. The estimated economic crash cost is about $33.0 million dollars over 5 years. Congestion is a major contributing factor to these crashes, and increasing congestion is expected to lead to an increase in crashes. Additional capacity is needed to accommodate safe weaving and merging between Western Beltway (SR 429) and I-4.

2.1.4 Travel Time and Reliability

The Western Beltway (SR 429) traffic has been increasing by an average of 10 percent per year within the study limits over the last 10 years. This can be attributed to the increase in population and employment opportunities in the area, as well as recreational activities. During the evening commute, traffic backs up on Western Beltway (SR 429) in the southbound direction towards I-4 and long queues have been observed at the Western Beltway (SR 429) southbound off-ramp to US 192.

To accommodate future travel demand, six (6) lanes are needed by 2030, and eight (8) lanes will be needed by 2045 for the segment between US 192 and Seidel Road, and between I-4 and US 192 by 2050. Improving capacity of the mainline and interchanges will reduce the travel times and improve travel time reliability.

2.1.5 Emergency Response and Evacuation

The Western Beltway (SR 429) corridor is a major transportation facility within the region and a primary emergency evacuation route. Improving capacity of the mainline and interchanges will reduce congestion in the corridor. Capacity improvements would reduce emergency response times, as well as evacuation and recovery times.

2.1.6 Economic Development

Extensive residential and commercial development in the corridor is expected to continue, and congestion on Western Beltway (SR 429) is expected to increase. In order to meet the existing and future traffic demands in the region, capacity improvements to Western Beltway (SR 429) are needed. Residents and workers will face severe congestion in the corridor, and so improvements to Western Beltway (SR 429) are needed to enhance the economic viability of the Central Florida economy.

2.1.7 Consistency with Planning Documents

Future phases of the project are not currently included in the MetroPlan Orlando Long Range Transportation Plan (LRTP) or the MetroPlan Orlando Transportation Improvement Program (TIP), or the State Transportation Improvement Program (STIP).

2.2 Proposed Improvements

2.2.1 No-Build Alternative

The No-Build Alternative assumes that the existing four mainline lanes would remain on Western Beltway (SR 429) through the design year 2050. It assumes that both normal and evacuation traffic volumes continue to increase in the future without construction of the roadway. The No-Build Alternative minimizes ROW and construction costs along with environmental impacts. It provides a benchmark for comparative purposes with the Build Alternatives. The No-Build Alternative remains a viable alternative throughout the study and the public involvement process.

2.2.2 Preferred Alternative

Five (5) build alternatives were considered as part of this PD&E Study and evaluated as potential options. Options that were evaluated for the alternatives included:

- Widening Western Beltway (SR 429) from four to eight lanes from the I-4 ramps to north of Seidel Road;
- Operational improvements at the existing interchanges;
- Converting toll plazas to electronic toll sites;
- Roundabout and traffic signals at the northbound on-ramp from Connector Road at the Sinclair Road interchange;
- Potential new interchange at an extension of Livingston Road; and
- Roundabout and traffic signals at the existing ramp terminal at Seidel Road interchange.

A detailed alternatives analysis is included in the Preliminary Engineering Report. The Preferred Alternative was selected based on the natural, physical, social, and ROW information.

The Preferred Alternative includes widening the Western Beltway (SR 429) from four (4) to eight (8) lanes from the I-4 ramps to north of Seidel Road, operational improvements at the existing interchanges, and converting the toll plazas to electronic toll sites (**Figure 2-1**). The Sinclair Road interchange would include a new traffic signal at the northbound on-ramp from Connector Road. A new T-Ramp interchange would be constructed at the extension of Livingston Road, and a new traffic signal would be constructed at each Seidel Road interchange ramp terminal. North of Seidel Road, the improvements would transition to match the existing four-lane configuration.

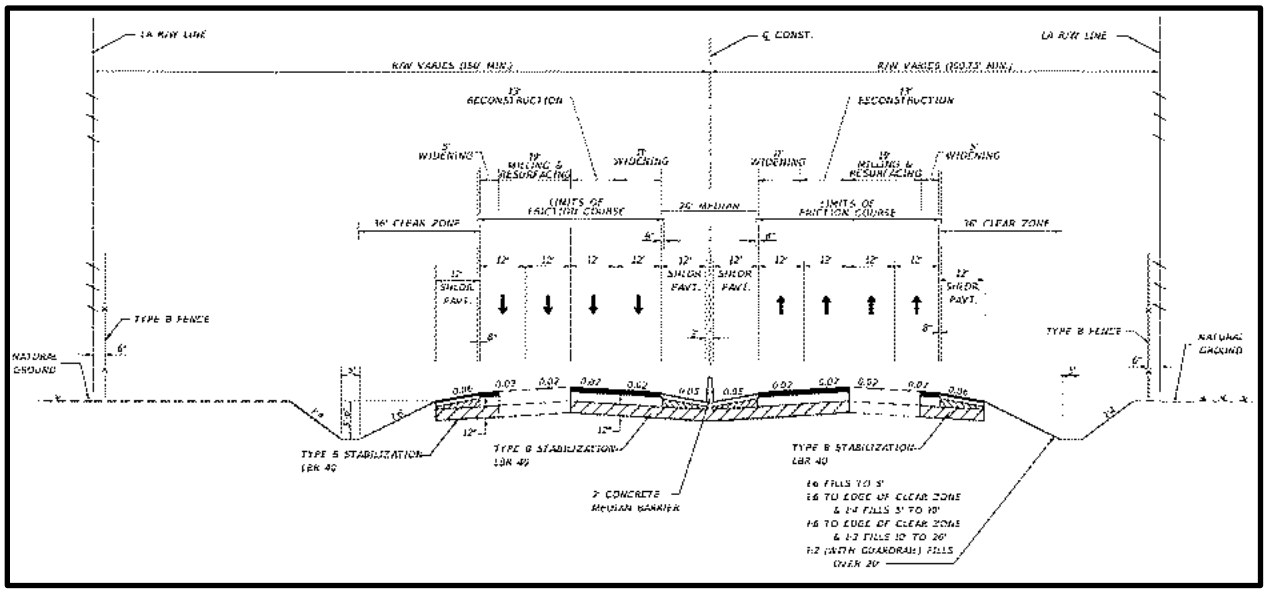

Figure 2-1 Proposed Typical Section for Preferred Alternative

3.0 EXISTING CONDITIONS

Pursuant to Presidential Executive Order 11990 entitled “Protection of Wetlands,” the United States Department of Transportation (USDOT) has developed the policy Preservation of the Nation’s Wetlands (USDOT Order 5660.1A), dated August 24, 1978, which requires all federally-funded highway projects to protect wetlands to the fullest extent possible. In accordance with this policy, the project study area was evaluated to assess potential wetland impacts that may be associated with the proposed improvements.

The project study area varies in width and extends along Western Beltway (SR 429) ROW from Seidel Road to the I-4/SR 429 interchange, as shown in **Figure 1-1**. This section presents a description of existing conditions within the project study area, including soils and land use/vegetative cover types within both wetlands and uplands. **Section 4.0** presents a description of the potential impacts to federal- and state- listed species and proposed conservation measures to off-set these impacts. **Section 5.0** presents a description of wetland and surface water impacts that would result from construction of the proposed project and a discussion of the mitigation options to offset these impacts.

3.1 Methodology

To assess the approximate locations and boundaries of existing wetland and upland communities within the project study area, the following site-specific data were collected and reviewed:

- Aerial photographs (scale, 1 inch = 400 feet), ESRI 2022;
- U.S. Department of Agriculture (USDA), Natural Resource Conservation Service (NRCS), *Soil Survey of Orange County, Florida* (NRCS 1989);
- U.S. Department of Agriculture (USDA), Natural Resource Conservation Service (NRCS), *Soil Survey of Osceola County Area, Florida* (NRCS 1979);
- Florida Association of Environmental Soil Scientists, *Hydric Soils of Florida Handbook*, 4th Edition (Hurt, 2007);
- Florida Department of Transportation, Florida Land Use, Cover and Forms Classification System (FLUCFCS) Handbook, 3rd Edition (FDOT, 1999);
- South Florida Water Management District (SFWMD) FLUCFCS GIS Database (2016);
- Reedy Creek Improvement District (RCID) Conservation Easements (2022);
- U.S. Fish and Wildlife Service (USFWS), National Wetlands Inventory, Wetlands Online Mapper (January 2022); and
- USFWS, Classification of Wetlands and Deepwater Habitats of the United States (Cowardin, et al., 1979).

For the purposes of this document, wetlands are defined as per 62.340 Florida Administrative Code (FAC) and Section 373.019 (27), Florida Statutes. Surface waters are defined as open water bodies or streams/waterways, including roadside ditches.

Environmental scientists, familiar with Florida's natural communities, conducted field reviews of the project study area on September 27, 2021 and January 12, 2022. Field reviews consisted of vehicular and pedestrian transects throughout natural habitat types found within the project study area. The purpose of the reviews was to verify and/or refine preliminary habitat boundaries and classification codes established through in-office literature reviews and aerial photo interpretation. During field investigations, wetland and surface water habitat within the project study area was visually inspected. Attention was given to identifying plant species composition for each community. Exotic plant infestations and other disturbances such as soil subsidence, clearing, canals, power lines, etc., were noted. Attention was also given to identifying wildlife and signs of wildlife usage in each wetland and adjacent upland habitats within the project study area.

3.2 Results

Based on site-specific data searches and field evaluations, a total of 26 soil types, 27 upland habitat types, and seven (7) wetland and surface water habitat types were identified within the project study area. The following subsections describe the soils, upland and wetland community types, and individual wetlands and surface waters that occur within the project study area.

3.2.1 Soils

Based on the *Soil Survey of Orange County, Florida* (NRCS, 1989) and the *Soil Survey of Osceola County Area*, *Florida* (NRCS, 1979), the project study area is comprised of 26 soil types. **Appendix A** provides aerial maps depicting the boundaries of each soil type within the project study area in addition to individual soil descriptions and their general characteristics. According to the *Hydric Soils of Florida Handbook* (Hurt, 2007), eight (8) of the soil types reported within the project study area are classified as hydric, 18 are non-hydric. Of the 18 non-hydric soils, ten (10) are reported as having hydric soil inclusions. Mapped hydric soils comprise 106.07 acres (11.67 percent) and non-hydric soils cover 801.37 acres (88.20 percent) of the project study area.

Table 4-1 lists the soil types reported within the project study area, their corresponding NRCS reference numbers reported in the *Soil Survey of Orange County, Florida* and *Soil Survey of Osceola County Area*, their hydric classification, and the approximate acreage and percentage of each soil type within the project study area.

Table 3-1 Soil Types and Coverage within the SR 429 Widening Project Study Area

Map Unit Symbol	Soil Type	Hydric Y/N	Acres in Study Area	Percent of Study Area
1A	Adamsville Sand, 0 To 2 Percent Slopes*	N	1.29	0.14
1B	Arents, Nearly Level	N	0.03	0.00
5A	Basinger Fine Sand, 0 To 2 Percent Slopes	Y	3.01	0.33
6A	Basinger Fine Sand, Depressional, 0 To 1 Percent Slopes	Y	0.06	0.01
3	Basinger Fine Sand, Frequently Ponded, 0 To 1 Percent Slopes	Y	7.62	0.84
4	Candler Fine Sand, 0 To 5 Percent Slopes	N	189.86	20.90
5B	Candler Fine Sand, 5 To 12 Percent Slopes	N	32.83	3.61
7	Candler Sand, 0 To 5 Percent Slopes	N	262.98	28.94
8	Candler Sand, 5 To 12 Percent Slopes*	N	73.96	8.14
6B	Candler-Apopka Fine Sands, 5 To 12 Percent Slopes	N	0.23	0.03
15	Hontoon Muck, Frequently Ponded, 0 To 1 Percent Slopes	Y	62.65	6.90
20	Immokalee Fine Sand*	N	50.37	5.54
16	Immokalee Fine Sand, 0 To 2 Percent Slopes*	N	18.92	2.08
22	Myakka Fine Sand, 0 To 2 Percent Slopes*	N	16.20	1.78
32	Placid Fine Sand, Frequently Ponded, 0 To 1 Percent Slopes	Y	3.81	0.42
33	Pits*	NA	0.59	0.07
34	Pomello Fine Sand, 0 To 5 Percent Slopes	N	36.06	3.97
37	Pompano Fine Sand, Frequently Ponded, 0 To 1 Percent Slopes	Y	13.46	1.48
41	Samsula-Hontoon-Basinger Association, Depressional	Y	3.43	0.38
42A	Sanibel Muck	Y	12.02	1.32
42B	Smyrna Fine Sand, 0 To 2 Percent Slopes*	N	8.22	0.90
44A	Smyrna-Smyrna, Wet, Fine Sand, 0 To 2 Percent Slopes*	N	2.41	0.26
44B	Tavares Fine Sand, 0 To 5 Percent Slopes	N	23.79	2.62
46	Tavares Fine Sand, 0 To 5 Percent Slopes	N	30.18	3.32
47	Tavares-Millhopper Complex, 0 To 5 Percent Slopes*	N	35.83	3.94
54	Zolfo Fine Sand, 0 To 2 Percent Slopes*	N	17.63	1.94
Total Hydric Soils			**106.07**	**11.67**
Total Non-Hydric Soils			**801.37**	**88.20**
Total Water			**1.15**	**0.13**
Totals for Project Study Area			**908.59**	**100.00**

* May have hydric soil inclusions

3.2.2 Existing Land Use

A total of 28 upland and seven (7) wetland habitat types were found within the project study area. Descriptions and aerial maps depicting existing land uses and habitats within the project study area are provided in **Appendix B**. **Table 3-2** provides land use and habitat types and their FLUCFCS classifications, in addition to their total acreage and percent coverage within the project study area.

Existing land use within the project study area was determined through the interpretation of 1" = 100' scale aerial photography, review of land cover GIS data obtained from the SFWMD and SWFWMD, and field reconnaissance of the project corridor conducted on September 27, 2021 and January 12, 2022.

Upland communities comprise 801.68 acres (88.23 percent) of the project study area and generally includes roads and highways, coniferous plantations, golf course, citrus groves, and herbaceous (dry prairie). Wetland and surface water communities comprise 106.92 acres (11.77 percent) of the project study area and include reservoirs, bay swamps, and mixed wetland hardwoods.

Approximately 9.46 acres of land is held under conservation easements within the proposed Livingston interchange portion of the project study area (**Appendix B)**.

Table 3-2 Existing Land Uses within the SR 429 Widening Road Project Study Area

FLUCFCS Classification[1]	FLUCFCS Description	USFWS Classification[2]	Acres within Study area	Percent of Study area
118	Rural Residential	NA	6.10	0.67
121	Fixed Single Family Units	NA	6.87	0.76
133	Multiple Dwelling Units, Low Rise	NA	3.58	0.39
134	Multiple Dwelling Units, High Rise	NA	0.49	0.05
139	High Density Under Construction	NA	0.53	0.06
140	Commercial and Services	NA	3.74	0.41
1411	Shopping Centers	NA	0.20	0.02
182	Golf Course	NA	13.13	1.45
190	Open Land	NA	3.76	0.41
211	Improved Pastures	NA	4.74	0.52
212	Unimproved Pastures	NA	7.32	0.81
213	Woodland Pastures	NA	0.04	0.00
221	Citrus Groves	NA	0.99	0.11
223	Other Groves	NA	0.09	0.01
310	Herbaceous (Dry Prairie)	NA	2.03	0.22
330	Mixed Rangeland	NA	0.07	0.01
411	Pine Flatwoods	NA	0.43	0.05
420	Upland Hardwood Forests	NA	1.13	0.12
434	Upland Mixed Coniferous / Hardwood	NA	1.19	0.13
441	Coniferous Plantations	NA	31.15	3.43

740	Disturbed Land	NA	7.19	0.79
743	Spoil Areas	NA	3.40	0.37
814	Roads and Highways	NA	700.79	77.13
820	Communications	NA	0.43	0.05
831	Electrical Power Facilities	NA	0.27	0.03
832	Electrical Power Transmission Lines	NA	1.14	0.13
834	Sewage Treatment	NA	0.87	0.10
		Total Uplands	**801.68**	**88.23**
530	Reservoirs	PUBHx	52.29	5.76
617	Mixed Wetland Hardwoods	PFO1C	3.94	0.43
6172	Mixed Shrubs	PSS1C	2.05	0.23
625	Wet Pinelands Hydric Pine	PFO4C	1.24	0.14
630	Wetland Forested Mixed	PFO1/3	35.23	3.82
641	Freshwater Marshes / Graminoid Prairie - Marsh	PEM1C	8.82	1.03
644	Emergent Aquatic Vegetation	PEM1Fx	3.35	0.37
		Total Wetlands and Surface Waters	**106.92**	**11.77**
		Total	**908.59**	**100.00**

[1]FDOT 1999

[2]Cowardin, *et al.*, 1979

PUBHx: Palustrine, Unconsolidated Bottom, Permanently Flooded, excavated

PFO1C: Palustrine, Forested, Broad-leaved Deciduous, Seasonally Flooded

PSS1C: Palustrine, Scrub-Shrub, Broad-Leaved Deciduous, Seasonally Flooded

PFO4C: Palustrine, Forested, Needle-Leaved Evergreen, Seasonally Flooded

PFO1/3: Palustrine, Forested, Broad-leaved Deciduous, Broad-leaved Evergreen

PEM1C: Palustrine, Emergent, Persistent, Seasonally Flooded

PEM1Fx: Palustrine, Emergent, Persistent, Semi-permanently Flooded, excavated

3.2.3 Wetlands and Surface Waters

During field reviews of the project study area, environmental scientists delineated the approximate boundaries of existing wetland and surface water communities on 1" = 200' true-color aerial photographs. Each wetland and surface water habitat within the project study area was classified using FLUCFCS (FDOT 1999) and the USFWS Classification of Wetlands and Deepwater Habitats of the United States (Cowardin et al., 1979). Approximate wetland boundaries were identified in accordance with the State of Florida Wetlands Delineation Manual [Chapter 62-340, Florida Administrative Code (F.A.C.)] and the criteria found within the U.S. Army Corps of Engineers (USACE) 1987 Corps of Engineers Wetland Delineation Manual (Y-87-1) and 2010 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coast Plain Region (Version 2.0) (ERDC/EL TR-10-20).

Formal wetland boundary delineations and surveys were not conducted as a part of this study but will be completed as part of the state and federal permit process.

Based on collected field data and in-house reviews, a total of seven (7) wetland and surface water habitat types were observed within the project study area. These include reservoirs, mixed

wetland hardwoods, mixed shrubs, wet pinelands hydric pine, wetland forested mixed, freshwater marshes/graminoid prairie – marsh, and emergent aquatic vegetation.

Appendix C provides individual descriptions of the identified wetland and surface water, a table of their acreage within the project study area, and aerial maps of the location of these systems within the project study area. There are no wetlands or surface waters designated as Outstanding Florida Waterways, Aquatic Preserves or Wild and Scenic Rivers within the project study area.

4.0 PROTECTED SPECIES

This project was evaluated for impacts to wildlife and habitat resources, including protected species, in accordance with 50 CFR Part 402 of the ESA of 1973, as amended, the Florida Endangered and Threatened Species Act, Section 379.2291, F.S., and Part 2, Chapter 16 of the PD&E Manual. Listed species are afforded special protective status by federal and state agencies. This special protection is federally administered by the United States Department of the Interior, USFWS, and National Oceanic and Atmospheric Administration – National Marine Fisheries Service (NOAA-NMFS) pursuant to the ESA of 1973 (as amended). The USFWS administers the federal list of animal species (50 CFR 17) and plant species (50 CFR 23). Federal protection of marine species is the responsibility of the NOAA-NMFS.

Administered by the Florida Fish and Wildlife Conservation Commission (FWC), the State of Florida affords special protection to animal species designated as State-designated Threatened or State Species of Special Concern, pursuant to Chapter 68A-27, F.A.C. The State of Florida also protects and regulates plant species designated as endangered, threatened or commercially exploited as identified on the Regulated Plant Index (5B-40.0055, F.A.C.), which is administered by the Florida Department of Agriculture and Consumer Services (FDACS), Division of Plant Industry, pursuant to Chapter 5B-40, F.A.C. Protected species evaluations were completed in accordance with FHWA's 2002 Memorandum, titled "Management of the Endangered Species Act Environmental Analysis and Consultation Process".

An ETDM Programming Screen Summary Report was published on January 8, 2021 containing comments from the Environmental Technical Advisory Team (ETAT) on the project's effects on various natural, physical and social resources. The USFWS, FDACS and FWC were commenting agencies for Wildlife and Habitat. Wildlife and Habitat were assigned a degree of effect of 3 – Moderate. The project is located within the USFWS Consultation Areas (CAs) of multiple federally protected species, including crested caracara (*Caracara cheriway*), Everglade snail kite (*Rostrhamus sociabilis plumbeus*), Florida grasshopper sparrow (*Ammodramus savannarum floridanus*), red-cockaded woodpecker (*Picoides borealis*), Florida scrub-jay (*Aphelocoma coerulescens*), sand skink (*Plestiodon reynoldsi*), and Lake Wales Ridge plants and within the Core Foraging Area (CFA) of three (3) active wood stork colonies.

The following sections describe the methodology used to assess the potential for occurrence of protected species and to identify the effects that implementation of the proposed project alternatives may have on protected species.

4.1 Data Collection

Available site-specific data was collected and evaluated to determine federal- and state-listed protected plant and animal species that have potential to occur within the project study area and to identify the approximate locations of existing upland and wetland communities.

Literature reviewed, and databases searched as part of this evaluation included:

- USFWS, Endangered and Threatened Wildlife and Plants, 50 CFR 17.11 and 17.12, June 2021;

- FWC, Florida's Endangered Species and Threatened Species, June 2021;
- Audubon Florida EagleWatch Public Nest website https://www.arcgis.com/apps/webappviewer/index.html?id=9ade9794b8494d2b84c8dea339ea1428), 2022*;*
- FWC, Wading Bird Rookeries website *(*http://ocean.floridamarine.org/TRGIS/Description_Layers_Terrestrial.htm*),* 1999;
- FNAI Biodiversity Matrix Map Server, May 2022, *(*https://www.fnai.org/BiodiversityMatrix/index.html*);*
- USFWS, 2010-2019 Wood Stork Nesting Colonies Maps (http://fgdl.org), June 2022;
- USFWS, Information for Planning and Consultation (IPaC) Mapper, June 2022;
- FDOT, Wildlife Permeability Along Interstate 4 Report, June 2020;
- USFWS, 2020 Peninsular Florida Species Conservation and Consultation Guide, Sand Skink and Blue-tailed (Bluetail) Mole Skink; and
- USFWS*,* Critical Habitat Portal website *(*http://criticalhabitat.fws.gov/crithab/*).*

Environmental scientists familiar with Florida natural communities conducted field reviews of the project study area and adjacent habitats and general species surveys on September 27, 2021 and January 12, 2022. Field reviews consisted of reviewing natural habitat types located within the project study area. The purpose of the reviews was to verify and/or refine preliminary habitat boundaries and classification codes established through in-office literature reviews and aerial photo interpretation. During field investigations, each upland and wetland community within the project study area were visually inspected. Attention was given to identifying dominant plant species composition for each community. Additional attention was given to identifying wildlife and signs of wildlife usage in each wetland and upland community within the project study area. The FNAI biodiversity matrix for documented occurrences of listed species within one (1) mile of the project study area was reviewed (**Appendix E**).

Based on the evaluation of collected data, field reviews, the FNAI biodiversity matrix review, and database searches, the federal- and state-listed protected species discussed in **Section 4.2** were considered as having the potential to occur within or adjacent to the project study area. For a species to be considered potentially present the project study area must be within the species' distribution range. An effect determination was then made for each federal- and state-listed species based on an analysis of the potential impacts of the proposed alternatives to each species.

4.2 Results

Based on the information collected and field reviews, a list of protected species with the potential to occur within the project study area was generated. This list includes a total of 58 federal or state protected species that have the potential for occurrence within the project study area. These

protected species include 39 floral, six (6) reptilian, and 13 avian species. **Appendix F** presents a list of protected species with the potential to occur within the project study area, their federal or state protection status, preferred habitat, and a ranking of potential occurrence. Locations of all listed species documented within one (1) mile of the project study area as well as the locations of all protected species observed during field reviews are also provided in **Appendix F**.

The potential for occurrence for each species was designated as None, Low, Moderate, or High based on the type of habitat present within the project study area, its relative condition, and if the species has been previously documented or was observed in the project study area. A *None* rating indicates that no habitat for that species was found within the project study area. A *Low* rating indicates that minimal/suboptimal habitat for that species was found within the project study area, but the species has not been documented within the project study area. A *Moderate* rating indicates that suitable habitat exists, and the species has been documented within one (1) mile of the project study area. A *High* rating indicates that suitable habitat exists, and the species was observed during field reviews.

While the proposed project has taken all practicable measures to avoid and minimize impacts to potentially occurring protected species and their habitats, unavoidable impacts may occur because of roadway and pond site construction. A determination of the anticipated project "effect" on protected species was made based on their probability of occurrence within the project study area, the proposed changes to their habitat quality, quantity and availability as a result of project construction, and how each species is expected to respond to anticipated habitat changes. Listed below are the "effect" determinations for each species.

4.2.1 Federal Protected Species

4.2.1.1 Flora

Avon Park Rabbit-bells (*Crotalaria avonensis*)

Avon Park Rabbit-bells is a bushy, perennial herb with hairy stems and leaves, and a yellow flower that is listed as ***endangered*** by the **USFWS.** This species is a member of the pea (*Fabaccaea*) family and occurs on bare patches of white sand in Lake Wales Ridge scrub and occasionally in disturbed areas or partial shade. Potential suitable habitat for this species was not observed within the project study area. According to FNAI data, Avon Park rabbit-bells has the potential to occur within the project study area; however, it has not been documented within one (1) mile of the project study area. Additionally, this species was not observed during the field reviews of the project study area. Based on this information and the lack of preferred habitat within the project study area, it has been determined that the project will have "**no effect**" on the Avon Park rabbit-bells.

Beautiful Pawpaw (*Deeringothamnus pulchellus*)

Beautiful pawpaw is a low, deciduous shrub with leathery, oblong leaves and white flowers that is listed as ***endangered*** by the **USFWS**. This species is a member of the custard apple (*Annonaceae*) family and occurs in open slash pine or longleaf pine flatwoods with wiregrass and dwarf live oak in the understory. Potential suitable habitat for this species was not observed within the project study area. According to FNAI data, beautiful pawpaw has the potential to occur within

the project study area; however, it has not been documented within one (1) mile of the project study area. Additionally, this species was not observed during the field reviews of the project study area. Based on this information and the lack of preferred habitat within the project study area, it has been determined that the project will have "**no effect**" on the beautiful pawpaw.

Britton's Beargrass (*Nolina brittoniana*)

Britton's beargrass is a perennial herb with long, stiff leaves and clusters of small white flowers that is listed as ***endangered*** by the **USFWS**. This species is a member of the agave (*Agavaceae*) family and occurs on scrub, sandhill, scrubby flatwoods, and xeric hammock. Potential suitable habitat for this species was not observed within the project study area. According to FNAI data, Britton's beargrass has been documented historically within one (1) mile of the project study area. However, this species was not observed during the field reviews of the project study area. Based on this information and the lack of preferred habitat within the project study area, it has been determined that the project will have "**no effect**" on Britton's beargrass.

Carter's Warea (*Warea carteri*)

Carter's warea is an annual herb with many slender, branching stems and white flower clusters that is listed as ***endangered*** by the **USFWS**. This species is a member of the mustard (*Brassicaceae*) family and occurs on sandhill, scrubby flatwoods, and inland scrub habitat. Potential suitable habitat for this species was not observed within the project study area. According to FNAI data, Carter's warea has the potential to occur within the project study area; however, it has not been documented within one (1) mile of the project study area. Additionally, this species was not observed during the field reviews of the project study area. Based on this information and the lack of preferred habitat within the project study area, it has been determined that the project will have "**no effect**" on the Carter's warea

Clasping Warea (*Warea amplexifolia*)

Clasping warea is an annual herb with pale green, heart-shaped leaves and clusters of pink/purple flowers that is listed as ***endangered*** by the **USFWS**. This species is a member of the mustard (*Brassicaceae*) family and occurs on sunny openings with exposed sand in longleaf pine/turkey oak/wiregrass sandhills. Potential suitable habitat for this species was not observed within the project study area. According to FNAI data, clasping warea has the potential to occur within the project study area; however, it has not been documented within one (1) mile of the project study area. Additionally, this species was not observed during the field reviews of the project study area. Based on this information and the lack of preferred habitat within the project study area, it has been determined that the project will have "**no effect**" on the clasping warea.

Florida Blazing Star (*Liatris ohlingerae*)

Florida blazing star is a perennial herb with hairy stems, narrow leaves, and many purple flower clusters that is listed as ***endangered*** by the **USFWS**. This species is a member of the composite (*Asteraceae*) family and occurs on rosemary balds, scrubby flatwoods, and disturbed scrub. Potential suitable habitat for this species was not observed within the project study area. According to FNAI data, the Florida blazing star has the potential to occur within the project study area; however, it has not been documented within one (1) mile of the project study area. Additionally, this species was not observed during the field reviews of the project study area.

Based on this information and the lack of preferred habitat within the project study area, it has been determined that the project will have "**no effect**" on the Florida blazing star.

Florida Bonamia (*Bonamia grandiflora*)

The Florida bonamia is a morning glory vine with large, blue flowers that is listed as ***threatened*** by the **USFWS**. This species is a member of the morning-glory (*Convolvulaceae*) family and occurs on open or disturbed areas in white sand scrub on central Florida ridges that include scrub oaks, sand pine, and lichens. Potential suitable habitat for this species was not observed within the project study area. According to FNAI data, Florida bonamia has been documented historically within one (1) mile of the project study area. However, this species was not observed during the field reviews of the project study area. Based on this information and the lack of preferred habitat within the project study area, it has been determined that the project will have "**no effect**" on the Florida bonamia.

Florida Jointweed (*Polygonella basiramia*)

The Florida jointweed is a perennial herb with slender, wiry, red or green stems, tiny red or green leaves and very small white/pinkish flowers that is listed as ***endangered*** by the **USFWS**. This species is a member of the buckwheat (*Polygonaceae*) family and occurs on white sands of sand pine scrub. Potential suitable habitat for this species was not observed within the project study area. According to FNAI data, the Florida jointweed has the potential to occur within Osceola and Polk Counties; however, it has not been documented within one (1) mile of the project study area. Additionally, this species was not observed during the field reviews of the project study area. Based on this information and the lack of preferred habitat within the project study area, it has been determined that the project will have "**no effect**" on the Florida jointweed.

Garrett's Scrub Balm (*Dicerandra christmanii*)

Garrett's scrub balm is a low shrub with square stems, 1-inch long leaves, and flowers that are white or cream colored with purple spots. It is listed as ***endangered*** by the **USFWS**. This species is a member of the mint (*Lamiacceae*) family and occurs on openings in oak scrub on Lake Wales Ridge. Potential suitable habitat for this species was not observed within the project study area. According to FNAI data, the Garrett's scrub balm has the potential to occur within the project study area; however, it has not been documented within one (1) mile of the project study area. Additionally, this species was not observed during the field reviews or species surveys of the project study area. Based on this information and the lack of preferred habitat within the project study area, it has been determined that the project will have "**no effect**" on the Garrett's scrub balm.

Highlands Scrub Hypericum (*Hypericum cumulicola*)

Highlands scrub hypericum a perennial herb with wiry, round stems and yellow flowers that is listed as ***endangered*** by the **USFWS**. This species is a member of the St. John's wort (*Guttiferae*) family and occurs on open patches in white sand scrub, rosemary balds, scrubby flatwoods, and oak scrubs. Potential suitable habitat for this species was not observed within the project study area. According to FNAI data, the highlands scrub hypericum has the potential to occur within the project study area; however, it has not been documented within one (1) mile of the project study area. Additionally, this species was not observed during the field reviews of the project study area.

Based on this information and the lack of preferred habitat within the project study area, it has been determined that the project will have "**no effect**" on the highlands scrub hypericum.

Lewton's Polygala (*Polygala lewtonii*)

Lewton's polygala is a short-lived perennial herb with bright pink flowers that is listed as ***endangered*** by the **USFWS**. This species is a member of the milkwort (*Polygalaceae*) family and occurs on oak scrub, sandhill, and transition zones between high pine and turkey oak barrens. Potential suitable habitat for this species was not observed within the project study area. According to FNAI data, the Lewton's polygala is likely to occur within the project study area; however, it has not been documented within one (1) mile of the project study area. Additionally, this species was not observed during the field reviews of the project study area. Based on this information and the lack of preferred habitat within the project study area, it has been determined that the project will have "**no effect**" on the Lewton's polygala.

Papery Nailwort (*Paronychia chartacea ssp. chartacea*)

The papery nailwort is an annual herb with spreading wiry stems and small white flowers that is listed as ***threatened*** by the **USFWS**. This species is a member of the pink (*Caryophyllaceae*) family and occurs in white sand clearing of scrub. Potential suitable habitat for this species was not observed within the project study area. According to FNAI data, the papery nailwort has the potential to occur within the project study area; however, it has not been documented within one (1) mile of the project study area. Additionally, this species was not observed during the field reviews of the project study area. Based on this information and the lack of preferred habitat within the project study area, it has been determined that the project will have "**no effect**" on the papery nailwort.

Perforate Reindeer Lichen (*Cladonia perforate*)

Perforate reindeer lichen is a yellowish-gray terrestrial lichen with densely forking branches that is listed as ***endangered*** by the **USFWS**. This species is a member of the reindeer lichen (*Cladoniaceae*) family and occurs in rosemary scrub on the Panhandle coasts, Lake Wales Ridge, and Atlantic Coast Ridge. Potential suitable habitat for this species was not observed within the project study area. According to FNAI data, perforate reindeer lichen has the potential to occur within the project study area; however, it has not been documented within one (1) mile of the project study area. Additionally, this species was not observed during the field reviews of the project study area. Based on this information and the lack of preferred habitat within the project study area, it has been determined that the project will have "**no effect**" on the perforate reindeer lichen.

Pygmy Fringe Tree (*Chionanthus pygmaeus*)

The pygmy fringe tree is a shrub/small tree with white and green flowers that is listed as ***endangered*** by the **USFWS**. This species is a member of the olive (*Oleaceae*) family and occurs on scrub, sandhill, and xeric hammocks, primarily on the Lake Wales Ridge. Potential preferred suitable habitat for this species was not observed within the project study area. According to FNAI data, the pygmy fringe tree has been historically documented within one (1) mile of the project study area. However, this species was not observed during the field reviews of the project study

area. Based on this information and the lack of preferred habitat within the project study area, it has been determined that the project will have "**no effect**" on the pygmy fringe tree.

Scrub Buckwheat (*Eriogonum longifolium var. gnaphalifolium*)

Scrub buckwheat is a short perennial herb that is listed as ***threatened*** by the **USFWS**. This species is a member of the buckwheat (*Polygonaceae*) family and occurs on sandhill, oak hickory scrub, high pinelands, and turkey oak barrens with wiregrass, blue jack, and turkey oak. Potential suitable habitat for this species was not observed within the project study area. According to FNAI data, scrub buckwheat has been documented within one (1) mile of the project study area. However, this species was not observed during the field reviews of the project study area. Based on this information and the lack of preferred habitat within the project study area, it has been determined that the project will have "**no effect**" on the scrub buckwheat.

Scrub Lupine (*Lupinus aridorum*)

Scrub lupine is a shrubby biennial or perennial with soft, silvery stems and leaves and pink flowers that is listed as ***endangered*** by the **USFWS**. This species is a member of the pea (*Fabeceae*) family and occurs on openings in sand pine and rosemary scrub. Potential suitable habitat for this species was not observed within the project study area. According to FNAI data, scrub lupine has the potential to occur within the project study area; however, it has not been documented within one (1) mile of the project study area. Additionally, this species was not observed during the field reviews of the project study area. Based on this information and the lack of preferred habitat within the project study area, it has been determined that the project will have "**no effect**" on the scrub lupine.

Scrub Mint (*Dicerandra frutescens*)

Scrub mint is a low shrub with oval leaves and purple flowers that is listed as ***endangered*** by the **USFWS**. This species is a member of the mint (*Lamiaceae*) family and occurs in sand pine scrub and sandhill on the Lake Wales Ridge. Potential suitable habitat for this species was not observed within the project study area. According to FNAI data, scrub mint has the potential to occur within the project study area; however, it has not been documented within one (1) mile of the project study area. Additionally, this species was not observed during the field reviews of the project study area. Based on this information and the lack of preferred habitat within the project study area, it has been determined that the project will have "**no effect**" on the scrub mint.

Scrub Pigeon-Wing (*Clitoria fragrans*)

The scrub pigeon-wing is a perennial herb with showy white to pink/purplish flowers that is listed as ***threatened*** by the **USFWS**. This species is a member of the pea (*Fabaceae*) family and occurs on turkey oak barrens with wire grass or scrub/scrubby high pine. Potential suitable habitat for this species was not observed within the project study area. According to FNAI data, the scrub pigeon-wing has the potential to occur within the project study area; however, it has not been documented within one (1) mile of the project study area. Additionally, this species was not observed during the field reviews of the project study area. Based on this information and the lack of preferred habitat within the project study area, it has been determined that the project will have "**no effect**" on the scrub pigeon-wing.

Scrub Plum (*Prunus geniculate*)

The scrub plum is a shrub that is six (6) feet tall with dense spiny branches and white flowers that is listed as ***endangered*** by the **USFWS**. This species is a member of the rose (*Rosaceae*) family and occurs in sandhill and oak scrub. Potential suitable habitat for this species was not observed within the project study area. According to FNAI data, the scrub plum has the potential to occur within the project study area; however, it has not been documented within one (1) mile of the project study area. Additionally, this species was not observed during the field reviews of the project study area. Based on this information and the lack of preferred habitat within the project study area, it has been determined that the project will have "**no effect**" on the scrub plum.

Short-Leaved Rosemary (*Conradina canescens = C. brevifolia*)

The short-leaved rosemary is a short-lived, erect, woody, perennial shrub that is listed as ***endangered*** by the **USFWS**. This species is a member of the mint (*Lamiaceae*) family and occurs on white sands of sand pine-oak scrub of the Lake Wales Ridge and the scattered overstory of sand and scrub oak. Potential suitable habitat for this species was not observed within the project study area. According to FNAI data, short-leaved rosemary has the potential to occur within Osceola and Polk counties; however, it has not been documented within one (1) mile of the project study area. Additionally, this species was not observed during the field reviews of the project study area. Based on this information and the lack of preferred habitat within the project study area, it has been determined that the project will have "**no effect**" on the short-leaved rosemary.

Small's Jointweed (*Polygonella myriophylla*)

The Small's jointweed is a low, sprawling shrub with reddish-brown, cracked bark and clusters of white flowers that is listed as ***endangered*** by the **USFWS**. This species is a member of the buckwheat (*Polygonaceae*) family and occurs in open, sandy areas within scrub. Potential suitable habitat for this species was not observed within the project study area. According to FNAI data, Small's jointweed has been documented within one (1) mile of the project study area. However, this species was not observed during the field reviews of the project study area. Based on this information, it has been determined that the project will have "**no effect**" on the Small's jointweed.

4.2.1.2 Fauna

Reptilian

American Alligator (*Alligator mississippiensis*)

The American alligator is a large aquatic reptile with a broad, rounded snout. This species is listed as ***threatened*** by the **USFWS** due to their similarity of appearance to the American crocodile. This species' range stretches from east Texas, across to North Carolina, and extends down into southern Florida. They prefer freshwater lakes, slow-moving rivers, and associated wetlands, but they are occasionally found in brackish water. According to FNAI data, this species was not listed as potentially to occurring within one (1) mile of the project study area. No American alligators were observed during field reviews; however, large wetland and surface water systems were

observed during fieldwork that provide suitable habitat and it is reasonable to expect that this species could utilize suitable habitat within the project study area. Based on this information, it has been determined that the project "**may affect, but is not likely to adversely affect**" on the American alligator.

Blue-tailed Mole Skink (*Plestiodon egregius lividus*) and Sand Skink (*Plestiodon reynoldsi*)

The blue-tailed mole skink and sand skink are small lizard-like reptiles that are listed as ***threatened*** by the **USFWS**. Blue-tailed mole skinks are expected to occur with sand skinks where the two species overlap in distribution. These species are found in central Florida in habitat with loose sandy areas, such as rosemary scrub, sand pine scrub, oak scrub, scrubby flatwoods, and turkey oak barrens. They are also known to utilize disturbed habitats with suitable soils, such as pine plantations, citrus groves, open fields, and pastures. According to the USFWS Sand Skink Survey Protocol (2020), skink distribution is defined by three (3) factors: location within a county designated by the USFWS with primary populations, at an elevation of 82 feet above sea level or higher and is comprised of any of the 28 soil types designated as sand skink soils by the USFWS. The project study area lies within the USFWS Sand Skink and Blue Skink CA and includes suitable skink soils at a suitable elevation. According to FNAI data, sand skinks have been historically documented within a one (1) mile of the project study area; however, no skink tracks were observed during field reviews. As a result of available suitable habitat, a sand skink survey may be required during the design phase of this project to determine the presence and extent of occupied habitat. Based on the Western Beltway USFWS Biological Opinion (BO) dated July 25, 2002 and USACE Section 404 approved permit dated October 22, 2002, approximately 113.4 acres of occupied sand skink habitat along the SR 429 mainline was impacted. According to the BO, the impacts were mitigated for via the acquisition of at least 230 acres of suitable habitat for multiple listed species including sand skinks. Suitable sand skink habitat remaining within the study area includes the proposed Livingston Road extension east of SR 429. Mitigation for unavoidable impacts to occupied sand skink habitat can be completed through the purchase of credits at an acceptable conservation mitigation bank. Based on this information, it has been determined that the project will have "**may affect, not likely adversely affect**" on the blue-tailed mole skink and sand skink.

