STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

TECHNICAL REPORT COVERSHEET

650-050-38
ENVIRONMENTAL
MANAGEMENT
08/22

NATURAL RESOURCES EVALUATION REPORT

Florida Department of Transportation

District 5

US 17/92 PD&E Study

Limits of Project: from Ivy Mist Lane to Avenue A

Osceola County, Florida

Financial Management Number: 437200-2-22-01

ETDM Number: 14365

Date: December 20, 2022

The environmental review, consultation, and other actions required by applicable federal environmental laws for this project are being, or have been, carried out by the Florida Department of Transportation (FDOT) pursuant to 23 U.S.C. § 327 and a Memorandum of Understanding dated May 26, 2022, and executed by the Federal Highway Administration and FDOT.

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Executive Summary

The Florida Department of Transportation (FDOT) is conducting a Project Development and Environment (PD&E) Study for a roadway widening project on US Highway 17/92 from Ivy Mist Lane to Avenue A, located within and west of Intercession City, Osceola County, Florida. A prior Corridor Planning Study of US 17/92 from County Road (CR) 54 (Ronald Reagan Parkway) in Polk County to 1,900 feet west of Poinciana Boulevard at Avenue A in Osceola County was completed in 2018. This Corridor Planning Study includes this PD&E Study limits, and the other segments outside of this PD&E Study limits (evaluated as part of other related studies) was screened by FDOT through the Efficient Transportation Decision Making (ETDM) Environmental Screening Tool (EST) and the programming screen was published in 2018 (ETDM #14365).

This Natural Resource Evaluation (NRE) documents the baseline conditions in the study area and assesses potential impacts to protected species, wetlands, and Essential Fish Habitat (EFH). It also describes avoidance, minimization, and mitigation measures and was prepared in accordance with FDOT's PD&E Manual: Wetlands and Other Surface Waters (updated July 1, 2020); Protected Species and Habitat (updated July 1, 2020); and Essential Fish Habitat (updated July 1, 2020) chapters. The NRE incorporates the requirements of the National Environmental Policy Act (NEPA) and related federal and state laws.

Protected Species

The Preferred Alternative would implement avoidance and minimization measures to the greatest extent feasible. In Section 3 - Protected Species and Habitat, 71 listed species have the potential to occur within the study area, and 23 of those species have a moderate or high potential of occurrence. Additionally, the FDOT conducted species specific surveys for the federally threatened sand skink *(Plestiodon [Neoseps] reynoldsi),* threatened Audubon's crested caracara (*Polyborus plancus audubonii*), and endangered Florida bonneted bat (*Eumops floridanus),* and the results of these surveys are discussed in Section 3. **Table ES-1** identifies the protected species that were evaluated in this document, their listing or regulatory status, and the effect determination.

ES-1: Protected Species Effect Determinations

Scientific Name	Common Name	FWC/FDACS	USFWS	Effect Determination
INVERTEBRATES				
Danaus plexippus	Monarch Butterfly	N	C	To Be Determined
AMPHIBIANS				
Notophthalmus perstriatus	Striped Newt	C	N	No Effect Anticipated
REPTILES				
Alligator mississippiensis	American Alligator	T	T(S/A)	No Effect
Drymarchon corais couperi	Eastern Indigo Snake	T	T	May Affect, Not Likely to Adversely Affect
Gopherus polyphemus	Gopher Tortoise	T	N	No Adverse Effect Anticipated
Pituophis melanoleucus	Pine Snake	T	N	No Adverse Effect Anticipated
Plestiodon (Eumeces) egregius lividus	Bluetail Mole Skink	T	T	May Affect, Not Likely to Adversely Affect

Scientific Name	Common Name	FWC/FDACS	USFWS	Effect Determination
Plestiodon (Neoseps) reynoldsi	Sand Skink	T	T	May Affect, Not Likely to Adversely Affect
BIRDS				
Ammodramus savannarum floridanus	Florida Grasshopper Sparrow	E	E	No Effect
Antigone canadensis pratensis	Florida Sandhill Crane	T	N	No Effect Anticipated
Aphelocoma coerulescens	Florida Scrub-Jay	T	T	No Effect
Athene cunicularia	Florida Burrowing Owl	T	N	No Effect Anticipated
Dryobates (Picoides) borealis	Red-cockaded Woodpecker	E	E	No Effect
Egretta caerulea	Little Blue Heron	T	N	No Adverse Effect Anticipated
Egretta tricolor	Tricolored Heron	T	N	No Adverse Effect Anticipated
Falco sparverius paulus	Southeastern American Kestrel	T	N	No Adverse Effect Anticipated
Laterallus Jamaicensis	Black Rail	N	T	No Effect
Mycteria americana	Wood Stork	T	T	May Affect, Not Likely to Adversely Affect
Polyborus plancus audubonii	Audubon's crested caracara	T	T	May Affect, Not Likely to Adversely Affect
Rostrhamus sociabilis plumbeus	Everglade Snail Kite	E	E	No Effect
MAMMALS				
Eumops floridanus	Florida Bonneted Bat	E	E	May Affect, Not Likely to Adversely Affect
Perimyotis subflavus	Tri-colored Bat	N	C	To Be Determined
Puma concolor coryi	Florida panther	E	E	No Effect
PLANTS				
Andropogon arctatus	Pinewoods Bluestem	T	N	No Effect Anticipated
Bonamia grandiflora	Florida Bonamia	E	T	No Effect
Calamintha ashei	Ashe's Savory	T	N	No Effect Anticipated
Calopogon multiflorus	Many-flowered Grass-pink	T	N	No Effect Anticipated
Carex chapmanii	Chapman's Sedge	T	N	No Adverse Effect Anticipated
Centrosema arenicola	Sand Butterfly Pea	E	N	No Effect Anticipated
Chionanthus pygmaeus	Pygmy Fringe Tree	E	E	No Effect
Cladonia perforata	Perforate Reindeer Lichen	E	E	No Effect
Clitoria fragrans	Scrub Pigeon-Wing	E	T	No Effect
Coelorachis tuberculosa	Piedmont Jointgrass	T	N	No Effect Anticipated
Coleataenia abscissa	Cut-throat Grass	E	N	No Effect Anticipated
Conradina brevifolia	Short-leaved Rosemary	E	E	No Effect

Scientific Name	Common Name	FWC/FDACS	USFWS	Effect Determination
Conradina grandiflora	Large-flowered Rosemary	T	N	No Effect Anticipated
Crotalaria avonensis	Avon Park rabbit-bells	E	E	No Effect
Dicerandra christmanii	Garrett's scrub balm	E	E	No Effect
Dicerandra frutescens	Scrub mint	E	E	No Effect
Eriogonum longifolium var. gnaphalifolium	Scrub Buckwheat	E	T	No Effect
Hartwrightia floridana	Hartwrightia	T	N	No Effect Anticipated
Hypericum cumulicola	Highlands scrub hypericum	E	E	No Effect
Illicium parviflorum	Star Anise	E	N	No Adverse Effect Anticipated
Lechea cernua	Nodding Pinweed	T	N	No Effect Anticipated
Lechea divaricata	Pine Pinweed	E	N	No Effect Anticipated
Lupinus aridorum	Scrub Lupine	E	E	No Effect
Lythrum flagellare	Lowland Loosestrife	E	N	No Effect Anticipated
Matelea floridana	Florida Spiny-pod	E	N	No Effect Anticipated
Najas filifolia	Narrowleaf Naiad	T	N	No Adverse Effect Anticipated
Nemastylis floridana	Celestial Lily	E	N	No Effect Anticipated
Nolina atopocarpa	Florida Beargrass	T	N	No Effect Anticipated
Nolina brittoniana	Britton's Beargrass	E	E	No Effect
Ophioglossum palmatum	Hand Fern	E	N	No Effect Anticipated
Paronychia chartacea var. chartacea	Paper-like Nailwort	E	T	No Effect
Pecluma plumula	Plume Polypody	E	N	No Adverse Effect Anticipated
Pecluma ptilota var. bourgeauana	Comb Polypody	E	N	No Adverse Effect Anticipated
Platanthera integra	Yellow Fringeless Orchid	E	N	No Effect Anticipated
Polygala lewtonii	Lewton's Polygala	E	E	No Effect
Polygonella myriophylla	Small's Jointweed	E	E	No Effect
Prunus geniculata	Scrub Plum	E	E	No Effect
Pteroglossaspis ecristata	Giant Orchid	T	N	No Effect Anticipated
Salix floridana	Florida willow	E	N	No Adverse Effect Anticipated
Schizachyrium niveum	Scrub Bluestem	E	N	No Effect Anticipated
Thelypteris serrata	Toothed Maiden Fern	E	N	No Effect Anticipated
Warea amplexifolia	Clasping Warea	E	E	No Effect

Scientific Name	Common Name	FWC/FDACS	USFWS	Effect Determination
Warea carteri	Carter's warea	E	E	No Effect
Zephyranthes simpsonii	Redmargin Zephyrlily	T	N	No Effect Anticipated

E = Endangered, T = Threatened, E = Endangered, C =Candidate for Listing, SSC=Species of Special Concern N = Not Listed,
FWC = Florida Fish and Wildlife Conservation Commission
FDACS = Florida Department of Agriculture and Consumer Services
USFWS = United States Fish and Wildlife Service

Wetlands and Other Surface Waters

The Preferred Alternative is expected to result in unavoidable wetland and other surface water (OSW) impacts. The direct and indirect wetland impacts associated with the Preferred Alternative are depicted in **Table ES-2.** The anticipated total direct wetland impacts for the Preferred Alternative is 54.24 acres and the anticipated other surface water impact is 2.88 acres.

Table ES-2: Anticipated Wetland and Other Surface Waters Impacts and Functional Loss from the Preferred Alternative

Wetland or Other Surface Water	FLUCFCS Code and Description	Direct Impacts		Indirect Impact	
		Acre(s)	Functional Loss	Acre(s)	Functional Loss
Wetlands	630 - Wetland Forested Mixed	54.24	38.721	11.24	0.735
	643 - Wet Prairie				
	640 - Vegetated Non-forested Wetlands				
	625 – Hydric Pine Flatwoods				
Other Surface Waters	510-Streams and Waterways	2.88	-	-	-
	530-Reserviors				
Note: Other surface water impacts are not anticipated to require wetland mitigation.					

Essential Fish Habitat

The National Marine Fisheries Service (NMFS) is the regulatory agency responsible for the nation's living marine resources and their habitats, including Essential Fish Habitat (EFH). Based on the ETDM coordination, the NMFS concluded that the study area will not directly or indirectly impact EFH and provided a no involvement determination. Based on the location of the project, comments received from NMFS and the field review, the project will have no involvement with EFH.

1.0 Project Description

The Florida Department of Transportation (FDOT) District 5 is conducting a Project Development and Environment (PD&E) Study to evaluate alternatives to widen US 17/92 from the existing two-lane roadway to a four-lane divided roadway from Ivy Mist Lane to Avenue A, a distance of 3.8 miles, in Osceola County. A prior Corridor Planning Study of US 17/92 from County Road (CR) 54 (Ronald Reagan Parkway) in Polk County to 1,900 feet west of Poinciana Boulevard at Avenue A in Osceola County was completed in 2018. This project traverses through the community of Poinciana, and the unincorporated community of Intercession City. **Figure 1** shows the US 17/92 PD&E Study limits (shown in light green) and previous Corridor Planning Study limits (shown in blue), along with the limits of adjacent projects mentioned below.

Two related projects overlap the western end of this PD&E Study:

- The segment of US 17/92 from west of Parker Road in Polk County to Ivy Mist Lane in Osceola County is included in the Central Florida Expressway Authority's (CFX) SR 538/Poinciana Parkway Extension to CR 532 project, which is under design and anticipated to be complete in late 2022 with construction beginning in mid-2023. The SR 538/Poinciana Parkway Extension project will include the widening of US 17/92 within these limits, as well as a proposed diverging diamond interchange with US 17/92 southwest of Ivy Mist Lane as shown in teal (**Figure 1**).
- Adjacent to the western end of the PD&E Study (shown in dark green) is a CFX study evaluating widening CR 532/Osceola Polk Line Road from two to four lanes from Old Lake Wilson Road to US 17/92 (**Figure 1**). This study includes design and is anticipated to begin construction in 2024.

One ongoing project abuts the eastern limits of this PD&E Study. FDOT District 5 is widening US 17/92 from two to four lanes, with limits from 1,900 feet west of Poinciana Boulevard (Avenue A) to CR 535 (Ham Brown Road) in Kissimmee (FPID: 239714-1). This project, shown in purple on Figure 1, is currently under construction and anticipated to be completed in 2022.

During the FDOT District 5 PD&E Study process and coordination with multiple agencies, it was determined that the US 27 Mobility Study (FDOT District 1), which evaluated a more regional approach to address congestion throughout Polk County, would better determine the need for US 17/92 from CR 54 to the Poinciana Parkway Extension. Also, the SR 538/Poinciana Parkway Extension will provide widening along US 17/92 in the vicinity of the interchange. Therefore, the analysis of the FDOT District 5 US 17/92 PD&E Study and development of alternatives will be restricted to the segment from Ivy Mist Lane to Avenue A, a distance of approximately 3.8 miles. These revised project limits are covered under FPID # 437200-2.

1.1 Purpose and Need

The purpose of this project is to provide needed capacity through the design year 2045, enhance regional connectivity, and improve safety conditions along the study corridor. The project is needed to meet future traffic demand, provide satisfactory future traffic operations, improve corridor access management, and improve safety along the corridor.

The following sections describe the need for improvements based on transportation connectivity, future traffic demand, and existing crash data.

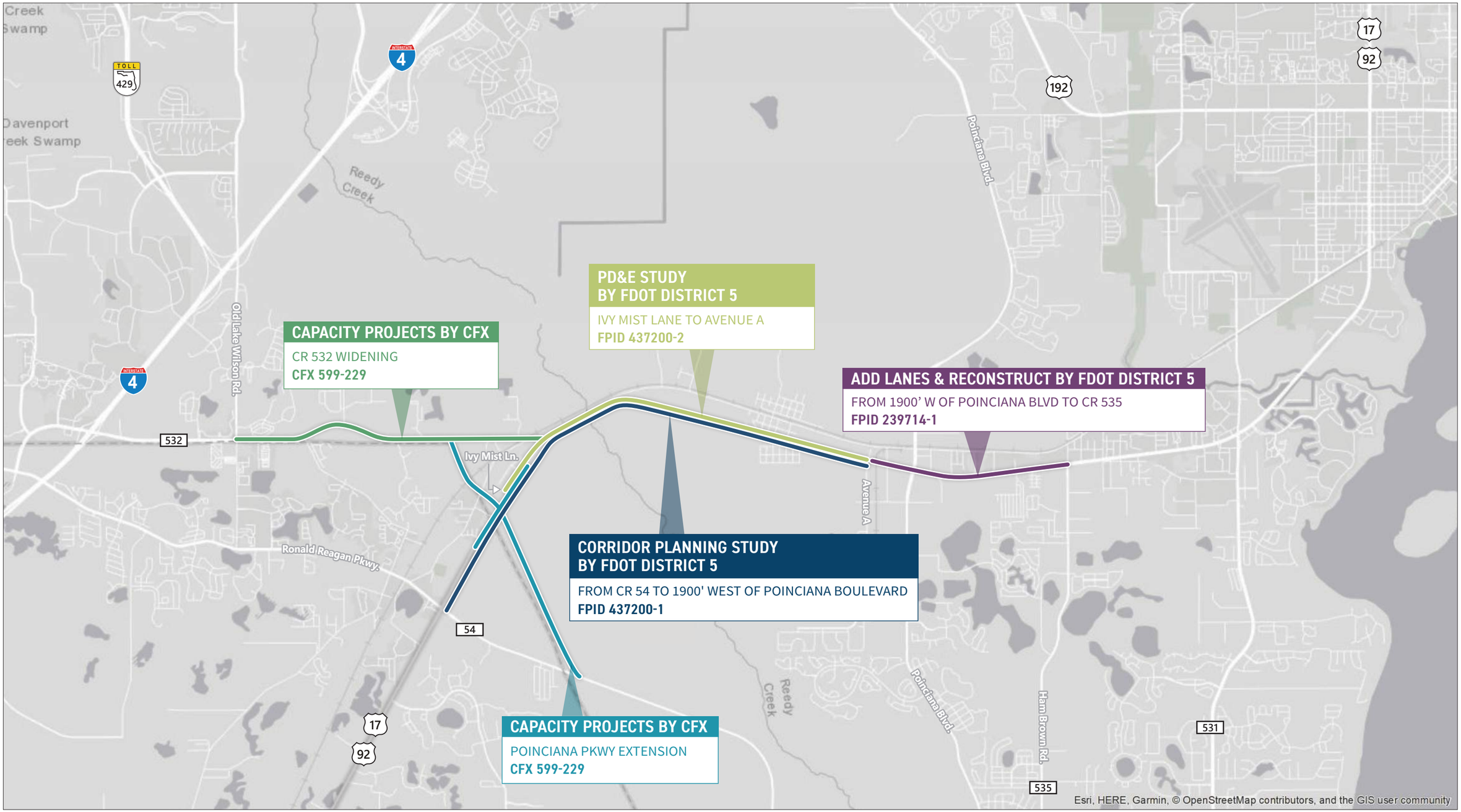

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Figure 1

Location Map
US 17/92 PD&E
FPID # 437200-2

1.1.1 Transportation Connectivity

The US 17/92 study corridor is a vital east-west segment in the regional transportation network within western Osceola County and the primary thoroughfare through Intercession City. Regionally, the US 17/92 corridor serves as a major arterial connecting Kissimmee to the north and Polk County to the south. The study corridor will connect to the programmed SR 538/Poinciana Parkway Extension at the western end of the project, which will include an interchange connection to US 17/92 immediately southwest of Ivy Mist Lane. The SR 538/Poinciana Parkway Extension is planned to extend to I-4 in the vicinity of the State Road (SR) 429 interchange providing enhanced connectivity from US 17/92 to Osceola and Orange Counties. This project would provide a continuous four-lane section between the Poinciana Parkway Extension and Avenue A. The programmed widening of CR 532 from US 17/92 to Lake Wilson Road will complete a continuous four-lane connection to I-4. The corridor is designated an evacuation route by the Florida Division of Emergency Management (FEMA).

1.1.2 Future Traffic Demand

Future traffic analyses were conducted for the US 17/92 study corridor for three analysis years (2025, 2035, and 2045). Based on the intersection operational analysis, by 2045 most of the study intersections are anticipated to experience very high delays. Specifically, the high delays start from 2025 for the majority of unsignalized intersections and the signalized intersection at US 17/92 and CR 532. Capacity improvements are needed to accommodate future traffic demand and provide satisfactory traffic operations.

Based on the arterial operational analysis, the US 17/92 study corridor is expected to operate at target LOS D or better through the design year 2045, except for the northbound/eastbound approach south of CR 532, which is expected to fail in the 2035 and 2045 AM design hour. These results are due to the lack of signalized intersections between CR 532 and Poinciana Boulevard and the existing high posted speed limit. However, the signalized intersection at CR 532 is expected to experience very high approach delays and extensive queueing along US 17/92, which will impact the arterial operations. Additionally, all of the future AADTs along the study corridor will exceed the Maximum Service Volume of 18,590 for LOS D for a two-lane urbanized arterial starting in opening year 2025.

1.1.3 Safety

Crash data for a five-year period (2014-2018) obtained from FDOT Crash Analysis Reporting System (CARS) found a total of 161 crashes occurred along the study corridor. Of the 161 reported crashes, 91 involved injuries and two resulted in fatalities. The highest portion of crashes were rear-end (62.1%). The crash rates at the Shepherd Lane/Nocatee Street intersection and at the Avenue A intersection were found to be above the statewide crash rate. The crash rate at the CR 532 (Osceola Polk Line Road) intersection was not higher than the statewide crash rate but very close. This project intends to increase capacity and improve access management, which is anticipated to reduce congestion and conflict points. This project will also provide pedestrian and bicycle facilities to improve multimodal accommodations throughout the study corridor.

1.2 Project Alternatives

1.2.1 No-Build Alternative

The No-Build Alternative assumes no improvements such as additional traffic lanes or other improvements will be made within the study area, except for programmed improvements to nearby or adjacent facilities. For this project, the No-Build Alternative includes the ongoing widening of US 17/92 from Avenue A to CR 535 (FPID: 239714-1) to four lanes, the programmed SR 538/Poinciana Parkway Extension, and the CR 532 widening.

The No-Build Alternative serves as the baseline for comparing the Preferred Alternative. Based on programmed improvements, the existing typical section assumed for the No-Build Alternative remains a two-lane undivided rural typical section. At the eastern end of the project at Avenue A, the corridor transitions to a four-lane typical section. For the majority of the study limits, the existing typical section along US 17/92 within the study limits is provided below in **Figure 2**. The existing bridge typical section is provided as **Figure 3**.

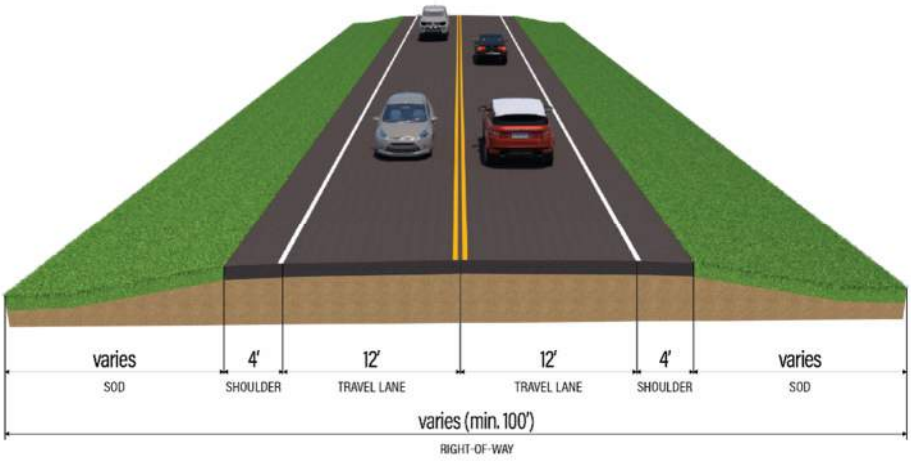


Figure 2: Existing US 17/92 Typical Section

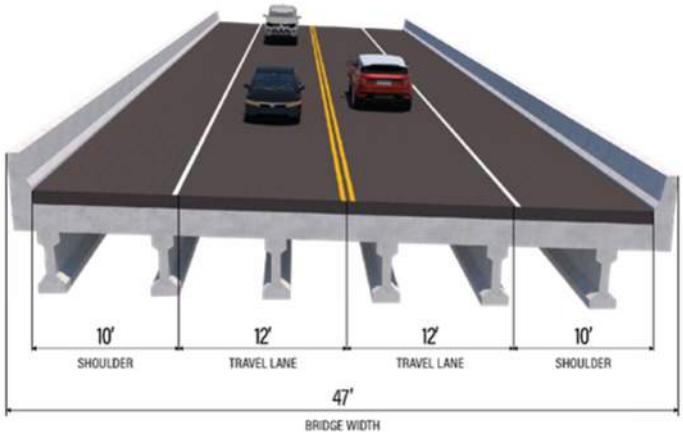


Figure 3: Existing US 17/92 Bridge Section

1.2.2 Alternatives Considered

The Preferred Alternative widens US 17/92 to four lanes (two lanes per direction) throughout the study limits from Ivy Mist Lane to Avenue A. Due to alignment constraints from adjacent facilities and the existing bridge over Reedy Creek, the Preferred Alternative applied from Ivy Mist Lane to east of Old Tampa Highway is a best-fit alignment. From east of Old Tampa Highway to Avenue A, the study developed three alignments for alternatives comparison. The recommended alignment maximizes the existing Right-of-Way (ROW) and consists of widening to the south on the west end of the project corridor to align with the Poinciana Parkway Extension proposed improvements, then shifts to the south through the central portion of the project corridor to avoid the existing cemetery, widens to the north through Intercession City to avoid relocations, and aligns with the adjacent widening at the east end of the project corridor. The Preliminary Engineering Report (PER) prepared for this study summarizes the alternatives considered, the related analysis, and selection of the Preferred Alternative. The Preferred Alternative was developed to avoid and minimize environmental effects where feasible. Several stormwater treatment pond alternatives were also evaluated, and the Pond Siting Report (PSR) discusses these alternatives and selection of the preferred pond sites.

1.2.3 Preferred Alternative Description

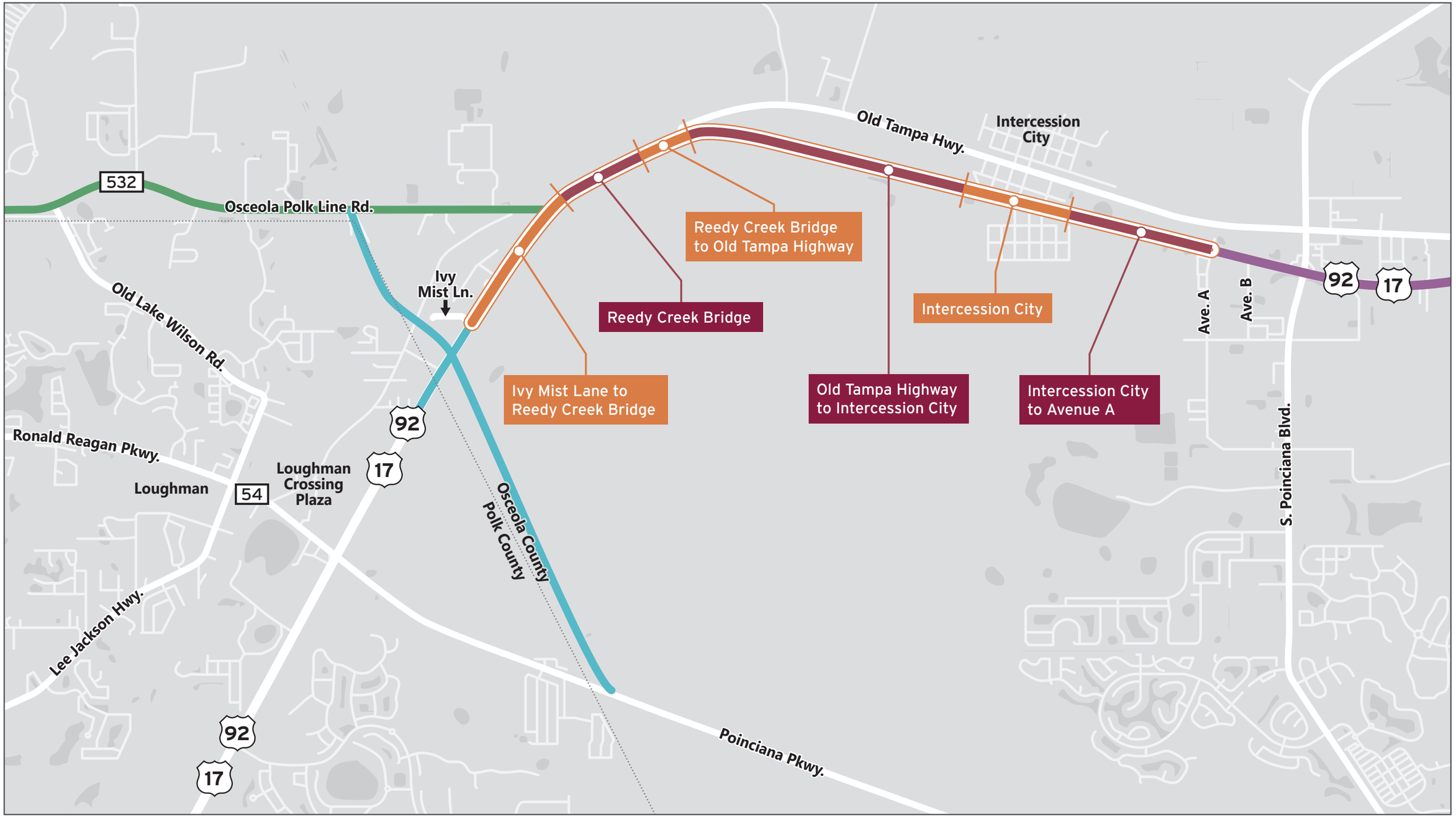
The Preferred Alternative widens US 17/92 from Ivy Mist Lane to Avenue A from the existing two-lane rural facility to a four-lane divided facility. The Preferred Alternative includes access management modifications to improve safety. The Preferred Alternative adds a continuous shared-use path to the north along the entire corridor and a continuous sidewalk to the south along the corridor except at the Reedy Creek Bridge, due to constraints along the existing bridge. A pedestrian crossing will be provided at the Osceola Polk Line Road and Old Tampa Highway intersections to provide pedestrians with a crossing over US 17/92 to the shared-use path.

The Preferred Alternative also involves the retention of the existing bridge over Reedy Creek to serve as the eastbound traffic lanes and the addition of a new bridge over Reedy Creek to serve as the westbound traffic lanes. The westbound bridge will have a 12-foot-wide shared use path for the use of pedestrians and bicyclists travelling in both directions. In addition to the widening and multimodal improvements along US 17/92, this project includes intersection improvements at CR 532, Old Tampa Highway, and Avenue A. Five pond site locations have been recommended as part of the Preferred Alternative for a total of 25.9 acres of stormwater ponds.

1.2.3.1 Segments

For the purposes of this study, the corridor has been separated into segments. The study corridor segments, as shown in **Figure 4**, are listed and described below:

- **Segment 1 – from Ivy Mist Lane to Reedy Creek Bridge**
  Segment 1 extends from western study limit at Ivy Mist Lane to the Reedy Creek Bridge, for approximately 0.70 mile in length. This segment ties into the planned Poinciana Parkway Extension and interchange connection with US 17/92 immediately west of this study limits.



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- Project Limits
- Poinciana Parkway Extension/Interstate 4 (I-4) Connector (in design)
- U.S. 17/92 Widening (under construction)
- Osceola Polk Line Road Widening (under construction)

Figure 4

Study Segments
US 17/92 PD&E
FPID # 437200-2

- **Segment 2 – Reedy Creek Bridge**
  Segment 2 encompasses the study corridor along the Reedy Creek Bridge, for approximately 0.43 mile in length. In this segment there are three abandoned bridges north of the existing US 17/92 bridge that previously served as the US 17/92 Reedy Creek Bridge alignment.

- **Segment 3 – Reedy Creek Bridge to Old Tampa Highway**
  Segment 3 extends from Reedy Creek Bridge to Old Tampa Highway, for approximately 0.28 miles in length.

- **Segment 4 – Old Tampa Highway to Intercession City**
  Segment 4 extends from Old Tampa Highway to Suwannee Avenue (into Intercession City), for approximately 1.34 miles in length.

- **Segment 5 – Intercession City**
  Segment 5 runs through Intercession City from Suwannee Avenue to Nocatee Street/Shepherd Lane, approximately 0.30 mile in length.

- **Segment 6 – Intercession City to Avenue A**
  Segment 6 completes the study corridor from Nocatee Street/Shepherd Lane to Avenue A, approximately 0.80 mile in length. This ending segment connects into the widening project immediately east of this study, currently under construction.

1.2.3.2 Typical Sections

Suburban Typical Section – Segments 1,4, and 6

A suburban roadway typical section is proposed for Segments 1, 4, and 6, the typical section (depicted in **Figure 5**) consists of a four-lane suburban roadway with a 22-foot raised median, two 11-foot travel lanes in each direction, five-foot paved outside shoulders, a 12-foot shared use path along the north side of the roadway and a six-foot sidewalk along the south side. The sidewalk and shared use path are both separated from the roadway by 47-foot-wide drainage swales. The required ROW for the suburban roadway typical section varies with a minimum of 200 feet.

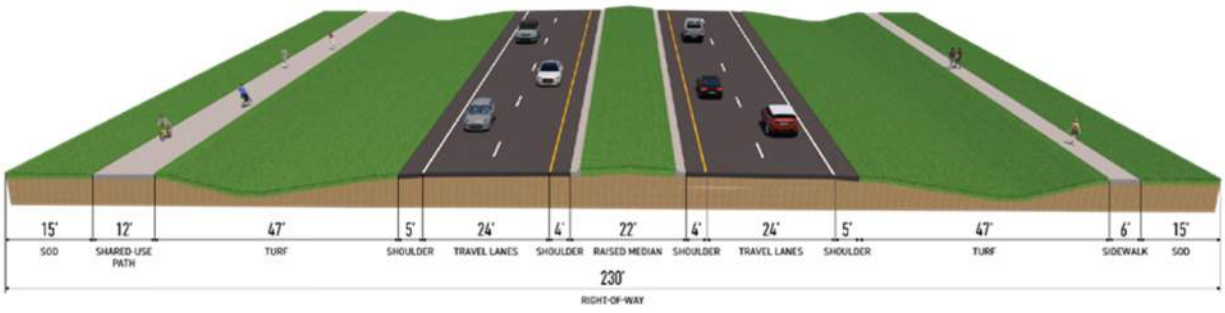

Figure 5: Suburban Typical Section (Segments 1, 4, and 6)

Bridge Typical Section – Segment 2

The typical section for the Reedy Creek Bridge, within Segment 2, includes two bridge structures (**Figure 6**). The existing bridge structure will serve eastbound traffic and a new bridge structure will serve the

westbound traffic. The two bridge structures will be separated by a width of 70 feet. The existing eastbound bridge includes 11-foot inside and outside shoulders and two 11-foot travel lanes. The new westbound structure includes a six-foot inside shoulder, a 10-foot outside shoulder, two 11-foot travel lanes, and a 12-foot shared-use path separated from the roadway by a raised concrete barrier. The existing 244 feet ROW accommodates the proposed bridge structure. The existing eastbound bridge is located in a permanent easement on the south side of the FDOT ROW, which allows the new westbound bridge to be located fully within the existing ROW to the north.

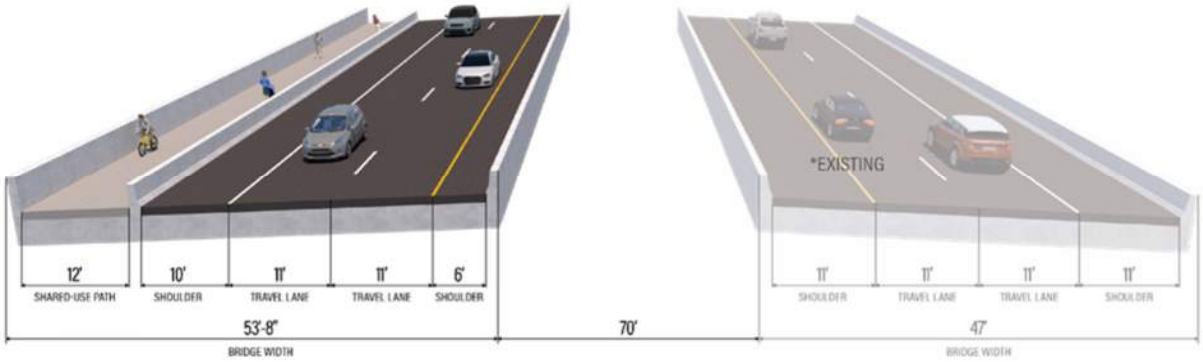

Figure 6: Bridge Typical Section (Segment 2)

Urban Typical Section – Segment 3

An urban typical section, as illustrated in **Figure 7**, is proposed for Segment 3 from the east end of the Reedy Creek Bridge to Old Tampa Highway. This typical section consists of two 11-foot travel lanes in each direction separated by a 22-foot raised median, five-foot outside paved shoulders with curb and gutter, a 12-foot shared use path along the north side of the roadway, and a six-foot sidewalk along the south side. The shared use path is separated from the roadway with a 4.5-foot buffer and the sidewalk is separated from the roadway with a three-foot buffer. The total ROW needed for this typical section varies with a minimum of 151 feet.

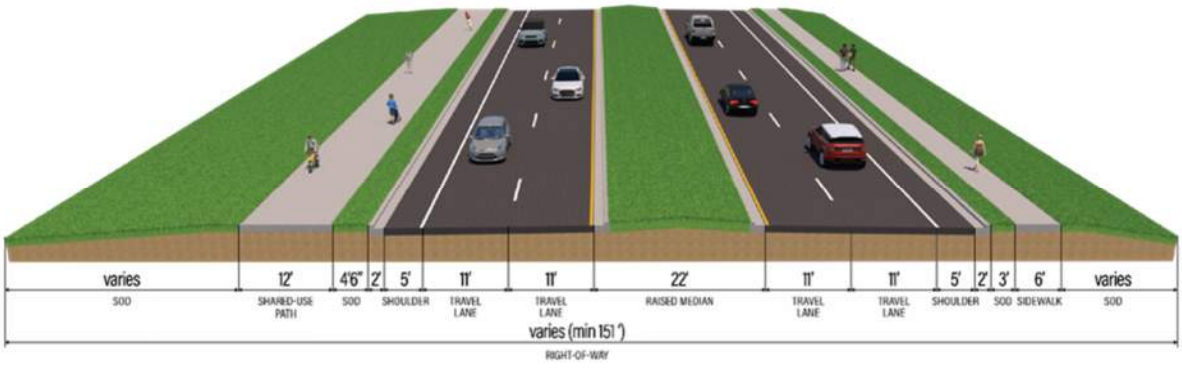

Figure 7: High Speed Urban Typical Section (Segment 3)

Urban Typical Section – Segment 5

An urban typical section is proposed for Segment 5 through Intercession City (**Figure 8**). This typical section includes a 15.5-foot raised median, two 11-foot travel lanes per direction, a 12-foot shared use

path along the north side of the roadway, and an eight-foot sidewalk along the south side. The shared use path is separated from the roadway by a 4.5-foot buffer, while the sidewalk is flush with the back of curb. The total ROW needed for this typical section varies with a minimum of 100 feet.

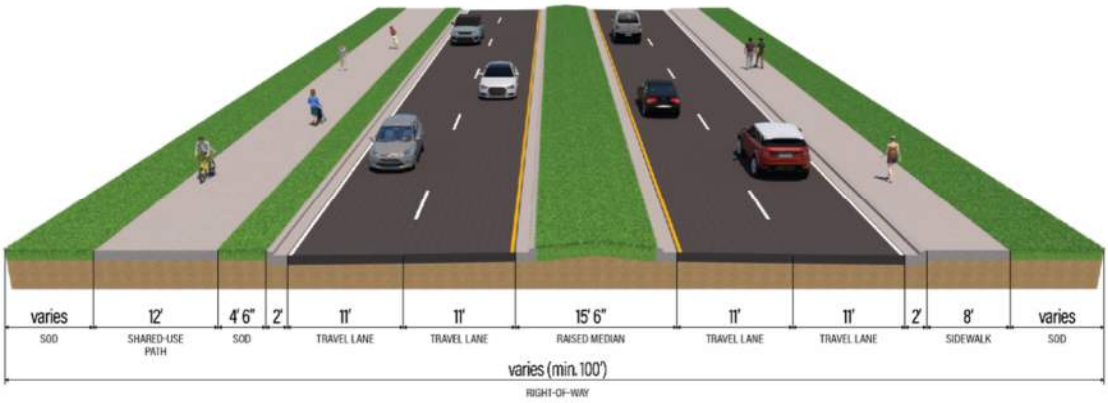

Figure 8: Urban Typical Section (Segment 5)

1.3 Study Area

The study area includes a 200-foot buffer from the existing ROW. The study area extends approximately 3.8 miles from Ivy Mist Lane to Avenue A, and it also includes the five (5) proposed drainage improvements including stormwater ponds and Floodplain Compensation Area (FPC). A location map of the study area is enclosed in **Appendix A, Exhibit 1**.

1.4 Regulatory Applicability and Purpose

This NRE was developed to comply with Section 7(a) of the ESA of 1973, as amended. Section 7(a)(2) of the ESA requires every federal agency to ensure that any action it authorizes, funds, or carries out is not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of critical habitat. Section 7(a)(3) of the ESA authorizes a prospective permit or license applicant to request the issuing federal agency to enter into early consultation with the U.S. Fish and Wildlife Service (USFWS) and/or the NMFS on a proposed action to determine whether such an action is likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of critical habitat.

In accordance with 16 United States Code (U.S.C.) 1536[(a)-(d)] of the ESA, as amended, federal agencies also impose specific requirements regarding endangered or threatened species of fish, wildlife, or plants (listed species) and habitat of such species that has been designated as critical habitat under Section 7(a) of the ESA. These specific requirements include the protection of all federally listed species (and their habitats) found in federally funded projects. Such species are afforded protection under the Code of Federal Regulations (CFR) Title 50 Part 402 and in other legislation and guidance documents listed below.

Other applicable federal laws, regulations, and guidance(s) include:

- 23 CFR, Part 771, Environmental Impact and Related Procedures;

- 40 CFR, Part 1500 et seq., Council on Environmental Quality, Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act;
- 42 U.S.C. 4321 et seq., National Environmental Policy Act of 1969, as amended;
- 16 U.S.C. 662, Section 2 of the Fish and Wildlife Coordination Act;
- 16 U.S.C. 1536, Section 7 of the Endangered Species Act of 1973;
- 16 U.S.C. 1801 et seq., Magnuson-Stevens Fishery Conservation and Management Act of 1976, as amended and reauthorized; and
- Federal Highway Administration (FHWA) Technical Advisory T6640.8A.

State laws include:

- Chapter 68A-27 Florida Administrative Code (FAC);
- Chapter 5B-40 FAC, Florida Endangered and Threatened Species Act of 1977; and
- Florida Statute (F.S.) 581.185, State Listed Plants.

The U.S. Department of Transportation (USDOT) developed a 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, as well as, the Wetlands and Other Surface Waters chapter of the FDOT PD&E Manual, this project was assessed to determine potential wetland and other surface water impacts.

2.0 Existing Environmental Conditions

The US 17/92 study area was considered to be the areas directly or indirectly affected by the proposed Preferred Alternative. It encompassed the geographic extent of the environmental changes that may result from the construction of the Preferred Alternative. For the purposes of this study, the study area included all lands within the Preferred Alternative and a 200-foot buffer from the Preferred Alternative, which the includes proposed pond and flood plain compensation sites. Additionally, a 1500-meter (4920 feet) buffer from the Preferred Alternative was also reviewed where suitable Audubon's crested caracara *(Polyborus plancus audubonii = Caracara cheriway audubonii)* habitat occurred in order to fulfill the requirements of the USFWS survey protocol as discussed in Section 3.

2.1 Existing Land Use

Land use types within the study area were determined by the various field surveys, the wetland delineation performed in March 2022, and evaluating readily available Geographic Information System (GIS) data and literature including the following:

- South Florida Water Management District (SFWMD) Florida Land Use, Cover and Forms Classification System (FLUCFCS) data (2018);
- USFWS National Wetlands Inventory (NWI) Wetland Mapper (accessed March 2022); and
- Florida Natural Areas Inventory (FNAI) Cooperative Land Cover Data (2019).

The SFWMD FLUCFCS, FNAI, and NWI GIS data sets and descriptions, as amended based on field reviews, are summarized for the study area in **Table 1**. These FLUCFCS classifications are also depicted in **Appendix A, Exhibit 2 A-F.**

Table 1: Land Use and Natural Community Classifications Within the Study Area and Preferred Alternative

FLUCFCS ID	FLUCFCS Description	FNAI Classification	NWI Description	Study Area Acreage	Preferred Alternative Acreage
111	Fixed Single Family Units	Developed	Upland	47.47	5.36
112	Mobile Home Units	Developed	Upland	6.21	1.98
118	Rural Residential	Developed	Upland	0.36	-
123	Mixed Units Residential	Developed	Upland	2.48	0.02
140	Commercial and Services	Developed	Upland	8.75	0.46
148	Cemeteries	Developed	Upland	4.45	0.10
155	Other Light Industrial	Developed	Upland	15.40	1.43
170	Institutional	Developed	Upland	1.25	-
172	Religious	Developed	Upland	1.48	0.12
193	Open Land in Transition	Developed	Upland	0.55	0.14
211	Improved Pastures	Developed	Upland	22.83	14.70
420	Upland Hardwood Forests	Upland Hardwood Forest	Upland	7.53	1.01
427	Live Oak	Upland Hardwood Forest	Upland	21.91	7.89
434	Hardwood-Coniferous Mixed	Upland Mixed Woodland / Upland Pine	Upland	26.05	5.67
510	Streams and Waterways	Canal/Ditch	Ditch	2.67	2.87
530	Reservoirs	Artificial pond	Freshwater Pond	3.17	0.01

FLUCFCS ID	FLUCFCS Description	FNAI Classification	NWI Description	Study Area Acreage	Preferred Alternative Acreage
617	Mixed Wetland Hardwoods	Mixed Hardwood Wetlands	Freshwater Forested	0.51	-
621	Cypress	Cypress/Tupelo	Freshwater Forested	3.00	-
630	Wetland Forested Mixed	Hardwood – Alluvial Forest	Freshwater Forested	147.71	53.14
640	Vegetated Non-Forested Wetland	Basin Marsh	Freshwater Emergent Wetland	2.55	1.08
643	Wet Prairie	Basin Marsh	Freshwater Emergent Wetland	0.02	0.02
743	Spoil Areas	Developed	Upland	0.13	0.12
812	Railroads	Developed	Upland	8.61	0.03
814	Roads and Highways	Developed	Upland	62.78	53.63
831	Electric Power Facilities	Developed	Upland	1.00	0.01

2.1.1 Uplands

Fixed Single Family Units (FLUCFCS 111)
These areas contain fixed single-family homes. This land use type is found in the central and western portion of the study area.

Mobile Home Units (FLUCFCS 112)
This land used type contains various sizes of mobile home units. This land use type is found in the western portion of the study area.

Rural Residential (FLUCFCS 118)
These areas include residential, low density, less than two dwellings per acre. This land use type is found in the central portion of the study area.

Mixed Units Residential (FLUCFCS 123)
These areas include fixed and mobile home units two to five dwellings per acre. This land use type is found in the eastern portion of the study area.

Commercial and Services (FLUCFCS 140)
These areas include a large number of individual types of commercial land uses which often occur in complex mixtures, predominantly associated with the distribution of products and services. This land use type is found in the central portion of the study area.

Cemeteries (FLUCFCS 148)
This land use type is for burial grounds. This land use type is found in the western and central portions of the study area.

Other Light Industrial (FLUCFCS 155)
These areas include small scale manufacturing such as, electronics, furniture, boat, aircraft and mobile homes. This land use type is found in the eastern portion of the study area.

Institutional (FLUCFCS 170)
These areas include educational, religious, health and military facilities such as university, colleges, vocational schools, religious campuses, health care facilities, etc. This land use type is found in the central portion of the study area and consists of a rehabilitation health care center.

Religious (FLUCFCS 172)
These areas include religious facilities such as churches, synagogues, etc. This land use type is found in the eastern portion of the study area.

Open Land in Transition (FLUCFCS 193)
These areas consist of urban land in transition without positive indicators of intended activity. This land use type is found in the eastern portion of the study area.

Improved Pastures (FLUCFCS 211)
These areas consist of land which has been cleared, tilled, reseeded with specific grass types and periodically improved with brush control and fertilizer application. These areas are dominated by beaksedge (*Rhynchospora sp.*) and broomsedge bluestem (*Andropogon virginicus*), two of which contain scattered cabbage palm (*Sabal palmetto*). This land use type is found in the western and central portions of the study area.

Upland Hardwood Forests (FLUCFCS 420)
These areas include upland forest lands with a crown canopy with at least a 66 percent dominance of naturally generated stands of hardwood tree species. These areas are dominated by live oak, (*Quercus virginiana*), laurel oak (*Quercus laurifolia*), red maple (*Acer rubrum*), and saw palmetto (*Serenoa repens*). This land use type is found in the western, central and eastern portions of the study area.

Live Oak (FLUCFCS 427)
These are forest communities in which live oak is either pure or predominant species. Other species include sweetgum (*Liquidambar styraciflua*), southern magnolia (*Magnolia grandiflora*), and laurel oak. This land use type is found in the central portions of the study area.

Hardwood-Coniferous Mixed (FLUCFCS 434)
These areas comprise forested areas in which neither upland conifers nor hardwoods achieve a 66 percent crown canopy dominance. These areas are dominated by live oak, laurel oak, red maple, and saw palmetto (*Serenoa repens*). Ground cover species include beautyberry (*Callicarpa americana*), and bracken (*Pteridium aquilinum*). This land use type is found throughout the study area.

Spoil Areas (FLUCFCS 743)
This area is a spoil site located in the western portion of the study area. Vegetation within this area is limited to grasses and typical weed species.

Railroads (FLUCFCS 812)
These areas are composed of railroad tracks along the northern portion of the study area.

Roads and Highways (FLUCFCS 814)
These areas comprise roadways and associated rights-of-way (ROW). This land use type is designated for US 17/92, Old Tampa Highway, and the intersections throughout the study area. The ROW comprises maintained grass and typical weed species.

Electric Power Facilities (FLUCFCS 831)
This land use is associated with an electrical power generation plant or substation. This land use type is located in the western portion of the study area.

2.1.2 Wetlands and Other Surface Waters

Streams and Waterways (FLUCFCS 510)
This land use types includes rivers, creeks, canals and other linear water such as ditches. This land use type is located throughout the study area and includes Reedy Creek.

Reservoirs (FLUCFCS 530)
These areas are artificial impoundments of water such as stormwater and detention ponds. This land use type is found in the central and eastern portions of the study area. Species include Cuban bulrush (*Cyperus blepharoleptos*), cattail (*Typha latifolia*), Peruvian primrose willow (*Ludwigia peruviana*), taro (*Colocasia esculenta*), and frog's bit (*Limnobium spongia*).

Mixed Wetland Hardwoods (FLUCFCS 617)
These areas are comprised of wetland hardwood communities which are composed of a large variety of hardwood species tolerant of hydric conditions yet exhibit an ill-defined mixture of species. This land use type is located in the central portion of the study area.

Cypress (FLUCFCS 621)
These areas are comprised of cypress (*Taxodium distichum*) which is either pure or predominant. In the case of pond cypress, common associates are swamp tupelo (*Nyssa biflora*), slash pine (*Pinus elliottii*) and black titi (*Cliftonia monophylla*). This land use type is located in the central and eastern portions of the study area.

Wetland Forested Mixed (FLUCFCS 630)
This forested wetland systems are dominated by a combination of conifer and hardwood species. This land use type is located throughout the study area. The canopy is comprised of cypress, red maple, pond pine (*Pinus serotina*), laurel oak, sweetbay (*Magnolia virginiana*), cabbage palm, dahoon holly (*Ilex cassine*), and wax myrtle (*Morella cerifera*). Groundcover includes four-petal St. John's wort (*Hypericum tetrapetalum*), bunch cord grass (*Spartina bakeri*), Virginia chain fern (*Woodwardia virginica*), cinnamon fern (*Osmundastrum cinnamomeum*), swamp fern (*Telmatoblechnum serrulatum*), lizard's tail (*Saururus cernuus*), and many flowered marsh pennywort (*Hydrocotyle umbellata*).

Vegetated Non-forested Wetland (FLUCFCS 640)
These areas are seasonably flooded with communities are usually confined to relatively level, low-lying areas with minimal tree cover. The dominant vegetation in these areas included elderberry (*Sambucus nigra*), wax myrtle, groundsel tree (*Baccharis halimifolia*), bushy bluestem (*Andropogon glomeratus*), dogfennel (*Eupatorium capillifolium*), and coffeeweed (*Sesbania herbacea*). This land use type is located in the eastern portion of the study area.

Wet Prairies (FLUCFCS 643)
These non-forested wetland areas are dominated by sawgrass (*Cladium jamaicense*), maidencane (*Panicum hemitomon*), cordgrasses, spike rushes (*Eleocharis* sp.), St. John's wort, spiderlily

(*Hymenocallis henryae*), yellow-eyed grass (*Xyris* sp.), and white top sedge (*Rhynchospora* sp.). This land use type is located in the western portion of the study area.

2.2 Existing Soil Types

Soils within the study area were mapped using the Natural Resources Conservation Services (NRCS) GIS data for Osceola County and *Soil Survey of Osceola County* (1979). Of the 14 soil types mapped (excluding pits and water which are not soil types) within the study area, seven (7) soil types are classified as hydric. Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as *"soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions"* near the ground surface and are typically associated with wetlands. The soil types which occur within the project area are listed in **Table 2** (below) and depicted in **Appendix A, Exhibit 3 A-F**.

Table 2: Soil types within the Study Area

Map Unit ID	Map Unit Name	Hydrological Group	Hydric (Yes/No)	Soil Type Location
7	Candler Sand, 0 to 5 Percent Slopes	A	No	This soil type is mapped in the western and central portions of the study area.
12	Floridana Fine Sand, Frequently Ponded, 0 to 1 Percent Slopes	C/D	Yes	This soil type is mapped in the western portion of the study area.
16	Immokalee Fine Sand, 0 to 2 Percent Slopes	B/D	No	This soil type is mapped in the western and central portions of the study area.
22	Myakka Fine Sand, 0 to 2 Percent Slopes	A/D	No	This soil type is mapped in the central and eastern portions of the study area.
23	Myakka-Urban Land Complex	A/D	No	This soil type is mapped in the eastern portion of the study area.
25	Nittaw Muck	C/D	Yes	This soil type is mapped in the western portion of the study area.
27	Ona fine sand, 0 to 2 Percent Slopes	B/D	No	This soil type is mapped in the western portion of the study area.
29	Parkwood Loamy Fine Sand, Occasionally Flooded	A/D	Yes	This soil type is mapped in the western portion of the study area.
31	Pits	-	-	This is not a soil type, but it is mapped in the western portion of the study area.
36	Pompano Fine Sand, 0 to 2 Percent Slopes	A/D	Yes	This soil type is mapped in the central portion of the study area.
37	Pompano Fine Sand, Frequently Ponded, 0 to 1 Percent Slopes	A/D	Yes	This soil type is mapped in the western and central portions of the study area.
38	Riviera Fine Sand, 0 to 2 Percent Slopes	A/D	Yes	This soil type is mapped in the central and eastern portions of the study area.
39	Riviera Fine Sand, Frequently Ponded, 0 to 1 Percent Slopes	A/D	Yes	This soil type is mapped in the central and eastern portions of the study area.

Map Unit ID	Map Unit Name	Hydrological Group	Hydric (Yes/No)	Soil Type Location
41	Satellite Sand, 0 to 2 Percent Slopes	A	No	This soil type is mapped in the western and central portions of the study area.
45	Wabasso fine sand, 0 to 2 Percent Slopes	A/D	No	This soil type is mapped in the central and eastern portions of the study area.
99	Water	-	-	This is not a soil type, but it is mapped in the central and eastern portions of the study area.

2.3 Public and Other Conservation Lands

According to the FNAI Florida Conservation Lands (2020) GIS data, the SFWMD Upper Lake Basin Watershed is located within and adjacent to the western and eastern end of the Preferred Alternative(**Appendix A, Exhibit 4**). In addition, several conservation easements and mitigation banks occur in the vicinity of the study area. The FNAI Florida Forever Board of Trustees Projects (FFBOT) GIS data was reviewed, and no areas have been proposed for acquisition within the study area.

Strategic Habitat Conservation Areas (SHCA) are areas of potential habitat not currently managed for the conservation of species. In 1994, Florida Fish and Wildlife Conservation Commission (FWC) biologists completed a project entitled “Closing the Gaps in Florida’s Wildlife Habitat Conservation System” (Cox et al 1994) that assessed the security of rare and imperiled species on existing conservation lands in Florida. This research identified important habitat areas for imperiled species in Florida with no conservation protection. These areas are ranked according to priority for conservation from one (1) to five (5), with one being the highest priority for conservation and five being lowest priority for conservation. The majority of the undeveloped land within and adjacent to the study area has been ranked one (1) which is the highest priority for conservation (**Appendix A, Exhibit 4**).

2.4 Other Natural Features

The Florida Department of Environmental Protection (FDEP) has established a Basin Management Action Plan (BMAP) for Lake Okeechobee (February 2020) that identifies water quality treatment standards within this basin. Included in this BMAP is Reedy Creek and its tributaries. The BMAPs are developed to ensure the State of Florida is in compliance with Section 303(d) of the (CWA), which requires that every two years each state must identify its "impaired" waters, including estuaries, lakes, rivers, and streams, that do not meet their designated uses. Therefore, stormwater design will follow the guidance within the SFWMD Environmental Resource Permit Applicant Handbook and Lake Okeechobee BMAP. This information is discussed further in the Pond Siting Report (PSR).

3.0 Protected Species and Habitat

Protected species refer to plant and animal species that are protected by law, regulation or rule. The protected species and habitat discussed in this document include those listed under Section 7 of the ESA, as amended (50 Code of Federal Regulations {CFR} 17); critical habitat as defined in the ESA (16 U.S.C. 1532); Chapter 68A-27, FAC; Florida Endangered and Threatened Species List; and Chapter 5B-40, FAC, Regulated Plant Index. The USFWS Vero Beach Field Office will be consulted for the potential impacts to federally protected species. For state protected species, the FWC oversees the protection of wildlife, and the Florida Department of Agriculture and Consumer Services (FDACS) oversees the protection of native plants.

The analysis conducted and documented within this report is consistent with the PD&E Manual Part 2, Protected Species and Habitat Chapter, and the current Natural Resources Evaluation Outline and Guidance (2022).

3.1 Efficient Transportation Decision Making Related to Protected Species

Previous agency correspondence was conducted through the ETDM Final Programming Screen. Representatives from ETAT reviewed the project information and provided comments about potential direct and indirect effects to resources under their jurisdiction. The USFWS, SFWMD, and FWC assigned a “Moderate Degree of Effect” to wildlife and habitat for the proposed project. The FDACS assigned a “No involvement” for the Preferred Alternative on plants, wildlife and habitat.

3.2 Methodology

Prior to the field review, biologists performed a GIS database and literature review to identify protected species or habitats that have been documented within and adjacent to the study area. Referenced materials included, but were not limited to, the following data sources:

- Current and historical aerial photography;
- USFWS consultation area GIS data layers;
- USFWS Information for Planning and Consultation (IPaC) website (accessed 2022);
- USFWS and National Oceanic and Atmospheric Administration (NOAA) critical habitat maps and GIS layers;
- USFWS Wood Stork Core Foraging Area data (2021);
- FWC Wildlife Observations:
    - Wildlife Occurrence System (2017);
    - Eagle Nesting Locations (2021);
    - Black Bear Roadkill Mortality (2021);
    - Black Bear Related Calls (2021);
- Audubon Florida EagleWatch Public Nest Locator Application for Bald Eagles (accessed 2022);
- FWC Historical Waterbird Colony Locator (accessed 2022); and
- ETDM Summary Report #14365 – US 17/92 from CR to Poinciana Boulevard (2018).

General wildlife surveys were performed in September 2020, to determine the presence/absence of protected wildlife and associated habitats that may occur within, or immediately adjacent to, the project

corridor. However, the FDOT requested technical assistance from the USFWS on November 16, 2021, regarding the project's location within the USFWS consultation areas for Audubon's crested caracara (caracara), Everglade snail kite (*Rostrhamus sociabilis plumbeus*), Florida grasshopper sparrow (*Ammodramus savannarum floridanus*), Florida scrub-jay (*Aphelocoma coerulescens*), Florida bonneted bat (*Eumops floridanus*), sand skink (*Neoseps reynoldsi*), and bluetail mole skink (*Eumeces egregius lividus*). During the technical assistance, the FDOT proposed to conduct formal species-specific surveys for caracara, sand skink, and Florida bonneted bat following USFWS survey protocols for these species. The FDOT proposed that no species-specific surveys would be conducted for the Everglade snail kite, Florida grasshopper sparrow, and Florida scrub-jay. On November 30, 2021, the USFWS agreed that FDOT would conduct species-specific surveys for caracara, sand skink, and Florida bonneted bat and approved the survey methodologies for these species. Additionally, USFWS agreed that no species-specific surveys would be conducted for Everglade snail kite, Florida grasshopper sparrow, and Florida scrub-jay. A copy of the USFWS technical assistance request and the USFWS response is found in **Appendix B**. The species-specific survey results are summarized in the following sections, and copies of sand skink, caracara, and Florida bonneted bat reports are found **Appendix C-E.**

For the species not discussed above, the presence/absence evaluation included a thorough review of readily available data from the USFWS, FWC, and FNAI. This included a review of designated critical habitat. Based on the data and field review, species were evaluated for their potential to occur within the study area and are included in **Table 3**. A "No" potential of occurrence designation is used when there is no suitable habitat or documented occurrence of a particular species within the vicinity of the study area. Species designated with "No" potential of occurrence are not described further, because although potential foraging or nesting habitat may occur within the region (i.e., within Osceola County), there are no habitats for the species to utilize. A "Low" potential of occurrence means there is limited suitable or sub-optimal habitat and there are no documented occurrences adjacent to the study area. Species designated as "Low" are discussed further in Section 3.3 if the study area is located in a USFWS Consultation Area and/or listed in the FNAI Biodiversity Matrix Query, however, other species not meeting this criterion are not described further. A "Moderate" potential of occurrence is used when there is suitable habitat within the study area and/or documented occurrences adjacent to the study area. A "High" potential of occurrence is designated when there is suitable habitat observed and documented occurrences within the study area

In addition, **Table 7** summarizes the effect determinations for both federally and state protected species. The relevant protected species occurrence GIS data and results of the field review are illustrated within **Appendix A**, **Exhibit 5**.