Eastern Indigo Snake (*Drymarchon couperi*)

The eastern indigo snake is a large, glossy black snake that is listed as *threatened* by the USFWS. This species can be found in a variety of habitat types, including pine flatwoods, scrubby flatwoods, high pine, dry prairie, tropical hardwood hammocks, edges of freshwater marshes, agricultural fields, coastal dunes, as well as human-altered habitats. It may also utilize gopher tortoise burrows for shelter to escape hot or cold ambient temperatures within its range. According to FNAI data, this species has been historically documented within one (1) mile of the project study area. While there is suitable habitat for this species throughout the undeveloped areas of the project study area, the eastern indigo snake was not observed during field reviews and has not been documented within one (1) mile of the project study area. However, it is reasonable to expect that this species could utilize suitable habitat within the project study area. To minimize potential adverse impacts to the eastern indigo snake, FTE will implement the USFWS *Standard Protection Measures for the Eastern Indigo Snake* (updated August 2013) during construction (see Appendix G). Additionally, the FTE wills survey the project limits prior to construction to

determine the presence and location of gopher tortoise burrows. If gopher tortoises or burrows are found within 25 feet of the limits of construction, the FTE will reinitiate technical assistance with the FWC to secure all permits needed to relocate the tortoises and associated commensal species. With the implementation of these measures, it has been determined that the project "may affect, not likely to adversely affect" the eastern indigo snake. The path to this determination followed the key steps A →B→C→D→MANLAA as shown in **Appendix G**.

Avian

Florida Grasshopper Sparrow (*Ammodramus savannarum floridanus*)

The Florida grasshopper sparrow is a small, short-tailed, flat-headed sparrow that is listed as ***endangered*** by the **USFWS**. This species requires large areas of frequently burned dry prairie habitat with patchy open areas sufficient for foraging. It may persist in pasture lands that have not been intensively managed. While the project study area lies within the USFWS Florida Grasshopper Sparrow CA, no potential habitat for this species was observed within the project study area and no individuals were observed during the field reviews. According to FNAI data, the Florida grasshopper sparrow has not been documented within one (1) mile of the project study area. Based on this information, it has been determined that the project will have "**no effect**" the Florida grasshopper sparrow.

Florida Scrub-Jay (*Aphelocoma coerulescens*)

The Florida scrub-jay is similar to the common blue jay in size and shape, with a pale blue crestless head, nape, wings, and tail. It is listed as ***threatened*** by the **USFWS**. Optimal scrub-jay habitat consists of low growing, scattered scrub species with patches of bare sandy soil such as those found in sand pine scrub and scrubby flatwoods habitats that are occasionally burned. In areas where these types of habitats are unavailable, Florida scrub-jays may be found in less optimal habitats such as pine flatwoods with scattered oaks. The project study area lies within the USFWS Florida Scrub-jay CA; however, no potential habitat for this species was observed. According to FNAI data, the Florida scrub-jay has not been documented within one (1) mile of the project study area. Based on this information, it has been determined that the project will have "**no effect**" the Florida scrub-jay.

Crested Caracara (*Caracara cheriway*)

The crested caracara is a large, boldly patterned raptor with a crest that is listed as ***threatened*** by the **USFWS**. This species often inhabits open country, such as dry prairie and pasture lands with scattered cabbage palms, cabbage palm/live oak hammocks, and shallow ponds and sloughs. It also requires cabbage palms or live oaks with low-growing surrounding vegetation for nesting. While the project study area lies within the USFWS Crested Caracara CA, no potential habitat for this species was observed within the project study area and the species was not observed during the field reviews. According to FNAI data, the crested caracara has not been documented within one (1) mile of the project study area. Based on these results, it has been determined that the project will have "**no effect**" the crested caracara.

Wood Stork (*Mycteria americana*)

The wood stork is a large, white, wading bird that is listed as ***threatened*** by the **USFWS**. The wood stork is opportunistic and utilizes various habitat types including freshwater marshes, swamps, lagoons, ponds, tidal creeks, flooded pastures, and ditches. Water that is relatively calm, uncluttered by dense aquatic vegetation, and with a permanent or seasonal water depth between 2 and 15 inches is considered suitable foraging habitat for this species. Potential suitable foraging habitat for this species was observed within the project study area; however, no individuals were observed foraging in the wetland or surface water areas. According to FNAI data, the wood stork has not been documented within one (1) mile of the project study area.

According to the USFWS wood stork colony website, the project study area is located within the Core Foraging Area (CFA) of three (3) active wood stork colonies: Eagle Nest Park, Gatorland, and Lake Russell. The CFA for Eagle Nest Park and Gatorland consists of a 15.0-mile buffer, and the CFA for Lake Russell consists of an 18.6-mile buffer. None of these nesting colonies are located within one (1) mile of the project study area (see **Figure 4-1**). The primary concern for this species is loss of suitable foraging habitat within the CFA of a wood stork colony. Since anticipated impacts are more than 0.5 acres, a wood stork suitable foraging analysis was completed (**Appendix H**). There are 5.19 acres of wetlands that could be utilized by the wood stork for foraging within the Preferred Alternative. Wood stork foraging biomass productivity is calculated based on hydroperiods of class of affected wetlands. The Preferred Alternative will impact 5.19 acres of long hydroperiod wetlands and result in the net loss of 10.22 kg total (fish and crayfish) biomass.

As part of this project, impacts to wetlands within the project study area will be mitigated for within the CFA of one (1) or more of the affected rookeries or at a regional mitigation bank that has been approved by the USFWS or pursuant to Section 373.4137, F.S. Therefore, it has been determined that the proposed project "**may affect, not likely to adversely affect**" the wood stork. The path to this determination followed the key steps A→B→C→E→MANLAA as shown in **Appendix G**.

Everglade Snail Kite (*Rostrhamus sociabilis plumbeus*)

The Everglade snail kite is listed as ***endangered*** by the **USFWS** due to degradation of its restricted range of foraging habitat and its highly specific diet, which is made up almost exclusively of apple snails (*Pomacea paludosa*). Everglade snail kites typically prefer large, open, freshwater marshes and shallow lakes (< 4 ft. deep) with a low density of emergent vegetation and typically nest in low trees or shrubs over water (commonly willow, wax myrtle, pond apple, or buttonbush, but also in non-woody vegetation like cattail or sawgrass). They are protected under the Endangered Species Conservation Act, U.S. Migratory Bird Treaty Act and state wildlife laws. The nesting season for this species occurs between December 1 and July 31 and, if a nest is located on a property, requires two (2) buffer zones around each nest to be established: a 500-foot no-entry buffer zone and a 1,640-foot limited activity buffer zone. Everglade snail kites do not exhibit fidelity to a specific nest site from year to year.

The project study area is located in USFWS Everglade snail kite CA; however, no potential suitable snail kite habitat was observed, no snail kites have been documented, according to FNAI data, within one (1) mile of the project study area, and no individuals were observed during field

reviews. Therefore, it has been determined that the proposed project will have "**no effect**" on the Everglade snail kite.

Red-cockaded Woodpecker (*Picoides borealis*)

The red-cockaded woodpecker is small woodpecker that is listed as ***endangered*** by the **USFWS**. The red-cockaded woodpecker (RCW) is found primarily in open, mature pine woodlands that have a diversity of grass and forbs. Potential suitable habitat for this species was not observed within the project study area. The project study area is located in USFWS RCW CA; however, no potential suitable RCW habitat was observed, no RCWs have been documented, according to FNAI data, within one (1) mile of the project study area, and no individuals were observed during field reviews. Therefore, it has been determined that the proposed project will have "**no effect**" on the RCW.

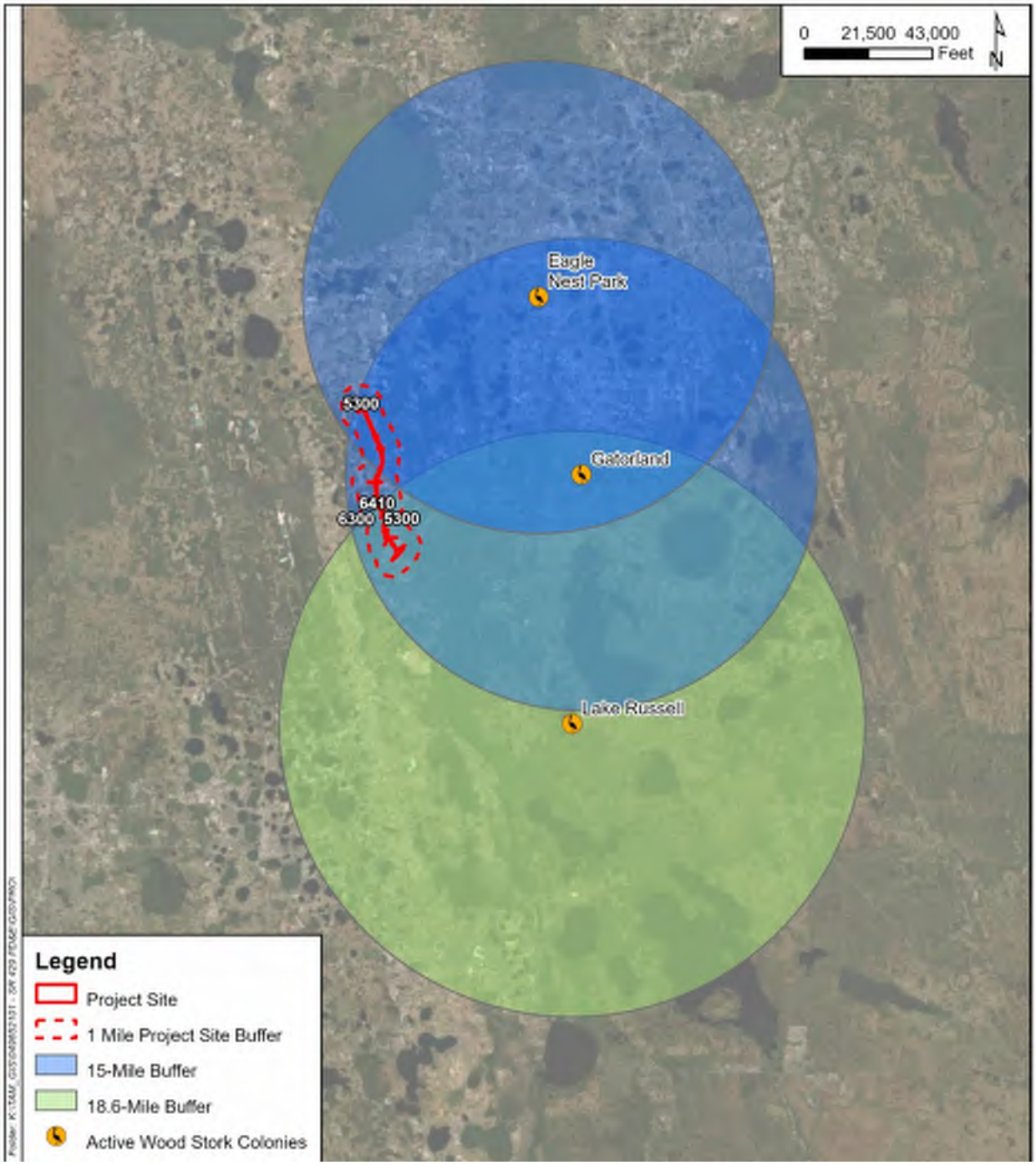

Figure 4-1 Wood Stork Core Foraging Map

4.2.2 State Protected Species

4.2.2.1 Flora

Ashe's Savory (*Calamintha ashei*)

Ashe's savory is a bushy shrub that has small whitish to lavender flowers that is listed as ***threatened*** by the **FDACS**. This species is a member of the mint (*Lamiaceae*) family and is found mostly in openings of pine scrub habitat in Florida but can also be found in disturbed areas such as abandoned fields, roadsides, and fire lanes. Preferred suitable habitat for this species was not observed within the project study area. According to FNAI data, Ashe's savory has the potential to occur within the project study area, but it has not been documented within one (1) mile of the project study area. Additionally, this species was not observed during the field reviews of the project study area. Based on this information, it has been determined that the project will have "**no effect anticipated**" on the Ashe's savory.

Celestial Lily (*Nemastylis floridana*)

The celestial lily is a perennial herb with a single, tall, slender stem and a dark blue flower that is listed as ***endangered*** by the **FDACS**. This species is a member of the iris (*Iridaceae*) family and occurs in wet flatwoods, prairies, marshes, and cabbage palm hammocks edges. Potential suitable habitat for this species was observed within the project study area. According to FNAI data, the celestial lily has the potential to occur within the project study area, but it has not been documented within one (1) mile of the project study area. Additionally, this species was not observed during the field reviews of the project study area. Based on this information, it has been determined that the project will have "**no effect anticipated**" on the celestial lily.

Chapman's sedge (*Carex chapmannii*)

Chapman's sedge is a perennial smooth sedge forming small to large tufts that is listed as ***threatened*** by the **FDACS**. This species is a member of the sedge (*Cyperaceae*) family and may occur in well-drained hammocks and floodplains of blackwater streams with intermittent floods. Potential suitable habitat for this species was not observed within the project study area. According to FNAI data, Chapman's sedge has the potential to occur within the project study area, but it has not been documented within one (1) mile of the project study area. Additionally, this species was not observed during the field reviews of the project study area. Based on this information, it has been determined that the project will have "**no effect anticipated**" on the Chapman's sedge

Cutthroat Grass (*Panicum abscissum*)

Cutthroat grass is a grass that grows approximately two (2) feet tall with purple panicles and is listed as ***endangered*** by the **FDACS**. This species is a member of the grass (*Poaceae*) family and occurs on dry prairies, mesic flatwoods, wet flatwoods, depressional marshes, and seepage slopes. Potential suitable habitat for this species was observed within the project study area. According to FNAI data, the cutthroat grass has the potential to occur within the project study area, but it has not been documented within one (1) mile of the project study area. Additionally, this species was not observed during the field reviews of the project study area. Based on this

information, it has been determined that the project will have "**no effect anticipated**" on the cutthroat grass.

Florida Beargrass (*Nolina atopocarpa*)

Florida beargrass is a perennial herb with long, stiff leaves and clusters of small white flowers that is listed as ***threatened*** by the **FDACS**. This species is a member of the agave (*Agavaceae*) family and occurs on pine flatwoods and scrubby flatwoods. Potential suitable habitat for this species was not observed within the project study area. According to FNAI data, the Florida beargrass has been historically documented within one (1) mile of the project study area; however, this species was not observed during the field reviews of the project study area. Based on this information, it has been determined that the project will have "**no effect anticipated**" on the Florida beargrass.

Florida Spiny-pod (*Matelea floridana*)

The Florida spiny-pod is a deciduous herbaceous vining plant that is listed as ***endangered*** by the **FDACS**. This species is a member of the milkweed (*Asclepiadaceae*) family and occurs on a variety of wooded habitats from fairly moist woods to upland hardwood forests. Potential suitable habitat for this species was observed within the project study area. According to FNAI data, the Florida spiny-pod has the potential to occur within the project study area, but it has not been documented within one (1) mile of the project study area. Additionally, this species was not observed during the field reviews of the project study area. Based on this information, it has been determined that the project will have "**no effect anticipated**" on the Florida spiny-pod.

Florida Willow (*Salix floridana*)

The Florida willow is a tall tree or shrub with gray bark and brittle, reddish-brown twigs that is listed as ***endangered*** by the **FDACS**. This species is a member of the willow (*Salicaceae*) family and occurs in springheads, edges of spring runs, hydric hammocks, and floodplains. Potential suitable habitat for this species was observed within the project study area. According to FNAI data, the Florida willow has the potential to occur within the project study area, but it has not been documented within one (1) mile of the project study area. Additionally, this species was not observed during the field reviews of the project study area. Based on this information, it has been determined that the project will have "**no effect anticipated**" on the Florida willow.

Giant Orchid (*Pteroglossaspis ecristata*)

The giant orchid is a perennial herb with yellow-green flowers twisted in towards the stalk that is listed as ***threatened*** by the **FDACS**. This species is a member of the orchid (*Orchidaceae*) family. This species occurs on sandhill, scrub, pine flatwoods, and pine rocklands. Potential suitable habitat for this species was not observed within the project study area. According to FNAI data, the giant orchid has the potential to occur within the project study area, but it has not been documented within one (1) mile of the project study area. Additionally, this species was not observed during the field reviews of the project study area. Based on this information, it has been determined that the project will have "**no effect anticipated**" on the giant orchid.

Hartwrightia (*Hartwrightia floridana*)

Hartwrightia is listed as ***threatened*** by the **FDACS**. This species is a member of the composite (*Asteraceae*) family and occurs on seepage slopes, edges of baygalls and springheads, wet prairies, and flatwoods with wet, peaty soils. Potential suitable habitat for this species was not observed within the project study area. According to FNAI data, the hartwrightia has the potential to occur within the project study area, but it has not been documented within one (1) mile of the project study area. Based on this information, it has been determined that the project will have "**no effect anticipated**" on the hartwrightia.

Incised Groove-bur (*Agrimonia incisa*)

Incised groover-bur is a perennial herb that grows to about 4 feet tall with hairy leaves and yellow flowers that is listed as ***threatened*** by the **FDACS**. This species is a member of the rose (*Rosaceae*) family and occurs in dry to moist longleaf pine-oak woods, oak-hickory slopes, roadsides, sand or shell maritime thickets. Potential suitable habitat for this species was not observed within the project study area. According to FNAI data, the incised groove-bur has the potential to occur within the project study area, but it has not been documented within one (1) mile of the project study area. Additionally, this species was not observed during field reviews of the project study area. Based on this information, it has been determined that the project will have "**no effect anticipated**" on the incised groove-bur.

Many-Flowered Grass-Pink (*Calopogon multiflorus*)

The many-flowered grass-pink is a small plant with grass like leaves and dark pink flowers that is listed as ***threatened*** by the **FDACS**. This species is a member of the orchid (*Orchidaceae*) family and occurs on dry to moist flatwoods with longleaf pine, saw palmetto, and wiregrass. Potential suitable habitat for this species was not observed within the project study area. According to FNAI data, the many-flowered grass-pink has the potential to occur within the project study area, but it has not been documented within one (1) mile of the project study area. Additionally, this species was not observed during the field reviews of the project study area. Based on this information, it has been determined that the project will have "**no effect anticipated**" on the many-flowered grass pink.

Nodding Pinweed (*Lechea cernua*)

The nodding pinweed is a small erect forb that is listed as ***threatened*** by the **FDACS**. This species is a member of the rock-rose (*Cistaceae*) family and is found in deep sands, usually ancient dunes, on which the most common forest is a mixture of evergreen scrub oaks. Potential suitable habitat for this species was not observed within the project study area. According to FNAI data, the nodding pinweed has been historically documented within one (1) mile of the project study area. However, this species was not observed during the field reviews of the project study area. Based on this information, it has been determined that the project will have "**no effect anticipated**" on the nodding pinweed.

Piedmont Jointgrass (*Coelorachis tuberculosa*)

Piedmont jointgrass is a perennial grass that is listed as ***threatened*** by the **FDACS**. This species is a member of the grass (*Poaceae*) family and is found mostly in moist to wet areas in bogs and

pinewoods. Potential suitable habitat for this species was not observed within the project study area. According to FNAI data, Piedmont jointgrass has the potential to occur within the project study area, but it has not been documented within one (1) mile of the project study area. Additionally, this species was not observed during the field reviews of the project study area. Based on this information, it has been determined that the project will have "**no effect anticipated**" on the Piedmont jointgrass.

Pine Pinweed (*Lechea divaricate*)

Pine pinweed is a perennial herb with slender, erect flowering stems rising from a dense mat of spreading, older stems that is listed as ***endangered*** by the **FDACS**. This species is a member of the rockrose (*Cistaceae*) family and is found mostly in scrub and scrubby flatwoods. Potential suitable habitat for this species was not observed within the project study area. According to FNAI data, pin pinweed has the potential to occur within the project study area, but it has not been documented within one (1) mile of the project study area. Additionally, this species was not observed during the field reviews of the project study area. Based on this information, it has been determined that the project will have "**no effect anticipated**" on the pine pinweed.

Pine-woods Bluestem (*Andropogon arctatus*)

Pine-woods bluestem is a perennial grass that grows up to 5 feet tall that is listed as ***threatened*** by the **FDACS**. This species is a member of the grass (*Poaceae*) family and is found mostly in open flatwoods, savanna, sand pine scrub, and can be found in seepage bogs. Potential suitable habitat for this species was not observed within the project study area. According to FNAI data, pine-woodsbluestem has the potential to occur within the project study area, but it has not been documented within one (1) mile of the project study area. Additionally, this species was not observed during the field reviews of the project study area. Based on this information, it has been determined that the project will have "**no effect anticipated**" on the pine-woods bluestem.

Sand Butterfly Pea (*Centrosema arenicola*)

The sand butterfly pea is a large perennial vine with purplish-blue flowers that is listed as ***endangered*** by the **FDACS**. This species is a member of the pea (*Fabaceae*) family and typically occurs on sandhill, scrubby flatwoods, and dry upland woods. Potential suitable habitat for this species was observed within the project study area. According to FNAI data, the sand butterfly pea has the potential to occur within the project study area, but it has not been documented within one (1) mile of the project study area. Additionally, this species was not observed during the field reviews of the project study area. Based on this information, it has been determined that the project will have "**no effect anticipated**" on the sand butterfly pea.

Scrub Bluestem (*Schizachyrium niveum*)

The scrub bluemstem is a small, tufted grass that is listed as ***endangered*** by the **FDACS**. This species is a member of the grass (*Poaceae*) family and typically occurs on white sand patches in rosemary scrub, and in sand pine scrub and oak scrub. Potential suitable habitat for this species was not observed within the project study area. According to FNAI data, the scrub bluestem has the potential to occur within the project study area, but it has not been documented within one (1) mile of the project study area. Additionally, this species was not observed during the field reviews

of the project study area. Based on this information, it has been determined that the project will have "**no effect anticipated**" on the scrub bluestem.

Star Anise (*Illicium parviflorum*)

Star anise is a shrub with one (1) to several trunks, 6-inch long, evergreen leaves, and small, drooping flowers that is listed as ***endangered*** by the **FDACS**. This species is a member of the anisetree (*Illiciaceae*) family and occurs in banks of seepage stream, bottomland forest, hydric hammock, or baygall. Potential suitable habitat for this species was observed within the project study area. According to FNAI data, star anise has the potential to occur within the project study area; however, it has not been documented within one (1) mile of the project study area. Additionally, this species was not observed during the field reviews of the project study area. Based on this information and the lack of preferred habitat within the study area, it has been determined that the project will have "**no effect anticipated**" on the star anise.

4.2.2.2 Fauna

Reptilian

Gopher Tortoise (*Gopherus polyphemus*)

The gopher tortoise is listed as ***threatened*** by the **FWC** and is a candidate species for listing under the ESA by USFWS. This species requires well-drained and loose sandy soils for burrowing and low-growing herbs and grasses for food. These conditions are best found in the sandhill (longleaf pine-xeric oak) community, although tortoises are known to use many other habitats including sand pine scrub, xeric oak hammocks, dry prairies, pine flatwoods, and ruderal sites. Potential suitable habitat and one (1) abandoned gopher tortoise burrow was observed within the project study area. According to FNAI data, individuals have been documented within one (1) mile of the project study area. If gopher tortoises or potentially occupied burrows are found within the project study area, FTE will coordinate with the FWC to secure all permits needed to relocate the tortoises and associated commensal species prior to construction. With the implementation of these measures, it has been determined that this project will have "**no adverse effect anticipated**" on the gopher tortoise.

Florida pine snake (*Pituophis melanoleucus mugitus*)

The Florida pine snake is listed as **threatened** by **FWC**. This species requires dry, sandy soils for burrowing and is most often found in pine hammocks, turkey oak hammocks, scrub, sandhill, and abandoned agricultural fields. Potential suitable habitat for this species was observed within the project study area; however, no individuals were observed during field reviews. Additionally, according to FNAI data, no individuals have been documented within one (1) mile of the project study area. Based on this information, it has been determined that the project will have "**no adverse effect anticipated**" on the Florida pine snake.

Avian

Florida Burrowing Owl (*Athene cunicularia floridana*)

The Florida burrowing owl is a small, ground-dwelling owl that is listed as ***threatened*** by the **FWC**. This species requires areas of short, herbaceous groundcover such as prairies, sandhills, and farmland. Potential suitable habitat for this species was not observed within the project study area and no individuals were observed during field reviews. Additionally, according to FNAI data, no individuals have been documented within one (1) mile of the project study area. Based on this information, it has been determined that the project will have "**no adverse effect anticipated**" on the Florida burrowing owl.

Wading Birds - Little Blue Heron *(Egretta caerulea),* Tricolored Heron *(Egretta tricolor),* and Roseate Spoonbill *(Platalea ajaja)*

The little blue heron, tricolored heron, and roseate spoonbill are listed as ***threatened*** by the **FWC**. While each species is distinct, wading birds are discussed collectively since they occupy similar habitats and have similar feeding patterns. These wading birds nest and forage among both fresh and saltwater habitats such as freshwater marshes, coastal beaches, mangrove swamps, cypress swamps, hardwood swamps, wet prairies and bay swamps. The populations of these species have been primarily impacted by the destruction of wetlands for development and by the drainage of wetlands for flood control and agriculture. Potential suitable habitat for these species was observed within the project study area. According to FNAI data and the FWC Wading Bird Rookery Database, none of these species or rookeries have been documented within the project study area and none were observed during field reviews.

The primary concern for impacts to these species is the loss of foraging habitat (wetlands). As part of implementing the proposed project, all wetland impacts will be mitigated to prevent a net loss of wetland habitat functions and values. Since the mitigation of wetland impacts will be undertaken by FTE, it has been determined that the proposed project will have "**no adverse effect anticipated**" on the little blue heron, tricolored heron, and roseate spoonbill.

Florida Sandhill Crane (*Antigone canadensis pratensis*)

The Florida sandhill crane is a tall, long-necked, long-legged crane that is listed as ***threatened*** by the **FWC**. This species requires wet and dry prairies, marshes, and marshy lake edges. Nests are generally a mound of herbaceous plant material in shallow water or on the ground in marshy areas. While there is minimal suitable habitat within the project study area, according to FNAI data, no individuals have been documented within one (1) mile of the project study area. Additionally, no individuals or nests were observed during field reviews. FTE will survey areas of suitable nesting habitat prior to construction if construction activities take place during the nesting season (January through July), and will coordinate with the FWC if nesting pairs are identified within 400 feet of the project's construction limits. With the implementation of these measures, it has been determined that the project will have "**no adverse effect anticipated**" on the Florida sandhill crane.

Southeastern American Kestrel (*Falco sparverius paulus*)

The southeastern American kestrel is the smallest falcon in United States. It is listed as ***threatened*** by the **FWC**. Kestrels are secondary cavity nesters using abandoned woodpecker cavities and prefer to nest in open pine habitats, woodland edges, prairies, and pastures throughout much of Florida. Nest sites are in tall dead trees or utility poles generally with an unobstructed view of surroundings. Sandhill habitats seem to be preferred, but kestrels have been observed in flatwoods settings. Open patches of grass or bare ground are necessary for kestrels to effectively utilize flatwoods settings, since thick palmettos may prevent detection of prey. Within the project study area, suitable habitat for the southeastern American kestrel was observed but is limited and cavity trees were not observed during field reviews. Additionally, according to FNAI data, no individuals have been documented within one (1) mile of the project study area and no individuals or nests were observed during field reviews. Based on this information, it has been determined that the project will have "**no adverse effect anticipated**" on the southeastern American kestrel.

4.2.2.3 Other Species of Concern

Bald Eagle (*Haliaeetus leucocephalus*)

The bald eagle is a large raptor with a distinctive white head and yellow bill. This species has been federally de-listed by the **USFWS**. However, it remains federally protected under the Bald and Golden Eagle Protection Act (BGEPA) in accordance with the 16 United States Code 668 and the Migratory Bird Treaty Act of 1918. In addition, the FWC has implemented a bald eagle management plan (FWC 2008). The bald eagle tends to utilize riparian habitat associated with coastal areas, lake shorelines, and river banks. Nests are generally located near water bodies that provide a dependable food source. The Florida Audubon closely monitors nests within Florida and maintains a website of known bald eagle nest locations, which was last updated in 2021. According to this database, one (1) active bald eagle nest is located within one (1) mile of the project study area. Bald eagle nest OS193 is located approximately 0.8 miles (4,118 feet) west of Western Beltway (SR 429) (**Figure 4-2**). The project is located outside of the primary (330 feet) and secondary (660 feet) nest buffer zones. Nest OS193 was last surveyed and determined active in 2021. No bald eagle nests were observed within 660 feet of the project study area during field reviews. During design and permitting, FTE will survey the project study area for eagle nests. If a nest is observed within 660 feet of the project limits, FTE will coordinate with the USFWS to secure all necessary permits.

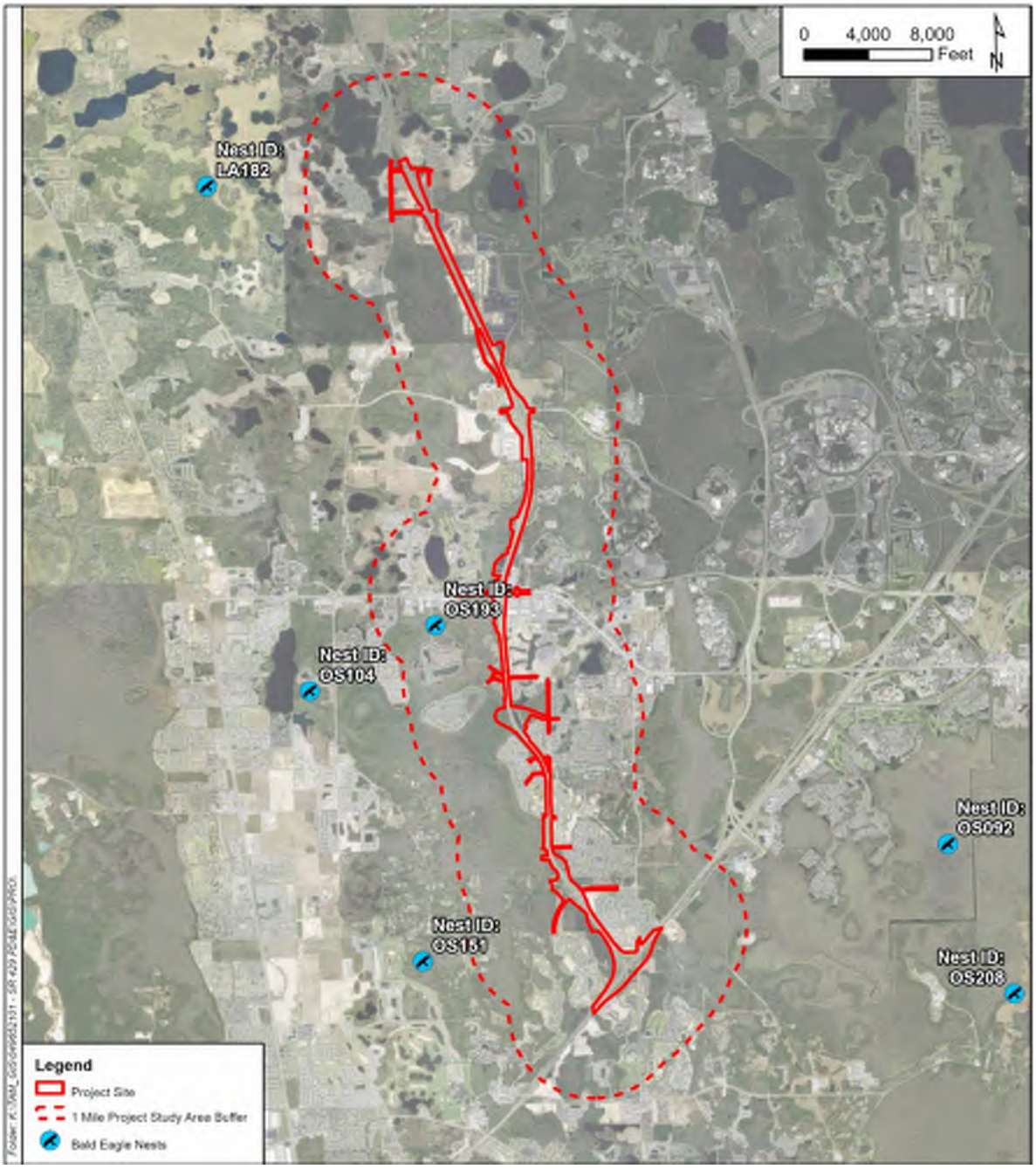

Figure 4-2 Bald Eagle Nest Location Map

4.2.3 Wildlife Crossings

The Preferred Alternative includes the extension of the various existing culverts at Whittenhorse Creek and Boggy Creek, as well as others not connecting named systems, which allow for connectivity of the wetland systems and small animal crossing under the existing roadway. Based on the existing roadway and the lack of conservation lands on both sides of the existing facility, the opportunity for wildlife crossings is limited according to FDOT wildlife corridor guidelines. Technical assistance with USFWS in October 2020 determined that no specific wildlife crossings or wildlife crossing retrofits were requested.

The Wildlife Permeability along Interstate 4 report was published in June 2020 and lists an opportunity for wildlife crossings in various locations. The report includes reference that the authors will conduct future studies of Target Wildlife Corridors to connect suitable panther corridors and natural habitats. The SR 429 crossing at Whittenhorse Creek was identified as part of a "Target Wildlife Corridor" by this report. FDOT will continue coordinating with the USFWS on wildlife connectivity issues as the project moves into Design and the Permeability study progresses in the future.

4.2.4 Critical Habitat

The project study area was evaluated for the occurrence of Critical Habitat as defined by the ESA of 1973 as amended and 50 CFR part 424. The USFWS is the authority, as a federal agency, to protect critical habitat from destruction or adverse modification of the biological or physical constituent elements essential to the conservation of listed species. Critical Habitat is defined as the specific areas within the geographical area occupied by a species on which are found those physical or biological features essential to the conservation of the species and which defined may require special management considerations or protection. No designated Critical Habitat for any federal listed species occurs within the project study area. Based on this information, it has been determined that the proposed project will have "**no effect**" on any Critical Habitat.

4.2.5 Indirect, Secondary, and Cumulative Impacts

Indirect and secondary effects are those that are reasonably certain to occur later in time as a result of the proposed project and may occur outside of the area directly affected by the proposed project. Potential secondary effects include increased noise, traffic, lighting and development, which could impact wildlife. Cumulative effects include the effects on the environment that results from the incremental impact of the action when added to other past, present, and future state, local, or private actions that are reasonably certain to occur in the project study area. Cumulative effects can result from individually minor but collectively significant actions taking place over time. Future federal actions that are unrelated to the proposed project are not considered in the determination of cumulative effects because they require a separate consultation in accordance with Section 7 of the ESA. Indirect, secondary, and cumulative impacts will be further defined and addressed through agency coordination during the project's design phase. However, a brief summary of these impacts is provided in sections below.

4.2.5.1 Preferred Alternative

Indirect, secondary, and cumulative impacts associated with the proposed project will likely be low as the majority of the project is within existing roadway ROW. Indirect, secondary, and cumulative effects are anticipated to impact land use, visual and aesthetic resources and transportation.

Secondary wetland impacts are anticipated to be limited to Livingston Rd, where a new interchange will be constructed. Secondary impacts of increased nuisance/exotic vegetation are anticipated adjacent to areas of direct impacts. Species such as Brazilian pepper (*Schinus terebinthifolia*) and cogongrass (*Imperata cylindrica*) are particularly aggressive and successful colonizers. Therefore, the disturbance of construction may allow these species to colonize and outcompete native vegetation within a certain distance from the direct impact. Nuisance/exotic vegetation has negative impacts to native wildlife and their habitats as they take over the natural habitats upon which the species rely.

4.2.5.2 No-Build Alternative

There are no indirect, secondary, or cumulative impacts to wildlife associated with the No-Build Alternative.

5.0 WETLANDS EVALUATION

5.1 Wetland and Surface Water Impacts

The jurisdictional limits of wetlands and surface waters were estimated in accordance with the State unified wetland delineation methodologies as adopted by the Florida Department of Environmental Protection (FDEP) and the water management districts per Chapter 62-340, F.A.C. and described in *The Florida Wetlands Delineation Manual* and the USACE 1987 Wetland Delineation Manual and regional supplement. The extent and types of wetlands in the project study area were documented in accordance with Executive Order 11990, Protection of Wetlands, and Part 2, Chapter 9 of the PD&E Manual.

FTE has undertaken all actions to minimize the destruction, loss or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands in carrying out the agency's responsibilities. Nonetheless, FTE has determined that there is no practicable alternative to construction impacts occurring in wetlands. Any unavoidable impacts to wetlands will be mitigated to achieve no net loss of wetland function. Impacts to wetlands are unavoidable for the build alternatives due to their location within the project area. However, potential wetland impacts have been minimized to the extent possible by incorporating bridges over large wetland systems a stormwater management system which would be constructed to meet state water quality criteria, thereby minimizing water quality impacts from stormwater discharges from roadway surfaces.

An ETDM Programming Screen Summary Report was published on January 8, 2021 containing comments from the ETAT on the project's effects on various natural, physical and social resources. The USFWS, NMFS, SFWMD, FDEP, U.S. Environmental Protection Agency (EPA), and U.S. Army Corps of Engineers (USACE) were commenting agencies for Wetlands and Surface Waters. Wetlands and Surface Waters were assigned a degree of effect of 2 – Minimal.

For the purposes of this document, wetlands are defined as per 62.340 F.A.C. and Section 373.019 (27), F.S. Surface waters are defined as open water bodies. Formal wetland boundary delineation and surveys were not conducted as part of this study and will be completed as part of the state and federal permit process.

The project study area is defined as the area occupied by the build alternatives for the roadway extension as described in **Section 2.0**. The No-Build Alternative would result in no impacts to wetlands or surface waters. Potential direct impacts to wetlands and surface waters were assessed for the Preferred Alternative (**Table 5-1).** Impacts associated with the Preferred Alternative total 11.92 acres and include 5.19 acres of wetlands and 6.73 acres of surface waters. Wetlands that are under a conservation easement within the Preferred Alternative included 1.89 acres. A map showing the locations of the proposed wetland impacts associated with the Preferred Alternative is provided in **Appendix C**. Under Section Florida Statute 704.6(11)(a), the use of lands under conservation easements can be negotiated for the construction and operation of linear facilities including public transportation corridors.

Mitigation alternatives for the preferred build alternative's impacts to conservation easements will be coordinated with the various regulatory agencies including the holder of the conservation easements and will be defined more completely during any future design/permitting phase.

Conceptual mitigation options for proposed impacts being reviewed during the design/permitting phase are anticipated to consider:

1. Available mitigation bank credit purchase to offset impacts to uplands/wetlands/listed species, and
2. Consideration for purchase/protection/donation to state land management agency of similar habitat acreage/condition not currently protected.

Secondary and indirect impacts will be assessed using the Uniform Mitigation Assessment Methodology (UMAM) at the time of permitting to determine loss within these systems and to estimate the mitigation.

Table 5-1 Proposed Wetland and Surface Water Impacts

ID	FLUCFCS Classification[1]	FLUCFCS Description	USFWS Classification[2]	Preferred Alternative Impact Acreage
WL 01	630	Wetland Forested Mixed	PFO1/3	3.05
WL Conservation Easements	630	Wetland Forested Mixed	PFO1/3	1.89
WL 02	641	Freshwater Marshes	PEM1C	0.25
SW 01	530	Reservoir	PUBHx	6.73
			Total Wetland Impacts	**5.19**
			Total Surface Water Impacts	**6.73**
			Total Impacts	**11.92**

[1] UMAM scores have not been approved by permitting agencies and are subject to change during the permitting process.

PFO1/3: Palustrine, Forested, Broad-leaved Deciduous, Broad-leaved Evergreen
PEM1C: Palustrine, Emergent, Persistent, Seasonally Flooded
PUBHx: Palustrine, Unconsolidated Bottom, Permanently Flooded, excavated

5.2 Uniform Mitigation Assessment Methodology

The UMAM per Chapter 62-345, F.A.C., is a state and federally approved method used to assess wetlands in the State of Florida. UMAM was developed by the FDEP and the water management districts to determine the amount of mitigation required to offset adverse impacts to wetlands. The methodology was designed to assess functions provided by wetlands, the amount those functions are reduced by a proposed impact, and the amount of mitigation necessary to offset the proposed functional losses. This method is also used to determine the degree of improvement in ecological value that will be created by proposed mitigation activities.

The UMAM assessment includes a Qualitative Characterization (Part 1) as well as a Quantitative Assessment and Scoring (Part 2). The Qualitative Assessment is a basic descriptor of the site being evaluated. The variables described include the following:

- Significant nearby features,
- Water classifications,
- Assessment area size,
- Hydrology and relationship to contiguous off-site wetlands,
- Uniqueness of the assessment area,
- Functions of the assessment area, and
- Wildlife utilization.