Table 3: Protected Species within the Region and Their Potential of Occurrence within the Study Area

Scientific Name	Common Name	FWC	USFWS	Preferred Habitat	Potential Occurrence
INVERTEBRATES					
Danaus plexippus	Monarch Butterfly	N	C	Flowering plants within fields, roadside areas, open areas, wet areas, or urban gardens.	Moderate

Scientific Name	Common Name	FWC	USFWS	Preferred Habitat	Potential Occurrence
AMPHIBIANS					
Notophthalmus perstriatus	Striped Newt	C	N	Xeric uplands: sandhill but also scrub; occasionally in pine flatwoods. Breeds in isolated, mostly ephemeral wetlands.	No
REPTILES					
Alligator mississippiensis	American Alligator	T	T(S/A)	Freshwater lakes, rivers, ponds. Brackish water estuaries and coastal areas.	Observed
Drymarchon corais couperi	Eastern Indigo Snake	T	T	Upland and wetland habitat, hydric ecotonal areas, gopher tortoise burrows.	Moderate
Gopherus polyphemus	Gopher Tortoise	T	N	Xeric uplands, pine flatwoods, pastures, and open, ruderal habitats.	Moderate
Pituophis melanoleucus	Pine Snake	T	N	Habitats with relatively open canopies and dry sandy soils. Sandhill and former sandhill, old fields and pastures, sand pine scrub and scrubby flatwoods. Often coexists with pocket gophers and gopher tortoises.	Moderate
Plestiodon (Eumeces) egregius lividus	Bluetail Mole Skink	T	T	Well-drained sandy uplands above 80 ft. Rosemary, oak, and sand pine scrubs; occasional in turkey oak barrens, sandhill, and xeric hammocks.	Moderate
Plestiodon (Neoseps) reynoldsi	Sand Skink	T	T	Well-drained sandy uplands above 80 ft. Rosemary, oak, and sand pine scrubs; occasional in turkey oak barrens, sandhill, and xeric hammocks.	Moderate
BIRDS					
Ammodramus savannarum floridanus	Florida Grasshopper Sparrow	E	E	Requires large areas of frequently burned dry prairie habitat, with patchy open areas sufficient for foraging.	Low
Antigone canadensis pratensis	Florida Sandhill Crane	T	N	Prairies, freshwater marshes, and pasture lands. Avoids forests and deep marshes but uses transition zones and edges between these and prairies or pasture lands.	Moderate
Aphelocoma coerulescens	Florida Scrub-Jay	T	T	Inhabits fire dominated, low-growing, oak scrub habitat found on well-drained sandy soils.	Low
Athene cunicularia	Florida Burrowing Owl	T	N	Open prairies that have very little understory vegetation, including golf courses, airports, pastures, agricultural fields, and vacant lots.	Low
Dryobates (Picoides) borealis	Red-cockaded Woodpecker	E	E	Inhabits open, mature pine woodlands containing a rich diversity of grasses, forbs, and shrubs.	Moderate

Scientific Name	Common Name	FWC	USFWS	Preferred Habitat	Potential Occurrence
Egretta caerulea	Little Blue Heron	T	N	Feeds in shallow freshwater, brackish, and saltwater habitats.	Moderate
Egretta tricolor	Tricolored Heron	T	N	Feeds in a variety of permanently and seasonally flooded wetlands, mangrove swamps, tidal creeks, ditches, and edges of ponds and lakes.	Moderate
Falco sparverius paulus	Southeastern American Kestrel	T	N	Found in open pine habitats, woodland edges, prairies, and pastures throughout much of Florida.	Moderate
Haliaeetus leucocephalus	Bald Eagle	68A-16.002 FAC*	BGEPA/ MBTA	Forested habitats for nesting and roosting, and expanses of shallow fresh or salt water for foraging.	Moderate
Laterallus Jamaicensis	Black Rail	N	T	Tidal marshes; grassy marshes inland. Shallow water, or damp soil with scattered puddles. Found in dense stands of spartina and other grasses, rushes, and sedges.	No
Mycteria americana	Wood Stork	T	T	Mixed hardwood swamps, sloughs, mangroves, and cypress domes for nesting and a variety of wetlands for foraging.	Moderate
Polyborus plancus audubonii	Audubon's crested caracara	T	T	Open land with limited canopy, including dry prairie and pasture lands with cabbage palm, cabbage palm/live oak hammocks, and shallow ponds and sloughs.	Moderate
Rostrhamus sociabilis plumbeus	Everglade Snail Kite	E	E	Large open freshwater marshes and lakes with shallow water with abundant apple snails.	Low
MAMMALS					
Eumops floridanus	Florida Bonneted Bat	E	E	Roosts in palms and hollow trees and in buildings. Forages high in air over natural as well as human-altered landscapes.	Moderate
Perimyotis subflavus	Tri-colored Bat	N	C	Roosts in mature hardwood forests, and manmade structures during the spring, summer, and fall. During the winter hibernates in caves and mines. Forages over openings and water such as agricultural fields and streams.	Detected**
Podomys floridanus	Florida mouse	68A-29.002, FAC.***	N	Xeric uplands including sandhill and xeric oak, other habitats with well drained soils.	Low
Puma concolor coryi	Florida panther	E	E	Forested habitats primarily south of Orlando.	Low
Sciurus niger niger	Southern fox squirrel	68A-29.002, FAC.***	N	Open pine flatwoods, longleaf pine, turkey oak, sandhills, flatwoods, and pastures with oak.	Low

Scientific Name	Common Name	FWC	USFWS	Preferred Habitat	Potential Occurrence
Ursus americanus floridanus	Florida black bear	68A-4.009, FAC****	N	Prefers a variety of habitats that contain a dense understory with shrubs and trees that produce fruit and nuts.	Moderate
PLANTS					
Andropogon arctatus	Pinewoods Bluestem	T	N	Dry to wet flatwoods and sand pine scrub.	Low
Bonamia grandiflora	Florida Bonamia	E	T	Openings or disturbed areas in white sand scrub on Central Florida Ridges.	Low
Calamintha ashei	Ashe's Savory	T	N	Occurs in scrub and sandhills.	Low
Calopogon multiflorus	Many-flowered Grass-pink	T	N	Dry to moist flatwoods with longleaf pine, wiregrass, saw palmetto.	Low
Carex chapmanii	Chapman's Sedge	T	N	Hydric hammock and bottomland forest; usually on wooded stream banks and in river floodplains.	Moderate
Centrosema arenicola	Sand Butterfly Pea	E	N	Sandhill, scrubby flatwoods, dry upland woods.	Low
Chionanthus pygmaeus	Pygmy Fringe Tree	E	E	Scrub, sandhill, and xeric hammock, primarily on the Lake Wales Ridge.	Low
Cladonia perforata	Perforate Reindeer Lichen	E	E	Rosemary scrub.	Low
Clitoria fragrans	Scrub Pigeon-Wing	E	T	Turkey oak barrens with wire grass, bluejack and turkey oak; also scrub, scrubby-high pine.	Low
Coelorachis tuberculosa	Piedmont Jointgrass	T	N	Ephemeral ponds and margins of sandhill upland lakes or depression marshes.	Low
Coleataenia abscissa	Cut-throat Grass	E	N	Wet flatwoods, prairies, and seepage areas.	Low
Conradina brevifolia	Short-leaved Rosemary	E	E	Scrub, scrubby sandhill. In open areas and along cleared roadsides.	Low
Conradina grandiflora	Large-flowered Rosemary	T	N	Scrub, scrubby flatwoods, and adjacent disturbed areas.	Low
Crotalaria avonensis	Avon Park rabbit-bells	E	E	Open edges in xeric scrub, sand pine scrub, chaparral, sand dune, and mixed woodland.	Low
Dicerandra christmanii	Garrett's scrub balm	E	E	Sand pine and oak scrub of the Lake Wales Ridge.	Low
Dicerandra frutescens	Scrub mint	E	E	Sand pine and oak scrub of the central Florida ridge.	Low
Eriogonum longifolium var. gnaphalifolium	Scrub Buckwheat	E	T	Sandhill, oak-hickory scrub on yellow sands, high pineland between scrub and sandhill, turkey oak barrens.	Low
Hartwrightia floridana	Hartwrightia	T	N	Wet, peat-enriched, usually sphagnous substrates, in full sunlight or light shade. Slash pine/longleaf pine, saw palmetto, gallberry, titi flatwoods,	Low

Scientific Name	Common Name	FWC	USFWS	Preferred Habitat	Potential Occurrence
				pineland swamps, bogs, and acidic seepage areas.	
Hypericum cumulicola	Highlands scrub hypericum	E	E	Patches of open, nutrient-poor sand within oak and rosemary scrub.	Low
Illicium parviflorum	Star Anise	E	N	Banks of spring-run or seepage streams, bottomland forest, hydric hammock, baygall dominated by red maple and sweet bay.	Moderate
Lechea cernua	Nodding Pinweed	T	N	Open, unshaded white sands of scrub and scrubby flatwoods.	Low
Lechea divaricata	Pine Pinweed	E	N	Scrub and scrubby flatwoods.	Low
Lupinus aridorum	Scrub Lupine	E	E	Openings in sand pine and rosemary scrub.	Low
Lythrum flagellare	Lowland Loosestrife	E	N	Pond margins, moist to wet prairies and roadsides, wet pinelands.	Low
Matelea floridana	Florida Spiny-pod	E	N	Sandhill, upland pine and dry hammocks.	Low
Najas filifolia	Narrowleaf Naiad	T	N	Floating annual plant that prefers dark water less than 2 meters deep.	Moderate
Nemastylis floridana	Celestial Lily	E	N	Wet flatwoods, prairies, marshes, cabbage palm hammocks edges.	Low
Nolina atopocarpa	Florida Beargrass	T	N	Grassy areas of mesic and wet flatwoods.	Low
Nolina brittoniana	Britton's Beargrass	E	E	Scrub, sandhill, scrubby flatwoods, and xeric hammocks.	Low
Ophioglossum palmatum	Hand Fern	E	N	Old leaf bases of cabbage palms in maritime hammocks and wet hammocks. Plants have been seen once in a saw palmetto.	Low
Paronychia chartacea var. chartacea	Paper-like Nailwort	E	T	Sandhills, pine/oak woodland, open scrub.	Low
Pecluma plumula	Plume Polypody	E	N	Wet hammocks and swamps; epiphytic on live oaks, occasionally on rocks or terrestrial.	Moderate
Pecluma ptilota var. bourgeauana	Comb Polypody	E	N	Rockland hammocks, strand swamps, and wet woods; often on tree bases and fallen logs.	Moderate
Platanthera integra	Yellow Fringeless Orchid	E	N	Open wet prairies, wet flatwoods, bogs, seepage slopes, wet pine barrens, and peaty depressions.	Low
Polygala lewtonii	Lewton's Polygala	E	E	Sandhill, scrub, scrubby flatwoods, and their transition zones.	Low
Polygonella myriophylla	Small's Jointweed	E	E	Open, sandy areas within scrub, mostly on white sands.	Low
Prunus geniculata	Scrub Plum	E	E	Sandhill and oak scrub.	Low

Scientific Name	Common Name	FWC	USFWS	Preferred Habitat	Potential Occurrence
Pteroglossaspis ecristata	Giant Orchid	T	N	Sandhill, scrub, pine flatwoods, pine rocklands, and occasionally in old fields.	Low
Salix floridana	Florida willow	E	N	Wet mucky soils in bottomland forests, floodplains, hydric hammocks, swamps, spring-runs, and streams.	Moderate
Schizachyrium niveum	Scrub Bluestem	E	N	White sand patches in rosemary scrub; also, sand pine scrub and oak scrub.	Low
Thelypteris serrata	Toothed Maiden Fern	E	N	Cypress swamps, sloughs, floodplains.	Low
Warea amplexifolia	Clasping Warea	E	E	Limited to sunny openings with exposed sand in longleaf pine/turkey oak/wiregrass sandhills.	Low
Warea carteri	Carter's warea	E	E	Sandy clearings in open, pine-dominated ecosystems including sand scrub, sandhills, and pine rock lands.	Low
Zephyranthes simpsonii	Redmargin Zephyrlily	T	N	Wet flatwoods and meadows. Also, in ditches and wet pastures; often in burned over areas.	Low

E = Endangered, T = Threatened, C =Candidate for Listing, SSC=Species of Special Concern N = Not Listed,
No = No suitable habitat present and no documented occurrences within or near the study area,
Low = Minimal suitable habitat present and no documented occurrences within or near the study area,
Moderate = Potentially suitable habitat present and/or documented occurrences near the study area,
High = Suitable habitat present and documented occurrences within the study area.
* Removed from Florida's Endangered and Threatened Species List in 2008, but is still protected under the Bald and Golden Eagle Protection Act (BGEPA), Migratory Bird Treaty Act (MBTA), and FAC.
** Detected during the Florida Bonneted Bat Acoustic Survey
*** Removed from Florida's Endangered and Threatened Species List in 2017, but still protected under the FAC.
****Removed from Florida's Endangered and Threatened Species List in 2012, but still protected under the FAC.

3.3 Federally Protected Species and Designated Critical Habitat

The following subsections describe the federally listed species identified to have a moderate or high potential of occurrence within the study area, as listed above in Table 3, the species in which the project occurs within the USFWS consultation area for said species, or species-specific surveys were conducted for the study area.

Invertebrates

Monarch Butterfly

The monarch butterfly is a candidate species for listing by the USFWS. There are known resident populations of monarch butterflies in Florida, and in the spring, Florida is an important stop over for monarch butterflies returning north from Mexico. Monarch butterflies rely on flowering plants within fields, roadside areas, open areas, wet areas, or urban gardens, and suitable habitat for this species is found within and adjacent to the study area. The effects of the Preferred Alternative on the monarch

butterfly will be determined once the listing status of the species is elevated by USFWS to Threatened or Endangered.

Reptiles

American Alligator

The **American alligator** is listed as threatened by both the USFWS and FWC due to its similar appearance to the American crocodile (*Crocodylus acutus*), which is restricted to southern Florida and listed by the USFWS as threatened. The American Alligator prefers lakes, rivers, and estuary habitats throughout Florida for their entire life cycle and these habitats are located within the study area. However, the proposed project is outside the range of the American crocodile making it unlikely to be confused with the American alligator. Numerous American alligators were observed during the field surveys within the wetlands along the corridor and Reedy Creek. Given this information, the ability of the American alligator to leave the area during construction, and the abundant suitable habitat surrounding the study area, the Preferred Alternative will have **No Effect** to the American alligator.

Eastern Indigo Snake

The eastern indigo snake is listed as Threatened by both the USFWS and FWC. No critical habitat has been designated for the eastern indigo snake. The eastern indigo snakes prefer xeric habitats, such as sandhill, scrub, pine flatwoods, pine rocklands, scrubby flatwoods, high pine, coastal prairies, mangrove swamps, tropical hardwood hammocks, hydric hammocks, edges of freshwater marshes and agricultural fields. They are also closely associated with gopher tortoise burrows and tree cavities for refuge. The USFWS assesses the effect of development on this species based on several factors, including the acreage of preferred habitat to be impacted and/or the number of tortoise burrows to be impacted. The property does include xeric habitats, and several tortoise burrows were observed within the ROW along US-17-92. Therefore, when applying the Eastern Indigo Snake Effect Determination Key, updated August 2017, the following sequential determination was reached:

A. The Preferred Alternatives not located in open water or salt marsh;
B. The Preferred Alternative will be conditioned to use the Standard Protection Measures for the Eastern Indigo Snake; and
C. The Preferred Alternative will impact (29.27 acres) more than 25 acres of eastern indigo snake habitat (**May Affect**).

Although the Preferred Alternative reaches a **May Affect** determination (A>B>C), no eastern indigo snakes were observed during the field surveys. According to the FWC Terrestrial Resources GIS Wildlife Observation data, the nearest documented occurrence of the eastern indigo snake (WEB001083) is approximately 35 miles south of the preferred alternative. All gopher tortoise burrows, including burrows with 25 feet of the preferred alternative, will be excavated and relocated prior to construction. The FDOT commits to implementing the USFWS's Standard Protection Measures for Eastern Indigo Snake during construction to protect the eastern indigo snake where it may occur. Therefore, the Preferred Alternative will result in a **May Affect, Not likely to Adversely Affect** determination for the eastern indigo snake. A copy of the Consultation Key for the Eastern Indigo Snake Effect is found in **Appendix F**.

Sand Skink and Bluetail Mole Skink

The sand skink and bluetail mole skink is listed as Threatened by both the USFWS and FWC, and the project area falls within the USFWS consultation areas for these species. No sand or bluetail mole skink critical habitat has been designated by USFWS. Sand skinks are endemic to ridge habitats including rosemary scrub, scrubby flatwoods, sand pine and oak scrubs, and turkey oak ridges with open, sandy patches of well-drained soils. The bluetail mole skink inhabits similar xeric habitat as the sand skink. The known range of the bluetail mole skink is within the Lake Wales Ridge in Highlands, Osceola, and Polk counties. There are areas at the western and central portions of the project corridor that contains soils which are mapped as suitable for sand and bluetail mole skink, and these areas are at elevations at which these skinks are known to occur.

Prior to the start of the coverboard sand skink surveys, biologists conducted pedestrian surveys to identified potential suitable habitat within the study area. Based on the pedestrian surveys, one 0.80-acre area was identified that met the required soils and elevation for potential sand skink habitat. A sand skink coverboard survey methodology was developed and submitted to USFWS on November 16, 2021, and the survey methodology was subsequently approved on November 30, 2021 (**Appendix B)**. The species-specific sand skink coverboard survey was conducted from March 9, 2022, and concluded on April 2, 2022, in accordance with USFWS Sand Skink and Blue-tailed Mole Skink Survey Protocol (2020). Coverboards were placed in areas with primarily loose sandy soils and reduced vegetative groundcover. Several areas that had denser vegetative groundcover were manually scraped by biologists to expose the sand underneath prior to placing the coverboards. A total of 33 coverboards were placed within the 0.80-acre survey area. After the coverboard installation, the boards were checked once a week, during the survey season, for four (4) weeks with at least one (1) week between survey events. The survey report depicting the overall project area, coverboard locations, data sheets, and photographs are included in **Appendix C**.

The 4-week survey beginning on March 9, 2022, and concluding on April 2, 2022, yielded no positive results of sand skink utilizing the 0.80-acre site. Therefore, the Preferred Alternative will result in a **May Affect, Not likely to Adversely Affect** determination for the sand or bluetail mole skink.

Birds

Florida grasshopper Sparrow

The Florida grasshopper sparrow is listed as Endangered by both the USFWS and FWC, and the project area falls within the consultation area for this species. No critical habitat for Florida grasshopper sparrow has been designated by USFWS. Florida grasshopper sparrow habitat consists of large, treeless grasslands which have a frequent fire regime. There are three documented locations of Florida grasshopper sparrow, and these occurrences are all on public lands (Three Lakes Wildlife Management Area, Avon Park Air Force Range, and Kissimmee Prairie State Preserve). The nearest known location of Florida grasshopper sparrow is approximately 28 miles southwest of the study area in Kissimmee Prairie State Preserve. No grasshopper sparrows were observed during the field surveys. Limited suitable habitat for the Florida grasshopper sparrow was observed within or adjacent to the study area; however, most of these habitats are fire suppressed or disturbed and not within the Preferred Alternative. Therefore, the Preferred Alternative will have **No Effect** on the Florida grasshopper sparrow.

Florida Scrub-jay

The Florida scrub-jay is listed as Threatened by both the USFWS and FWC, and the project area falls within the consultation area for this species. No critical habitat has been designated by USFWS for this species. The Florida scrub-jay prefers relict oak-dominated scrub or xeric oak scrub habitat with trees that are 4-10 feet in height, and typically maintains a permanent 12 to 25-acre territory. The nearest documented occurrence of Florida scrub- jay is approximately 2 miles west of the study area. During the field surveys, limited suitable habitat was observed within the study area; however, these areas were fire suppressed, overgrown with trees taller than 10 feet, and no suitable habitat was observed within the Preferred Alternative. Additionally, no Florida scrub-jays were observed within preferred alternative during the field surveys. Therefore, the Preferred Alternative will have **No Effect** on the Florida scrub-jay.

Red-cockaded Woodpecker

The red-cockaded woodpecker (RCW) is listed by the USFWS and FWC as Endangered. The entire study area is located within the USFWS's RCW consultation area. RCW habitat consists of pine stands or pine dominated forests with little to no understory and numerous old growth pines, particularly longleaf pine. This avian species excavates cavities in the living parts of pine trees, typically choosing trees greater than 80 years old. No critical habitat has been designated for the RCW, and the nearest known location of a documented RCW is approximately 7 miles north of the study area. No RCWs or their cavities were observed during the field survey. There is limited habitat mapped within or adjacent to the study area capable of supporting RCWs; however, these areas are fire suppressed or developed and no suitable habitat was observed with the Preferred Alternative. Given the habitats within and adjacent to the Preferred Alternative and existing developed areas present, the Preferred Alternative will have **No Effect** on the RCW.

Wood Stork

The wood stork is listed as Threatened by both the USFWS and FWC. No critical habitat has been designated by USFWS for this species. Wood storks nest colonially in a variety of inundated forested wetlands, including cypress strands and domes, mixed hardwood swamps, sloughs, and mangrove swamps. Suitable foraging habitat is shallow open water wetlands and surface waters within a USFWS core foraging area (CFA). The closest known nesting colony (Gatorland) is located approximately 8.80 miles to the northeast; therefore, the study area is located within a USFWS CFA. The study area does contain suitable foraging habitat of more than 0.50 acre. One wood stork was observed foraging in a ditch north of the study area during the field surveys. When following the Corps of Engineers, Jacksonville District, U.S. Fish and Wildlife Service, South Florida Ecological Services Field Office Wood Stork Effect Determination Key (2010):

A. The Preferred Alternative is more than 2,500 feet from a colony;
B. The Preferred Alternative will impact suitable foraging habitat that is greater 0.5 acre;
C. The Preferred Alternative impacts suitable foraging habitat within a CFA; and
E. The Preferred Alternative will result in unavoidable wetland impacts and these impacts will be offset by obtaining USFWS-approved wetland mitigation within a CFA to satisfy all elements detailed in the key.

Based on the Effect Determination Key (A>B>C>E), the Preferred Alternative results in a **May Affect, Not Likely to Adversely Affect** determination for the wood stork. To further support the effect determination for this species, a Wood Stork Foraging Analysis was conducted using the methodology found in the USFWS Florida Programmatic Concurrence Wood Stork Key (2010) to determine impacts to potential suitable foraging habitat from the Preferred Alternative. This analysis revealed that the Preferred Alternative would result in a net loss of 353.29 kilograms (kg) of foraging biomass for wood storks. Although the preferred alternative results in a net loss of foraging biomass, the wetland mitigation provided will be from an USFWS approved wetland mitigation bank, such as Reedy Creek Mitigation Bank and/or Southport Ranch Mitigation Bank. These banks are located within wood stork core foraging areas and will compensate for the net loss in biomass as a result of the construction of the Preferred Alternative. Therefore, this analysis supports the effect determination for wood stork. The Wood Stork Foraging Analysis for the Preferred Alternative is located in **Appendix G.** A copy of the Wood Stork Effect Determination Key in South Florida is found in **Appendix H**.

Audubon's crested caracara (caracara)

The caracara is listed as Threatened by both the USFWS and FWC. The study area falls within the USFWS consultation area for crested caracara; however, no critical habitat has been designated by the USFWS for this species. The caracara inhabits wet or dry prairies with cabbage palms, pastures with cabbage palms, and lightly wooded areas with scattered saw palmetto, cypress, or scrub oaks. Caracaras were not observed during the general wildlife surveys; however, pastures within two of the potential pond sites may provide potential suitable habitat for this species. Based on the general wildlife survey and technical assistance request from USFWS, a caracara survey methodology was developed and submitted to USFWS on November 16, 2021, and the survey methodology was subsequently approved on November 30, 2021 (**Appendix B**).

A species-specific caracara survey was conducted in accordance with USFWS Crested Caracara Draft Survey Protocol (2016) from January 5, 2022, to April 29, 2022. This includes the timeframe from January through March when there is the highest probability of finding caracara nests, as adult caracaras are foraging to feed nestlings and therefore, are more visible to observers. Nine (9) survey events, each approximately two (2) weeks apart, were conducted at four (4) approved survey stations. Surveys began at least 15 minutes before sunrise and lasted for at least 3 hours. Surveys were also conducted when wind speeds were less than 12 miles per hour and there was no rain or fog present. Four survey stations (approved by the USFWS) were established within or adjacent to the onsite suitable habitat and positioned to maximize the viewing distance and area. Scientists visually scanned the appropriate habitat for the presence of caracara for the duration of the survey. The survey report depicting the overall project area, survey stations, data sheets, and photographs are included in **Appendix D**.

The caracara survey from January to April resulted in no caracara within or adjacent to the study area. While suitable habitat to support foraging and nesting is present on site, caracaras were not observed utilizing the project area or adjacent properties during the 2022 survey season, resulting in a negative presence survey. However, the project will impact some suitable habitat for the construction of ponds, and therefore, the Preferred Alternative results in a **May Affect, Not Likely to Adversely Affect** determination for the caracara.

Everglade Snail Kite

The Everglade snail kite (snail kite) is listed as Endangered by both the USFWS an FWC, and the study area falls within the USFWS consultation area for this species. However, the study area is not located in critical habitat for snail kites. Snail kites are primarily found in lowland freshwater marshes and the shallow vegetated edges of lakes (natural and man-made) where they feed almost entirely on apple snails (*Pomacea* sp.). Snail kites nest and roost in Carolina willow (*Salix sp.)* adjacent to the marshes and lakes for which they forage for apple snails. Given that no apple snails, suitable nesting habitat, or snail kites were observed during the field surveys, the Preferred Alternative will have **No Effect** on the Everglade snail kite.

Mammals

Florida Bonneted Bat

The Florida bonneted bat is listed as Endangered by both the USFWS and FWC, and the majority of the study area is within the USFWS consultation area for this species. In addition, the study area is not located within USFWS critical habitat for this species. Florida bonneted bats can be found in forests, wetlands and other natural habitats, along with residential and urban areas. Florida bonneted bats roost in palms and hollow trees, and in buildings and other structures, and they forage high the in air over natural as well as human-altered landscapes. There is potential roosting habitat within and adjacent to the study area. During the field surveys, visual inspection of potential roosting trees, cavities, and existing bridges was conducted to identify potential bat roosting sites within the study area; however, no evidence (guano, staining, smell or aural sounds) of roosting bat habitat was observed within or adjacent to the study area. Based on the habitats within and adjacent to study area and technical assistance requested from USFWS, a Florida bonneted bat acoustic survey methodology was developed and submitted to USFWS on November 16, 2021, and the survey methodology was subsequently approved on November 30, 2021 (**Appendix B**).

A full acoustic survey for the Florida bonneted bat was conducted in accordance with USFWS Consultation Key for the Florida Bonneted Bat (Appendix B Full Acoustic/Roost Survey Framework) dated 2019. The acoustic survey was conducted from March 9 through March 20, 2022, to determine the presence of the Florida bonneted bat within the study area. Based on the minimum requirements for linear projects over 50 acres, a minimum of five detector nights per every 0.6 linear mile was required. The project corridor is approximately 3.8 miles in length. As such, seven (7) stations were surveyed, with a total of 40 detector nights. A qualified biologist deployed acoustic equipment at the seven (7) survey station locations. The acoustic detectors and microphones were micro-sited on the date of deployment to: (1) target areas that may concentrate bat activity and commuting bats; (2) minimize echoes; (3) camouflage the detectors by deploying near natural landscape features; and (4) remain at least one meter away from vegetation. Based on the minimum requirements outlined in the Guidelines, seven Pettersson D500x Ultrasonic Detectors were each deployed for between 5 and 6 nights allowing for a total of 40 detector-nights, excluding detector nights with equipment malfunctions. The survey report depicting the overall project area, survey stations, data sheets, and photographs are included in **Appendix E**.

The full acoustic survey resulted in no Florida bonneted bats being detected. However, the survey resulted in the detection of seven species of bat, and they include big brown bat (*Eptesicus fuscus*),

southeastern bat (*Myotis austroriparius*), eastern red bat/Seminole bat (*Lasiurus borealis/L. seminolus*), northern yellow bat (*Lasiurus intermedius*), evening bat (*Nycticeius humeralis*), tri-colored bat (*Perimyotis subflavus*), and Mexican free-tailed bat (*Tadarida brasiliensis*).

When following the USFWS Consultation Key for the Florida Bonneted Bat (2019):

- 1a. The Preferred Alternative or land use change is partially or wholly within the Consultation Area;
- 2a. Potential Florida bonneted Bat roosting habitat exists within the Preferred Alternative;
- 3b. Preferred Alternative is greater than 5 acres;
- 6b. Results show no Florida Bonneted Bat activity.

Although suitable habitat to support foraging and nesting is present on site, no evidence of the Florida bonneted bat was detected during the roosting and acoustic surveys. Therefore, the Preferred Alternative results in a determination of **May Affect, Not Likely to Adversely Affect** the Florida bonneted bat (1a>2a>3b>6b). A copy of the Consultation Key for the Florida Bonneted Bat is provided in **Appendix E**.

Tri-colored Bat

The tri-colored bat was listed as a candidate species by the USFWS on September 13, 2022. During the spring, summer, and fall tri-colored bats primarily roost among live and dead leaf clusters of live or recently dead deciduous hardwood trees, Spanish moss (*Tillandsia usneoides*) and lichens. They will also roost within artificial roosts like barns, beneath porch roofs, bridges, concrete bunkers, and rarely within caves during the spring, summer, and fall. Female tri-colored bats exhibit high site fidelity, returning year after year to the same summer roosting locations. Female tri-colored bats form maternity colonies and switch roost trees regularly, while the Males roost singly. During the winter, tri-colored bats hibernate in caves and mines; although, in the southern United States, where caves are sparse, tri-colored bats often hibernate in road-associated culverts, as well as sometimes in tree cavities and abandoned water wells. There is potential roosting habitat within and adjacent to the study area. During the field surveys, visual inspection of potential roosting trees, cavities, and existing bridges was conducted to identify potential bat roosting sites within the study area; however, no evidence (guano, staining, smell or aural sounds) of roosting bat habitat was observed within or adjacent to the study area. Although no evidence of bat roosting was observed, the results Florida bonneted bat acoustic survey revealed the presence of the tri-colored bat within the preferred alternative. The effects of the Preferred Alternative on the tri-colored bat will be determined once the listing status of this species is elevated by USFWS to Threatened or Endangered. Additionally, if the listing status of the tri-colored bat is elevated by USFWS to Threatened or Endangered and the Preferred Alternative is located within the consultation area during the design and permitting phase of the proposed project, FDOT commits to re-initiating consultation with the USFWS to determine the appropriate survey methodology and to address USFWS regulations regarding the protection of the tri-colored bat.

Plants

According to the FNAI and USFWS, there are 17 federally protected plants that have a low potential to occur within the study area (**Table 3**). The species that are listed as Endangered include pigmy fringe tree, perforate reindeer lichen, short-leaved rosemary, Garett's scrub balm, Avon Park rabbits-bells,

scrub mint, scrub lupine, Britton's beargrass, Lewton's polygala, Small's jointweed, scrub plum, clasping warea, and Carter's warea. The species that are listed as Threatened include Florida bonamia, scrub pigeon-wing, scrub buck wheat, and paper-like nailwort. These species are restricted to sandy habitats maintained by periodic fire, such as scrub, high pine, and sandhill and most occur in habitats closely associated with central Florida ridge, which is approximately four (4) miles west of the study area. The observed habitats within the preferred alternative capable of supporting these plant species has been developed, disturbed by agricultural activities, or fire suppressed. Additionally, no federally protected plants were observed during the field surveys. Given that there were no observations of federally protected plants and the observed habitat disturbance, it is anticipated the Preferred Alternative will have **No Effect** on federally protected plants.

3.3.1 Critical Habitat

Based on the review of USFWS GIS data and literature, there are no designated critical habitats documented within the study area. Therefore, no coordination with USFWS with regards to critical habitat is anticipated.

3.4 State Listed Protected Species in the Project Area

The following subsections describe the state listed species identified to have a moderate or high potential of occurrence within the study area, as listed above in Table 3.

Reptiles

Gopher tortoise

The gopher tortoise is listed as Threatened by the FWC. Desired habitat for this species includes xeric scrub and pine flatwoods with sandy soil profiles. Potentially suitable habitat occurs within the project corridor and several gopher tortoise burrows were observed adjacent to the study area. Due to the presence of gopher tortoise burrows adjacent to the study area and the extent of preferred habitat along the corridor, FDOT will conduct a gopher tortoise survey of all suitable habitat within the project footprint prior to construction, following the FWC *Gopher Tortoise Permitting Guidelines* (FWC 2008, revised 2020). A gopher tortoise relocation permit will be obtained from the FWC for any burrow proposed for impact. Therefore, **No Adverse effect is Anticipated** on the gopher tortoise from the Preferred Alternative.

Florida Pine Snake

The Florida pine snake is listed as threatened by the FWC. The Florida pine snake is a large, stocky, tan colored snake with a relatively small head. It spends the majority of its time below ground with occasional surface activity from spring through fall. According to the FWC Species Conservation Measures and Permitting Guidelines (2020) for Florida Pine Snake, their preferred habitat includes relatively open canopies with dry sandy uncompacted soils in which it can burrow, as it often coexists in areas with a high population density of pocket gophers (*Geomys pinetis*) and gopher tortoises. The Florida pine snake was not observed within the limits of the study area. Potentially suitable habitat is available within the study area, but no pocket gophers were observed during the field survey. Current FWC guidelines for the relocation of the Florida pine snake are directly related to gopher tortoise relocation guidelines, and these guidelines state that any incidentally captured pine snake should be

released on-site or allowed to escape unharmed if habitat will remain post-development. Since there were no pocket gopher burrows observed and the majority of the study area consists of wetlands and existing development, **No Adverse Effect is Anticipated** on the Florida pine snake from the Preferred Alternative.

Birds

Florida Sandhill Crane

The Florida sandhill crane is listed by the FWC as threatened due to the loss and degradation to nesting and foraging habitat from development and hydrologic alteration. It is widely distributed throughout most of peninsular Florida. Sandhill cranes rely on shallow marshes for roosting and nesting and open upland and wetland habitats for foraging. The wetlands within the study area are forested, and therefore, no nesting or roosting habitat is available for Florida sandhill cranes. However, the open pasturelands within the study area do provide foraging habitat for Florida sandhill cranes. During the field surveys, no Florida sandhill cranes were observed within or adjacent to the study area. Following the FWC *Species Conservation Measures and Permitting Guidelines for Florida Sandhill Crane* (2019), no nests or roosting habitat was observed within 400 feet of the Preferred Alternative; therefore, **No Effect is Anticipated** to the Florida sandhill crane.

Southeastern American kestrel

The southeastern American kestrel (kestrel) is listed as Threatened by the FWC. While kestrels are known to utilize a wide range of habitat types, preferred habitat includes open pastures, fields, mesic flatwoods, and sandy flatwoods. These birds utilize open areas for foraging and often nest in abandoned woodpecker cavities, tree snags, or utility poles. Several open pastures are located within the project area, which may provide potential habitat for this species. However, no kestrels were observed during the field surveys. The potentially suitable habitat observed were fire suppressed or disturbed; therefore, providing minimal suitable habitat for Kestrels to utilize. **No Adverse Effect is Anticipated** on the kestrel from the Preferred Alternative.

State listed Wading Birds

The little blue heron and tri-colored heron are listed by FWC as Threatened. The little blue heron and tri-colored heron nest in small trees or shrubs on islands surrounded by water. The FWC Historic Waterbird Colony Locator database indicates that the nearest wading bird colony is 2 miles north of the study area. It is anticipated that the little blue heron and tri-colored heron utilize habitats present within the study area for foraging; however, there was no evidence of nesting or roosting habitat within the study area. The impacts to foraging habitat will be offset by through wetland mitigation. In addition, the proposed stormwater ponds will provide additional foraging habitat within the existing corridor. The Preferred alternative is not anticipated to impact nest sites, and therefore **no adverse effect is anticipated** to state listed wading birds.

Plants

Chapman's Sedge

The Chapman's sedge is designated as Threatened by FDACS. Habitat for this species includes hydric hammock and bottomland forest; usually on wooded stream banks and in river floodplains. The greatest threat to this species is the destruction of its habitat and introduction of invasive species. The floodplain

of Reedy Creek represents suitable habitat for this species. No occurrences of Chapman's sedge are documented within or adjacent to the study area, and the nearest known population of Chapman's sedge is located in the Ocala National Forest, approximately 50 miles north of the study area. No individuals were observed during the field survey. Therefore, **No Adverse Effect is Anticipated** to the Chapman's sedge from the Preferred Alternative.

Star Anise

The star anise is designated as Endangered by FDACS. Habitat for this species includes banks of spring-run or seepage streams, bottomland forest, hydric hammock, and baygalls dominated by red maple and sweet bay. Almost all known populations occur in five conservation areas, where it often forms a dense understory. It is widely used in landscaping and has been exploited for commercial use. The greatest threat to this species is the destruction of its habitat. Suitable habitat for this species is present within the study area. No occurrences of star anise are documented within or adjacent to the study area, and the nearest known population of star anise is located in the Lake Marion Creek Wildlife Management Area, approximately 4 miles south of the study area. No individuals were observed during the field survey. Therefore, **No Adverse Effect is Anticipated** to the star anise from the Preferred Alternative.

Narrowleaf Naiad

The narrowleaf naiad is designated as Threatened by FDACS. Habitat for this species is dark water less than 2 meters deep. This species has mostly been recorded in lakes and ponds. The threat to this species is the use of aquatic herbicide. Reedy Creek represents suitable habitat for this species. However, no occurrences of narrowleaf naiad are documented within or adjacent to the study area. No individuals were observed during the field survey. Therefore, **No Adverse Effect is Anticipated** to the narrowleaf naiad from the Preferred Alternative.

Plume Polypody

The plume polypody is designated as Endangered by FDACS. Habitat for this species includes wet hammocks, swamps, epiphytic on live oaks, and limestone outcrops. Most known populations occur on conservation land. Suitable habitat for this species is present within the study area. The threats to this plume polypody are exotic species and disturbance to substrate. No occurrences of plume polypody are documented within or adjacent to the study area and the nearest known population of plume polypody is located in the Richloam Wildlife Management Area, approximately 26 miles northwest of the study area. No individuals were observed during the field survey. Therefore, **No Adverse Effect is Anticipated** to the plume polypody from the Preferred Alternative.

Comb Polypody

The comb polypody is designated as Endangered by FDACS. Habitat for this species includes rockland hammocks, strand swamps, and wet woods; often on tree bases and fallen logs, tree branches and limestone outcrops in dry hammocks. The threat to this species is loss of habitat by drainage, logging, and development. Suitable habitat for this species is present within the study area. There are very few recent populations of comb polypody that have been observed, and no occurrences of comb polypody are documented within or adjacent to the study area. The nearest known population of comb polypody is located in the Richloam Wildlife Management Area, approximately 26 miles northwest of the study area. No individuals were observed during the field survey. Therefore, **No Adverse Effect is Anticipated** to the comb polypody from the Preferred Alternative.

Florida Willow

The Florida willow is designated as Endangered by FDACS. Habitat for this species includes wet, mucky soils in bottomland forests, floodplains, hydric hammocks, swamps, edges of spring-runs, and streams. The threats to species include habitat loss through changes in water level; clearing of ditches, sedimentation and pollution to springs and streams; clearcutting and draining floodplains and wet hammocks; and conversion to pine plantation. Suitable habitat for this species is present within the study area. There are 22 known occurrences in Florida, with about half occurring in conservation areas in Lake and Orange counties representing the southernmost Florida populations of this species. No occurrences of Florida willow are documented within or adjacent to the study area. No individuals were observed during the field survey. Therefore, **No Adverse Effect is Anticipated** to the Florida willow from the Preferred Alternative.

3.5 Other Protected Species or Habitats

Several species are not protected by the ESA or state designation but are protected under separate regulation or are managed species. These species are discussed below:

Bald Eagle

The bald eagle was removed from the protection of the ESA in September 2007; however, it is still protected under the Bald and Golden Eagle Protection Act (BGEPA), Migratory Bird Treaty Act (MBTA), the Lacey Act, and by 68A-16.002, FAC. To reduce the potential for human activity to adversely affect bald eagles, USFWS and FWC management guidelines suggest the protection of a 660-ft habitat buffer around each active and alternate bald eagle nest (USFWS 2007). The FWC Eagle Nest Locator and the Audubon EagleWatch Bald Eagle Nest Locator do not indicate the presence of any bald eagle nests within, or immediately adjacent to, the study area. The closest bald eagle nest is mapped approximately 0.62 mile to the north of the study area. While suitable habitat exists in the project area, no evidence of bald eagle nesting was observed during the field surveys. Therefore, the Preferred Alternative will not impact the bald eagle.

Florida Black Bear

The Florida Black Bear is a state managed species. Once a state listed species, the black bear population has increased and is now managed under the FWC *Florida Black Bear Management Plan* which was approved in 2012 and revised in 2019. The study area is located within the FWC's "Frequent Range", an area with the highest density of bears where bears spend a considerable amount of time and where evidence of reproduction is consistent. FWC also maintains a database of bear telemetry, related calls (nuisance) and roadkill reports. Based on available FWC GIS bear nuisance data, bears have been documented in the vicinity. In addition, one nuisance bear was reported within study area, located near the intersection of the US 17/92 and Old Tampa Highway (see **Appendix A, Exhibit 5**). Additionally, the FWC roadkill data was reviewed, and no bear mortalities occurred within or adjacent to the study area. No bears or evidence thereof were observed during the field surveys. To further avoid bears during construction, and in accordance with the Florida Black Bear Management Plan, the FDOT commits that garbage and food debris will be properly removed during construction to eliminate possible sources of odors that could encourage and attract bears. Therefore, the Preferred Alternative will not impact the Florida black bear.

Bats

During the Florida bonneted bat acoustic and roost survey, seven (7) species of bat were detected, and they include the big brown bat, southeastern bat, eastern red bat/Seminole bat, northern yellow bat, evening bat, and Mexican free-tailed bat. Although the federally protected Florida bonneted bat was not detected, all bats are protected from harm and harassment by state law 68A-9.010, FAC. Bats are known to roost year-round in longitudinal concrete joints in bridges or trees. During the field and species-specific bat surveys, no bats or evidence thereof was observed utilizing the bridges within the study area. Therefore, the Preferred alternative will not adversely impact bats.

4.0 Wetlands and Other Surface Waters

The presence of wetlands and other surface waters associated with Reedy Creek fall under the jurisdiction of the United States Army Corps of Engineers (USACE) and this agency regulates the discharge of dredged or fill material into waters of the United States under the Clean Water Act of 1972 (CWA) in retained federal waters. Therefore, the USACE will have jurisdiction over Reedy Creek and the wetlands or other surface waters within the study area. The SFWMD has state jurisdiction over the wetlands and other surface waters within the study area. The wetland evaluation conducted and documented within this report is consistent with the requirements of the following regulations and guidance:

- Section 404 of the CWA;
- Federal Executive Order 11990, Protection of Wetlands;
- U.S. Department of Transportation (USDOT) Order 5660.1A, Preservation of the Nation's Wetlands;
- Federal Highway Administration (FHWA) Technical Advisory T6640.8A;
- Chapter 62-340, FAC, Delineation of the Landward Extent of Wetlands and Surface Waters; and
- PD&E Manual Part 2, Wetlands and Other Surface Waters Chapter.

The project is in the Kissimmee Watershed, having a US Geologic Survey (USGS) Hydrologic Unit code of 03090101, and within Reedy Creek Above Lake Russell Drainage Basin (Water Body Identification Number {WBID} 3170C). Pursuant to Executive Order 11990 entitled "Protection of Wetlands", and Part 2, Wetlands and Other Surface Waters Chapter of the PD&E Manual, wetlands within the corridor were evaluated for potential impacts resulting either directly or indirectly from the project. The present and jurisdictional extent of wetlands were field delineated within the Preferred Alternative in March 2022 by environmental scientists. A map depicting the wetlands and other surface waters, both delineated within the Preferred Alternative, and interpreted within the remainder of the study area, is located in **Appendix A, Exhibit 6 A-F** and presented by type in **Table 4**.

4.1 Efficient Transportation Decision Making Related to Wetlands and Other Surface Waters

During ETDM coordination, the United States Environmental Protection Agency (USEPA) assigned a Substantial Degree of Effect to wetlands and other surface waters citing concerns over the potential wetland impacts and water quality. The USACE, USFWS, FDEP and SFWMD assigned Moderate Degrees of Effect to wetlands and other surface waters, citing potential impacts to adjacent wetlands and the riparian areas of Reedy Creek. During the ETDM process, the NMFS confirmed that there are no direct or indirect impacts to NMFS trust resources, and the U.S. Coast Guard confirmed there will be "No Involvement" with navigation resources as it relates to the proposed bridge.

4.2 Wetland Methodologies

Prior to the field review, biologists performed a GIS database and literature review to identify wetlands that have been documented within and adjacent to the study area. Referenced materials included, but were not limited to, the following data sources:

- Current and historical aerial photography;
- SFWMD land use data (2018);
- NRCS Soil GIS data (2020) and Soil Survey for Osceola County (1979);
- USFWS National Wetland Inventory (NWI) Mapper (accessed 2022);
- US Army Corps of Engineers Wetland Delineation Manual, 1987;
- Regional Supplement to the US Army Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region, 2010; and
- Chapter 62-345, FAC, Uniform Mitigation Assessment Method (UMAM).

In March 2022, biologists delineated the wetlands and other surface waters within the Preferred Alternative in accordance with federal and state guidelines noted above. Wetlands beyond the construction limits, but within the study area were interpreted using GIS analysis and limited field review. There are three wetland habitat types, and 29 other surface waters within the study area, and these systems are hydrologically connected to Reedy Creek. This data is depicted in **Appendix A, Exhibit 6 A-F**. A UMAM analysis, pursuant to Chapter 62-345, FAC, was also performed to evaluate the existing ecological quality of the wetland and surface water areas to be impacted (**Appendix I**).

4.3 Wetlands and Other Surface Waters Descriptions

The study area includes wetlands and other surface waters that are directly or indirectly connected to Reedy Creek. The wetlands within the study area are adjacent to developed and undeveloped areas that have altered the hydrology of these systems (**Appendix A, Exhibit 6 A-F**). The wetlands and OSWs discussed below are anticipated to be impacted by the Preferred Alternative, which includes preferred stormwater pond and floodplain compensation locations.

Wetland 2 (WL-2)
FLUCFCS 630 – Wetland Forested Mixed
USFWS: (PFO1/3C) Palustrine, Forested, Broad-Leaved Deciduous, Broad-Leaved Evergreen Seasonally Flooded
Wetland 2 is located in the western portion of the study area, along the south side of US 17/92. Wetland 2 is contiguous with the larger wetland system outside of the study area, and it is directly connected to Reedy Creek. Wetland 2 is dominated by a canopy of cypress, red maple, sweet gum, and sweet bay. The understory is made up of elderberry, wax myrtle, lizard's tail, buttonbush, fetterbush, swamp fern, redroot, royal fern, cinnamon fern, pickerelweed, cattail, and saw palmetto.

Wetland 2 has a high ecological value for fish and wildlife, providing habitat for reptiles, amphibians, and various mammals. However, US 17/92 has negatively affected the water quality because of the untreated stormwater entering Wetland 2.

Wetland 2A (WL-2A)
FLUCFCS 630 – Wetland Forested Mixed
USFWS – Not Applicable
Wetland 2A is located in the western portion of the study area, along the northside of US 17/92. Wetland 2A continues north outside of the study area, and it is directly connected to Reedy Creek. Wetland 2A is dominated by a canopy of cypress, red maple, sweet gum, and sweet bay. The understory is made up of

elderberry, wax myrtle, lizard's tail, buttonbush, fetterbush, swamp fern, redroot, royal fern, cinnamon fern, pickerelweed, cattail, and saw palmetto.

Wetland 2A has a high ecological value for fish and wildlife, providing habitat for reptiles, amphibians, and various mammals. However, US 17/92 has negatively affected the water quality because of untreated stormwater the entering Wetland 2A.

Wetland 3 (WL-3)
FLUCFCS 630 – Wetland Forested Mixed
USFWS – Not Applicable
Wetland 3 is located in the western portion of the study area, north of the intersection of 17/92 and Osceola Polk Line Road, and this system is connected to Reedy Creek. Wetland 3 has a canopy made up of red maple, sweet gum, slash pine, and cypress. The understory includes lizard's tail, swamp fern, royal fern, soft rush (*Juncus effusus*), and wax myrtle.

Wetland 3 has a moderate ecological value for fish and wildlife, providing habitat for reptiles, amphibians, and various mammals. However, US 17/92 has negatively affected the water quality because of the untreated stormwater entering Wetland 3.

Wetland 4 (WL-4)
FLUCFCS 643 – Wet Prairies
USFWS – Not Applicable
Wetland 4 is located in the western portion of the study area, and it is adjacent to Osceola Polk Line Road. A railroad right-of-way is also located to the north of this wetland. Wetland 4 continues outside of the study area, and it is connected to Reedy Creek. The vegetation found in Wetland 4 includes groundsel tree, cogongrass (*Imperata cylindrica*), dog fennel (*Eupatorium capillifolium*), soft rush, cattail, and Bahiagrass (*Paspalum notatum*).

Wetland 4 has a low ecological value for fish and wildlife, providing some habitat for reptiles, amphibians, and various mammals. However, US 17/92 and Osceola Polk Line Road has negatively affected the water quality because of the untreated stormwater flowing into this system. In addition, exotic vegetation was observed in Wetland 4.

Wetland 5 (WL-5)
FLUCFCS 630 – Wetland Forested Mixed
USFWS: (PFO1/3C) Palustrine, Forested, Broad-Leaved Deciduous, Broad-Leaved Evergreen Seasonally Flooded
Wetland 5 is located in the western portion of the study area and is adjacent to the southside of Osceola Polk Line Road, near the intersection of US17/92 and Osceola Polk Line Road. The wetland continues south outside of the study area and ultimately drains to Reedy Creek. The dominant vegetation in the system includes sweet gum, red maple, cypress, slash pine, cogon grass, soft rush, dog fennel, pickerelweed, and maidencane.

Wetland 5 has a Low ecological value for fish and wildlife, providing habitat for reptiles, amphibians, and various mammals. However, Osceola Polk Line Road and surrounding development has negatively

affected the water quality because of the untreated stormwater flowing into this system. In addition, exotic vegetation was observed in Wetland 5.

Wetland 6 (WL-6)

FLUCFCS 630- Wetland Forested Mixed

USFWS: (PFO1/3C) Palustrine, Forested, Broad-Leaved Deciduous, Broad-Leaved Evergreen Seasonally Flooded

Wetland 6 is located in the western portion of the study area and is adjacent to the southside intersection of Osceola Polk Line and US 17/92. Wetland 6 is indirectly connected to Reedy Creek. The dominant vegetation in the system includes sweet gum, red maple, cypress, slash pine. The understory includes lizard's tail, swamp fern, royal fern, soft rush, and wax myrtle. Exotic species include primrose willow.

Wetland 6 has a moderate ecological value for fish and wildlife, providing habitat for reptiles, amphibians, and various mammals. However, US 17/92 and the surrounding development has negatively affected the water quality because of the untreated stormwater flowing into this system. In addition, exotic vegetation is present in Wetland 6.

Wetland 9 (WL-9)

FLUCFCS 630 – Wetland Forested Mixed

USFWS-None

Wetland 9 is located near the central portion of the study area, east of the intersection of Old Tampa Highway and US 17/92. Wetland 9 is contiguous with the larger wetland system outside of the study area and it is directly connected to Reedy Creek. The canopy in the system is a mix of sweet gum, cypress, slash pine, and red maple. The understory is sparse but includes saw palmetto, lizard's tail, Virginia chain fern, and several species of nutsedges (*Cyperus* spp.).

Wetland 9 has a moderate ecological value for fish and wildlife, providing habitat for reptiles, amphibians, and various mammals. However, US 17/92 and the surrounding development has negatively affected the water quality because of the untreated stormwater entering in Wetland 9.

Wetland 10 (WL-10)

FLUCFCS 630 – Wetland Forested Mixed

USFWS-None

Wetland 10 is located near the central portion of the study area, east of the intersection of Old Tampa Highway and US 17/92. The canopy in the system consists of cypress with scattered sweet gum and slash pine. The understory is sparse but includes scattered saw palmetto, lizard's tail, Virginia chain fern, and maidencane.

Wetland 10 has a moderate ecological value for fish and wildlife, providing habitat for reptiles, amphibians, and various mammals. However, US 17/92 and the surrounding development has affected the water quality because of the untreated stormwater entering Wetland 10.

Wetland 11 (WL-11)

FLUCFCS 630 - Wetland Forested Mixed

USFWS: (PFO2C) Palustrine, Forested, Needle-Leaved Deciduous, Seasonally Flooded

Wetland 11 is near the central portion of the study area, west of Wetland 12 and on the south of US 17/92. Wetland 11 continues outside of the study area, and it ultimately drains toward Reedy Creek. The forested system has a canopy of cypress, red maple, sweet gum, and slash pine, and an understory with scattered lizard's tail, Virginia chain fern, and maiden cane.

Wetland 11 has a moderate ecological value for fish and wildlife, providing habitat for reptiles, amphibians, and various mammals. However, US 17/92 and the surrounding development has negatively affected the water quality because of the untreated stormwater entering Wetland 11.

Wetland 12 (WL-12)

FLUCFCS 630 - Wetland Forested Mixed

USFWS: (PFO2C) Palustrine, Forested, Needle-Leaved Deciduous, Seasonally Flooded

Wetland 12 is in the central portion of the study area, east of Wetland 11, and on the southside of US 17/92. Wetland 12 continues outside of study area, and this system collects stormwater from a culvert and drains south toward Reedy Creek. Wetland 12 is a forested system with a canopy of red maple, sweet gum, and slash pine. The understory is infested by primrose willow but also includes lizard's tail, pickerelweed, and nutsedge.

Wetland 12 has a low ecological value for fish and wildlife, providing habitat for reptiles, amphibians, and various mammals. This is due to US 17/92 and the surrounding development negatively affecting the water quality because of the untreated stormwater flowing into this system and the observed exotic vegetation in Wetland 12.

Wetland 13 (WL-13)

FLUCFCS 630 - Wetland Forested Mixed

USFWS: (PFO1/3C) Palustrine, Forested, Broad-Leaved Deciduous, Broad-Leaved Evergreen Seasonally Flooded

Wetland 13 is in the central portion of the study area, across from Wetland 17 and on the southside of US 17/92. Wetland 13 continues outside of the study area, and this system collects stormwater from a roadside ditch and ultimately drains toward Reedy Creek. Wetland 13 is a forested system with a canopy of red maple, sweet gum, American elm (*Ulmus americana*), and cypress with an understory that is made up of elderberry, wax myrtle, lizard tail, Virginia chain fern, royal fern, bull-tongue arrowhead (*Sagittaria lancifolia*), pickerelweed, swamp fern, and nutsedge.

Wetland 13 has a moderate ecological value for fish and wildlife, providing habitat for reptiles, amphibians, and various mammals. However, US 17/92 and the surrounding development has negatively affected the water quality because of the untreated stormwater entering Wetland 13.

Wetland 14 (WL-14)

FLUCFCS 630 - Wetland Forested Mixed

USFWS- (PFO6F) Palustrine, Forested, Deciduous, Semi-permanently Flooded

Wetland 14 is located in the eastern portion of the study area, across from Wetland 16 and on the southside of US 17/92. Wetland 14 continues outside of the study area, and this system collects

stormwater from a roadside ditch and ultimately drains to Reedy Creek. Wetland 14 is a forested system dominated by cypress with slash pine, sweetgum, red maple, and sweet bay. The understory is made up of elderberry, wax myrtle, lizard's tail, buttonbush, fetterbush, swamp fern, redroot, royal fern, cinnamon fern, pickerelweed, cattail, sawgrass, soft rush, and saw palmetto.

Wetland 14 has a moderate ecological value for fish and wildlife, providing habitat for reptiles, amphibians, and various mammals. However, US 17/92 and the surrounding development has negatively affected the water quality because of the untreated stormwater entering Wetland 14.

Wetland 16 (WL-16)

FLUCFCS 630 - Wetland Forested Mixed

USFWS- (PFO6F) Palustrine, Forested, Deciduous, Semi-permanently Flooded

Wetland 16 is located in the eastern portion of the study area, across from Wetland 14, on the northside of US 17/92. Wetland 16 continues outside of the project area and this system collects stormwater from a roadside ditch and ultimately drains toward Reedy Creek. Wetland 16 is a forested system with a canopy of cypress with slash pine, sweetgum, red maple, sweetbay and American elm. Some areas include open areas that consist of elderberry, wax myrtle, groundsel tree, bushy bluestem (*Andropogon glomeratus*), dogfennel, and coffeeweed. The understory includes lizard's tail, swamp fern, royal fern, and soft rush. The wetland also consists of areas of open water. Wetland 16 is partly disturbed due to the active road construction project.

Wetland 16 has a moderate to high ecological value for fish and wildlife, providing habitat for reptiles, amphibians, and various mammals. However, US 17/92 and the surrounding development has negatively affected the water quality because of the untreated stormwater entering Wetland 16.

Wetland 16A (WL-16A)

FLUCFCS 640 - Vegetated Non-forested Wetlands

USFWS- (PFO6F) Palustrine, Forested, Deciduous, Semi-permanently Flooded

Wetland 16A is located in the eastern portion of the study area, across from Wetland 14, on the northside of US 17/92. This system was permitted for impact under SFWMD Permit Number 171011-17. Wetland 16A continues outside of the project area and this system collects stormwater from a roadside ditch and ultimately drains toward Reedy Creek. Wetland 16 is an herbaceous system with an elderberry, wax myrtle, groundsel tree, bushy bluestem (*Andropogon glomeratus*), dogfennel, and coffeeweed. The understory includes lizard's tail, swamp fern, royal fern, and soft rush. The wetland also consists of areas of open water. The roadside ditches associated with this wetland are dominated by primrose willow. Wetland 16A is partly disturbed due to the active road construction project to the east.

Wetland 16A has a moderate to high ecological value for fish and wildlife, providing habitat for reptiles, amphibians, and various mammals. However, US 17/92 and the surrounding development has negatively affected the water quality entering Wetland 16A.

Wetland 17 (WL-17)

FLUCFCS 630 - Wetland Forested Mixed

USFWS: (PFO1/3C) Palustrine, Forested, Broad-Leaved Deciduous, Broad-Leaved Evergreen Seasonally Flooded

Wetland 17 is in the central portion of the study area, across from Wetland 13 and on the northside of US 17/92. Wetland 17 continues outside of the study area, and this system collects stormwater from a roadside ditch that ultimately drains toward Reedy Creek. Wetland 17 is a forested system with a canopy of red maple, sweet gum, American elm, and cypress with an understory that is made up of elderberry, wax myrtle, lizard tail, Virginia chain fern, royal fern, bull-tongue arrowhead, pickerelweed, swamp fern, and nutsedge.

Wetland 17 has a moderate ecological value for fish and wildlife, providing habitat for reptiles, amphibians, and various mammals. However, US 17/92 and the surrounding development has negatively affected the water quality because of the untreated stormwater entering Wetland 17.

Wetland 18 (WL-18)

FLUCFCS 630 - Wetland Forested Mixed

USFWS- (PFO6F) Palustrine, Forested, Deciduous, Semi-permanently Flooded

Wetland 18 is located in the central portion of the study area, across from Wetland 11. Wetland 18 continues outside of the study area, and this system collects stormwater from a roadside ditch and ultimately drains toward Reedy Creek. Wetland 18 is a forested system with a mixture of cypress, slash pine, sweetgum, red maple, and sweetbay. The understory includes lizard's tail, swamp fern, royal fern, soft rush, cattail, dogfennel, nutsedge, alligator weed (*Alternanthera philoxeroides*), and wax myrtle.

Wetland 18 has a moderate ecological value for fish and wildlife, providing habitat for reptiles, amphibians, and various mammals. However, US 17/92 and the surrounding development has negatively affected the water quality because of the untreated stormwater. In addition, exotic vegetation was observed in Wetland 18.

Wetland 19 (WL-19)

FLUCFCS 630 - Wetland Forested Mixed

USFWS- Not Applicable

Wetland 19 is located in the western portion of the study area, southeast of Wetland 2, and on the eastside of US 17/92. Wetland 19 continues south outside of the study area and this system collects stormwater from a roadside ditch. A secondary branch of the wetland extends from the wetland to the south, into pasture to the east of the project corridor. Wetland 19 is a forested system with sweetgum and scattered red maple and slash pine. The understory includes groundsel tree, cattail, primrose willow, beggarticks (*Bidens laevis*), poison ivy (*Toxicodendron radicans*), and blackberry (*Rubus* spp.).

Wetland 19 has a low ecological value for fish and wildlife, providing minimal habitat for reptiles, amphibians, and various mammals. Additionally, US 17/92 and the surrounding development has negatively affected the water quality because of the untreated stormwater entering Wetland 19.

Wetland 21 (WL-21)

FLUCFCS 630 - Wetland Forested Mixed

USFWS- (PFO6F) Palustrine, Forested, Deciduous, Semi-permanently Flooded

Wetland 21 is located in the central portion of the study area between Old Tampa Highway and US 17/92. Wetland 21 continues outside of the study area to the west and this system collects stormwater from a roadside ditch and ultimately drains towards Reedy Creek. Wetland 21 is mainly a forested system dominated by sweetgum and slash pine with scattered red maple and cypress. Part of the wetland has a canopy mainly made up of Carolina willow. The understory is a mixture of elderberry, willow, wax myrtle, cogon grass, cattail, lizard's tail, Caesarweed (*Urena lobata*), dogfennel, primrose willow, bogbutton, bushy bluestem, coffeeweed, soft rush, alligator weed, bull-tongue arrowhead, pickerelweed, and redroot.

Wetland 21 has a moderate ecological value for fish and wildlife, providing habitat for reptiles, amphibians, and various mammals. Additionally, US 17/92, Old Tampa Highway, and the surrounding development has negatively affected the water quality because of the untreated stormwater flowing into this system. In addition, the observed exotic vegetation in Wetland 21 has also affected the function and value.

Wetland 41 (WL-41)

FLUCFCS 630 - Wetland Forested Mixed

USFWS- (PFO2) Palustrine, Forested, Needle-Leaved Deciduous, Seasonally Flooded

Wetland 41 is located in the central portion of the study area between Old Tampa Highway and US 17/92. Wetland 41 continues outside of the study area to the east and collects stormwater from a roadside ditch and ultimately drains towards Reedy Creek. Wetland 41 is mainly a forested system dominated by sweetgum and slash pine with scattered red maple and cypress. The understory is a mixture of elderberry, willow, wax myrtle, cogon grass, cattail, lizard's tail, primrose willow, bogbutton, and bushy bluestem.

Wetland 21 has a moderate ecological value for fish and wildlife, providing habitat for reptiles, amphibians, and various mammals. However, US 17/92 and the surrounding development has negatively affected the water quality because of the untreated stormwater flowing into this system and the observed exotic vegetation has also affected Wetland 41.

Wetland 41A (WL-41A)

FLUCFCS 630 - Wetland Forested Mixed

USFWS- Not Applicable

Wetland 41A is located in the central portion of the study area north of Old Tampa Highway and south of a railway line which runs parallel to Old Tampa Highway. Wetland 41A flows from a wetland located north of the railway and flows south under Old Tampa Highway into Wetland 41 to the south. This system collects stormwater from a roadside ditch and ultimately drains towards Reedy Creek. Wetland 41A is mainly a forested system dominated by sweetgum with scattered red maple. Part of the wetland has a canopy mainly made up of Carolina willow. The understory is a mixture of elderberry, willow, wax myrtle, Caesarweed, dogfennel, primrose willow, bull-tongue arrowhead, pickerelweed, and redroot.

Wetland 41A has a low ecological value for fish and wildlife, providing minimal habitat for reptiles, amphibians, and various mammals. Additionally, Old Tampa Highway, the railway, and the surrounding development has negatively affected the water quality because of the untreated stormwater flowing into this system. Observed exotic vegetation has also affected Wetland 41A.

Other Surface Waters

There are 29 other surface waters identified that will impacted by the Preferred Alternative and they are describe below:

FLUCFCS 510 – Streams and Waterways

Surface Water (SW-#) systems: SW-6, SW-7, SW-8, SW-14, SW-16, SW-17, SW-18, SW-19, SW-20, SW-21, SW-22, SW-23, SW-24, SW-25, SW-26, SW-27, SW-28, SW-29, SW-30, SW-31, SW-32, SW-33, SW-34, SW-35, SW-36, SW-37, SW-38, SW-39.

There are 28 linear roadside ditches (FLUCFCS 510) that convey stormwater through the existing project corridor and some of these ditches are maintained, while others are overgrown. Additionally, these drainage ditches are located in areas with residential and commercial development. The vegetation observed in these other surface waters includes, but is not limited to, cattail, primrose willow, beggarticks, Bahia, and blackberry. The systems are made linear ditches with minimal ecological value for fish and wildlife.

FLUCFCS 530 – Reservoirs

Surface Water 15 (SW-15)

Surface water 15 is a reservoir- or artificial impoundment of water used for irrigation, flood control, municipal and rural water supplies. SW-15 is located in the eastern portion of the study area at the intersection of Avenue A and US 17/92. The stormwater pond provides treatment for a commercial building along US 17/92. The vegetation observed includes bull tongue, cattail, and various other grasses and sedges.

4.4 Potential Wetland and Other Surface Water Impacts

Preferred Alternative

The Preferred Alternative will widen US 17/92 from the 2-lane typical section to a 4-lane typical section and it includes a new bridge north of the existing bridge which utilizes the old US17/92 bridge alignment no longer in use. The best-fit alignment maximizes the existing ROW, and it consists of widening to the north on the east end of the project corridor to minimize relocations, then shifts to the south through the central portion of the project corridor to avoid an existing cemetery, and then shifts back to the north on the west end of the project corridor to align with the Poinciana Parkway Extension. Therefore, the best-fit alignment and utilization of existing infrastructure minimizes impacts to natural resources, such as wetlands. Pond siting was limited due to the tie-in locations from projects on the west and east end of the Preferred Alternative. Two of the proposed ponds will be joint-use retention to treat stormwater from the Preferred Alternative and aforementioned projects in Section 1. Additionally, there is a stormwater pond (Pond 3.1) and Floodplain Compensation Area (FPC) included in the Preferred Alternative that are not associated with the joint use ponds, and they are located in the central portion of the study area. Pond 3.1 is located between US 17/92 and Old Tampa Highway, and FPC is located north of the Old Tampa Highway. Pond 3.1 was selected and will result in wetland impacts; however,

these impacts are lower when compared to the other pond site alternatives that were previously evaluated. The FPC site will not impact wetlands, and therefore, it was selected over the two other potential FPC locations. Pond 4.1 is included in the Preferred Alternative and results in no wetland impacts. Please see the PSR for more details on the Pond Sites and FPCs. However, direct and indirect impacts anticipated from the Preferred Alternative are discussed in the subsections below.

4.4.1 Direct Impacts

The Preferred Alternative will result in wetland and OSW impacts. Accounting for the proposed typical sections and drainage improvements, the estimated project footprint will result in 54.24 acres of direct wetland impacts and 2.88 acres of other surface waters impacts. The calculated impacts per system are provided below in **Table 4**.

4.4.2 Indirect Impacts

The Preferred Alternative was evaluated for potential indirect (i.e., secondary) impacts during construction, these impacts were calculated in wetland areas 25 feet beyond the limits of the direct wetland impacts (**Table 4**). It is anticipated that the Preferred Alternative will result in 11.24 acres of indirect wetland impact.

The Preferred Alternative may result in indirect water quality impacts, but those impacts will be reduced by capturing and treating stormwater prior to discharge. In addition, erosion control measures and the use of Best Management Practices (BMPs) during construction will be implemented to provide reasonable assurance that the Preferred Alternative will not contribute to violations of water quality standards.

Table 4: Anticipated Wetland Impacts and Functional Loss from the Preferred Alternative

Wetland or OSW ID	FLUCFCS Code and Description	Direct Impacts		Indirect Impact	
		Acre(s)	Functional Loss	Acre(s)	Functional Loss
WL-2	630 – Wetland Forested Mixed	16.78	13.424	3.61	0.241
WL-2A	630 – Wetland Forested Mixed	4.64	3.712	0.39	0.026
WL-3	630 – Wetland Forested Mixed	2.37	1.580	0.50	0.017
WL-4	643 - Wet Prairies	0.02	0.011	0.09	0.006
WL-5	630 – Wetland Forested Mixed	0.27	0.162	0.07	0.005
WL-6	630 – Wetland Forested Mixed	7.17	5.019	0.93	0.062
WL-9	630 – Wetland Forested Mixed	0.63	0.462	0.06	0.004
WL-10	630 – Wetland Forested Mixed	0.69	0.529	0.14	0.009
WL-11	630 – Wetland Forested Mixed	0.71	0.544	0.13	0.009
WL-12	630 – Wetland Forested Mixed	0.13	0.074	0.04	0.003
WL-13	630 – Wetland Forested Mixed	1.97	1.379	0.67	0.045
WL-14	630 – Wetland Forested Mixed	2.58	1.806	1.57	0.105
WL-16	630 – Wetland Forested Mixed	6.21	3.519	0.82	0.055
WL-16A	640 - Vegetated Non-forested Wetlands	1.08	0.540	0.43	0.029
WL-17	630 – Wetland Forested Mixed	1.41	0.752	0.55	0.037
WL-18	630 – Wetland Forested Mixed	0.06	0.042	0.08	0.005

WL-19	630 – Wetland Forested Mixed	0.46	0.230	0.24	0.016
WL-21	630 – Wetland Forested Mixed	7.00	4.900	0.69	0.046
WL 41	630 – Wetland Forested Mixed	0.04	0.025	0.11	0.007
WL 41A	630 – Wetland Forested Mixed	0.02	0.011	0.12	0.008
Total Wetland Impacts and Functional Loss		**54.24**	**38.721**	**11.24**	**0.735**

Table 5: Anticipated Other Surface Impacts from the Preferred Alternative

Other Surface Water ID	FLUCFCS Code and Description	Direct Impacts
SW-6	510-Streams and Waterways	0.09
SW-7	510-Streams and Waterways	0.02
SW-8	510-Streams and Waterways	0.01
SW-14	510-Streams and Waterways	0.44
SW-15	530-Reserviors	0.01
SW-16	510-Streams and Waterways	1.19
SW-17	510-Streams and Waterways	0.03
SW-18	510-Streams and Waterways	0.22
SW-19	510-Streams and Waterways	0.03
SW-20	510-Streams and Waterways	0.07
SW-21	510-Streams and Waterways	0.07
SW-22	510-Streams and Waterways	0.02
SW-23	510-Streams and Waterways	0.03
SW-24	510-Streams and Waterways	0.06
SW-25	510-Streams and Waterways	0.05
SW-26	510-Streams and Waterways	0.04
SW-27	510-Streams and Waterways	0.04
SW-28	510-Streams and Waterways	0.06
SW-29	510-Streams and Waterways	0.20
SW-30	510-Streams and Waterways	0.02
SW-31	510-Streams and Waterways	0.02
SW-32	510-Streams and Waterways	0.02
SW-33	510-Streams and Waterways	0.03
SW-34	510-Streams and Waterways	0.05
SW-35	510-Streams and Waterways	0.02
SW-36	510-Streams and Waterways	0.01
SW-37	510-Streams and Waterways	0.01
SW-38	510-Streams and Waterways	0.01
SW 39	510-Streams and Waterways	0.01
Total Impacts		**2.88**
Note: Other surface water impacts are not anticipated to require wetland mitigation.		

4.4.3 Cumulative Impacts

Direct and indirect impacts from the Preferred Alternative are minimal. Mitigation will be provided to offset the anticipated functional loss of wetlands and therefore, no adverse cumulative impacts are anticipated.

4.4.3 Avoidance and Minimization

In accordance with federal and state regulations, avoidance and minimization of wetland impacts were considered in developing the Preferred Alternative. These measures include proposing a typical section to meet the needs of the project and the minimum requirements of the FDOT standard design criteria; evaluating the best fit options for widening, including left/center/right; analyzing potential pond sites to collect stormwater runoff, and considering the use of retaining walls along steep side slopes to minimize the construction footprint.

4.5 Wetland Functional Assessment

An assessment was conducted for the wetlands within the footprint of the Preferred Alternative using the Chapter 62-345, FAC, Uniform Mitigation Assessment Method (UMAM). This process is used to determine the functional loss of the impacted wetlands and the amount of mitigation required to offset adverse impacts to these systems. The functional loss of wetlands is determined by assessing three parameters and scoring these parameters from one (1) to ten (10), with one being the lowest score and ten being the highest. These parameters are described below:

1. **Location and Landscape Support** - The value of functions provided by an assessment area to fish and wildlife are influenced by the landscape position of the assessment area and its relationship with surrounding areas. A score of ten (10) means the assessment area is ideally located and the surrounding landscape provides full opportunity for the assessment area to perform beneficial functions at an optimal level.
2. **Water Environment** - The quantity of water in an assessment area, including the timing, frequency, depth and duration of inundation or saturation, flow characteristics, and the quality of that water, may facilitate or preclude its ability to perform certain functions and may benefit or adversely impact its capacity to support certain wildlife. A score of ten (10) means that the hydrology and water quality fully support the functions and provide benefits to fish and wildlife at optimal capacity for the assessment area.
3. **Community Structure** - Each impact and mitigation assessment area are evaluated with regards to its characteristic vegetative community structure. In general, these areas are characterized either by plant cover or by open water with a submerged benthic community. A score of ten (10) means that the vegetation community and physical structure provide conditions which support an optimal level of function to benefit fish and wildlife utilizing the assessment area.

The results of the UMAM assessment are provided in **Table 4** (above). The UMAM assessment worksheets demonstrating these results are provided in **Appendix I**. These values may be refined with coordination and review by the regulatory agencies.

4.6 Wetland Mitigation

The FDOT will evaluate mitigation needs of the Preferred Alternative 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. There are multiple mitigation banks including, but not limited to, Reedy Creek and Southport Ranch Mitigation Banks that have credits available to offset the wetland impacts associated with the Preferred Alternative and meet the mitigation requirements of the USACE and SFWMD.

The Preferred Alternative has been evaluated in accordance with Federal Executive Order 11990 - "Protection of Wetlands." Based upon the above considerations, it is determined that there are no practicable alternatives to the proposed construction in wetlands and that the proposed action includes all practicable measures to minimize harm to wetlands which may result from such use. As the project advances through subsequent phases, avoidance and minimization of wetland impacts will continue to be considered to the maximum extent practicable. Therefore, with proper mitigation, the proposed project is expected to result in no significant impacts to wetlands.

5.0 Essential Fish Habitat

The NMFS is the regulatory agency responsible for the nation's living marine resources and their habitats, including EFH. This authority is designated by the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA), as amended. The MSFCMA defines EFH as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity" (16 U.S.C. § 1802(10)]. Based on the ETDM coordination, the NMFS concluded that the study area will not directly or indirectly impact EFH and provided a no involvement determination. Based on the location of the project, comment received from NMFS, and field review, the project will have no involvement with EFH.

6.0 Anticipated Permits

The Preferred Alternative will require permits from state and federal regulatory agencies for impacts to wetlands, other surface waters and water quality. **Table 6** provides a list of anticipated permits associated with the construction of the Preferred Alternative.

Table 6: Anticipated Permits for the Preferred Alternative

Permit Type	Agency
Individual Federal Section 404	USACE/FDEP
Individual Environmental Resource Permit (ERP)	SFWMD
National Pollution Discharge Prevention and Elimination System (NPDES)*	FDEP
Note: *This permit will be obtained by the selected construction contractor	

According to 18-21, FAC, projects that cross-state owned submerged lands are required to obtain or modify a Sovereign Submerged Lands (SSL) lease/easement for use of these lands. A review of the FDEP State Lands Board of Trustees Land Document System was conducted, and it was determined that the FDOT has an existing SSL easement for the existing bridge; however, this easement will not accommodate the proposed bridge over the previous bridge alignment. Therefore, the SSL easement will need to be modified for the Preferred Alternative. A copy of the existing SSL easement is located in **Appendix J**.

7.0 Conclusion

The US 17/92 PD&E Study was conducted to evaluate alternatives to address roadway deficiencies and capacity improvements from Ivy Mist Lane to Avenue A. The Preferred Alternative would address those safety and capacity concerns, be designed to current FDOT criteria, and implement avoidance and minimization measures to the greatest extent feasible to reduce impacts to wetlands and OSWs. Pursuant to Section 7 of the ESA, **Table 7** lists the federally listed species and the effects determinations. **Table 8** lists the anticipated wetland and OSW impacts for the Preferred Alternative.

Table 7: Federal and State Listed Species Effects Determinations for the Preferred Alternative

Scientific Name	Common Name	FWC	USFWS	Effect Determination
INVERTEBRATES				
Danaus plexippus	Monarch Butterfly	N	C	To Be Determined
AMPHIBIANS				
Notophthalmus perstriatus	Striped Newt	C	N	No Effect Anticipated
REPTILES				
Alligator mississippiensis	American Alligator	T	T(S/A)	No Effect
Drymarchon corais couperi	Eastern Indigo Snake	T	T	May Affect, Not Likely to Adversely Affect
Gopherus polyphemus	Gopher Tortoise	T	N	No Adverse Effect Anticipated
Pituophis melanoleucus	Pine Snake	T	N	No Adverse Effect Anticipated
Plestiodon (Eumeces) egregius lividus	Bluetail Mole Skink	T	T	May Affect, Not Likely to Adversely Affect
Plestiodon (Neoseps) reynoldsi	Sand Skink	T	T	May Affect, Not Likely to Adversely Affect
BIRDS				
Ammodramus savannarum floridanus	Florida Grasshopper Sparrow	E	E	No Effect
Antigone canadensis pratensis	Florida Sandhill Crane	T	N	No Effect Anticipated
Aphelocoma coerulescens	Florida Scrub-Jay	T	T	No Effect
Athene cunicularia	Florida Burrowing Owl	T	N	No Effect Anticipated
Dryobates (Picoides) borealis	Red-cockaded Woodpecker	E	E	No Effect
Egretta caerulea	Little Blue Heron	T	N	No Adverse Effect Anticipated
Egretta tricolor	Tricolored Heron	T	N	No Adverse Effect Anticipated
Falco sparverius paulus	Southeastern American Kestrel	T	N	No Adverse Effect Anticipated
Laterallus Jamaicensis	Black Rail	N	T	No Effect
Mycteria americana	Wood Stork	T	T	May Affect, Not Likely to Adversely Affect
Polyborus plancus audubonii	Audubon's crested caracara	T	T	May Affect, Not Likely to Adversely Affect
Rostrhamus sociabilis plumbeus	Everglade Snail Kite	E	E	No Effect

Scientific Name	Common Name	FWC	USFWS	Effect Determination
MAMMALS				
Eumops floridanus	Florida Bonneted Bat	E	E	May Affect, Not Likely to Adversely Affect
Perimyotis subflavus	Tri-colored Bat	N	C	To Be Determined
Puma concolor coryi	Florida panther	E	E	No Effect
PLANTS				
Andropogon arctatus	Pinewoods Bluestem	T	N	No Effect Anticipated
Bonamia grandiflora	Florida Bonamia	E	T	No Effect
Calamintha ashei	Ashe's Savory	T	N	No Effect Anticipated
Calopogon multiflorus	Many-flowered Grass-pink	T	N	No Effect Anticipated
Carex chapmanii	Chapman's Sedge	T	N	No Adverse Effect Anticipated
Centrosema arenicola	Sand Butterfly Pea	E	N	No Effect Anticipated
Chionanthus pygmaeus	Pygmy Fringe Tree	E	E	No Effect
Cladonia perforata	Perforate Reindeer Lichen	E	E	No Effect
Clitoria fragrans	Scrub Pigeon-Wing	E	T	No Effect
Coelorachis tuberculosa	Piedmont Jointgrass	T	N	No Effect Anticipated
Coleataenia abscissa	Cut-throat Grass	E	N	No Effect Anticipated
Conradina brevifolia	Short-leaved Rosemary	E	E	No Effect
Conradina grandiflora	Large-flowered Rosemary	T	N	No Effect Anticipated
Crotalaria avonensis	Avon Park rabbit-bells	E	E	No Effect
Dicerandra christmanii	Garrett's scrub balm	E	E	No Effect
Dicerandra frutescens	Scrub mint	E	E	No Effect
Eriogonum longifolium var. gnaphalifolium	Scrub Buckwheat	E	T	No Effect
Hartwrightia floridana	Hartwrightia	T	N	No Effect Anticipated
Hypericum cumulicola	Highlands scrub hypericum	E	E	No Effect
Illicium parviflorum	Star Anise	E	N	No Adverse Effect Anticipated
Lechea cernua	Nodding Pinweed	T	N	No Effect Anticipated
Lechea divaricata	Pine Pinweed	E	N	No Effect Anticipated
Lupinus aridorum	Scrub Lupine	E	E	No Effect
Lythrum flagellare	Lowland Loosestrife	E	N	No Effect Anticipated
Matelea floridana	Florida Spiny-pod	E	N	No Effect Anticipated
Najas filifolia	Narrowleaf Naiad	T	N	No Adverse Effect Anticipated
Nemastylis floridana	Celestial Lily	E	N	No Effect Anticipated

Scientific Name	Common Name	FWC	USFWS	Effect Determination
Nolina atopocarpa	Florida Beargrass	T	N	No Effect Anticipated
Nolina brittoniana	Britton's Beargrass	E	E	No Effect
Ophioglossum palmatum	Hand Fern	E	N	No Effect Anticipated
Paronychia chartacea var. chartacea	Paper-like Nailwort	E	T	No Effect
Pecluma plumula	Plume Polypody	E	N	No Adverse Effect Anticipated
Pecluma ptilota var. bourgeauana	Comb Polypody	E	N	No Adverse Effect Anticipated
Platanthera integra	Yellow Fringeless Orchid	E	N	No Effect Anticipated
Polygala lewtonii	Lewton's Polygala	E	E	No Effect
Polygonella myriophylla	Small's Jointweed	E	E	No Effect
Prunus geniculata	Scrub Plum	E	E	No Effect
Pteroglossaspis ecristata	Giant Orchid	T	N	No Effect Anticipated
Salix floridana	Florida willow	E	N	No Adverse Effect Anticipated
Schizachyrium niveum	Scrub Bluestem	E	N	No Effect Anticipated
Thelypteris serrata	Toothed Maiden Fern	E	N	No Effect Anticipated
Warea amplexifolia	Clasping Warea	E	E	No Effect
Warea carteri	Carter's warea	E	E	No Effect
Zephyranthes simpsonii	Redmargin Zephyrlily	T	N	No Effect Anticipated
E = Endangered, T = Threatened, E = Endangered, C =Candidate for Listing, SSC=Species of Special Concern N = Not Listed,				

Table 8: Anticipated Wetland and Other Surface Water Impacts for the Preferred Alternative

Wetlands and Other Surface Waters	Direct Impacts		Indirect Impact	
	Acre(s)	Functional Loss	Acre(s)	Functional Loss
Wetlands	54.24	38.721	11.24	0.735
Other Surface Water	2.86	-	-	-
Note: Other surface water impacts are not anticipated to require wetland mitigation.				

In accordance with Federal Executive Order 11990 "Protection of Wetlands", United States Department of Transportation Order 5660.1A "Preservation of the Nation's Wetlands", and Part 2, Wetlands and Other Surface Waters Chapter, of the PD&E Manual, the study area was reviewed to identify, quantify, and map wetland communities that are located within the proposed project boundaries. The Preferred Alternative was developed by determining a best-fit alignment by using avoidance and minimization to accommodate the proposed typical sections by evaluating left, right and center alignments. Therefore, with proper mitigation, the Preferred Alternative is expected to result in no significant impacts to wetlands or other surface waters.

The NMFS concluded during ETDM evaluation that the study area will not directly or indirectly impact EFH and provided a no involvement determination. Based on the location of the project, comment received from NMFS and field review, the Preferred Alternative will have no involvement with EFH.

7.1 Implementation Measures

Implementation Measures are actions the FDOT would be required to take per procedure, standard specifications, or other agency requirements that would be implemented at a later project phase, but which would help address or reduce project effects and that need to be relayed to the agencies during review of the NRE. The FDOT intends to conduct gopher tortoise surveys and obtain relocation permits, as required by the FWC *Gopher Tortoise Permitting Guidelines*.

7.2 Commitments

The FDOT commits to implementing the following measures during the final design, permitting and construction phases of this project:

Commitments

- Implement the USFWS's *Standard Protection Measures for the Eastern Indigo Snake* during construction and to inspect potential eastern indigo snake refugia prior to construction.
- If the listing status of the tri-colored bat is elevated by USFWS to Threatened or Endangered and the Preferred Alternative is located within the consultation area during the design and permitting phase of the proposed project, FDOT commits to re-initiating consultation with the USFWS to determine the appropriate survey methodology and to address USFWS regulations regarding the protection of the tri-colored bat.
- FDOT commits to re-initiating consultation with the USFWS to determine the appropriate survey methodology for the Audubon's crested caracara and to re-survey for this species prior to construction.
- The project is located within the Frequent Range of the Florida Black Bear. Therefore, consistent with the FWC Black Bear Management Plan, garbage and food debris must be properly removed from the construction site daily to eliminate possible sources that could encourage and attract bears. Nuisance black bears are to be reported to the FWC at the Wildlife Alert Hotline at 1-888-404-3922.

7.3 Agency Coordination

Coordination with the regulatory agencies was initiated through 2018 ETDM Summary Report #14365. This NRE will be submitted to the USFWS, USACE, FDEP, SFWMD, and FWC for review and additional coordination/consultation for the project. During this study, technical assistance from USFWS was obtained and the resulting coordination with USFWS is included in **Appendix B**.

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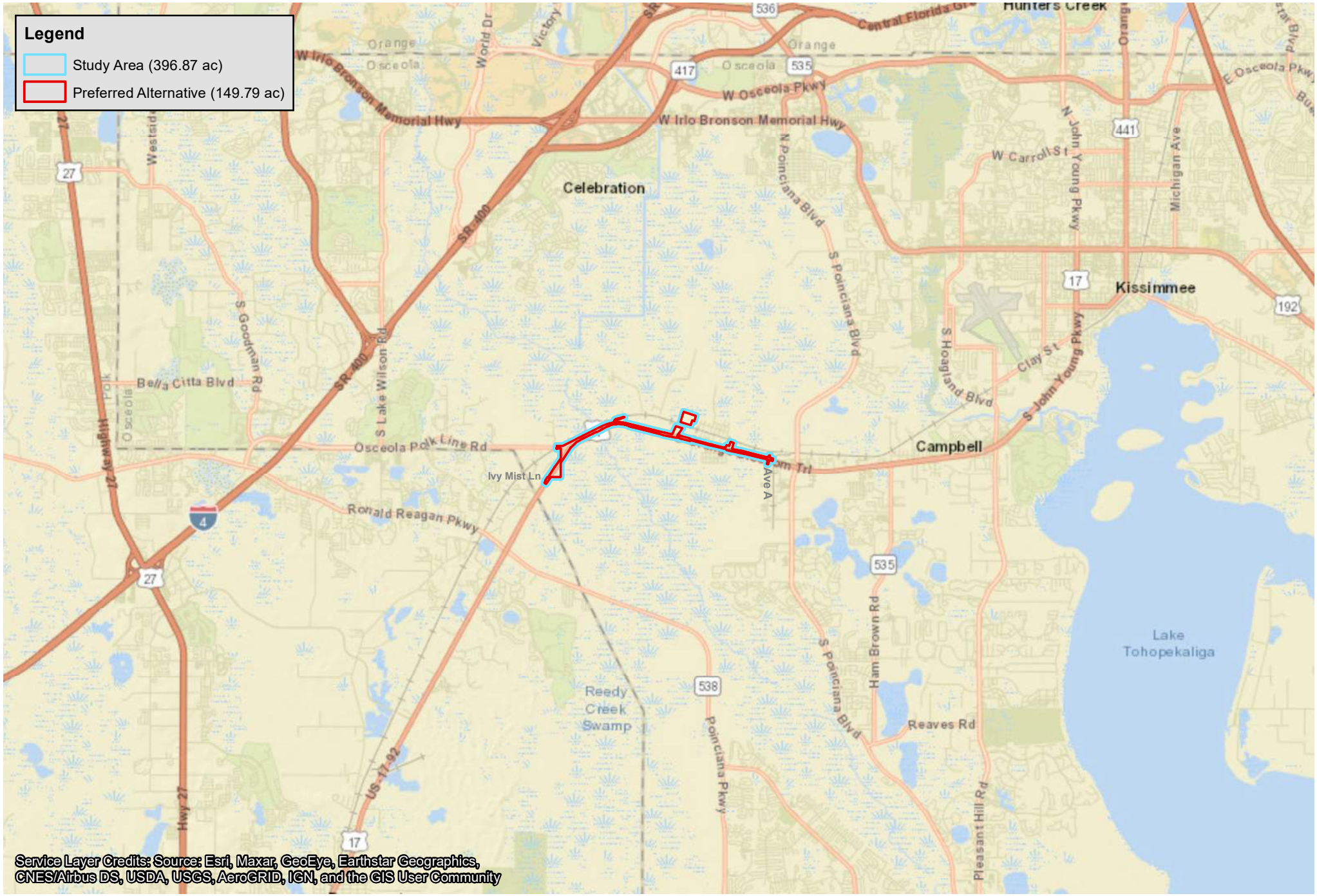
Appendix A:

Exhibits



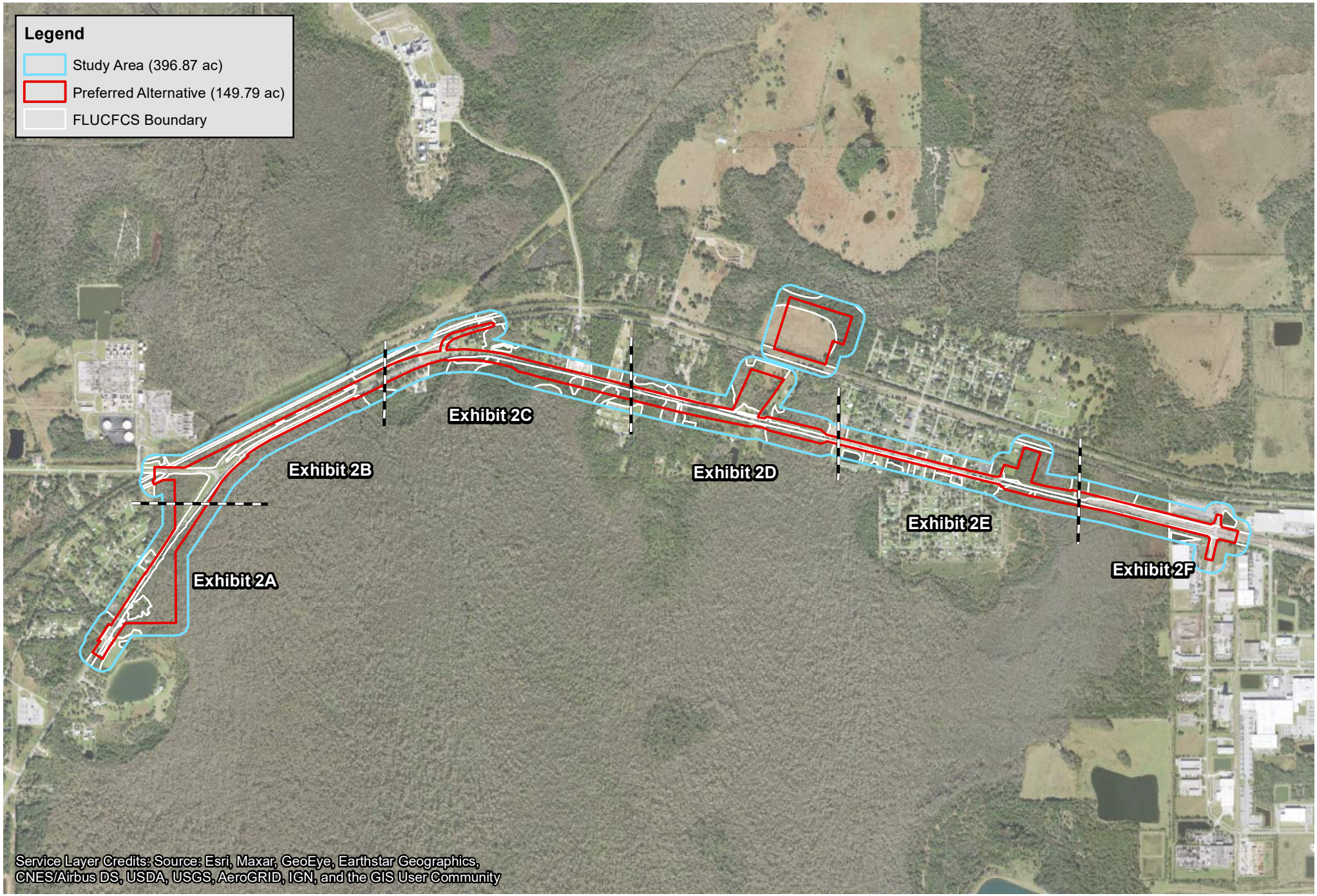
FDOT

Location Map
US 17/92 from CR 54 to Avenue A
Osceola County, FL
FPID: 437200-1-22-01/437200-2-22-01

Exhibit 1
September 2022

0 5,000 10,000 Feet

N



FDOT

Land Use Overview Map
US 17/92 from CR 54 to Avenue A
Osceola County, Florida
FPID: 437200-1-22-01/437200-2-22-01

Exhibit 2
September 2022

0 1,000 2,000 Feet

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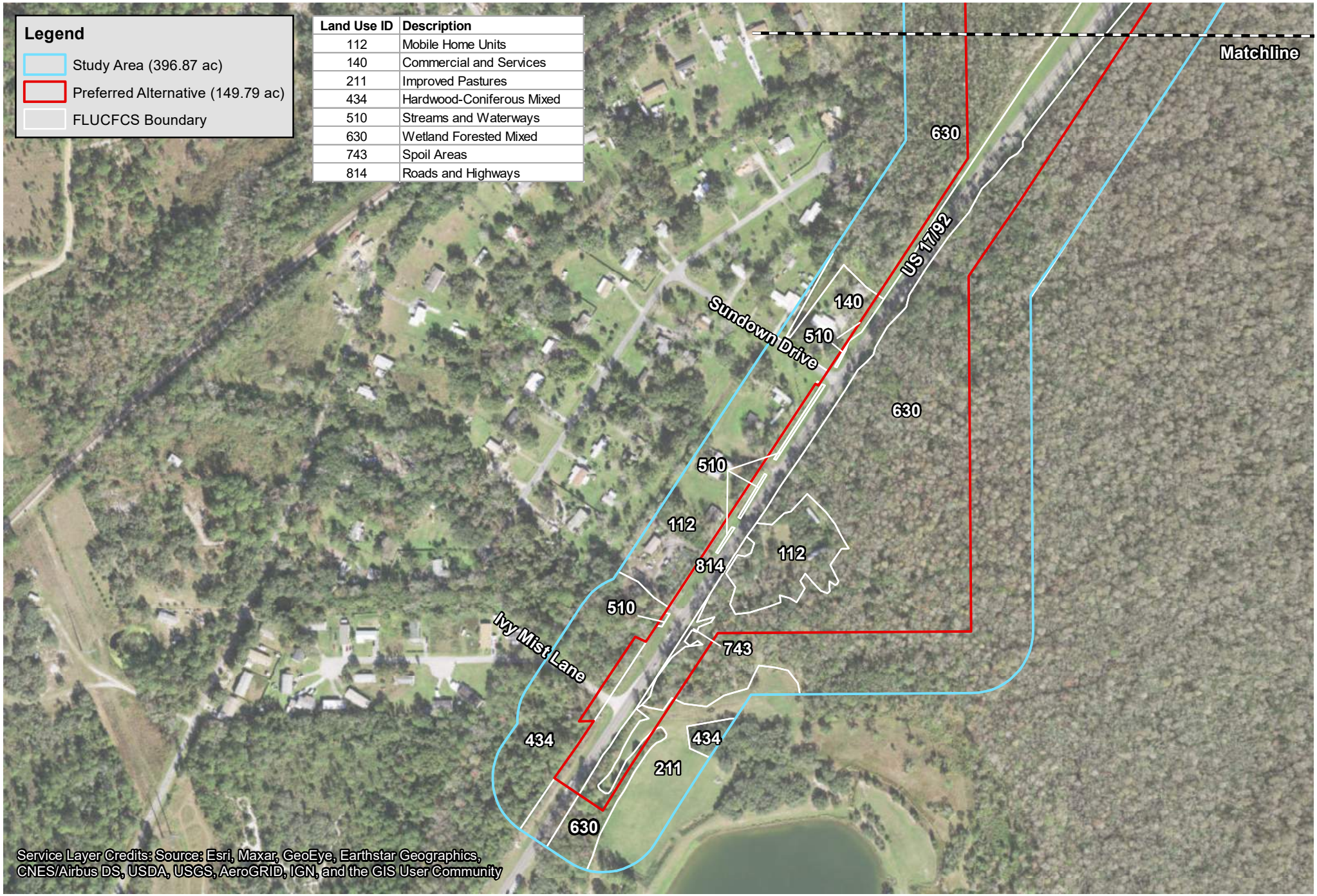

FDOT

Land Use Map
US 17/92 from CR 54 to Avenue A
Osceola County, Florida
FPID: 437200-1-22-01/437200-2-22-01

Exhibit 2A
September 2022

0 200 400 Feet

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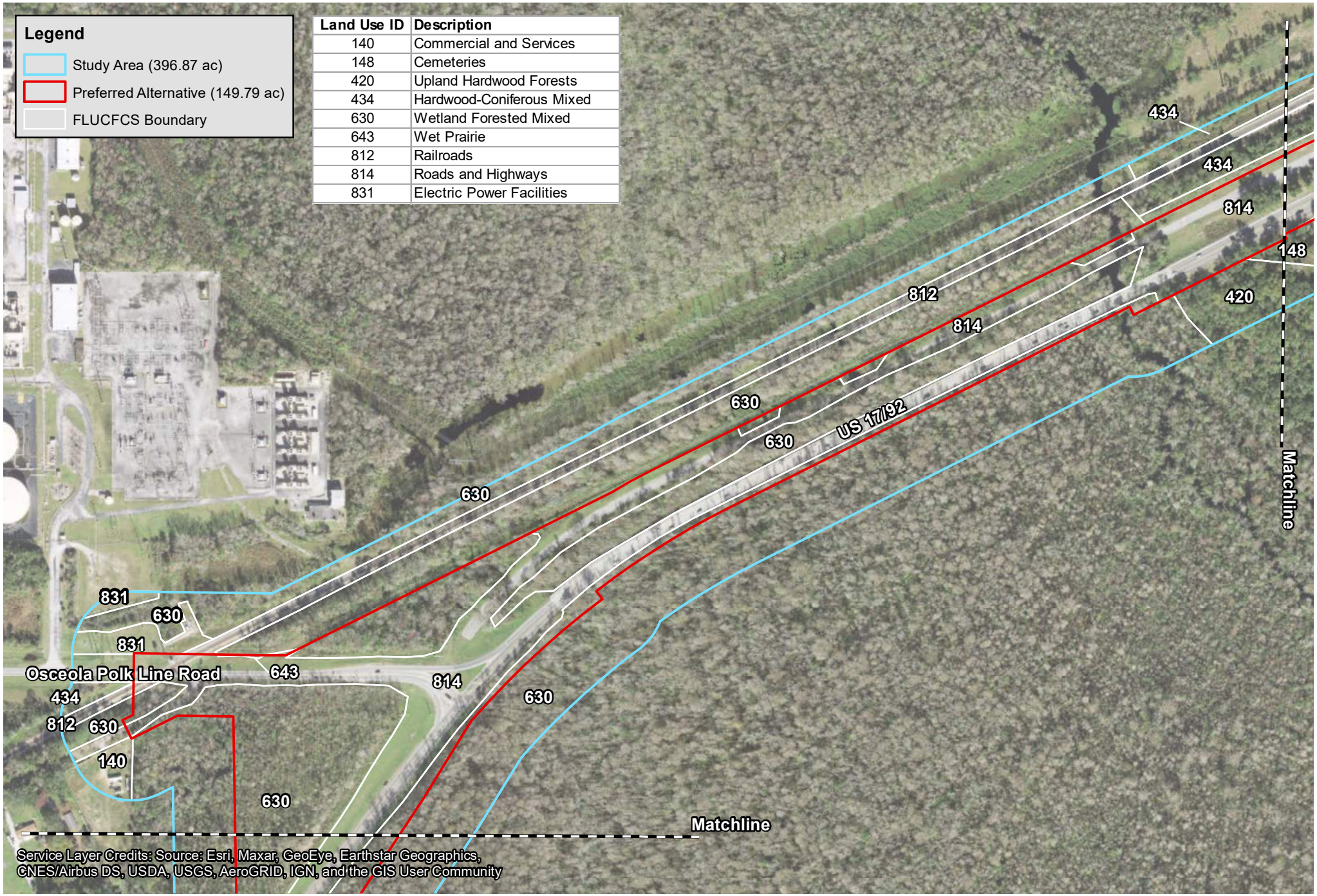


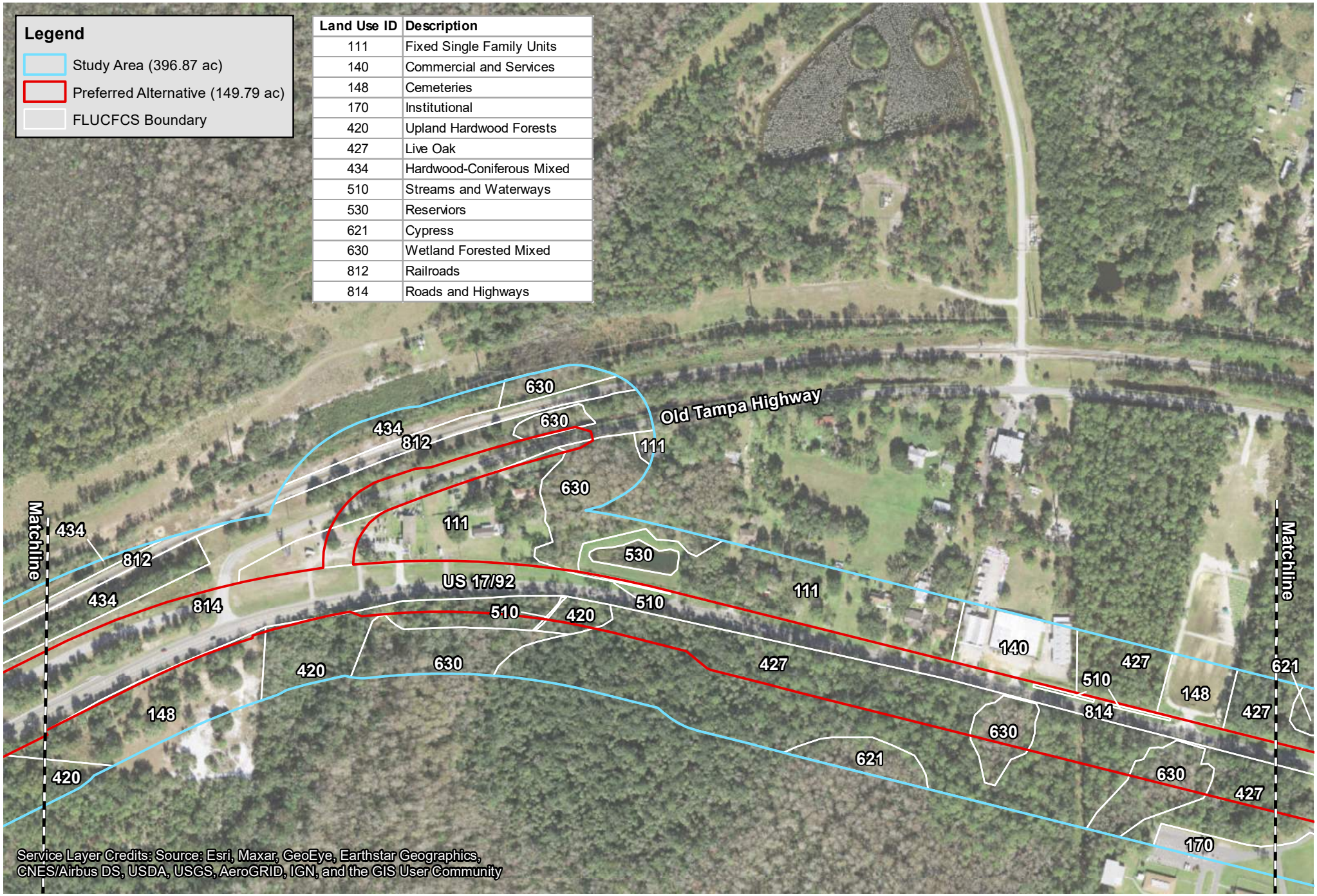
FDOT

Land Use Map
US 17/92 from CR 54 to Avenue A
Osceola County, Florida
FPID: 437200-1-22-01/437200-2-22-01

Exhibit 2B
September 2022

0 200 400 Feet

N



Land Use ID	Description
111	Fixed Single Family Units
140	Commercial and Services
148	Cemeteries
170	Institutional
420	Upland Hardwood Forests
427	Live Oak
434	Hardwood-Coniferous Mixed
510	Streams and Waterways
530	Reservoirs
621	Cypress
630	Wetland Forested Mixed
812	Railroads
814	Roads and Highways

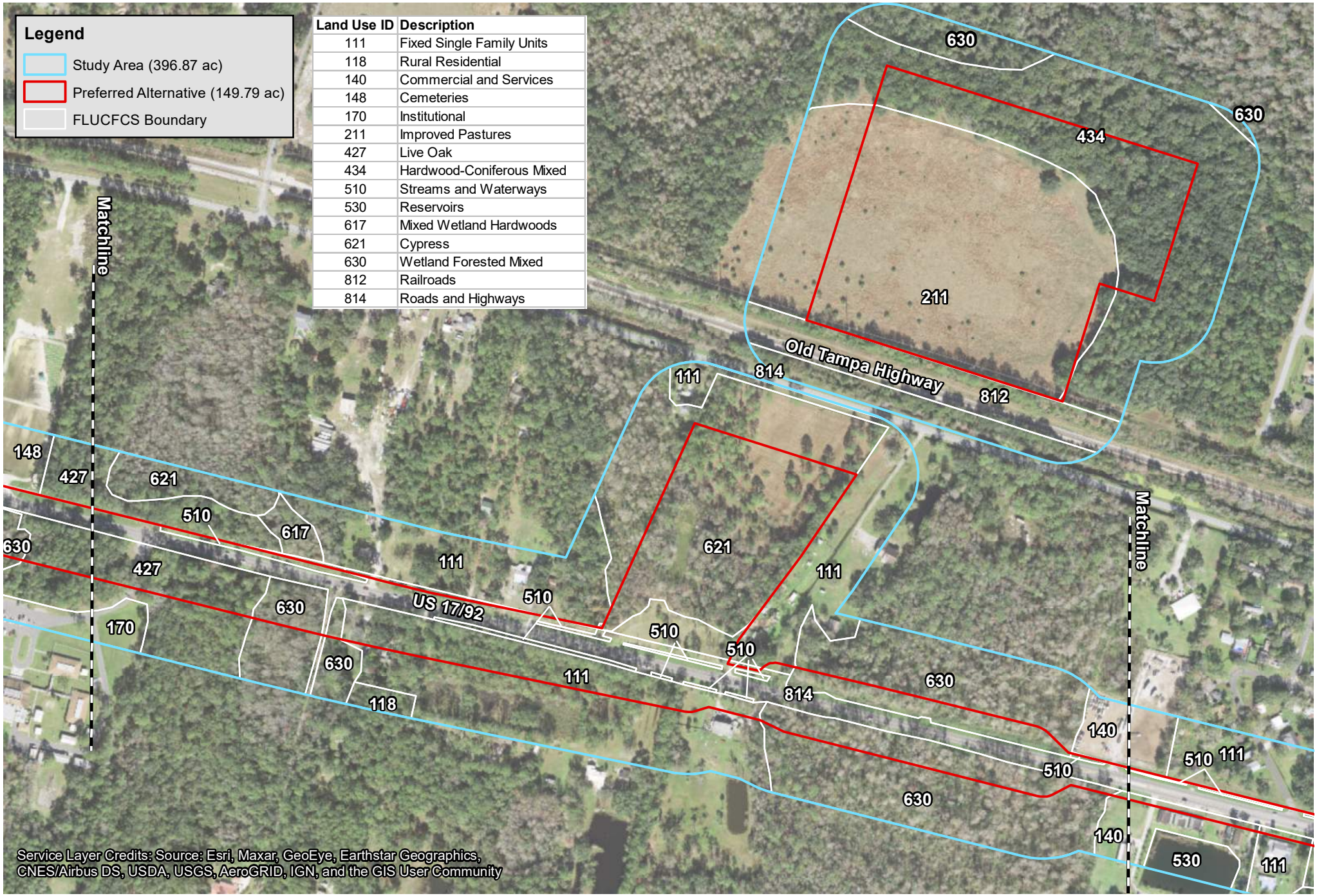
FDOT

Land Use Map
US 17/92 from CR 54 to Avenue A
Osceola County, Florida
FPID: 437200-1-22-01/437200-2-22-01

Exhibit 2C
September 2022

0 200 400 Feet

N



FDOT

Land Use Map
US 17/92 from CR 54 to Avenue A
Osceola County, Florida
FPID: 437200-1-22-01/437200-2-22-01

Exhibit 2D
September 2022

0 200 400 Feet

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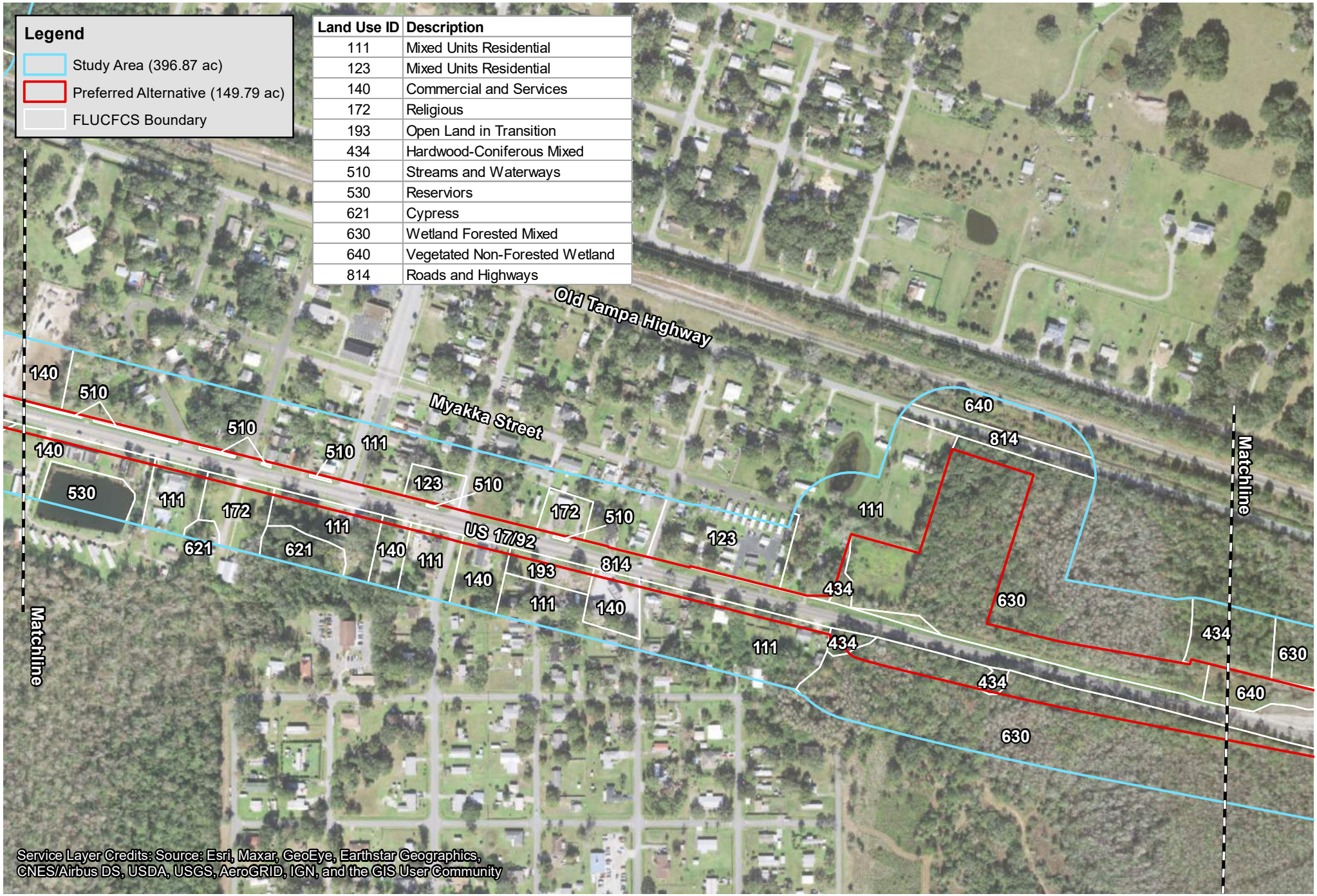


Land Use ID	Description
111	Mixed Units Residential
123	Mixed Units Residential
140	Commercial and Services
172	Religious
193	Open Land in Transition
434	Hardwood-Coniferous Mixed
510	Streams and Waterways
530	Reserviors
621	Cypress
630	Wetland Forested Mixed
640	Vegetated Non-Forested Wetland
814	Roads and Highways

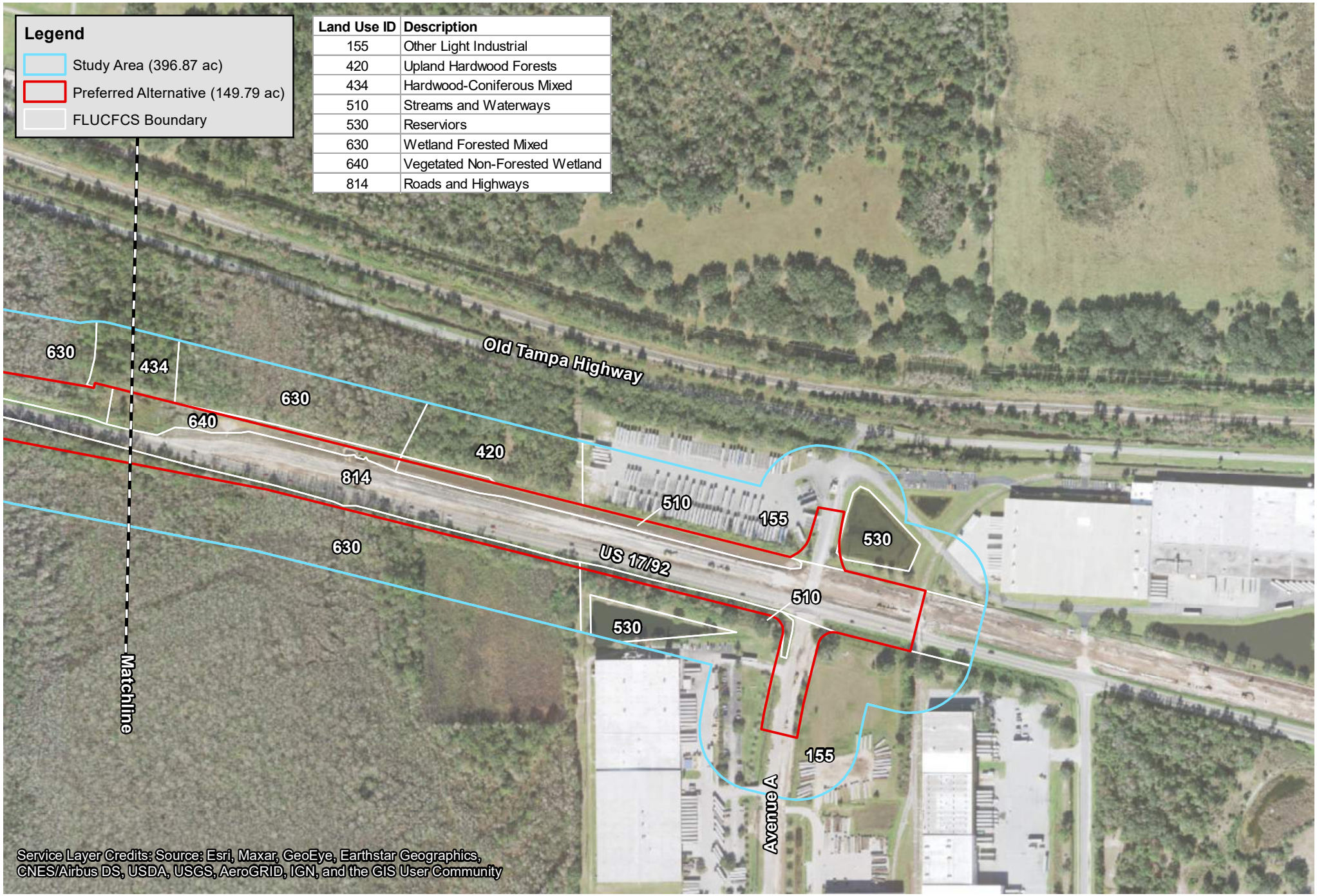
FDOT

Land Use Map
US 17/92 from CR 54 to Avenue A
Osceola County, Florida
FPID: 437200-1-22-01/437200-2-22-01

Exhibit 2E
September 2022

0 200 400 Feet

N



Land Use ID	Description
155	Other Light Industrial
420	Upland Hardwood Forests
434	Hardwood-Coniferous Mixed
510	Streams and Waterways
530	Reserviors
630	Wetland Forested Mixed
640	Vegetated Non-Forested Wetland
814	Roads and Highways

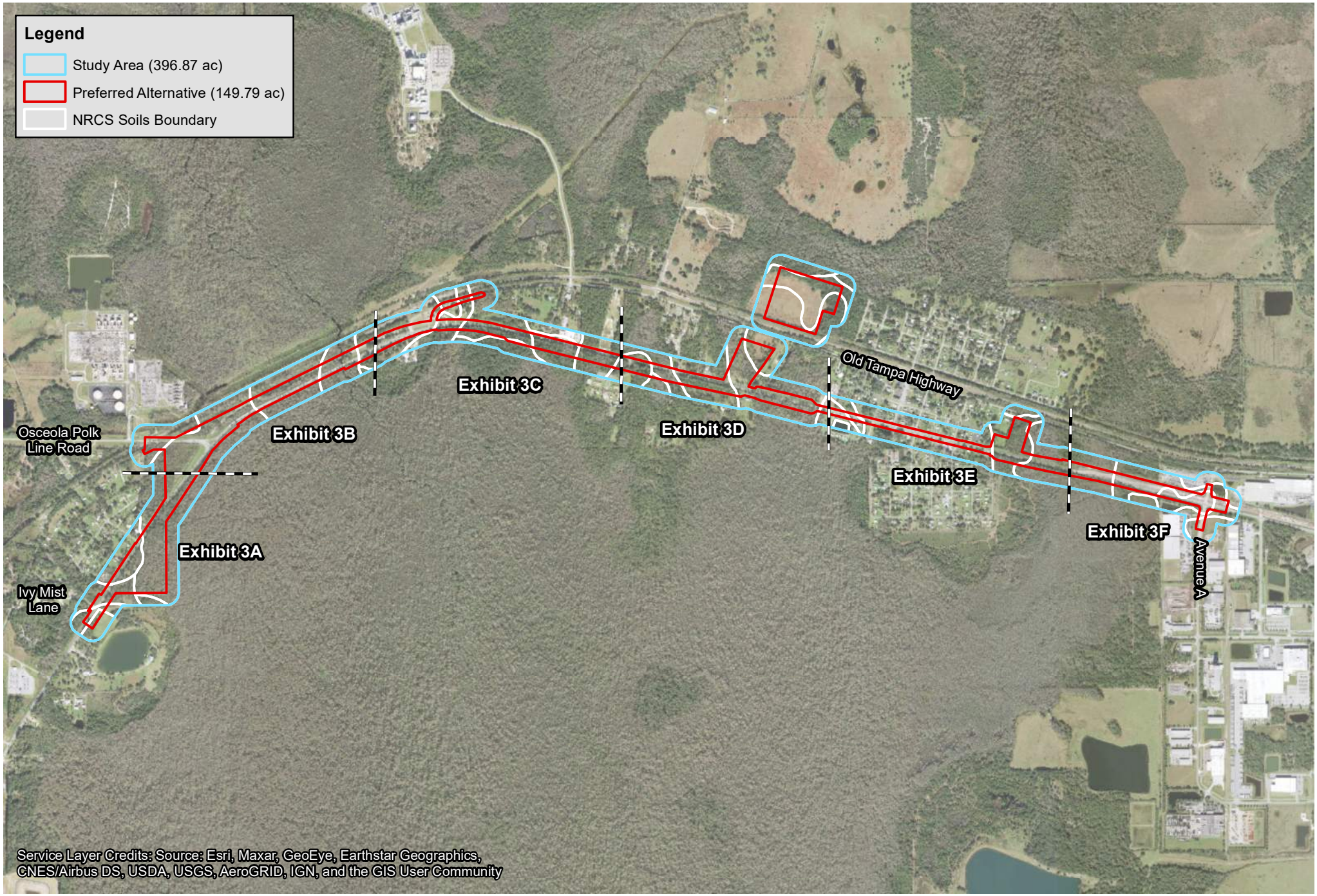
FDOT

Land Use Map
US 17/92 from CR 54 to Avenue A
Osceola County, Florida
FPID: 437200-1-22-01/437200-2-22-01

Exhibit 2F
September 2022

0 200 400 Feet

N



FDOT

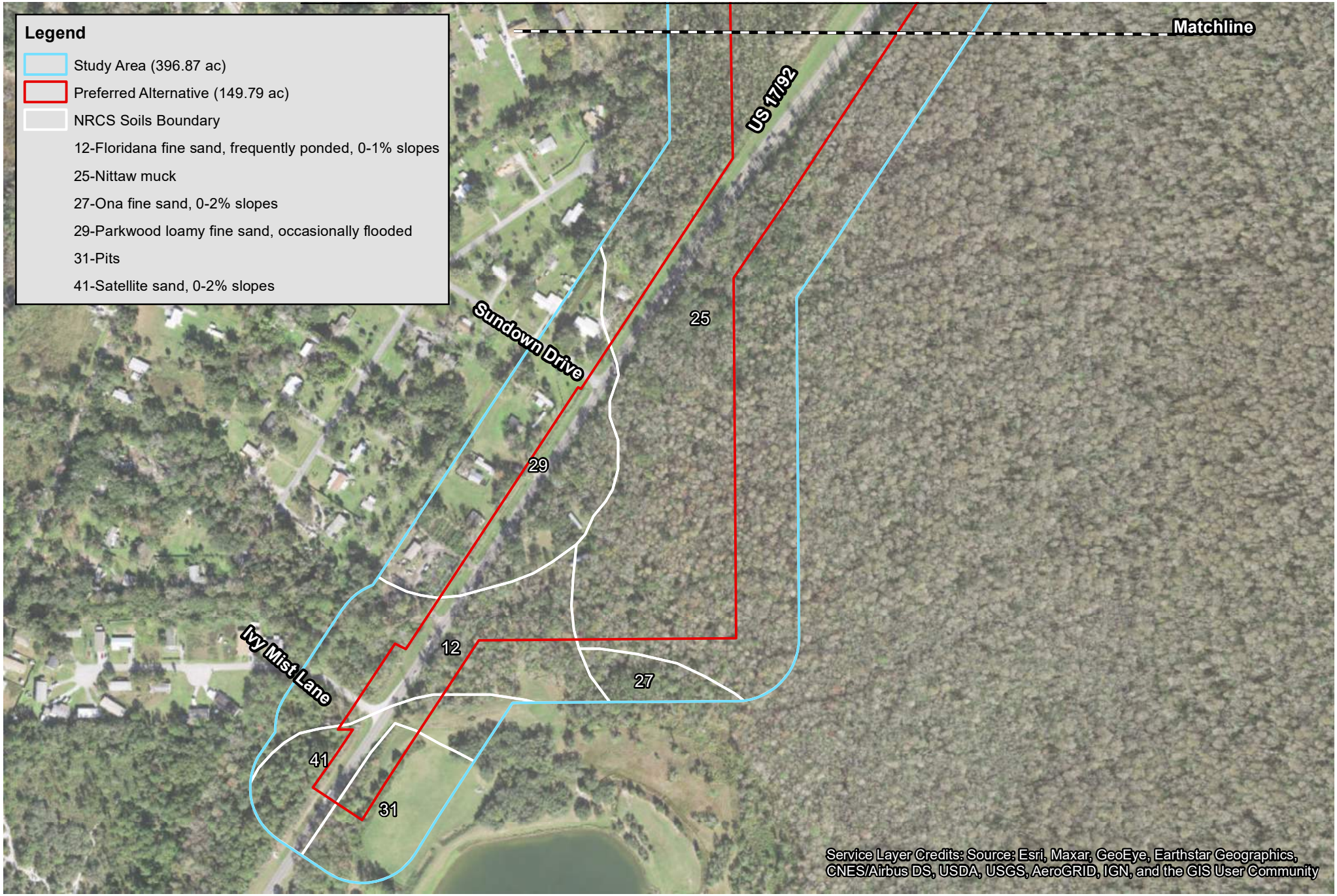
Source: NRCS Soil Data

NRCS Soil Boundary Overview Map
US 17/92 from CR 54 to Avenue A
Osceola County, FL
FPID: 437200-1-22-01/437200-2-22-01

Exhibit 3
September 2022

0 1,000 2,000 Feet

N



FDOT

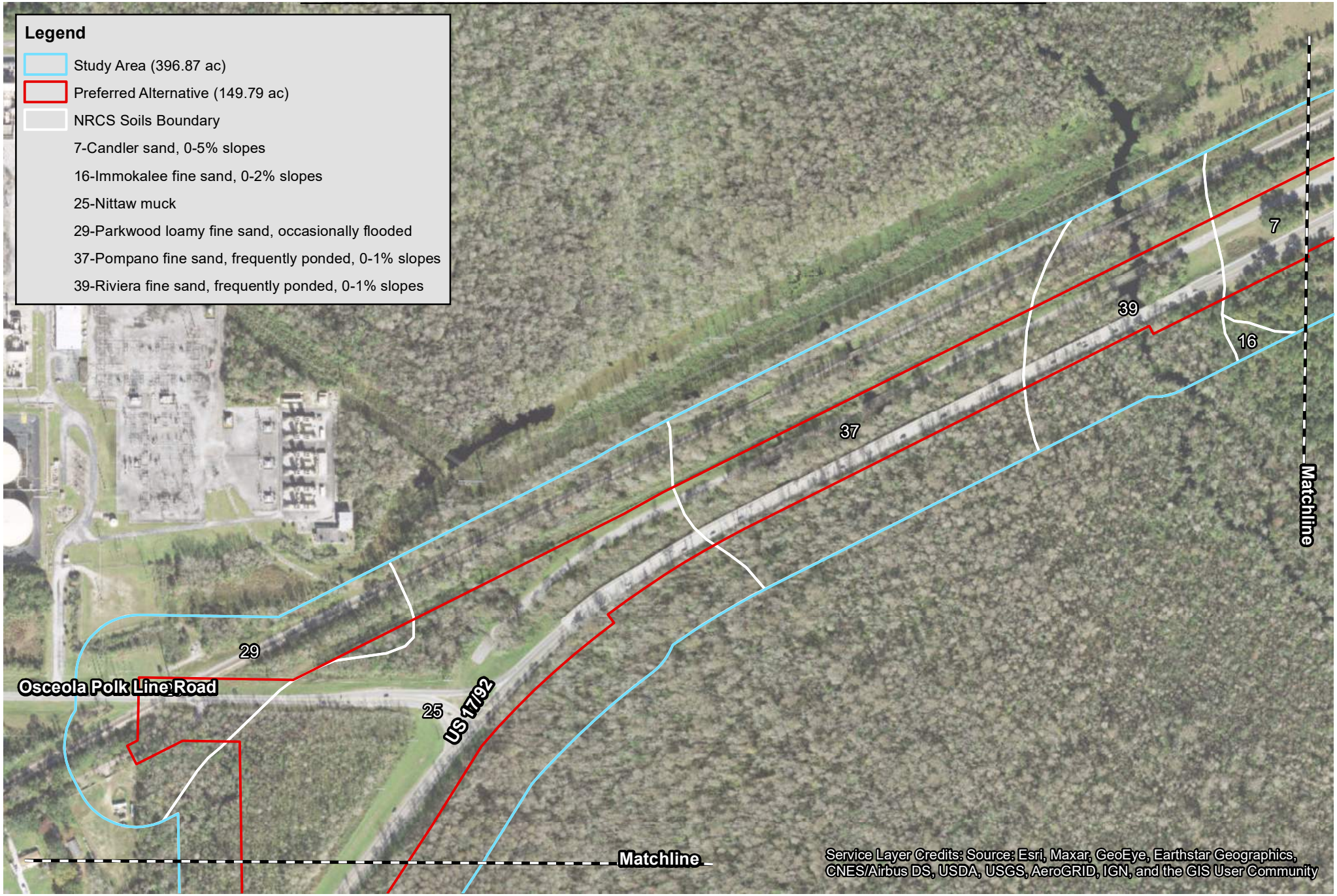
Source: NRCS Soil Data

NRCS Soils Map
US 17/92 from CR 54 to Avenue A
Osceola County, FL
FPID: 437200-1-22-01/437200-2-22-01

Exhibit 3A
September 2022

0 200 400 Feet

N



FDOT

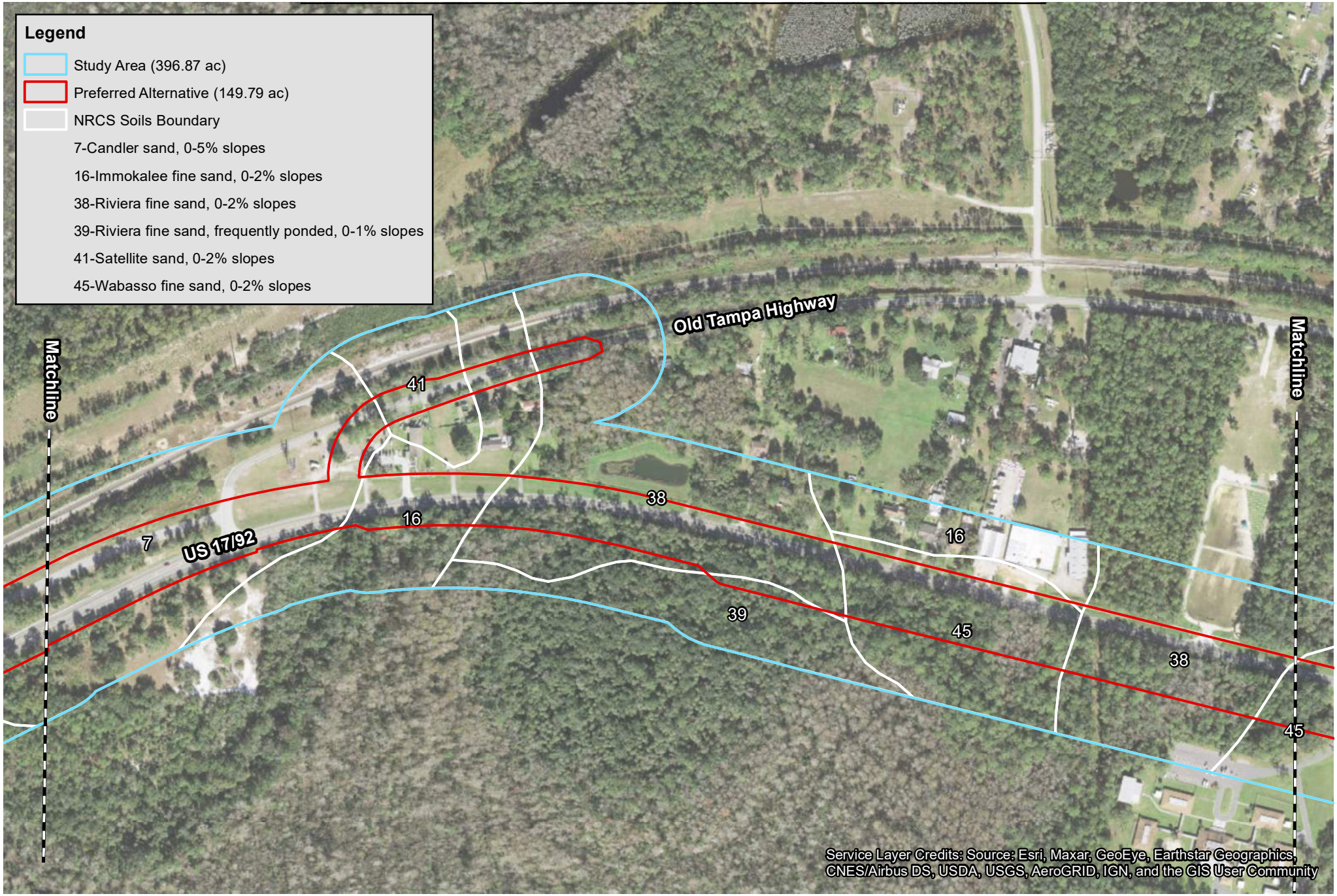
Source: NRCS Soil Data

NRCS Soils Map
US 17/92 from CR 54 to Avenue A
Osceola County, FL
FPID: 437200-1-22-01/437200-2-22-01

Exhibit 3B
September 2022

0 200 400 Feet

N



FDOT

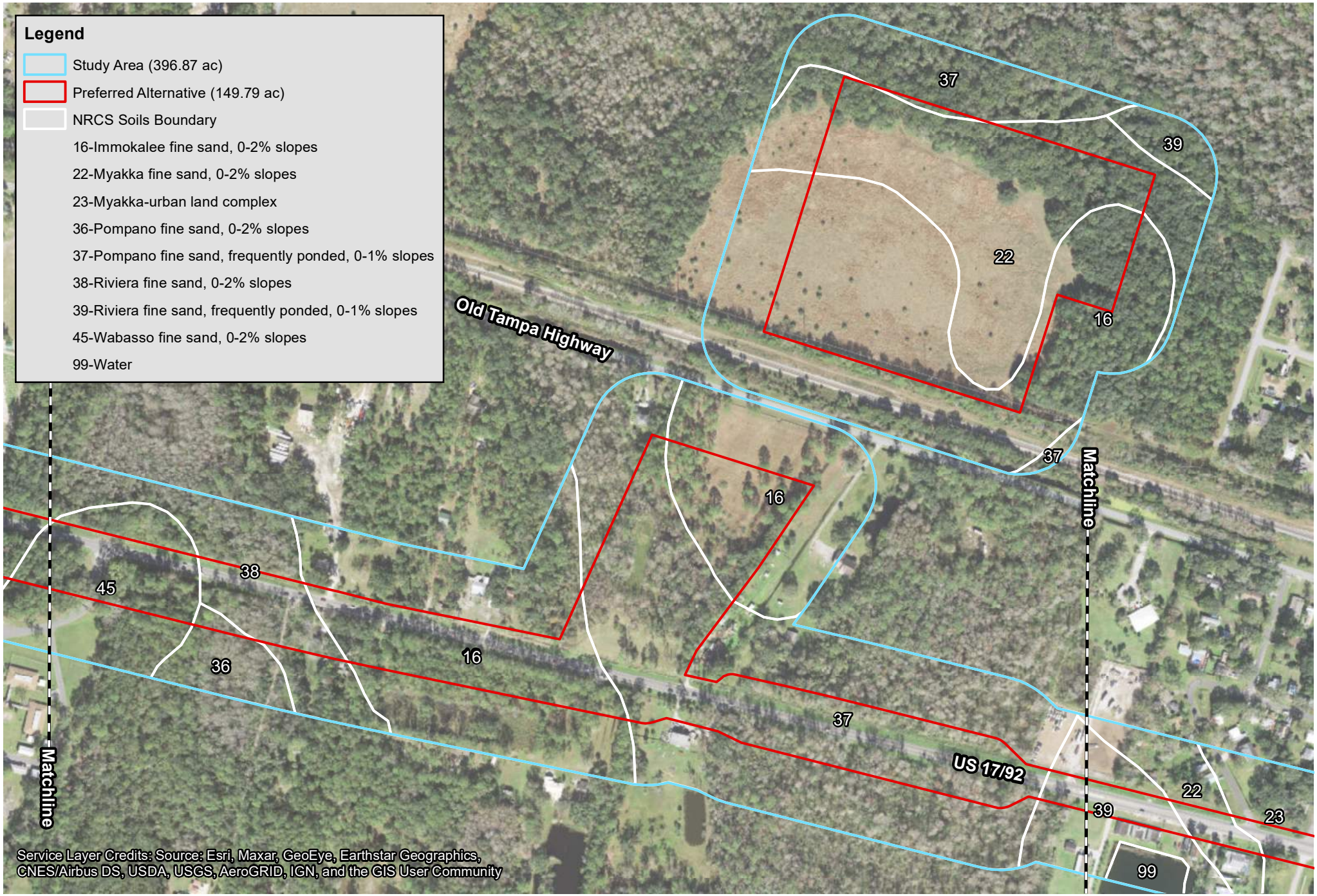
Source: NRCS Soil Data

NRCS Soils Map
US 17/92 from CR 54 to Avenue A
Osceola County, FL
FPID: 437200-1-22-01/437200-2-22-01

Exhibit 3C
September 2022

0 200 400 Feet

N



FDOT

Source: NRCS Soil Data

NRCS Soils Map
US 17/92 from CR 54 to Avenue A
Osceola County, FL
FPID: 437200-1-22-01/437200-2-22-01

Exhibit 3D
September 2022

0 200 400 Feet

N

FDOT

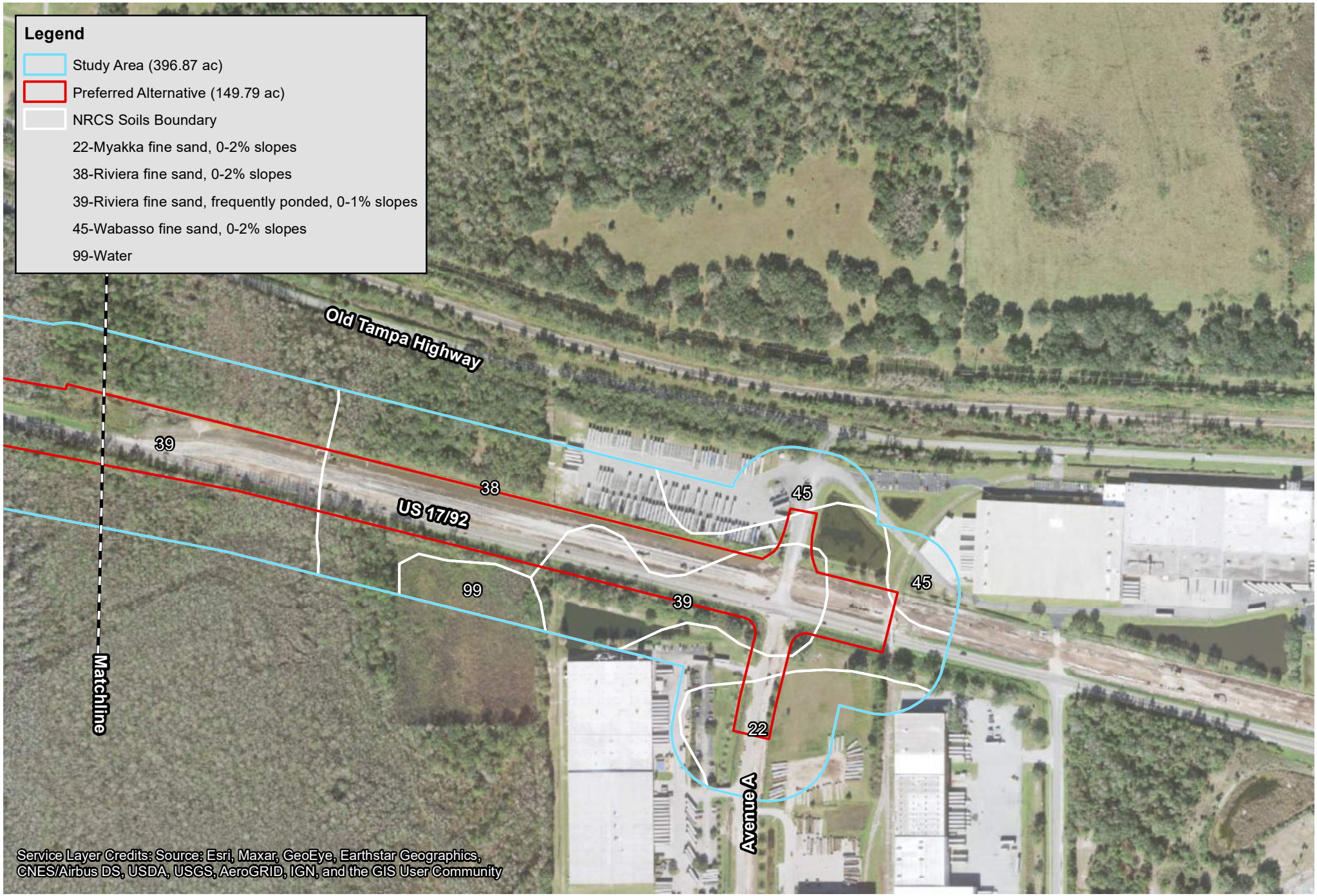
Source: NRCS Soil Data

NRCS Soils Map
US 17/92 from CR 54 to Avenue A
Osceola County, FL
FPID: 437200-1-22-01/437200-2-22-01