The Quantitative Assessment provides a score of the assessment area in both the current condition and "with impact" condition. The assessment scoring evaluates the following parameters:

- Location and landscape support,
- Water environment, and
- Vegetative community.

5.3 Uniform Mitigation Assessment Results

For this PD&E Study, representative UMAM scores were developed for each wetland and surface water habitat type (by FLUCFCS category) affected by the proposed project.

To calculate functional loss, the difference between the existing condition (current) scores and the proposed condition (with) scores for each habitat type within the Preferred Alternative was multiplied by the acreage of proposed impact to determine the lost value of functions to fish and wildlife resulting from construction of the Preferred Alternative. The completed UMAM data sheets for each habitat type within the Preferred Alternative are provided in **Appendix D**. Functional loss was calculated by habitat type for the Preferred Alternative. Construction of the Preferred Alternative would result in an estimated loss of 3.84 functional units.

These UMAM calculations are estimates and are based on existing conditions. The UMAM scores and values presented in **Table 5-2** are subject to agency review and may not be indicative of values determined during the design and permitting phases.

Table 5-2 Estimated UMAM Functional Loss for Wetlands in the Preferred Alternative (Direct Impacts)

Representative Wetlands	FLUCFCS Classification	FLUCFCS Description	USFWS Classification	UMAM[1] Delta	Impact Acres	Functional Loss
WL 01	630	Wetland Forested Mixed	PFO1/3	-0.67	3.05	2.03
WL Conservation Easements	630	Wetland Forested Mixed	PFO1/3	-0.87	1.89	1.64
WL 02	641	Freshwater Marshes	PEM1C	-0.67	0.25	0.17
				Total	**5.19**	**3.84**

[1] UMAM scores have not been approved by permitting agencies and are subject to change during the permitting process.

PFO1/3: Palustrine, Forested, Broad-leaved Deciduous, Broad-leaved Evergreen

PEM1C: Palustrine, Emergent, Persistent, Seasonally Flooded

PUBHx: Palustrine, Unconsolidated Bottom, Permanently Flooded, excavated

5.4 Avoidance and Minimization

As part of this evaluation, five (5) build alternatives were evaluated in this PD&E study. The Preferred Alternative was selected based on the natural, physical, social, and right of way information. Avoidance and minimization measures for wetlands and surface water impacts were considered in the selection of the Preferred. A detailed alternatives analysis is included in the Preliminary Engineering Report.

5.5 Indirect, Secondary, and Cumulative Impacts

Indirect and secondary effects are those impacts that are reasonably certain to occur later in time as a result of the proposed project. They may occur outside of the area directly affected by the proposed project. Cumulative effects include the effects of future state, local, or private actions that are reasonably certain to occur in the project area. Indirect, secondary, and cumulative impacts will be further defined and addressed through agency coordination during the project's design phase. However, a brief summary of these impacts is provided below.

5.5.1 Preferred Alternative

Indirect impacts are anticipated to occur as a result of the Preferred Alternative. Secondary impacts of edge effects will likely occur. At locations where natural areas meet development, edge effects such as increased cover of nuisance/exotic vegetation and changes in microclimate generally take place. All of the wetlands within the Preferred Alternative project footprint already experience edge effects as they are within or adjacent to roadway ROW. In areas designated for stormwater treatment, secondary impacts of increased nuisance/exotic vegetation are anticipated. Species such as Brazilian pepper (*Schinus terebinthifolia*) and cogongrass (*Imperata cylindrica*) are particularly aggressive and successful colonizers within newly disturbed areas. Therefore, the disturbance of construction may allow these species to colonize and outcompete native vegetation. Nuisance/exotic vegetation has negative impacts to wetlands and surface

waters as these species may take over native vegetation. Since wetland impacts resulting from the construction of this project will be mitigated, no cumulative impacts are anticipated to occur. Potential secondary wetland impacts were evaluated and assessed as part of the Preferred Alternative Evaluation Report. Direct, secondary and indirect wetland impacts will be assessed during the design phase for this project and will also include identification of mitigation needs to offset any unavoidable wetland impacts, at which time mitigation required will be quantified and pursued.

5.5.2 No-Build Alternative

There are no indirect, secondary, or cumulative impacts to wetlands associated with the No-Build Alternative.

5.6 Mitigation

In 2008, the USACE and the EPA issued regulations governing compensatory mitigation for activities authorized by the Department of the Army (Federal Register, 2008). These regulations, as promulgated in 33 Code of Federal Regulations (CFR) Part 332, establish a hierarchy for determining the type and location of compensatory mitigation. To briefly summarize, the rule establishes a preference for the use of mitigation bank credits if a mitigation bank has the appropriate number and resource type of credits available. If the permitted impacts are not in the service area of an approved mitigation bank, or if the appropriate number and resource type of credits are otherwise unavailable, then the rule establishes a preference for in lieu fee program credits. If an approved mitigation bank or in-lieu fee program cannot be used to provide the required compensatory mitigation, the rule establishes a preference for permittee responsible mitigation conducted under a watershed approach. Wetland impacts which will result from the construction of this project will be mitigated pursuant to Section 373.4137, F.S., to satisfy all mitigation requirements of Part IV of Chapter 373, F.S., and 33 U.S.C. §1344. Compensatory mitigation for this project will be completed through the use of mitigation banks and any other mitigation options that satisfy state and federal requirements. The proposed project will have no significant short-term or long-term adverse impacts to wetlands because any unavoidable impacts to wetlands will be mitigated to achieve no net loss of wetland function.

Compensatory mitigation for this project will be completed using mitigation banks and other mitigation options to satisfy state and federal requirements. The project study area is currently located within the service area of the following mitigation banks: Hatchineha Ranch, Kissimmee Ridge, Collany, Southport Ranch, Twin Oaks, Florida, Shingle Creek, Reedy Creek and Split Oak Forest. As of the date of this NRE, federal and/or state credits are available Southport Ranch, Florida, and Reedy Creek Mitigation Banks. State only credits are currently available through Hatchineha Ranch, Shingle Creek, and Twin Oaks Mitigation Banks. Credit availability for Kissimmee Ridge and Split Oak Forest was not readily accessible at the date of this NRE. Collany Mitigation Bank is a conservation bank that provide mitigation credits for protected species impacts.

All UMAM scores, UMAM calculations, preliminary wetland lines and determinations discussed are subject to revision and approval by regulatory agencies during the permitting process. The exact type of mitigation used to offset wetland impacts from the proposed Western Beltway (SR

429) widening will be coordinated with the FDEP and SFWMD during the permitting phase(s) of this project.

6.0 PERMITTING REQUIREMENTS AND COORDINATION

The FDEP, RCID, and SFWMD regulate impacts to wetlands within the project study area. Other agencies, including the USFWS, NMFS, EPA, and the FWC, review and comment on wetland permit applications. The FWC also issues permit for gopher tortoise relocation activities and incidental takes for state protected avian species and the USFWS is the lead agency for eagle nest take permitting or coordination. In addition, the FDEP regulates stormwater discharges from construction sites. The complexity of the permitting process will depend on the degree of the impact to jurisdictional areas. It is anticipated that the following permits will be required for this project:

Permit	**Issuing Agency**
Environmental Resource Permit (ERP)	RCID and FDEP
Section 404 State Assumption	FDEP
National Pollutant Discharge Elimination System (NPDES)	FDEP
Gopher Tortoise Relocation Permit (as necessary)	FWC
Incidental Take Permit (as necessary)	FWC

Environmental Resource Permit

The current Western Beltway (SR 429) roadway was previously permitted through FDEP with review of the application by the RCID prior to permit approval. Pre-application meetings were held with both RCID and FDEP (**Appendix I**). FDEP will be the lead permitting agency for the project with the permit application will be submitted to the RCID for review and comment before submitting to the FDEP. An ERP is required when construction of any project results in the creation of a new or modification of an existing surface water management system or results in impacts to waters of the state, including wetlands. As with USACE permits, the complexity associated with the ERP permitting process will depend on the size of the project and/or the extent of wetland impacts. Under current state rules, the FDEP will likely require an individual permit for this project.

FDEP State 404 Program

In 2018, FDEP was given the authority to begin the rulemaking process to assume the federal dredge and fill permitting program under section 404 of the Clean Water Act within state-assumed waters. This process was completed in July 2020 and created the State 404 Program within Chapter 62-330 and 62-331, F.A.C. to facilitate this assumption. This State 404 Program is responsible for overseeing permitting for any project proposing dredge or fill activities within state-assumed waters. The State 404 Program is a separate program from the existing ERP program, and projects within the state-assumed waters require both an ERP and a State 404 Program

authorization. The wetlands and surface waters associated with this project would fall under the state-assumed waters definition and therefore would require a permit through this program.

NPDES

40 CFR Part 122 prohibits point source discharges of stormwater to waters of the U.S. without a NPDES permit. Under the State of Florida's delegated authority to administer the NPDES program, construction sites that will result in greater than one (1) acre of disturbance must file for and obtain either coverage under an appropriate generic permit contained in Chapter 62-621, F.A.C., or an individual permit issued pursuant to Chapter 62-620, F.A.C. A major component of the NPDES permit is the development of a Stormwater Pollution Prevention Plan (SWPPP). The SWPPP identifies potential sources of pollution that may reasonably be expected to affect the quality of stormwater discharges from the site and discusses good engineering practices (i.e., best management practices) that will be used to reduce the pollutants.

FWC Gopher Tortoise Relocation Permit (as necessary)

At the time of the site reviews, one (1) abandoned and no potentially occupied gopher tortoise burrows were observed within or adjacent to the project study area. If gopher tortoises or potentially occupied burrows are found within the project limits, FTE will coordinate with the FWC to secure all permits needed to relocate the tortoises and associated commensal species prior to construction. FWC requires the excavation and relocation of any gopher tortoise burrows and individuals within the project limits prior to construction.

According to the FWC Gopher Tortoise permitting guidelines, there are four (4) available options to address the presence of gopher tortoises on lands slated for development:

1. Avoid development,
2. Avoid destruction of tortoise burrows,
3. Relocate tortoises on site (permit required), or
4. Relocate tortoises off site (permit required).

In accordance with the requirements of Rules 68A-25.002 and 68A-27.004 F.A.C., a permit for gopher tortoise capture/release activities must be secured from FWC before initiating any relocation work. A Conservation Permit is available for development projects that require the relocation of gopher tortoises when more than 10 burrows occur on the development site. The 10 or Fewer Burrows Permit is available for projects that contain 10 or fewer gopher tortoise burrows on the development site. Both of these permits allow for relocation either to an on-site preserve or off-site to a FWC-certified Recipient Site. The FWC will require a 100 percent gopher tortoise survey to be conducted within 90 days of construction commencement.

FWC Incidental Take Permit (as necessary)

Based on field reviews, suitable foraging and nesting habitat exists within the project study area for the species listed in **Section 5.2.2**. In accordance with 68A-27.001(4), 68A-27.003(a), 68A-25.002(10), 68A-27.003(2)(a), 68A-27.001(4), 68A-1.004, and 68A-27.005 F.A.C., a permit for

removal of state protected species must be secured from the FWC before initiating incidental take.

While avoidance and minimization is the preferred course of action, a Listed Species Incidental Take Permit is available for situations that require the removal of these species. Further technical assistance will be reinitiated during the design phase of the project.

7.0 CONCLUSIONS

7.1 Protected Species and Habitat

The project study area was evaluated for the presence of federal and/or state protected species and their suitable habitat in accordance with Section 7 of the ESA and Part 2, Chapter 16 of the PD&E Manual. **Tables 7-1, 7-2**, and **7-3** summarize the impact determination that has been made for each federal and state listed species based upon their probability ranking and the implementation measures and/or commitments to offset any potential impacts to each species.

Table 7-1 Federal Protected Species Impact Determinations

Project Impact Determination	Federal Listed Species
"No effect"	***Flora***
	Avon Park rabbit-bells (*Crotalaria avonensis*)
	Beautiful pawpaw (*Deeringothamnus pulchellus*)
	Britton's beargrass (*Nolina brittoniana*)
	Carter's warea (*Warea carteri*)
	Clasping warea (*Warea amplexifolia*)
	Florida blazing star (*Liatris ohlingerae*)
	Florida bonamia (*Bonamia grandiflora*)
	Florida jointweed (*Polygonella basiramia*)
	Garrett's scrub balm (*Dicerandra christmanii*)
	Highlands scrub hypericum (*Hypericum cumulicola*)
	Lewton's polygala (*Polygala lewtonii*)
	Papery nailwort (*Paronychia chartacea ssp. Chartacea*)
	Perforate reindeer lichen (*Cladonia perforata*)
	Pygmy fringe tree (*Chionanthus pygmaeus*)
	Scrub buckwheat (*Eriogonum longifolium var. gnaphalifolium*)
	Scrub lupine (*Lupinus aridorum*)
	Scrub mint (*Dicerandra frutescens*)
	Scrub pigeon-wing (*Clitoria fragrans*)
	Scrub plum (*Prunus geniculata*)
	Short-leaved rosemary (*Conradina brevifolia*)
	Small's jointweed (Polygonella myriophylla)
	Fauna
	Crested caracara (*Caracara cheriway*)
	Florida grasshopper sparrow (*Ammodramus savannarum floridanus*)
	Florida scrub-jay (*Aphelocoma coerulescens*)
	Everglade snail kite (*Rostrhamus sociabilis*)
	Red-cockaded woodpecker (*Picoides borealis*)

"May effect, but not likely to adversely affect"	***Fauna***
	American alligator (*Alligator mississippiensis*)
	Blue-tailed mole skink (*Plestiodon egregius lividus*)
	Eastern indigo snake (*Drymarchon couperi*)
	Sand skink (*Plestiodon reynoldsi*)
	Wood stork (*Mycteria americana*)

Table 7-2 State Protected Species Impact Determinations

Project Impact Determination	State Listed Species
“No effect anticipated”	***Flora***
	Ashe's savory (*Calamintha ashei*)
	Celestial lily (*Nemastylis floridana*)
	Chapman's sedge (*Carex chapmanii*)
	Cutthroat grass (*Panicum abscissum*)
	Florida beargrass (*Nolina atopocarpa*)
	Florida spiny-pod (*Matelea floridana*)
	Florida willow (*Salix floridana*)
	Giant orchid (*Pteroglossaspis ecristata*)
	Hartwrightia (*Hartwrightia floridana*)
	Incised groove-bur (*Agrimonia incisa*)
	Many-flowered grass-pink (*Calopogon multiflorus*)
	Nodding pinweed (*Lechea cernua*)
	Piedmont jointgrass (*Coelorachis tuberculosa*)
	Pine pinweed (*Lechea divaricata*)
	Pine-woods bluestem (*Andropogon arctatus*)
	Sand butterfly pea (*Centrosema arenicola*)
	Scrub bluestem (*Schizachyrium niveum*)
	Star anise (*Illicium parviflorum*)
“No adverse effect anticipated”	***Fauna***
	Gopher tortoise (*Gopherus polyphemus*)
	Florida pine snake (*Pituophis melanoleucus mugitus*)
	Florida burrowing owl (*Athene cunicularia floridana*)
	Little blue heron (*Egretta caerulea*)
	Tricolored heron (*Egretta tricolor*)
	Roseate spoonbill (*Platalea ajaja*)
	Florida sandhill crane (*Grus canadensis pratensis*)
	Southeastern American kestrel (*Falco sparverius paulus*)

Table 7-3 Other Species of Concern Impact Determinations

Project Impact Determination	Additional Protected Species
No impacts to primary or secondary buffer zones	Bald eagle (*Haliaeetus leucocephalus*)

7.2 Wetland Evaluation

The proposed project alternatives were evaluated for impacts to wetlands in accordance with EO 11990 and Part 2, Chapter 9 of the PD&E Manual. The proposed project will have significant short-term and long-term adverse impacts to wetlands. In accordance with EO 11990, FTE has undertaken all actions to minimize the destruction, loss or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands in carrying out the agency's responsibilities. Nonetheless, FTE has determined that there is no practicable alternative to construction impacts occurring in wetlands. Any unavoidable impacts to wetlands will be mitigated to achieve no net loss of wetland function.

A UMAM analysis (**Appendix D**) was performed to determine an estimate to the functional loss due to wetland impacts from the Preferred Alternative. Construction of the Preferred Alternative results in an estimated total of 5.19 acres of wetland impacts and a loss of 3.84 functional units.

Wetland impacts which will result from the construction of this project will be mitigated pursuant to Section 373.4137, F.S. to satisfy all mitigation requirements of Part IV Chapter 373, F.S. and 33 U.S.C. 1344. Compensatory mitigation for this project will be completed through the use of mitigation banks and any other mitigation options that satisfy state and federal requirements.

7.3 Implementation Measures

Based on the field and literature reviews outlined in this report, federal- or state-listed protected species have the potential to occur within the project study area. To assure that the proposed project will not adversely impacts these species, FTE will adhere to the following:

- As needed, the FTE will perform updated wildlife surveys for the species discussed in this report and other wildlife species, during the project design phase to ascertain the involvement, if any, of listed species.
- During the design and permitting phase of this project, gopher tortoise surveys will be conducted and if any burrows are found within 25 feet of construction limits, technical assistance with the FWC will be reinitiated to secure any necessary permits for gopher tortoises and associated commensal species before construction.
- If a bald eagle nest is observed within 660 feet of the project limits, Florida's Turnpike Enterprise will coordinate with the USFWS to secure necessary approvals prior to constructing the project.
- Impacts to suitable foraging habitat for the federally-listed wood stork will be mitigated through the purchase of credits from a USFWS-approved mitigation bank pursuant to Section 373.4137, F.S. or as otherwise agreed to by the FTE and the appropriate regulatory agencies.

- During the design and permitting phases of this project, the FTE will conduct a general plant survey concurrently with other wildlife surveys. If any federal or state protected plant species are found within 25 feet of construction limits, coordination will occur with USFWS (through USACE) and FDACS to secure any necessary permits.
- If Florida sandhill crane nests are observed during future re-surveys prior to construction, then a 400-foot buffer will be used if construction occurs during the nesting season (January through July). The FTE will coordinate with the FWC during the project construction phase, if necessary.

7.4 Commitments

Based on the field and literature reviews outlined in this report, federal- or state-listed species have the potential to occur within the project study area. In order to assure that the proposed project will not adversely impacts these species, FTE will make the following commitment:

- The FTE will conduct design-phase coverboard surveys in accordance with the most recent USFWS guidelines to verify activity and occupancy status of the blue-tailed mole skink and sand skink. Mitigation for impacts to occupied sand skink habitat will be provided as needed.
- The most recent version of the USFWS Standard Protection Measures for the Eastern Indigo Snake will be adhered to during construction of the proposed project.

7.5 Agency Coordination

The ETAT evaluated the project's effects on various natural, physical and social resources. ETAT comments are summarized in **Section 4.0 and 5.1**. Coordination with SFWMD took place on April 13, 2022 to discuss the drainage criteria, conservation easements, wetlands, and permitting requirements. Coordination with FDEP took place on April 11, 2022 to discuss the drainage criteria, conservation easements, wetlands, and permitting requirements. Coordination with RCID took place on May 19, 2021 and March 3, 2022 to discuss the drainage criteria, conservation easements, wetlands, and permitting requirements. A technical guidance meeting with the USFWS was held on October 27, 2020 to determine the implementation of specific actions and measures relative to federal protected species with available suitable habitat within the project study area. Meeting notes for the SFWMD, FDEP, RCID pre-application meetings and the USFWS technical assistance meetings are provided in **Appendix I**.

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APPENDIX A

Soils Descriptions and Map

1A – Adamsville sand

Adamsville sand is somewhat poorly drained and sits nearly level on narrow ridges next to and slightly higher than slough, marshes, and lakes, and on low knolls in the flatwoods. The slopes range from 0 to 2 percent. The water table sits at a depth of 20 to 40 inches for 2 to 6 months annually. Permeability is rapid throughout, and the water available water capacity is very low to low. Adamsville sand is not classified as hydric, but it may contain hydric inclusions.

1B – Arents, nearly level

Arents are made up of a combination of different kinds of soil dug from several areas. It is soil used to fill low lying areas, depressions, swamps, sloughs, or to cover sanitary landfills. The slopes range from 0 to 2 percent and are smooth to concave. The seasonal high water table for this soil is at a depth of 24 to 36 inches and drops to 60 inches or lower during dry periods.

5A – Basinger fine sand, 0 to 2 percent slopes

Basinger fine sand is poorly drained and sits nearly level in low, broad flats and sloughs in flatwoods. Its slopes are 0 to 2 percent and smooth to concave. Basinger fine sand has a water table depth of less than 10 inches for 2 to 6 months during most years but can drop to 40 inches in extended dry periods. Permeability is very rapid throughout, and the available water capacity is low to very low. The *Hydric Soils of Florida Handbook* (Hurt 2007) classifies Basinger fine sand as hydric.

6A – Basinger fine sand, depressional, 0 to 1 percent slopes

Basinger fine sand, depressional is poorly drained, nearly level, and found in shallow depressions and indistinct flatwood drainageways. Slopes are 0 to 1 percent and flat to concave. Water stands on the surface of Basinger fine sand, depressional for 6 to 12 months during most years. Permeability is very rapid throughout, and the available water capacity is low to very low. The *Hydric Soils of Florida Handbook* (Hurt 2007) classifies Basinger fine sand, depressional as hydric.

3 – Basinger fine sand, frequently ponded, 0 to 1 percent slopes

Basinger fine sand, frequently ponded is nearly level and very poorly drained. It can be found in shallow depressions, sloughs, and along edges of freshwater marshes and swamps. Its slopes are 0 to 1 percent and concave. Water sits on the surface of this sand for 6 to 9 months of the year and within 12 inches for the rest of the year. Permeability is rapid throughout and available water capacity is low in the surface layer and medium in the subsoil. The *Hydric Soils of Florida Handbook* (Hurt 2007) classifies Basinger fine sand, depressional as hydric.

4 – Candler fine sand, 0 to 5 percent slopes

Candler fine sand, 0 to 5 percent slopes, is nearly level to gently sloping and excessively drained. It can be found in uplands and its slopes are nearly smooth to convex. The seasonal high water table sits at a depth of more than 80 inches. Permeability is rapid at the surface and rapid to moderately rapid in the subsoil. Its available water capacity is very low in the surface layer and low in the subsoil. Candler fine sand is not classified as hydric.

5B – Candler fine sand, 5 to 12 percent slopes

Candler fine sand, 5 to 12 percent slopes, is excessively drained and found in the uplands. The seasonal high water table sits at a depth of more than 80 inches. Permeability is rapid at the surface and rapid to moderately rapid in the subsoil. The available water capacity is very low at the surface and low in the subsoil. Candler fine sand is not classified as hydric.

7 – Candler sand, 0 to 5 percent slopes

Candler sand, 0 to 5 percent slopes, is excessively drained and found on uplands. The water table sits at a depth of more than 72 inches. Permeability is rapid to very rapid throughout, and the available water capacity is low to very low. Candler sand, 0 to 5 percent slopes, is not classified as hydric.

8 – Candler sand, 5 to 12 percent slopes*

Candler sand, 5 to 12 percent slopes, is excessively drained soil and found sloping strongly on uplands. The water table sits at a depth of more than 72 inches. Permeability is rapid to very rapid throughout, and the available water capacity is low to very low. Candler sand, 5 to 12 percent slopes, is not classified as hydric, but it may contain hydric inclusions.

6B – Candler-Apopka fine sand, 5 to 12 percent slopes

Candler-Apopka fine sand, 5 to 12 percent slopes, is strongly sloped, excessively drained, and found on uplands. The seasonal high water table sits at a depth of more than 80 inches. Permeability is rapid in the surface layers and moderately rapid in the subsoil. The available water capacity is very low in the surface layers and low in the subsoil. Candler-Apopka fine sand is not classified as hydric.

15 – Hontoon muck, frequently ponded, 0 to 1 percent slopes

Hontoon muck is very poorly drained and found in depressional areas, freshwater marshes, and swamps. Slopes are less than 1 percent. Typically, the water table is at the surface or up to 10 inches below the surface. Permeability is rapid throughout and the available water capacity is very high. The *Hydric Soils of Florida Handbook* (Hurt 2007) classifies Hontoon muck as hydric.

20 – Immokalee fine sand

Immokalee fine sand is nearly level, poorly drained, and found on broad flatwoods. The slopes are 0 to 2 percent and smooth. The seasonal high water table sits within 10 inches of the surface for 1 to 3 months and drops to a depth of 10 to 40 inches for more than 6 months. Permeability is rapid in the surface layers and moderate in the subsoil. The available water capacity is very low in the surface layers and medium in the subsoil. Immokalee fine sand is not classified as hydric, but it may contain hydric inclusions.

16 – Immokalee fine sand, 0 to 2 percent slopes

Immokalee fine sand is a poorly drained soil found in broad flatwoods. Slopes range from 0 to 2 percent. The water table sits less than 10 inches deep for 2 months of the year, between 10 to 40 inches for 8 eight months of the year, and below 40 inches during dry periods. Permeability is rapid in the surface layer and moderately rapid in the subsoil. Available water capacity is low in

surface layers, very low in the subsurface layer, medium in the subsoil, and very low in the substratum. Immokalee fine sand is not classified as hydric, but it may contain hydric inclusions.

22 – Myakka fine sand, 0 to 2 percent slopes*

Myakka fine sand is poorly drained and found in broad flatwoods. Slopes range from 0 to 2 percent. The water table typically sits at a depth of less than 10 inches for 1 to 4 months and more than 40 inches during dry seasons. Permeability is rapid in the surface layer and moderate to moderately rapid in the subsoil. The available water capacity is very low in the surface layer and medium in the subsoil. Myakka fine sand is not classified as hydric, but it may contain hydric inclusions.

33 – Pits

Pits are made up of excavated areas of unconsolidated or heterogeneous soil and geological materials which have been removed mainly for use in road construction or as fill material. The have a variety of slopes and are 5 to 40 feet deep. Some ponds are filled with water all year while others are seasonally ponded. Pits is not classified as hydric, but it may contain hydric inclusions.

32 – Placid fine sand, frequently ponded, 0 to 1 percent slopes

Placid fine sand is very poorly drained, nearly level, and found in low, wet depressions in swamps in flatwoods. Slopes are less than 1 percent. Water stays on the surface of this sand for 6 to 9 months or more in most years. Permeability is rapid throughout, and the available water capacity is high in the surface layer and low in the subsoil. *Hydric Soils of Florida Handbook* (Hurt 2007) classifies Placid fine sand as hydric.

34 – Pomello fine sand, 0 to 5 percent slopes

Pomello fine sand, 0 to 5 percent slopes, is nearly level, moderately well drained, and found on low ridges and knolls of flatwoods. The slopes are smooth to convex. The seasonal high water table sits 24 to 40 inches below the surface for 1 to 4 months of the year and drops to a depth of 40 to 60 inches during dry periods. Permeability is very rapid in the surface layers and moderately rapid in the subsoil. The available water capacity is very low in the surface layer and medium in the subsoil. Pomello fine sand is not classified as hydric.

37 – Pompano fine sand, frequently ponded, 0 to 1 percent slopes

Pompano fine sand, depressional, is nearly level, poorly drained, and found in depressions and drainageways. Slopes are less than 1 percent. This sand is covered in standing water for 6 to 12 months during most years. Permeability is rapid throughout, and the available water capacity is very low throughout. *Hydric Soils of Florida Handbook* (Hurt 2007) classifies Pompano fine sand, depressional, as hydric.

41 – Samsula-Hontoon-Basinger association, depressional

Samsula-Hontoon-Basinger association, depressional, is nearly level, very poorly drained, and found in freshwater swamps, depressions, sloughs, and broad, poorly defined drainageways. Undrained areas remain ponded for 6 to 9 months of the year, and during dry periods, the water table fluctuates between the surface and a 10-inch depth. In drained areas, the organic material subsides. Permeability is rapid in Samsula-Hontoon soils and very rapid in Basinger soils. The available water capacity is very high in the organic portion of Samsula-Hontoon soils, very low in

the sandy Samsula portion, and very low to medium in the Basinger portion. The *Hydric Soils of Florida Handbook* (Hurt 2007) classifies Samsula_Hontoon-Basinger association, depressional as hydric.

42A – Sanibel muck

Sanibel muck is nearly level, very poorly drained, and found in depressions, freshwater swamps, marshes, and poorly defined drainageways. The slopes are less than 1 percent and concave. Undrained areas are ponded 6 to 9 months of most years, and during dry periods the water table fluctuates between the surface and a 10-inch depth. In drained areas, the organic material subsides. Permeability is rapid throughout. The available water capacity is very high in the organic material and medium to low in the underlying sandy material. The *Hydric Soils of Florida Handbook* (Hurt 2007) classifies Sanibel muck as hydric.

42B – Smyrna fine sand, 0 to 2 percent slopes

Smyrna fine sand is nearly level, poorly drained, and found in broad flat areas in flatwoods. The water table sits at a depth of less than 10 inches for 1 to 4 months of a year and between 10 to 40 inches for more than 6 months of a typical year. During rainy season, the water table rises above the surface briefly. Permeability is rapid in the surface layer and moderate to moderately rapid in the subsoil. The available water capacity is very low to low in the surface layer and medium in the subsoil. Smyrna fine sand, 0 to 2 percent slopes, is not classified as hydric, but it may contain hydric inclusions.

44A – Smyrna-Smyrna, wet, fine sand, 0 to 2 percent slopes

Smyrna fine sand is nearly level, poorly drained, and found on broad flatwoods. The slopes are 0 to 2 percent and smooth. The seasonal high water table sits within 10 inches of the surface for 1 to 4 months and drops to 10 to 40 inches for more than 6 months of the year. Permeability is rapid in the surface layer and moderate to moderately rapid in the subsoil. The available water capacity is low to very low in the surface layers and medium in the subsoil. Smyrna-Smyrna, wet, fine sand, 0 to 2 percent slopes, is not classified as hydric, but it may contain hydric inclusions.

44B – Tavares fine sand, 0 to 5 percent slopes

Tavares fine sand, 0 to 5 percent slopes, is moderately well drained, nearly level, and found on low ridges in flatwoods. The water table sits at a depth of 40 to 60 inches most of the year and more than 60 inches during dry periods. Permeability is very rapid throughout, and the available water capacity is very low throughout. Tavares fine sand, 0 to 5 percent slopes, is not classified as hydric.

46 – Tavares fine sand, 0 to 5 percent slopes

Tavares fine sand, 0 to 5 percent slopes, is nearly level to gently sloping, moderately well drained, and found on low ridges on knolls on uplands and flatwoods. The slopes are nearly smooth to slightly convex. The seasonal high water table sits at a depth of 40 to 80 inches for more than 6 months of the year and drops to more than 80 inches during dry periods. Permeability is very rapid throughout, and the available water capacity is very low. Tavares fine sand is not classified as hydric.

47 – Tavares-Millhopper fine sand, 0 to 5 percent slopes*

Tavares-Millhopper fine sand, 0 to 5 percent slopes, is nearly level to gently sloping, moderately well drained, and found on low ridges and knolls on the uplands and flatwoods. The slopes are nearly smooth to slightly convex. In Tavares soil, a seasonal high water table sits at a depth of 40 to 72 inches for more than 6 months and drops below 80 inches during dry periods. In Millhopper soil, a seasonal high water table sits at a depth of 40 to 60 inches for 1 to 4 months and drops 60 to 72 inches for 2 to 4 months. During rainy periods, the water table sits at a depth of 30 to 40 inches. Permeability of Tavares soil is very rapid, and permeability of Millhopper soil is rapid in the surface layers and moderate to moderately rapid in the subsoil. The available water capacity of Tavares soil is very low and, in Millhopper soil, available water capacity is low I the surface layers and medium in the subsoil. Tavares-Millhopper fine sand is not classified as hydric, but it may contain hydric inclusions.

54 – Zolfo fine sand, 0 to 2 percent slopes*

Zolfo fine sand is nearly level, somewhat poorly drained, and found in broad, slightly higher positions adjacent to flatwoods. The slopes are smooth to convex and range from 0 to 2 percent. A seasonal high water table sits at a depth of 24 to 40 inches for 2 to 6 months, 10 to 24 inches during rainy periods, and 60 inches during dry periods. Permeability is rapid in the surface layers and moderate in the subsoil. The available water capacity is low in the surface layers and medium in the subsoil. Zolfo fine sand is not classified as hydric, but it may contain hydric inclusions.

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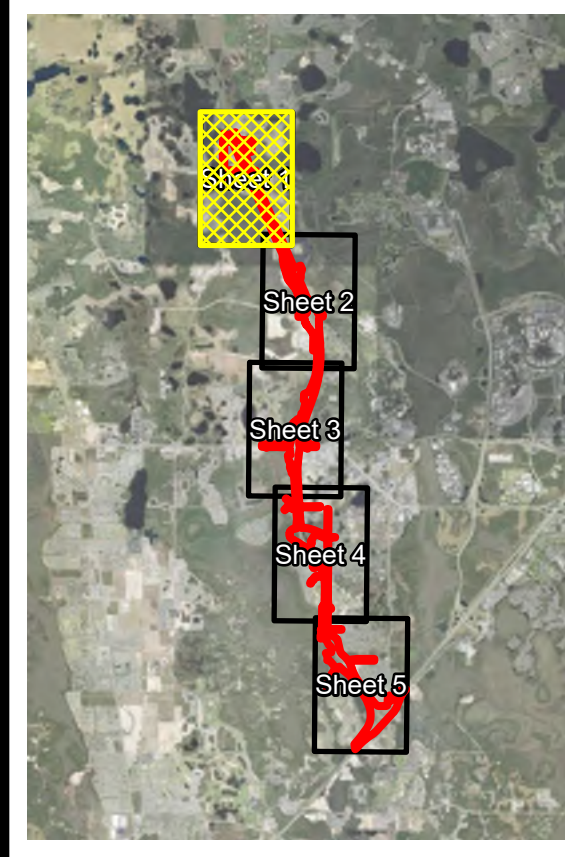
Avalon Rd



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FLORIDA'S TURNPIKE

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FLORIDA'S TURNPIKE

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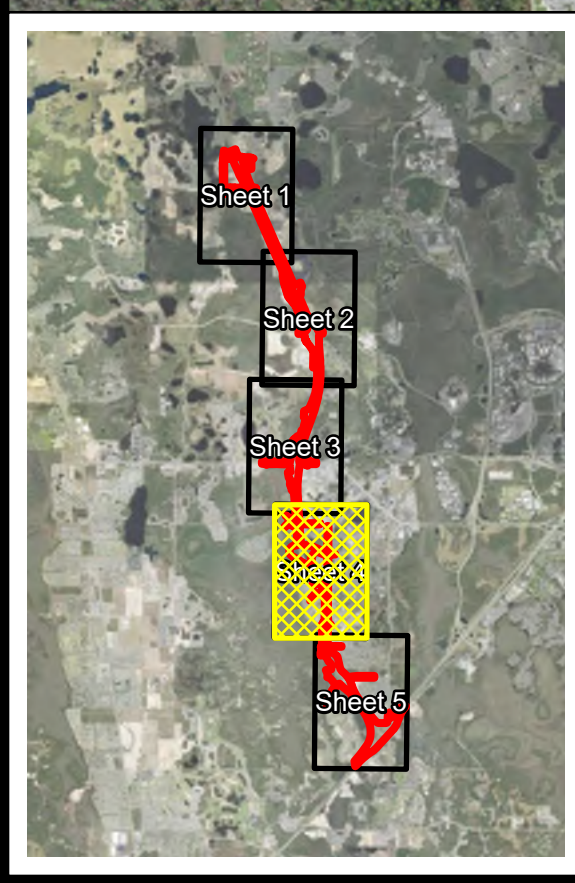
Funie Steed Rd

Livingston Rd

Formosa Gardens Blvd



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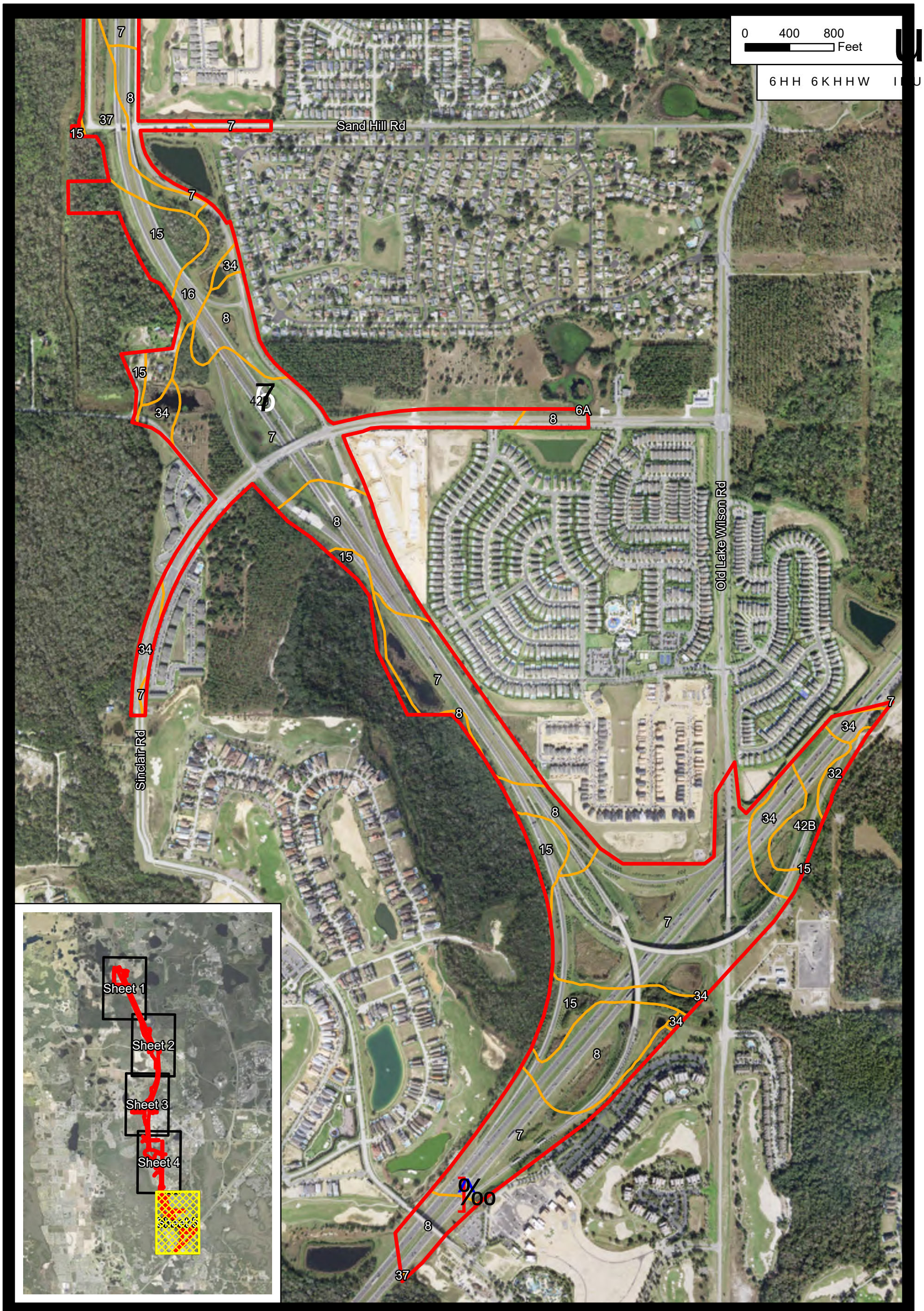
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Old Lake Wilson Rd
Sinclair Rd
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Sheet 6
FLORIDA'S TURNPIKE

APPENDIX B

Land Use Descriptions and Map

Upland Habitats and Land Uses

FLUCFCS: 118 Rural Residential

Rural residential land use falls under the low density residential classification as it contains less than two (2) dwelling units per acre. A single, small area of this land use can be found north of Sinclair Rd, west of Western Beltway (SR 429). Rural residential land use comprises 6.10 acres (0.67 percent) of the project study area.

FLUCFCS: 121 Fixed Single Family Units

Fixed single family units land use falls under the medium density residential classification as it contains two (2) to five (5) dwelling units per acre. Several areas of this land use can be found in the southern half of the project study area, where several subdivisions are located on the either side of Western Beltway (SR 429). Fixed single family units comprise 6.87 acres (0.76 percent) of the project study area.

FLUCFCS: 133 Multiple Dwelling Units, Low Rise

Multiple dwelling units, low rise land use can be found in the southern half of the project study area, within subdivisions on the west side of Western Beltway (SR 429). This land use comprises 3.58 acres (0.39 percent) of the project study area.

FLUCFCS: 134 Multiple Dwelling Units, High Rise

This land use falls under the high density residential classification. These high rises are located south of the I-4/SR 429 interchange. This area is developed with no natural habitat. The multiple dwelling units, high rise land use comprises 0.49 acres (0.05 percent) of the project study area.

FLUCFCS: 139 High Density Under Construction

This land use includes residential area with six (6) or more dwelling units per acre. This land use consists of a small area south of I-4, in the southwest corner of the project study area. This area is developed with no natural habitat. High density, under construction, land use comprises 0.53 acres (0.06 percent) of the project study area.