Exhibit 3E
September 2022

0 200 400 Feet

N



FDOT

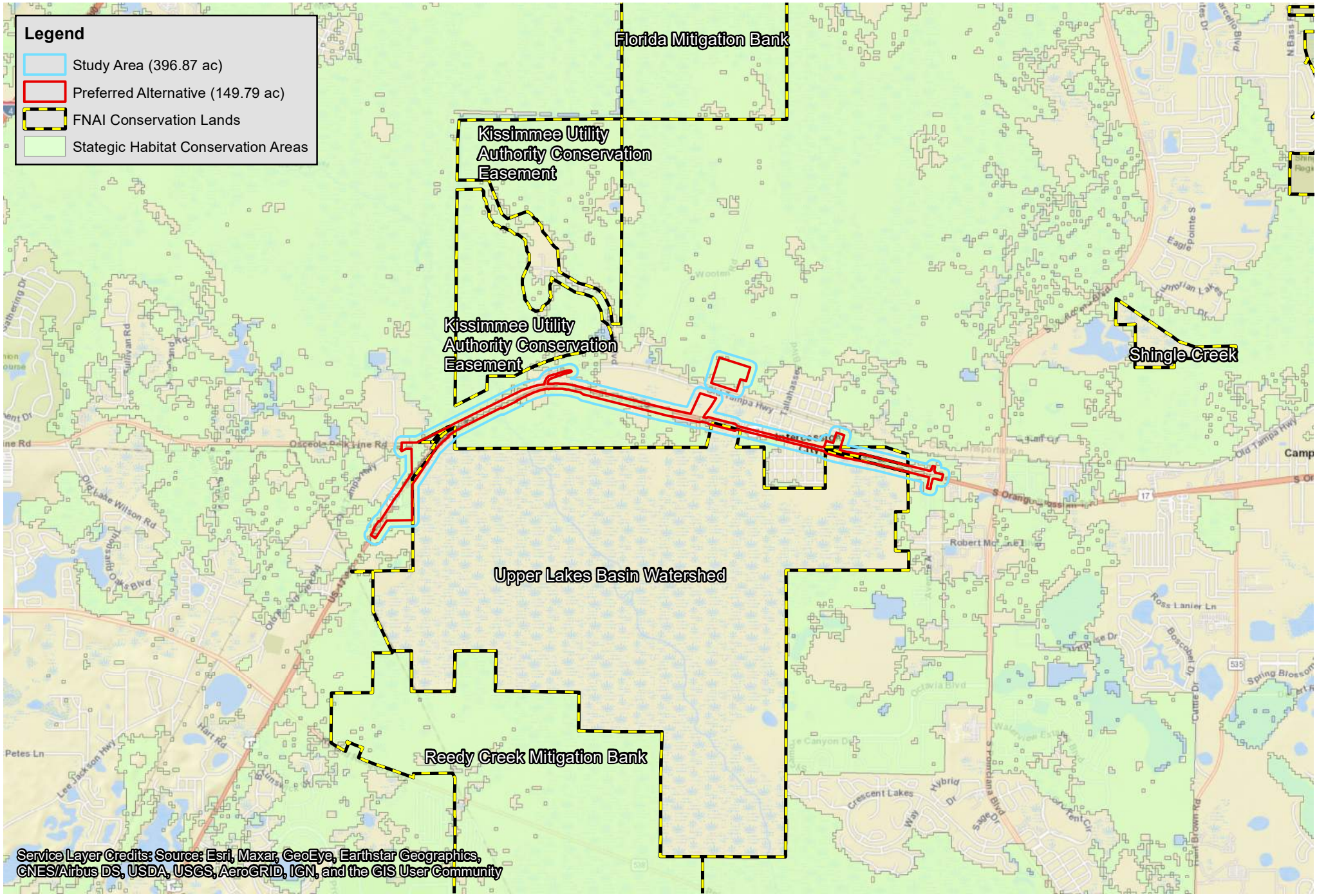
Source: NRCS Soil Data

NRCS Soils Map
US 17/92 from CR 54 to Avenue A
Osceola County, FL
FPID: 437200-1-22-01/437200-2-22-01

Exhibit 3F
September 2022

0 200 400 Feet

N



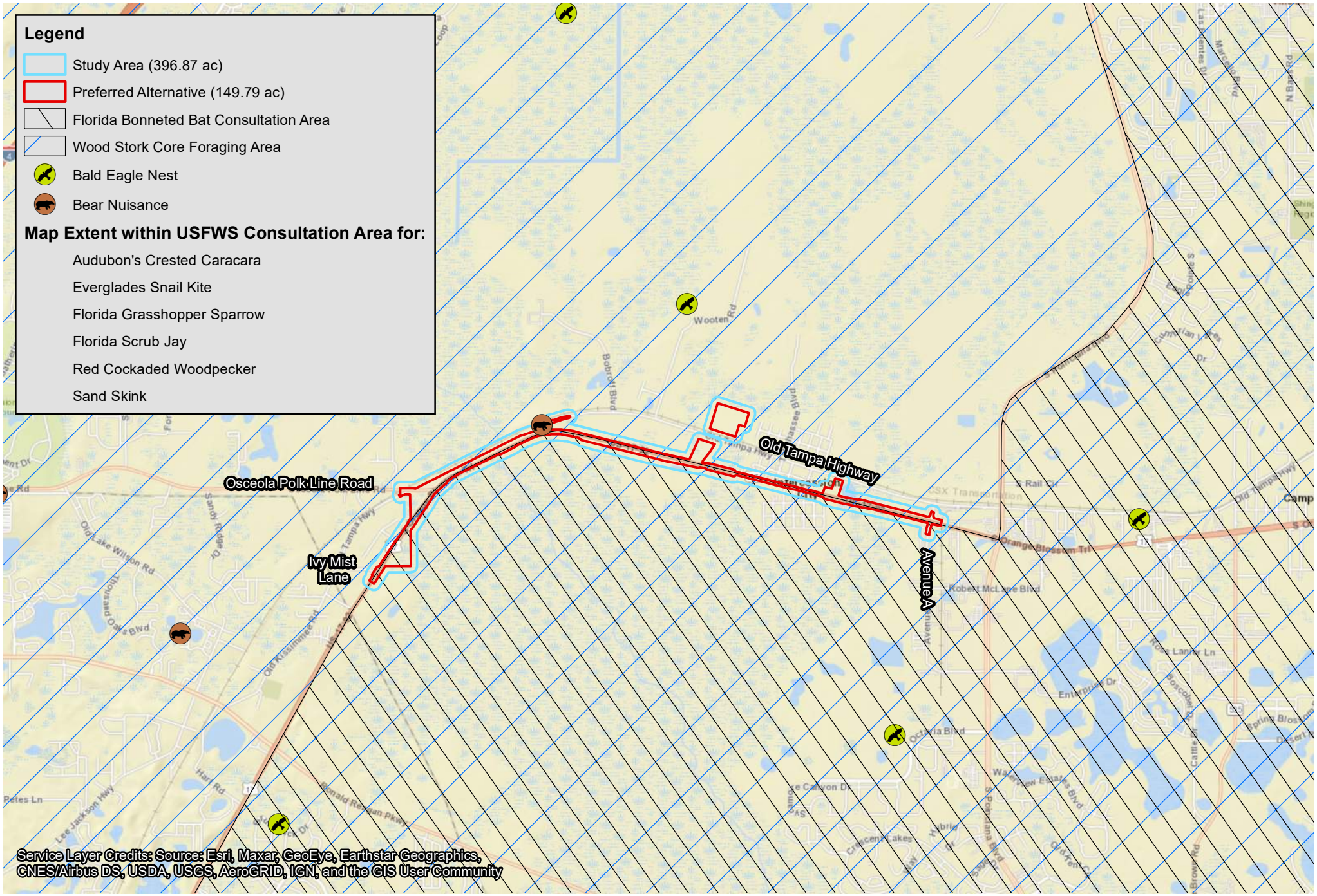
FDOT

Conservation Lands Map
US 17/92 from CR 54 to Avenue A
Osceola County, Florida
FPID: 437200-1-22-01/437200-2-22-01

Exhibit 4
September 2022

0 2,000 4,000 Feet

N



FDOT

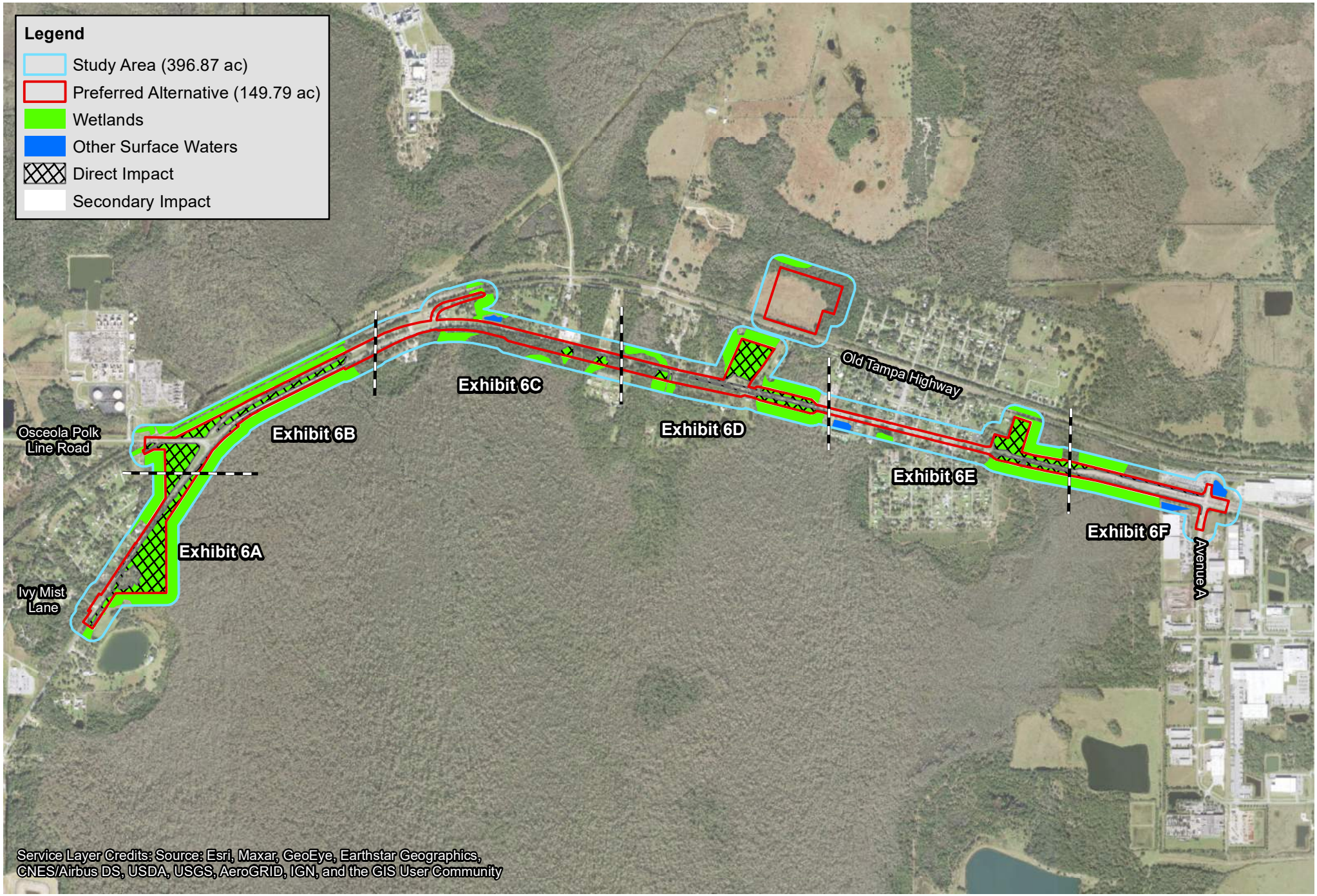
Source: USFWS Consultation Area GIS Data, FWC Bald Eagle Nest and Audobon Eaglewatch Program

Protected Species Map
US 17/92 from CR 54 to Avenue A
Osceola County, FL
FPID: 437200-1-22-01/437200-2-22-01

Exhibit 5
September 2022

0 2,000 4,000 Feet

N



FDOT

Wetlands and Other Surface Waters Overview Map
US 17/92 from CR 54 to Avenue A
Osceola County, FL
FPID: 437200-1-22-01/437200-2-22-01

Exhibit 6
September 2022

0 1,000 2,000 Feet

N

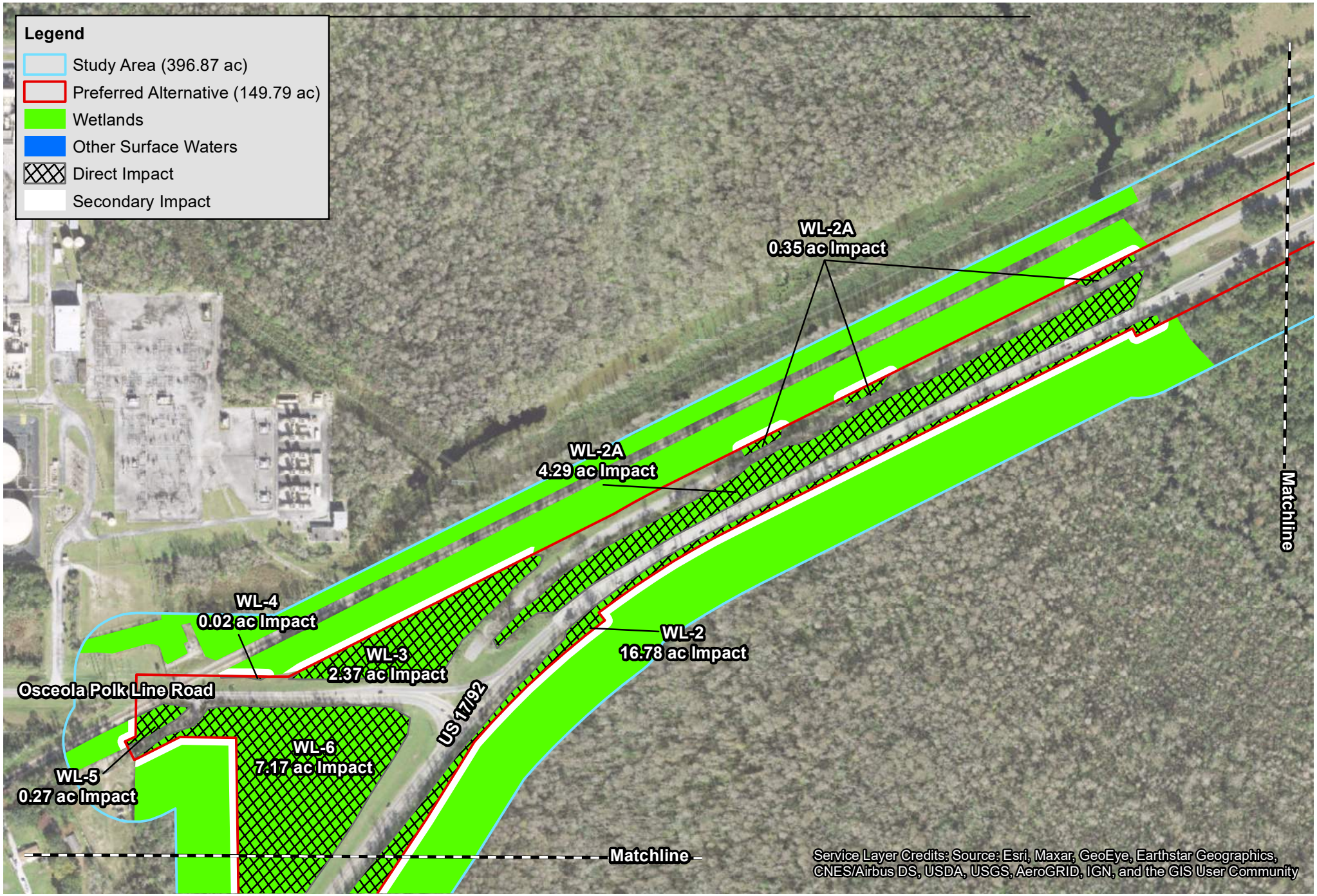
FDOT

Wetlands and Other Surface Waters Map
US 17/92 from CR 54 to Avenue A
Osceola County, FL
FPID: 437200-1-22-01/437200-2-22-01

Exhibit 6A
September 2022

0 200 400 Feet

N



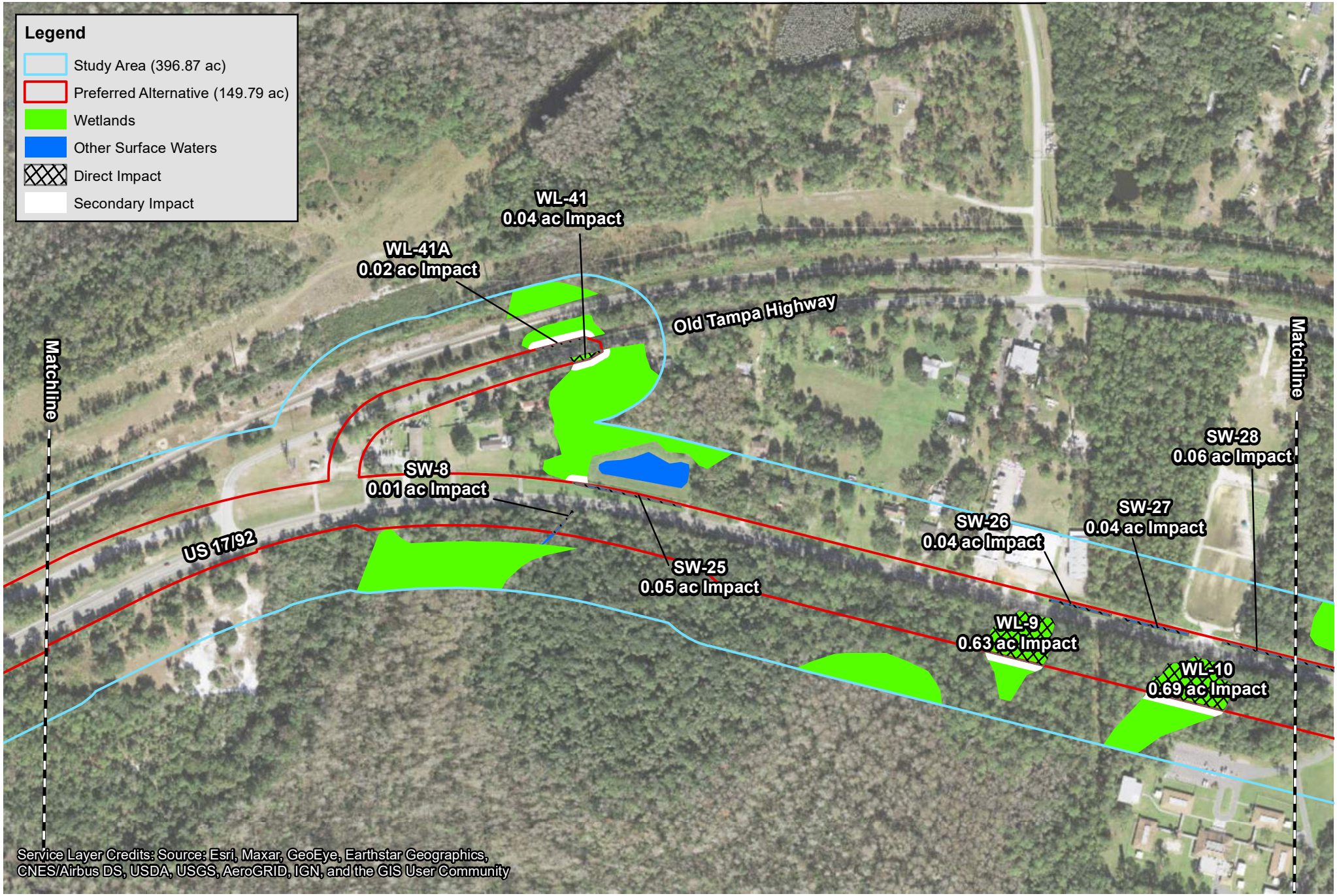
FDOT

Wetlands and Other Surface Waters Map
US 17/92 from CR 54 to Avenue A
Osceola County, FL
FPID: 437200-1-22-01/437200-2-22-01

Exhibit 6B
September 2022

0 200 400 Feet

N



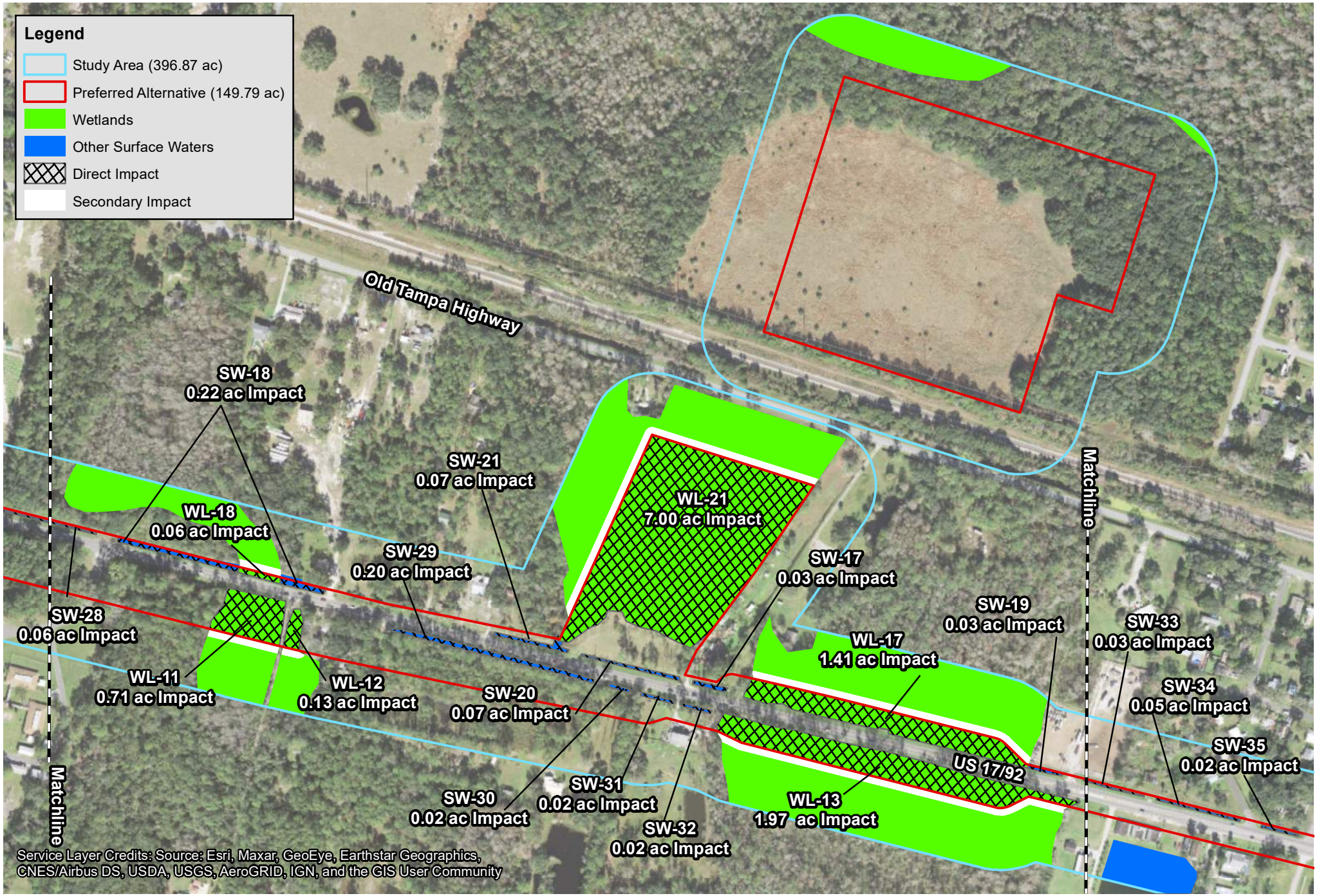
FDOT

Wetlands and Other Surface Waters Map
US 17/92 from CR 54 to Avenue A
Osceola County, FL
FPID: 437200-1-22-01/437200-2-22-01

Exhibit 6C
September 2022

0 200 400 Feet

N



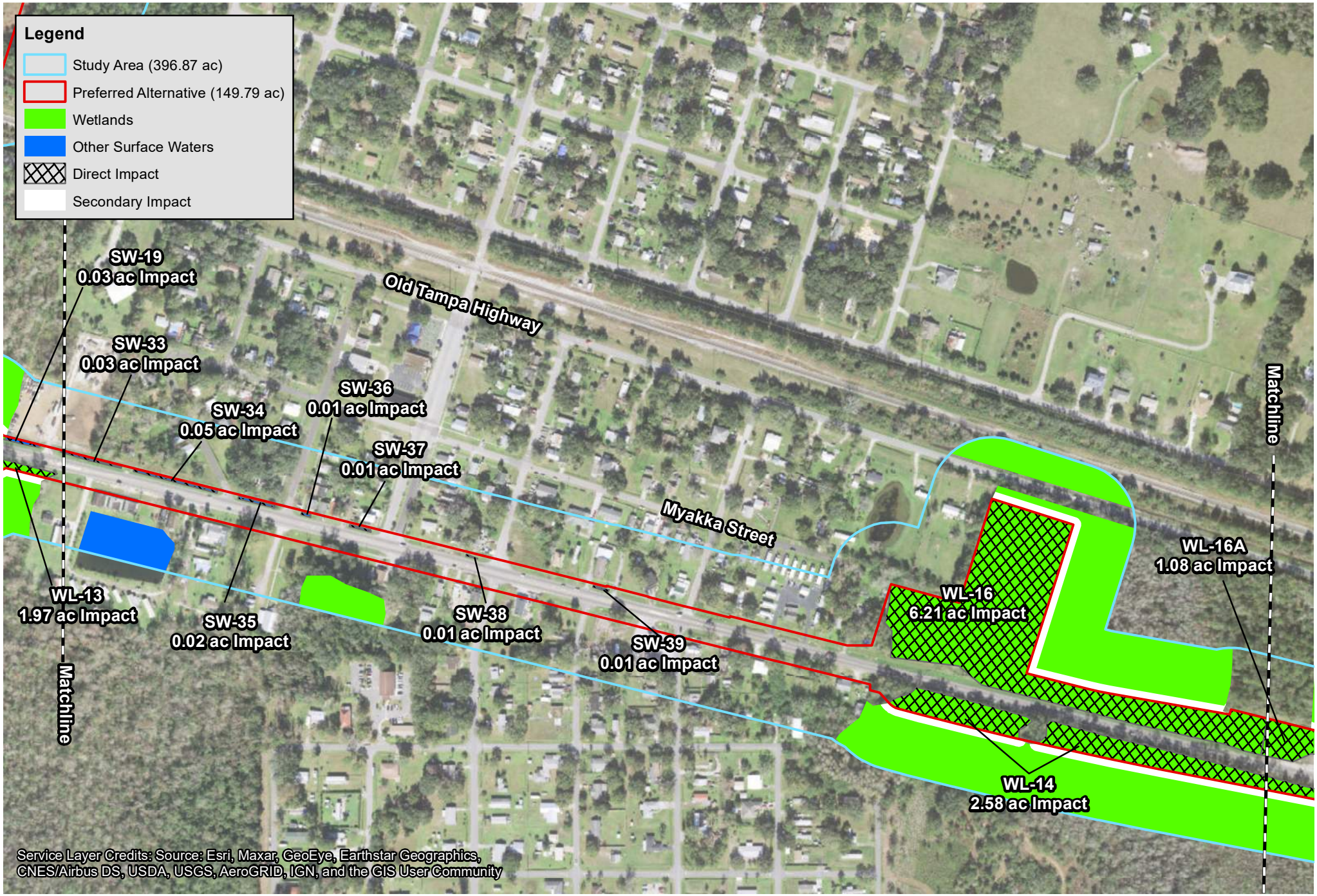
FDOT

Wetlands and Other Surface Waters Map
US 17/92 from CR 54 to Avenue A
Osceola County, FL
FPID: 437200-1-22-01/437200-2-22-01

Exhibit 6D
September 2022

0 200 400 Feet

N



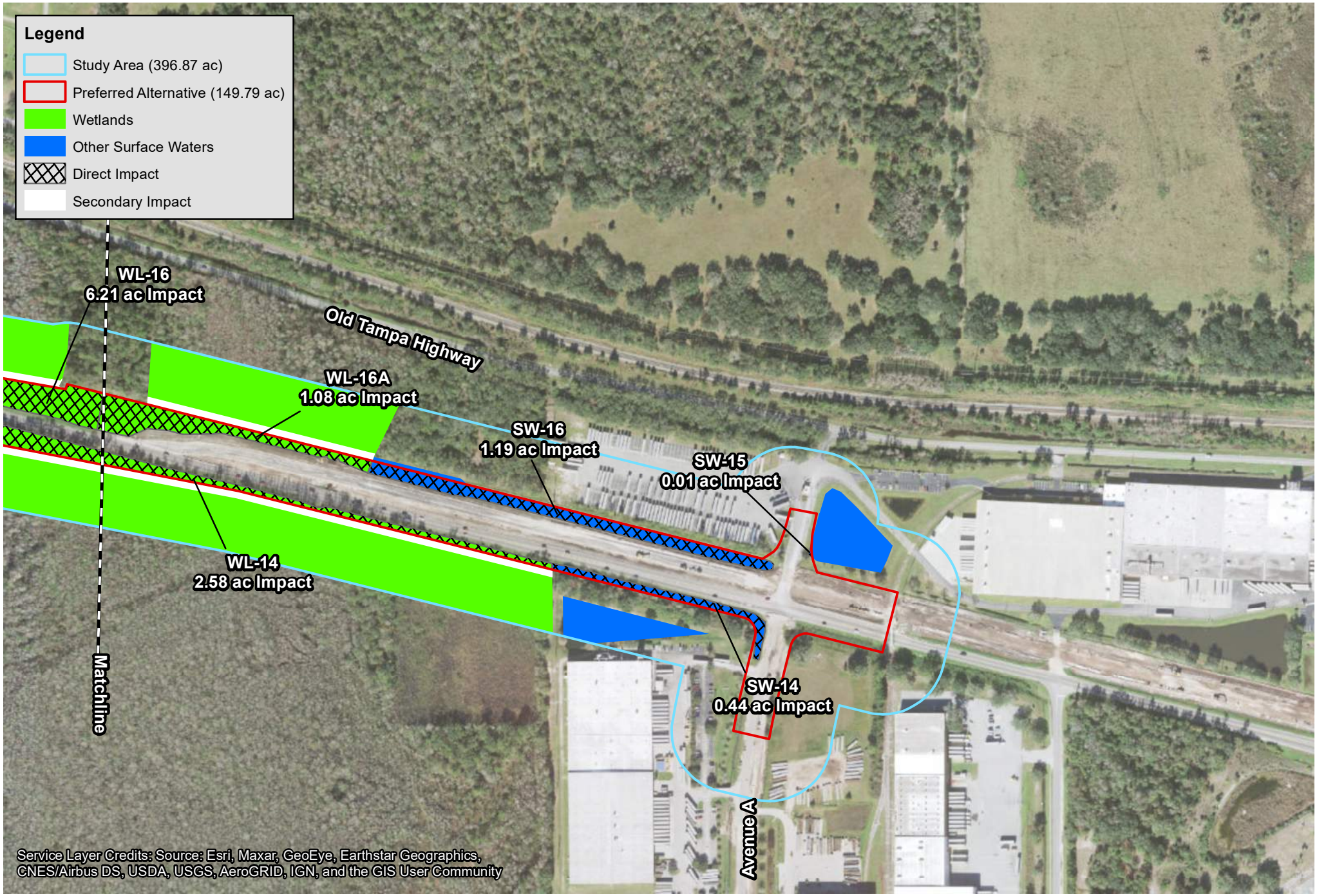
FDOT

Wetlands and Other Surface Waters Map
US 17/92 from CR 54 to Avenue A
Osceola County, FL
FPID: 437200-1-22-01/437200-2-22-01

Exhibit 6E
September 2022

0 200 400 Feet

N



FDOT

Wetlands and Other Surface Waters Map
US 17/92 from CR 54 to Avenue A
Osceola County, FL
FPID: 437200-1-22-01/437200-2-22-01

Exhibit 6F
September 2022

0 200 400 Feet

N

Appendix B:

Agency Coordination

Chuck Smith

From: Wrublik, John <john_wrublik@fws.gov>
Sent: Tuesday, November 30, 2021 8:16 AM
To: Chasez, Heather
Cc: Shannon Ruby Julien; Kevin Freeman; Cucek, Lorena
Subject: Re: [EXTERNAL] 437200-1 US 17-92 PD&E Study Technical Assistance

Looks good, no additional comments provided.

John

John M. Wrublik
U.S. Fish and Wildlife Service
1339 20th Street
Vero Beach, Florida 32960
Office: (772) 469-4282
Fax: (772) 562-4288
email: John_Wrublik@fws.gov

From: Chasez, Heather <Heather.Chasez@dot.state.fl.us>
Sent: Wednesday, November 17, 2021 9:19 AM
To: Wrublik, John <john_wrublik@fws.gov>
Cc: Shannon Ruby Julien <srubyjulien@vhb.com>; Freeman, Kevin <KFreeman@VHB.com>; Cucek, Lorena <Lorena.Cucek@dot.state.fl.us>
Subject: [EXTERNAL] 437200-1 US 17-92 PD&E Study Technical Assistance

Hello John,

Please find attached our request for technical assistance for this project. This request includes multiple species surveys, including the Audubon's crested caracara. Please let me know if you have any questions, comments, or concerns.

Cheers,

Heather Chasez
Environmental Specialist IV
Project Compliance Coordinator
FDOT District Five
719 S. Woodland Blvd.
DeLand, FL 32720

Florida Department of Transportation

RON DESANTIS
GOVERNOR

605 Suwannee Street
Tallahassee, FL 32399-0450

KEVIN J. THIBAULT, P.E.
SECRETARY

November 16, 2021

John Wrublik
U.S. Fish & Wildlife Service
South Florida Ecological Services Field Office
1339 20th Street
Vero Beach, Florida 32960-3559

Re: Technical Assistance for FDOT D5 FPID 437200-1- US 17/92 from Ivy Mist Lane to Avenue A, Osceola County, Florida

Dear Mr. Wrublik,

The Florida Department of Transportation District 5 (FDOT D5) is requesting technical assistance regarding protected species survey methodologies from the U.S. Fish & Wildlife Service (USFWS) for the proposed project "US 17/92 from Ivy Mist Lane to Avenue A" in Osceola County. FL. FDOT D5 is proposing to widen and reconstruct US 17-92 from two-lanes to four-lanes, from Ivy Mist Lane to Avenue A. The project area consists of the US-17-92 project corridor and potential pond siting parcels (**Figure 1**).

The project area is wholly within the consultation area for Audubon's crested caracara (*Polyborus plancus audubonii* = *Caracara cheriway audubonii,* Everglade snail kite (*Rostrhamus sociabilis plumbeus*), Florida grasshopper sparrow (*Ammodramus savannarum floridanus*), Florida scrub-jay (*Aphelocoma coerulescens*), sand skink (*Neoseps reynoldsi*), and bluetail mole skink (*Eumeces egregius lividus*)). Further, the project area south of US 19-92 is within the consultation area for the Florida Bonneted Bat (*Eumops floridanus*).

Technical Assistance is requested as it relates to proposed surveys for the caracara, sand skink, bluetail mole skink, and Florida bonneted bat, following USFWS methodology, or as described within this letter.

CARACARA

Caracara were not observed during initial field assessments (September 9, 2020 and November 2, 2020); however, potential habitat is scattered throughout the project limits and within or adjacent to pond locations. Therefore, surveys are proposed following the methodology described in **Attachment** with survey locations provided as **Figure 2**.

Phone: (386) 943-5393

SAND AND BLUETAIL MOLE SKINK

An 0.8-acre area of the ROW within the central portion of the project corridor (see **Figure 3**) contains soils which are mapped as suitable for sand skink and bluetail mole skink and are at an elevation at which skinks are known to occur. This area is comprised of urbanized and disturbed ROW along US 17-92 and therefore it is considered unlikely that skinks occur in this area. Nevertheless, cover board surveys are proposed to confirm the presence or absence of skinks. A total of 32 cover boards will be utilized in this area in compliance with the July 2020 USFWS Sand Skink and Blue-tailed Mole Skink Survey Protocol.

FLORIDA BONNETED BAT

The project corridor is located at the northern boundary of the Florida bonneted bat consultation area; therefore, acoustic surveys are proposed for this species. Based on the minimum requirements for linear projects over 50 acres, a minimum of five detector nights per every 0.6 linear miles is required. The project corridor is 3.8 miles in length. As such 7 survey stations are proposed, with a total of 35 detector nights (**Figure 4**). The acoustic surveys will follow the guidelines set forth in Appendix B: Full Acoustic / Roost Survey Framework of the October 2019 Consultation Key for the Florida bonneted bat.

ADDITIONAL PROTECTED SPECIES

FDOT D5 also requests technical assistance and concurrence that surveys are not required for the following species:

The project area falls within the consultation area for the Everglade snail kite. While the site is located within the consultation area, it is not located in critical habitat, nor is there suitable habitat present within the project area. Further, no apple snails were observed and there are no snail kites have been documented in the immediate area, therefore, no species-specific surveys are proposed for this species.

The project area falls within the consultation area for the Florida grasshopper sparrow. Suitable habitat for the Florida grasshopper sparrow is not located within the property and no grasshopper sparrows were observed during the protected species surveys which included field reviews for habitat and species presence. Further, there are no documented occurrences of Florida grasshopper sparrows in the project vicinity. Therefore, no additional surveys are proposed.

The project area falls within the consultation area for the Florida scrub-jay. Suitable habitat for the Florida scrub-jay is not located within the project area and no scrub jays were observed during the protected species surveys. Further, there are no documented scrub jays within the project vicinity and therefore, no additional surveys are proposed.

Should you have questions or concerns, please do not hesitate to contact me at 386-943-5393, or via email at Heather.Chasez@dot.state.fl.us.

Sincerely,

Heather Chasez
Environmental Specialist IV
Project Compliance Coordinator
FDOT District Five

cc: Shannon Ruby Julien, VHB, SRubyJulien@vhb.com

Enclosures: Attachment 1 Proposed Caracara Survey Methodology
Figure 1 - USFWS 17/92 Project Corridor and Pond Location Map
Figure 2 - Pond Location Map and Caracara Habitat and Survey Station Map
Figure 3 - Suitable Skink Soils and Elevation Map
Figure 4 - Florida Bonneted Bat Survey Station Map

ATTACHMENT 1

Caracara Survey Methodology

This methodology outlines the proposed survey techniques to locate caracara nests in proximity to the US 17/92 project corridor and potential pond sites. As noted, the project corridor begins at Ivy Mist Lane and ends at Avenue A in Osceola County. **Figure 1** depicts the project corridor and proposed pond locations. The proposed survey methodology generally conforms to the United States Fish and Wildlife Service (USFWS) Crested Caracara Draft Survey Protocol – Additional Guidance (2016-2017 Breeding Season) (2016).

The proposed survey covers areas of suitable habitat within and adjacent to the project area. Suitable habitats (dry prairie, lightly wooded areas, improved and unimproved pastures) were identified based on GIS habitat mapping and onsite evaluation. **Figure 2** depicts the areas of suitable habitat within the project area, the 1,500-meter buffer, and the proposed observation blocks/survey stations.

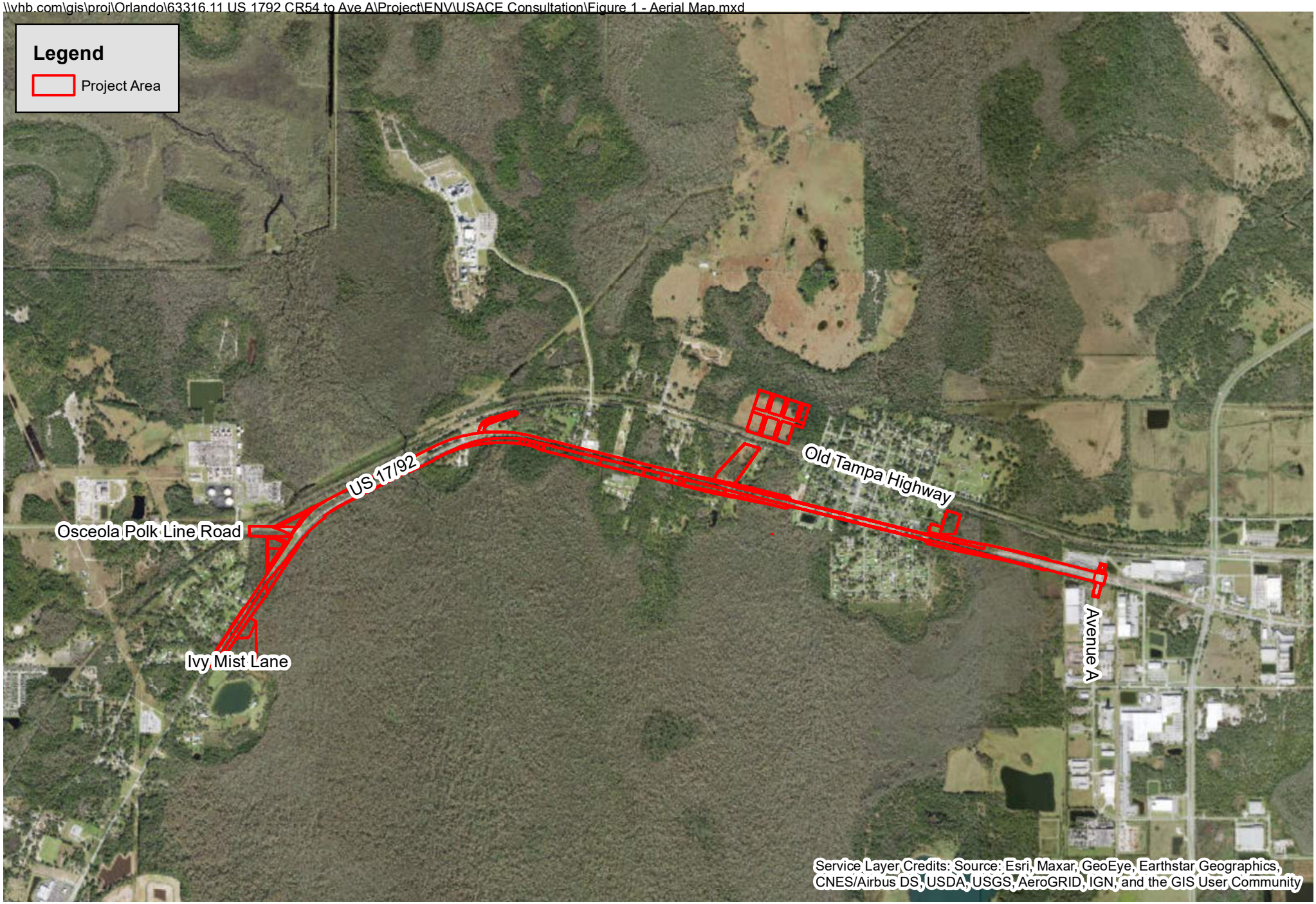
Survey stations are located adjacent to suitable habitat or where unobstructed views into suitable habitat are present. Accessibility was also considered with respect to ownership and right of entry agreements. In addition, some areas of suitable habitat within the 1,500-meter buffer area, outside of the project area, are a significant distance from proposed construction, while others are not able to be surveyed due to accessibility or access issues. The survey stations recommended should provide sufficient insight into the potential use of the land within the 1,500-meter buffer by caracara. The survey stations allow assessment of a significant portion of the suitable habitat adjacent to the project area in order to identify caracara activity.

Surveys will be conducted by qualified observers, commencing no later than January 10th and terminating April 30th since this is the time when the birds are active around the nest and are more visible to observers. The survey area will be viewed during the morning (15 minutes prior sunrise to 11AM) a minimum of once every two (2) weeks. Afternoon surveys (three hours before sunset) may supplement, but not obviate the required morning surveys of once per every two (2) weeks.

The observer(s) shall position themselves in strategic locations where the best habitat (unobstructed by trees, fences or buildings) can be viewed and will reposition themselves as needed in an effort to view as much of the potential habitat as possible. From each stationary position the observer will use spotting scopes and/or binoculars to search for caracara activity, especially birds moving to the nest tree. Observers will follow the USFWS guidance to "watch for other birds", such as American crows (*Corvus brachyrhynchos*), red-tailed hawks (*Buteo jamaicensis*), and turkey vultures (*Cathertes aura*), that might elicit an aggressive response from caracaras or indicate the presence of naturally occurring carrion that may attract caracaras. If no nests are found during the initial survey, then the survey will be repeated every two weeks through the end of April or until a nest is found.

If a nest in the survey area is found, productivity surveys will commence and additional observations of caracara activity will be recorded by time of day and age of bird (i.e., juvenile or adult). Flight directions will be recorded to identify foraging areas and the nesting tree. Any nesting tree location shall be marked on the map and GPS coordinates obtained. Weather conditions (temperature, wind speed and direction, cloud cover, visibility, and precipitation) shall be recorded at the start and end of each survey period. The survey at an individual survey station may be terminated when the nest tree is located and information on the birds preferred foraging areas is determined.

\\vhb.com\gis\proj\Orlando\63316.11 US 1792 CR54 to Ave A\Project\ENV\USACE Consultation\Figure 1 - Aerial Map.mxd



FDOT

USFWS 17/92 Project Corridor and Pond Location Map

US 17/92 from Ivy Mist Lane to Avenue A
Osceola County, Florida

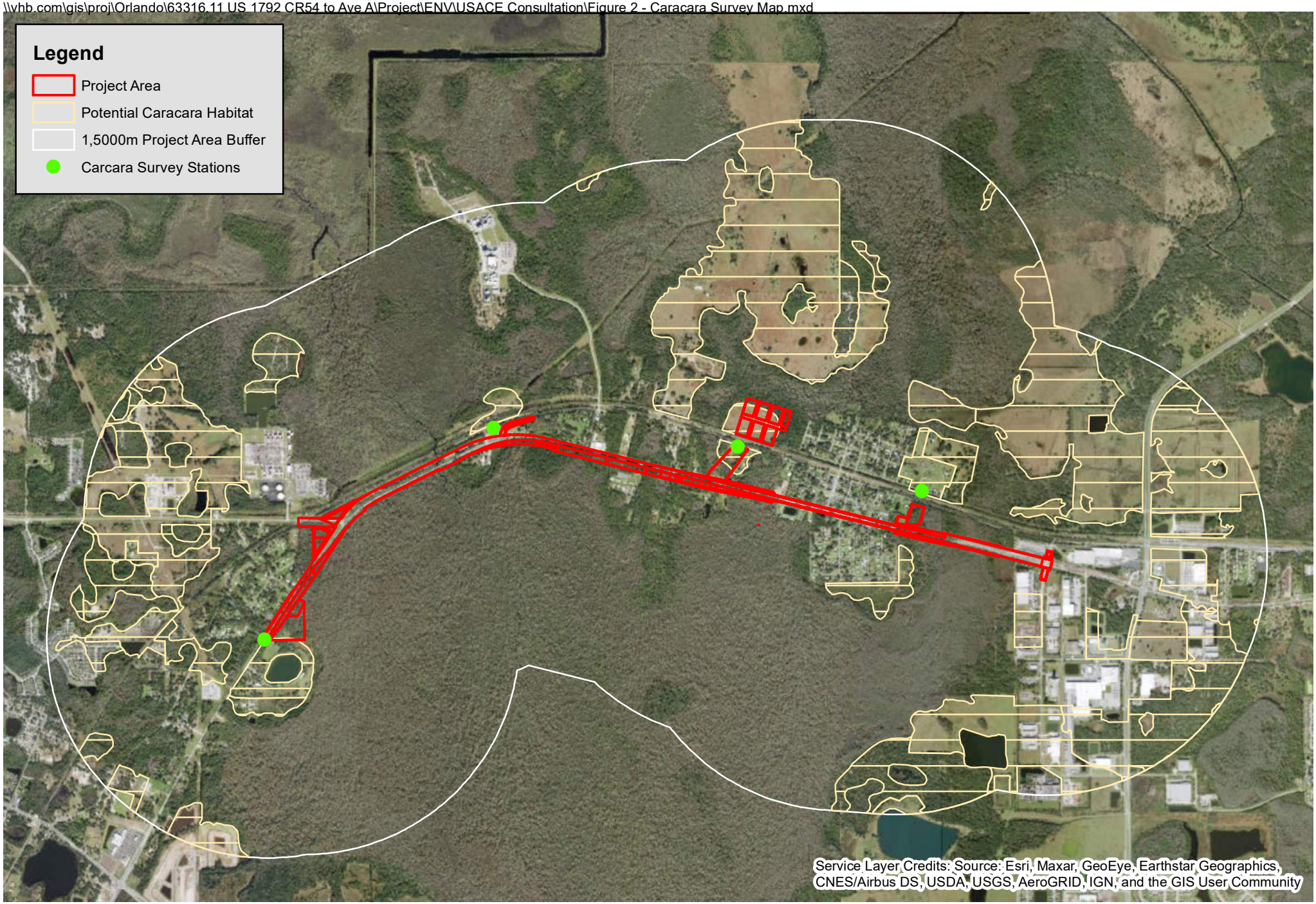
October 2021

Figure 1

0 1,375 2,750 Feet

N

\\vhb.com\gis\proj\Orlando\63316.11 US 1792 CR54 to Ave A\Project\ENV\USACE Consultation\Figure 2 - Caracara Survey Map.mxd



FDOT

Caracara Habitat and Survey Station Map

US 17/92 from Ivy Mist Lane to Avenue A
Osceola County, Florida

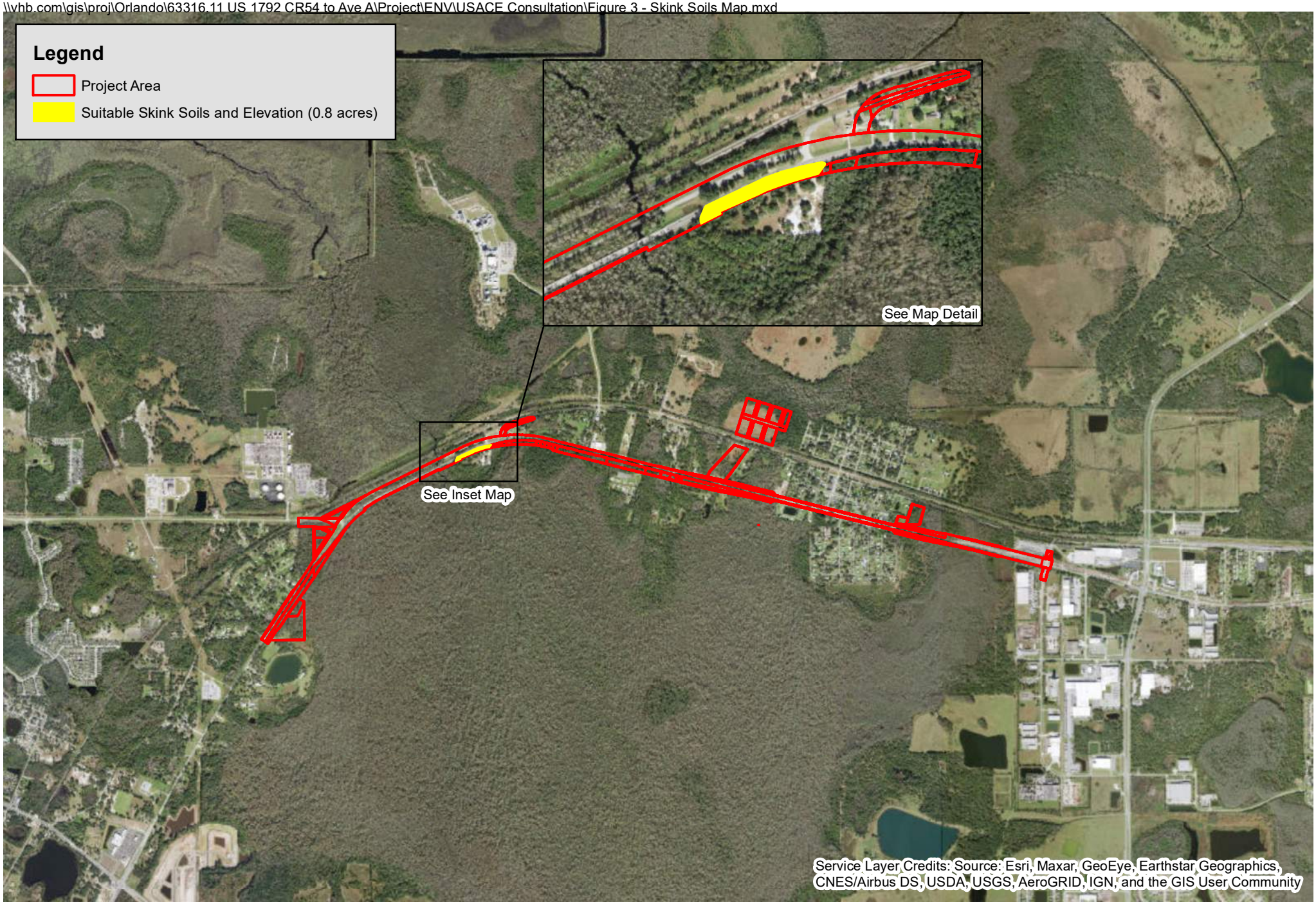
October 2021

Figure 2

0 0.25 0.5 Miles

N

\\vhb.com\gis\proj\Orlando\63316.11 US 1792 CR54 to Ave A\Project\ENV\USACE Consultation\Figure 3 - Skink Soils Map.mxd



FDOT

Suitable Skink Soils and Elevation Map

US 17/92 from Ivy Mist Lane to Avenue A

Osceola County, Florida

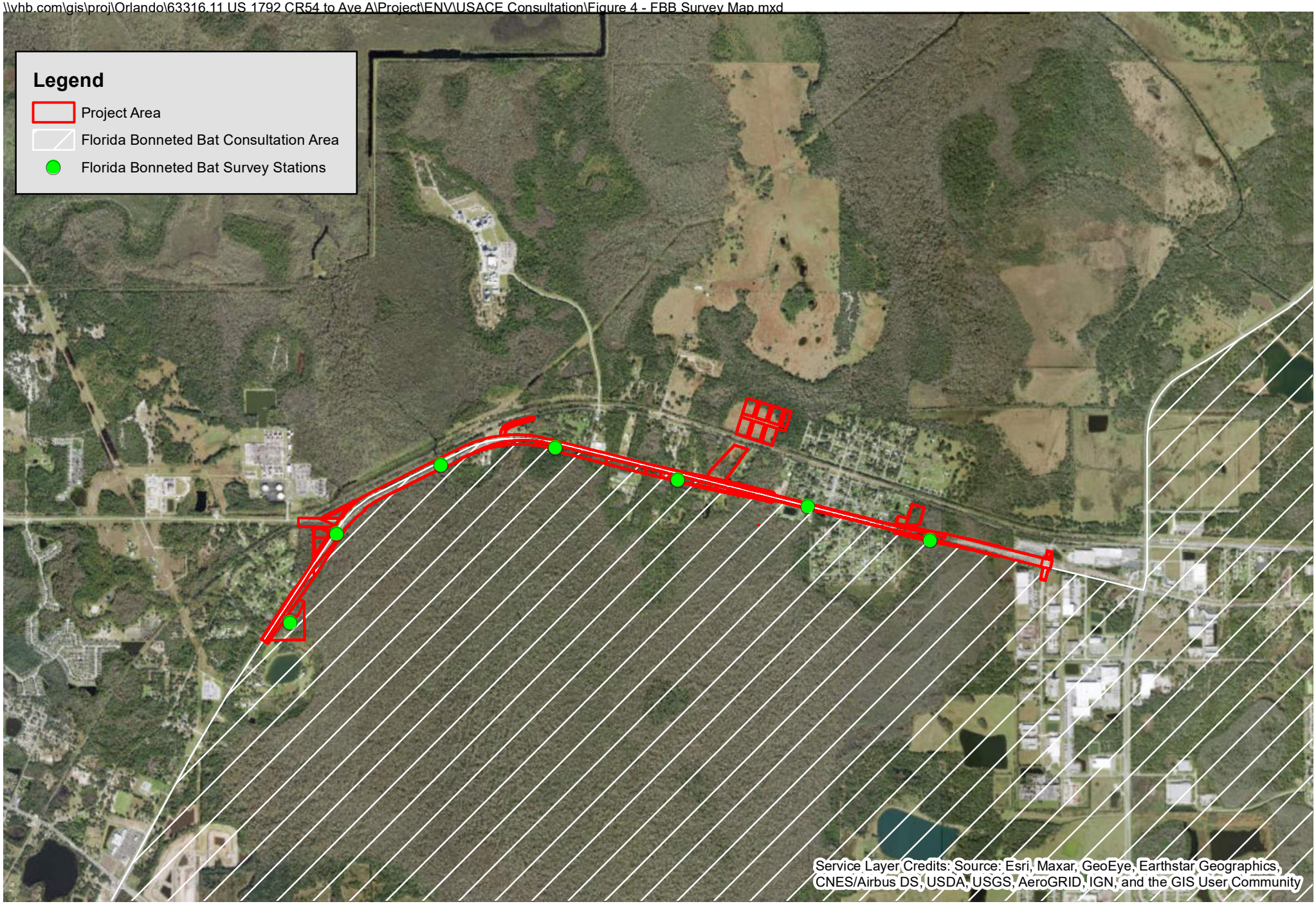
October 2021

Figure 3

0 0.25 0.5 Miles

N

\\vhb.com\gis\proj\Orlando\63316.11 US 1792 CR54 to Ave A\Project\ENV\USACE Consultation\Figure 4 - FBB Survey Map.mxd



Florida Bonneted Bat Survey Station Map

US 17/92 from Ivy Mist Lane to Avenue A
Osceola County, Florida

October 2021

Figure 4

0 0.25 0.5 Miles

N

Appendix C:

Sand Skink Survey Results Report

US 17/92 FROM IVY MIST LANE TO AVENUE A
OSCEOLA COUNTY, FL

FPID 437200-1-22-91/437200-2-22-01

Sand Skink Survey Result Report

Florida Department of Transportation District 5
719 S Woodland Blvd
DeLand, FL 32720

August 18, 2022

TABLE OF CONTENTS

Figures

Appendixes:

INTRODUCTION

The Florida Department of Transportation (FDOT), District 5 is providing the following report, which includes results from the federally protected sand skink (*Neoseps reynoldsi*) survey along US 17/92, from Ivy Mist Lane to Avenue A (the Project Corridor), located in Osceola County, Florida (see **Figure 1**). The total project length is 3.8 miles and includes construction of a westbound bridge across Reedy Creek and conversion of the existing bridge over Reedy Creek for eastbound travel lanes. The project area right-of-way (ROW) lies within the following: Sections 3, 6, 7, Township 26S, Range 28E; Section 12, Township 26S, Range 27E; and Sections 31, 32, 33, 34, Township 25S, Range 28E. The approximate center of the project is located at longitude 81.531837 °W, latitude 28.265101°N. The project area consists of the US-17-92 project corridor, three pond sites and one floodplain compensatory storage pond site. The proposed pond sites are all located on undeveloped land comprised of a mixture of wetlands and uplands.

An 0.5-acre area of the ROW within the central portion of the Project Corridor (**Figure 2**) contains soils which are mapped as suitable for sand skinks and is at an elevation at which skinks are known to occur. This area is comprised of urbanized and disturbed ROW along US 17-92 and therefore it was considered unlikely for skinks to occur in this area. Nevertheless, cover board surveys were conducted to confirm the presence or absence of skinks. Based on concurrence received from the U.S. Fish and Wildlife Service (USFWS) with respect to the survey methodology on November 30, 2021, a total of 33 cover boards were utilized in this area in compliance with the July 2020 USFWS Sand Skink and Blue-tailed Mole Skink Survey Protocol.

EXISTING CONDITIONS

Topography, Soils, and Habitat Assessment

According to Osceola County topographic data, the elevation of the survey area is between 85 and 88 feet above mean sea level which meets the 82-foot elevation requirement for sand skinks.

Based on the Natural Resources Conservation Service (NRCS) Soil Survey, the survey area consists of a soil type that is known to be suitable habitat for sand skinks.

Suitable Sand Skink Soils

- 7-Candler sand with 0 to 5% slopes.

The habitat is comprised of urbanized and disturbed ROW along US17-92 and is mainly comprised of maintained grasses and weeds such as Bahiagrass (*Paspalum notatum*), natal grass (*Melinis repens*), and beggar's ticks (*Bidens laevis*). Due to the density of herbaceous growth and heavily utilized paved roadways, the presence of sand skinks was considered to be unlikely.

SURVEY METHODS & RESULTS

Coverboard Survey

Coverboard installation and surveys were performed within the 0.5-acre survey area based on the proposed survey methodology and USFWS concurrence. Coverboards were placed in areas with primarily loose sandy soils and reduced vegetative groundcover. Several areas that had denser vegetative groundcover were manually scraped by scientists to expose the sand underneath prior to placing coverboards. A total of 33 coverboards were placed within the 0.5-acre survey area (**Figure 3**).

After coverboard installation, the boards were checked once a week, during the survey season, for four (4) weeks with at least one (1) week between survey events. The 4-week survey began on March 9, 2022, and concluded on April 2, 2022. The results of the survey are summarized below in **Table 1**.

Table 1: Summary of Sand Skink Coverboard Survey

Survey Week	Date	Results
1	March 9, 2022	No Evidence of sand skinks
2	March 16, 2022	No Evidence of sand skinks
3	March 25, 2022	No Evidence of sand skinks
4	April 2, 2022	No Evidence of sand skinks

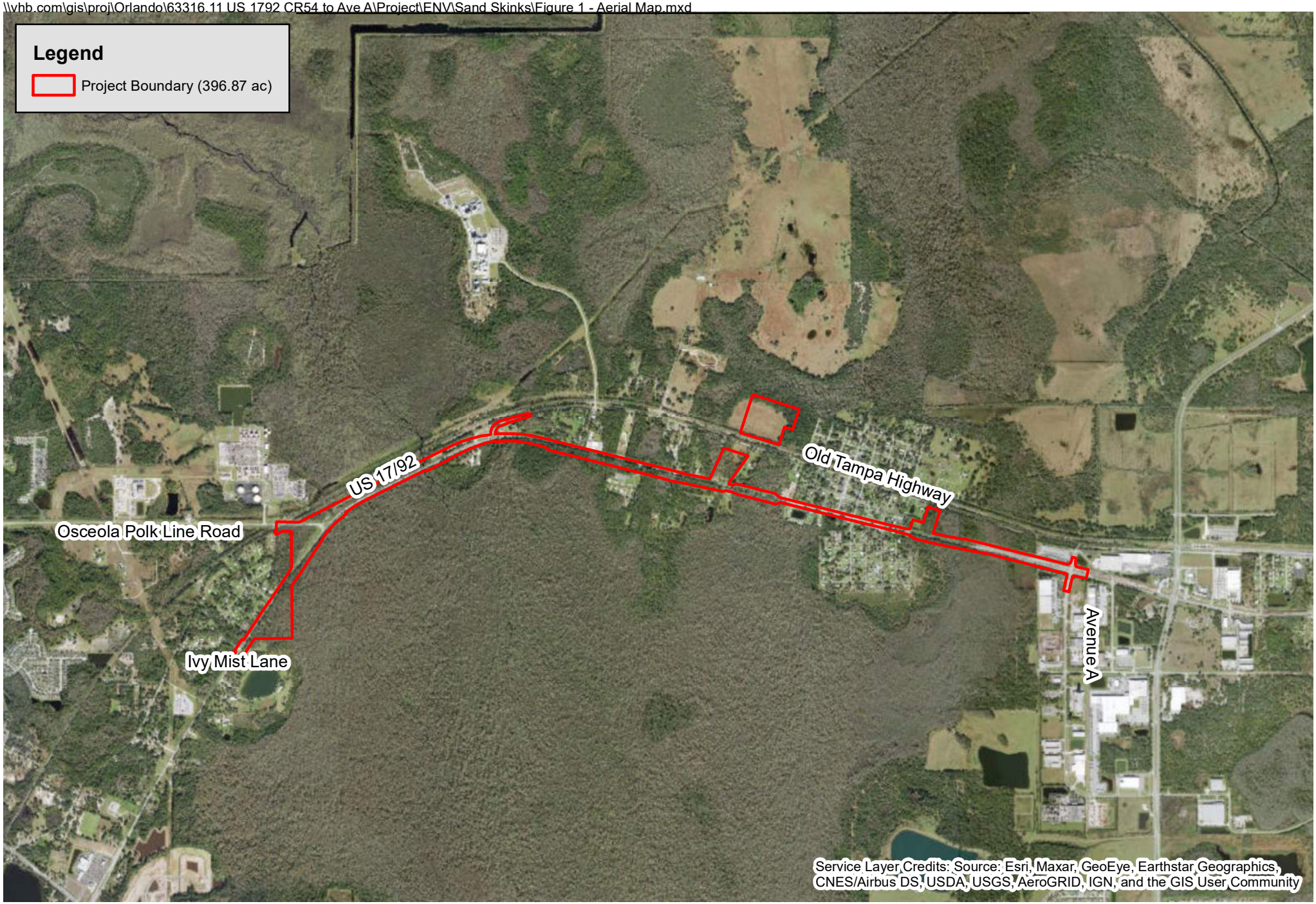
Results

No coverboards showed positive evidence of sand skink activity so therefore no sand skinks were found to be utilizing the site. The overall results of the coverboard survey are provided in **Appendix A**. Based on the survey results and USFWS guidelines, the project will have '**may affect, not likely to adversely affect**' on the sand skinks.

SUMMARY

A coverboard survey was conducted in accordance with USFWS survey protocols for a 0.5-acre portion of the Project Corridor that had appropriate soils and elevations, thereby meeting the survey requirements for suitable habitat for the sand skink. The 4-week survey beginning on March 9, 2022, and concluding on April 2, 2022, yielded no positive results. Based on the survey results and a lack of presence, it was determined that sand skinks do not utilize the Project Corridor. Therefore, the effect determination is '**may affect, not likely to adversely affect**' for the sand skink.

\\vhb.com\gis\proj\Orlando\63316.11 US 1792 CR54 to Ave A\Project\ENV\Sand Skinks\Figure 1 - Aerial Map.mxd



FDOT

USFWS 17/92 Project Corridor Location Map

US 17/92 from Ivy Mist Lane to Avenue A

Osceola County, Florida

FPID: 437200-1-22-91-01/437200-2-22-01

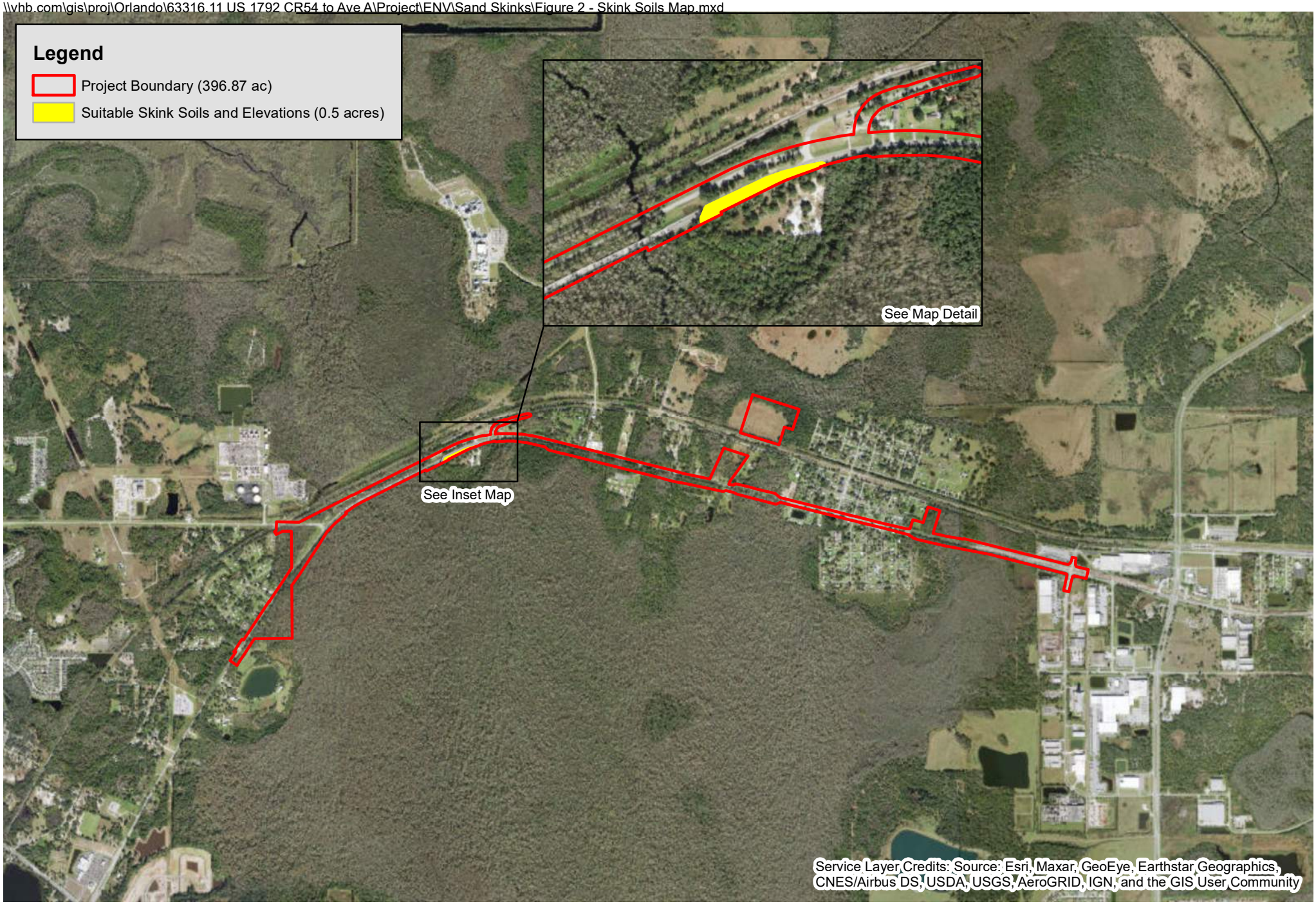
August 2022

Figure 1

0 0.25 0.5 Miles

N

\\vhb.com\gis\proj\Orlando\63316.11 US 1792 CR54 to Ave A\Project\ENV\Sand Skinks\Figure 2 - Skink Soils Map.mxd



FDOT

Suitable Skink Soils and Elevation Map

US 17/92 from Ivy Mist Lane to Avenue A

Osceola County, Florida

FPID: 437200-1-22-91-01/437200-2-22-01

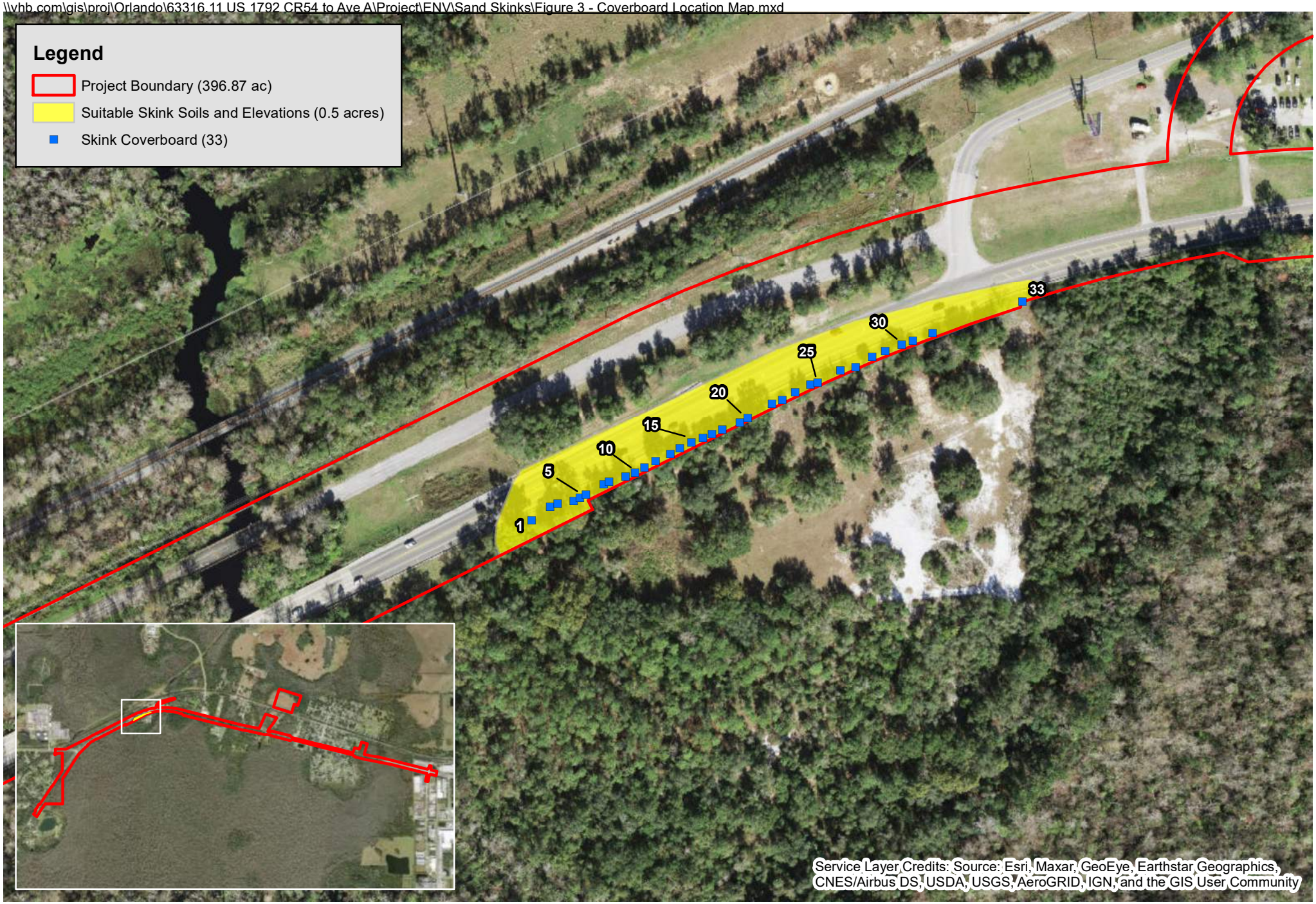
August 2022

Figure 2

0 0.25 0.5 Miles

N

\\vhb.com\gis\proj\Orlando\63316.11 US 1792 CR54 to Ave A\Project\ENV\Sand Skinks\Figure 3 - Coverboard Location Map.mxd



FDOT

Sand Skink Coverboard Location Map

US 17/92 from Ivy Mist Lane to Avenue A

Osceola County, Florida

FPID: 437200-1-22-91-01/437200-2-22-01

August 2022

Figure 3

0 100 200 Feet

N

Appendix A: Sand Skink Survey Coverboard Results

Project Site:	US17/92 PD&E Study						PN:FPID 437200-1	
	Week 1		Week 2		Week 3		Week 4	
Survey Date:	3/9/2022		3/16/2022		3/25/2022		4/2/2022	
Time:	8:00AM - 9:00AM		11:00AM - 12:00PM		9:00AM - 10:00AM		9:00AM - 10:00AM	
Surveyors:	AM		AM		HR		HR	
Visibility:	10.00 mi		10.00 mi		10.00 mi		10.00 mi	
Temperature (°F):	75F Clear		68F Clear		67F Clear		75F Clear	
Precipitation:	N		N		N		N	
Wind:	S 10 mph		SW 5 mph		NW 8-9 mph		S 3-4 mph	
Coverboard Number	SS Tracks Observed?	Sand Skink Individual Observed?	SS Tracks Observed?	SS Individual Observed?	SS Tracks Observed?	SS Individual Observed?	SS Tracks Observed?	SS Individual Observed?
1	Negative	No	Negative	No	Negative	No	Negative	No
2	Negative	No	Negative	No	Negative	No	Negative	No
3	Negative	No	Negative	No	Negative	No	Negative	No
4	Negative	No	Negative	No	Negative	No	Negative	No
5	Negative	No	Negative	No	Negative	No	Negative	No
6	Negative	No	Negative	No	Negative	No	Negative	No
7	Negative	No	Negative	No	Negative	No	Negative	No
8	Negative	No	Negative	No	Negative	No	Negative	No
9	Negative	No	Negative	No	Negative	No	Negative	No
10	Negative	No	Negative	No	Negative	No	Negative	No
11	Negative	No	Negative	No	Negative	No	Negative	No
12	Negative	No	Negative	No	Negative	No	Negative	No
13	Negative	No	Negative	No	Negative	No	Negative	No
14	Negative	No	Negative	No	Negative	No	Negative	No
15	Negative	No	Negative	No	Negative	No	Negative	No
16	Negative	No	Negative	No	Negative	No	Negative	No
17	Negative	No	Negative	No	Negative	No	Negative	No
18	Negative	No	Negative	No	Negative	No	Negative	No
19	Negative	No	Negative	No	Negative	No	Negative	No
20	Negative	No	Negative	No	Negative	No	Negative	No
21	Negative	No	Negative	No	Negative	No	Negative	No
22	Negative	No	Negative	No	Negative	No	Negative	No
23	Negative	No	Negative	No	Negative	No	Negative	No
24	Negative	No	Negative	No	Negative	No	Negative	No
25	Negative	No	Negative	No	Negative	No	Negative	No
26	Negative	No	Negative	No	Negative	No	Negative	No
27	Negative	No	Negative	No	Negative	No	Negative	No
28	Negative	No	Negative	No	Negative	No	Negative	No
29	Negative	No	Negative	No	Negative	No	Negative	No
30	Negative	No	Negative	No	Negative	No	Negative	No
31	Negative	No	Negative	No	Negative	No	Negative	No
32	Negative	No	Negative	No	Negative	No	Negative	No
33	Negative	No	Negative	No	Negative	No	Negative	No

Appendix D:

Crested Caracara Survey Results

To: Heather Chasez
Florida Department of
Transportation - District 5
719 S Woodland Boulevard,
Deland, FL 32720

Date: August 18, 2022

Project #: 63316.11

From: Shannon Ruby Julien

Re: FPID 437200-1-22-91/437200-2-22-01
US 17/92 PD&E - Crested Caracara Survey

The proposed project falls within the US Fish and Wildlife Service (USFWS) consultation area for Audubon's crested caracara (*Polyborus plancus audubonii*, f.k.a. *Caracara cheriway*), a Threatened species. Furthermore, habitat within and adjacent to the project have the potential to support this species. A survey methodology was developed, presented, and approved by USFWS for approval in November/December 2021. Surveys commenced on January 5, 2022, and concluded on April 29, 2022. This memo documents the results of the crested caracara survey conducted for the US 17/92 PD&E for the 2022 survey period.

Site Location

- The project consists of the US-17-92 project boundary from Ivy Mist Lane to Avenue A, three proposed pond sites, and one floodplain compensatory storage pond site located just west of Intercession City in Osceola County, Florida. The total project length is 3.8 miles and includes construction of a westbound bridge and conversion of the existing bridge over Reedy Creek for eastbound travel lanes. The proposed pond sites are all located on undeveloped land and comprise a mixture of wetlands and uplands. The project area right-of-way (ROW) lies within the following areas: Sections 3, 6, 7, Township 26S, Range 28E; Section 12, Township 26S, Range 27E; and Sections 31, 32, 33, 34, Township 25S, Range 28E (**Figure 1**). The approximate center of the project is located at longitude 81.531837 °W, latitude 28.265101°N.

Habitat Requirements

- The crested caracara prefers dry or wet prairies with scattered cabbage palms (*Sabal palmetto*). It may also be found in lightly wooded areas with saw palmetto (*Serenoa repens*), cypress (*Taxodium* spp.), various oaks (*Quercus geminata, Q. minima, Q. pumila*), and pastures. The presence of wetlands, which may serve as foraging habitat, is an important factor in the attractiveness to caracaras. Upland and wetland mixed forests and unimproved pastures found within the project limits are some types of potential suitable habit for the crested caracara. The majority of nesting habitat is situated in the vicinity of survey station 4.

Survey Methods

- The survey for the presence of crested caracara was conducted by experienced scientists according to the USFWS's Crested Caracara Draft Survey Protocol, December 2016 and the approved USFWS site specific methodology/survey plan (**Attachment 1**). The survey spanned the period from January 5, 2022, to April 29, 2022. According to USFWS guidelines, this includes the time from January through March when there is the highest probability of finding caracara nests, as adult caracaras are foraging to feed nestlings and therefore, are more visible to observers. Nine (9) survey events, each approximately two (2) weeks apart, were conducted at four (4) approved survey stations. Surveys began at least 15 minutes before sunrise and lasted for at least

- Four survey stations (approved by the USFWS) were established within or adjacent to the onsite suitable habitat and positioned to maximize the viewing distance and area (**Figure 2**). Scientists visually scanned the appropriate habitat for the presence of crested caracara for the duration of the survey.

Results

- No observations of crested caracara were recorded onsite or adjacent to the project during any of the surveys. However, numerous other bird species including adult bald eagles (*Haliaeetus leucocephalus*), red shouldered hawks (*Buteo lineatus*), turkey vultures (*Cathartes aura*), black vultures (*Coragyps atratus*), wild turkeys (*Meleagris gallopavo*), and various passerine birds were consistently observed in the area. Tables 1 through 4 summarize the survey dates and results at each respective station. A compilation of the individual Caracara Survey Forms (by survey station) is provided in **Attachment 2**.

Table 1: US 17/92 Caracara Survey Results – Station 1

Survey Date	Start Time of Survey	Max Temperature	Max Wind Speed and Direction	Caracara Observed
01/05/22	7:00 am	63 °F	Calm	No
01/19/22	7:00 am	63 °F	NE 6 mph	No
01/31/22	6:55 am	55 °F	WSW 6 mph	No
02/16/22	6:45 am	72 °F	E 9 mph	No
03/01/22	6:30 am	67 °F	NNE 8 mph	No
03/16/22	7:15 am	69 °F	Calm	No
04/05/22	7:00 am	77 °F	SE 9 mph	No
04/13/22	6:45 am	76 °F	SE 7 mph	No
04/27/22	6:30 am	75 °F	SW 4 mph	No

Table 2: US 17/92 Caracara Survey Results – Station 2

Survey Date	Start Time of Survey	Max Temperature	Max Wind Speed and Direction	Caracara Observed
01/05/22	7:00 am	66 °F	Calm	No
01/19/22	7:00 am	61 °F	N 5 mph	No
01/31/22	6:55 am	57 °F	SW 5 mph	No
02/16/22	6:45 am	69 °F	E 9 mph	No
03/01/22	6:30 am	61 °F	NNW 9 mph	No
03/16/22	7:15 am	66 °F	S 8 mph	No
03/27/22	7:00 am	67 °F	NW 10 mph	No
04/13/22	6:45 am	73 °F	SE 11 mph	No
04/24/22	6:30 am	76 °F	E 9 mph	No

Table 3: US 17/92 Caracara Survey Results – Station 3

Survey Date	Start Time of Survey	Max Temperature	Max Wind Speed and Direction	Caracara Observed
01/07/22	7:00 am	68 °F	NNW 4 mph	No
01/21/22	7:00 am	64 °F	Calm	No
02/04/22	6:55 am	73 °F	S 10 mph	No
02/18/22	6:45 am	75 °F	SSW 9mph	No
03/03/22	6:30 am	68 °F	NE 3 mph	No
03/18/22	7:15 am	71 °F	Calm	No
03/30/22	7:00 am	73 °F	SSE 9 mph	No
04/14/22	6:45 am	77 °F	SE 7 mph	No
04/29/22	6:33 am	75 °F	E 11 mph	No

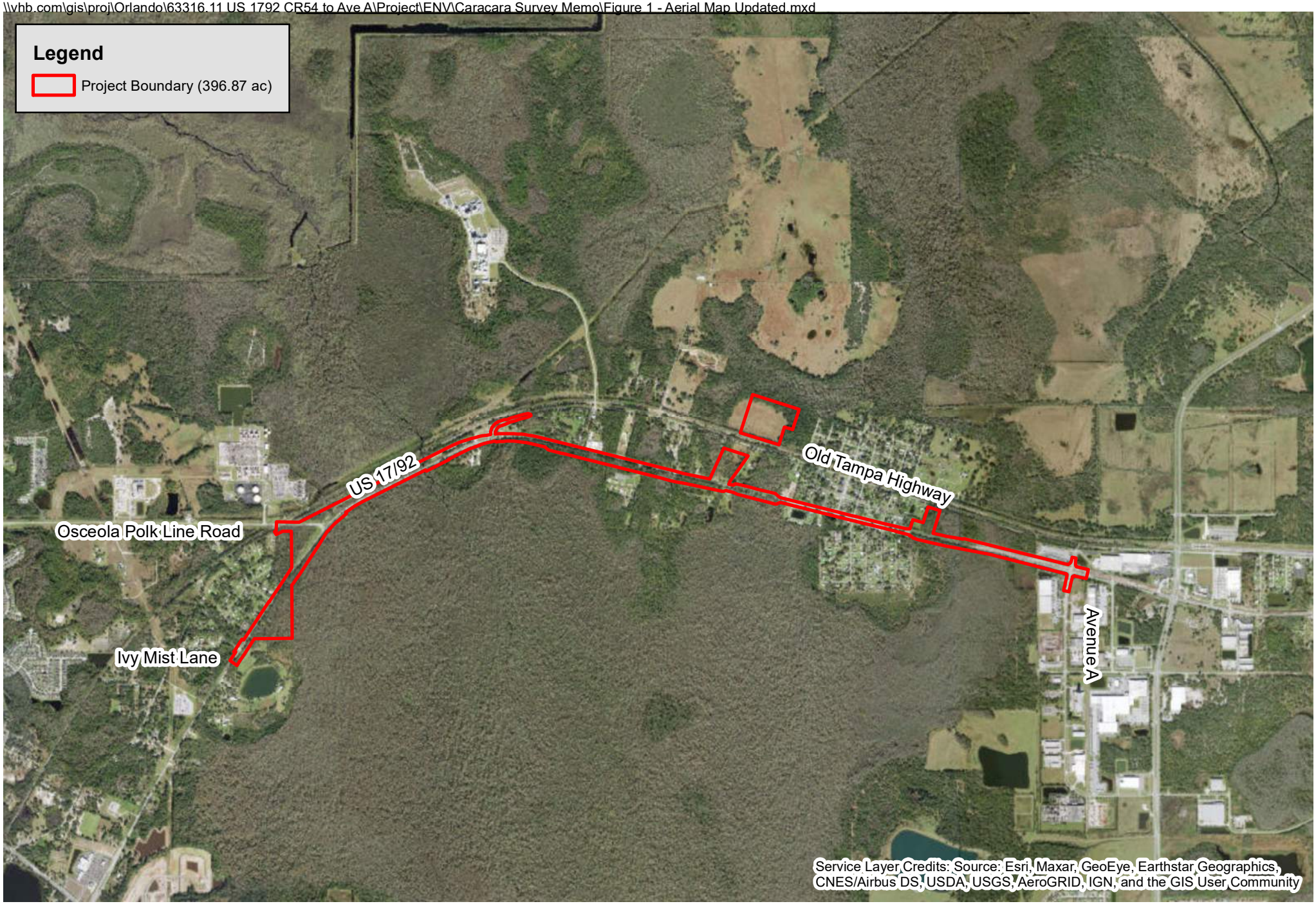
Table 4: US 17/92 Caracara Survey Results – Station 4

Survey Date	Start Time of Survey	Max Temperature	Max Wind Speed and Direction	Caracara Observed
01/07/22	7:00 am	69 °F	WNW 5 mph	No
01/21/22	7:00 am	64 °F	Calm	No
02/04/22	6:55 am	73 °F	S 10 mph	No
02/18/22	6:45am	72 °F	SSW 10 mph	No
03/03/22	6:30 am	66 °F	N 4 mph	No
03/18/22	7:15 am	71 °F	Calm	No
04/06/22	7:00 am	79 °F	S 11 mph	No
04/14/22	6:45 am	78 °F	E 4 mph	No
04/27/22	6:30 am	73 °F	Calm	No

Conclusion

While suitable habitat to support foraging and nesting is present on site, Audubon's crested caracara was not observed utilizing the project area or adjacent properties during the 2022 survey season, resulting in a negative presence survey. However, the project will impact some suitable habitat for the construction of ponds, and thus the project '**May Affect, Not Likely to Adversely Affect'** the crested caracara.

\\vhb.com\gis\proj\Orlando\63316.11 US 1792 CR54 to Ave A\Project\ENV\Caracara Survey Memo\Figure 1 - Aerial Map Updated.mxd



FDOT

USFWS 17/92 Project Corridor Location Map

US 17/92 from Ivy Mist Lane to Avenue A

Osceola County, Florida

FPID: 437200-1-22-91-01/437200-2-22-01

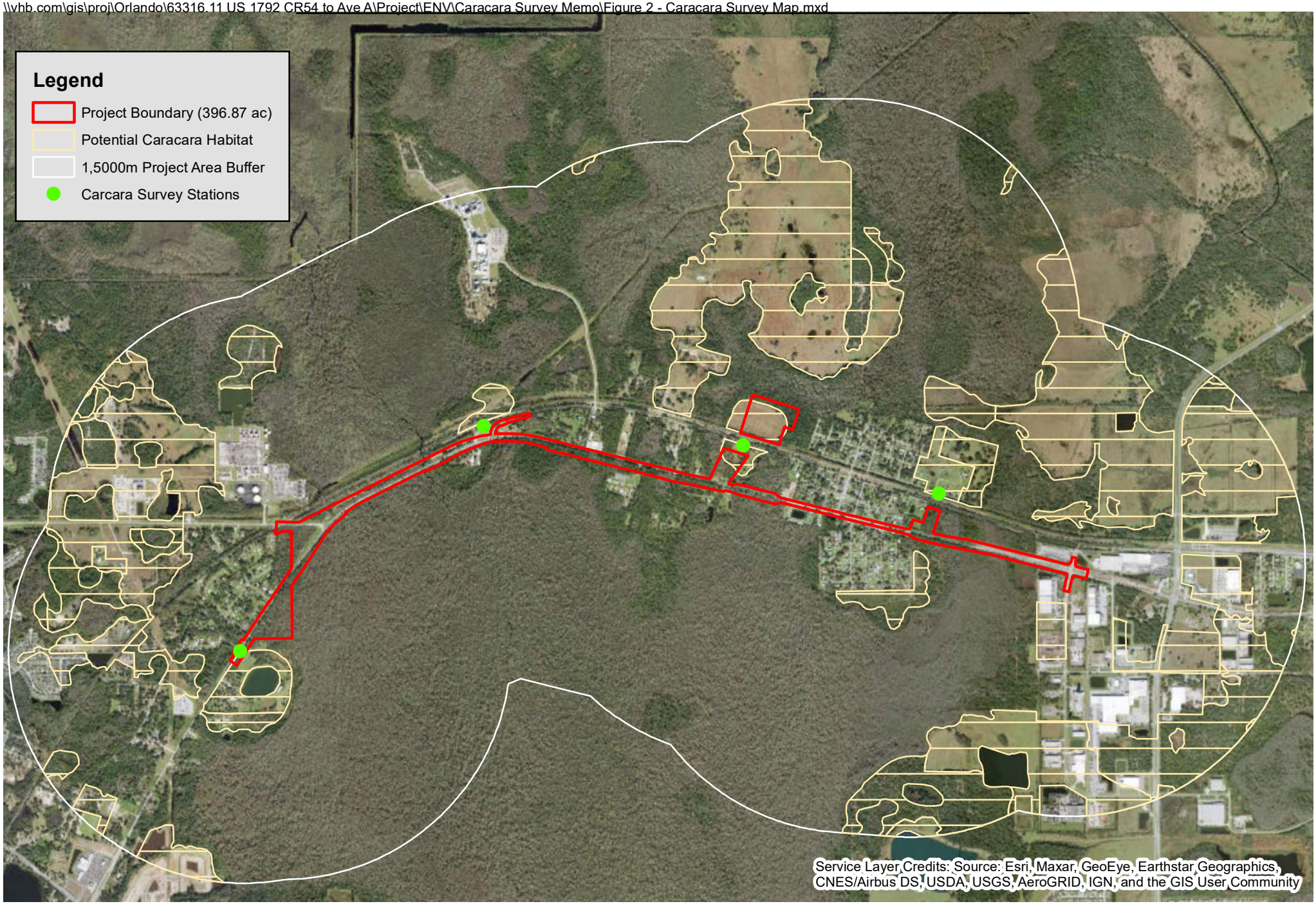
August 2022

Figure 1

0 0.25 0.5 Miles

N

\\vhb.com\gis\proj\Orlando\63316.11 US 1792 CR54 to Ave A\Project\ENV\Caracara Survey Memo\Figure 2 - Caracara Survey Map.mxd



FDOT

Caracara Habitat and Survey Station Map

US 17/92 from Ivy Mist Lane to Avenue A

Osceola County, Florida

FPID: 437200-1-22-91-01/437200-2-22-01

August 2022

Figure 2

0 0.25 0.5 Miles

N

ATTACHMENT 1

Caracara Survey Methodology

This methodology outlines the proposed survey techniques to locate caracara nests in proximity to the US 17/92 project corridor and potential pond sites. As noted, the project corridor begins at Ivy Mist Lane and ends at Avenue A in Osceola County. **Figure 1** depicts the project corridor location. The proposed survey methodology generally conforms to the United States Fish and Wildlife Service (USFWS) Crested Caracara Draft Survey Protocol – Additional Guidance (2016-2017 Breeding Season) (2016).

The proposed survey covers areas of suitable habitat within and adjacent to the project area. Suitable habitats (dry prairie, lightly wooded areas, improved and unimproved pastures) were identified based on GIS habitat mapping and onsite evaluation. **Figure 2** depicts the areas of suitable habitat within the project area, the 1,500-meter buffer, and the proposed observation blocks/survey stations.

Survey stations are located adjacent to suitable habitat or where unobstructed views into suitable habitat are present. Accessibility was also considered with respect to ownership and right of entry agreements. In addition, some areas of suitable habitat within the 1,500-meter buffer area, outside of the project area, are a significant distance from proposed construction, while others are not able to be surveyed due to accessibility or access issues. The survey stations recommended should provide sufficient insight into the potential use of the land within the 1,500-meter buffer by caracara. The survey stations allow assessment of a significant portion of the suitable habitat adjacent to the project area in order to identify caracara activity.

Surveys will be conducted by qualified observers, commencing no later than January 10th and terminating April 30th since this is the time when the birds are active around the nest and are more visible to observers. The survey area will be viewed during the morning (15 minutes prior sunrise to 11AM) a minimum of once every two (2) weeks. Afternoon surveys (three hours before sunset) may supplement, but not obviate the required morning surveys of once per every two (2) weeks.

The observer(s) shall position themselves in strategic locations where the best habitat (unobstructed by trees, fences or buildings) can be viewed and will reposition themselves as needed in an effort to view as much of the potential habitat as possible. From each stationary position the observer will use spotting scopes and/or binoculars to search for caracara activity, especially birds moving to the nest tree. Observers will follow the USFWS guidance to "watch for other birds", such as American crows (*Corvus brachyrhynchos*), red-tailed hawks (*Buteo jamaicensis*), and turkey vultures (*Cathertes aura*), that might elicit an aggressive response from caracaras or indicate the presence of naturally occurring carrion that may attract caracaras. If no nests are found during the initial survey, then the survey will be repeated every two weeks through the end of April or until a nest is found.

If a nest in the survey area is found, productivity surveys will commence and additional observations of caracara activity will be recorded by time of day and age of bird (i.e., juvenile or adult). Flight directions will be recorded to identify foraging areas and the nesting tree. Any nesting tree location shall be marked on the map and GPS coordinates obtained. Weather conditions (temperature, wind speed and direction, cloud cover, visibility, and precipitation) shall be recorded at the start and end of each survey period. The survey at an individual survey station may be terminated when the nest tree is located and information on the birds preferred foraging areas is determined.

ATTACHMENT 2
Caracara Survey Datasheets
Stations 1-4

STATION 1

USFWS Crested Caracara Draft Survey Protocol –
Additional Guidance (2016-2017 Breeding Season)

Caracara Survey Form (updated 12/9/2016)

Project Name: 17/92
Location/Observation Block/Lat-Long: Station 1

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
1/4/21	7:00 AM	10:00 AM	Alex Meehean / Biologist

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start: 7:00	60°	N/A	15%	–	none
Finish: 10:00	63°	N/A	50%	–	none

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area
Mowed + maintained feild, large trees around feild. Church parking lot nearby, oak hammock

Observations

(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
1	–	7:00	- No birds heard - heavy traffic from road - No wind
	–	7:15	- small ducks? fly over (x3) - squirrel
	–	7:30	- No Activity - Very heavy traffic from 17/92
	–	7:45	- No change

USFWS Crested Caracara Draft Survey Protocol –
Additional Guidance (2016-2017 Breeding Season)

	–	8:00	- Male boat tailed grackle
	–	8:15	- No change
	–	8:30	- Cardinal
	–	8:45	- No change - Still no wind + heavy traffic
	–	9:00	- No change
	–	9:15	- Turkey
	–	9:30	- No change - No activity + still heavy traffic
	–	9:45	- No change
1	–	10:00	- Eastern meadowlark - Mockingbird - No caracara observed - Catbird - No wind [redacted] - Heavy car traffic

USFWS Crested Caracara Draft Survey Protocol – Additional Guidance (2016-2017 Breeding Season)

Caracara Survey Form (updated 12/9/2016)

Project Name: 17/92

Location/Observation Block/Lat-Long: Station 1

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
1/19/22	7:00 AM		Alex Meehean Biologist

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start: 7:00AM	43°	NE 6mph	0%	—	none
Finish: 10:00AM	63°	NE 4mph	0%	—	none

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area
- mowed + maintained field owned by nearby church - large trees surrounding field, oaks, sweet gum, some pine

Observations

(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
1	–	7:00	- no calls or sighted birds - heavy traffic, hard to hear
	–	7:15	- no signs of any birds + caracara - very heavy traffic
	–	7:30	- Palm warbler - Great Blue Heron fly over to south - cooler air might reduce activity
	–	7:45	- No activity - medium traffic

1	-	8:00	- crow (x2) - medium traffic
1	-	8:15	- No activity - Low traffic
1	-	8:30	- some song birds - Cardinal - medium traffic
1	-	8:45	- No activity - Low traffic
1	-	9:00	- No change - low traffic
1	-	9:15	- Eastern meadowlark - medium traffic
1	-	9:30	- Palm warbler - Medium traffic
1	-	9:45	- Several Palm warblers - low traffic
1	-	10:00	- no signs of carcara activity - low traffic

USFWS Crested Caracara Draft Survey Protocol –
Additional Guidance (2016-2017 Breeding Season)

Caracara Survey Form (updated 12/9/2016)

Project Name: 17/92

Location/Observation Block/Lat-Long: Station 1

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
1/31/22	7:00 AM	10:00 AM	Alex Meehean Biologist

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start: 7:00 AM	34°	WSW 6mph	0%	–	–
Finish: 10:00 AM	55°	WSW 2mph	0 %	–	–

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area
Mowed + maintained field. Frost overnight, heavy traffic

Observations

(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
1	-	7:00	- heavy traffic - can't hear any birds - Frost on grass + trees
1	-	7:15	- no activity
1	-	7:30	- no activity - heavy traffic
1	-	7:45	- Palm warbler ? - Crow fly over

1	–	8:00	- No activity
1	–	8:15	- No change - traffic dying down
1	–	8:30	- Eastern pheobe?
1	–	8:45	- Cattle egret
1	–	9:00	- No activity
1	–	9:15	- Vulture fly over
1	–	9:30	- No activity
1	–	9:45	- Palm warbler - Cardinal - Grackles
1	–	10:00	- no signs of caracara

USFWS Crested Caracara Draft Survey Protocol –
Additional Guidance (2016-2017 Breeding Season)

Caracara Survey Form (updated 12/9/2016)

Project Name: [redacted] 17/92

Location/Observation Block/Lat-Long: station 1

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
2/16/22	6:45	9:45	Alex Meehean Biologist

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start: 645	55	5mph SW	0%	-	-
Finish: 945	72	12 mph E	0%	-	-

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area
- Field opening off 17/92, maintained + mowed, heavy traffic, some trees include oaks, pine, sweet gum, palm

Observations

(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
1	-	6:45	- Bats still flying around - Heavy traffic, hard to hear birds - Palm warbler ?
1	-	7:00	- Cattle egret fly over - crow - vulture
1	-	7:15	- heavy traffic - no activity
1	-	7:30	- Vulture some songbirds

1	-	7:45	- Northern mocking bird - mourning dove -heavy traffic
1	-	8:00	-palm warbler -heavy traffic
1	-	8:15	- No activity
1	-	8:30	-palm warbler - eastern phoebe -traffic starting to die down
1	-	8:45	-unidentified woodpecker -traffic picking back up
1	-	9:00	-GBH flyover -traffic light now
1	-	9:15	- No activity
1	-	9:30	-Tried to move down road 500' to get different view - No activity
1	-	9:45	-vultures - no signs of caracara activity

C-C

USFWS Crested Caracara Draft Survey Protocol –
Additional Guidance (2016-2017 Breeding Season)

Caracara Survey Form (updated 12/9/2016)

Project Name: 17/92

Location/Observation Block/Lat-Long: Station 1

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
3/1/22	6:30	9:30	Alex Meehan Biologist

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start: 6:30	59°	NNE 8mph	100%	stratus	N/A
Finish: 9:30	67°	NE 6mph	100%	Stratus	N/A

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area
Field maintained by nearby church, surrounded by pines/oaks heavy, heavy traffic

Observations

(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
1	-	6:30	heavy traffic, very overcast, no activity
1	-	6:45	heavy traffic, no activity
1	-	7:00	- crows - still heavy traffic - birds quiet
1	-	7:15	- vulture - mourning dove

1	–	7:30	- crows - very little activity
1	-	7:45	- GBH flyover - palm warbler - heavy traffic
1	–	8:00	- still very overcast + heavy traffic - some song birds heard but still very quiet
1	–	8:15	- No activity
1	–	8:30	- No change
1	–	8:45	- No activity
1	-	9:00	- crow flyover
1	-	9:15	- No activity
1	–	9:30	- No evidence of caracara - traffic remained busy throughout

USFWS Crested Caracara Draft Survey Protocol –
Additional Guidance (2016-2017 Breeding Season)

Caracara Survey Form (updated 12/9/2016)

Project Name: 17/92

Location/Observation Block/Lat-Long: Station 1

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
3/16	7:15	10:15	Alix Meehean Biologist

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start: 7:15	65°	calm	100%	stratus	—
Finish: 10:15	69°	calm	40%	stratus	—

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area
- field maintained by nearby church, pine + live oak surrounding - heavy traffic off 17/92 - thunderstorm blew through last night

Observations

(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
1	–	7:15	- Very heavy traffic - no signs of birds/caracara
1	–	7:30	- No change
1	–	7:45	- grackles
1	–	8:00	- turkey

1	-	8:15	- heavy traffic - no activity
1	-	8:30	- cattle egret - palm warbler
1	-	8:45	- unidentified woodpecker - still heavy traffic
1	-	9:00	- palm warblers - heavy traffic
1	-	9:15	- No activity
1		9:30	- grackle - crows - vuture
1		9:45	- No activity - heavy traffic
1		10:00	- red shoulder hawk perched in tree - crow fly over
1		10:15	- No signs of caracara activity

USFWS Crested Caracara Draft Survey Protocol –
Additional Guidance (2016-2017 Breeding Season)

Caracara Survey Form (updated 12/9/2016)

Project Name: I7/92

Location/Observation Block/Lat-Long: Station 1

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
4/5/22	7:00	10:00	Alex Meehean Biologist

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start: 7:00	68°	SE 6mph	0%	–	–
Finish: 10:00	77°	SE 9mph	20%	Stratus	–

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area
- maintained mowed field near church, pine, live oaks, and sweetgum, heavy traffic on I7/92 - Not most ideal habitat

Observations

(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
1	–	7:00	- Extremely heavy traffic, difficult to hear anything - no activity
1	–	7:15	- No activity - heavy traffic
1	–	7:30	- Cardinal
1	–	7:45	- cattle egret

1		8:00	-Turkey
1		8:15	-more turkeys
1		8:30	-GBH flyover -heavy traffic
1		8:45	-palm warbler -traffic dying down
1		9:00	-became very cloudy - songbirds
1		9:15	-no activity
1		9:30	-crow (x2) flyover -traffic picking up again -sunny again
1		9:45	-palm warbler -eastern towhee -unidentified woodpecker
1		10:00	-No caracara activity -Still heavy traffic

USFWS Crested Caracara Draft Survey Protocol –
Additional Guidance (2016-2017 Breeding Season)

Caracara Survey Form (updated 12/9/2016)

Project Name: 17/92

Location/Observation Block/Lat-Long: Station 1

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
4/13/22	6:45	9:45	Alex Meehan Biologist

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start: 6:45	66°	7mph SE	35%	–	–
Finish: 9:45	76°	8mph SE	70%	stratus	–

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area
- maintained field surrounded by live oaks, slash pine, sweetgum - very busy + heavy traffic from 17/92

Observations

(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
~~1~~	–	6:45	- heavy traffic - song birds - vulture
1	–	7:00	- cardinal - song birds - heavy traffic
1	–	7:15	- Great egret flyover - palm warbler
1	–	7:30	- no change

1	-	7:45	- song birds
1	-	8:00	- Turkey - white ibis
1	-	8:15	- no activity
1	-	8:30	- crows
1	-	8:45	- cardinal
1	-	9:00	- crow flyover - heavy traffic
1	-	9:15	- no activity
1	-	9:30	- no activity
1	-	9:45	- no signs of caracara activity

USFWS Crested Caracara Draft Survey Protocol –
Additional Guidance (2016-2017 Breeding Season)

Caracara Survey Form (updated 12/9/2016)

Project Name: 17192

Location/Observation Block/Lat-Long: Station 1

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
4/27/22	6:30	9:30	Alex Meehean Biologist

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start: 6:30	66°	SW 3 mph	0%	–	–
Finish: 9:30	75°	SW 4 mph	0%	–	–

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area
-Heavy traffic, field recently mowed, recently burned wood pile in field, still smoking

Observations

(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
[redacted] 1	–	6:30	-Heavy traffic -hard to hear over - Eastern meadowlark
1	–	6:45	- Boat-tailed grackle - great egret flyover (N) - cardinal
1	–	7:00	- cardinal - crow heard - eastern meadowlark
1	–	7:15	- palm warbler

1	–	7:30	- heavy traffic in a stands till - wood pile in field still smouldering/smoking - no birds seen, some songbirds heard
1	–	7:45	- unidentified woodpecker
1	–	8:00	- vulture fly over - GBH flyover
1	–	8:15	- palm warbler - Eastern meadowlark
1	–	8:30	- some songbirds heard but no activity
1	–	8:45	- Turkeys (x3) - red shouldered hawk
1	–	9:00	- still heavy traffic
1	–	9:15	- palm warbler, cardinal
1	–	9:30	- no signs of caracara observed

STATION 2

USFWS Crested Caracara Draft Survey Protocol –
Additional Guidance (2016-2017 Breeding Season)

Caracara Survey Form (updated 12/9/2016)

Project Name: 17192

Location/Observation Block/Lat-Long: SURVEY LOCATION 2

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
1/5/22	7.00	10.00	HANNAH ROWE

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start:	58°F	CALM	10	–	NONE
Finish:	66°F	CALM	70	–	NONE

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area
GRASSY AREA AT INTERSECTION NEXT TO RAILROAD, LOOKING NORTH TO PREFERED HABITAT. NOISE FROM ADJACENT ROADWAYS. NO RAIL ACTIVITY

Observations

(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
SURVEY STATION		7.05	FLOCK OF GRACKLES FLY E→W
		7.14	SONG BIRD HEARD
		7.21	SONG BIRD HEARD
		7.36	SONG BIRD HEARD IN TREE TO EAST
		7.48	SONG BIRD FLIES OVER RAILROAD W→E
		8.08	CROWS HEARD - TWO ON LIGHT POLE TO EAST
		8.18	SONG BIRD HEARD TO EAST
		8.24	TWO GRACKLES FLY N→S
		8.36	GROUP OF SPARROWS FLY S (LOW)
		8.49	SONG BIRD HEARD
		9.32	PINE WARBLER FLIES BETWEEN BUSHES TO WEST

		8.51 8.54	CROW FLIES ~~W~~ N → S, CALLING CARDINAL FLIES FROM CABBAGE PALM IMMEDIATELY N~~&~~ OF ROADWAY TO ELECTRIC LINE ADJACENT, AND
		9.01	RETURNS TO CABBAGE PALM / OAKS LITTLE BLUE HERON CROSSES DRIWAY, WALKING EAST TO DITCH
		9.02 9.10	LITTLE BLUE HERON FLIES TO NORTH WEST. CARDINAL FLIES TO ELECTRIC
		9.12	LINE, PERCHES + RETURNS TO CABBAGE PALM CROW CROWS
		9.20 9.28	SONG BIRDS HEARD CROW FLIES S → N ACROSS HABITAT.
		9.48 9.56	CROWS HEARD CARDINAL FLIES TO POLE, ELECTRIC LINE + BACK TO OAK TREE

USFWS Crested Caracara Draft Survey Protocol –
Additional Guidance (2016-2017 Breeding Season)

Caracara Survey Form (updated 12/9/2016)

Project Name: 17192

Location/Observation Block/Lat-Long: SURVEY STATION 2

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
1/19/22	7.00	10.00	HANNAH ROWE

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start:	44	2MPH N	10	-	NONE
Finish:	61	5MPH N	0	-	NONE

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area
NO RAIL TRAFFIC TYPICAL ROADWAY TRAFFIC

Observations

(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
		7.08	SONG BIRD HEARD
		7.25	TWO GRACKLES FLY WEST TO EAST OVER AREA OF HABITAT
		7.48	CROWS HEARD
		7.55	SMALL BIRD, DARTS FROM EAST TO WEST
		8.08	BETWEEN TREES SOUTH OF RAILROAD THREE GRACKLES FLY WEST TO EAST OVER RAILROAD
		8.09	TWO GRACKLES FLY WEST TO EAST OVER AREA OF HABITAT.
		8.21	SONG BIRD HEARD

		8.29 9.07	EASTERN PHOEBE FLYS BETWEEN TWO OAK TREES SOUTH OF RAILROAD SONG BIRD HEARD
		9.35 9.42	CARDINAL OBSERVED IN OAK SW OF RAILWAY LINE SONG BIRD HEARD

USFWS Crested Caracara Draft Survey Protocol – Additional Guidance (2016-2017 Breeding Season)

Caracara Survey Form (updated 12/9/2016)

Project Name: 17192

Location/Observation Block/Lat-Long: SURVEY STATION 2

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
1/31/22	6.55	9.55	HANNAH ROWE

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start:	35F	2MPH S	NONE	–	NONE
Finish:	37F	5MPH SW	NONE	–	NONE

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area
NO RAIL TRAFFIC TYPICAL ROADWAY TRAFFIC

Observations

(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
		7.08	CROW FLIES EAST TO WEST, ABOVE RAILWAY
		7.22	SONG BIRD HEARD
		7.30	FIVE GRACKLES FLY NORTH TO SOUTH
		7.36	BLACK VULTURE FLIES FROM WEST OVER RAILWAY + SOUTH
		7.42	CROW PERCHES ON POLE ON ROADWAY + CROWS
		8.06	BLACK VULTURE PERCHES ON POLE ALONG ROADWAY TO EAST
		8.15	CARDINAL FLIES BETWEEN OAKS TO WEST

		8:26 8:42	SONG BIRDS HEARD BLACK VULTURE FLIG WEST TO EAST AND PERCHED ON POLE NEXT TO OTHER VULTURE
		8:56 9 02	SONG BIRD HEARD PARM WARBLER FLY'S BETWEEN TWO OAKS TO THE NORTHEAST
		9 22 9 36	SONG BIRD HEARD SONG BIRD HEARD

USFWS Crested Caracara Draft Survey Protocol –
Additional Guidance (2016-2017 Breeding Season)

Caracara Survey Form (updated 12/9/2016)

Project Name: 17/92

Location/Observation Block/Lat-Long: SURVEY STATION 2

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
2/16/22	6.45	9.45	HANNAH ROWE

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start:	55F	5 ENE	5	–	NONE
Finish:	69F	9 E	0	–	NONE

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area
TYPICAL RESIDENTIAL TRAFFIC

Observations

(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
		7.01	SONG BIRD HEARD
		7.07	TWO GRACKLES FLY W→E ABOVE S.S.
		7.08	LARGE GROUP OF GRACKLES FLY W→E ABOVE RAILWAY.
		7.14	CROW FLYS S→NW
		7.17	TWO GRACKLES FLY W→E OVER S.S.
		7.26	SONG BIRD HEARD
		7.28	CROW PERCHED ON ELECTRIC LINE ABOVE S.S + CROWS, FLIES TO W
		7.40	CROW FLIES W→E, ABOVE S.S.
		7.46	SONG BIRDS HEARD
		7.57	TWO CROWS FLY S→N

		8.04 8.09 8.40	SONG BIRD HEARD GRACKLE FLIES W→E ABOVE S.S. SONG BIRDS HEARD
		8.59 9.16	BLACK VULTURE FLIES OVER RAILROAD W→E + THEN TO NE. BLACK VULTURE FLIES OVER TREES TO WEST
		9.37	BLACK VULTURE FLIES OVER TREES TO NW.

USFWS Crested Caracara Draft Survey Protocol –
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Caracara Survey Form (updated 12/9/2016)

Project Name: 17192
Location/Observation Block/Lat-Long: SURVEY STATION 2

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
3/1/22	6.30	9.30	HANNAH ROWE

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start:	60	8 MPH N	100	-	NONE
Finish:	61	9 MPH NNW	90	-	NONE

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area
NO RAIL ACTIVITY TYPICAL ROADWAY TRAFFIC QUIETER THAN TYPICAL TODAY.

Observations

(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
		6.31	SONG BIRDS HEARD
		6.42	4 CRACKLES FLY N → NW OVER HABITAT AREA.
		6.57	SONG BIRD HEARD
		7.15	SONG BIRDS HEARD.
		7.22	CROW, CROWS
		7.23	THREE CROWS PERCH ON ELECTRIC LINE ON OLD TAMPA HIGHWAY
		7.36	AN EASTERN PHOEBE FLIES TO OAK TREE SW OF RAILWAY LINE
		7.49	CROW FLIES E → W OVER RAILROAD
		8.06	SONG BIRD HEARD
		8.20	SONG BIRD HEARD
		8.37	SONG BIRDS HEARD
		8.59	CROW HEARD

		9.03 9.07	CROW FLIES FROM S TO ELECTRIC LINE S OF RAILWAY SONG BIRDS HEARD
		9.16 9.22 9.24	CROW HEARD SONG BIRD HEARD TWO VULTURES CIRCLE TO NE

USFWS Crested Caracara Draft Survey Protocol –
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Caracara Survey Form (updated 12/9/2016)

Project Name: US 17/92

Location/Observation Block/Lat-Long: SURVEY STATION 2

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
3/16/22	7.15	10.15	HANNAH ROWE

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start:	65	CALM	90	-	NONE
Finish:	69	8MPH S	40	-	NONE

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area
NO NAIL ACTIVITY TYPICAL TRAFFIC ON ADJACENT ROADWAYS

Observations

(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
		7.18	SONG BIRD HEARD
		7.25	SNOWY EGRET FLIES OVERHEAD N → S
		7.42	SONG BIRDS HEARD
		7.58	SONG BIRD HEARD
		8.05	GROUP OF GRACKLES FLY N→S
		8.12	CROW HEARD
		8.16	SONG BIRD HEARD
		8.27	SONG BIRDS HEARD
		8.53	CARDINAL FLIES BETWEEN OAKS TO WEST.

		9.02 9.07	CROW PERCHED ON ELECTRIC LINE TO NORTHEAST SONG BIRDS HEARD
		9.32 9.46 10.02	SONG BIRDS HEARD MOURNING DOVE HEARD CROW HEARD

USFWS Crested Caracara Draft Survey Protocol –
Additional Guidance (2016-2017 Breeding Season)

Caracara Survey Form (updated 12/9/2016)

Project Name: SURVEY STATION 2

Location/Observation Block/Lat-Long: SURVEY STATION 2

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
3/27/22	7.00	10.00	HANNAH ROWE

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start:	55	4MPH W	0	-	NONE
Finish:	67	10MPH NW	0	-	NONE

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area
NO RAILWAY ACTIVITY TYPICAL ROADWAY NOISE.

Observations

(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
		7.01	SONG BIRDS HEARD
		7.05	CROW HEARD
		7.09	CROW PERCHED ON POLE ON ROAD
		7.17	GROUP OF GRACKLES FLY E-W OVER RAILWAY (15)
		7.23	CROWS HEARD
		7.31	SONG BIRD HEARD
		7.42	CROWS HEARD
		7.48	FLOCK OF ~30 WHITE IBIS FLY E→W OVER HABITAT AREA
		7.50	SONG BIRDS HEARD
		8.02	TWO CARDINALS FLY W→E

		8.08 8.14	SONG BIRDS HEARD EASTERN PHEOBE FLIES BETWEEN TWO OAK TREES TO NORTH
		8.23 8.39	SONG BIRD HEARD RED SHOULDERED HAWK CATCHES PREY TO NW, SOUTH OF RAILWAY LINE.
		8.47 9.02 9.12	SONG BIRDS HEARD CROWS HEARD SONG BIRD HEARD
		9.27 9.34 9.41	CARDINAL FLIES E→W SONG BIRD HEARD CROW HEARD
		9.49	CROW PERCHES ON POLE ON ROADWAY.

USFWS Crested Caracara Draft Survey Protocol –
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Caracara Survey Form (updated 12/9/2016)

Project Name: 17/92

Location/Observation Block/Lat-Long: SURVEY STATION 2

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
4/13/22	6.45	9.45	HANNAH ROWE

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start:	66	7 EAST	10	–	NONE
Finish:	73	11 SE	30	–	NONE

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area
NO RAIL ACTIVITY. TYPICAL ROADWAY NOISE.

Observations

(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
		6.45	SONG BIRDS HEARD IN TREES TO WEST + EAST
		7.00	GREAT EGRET FLIES E→W
			ABOVE RAILWAY
		7.08	TWO CROWS PERCH ON ELECTRIC LINE NORTHEAST OF RAILWAY.
		7.14	GRACKLES FLY E→W OVER ~~FIELD~~ AREA OF HABITAT
		1.33	BOTH CROWS FLY OFF TO WEST
		7.40	CROWS HEARD
		7.44	MOURNING DOVE PERCHES ON ELECTRIC LINE ABOVE + COOS

		8.20 8.36 8.48	SONG BIRD HEARD TO WEST CROW HEARD SONG BIRD HEARD TO WEST
		9.20 9.35	CARDINAL FLIES TO OAK TREE TO EAST SONG BIRD HEARD

USFWS Crested Caracara Draft Survey Protocol –
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Caracara Survey Form (updated 12/9/2016)

Project Name: US 17/92

Location/Observation Block/Lat-Long: SURVEY STATION 2

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
4/24/22	6.30	9.30	HANGAM RONE

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start:	65°	4MPH ENE	100	–	NONE
Finish:	76°	9MPH E	70	–	NONE

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area
TYPICAL WEEKEND TRAFFIC ON US 17/92 QUIETIER THAN USUAL

Observations

(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
		6.30	SONG BIRDS HEARD
		6.44	BLACK VULTURE FLIES N→S
		6.59	SONG BIRD HEARD
		7.08	CARDINAL FLIES BETWEEN OAKS TO EAST
		7.19	SONG BIRD HEARD
		7.24	TWO CRACKLES FLY E→W
		7.48	CROWS HEARD
		7.53	SONG BIRD HEARD
		8.22	SONG BIRDS HEARD
		8.38	SONG BIRD HEARD
		8.51	FIVE CRACKLES FLY SW→NE

		9.06 9.12 9.24	BLACK VULTURE FLIES S-SW GREAT EGRET FLIES N->S SONG BIRDS HEARD

STATION 3

USFWS Crested Caracara Draft Survey Protocol –
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Caracara Survey Form (updated 12/9/2016)

Project Name: 17192

Location/Observation Block/Lat-Long: Station 3

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
1/7/21	7:00 AM		Alex Meehean / Biologist

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start: 7:00 AM	63°	NW 4	100%	—	—
Finish: 10:00 AM	68°	NNW 2	0%	—	—

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area
- semi maintained feild, surrounded by pines. Large field to the north (sight obscured). Medium traffic from road - Between two residental areas

Observations

(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
3	—	7:00	- No birds heard - medium traffic from road
	—	7:15	- some song birds - possibly eastern towhee
	—	7:30	- mourning dove - large (20-40) flock of grackles - Eastern meadowlark
	-	7:45	- hear woodpeckers - red shouldered hawk - mourning dove

	–	8:00	- (4x) crows perched on tree - GBH fly over - boat tailed grackle
	–	8:15	- Eastern phoebe - grackle - Turkey vulture fly over - Medium traffic from road
	–	8:30	- Cardinal across road
	–	8:45	- wood peckers - meadow lark
	–	9:00	- Activity decreased a lot - less traffic now
	–	9:15	- grey cat bird - eastern phoebe
	–	9:30	- No Activity
	–	9:45	- blue grey gnat catcher - palm warbler (x2)
3	–	10:00	- No activity - No caracara observed - Low car traffic

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Caracara Survey Form (updated 12/9/2016)

Project Name: 17/92

Location/Observation Block/Lat-Long: ~~Alex~~ Station 3

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
1/21/22	7:00 AM	10:00 AM	Alex Meehean Biologist

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start: 7:00AM	55°	NNE 4mph	0%	-	none
Finish: 10:00 AM	64F	Calm	0	-	none

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area
- recently mowed field surrounded by pines, moderate to heavy traffic in area, two residental areas to east and west

Observations

(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
3	-	7:00	- hear some song birds - moderate traffic
3		7:15	- no activity - crows heard
3		7:30	- cattle egret flyover - crows (x2) - GBH fly over
3		7:45	- palm warbler - mourning doves (x2)

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3		8:00	-Unknown woodpecker heard
3		8:15	-wood stork grazing roadside ditch -boat tailed grackle
3		8:30	-palm warbler -traffic very light now -green heron? flyover
3		8:45	-Eastern meadowlark in grass -unidentified hawk flyover -little Blue Heron fly by
3		9:00	-Wood stork left site -Bald Eagle flyover -common yellowthroat?? -crow flyover - eastern phoebe
3		9:15	-No activity
3		9:30	- Palm warbler
3		9:45	-No activity
3		10:00	-No signs of caracara -low traffic, light bird chatter -Not much activity

USFWS Crested Caracara Draft Survey Protocol –
Additional Guidance (2016-2017 Breeding Season)

Caracara Survey Form (updated 12/9/2016)

Project Name: 17/92

Location/Observation Block/Lat-Long: Station 3

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
2/4/22	7:00 AM	10:00AM	Alex Meehean Biologist

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start: 7:00AM	63°	SSE 7mph	0%	-	-
Finish: 10:00AM	73°	S 11mph	0%	-	-

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area
recently mowed field to south, low growing treeline w/ railroad to north. Moderate to low traffic.

Observations

(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
3	-	7:00	- crows - cattle egret - moderate traffic
3	-	7:15	- GBH fly over
3	-	7:30	- Unknown woodpecker - Grackle
3	-	7:45	- No activity

3	–	8:00	-Eastern pheobe -Grackle -palm warbler -crows flyover
3	–	8:15	-more crows -Grackle
3	–	8:30	-vulture -palm warbler -unidentified hawk
3	–	8:45	-eastern meadowlark -more crows, so many crows
3	–	9:00	-No activity
3	–	9:15	-Palm warbler -crow
3	–	9:30	-vulture
3	–	9:45	-No activity -palm warblers
3	–	10:00	-No signs of caracara -low traffic

USFWS Crested Caracara Draft Survey Protocol –
Additional Guidance (2016-2017 Breeding Season)

Caracara Survey Form (updated 12/9/2016)

Project Name: 17/92

Location/Observation Block/Lat-Long: Station 3

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
2/18/22	6:45	9:45	Alex Meehan Biologist

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start: 645	70°	S 8mph	100%	stratus	–
Finish: 945	75°	SSW 9mph	90%	stratus	–

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area
open field surrounded by slash pines Adjacent to semi busy road. pasture to the north divided by tree line/road/railroad

Observations

(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
3	–	6:45	- heavy traffic - quiet - very overcast/dark
3	–	7:00	- crow - heavy traffic - overcast
3	–	7:15	- unidentified woodpecker - some song birds (eastern towhee??) - eastern meadowlark
3	–	7:30	- vulture - ~~bald~~ bald eagle fly over to the east

3	-	7:45	-vultures -palm warblers -eastern phoebe -traffic dying down
3	-	8:00	-snowy egret flyover -grackles -crow
3	-	8:15	-crows -vultures -eastern meadowlark
3	-	8:30	-palm warbler
3	-	8:45	-No activity
3	-	9:00	-palm warbler -grackle -eastern meadowlark
3	-	9:15	-No activity
3	-	9:30	-vultures
3	-	9:45	-No signs of caracara activity

USFWS Crested Caracara Draft Survey Protocol –
Additional Guidance (2016-2017 Breeding Season)

Caracara Survey Form (updated 12/9/2016)

Project Name: 17/92

Location/Observation Block/Lat-Long: Station 3

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
3/3/22	6:30	9:30	Alex Meehan Biologist

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start: 6:30	57°	NE 3mph	0%	–	–
Finish: 9:30	68°	ENE 2mph	0%	–	–

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area
-moderate to heavy traffic, maintained feild to south, another feild to north but sight obscured by trees

Observations

(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
3	-	6:30	-heavy traffic -quiet with a few song birds
3	-	6:45	-vulture fly over
3	-	7:00	-unidentified woodpecker -~~was~~ palm warbler -heavy traffic -short tailed hawk
3	-	7:15	-wood stork flyover -eastern phoebe

3	-	7:30	- mourning dove - blue jay - vulture
3	-	7:45	- palm warbler - crow - wood stork flyover
3	-	8:00	- black vulture
3	-	8:15	- eastern phoebe
3	-	8:30	- no activity
3	-	8:45	- grackle - snowy egret flyover
3	-	9:00	unidentified woodpecker
3	-	9:15	no activity
3	-	9:30	- No signs of caracara on site

USFWS Crested Caracara Draft Survey Protocol –
Additional Guidance (2016-2017 Breeding Season)

Caracara Survey Form (updated 12/9/2016)

Project Name: 17/92

Location/Observation Block/Lat-Long: Station 3

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
3/18/22	7:15	10:15	Alex Meehean Biologist

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start: 7:15	59°	ENE 4 mph	0%	–	–
Finish: 10:15	71	calm	0%	-	-

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area
- maintained field with surrounding pines, along road + railroad. - moderate traffic

Observations

(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
3	–	7:15	- heavy traffic - no activity
3	–	7:30	- Eastern towhee - crow - vulture - unidentified woodpecker
3	-	7:45	- wood stork fly over (x 3)
3	-	8:00	- no activity

3	–	8:15	- Eastern phoebe - cardinal
3	–	8:30	- crow flyover - grackles
3	–	8:45	- crows
3	–	9:00	No activity
3	–	9:15	- Palm warblers
3	–	9:30	- hear woodpeckers - crows - grackle
3	–	9:45	- vulture - osprey fly over - some songbirds
3	–	10:00	- no activity
3	–	10:15	- no signs of caracara activity

USFWS Crested Caracara Draft Survey Protocol –
Additional Guidance (2016-2017 Breeding Season)

Caracara Survey Form (updated 12/9/2016)

Project Name: US 17/92

Location/Observation Block/Lat-Long: SURVEY STATION 3

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
3/30/22	7.00	10.00	HANNAH ROWE

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start:	64	3MPH SE	5	-	NONE
Finish:	73	9MPH. SSE	1	-	NONE

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area
OPEN PASTURE ADJACENT TO ROADWAY WITH INTERMITTENT TRAFFIC. NOISE OF US 17/92 ALSO AUDIBLE. INTERMITTENT SONG BIRDS.

Observations

(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
		7.07	THREE WHITE IBIS FLY S>N
		7.11	SONG BIRDS HEARD
		7.17	CROW FLIES E > W
		7.22	SONG BIRDS HEARD
		7.37	CROW FLIES S>N
		7.48	SONG BIRDS HEARD
		7.59	CROW PERCHES ON ELECTRIC POLE NORTH OF ROADWAY
		8.14	SONG BIRDS HEARD
		8.20	CROWS HEARD
		8.28	BLACK VULTURE FLIES SOUTH TREELINE TO W

		8.46 8.59 9.14	CROW HEARD SONG BIRD HEARD SONG BIRDS HEARD
		9.24 9.32	BLACK VULTURE FLIES OVER ROAD TO WEST. HAWK HEARD
		9.39 9.43	HAWK FLIES W → E OVER TREELINE CROW FLIES E → W + PERCHES
		 9.45	IN PINE TREE. BLACK VULTURE FLIES OVER ROAD
		 9.47	TO WEST. CROW FLIES N FROM PINE TREE TO ELECTRIC LINE N OF ROADWAY
		9.51	BALD EAGLE HEARD

USFWS Crested Caracara Draft Survey Protocol –
Additional Guidance (2016-2017 Breeding Season)

Caracara Survey Form (updated 12/9/2016)

Project Name: 17/92
Location/Observation Block/Lat-Long: Station 3

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
4/14	6:45	9:45	Alex Meehean Biologist

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start: 6:45	70°	SE 4	100%	stratus	—
Finish: 9:45	77°	SE 7	85%	—	—

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area
- mowed field to south of Old Tampa Hwy - moderate traffic - slash piles surrounding

Observations

(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
3	-	6:45	- Heavy traffic - still dark due to cloudy morning - some song birds
3	-	7:00	- crow - Great egret
3	-	7:15	- Grackles - crow
3	-	7:30	- unidentified song bird - wood pecker

3	-	7:45	- duck flyover
3	-	8:00	- heavy traffic - no activity
3	-	8:15	- grackle - vulture fly over
3	-	8:30	- crow - cardinal - palm warbler - traffic dying down
3	-	8:45	- no activity
3	-	9:00	- crows - unidentified woodpecker
3	-	9:15	- grackles
3	-	9:30	- no activity
3	-	9:45	- no signs of caracara

USFWS Crested Caracara Draft Survey Protocol –
Additional Guidance (2016-2017 Breeding Season)

Caracara Survey Form (updated 12/9/2016)

Project Name: 17192
Location/Observation Block/Lat-Long: Station 3

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
4/29/22	6:30	9:30	Alex Meehean Biologist

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start: 6:30	66°	ENE 6mph	0%	–	–
Finish: 9:30	75°	E 11 mph	0%	–	–

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area
recently mowed field, heavy traffic,

Observations

(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
3	–	6:30	- great egret flyover - song birds - white ibis
3	–	6:45	- Eastern phoebe? - cardinal
3	–	7:00	- crow flyover - heavy traffic
3	–	7:15	- eastern meadowlark

3		7:30	white ibis flyover grackles
3		7:45	- vultures flyover - palm warbler - unidentified woodpecker
3		8:00	-no activity
3		8:15	-crows -GBH flyover
3		8:30	-no activity
3		8:45	-grackles - unidentified song bird
3		9:00	-towhee?
3		9:15	-no activity
3		9:30	-no signs of caracara activity

STATION 4

USFWS Crested Caracara Draft Survey Protocol – Additional Guidance (2016-2017 Breeding Season)

Caracara Survey Form (updated 12/9/2016)

Project Name: 17192

Location/Observation Block/Lat-Long: SURVEY STATION 4

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
1/7/2022	7.00	10.00	HANNAH ROWE

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start:	62F	1MPH WSW	80	-	NONE
Finish:	69F	5MPH WNW	2	-	NONE

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area
LOOKING NORTH INTO PASTURE AREA WITH FARM BUILDINGS + RESIDENCE, DRIVEWAY. SEVERAL CARS PASS BY, LITTLE OTHER NOISE

Observations

(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
SURVEY STATION	A	7.06	TWO CROWS FLY S FROM SUITABLE HABITAT, OVER ROAD + TOWARDS RAILWAY
		7.17	HAWK HEARD
		7.19	CROWS CALL
		7.20	SINGLE CROW FLIES NORTH
		7.24	SONG BIRDS HEARD
		7.30	RED BELLIED WOODPECKER FLYS TO LIGHTPOLE ON CORNER OF DRIVEWAY + PECKS
		7.32	EASTERN PHOEBE PERCHES ON ELECTRIC LINE ON NORTH SIDE OF THE ROAD.
		7.34	SMALL BIRD FLIES BETWEEN TWO CABBAGE PALMS 100FT NE.
		7.36	MEADOWLARK FLY E-W ABOVE FIELD

		7.37	FOUR GRACKLES FLY E⇒W ACCROSS POTENTIAL HABITAT AREA
		7.42	SONG BIRDS HEARD
		7.48	TWO MOURNING DOVES FLY E-W ACROSS
			HABITAT + PERCH ON ELECTRIC LINE
		7.52	CROW CALLS
		7.56	EASTERN PHOEBE FLYS NORTH FROM
			ELECTRIC LINE
		8.00	WOODPECKER FLIES NORTH FROM POLE
		8.04	TWO MOURNING DOVES FLY NW FROM
			ELECTRIC LINE
		8.06	SONG BIRDS HEARD
		8.08	MOURNING DOVE HEARD
		8.12	WOODPECKER FLIES BACK TO POLE + PECKS
		8.13	CROW FLIES TO ELECTRIC LINE SOUTH OF ROAD + PERCHES ON POLE, CROWS
		8.15	CROW CALLS
		8.18	SONG BIRDS HEARD
		8.25	MOURNING DOVE FLIES BACK TO
			ELECTRIC LINE FROM NW, BEFORE FLYING TO THE EAST.
		8.29	CARDINAL FLIES WITHIN CABBAGE PALM 100 FT NW
		8.40	MOURNING DOVE RETURNS TO ELECTRIC LINE
		8.47	EASTERN PHOEBE FLIES TO PERCH
			ON ELECTRIC LINE ON DRIVEWAY
		8.49	MOURNING DOVE FLIES EAST
		8.53	EASTERN PHOEBE FIES WEST.