FLUCFCS: 140 Commercial and Services

The commercial and services land use is comprised of commercial areas that are predominantly associated with the distribution of products and services. This land use includes all secondary structures associated with an enterprise in addition to the main building and integral areas assigned to support the base unit. This land use is distributed throughout the center of the project corridor, with areas of this land use on both sides of Western Beltway (SR 429)and its intersecting roads. Within the project study area, this land use consists of resorts, restaurants, and retail stores. This area is developed with no natural habitat present. Commercial and services facilities comprise 3.74 acres (0.44 percent) of the project study area.

FLUCFCS: 1411 Shopping Centers

Two small shopping centers land use area can be found near the center of the project study area, at the Highway 192 intersection. This land use comprises 0.20 acres (0.02 percent) of the project study area.

FLUCFCS: 182 Golf Course

Golf course land use is scattered along the edges of the project study area. This land use comprises 13.13 acres (1.45 percent) of the project study area.

FLUCFCS: 190 Open Lands

The open land classification includes undeveloped land within urban areas and inactive land with street patterns but without structures. Open land in the study area consists of live oak (*Quercus virginiana*), sabal palm (*Sabal palmetto*), and bahiagrass (*Paspalum notatum*). This land use is scattered around the midpoint of the study area. Open lands consist of 3.76 acres (0.41 percent) of the project study area.

FLUCFCS: 211 Improved Pasture

Improved pasture falls under the agriculture classification and is composed of land which has been cleared, tilled, reseeded with specific grasses, and regularly improved with brush control and fertilizer. This land use is dominated by bahiagrass (*Paspalum notatum*).

FLUCFCS: 212 Unimproved Pasture

Unimproved pasture falls under the agriculture classification and includes cleared land with major stands of trees and brush where native grasses have been allowed to develop. This land use is dominated by sabal palm (*Sabal palmetto*), scattered live oak (*Quercus virginiana*), saw palmetto (*Serenoa repens*), and bahiagrass. Unimproved pasture can be found north of I-4, east of Western Beltway (SR 429). This land use comprises 7.32 acres (0.81 percent) of the project study area.

FLUCFCS: 213 Woodland Pastures

Woodland pasture falls under the agriculture classification and includes forest lands that are being used as pastures. This land use is dominated by sabal palm, live oak, slash pine (*Pinus elliottii*), saw palmetto, and bahiagrass. Woodland pasture can be found along Sinclair Rd and along the east side of Western Beltway (SR 429), directly north of the I-4/SR 429 interchange. This land use comprises 0.04 acres (0.00 percent) of the project study area.

FLUCFCS: 221 Citrus Groves

Citrus grove falls under the agriculture classification. This land use can be found scattered along SR 429, in the northern half of the project study area. This land use comprises 0.99 acres (0.11 percent) of the project study area.

FLUCFCS: 223 Other Groves

Other grove falls under the agricultural classification. One, small area of the land use can be found east of Western Beltway (SR 429), along the southern side of Seidel Rd. This land use comprises 0.09 acres (0.01 percent) of the project study area.

FLUCFCS: 310 Herbaceous (Dry Prairie)

This land use is characterized by upland prairie grasses, sedges, rushes, and other herbs including wire grasses with some saw palmetto present. Herbaceous dry prairie can be found in the northern extent of the project study area. This land use comprises 2.03 acres (0.22 percent) of the project study area.

FLUCFCS: 330 Mixed Rangeland

The mixed rangeland land use occurs where there is a more than one-third intermixture of either grassland or shrub-brushland range species. A single, mixed rangeland community is located in the north of the project study area and comprises 0.07 acres (0.01 percent) of the project study area.

FLUCFCS: 411 Pine Flatwoods

The pine flatwoods land use includes longleaf pine and slash pine flatwoods. This includes where slash pine communities have extended due to fire control and artificial reforestation. Pine flatwoods are dominated by slash pine, longleaf pine, or both, and less frequently pond pine. Common understory species include saw palmetto, wax myrtle, gallberry, and a wide variety of herbs and shrubs. One, small area of this land use can be found east of SR 429, along Funie Steed Rd. Pine flatwoods communities comprise 0.43 acres (0.05 percent) of the project study area.

FLUCFCS: 420 Upland Hardwood Forests

The upland hardwood forest land use includes upland forests in which hardwoods have achieved a 66-percent crown canopy dominance. This classification is reserved for naturally generated hardwood stands. Upland hardwood forest communities are located south of the midpoint of the project study area. Upland hardwood forest communities comprise 1.13 acres (0.12 percent) of the project study area.

FLUCFCS: 434 Hardwood-Conifer Mixed

The hardwood-conifer mixed land use includes forested uplands in which neither upland conifers nor hardwoods achieve 66-percent crown canopy dominance. Dominant vegetation within these communities consists of slash pine, live oak, and cabbage palm, with saw palmetto and beauty berry. Several hardwood conifer mixed communities are scattered along the edges of the project study area. Hardwood conifer mixed communities comprise 1.19 acres (0.13 percent) of the project study area.

FLUCFCS: 441 Coniferous Plantations

This land use includes planted pine forests and is characterized by high tree density and uniform appearance. Several coniferous plantation land use areas can be found scattered throughout the project study area. This land use comprises 31.15 acres (3.43 percent) of the project study area.

FLUCFCS: 740 Disturbed Land

Disturbed land use are areas which have been changed due primarily to human activities other than mining. Several disturbed land areas are found west of the Western Way and the Sinclair Rd intersections. This land use comprises 7.19 acres (0.79 percent) of the project study area.

FLUCFCS: 743 Spoil Areas

Several spoil areas can be found on the west side of SR 429, between the Seidel Rd. and Western Way intersections. This land use comprises 3.40 acres (0.38 percent) of the project study area.

FLUCFCS: 814 Roads and Highways

The roads and highways land use are transportation facilities used for the movement of people and goods and encompass all areas used for intersections and ROW including pavement, medians, and buffers. Located throughout the project study area, this land use type includes the existing Western Beltway (SR 429) Road ROW and associated roadways. Roads and highways comprise 700.79 acres (77.13 percent) of the project study area.

FLUCFCS: 820 Communications

The communications land use includes airwave communications and radar and television antennas with associated structures. There is only one of this land use type in the project study area, and it located along Hartzog Rd., west of Western Beltway (SR 429). Communications comprise 0.43 acres (0.05 percent) of the project study area.

FLUCFCS: 831 Electrical Power Facilities

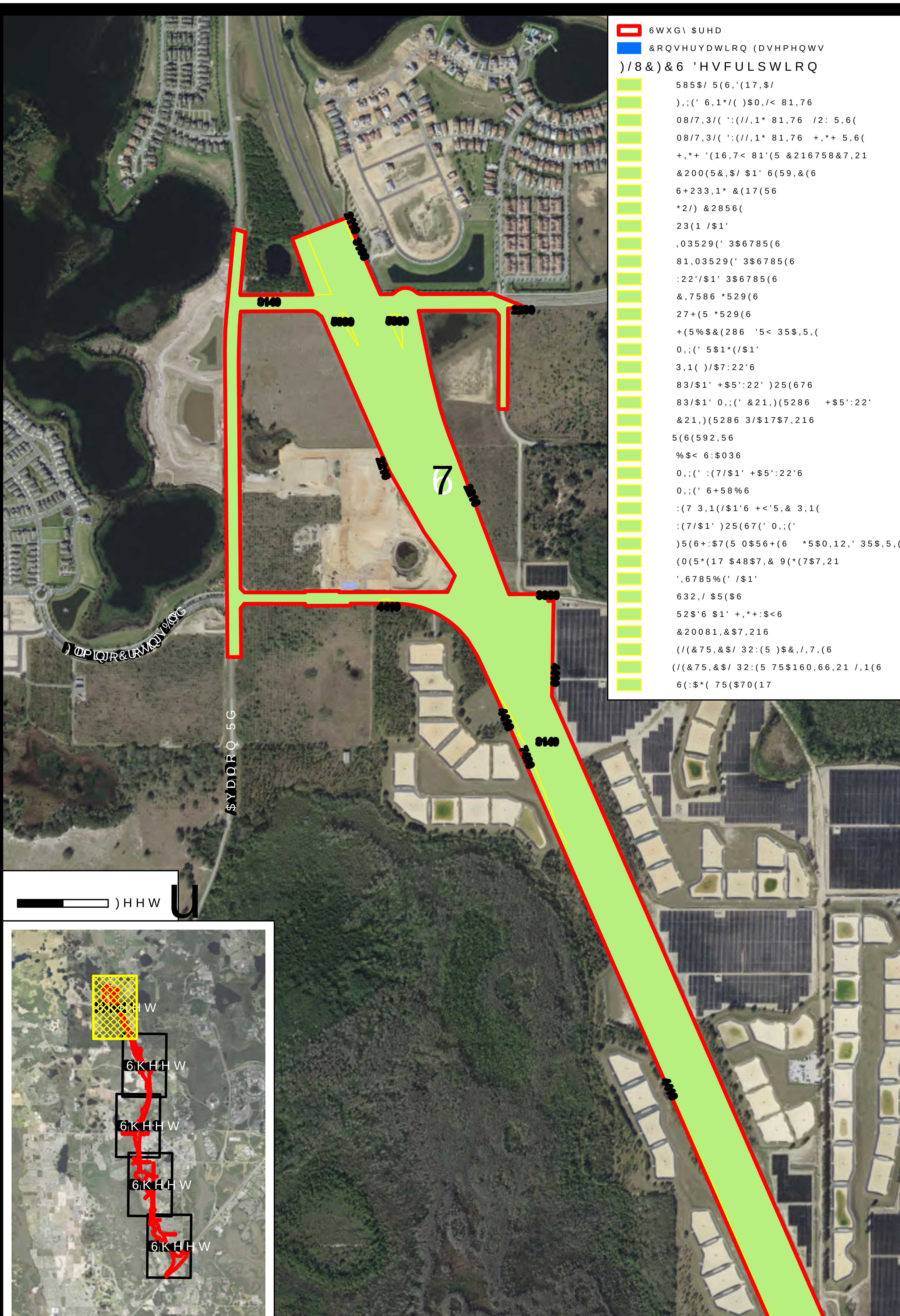
The electrical power facilities land use include power generating facilities and water treatment plants including their related facilities such as transmission lines for electric generation plants and aeration fields for sewage treatment sites. Small facilities or those associated with an industrial, commercial or extractive land use are included within these larger respective categories. There is only one of this land use type in the project study area, and it is located at the southern end of the project study area. Electrical power facilities comprise 0.27 acres (0.03 percent) of the project study area.

FLUCFCS: 832 Electrical Power Transmission Lines

There is one electrical power transmission lines land use area found on Hartzog Rd. This land use comprises 1.14 acres (0.13 percent) of the project study area.

FLUCFCS: 834 Sewage Treatment

The sewage treatment land use is composed of all related facilities such as aeration fields, digesters, etc. There is only one of this land use type in the project study area, and it is the Sand Hill Waste Water Treatment Plant located on Sand Hill Rd., west of Western Beltway (SR 429). Sewage treatment comprise 0.87 acres (0.10 percent) of the project study area.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FLORIDA'S TURNPIKE

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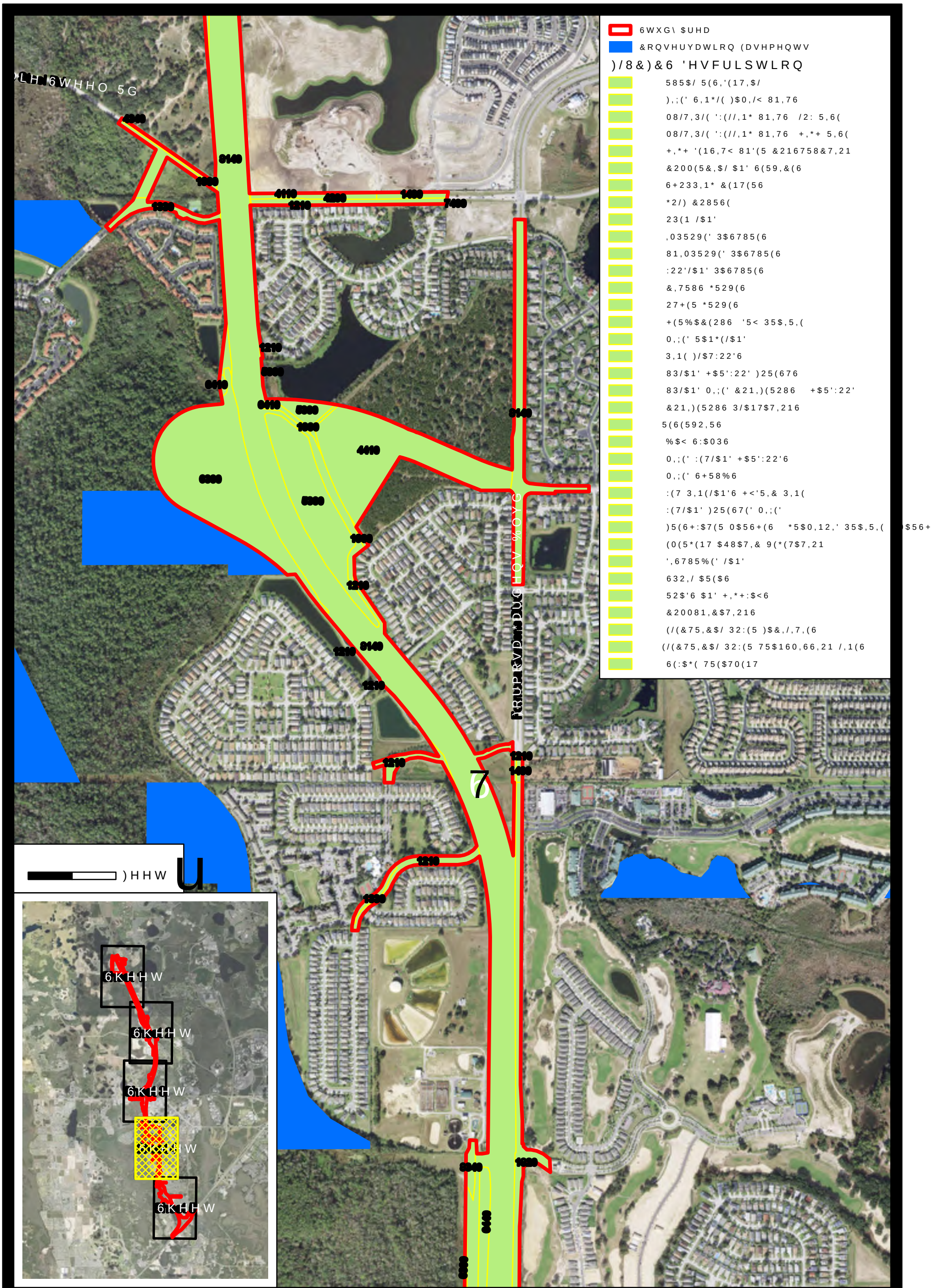
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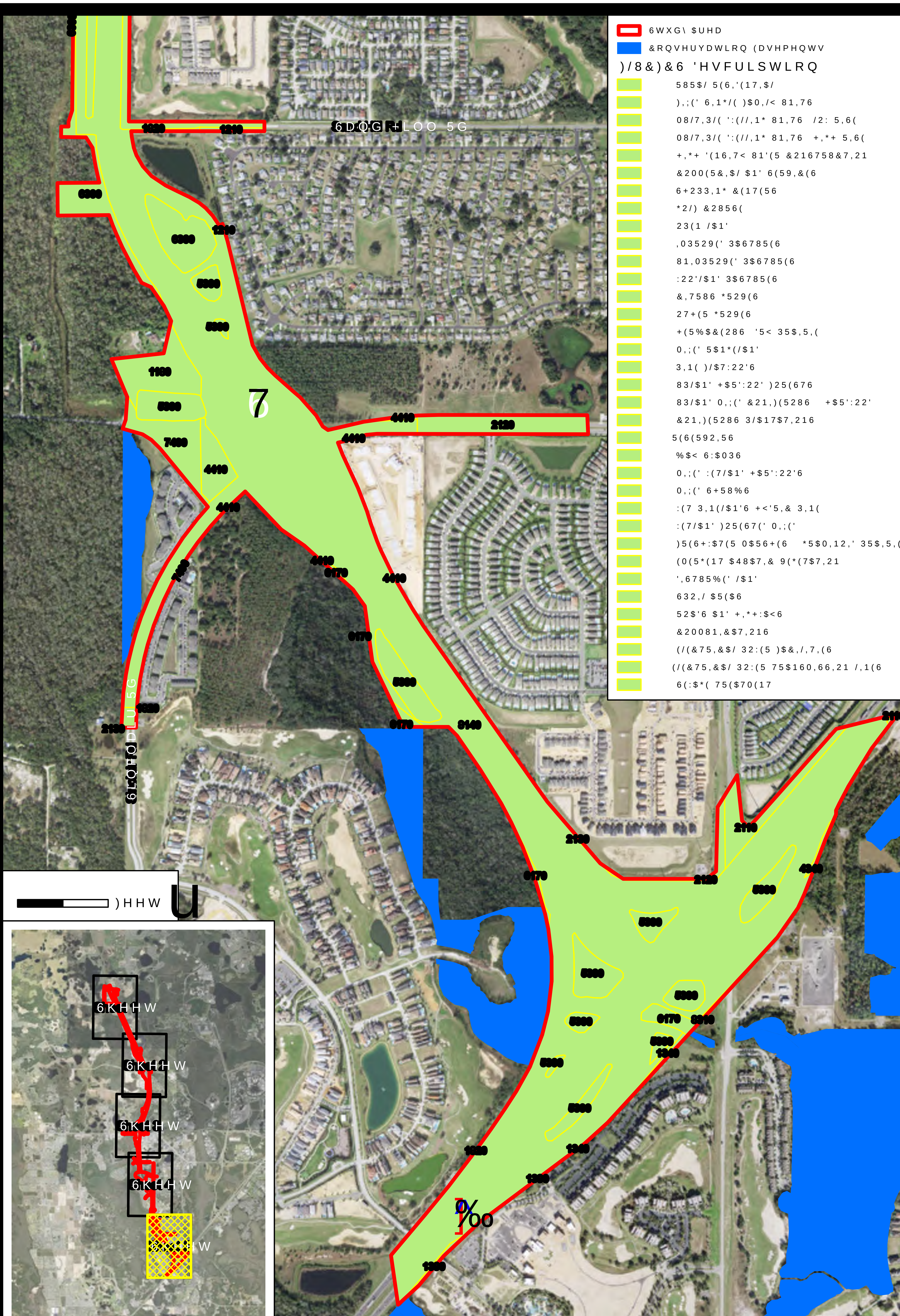
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APPENDIX C

WETLAND AND SURFACE WATER DESCRIPTIONS AND MAP

Wetland and Surface Water Habitats

Name: **SW 01**
FLUCFCS: **530** **(Reservoirs)**
USFWS: **PUBHx** **(Palustrine, Unconsolidated Bottom, Permanently Flooded, excavated)**

Reservoirs are artificial impoundments of water. These waterbodies are scattered along I-4 and the existing section of Western Beltway (SR 429) within the study area. Dominant vegetation within the littoral edge of the reservoirs includes Mexican primrose willow, Peruvian primrose willow, Carolina willow, Brazilian pepper, cattail, and frogfruit. Reservoirs comprise 52.29 acres (5.76 percent) of the study area.

Name: **WL 01**
FLUCFCS: **630** **(Wetland Forested Mixed)**
USFWS: **PFO1/3** **(Palustrine, Forested, Broad-leaved Deciduous, Broad-leaved Evergreen)**

This habitat type includes mixed wetland forest communities in which neither hardwood nor conifers dominate the canopy. These communities are located west of Western Beltway (SR 429) near Sand Hill Road, Livingston Road, and US 192. Species observed in this habitat include red maple, slash pine, wax myrtle, sweet gum, cinnamon fern (*Osmunda cinnamomea*), water oak, sweetbay (*Magnolia virginiana*), and pop ash (*Fraxinus caroliniana*). Wetland forested mixed communities comprise 35.23 acres (3.82 percent) of the total study area.

Name: **WL 02**
FLUCFCS: **641** **(Freshwater Marshes)**
USFWS: **PEM1C** **(Palustrine, Emergent, Persistent, Seasonally Flooded)**

Freshwater marsh is characterized by its lack of tree cover and falls under the vegetated non-forested wetlands classification. These habitats are scattered throughout the project study area, primarily outside of Western Beltway (SR 429) ROW. Dominant vegetation consists of marshpennywort (*hydrocotyl* spp.), smartweed (*Persicaria spp*.), elephant ear, pickerelweed (*Pontederia cordata*), and Peruvian primrose willow. Freshwater marshes comprise 8.82acres (1.03 percent) of the total study area.

Name: **WL 03**
FLUCFCS: **617** **(Mixed Wetland Hardwoods)**
USFWS: **PFO1C** **(Palustrine, Forested, Broad-leaved Deciduous, Seasonally Flooded)**

Mixed wetland hardwood habitats are composed of a large variety of hardwood species that are tolerant of hydric conditions. These habitats are scattered throughout the project study area, primarily outside of Western Beltway (SR 429) ROW. Vegetation observed within this wetland type includes sweetgum (*Liquidambar styraciflua*), cabbage palm, laurel oak (*Quercus laurifolia*), bald cypress (*Taxodium distichum*), red maple, water oak (*Quercus nigra*), and blackgum (*Nyssa sylvatica*). Mixed wetland hardwood communities comprise 3.94 acres (0.43 percent) of the study area.

Name: **WL 04**
FLUCFCS: **6172** **(Mixed Wetland Shrubs)**
USFWS: **PSS1C** **(Palustrine, Scrub-Shrub, Broad-leaved Deciduous, Seasonally Flooded)**

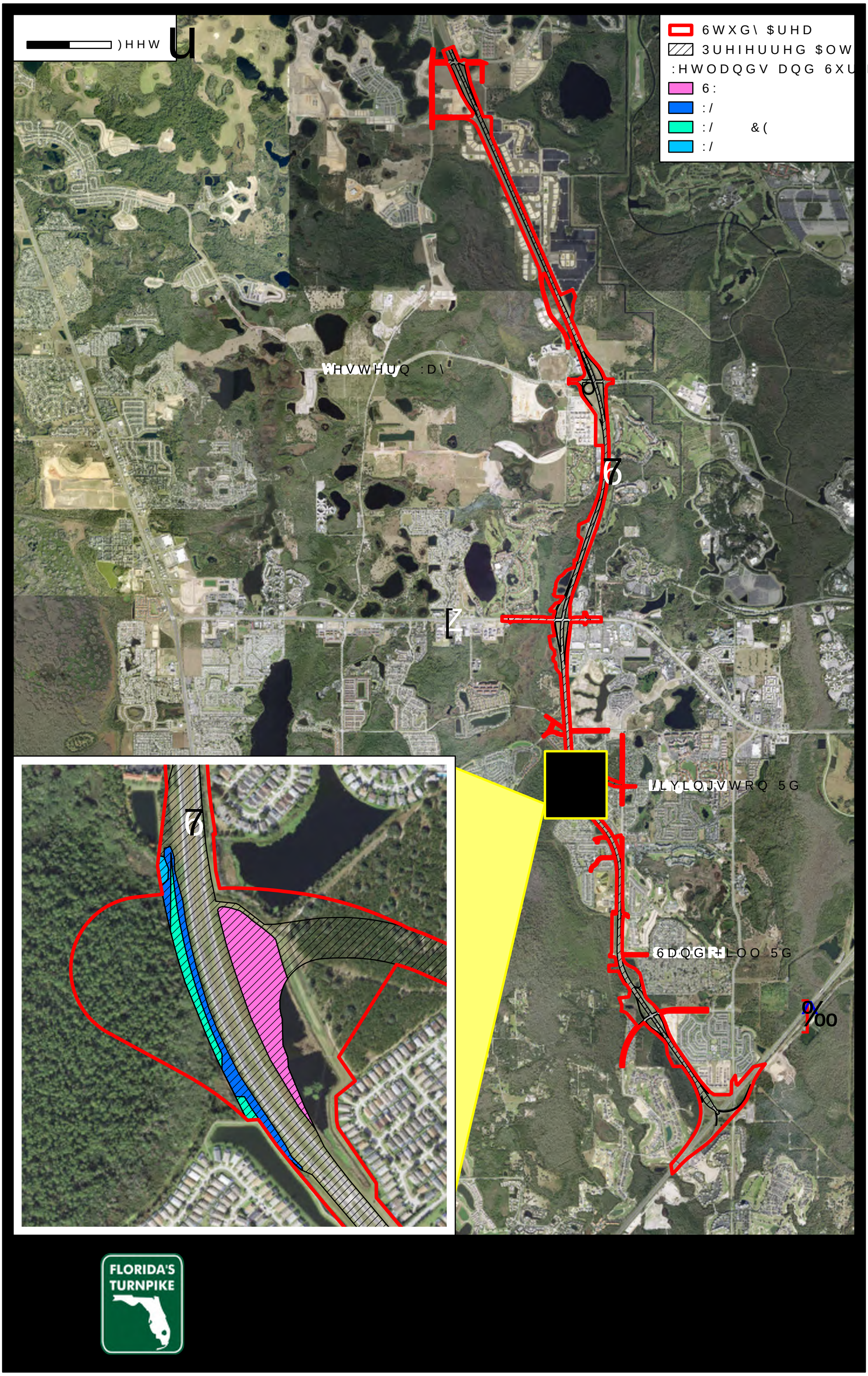
Mixed wetland shrub habitats are composed of a shrub species typically found on edge habitat and that are tolerant of hydric conditions. This habitat is found west of Western Beltway (SR 429), near US 192. Vegetation observed within this wetland type was dominated by two (2) species including Carolina willow and Peruvian primrose willow. Mixed wetland shrub communities comprise 2.05 acres (0.23 percent) of the study area.

Name: **WL 05**
FLUCFCS: **625** **(Hydric Pine Flatwoods)**
USFWS: **PFO4C** **(Palustrine, Forested, Needle-leaved Evergreen, Seasonally Flooded)**

Hydric pine flatwoods are characterized by a sparse to moderate canopy of slash pine and an understory of grasses, forbs, and sparse saw palmetto. Other species observed in this habitat include water oak, loblolly bay (*Gordonia lasianthus*), maidencane, torpedograss, and wax myrtle (*Morella cerifera*). This habitat is found west of Western Beltway (SR 429), near US 192. Hydric pine flatwoods comprise 1.24 acres (0.14 percent) of the total study area.

Name: **WL 06**
FLUCFCS: **644** **(Emergent Aquatic Vegetation)**
USFWS: **PEM1Fx** **(Palustrine, Emergent, Persistent, Semi-permanently Flooded, excavated)**

This habitat type is characterized by floating vegetation. There is a single emergent aquatic vegetation community located west of Western Beltway (SR 429), near Sand Hill Road. Dominant vegetation consists of water lily (*Nymphaea odorata*), duckweed (*Lemna minor*), water lettuce (*Pistia stratiotes*), torpedograss, cattail. Emergent aquatic vegetation communities comprise 3.35 acres (0.37 percent) of the total study area.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FLORIDA'S TURNPIKE

APPENDIX D

UNIFORM MITIGATION ASSESSMENT METHODOLOGY FORMS

PART I – Qualitative Description
(See Section 62-345.400, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
SR 429	TBD	Wetland Conservation Easements Direct

FLUCCs code	Further classification (optional)	Impact or Mitigation Site?	Assessment Area Size
630 Wetland Forested Mixed	N/A	Impact (Direct)	1.89

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)
Reedy Creek (3170)	Class 1	N/A

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

Wetland 1 is a forested wetland contiguously connected to Davenport Creek Swamp, ultimately outflowing to Reedy Creek

Assessment area description

The assessment area is a 1.89-acre impact to Wetland 1 within the proposed project area. This area is adjacent to and west of SR 429.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
SR 429, Emerald Isle Resort	Conservation Easement over this wetland

Functions	Mitigation for previous permit/other historic use
Potential wildlife habitat	N/A

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)
Small mammals and wading birds	Wood stork - T; wading birds

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

None

Additional relevant factors:

None

Assessment conducted by:	Assessment date(s):
Hannah Smith	Jun-22

PART II – Quantification of Assessment Area (impact or mitigation)
(See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
SR 429	TBD	Wetland Conservation Easements Direct
Impact or Mitigation	**Assessment conducted by:**	**Assessment date:**
Impact (Direct)	Hannah Smith	Jun-22

Scoring Guidance
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed

Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

.500(6)(a) Location and Landscape Support	w/o pres or current: 8	with: 0
Wetland 1 is a forested mixed wetland contiguous with the Davenport Creek swamp and ultimately outflowing into Reedy Creek. The system is adjacent to SR 429 and residential development. However, the system as a whole has been marginally impacted		
.500(6)(b)Water Environment (n/a for uplands)	w/o pres or current: 9	with: 0
The hydrology of Wetland 1 has been impacted marginally by development. System is adjacent to a roadway and not longer connects to the east side. Wetland indicators present, such as water presence, biological seasonal high indicators, stain lines, etc. No signs of stress were observed.		
.500(6)(c)Community structure 1. Vegetation and/or 2. Benthic Community	w/o pres or current: 9	with: 0
Wetland 1 is a mix of red maple (*Acer rubrum*), slash pine (*Pinus elliottii*), cypress (*Taxodium spp.*), magnolia (*Magnolia grandiflora*), wax myrtle (*Morella cerifera*), sweetgum (*Liquidambar styraciflua*), cinnamon fern (*Osmundastrum cinnamomeum*), and pop ash (*Fraxinus caroliniana*). Obvious signs of recruitment, good mixture of adult and subadult trees. *Ludwigia sp.* observed at the edges of this wetland.		

Score = sum of above scores/30 (if uplands, divide by 20)	current or w/o pres: 0.87	with: 0

If preservation as mitigation,
Preservation adjustment factor =
Adjusted mitigation delta =

For impact assessment areas
FL = delta x acres = 1.64

Delta = [with-current]
-0.87

If mitigation
Time lag (t-factor) =
Risk factor =

For mitigation assessment areas
RFG = delta/(t-factor x risk) =

PART I – Qualitative Description
(See Section 62-345.400, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
SR 429	TBD	Wetland 1 Direct

FLUCCs code	Further classification (optional)	Impact or Mitigation Site?	Assessment Area Size
630 Wetland Forested Mixed	N/A	Impact (Direct)	3.05

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)
Reedy Creek (3170)	Class 1	N/A

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

Wetland 1 is a forested wetland contiguously connected to Davenport Creek Swamp, ultimately outflowing to Reedy Creek

Assessment area description

The assessment area is a 3.05-acre impact to Wetland 1 within the proposed project area. This area is adjacent to and west of SR 429.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
SR 429, Emerald Isle Resort	Not Unique

Functions	Mitigation for previous permit/other historic use
Potential wildlife habitat	N/A

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)
Small mammals and wading birds	Wood stork - T; wading birds

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

None

Additional relevant factors:

None

Assessment conducted by:	Assessment date(s):
Hannah Smith	Jun-22

PART II – Quantification of Assessment Area (impact or mitigation)
(See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
SR 429	TBD	Wetland 1 Direct
Impact or Mitigation	**Assessment conducted by:**	**Assessment date:**
Impact (Direct)	Hannah Smith	Jun-22

Scoring Guidance
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed

Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

.500(6)(a) Location and Landscape Support	w/o pres or current: 6	with: 0	Wetland 1 is a forested mixed wetland contiguous with the Davenport Creek swamp and ultimately outflowing into Reedy Creek. The system is adjacent to SR 429 and residential development. However, the system as a whole has been marginally impacted
.500(6)(b)Water Environment (n/a for uplands)	w/o pres or current: 7	with: 0	The hydrology of Wetland 1 has been impacted marginally by development. System is adjacent to a roadway and not longer connects to the east side. Wetland indicators present, such as water presence, biological seasonal high indicators, stain lines, etc. No signs of stress were observed.
.500(6)(c)Community structure 1. Vegetation and/or 2. Benthic Community	w/o pres or current: 7	with: 0	Wetland 1 is a mix of red maple (*Acer rubrum*), slash pine (*Pinus elliottii*), cypress (*Taxodium spp.*), magnolia (*Magnolia grandiflora*), wax myrtle (*Morella cerifera*), sweetgum (*Liquidambar styraciflua*), cinnamon fern (*Osmundastrum cinnamomeum*), and pop ash (*Fraxinus caroliniana*). Obvious signs of recruitment, good mixture of adult and subadult trees. *Ludwigia sp.* observed at the edges of this wetland.

Score = sum of above scores/30 (if uplands, divide by 20)	current or w/o pres: 0.67	with: 0

If preservation as mitigation,
Preservation adjustment factor =
Adjusted mitigation delta =

For impact assessment areas
FL = delta x acres = 2.03

Delta = [with-current]
-0.67

If mitigation
Time lag (t-factor) =
Risk factor =

For mitigation assessment areas
RFG = delta/(t-factor x risk) =

PART I – Qualitative Description
(See Section 62-345.400, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
SR 429	TBD	Wetland 2 Direct

FLUCCs code	Further classification (optional)	Impact or Mitigation Site?	Assessment Area Size
641 Freshwater Marsh	N/A	Impact (Direct)	0.25

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)
Reedy Creek (3170)	Class 1	N/A

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

Wetland 2 is a freshwater marsh adjacent to a stormwater pond and SR 429. It is connected to forested systems of Davenport Creek Swamp, ultimately outflowing to Reedy Creek.

Assessment area description

The assessment area is a 0.25-acre impact to Wetland 2 within the proposed project area drainage easement. Wetland 2 is contiguously connected to Davenport Creek Swamp, ultimately outflowing to Reedy Creek

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
SR 429, Emerald Isle Resort	Not unique

Functions	Mitigation for previous permit/other historic use
Potential wildlife habitat, shoreline stabilization, carbon storage	N/A

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)
Small mammals and wading birds	Wood stork - T, Threatened wading birds

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

None

Additional relevant factors:

None

Assessment conducted by:	Assessment date(s):
Hannah Smith	Jun-22

PART II – Quantification of Assessment Area (impact or mitigation)
(See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
SR 429	TBD	Wetland 2 Direct
Impact or Mitigation	**Assessment conducted by:**	**Assessment date:**
Impact (Direct)	Hannah Smith	Jun-22

Scoring Guidance
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed

Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

.500(6)(a) Location and Landscape Support	w/o pres or current: 6	with: 0
Wetland 2 is a freshwater marsh adjacent to a stormwater pond and SR 429. It is connected to forested systems of Davenport Creek Swamp, ultimately outflowing to Reedy Creek.		
.500(6)(b)Water Environment (n/a for uplands)	w/o pres or current: 6	with: 0
There are clear wetland indicators such as innundation, muck presence, and adventitious rooting.		
.500(6)(c)Community structure 1. Vegetation and/or 2. Benthic Community	w/o pres or current: 5	with: 0
Wetland 2 is primarily occupied by maidencane (*Panicum hemitomon*), arrowhead (*Sagittaria spp.*), cattail (*Typha spp.*), pickerel weed (*Pontederia cordata*), and soft rush (*Juncus effusus*). Invasive species present include torpedo grass (*Panicum repens*), carolina willow (*Salix caroliniana*), and peruvian primrose willow (*ludwigia peruviana*). Wetland edges are dominated by willow species. Vegetation is approximately 25-50% invasive species.		

Score = sum of above scores/30 (if uplands, divide by 20)	current or w/o pres: 0.57	with: 0

If preservation as mitigation,
Preservation adjustment factor =
Adjusted mitigation delta =

For impact assessment areas
FL = delta x acres = 0.17

Delta = [with-current]
-0.57

If mitigation
Time lag (t-factor) =
Risk factor =

For mitigation assessment areas
RFG = delta/(t-factor x risk) =

APPENDIX E

FNAI BIODIVERSITY MATRIX REPORT

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

Florida Natural Areas Inventory

Biodiversity Matrix Query Results

UNOFFICIAL REPORT

Created 1/27/2022

(Contact the FNAI Data Services Coordinator at 850.224.8207 or kbrinegar@fnai.fsu.edu for information on an official Standard Data Report)

NOTE: The Biodiversity Matrix includes only rare species and natural communities tracked by FNAI.

Report for 1 Matrix Unit: 41434

Descriptions

DOCUMENTED - There is a documented occurrence in the FNAI database of the species or community within this Matrix Unit.

DOCUMENTED-HISTORIC - There is a documented occurrence in the FNAI database of the species or community within this Matrix Unit; however the occurrence has not been observed/reported within the last twenty years.

LIKELY - The species or community is *known* to occur in this vicinity, and is considered likely within this Matrix Unit because:

1. documented occurrence overlaps this and adjacent Matrix Units, but the documentation isn't precise enough to indicate which of those Units the species or community is actually located in; *or*
2. there is a documented occurrence in the vicinity and there is suitable habitat for that species or community within this Matrix Unit.

POTENTIAL - This Matrix Unit lies within the known or predicted range of the species or community based on expert knowledge and environmental variables such as climate, soils, topography, and landcover.

Matrix Unit ID: 41434

0 **Documented** Elements Found

0 **Documented-Historic** Elements Found

2 **Likely** Elements Found

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
Mesic flatwoods	G4	S4	N	N
Mycteria americana Wood Stork	G4	S2	LT	FT

Matrix Unit ID: 41434

47 **Potential** Elements for Matrix Unit 41434

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing

Agrimonia incisa Incised Groove-bur	G3	S2	N	T
Athene cunicularia floridana Florida Burrowing Owl	G4T3	S3	N	SSC
Bonamia grandiflora Florida Bonamia	G3	S3	LT	E
Calamintha ashei Ashe's Savory	G3	S3	N	T
Calopogon multiflorus Many-flowered Grass-pink	G2G3	S2S3	N	T
Carex chapmanii Chapman's Sedge	G3	S3	N	T
Centrosema arenicola Sand Butterfly Pea	G2Q	S2	N	E
Chionanthus pygmaeus Pygmy Fringe Tree	G2G3	S2S3	LE	E
Clitoria fragrans Scrub Pigeon-wing	G3	S3	LT	E
Coelorachis tuberculosa Piedmont Jointgrass	G3	S3	N	T
Drymarchon couperi Eastern Indigo Snake	G3	S3	LT	FT
Eriogonum longifolium var. gnaphalifolium Scrub Buckwheat	G4T3	S3	LT	E
Gopherus polyphemus Gopher Tortoise	G3	S3	C	ST
Grus canadensis pratensis Florida Sandhill Crane	G5T2T3	S2S3	N	ST
Gymnopogon chapmanianus Chapman's Skeletongrass	G3	S3	N	N
Hartwrightia floridana Hartwrightia	G2	S2	N	T
Heterodon simus Southern Hognose Snake	G2	S2	N	N
Illicium parviflorum Star Anise	G2	S2	N	E
Lechea cernua Nodding Pinweed	G3	S3	N	T
Liatris ohlingerae Florida Blazing Star	G2	S2	LE	E
Lithobates capito Gopher Frog	G3	S3	N	SSC
Lupinus aridorum Scrub Lupine	G1	S1	LE	E
Matelea floridana Florida Spiny-pod	G2	S2	N	E
Mustela frenata peninsulae Florida Long-tailed Weasel	G5T3	S3	N	N
Nemastylis floridana Celestial Lily	G2	S2	N	E
Neofiber alleni Round-tailed Muskrat	G3	S3	N	N
Nolina atopocarpa Florida Beargrass	G3	S3	N	T
Nolina brittoniana Britton's Beargrass	G3	S3	LE	E
Notophthalmus perstriatus Striped Newt	G2G3	S2	C	N
Panicum abscissum Cutthroat Grass	G3	S3	N	E
Paronychia chartacea ssp. chartacea Paper-like Nailwort	G3T3	S3	LT	E
Peucaea aestivalis Bachman's Sparrow	G3	S3	N	N
Picoides borealis	G3	S2	LE	FE

Red-cockaded Woodpecker				
Pituophis melanoleucus mugitus Florida Pine Snake	G4T3	S3	N	SSC
Plestiodon egregius lividus Blue-tailed Mole Skink	G5T2	S2	LT	FT
Podomys floridanus Florida Mouse	G3	S3	N	SSC
Polygala lewtonii Lewton's Polygala	G2G3	S2S3	LE	E
Polygonella myriophylla Small's Jointweed	G3	S3	LE	E
Prunus geniculata Scrub Plum	G3	S3	LE	E
Pteroglossaspis ecristata Giant Orchid	G2G3	S2	N	T
Rostrhamus sociabilis Snail Kite	G4G5	S2	LE	N
Salix floridana Florida Willow	G2	S2	N	E
Sceloporus woodi Florida Scrub Lizard	G2G3	S2S3	N	N
Sciurus niger shermani Sherman's Fox Squirrel	G5T3	S3	N	SSC
Ursus americanus floridanus Florida Black Bear	G5T2	S2	N	N
Warea amplexifolia Clasping Warea	G1	S1	LE	E
Warea carteri Carter's Warea	G3	S3	LE	E

Unofficial Report

These results are considered unofficial. FNAI offers a Standard Data Request option for those needing certifiable data.

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

Florida Natural Areas Inventory

Biodiversity Matrix Query Results

UNOFFICIAL REPORT

Created 1/27/2022

(Contact the FNAI Data Services Coordinator at 850.224.8207 or kbrinegar@fnai.fsu.edu for information on an official Standard Data Report)

NOTE: The Biodiversity Matrix includes only rare species and natural communities tracked by FNAI.

Report for 10 Matrix Units: 41432 , 41433 , 41800 , 41801 , 41802 , 41803 , 41804 , 42172 , 42173 , 42174

Descriptions

DOCUMENTED - There is a documented occurrence in the FNAI database of the species or community within this Matrix Unit.