USFWS Crested Caracara Draft Survey Protocol – Additional Guidance (2016-2017 Breeding Season)

Caracara Survey Form (updated 12/9/2016)

Project Name: 17192

Location/Observation Block/Lat-Long: SURVEY STATION 4

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
1/21/22	7.00	10.00	HANNAH ROWE

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start: 7.00	55F	CALM	20	-	NONE
Finish: 10.00	64F	CALM	40	-	NONE

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area
RESIDENTIAL TRAFFIC - OCCASIONAL

Observations

(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
		7.02	SONG BIRDS HEARD
		7.17	HAWK HEARD
		7.19	CROWS HEARD
		7.22	SONG BIRDS HEARD
		7.28	THREE PINE WARBLERS FLY E→W ACROSS DRIVEWAY
		7.32	GRACKLE FLIES SOUTH AND PERCHES IN TREE SOUTH OF ROADWAY
		7.36	TWO PINE WARBLERS FLY TO + PERCH ON ELECTRIC LINE ALONG DRIVEWAY.
		7.38	SONG BIRDS HEARD.
		7.38	CATTLE EGRET FLIES N→NW
		7.40	CROW HEARD
		7.42	SONG BIRDS HEARD

		7.43 7.45 7.51	CROP OF GRACKLES FLY W TO E SMALL CROUP OF SPARROWS PERCH ON ELECTRIC LINE ON DRIVEWAY SONG BIRDS HEARD
		7.54 7.57 7.59	PINE WARBLERS FLY FROM ELECTRIC LINE TO WEST 5 GRACKLE FLY TO ELECTRIC LINE MOURNING DOVE FLIES S TO N TO
		 8.04 8.09	ELECTRIC LINE ON ROADWAY. MOURNING DOVE COOS MORNING DOVE FLIES SOUTH
		8.12 8.15 8.19	CROWS HEARD SONG BIRDS HEARD MOURNING DOVE FLIES TO ELECTRIC
		 8.26	LINE ALONG DRIVEWAY. RED BELLIED WOODPECKER FLIES TO ELECTRIC POST SW OF DRIVEWAY + THEN TO CABBAGE PALM TO EAST.
		8.29 8.32 8.37	BALD EAGLE HEARD. SONG BIRDS HEARD. MORNING DOVE FLIES TO ELECTRIC LINE ON DRIVEWAY
		8.42 8.49 8.55	CROWS HEARD RED BELLIED WOODPECKER FLIES TO ELECTRIC POLE + TO SE SONG BIRD HEARD
		9.02 9.05	MOURNING DOVE HEARD MOURNING DOVE FLIES EAST TO PERCH ON ELECTRIC LINE ON DRIVEWAY
		9.09 9.13 9.13	CROW HEARD LITTLE BLUE HERON FLIES SW TO NE BALD EAGLE HEARD
		9.20 9.26 9.34 9.43	SONG BIRD HEARD BLACK VULTURE FLIES W>E CROUP OF MOURNING DOVES PERCH ON ELECTRIC LINE ON DRIVEWAY LITTLE BLUE HERON FLIES NORTH

USFWS Crested Caracara Draft Survey Protocol – Additional Guidance (2016-2017 Breeding Season)

Caracara Survey Form (updated 12/9/2016)

Project Name: 17192

Location/Observation Block/Lat-Long: SURVEY STATION 4

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
2/4/22	6.55	9.55	HANNAH ROWE

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start:	62°	2MPH SSE	0%	N/A	NONE
Finish:	73°	10MPH S	0%	N/A	NONE

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area
TYPICAL ROADWAY TRAFFIC - RESIDENTIAL

Observations

(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
		7.03	CROW, CROWS
		7.05	SONG BIRDS HEARD
		7.07	CROW FLIES SOUTH FROM NORTH
		7.12	HAWK (COOPER'S) PERCHES ON DEAD
			SABAL PALM TREE TOP TO NE, WITHIN HABITAT AREA
		7.16	MOURNING DOVE PERCHES ON ELECTRIC LINE ON ROADWAY
		7.18	TWO PALM WARBLERS FLY E→W ACCROSS DRIVEWAY.
		7.24	CROW HEARD
		7.27	SONG BIRDS HEARD
		7.37	EIGHT MOURNING DOVES + ONE PALM WARBLER PERCH ON ELECTRIC LINE ON DRIVEWAY

		7.34	COOPER'S HAWK ON DEAD PALM FLIES TO NORTH
		7.37	MOURNING DOVE CALLS
		7.42	CROW, CROWS
		7.47	MOURNING DOVES FLY FROM ELECTRIC LINE.
		7.54	EASTERN PHOEBE FLIES TO PERCH ON ELECTRIC LINE
		8.03	BLACK VULTURE FLIES NORTH TO SOUTH OVER ROADWAY
		8.03	MOURNING DOVE CALLS
		8.16	CROW CALLS
		8.23	TWO PALM WARBLERS FLY W → E
		8.31	SONG BIRD HEARD
		8.44	CROW FLIES N → S, CROWS
		8.53	CARDINAL FLIES FROM SABAL PALM TO OAK NE OF ROAD
		8.57	CROW FLIES SW → NE
		9.02	HAWK FLIES E → W ALONG FAR TREE LINE, WHILE CALLING
		9.04	THREE VULTURES FLY SLOWLY OVERHEAD
		9.10	MOURNING DOVE FLIES FROM SOUTH TO ELECTRIC LINE ON DRIVEWAY + THEN FLIES WEST.
		9.23	SONG BIRDS HEARD
		9.35	SIX GRACKLES FLY SOUTH
		9.42	SONG BIRD HEARD
		9.47	TWO MOURNING DOVES PERCH ON ELECTRIC LINE ON ROADWAY
		9.53	CROW FLIES SOUTH

USFWS Crested Caracara Draft Survey Protocol –
Additional Guidance (2016-2017 Breeding Season)

Caracara Survey Form (updated 12/9/2016)

Project Name: 17/92

Location/Observation Block/Lat-Long: SURVEY STATION 4

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
2/18/22	6.45	9.45	HANNAH ROWE

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start:	70F	7MPH S	100	-	NONE
Finish:	72F	10MPH SSW	95	-	NONG

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area
TYPICAL RESIDENT TRAFFIC

Observations

(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
		6.45	SONG BIRDS HEARD
		6.46	CROW CROWS
		6.54	CROW CROWS
		6.54	CROW FLIES N→S
		7.02	TWO CROWS FLY S→N.
		7.06	GRACKLE FLIES NW→SE
		7.15	TWO MOURNING DOVES FLY TO ELECTRIC LINE ON DRIVEWAY. ONE CALLS
		7.21	BLACK VULTURE FLIES S→N
		7.23	CROW CALLS
		7.27	TWO BLACK VULTURE FLY SOUTH
		7.30	MOURNING DOVES CALL
		7.32	LARGE GROUP (15/20) VULTURES CIRCLE OVERHEAD.

		7.40	PALM WARBLER FLIES WEST TO ELETRIC LINE ON DRIVEWAY
		7.44	SIX MOURNING DOVES FLY TO PERCH ON ELECTRIC LINE
		7.50	CROW CAWS
		7.52	GROUP OF GRACKLES FLY NE → SE
		7.56	SONG BIRDS HEARD
		8.00	MOURNING DOVE CALLS
		8.06	BALD EAGLE HEARD
		8.14	SONG BIRDS HEARD
		8.19	TWO GRACKLES FLY W → E
		8.26	MOURNING DOVE HEARD.
		8.30	VULTURE CIRCLES TO N6
		8.36	COOPERS HAWK FLIES NW → SE
		8.39	CROW CALLS
		8.56	SONG BIRDS HEARD
		9.00	TWENTY TURKEYS ON GROUND TO E
		9.14	BLACK VULTURE FLIES E → W

USFWS Crested Caracara Draft Survey Protocol –
Additional Guidance (2016-2017 Breeding Season)

Caracara Survey Form (updated 12/9/2016)

Project Name: 17192

Location/Observation Block/Lat-Long: SURVEY STATION 4

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
3/3/22	6.30	9.30	HANNAH ROWE

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start:	57	1MPH N	0	-	NONE
Finish:	66	4MPH N	0	-	NONE

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area
OCCASIONAL RESIDENT TRAFFIC

Observations

(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
		6.30	SONG BIRDS HEARD
		6.32	CROWS HEARD
		6.34	4 GRACKLES FLY S → NW
		6.45	BALD EAGLE HEARD
		6.47	CROW FLIES N → SW
		6.48	MOURNING DOVE FLIES TO ELECTRIC LINE ON DRIVEWAY.
		6.51	FLOCK OF GRACKLES FLY E → W
		6.58	BALD EAGLE HEARD
		7.02	TWO MOURNING DOVES PERCHED ON ELECTRIC LINE ALONG DRIVEWAY
		7.06	MOURNING DOVE COOS
		7.16	TWO PALM WARBLERS FLY TO ELECTRIC LINE ON DRIVEWAY

		7.20 7.24 7.32 7.35	WOODPECKER HEARD MOURNING DOVE FLIES EAST CROWS HEARD EASTERN PHEOBE PERCHED IN
		 7.40 7.48	SABAL PALM TO NW CROWS HEARD SONG BRD HEARD
		7.51 8.02	RED BELLIED WOODPECKER FLIES TO ~~LIGHT POLE~~ ELECTRIC POLE NORTH OF ROADWAY. MOURNING DOVE FLIES TO ELECTRIC
		 8.07 8.13	LINE ON DRIVEWAY EASTERN PHEOBE FLIES N ⇒ S CROWS HEARD
		8.20 8.24 8.32	FLOCK OF GRACKLES FLY TO ELECTRIC LINE ON DRIVEWAY BALD EAGLE HEARD SONG BIRD HEARD
		8.47 9.02	CROWS HEARD MOURNING DOVE PERCHED ON ELECTRIC LINE ON ROADWAY
		9.04 9.06 9.17	BALD EAGLE HEARD BALD EAGLE HEARD SONG BIRDS HEARD
		9.22	TWO GRACKLES FLY SOUTH

USFWS Crested Caracara Draft Survey Protocol –
Additional Guidance (2016-2017 Breeding Season)

Caracara Survey Form (updated 12/9/2016)

Project Name: US 17/92

Location/Observation Block/Lat-Long: SURVEY STATION 4

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
3/18/22	7.15	10.15	HANNAH ROWE

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start:	60	CALM	0	–	NONE
Finish:	71	CALM	0	–	NONE

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area
OCCASIONAL VEHICLE TRAFFIC FROM RESIDENTS NEAR CONSTANT SONG BIRDS.

Observations

(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
		7.18 7.22	FLOCK OF WHITE IBIS FLY S→N ANOTHER FLOCK OF WHITE IBIS FLY S→N
		7.24 7.26 7.27	MOURNING DOVE FLIES TO ELECTRIC LINE ON DRIVEWAY CROW CROWS MOURNING DOVE COOS
		7.32 7.40 7.44	SONG BIRDS HEARD MOURNING DOVE FLIES WEST COOPERS HAWK PERCHED ON POLE ON DRIVEWAY
		7.50 7.53 8.00	MOURNING DOVE HEARD THREE WHITE IBIS FORAGE TO NORTH SONG BIRDS HEARD

		8.03 8.07 8.12	MOURNING DOVE HEARD SONG BIRDS HEARD WILD TURKEY FORAGED TO NE
		8.14 8.20 8.24	SONG BIRDS HEARD GROUP OF GRACKLES FLY E->W CROW HEARD
		8.35 8.42	MOURNING DOVE FLIES TO ELECTRIC LINE ON DRIVEWAY SONG BIRDS HEARD
		8.54 9.03 9.10	TWO GRACKLES FLY S->N BALD EAGLE HEARD SONG BIRDS HEARD
		9.14 9.30	CROWS HEARD EASTERN PHOEBE PERCHED ON ELECTRIC LINE NORTHEAST OF ROADWAY
		9.44 9.50 9.55	MOURNING DOVE FLIES SW BALD EAGLE HEARD SONG BIRDS HEARD

USFWS Crested Caracara Draft Survey Protocol – Additional Guidance (2016-2017 Breeding Season)

Caracara Survey Form (updated 12/9/2016)

Project Name: 17/92

Location/Observation Block/Lat-Long: Station 4

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
4/6/22	7:00	10:00	Alex Meehean Biologist

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start: 7:00	72°	S 8mph	0%	–	–
Finish: 10:00	79°	S 11mph	60%	stratus	–

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area
- open field with multiple cabbage palms. Several powerlines going through field. Agriculture/Residental use. mostly mowed no traffic

Observations

(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
4	–	7:00	- no sign of caracara - Mourning dove - grackle - crow flyover - cardinal
4	–	7:15	- GBH flyover - mourning dove - song birds - unidentified woodpecker
4	–	7:30	- red shouldered hawk - mourning doves - palm warblers
4	–	7:45	- Eastern towhee - grackles - Bald eagle flyover

4	–	8:00	-red shoulder hawk -crow -cattle egret -various songbirds
4	-	8:15	-eastern meadowlark -phoebe -cardinal
4		8:30	-grackles - crested fly catcher
4		8:45	-huge flock of cedar waxwing
4		9:00	-no activity
4		9:15	-mourning dove -vultures
4		9:30	-white ibis -mourning dove
4		9:45	-no activity
4		10:00	-no signs of caracara activity -no traffic

USFWS Crested Caracara Draft Survey Protocol –
Additional Guidance (2016-2017 Breeding Season)

Caracara Survey Form (updated 12/9/2016)

Project Name: US 17/92

Location/Observation Block/Lat-Long: SURVEY STATION 4

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
4.14.22	6.45	9.45	HANNAH ROWE

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start:	67F	1MPH S	100	-	NONE
Finish:	78F	4MPH E	95	-	NONE

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area
TYPICAL RESIDENTIAL TRAFFIC

Observations

(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
		6.45	SONG BIRDS HEARD
		6.49	CROW FLIES E→W
		6.54	MOURNING DOVE PERCHED ON ELECTRIC LINE ON DRIVEWAY
		7.03	LITTLE BLUE HERON FORAGING TO NW.
		7.14	GREAT EGRET FLIES OVERHEAD S→N
		7.20	TWO MOURNING DOVES FLY TO PERCH ON ELETRIC LINE ON ROAD WAY
		7.24	LITTLE BLUE HERON FLIES SOUTH
		7.30	MOURNING DOVE FLIES TO ELECTRIC LINE ON DRIVEWAY + COOS

		7.32 7.35	SONG BIRDS HEARD LITTLE BLUE HERON FLIES TO NW.
		7.37 7.44 7.50	CROW CROWS ANY FLIES N→S PALM WARBLER FLIES W→E CROW HEARD
		7.55 8.00	RED SHOULDERED HAWK PERCHES ON POLE NW OF DRIVEWAY ~~FLEW~~ SANDHILL CRANE HEARD
		8.01 8.12	TWO SANDHILL CRANE FLY W→E HAWK FLIES OFF TO EAST
		8.20 8.36 8.44	MOURNING DOVE COOS TWO GRACKLES FLY S→N SONG BIRD HEARD
		8.59 9.07	CROW HEARD SANDHILL CRANES HEARD
		9.09 9.25	CROW FLIES S→N SONG BIRD HEARD

USFWS Crested Caracara Draft Survey Protocol –
Additional Guidance (2016-2017 Breeding Season)

Caracara Survey Form (updated 12/9/2016)

Project Name: US 17/92

Location/Observation Block/Lat-Long: SURVEY STATION 4

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)
4/27/22	6.30	9.30	HANNAH ROWE

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start:	65	CALM	15	-	NONE
Finish:	73	CALM	5	-	NONE

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area
TYPICAL RESIDENTIAL TRAFFIC – QUIET

Observations

(flight data, perching, preening, courtship, feeding, nest building, incubation, head throwback, diving, reaction to passing planes/traffic/pedestrians, other bird species, etc)

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc
		6.30 6.33	SONG BIRDS HEARD MOURNING DOVE FLIES TO PERCH ON ELECTRIC LINE IN
		6.37	DRIVEWAY PALM WARBLER FLIES TO TOP OF SABAL PALM + THEN EAST
		6.39 6.42 6.49	SONG BIRD HEARD CROW FLIES S → N SANDHILL CRANES HEARD
		6.50 6.50	CRACKLE FLIES W → E TWO SANDHILL CRANES FLY TO PASTURE FROM WEST

		7.01	SANDHILL CRANE FLIES SOUTH
		7.05	4 CRACKLES FLY W→E OVER ROADWAY
		7.08	MOURNING DOVE HEARD
		7.12	CROW HEARD
		7.14	SONG BIRDS HEARD
		7.16	TWO MOURNING DOVE FLY
		7.20	TO ELECTRIC LINE FROM E EASTERN PHASE FLIES TO ELECTRIC LINE ON DRIVEWAY
		7.22	SANDHILL CRANE HEARD
		7.28	SWALLOW TAILED KITE FLIES N→S.
		7.34	TWO SANDHILL CRANES WALK E→W WITHIN PASTURE, FORAGING
		7.38	SONG BIRDS HEARD
		7.44	BALD EAGLE HEARD
		7.48	MOURNING DOVE FLIES TO ELETRIC LINE ON DRIVEWAY
		7.52	CROW HEARD
		8.00	SONG BIRDS HEARD
		8.11	BALD EAGLE HEARD
		8.17	CROW HEARD
		8.22	MOURNING DOVE ON ELECTRIC LINE ON DRIVEWAY COOS.
		8.29	HAWK PERCHS IN TREE TO WEST, NORTH OF ROADWAY
		8.35	CROW HEARD

		8.38 8.42 8.48	SONG BIRDS HEARD CROW HEARD SANDHILL CRANE HEARD
		8.56 9.04	SONG BIRD HEARD TWO GRACKLES FLY W→E
		9.13 9.17 9.22	GREAT EGRET FLIES S→N SONG BIRD HEARD CROWS HEARD

Appendix E:

Presence/Absence Acoustic Monitoring Survey for the Florida Bonneted Bat

US 17/92 FROM IVY MIST LANE TO AVENUE A
OSCEOLA COUNTY, FL

FPID 437200-1-22-91/437200-2-22-01

Presence/Absence Acoustic Monitoring Survey
For the Florida Bonneted Bat

Florida Department of Transportation District 5
719 S Woodland Blvd
DeLand, FL 32720

August 18, 2022

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Introduction

The Florida Department of Transportation (FDOT), District 5, is conducting a Project Development and Environment (PD&E) study to evaluate the widening of US 17/92 from Ivy Mist Lane to Avenue A from the current two-lane roadway to a four-land divided highway. As part of the PD&E study, FDOT requested technical assistance from the United States Fish and Wildlife Services (USFWS) regarding the Florida bonneted bat (*Eumops floridanus*) and proposed survey methodology. As a result of this coordination, the USFWS requested full acoustic bat surveys be conducted for the project and approved the methodology and survey station locations. FDOT is providing this report to document the results of the bat acoustic monitoring surveys along US 17/92, from Ivy Mist Lane to Avenue A located in Osceola County, Florida (see **Figure 1**). The project consists of the US 17/92 project corridor, three pond sites and one floodplain compensatory storage pond site. The proposed pond sites are all located within undeveloped land and comprise a mixture of wetlands and uplands (see **Figure 2)**.

The southern portion of the project area, from the centerline of the roadway, falls within the USFWS Consultation Area of the federally endangered Florida bonneted bat (see **Figure 3**). Florida bonneted bats can be found in forests, wetlands and other natural habitats, along with residential and urban areas. To assess potential impacts of the roadway widening and pond construction on the Florida bonneted bat, full acoustic surveys were conducted on-site in compliance with the 2019, USFWS Florida Bonneted Bat Guidelines (Guidelines).

Methods

Acoustic Surveys

Based on the minimum requirements for linear projects over 50 acres, a minimum of five detector nights per every 0.6 linear mile is required. The project corridor is 3.8 miles in length. As such 7 survey stations were proposed, with a total of 35 detector nights (**Figure 3**). The acoustic surveys followed the guidelines set forth in **Appendix A: Full Acoustic / Roost Survey Framework of the October 2019 Consultation Key for the Florida bonneted bat**.

A qualified Biologist (see **Appendix B**) deployed acoustic equipment at the seven survey station locations. The acoustic detectors and microphones were micro-sited on the date of deployment to: (1) target areas that may concentrate bat activity and commuting bats; (2) minimize echoes; (3) camouflage the detectors by deploying near natural landscape features; and (4) remain at least one meter away from vegetation. Based on the minimum

requirements outlined in the Guidelines, seven Pettersson D500x Ultrasonic Detectors (detectors) were each deployed for between 5 and 6 nights allowing for a total of 40 detector-nights, excluding detector nights with equipment malfunctions.[1]

Surveys were conducted on nights with suitable weather conditions, which were monitored prior to and after each survey using both the National Weather Service's Administration's Kissimmee Gateway Station (KISM), and Weather Underground (USFWS, 2020) (see **Appendix C**). The equipment was left in the field and housed in weather-proof containers. Detector data download and maintenance occurred routinely throughout the survey. The detectors were programmed to turn on approximately 30 minutes prior to sunset (18:01-19:06 EST) and turn off approximately 30 minutes after sunrise (7:11-8.01 EST). Detector locations are provided in **Figure 3**, representative photographs of the survey locations are provided in **Appendix D**, and data forms are provided in **Appendix E**.

Parameters Used for Acoustic Analysis

Detectors were affixed with Petterson D500x external directional microphones with PVC weatherproof casing and a directional horn. Detectors recorded in full spectrum. For all detectors, sensitivity was set to low, gain was set to 45, and trigger was set to 160.

Quantitative Analysis and Manual Vetting

Data analysis was completed using SonoBat 4.4.5 (SonoBat). Each sound file (.wav format) was attributed to a text file denoting the weather conditions, survey location, detector parameters, dates, and length of the survey period using SonoBat. Sound files were then processed in SonoBat to remove noise produced by a source other than a bat. Data determined to be noise or calls that did not meet the pre-specified criteria, to be termed a pass, were removed from the analysis. Qualitative analysis was conducted by a qualified biologist for all auto-classified low frequency calls, such as those of the big brown bat (*Eptesicus fuscus*), Northern yellow bat (*Lasiurus intermedius*), Mexican free-tailed bat (*Tadarida brasiliensis*), and unknown calls, using SonoBat.

[1]A detector-night spans the evening and early morning hours of two calendar dates.

Results

Weather Conditions

Weather conditions were monitored closely for temperature, precipitation, and wind speed prior to and after each night of acoustic monitoring. Surveys were not conducted during periods with temperatures that fell below 65°F (18.3°C) during the first 5 hours of the survey period, precipitation, including rain and/or fog, that exceeded 30 minutes or continued intermittently during the first 5 hours of the survey period, and/or sustained wind speeds greater than 9 miles/hour for 30 minutes or more during the first 5 hours of the survey period. A summary of weather conditions is provided in **Table 1**.

Table 1. Summary of weather conditions by detector-night - March 9 to 20, 2022.

Detector-night	Ave. Temp. (°F)	Ave. Wind (mph)	Max. Wind (mph)	Min. Wind (mph)	Precipitation (inches)
March 9-10, 2022	70.5	2.25	6	0	0
March 10-11, 2022	68.48	3.66	7	0	0
March 12-16, 2022	Weather parameters exceeded allowable limits, no survey.				
March 16-17, 2022	67.55	4.5	8	3	0
March 17-18, 2022	65.69	2.46	7	0	0
March 18-19, 2022	69.77	6.3	12	0	0
March 19-20, 2022	72.53	5.73	9	0	0

Acoustic Data Analysis

SonoBat auto-classified 1,412 call sequences (or calls) that rendered the identification of seven species, including: big brown bat, southeastern bat (*Myotis austroriparius*), eastern red bat/Seminole bat[2] (*Lasiurus borealis/L. seminolus*); northern yellow bat; evening bat (*Nycticeius humeralis*); tri-colored bat (*Perimyotis subflavus*); and Mexican free-tailed bat and 4,158 calls were assigned as unknown bats. The number of calls and Maximum Likelihood Estimates (MLE) are provided for each species by detector at respective survey locations in **Table 2**. The number of calls for each species by detector-night at respective survey locations are provided in **Appendix F**. Representative spectrograms of high frequency bat calls are provided in **Attachment G**.

Qualitative review was performed on all low frequency calls and all auto-classified calls to confirm species presence and the total number of calls as provided in **Table 2**. Qualitative

[2] Eastern red bat and Seminole bat are acoustically ambiguous and have been grouped together.

analysis confirmed the presence of the aforementioned seven bat species within the survey area.

Table 2. Total number of calls by species/detector recorded - March 9 to 20, 2022

Detector Site	Big Brown Bat			Eastern Red Bat/Seminole Bat			Northern Yellow Bat			Southeastern Myotis			Evening Bat			Tri-colored Bat			Mexican Free-tailed Bat		
	Number of Calls	Number of Confirmed	MLE	Number of Calls	Number of Confirmed	MLE	Number of Calls	Number of Confirmed	MLE	Number of Calls	Number of Confirmed	MLE	Number of Calls	Number of Confirmed	MLE	Number of Calls	Number of Confirmed	MLE	Number of Calls	Number of Confirmed	MLE
1	0	0	1	6	6	0.3	6	6	0.22	5	5	0.41	4	4	0.48	2	2	0.74	14	14	<0.01
2	0	0	1	2	2	0.99	8	8	1	2	2	0.99	4	4	0.99	112	6	<0.01	385	385	<0.01
3	1	1	0.91	0	0	1	7	7	0.21	2	2	0.96	14	8	0.08	38	12	<0.01	23	23	<0.01
4	0	0	1	11	11	0.97	7	7	0.6	7	7	0.94	147	10	<0.01	5	5	1	125	125	<0.01
5	0	0	1	10	10	0.19	3	3	0.84	3	3	0.88	12	12	0.12	25	7	<0.01	62	62	<0.01
6	0	0	1	0	0	1	11	11	0.39	0	0	1	42	8	<0.01	10	8	0.14	171	171	<0.01
7	0	0	1	3	3	0.68	8	8	0.43	4	4	0.48	6	6	0.25	0	0	1	105	105	<0.01
Total	**1**	**1**	**-**	**32**	**32**	**-**	**50**	**50**	**-**	**23**	**23**	**-**	**229**	**52**	**-**	**192**	**40**	**-**	**885**	**885**	**-**

MLE= Maximum Likelihood Estimates

`

Conclusions

Based on the acoustic monitoring survey results, the Florida bonneted bat was not recorded. When following the US Army Corps of Engineers, Jacksonville District, USFWS, Vero Beach Ecological Services Field Office and State of Florida Effect Determination Key for Florida Bonneted Bat (2019):

1a. Proposed project or land use change is partially or wholly within the Consultation Area;
2a. Potential FBB roosting habitat exists within the project area;
3b. Project size/footprint> 5 acres;
6b. Results show no FBB activity.

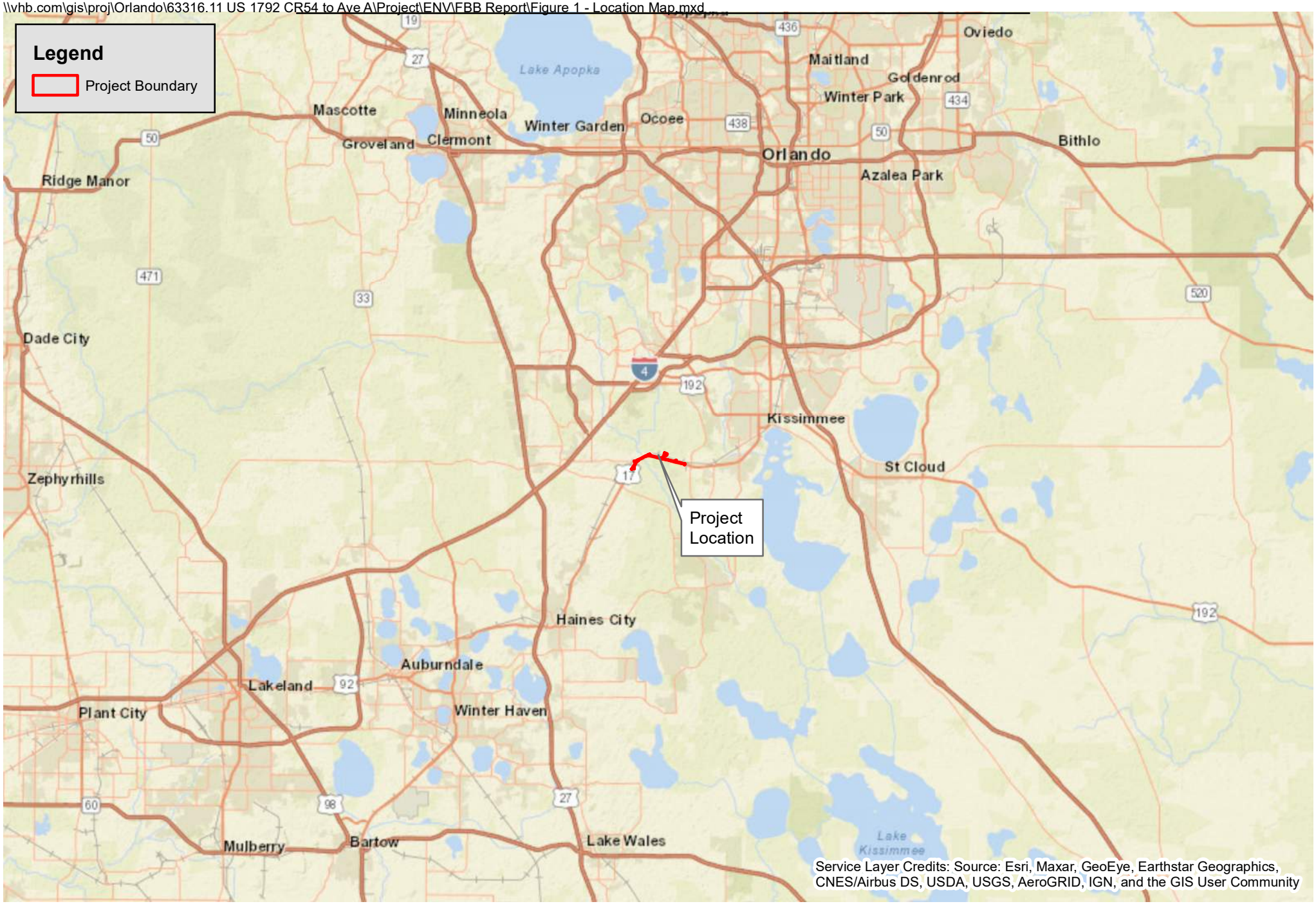
Based on the Effect Determination Key (1a>2a>3b>6b), the proposed build alternative results in a "**may affect, not likely to adversely affect**" determination for the Florida bonneted bat. A copy of the Effect Determination Key is found in Appendix C.

References

U.S. Fish and Wildlife Service. 2019. Florida Bonneted at Consultation Guidelines. Available at: https://www.fws.gov/verobeach/ProgrammaticPDFs/20191022_letter_ServicetoCorps_FBB-ProgrammaticKey.pdf

Figures

\\vhb.com\gis\proj\Orlando\63316.11 US 1792 CR54 to Ave A\Project\ENV\FBB Report\Figure 1 - Location Map.mxd



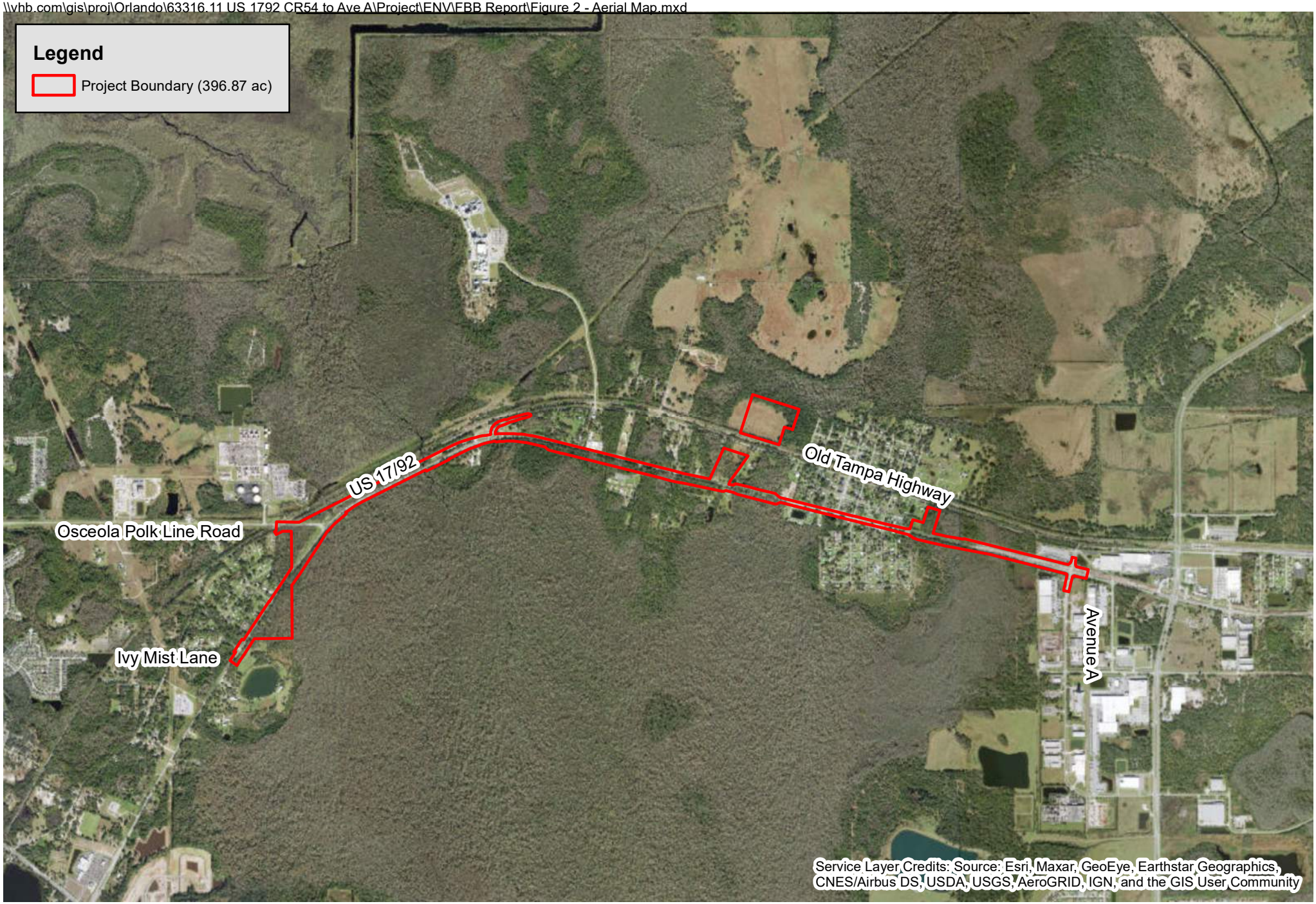
Project Location Map
US 17/92 from Ivy Mist Lane to Avenue A
Osceola County, Florida
FPID: 437200-1-22-91-01/437200-2-22-01
August 2022

Figure 1

0 4 8 Miles

N

\\vhb.com\gis\proj\Orlando\63316.11 US 1792 CR54 to Ave A\Project\ENV\FBB Report\Figure 2 - Aerial Map.mxd



FDOT

USFWS 17/92 Project Corridor Map

US 17/92 from Ivy Mist Lane to Avenue A

Osceola County, Florida

FPID: 437200-1-22-91-01/437200-2-22-01

August 2022

Figure 2

0 0.25 0.5 Miles

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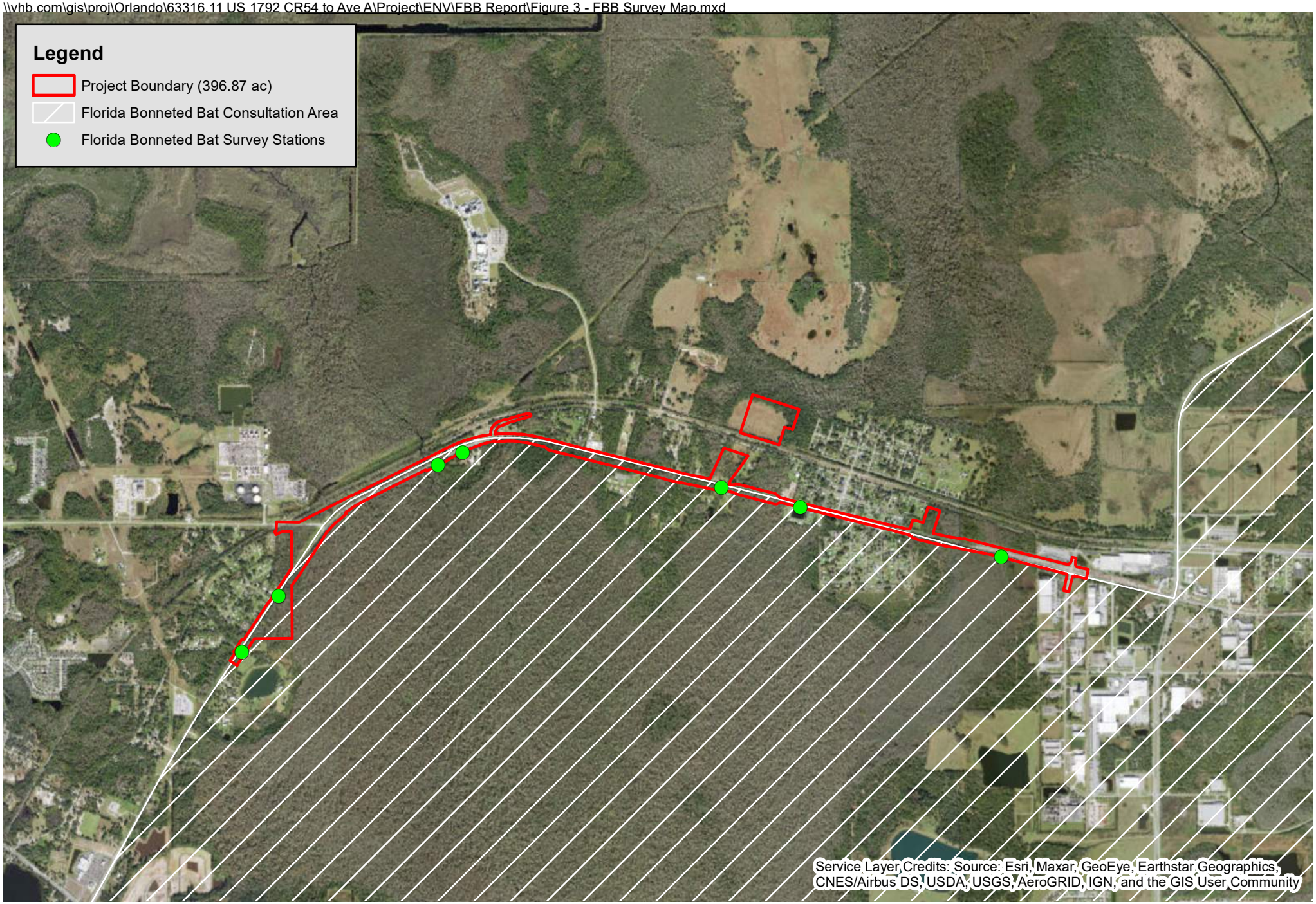
\\vhb.com\gis\proj\Orlando\63316.11 US 1792 CR54 to Ave A\Project\ENV\FBB Report\Figure 3 - FBB Survey Map.mxd



FDOT

Florida Bonneted Bat Survey Station Map

US 17/92 from Ivy Mist Lane to Avenue A

Osceola County, Florida

FPID: 437200-1-22-91-01/437200-2-22-01

August 2022

Figure 3

0 0.25 0.5 Miles

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APPENDIX A

Full Acoustic / Roost Survey Framework and October 2019 Consultation Key for the Florida bonneted bat

United States Department of the Interior

FISH AND WILDLIFE SERVICE
South Florida Ecological Services Office
1339 20th Street
Vero Beach, Florida 32960
October 22, 2019

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

Subject: Consultation Key for the Florida bonneted bat; 04EF2000-2014-I-0320-R001

Dear Mr. Zinszer:

This letter replaces the December 2013, Florida bonneted bat guidelines provided to the U.S. Army Corps of Engineers (Corps) to assist your agency with effect determinations within the range of the Florida bonneted bat (*Eumops floridanus*). This October 2019 revision supersedes all prior versions. The enclosed *Florida Bonneted Bat Consultation Guidelines* and incorporated *Florida Bonneted Bat Consultation Key* (Key) are provided pursuant to the U.S. Fish and Wildlife Service's (Service) authorities under the Endangered Species Act of 1973, as amended (Act) (87 Stat. 884; 16 U.S.C.1531 *et seq.*). This letter, guidelines, and Key have been assigned Service Consultation Code: 41420- 04EF2000-2014-I-0320-R001.

The purpose of the guidelines and Key is to aid the Corps (or other Federal action agency) in making appropriate effect determinations for the Florida bonneted bat under section 7 of the Act, and streamline informal consultation with the Service for the Florida bonneted bat when the proposed action is consistent with the Key. 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, applicants do not wish to implement the identified survey or best management practices, or if there is new biological information about the species. In these cases, we recommend the Corps (or other Federal action agency) initiate traditional consultation pursuant to section 7 of the Act, and identify that consultation is being requested outside of the Key.

This Key uses type of habitat (*i.e*, roosting or foraging), survey results, and project size as the basis for making determinations of "may affect, but is not likely to adversely affect" (MANLAA) and "may affect, and is likely to adversely affect" (LAA). The Key is structured to focus on the type(s) of habitat that will be affected by a project. When proposed project areas provide features that could support roosting of Florida bonneted bats, it is considered roosting habitat. If evaluation of roosting habitat determines that roosting is not likely, then the area is subsequently evaluated for its value to the species as foraging habitat.

Roosting habitat

The guidelines describe the features of roosting habitat. When a project is proposed in roosting habitat, the likelihood that roosting is occurring is evaluated through surveys (*i.e.*, full acoustic or limited roost). When a roost is expected and the proposed activity will affect that roost, formal consultation is required. This is because the proposed activity is expected to take individuals through the destruction of the roost and the appropriate determination is that the project may affect, and is likely to adversely affect (LAA) the species. When roosting is expected, but all impacts to the roost can be avoided, and only foraging habitat (without roost structure) will be affected, the Service finds that it is reasonable to conclude that the proposed action is not likely to impair feeding, breeding, or sheltering. Thus, the proposed project may affect, but is not likely to affect the Florida bonneted bat (MANLAA).

The exception to this logic path is if the proposed action will affect more than 50 acres of foraging habitat in proximity to the roost. Under this scenario, we anticipate that the loss of the larger amount of foraging habitat near the roost could significantly impair feeding of young and overall breeding (*i.e.*, LAA). Consequently, these projects would require formal consultation to analyze the effect of the incidental take.

If the roost surveys demonstrate that roosting is not likely, the project is then evaluated for its effects to foraging habitat. Our evaluation of these actions is described below. The exception is for projects less than or equal to 5 acres if a limited roost survey is conducted. Limited roost surveys rely on peeping and visual surveys to determine whether roosting is likely. On these small projects, this survey strategy is believed to be more economical and is considered a reasonable effort to evaluate the potential for roosting. The Service acknowledges that this approach is less reliable in evaluating the likelihood of roosting when it is not combined with acoustic surveys. Therefore, when limited roost surveys are conducted for projects that are less than or equal to 5 acres in size and the determination is that roosting is not likely, we conclude that the proposed project may affect, but is not likely to adversely affect the species (MANLAA).

Foraging habitat

The guidelines describe the features of foraging habitat. Data informing the home range size of the Florida bonneted bats is limited. Global Positioning System (GPS) and radio-telemetry data for Florida bonneted bats documents that they move large distances and likely have large home ranges. Data from recovered GPS satellite tags on Florida bonneted bats tagged at Babcock-Webb Wildlife Management Area (BWWMA) found the maximum distance detected from a capture site was 24.2 mi (38.9 km); the greatest path length travelled in a single night was 56.3 mi (90.6 km) (Ober 2016; Webb 2018a-b). At BWWMA, researchers found that most individual locations were within one mile of the roost (point of capture) (Ober 2015). Additional data collected during the month of December documented the mean maximum distance Florida bonneted bats (n=8) with tags traveled from the roost was 9.5 mi (Webb 2018b).

The Service recognizes that the movement information comes from only one site (BWWMA and vicinity), and data are from small numbers (n=20) of tagged individuals for only short periods of time (Webb 2018a-b). We expect that across the Florida bonneted bat's range differences in

habitat quality, prey availability, and other factors will result in variable habitat use and home range sizes between locations. Foraging distances and home range sizes in high quality habitats are expected to be smaller while foraging distances and home range sizes in low quality habitat would be expected to be larger. Regardless, we use these studies as our best available information to evaluate when changes to foraging habitat may have an effect on the species ability to feed, breed, and shelter and subsequently result in incidental take. When considering where most of the nightly activity was observed, we calculate a foraging area centered on a roost with a 1 mile radius would include approximately 2,000 acres, and a foraging area centered on a 9.5 mile radius would encompass approximately 181,000 acres, on any given night.

Given the Service's limited understanding of how the Florida bonneted bat moves throughout its home range and selects foraging areas, we choose to use 50 acres of habitat as a conservative estimate to when loss of foraging habitat may affect the fitness of an individual to the extent that it would impair feeding and breeding. Projects that would remove, destroy or convert less than 50 acres of Florida bonneted bat foraging habitat are expected to result in a loss of foraging opportunities; however, this decrease is not expected to significantly impair the ability of the individual to feed and breed. Consequently, projects impacting less than 50 acres of foraging habitat that implement the identified best management practices in the Key would be expected to avoid take, and the appropriate determination is that the project may affect, but is not likely to adversely affect the species (MANLAA).

Next, the Service incorporated the level of bat activity into our Key to evaluate when a foraging area may have greater value to the species. When surveys document high bat activity, we deduce that this area has increased value and importance to the species. Thus, when high bat activity is detected in parcels with greater than 50 acres of foraging habitat, we anticipate that the loss, destruction, or conversion of this habitat could significantly impair the ability of an individual to feed and breed (*i.e.*, LAA); thus formal consultation is warranted.

If surveys do not indicate high bat activity, we anticipate that loss of this additional foraging habitat may affect, but is not likely to adversely affect the species (MANLAA). This is because although the acreage is large, the area does not appear to be important at the landscape scale of nightly foraging. Therefore, its loss is not anticipated to significantly impair the ability of an individual to feed or breed.

The exception to this approach is for projects greater than 50 acres when they occur in potential roosting habitat that is not found to support roosting or high bat activity. Under this scenario, the Service concludes that the loss of the large acreage of suitable roosting habitat has the potential to significantly impair the ability of an individual to breed or shelter (*i.e.*, LAA) because the species is cavities for roosting are expected to be limited range wide and the project will impair these limited opportunities for roosting.

Determinations

The Corps (or other Federal action agency) may reach one of several determinations when using this Key. Regardless of the determination, when acoustic bat surveys have been conducted, the Service requests that these survey results are provided to our office to increase our knowledge of

the species and improve our consultation process. Surveys results and reports should be transmitted to the Service at FBBsurveyreport@fws.gov or mail electronic file to U.S. Fish and Wildlife Service, Attention Florida bonneted bat surveys, 1339 20th Street, Vero Beach, Florida 32960. When formal consultation is requested, survey results and reports should be submitted with the consultation request to verobeach@fws.gov.

No effect: If the use of the Key results in a determination of "no effect," no further consultation is necessary with the Service. The Service recommends that the Corps (or other Federal action agency) documents the pathway used to reach the determination in the project record and proceeds with other species analyses as warranted.

May Affect, Not Likely to Adversely Affect (MANLAA): In this Key we have identified two ways that consultation can conclude informally, MANLAA-P and MANLAA-C.

> **MANLAA-P**: If the use of the Key results in a determination of "MANLAA- P," the Service 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 Florida bonneted bat. The Service recommends that the Corps (or other Federal action agency) documents the pathway used to reach the determination in the project record and proceeds with other species analyses as warranted.
>
> **MANLAA-C**: If the use of the Key results in a determination of MANLAA-C, further consultation with the Service is required to confirm that the Key has been used properly, and the Service concurs with the evaluation of the survey results. Survey results should be submitted with the consultation request.

May Affect, Likely to Adversely Affect (LAA) - When the determination in the Key is "LAA" technical assistance with the Service and modifications to the proposed action may enable the project to be reevaluated and conclude with a MANLAA-C determination. Under other circumstance, "LAA" determinations will require formal consultation.

Working with the Fish and Wildlife Foundation of Florida, the Service has established a fund to support conservation and recovery for the Florida bonneted bat. Any project that has the potential to affect the Florida bonneted bat 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 Florida bonneted bat recovery please contact Ashleigh Blackford, Connie Cassler, or José Rivera at 772-562-3909.

This revised Key is effective immediately upon receipt by the Corps. Should circumstances change or new information become available regarding the Florida bonneted bat and/or implementation of the Key, the determinations herein may be reconsidered and this Key further revised or amended. We have established an email address to collect comments on the Key and the survey protocols at: FBBguidelines@fws.gov.

Thank you for your continued cooperation in the effort to conserve fish and wildlife resources. If you have any questions regarding this Key, please contact the South Florida Ecological Services Office at 772-562-3909.

Sincerely,

Roxanna Hinzman
Field Supervisor
South Florida Ecological Services

Enclosure

Cc: electronic only
Corps, Jacksonville, Florida (Dale Beter, Muriel Blaisdell, Ingrid Gilbert, Alisa Zarbo, Melinda Charles-Hogan, Susan Kaynor, Krista Sabin, John Fellows)

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U.S. Fish and Wildlife Service
South Florida Ecological Services Office

FLORIDA BONNETED BAT CONSULTATION GUIDELINES

October - 2019

The U.S. Fish and Wildlife Service's South Florida Ecological Services Field Office (Service) developed the Florida Bonneted Bat Consultation Guidelines (Guidelines) to assist in avoiding and minimizing potential negative effects to roosting and foraging habitat, and assessing effects to the Florida bonneted bat (*Eumops floridanus*) from proposed projects. The Consultation Key within the Guidelines assists applicants in evaluating their proposed projects and identifying the appropriate consultation paths under sections 7 and 10 of the Endangered Species Act of 1973 (Act), as amended (87 Stat. 884; 16 U.S.C. 1531 *et seq.*). These Guidelines are primarily for use in evaluating regulatory projects where development and land conversions are anticipated. These Guidelines focus on conserving roosting structures in natural and semi-natural environments. The following Consultation Area map (Figure 1 and Figure 2, Appendix A), Consultation Flowchart (Figure 3), Consultation Key, Survey Framework (Appendices B-C), and **Best Management Practices (BMPs)** (Appendix D) are based upon the best available scientific information. As more information is obtained, these Guidelines will be revised as appropriate. If you have comments, or suggestions on these Guidelines or the Survey Protocols (Appendix B and C), please email your comments to FBBguidelines@fws.gov. These comments will be reviewed and incorporated in an annual review.

Terms in **bold** are further defined in the Glossary.

Wherever possible, proposed development projects within the Consultation Area should be designed to avoid and minimize take of Florida bonneted bats and to retain their habitat. Applicants are encouraged to enter into early technical assistance/consultation with the Service so we may provide recommendations for avoiding and minimizing adverse effects. Although these Guidelines focus on the effects of a proposed action (*e.g.*, development) on natural habitat, (*i.e.*, non-urban), Appendix E also provides Best Management Practices for Land Management Projects.

If you are renovating an existing artificial structure (*e.g.*, building) within the urban environment with or without additional ground disturbing activities, these Guidelines do not apply. The Service is developing separate guidelines for consultation in these situations. Until the urban guidelines are complete, please contact the Service for additional guidance.

The final listing rule for the Florida bonneted bat (Service 2013) describes threats identified for the species. Habitat loss and degradation, as well as habitat modification, have historically affected the species. Florida bonneted bats are different from most other Florida bat species because they are reproductively active through most of the year, and their large size makes them capable of foraging long distances from their roost (Ober *et al.* 2016). Consequently, this species is vulnerable to disturbances around the roost during a greater portion of the year and considerations about foraging habitat extend further than the localized roost.

Use of Consultation Area, Flowchart, and Key

Figure 1 shows the Consultation Area for the Florida bonneted bat where this consultation guidance applies. For information on how the Consultation Area was delineated see Appendix A. The Consultation Flowchart (Figure 3) and Consultation Key direct project proponents through a series of couplets that will provide a conclusion or determination for potential effects to the Florida bonneted bat. *Please Note: If additional listed species, or candidate or proposed species, or designated or proposed critical habitat may be affected, a separate evaluation will be needed for these species/critical habitats.*

Currently, the Consultation Flowchart (Figure 3) and Consultation Key cannot be used for actions proposed within the urban development boundary in Miami-Dade and Broward County. The urban development boundary is part of the Consultation Area, but it is excluded from these Guidelines because Florida bonneted bats use this area differently (roosting largely in artificial structures), and small natural foraging areas are expected to be important. Applicants with projects in this area should contact the Service for further guidance and individual consultation.

Determinations may be either "no effect," "may affect, but is not likely to adversely affect" (**MANLAA**), or "may affect, and is likely to adversely affect" (**LAA**). An applicant's willingness and ability to alter project designs could sufficiently minimize effects to Florida bonneted bats and allow for a **MANLAA** determination for this species (informal consultation). The Service is available for early technical assistance/consultation to offer recommendations to assist in project design that will minimize effects. When take cannot be avoided, applicants and action agencies are encouraged to incorporate compensation to offset adverse effects. The Service can assist with identifying compensation options (*e.g.,* conservation on site, conservation off-site, contributions to the Service's Florida bonneted bat conservation fund, *etc*.).

Using the Key and Consultation Flowchart

- "No effect" determinations do not need Service concurrence.
- "May affect, but is not likely to adversely affect" **MANLAA**. Applicants will be expected to incorporate the appropriate BMPs to reach a **MANLAA** determination.
    - **MANLAA-P** (in blue in Consultation Flowchart) have programmatic concurrence through the transmittal letter of these Guidelines, and therefore no further consultation with the Service is necessary unless assistance is needed in interpreting survey results.
    - **MANLAA-C** (in black in Consultation Flowchart) determinations require further consultation with the Service.
- "May affect, and is likely to adversely affect" (**LAA**) determinations require consultation with the Service. Project modifications could change the **LAA** determinations in numbers 5, 8, 9, 11, 12, and 17 to **MANLAA**. When take cannot be avoided, **LAA** determinations will require a biological opinion.
- The Service requests copies of surveys used to support all determinations. If a survey is required by the Consultation Key and the final determination is "no effect" or "MANLAA-P", send the survey to FBBsurveyreport@fws.gov , or mail electronic file to U.S. Fish and Wildlife Service, Attention Florida bonneted bat surveys, 1339 20th Street, Vero Beach, Florida 32960. If a survey is required by the Consultation Key and the determination is "MANLAA-C" or "LAA", submit the survey in the consultation request.

For the purpose of making a decision at Couplet 2: If any potential roosting structure is present, then the habitat is classified as **potential roosting habitat**, and the left half of the flowchart should be followed (see Figure 3). We recognize that roosting habitat may also be used by Florida bonneted bats for foraging. If the project site only consists of **foraging habitat** (*i.e.*, no suitable roosting structures), then the right side of the flowchart should be followed beginning at step 13.

For couplets 11 and 12: **Potential roosting habitat** is considered **Florida bonneted bat foraging habitat** when a determination is made that roosting is not likely.

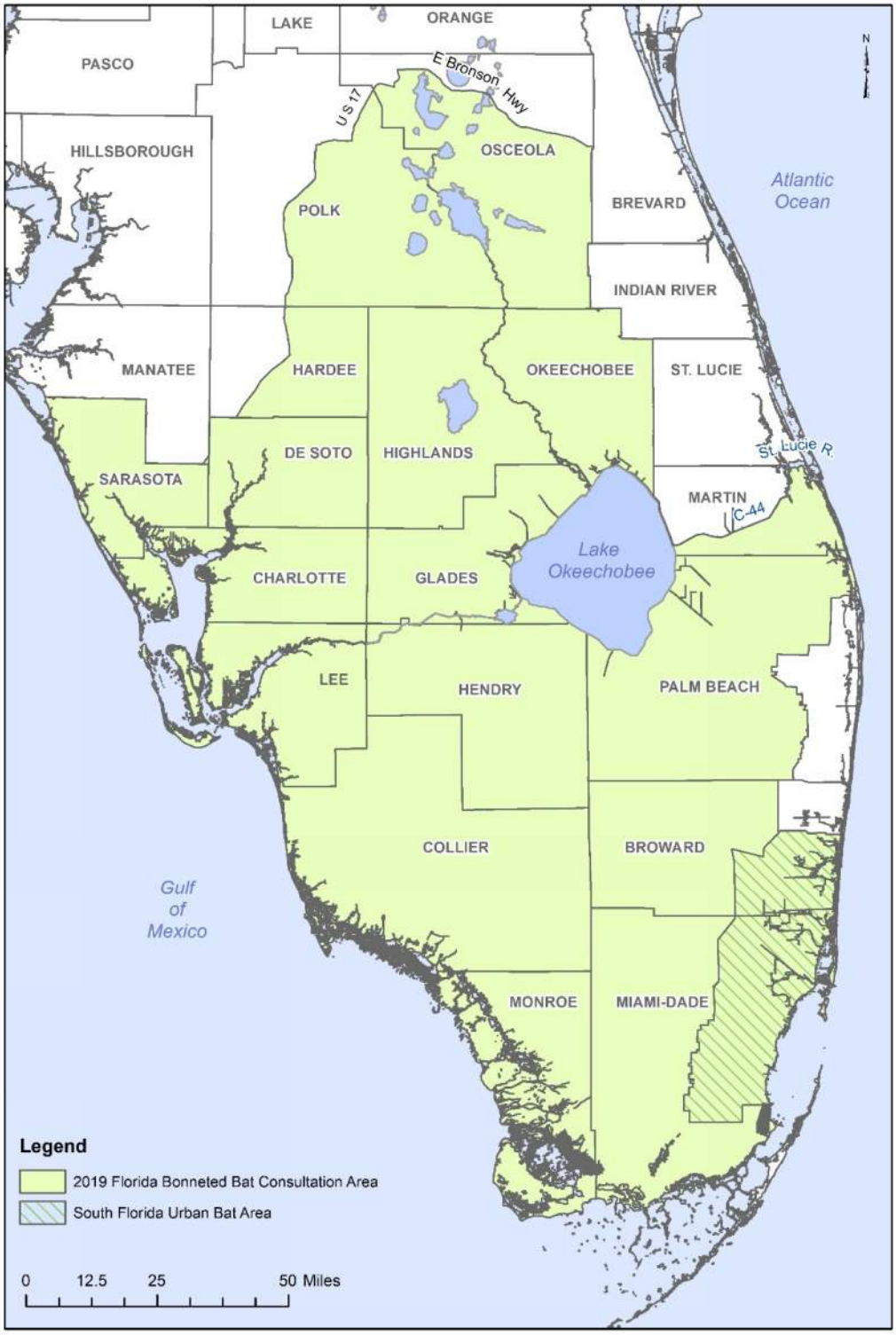

Figure 1. Florida Bonneted Bat Consultation Area. Hatched area (Figure 2) identifies the urban development boundary in Miami-Dade and Broward County. Applicants with projects in this area should contact the Service for specific guidance addressing this area and individual consultation. The Consultation Key should not be used for projects in this area.

Figure 2. Urban development boundary in Miami-Dade and Broward County. The Consultation Key should not be used for projects in this area. Applicants with projects in this South Florida Urban Bat Area should contact the Service for specific guidance addressing this area and individual consultation.

Florida Bonneted Bat Consultation Key[#]

Use the following key to evaluate potential effects to the Florida bonneted bat (FBB) from the proposed project. Refer to the Glossary as needed.

1a. Proposed project or land use change is partially or wholly within the Consultation Area (Figure 1).....**Go to 2**
1b. Proposed project or land use change is wholly outside of the Consultation Area (Figure 1).....**No Effect**

2a. Potential FBB roosting habitat exists within the project area.....**Go to 3**
2b. No potential FBB roosting habitat exists within the project area.....**Go to 13**

3a. Project size/footprint* ≤ 5 acres (2 hectares)..... **Conduct Limited Roost Survey (Appendix C)** then **Go to 4**
3b. Project size/footprint* > 5 acres (2 hectares).....**Conduct Full Acoustic/Roost Surveys (Appendix B)** then **Go to 6**

4a. Results show FBB roosting is likely .....**Go to 5**
4b. Results do not show FBB roosting is likely.....**MANLAA-P if BMPs (Appendix D) used and survey reports are submitted. Programmatic concurrence.**

5a. Project will affect roosting habitat.....**LAA[+] Further consultation with the Service required.**
5b. Project will not affect roosting habitat..... **MANLAA-C with required BMPs (Appendix D). Further consultation with the Service required.**

6a. Results show some FBB activity.....**Go to 7**
6b. Results show no FBB activity.....**No Effect**

7a. Results show FBB roosting is likely.....**Go to 8**
7b. Results do not show FBB roosting is likely.....**Go to 10**

8a. Project will not affect roosting habitat.....**Go to 9**
8b. Project will affect roosting habitat.....**LAA[+] Further consultation with the Service required.**

9a. Project will affect* > 50 acres (20 hectares) (wetlands and uplands) of foraging habitat.....**LAA[+] Further consultation with the Service required.**
9b. Project will affect* ≤ 50 acres (20 hectares) (wetlands and uplands) of foraging habitat..... **MANLAA-C with required BMPs (Appendix D). Further consultation with the Service required.**

10a. Results show high FBB activity/use.....**Go to 11**
10b. Results do not show high FBB activity/use.....**Go to 12**

11a. Project will affect* > 50 acres (20 hectares) (wetlands and uplands) of FBB habitat (roosting and/or foraging)..... **LAA[+] Further consultation with the Service required.**
11b. Project will affect* ≤ 50 acres (20 hectares) (wetlands and uplands) of FBB habitat (roosting and/or foraging)..... **MANLAA-C with required BMPs (Appendix D). Further consultation with the Service required.**

12a. Project will affect* > 50 acres (20 hectares) (wetlands and uplands) of FBB habitat..... **LAA[+] Further consultation with the Service required.**
12b. Project will affect* ≤ 50 acres (20 hectares) (wetlands and uplands) of FBB habitat..... **MANLAA-P if BMPs (Appendix D) used and survey reports are submitted. Programmatic concurrence.**

13a. FBB foraging habitat exists within the project area and foraging habitat will be affected…..……..**Go to 14**

13b. FBB foraging habitat exists within the project area and foraging habitat will not be affected **OR** no FBB foraging habitat exists within the project area…..……..**No Effect**

14a. Project size* > 50 acres (20 hectares) (wetlands and uplands) ……..…….....**Go to 15**

14b. Project size* ≤ 50 acres (20 hectares) (wetlands and uplands) ……...….. **MANLAA-P if BMPs (Appendix D) used. Programmatic concurrence.**

15a. Project is within 8 miles (12.9 kilometers) of high quality potential roosting areas^……..……**Conduct Full Acoustic Survey (Appendix B) and Go to 16**

15b. Project is not within 8 miles (12.9 kilometers) of high quality potential roosting area^…….....….**MANLAA-P if BMPs (Appendix D) used. Programmatic concurrence.**

16a. Results show some FBB activity……...…….....**Go to 17**

16b. Results show no FBB activity……..…….…....**No Effect**

17a. Results show high FBB activity/use……...…...…....**LAA[+] Further consultation with the Service required.**

17b. Results do not show high FBB activity/use……....…….. **MANLAA-P if BMPs (Appendix D) used and survey reports submitted. Programmatic concurrence.**

[#] If you are within the urban environment and you are renovating an existing artificial structure (with or without additional ground disturbing activities), these Guidelines do not apply. The Service is developing separate guidelines for consultation in these situations. Until the urban guidelines are complete, please contact the Service for additional guidance

*****Includes wetlands and uplands that are going to be altered along with a 250- foot (76.2- meter) buffer around these areas if the parcel is larger than the altered area.

[+]Project modifications could change the **LAA** determinations in numbers 5, 8, 9, 11, 12, and 17 to **MANLAA** determinations.

^Determining if **high quality potential roosting areas** are within 8 mi (12.9 km) of a project is intended to be a desk-top exercise looking at most recent aerial imagery, not a field exercise.

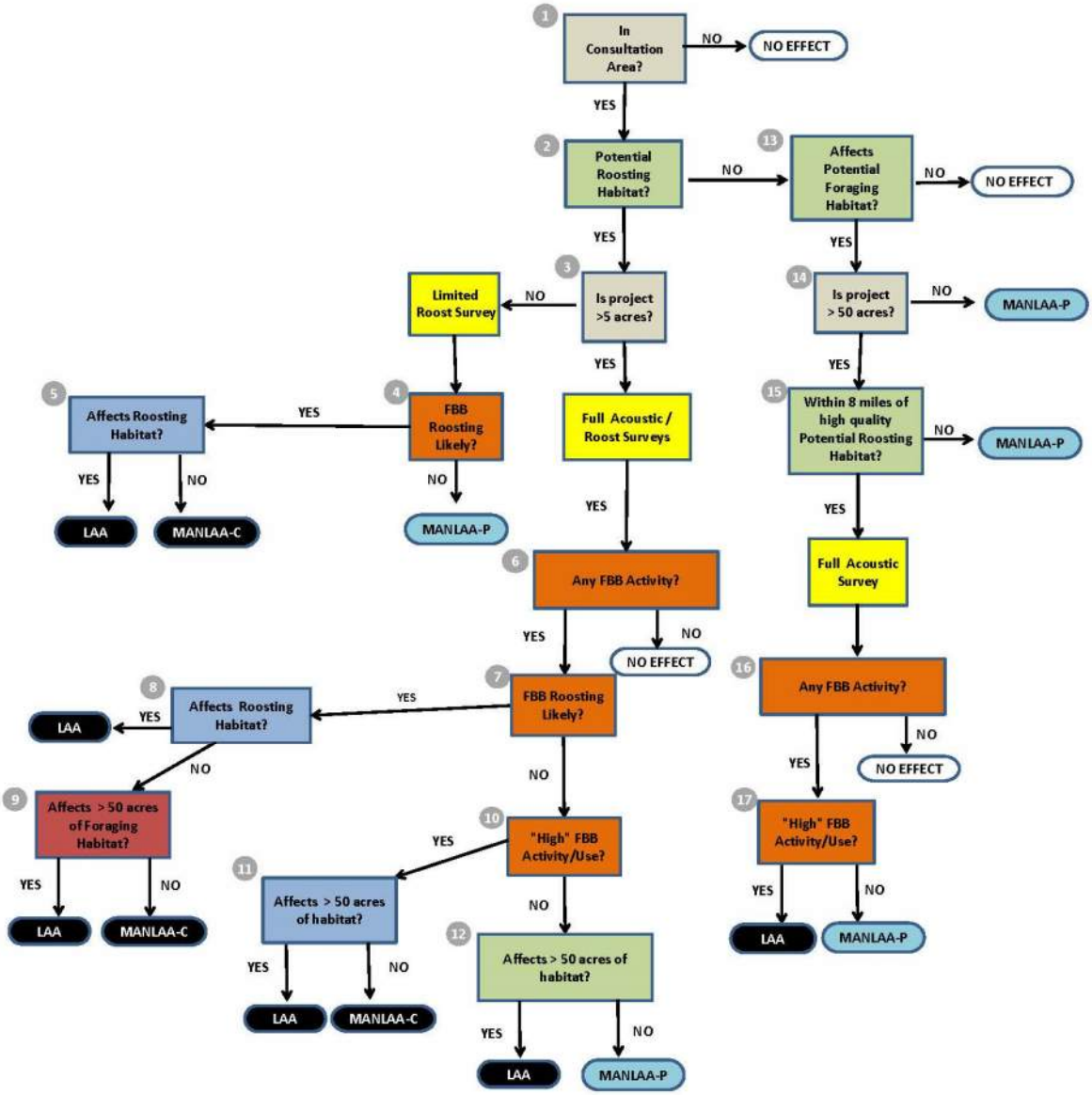

Figure 3. Florida bonneted bat Consultation Flowchart. "**No effect**" determinations do not need Service concurrence. "May affect, but not likely to adversely affect", **MANLAA-P,** in blue have programmatic concurrence through the transmittal letter of these Guidelines, and therefore no further consultation with the Service is necessary unless assistance is needed in interpreting survey results. **MANLAA-C** determinations in black require further consultation with the Service. Applicants are expected to incorporate the appropriate **BMPs** to reach a **MANLAA** determination. "May affect, and is likely to adversely affect", **LAA, (**also in black) determinations require consultation with the Service. Further consultation with the Service may identify project modifications that could change the **LAA** determinations in numbers 5, 8, 9, 11, 12, and 17 to **MANLAA** determinations. The Service requests Florida bonneted bat survey reports for all determinations.