DOCUMENTED-HISTORIC - There is a documented occurrence in the FNAI database of the species or community within this Matrix Unit; however the occurrence has not been observed/reported within the last twenty years.

LIKELY - The species or community is *known* to occur in this vicinity, and is considered likely within this Matrix Unit because:

1. documented occurrence overlaps this and adjacent Matrix Units, but the documentation isn't precise enough to indicate which of those Units the species or community is actually located in; *or*
2. there is a documented occurrence in the vicinity and there is suitable habitat for that species or community within this Matrix Unit.

POTENTIAL - This Matrix Unit lies within the known or predicted range of the species or community based on expert knowledge and environmental variables such as climate, soils, topography, and landcover.

Matrix Unit ID: 41432

0 **Documented** Elements Found

0 **Documented-Historic** Elements Found

4 **Likely** Elements Found

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
Drymarchon couperi Eastern Indigo Snake	G3	S3	LT	FT
Mesic flatwoods	G4	S4	N	N
Mycteria americana Wood Stork	G4	S2	LT	FT
Scrub	G2	S2	N	N

Matrix Unit ID: 41433

0 **Documented** Elements Found

0 **Documented-Historic** Elements Found

3 **Likely** Elements Found

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
Drymarchon couperi Eastern Indigo Snake	G3	S3	LT	FT
Mesic flatwoods	G4	S4	N	N
Mycteria americana Wood Stork	G4	S2	LT	FT

Matrix Unit ID: 41800

3 **Documented** Elements Found

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
Eriogonum longifolium var. gnaphalifolium Scrub Buckwheat	G4T3	S3	LT	E
Polygonella myriophylla Small's Jointweed	G3	S3	LE	E
Scrubby flatwoods	G2	S2?	N	N

5 **Documented-Historic** Elements Found

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
Drymarchon couperi Eastern Indigo Snake	G3	S3	LT	FT
Gopherus polyphemus Gopher Tortoise	G3	S3	C	ST
Lithobates capito Gopher Frog	G3	S3	N	SSC
Plestiodon reynoldsi Sand Skink	G2	S2	LT	FT
Podomys floridanus Florida Mouse	G3	S3	N	SSC

4 **Likely** Elements Found

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
Mesic flatwoods	G4	S4	N	N
Mycteria americana Wood Stork	G4	S2	LT	FT
Nolina brittoniana Britton's Beargrass	G3	S3	LE	E
Sandhill	G3	S2	N	N

Matrix Unit ID: 41801

0 **Documented** Elements Found

1 **Documented-Historic** Element Found

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
Lithobates capito Gopher Frog	G3	S3	N	SSC

4 **Likely** Elements Found

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
Drymarchon couperi Eastern Indigo Snake	G3	S3	LT	FT
Mesic flatwoods	G4	S4	N	N
Mycteria americana Wood Stork	G4	S2	LT	FT
Scrub	G2	S2	N	N

Matrix Unit ID: 41802

0 **Documented** Elements Found

0 **Documented-Historic** Elements Found

3 **Likely** Elements Found

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
Drymarchon couperi Eastern Indigo Snake	G3	S3	LT	FT
Mesic flatwoods	G4	S4	N	N
Mycteria americana Wood Stork	G4	S2	LT	FT

Matrix Unit ID: 41803

0 **Documented** Elements Found

0 **Documented-Historic** Elements Found

5 **Likely** Elements Found

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
Dasymutilla archboldi Lake Wales Ridge Velvet Ant	G2G3	S2S3	N	N
Drymarchon couperi Eastern Indigo Snake	G3	S3	LT	FT
Mesic flatwoods	G4	S4	N	N
Mycteria americana Wood Stork	G4	S2	LT	FT
Scrub	G2	S2	N	N

Matrix Unit ID: 41804

0 **Documented** Elements Found

0 **Documented-Historic** Elements Found

6 **Likely** Elements Found

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
Dasymutilla archboldi Lake Wales Ridge Velvet Ant	G2G3	S2S3	N	N
Drymarchon couperi Eastern Indigo Snake	G3	S3	LT	FT
Mesic flatwoods	G4	S4	N	N
Mycteria americana Wood Stork	G4	S2	LT	FT
Sandhill upland lake	G3	S2	N	N
Scrub	G2	S2	N	N

Matrix Unit ID: 42172

1 **Documented** Element Found

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
Scrubby flatwoods	G2	S2?	N	N

1 **Documented-Historic** Element Found

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
Lithobates capito Gopher Frog	G3	S3	N	SSC

9 **Likely** Elements Found

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
Dasymutilla archboldi Lake Wales Ridge Velvet Ant	G2G3	S2S3	N	N
Mesic flatwoods	G4	S4	N	N
Mycteria americana Wood Stork	G4	S2	LT	FT
Nolina brittoniana Britton's Beargrass	G3	S3	LE	E
Plestiodon reynoldsi Sand Skink	G2	S2	LT	FT
Polygonella myriophylla Small's Jointweed	G3	S3	LE	E
Sandhill	G3	S2	N	N
Sandhill upland lake	G3	S2	N	N
Scrub	G2	S2	N	N

Matrix Unit ID: 42173

0 **Documented** Elements Found

1 **Documented-Historic** Element Found

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
Lithobates capito Gopher Frog	G3	S3	N	SSC

6 **Likely** Elements Found

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
Dasymutilla archboldi Lake Wales Ridge Velvet Ant	G2G3	S2S3	N	N
Mesic flatwoods	G4	S4	N	N
Mycteria americana Wood Stork	G4	S2	LT	FT
Nolina brittoniana Britton's Beargrass	G3	S3	LE	E
Plestiodon reynoldsi Sand Skink	G2	S2	LT	FT
Scrub	G2	S2	N	N

Matrix Unit ID: 42174

0 **Documented** Elements Found

0 **Documented-Historic** Elements Found

4 **Likely** Elements Found

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
Dasymutilla archboldi Lake Wales Ridge Velvet Ant	G2G3	S2S3	N	N
Mesic flatwoods	G4	S4	N	N
Mycteria americana Wood Stork	G4	S2	LT	FT
Scrub	G2	S2	N	N

Matrix Unit IDs: 41432 , 41433 , 41800 , 41801 , 41802 , 41803 , 41804 , 42172 , 42173 , 42174

59 **Potential** Elements Common to Any of the 10 Matrix Units

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
Andropogon arctatus Pine-woods Bluestem	G3	S3	N	T
Aphelocoma coerulescens Florida Scrub-Jay	G2	S2	LT	FT
Athene cunicularia floridana Florida Burrowing Owl	G4T3	S3	N	SSC
Bonamia grandiflora Florida Bonamia	G3	S3	LT	E
Calamintha ashei Ashe's Savory	G3	S3	N	T
Calopogon multiflorus Many-flowered Grass-pink	G2G3	S2S3	N	T
Carex chapmanii Chapman's Sedge	G3	S3	N	T
Centrosema arenicola Sand Butterfly Pea	G2Q	S2	N	E
Chionanthus pygmaeus Pygmy Fringe Tree	G2G3	S2S3	LE	E
Cladonia perforata Perforate Reindeer Lichen	G1	S1	LE	E
Clitoria fragrans Scrub Pigeon-wing	G3	S3	LT	E
Coelorachis tuberculosa Piedmont Jointgrass	G3	S3	N	T
Corynorhinus rafinesquii Rafinesque's Big-eared Bat	G3G4	S2	N	N
Crotalaria avonensis Avon Park Rabbit-bells	G1	S1	LE	E
Dicerandra christmanii Garrett's Scrub Balm	G1	S1	LE	E
Dicerandra frutescens Scrub Mint	G1	S1	LE	E
Drymarchon couperi Eastern Indigo Snake	G3	S3	LT	FT
Eriogonum longifolium var. gnaphalifolium Scrub Buckwheat	G4T3	S3	LT	E
Gopherus polyphemus Gopher Tortoise	G3	S3	C	ST
Grus canadensis pratensis Florida Sandhill Crane	G5T2T3	S2S3	N	ST
Gymnopogon chapmanianus Chapman's Skeletongrass	G3	S3	N	N
Hartwrightia floridana	G2	S2	N	T

Hartwrightia				
Heterodon simus Southern Hognose Snake	G2	S2	N	N
Hypericum cumulicola Highlands Scrub Hypericum	G2	S2	LE	E
Illicium parviflorum Star Anise	G2	S2	N	E
Lechea cernua Nodding Pinweed	G3	S3	N	T
Lechea divaricata Pine Pinweed	G2	S2	N	E
Liatris ohlingerae Florida Blazing Star	G2	S2	LE	E
Lithobates capito Gopher Frog	G3	S3	N	SSC
Lupinus aridorum Scrub Lupine	G1	S1	LE	E
Matelea floridana Florida Spiny-pod	G2	S2	N	E
Mustela frenata peninsulae Florida Long-tailed Weasel	G5T3	S3	N	N
Nemastylis floridana Celestial Lily	G2	S2	N	E
Neofiber alleni Round-tailed Muskrat	G3	S3	N	N
Nolina atopocarpa Florida Beargrass	G3	S3	N	T
Nolina brittoniana Britton's Beargrass	G3	S3	LE	E
Notophthalmus perstriatus Striped Newt	G2G3	S2	C	N
Panicum abscissum Cutthroat Grass	G3	S3	N	E
Paronychia chartacea ssp. chartacea Paper-like Nailwort	G3T3	S3	LT	E
Peucaea aestivalis Bachman's Sparrow	G3	S3	N	N
Picoides borealis Red-cockaded Woodpecker	G3	S2	LE	FE
Pituophis melanoleucus mugitus Florida Pine Snake	G4T3	S3	N	SSC
Plestiodon egregius lividus Blue-tailed Mole Skink	G5T2	S2	LT	FT
Plestiodon reynoldsi Sand Skink	G2	S2	LT	FT
Podomys floridanus Florida Mouse	G3	S3	N	SSC
Polygala lewtonii Lewton's Polygala	G2G3	S2S3	LE	E
Polygonella basiramia Florida Jointweed	G3	S3	LE	E
Polygonella myriophylla Small's Jointweed	G3	S3	LE	E
Prunus geniculata Scrub Plum	G3	S3	LE	E
Pteroglossaspis ecristata Giant Orchid	G2G3	S2	N	T
Puma concolor coryi Florida Panther	G5T1	S1	LE	FE
Rostrhamus sociabilis Snail Kite	G4G5	S2	LE	N
Salix floridana Florida Willow	G2	S2	N	E
Sceloporus woodi Florida Scrub Lizard	G2G3	S2S3	N	N

Schizachyrium niveum Scrub Bluestem	G1G2	S1S2	N	E
Sciurus niger shermani Sherman's Fox Squirrel	G5T3	S3	N	SSC
Ursus americanus floridanus Florida Black Bear	G5T2	S2	N	N
Warea amplexifolia Clasping Warea	G1	S1	LE	E
Warea carteri Carter's Warea	G3	S3	LE	E

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Florida Natural Areas Inventory

Biodiversity Matrix Query Results

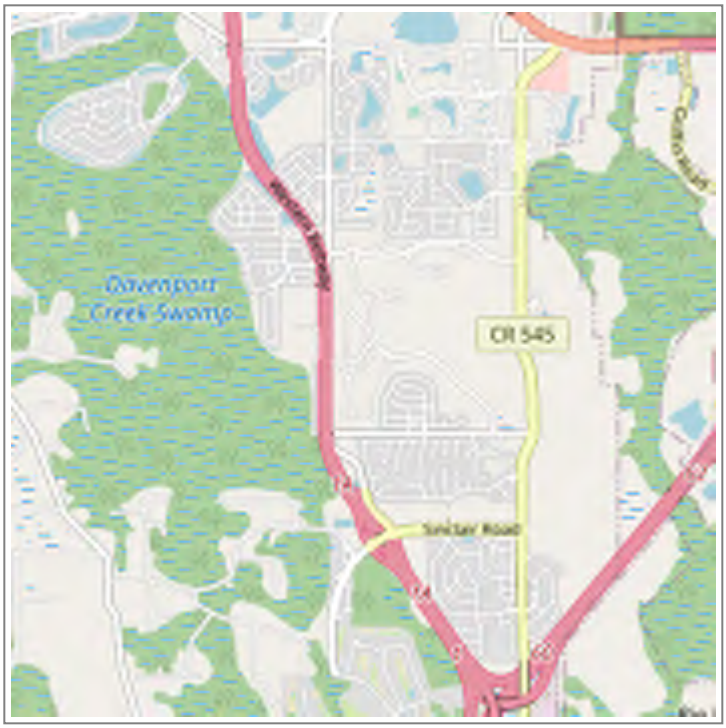
UNOFFICIAL REPORT

Created 1/27/2022

(Contact the FNAI Data Services Coordinator at 850.224.8207 or kbrinegar@fnai.fsu.edu for information on an official Standard Data Report)

NOTE: The Biodiversity Matrix includes only rare species and natural communities tracked by FNAI.

Report for 10 Matrix Units: 41797 , 41798 , 41799 , 42167 , 42168 , 42169 , 42170 , 42171 , 42538 , 42539



Descriptions

DOCUMENTED - There is a documented occurrence in the FNAI database of the species or community within this Matrix Unit.

DOCUMENTED-HISTORIC - There is a documented occurrence in the FNAI database of the species or community within this Matrix Unit; however the occurrence has not been observed/reported within the last twenty years.

LIKELY - The species or community is *known* to occur in this vicinity, and is considered likely within this Matrix Unit because:

1. documented occurrence overlaps this and adjacent Matrix Units, but the documentation isn't precise enough to indicate which of those Units the species or community is actually located in; *or*
2. there is a documented occurrence in the vicinity and there is suitable habitat for that species or community within this Matrix Unit.

POTENTIAL - This Matrix Unit lies within the known or predicted range of the species or community based on expert knowledge and environmental variables such as climate, soils, topography, and landcover.

Matrix Unit ID: 41797

0 **Documented** Elements Found

0 **Documented-Historic** Elements Found

1 **Likely** Element Found

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
Mycteria americana Wood Stork	G4	S2	LT	FT

Matrix Unit ID: 41798

0 **Documented** Elements Found

3 **Documented-Historic** Elements Found

Scientific and Common Names	Global	State	Federal	State

	Rank	Rank	Status	Listing
Eriogonum longifolium var. gnaphalifolium Scrub Buckwheat	G4T3	S3	LT	E
Gopherus polyphemus Gopher Tortoise	G3	S3	C	ST
Plestiodon reynoldsi Sand Skink	G2	S2	LT	FT

2 **Likely** Elements Found

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
Mycteria americana Wood Stork	G4	S2	LT	FT
Sandhill	G3	S2	N	N

Matrix Unit ID: 41799

0 **Documented** Elements Found

2 **Documented-Historic** Elements Found

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
Gopherus polyphemus Gopher Tortoise	G3	S3	C	ST
Plestiodon reynoldsi Sand Skink	G2	S2	LT	FT

3 **Likely** Elements Found

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
Eriogonum longifolium var. gnaphalifolium Scrub Buckwheat	G4T3	S3	LT	E
Mesic flatwoods	G4	S4	N	N
Mycteria americana Wood Stork	G4	S2	LT	FT

Matrix Unit ID: 42167

0 **Documented** Elements Found

0 **Documented-Historic** Elements Found

3 **Likely** Elements Found

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
Mesic flatwoods	G4	S4	N	N
Mycteria americana Wood Stork	G4	S2	LT	FT
Sandhill	G3	S2	N	N

Matrix Unit ID: 42168

0 **Documented** Elements Found

0 **Documented-Historic** Elements Found

4 **Likely** Elements Found

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing

Eriogonum longifolium var. gnaphalifolium Scrub Buckwheat	G4T3	S3	LT	E
Mycteria americana Wood Stork	G4	S2	LT	FT
Sandhill	G3	S2	N	N
Sceloporus woodi Florida Scrub Lizard	G2G3	S2S3	N	N

Matrix Unit ID: 42169

0 **Documented** Elements Found

0 **Documented-Historic** Elements Found

2 **Likely** Elements Found

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
Eriogonum longifolium var. gnaphalifolium Scrub Buckwheat	G4T3	S3	LT	E
Mycteria americana Wood Stork	G4	S2	LT	FT

Matrix Unit ID: 42170

0 **Documented** Elements Found

0 **Documented-Historic** Elements Found

1 **Likely** Element Found

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
Mycteria americana Wood Stork	G4	S2	LT	FT

Matrix Unit ID: 42171

0 **Documented** Elements Found

0 **Documented-Historic** Elements Found

3 **Likely** Elements Found

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
Mesic flatwoods	G4	S4	N	N
Mycteria americana Wood Stork	G4	S2	LT	FT
Sandhill upland lake	G3	S2	N	N

Matrix Unit ID: 42538

0 **Documented** Elements Found

6 **Documented-Historic** Elements Found

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
Bonamia grandiflora Florida Bonamia	G3	S3	LT	E
Chionanthus pygmaeus Pygmy Fringe Tree	G2G3	S2S3	LE	E
Gopherus polyphemus Gopher Tortoise	G3	S3	C	ST

Nolina brittoniana Britton's Beargrass	G3	S3	LE	E
Sceloporus woodi Florida Scrub Lizard	G2G3	S2S3	N	N
Scrub	G2	S2	N	N

4 **Likely** Elements Found

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
Mesic flatwoods	G4	S4	N	N
Mycteria americana Wood Stork	G4	S2	LT	FT
Sandhill	G3	S2	N	N
Stenacron floridense A Mayfly	G3G4	S3S4	N	N

Matrix Unit ID: 42539

1 **Documented** Element Found

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
Gopherus polyphemus Gopher Tortoise	G3	S3	C	ST

0 **Documented-Historic** Elements Found

6 **Likely** Elements Found

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
Chionanthus pygmaeus Pygmy Fringe Tree	G2G3	S2S3	LE	E
Mesic flatwoods	G4	S4	N	N
Mycteria americana Wood Stork	G4	S2	LT	FT
Sandhill	G3	S2	N	N
Sceloporus woodi Florida Scrub Lizard	G2G3	S2S3	N	N
Scrub	G2	S2	N	N

Matrix Unit IDs: 41797 , 41798 , 41799 , 42167 , 42168 , 42169 , 42170 , 42171 , 42538 , 42539

62 **Potential** Elements Common to Any of the 10 Matrix Units

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
Andropogon arctatus Pine-woods Bluestem	G3	S3	N	T
Aphelocoma coerulescens Florida Scrub-Jay	G2	S2	LT	FT
Athene cunicularia floridana Florida Burrowing Owl	G4T3	S3	N	SSC
Bonamia grandiflora Florida Bonamia	G3	S3	LT	E
Calamintha ashei Ashe's Savory	G3	S3	N	T
Calopogon multiflorus Many-flowered Grass-pink	G2G3	S2S3	N	T
Carex chapmanii Chapman's Sedge	G3	S3	N	T
Centrosema arenicola Sand Butterfly Pea	G2Q	S2	N	E

Chionanthus pygmaeus Pygmy Fringe Tree	G2G3	S2S3	LE	E
Cladonia perforata Perforate Reindeer Lichen	G1	S1	LE	E
Clitoria fragrans Scrub Pigeon-wing	G3	S3	LT	E
Coelorachis tuberculosa Piedmont Jointgrass	G3	S3	N	T
Conradina brevifolia Short-leaved Rosemary	G2Q	S2	LE	E
Corynorhinus rafinesquii Rafinesque's Big-eared Bat	G3G4	S2	N	N
Crotalaria avonensis Avon Park Rabbit-bells	G1	S1	LE	E
Dicerandra christmanii Garrett's Scrub Balm	G1	S1	LE	E
Dicerandra frutescens Scrub Mint	G1	S1	LE	E
Drymarchon couperi Eastern Indigo Snake	G3	S3	LT	FT
Egretta tricolor Tricolored Heron	G5	S4	N	SSC
Eriogonum longifolium var. gnaphalifolium Scrub Buckwheat	G4T3	S3	LT	E
Falco sparverius paulus Southeastern American Kestrel	G5T4	S3	N	ST
Gopherus polyphemus Gopher Tortoise	G3	S3	C	ST
Grus canadensis pratensis Florida Sandhill Crane	G5T2T3	S2S3	N	ST
Gymnopogon chapmanianus Chapman's Skeletongrass	G3	S3	N	N
Hartwrightia floridana Hartwrightia	G2	S2	N	T
Heterodon simus Southern Hognose Snake	G2	S2	N	N
Hypericum cumulicola Highlands Scrub Hypericum	G2	S2	LE	E
Illicium parviflorum Star Anise	G2	S2	N	E
Lechea cernua Nodding Pinweed	G3	S3	N	T
Lechea divaricata Pine Pinweed	G2	S2	N	E
Liatris ohlingerae Florida Blazing Star	G2	S2	LE	E
Lithobates capito Gopher Frog	G3	S3	N	SSC
Lupinus aridorum Scrub Lupine	G1	S1	LE	E
Matelea floridana Florida Spiny-pod	G2	S2	N	E
Mustela frenata peninsulae Florida Long-tailed Weasel	G5T3	S3	N	N
Nemastylis floridana Celestial Lily	G2	S2	N	E
Neofiber alleni Round-tailed Muskrat	G3	S3	N	N
Nolina atopocarpa Florida Beargrass	G3	S3	N	T
Nolina brittoniana Britton's Beargrass	G3	S3	LE	E
Notophthalmus perstriatus Striped Newt	G2G3	S2	C	N
Panicum abscissum	G3	S3	N	E

Cutthroat Grass				
Paronychia chartacea ssp. chartacea Paper-like Nailwort	G3T3	S3	LT	E
Peucaea aestivalis Bachman's Sparrow	G3	S3	N	N
Picoides borealis Red-cockaded Woodpecker	G3	S2	LE	FE
Pituophis melanoleucus mugitus Florida Pine Snake	G4T3	S3	N	SSC
Plestiodon egregius lividus Blue-tailed Mole Skink	G5T2	S2	LT	FT
Plestiodon reynoldsi Sand Skink	G2	S2	LT	FT
Podomys floridanus Florida Mouse	G3	S3	N	SSC
Polygala lewtonii Lewton's Polygala	G2G3	S2S3	LE	E
Polygonella basiramia Florida Jointweed	G3	S3	LE	E
Polygonella myriophylla Small's Jointweed	G3	S3	LE	E
Prunus geniculata Scrub Plum	G3	S3	LE	E
Pteroglossaspis ecristata Giant Orchid	G2G3	S2	N	T
Puma concolor coryi Florida Panther	G5T1	S1	LE	FE
Rostrhamus sociabilis Snail Kite	G4G5	S2	LE	N
Salix floridana Florida Willow	G2	S2	N	E
Sceloporus woodi Florida Scrub Lizard	G2G3	S2S3	N	N
Schizachyrium niveum Scrub Bluestem	G1G2	S1S2	N	E
Sciurus niger shermani Sherman's Fox Squirrel	G5T3	S3	N	SSC
Ursus americanus floridanus Florida Black Bear	G5T2	S2	N	N
Warea amplexifolia Clasping Warea	G1	S1	LE	E
Warea carteri Carter's Warea	G3	S3	LE	E

APPENDIX F

PROTECTED SPECIES POTENTIAL FOR OCCURRENCE AND MAP

Species	Designated Status			Habitat Preference	Potential for Occurrence
	Federal	State	FDACS		
Flora					
Ashe's savory (*Calamintha ashei*)	-	-	T	Open areas of pine scrub habitat, sandhills, and scrub and disturbed areas such as abandoned fields, roadsides, and fire lanes.	None
Avon Park rabbit-bells (*Crotalaria avonensis*)	E	-	-	Bare patches of white sand in Lake Wales Ridge scrub and occasionally in disturbed areas or partial shade	None
Beautiful pawpaw (*Deeringothamnus pulchellus*)	E	-	-	Open slash pine or longleaf pine flatwoods with wiregrass and dwarf live oak in the understory.	None
Britton's beargrass (*Nolina brittoniana*)	E	-	-	Scrub, sandhill, scrubby flatwoods, and xeric hammock.	None
Carter's warea (*Warea carteri*)	E	-	-	Scrub and sandhills with longleaf pine and wiregrass.	None
Celestial lily (*Nemastylis floridana*)	-	-	E	Wet flatwoods, prairies, marshes, and cabbage palm hammocks edges.	Low
Chapman's sedge (*Carex chapmanii*)	-	-	T	Hammocks/floodplains of blackwater streams with intermittent floods.	None

Species	Designated Status			Habitat Preference	Potential for Occurrence
	Federal	State	FDACS		
Clasping warea (*Warea amplexifolia*)	E	-	-	Sunny openings with exposed sand in longleaf pine/turkey oak/wiregrass sandhills.	None
Cutthroat grass (*Panicum abscissum*)	-	-	E	Dry prairies, mesic flatwoods, wet flatwoods, depressional marshes, and seepage slopes.	Low
Florida beargrass (*Nolina atopocarpa*)	-	-	T	Pine flatwoods, scrubby flatwoods.	None
Florida blazing star (*Liatris ohlingerae*)	E	-	-	Rosemary balds, scrubby flatwoods, and disturbed scrub.	None
Florida bonamia (*Bonamia grandiflora*)	T	-	-	Open and disturbed areas in white sand scrub on central Florida ridges that include scrub oaks, sand pine, and lichens.	None
Florida jointweed (*Polygonella basiramia*)	E	-	-	Open, sandy areas within sand pine scrub.	None
Florida spiny-pod (*Matelea floridana*)	-	-	E	Occurs on a variety of wooded habitats from fairly moist woods to upland hardwood forests.	Low
Florida willow (*Salix floridana*)	-	-	E	Springheads, edges of spring runs, hydric hammocks, and floodplains.	Low
Garrett's scrub balm (*Dicerandra christmanii*)	E	-	-	Openings in oak scrub on Lake Wales Ridge.	None

Species	Designated Status			Habitat Preference	Potential for Occurrence
	Federal	State	FDACS		
Giant orchid (*Pteroglossaspis ecristata*)	-	-	T	Sandhill, scrub, pine flatwoods, and pine rocklands.	None
Hartwrightia (*Hartwrightia floridana*)	-	-	T	Seepage slopes, edges of baygalls and springheads, wet prairies, and flatwoods with wet peaty soils.	None
Highlands scrub hypericum (*Hypericum cumulicola*)	E	-	-	Open patches in white sand scrub, rosemary balds, scrubby flatwoods, and oak scrubs.	None
Incised groove-bur (*Agrimonia incisa*)	-	-	T	Dry to moist longleaf pine-oak woods, oak-hickory slopes, roadsides, sand or shell maritime thickets.	None
Lewton's polygala (*Polygala lewtonii*)	E	-	-	Oak scrub, sandhill, and transition zones between high pine and turkey oak barrens.	None
Many-flowered grass-pink (*Calopogon multiflorus*)	-	-	T	Dry to moist flatwoods with longleaf pine, wiregrass, and saw palmetto.	None
Nodding pinweed (*Lechea cernua*)	-	-	T	Deep sands, usually ancient dunes, on which the most common forest is a mixture of evergreen scrub oaks.	None
Papery nailwort (*Paronychia chartacea ssp. Chartacea*)	T	-	-	White sand clearings in sand scrub of ancient dunes.	None

Species	Designated Status			Habitat Preference	Potential for Occurrence
	Federal	State	FDACS		
Perforate reindeer lichen (*Cladonia perforate*)	E	-	-	Rosemary scrub on the Panhandle coasts, Lake Wales Ridge, and Atlantic Coast Ridge.	None
Piedmont jointgrass (*Coelorachis tuberculosa*)	-	-	T	Margins of lakes and ponds or in wet savanna swales.	None
Pine pinweed (*Lechea divaricate*)	-	-	E	Scrub and scrubby flatwoods.	None
Pine-woods bluestem (*Andropogon arctatus*)	-	-	T	Open flatwoods, savanna, sand pine scrub, and in seepage bogs	None
Pygmy fringe tree (*Chionanthus pygmaeus*)	E	-	-	Scrub, sandhills, and xeric hammocks.	None
Sand butterfly pea (*Centrosema Arenicola*)	-	-	E	Sandhill, scrubby flatwoods, and dry upland woods.	Low
Scrub bluestem (*Schizachyrium niveum*)	-	-	E	White sand patches in rosemary scrub, and in sand pine scrub and oak scrub.	None
Scrub buckwheat (*Eriogonum longifolium var. gnaphalifolium*)	T	-	-	Sandhill, oak hickory scrub, high pinelands, and turkey oak barrens with wiregrass, blue jack, and turkey oak.	None
Scrub lupine (*Lupinus aridorum*)	E	-	-	Openings in sand pine and rosemary scrub.	None
Scrub mint (*Dicerandra frutescens*)	E	-	-	Sand pine scrub and sandhill on the Lake Wales Ridge.	None

Species	Designated Status			Habitat Preference	Potential for Occurrence
	Federal	State	FDACS		
Scrub pigeon-wing (*Clitoria fragrans*)	T	-	-	Turkey oak barrens with wire grass or scrub/scrubby high pine.	None
Scrub plum (*Prunus geniculate*)	E	-	-	Sandhill and oak scrub.	None
Short-leaved rosemary (*Conradina brevifolia*)	E	-	-	Florida scrub habitat on white sand substrates among sand pines and oaks.	None
Small's jointweed (*Polygonella myriophylla*)	E	-	-	Open, sandy areas within scrub.	None
Star anise (*Illicium parviflorum*)	-	-	E	Banks of seepage stream, bottomland forest, hydric hammock, or baygall.	Low
Reptilian					
American alligator (*Alligator mississippiensis*)	T(S/A)	-	-		Low
Blue-tailed mole skink (*Plestiodon egregius lividus*)	T	-	-	Sandhill, Scrub, and longleaf pine-turkey oak habitats.	Moderate
Eastern indigo snake (*Drymarchon couperi*)	T	-	-	Mesic flatwoods, upland pine forests, swamps, wet prairies, xeric pinelands, and scrub habitats.	Moderate
Florida pine snake (*Pituophis melanoleucus mugitus*)	-	T	-	Dry, sandy soils for burrowing and is most often found in pine hammocks, turkey oak hammocks, scrub, sandhill, and abandoned agricultural fields.	Low

Species	Designated Status			Habitat Preference	Potential for Occurrence
	Federal	State	FDACS		
Gopher tortoise (*Gopherus polyphemus*)	C	T	-	Typically found in dry upland habitats including sandhills, scrub, xeric oak hammock, and dry pine flatwoods; also, commonly uses disturbed habitats such as pastures, old fields, and road shoulders.	Moderate
Sand skink (*Plestiodon reynoldsi*)	T	-	-	Sandhill, scrub, and longleaf pine-turkey oak habitats.	Moderate
Avian					
Bald eagle (*Haliaeetus leucocephalus*)	NL1	NL2	-	Large open water bodies, saltwater marshes, dry prairies, mixed pine, hardwood forests, wet prairies, marshes, pine flatwoods, and sandhills	Moderate
Crested caracara (*Caracara cheriway*)	T	-	-	Open country such as dry prairie and pasture lands with scattered cabbage palm, cabbage palm/live oak hammocks, and shallow ponds and sloughs. Cabbage palms or live oaks with low-growing surrounding vegetation are required for nesting.	None

Species	Designated Status			Habitat Preference	Potential for Occurrence
	Federal	State	FDACS		
Everglade snail Kite (*Rostrhamus sociabilis*)	E	-	-	Large, open, freshwater marshes and shallow lakes (< 4 ft. deep) with a low density of emergent vegetation and typically nest in low trees or shrubs over water (commonly willow, wax myrtle, pond apple, or buttonbush, but also in non-woody vegetation like cattail or sawgrass).	None
Florida burrowing owl (*Athene cunicularia floridana*)	-	T	-	Areas of short, herbaceous groundcover; including prairies, sandhills, and farmland.	None
Florida grasshopper sparrow (*Ammodramus savannarum floridanus*)	E	-	-	Requires large areas of frequently burned dry prairie habitat with patchy open areas sufficient for foraging. May persist in pasture lands that have not been intensively managed so as to remove all vegetation.	None
Florida sandhill crane (*Grus canadensis pratensis*)	N	ST	-	Wet and dry prairies, marshes, and marshy lake edges.	Low

Species	Designated Status			Habitat Preference	Potential for Occurrence
	Federal	State	FDACS		
Florida scrub-jay (*Aphelocoma coerulescens*)	T	-	-	Typically found in early successional stages of fire-dominated xeric oak communities located on well-drained, sandy soils; preferred habitat consists of scrub oaks between 3 and 10 feet tall, with open sand and scattered clumps of herbaceous vegetation.	None
Little blue heron (*Egretta caerulea*)	-	T	-	Freshwater marshes, coastal beaches, mangrove swamps, cypress swamps, hardwood swamps, wet prairies and bay swamps.	Low
Red-cockaded woodpecker (*Picoides borealis*)	E	-	-	Mature pine woodlands that have a diversity of grass, forb, and shrub species. Longleaf and slash pine flatwoods.	None
Roseate spoonbill (*Platalea ajaja*)	-	T	-	Freshwater marshes, coastal beaches, mangrove swamps, cypress swamps, hardwood swamps, wet prairies and bay swamps.	Low

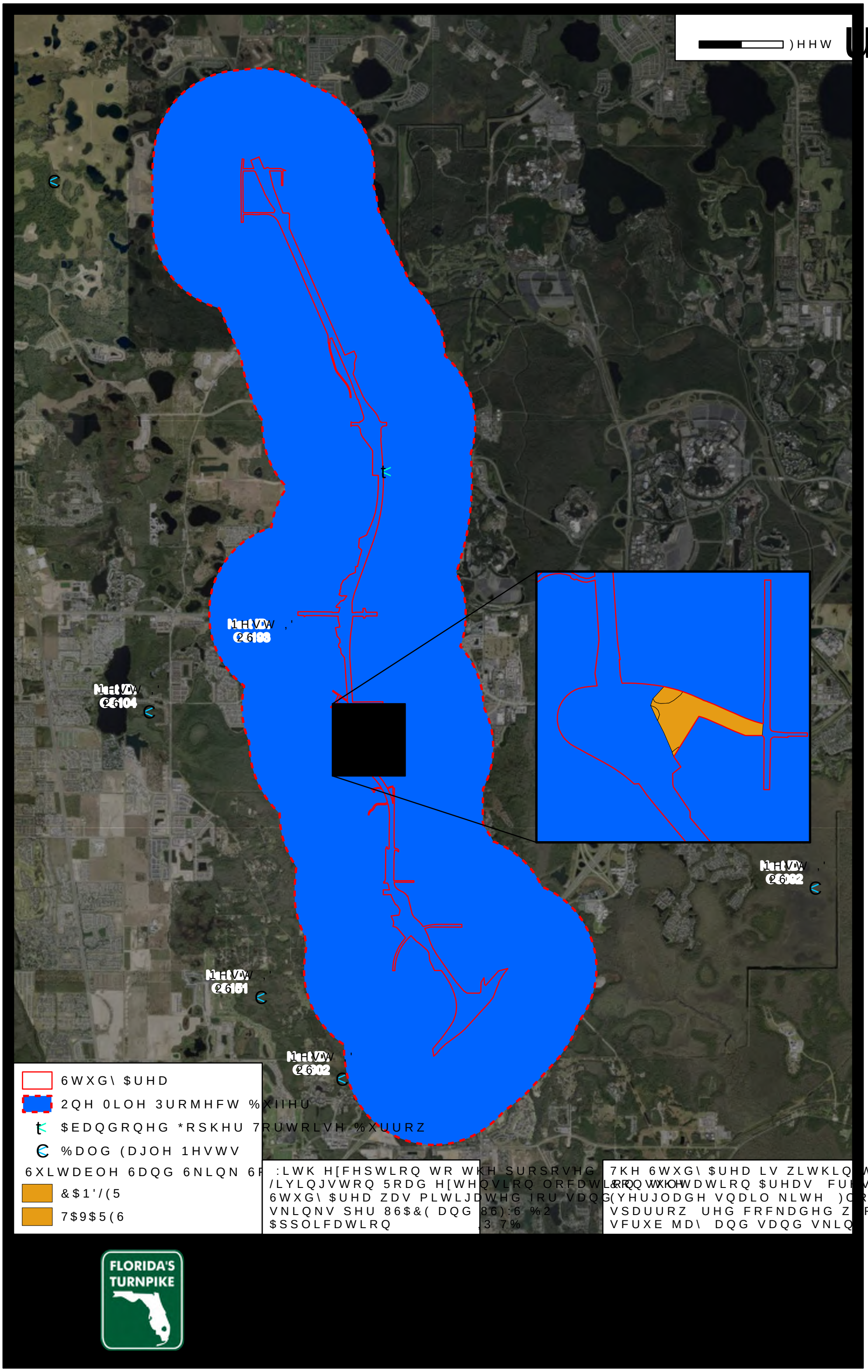
Species	Designated Status			Habitat Preference	Potential for Occurrence
	Federal	State	FDACS		
Southeastern American kestrel (*Falco sparverius paulus*)	-	T	-	Abandoned woodpecker cavities, nest in open pinelands, woodland edges, prairies, and pastures. Sandhill habitats are preferred but observed in flatwoods.	Low
Tricolored heron (*Egretta tricolor*)	-	T	-	Freshwater marshes, coastal beaches, mangrove swamps, cypress swamps, hardwood swamps, wet prairies and bay swamps.	Low
Wood stork (*Mycteria americana*)	T	-	-	Fresh and saltwater habitats such as fresh and saltwater marshes, tidal flats, wet prairies, cypress swamps, and agricultural environments.	Low

Notes:

E = endangered, T = threatened, SSC = species of special concern, T(S/A) = Federal Threatened due to similarity of appearance, C = candidate, NL = not listed

[1] While not listed under the ESA, the Bald Eagle is federally protected under the Bald and Golden Eagle Protection Act.

[2] While not listed under Chapter 68A-27 FAC, the Bald Eagle is state protected under the FWC Bald Eagle Management Plan (2008).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FLORIDA'S TURNPIKE

APPENDIX G

SPECIES DETERMINATION KEY PATHS AND STANDARD PROTECTION MEASURES FOR THE EASTERN INDIGO SNAKE

United States Department of the Interior

FISH AND WILDLIFE SERVICE
South Florida Ecological Services Office
1339 20th Street
Vero Beach, Florida 32960

May 18, 2010

Donnie Kinard
Chief, Regulatory Division
Jacksonville District Corps of Engineers
Post Office Box 4970
Jacksonville, Florida 32232-0019

Service Federal Activity Code: 41420-2007-FA-1494
Service Consultation Code: 41420-2007-I-0964
Subject: South Florida Programmatic Concurrence
Species: Wood Stork

Dear Mr. Kinard:

This letter addresses minor errors identified in our January 25, 2010, wood stork key and as such, supplants the previous key. The key criteria and wood stork biomass foraging assessment methodology have not been affected by these minor revisions.

The Fish and Wildlife Service's (Service) South Florida Ecological Services Office (SFESO) and the U.S. Army Corps of Engineers Jacksonville District (Corps) have been working together to streamline the consultation process for federally listed species associated with the Corps' wetland permitting program. The Service provided letters to the Corps dated March 23, 2007, and October 18, 2007, in response to a request for a multi-county programmatic concurrence with a criteria-based determination of "may affect, not likely to adversely affect" (NLAA) for the threatened eastern indigo snake (*Drymarchon corais couperi*) and the endangered wood stork (*Mycteria americana*) for projects involving freshwater wetland impacts within specified Florida counties. In our letters, we provided effect determination keys for these two federally listed species, with specific criteria for the Service to concur with a determination of NLAA.

The Service has revisited these keys recently and believes new information provides cause to revise these keys. Specifically, the new information relates to foraging efficiencies and prey base assessments for the wood stork and permitting requirements for the eastern indigo snake. This letter addresses the wood stork key and is submitted in accordance with section 7 of the Endangered Species Act of 1973, as amended (Act) (87 Stat. 884; 16 U.S.C. 1531 *et seq.*). The eastern indigo snake key will be provided in a separate letter.

Wood stork

Habitat

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 (Ogden 1991, 1996; Rodgers et al. 1996). 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.

Successful nesting generally involves combinations of average or above-average rainfall during the summer rainy season and an absence of unusually rainy or cold weather during the winter-spring breeding season (Kahl 1964; Rodgers et al. 1987). This pattern produces widespread and prolonged flooding of summer marshes, which maximize production of freshwater fishes, followed by steady drying that concentrate fish during the season when storks nest (Kahl 1964). Successful nesting colonies are those that have a large number of foraging sites. To maintain a wide range of foraging sites, a variety of wetland types should be present, with both short and long hydroperiods. The Service (1999) describes a short hydroperiod as a 1 to 5-month wet/dry cycle, and a long hydroperiod as greater than 5 months. During the wet season, wood storks generally feed in the shallow water of the short-hydroperiod wetlands and in coastal habitats during low tide. During the dry season, foraging shifts to longer hydroperiod interior wetlands as they progressively dry-down (though usually retaining some surface water throughout the dry season).

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. Through tactolocation, or grope feeding, wood storks in south Florida feed almost exclusively on fish between 2 and 25 centimeters [cm] (1 and 10 inches) in length (Ogden et al. 1976). Good foraging conditions are characterized by water that is relatively calm, uncluttered by dense thickets of aquatic vegetation, and having a water depth between 5 and 38 cm (5 and 15 inches) deep, although wood storks may forage in other wetlands. Ideally, preferred foraging wetlands would include a mosaic of emergent and shallow open-water areas. The emergent component provides nursery habitat for small fish, frogs, and other aquatic prey and the shallow, open-water areas provide sites for concentration of the prey during seasonal dry-down of the wetland.