GLOSSARY

BMPs – Best Management Practices. Recommendations for actions to conserve roosting and foraging habitat to be implemented before, during, and after proposed development, land use changes, and land management activities.

FBB Activity – Florida bonneted bat (FBB) activity is when any Florida bonneted bat calls are recorded during an acoustic survey or human observers see or hear Florida bonneted bats on a site.

FORAGING HABITAT - Comprised of relatively open (*i.e.,* uncluttered or reduced numbers of obstacles, such as fewer tree branches and leaves, in the flight environment) areas to find and catch prey, and sources of drinking water. In order to find and catch prey, Florida bonneted bats forage in areas with a reduced number of obstacles. This includes: open fresh water, permanent or seasonal freshwater wetlands, within and above wetland and upland forests, wetland and upland shrub, and agricultural lands (Bailey *et al.* 2017). In urban and residential areas drinking water, prey base, and suitable foraging can be found at golf courses, parking lots, and parks in addition to relatively small patches of natural habitat.

FULL ACOUSTIC/ROOST SURVEY - This is a comprehensive survey that will involve systematic acoustic surveys (*i.e.,* surveys conducted 30 minutes prior to sunset to 30 minutes after sunrise, over multiple consecutive nights). Depending upon acoustic results and habitat type, targeted roost searches through thorough visual inspection using a tree-top camera system or observations at emergence (*e.g.,* looking and listening for bats to come out of tree cavities around sunset) or more acoustic surveys may be necessary. See Appendix B for a full description.

HIGH FBB ACTIVITY/USE - High Florida bonneted bat (FBB) activity/use or importance of an area can be defined using several parameters (*e.g*., types of calls, numbers of calls). An area will be considered to have high FBB activity/use if **ANY** of the following are found: (a) multiple FBB feeding buzzes are detected; (b) FBB social calls are recorded; (c) large numbers of Florida bonneted bat calls (9 or more) are recorded throughout one night. Each of these parameters is considered to indicate that an area is actively used and important to FBBs, however, the Service will further evaluate the activity/use of the area within the context of the site (*i.e.,* spatial distribution of calls, site acreage, habitat on site, as well as adjacent habitat) and provide additional guidance.

HIGH QUALITY POTENTIAL ROOSTING AREAS - Sizable areas (>50 acres) [20 hectares] that contain large amounts of high-quality, natural roosting structure – (*e.g.,* predominantly native, mature trees; especially pine flatwoods or other areas with a large number of cavity trees, tree hollows, or high woodpecker activity).

LAA - May Affect, and is Likely to Adversely Affect. The appropriate conclusion if any adverse effect to listed species may occur as a direct or indirect result of the proposed action or its interrelated or interdependent actions, and the effect is not: discountable, insignificant, or

beneficial [see definition of "may affect, but is not likely to adversely affect" (**MANLAA**)]. In the event the overall effect of the proposed action is beneficial to the listed species, but also is likely to cause some adverse effects, then the proposed action is "likely to adversely affect" the listed species. If incidental take is anticipated to occur as a result of the proposed action, an "is likely to adversely affect" (**LAA**) determination should be made. An "is likely to adversely affect" determination requires the initiation of formal section 7 consultation.

LIMITED ROOST SURVEY - This is a reduced survey that may include the following methods: acoustics, observations at emergence (*e.g.,* looking and listening for bats to come out of tree cavities around sunset), and visual inspection of trees with cavities or loose bark using tree-top cameras (or combination of these methods). Methods are fairly flexible and dependent upon composition and configuration of project site and willingness and ability of applicant and partners to conserve roosting structures on site. See also Appendix C for a full description.

MANLAA - May Affect, but is Not Likely to Adversely Affect. The appropriate conclusion when effects on listed species are expected to be discountable, insignificant, or completely beneficial. Beneficial effects are contemporaneous positive effects without any adverse effects to the species. Insignificant effects relate to the size of the impact and should never reach the scale where take occurs. Discountable effects are those extremely unlikely to occur. Based on best judgment, a person would not: (1) be able to meaningfully measure, detect, or evaluate insignificant effects; or (2) expect discountable effects to occur. To use these Guidelines and Consultation Key applicants must incorporate the appropriate **BMPs** (Appendix D) to reach a **MANLAA** determination.

In this Consultation Key we have identified two ways that consultation can conclude informally, **MANLAA-P and MANLAA-C**:

> **MANLAA-P**: programmatic concurrence is provided through the transmittal letter of these Guidelines, no additional consultation is required with the Service for Florida bonneted bats. All survey results must be submitted to Service.
>
> **MANLAA-C**: further consultation with the Service is required to confirm that the Consultation Key has been used properly, and the Service concurs with the evaluation of the survey results. Request for consultation must include survey results.

NO EFFECT - The appropriate conclusion when the action agency determines its proposed action will not affect listed species or designated critical habitat.

POTENTIAL ROOSTING HABITAT - Includes forest and other areas with tall, mature trees or other areas with suitable roost structures (*e.g.,* utility poles, artificial structures). Forest is defined as all types including: pine flatwoods, scrubby flatwoods, pine rocklands, royal palm hammocks, mixed or hardwood hammocks, cypress, sand pine scrub, or other forest types. (Forrest types currently include exotic forests such as melaleuca, please contact the Service for additional guidance as needed). More specifically, this includes habitat in which suitable structural features for breeding and sheltering are present. In general, roosting habitat contains one or more of the following structures: tree snags, and trees with cavities, hollows, deformities, decay, crevices, or loose bark. Structural characteristics are of primary importance.

Florida bonneted bats have been found roosting in habitat with the following structural features, but may also occur outside of these parameters:

- trees greater than 33 feet (10 meters) in height, greater than 8 inches (20 centimeters) in diameter at breast height (DBH), with cavity elevations higher than 16 feet (5 meters) above ground level (Braun de Torrez 2019);
- areas with a high incidence of large or mature live trees with various deformities (*e.g.,* large cavities, hollows, broken tops, loose bark, and other evidence of decay) (*e.g.,* pine flatwoods);
- rock crevices (*e.g.,* limestone in Miami-Dade County); and/or
- artificial structures, mimicking natural roosting conditions (*e.g.,* bat houses, utility poles, buildings), situated in natural or semi-natural habitats.

In order for a building to be considered a roosting structure, it should be a minimum of 15 feet high and contain one or more of the following features: chimneys, gaps in soffits, gaps along gutters, or other structural gaps or crevices (outward entrance approximately 1 inch (2.5 centimeters) in size or greater. Structures similar to the above (*e.g.,* bridges, culverts, minimum of 15 feet high) are expected to also provide roosting habitat, based upon the species' morphology and behavior (Keeley and Tuttle 1999). Florida bonneted bat roosts will be situated in areas with sufficient open space for these bats to fly (*e.g.,* open or semi-open canopy, canopy gaps, above the canopy, and edges which provide relatively uncluttered conditions [*i.e.,* reduced numbers of obstacles, such as fewer tree branches and leaves, in the flight environment]).

For the purpose of this Consultation Key*: Roosting habitat refers to habitat with structures that can be used for daytime and maternity roosting. Roosting at night between periods of foraging can occur in a broader range of structure types. For the purposes of this guidance we are focusing on day roosting habitat.*

ROOSTING IS LIKELY– Determining likelihood of roosting is challenging. The Service has provided the following definition for the express purpose of these Guidelines. Researchers use additional cues to assist in locating roosts. As additional indicators are identified and described we expect our Guidelines will be improved.

In this Consultation Key the Service will consider the following evidence indicative that roosting is likely nearby (*i.e.,* reasonably certain to occur) if **ANY** of the following are documented: (a) Florida bonneted bat calls are recorded within 30 minutes before sunset to 1½ hours following sunset or within 1½ hours before sunrise; (b) emergence calls are recorded; (c) human observers see (or hear) Florida bonneted bats flying from or to potential roosts; (d) human observers see and identify Florida bonneted bats within a natural roost or artificial roost; and/or (e) other bat sign (*e.g*., guano, staining, etc.) is found that is identified to be Florida bonneted bat through additional follow-up.

In addition to the aforementioned events, researchers consider roosting likely in an area when (1) large numbers of Florida bonneted bat calls are recorded throughout the night (*e.g.,* ≥ 25 files per night at a single acoustic station when 5 second file lengths are recorded); (2) large numbers of FBB calls are recorded over multiple nights (*e.g.,* an average of ≥ 20 files per night from a single detector when 5 second file lengths are recorded); or (3) social calls are recorded. Because social calls and large numbers of calls recorded over one or more nights can be indicative of high

FBB activity/use or when roosting is likely, the Service is choosing not to use these as indicators to make the determination that roosting is likely. Instead we are relying on the indicators that are only expected to occur at or very close to a roost location [(a)-(e) above].

TAKE - to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in any such conduct. [ESA §3(19)] Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering. Harass is defined by the Service as actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. [50 CFR §17.3].

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Appendix A. Delineation and Justification for Consultation Area

The Consultation Area (Figure 1) represents the general range of the species. The Consultation Area represents the area within which consideration should be given to potential effects to Florida bonneted bats from proposed projects or actions. Coordination and consultation with the Service helps to determine whether proposed actions and activities may affect listed species. This Consultation Area defines the area where proposed actions and activities may affect the Florida bonneted bat.

This area was delineated using confirmed presence data, key habitat features, reasonable flight distances and home range sizes. Where data were lacking, we used available occupancy models that predict probability of occurrence (Bailey *et al.* 2017). Below we describe how each one of these data sources was used to determine the overall Consultation Area.

Presence data: Presence data included locations for: (1) confirmed Florida bonneted bat acoustic detections; (2) known roost sites (occupied or formerly occupied; includes natural roosts, bat houses, and utility poles); (3) live Florida bonneted bats observed or found injured; (4) live Florida bonneted bats captured during research activities; and (5) Florida bonneted bats reported as dead. The Geographic Information Systems (GIS) dataset incorporates information from January 2003 to May 2019.

The vast majority of the presence data came from acoustic surveys. The species' audible, low frequency, distinct, echolocation calls are conducive for acoustic surveys. However, there are limitations in the range of detection from ultrasonic devices, and the fast, high-flying habits of this species can confound this. Overall, detection probabilities for Florida bonneted bats are generally considered to be low. For example, in one study designed to investigate the distribution and environmental associations of Florida bonneted bat, Bailey *et al.* 2017 found overall nightly detection probability was 0.29. Based on the estimated detection probabilities in that study, it would take 9 survey nights (1 detector per night) to determine with 95% certainty whether Florida bonneted bat are present at a sampling point. Positive acoustic detection data are extremely valuable. However, it is important to recognize that there are issues with false negatives due to limitations of equipment, low detection probabilities, difference in detection due to prey availability and seasonal movement over the landscape, and in some circumstances improperly conducted surveys (*i.e.,* short duration or in unsuitable weather conditions).

Key habitat features: We considered important physical and biological features with a focus on potential roosting habitat and applied key concepts of bat conservation (*i.e*., need to conserve roosting habitat, foraging habitat, and prey base). To date, all known natural Florida bonneted bat roosts (n=19 have been found in live trees and snags of the following types: slash pine, longleaf pine, royal palm, and cypress (Braun de Torrez 2018). Several of the recent roost discoveries are located in fire-maintained vegetation communities, and it appears that Florida bonneted bats are fire-adapted and can benefit from prescribed burn regimes that closely mimic historical fire patterns (Ober *et al.* 2018).

From a landscape and roosting perspective, we consider key habitat features to include forested areas and other areas with mature trees, wetlands, areas used by red-cockaded woodpeckers

(*Picoides borealis*; RCW), and fire-managed and other conservation areas. However, recent work suggests that Florida bonneted bats do not use pinelands more than other land cover types (Bailey *et al.* 2017). In fact, Bailey *et al.* 2017 detected Florida bonneted bats in all land cover types investigated in their study (e.g., agricultural, developed, upland, and wetland). For the purposes of these consultation guidelines, we are focusing on the conservation of potential roosting habitats across the species' range. However, we also recognize the need for comprehensive consideration of foraging habitats, habitat connectivity, and long-term suitability.

Flight distances and home range sizes: Like most bats, Florida bonneted bats are colonial central-place foragers that exploit distant and scattered resources (Rainho and Palmeirim 2011). Morphological characteristics (narrow wings, high wing-aspect ratio) make *Eumops* spp. well-adapted for efficient, low-cost, swift, and prolonged flight in open areas (Findley *et al*. 1972, Norberg and Rayner 1987). Other Eumops including Underwood's mastiff bat (*Eumops underwoodi*), and Greater mastiff bat or Western mastiff bat (*Eumops perotis*) are known to forage and/or travel distances ranging from 6.2 miles to 62 miles from the roost with multiple studies documenting flight distances approximately 15- 18 miles from the roost (Tibbitts *et al* 2002, Vaugh 1959 as cited in Best *et al*. 1996, Siders *et al.* 1999, Siders 2005, Vaughan 1959 as cited in Siders 2005.)

Like other *Eumops,* Florida bonneted bats are strong fliers, capable of travelling long distances (Belwood 1992). Recent Global Positioning System (GPS) and radio-telemetry data for Florida bonneted bats documents that they also move large distances and likely have large home ranges. Data from recovered GPS satellite tags on Florida bonneted bats tagged at Babcock-Webb Wildlife Management Area (WMA), found the maximum distance detected from a capture site was 24.2 mi (38.9 km); the greatest path length travelled in a single night was 56.3 mi (90.6 km) (Ober 2016; Webb 2018a-b). Additional data collected during the month of December documented the mean maximum distance of Florida bonneted bats (n=8) with tags traveled from the roost was 9.5 mi (Webb 2018b). The Service recognizes that the movement information comes from only one site (Babcock-Webb WMA and vicinity), and data are from small numbers (n=20) of tagged individuals for only short periods of time (Webb 2018a-b). We expect that across the Florida bonneted bat's range differences in habitat quality, prey availability, and other factors will result in variable habitat use and home range sizes between locations. Foraging distances and home range sizes in high quality habitats are expected to be smaller while foraging distances and home range sizes in low quality habitat would be expected to be larger. Consequently, because Babcock-Webb WMA provides high quality roosting habitat, this movement data could represent the low end of individual flight distances from a roost.

Given the species' morphology and habits (*e.g*., central-place forager) and considering available movement data from other *Eumops* and Florida bonneted bats discussed above, we opted to use 15 miles (24 km) as a reasonable estimate of the distance Florida bonneted bats would be expected to travel from a roost on any given night. For the purposes of delineating a majority of the Consultation Area, we used available confirmed presence point location data and extended out 15 miles (24 km), with modifications for habitat features (as described above). As more movement data are obtained and made available, this distance estimate may change in the future.

Occupancy model – Research by Bailey *et al.* (2017) indicates the species' range is larger than previously known. Their model performed well across a large portion of the previously known

range when considering confirmed Florid bonneted bat locations; thus it is anticipated to be useful where limited information is available for the species.

We used the model output from Bailey *et al.* (2017) to more closely examine areas where we are data-deficient (*i.e.,* areas where survey information is particularly lacking). We considered 0.27 probability of occurrence a filter for high likelihood of occurrence because 0.27 was the model output for Babcock-Webb WMA, an area where Florida bonneted bats are known to occupy and heavily use. Large portions of Sarasota, Martin, and Palm Beach counties were identified as having probability of occurrence of 0.27. The consultation area should include areas where the species has a high likelihood of occurring. Based on this reasoned approach, all of Sarasota County, portions of Martin County, and greater parts of Palm Beach County were included in the Consultation Area.

We recognize that there are areas in the northern portion of the range where the model is less successful predicting occurrence based on the known Florida bonneted bat locations (*i.e*., the model predicts low likelihood of occurrence on Avon Park Air Force range, where the species is known to roost). Consequently, the Service is proactively working with partners to conduct surveys in the areas added based on the model to confirm that inclusion of these portions of the aforementioned counties is appropriate. The Consultation Area may be adjusted based on changes in this information.

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Appendix B: Full Acoustic / Roost Survey Framework

Purpose: The purpose of this survey is to: (1) determine if Florida bonneted bats are likely to be actively roosting or using the site; (2) locate active roost(s) and avoid the loss of the structure, if possible; and, (3) avoid or minimize the take of individuals. In some cases, changes in project designs or activities can help avoid and minimize take. For example, project proponents may be able to retain suspected roosts or conserve roosting and foraging habitats. Changing the timing or nature of activities can also help reduce the losses of non-volant young or effects to pregnant or lactating females. If properly conducted, acoustic surveys are the most effective way to determine presence and assess habitat use. If the applicant is unable to follow or does not want to follow the Full Acoustic/Roost Survey framework when recommended according to the Key, the Corps (or other Action Agency) will not be able to use these Guidelines and will need to provide a biologically supported rational using the best available information for their determination in their request for consultation.

General Description: This is a *comprehensive survey effort*, and robust acoustic surveys (*i.e.,* surveys conducted 30 minutes prior to sunset to 30 minutes after sunrise, over multiple nights) are a fundamental component of the approach. Depending upon acoustic results and habitat type, it may also include: observations at emergence (*e.g.,* emergence surveys during which observers look and listen for bats to come out of roost structures around sunset), visual inspection of trees/snags (*i.e.,* those with cavities, hollows, and loose bark) and other roost structures with tree-top cameras, or follow-up targeted acoustic surveys. Methods are dependent upon composition and configuration of project site and willingness and ability of applicant and partners to conserve roosting and foraging habitats on site.

General Survey Protocol:

[Note: The Service will provide more information in separate detailed survey protocols in the near future. This will include specific information on: detector types, placement, orientation, verification of proper functioning, analysis, reporting requirements, etc.]

- Approach is intended for project sites > 5 acres (2 hectares).
- For sites containing roosting habitat, acoustic surveys should primarily focus on assessing roosting habitat within the project site that will be lost or modified (*i.e.,* areas that will not be conserved), and locations on the property within 250 feet (76.2 meters) of areas that will not be conserved. This will help avoid or minimize the loss of an active roost and individuals. Secondarily, since part of the purpose is to determine if Florida bonneted bats are using the site, acoustic devices should also be placed near open water and wetlands to maximize chances of detection and aid in assessing foraging habitat that may be lost.
- For sites that do not contain ANY roosting habitat, but do contain foraging habitat (see Figure 3 - Consultation Flowchart and Key, Step 2 [no], Step 13 [yes]), efforts should focus on assessing foraging habitat within the project site that will be lost or modified (*i.e.,* areas that will not be conserved).
- Acoustic surveys should be performed by those who are trained and experienced in setting up, operating, and maintaining acoustic equipment; and retrieving, saving,

analyzing, and interpreting data. Surveyors should have completed one or more of the available bat acoustic courses/workshops, or be able to show similar on-the-job or academic experience (Service 2018).

- Due to the variation in the quality of recordings, the influence of clutter, the changing performances of software packages over time, and other factors, manual verification is recommended (Loeb *et al.* 2015). Files that are identified to species from auto-ID programs must be visually reviewed and manually verified by experienced personnel.
- Acoustic devices should be set up to record from 30 minutes prior to sunset to 30 minutes after sunrise for multiple nights, under suitable weather conditions.
- Acoustic surveys can be conducted any time of year as long as weather conditions meet the criteria. If any of the following weather conditions exist at a survey site during acoustic sampling, note the time and duration of such conditions, and repeat the acoustic sampling effort for that night: (a) temperatures fall below 65°F (18.3°C) during the first 5 hours of survey period; (b) precipitation, including rain and/or fog, that exceeds 30 minutes or continues intermittently during the first 5 hours of the survey period; and (c) sustained wind speeds greater than 9 miles/hour (4 meters/second; 3 on Beaufort scale) for 30 minutes or more during the first 5 hours of the survey period (Service 2018). At a minimum, nightly weather conditions for survey sites should be checked using the nearest NOAA National Weather Service station and summarized in the survey reports. Although not required at this time, it has been demonstrated that conducting surveys on warm nights late in the spring can help maximize detection probabilities (Ober *et al.* 2016; Bailey *et al.* 2017).
- Acoustic devices should be calibrated and properly placed. Microphones should be directed away from surrounding vegetation, not beneath tree canopy, away from electrical wires and transmission lines, away from echo-producing surfaces, and away from external noises. Directional microphones should be aimed to sample the majority of the flight path/zone. Omnidirectional microphones should be deployed on a pole in the center of the flight path/zone and oriented horizontally. For monitoring possible roost sites, microphones should be directed to maximize likelihood of detection.
- To standardize recordings, acoustic device recordings should have a 2-second trigger window and a maximum file length of 15 seconds.
- The number of acoustic survey sites and nights needed for the assessment is dependent upon the overall acreage of suitable habitat proposed to be impacted by the action.
    - For non-linear projects, a minimum of 16 detector nights per 20 acres of suitable habitat expected to be impacted is recommended.
    - For linear projects (*e.g.,* roadways, transmission lines), a minimum of five detector nights per 0.6 mi (0.97 km) is recommended. Detectors can be moved to multiple locations within each kilometer surveyed, but must remain in a single location throughout any given night.
    - For any site, and in particular for sites > 250 acres, please contact the Service to assist in designing an appropriate approach.
- If results of acoustic surveys show **high Florida bonneted bat activity** or **Florida bonneted bat roosting likely** (*e.g.,* high activity early in the evening) (see definitions in Glossary), follow-up methods such as emergence surveys, visual inspection of the roosting structures, or follow-up acoustic surveys are recommended to locate potential roosts. Using a combination of methods may be helpful.

- For bat emergence surveys, multiple observers should be stationed at potential roosts if weather conditions (as above) are suitable. Surveyors should be quietly stationed 30 minutes before sunset so they are ready to look and listen for emerging FBBs from sunset to 1½ hours after sunset. When conducting emergence surveys it is best to orient observers so that the roost is silhouetted in the remaining daylight; facing west can help maximize the ability to notice movement of animals out of a roost structure.
- Visual inspection of trees with cavities and loose bark during the day may be helpful. Active RCW trees should not be visually inspected during the RCW breeding season (April 15 through June 15).
- Visual inspection alone is not recommended due to the potential for roosts to be too high for cameras to reach, too small for cameras to fit, or shaped in a way that contents are out of view (Braun de Torrez *et al.* 2016).
- If roosting is suspected on site, use tree-top cameras during the day to search those trees/snags or other structures that have potential roost features (*i.e.,* cavities, hollows, crevices, or other structure for permanent shelter). If unsuccessful (*e.g.,* cannot see entire contents within a given cavity, cannot reach cavity, cannot see full extent of cavity) OR occupied roosts are found with the tree-top camera within the area in which high Florida bonneted bat activity/likely Florida bonneted bats roosting were identified, we recommend emergence surveys and/or acoustics to verify occupancy and/or identify bat species.
- Provide report showing effort, methods, weather conditions, findings, and summary of acoustic data relating to Florida bonneted bats (*e.g.,* # of calls, time of calls, and station number) organized by the date on which the data were collected. Sonograms of all calls with signatures at or below 20kHz shall be included in the report. The report shall be provided to the Corps project manager assigned to the project for which the survey was conducted and to the Service via the email address **verobeach@fws.gov. Raw acoustic data should be provided to the Service for all surveys. Raw acoustic data should be provided as "all raw data" and "all raw data with signatures at or below 20kHz". Data can be submitted to the Service via flash drive, memory stick, or hard drive. Data can be submitted digitally to verobeach@fws.gov or via mail to U.S. Fish and Wildlife Service, Attn: Florida bonneted bat data manager, 1339 20th Street, Vero Beach, Florida 32960.**
- Negative surveys are valid for 1 year after completion of the survey.

If you have comments, or suggestions on this survey protocols, please email your comments to FBBguidelines@fws.gov. These comments will be reviewed and incorporated in an annual review.

Literature Cited – Appendix B

Bailey, A.M., H.K. Ober, A.R. Sovie, and R.A. McCleery. 2017. Impact of land use and climate on the distribution of the endangered Florida bonneted bat. Journal of Mammalogy. 98:1586-1593.

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Appendix C: Limited Roost Survey Framework

Purpose: The purpose of this survey is to: (1) determine if Florida bonneted bats are likely to be actively roosting within suitable structures on-site; (2) locate active roost(s) and avoid the loss of the structure, if possible; and, (3) avoid or minimize the take of individuals. In some cases, changes in project designs or activities can help avoid and minimize take. For example, applicants and partners may be able to retain the suspected roosts or conserve roosting and foraging habitats. Changing the timing of activities can also help reduce the losses of non-volant young or effects to pregnant or lactating females.

General Description: This is a *reduced survey effort* that may include the following methods: visual inspection of trees/snags (*i.e.,* those with cavities, hollows, and loose bark) and other roost structures with tree-top cameras, observations at emergence (*e.g.,* emergence surveys during which observers look and listen for bats to come out of roost structures around sunset), acoustic surveys, or a combination of these methods. Methods are fairly flexible and dependent upon composition and configuration of project site and willingness and ability of applicant and partners to conserve roosting habitat on site.

General Survey Protocol:

[Note: The Service will provide more information in separate, detailed survey protocols in the near future. This will include specific information on: detector types, placement, orientation, verification of proper functioning, analysis, reporting requirements, etc.]

- Approach is **intended only for small project sites** (*i.e.,* sites ≤ 5 acres [2 hectares]).
- Efforts should focus on assessing potential roosting structures within the project site that will be lost or modified (*i.e.,* areas that will not be conserved), or are located on the property within 250 feet (76.2 meters) of areas that will not be conserved.

Identification of potential roost structures

- This step is necessary prior to any of the methods that follow.
- Run line transects through roosting habitat close enough that all trees and snags are easily inspected. Transect spacing will vary with habitat structure and season from a maximum of 91 m (300 ft) between transects in very open pine stands to 46 m (150 ft) or less in areas with dense mid-story. Transects should be oriented north to south, to optimize cavity detectability because many RCW cavity entrances are oriented in a westerly direction (Service 2004).
- Visually inspect all trees and snags or other structures for evidence of cavities, hollows, crevices that can be used for permanent shelter. Using binoculars, examine structures for cavities, loose bark, hollows, or other crevices that are large enough for Florida bonneted bats (diameter of opening > or = to 1 inch (2.5 cm) (Braun de Torrez *et al*. 2016).
- When potential roosting structures are found, record their location in the field using a Global Positioning System (GPS) unit.

Visual Inspection of trees and snags with tree-top cameras

- Visually inspect all cavities using a video probe (peeper) and assess the cavity contents.

Active RCW trees should not be visually inspected during the RCW breeding season (April 15 through June 15).

- Visual inspection alone is valid only when the entire cavity is observed and the contents can be identified. Typically, acoustics at emergence will also be needed to definitively identify bat species, if bats are present or suspected.
- If bats are suspected, or if contents cannot be determined, or if the entire cavity cannot be observed with the video probe; follow methods for an Acoustic Survey or an Emergence Survey (below). If the Corps (or other action agency) or applicant does not wish to conduct acoustic or emergence surveys, the Corps (or other action agency) cannot use the key and must request formal consultation with the Service.
- Record tree species or type of cavity structure, tree diameter and height, cavity height, cavity orientation and cavity contents.

Emergence Surveys

- For bat emergence surveys, multiple observers should be stationed at potential roosts if weather conditions (as described below in Acoustic Surveys) are suitable.
- Surveyors should be quietly stationed 30 minutes prior to sunset so they are ready to look and listen for emerging Florida bonneted bats from sunset to 1½ hours after sunset.
- When conducting emergence surveys it is best to orient observers so that the roost is silhouetted in the remaining daylight; facing west can help maximize the ability to notice movement of animals out of a roost structure.
- Record number of bats that emerged, the time of emergence, and if bat calls were heard.

Acoustic surveys

- Acoustic surveys should be performed by those who are trained and experienced in setting up, operating, and maintaining acoustic equipment; and retrieving, saving, analyzing, and interpreting data. Surveyors should have completed one or more of the available bat acoustic courses/workshops, or be able to show similar on-the-job or academic experience (Service 2018).
- Due to the variation in the quality of recordings, the influence of clutter, and the changing performances of software packages over time, and other factors, manual verification is recommended (Loeb *et al.* 2015). Files that are identified to species from auto-ID programs must be visually reviewed and manually verified by experienced personnel.
- Acoustic devices should be set up to record from 30 minutes prior to sunset to 30 minutes after sunrise for multiple nights, under suitable weather conditions.
- Acoustic surveys can be conducted any time of year as long as weather conditions meet the criteria. If any of the following weather conditions exist at a survey site during acoustic sampling, note the time and duration of such conditions, and repeat the acoustic sampling effort for that night: (a) temperatures fall below 65°F (18.3°C) during the first 5 hours of survey period; (b) precipitation, including rain and/or fog, that exceeds 30 minutes or continues intermittently during the first 5 hours of the survey period; and (c) sustained wind speeds greater than 9 miles/hour (4 meters/second; 3 on Beaufort scale) for 30 minutes or more during the first 5 hours of the survey period (Service 2018). At a minimum, nightly weather conditions for survey sites should be checked using the nearest NOAA National Weather Service station and summarized in the survey reports. Although not required at this time, it has been demonstrated that conducting surveys on

warm nights late in the spring can help maximize detection probabilities (Ober *et al.* 2016; Bailey *et al.* 2017).

- Acoustic devices should be calibrated and properly placed. Microphones should be directed away from surrounding vegetation, not beneath tree canopy, away from electrical wires and transmission lines, away from echo-producing surfaces, and away from external noises. Directional microphones should be aimed to sample the majority of the flight path/zone. Omnidirectional microphones should be deployed on a pole in the center of the flight path/zone and oriented horizontally. For monitoring possible roost sites, microphones should be directed to maximize likelihood of detection.
- To standardize recordings, acoustic device recordings should have a 2-second trigger window and a maximum file length of 15 seconds.
- Acoustic surveys should be conducted over a minimum of four nights.
- If acoustic devices cannot be left in place for the entire night for multiple nights as above, then a combination of short acoustic surveys (from sunset and extending for 1½ hours), stationed observers for emergence surveys or visual inspection of trees/snags with tree-top cameras may be acceptable. Contact the Service for guidance under this circumstance.

Reporting

- Provide report showing effort, methods, weather conditions, findings, and summary of acoustic data relating to Florida bonneted bat by date (*e.g.,* # of calls, time of calls). Sonograms of all calls with signatures at or below 20kHz shall be included in the report. The report shall be provided to the Corps project manager assigned to the project for which the survey was conducted and to the Service via the email address **verobeach@fws.gov. Raw acoustic data should be provided to the Service for all surveys. Raw acoustic data should be provided as "all raw data" and "all raw data with signatures at or below 20kHz". Data can be submitted to the Service via flash drive, memory stick, or hard drive. Data can be submitted digitally to verobeach@fws.gov or via mail to U.S. Fish and Wildlife Service, Attn: Florida bonneted bat data manager, 1339 20th Street, Vero Beach, Florida 32960.**
- Negative surveys are valid for 1 year after completion of the survey

If you have comments, or suggestions on this survey protocols, please email your comments to FBBguidelines@fws.gov. These comments will be reviewed and incorporated in an annual review.

Literature Cited – Appendix C

Bailey, A.M., H.K. Ober, A.R. Sovie, and R.A. McCleery. 2017. Impact of land use and climate on the distribution of the endangered Florida bonneted bat. Journal of Mammalogy. 98:1586-1593.

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Appendix D: Best Management Practices (BMPs) for Development Projects

Ongoing research and monitoring will continue to increase the understanding of the Florida bonneted bat and its habitat needs and will continue to inform habitat and species management recommendations. These BMPs incorporate what is known about the species and also include recommendations that are beneficial to all bat species in Florida. These BMPs are intended to provide recommendations for improving conditions for use by Florida bonneted bats, and to help conserve Florida bonneted bats that may be foraging or roosting in an area.

The BMPs required to reach a "may affect, but is not likely to adversely affect" (MANLAA) determination vary depending on the couplet from the Consultation Key used to reach that particular MANLAA. The requirements for each couplet are provided below followed by the list of BMPs. If the applicant is unable or does not want to do the required BMPs, then the Corps (or other Action Agency) will not be able to use this Guidance and formal consultation with the Service is required.

Couplet Number for MANLAA from Consultation Key	Required BMPs
4b	BMP number 1 if more than 3 months has occurred between the survey and start of the project, and any 3 BMPs out of BMPs 4 through 13
5b	BMP number 2, and any 3 BMPs out of BMPs 3 through 13
9b	BMPs number 2 and 3, and any 4 BMPs out of BMPs 5 through 13
11b	BMPs number 1 and 4, and any 4 BMPs out of BMPs 5 through 13
12b	BMP number 1, and any 3 BMPs out of BMPs 3 through 13
14b	Any 2 BMPs out of BMPs 3 through 13
15b	Any 3 BMPs out of BMPs 3 through 13
17b	Any 4 BMPs out of BMPs 3 through 13

BMPs for development, construction, and other general activities:

1. If potential roost trees or structures need to be removed, check cavities for bats within 30 days prior to removal of trees, snags, or structures. When possible, remove structure outside of breeding season (*e.g.*, January 1 – April 15). If evidence of use by any bat species is observed, discontinue removal efforts in that area and coordinate with the Service on how to proceed.
2. When using heavy equipment, establish a 250 foot (76 m) buffer around known or suspected roosts to limit disturbance to roosting bats.
3. For every 5 acres of impact, retain a minimum of 1.0 acre of native vegetation. If upland habitat is impacted, then upland habitat with native vegetation should be retained.
4. For every 5 acres of impact, retain a minimum of 0.25 acre of native vegetation. If upland habitat is impacted, then upland habitat with native vegetation should be retained..
5. Conserve open freshwater and wetland habitats to promote foraging opportunities and avoid impacting water quality. Created/restored habitat should be designed to replace the function of native habitat.

6. Conserve and/or enhance riparian habitat. A 50-ft (15.2 m) buffer is recommended around water bodies and stream edges. In cases where artificial water bodies (*i.e.,* stormwater ponds) are created, enhance edges with native plantings especially in cases in which wetland habitat was affected.
7. Avoid or limit widespread application of insecticides (*e.g.,* mosquito control, agricultural pest control) in areas where Florida bonneted bats are known or expected to forage or roost.
8. Conserve natural vegetation to promote insect diversity, availability, and abundance. For example, retain or restore 25% of the parcel in native contiguous vegetation.
9. Retain mature trees and snags that could provide roosting habitat. These may include live trees of various sizes and dead or dying trees with cavities, hollows, crevices, and loose bark. See "Roosting Habitat" in "Background" above.
10. Protect known Florida bonneted bat roost trees, snags or structures and trees or snags that have been historically used by Florida bonneted bats for roosting, even if not currently occupied, by retaining a 250 foot (76 m) disturbance buffer around the roost tree, snag, or structure to ensure that roost sites remain suitable for use in the future.
11. Avoid and minimize the use of artificial lighting, retain natural light conditions, and install wildlife friendly lighting (*i.e*., downward facing and lowest lumens possible). Avoid permanent night-time lighting to the greatest extent practicable.
12. Incorporate engineering designs that discourage bats from using buildings or structures. If Florida bonneted bats take residence within a structure, contact the Service and Florida Fish and Wildlife Conservation Commission prior to attempting removal or when conducting maintenance activities on the structure.
13. Use or allow prescribed fire to promote foraging habitat.

Appendix E: Additional Best Management Practices (BMPs) for Land Management Projects

Ecological Land Management

The Service reviews and develops Ecological Land Management projects that use land management activities to restore and maintain native, natural communities that are beneficial to bats. These activities include prescribed fire, mechanical treatments to reduce vegetation densities, timber thinning to promote forest health, trail maintenance, and the treatment of exotic vegetation. The following BMPs provide recommendations for conserving Florida bonneted bat roosting and foraging habitat during ecological land management activities. The Service recommends incorporating these BMP into ecological land management plans.

If potential roost trees need to be removed, check cavities for bats prior to removal of trees or snags. If evidence of use by any bat species is observed, discontinue removal efforts in that area and coordinate with the Service on how to proceed.

Ecological Land Management BMPs:

- Protect potential roosting habitat during ecological land management activities, if feasible. Avoid removing trees or snags with cavities.
- Rake and/or manually clear vegetation around the base of known or suspected roost trees to remove fuel prior to prescribed burning.
- If possible, use ignition techniques such as spot fires or backing fire to limit the intensity of fire around the base of the tree or snag containing the roost. The purpose of this action is to prevent the known or suspected roost tree or snag from catching fire and also to attempt to limit the exposure of the roosting bats to heat and smoke. A 250-ft (76 m) buffer is recommended.
- If prescribed fire is being implemented to benefit Florida bonneted bats, Braun de Torrez et al. (2018) noted that fire in the dry/spring season could be most beneficial.
- When creating firebreaks or conducting fire-related mechanical treatment, mark and avoid any known or suspected bat roosts.
- When using heavy equipment, establish a buffer of 250 feet (76 m) around known roosts to limit disturbance to roosting bats.
- Establish forest management efforts to maintain tree species and size class diversity to ensure long-term supply of potential roost sites.
- For every 5 acres (2 hectares) of timber that is harvested, retain a clump of trees 1-2 acres (0.4 - 0.8 hectare) in size containing potential roost trees, especially pines and royal palms (live or dead). Additionally, large snags in open canopy should be preserved.

Literature Cited – Appendix E

Braun de Torrez, E.C., H.K. Ober, and R.A. McCleery. 2018. Activity of an Endangered Bat Increases Immediately Following Prescribed Fire. The Journal of Wildlife Management.

APPENDIX B

Qualified Biologist and Assistants Resumes

Kaitlyn Torrey

Ecologist

Education

BS, Wildlife Biology, University of Georgia, 2015

MS, Biology, University of West Georgia, 2018

Ct, Geographic Information Systems, University of West Georgia, 2018

Ct, Bat Acoustic Qualitative Analysis Training (Titley Scientific), 2020

Ct, Acoustic Survey Methods (Bat Survey Solutions) 2020

Ct, Bats and Bridges Training 2018

Affiliations/Memberships

Southeastern Bat Diversity Network, 2016

The Wildlife Society, 2013

Georgia Bat Working Group, 2014

VHB Office

Atlanta, GA

Kaitlyn is an ecologist with a M.S. in Biology and a B.S. in Wildlife Science. Her master's work focused on threatened and endangered bats in the Southeastern United States. Prior to joining VHB, Kaitlyn worked as a Biologist with the Georgia Department of Natural Resources (GDNR), focusing on bat surveys across Georgia. She has extensive field ecology experience and is proficient with Geographic Information Systems. Kaitlyn is currently on VHB's company U.S. Fish and Wildlife Service (USFWS), Section 10 Permit that authorizes her to conduct surveys for federally and state listed bat species including the Indiana bat (Myotis sodalis), gray bat (Myotis grisescens), and northern long-eared bat (Myotis septentrionalis) throughout their range (Permit Number TE 6439C-0). Kaitlyn has 5 years' experience conducting bat surveys, including mist net and harp trapping, radio tracking, acoustic, cave and hibernacula, roost and emergence, and bridge and structures.

5 years of professional experience

Silver Arrow Solar Northern Long-Eared and Indiana Bat Acoustic and Mist Netting Survey, Vance, AL (June-July 2020)

Kaitlyn was the qualified biologist assigned to conduct the acoustic survey and mist netting survey for northern long-eared bats and Indiana bats in Vance, AL on the Silver Arrow Solar project. Her responsibilities included detector installation, operation, data retrieval, storage, and analysis, and interpretation of acoustic data. She also led the mist netting surveys, including site selection, set up, bat handling and identification, radio telemetry, and tracking. Kaitlyn also authored the reports for both.

Bat Acoustic Qualitative Analysis Training, Virtual (July 2020)

Kaitlyn participated in the online training course specializing in acoustic analysis of bat calls provided by Titley Scientific. The training focused on the qualitative analysis of bat call sonograms to visually identify bat calls to species.

Legacy Trail Florida Bonneted Bat Acoustic Survey, Sarasota, FL (April 2020)

Kaitlyn was the qualified bat biologist assigned to conduct the acoustic survey for Florida bonneted bats in Sarasota, FL on the Legacy Trail project. Her responsibilities included detector installation, operation, data retrieval, storage, and analysis, and interpretation of acoustic data, as well as writing the report.

Acoustic Survey Methods Course, Punta Gorda, FL (January 2020)

Kaitlyn completed the acoustic survey methods course in Punta Gorda, FL. This course provides a comprehensive training on conducting bat acoustic monitoring with acoustic monitoring equipment to document bat activity and occupancy. The course also provides training on data management and analysis on bat echolocation calls to the species level for all bats found in the southeast, including the Florida bonneted bat.

Cave and Culvert Bat Monitoring, Georgia (February 2020)

Kaitlyn volunteered with the GDNR to help survey culverts and caves in Georgia for bat affected by white-nose syndrome (WNS). Surveys included a count of bats

present in the culvert/cave as well bat swabbing for WNS and banding bats. Bats that were banded and bats that were found in the cave/culvert that already had bands were retrieved and data was collected from bats to provide information for ongoing and future monitoring.

CHWW&A/Bat Surveys, Alabama (2019)
Kaitlyn assisted in performing bat surveys with a focus on state and federally rare, threatened, and endangered bats in Elmore, Montgomery, and Escambia Counties in Alabama. Surveys included mist netting for bats and conducting acoustical bat surveys. She also assisted with conducting habitat assessments for bats.

NCDOT, 2019 Eastern NC Northern Long-eared Bat Research Study, NC (2019)
Kaitlyn assisted with the bat research project, which is a part of a programmatic agreement between the North Carolina Department of Transportation (NCDOT), Federal Highway Administration (FHWA), U.S. Army Corps of Engineers, and the USFWS. She assisted in conducting mist netting and radio telemetry on federally listed as threatened northern long-eared bats.

Georgia Department of Transportation (GDOT), I-75 Commercial Vehicle Lanes PI No. 0014203, Monroe, Spalding, Butts, and Henry counties, GA (2019)
Kaitlyn participated in baseline conditions field studies for this Major Mobility Investment Program (MMIP) project, which will improve mobility and enhance safety for passenger vehicles and freight operators along a busy stretch of interstate south of Atlanta. As part of this design-build project, the VHB team is leading development of the Environmental Impact Statement with a Record of Decision expected by 2023. As part of this effort, VHB is leading efforts that identify ecological and historic resources, evaluate noise impacts, identify minority and/or low-income communities, evaluate impacts to communities and their resources, and assess indirect and cumulative impacts. In her role as an ecologist and bat specialist, Kaitlyn performed surveys on bridges and culverts for bats and migratory birds throughout the 40 -mile corridor. A total of 118 structures were surveyed.

GDOT, SR 11 from Lumpkin County Line to South of SR 515/US 76 PI No. M005586, Union County, GA (2019)
Kaitlyn performed a requiredpreconstruction inspection for bats in the bridge that carries SR 11/US 19/US 129 over Arkaquah Creek in the Chattahoochee National Forest.

GDOT, Structure Inspections for North Georgia Bridge Replacements
Kaitlyn was an ecologist on the following GDOT projects: CR 30/Airport Road at Mossy Creek Tributary Bridge Replacement, PI No. 0015616, White County, GA; SR 136 Bridge Replacement over Lookout Creek, PI No. 0015542, Dade County, GA; CR 479/Belmont Road at Shoal Creek Bridge Replacement, PI No. 0015645, Clarke County, GA; CR 592/Clotfelter Road at Barber Creek Bridge Replacement, PI No. 0015656, Oconee County, GA; SR 3 at Peavine Creek Bridge Replacement, PI No. 0015538, Catoosa County, GA; SR 28 at Big Creek Bridge Replacement, PI No. 0015562, Rabun County, GA; CR255/Tugalo Short Cut Road at Little Panther Creek Bridge Replacement, PI No. 0015636, Habersham County, GA; CR 92/Wrights Mill Road at Hudson River Bridge Replacement, PI No. 0015608, Banks County, GAKaitlyn performed surveys on bridges and culverts for bats throughout the corridor. She also

assisted with wetland and stream delineations and with quality control of the Aquatic Resource Delineation Review Request.

Summer and fall mist-netting surveys conducted for the Georgia Department of Natural Resources: Bibb, Glynn, McIntosh, Daugherty, Calhoun, Decatur, Jasper, Appling, Wayne, Chatham, and Effingham Counties, Georgia. MYAU, PESU, LABO, LACI, NYHU, LASE, TABR, EPFU, CORA, NYHU. Supervised by Trina Morris, conducted surveys as an agent of the state

Masters Research summer mist-netting surveys (2016-2017): Talladega National Forest, Cleburne County, Alabama. MYSE, MYSO, MYAU, PESU, LABO, LASE, NYHU, LACI, EPFU, NYHU. Tissue samples for all non-T&E species. Radio-transmitter attachment to MYSE, MYSO, and MYAU. Night and day tracking. Banding on all cave-dwelling species. All surveys, banding, and radio-transmitter application was conducted under Joseph Johnson permit as a sub-permittee

Summer mist-netting surveys (2015): working for EcoTech Consultants, Inc. on GDOT, solar, pipeline, and research projects. Richmond County, GA: CORA (assisted radio-transmitter attachment and tracking), NYHU, LASE, PESU, LABO, EPFU; Union County, GA: LABO, EPFU; Paulding County, GA: LABO, EPFU, PESU; Carroll County, GA: LABO; Tallapoosa County, AL: LABO, LASE, EPFU; Harrison County, OH: MYSE (tracked 2 MYSE, handled 1 MYSE, banded 1 MYSE- under supervision), LABO, EPFU; Sanilac County, MI: LABO, EPFU; Monmouth County, NJ: LABO, LACI, EPFU, MYSE (assisted in radio-transmitter attachment and tracking). All mist-netting surveys were conducted under the firm's recovery permit.

Hannah Rowe

Project Scientist

Hannah is a Project Scientist in VHB's Orlando office. She is an ESA Certified Ecologist, an ISA Certified Arborist (FL – 9204A), an FFWCC Authorized Gopher Tortoise Agent (GTA-15-00084C) and is trained in prescribed fire as a land management technique. She is proficient in protected species surveys, tree inventories and health assessments, state and federal permit regulations, Phase I Environmental Site Assessments, and GIS mapping and analysis.

9 years of professional experience

Education

MS, Environmental Management, University of Manchester (England), 2012

BSc, Ecology, Manchester Metropolitan Univ (England), 2010

Registrations/Certifications

Certified Arborist, FL

Ct, Fundamentals of Environmental Justice, National Highway Institute, 2017

Authorized Gopher Tortoise Agent, Florida Fish & Wildlife Conservation Commission, FL, 11/2021

Certified Ecologist (The Ecological Society of America)

Affiliations/Memberships

Ecological Society of America, 2016

Florida Association of Environmental Professionals, Central Florida, 2015

International Society of Arboriculture, 2016

Society of Wetland Scientists, 2019

Bat Acoustic Survey Methods (December 2021)

Hannah participated in the in-person training course specializing in bat acoustic survey methods provided by Bat Survey Solutions. The training focused on acoustic bat data management, use of autoclassification software, interpreting results, and manual vetting.

Bat Acoustic Qualitative Analysis Training, Virtual (July 2020)

Hannah participated in the online training course specializing in acoustic analysis of bat calls provided by Titley Scientific. The training focused on the qualitative analysis of bat call sonograms to visually identify bat calls to species.

Barwood Land and Estates, Residential Development, Bodelwyddan, Wales, UK

Prior to VHB, Hannah served as an ecologist as part of a team undertaking bat surveys, acoustic analysis, and assessments at a proposed housing site in Bodelwyddan, Wales. Input was provided into the masterplan for the project, to ensure consideration of several notable bat populations.

Industrial Demolition, SCA, Oughtibridge, England, UK

Prior to VHB, Hannah conducted dusk emergence / dawn re-entry building bat surveys at a paper mill prior to its demolition, confirming no bats were roosting in the structure. Demolition inspections, conditioned by a Natural England bat license, were conducted during demolition prior to sections of soft demolition, to confirm that no bats were present.

UK Ministry of Defense, Residential Development, Bicester, England, UK

Prior to VHB, Hannah served as an ecologist as part of a team undertaking a suite of ecological assessments and protected species surveys at Bicester, a UK Ministry of Defense site. The site is due to be redeveloped (in-part) for a large self-build residential project. Specifically, great crested newt, reptile and bat survey and assessment.

London Heathrow Airport Expansion, London, England, UK

Prior to VHB, Hannah served as an ecologist as part of a team undertaking a suite of ecological assessments and protected species surveys at the potential London

Heathrow Airport expansion site. Specifically, great crested newt, reptile, bat and botanical survey and assessment.

Confidential Client, Large Scale Solar Ecological Services, Putnam County, FL
VHB provided ecological services for a proposed solar site in Putnam County. The services provided for the 1500+ acre property included ecological due diligence, species specific protected species surveys, wetland delineation, and FDEP formal jurisdictional determination. Additional siting and permitting services for two 74.5 MW sites are expected to occur prior to 2020. As Project Scientist, Hannah conducted a site visit to determine the presence of jurisdictional wetlands and protected species occurrence. She used current methodologies of the FDEP and USACE to delineate the onsite wetlands and assisted with the preparation of the formal jurisdictional determination request to the FDEP.

FDOT District 5, Districtwide Environmental Permitting Services, FL

Prior to VHB, Hannah served as an environmental scientist for districtwide as-needed environmental permitting services. Hannah performed tasks including arboricultural assessments, protected species surveys, osprey nest monitoring and migratory bird nest removal permitting, bat exclusion and permitting requirements, GIS mapping and analysis, and other miscellaneous tasks as assigned to assure design projects met critical production schedules.

City of Cape Coral, Van Buren Parkway Multi-Use Trail, Cape Coral, FL
VHB was commissioned by the City to develop design plans for the construction of a 6.5-mile Shared-Use Trail. The trail, funded by Florida Department of Transportation's (FDOT) Shared-Use Non-Motorized (SUN) Trail program, is a critical link in the Florida Greenways and Trails network. It will eliminate the need for bicyclists and pedestrians to walk and ride within the roadway and will provide connectivity between Burnt Store Road and Del Prado Boulevard along Van Buren Parkway, El Dorado Boulevard, and Kismet Parkway, including three pedestrian bridges over existing canals. Services include design and right-of-way survey, environmental surveys, trail design, drainage design, grading, structural design, maintenance of traffic (MOT), utilities, geotechnical investigation, limited landscape design, public involvement, environmental permitting, plan preparation, construction cost estimating, specification package, and post-design tasks including bidding assistance and construction administration. VHB is also preparing a Community Awareness Plan (CAP) which notifies local governments, affected property owners, and the public of the City's proposed construction and the anticipated impacts of construction. Hannah serves as an Environmental Scientist assisting with field reviews for habitat and protected floral and faunal species, federal, state, and local agency concurrence, and permitting approvals for both wildlife and wetland issues.

APPENDIX C

Weather Data

Daily Observations 03.9.22

Time	Temperature	Dew Point	Humidity	Wind	Wind Speed	Wind Gust	Pressure	Precip.	Condition
1:56 AM	72 °F	70 °F	93 %	S	3 mph	0 mph	29.92 in	0.0 in	Cloudy
2:36 AM	72 °F	70 °F	94 %	S	5 mph	0 mph	29.91 in	0.0 in	Cloudy
2:56 AM	72 °F	70 °F	93 %	SSW	5 mph	0 mph	29.91 in	0.0 in	Cloudy
3:38 AM	72 °F	70 °F	94 %		0 mph	0 mph	29.90 in	0.0 in	Partly Cloudy
3:56 AM	70 °F	69 °F	97 %		0 mph	0 mph	29.89 in	0.0 in	Fair
4:56 AM	71 °F	69 °F	93 %	S	7 mph	0 mph	29.89 in	0.0 in	Fair
5:56 AM	71 °F	69 °F	93 %	S	5 mph	0 mph	29.90 in	0.0 in	Mostly Cloudy
6:34 AM	70 °F	70 °F	100 %	S	7 mph	0 mph	29.91 in	0.0 in	Mostly Cloudy
6:56 AM	70 °F	69 °F	97 %	S	7 mph	0 mph	29.91 in	0.0 in	Cloudy
7:20 AM	70 °F	70 °F	100 %	S	6 mph	0 mph	29.91 in	0.0 in	Mostly Cloudy
7:46 AM	70 °F	70 °F	100 %	S	6 mph	0 mph	29.92 in	0.0 in	Cloudy
7:53 AM	72 °F	70 °F	94 %	S	6 mph	0 mph	29.92 in	0.0 in	Cloudy
7:56 AM	71 °F	69 °F	93 %	S	6 mph	0 mph	29.92 in	0.0 in	Cloudy
8:56 AM	72 °F	70 °F	93 %	S	10 mph	0 mph	29.93 in	0.0 in	Cloudy
9:56 AM	74 °F	71 °F	91 %	S	10 mph	0 mph	29.94 in	0.0 in	Cloudy
10:40 AM	75 °F	72 °F	89 %	SSW	13 mph	16 mph	29.94 in	0.0 in	Mostly Cloudy
10:56 AM	77 °F	71 °F	82 %	SSW	14 mph	18 mph	29.94 in	0.0 in	Cloudy
11:56 AM	80 °F	71 °F	74 %	SW	14 mph	0 mph	29.94 in	0.0 in	Cloudy
12:56 PM	82 °F	71 °F	69 %	SSW	9 mph	0 mph	29.91 in	0.0 in	Cloudy
1:08 PM	81 °F	70 °F	70 %	SSW	10 mph	0 mph	29.90 in	0.0 in	Mostly Cloudy
1:25 PM	82 °F	72 °F	70 %	SSW	9 mph	0 mph	29.89 in	0.0 in	Mostly Cloudy

Time	Temperature	Dew Point	Humidity	Wind	Wind Speed	Wind Gust	Pressure	Precip.	Condition
1:56 PM	83 °F	70 °F	65 %	SSW	9 mph	0 mph	29.87 in	0.0 in	Mostly Cloudy
2:16 PM	82 °F	70 °F	66 %	SW	13 mph	0 mph	29.87 in	0.0 in	Thunder in the Vicinity
2:33 PM	75 °F	68 °F	78 %	NNW	13 mph	0 mph	29.87 in	0.0 in	Thunder
2:56 PM	75 °F	69 °F	82 %	S	9 mph	0 mph	29.87 in	0.0 in	Light Rain with Thunder
3:48 PM	77 °F	66 °F	69 %	ESE	6 mph	0 mph	29.84 in	0.0 in	Cloudy
3:56 PM	76 °F	69 °F	79 %	SSE	5 mph	0 mph	29.84 in	0.0 in	Rain
4:56 PM	75 °F	71 °F	87 %	SW	7 mph	0 mph	29.83 in	0.0 in	Light Rain
5:56 PM	76 °F	70 °F	82 %	S	3 mph	0 mph	29.83 in	0.0 in	Cloudy
6:56 PM	76 °F	71 °F	85 %	S	5 mph	0 mph	29.83 in	0.0 in	Mostly Cloudy
7:56 PM	73 °F	71 °F	93 %	SSE	5 mph	0 mph	29.85 in	0.0 in	Fair
8:56 PM	72 °F	70 °F	93 %	CALM	0 mph	0 mph	29.88 in	0.0 in	Fair
9:56 PM	72 °F	71 °F	97 %	CALM	0 mph	0 mph	29.91 in	0.0 in	Fair
10:56 PM	72 °F	70 °F	93 %	E	5 mph	0 mph	29.93 in	0.0 in	Partly Cloudy
11:20 PM	72 °F	70 °F	94 %	E	6 mph	0 mph	29.94 in	0.0 in	Mostly Cloudy
11:56 PM	71 °F	69 °F	93 %	NE	6 mph	0 mph	29.94 in	0.0 in	Mostly Cloudy
12:09 AM	72 °F	70 °F	94 %	E	6 mph	0 mph	29.94 in	0.0 in	Mostly Cloudy
12:18 AM	72 °F	70 °F	94 %	E	5 mph	0 mph	29.94 in	0.0 in	Mostly Cloudy
12:25 AM	70 °F	70 °F	100 %	ENE	6 mph	0 mph	29.94 in	0.0 in	Cloudy
12:56 AM	70 °F	68 °F	93 %	CALM	0 mph	0 mph	29.93 in	0.0 in	Mostly Cloudy

Daily Observations 03.10.22

Time	Temperature	Dew Point	Humidity	Wind	Wind Speed	Wind Gust	Pressure	Precip.	Condition
1:56 AM	69 °F	68 °F	96 %	E	3 mph	0 mph	29.91 in	0.0 in	Fair
2:32 AM	70 °F	68 °F	94 %	CALM	0 mph	0 mph	29.91 in	0.0 in	Partly Cloudy
2:41 AM	70 °F	68 °F	94 %	CALM	0 mph	0 mph	29.91 in	0.0 in	Mostly Cloudy
2:56 AM	69 °F	68 °F	96 %	CALM	0 mph	0 mph	29.90 in	0.0 in	Cloudy
3:04 AM	70 °F	68 °F	94 %	CALM	0 mph	0 mph	29.90 in	0.0 in	Cloudy
3:56 AM	69 °F	68 °F	96 %	SE	3 mph	0 mph	29.88 in	0.0 in	Mostly Cloudy
4:07 AM	70 °F	68 °F	94 %	SE	3 mph	0 mph	29.88 in	0.0 in	Partly Cloudy
4:56 AM	69 °F	68 °F	96 %	SSE	3 mph	0 mph	29.88 in	0.0 in	Fair
5:13 AM	70 °F	70 °F	100 %	CALM	0 mph	0 mph	29.88 in	0.0 in	Mostly Cloudy
5:27 AM	70 °F	68 °F	94 %	CALM	0 mph	0 mph	29.88 in	0.0 in	Cloudy
5:51 AM	70 °F	70 °F	100 %	CALM	0 mph	0 mph	29.89 in	0.0 in	Cloudy
5:56 AM	70 °F	69 °F	97 %	CALM	0 mph	0 mph	29.89 in	0.0 in	Cloudy
6:07 AM	70 °F	70 °F	100 %	CALM	0 mph	0 mph	29.89 in	0.0 in	Cloudy
6:56 AM	70 °F	69 °F	97 %	S	3 mph	0 mph	29.91 in	0.0 in	Cloudy
7:33 AM	70 °F	70 °F	100 %	CALM	0 mph	0 mph	29.92 in	0.0 in	Partly Cloudy
7:56 AM	70 °F	70 °F	100 %	SSW	5 mph	0 mph	29.92 in	0.0 in	Cloudy
8:54 AM	72 °F	70 °F	94 %	SSW	5 mph	0 mph	29.95 in	0.0 in	Mostly Cloudy
8:56 AM	72 °F	70 °F	93 %	SSW	3 mph	0 mph	29.95 in	0.0 in	Partly Cloudy
9:56 AM	73 °F	71 °F	93 %	SSW	7 mph	0 mph	29.95 in	0.0 in	Partly Cloudy
10:17 AM	73 °F	72 °F	94 %	S	6 mph	0 mph	29.94 in	0.0 in	Mostly Cloudy
10:25 AM	73 °F	72 °F	94 %	S	6 mph	0 mph	29.94 in	0.0 in	Cloudy

Time	Temperature	Dew Point	Humidity	Wind	Wind Speed	Wind Gust	Pressure	Precip.	Condition
11:44 AM	77 °F	72 °F	83 %	S	9 mph	0 mph	29.93 in	0.0 in	Mostly Cloudy
11:56 AM	77 °F	72 °F	84 %	S	9 mph	0 mph	29.94 in	0.0 in	Mostly Cloudy
12:56 PM	80 °F	71 °F	74 %	SSW	12 mph	0 mph	29.93 in	0.0 in	Mostly Cloudy
1:09 PM	81 °F	72 °F	74 %	SSW	9 mph	0 mph	29.93 in	0.0 in	Partly Cloudy
1:20 PM	81 °F	72 °F	74 %	SSW	9 mph	0 mph	29.93 in	0.0 in	Mostly Cloudy
1:29 PM	81 °F	72 °F	74 %	SSW	8 mph	0 mph	29.92 in	0.0 in	Mostly Cloudy
1:56 PM	82 °F	71 °F	69 %	WSW	12 mph	0 mph	29.90 in	0.0 in	Fair
2:56 PM	83 °F	71 °F	67 %	SW	8 mph	0 mph	29.88 in	0.0 in	Mostly Cloudy
3:19 PM	81 °F	72 °F	74 %	WSW	8 mph	0 mph	29.88 in	0.0 in	Thunder in the Vicinity
3:27 PM	81 °F	72 °F	74 %	W	5 mph	0 mph	29.89 in	0.0 in	Thunder in the Vicinity
3:56 PM	77 °F	72 °F	84 %	WNW	14 mph	0 mph	29.89 in	0.0 in	T-Storm
4:11 PM	75 °F	72 °F	89 %	NW	12 mph	0 mph	29.87 in	0.0 in	Light Rain
4:31 PM	75 °F	72 °F	89 %	NW	8 mph	0 mph	29.90 in	0.0 in	Thunder in the Vicinity
4:56 PM	74 °F	68 °F	82 %	N	14 mph	20 mph	29.91 in	0.0 in	Thunder in the Vicinity
5:09 PM	72 °F	66 °F	83 %	NNW	23 mph	30 mph	29.93 in	0.0 in	Cloudy / Windy
5:56 PM	70 °F	66 °F	87 %	ENE	9 mph	0 mph	29.89 in	0.0 in	Fair
7:48 PM	70 °F	66 °F	88 %	E	3 mph	0 mph	29.91 in	0.0 in	Partly Cloudy
7:56 PM	69 °F	66 °F	90 %	ESE	3 mph	0 mph	29.91 in	0.0 in	Partly Cloudy
8:04 PM	68 °F	66 °F	94 %	E	5 mph	0 mph	29.91 in	0.0 in	Mostly Cloudy
8:13 PM	70 °F	66 °F	88 %	E	3 mph	0 mph	29.92 in	0.0 in	Partly Cloudy
8:56 PM	69 °F	66 °F	90 %	CALM	0 mph	0 mph	29.94 in	0.0 in	Partly Cloudy
9:56 PM	68 °F	66 °F	93 %	ESE	7 mph	0 mph	29.95 in	0.0 in	Fair
10:16 PM	68 °F	66 °F	94 %	CALM	0 mph	0 mph	29.97 in	0.0 in	Fair
10:47 PM	68 °F	66 °F	94 %	SE	6 mph	0 mph	29.97 in	0.0 in	Mostly Cloudy

Time	Temperature	Dew Point	Humidity	Wind	Wind Speed	Wind Gust	Pressure	Precip.	Condition
10:56 PM	68 °F	66 °F	93 %	SE	6 mph	0 mph	29.97 in	0.0 in	Mostly Cloudy
11:07 PM	68 °F	66 °F	94 %	ESE	5 mph	0 mph	29.96 in	0.0 in	Partly Cloudy
11:56 PM	68 °F	65 °F	90 %	CALM	0 mph	0 mph	29.97 in	0.0 in	Cloudy
12:05 AM	68 °F	66 °F	94 %	CALM	0 mph	0 mph	29.97 in	0.0 in	Cloudy
12:56 AM	68 °F	65 °F	90 %	E	6 mph	0 mph	29.96 in	0.0 in	Mostly Cloudy

Daily Observations 03.11.22

Time	Temperature	Dew Point	Humidity	Wind	Wind Speed	Wind Gust	Pressure	Precip.	Condition
1:08 AM	68 °F	64 °F	88 %	ESE	5 mph	0 mph	29.97 in	0.0 in	Partly Cloudy
1:56 AM	68 °F	66 °F	93 %	CALM	0 mph	0 mph	29.97 in	0.0 in	Mostly Cloudy
2:16 AM	68 °F	66 °F	94 %	SE	3 mph	0 mph	29.96 in	0.0 in	Partly Cloudy
2:56 AM	69 °F	67 °F	93 %	CALM	0 mph	0 mph	29.95 in	0.0 in	Fair
3:56 AM	69 °F	67 °F	93 %	SE	5 mph	0 mph	29.94 in	0.0 in	Fair
4:56 AM	69 °F	67 °F	93 %	SE	6 mph	0 mph	29.92 in	0.0 in	Fair
5:56 AM	69 °F	67 °F	93 %	ESE	5 mph	0 mph	29.91 in	0.0 in	Fair
6:25 AM	68 °F	66 °F	94 %	ESE	5 mph	0 mph	29.91 in	0.0 in	Mostly Cloudy
6:56 AM	69 °F	68 °F	96 %	ESE	5 mph	0 mph	29.92 in	0.0 in	Mostly Cloudy
7:04 AM	70 °F	68 °F	94 %	SE	5 mph	0 mph	29.92 in	0.0 in	Cloudy
7:56 AM	69 °F	69 °F	100 %	SSE	9 mph	0 mph	29.91 in	0.0 in	Cloudy
8:56 AM	71 °F	70 °F	96 %	SSE	10 mph	0 mph	29.91 in	0.0 in	Mostly Cloudy
9:07 AM	72 °F	70 °F	94 %	S	13 mph	0 mph	29.91 in	0.0 in	Partly Cloudy
9:56 AM	74 °F	70 °F	87 %	S	12 mph	0 mph	29.93 in	0.0 in	Fair
10:56 AM	78 °F	69 °F	74 %	S	13 mph	0 mph	29.93 in	0.0 in	Fair
11:56 AM	80 °F	69 °F	69 %	S	13 mph	0 mph	29.93 in	0.0 in	Fair
12:14 PM	81 °F	70 °F	70 %	SSW	10 mph	0 mph	29.93 in	0.0 in	Fair
12:56 PM	83 °F	69 °F	63 %	S	14 mph	0 mph	29.91 in	0.0 in	Fair
1:56 PM	84 °F	68 °F	58 %	SSW	14 mph	22 mph	29.89 in	0.0 in	Partly Cloudy
2:56 PM	84 °F	69 °F	61 %	S	6 mph	0 mph	29.86 in	0.0 in	Partly Cloudy
3:56 PM	86 °F	67 °F	53 %	SW	13 mph	17 mph	29.82 in	0.0 in	Partly Cloudy