Conservation Measures

The Service routinely concurs with the Corps' "may affect, not likely to adversely affect" determination for individual project effects to the wood stork when project effects are insignificant due to scope or location, or if assurances are given that wetland impacts have been avoided, minimized, and adequately compensated such that there is no net loss in foraging potential. We utilize our *Habitat Management Guidelines for the Wood Stork in the Southeast Region* (Service 1990) (Enclosure 1) (HMG) in project evaluation. The HMG is currently under review and once final will replace the enclosed HMG. There is no designated critical habitat for the wood stork.

The SFESO recognizes a 29.9 kilometer [km] (18.6-mile) core foraging area (CFA) around all known wood stork colonies in south Florida. Enclosure 2 (to be updated as necessary) provides locations of colonies and their CFAs in south Florida that have been documented as active within the last 10 years. The Service believes loss of suitable wetlands within these CFAs may reduce foraging opportunities for the wood stork. To minimize adverse effects to the wood stork, we recommend compensation be provided for impacts to foraging habitat. The compensation should consider wetland type, location, function, and value (hydrology, vegetation, prey utilization) to ensure that wetland functions lost due to the project are adequately offset. Wetlands offered as compensation should be of the same hydroperiod and located within the CFAs of the affected wood stork colonies. The Service may accept, under special circumstances, wetland compensation located outside the CFAs of the affected wood stork nesting colonies. On occasion, wetland credits purchased from a "Service Approved" mitigation bank located outside the CFAs could be acceptable to the Service, depending on location of impacted wetlands relative to the permitted service area of the bank, and whether or not the bank has wetlands having the same hydroperiod as the impacted wetland.

In an effort to reduce correspondence in effect determinations and responses, the Service is providing the Wood Stork Effect Determination Key below. If the use of this key results in a Corps determination of "no effect" for a particular project, the Service supports this determination. If the use of this Key results in a determination of NLAA, the Service concurs with this determination[1]. This Key is subject to revisitation as the Corps and Service deem necessary.

The Key is as follows:

A. Project within 0.76 km (0.47 mile)[2] of an active colony site[3] ..... "*may affect*[4]"

Project impacts Suitable Foraging Habitat (SFH)[5] at a location greater than 0.76 km (0.47 mile) from a colony site..... ....."*go to* B"

[1] With an outcome of "no effect" or "NLAA" as outlined in this key, and the project has less than 20.2 hectares (50 acres) of wetland impacts, the requirements of section 7 of the Act are fulfilled for the wood stork and no further action is required. For projects with greater than 20.2 hectares (50 acres) of wetland impacts, written concurrence of NLAA from the Service is necessary.

[2] Within the secondary zone (the average distance from the border of a colony to the limits of the secondary zone is 0.76 km (2,500 feet, or 0.47 mi).

[3] An active colony is defined as a colony that is currently being used for nesting by wood storks or has historically over the last 10 years been used for nesting by wood storks.

[4] Consultation may be concluded informally or formally depending on project impacts.

[5] Suitable foraging habitat (SFH) includes wetlands that typically have shallow-open water areas that are relatively calm and have a permanent or seasonal water depth between 5 to 38 cm (2 to 15 inches) deep. Other shallow non-wetland water bodies are also SFH. SFH supports and concentrates, or is capable of supporting and concentrating small fish, frogs, and other aquatic prey. Examples of SFH include, but are not limited to freshwater marshes, small ponds, shallow, seasonally flooded roadside or agricultural ditches, seasonally flooded pastures, narrow tidal creeks or shallow tidal pools, managed impoundments, and depressions in cypress heads and swamp sloughs.

Project does not affect SFH……..…..*"no effect[1]".*

B. Project impact to SFH is less than 0.20 hectare (one-half acre)[6]……..……*NLAA[1]"*

Project impact to SFH is greater in scope than 0.20 hectare (one-half acre)....……*go to* C

C. Project impacts to SFH not within the CFA (29.9 km, 18.6 miles) of a colony site ……..…….…….…..……*go to* D

Project impacts to SFH within the CFA of a colony site …….…..…...…….*go to* E

D. Project impacts to SFH have been avoided and minimized to the extent practicable; compensation (Service approved mitigation bank or as provided in accordance with Mitigation Rule 33 CFR Part 332) for unavoidable impacts is proposed in accordance with the CWA section 404(b)(1) guidelines; and habitat compensation replaces the foraging value matching the hydroperiod[7] of the wetlands affected and provides foraging value similar to, or higher than, that of impacted wetlands. See Enclosure 3 for a detailed discussion of the hydroperiod foraging values, an example, and further guidance[8]…….. *NLAA[1]"*

Project not as above.……... *"may affect[4]"*

E. Project provides SFH compensation in accordance with the CWA section 404(b)(1) guidelines and is not contrary to the HMG; habitat compensation is within the appropriate CFA or within the service area of a Service-approved mitigation bank; and habitat compensation replaces foraging value, consisting of wetland enhancement or restoration matching the hydroperiod[7] of the wetlands affected, and provides foraging value similar

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[6] On an individual basis, SFH impacts to wetlands less than 0.20 hectare (one-half acre) generally will not have a measurable effect on wood storks, although we request that the Corps require mitigation for these losses when appropriate. Wood storks are a wide ranging species, and individually, habitat change from impacts to SFH less than one-half acre are not likely to adversely affect wood storks. However, collectively they may have an effect and therefore regular monitoring and reporting of these effects are important.

[7] Several researchers (Flemming et al. 1994; Ceilley and Bortone 2000) believe that the short hydroperiod wetlands provide a more important pre-nesting foraging food source and a greater early nestling survivor value for wood storks than the foraging base (grams of fish per square meter) than long hydroperiod wetlands provide. Although the short hydroperiod wetlands may provide less fish, these prey bases historically were more extensive and met the foraging needs of the pre-nesting storks and the early-age nestlings. Nest productivity may suffer as a result of the loss of short hydroperiod wetlands. We believe that most wetland fill and excavation impacts permitted in south Florida are in short hydroperiod wetlands. Therefore, we believe that it is especially important that impacts to these short hydroperiod wetlands within CFAs are avoided, minimized, and compensated for by enhancement/restoration of short hydroperiod wetlands.

[8] For this Key, the Service requires an analysis of foraging prey base losses and enhancements from the proposed action as shown in the examples in Enclosure 3 for projects with greater than 2.02 hectares (5 acres) of wetland impacts. For projects with less than 2.02 hectares (5 acres) of wetland impacts, an individual foraging prey base analysis is not necessary although type for type wetland compensation is still a requirement of the Key.

to, or higher than, that of impacted wetlands. See Enclosure 3 for a detailed discussion of the hydroperiod foraging values, an example, and further guidance[8]..... *"NLAA[1]"*

Project does not satisfy these elements ..... *"may affect[4]"*

This Key does not apply to Comprehensive Everglades Restoration Plan projects, as they will require project-specific consultations with the Service.

Monitoring and Reporting Effects

For the Service to monitor cumulative effects, it is important for the Corps to monitor the number of permits and provide information to the Service regarding the number of permits issued where the effect determination was: "may affect, not likely to adversely affect." We request that the Corps send us an annual summary consisting of: project dates, Corps identification numbers, project acreages, project wetland acreages, and project locations in latitude and longitude in decimal degrees.

Thank you for your cooperation and effort in protecting federally listed species. If you have any questions, please contact Allen Webb at extension 246.

Sincerely yours,

Paul Souza
Field Supervisor
South Florida Ecological Services Office

Enclosures

cc: w/enclosures (electronic only)
Corps, Jacksonville, Florida (Stu Santos)
EPA, West Palm Beach, Florida (Richard Harvey)
FWC, Vero Beach, Florida (Joe Walsh)
Service, Jacksonville, Florida (Billy Brooks)

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HABITAT MANAGEMENT GUIDELINES FOR THE WOOD STORK IN THE SOUTHEAST REGION

HABITAT MANAGEMENT GUIDELINES FOR THE WOOD STORK IN THE SOUTHEAST REGION

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Wildlife Research
Everglades National Park

for the

Southeast Region
U.S. Fish and Wildlife Service

Cover design by
Florida Power & Light Company
Miami, Florida

HABITAT MANAGEMENT GUIDELINES FOR THE WOOD STORK IN THE SOUTHEAST REGION

Introduction

A number of Federal and state laws and/or regulations prohibit, cumulatively, such acts as harrassing, disturbing, harming, molesting, pursuing, etc., wood storks, or destroying their nests (see Section VII). Although advisory in nature, these guidelines represent a biological interpretation of what would constitute violations of one or more of such prohibited acts. Their purpose is to mainain and/or improve the environmental conditions that are required for the survival and well-being of wood storks in the southeastern United States, and are designed essentially for application in wood stork/human activity conflicts (principally land development and human intrusion into stork use sites). The emphasis is to avoid or minimize detrimental human-related impacts on wood storks. These guidelines were prepared in consultations with state wildlife agencies and wood stork experts in the four southeastern states where the wood stork is listed as Endangered (Alabama, Florida, Georgia, South Carolina).

General

The wood stork is a gregarious species, which nests in colonies (rookeries), and roosts and feeds in flocks, often in association with other species of long-legged water birds. Storks that nest in the southeastern United States appear to represent a distinct population, separate from the nearest breeding population in Mexico. Storks in the southeastern U.S. population have recently (since 1980) nested in colonies scattered throughout Florida, and at several central-southern Georgia and coastal South Carolina sites. Banded and color-marked storks from central and southern Florida colonies have dispersed during non-breeding seasons as far north as southern Georgia, and the coastal counties in South Carolina and southeastern North Carolina, and as far west as central Alabama and northeastern Mississippi. Storks from a colony in south-central Georgia have wintered between southern Georgia and southern Florida. This U.S. nesting population of wood storks was listed as endangered by the U.S. Fish and Wildlife Service on February 28, 1984 (*Federal Register* 49(4):7332-7335).

Wood storks use freshwater and estuarine wetlands as feeding, nesting, and roosting sites. Although storks are not habitat specialists, their needs are exacting enough, and available habitat is limited enough, so that nesting success and the size of regional populations are closely regulated by year-to-year differences in the quality and quantity of suitable habitat. Storks are especially sensitive to environmental conditions at feeding sites; thus, birds may fly relatively long distances either daily or between regions annually, seeking adequate food resources.

All available evidence suggests that regional declines in wood stork numbers have been largely due to the loss or degradation of essential wetland habitat. An understanding of the qualities of good stork habitat should help to focus protection efforts on those sites

that are seasonally important to regional populations of wood storks. Characteristics of feeding, nesting, and roosting habitat, and management guidelines for each, are presented here by habitat type.

I. Feeding habitat.

A major reason for the wood stork decline has been the loss and degredation of feeding habitat. Storks are especially sensitive to any manipulation of a wetland site that results in either reduced amounts or changes in the timing of food availability.

Storks feed primarily (often almost exclusively) on small fish between 1 and 8 inches in length. Successful foraging sites are those where the water is between 2 and 15 inches deep. Good feeding conditions usually occur where water is relatively calm and uncluttered by dense thickets of aquatic vegetation. Often a dropping water level is necessary to concentrate fish at suitable densities. Conversely, a rise in water, especially when it occurs abruptly, disperses fish and reduces the value of a site as feeding habitat.

The types of wetland sites that provide good feeding conditions for storks include: drying marshes or stock ponds, shallow roadside or agricultural ditches, narrow tidal creeks or shallow tidal pools, and depressions in cypress heads or swamp sloughs. In fact, almost any shallow wetland depression where fish tend to become concentrated, either through local reproduction or the consequences of area drying, may be used by storks.

Nesting wood storks do most of their feeding in wetlands between 5 and 40 miles from the colony, and occasionally at distances as great as 75 miles. Within this colony foraging range and for the 110-150 day life of the colony, and depending on the size of the colony and the nature of the surrounding wetlands, anywhere from 50 to 200 different feeding sites may be used during the breeding season.

Non-breeding storks are free to travel much greater distances and remain in a region only for as long as sufficient food is available. Whether used by breeders or non-breeders, any single feeding site may at one time have small or large numbers of storks (1 to 100+), and be used for one to many days, depending on the quality and quantity of available food. Obviously, feeding sites used by relatively large numbers of storks, and/or frequently used areas, potentially are the more important sites necessary for the maintenance of a regional population of birds.

Differences between years in the seasonal distribution and amount of rainfall usually mean that storks will differ between years in where and when they feed. Successful nesting colonies are those that have a large number of feeding site options, including sites that may be suitable only in years of rainfall extremes. To maintain the wide range of feeding site options requires that many different wetlands, with both relatively short and long annual hydroperiods, be preserved. For example, protecting only the larger wetlands, or those with longer annual hydroperiods, will result in the eventual loss of smaller, seemingly less important wetlands. However, these small scale wetlands are crucial as the only available feeding sites during the wetter periods when the larger habitats are too deeply flooded to be used by storks.

II. Nesting habitat.

Wood storks nest in colonies, and will return to the same colony site for many years so long as that site and surrounding feeding habitat continue to supply the needs of the birds. Storks require between 110 and 150 days for the annual nesting cycle, from the period of courtship until the nestlings become independent. Nesting activity may begin as early as December or as late as March in southern Florida colonies, and between late February and April in colonies located between central Florida and South Carolina. Thus, full term colonies may be active until June-July in south Florida, and as late as July-August at more northern sites. Colony sites may also be used for roosting by storks during other times of the year.

Almost all recent nesting colonies in the southeastern U.S. have been located either in woody vegetation over standing water, or on islands surrounded by broad expanses of open water. The most dominant vegetation in swamp colonies has been cypress, although storks also nest in swamp hardwoods and willows. Nests in island colonies may be in more diverse vegetation, including mangroves (coastal), exotic species such as Australian pine (*Casuarina*) and Brazilian Pepper (*Schinus*), or in low thickets of cactus (*Opuntia*). Nests are usually located 15-75 feet above ground, but may be much lower, especially on island sites when vegetation is low.

Since at least the early 1970's, many colonies in the southeastern U.S. have been located in swamps where water has been impounded due to the construction of levees or roadways. Storks have also nested in dead and dying trees in flooded phosphate surface mines, or in low, woody vegetation on mounded, dredge islands. The use of these altered wetlands or completely "artificial" sites suggests that in some regions or years storks are unable to locate natural nesting habitat that is adequately flooded during the normal breeding season. The readiness with which storks will utilize water impoundments for nesting also suggests that colony sites could be intentionally created and maintained through long-term site management plans. Almost all impoundment sites used by storks become suitable for nesting only fortuitously, and therefore, these sites often do not remain available to storks for many years.

In addition to the irreversible impacts of drainage and destruction of nesting habitat, the greatest threats to colony sites are from human disturbance and predation. Nesting storks show some variation in the levels of human activity they will tolerate near a colony. In general, nesting storks are more tolerant of low levels of human activity near a colony when nests are high in trees than when they are low, and when nests contain partially or completely feathered young than during the period between nest construction and the early nestling period (adults still brooding). When adult storks are forced to leave their nests, eggs or downy young may die quickly (<20 minutes) when exposed to direct sun or rain.

Colonies located in flooded environments must remain flooded if they are to be successful. Often water is between 3 and 5 feet deep in successful colonies during the nesting season. Storks rarely form colonies, even in traditional nesting sites, when they are dry, and may abandon nests if sites become dry during the nesting period. Flooding in colonies may be most important as a defense against mammalian predators. Studies of stork colonies in Georgia and

Florida have shown high rates of raccoon predation when sites dried during the nesting period. A reasonably high water level in an active colony is also a deterrent against both human and domestic animal intrusions.

Although nesting wood storks usually do most feeding away from the colony site (>5 miles), considerable stork activity does occur close to the colony during two periods in the nesting cycle. Adult storks collect almost all nesting material in and near the colony, usually within 2500 feet. Newly fledged storks, near the end of the nesting cycle, spend from 1-4 weeks during the fledging process flying locally in the colony area, and perched in nearby trees or marshy spots on the ground. These birds return daily to their nests to be fed. It is essential that these fledging birds have little or no disturbance as far our as one-half mile within at least one or two quadrants from the colony. Both the adults, while collecting nesting material, and the inexperienced fledglings, do much low, flapping flight within this radius of the colony. At these times, storks potentially are much more likely to strike nearby towers or utility lines.

Colony sites are not necessarily used annually. Regional populations of storks shift nesting locations between years, in response to year-to-year differences in food resources. Thus, regional populations require a range of options for nesting sites, in order to successfully respond to food availability. Protection of colony sites should continue, therefore, for sites that are not used in a given year.

III. Roosting habitat.

Although wood storks tend to roost at sites that are similar to those used for nesting, they also use a wider range of site types for roosting than for nesting. Non-breeding storks, for example, may frequently change roosting sites in response to changing feeding locations, and in the process, are inclined to accept a broad range of relatively temporary roosting sites. Included in the list of frequently used roosting locations are cypress "heads" or swamps (not necessarily flooded if trees are tall), mangrove islands, expansive willow thickets or small, isolated willow "islands" in broad marshes, and on the ground either on levees or in open marshes.

Daily activity patterns at a roost vary depending on the status of the storks using the site. Non-breeding adults or immature birds may remain in roosts during major portions of some days. When storks are feeding close to a roost, they may remain on the feeding grounds until almost dark before making the short flight. Nesting storks traveling long distances (>40 miles) to feeding sites may roost at or near the latter, and return to the colony the next morning. Storks leaving roosts, especially when going long distances, tend to wait for mid-morning thermals to develop before departing.

IV. Management zones and guidelines for feeding sites.

To the maximum extent possible, feeding sites should be protected by adherence to the following protection zones and guidelines:

A. There should be no human intrusion into feeding sites when storks are present. Depending upon the amount of screening vegetation, human activity should be no closer than between 300 feet (where solid vegetation screens exist) and 750 feet (no vegetation screen).

B. Feeding sites should not be subjected to water management practices that alter traditional water levels or the seasonally normal drying patterns and rates. Sharp rises in water levels are especially disruptive to feeding storks.

C. The introduction of contaminants, fertilizers, or herbicides into wetlands that contain stork feeding sites should be avoided, especially those compounds that could adversely alter the diversity and numbers of native fishes, or that could substantially change the characteristics of aquatic vegetation. Increase in the density and height of emergent vegetation can degrade or destroy sites as feeding habitat.

D. Construction of tall towers (especially with guy wires) within three miles, or high power lines (especially across long stretches of open country) within one mile of major feeding sites should be avoided.

V. Management zones and guidelines for nesting colonies.

A. Primary zone: This is the most critical area, and must be managed according to recommended guidelines to insure that a colony site survives.

1. Size: The primary zone must extend between 1000 and 1500 feet in all directions from the actual colony boundaries when there are no visual or broad aquatic barriers, and never less than 500 feet even when there are strong visual or aquatic barriers. The exact width of the primary zone in each direction from the colony can vary within this range, depending on the amount of visual screen (tall trees) surrounding the colony, the amount of relatively deep, open water between the colony and the nearest human activity, and the nature of the nearest human activity. In general, storks forming new colonies are more tolerant of existing human activity, than they will be of new human activity that begins after the colony has formed.

2. Recommended Restrictions:

a. Any of the following activities within the primary zone, at any time of the year, are likely to be detrimental to the colony:

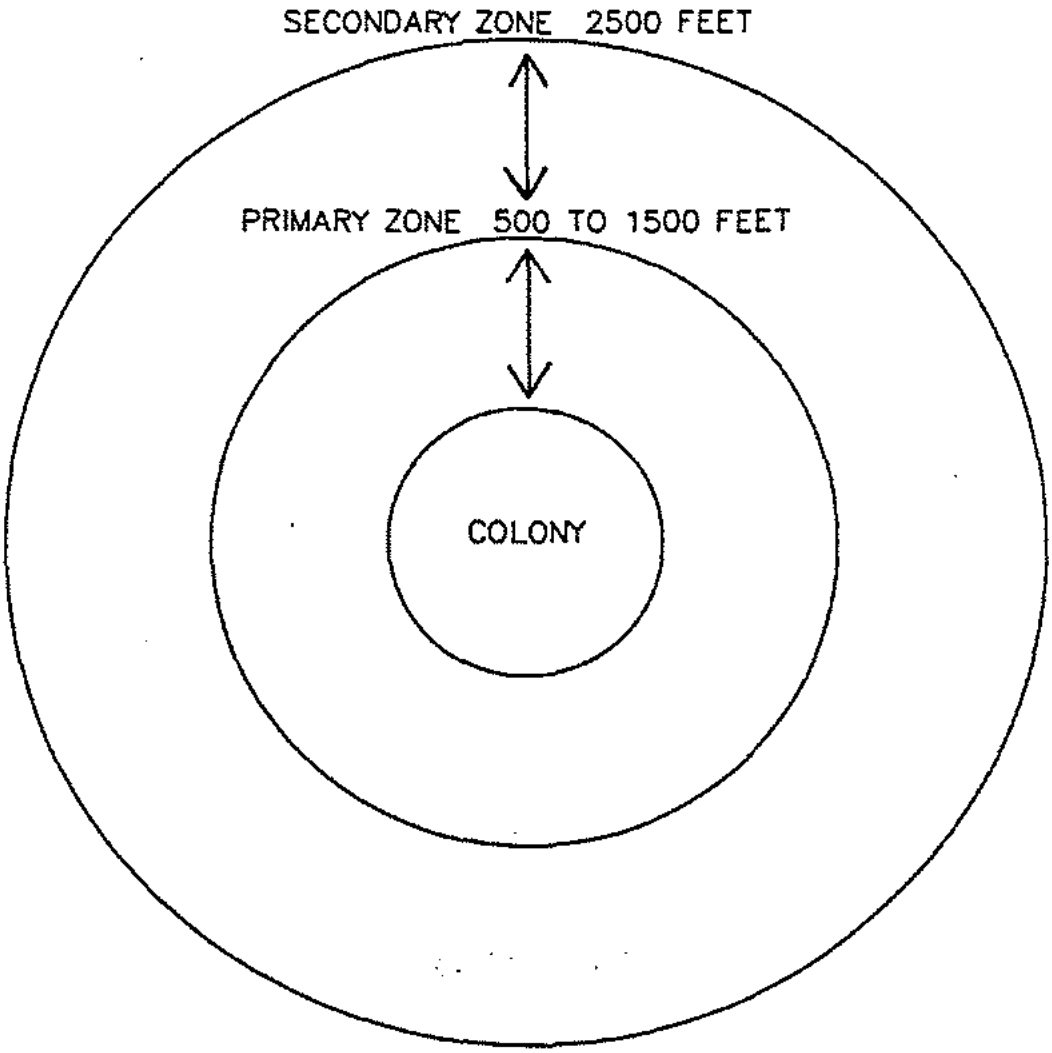
(1) Any lumbering or other removal of vegetation, and

(2) Any activity that reduces the area, depth, or length of flooding in wetlands under and surrounding the colony, except where periodic (less than annual) water control may be required to maintain the health of the aquatic, woody vegetation, and

(3) The construction of any building, roadway, tower, power line, canal, etc.

b. The following activities within the primary zone are likely to be detrimental to a colony if they occur when the colony is active:

(1) Any unauthorized human entry closer than 300 feet of the colony, and


SECONDARY ZONE 2500 FEET
PRIMARY ZONE 500 TO 1500 FEET
COLONY

(2) Any increase or irregular pattern in human activity anywhere in the primary zone, and

(3) Any increase or irregular pattern in activity by animals, including livestock or pets, in the colony, and

(4) Any aircraft operation closer than 500 feet of the colony.

B. Secondary Zone: Restrictions in this zone are needed to minimize disturbances that might impact the primary zone, and to protect essential areas outside of the primary zone. The secondary zone may be used by storks for collecting nesting material, for roosting, loafing, and feeding (especially important to newly fledged young), and may be important as a screen between the colony and areas of relatively intense human activities.

1. Size: The secondary zone should range outward from the primary zone 1000-2000 feet, or to a radius of 2500 feet of the outer edge of the colony.

2. Recommended Restrictions:

a. Activities in the secondary zone which may be detrimental to nesting wood storks include:

(1) Any increase in human activities above the level that existed in the year when the colony first formed, especially when visual screens are lacking, and

(2) Any alteration in the area's hydrology that might cause changes in the primary zone, and

(3) Any substantial (>20 percent) decrease in the area of wetlands and woods of potential value to storks for roosting and feeding.

b. In addition, the probability that low flying storks, or inexperienced, newly-fledged young will strike tall obstructions, requires that high-tension power lines be no closer than one mile (especially across open country or in wetlands) and tall trans-mission towers no closer than 3 miles from active colonies. Other activities, including busy highways and commercial and residential buildings may be present in limited portions of the secondary zone at the time that a new colony first forms. Although storks may tolerate existing levels of human activities, it is important that these human activities not expand substantially.

VI. Roosting site guidelines.

The general characteristics and temporary use-patterns of many stork roosting sites limit the number of specific management recommendations that are possible:

A. Avoid human activities within 500-1000 feet of roost sites during seasons of the year and times of the day when storks may be present. Nocturnal activities in active roosts may be especially disruptive.

B. Protect the vegetative and hydrological characteristics of the more important roosting sites--those used annually and/or used by flocks of 25 or more storks. Potentially, roosting sites may, some day, become nesting sites.

VII. Legal Considerations.

A. Federal Statutes

The U.S. breeding population of the wood stork is protected by the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.)(Act). The population was listed as endangered on February 28, 1984 (49 Federal *Register* 7332); wood storks breeding in Alabama, Florida, Georgia, and South Carolina are protected by the Act.

Section 9 of the Endangered Species Act of 1973, as amended, states that it is unlawful for any person subject to the jurisdiction of the United States to take (defined as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.") any listed species anywhere within the United States.

The wood stork is also federally protected by its listing (50 CFR 10.13) under the Migratory Bird Treaty Act (167 U.S.C. 703-711), which prohibits the taking, killing or possession of migratory birds except as permitted.

B. State Statutes

1. State of Alabama

Section 9-11-232 of Alabama's Fish, Game, and Wildlife regulations curtails the possession, sale, and purchase of wild birds. "Any person, firm, association, or corporation who takes, catches, kills or has in possession at any time, living or dead, any protected wild bird not a game bird or who sells or offers for sale, buys, purchases or offers to buy or purchase any such bird or exchange same for anything of value or who shall sell or expose for sale or buy any part of the plumage, skin, or body of any bird protected by the laws of this state or who shall take or willfully destroy the nests of any wild bird or who shall have such nests or eggs of such birds in his possession, except as otherwise provided by law, shall be guilty of a misdemeanor...

Section 1 of the Alabama Nongame Species Regulation (Regulation 87-GF-7) includes the wood stork in the list of nongame species covered by paragraph (4). " It shall be unlawful to take, capture, kill, possess, sell, trade for anything of monetary value, or offer to sell or trade for anything of monetary value, the following nongame wildlife species (or any parts or reproductive products of such species) without a scientific collection permit and written permission from the Commissioner, Department of Conservation and Natural Resources,..."

2. State of Florida

Rule 39-4.001 of the Florida Wildlife Code prohibits "taking, attempting to take, pursuing, hunting, molesting, capturing, or killing (collectively defined as "taking"), transporting, storing, serving, buying, selling,

possessing, or wantonly or willingly wasting any wildlife or freshwater fish or their nests, eggs, young, homes, or dens except as specifically provided for in other rules of Chapter 39, Florida Administrative Code.

Rule 39-27.011 of the Florida Wildlife Code prohibits "killing, attempting to kill, or wounding any endangered species." The "Official Lists of Endangered and Potentially Endangered Fauna and Flora in Florida" dated 1 July 1988, includes the wood stork, listed as "endangered" by the Florida Game and Fresh Water Fish Commission.

3. State of Georgia

Section 27-1-28 of the Conservation and Natural Resources Code states that "Except as otherwise provided by law, rule, or regulation, it shall be unlawful to hunt, trap, fish, take, possess, or transport any nongame species of wildlife..."

Section 27-1-30 states that, "Except as otherwise provided by law or regulation, it shall be unlawful to disturb, mutilate, or destroy the dens, holes, or homes of any wildlife; "

Section 27-3-22 states, in part, "It shall be unlawful for any person to hunt, trap, take, possess, sell, purchase, ship, or transport any hawk, eagle, owl, or any other bird or any part, nest, or egg thereof...".

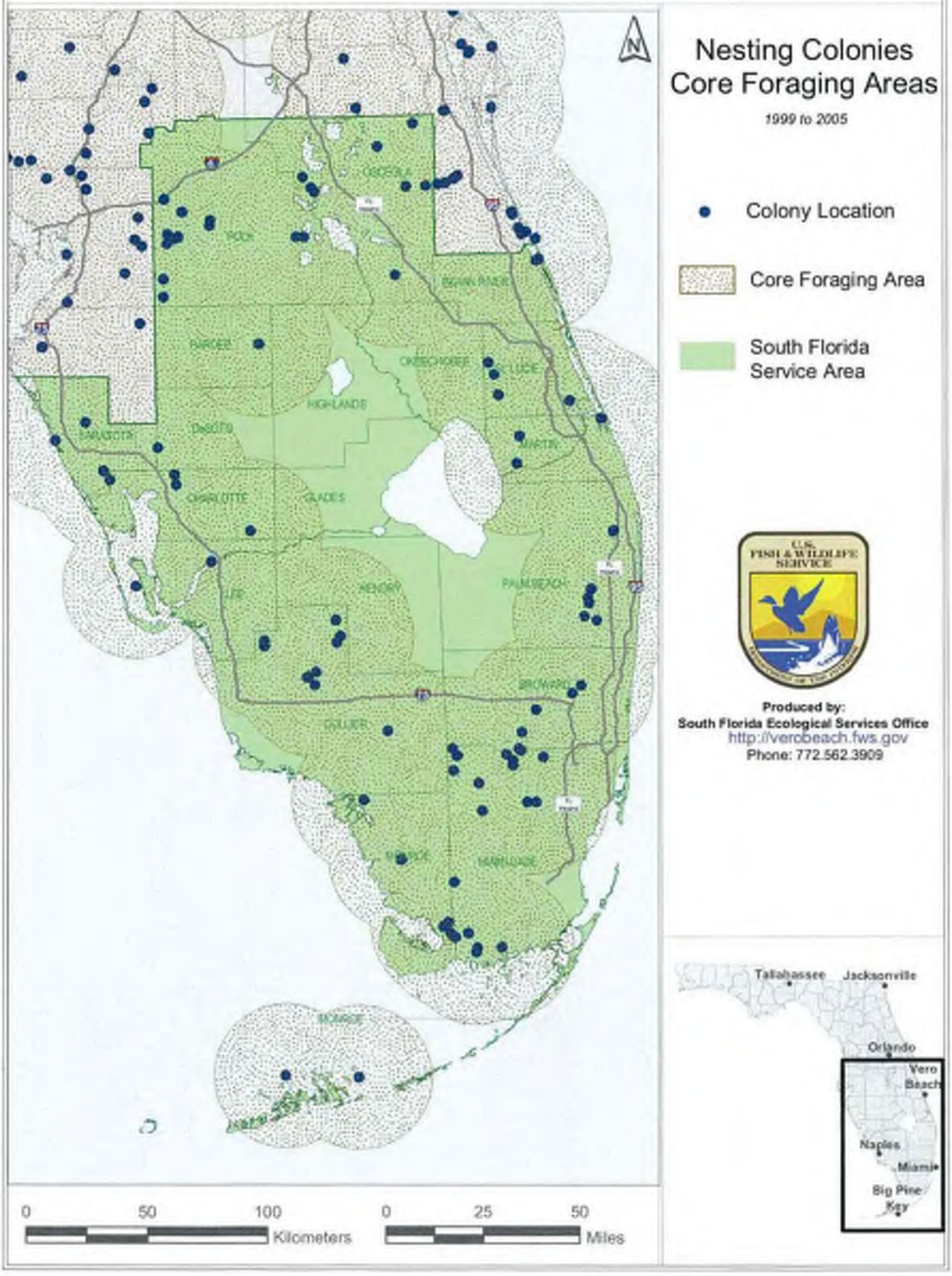
The wood stork is listed as endangered pursuant to the Endangered Wildlife Act of 1973 (Section 27-3-130 of the Code). Section 391-4-13-.06 of the Rules and Regulations of the Georgia Department of Natural Resources prohibits harassment, capture, sale, killing, or other actions which directly cause the death of animal species protected under the Endangered Wildlife Act. The destruction of habitat of protected species on public lands is also prohibited.

4. State of South Carolina

Section 50-15-40 of the South Carolina Nongame and Endangered Species Conservation Act states, "Except as otherwise provided in this chapter, it shall be unlawful for any person to take, possess, transport, export, process, sell, or offer of sale or ship, and for any common or contract carrier knowingly to transport or receive for shipment any species or subspecies of wildlife appearing on any of the following lists: (1) the list of wildlife indigenous to the State, determined to be endangered within the State...(2) the United States' List of Endangered Native Fish and Wildlife... (3) the United States' List of Endangered Foreign Fish and Wildlife ..."

5/21/2010

Wood Stork



Nesting Colonies
Core Foraging Areas

1999 to 2005

- Colony Location
- Core Foraging Area
- South Florida Service Area

U.S. FISH & WILDLIFE SERVICE

Produced by:
South Florida Ecological Services Office
http://verobeach.fws.gov
Phone: 772.562.3909

5/21/2010

Wood Stork Foraging Analysis: Excerpts of concepts and procedure as presented by the Service in this appendix may be viewed in detail in any one of our recent Biological Opinions for project related impacts to the wood stork. These documents can be found at the internet website address http://www.fws.gov/filedownloads/ftp%5verobeach.

Foraging Habitat

Researchers have shown that wood storks forage most efficiently and effectively in habitats where prey densities are high and the water shallow and canopy open enough to hunt successfully (Ogden et al. 1978, Browder 1984, Coulter 1987). Prey availability to wood storks is dependent on a composite variable consisting of density (number or biomass/m^2) and the vulnerability of the prey items to capture (Gawlik 2002). For wood storks, prey vulnerability appears to be largely controlled by physical access to the foraging site, water depth, the density of submerged vegetation, and the species-specific characteristics of the prey. For example, fish populations may be very dense, but not available (vulnerable) because the water depth is too deep (greater than 30 cm) for storks or the tree canopy at the site is too dense for storks to land. Calm water, about 5-40 cm (2-16 in) in depth, and free of dense aquatic vegetation is ideal (Coulter and Bryan 1993).

Coulter and Bryan's (1993) study suggested that wood storks preferred ponds and marshes, and visited areas with little or no canopy more frequently. Even in foraging sites in swamps, the canopy tended to be sparse. They suggested that open canopies may have contributed to detection of the sites and more importantly may have allowed the storks to negotiate landing more easily than at closed-canopy sites. In their study, the median amount of canopy cover where wood stork foraging was observed was 32 percent. Other researchers (P.C. Frederick, University of Florida, personal communication 2006; J.A. Rodgers, FWC, personal communication 2006) also confirm that wood storks will forage in woodlands, though the woodlands have to be fairly open and vegetation not very dense. Furthermore, the canopies must be open enough for wood storks to take flight quickly to avoid predators.

Melaleuca-infested Wetlands: As discussed previously, wetland suitability for wood stork foraging is partially dependent on vegetation density. Melaleuca is a dense-stand growth plant species, effectively producing a closed canopy and dense understory growth pattern that generally limits a site's accessibility to foraging by wading birds. However, O'Hare and Dalrymple (1997) suggest moderate infestations of melaleuca may have little effect on some species' productivity (*i.e.*, amphibians and reptiles) as long as critical abiotic factors such as hydrology remain. They also note as the levels of infestation increase, usage by wetland dependent species decreases. Their studies also showed that the number of fish species present in a wetland system remain stable at certain levels of melaleuca. However, the availability of the prey base for wood storks and other foraging wading birds is reduced by the restriction of access caused from dense and thick exotic vegetation. Wood storks and other wading birds can forage in these systems in open area pockets (*e.g.*, wind blow-downs), provided multiple conditions are optimal (*e.g.*, water depth, prey density). In O'Hare and Dalrmyple's study (1997), they identify five cover types (Table 1) and

provide information on the number of wetland dependent bird species and the number of individuals observed within each of these vegetation classes (Table 2).

Table 1: Vegetation classes

DMM	75-100 percent mature dense melaleuca coverage
DMS or (SDM)	75-100 percent sapling dense melaleuca coverage
P75	50-75 percent melaleuca coverage
P50	0-50 percent melaleuca coverage
MAR (Marsh)	0-10 percent melaleuca coverage

The number of wetland-dependent species and individuals observed per cover type is shown below in columns 1, 2, and 3 (Table 2). To develop an estimate of the importance a particular wetland type may have (based on density and aerial coverage by exotic species) to wetland dependent species, we developed a foraging suitability value using observational data from O'Hare and Dalrymple (1997). The Foraging Suitability Value as shown in column 5 (Table 2) is calculated by multiplying the number of species by the number of individuals and dividing this value by the maximum number of species and individuals combined (12*132=1584). The results are shown below for each of the cover types in O'Hare and Dalrymple (1997) study (Table 1). As an example, for the P50 cover type, the foraging suitability is calculated by multiplying 11 species times 92 individuals for a total of 1,012. Divide this value by 1,584, which is the maximum number of species times the maximum number of individuals (12*132 = 1,584). The resultant is 0.6389 or 64 percent 11*92=1012/1584*100=63.89).

Table 2: Habitat Foraging Suitability

Cover Type	# of Species (S)	# of Individuals (I)	S*I	Foraging Suitability
DMM	1	2	2	0.001
DMS	4	10	40	0.025
P75	10	59	590	0.372
P50	11	92	1,012	0.639
MAR	12	132	1,584	1.000

This approach was developed to provide us with a method of assessing wetland acreages and their relationship to prey densities and prey availability. We consider wetland dependent bird use to be a general index of food availability. Based on this assessment we developed an exotic foraging suitability index (Table 3):

Table 3. Foraging Suitability Percentages

Exotic Percentage	Foraging Suitability (percent)
Between 0 and 25 percent exotics	100
Between 25 and 50 percent exotics	64
Between 50 and 75 percent exotics	37
Between 75 and 90 percent exotics	3
Between 90 and 100 percent exotics	0

In our assessment however, we consider DMM to represent all exotic species densities between 90 and 100 percent and DMS to represent all exotic species densities between 75 and 90 percent. In our evaluation of a habitat's suitability, the field distinction between an exotic coverage of

90 percent and 100 percent in many situations is not definable, therefore unless otherwise noted in the field reports and in our analysis; we consider a suitability value of 3 percent to represent both densities.

Hydroperiod: The hydroperiod of a wetland can affect the prey densities in a wetland. For instance, research on Everglades fish populations using a variety of quantitative sampling techniques (pull traps, throw traps, block nets) have shown that the density of small forage fish increases with hydroperiod. Marshes inundated for less than 120 days of the year average ± 4 fish/m^2; whereas, those flooded for more than 340 days of the year average ± 25 fish/m^2 (Loftus and Eklund 1994, Trexler et al. 2002).

The Service (1999) described a short hydroperiod wetland as wetlands with between 0 and 180-day inundation, and long hydroperiod wetlands as those with greater than 180-day inundation. However, Trexler et al. (2002) defined short hydroperiod wetlands as systems with less than 300 days per year inundation. In our discussion of hydroperiods, we are considering short hydroperiod wetlands to be those that have an inundation of 180 days or fewer.

The most current information on hydroperiods in south Florida was developed by the SFWMD for evaluation of various restoration projects throughout the Everglades Protection Area. In their modeling efforts, they identified the following seven hydroperiods:

Table 4. SFWMD Hydroperiod Classes – Everglades Protection Area

Hydroperiod Class	Days Inundated
Class 1	0-60
Class 2	60-120
Class 3	120-180
Class 4	180-240
Class 5	240-300
Class 6	300-330
Class 7	330-365

Fish Density per Hydroperiod: In the Service's assessment of project related impacts to wood storks, the importance of fish data specific to individual hydroperiods is the principle basis of our assessment. In order to determine the fish density per individual hydroperiod, the Service relied on the number of fish per hydroperiod developed from throw-trap data in Trexler et al.'s (2002) study and did not use the electrofishing data also presented in Trexler et al.'s study that defined fish densities in catch per unit effort, which is not hydroperiod specific. Although the throw-trap sampling generally only samples fish 8 cm or less, the Service believes the data can be used as a surrogate representation of all fish, including those larger than 8 cm, which are typically sampled by either electrofishing or block net sampling.

We base this evaluation on the following assessment. Trexler et al.'s (2002) study included electrofishing data targeting fish greater than 8 cm, the data is recorded in catch per unit effort and in general is not hydroperiod specific. However, Trexler et al. (2002) notes in their assessment of the electrofishing data that in general there is a correlation with the number of fish per unit effort per changes in water depth. In literature reviews of electrofishing data by Chick et

al. (1999 and 2004), they note that electrofishing data provides a useful index of the abundance of larger fish in shallow, vegetated habitat, but length, frequency, and species compositional data should be interpreted with caution. Chick et al. (2004) also noted that electrofishing data for large fish (> 8cm) provided a positive correlation of the number of fish per unit effort (abundance) per changes in hydropeiod. The data in general show that as the hydroperiod decreases, the abundance of larger fishes also decreases.

Studies by Turner et al. (1999), Turner and Trexler (1997), and Carlson and Duever (1979) also noted this abundance trend for fish species sampled. We also noted in our assessment of prey consumption by wood storks in the Ogden et al. (1976) study (Figure 4) (discussed below), that the wood stork's general preference is for fish measuring 1.5 cm to 9 cm, although we also acknowledged that wood storks consume fish larger than the limits discussed in the Ogden et al. (1976) study. A similar assessment is reference by Trexler and Goss (2009) noting a diversity of size ranges of prey available for wading birds to consume, with fish ranging from 6 to 8 cm being the preferred prey for larger species of wading birds, particularly wood storks (Kushlan et al. 1975).

Therefore, since data were not available to quantify densities (biomass) of fish larger than 8 cm to a specific hydroperiod, and Ogden et al.'s (1976) study notes that the wood stork's general preference is for fish measuring 1.5 cm to 9 cm, and that empirical data on fish densities per unit effort correlated positively with changes in water depth, we believe that the Trexler et al. (2002) throw-trap data represents a surrogate assessment tool to predict the changes in total fish density and the corresponding biomass per hydroperiod for our wood stork assessment.

In consideration of this assessment, the Service used the data presented in Trexler et al.'s (2002) study on the number of fish per square-meter per hydroperiod for fish 8 cm or less to be applicable for estimating the total biomass per square-meter per hydroperiod for all fish. In determining the biomass of fish per square-meter per hydroperiod, the Service relied on the summary data provided by Turner et al. (1999), which provides an estimated fish biomass of 6.5 g/m^2 for a Class 7 hydroperiod for all fish and used the number of fish per square-meter per hydroperiod from Trexler et al.'s data to extrapolate biomass values per individual hydroperiods.

Trexler et al.'s (2002) studies in the Everglades provided densities, calculated as the square-root of the number of fish per square meter, for only six hydroperiods; although these cover the same range of hydroperiods developed by the SFWMD. Based on the throw-trap data and Trexler et al.'s (2002) hydroperiods, the square-root fish densities are:

Table 5. Fish Densities per Hydroperiod from Trexler et al. (2002)

Hydroperiod Class	Days Inundated	Fish Density
Class 1	0-120	2.0
Class 2	120-180	3.0
Class 3	180-240	4.0
Class 4	240-300	4.5
Class 5	300-330	4.8
Class 6	330-365	5.0

Trexler et al.'s (2002) fish densities are provided as the square root of the number of fish per square meter. For our assessment, we squared these numbers to provide fish per square meter, a simpler calculation when other prey density factors are included in our evaluation of adverse effects to listed species from the proposed action. We also extrapolated the densities over seven hydroperiods, which is the same number of hydroperiods characterized by the SFWMD. For example, Trexler et al.'s (2002) square-root density of a Class 2 wetland with three fish would equate to a SFWMD Model Class 3 wetland with nine fish. Based on the above discussion, the following mean annual fish densities were extrapolated to the seven SFWMD Model hydroperiods:

Table 6. Extrapolated Fish Densities for SFWMD Hydroperiods

Hydroperiod Class	Days Inundated	Extrapolated Fish Density
Class 1	0-60	2 fish/m^2
Class 2	60-120	4 fish/m^2
Class 3	120-180	9 fish/m^2
Class 4	180-240	16 fish/m^2
Class 5	240-300	20 fish/m^2
Class 6	300-330	23 fish/m^2
Class 7	330-365	25 fish/m^2

Fish Biomass per Hydroperiod: A more important parameter than fish per square-meter in defining fish densities is the biomass these fish provide. In the ENP and WCA-3, based on studies by Turner et al. (1999), Turner and Trexler (1997), and Carlson and Duever (1979), the standing stock (biomass) of large and small fishes combined in unenriched Class 5 and 6 hydroperiod wetlands averaged between 5.5 to 6.5 grams-wet-mass/m^2. In these studies, the data was provided in g/m^2 dry-weight and was converted to g/m^2 wet-weight following the procedures referenced in Kushlan et al. (1986) and also referenced in Turner et al. (1999). The fish density data provided in Turner et al. (1999) included both data from samples representing fish 8 cm or smaller and fish larger than 8 cm and included summaries of Turner and Trexler (1997) data, Carlson and Duever (1979) data, and Loftus and Eklund (1994) data. These data sets also reflected a 0.6 g/m^2 dry-weight correction estimate for fish greater than 8 cm based on Turner et al.'s (1999) block-net rotenone samples.

Relating this information to the hydroperiod classes developed by the SFWMD, we estimated the mean annual biomass densities per hydroperiod. For our assessment, we considered Class 7 hydroperiod wetlands based on Turner et al. (1999) and Trexler et al. (2002) studies to have a mean annual biomass of 6.5 grams-wet-mass/m^2 and to be composed of 25 fish/m^2. The remaining biomass weights per hydroperiod were determined as a direct proportion of the number of fish per total weight of fish for a Class 7 hydroperiod (6.5 grams divided by 25 fish equals 0.26 grams per fish).

For example, given that a Class 3 hydroperiod has a mean annual fish density of 9 fish/m^2, with an average weight of 0.26 grams per fish, the biomass of a Class 3 hydroperiod would be 2.3 grams/m^2 (9*0.26 = 2.3). Based on the above discussion, the biomass per hydroperiod class is:

Table 7. Extrapolated Mean Annual Fish Biomass for SFWMD Hydroperiods

Hydroperiod Class	Days Inundated	Extrapolated Fish Biomass
Class 1	0-60	0.5 gram/m^2
Class 2	60-120	1.0 gram/m^2
Class 3	120-180	2.3 grams/m^2
Class 4	180-240	4.2 grams/m^2
Class 5	240-300	5.2 grams/m^2
Class 6	300-330	6.0 grams/m^2
Class 7	330-365	6.5 grams/m^2

Wood stork suitable prey size: Wood storks are highly selective in their feeding habits and in studies on fish consumed by wood storks, five species of fish comprised over 85 percent of the number and 84 percent of the biomass of over 3,000 prey items collected from adult and nestling wood storks (Ogden et al. 1976). Table 8 lists the fish species consumed by wood storks in Ogden et al. (1976).

Table 8. Primary Fish Species consumed by Wood Storks from Ogden et al. (1976)

Common name	Scientific name	Percent Individuals	Percent Biomass
Sunfishes	*Centrarchidae*	14	44
Yellow bullhead	*Italurus natalis*	2	12
Marsh killifish	*Fundulus confluentus*	18	11
Flagfish	*Jordenella floridae*	32	7
Sailfin molly	*Poecilia latipinna*	20	11

These species were also observed to be consumed in much greater proportions than they occur at feeding sites, and abundant smaller species [*e.g.*, mosquitofish (*Gambusia affinis*), least killifish (*Heterandria formosa*), bluefin killifish (*Lucania goodei*)] are under-represented, which the researchers believed was probably because their small size did not elicit a bill-snapping reflex in these tactile feeders (Coulter et al. 1999). Their studies also showed that, in addition to selecting larger species of fish, wood storks consumed individuals that are significantly larger (>3.5 cm) than the mean size available (2.5 cm), and many were greater than 1-year old (Ogden et al. 1976, Coulter et al. 1999). However, Ogden et al. (1976) also found that wood storks most likely consumed fish that were between 1.5 and 9.0 cm in length (Figure 4 in Ogden et al. 1976).

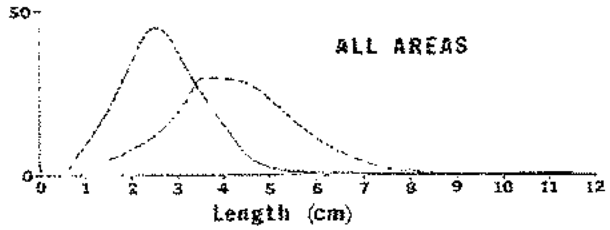


FIGURE 4. Length frequency distribution of fish available to and consumed by Wood Storks in different habitats.

In Ogden et al.'s (1976) Figure 4, the dotted line is the distribution of fish consumed and the solid line is the available fish. Straight interpretation of the area under the dotted line curve

represents the size classes of fish most likely consumed by wood storks and is the basis of our determination of the amount of biomass that is within the size range of fish most likely consumed by wood storks, which in this example is a range size of 1.5 to 9.0 cm in length.

Wood stork suitable prey base (biomass per hydroperiod): To estimate that fraction of the available fish biomass that might be consumed by wood storks, the following analysis was conducted. Trexler et al.'s (2002) 2-year throw trap data of absolute and relative fish abundance per hydroperiod distributed across 20 study sites in the ENP and the WCAs was considered to be representative of the Everglades fish assemblage available to wood storks (n = 37,718 specimens of 33 species). Although Trexler et al.'s (2002) data was based on throw-trap data and representative of fish 8 cm or smaller, the Service believes the data set can be used to predict the biomass/m^2 for total fish (those both smaller and larger than 8 cm). This approach is also supported, based on our assessment of prey consumption by wood storks in Ogden et al.'s (1976) study (Figure 4), that the wood storks general preference is for fish measuring 1.5 cm to 9 cm and is generally inclusive of Trexler et al.'s (2002) throw-trap data of fish 8 cm or smaller.

To estimate the fraction of the fish biomass that might be consumed by wood storks, the Service, using Trexler et al.'s (2002) throw-trap data set, determined the mean biomass of each fish species that fell within the wood stork prey size limits of 1.5 to 9.0 cm. The mean biomass of each fish species was estimated from the length and wet mass relationships for Everglades' icthyofauna developed by Kushlan et al. (1986). The proportion of each species that was outside of this prey length and biomass range was estimated using the species mean and variance provided in Table 1 in Kushlan et al. (1986). These biomass estimates assumed the length and mass distributions of each species was normally distributed and the fish biomass could be estimated by eliminating that portion of each species outside of this size range. These biomass estimates of available fish prey were then standardized to a sum of 6.5 g/m^2 for Class 7 hydroperiod wetlands (Service 2009).

For example, Kushlan et al. (1986) lists the warmouth (*Lepomis gulosus*) with a mean average biomass of 36.76 g. In fish samples collected by Trexler et al. (2002), this species accounted for 0.048 percent (18/37,715=0.000477) of the Everglades freshwater ichthyofauna. Based on an average biomass of 36.76 g (Kushlan et al. 1986), the 0.048 percent representation from Trexler et al. (2002) is equivalent to an average biomass of 1.75 g (36.76*0.048) or 6.57 percent (1.75/26.715) of the estimated average biomass (26.715 g) of Trexler et al.'s (2002) samples (Service 2009).

Standardizing these data to a sample size of 6.5 g/m^2, the warmouth biomass for long hydroperiod wetlands would be about 0.427 g (Service 2009). However, the size frequency distribution (assumed normal) for warmouth (Kushlan et al. 1986) indicate 48 percent are too large for wood storks and 0.6 percent are too small (outside the 1.5 cm to 9 cm size range most likely consumed), so the warmouth biomass within the wood stork's most likely consumed size range is only 0.208 g (0.427*(0.48+0.006)=0.2075) in a 6.5 g/m^2 sample. Using this approach summed over all species in long hydroperiod wetlands, only 3.685 g/m^2 of the 6.5 g/m^2 sample consists of fish within the size range likely consumed by wood storks or about 57 percent (3.685/6.5*100=56.7) of the total biomass available.

An alternative approach to estimate the available biomass is based on Ogden et al. (1976). In their study (Table 8), the sunfishes and four other species that accounted for 84 percent of the biomass eaten by wood storks totaled 2.522 g of the 6.5 g/m^2 sample (Service 2009). Adding the remaining 16 percent from other species in the sample, the total biomass would suggest that 2.97 g of a 6.5 g/m^2 sample are most likely to be consumed by wood storks or about 45.7 percent (2.97/6.5=0.4569)

The mean of these two estimates is 3.33g/m^2 for long hydroperiod wetlands (3.685 + 2.97 = 6.655/ 2 = 3.33). This proportion of available fish prey of a suitable size (3.33 g/m^2 / 6.5 g/m^2 = 0.51 or 51 percent) was then multiplied by the total fish biomass in each hydroperiod class to provide an estimate of the total biomass of a hydroperiod that is the appropriate size and species composition most likely consumed by wood storks.

As an example, a Class 3 SFWMD model hydroperiod wetland with a biomass of 2.3 grams/m^2, adjusted by 51 percent for appropriate size and species composition, provides an available biomass of 1.196 grams/m^2. Following this approach, the biomass per hydroperiod potentially available to predation by wood storks based on size and species composition is:

Table 9. Wood Stork Suitable Prey Base (fish biomass per hydroperiod)

Hydroperiod Class	Days Inundated	Fish Biomass
Class 1	0-60	0.26 gram/m^2
Class 2	60-120	0.52 gram/m^2
Class 3	120-180	1.196 grams/m^2
Class 4	180-240	2.184 grams/m^2
Class 5	240-300	2.704 grams/m^2
Class 6	300-330	3.12 grams/m^2
Class 7	330-365	3.38 grams/m^2

Wood Stork-Wading Bird Prey Consumption Competition: In 2006, (Service 2006), the Service developed an assessment approach that provided a foraging efficiency estimate that 55 percent of the available biomass was actually consumed by wood storks. Since the implementation of this assessment approach, the Service has received comments from various sources concerning the Service's understanding of Fleming et al.'s (1994) assessment of prey base consumed by wood storks versus prey base assumed available to wood stork and the factors included in the 90 percent prey reduction value.

In our original assessment, we noted that, "*Fleming et al. (1994) provided an estimate of 10 percent of the total biomass in their studies of wood stork foraging as the amount that is actually consumed by the storks. However, the Fleming et al. (1994) estimate also includes a second factor, the suitability of the foraging site for wood storks, a factor that we have calculated separately. In their assessment, these two factors accounted for a 90 percent reduction in the biomass actually consumed by the storks. We consider these two factors as equally important and are treated as equal components in the 90 percent reduction; therefore, we consider each factor to represent 45 percent of the reduction. In consideration of this approach, Fleming et al.'s (1994) estimate that 10 percent of the biomass would actually be consumed by the storks would be added to the 45 percent value for an estimate that 55 percent (10 percent plus the remaining 45 percent) of the available biomass would actually be consumed by the storks and is the factor we believe represents the amount of the prey base that is actually consumed by the stork.*"

In a follow-up review of Fleming et al.'s (1994) report, we noted that the 10 percent reference is to prey available to wood storks, not prey consumed by wood storks. We also noted the 90 percent reduction also includes an assessment of prey size, an assessment of prey available by water level (hydroperiod), an assessment of suitability of habitat for foraging (openness), and an assessment for competition with other species, not just the two factors considered originally by the Service (suitability and competition). Therefore, in re-evaluating of our approach, we identified four factors in the 90 percent biomass reduction and not two as we previously considered. We believe these four factors are represented as equal proportions of the 90 percent reduction, which corresponds to an equal split of 22.5 percent for each factor. Since we have accounted previously for three of these factors in our approach (prey size, habitat suitability, and hydroperiod) and they are treated separately in our assessment, we consider a more appropriate foraging efficiency to represent the original 10 percent and the remaining 22.5 percent from the 90 percent reduction discussed above. Following this revised assessment, our competition factor would be 32.5 percent, not the initial estimate of 55 percent.

Other comments reference the methodology's lack of sensitivity to limiting factors, i.e., is there sufficient habitat available across all hydroperiods during critical life stages of wood stork nesting and does this approach over emphasize the foraging biomass of long hydroperiod wetlands with a corresponding under valuation of short hydroperid wetlands. The Service is aware of these questions and is examining alternative ways to assess these concerns. However, until futher research is generated to refine our approach, we continue to support the assessment tool as outlined.

Following this approach, Table 10 has been adjusted to reflect the competition factor and represents the amount of biomass consumed by wood storks and is the basis of our effects assessments (Class 1 hydroperiod with a biomass 0.26 g, multiplied by 0.325, results in a value of 0.08 g [0.25*.325=0.08]) (Table 10).

Table 10 Actual Biomass Consumed by Wood Storks

Hydroperiod Class	Days Inundated	Fish Biomass
Class 1	0-60	0.08 gram/m^2
Class 2	60-120	0.17 gram/m^2
Class 3	120-180	0.39 grams/m^2
Class 4	180-240	0.71 grams/m^2
Class 5	240-300	0.88 grams/m^2
Class 6	300-330	1.01 grams/m^2
Class 7	330-365	1.10 grams/m^2

Sample Project of Biomass Calculations and Corresponding Concurrence Determination

Example 1:

An applicant is proposing to construct a residential development with unavoidable impacts to 5 acres of wetlands and is proposing to restore and preserve 3 acres of wetlands onsite. Data on the onsite wetlands classified these systems as exotic impacted wetlands with greater than 50

percent but less than 75 percent exotics (Table 3) with an average hydroperiod of 120-180 days of inundation.

The equation to calculate the biomass lost is: The number of acres, converted to square-meters, times the amount of actual biomass consumed by the wood stork (Table 10), times the exotic foraging suitability index (Table 3), equals the amount of grams lost, which is converted to kg.

Biomass lost (5*4,047*0.39 (Table 10)*0.37 (Table 3)=2,919.9 grams or 2.92 kg)

In the example provided, the 5 acres of wetlands, converted to square-meters (1 acre= 4,047 m^2) would provide 2.9 kg of biomass (5*4,047*0.39 (Table 10)*0.37 (Table 3)= 2,919.9 grams or 2.9 kg), which would be lost from development.

The equation to calculate the biomass from the preserve is the same, except two calculations are needed, one for the existing biomass available and one for the biomass available after restoration.

Biomass Pre: (3*4,047*0.39(Table 10)*0.37 (Table 3)=1,751.95grams or 1.75 kg)

Biomass Post: (3*4,047*0.39 (Table 10)*1(Table 3)=4,734.99 grams or 4.74 kg)

Net increase: 4.74 kg-1.75 kg = 2.98 kg Compensation Site

Project Site Balance 2.98 kg- 2.92 kg = 0.07kg

The compensation proposed is 3 acres, which is within the same hydroperiod and has the same level of exotics. Following the calculations for the 5 acres, the 3 acres in its current habitat state, provides 1.75 kg (3*4,047*0.39 (Table 10)*0.37 (Table 3)=1,751.95grams or 1.75 kg) and following restoration provides 4.74 kg (3*4,047*0.39 (Table 10)*1(Table 3)=4,734.99 grams or 4.74 kg), a net increase in biomass of 2.98 kg (4.74-1.75=2.98).

Example 1: 5 acre wetland loss, 3 acre wetland enhanced – same hydroperiod - NLAA

Hydroperiod	Existing Footprint		On-site Preserve Area				Net Change*	
			Pre Enhancement		Post Enhancement			
	Acres	Kgrams	Acres	Kgrams	Acres	Kgrams	Acres	Kgrams
Class 1 - 0 to 60 Days								
Class 2 - 60 to 120 Days								
Class 3 - 120 to 180 Days	5	2.92	3	1.75	3	4.74	(5)	0.07
Class 4 - 180 to 240 Days								
Class 5 - 240 to 300 Days								
Class 6 - 300 to 330 Days								
Class 7 - 330 to 365 days								
TOTAL	**5**	**2.92**	**3**	**1.75**	**3**	**4.74**	**(5)**	**0.07**

*Since the net increase in biomass from the restoration provides 2.98 kg and the loss is 2.92 kg, there is a positive outcome (4.74-1.75-2.92=0.07) in the same hydroperiod and Service concurrence with a NLAA is appropriate.

Example 2:

In the above example, if the onsite preserve wetlands were a class 4 hydroperiod, which has a value of 0.71. grams/m^2 instead of a class 3 hydroperiod with a 0.39 grams/m^2 [Table 10]), there would be a loss of 2.92 kg of short hydroperiod wetlands (as above) and a net gain of 8.62 kg of long-hydroperiod wetlands.

Biomass lost: (5*4,047*0.39 (Table 10)*0.37 (Table 3)=2,919.9 grams or 2.92 kg)

The current habitat state of the preserve provides 3.19 kg (3*4,047*0.71 (Table 10)*0.37 (Table 3)=3,189.44 grams or 3.19 kg) and following restoration the preserve provides 8.62 kg (3*4,047*0.71 (Table 10)*1(Table 3)= 8,620.11 grams or 8.62 kg, thus providing a net increase in class 4 hydroperiod biomass of 5.43 kg (8.62-3.19=5.43).

Biomass Pre: (3*4,047*0.71(Table 10)*0.37 (Table 3) = 3,189.44 grams or 3.19 kg)

Biomass Post: (3*4,047*0.71 (Table 10)*1(Table 3)=8,620.11 grams or 8.62 kg)

Net increase: 8.62 kg-3.19 kg = 5.43 kg

Project Site Balance 5.43 kg- 2.92 kg = 2.51 kg

Example 2: 5 acre wetland loss, 3 acre wetland enhanced – different hydroperiod – May Affect

Hydroperiod	Existing Footprint		On-site Preserve Area				Net Change*	
			Pre Enhancement		Post Enhancement			
	Acres	Kgrams	Acres	Kgrams	Acres	Kgrams	Acres	Kgrams
Class 1 - 0 to 60 Days								
Class 2 - 60 to 120 Days								
Class 3 - 120 to 180 Days	5	2.92					(5)	-2.92
Class 4 - 180 to 240 Days			3	3.19	3	8.62	0	5.43
Class 5 - 240 to 300 Days								
Class 6 - 300 to 330 Days								
Class 7 - 330 to 365 days								
TOTAL	**5**	**2.92**	**3**	**3.19**	**3**	**8.62**	**(5)**	**2.51**

In this second example, even though there is an overall increase in biomass, the biomass loss is a different hydroperiod than the biomass gain from restoration, therefore, the Service could not concur with a NLAA and further coordination with the Service is appropriate.

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August 1, 2017

Donnie Kinard
U.S. Army Corps of Engineers
Post Office Box 4970
Jacksonville, Florida 32232-0019

Subject: Consultation Key for the Eastern Indigo Snake – Revised

Dear Mr. Kinard:

This letter revises and replaces the January 25, 2010, and August 13, 2013, letters to the U.S. Army Corps of Engineers (Corps) regarding the use of the eastern indigo snake programmatic effect determination key (Key) for projects occurring within the South Florida Ecological Service's Office (SFESO) jurisdiction. This revision supersedes all prior versions of the Key in the SFESO area. The purpose of this revision is to clarify portions of the previous keys based on questions we have been asked, specifically related to habitat and refugia used by eastern indigo snakes (*Drymarchon corais couperi*), in the southern portion of their range and within the jurisdiction of the SFESO. This Key is provided pursuant to the Service's authorities under the Endangered Species Act of 1973, as amended (Act) (87 Stat. 884; 16 U.S.C.1531 *et seq.*). This Key revision has been assigned Service Consultation Code: 41420-2009-I-0467-R001.

The purpose of this Key is to assist the Corps (or other Federal action agency) in making appropriate effects determinations for the eastern indigo snake under section 7 of the Act, and streamline informal consultation with the SFESO for the eastern indigo snake when the proposed action can be walked through the Key. The Key is a tool available to the Corps (or other Federal action agency) for the purposes of expediting section 7 consultations. There is no requirement to use the Key. There will be cases when the use of the Key is not appropriate. These include, but are not limited to: where project specific information is outside of the scope of the Key or instances where there is new biological information about the species. In these cases, we recommend the Corps (or other Federal action agency) initiates traditional consultation pursuant to section 7 of the Act, and identify that consultation is being requested outside of the Key.

This Key uses project size and home ranges of eastern indigo snakes as the basis for making determinations of "may affect, but is not likely to adversely affect" (NLAA) and "may affect, and is likely to adversely affect" (may affect). Suitable habitat for the eastern indigo snake consists of a mosaic of habitats types, most of which occur throughout South Florida. Information on home ranges for individuals is not available in specific habitats in South Florida. Therefore, the SFESO uses the information from a 26-year study conducted by Layne and Steiner (1996) at Archbold Biological Station, Lake Placid, Florida, as the best available

information. Layne and Steiner (1996) determined the average home range size for a female eastern indigo snake was 46 acres and 184 acres for a male.

Projects that would remove/destroy less than 25 acres of eastern indigo snake habitat are expected to result in the loss of a portion of an eastern indigo snakes home range that would not impair the ability of the individual to feed, breed, and shelter. Therefore, the Service finds that take would not be reasonably certain to occur due to habitat loss. However, these projects have the potential to injure or kill an eastern indigo snake if the individual is crushed by equipment during site preparation or other project aspects. The Service's *Standard Protection Measures for the Eastern Indigo Snake* (Service 2013 or most current version) and the excavation of underground refugia (where a snake could be buried, trapped and/or injured), when implemented, are designed to avoid these forms of take. Consequently, projects less than 25 acres that include the Service's *Standard Protection Measures for the Eastern Indigo Snake* (Service 2013 or most current version) and a commitment to excavate underground refugia as part of the proposed action would be expected to avoid take and thus, may affect, but are not likely to adversely affect the species.

If a proposed project would impact less than 25 acres of vegetated eastern indigo snake habitat (not urban/ human-altered) completely surrounded by urban development, and an eastern indigo snake has been observed on site, the Key should not be used. The Service recommends formal consultation for this situation because of the expected increased value of the vegetated habitat within the individual's home range.

Projects that would remove 25 acres or more of eastern indigo snake habitat could remove more than half of a female eastern indigo snakes home range. This loss of habitat within a home range would be expected to significantly impair the ability of that individual to feed, breed, and shelter. Therefore, the Service finds take through habitat loss would be reasonably certain to occur and formal consultation is appropriate. Furthermore, these projects have the potential to injure or kill an eastern indigo snake if the individual is crushed by equipment during site preparation or other project aspects. The Service's *Standard Protection Measures* for the *Eastern Indigo Snake* (Service 2013 or most current version) and the excavation of underground refugia (where a snake could be buried, trapped and/or injured), when implemented, are designed to avoid these forms of take.

Eastern indigo snakes use a variety of habitat and are difficult to detect. Therefore, site specific information on the land use, observations of eastern indigo snakes within the vicinity, as well as other factors, as appropriate, will all be considered by the Service when making a final recommendation on the appropriate effects determination and whether it is appropriate to conclude consultation with the Corps (or other Federal action agency) formally or informally for projects that will impact 25 acres or more of habitat. Accordingly, when the use of the Key results in a determination of "may affect," the Corps (or other Federal action agency) is advised that consultation may be concluded informally or formally, depending on the project specific effects to eastern indigo snakes. Technical assistance from the Service can assist you in making a determination prior to submitting a request for consultation. In circumstances where the Corps (or other Federal action agency) desires to proceed with a consultation request prior to receiving

additional technical assistance from the Service, we recommend the agency documents the biological rationale for their determination and proceed with a request accordingly.

If the use of the Key results in a determination of "no effect," no further consultation is necessary with the SFESO. If the use of the Key results in a determination of "NLAA," the SFESO concurs with this determination based on the rationale provide above, and no further consultation is necessary for the effects of the proposed action on the eastern indigo snake. For "no effect" or "NLAA" determinations, the Service recommends that the Corps (or other Federal action agency) documents the pathway used to reach your no effect or NLAA determination in the project record and proceed with other species analysis as warranted.

Eastern Indigo Snake Programmatic Effect Determination Key
Revised July 2017
South Florida Ecological Service Office

Scope of the Key

This Key should be used only in the review of permit applications for effects determinations for the eastern indigo snake (*Drymarchon corais couperi*) within the South Florida Ecological Service's Office (SFESO) area (Broward, Charlotte, Collier, De Soto, Glades, Hardee, Hendry, Highlands, Lee, Indian River, Martin, Miami-Dade, Monroe, Okeechobee, Osceola, Palm Beach, Polk, Sarasota, and St. Lucie Counties). There is no designated critical habitat for the eastern indigo snake.

This Key is subject to revision as the Corps (or other Federal action agency) and Service deem necessary and in particular whenever there is new information on eastern indigo snake biology and effects of proposed projects.

The Key is a tool available to the Corps (or other Federal action agency) for the purposes of expediting section 7 consultations. There is no requirement to use the Key. There will be cases when the use of the Key is not appropriate. These include, but are not limited to: where project specific information is outside of the scope of the Key or instances where there is new biological information about the species. In these cases, we recommend the Corps (or other Federal action agency) initiates traditional consultation pursuant to section 7 of the Act, and identify that consultation is being requested outside of the Key.

Habitat

Habitat use varies seasonally between upland and wetland areas, especially in the more northern parts of the species' range. In southern parts of their range eastern indigo snakes are habitat generalists which use most available habitat types. Movements between habitat types in northern areas of their range may relate to the need for thermal refugia (protection from cold and/or heat).

In northern areas of their range eastern indigo snakes prefer an interspersion of tortoise-inhabited sandhills and wetlands (Landers and Speake 1980). In these northern regions eastern indigo

snakes most often use forested areas rich with gopher tortoise burrows, hollowed root channels, hollow logs, or the burrows of rodents, armadillos, or land crabs as thermal refugia during cooler seasons (Lawler 1977; Moler 1985a; Layne and Steiner 1996). The eastern indigo snake in the northern region is typically classified as a longleaf pine savanna specialist because here, in the northern four-fifths of its range, the eastern indigo snake is typically only found in vicinity of xeric longleaf pine–turkey oak sandhills inhabited by the gopher tortoise (Means 2006).

In the milder climates of central and southern Florida, comprising the remaining one fifth of its range, thermal refugia such as those provided by gopher tortoise burrows may not be as critical to survival of indigo snakes. Consequently, eastern indigo snakes in these regions use a more diverse assemblage of habitats such as pine flatwoods, scrubby flatwoods, floodplain edges, sand ridges, dry glades, tropical hammocks, edges of freshwater marshes, muckland fields, coastal dunes, and xeric sandhill communities; with highest population concentrations of eastern indigo snakes occurring in the sandhill and pineland regions of northern and central Florida (Service 1999). Eastern indigo snakes have also been found on agricultural lands with close proximity to wetlands (Zeigler 2006).

In south Florida, agricultural sites (*e.g.*, sugar cane fields and citrus groves) are occupied by eastern indigo snakes. The use of sugarcane fields by eastern indigo snakes was first documented by Layne and Steiner in 1996. In these areas there is typically an abundance of wetland and upland ecotones (due to the presence of many ditches and canals), which support a diverse prey base for foraging. In fact, some speculate agricultural areas may actually have a higher density of eastern indigo snakes than natural communities due to the increased availability of prey. Gopher tortoise burrows are absent at these locations but there is an abundance of both natural and artificial refugia. Enge and Endries (2009) reporting on the status of the eastern indigo snake included sugarcane fields and citrus groves in a Global Information Systems (GIS)-base map of potential eastern indigo snake habitat. Numerous sightings of eastern indigo snakes within sugarcane fields have been reported within south Florida (Florida Fish and Wildlife Conservation Commission Indigo Snake Database [Enge 2017]). A recent study associated with the Comprehensive Everglades Restoration Plan (CERP) (A-1 FEB Project formerly A-1 Reservoir; Service code: 41420-2006-F-0477) documented eastern indigo snakes within sugarcane fields. The snakes used artificial habitats such as piles of limerock, construction debris, and pump stations. Recent studies also associated with the CERP at the C-44 Project (Service code: 41420-2009-FA-0314), and C-43 Project (Service code: 41420-2007-F-0589) documented eastern indigo snakes within citrus groves. The snakes used artificial habitats such as boards, sheets of tin, construction debris, pipes, drain pipes in abandoned buildings and septic tanks.

In extreme south Florida (*i.e.*, the Everglades and Florida Keys), eastern indigo snakes also utilize tropical hardwood hammocks, pine rocklands, freshwater marshes, abandoned agricultural land, coastal prairie, mangrove swamps, and human-altered habitats. Though eastern indigo snakes have been found in all available habitats of south Florida it is thought they prefer hammocks and pine forests since most observations occur there and use of these areas is disproportionate compared to the relatively small total area of these habitats (Steiner *et al.* 1983).

Even though thermal stress may not be a limiting factor throughout the year in south Florida, eastern indigo snakes still seek and use underground refugia. On the sandy central ridge of central Florida, eastern indigo snakes use gopher tortoise burrows more (62 percent) than other underground refugia (Layne and Steiner 1996). Other underground refugia used include armadillo (*Dasypus novemcinctus*) burrows near citrus groves, cotton rat (*Sigmodon hispidus*) burrows, and land crab (*Cardisoma guanhumi*) burrows in coastal areas (Layne and Steiner 1996; Wilson and Porras 1983). Natural ground holes, hollows at the base of trees or shrubs, ground litter, trash piles, and crevices of rock-lined ditch walls are also used (Layne and Steiner 1996). These refugia are used most frequently where tortoise burrows are not available, principally in low-lying areas off the central and coastal ridges.

Minimization Measures

The Service developed protection measures for the eastern indigo snake "Standard Protection Measures for the Eastern Indigo Snake" (Service 2013) located at: https://www.fws.gov/verobeach/ReptilesPDFs/20130812_EIS%20Standard%20Protection%20Measures_final.pdf . These protections measures (or the most updated version) are considered a minimization measure for projects proposed within eastern indigo snake habitat.

Determinations

If the use of this Key results in a determination of "**no effect**," no further consultation is necessary with the SFESO.

If the use of this Key results in a determination of "**NLAA**," the SFESO concurs with this determination and no further consultation is necessary for the effects of the proposed action on the eastern indigo snake.

For no effect or NLAA determinations, the Corps (or other Federal action agency) should make a note in the project file indicating the pathway used to reach your no effect or NLAA determination.

If a proposed project would impact less than 25 acres of vegetated eastern indigo snake habitat (not urban/ human-altered) completely surrounded by urban development, and an eastern indigo snake has been observed on site, the subsequent Key should not be used. The Service recommends formal consultation for this situation because of the expected increased value of the vegetated habitat within the individual's home range.

If the use of this Key results in a determination of "**may affect**," consultation may be concluded informally or formally depending on project effects to eastern indigo snakes. Technical assistance from the Service can assist you in making a determination prior to submitting a request for consultation. In circumstances where the Corps desires to proceed with a consultation request prior to receiving additional technical assistance from the Service, we recommend the Corps document the biological rationale for their determination and proceed with a request accordingly.

A. Project is not located in open water or salt marsh.....go to B

Project is located solely in open water or salt marsh.....**no effect**

B. Permit will be conditioned for use of the Service's most current guidance for Standard Protection Measures For The Eastern Indigo Snake (currently 2013) during site preparation and project construction.....go to C

Permit will not be conditioned as above for the eastern indigo snake, or it is not known whether an applicant intends to use these measures and consultation with the Service is requested.....**may affect**

C. The project will impact less than 25 acres of eastern indigo snake habitat (*e.g.*, sandhill, scrub, pine flatwoods, pine rocklands, scrubby flatwoods, high pine, dry prairie, coastal prairie, mangrove swamps, tropical hardwood hammocks, hydric hammocks, edges of freshwater marshes, agricultural fields [including sugar cane fields and active, inactive, or abandoned citrus groves], and coastal dunes).....go to D

The project will impact 25 acres or more of eastern indigo snake habitat (*e.g.*, sandhill, scrub, pine flatwoods, pine rocklands, scrubby flatwoods, high pine, dry prairie, coastal prairie, mangrove swamps, tropical hardwood hammocks, hydric hammocks, edges of freshwater marshes, agricultural fields [including sugar cane fields and active, inactive, or abandoned citrus groves], and coastal dunes).....**may affect**

D. The project has no known holes, cavities, active or inactive gopher tortoise burrows, or other underground refugia where a snake could be buried, trapped and/or injured during project activities.....**NLAA**

The project has known holes, cavities, active or inactive gopher tortoise burrows, or other underground refugia where a snake could be buried, trapped and /or injured.....go to E

E. Any permit will be conditioned such that all gopher tortoise burrows, active or inactive, will be excavated prior to site manipulation in the vicinity of the burrow[1]. If an eastern indigo snake is encountered, the snake must be allowed to vacate the area prior to additional site manipulation in the vicinity. Any permit will also be conditioned such that holes, cavities, and snake refugia other than gopher tortoise burrows will be inspected each morning before planned site manipulation of a particular area, and, if occupied by an eastern indigo snake, no work will commence until the snake has vacated the vicinity of proposed work.....**NLAA**[2]

Permit will not be conditioned as outlined above.....**may affect**

End Key

[1] If excavating potentially occupied burrows, active or inactive, individuals must first obtain state authorization via a Florida Fish and Wildlife Conservation Commission Authorized Gopher Tortoise Agent permit. The excavation method selected should also minimize the potential for injury of an indigo snake. Applicants should follow the excavation guidance provided within the most current Gopher Tortoise Permitting Guidelines found at http://myfwc.com/gophertortoise.

[2] Please note, if the proposed project will impact less than 25 acres of vegetated eastern indigo snake habitat (not urban/ human-altered) completely surrounded by urban development, and an eastern indigo snake has been observed on site, NLAA is not the appropriate conclusion. The Service recommends formal consultation for this situation because of the expected increased value of the vegetated habitat within the individual's home range

Working with the Fish and Wildlife Foundation of Florida, the Service has established a fund to support conservation and recovery for the eastern indigo snake. Any project that has the potential to affect the eastern indigo snake and/or its habitat is encouraged to make a voluntary contribution to this fund. If you would like additional information about how to make a contribution and how these monies are used to support eastern indigo snake recovery please contact Ashleigh Blackford, Connie Cassler, or José Rivera at 772-562-3559.

This revised Key is effective immediately upon receipt by the Corps. Should circumstances change or new information become available regarding the eastern indigo snake and/or implementation of the Key, the determinations herein may be reconsidered and this Key further revised or amended.

Thank you for your continued cooperation in the effort to conserve fish and wildlife resources. If you have any questions or comments regarding this Key, please contact the SFESO at 772-562-3909.

Sincerely,

Roxanna Hinzman
Field Supervisor
South Florida Ecological Services

Cc:
Corps, Jacksonville, Florida (Dale Beter, Muriel Blaisdell, Ingrid Gilbert, Angela Ryan, Irene Sadowski, Victoria White, Alisa Zarbo)
Service, Athens, Georgia (Michelle Elmore)
Service, Jacksonville, Florida (Annie Dziergowski)
Service, Panama City, Florida (Sean Blomquist)

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STANDARD PROTECTION MEASURES FOR THE EASTERN INDIGO SNAKE
U.S. Fish and Wildlife Service
August 12, 2013

The eastern indigo snake protection/education plan (Plan) below has been developed by the U.S. Fish and Wildlife Service (USFWS) in Florida for use by applicants and their construction personnel. At least **30 days prior** to any clearing/land alteration activities, the applicant shall notify the appropriate USFWS Field Office via e-mail that the Plan will be implemented as described below (North Florida Field Office: jaxregs@fws.gov; South Florida Field Office: verobeach@fws.gov; Panama City Field Office: panamacity@fws.gov). As long as the signatory of the e-mail certifies compliance with the below Plan (including use of the attached poster and brochure), no further written confirmation or "approval" from the USFWS is needed and the applicant may move forward with the project.

If the applicant decides to use an eastern indigo snake protection/education plan other than the approved Plan below, written confirmation or "approval" from the USFWS that the plan is adequate must be obtained. At least 30 days prior to any clearing/land alteration activities, the applicant shall submit their unique plan for review and approval. The USFWS will respond via e-mail, typically within 30 days of receiving the plan, either concurring that the plan is adequate or requesting additional information. A concurrence e-mail from the appropriate USFWS Field Office will fulfill approval requirements.

The Plan materials should consist of: 1) a combination of posters and pamphlets (see **Poster Information** section below); and 2) verbal educational instructions to construction personnel by supervisory or management personnel before any clearing/land alteration activities are initiated (see **Pre-Construction Activities** and **During Construction Activities** sections below).

POSTER INFORMATION

Posters with the following information shall be placed at strategic locations on the construction site and along any proposed access roads (a final poster for Plan compliance, to be printed on 11" x 17" or larger paper and laminated, is attached):

DESCRIPTION: The eastern indigo snake is one of the largest non-venomous snakes in North America, with individuals often reaching up to 8 feet in length. They derive their name from the glossy, blue-black color of their scales above and uniformly slate blue below. Frequently, they have orange to coral reddish coloration in the throat area, yet some specimens have been reported to only have cream coloration on the throat. These snakes are not typically aggressive and will attempt to crawl away when disturbed. Though indigo snakes rarely bite, they should NOT be handled.

SIMILAR SNAKES: The black racer is the only other solid black snake resembling the eastern indigo snake. However, black racers have a white or cream chin, thinner bodies, and WILL BITE if handled.

LIFE HISTORY: The eastern indigo snake occurs in a wide variety of terrestrial habitat types throughout Florida. Although they have a preference for uplands, they also utilize some wetlands

and agricultural areas. Eastern indigo snakes will often seek shelter inside gopher tortoise burrows and other below- and above-ground refugia, such as other animal burrows, stumps, roots, and debris piles. Females may lay from 4 - 12 white eggs as early as April through June, with young hatching in late July through October.

PROTECTION UNDER FEDERAL AND STATE LAW: The eastern indigo snake is classified as a Threatened species by both the USFWS and the Florida Fish and Wildlife Conservation Commission. "Taking" of eastern indigo snakes is prohibited by the Endangered Species Act without a permit. "Take" is defined by the USFWS as an attempt to kill, harm, harass, pursue, hunt, shoot, wound, trap, capture, collect, or engage in any such conduct. Penalties include a maximum fine of $25,000 for civil violations and up to $50,000 and/or imprisonment for criminal offenses, if convicted.

Only individuals currently authorized through an issued Incidental Take Statement in association with a USFWS Biological Opinion, or by a Section 10(a)(1)(A) permit issued by the USFWS, to handle an eastern indigo snake are allowed to do so.

IF YOU SEE A <u>LIVE</u> EASTERN INDIGO SNAKE ON THE SITE:

- Cease clearing activities and allow the live eastern indigo snake sufficient time to move away from the site without interference;
- Personnel must NOT attempt to touch or handle snake due to protected status.
- Take photographs of the snake, if possible, for identification and documentation purposes.
- Immediately notify supervisor or the applicant's designated agent, **and** the appropriate USFWS office, with the location information and condition of the snake.
- If the snake is located in a vicinity where continuation of the clearing or construction activities will cause harm to the snake, the activities must halt until such time that a representative of the USFWS returns the call (within one day) with further guidance as to when activities may resume.

IF YOU SEE A <u>DEAD</u> EASTERN INDIGO SNAKE ON THE SITE:

- Cease clearing activities and immediately notify supervisor or the applicant's designated agent, **and** the appropriate USFWS office, with the location information and condition of the snake.
- Take photographs of the snake, if possible, for identification and documentation purposes.
- Thoroughly soak the dead snake in water and then freeze the specimen. The appropriate wildlife agency will retrieve the dead snake.

Telephone numbers of USFWS Florida Field Offices to be contacted if a live or dead eastern indigo snake is encountered:

North Florida Field Office – (904) 731-3336
Panama City Field Office – (850) 769-0552
South Florida Field Office – (772) 562-3909

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 (example: discovery of snake sheds, tracks, lots of refugia and cavities present in the area of clearing activities, and 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, and replace 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.

APPENDIX H

WOOD STORK FORAGING ASSESSMENT MEMORANDUM

WOOD STORK FORAGING HABITAT ASSESSMENT

1.0 INTRODUCTION

The Florida's Turnpike Enterprise (FTE) is conducting a Project Development and Environment (PD&E) study to evaluate the proposed widening of Western Beltway (State Route (SR) 429)) from north of Interstate 4 (I-4) to Seidel Road in Orange and Osceola County, Florida. The purpose of this PD&E Study is to evaluate engineering and environmental data and document information that will support FTE in determining the type, preliminary design, and location of the proposed improvements. The selected Preferred Alternative proposes an eight (8) lane expansion of Western Beltway (SR 429) from north of I-4 to Seidel Road with a T-Ramp Interchange at Livingston Road and signals at Sinclair Road and Seidel Road. The study was conducted to meet the requirements of the FDOT, the National Environmental Policy Act (NEPA), and other related federal and state laws, rules, and regulations.

2.0 WOOD STORK NESTING AND SUITABLE FORAGING HABITAT

The wood stork (*Mycteria americana*) is primarily associated with freshwater and estuarine habitats that are used for nesting, roosting, and foraging. Wood storks typically nest colonially in medium to tall trees that occur in stands located in swamps or on islands surrounded by relatively broad expanses of open water. Successful breeding sites are those that have limited human disturbance and low exposure to land-based predators. Nesting sites protected from land-based predators are characterized as areas 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.

In addition to limited human disturbance and land-based predation, successful nesting depends on the availability of suitable foraging habitat. Because of their specialized feeding behavior, wood storks forage most effectively in shallow-water areas with highly concentrated prey. Typical foraging sites for the wood stork include freshwater marshes, depressions in cypress heads, swamps sloughs, managed impoundments, stock ponds, shallow-seasonally flooded roadside or agricultural ditches, and narrow tidal creeks or shallow tidal pools. Suitable foraging habitat is described as wetland or open water areas that are relatively calm, uncluttered by dense thickets of aquatic vegetation and have a water depth between 5 and 15 inches. Preferred foraging habitat includes wetlands exhibiting a mosaic of submerged and/or emergent aquatic vegetation, and shallow, open-water areas subject to hydraulic regimes that exhibit short and long hydroperiods. The vegetative component provides nursery habitat for small fish, crayfish, frogs, and other aquatic prey, and the shallow open-water areas provide sites for concentration of the prey during daily or seasonal low water periods. In Orange County, suitable wetland and open water habitats within 15.0 miles of a wood stork nesting colony are considered Core Foraging Areas (CFA) by the U.S. Fish and Wildlife Service (USFWS). In Osceola County, suitable wetland and open water habitats within 18.6 miles of a wood stork nesting colony are considered CFA.

The loss of wetland habitats, or wetland function, has been the primary cause of the wood stork population decline in the United States. The alteration of wetlands and the manipulation of wetland hydroperiods to suit human needs have also reduced the amount of available habitat to wood storks and affected prey base availability. The altered hydrology of these systems has also enhanced the invasion of these systems by exotic plant species. These exotic plants can produce a dense understory and closed canopy, limiting suitability of these wetland systems for foraging by wood storks, although a sufficient prey base may be present in the wetlands.

Four (4) variables are indicative of the necessities and functions of optimal or suitable foraging habitat required by the wood stork:

1. Vegetation Density: the density of vegetation within habitats suitable for wood stork foraging;
2. Wetland Hydroperiods: the hydroperiod of the wetland, which includes two (2) subcomponents; (1) the fish and crayfish density per hydroperiod; and (2) the fish and crayfish biomass per hydroperiod;
3. Prey Size Suitability: the suitability of prey size for the wood stork, which provides an adjustment to the fish and crayfish biomass per hydroperiod and is referenced hereafter as the "wood stork suitability prey base"; and
4. Competition with other wading bird species: the likelihood that the wood stork is the wading bird species that actually consumes the concentrated prey.

3.0 SUITABLE FORAGING HABITATS WITHIN THE PROJECT STUDY AREA

The proposed project study area contains wood stork foraging habitat and is located within the CFA of three (3) active wood stork nesting colonies: Eagle Nest Park, Gatorland, and Lake Russell. There are approximately 5.19 acres of wetlands that could be utilized by the wood stork for foraging in the Preferred Alternative. There are no surface waters in the Preferred Alternative. These wetlands were grouped by similar habitat types and evaluated relative to exotic species density and hydroperiod.

Exotic Vegetation Density

Wood stork habitat quality can be adversely affected by the level of exotic species infestation within wetlands and surface waters. The availability of the prey base for wood storks and other foraging wading birds is reduced by the restriction of access caused from dense and thick exotic vegetation. **Table 1** provides the foraging suitability value (FSV) percentages used in the Wood Stork Biomass Analysis.

The wetland habitats within the Western Beltway (SR 429) project study area vary in the percentage of exotic vegetation. Depending on the percent of exotics present, FSVs of 100, 64, 37, and 3 were assigned to the potential foraging habitat available to wood storks within the project study area.

Table 1 – Exotic Vegetation Cover Percentage Foraging Suitability Value

PERCENTAGE OF EXOTIC VEGETATION	FSV (PERCENT)
Between 0 and 25 Percent Exotics	**100**
Between 25 and 50 Percent Exotics	**64**
Between 50 and 75 Percent Exotics	**37**
Between 75 and 90 Percent Exotics	**3**
Between 90 and 100 Percent Exotics	**0**

Hydroperiod

The hydroperiod of the wetlands potentially affected by a project is an important consideration in determining effects on wood stork foraging habitat due to the dependency of fish and crayfish (potential foraging biomass) on hydroperiod. Wetlands and surface waters within the project area were grouped according to hydroperiod class.

4.0 IMPACTS

The Preferred Alternative for this project proposes widen from four (4) toeight (8) lanes from north of I-4 to Seidel Road with a T-Ramp Interchange at Livingston Road and signals at Sinclair Road and Seidel Road. Impacts will be limited to wetlands previously impacted by roadway activity. This section analyzes the impacts of the proposed project on the wood stork and wood stork foraging habitat.

For assessment purposes, this wood stork biomass analysis addresses the loss of wetlands within the proposed right-of-way of the Preferred Alternative. For the assessment of the Preferred Alternative, 5.19 acres of wetlands were analyzed.

The analysis determined that Preferred Alternative will result in the net loss of 10.22 kg total (fish and crayfish) biomass. The total biomass loss are from long hydroperiod wetlands. **Table 2** presents the analysis of the impacts to wood stork foraging habitat and forage for the Preferred Alternative.

Table 2 – Preferred Alternative Wood Stork Foraging Analysis Summary

Wood Stork Foraging Analysis Summary - Total Biomass (Including Crayfish and Fish)							
Impact Area							
Hydroperiods	**Acres**	**% Exotics**	**FSV**	**m^2**	**m^2 suitable**	**Crayfish and fish biomass g/m^2**	**Biomass loss (kg)**
Long Hydroperiod (Class 4)	5.19	25-50	0.37	21,003.27	7,771.21	2.34	10.22
Total	**5.19**			**21,003.27**	**7,771.21**		**10.22**

5.0 MITIGATION

Impacts to wetlands within the Preferred Alternative will be mitigated for within the CFA of one or more of the affected rookeries or at a regional mitigation bank that has been approved by the USFWS or pursuant to Section 373.4137, F.S. Wetland mitigation will include compensation for the loss of wood stork foraging habitat and prey resulting from construction of the proposed project. Compensation for the loss of wetlands, as well as wood stork habitat and foraging area (long term hydroperiod wetlands), will be provided at a state and federal approved mitigation bank.

6.0 SUMMARY

The proposed project study area contains wood stork foraging habitat and is located within the CFA of three (3) active wood stork nesting colonies: Eagle Nest Park, Gatorland, and Lake Russell. There are 5.19 acres of wetlands that are wood stork foraging habitat within the Preferred Alternative. Wood stork foraging biomass productivity is calculated based on hydroperiods of class of affected wetlands. The Preferred Alternative will impact 5.19 acres of long hydroperiod wetlands and will result in the net loss of 10.22 kg total (fish and crayfish) biomass. Loss of potential wood stork foraging habitat attributable to the project will be offset by providing the equivalent credits at a federally approved mitigation bank.

7.0 REFERENCES

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APPENDIX I
AGENCY COORDINATION

Florida Department of Transportation

RON DESANTIS
GOVERNOR

Florida's Turnpike Enterprise
P.O. Box 613069, Ocoee, FL 34761
407-532-3999

KEVIN J. THIBAULT, P.E.
SECRETARY

FDOT, Office of Environmental Management/Florida's Turnpike Enterprise/U.S. Fish and Wildlife Service Coordination Meeting Minutes

FPID 446581-1-22-01 (Turnpike)
Poinciana Parkway Extension from CR 532 to north of I-4/SR 429 Interchange PD&E
Osceola and Polk Counties

Date: October 27, 2020
Time: 1:00 pm
Venue: TEAMS Meeting

Attendees:
John Wrublik – USFWS
Brittany Bianco – FDOT OEM
Henry Pinzon, PE – FTE
Rax Jung, PhD, PE – FTE
Philip Stein – FTE
Annemarie Hammond – FTE
Stephanie Underwood, PE – HNTB
Doug Zang, AICP – Atkins
Fred Gaines, PWS – Atkins

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1. Introductions

All attendees introduced themselves.

2. Project Overview (map provided)

FTE indicated that the intent of the meeting is to utilize available information including the various agencies' ETDM input to develop the project PD&E scope. This PD&E project will result in a federal environmental document as the project ties in with Interstate 4. FTE provided the overall project description from the ETDM/AN process: "*CFX's Poinciana Parkway currently terminates at the intersection of US 17/92 and County Road 54 (CR 54). As part of a separate CFX effort, the Poinciana Parkway is being extended approximately 1.75 miles north to CR 532. Therefore, this project would complete the remaining 2.5-mile gap in the Poinciana Parkway between CR 532 and I-4 / SR 429.*"

FTE went over the ETDM/AN provided Purpose and Need Statement: "*The purpose of this project is to complete the missing link in the Poinciana Parkway between the planned terminus at County Road 532 (CR 532) to the Interstate 4 (I-4) / State Road 429 (SR 429) interchange. The project will also address future congestion on SR 429 from the I-4 / SR 429 interchange to the SR 429 / Sinclair Road interchange.*"

FTE provided a brief history of the project resulting in various similar projects:

1980/1990 Central Florida Beltway studies
2005 Osceola Co. Comp. Plan – New corridors (Poinciana Parkway Extension /I-4 Connector)
2012 Osceola County Expressway Authority (OCX)) – 2040 Master Plan
2016 FDOT designated Poinciana Pkwy as SR 538. Poinciana Pkwy connected to US 17/92

Mar. 2018 CFX Concept Feasibility Study Completed
July 2018 CFX Poinciana Parkway Ext. PD&E Study (state) from US 17/92 to CR 532 – NTP
Aug. 2019 FTE takes lead on Poinciana Parkway Ext./I-4 PD&E Study per FDOT Secretary direction
Oct. 2019 CFX advanced their Poinciana Parkway Ext. project (design & construction funded)
Spring 2020 CFX Design NTP for Poinciana Parkway Extension, from US 17/92 to CR 532, with Construction in 2022
Dec. 2020 FTE Poinciana Parkway Extension, from CR 532 to I/4/SR 429 Interchange will be under contract to begin the federal PD&E Study (FPID 446581-1).

FTE generally presented pertinent details from ETDM No. 14445 published on September 10, 2020

- Follow NEPA process for environmental document
- USFWS Consultation Area/concerns included potential impacts to the following federal listed species:
  - Wood stork (*Mycteria americana*)
  - Eastern indigo snake (*Drymarchon corais couperi*)
  - Audubon's crested caracara (*Caracara cheriway*)
  - Florida scrub-jay (*Aphelocoma coerulescens*)
  - Skinks
    - Blue-tailed mole skink (*Plestiodon egregius lividus*)
    - Sand skink (*Plestiodon reynoldsi*)
  - Red-cockaded woodpecker (*Leuconotopicus borealis*)
  - Florida grasshopper sparrow (*Ammodramus savannarum floridanus*)
  - Everglade snail kite (*Rostrhamus sociabilis plumbeus*)
  - Federal listed plants (such as but may not be limited to)
    - Britton's bear grass (*Nolina brittoniana*)
    - Lewton's polygala (*Polygala lewtonia*)
    - Florida bonamia (*Bonamia grandiflora*)
    - Scrub buckwheat (*Eriogonum longifolium* var. *gnaphalifolium*)
  - Bald eagle (*Haliaeetus leucocephalus*)

FTE next went over each federally listed species with the proposed PD&E approach.

3. Wood Stork

FTE presented that the project is assumed to be within several wood stork rookeries' Core Foraging Area. FTE is not proposing specific surveys but will document opportunistic observations. FTE will utilize the USFWS Wood Stork Key and recommend suitable mitigation for the preferred alternative as required. USFWS concurred with approach.

4. Eastern Indigo Snake

FTE indicated that the historical records for eastern indigo snake and historical records do not appear to indicate a recent observation within 1 mile of the project. More research will be conducted during the PD&E. FTE is not proposing specific surveys but will document opportunistic observations. FTE will utilize the USFWS Eastern Indigo Snake Key and recommend suitable protection measures for the preferred alternative as required. USFWS concurred with approach.

5. Audubon's Crested Caracara

FTE indicated that research of the available Biological Opinions for surrounding developments and historical records do not appear to reference caracara observations. FTE is not proposing specific surveys but will document opportunistic observations. FDOT/FTE will coordinate with USFWS on this species

relative to the preferred alternative. USFWS concurred with approach.

6. Florida Scrub-jay

FTE indicated that research indicates recent projects in the vicinity have identified scrub jay observations near the southern end of the project area. FTE proposes one seasonal event according to scrub jay guidelines limited to the best habitat within the study area. FDOT/FTE will coordinate with USFWS after the survey is conducted to address the results relative to the preferred alternative. USFWS concurred with approach.

7. Skinks

FTE indicates that the majority of the project area uplands are within the anticipated sand skink soil and elevation criteria requiring consultation. Assuming that most of the developed area has addressed skinks previously, FTE proposes assuming sand/blue-tailed mole skink presence for the purposes of the PD&E and proposes no surveys at this point. The preferred alternative skink involvement will be coordinated with USFWS. USFWS concurred with this approach.

8. Red-cockaded Woodpecker

FTE indicated that research of the available Biological Opinions for surrounding developments and historical records do not appear to reference red-cockaded woodpecker observations. FTE is not proposing specific surveys but will document opportunistic observations. FDOT/FTE will coordinate with USFWS on this species relative to the preferred alternative. USFWS concurred with approach.

9. Florida Grasshopper Sparrow

FTE indicated that research of the available Biological Opinions for surrounding developments and historical records do not appear to reference Florida grasshopper sparrow observations. There is no apparent habitat for the species in the study area, and it appears the closest observations are relatively distant from the study area. FTE is not proposing specific surveys but will document opportunistic observations. FDOT/FTE will coordinate with USFWS on this species relative to the preferred alternative. USFWS concurred with approach.

10. Everglade Snail Kite

FTE indicated that research of the available Biological Opinions for surrounding developments and historical records do not appear to reference everglade snail kite observations. There is no apparent habitat for the species in the study area, and it appears the closest observations are relatively distant from the study area. FTE is not proposing specific surveys but will document opportunistic observations. FDOT/FTE will coordinate with USFWS on this species relative to the preferred alternative. USFWS concurred with approach.

11. Florida Bonneted Bat

FTE indicated that the project not in FBB Consultation Area and the species will not be addressed as part of the project. USFWS concurred with approach.

12. Federal Protected Plants

FTE will conduct opportunistic surveys for federal listed plant species while in the study area. FDOT/FTE will coordinate results with USFWS relative to the preferred alternative. USFWS concurred with approach.

13. Bald Eagle

FTE indicated that research into the current and historical bald eagle nest database will be reviewed. Any

potential impacts identified relative to the preferred alternative will be coordinated with USFWS Bald Eagle group. USFWS concurred with approach.

14. Wildlife Habitat Connectivity

FTE noted that there is significant planned and constructed development in the study area. There are conservation easements to SFWMD associated with some uplands and most wetland systems on the middle and western portion of the study area (Reunion and Celebration/RCID). More detailed permit research will be conducted to identify the conservation easement holders within the preferred alternative. Bridging of more substantial wetland systems will be considered for hydrologic concerns, but since the systems are not under state/federal resource agency control the potential for wildlife crossings is limited according to FDOT wildlife corridor guidelines. FTE will consider wildlife enhancements at any preferred alternative wetland bridge crossings. USFWS concurred with approach indicating that no specific wildlife crossings are requested at this time and agreed that wildlife enhancements be considered at the wetland bridge crossings.

15. Roundtable/Questions/Comments

There were no additional discussion items.

MEETING MINUTES
USFWS/FDOT COORDINATION MEETING

FPID: 446581-1-22-01 Poinciana Parkway Extension
from CR 532 to North of I-4/SR 429 Interchange
Osceola and Polk Counties, Florida
Contract Number CAB30

PROJECT MANAGER:	Stephanie Underwood, PE
PD&E CONSULTANT:	RS&H
CONSULTANT PM:	Doug Reed, PE
SUBCONSULTANTS:	American Acquisition Group, Cotleur & Hearing, Diversified Professional Services Corp, ECHO UES, Florida Transportation Engineering, IF Rooks, Janus Research, Kimley-Horn & Associates, Inc. (KHA), Patel, Greene & Associates, Tierra, Inc.
DATE:	Thursday, October 21, 2021, 8:30 am TEAMS Meeting
MEETING LOCATION:	Microsoft Teams Meeting

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1. **Attendees**

Fred Gaines (FTE)	Annemarie Hammond (FTE)	Tiffany Crosby (FTE)	Doug Reed (RS&H)
Philip Stein (FTE)	Doug Zang (FTE)	John Wrublik (USFWS)	Ramon Breton (KHA)

2. **PPE Project Summary**
   After introductions, Fred Gaines showed the Project Location Map (attached) and briefly explained the Poinciana Parkway Extension (PPE) PD&E Study project, noting that this is not yet in permitting phase.

   Previous discussions with USFWS resulted in the decision to assume sand skink presence and perform a survey for scrub jays in the Type 1 (prime) habitat areas near or potentially affected by the proposed improvements.

3. **Potential Scrub Jay Habitat**
   Fred Gaines displayed Figure 1 (attached) showing a map of the original study area in red, the proposed alignment footprint in yellow, and FLUCFCS land use codes within the study area, including Type 1 Optimal and Sub-Optimal scrub-jay habitat and Type III Habitat. The 1993 scrub-jay observation location along CR 532 within a mile of the project was also shown on the map. Fred explained that the alignment location was developed to minimize or avoid the existing Reunion and Celebration developments and the planned development of Mattamy Homes. In doing so, areas of Optimal and Sub-Optimal Type 1 habitat (FLUCFCS 320) would be within the proposed roadway footprint.

4. **Proposed Survey Stations**
   Fred then presented Figure 2 (attached) showing six survey stations proposed for survey within three areas of Optimal Type 1 Habitat within and near the proposed alignment. It was noted that Reunion had surveyed the area in the past and not found any scrub-jays. That data will be requested and referenced in the PD&E study. John Wrublik agreed that the survey approach was acceptable. Fred also noted that we are in the PD&E phase. Should a build alternative be recommended, a different process may be proposed for the permitting phase.

5. **Other Discussion – None**

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MEETING MINUTES
FTE/FDEP PRE-APP COORDINATION MEETING
Poinciana Parkway Extension PD&E Study from CR 532 to North of I-4
FPID No.: 446581-1-22-01
Western Beltway (SR 429) Widening PD&E Study from North of I-4 to Seidel Road
FPID No.: 446164-1-22-01

Osceola and Orange Counties County, Florida
Monday, April 11, 2022, 9:00 am

I. Attendees:

FTE
Henry Pinzon (PD&E)
Rax Jung (Project Dev. Engineer/EMO)
Philip Stein (Environmental)
Annemarie Hammond (Environmental Permits Coordinator)
Erin Yao (Drainage Engineer)

FDEP
Teayann Duclos (Environmental Manager)
Jennipher Walton (Env. Specialist)
Leo Anglero (ERP/Stormwater)
Allan Popak (Environmental Specialist)
Lindsay Furr (Environmental Consultant)
Jill Farris (Environmental Consultant)

FTE/GEC
Stephanie Underwood (PM/HNTB GEC)
Fred Gaines (Permitting/Atkins GEC)
Adriana Kirwan (Drainage/HNTB GEC)
Tiffany Crosby (Senior Scientist/Atkins GEC)

RS&H Team
Douglas Reed (RS&H PM)
Erik Scott (RS&H Drainage)
Sarah Johnson (KHA/Environmental)

FDOT Central Office
Jonathan Turner (Project Delivery Coordinator)

FDOT District 5
Casey Lyon (Env. Permits Coordinator)

II. Introductions

The meeting started with FDOT District 5 discussed their projects with FDEP. After attendees were introduced, Stephanie Underwood explained the purpose of the meeting was to initiate pre-application coordination with the Florida Department of Environmental Protection for the two Project Development and Environment (PD&E) studies.

III. PowerPoint presentation

Erik Scott explained the two projects with a PowerPoint presentation and separate exhibits (attached). Discussion is summarized below.

Widen Western Beltway PD&E Study:

- The PD&E study was summarized, including existing conditions and the proposed widening of SR

429 from four to eight-lanes from north of I-4 to Seidel Road. Improvements are also proposed at the existing interchanges at Sinclair Road, US 192, Western Way, and Seidel Road. A new interchange is proposed at Livingston Road. It was noted that this is early in the process in the PD&E phase, and not the Design phase, so a permit application is not imminent.

- FDEP and Reedy Creek Improvement District (RCID) permitted SR 429 in 2001. FTE is coordinating with RCID.
- The existing water quality volume was calculated based on the criteria of 1-inch over the contributing basin or 2.5-inches over the impervious area. For most of the basins the 1-inch over the contributing area was the controlling factor for the required water quality. This is due in part because the existing corridor was in located within a rural corridor and offsite areas were included in the contributing basin calculation. Since 2001, some of the offsite areas have been developed with new, offsite ponds. Therefore, when adding the additional pavement along SR 429 for the eight-lane configuration, most of the basins still have sufficient water quality volume provided in the existing ponds. For any basins lacking the required water quality volume within the existing permitted ponds, the difference will be accommodated by adjusting the existing control structures or providing additional pond area.
- Basin boundaries will be revised to reflect the development adjacent to SR 429.
- The project study area is located within two impaired WBIDs, Davenport Creek for bacteria and Whittenhorse Creek for dissolved oxygen. In addition, the project study is located within the Lake Okeechobee Subwatershed BMAP. FTE believes that additional treatment is not required given FDOT BMPs include a series of treatment trains and their facilities do not directly discharge into the impaired waterbodies. FDEP stated that additional treatment considerations may not be necessary because they are moving away from the 50% additional treatment volume but will need to be discussed further during the design phase.
- Attenuation will be provided per FDEP criteria for open and closed basins, with consideration for RCID requirements.
- FDEP agreed this stormwater approach is reasonable.
- The corridor has floodplains associated with Boggy Creek and Whittenhorse Creek. There is one existing Floodplain Compensation site located north of Indian Creek Boulevard adjacent to the southbound lanes. Though encroachments are anticipated, they will be minimal. Encroachments will be mitigated by compensation sites or by using the importer/exporter method.
- FTE confirmed with FDEP that the Environmental Resource Permit (ERP) for widening of Western Beltway (SR 429) will be handled by FDEP. This includes the 404 permit.
- Wetland lines from the previous permit will be used as much as possible in areas that are not new interchanges. Direct wetland impacts are approximately 10 acres.
- Conservation easements are located within the project study area.
- Wetlands and conservation easements impacts will be avoided and minimized as much as possible. Some minimization methods considered include bridging or MSE walls.
- Impacts to most species is minimal along the existing roadway; however, there is suitable sand skink habitat to be considered especially within the new interchange area.
- Mitigation banks are located within the available service area for this project to offset any unavoidable wetland impacts.
- Coordination with USFWS for species involvement occurred in 2021.
- There were no questions, but if any questions arise, additional coordination can occur.

Poinciana Parkway Extension PD&E Study:

- The PD&E study was summarized, including existing conditions; the proposed new six-lane expressway on new alignment; and interchanges at CR 532, I-4, and Sinclair Road. The new

alignment crosses Davenport Creek on bridge structure.

- There are two alternatives, but the worst-case Alternative 1 was discussed.
- FTE clarified with FDEP that they anticipated that SFWMD would be responsible for issuing the ERP and FDEP would be responsible for reviewing and issuing the 404 permit.
- The team depicted the wetlands and conservation areas within the study area.
- Wetland lines from the previous permits will be used as much as possible in existing roadway areas; new wetland lines will be set in the new alignment area. Direct wetland impacts range from 131 acres to 141 acres for the alternatives. Approximately 130 acres of direct impacts will be minimized with bridges and MSE walls.
- Conservation easements for RCID and Reunion are present within and adjacent to the project study area.
- Wetlands and conservation easements impacts will be avoided and minimized as much as possible. Some minimization methods considered include bridging or MSE walls.
- FTE has already met with USFWS in October 2020 and again in October 2021. A scrub jay survey was completed in October 2021, however; there were no observations of scrub-jays as a result of the survey. Suitable sand skink habitat is located within the project study area and sand skink tracks were observed during pedestrian transects.
- We will coordinate with FWC for state-listed species.
- Mitigation banks are located within the available service area for this project to offset any unavoidable wetland impacts. FDEP confirmed with FTE that mitigation banks should be utilized for wetland mitigation as the 1st priority and followed by other options after this measure. Impacts to conservation easements should be a last resort. Should the release of a Conservation Easement or an impact to a Conservation Easement be necessary, FDEP has asked that FTE coordinate with FDEP early in the design development given the process is different than that of mitigation banks.
- FTE indicated that the avoidance and minimization measures mentioned previously is standard and considered adequate; FDEP indicated that FTE is on the right track

MEETING MINUTES
FTE/RCID AGENCY COORDINATION MEETING
Poinciana Parkway Extension PD&E Study from CR 532 to North of I-4
FPID No.: 446581-1-22-01
Western Beltway (SR 429) Widening PD&E Study from North of I-4 to Seidel Road
FPID No.: 446164-1-22-01

Osceola and Orange Counties County, Florida
Wednesday, May 19, 2021, 1:00 pm

I. Attendees:

Henry Pinzon (FTE PD&E)	Erin Yao (FTE/Drainage)	Rax Jung (FTE Project Dev. Eng./EMO)	Douglas Reed (RS&H PM)
Stephanie Underwood (FTE PM)	Doug Zang (FTE/Environmental)	Annemarie Hammond (FTE/Env. Permit Coordinator)	Erik Scott (RS&H Drainage)
Ramon Breton (KHA, DPM 446581)	Fred Gaines (FTE/Permitting)	Clif Tate (KHA/Engineering)	Sarah Johnson (KHA/Environmental)
Adriana Kirwan (FTE/Drainage)		Kate Kolbo (RCID Planning/Engineering)	

II. Introductions

Stephanie introduced the Florida Turnpike Enterprise (FTE) staff and explained the purpose of the meeting was to coordinate with the Reedy Creek Improvement District (RCID). RS&H team staff was introduced followed by the RCID staff. John Classe (RCID District Administrator and Sam Dewes (RCID Roadway) were not in attendance.

III. PowerPoint presentation

Doug Reed went through a PowerPoint presentation (attached), which was sent to RCID after the meeting. Discussion is summarized below.

a. Slide 7: Kate Kolbo explained that there are no set procedures if the Wildlife Management Conservation Area (WMCA) is impacted. It was set up in 1966 as a major floodway to never be impacted. Although two crossings were anticipated, including I-4. Poinciana Parkway would also be an exemption. However, there cannot be any adverse impacts to the existing flow rates. Most flows are north to south, except for Reunion which flows south to north. Major cross drains will be required along the utility "stair step" area to maintain flows.

   Sarah Johnson pointed out the two graphics were slightly different and asked which one is correct. Kate Kolbo will send the CADD file for the correct WMCA limits to Stephanie Underwood, who will distribute it to the team. Kate mentioned that they use a different datum and they will convert it to NAVD88 before sending.

   Fred Gaines asked if any easements had been transferred to other owners. Kate responded that none had been transferred.

b. Slide 15: Kate indicated that the system is well defined. The cross section is fixed, canals cannot be widened, and drainage structures cannot be modified. Therefore, the flow cannot be increased. Any additional runoff must flow elsewhere. Stephanie Underwood suggested pre-post flows should be ok. Kate responded that it may not

be, depending on the definition off pre-post, but she will send the stipulations to Stephanie. The Reedy Creek system is based on 13 cfm/sq mile, and they are already exceeding that volume. Anything over that will require a fee. Kate mentioned that I-4 Beyond the Ultimate (BtU) project is attenuating to below the pre-post volume.

Fred Gaines mentioned that Turnpike had already paid a fee for SR 429 during the original construction.

Erik Scott asked about the permit process. Kate responded that a SFWMD permit application should be sent to RCID first for review and approval before being submitted to South Florida Water Management District (SFWMD). RCID will then send SFWMD a letter explaining the negotiation points and expressing support.

Kate mentioned that RCID uses a different rainfall distribution than SFWMD with a 50 yr/72 hr event. Erik asked about the unit hydrograph, and Kate will send Stephanie the RCID drainage person's contact information who can provide the information.

Erik mentioned we anticipate staying below the 290 cfs that was used previously. Kate will pull the permit and modifications can be worked through. Kate also mentioned they would require an initial 30-day review period to provide comments or questions. The Turnpike's team will provide information for RCID to feed into the model. Kate also mentioned they will review the projects even if outside the RCID boundary as long as it is within the watershed.

Erik asked if there were any other entities that were interested in taking additional water. Kate responded that there were none.

Fred asked if RCID can provide conceptual approval since this is PD&E and we are not submitting an actual permit until a later phase. Kate responded that conceptual approval can be granted.

The bottom line was reiterated:

- Stay out of the WMCA, and
- Do not discharge more flow into RCID

IV. Action Items

a. Doug Reed will prepare meeting minutes. (done)
b. Kate Kolbo will send the CADD files for the correct WMCA limits and flow stipulations. (done)

MEETING MINUTES
FTE/RCID AGENCY COORDINATION MEETING #2
Poinciana Parkway Extension PD&E Study from CR 532 to North of I-4
FPID No.: 446581-1-22-01
Western Beltway (SR 429) Widening PD&E Study from North of I-4 to Seidel Road
FPID No.: 446164-1-22-01

Osceola and Orange Counties County, Florida
Thursday, March 3, 2022, 10:00 am

I. Attendees:

Henry Pinzon (FTE PD&E)	Todd Rimmer (Walt Disney Planning)	Rax Jung (FTE Project Dev. Eng./EMO)	Douglas Reed (RS&H PM)
Stephanie Underwood (FTE PM)	Emam Emam (FTE/Planning/Traffic)	Philip Stein (FTE/Environmental)	Erik Scott (RS&H Drainage)
Ramon Breton (KHA, DPM 446581)	Fred Gaines (FTE/Permitting)	Clif Tate (KHA/Engineering)	Matt Betancourt (RS&H Public Inv.)
Katherine Luetzow (RCID)	Sarah Johnson (KHA/Env)	Kate Kolbo (RCID Planning/Eng)	Rick Langlass (RS&H DPM/Eng.)
Sandy Morales (RCID)			

II. Introductions

Stephanie introduced the Florida Turnpike Enterprise (FTE) staff and explained the purpose of the meeting was to continue coordination with the Reedy Creek Improvement District (RCID) on the two PD&E studies. The RS&H team and RCID was also introduced.

III. PowerPoint presentation

Doug Reed went through a PowerPoint presentation. Discussion is summarized below.

<u>Poinciana Parkway Extension PD&E Study and Drainage Design:</u>
Erik Scott outlined the anticipated worst—case encroachment into Whittenhorse Creek with the proposed 8-lane typical. Kate Kolbo requested the hydraulic model FTE is using to evaluate the HGL. RS&H does not anticipate any changes to the Boggy Creek culvert. Davenport Creek will be bridged

Kate Kolbo indicated that FTE is not required to use a specific hydraulic model, but all modeling (electronic executable files) would need to be submitted for RCID review.

Todd Rimmer indicated that the CADD files would be requested from Mattamy Homes for the Celebration Island Village site plan.

Erik Scott requested the RCID model for use. Kate Kolbo agreed to send it after the meeting.

Kate Kolbo suggested the permit request should be submitted to RCID before submitting to the South Florida Water Management District (SFWMD).

The fee structure of $4.15 per acre/csm is still applicable. The $200/acre is also still

applicable for the portion of the project located within the RCID boundary if runoff drains into RCID. The original permits will be reviewed and fees will be assessed based on the improvements.

It was noted that the easements are water management first and foremost, then wildlife conservation.

Todd Rimmer asked if the two Poinciana Parkway Extension alternatives operate similarly. The response was yes, the configuration differs, but operations are similar. Todd also suggested the relocation of utilities be included in the evaluation and footprint.

Historical storage must be preserved as this area serves a large area of Osceola and Orange counties. Flood storage is critical.

Kate Kolbo will send the latest GIS files for the most up to date information on the jurisdictional and water management conservation area limits. A separate meeting can be set up to go through the information.

Widen Western Beltway PD&E Study:
Todd Rimmer indicated they are looking at 2040 traffic models for Western Way due to its connection into Lake County. Emam Emam indicated he can share the Synchro files which have been coordinated with District 5 and FDOT Central Office.

Bike and pedestrian facilities can be removed from Western Way since other means (i.e. shuttles) are being incorporated by Disney for bike and pedestrian accommodations. This will ultimately be safer due to the free flow ramp movements.

RCID is evaluating widening Western Way to six lanes. Funding is included in the 10-year plan.

It was noted that Disney was not invited to the Reunion Coordination meeting scheduled for March 10, 2022.

In general, it was agreed that Poinciana Parkway Extension Alternative 2 has reduced direct and indirect impacts to RCID resources compared to Alternative 1.

IV. Action Items

a. Doug Reed will prepare meeting minutes. (done)
b. Kate Kolbo will send the RCID model.
c. Stephanie Underwood will send the HEC-RAS and Synchro models.

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GOVERNOR

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MEETING MINUTES
FTE/SFWMD PRE-APP COORDINATION MEETING
Poinciana Parkway Extension PD&E Study from CR 532 to North of I-4
FPID No.: 446581-1-22-01

Osceola and Polk Counties County, Florida
Wednesday, April 13, 2022, 2:00 pm

I. Attendees

Florida's Turnpike Enterprise (FTE)
Henry Pinzon (Environmental Management Engineer)
Rax Jung (Project Dev. Engineer/EMO)
Annemarie Hammond (Environmental Permits Coordinator)
Erin Yao (District Drainage Engineer)

FTE/GEC
Stephanie Underwood (PM/HNTB GEC)
Fred Gaines (Permitting/Atkins GEC)
Adriana Kirwan (Drainage/HNTB GEC)
Doug Zang (Noise/Atkins GEC)

SFWMD
Patricia Therrien (Lead Eng/Env Review)
Richard Lott (Engineering)
Lisa Prather (Section Leader/Environmental)
Richard Walker (Reg. Information Specialist)

FDEP
Lee Anglero (ERP)

RS&H Team
Douglas Reed (RS&H PM)
Erik Scott (RS&H Drainage)
Sarah Johnson (KHA/Environmental)

II. Introduction

After introductions, Erik Scott went through the agenda (attached to meeting request) and explained this is a PD&E study, so no permit application is imminent. He then went through a PowerPoint presentation (attached) that started with an introduction to the Poinciana Parkway Extension (PPE) Project Development and Environment (PD&E) Study from CR 532 to north of the I-4/SR 429 interchange. The project is a new six-lane expressway with interchanges at CR 532, I-4, and SR 429/Sinclair Road. At the south end, PPE ties into the Central Florida Expressway Authority (CFX) Poinciana Parkway, which is currently in the Design Phase south of CR 532. At the north end, PPE ties into the SR 429/Western Beltway Widening PD&E Study from north of I-4 to Seidel Road. PPE has Independent Utility, so it provides benefits even if the Poinciana Parkway is not constructed and the Western Beltway is not widened.

III. Drainage Discussion

Erik Scott stated that treatment would be provided for the improvements utilizing the criteria of 1-inch over the developed area or 2.5-inches over the impervious, which ever is greater. It was noted that the interchange and SR 429 to the north are currently permitted by FDEP and RCID. New water quality volumes will be computed using the criteria and compared against permitted water quality volumes. Should there be a deficiency, additional water quality volume will be provided in new ponds or in existing ponds with modified control structures.

Erik Scott explained that the project was located within a WBID impaired for bacteria (fecal), as well as being within the Lake Okeechobee Watershed BMAP. FTE believes that additional treatment is not required given FDOT BMPs include a series of treatment trains and their facilities do not directly discharge into the impaired waterbodies. SFWMD stated that phosphorus should still be analyzed to ensure a net reduction. Fred Gaines indicated that this is consistent with what FTE has been doing. Additionally, if the implemented BMPs have a net reduction in phosphorus it is implied that other impairments such as bacteria will be sufficiently reduced. SFWMD recommended that an additional pre-application meeting be held during the design phase to verify the design criteria closer to the time of permitting.

The PD&E Team met with FDEP on 4/11/22, and Lee Anglero was invited to this meeting.

Erik Scott indicated that the Davenport Creek floodplain would be bridged so there would be no impacts, and improvements along SR 429 would have minimal floodplain impacts. Unavoidable floodplain impacts would be mitigated using floodplain compensation sites. SFWMD stated that they would accept the "cup-for-cup" methodology.

IV. Environmental Discussion

Sarah Johnson displayed a wetlands graphic (attached) and explained the blue color indicates wetlands, yellow indicates surface water/ditches. Wetland impacts will be minimized or avoided using MSE walls and bridges.

There are Conservation Easement areas managed by Reunion, SFWMD, and RCID within the project study area. SFWMD stated that it has been difficult to process the release of conservation easements and that currently they are not accepting mitigation credits as the mitigation option for releasing CEs. Fred Gaines asked if a "swap", impacting one area and providing an equal compensation area nearby for the same system, is a potential option. Lisa Prather stated that swaps are a release which is not guaranteed to gain approval through the SFWMD Board. SFWMD stated that it was their understanding that impacting a Reedy Creek Improvement District (RCID) conservation easement was not possible. Fred Gaines reminded attendees that the permit is still 2-3 years out. Bridging the conservation area may be another potential option, but the Board will review and make that decision. The Executive Director could be consulted for input in advance. Impacts should be minimized to the greatest extent possible. It was also noted that privately held (Reunion) conservation easements are not as big of a challenge. Lisa Prather suggested that any potential swap areas would need to be connected to the same site/wetland and have an equal or greater functional value.

FTE met with USFWS previously. A scrub jay survey was conducted in October 2021. The Team will coordinate with FWC for state-listed species.

V. Other Discussion

SFWMD stated that using the 10-yr/72-hr storm event is an option in Osceola County for water quantity. RS&H staff will review existing SR 429 permits and utilize the same storm event for the purposes of SFWMD permitting. *It should be noted that RCID has a more stringent water quantity requirement that will dictate the overall design.*

Patricia Therrien asked when the Bridge Hydraulic Report would be completed. Erik Scott responded that it is not done in the PD&E phase, it is done is Final Design. Some ramps need to at a higher elevation due to interchange profiles, so bridges are an option to maintain conveyance and keep flow rates and velocity rates similar to existing and avoid erosive velocities.

FTE asked if SFWMD would be responsible for permitting the new alignment and the I-4 Interchange improvements previously permitted by FDEP. FDEP will still be responsible for permitting the portions of the

existing SR 429 corridor and the I-4 interchange previously permitted by FDEP. An additional pre-application meeting can be held during the Design phase to determine the exact limits of the FDEP ERP and the SFWMD ERP.