Time	Temperature	Dew Point	Humidity	Wind	Wind Speed	Wind Gust	Pressure	Precip.	Condition
5:56 PM	86 °F	65 °F	49 %	SW	15 mph	23 mph	29.79 in	0.0 in	Partly Cloudy
6:56 PM	83 °F	66 °F	56 %	WSW	7 mph	0 mph	29.81 in	0.0 in	Fair
7:56 PM	81 °F	66 °F	60 %	SW	8 mph	0 mph	29.81 in	0.0 in	Fair
8:56 PM	80 °F	66 °F	62 %	SSW	8 mph	0 mph	29.82 in	0.0 in	Fair
9:56 PM	78 °F	67 °F	68 %	SW	8 mph	0 mph	29.84 in	0.0 in	Fair
10:56 PM	76 °F	68 °F	76 %	SW	8 mph	0 mph	29.84 in	0.0 in	Fair
11:56 PM	75 °F	68 °F	79 %	SSW	7 mph	0 mph	29.82 in	0.0 in	Fair
12:56 AM	73 °F	68 °F	84 %	S	6 mph	0 mph	29.81 in	0.0 in	Fair

Daily Observations 03.16.22

Time	Temperature	Dew Point	Humidity	Wind	Wind Speed	Wind Gust	Pressure	Precip.	Condition
12:19 AM	70 °F	70 °F	100 %	CALM	0 mph	0 mph	30.03 in	0.0 in	Thunder in the Vicinity
12:47 AM	70 °F	70 °F	100 %	SE	5 mph	0 mph	30.02 in	0.0 in	Heavy T-Storm
12:56 AM	67 °F	66 °F	97 %	SSW	12 mph	25 mph	30.01 in	0.0 in	T-Storm
1:03 AM	66 °F	64 °F	94 %	SW	13 mph	0 mph	30.03 in	0.0 in	Light Rain with Thunder
1:26 AM	66 °F	64 °F	94 %	S	10 mph	0 mph	30.02 in	0.0 in	Light Rain
1:33 AM	64 °F	63 °F	94 %	S	7 mph	0 mph	30.01 in	0.0 in	Light Rain
1:56 AM	65 °F	63 °F	93 %	SSE	7 mph	0 mph	29.99 in	0.0 in	Light Rain
2:56 AM	65 °F	64 °F	97 %	WSW	3 mph	0 mph	29.95 in	0.0 in	Mostly Cloudy
3:56 AM	65 °F	64 °F	97 %	CALM	0 mph	0 mph	29.89 in	0.0 in	Fair
4:56 AM	65 °F	64 °F	97 %	S	8 mph	0 mph	29.91 in	0.0 in	Fair
5:56 AM	65 °F	64 °F	97 %	SW	5 mph	0 mph	29.92 in	0.0 in	Fair
6:56 AM	65 °F	64 °F	97 %	WSW	3 mph	0 mph	29.94 in	0.0 in	Partly Cloudy
7:56 AM	65 °F	64 °F	97 %	CALM	0 mph	0 mph	29.95 in	0.0 in	Partly Cloudy
8:56 AM	67 °F	66 °F	97 %	CALM	0 mph	0 mph	29.97 in	0.0 in	Mostly Cloudy
9:09 AM	66 °F	66 °F	100 %	CALM	0 mph	0 mph	29.97 in	0.0 in	Cloudy
9:56 AM	70 °F	67 °F	90 %	SSW	8 mph	0 mph	29.97 in	0.0 in	Cloudy
10:56 AM	75 °F	67 °F	76 %	SW	8 mph	0 mph	29.98 in	0.0 in	Mostly Cloudy
11:56 AM	77 °F	69 °F	76 %	SW	12 mph	0 mph	29.97 in	0.0 in	Mostly Cloudy
12:56 PM	80 °F	69 °F	69 %	WSW	14 mph	0 mph	29.95 in	0.0 in	Mostly Cloudy
1:10 PM	79 °F	68 °F	69 %	SW	8 mph	0 mph	29.94 in	0.0 in	Mostly Cloudy
1:56 PM	82 °F	68 °F	62 %	WSW	14 mph	20 mph	29.91 in	0.0 in	Mostly Cloudy

Time	Temperature	Dew Point	Humidity	Wind	Wind Speed	Wind Gust	Pressure	Precip.	Condition
2:56 PM	79 °F	68 °F	69 %	WSW	7 mph	0 mph	29.88 in	0.0 in	Thunder in the Vicinity
3:03 PM	79 °F	68 °F	69 %	WSW	7 mph	0 mph	29.87 in	0.0 in	T-Storm
3:20 PM	73 °F	70 °F	88 %	SW	15 mph	0 mph	29.89 in	0.0 in	Heavy T-Storm
3:30 PM	70 °F	66 °F	88 %	SSW	12 mph	0 mph	29.91 in	0.0 in	T-Storm
3:56 PM	70 °F	67 °F	90 %	S	5 mph	0 mph	29.87 in	0.0 in	Cloudy
4:56 PM	72 °F	69 °F	91 %	SSW	6 mph	0 mph	29.87 in	0.0 in	Light Rain
5:56 PM	74 °F	70 °F	87 %	WSW	6 mph	0 mph	29.86 in	0.0 in	Mostly Cloudy
6:56 PM	75 °F	69 °F	82 %	W	7 mph	0 mph	29.86 in	0.0 in	Fair
7:56 PM	72 °F	68 °F	87 %	WSW	5 mph	0 mph	29.88 in	0.0 in	Fair
8:56 PM	71 °F	67 °F	87 %	SW	5 mph	0 mph	29.89 in	0.0 in	Partly Cloudy
9:44 PM	72 °F	66 °F	83 %	SW	3 mph	0 mph	29.91 in	0.0 in	Mostly Cloudy
9:56 PM	71 °F	67 °F	87 %	SW	3 mph	0 mph	29.91 in	0.0 in	Cloudy
10:19 PM	70 °F	68 °F	94 %	WSW	5 mph	0 mph	29.92 in	0.0 in	Cloudy
10:56 PM	70 °F	68 °F	93 %	SW	3 mph	0 mph	29.93 in	0.0 in	Cloudy
11:56 PM	69 °F	67 °F	93 %	W	6 mph	0 mph	29.93 in	0.0 in	Mostly Cloudy

Daily Observations 03.17.22

Time	Temperature	Dew Point	Humidity	Wind	Wind Speed	Wind Gust	Pressure	Precip.	Condition
12:56 AM	68 °F	67 °F	96 %	W	5 mph	0 mph	29.92 in	0.0 in	Fair
1:56 AM	67 °F	66 °F	97 %	W	5 mph	0 mph	29.91 in	0.0 in	Fair
2:33 AM	66 °F	66 °F	100 %	W	3 mph	0 mph	29.91 in	0.0 in	Partly Cloudy
2:41 AM	66 °F	66 °F	100 %	W	3 mph	0 mph	29.90 in	0.0 in	Mostly Cloudy
2:45 AM	66 °F	66 °F	100 %	W	3 mph	0 mph	29.90 in	0.0 in	Fog
2:47 AM	66 °F	66 °F	100 %	W	3 mph	0 mph	29.90 in	0.0 in	Fog
2:50 AM	66 °F	66 °F	100 %	W	5 mph	0 mph	29.90 in	0.0 in	Fog
2:56 AM	67 °F	66 °F	97 %	W	3 mph	0 mph	29.90 in	0.0 in	Fog
3:28 AM	66 °F	64 °F	94 %	W	3 mph	0 mph	29.90 in	0.0 in	Fog
3:39 AM	64 °F	64 °F	100 %	WSW	5 mph	0 mph	29.90 in	0.0 in	Fog
3:56 AM	65 °F	65 °F	100 %	W	6 mph	0 mph	29.89 in	0.0 in	Fog
4:27 AM	66 °F	64 °F	94 %	W	6 mph	0 mph	29.89 in	0.0 in	Fog
4:39 AM	66 °F	64 °F	94 %	W	3 mph	0 mph	29.89 in	0.0 in	Fog
4:56 AM	66 °F	66 °F	100 %	W	5 mph	0 mph	29.89 in	0.0 in	Fog
5:07 AM	66 °F	64 °F	94 %	W	8 mph	0 mph	29.89 in	0.0 in	Cloudy
5:56 AM	65 °F	64 °F	97 %	W	6 mph	0 mph	29.91 in	0.0 in	Cloudy
6:54 AM	64 °F	63 °F	94 %	W	6 mph	0 mph	29.93 in	0.0 in	Cloudy
6:56 AM	64 °F	63 °F	96 %	WNW	5 mph	0 mph	29.93 in	0.0 in	Cloudy
7:33 AM	63 °F	63 °F	100 %	NW	7 mph	0 mph	29.94 in	0.0 in	Fog
7:45 AM	63 °F	63 °F	100 %	WNW	7 mph	0 mph	29.95 in	0.0 in	Fog
7:52 AM	63 °F	63 °F	100 %	WNW	7 mph	0 mph	29.95 in	0.0 in	Cloudy

Time	Temperature	Dew Point	Humidity	Wind	Wind Speed	Wind Gust	Pressure	Precip.	Condition
8:10 AM	63 °F	61 °F	94 %	NW	5 mph	0 mph	29.96 in	0.0 in	Cloudy
8:56 AM	63 °F	62 °F	97 %	WNW	6 mph	0 mph	29.98 in	0.0 in	Cloudy
9:56 AM	65 °F	62 °F	90 %	W	5 mph	0 mph	29.98 in	0.0 in	Cloudy
10:07 AM	64 °F	63 °F	94 %	WSW	5 mph	0 mph	29.99 in	0.0 in	Mostly Cloudy
10:19 AM	66 °F	63 °F	88 %	SW	3 mph	0 mph	29.99 in	0.0 in	Partly Cloudy
10:56 AM	68 °F	62 °F	81 %	S	5 mph	0 mph	30.00 in	0.0 in	Partly Cloudy
11:56 AM	72 °F	60 °F	66 %	VAR	5 mph	0 mph	30.00 in	0.0 in	Fair
12:56 PM	74 °F	59 °F	59 %	CALM	0 mph	0 mph	29.99 in	0.0 in	Fair
1:56 PM	78 °F	57 °F	48 %	CALM	0 mph	0 mph	29.96 in	0.0 in	Fair
2:56 PM	80 °F	56 °F	43 %	VAR	6 mph	0 mph	29.94 in	0.0 in	Fair
3:56 PM	80 °F	60 °F	50 %	SSE	7 mph	0 mph	29.92 in	0.0 in	Fair
4:56 PM	82 °F	57 °F	42 %	SW	9 mph	0 mph	29.90 in	0.0 in	Fair
5:56 PM	82 °F	56 °F	41 %	SW	7 mph	0 mph	29.91 in	0.0 in	Fair
6:56 PM	80 °F	57 °F	45 %	SSW	7 mph	0 mph	29.93 in	0.0 in	Fair
7:56 PM	77 °F	58 °F	52 %	SSW	3 mph	0 mph	29.95 in	0.0 in	Fair
8:56 PM	73 °F	59 °F	61 %	SW	5 mph	0 mph	29.96 in	0.0 in	Fair
9:56 PM	71 °F	58 °F	63 %	W	7 mph	0 mph	29.99 in	0.0 in	Fair
10:56 PM	68 °F	58 °F	70 %	NW	6 mph	0 mph	29.99 in	0.0 in	Fair
11:56 PM	68 °F	58 °F	70 %	NNW	5 mph	0 mph	29.99 in	0.0 in	Fair

Daily Observations 03.18.22

Time	Temperature	Dew Point	Humidity	Wind	Wind Speed	Wind Gust	Pressure	Precip.	Condition
12:56 AM	65 °F	59 °F	81 %	CALM	0 mph	0 mph	30.00 in	0.0 in	Fair
1:56 AM	63 °F	59 °F	87 %	CALM	0 mph	0 mph	29.99 in	0.0 in	Fair
2:56 AM	62 °F	59 °F	90 %	CALM	0 mph	0 mph	29.98 in	0.0 in	Fair
3:56 AM	62 °F	59 °F	90 %	NNW	3 mph	0 mph	29.96 in	0.0 in	Fair
4:56 AM	61 °F	59 °F	93 %	CALM	0 mph	0 mph	29.94 in	0.0 in	Fair
5:56 AM	61 °F	59 °F	93 %	CALM	0 mph	0 mph	29.94 in	0.0 in	Fair
6:56 AM	61 °F	59 °F	93 %	CALM	0 mph	0 mph	29.96 in	0.0 in	Fair
7:56 AM	62 °F	60 °F	93 %	E	3 mph	0 mph	29.97 in	0.0 in	Fair
8:56 AM	67 °F	63 °F	87 %	ESE	3 mph	0 mph	29.99 in	0.0 in	Fair
9:56 AM	72 °F	67 °F	84 %	VAR	3 mph	0 mph	30.00 in	0.0 in	Fair
10:56 AM	75 °F	69 °F	82 %	S	9 mph	0 mph	30.00 in	0.0 in	Fair
11:56 AM	80 °F	69 °F	69 %	S	9 mph	0 mph	30.00 in	0.0 in	Fair
12:56 PM	84 °F	69 °F	61 %	S	10 mph	0 mph	29.98 in	0.0 in	Fair
1:56 PM	86 °F	70 °F	59 %	SSE	13 mph	0 mph	29.95 in	0.0 in	Fair
2:56 PM	87 °F	67 °F	51 %	S	10 mph	0 mph	29.94 in	0.0 in	Mostly Cloudy
3:56 PM	87 °F	66 °F	49 %	SSE	9 mph	0 mph	29.93 in	0.0 in	Partly Cloudy
4:56 PM	87 °F	67 °F	51 %	SSE	13 mph	0 mph	29.92 in	0.0 in	Fair
5:56 PM	86 °F	66 °F	51 %	SSE	12 mph	0 mph	29.92 in	0.0 in	Partly Cloudy
6:56 PM	83 °F	67 °F	58 %	SSE	7 mph	0 mph	29.93 in	0.0 in	Fair
7:56 PM	81 °F	68 °F	65 %	CALM	0 mph	0 mph	29.94 in	0.0 in	Thunder in the Vicinity
8:56 PM	76 °F	69 °F	79 %	SSE	12 mph	0 mph	29.99 in	0.0 in	Thunder in the Vicinity

Time	Temperature	Dew Point	Humidity	Wind	Wind Speed	Wind Gust	Pressure	Precip.	Condition
9:56 PM	74 °F	69 °F	85 %	S	8 mph	0 mph	30.01 in	0.0 in	Partly Cloudy
10:56 PM	73 °F	67 °F	81 %	WNW	7 mph	0 mph	30.03 in	0.0 in	Partly Cloudy
11:56 PM	72 °F	68 °F	87 %	WNW	7 mph	0 mph	30.04 in	0.0 in	Fair

Daily Observations 03.19.22

Time	Temperature	Dew Point	Humidity	Wind	Wind Speed	Wind Gust	Pressure	Precip.	Condition
12:56 AM	71 °F	65 °F	81 %	N	10 mph	0 mph	30.04 in	0.0 in	Cloudy
1:56 AM	68 °F	64 °F	87 %	NNE	7 mph	16 mph	30.05 in	0.0 in	Fair
2:08 AM	68 °F	64 °F	88 %	NE	7 mph	0 mph	30.05 in	0.0 in	Partly Cloudy
2:16 AM	68 °F	64 °F	88 %	NE	8 mph	0 mph	30.04 in	0.0 in	Mostly Cloudy
2:41 AM	68 °F	64 °F	88 %	NE	9 mph	0 mph	30.03 in	0.0 in	Partly Cloudy
2:56 AM	68 °F	64 °F	87 %	NE	8 mph	0 mph	30.03 in	0.0 in	Fair
3:56 AM	68 °F	64 °F	87 %	E	9 mph	0 mph	30.01 in	0.0 in	Mostly Cloudy
4:04 AM	68 °F	64 °F	88 %	ENE	9 mph	0 mph	30.01 in	0.0 in	Mostly Cloudy
4:37 AM	68 °F	64 °F	88 %	ENE	7 mph	0 mph	30.00 in	0.0 in	Cloudy
4:49 AM	68 °F	66 °F	94 %	E	9 mph	0 mph	30.00 in	0.0 in	Cloudy
4:56 AM	68 °F	66 °F	93 %	E	8 mph	0 mph	29.99 in	0.0 in	Cloudy
5:56 AM	68 °F	66 °F	93 %	E	8 mph	0 mph	29.99 in	0.0 in	Mostly Cloudy
6:03 AM	68 °F	66 °F	94 %	E	7 mph	0 mph	29.99 in	0.0 in	Partly Cloudy
6:52 AM	68 °F	66 °F	94 %	CALM	0 mph	0 mph	30.00 in	0.0 in	Mostly Cloudy
6:53 AM	68 °F	66 °F	93 %	CALM	0 mph	0 mph	30.00 in	0.0 in	Mostly Cloudy
7:00 AM	68 °F	66 °F	94 %	CALM	0 mph	0 mph	30.00 in	0.0 in	Cloudy
7:30 AM	68 °F	66 °F	94 %	CALM	0 mph	0 mph	30.01 in	0.0 in	Cloudy
7:56 AM	69 °F	67 °F	93 %	SE	5 mph	0 mph	30.01 in	0.0 in	Cloudy
8:19 AM	70 °F	68 °F	94 %	SE	3 mph	0 mph	30.02 in	0.0 in	Partly Cloudy
8:41 AM	72 °F	68 °F	88 %	SSE	3 mph	0 mph	30.04 in	0.0 in	Mostly Cloudy
8:56 AM	71 °F	69 °F	93 %	SSE	6 mph	0 mph	30.04 in	0.0 in	Cloudy

Time	Temperature	Dew Point	Humidity	Wind	Wind Speed	Wind Gust	Pressure	Precip.	Condition
10:53 AM	77 °F	70 °F	78 %	S	9 mph	0 mph	30.06 in	0.0 in	Partly Cloudy
10:56 AM	78 °F	70 °F	76 %	SSW	10 mph	0 mph	30.06 in	0.0 in	Fair
11:56 AM	80 °F	70 °F	71 %	S	9 mph	0 mph	30.06 in	0.0 in	Partly Cloudy
12:19 PM	81 °F	70 °F	70 %	SSW	9 mph	0 mph	30.06 in	0.0 in	Mostly Cloudy
12:48 PM	82 °F	70 °F	66 %	S	12 mph	0 mph	30.06 in	0.0 in	Partly Cloudy
12:56 PM	82 °F	68 °F	62 %	S	12 mph	18 mph	30.05 in	0.0 in	Fair
1:56 PM	84 °F	68 °F	58 %	SW	10 mph	0 mph	30.02 in	0.0 in	Fair
2:56 PM	86 °F	67 °F	53 %	SW	9 mph	0 mph	29.99 in	0.0 in	Partly Cloudy
3:56 PM	86 °F	67 °F	53 %	SW	7 mph	0 mph	29.97 in	0.0 in	Partly Cloudy
4:56 PM	87 °F	67 °F	51 %	SSW	7 mph	0 mph	29.95 in	0.0 in	Partly Cloudy
5:56 PM	87 °F	64 °F	46 %	SW	9 mph	0 mph	29.94 in	0.0 in	Partly Cloudy
6:56 PM	84 °F	66 °F	55 %	WSW	5 mph	0 mph	29.95 in	0.0 in	Fair
7:56 PM	81 °F	66 °F	60 %	W	7 mph	0 mph	29.95 in	0.0 in	Fair
8:56 PM	78 °F	68 °F	71 %	W	6 mph	0 mph	29.96 in	0.0 in	Fair
9:56 PM	77 °F	66 °F	69 %	W	7 mph	0 mph	29.98 in	0.0 in	Fair
10:56 PM	75 °F	64 °F	69 %	WNW	9 mph	0 mph	30.01 in	0.0 in	Fair
11:56 PM	73 °F	65 °F	76 %	NW	6 mph	0 mph	30.02 in	0.0 in	Fair

Daily Observations 03.20.22

Time	Temperature	Dew Point	Humidity	Wind	Wind Speed	Wind Gust	Pressure	Precip.	Condition
12:56 AM	73 °F	66 °F	79 %	WNW	6 mph	0 mph	30.03 in	0.0 in	Mostly Cloudy
1:56 AM	71 °F	68 °F	90 %	WNW	5 mph	0 mph	30.02 in	0.0 in	Fair
2:46 AM	72 °F	68 °F	88 %	WNW	6 mph	0 mph	30.02 in	0.0 in	Mostly Cloudy
2:56 AM	71 °F	68 °F	90 %	NW	6 mph	0 mph	30.01 in	0.0 in	Cloudy
3:26 AM	72 °F	68 °F	88 %	CALM	0 mph	0 mph	30.01 in	0.0 in	Partly Cloudy
3:56 AM	70 °F	68 °F	93 %	WNW	3 mph	0 mph	30.00 in	0.0 in	Fair
4:56 AM	70 °F	65 °F	84 %	NNW	6 mph	0 mph	29.99 in	0.0 in	Fair
5:56 AM	69 °F	64 °F	84 %	NNW	7 mph	0 mph	30.01 in	0.0 in	Fair
6:56 AM	68 °F	63 °F	84 %	NW	5 mph	0 mph	30.04 in	0.0 in	Fair
7:56 AM	68 °F	62 °F	81 %	N	7 mph	0 mph	30.05 in	0.0 in	Cloudy
8:56 AM	70 °F	63 °F	78 %	NNW	13 mph	0 mph	30.08 in	0.0 in	Fair
9:56 AM	70 °F	61 °F	73 %	NNW	13 mph	0 mph	30.10 in	0.0 in	Mostly Cloudy
10:09 AM	72 °F	63 °F	73 %	NNW	12 mph	0 mph	30.10 in	0.0 in	Mostly Cloudy
10:53 AM	70 °F	59 °F	68 %	N	12 mph	0 mph	30.11 in	0.0 in	Cloudy
10:56 AM	70 °F	60 °F	71 %	N	10 mph	0 mph	30.11 in	0.0 in	Cloudy
11:56 AM	70 °F	60 °F	71 %	NW	9 mph	0 mph	30.12 in	0.0 in	Mostly Cloudy
12:56 PM	73 °F	58 °F	59 %	NNW	9 mph	0 mph	30.11 in	0.0 in	Mostly Cloudy
1:56 PM	75 °F	58 °F	55 %	N	9 mph	0 mph	30.09 in	0.0 in	Fair
2:56 PM	77 °F	56 °F	48 %	NW	7 mph	0 mph	30.07 in	0.0 in	Fair
3:56 PM	78 °F	55 °F	45 %	NNW	6 mph	0 mph	30.06 in	0.0 in	Fair
4:56 PM	79 °F	51 °F	38 %	NNE	6 mph	0 mph	30.05 in	0.0 in	Fair

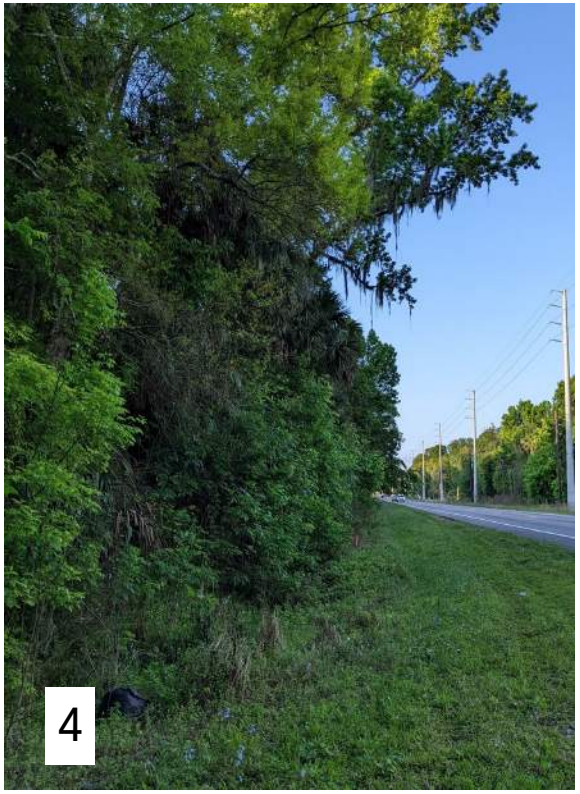
Time	Temperature	Dew Point	Humidity	Wind	Wind Speed	Wind Gust	Pressure	Precip.	Condition
6:56 PM	77 °F	51 °F	40 %	NE	3 mph	0 mph	30.05 in	0.0 in	Fair
7:56 PM	74 °F	40 °F	29 %	ENE	6 mph	0 mph	30.07 in	0.0 in	Fair
8:56 PM	67 °F	53 °F	61 %	E	9 mph	0 mph	30.09 in	0.0 in	Fair
9:56 PM	66 °F	45 °F	47 %	ENE	7 mph	0 mph	30.11 in	0.0 in	Fair
10:56 PM	64 °F	47 °F	54 %	ENE	6 mph	0 mph	30.12 in	0.0 in	Fair
11:56 PM	62 °F	49 °F	62 %	ENE	5 mph	0 mph	30.13 in	0.0 in	Fair

APPENDIX D

Site Photographs

Photographs 1 and 2: View of Detector 1, illustrating the microphone was tilted vertically at approximately 45° (**Photograph 1**). View of the pasture that the Detector 1 was targeting (**Photograph 2**).

Photographer: Hannah Rowe
Photograph Taken: March 3 and 9, 2022



Photographs 3 and 4: View of Detector 2, illustrating the microphone was tilted vertically at approximately 45° (**Photograph 3**). View of the location targeting commuting bats traveling along the wetland forest edge and road corridor (**Photograph 4**).

Photographer: Hannah Rowe
Photograph Taken: March 3 and 9, 2022

Photographs 5 and 6: View of Detector 3, illustrating the microphone was tilted vertically at approximately 45° (**Photograph 5**). View of the location targeting commuting bats at the Reedy Creek roadway crossing and forested edge that Detector 3 was targeting (**Photograph 6**).

Photographer: Hannah Rowe
Photograph Taken: March 20, 2022

Photographs 7 and 8: View of Detector 4, illustrating the microphone was tilted vertically at approximately 45° (**Photograph 7**). View of the open area habitat that Detector 4 was targeting (**Photograph 8**).

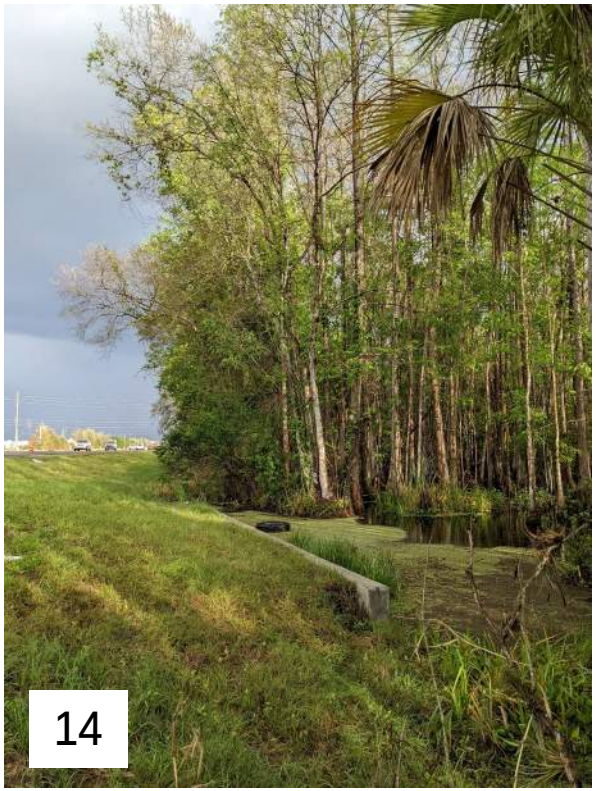
Photographer: Hannah Rowe
Photograph Taken: March 20, 2022

Photographs 9 and 10: View of Detector 5, illustrating the microphone was tilted vertically at approximately 45° (**Photograph 9**). View of the pasture that the Detector 5 was targeting (**Photograph 10**).

Photographer: Hannah Rowe
Photograph Taken: March 20, 2022

Photographs 11 and 12: View of Detector 6, illustrating the microphone was tilted vertically at approximately 45° (**Photograph 11**). View of the pond targeted at Detector 6 (**Photograph 12**).

Photographer: Hannah Rowe
Photograph Taken: March 20, 2022



Photographs 13 and 14: View of Detector 7, illustrating the microphone was tilted vertically at approximately 45° (**Photograph 13**). View of the targeted forested wetland edge at Detector 7 (**Photograph 14**).

Photographer: Hannah Rowe
Photograph Taken: March 9 and 20, 2022

APPENDIX E

Data Forms

Bat Survey Data Form

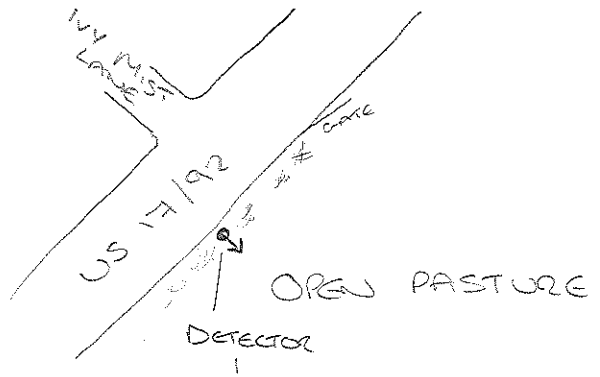
If found, please return to: Kaitlyn Torrey *ktorrey@vhb.com*

Project:	US 17/92	**County:**	Osceola	**Site#:**	1	**Night#:**	1	**Site Name:**	N/A	**Date:**	3/9/22
Latitude: 28.252409		Longitude: -81.548757						Datum: WGS 84	Elevation:	ID By: KT HR	
Observers: KT HR								Start Time: 18:01		End Time: 7:11	
Moon Effect: 43% Waxing crescent								**Land Use:** Urban / (Agriculture) / Forest / Water / Wetland / Barren *(describe)*: Within right-of-way facing open pasture			

BD#	Make / Model / Mic	Lat / Long	horn	h-AGL[1]	Clutter[2]	gain	trigger	Azimuth	Start time	Stop Time	Photo?
1	Petterson/D500/Petterson	28.254409, -81.548757	NO	3 m	low	45	160	135	17.58	7.18	Yes

Site Description: Located within ROW at gap in hedge pointed into open pasture adjacent.

Remarks: New batteries



Site sketch (label to match Nets/Traps and BD# above)

[1] Height of microphone above ground level

[2] Low, medium or high

Bat Survey Data Form

If found, please return to: Kaitlyn Torrey *ktorrey@vhb.com*

Project:	US 17/92	**County:**	OSCEOLA	**Site#:**	2	**Night#:**	1	**Site Name:**	N/A	**Date:**	3/9/22
Latitude:	28.255722	Longitude:	-81.546355					Datum: WGS 84	Elevation:	ID By:	KT HR
Observers:	KT HR							Start Time:	18.01	End Time:	7.11
Moon Effect:	43% WAXING CRESCENT							**Land Use:** Urban / Agriculture / (Forest) / Water / Wetland / Barren *(describe)*: ROADWAY ROW + FORESTED WETLAND EDGE			

BD#	Make / Model / Mic	Lat / Long	horn	h-AGL[1]	Clutter[2]	gain	trigger	Azimuth	Start time	Stop Time	Photo?
1	Petterson/D500/Petterson	28.255722,-81.546355	No	3 m	low	45	160	215	17.58	7.18	YES

Site Description: LOCATED WITHIN ROW ADJACENT TO FORESTED WETLAND AND CULVERTED WATER CROSSING POINTED ALONG THE RIGHT OF WAY, PARALELL WITH ROAD

Remarks: NEW BATTERIES

Site sketch (label to match Nets/Traps and BD# above)

[1] Height of microphone above ground level

[2] Low, medium or high

Bat Survey Data Form

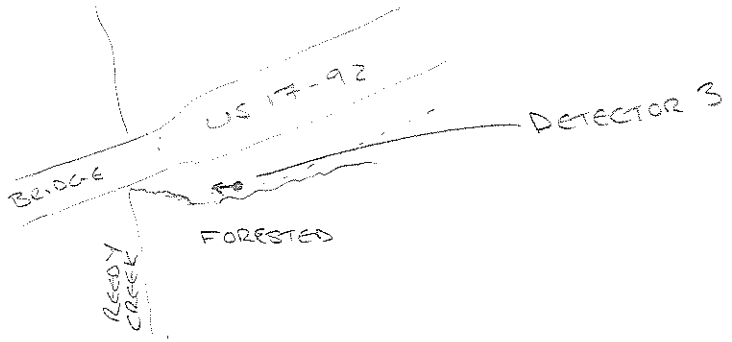
If found, please return to: Kaitlyn Torrey *ktorrey@vhb.com*

Project:	US 17/92	**County:**	Osceola	**Site#:**	3	**Night#:**	1	**Site Name:**	N/A	**Date:**	3/9/22
Latitude: 28.263480		Longitude: -81.535820						Datum: WGS 84	Elevation:	ID By: KT HR	
Observers: KT HR								Start Time: 18:01		End Time: 7:11	
Moon Effect: 43% Waxing Crescent								**Land Use:** Urban / Agriculture / (Forest) / Water / Wetland / Barren *(describe)*:			

BD#	Make / Model / Mic	Lat / Long	horn	h-AGL[1]	Clutter[2]	gain	trigger	Azimuth	Start time	Stop Time	Photo?
1	Petterson/D500/Petterson	28.263480, -81.535820	Yes	3 m	low	45	160	255	17:58	7:18	Yes

Site Description: LOCATED AT ROW FENCE ADJACENT TO FORESTED UPLANDS AND ROADWAY ROW, POINTED TOWARDS TREELINE TOWARDS BRIDGE OVER REEDY CREEK

Remarks: NEW BATTERIES



Site sketch (label to match Nets/Traps and BD# above)

[1] Height of microphone above ground level

[2] Low, medium or high

Bat Survey Data Form

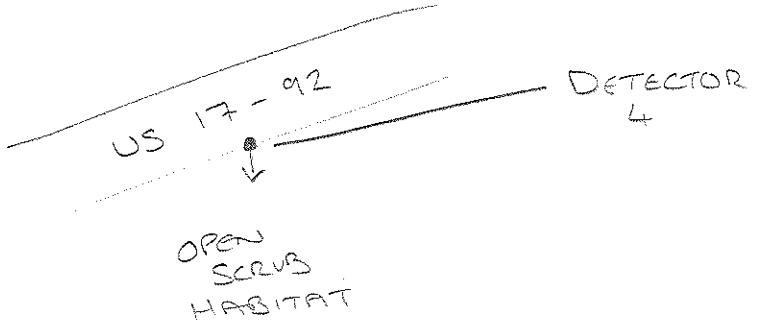
If found, please return to: Kaitlyn Torrey *ktorrey@vhb.com*

Project:	US 17/92	**County:**	Osceola	**Site#:**	4	**Night#:**	1	**Site Name:**	N/A	**Date:**	3/9/22
Latitude: 28.264284		Longitude: −81.534004						Datum: WGS 84	Elevation:	ID By:	KT HR
Observers: KT HR								Start Time: 18.01		End Time:	7.11
Moon Effect: 43% WAXING CRESCENT								**Land Use:** Urban / Agriculture / Forest / Water / Wetland / Barren *(describe)*: OPEN SCRUB HABITAT			

BD#	Make / Model / Mic	Lat / Long	horn	h-AGL[1]	Clutter[2]	gain	trigger	Azimuth	Start time	Stop Time	Photo?
1	Petterson/D500/Petterson	28.264284, -81.534004	No	3 m	low	45	160	180	18.01	7.11	YES

Site Description: LOCATED AT ROW FENCE POINTED INTO ADJACENT OPEN SCRUB HABITAT

Remarks: NEW BATTERIES



Site sketch (label to match Nets/Traps and BD# above)

[1] Height of microphone above ground level

[2] Low, medium or high

Bat Survey Data Form

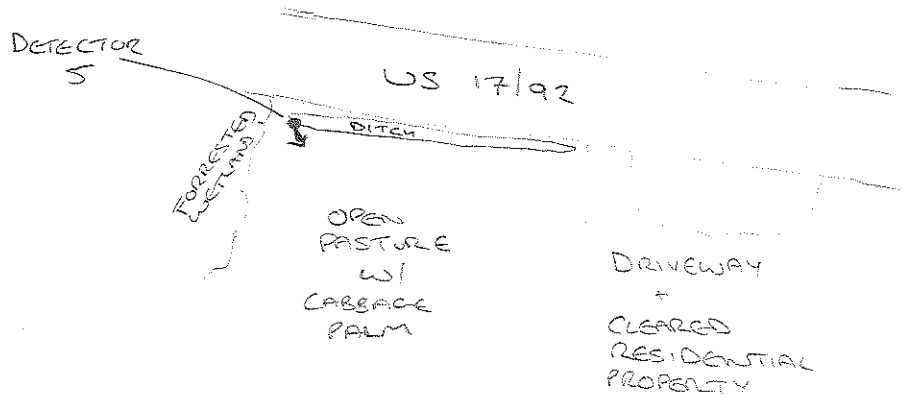
If found, please return to: Kaitlyn Torrey *ktorrey@vhb.com*

Project:	US 17/92	**County:**	OSCEOLA	**Site#:**	5	**Night#:**	1	**Site Name:**	N/A	**Date:**	3/9/22
Latitude: 28.262263		Longitude: −81.516509						Datum: WGS 84	Elevation:	ID By: KT HR	
Observers: KT HR								Start Time: 18.01		End Time: 7.11	
Moon Effect: 43% WAXING CRESCENT								**Land Use:** Urban / Agriculture / Forest / Water / Wetland / Barren *(describe)*: OPEN CLEARED RESIDENTIAL PLOT / PASTURE			

BD#	Make / Model / Mic	Lat / Long	horn	h-AGL[1]	Clutter[2]	gain	trigger	Azimuth	Start time	Stop Time	Photo?
1	Petterson/D500/Petterson	28.262263, -81.516509	No	3 m	low	45	160	140	18.01	7.11	Yes

Site Description: LOCATED AT THE ROW POINTED INTO AN OPEN LOT, PREVIOUSLY OCCUPIED BY A RESIDENCE AND PASTURE LAND

Remarks: NEW BATTERIES



Site sketch (label to match Nets/Traps and BD# above)

[1] Height of microphone above ground level

[2] Low, medium or high

Bat Survey Data Form

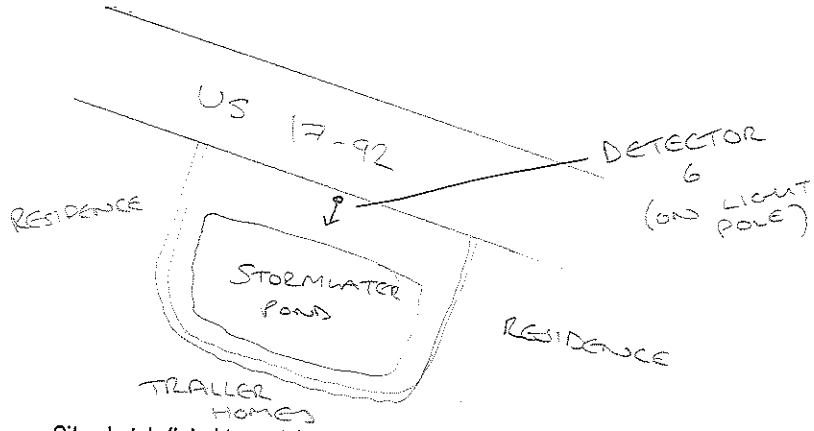
If found, please return to: Kaitlyn Torrey *ktorrey@vhb.com*

Project:	US 17/92	**County:**	OSCEOLA	**Site#:**	6	**Night#:**	1	**Site Name:**	N/A	**Date:**	3/9/22
Latitude: 28.2621132		Longitude: -81.511333						Datum: WGS 84	Elevation:	ID By: KT HR	
Observers: KT HR								Start Time: 18.01		End Time: 7.11	
Moon Effect: 43% WAXING CRESCENT								**Land Use:** (Urban) / Agriculture / Forest / (Water) / Wetland / Barren *(describe)*: STORMWATER POND IN URBAN AREA			

BD#	Make / Model / Mic	Lat / Long	horn	h-AGL[1]	Clutter[2]	gain	trigger	Azimuth	Start time	Stop Time	Photo?
1	Petterson/D500/Petterson	28.2621132, -81.511333	No	3 m	low	45	160	190	18.01	7.11	Yes

Site Description: LOCATED AT AN ELECTRIC POLE ON THE ROW EDGE FACING AN OPEN STORMWATER POND

Remarks: NEW BATTERIES



Site sketch (label to match Nets/Traps and BD# above)

[1] Height of microphone above ground level

[2] Low, medium or high

Bat Survey Data Form

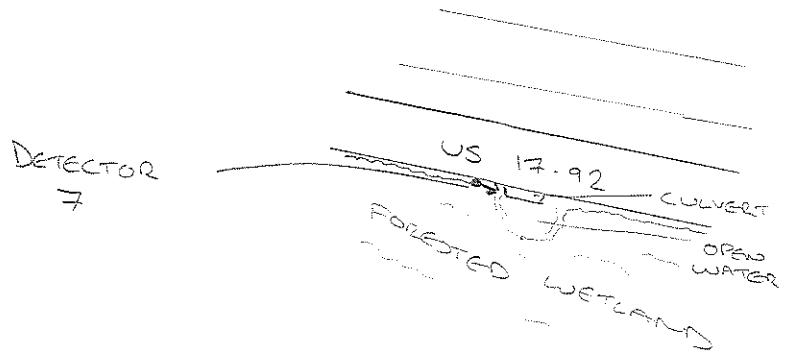
If found, please return to: Kaitlyn Torrey *ktorrey@vhb.com*

Project:	US 17/92	**County:**	Osceola	**Site#:**	7	**Night#:**	1	**Site Name:**	N/A	**Date:**	3/9/22
Latitude: 28.258219		Longitude: -81.497897						Datum: WGS 84	Elevation:	ID By:	KT HR
Observers: KT HR								Start Time: 18.01		End Time: 7.11	
Moon Effect: 43% Waxing Crescent								**Land Use:** Urban / Agriculture / Forest / Water / (Wetland) / Barren *(describe)*: Forested wetland at road culvert			

BD#	Make / Model / Mic	Lat / Long	horn	h-AGL[1]	Clutter[2]	gain	trigger	Azimuth	Start time	Stop Time	Photo?
1	Petterson/D500/Petterson	28.258219, -81.497897	No	3 m	low	45	160	105	18.01	7.11	Yes

Site Description: Located at edge of forested wetland at ROW edge facing open water where culvert flows into forested wetland system.

Remarks: New batteries



Site sketch (label to match Nets/Traps and BD# above)

[1] Height of microphone above ground level
[2] Low, medium or high

APPENDIX F

Survey-Night Detector Tables for Detectors 1-10

Table 1. Total number of bat calls recorded at Detector 1 along US 17/92 in Osceola County, Florida between the dates of March 9, 2022 and March 20, 2022

Bat Detector 1		**March 9-10**	**March 10-11**	**March 16-17**	**March 17-18**	**March 18-19**	**March 19-20**
Species	*Scientific name*	# Calls	# Calls	# Calls	# Calls	# Calls	# Calls
eastern red bat/ Seminole bat	*Lasiurus borealis/ L. seminolus*	0	1	2	1	1	1
northern yellow bat	*L. intermedius*	4	2	0	0	0	0
Southeastern bat	*Myotis austroriparius*	0	0	4	1	0	0
evening bat	*Nycticeius humeralis*	2	0	1	0	1	0
tri-colored bat	*Perimyotis subflavus*	1	0	0	0	0	1
Mexican free-tailed bat	*Tadarida brasiliensis*	2	2	1	5	3	1
Unknown		40	42	67	35	49	32
Total # Calls		**49**	**47**	**75**	**42**	**54**	**35**

Table 2. Total number of bat calls recorded at Detector 2 along US 17/92 in Osceola County, Florida between the dates of March 9, 2022 and March 20, 2022

Bat Detector 2		**March 9-10**	**March 10-11**	**March 16-17**	**March 17-18***	**March 18-19**	**March 19-20**
Species	*Scientific name*	# Calls	# Calls	# Calls	# Calls	# Calls	# Calls
eastern red bat/ Seminole bat	*Lasiurus borealis/ L. seminolus*	0	2	0	N/A	0	0
northern yellow bat	*L. intermedius*	1	4	0	N/A	3	0
Southeastern bat	*Myotis austroriparius*	0	0	1	N/A	0	1
evening bat	*Nycticeius humeralis*	0	0	3	N/A	1	0
tri-colored bat	*Perimyotis subflavus*	32	13	19	N/A	24	24
Mexican free-tailed bat	*Tadarida brasiliensis*	106	136	36	N/A	58	49
Unknown		310	274	197	N/A	290	158
Total # Calls		**449**	**429**	**256**	**N/A**	**376**	**232**

*Key: *Detector malfunctioned on the night of March 17, 2022*

Table 3. Total number of bat calls recorded at Detector 3 along US 17/92 in Osceola County, Florida between the dates of March 9, 2022 and March 20, 2022

Bat Detector 3		**March 9-10**	**March 10-11**	**March 16-17**	**March 17-18**	**March 18-19**	**March 19-20**
Species	*Scientific name*	# Calls	# Calls	# Calls	# Calls	# Calls	# Calls
big brown bat	*Eptesicus fuscus*	0	1	0	0	0	0
eastern red bat/ Seminole bat	*Lasiurus borealis/ L. seminolus*	0	0	0	0	0	0
northern yellow bat	*L. intermedius*	6	1	0	0	0	0
Southeastern bat	*Myotis austroriparius*	0	0	1	0	1	0
evening bat	*Nycticeius humeralis*	1	1	2	1	4	5
tri-colored bat	*Perimyotis subflavus*	19	7	10	1	1	0
Mexican free-tailed bat	*Tadarida brasiliensis*	3	2	6	6	4	2
Unknown		47	24	36	9	32	20
Total # Calls		**76**	**36**	**55**	**17**	**42**	**27**

Table 4. Total number of bat calls recorded at Detector 4 along US 17/92 in Osceola County, Florida between the dates of March 9, 2022 and March 20, 2022

Bat Detector 4		**March 9-10**	**March 10-11**	**March 16-17**	**March 17-18**	**March 18-19**	**March 19-20**
Species	*Scientific name*	# Calls	# Calls	# Calls	# Calls	# Calls	# Calls
eastern red bat/ Seminole bat	*Lasiurus borealis/ L. seminolus*	0	0	3	1	3	4
northern yellow bat	*L. intermedius*	1	4	0	0	1	1
Southeastern bat	*Myotis austroriparius*	2	2	3	0	0	0
evening bat	*Nycticeius humeralis*	13	12	34	15	31	42
tri-colored bat	*Perimyotis subflavus*	0	1	0	0	4	0
Mexican free-tailed bat	*Tadarida brasiliensis*	6	10	19	8	33	49
Unknown		66	67	119	48	114	192
Total # Calls		**88**	**96**	**178**	**72**	**186**	**288**

Table 5. Total number of bat calls recorded at Detector 5 along US 17/92 in Osceola County, Florida between the dates of March 9, 2022 and March 20, 2022

Bat Detector 5		**March 9-10**	**March 10-11**	**March 16-17**	**March 17-18**	**March 18-19**	**March 19-20**
Species	*Scientific name*	# Calls	# Calls	# Calls	# Calls	# Calls	# Calls
eastern red bat/ Seminole bat	*Lasiurus borealis/ L. seminolus*	0	1	5	2	2	0
northern yellow bat	*L. intermedius*	0	0	2	0	0	1
Southeastern bat	*Myotis austroriparius*	0	0	1	0	0	2
evening bat	*Nycticeius humeralis*	5	0	4	0	1	2
tri-colored bat	*Perimyotis subflavus*	8	2	2	8	2	3
Mexican free-tailed bat	*Tadarida brasiliensis*	7	6	19	9	8	13
Unknown		71	43	60	51	49	57
Total # Calls		**92**	**52**	**93**	**70**	**61**	**78**

Table 6. Total number of bat calls recorded at Detector 6 along US 17/92 in Osceola County, Florida between the dates of March 9, 2022 and March 20, 2022

Bat Detector 6		**March 9-10**	**March 10-11**	**March 16-17**	**March 17-18***	**March 18-19**	**March 19-20**
Species	*Scientific name*	# Calls	# Calls	# Calls	# Calls	# Calls	# Calls
eastern red bat/ Seminole bat	*Lasiurus borealis/ L. seminolus*	0	0	0	N/A	0	0
northern yellow bat	*L. intermedius*	1	3	1	N/A	1	5
Southeastern bat	*Myotis austroriparius*	0	0	0	N/A	0	0
evening bat	*Nycticeius humeralis*	8	14	12	N/A	3	5
tri-colored bat	*Perimyotis subflavus*	0	6	4	N/A	0	0
Mexican free-tailed bat	*Tadarida brasiliensis*	52	56	6	N/A	31	26
Unknown		122	126	192	N/A	45	65
Total # Calls		**183**	**205**	**215**	**N/A**	**80**	**101**

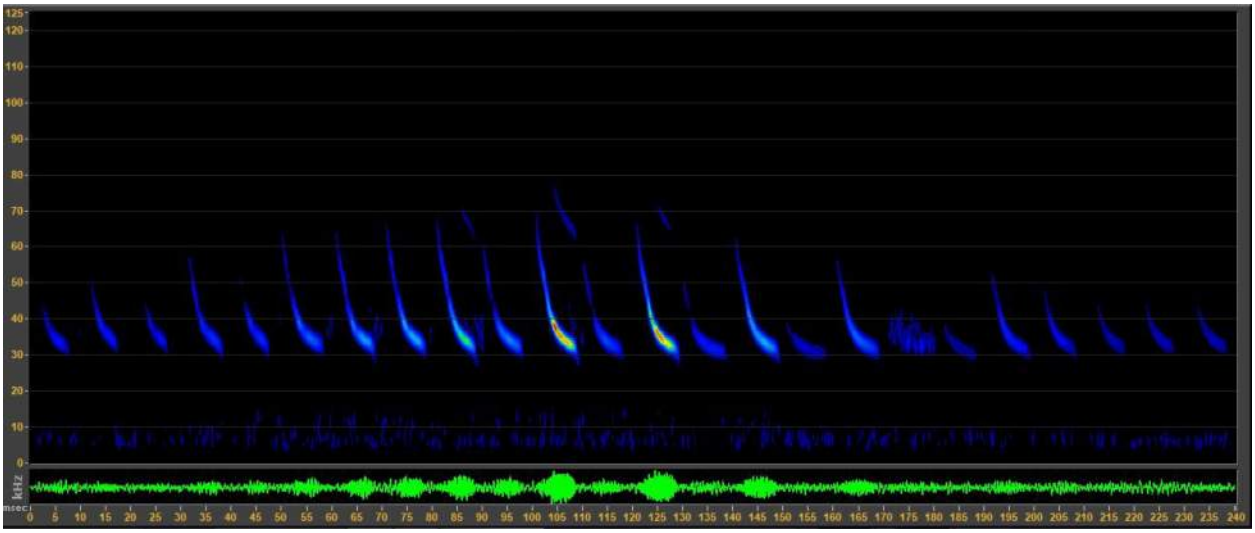
*Key: *Detector malfunctioned on the night of March 17, 2022*

Table 7. Total number of bat calls recorded at Detector 7 along US 17/92 in Osceola County, Florida between the dates of March 9, 2022 and March 20, 2022

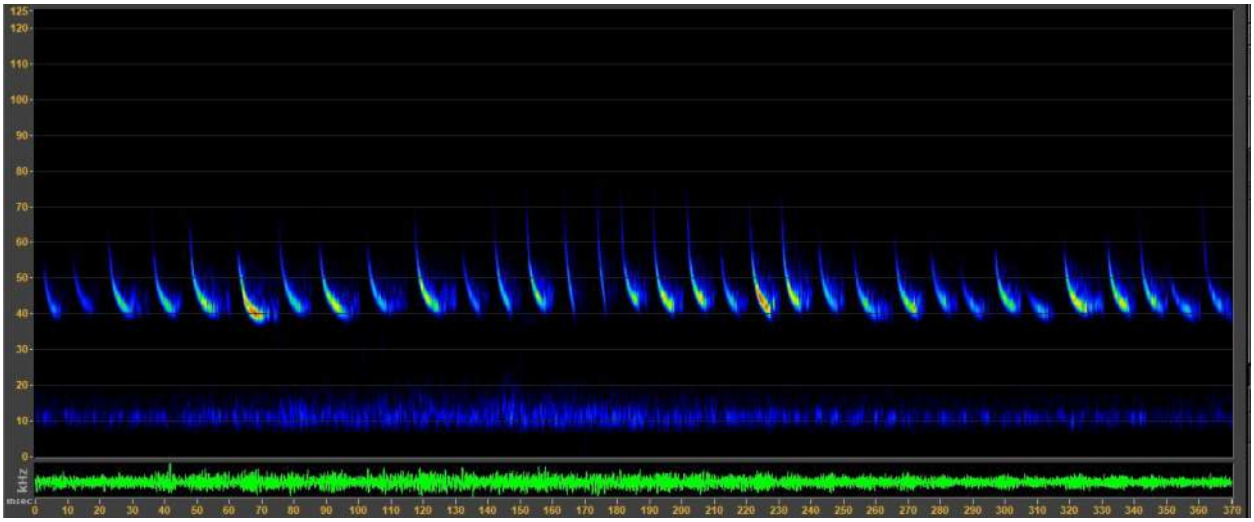
Bat Detector 7		**March 9-10**	**March 10-11**	**March 16-17**	**March 17-18**	**March 18-19**	**March 19-20**
Species	*Scientific name*	# Calls	# Calls	# Calls	# Calls	# Calls	# Calls
eastern red bat/ Seminole bat	*Lasiurus borealis/ L. seminolus*	3	0	0	0	0	0
northern yellow bat	*L. intermedius*	0	0	0	0	0	8
Southeastern bat	*Myotis austroriparius*	0	0	0	1	2	1
evening bat	*Nycticeius humeralis*	4	0	0	0	1	1
tri-colored bat	*Perimyotis subflavus*	0	0	0	0	0	0
Mexican free-tailed bat	*Tadarida brasiliensis*	1	6	9	12	5	72
Unknown		64	113	161	103	91	477
Total # Calls		**72**	**119**	**170**	**116**	**99**	**559**

APPENDIX G

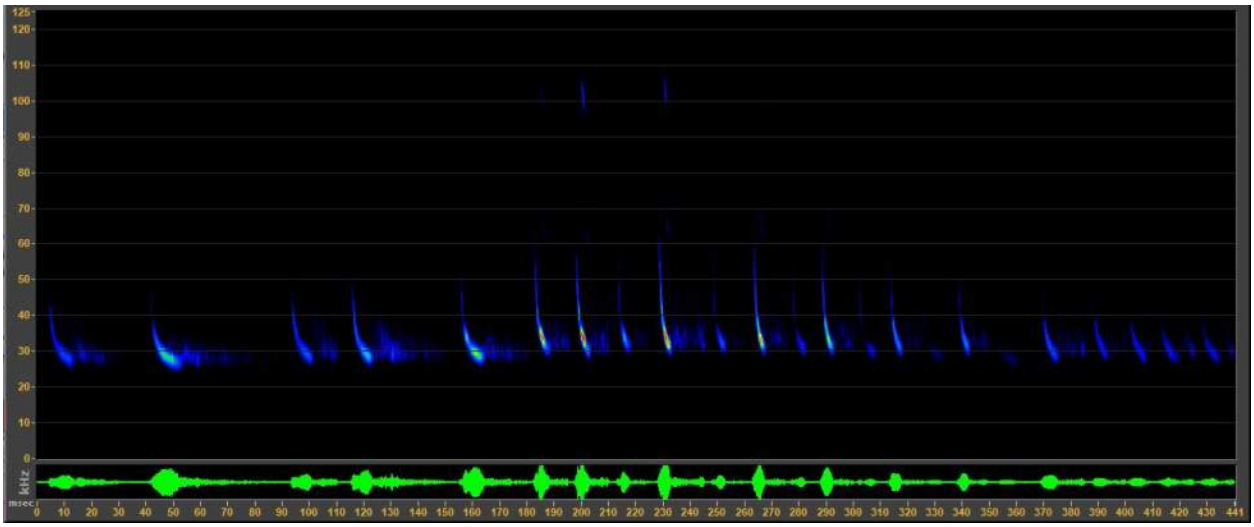
Representative Spectrograms



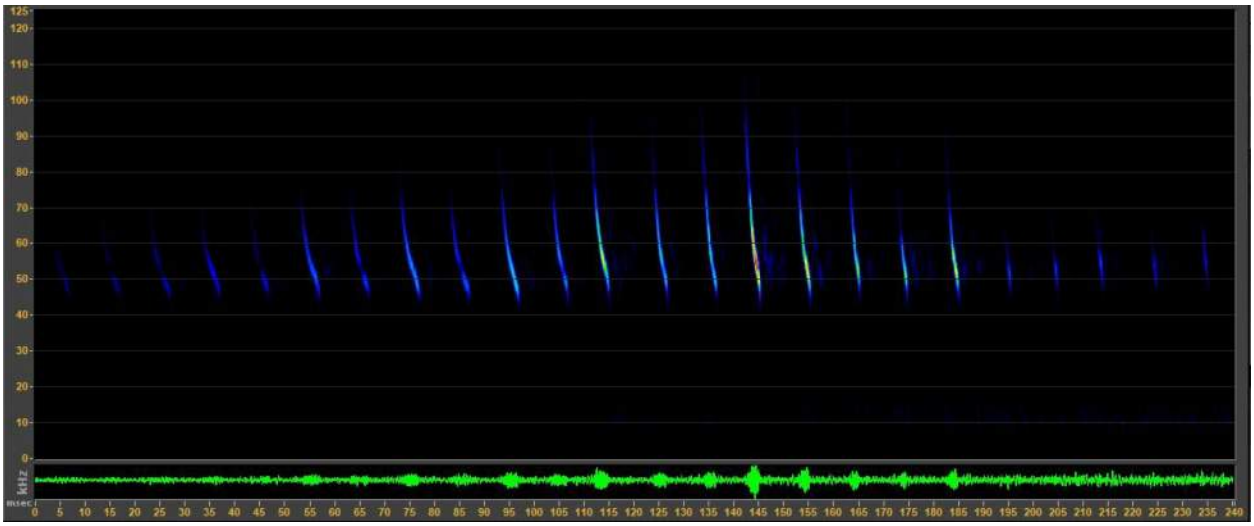
Spectrogram 1: A confirmed big brown bat (*Eptesicus fuscus*) call that was recorded by Detector 3 on March 10, 2022 at 1846 EST.



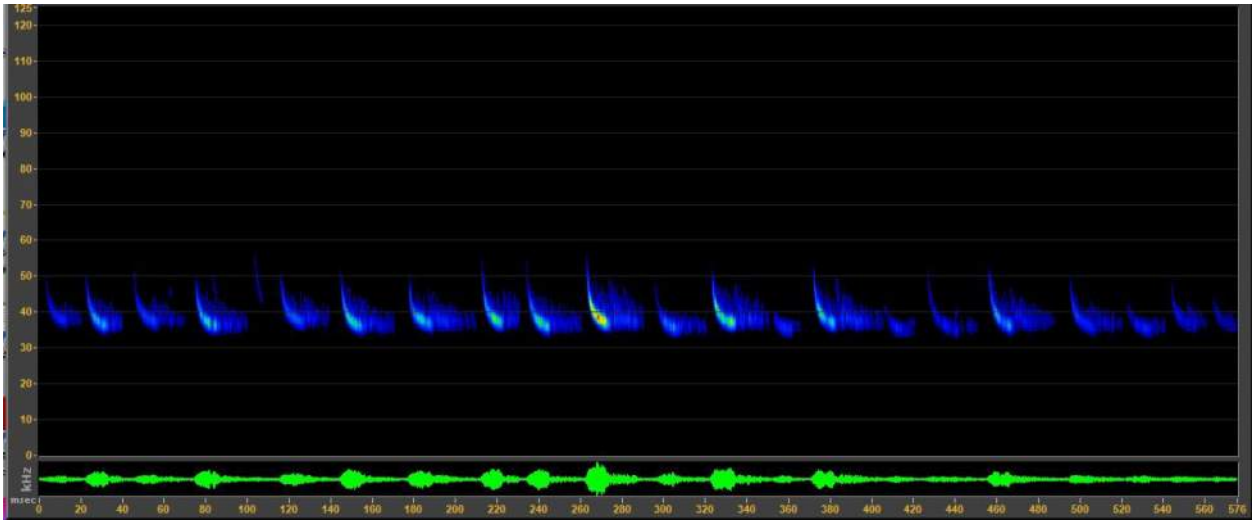
Spectrogram 2: A confirmed eastern red bat/ Seminole bat (*Lasiurus borealis/L. seminolus*) call that was recorded by Detector 5 on March 18, 2022 at 2005 EST.



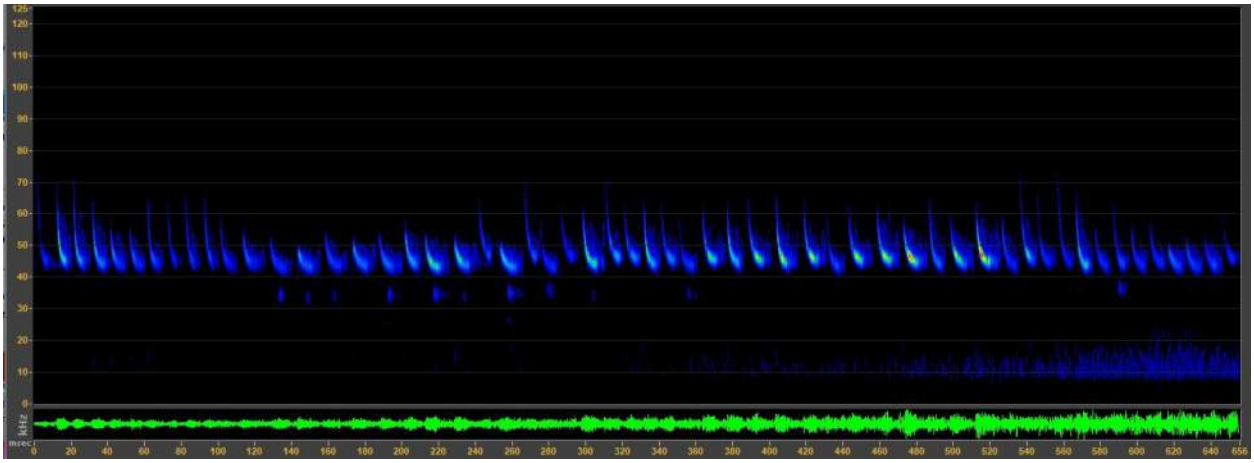
Spectrogram 3: A confirmed northern yellow bat (*Lasiurus intermedius*) call that was recorded by Detector 4 on March 11, 2022 at 0120 EST.



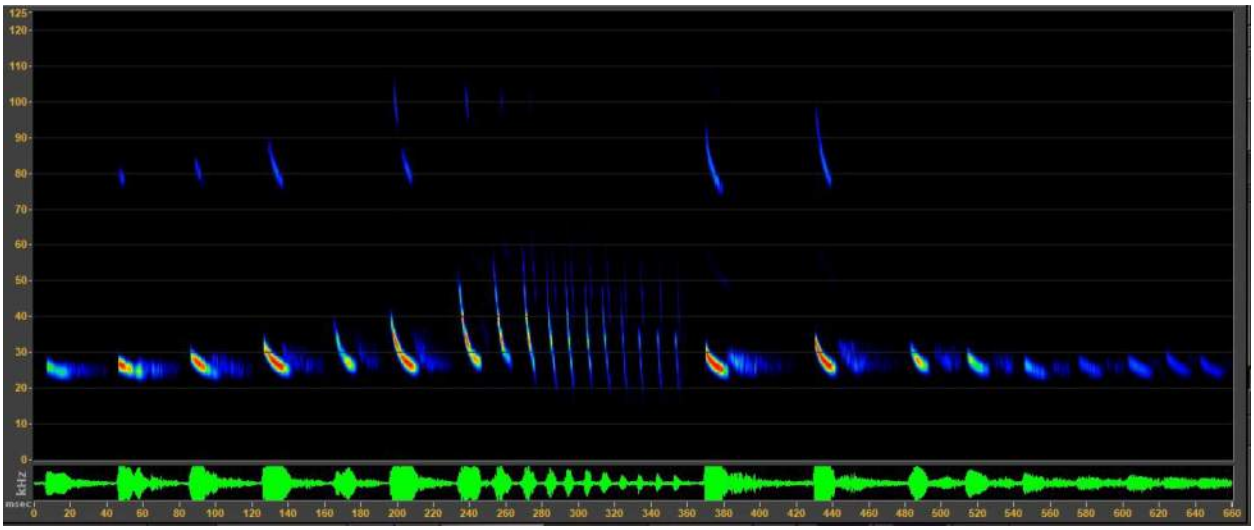
Spectrogram 4: A confirmed southeastern myotis (*Myotis austroriparius*) call that was recorded by Detector 7 on March 19, 2022 at 0710 EST.



Spectrogram 5: A confirmed evening bat (*Nycticeius humeralis*) call that was recorded by Detector 2 on March 16, 2022 at 1950 EST.



Spectrogram 6: A confirmed tri-colored bat (*Perimyotis subflavus*) call that was recorded by Detector 1 on March 9, 2022 at 1953 EST.



Spectrogram 7: A confirmed Mexican free-tailed bat (*Tadarida brasiliensis*) feeding buzz that was recorded by Detector 6 on March 11, 2022 at 0605 EST.

Appendix F:

Consultation Key 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

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

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[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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Appendix G:

Wood Stork Foraging Analysis

US 17/92 FROM IVY MIST LANE TO AVENUE A
OSCEOLA COUNTY, FL

FPID:
437200-1-22-01/437200-2-22-01

Wood Stork Foraging Analysis

Florida Department of Transportation District 5
719 S Woodland Blvd
DeLand, FL 32720

January 2023

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Tables

Attachment

Introduction

The Florida Department of Transportation (FDOT), District 5, is conducting a Project Development and Environment (PD&E) study to evaluate the widening of US 17/92 from Ivy Mist Lane to Avenue A from the current two-lane roadway to a four-lane divided highway. Based on the wetland delineation performed in March 2022, impacts to wetlands and other surface waters would occur as a result of the construction of the preferred alternative. These impacts were evaluated with respect to their potential to negatively affect wood stork foraging opportunity within the core foraging areas of the wood stork colony (Gatorland) that is less than 18.6 miles from the preferred alternative.

The U.S. Fish and Wildlife Service (USFWS) defines suitable foraging habitat as shallow-open water areas that are relatively calm and have a permanent pool or seasonal water depth between two (2) to 15 inches. The other surface waters, consisting of parallel ditches and one existing stormwater pond that occur along US 17/92, will be impacted by the preferred alternative for a total of 2.88 acres, and these ditches meet the USFWS definition of suitable foraging habitat. Wetland 16A and Wetland 21 meets USFWS's definition of suitable foraging habitat. The wetlands that will be impacted by the preferred alternative total 54.24 acres. However, for the purposes of this analysis, all wetlands have been considered suitable foraging habitat. In addition, impacts will be offset in the post construction condition due to new ditches, ponds sites and a Floodplain Compensation Area (FPC) that will be constructed along the new roadway travel lanes. The ponds sites will be constructed with a littoral shelf and have water in them throughout the year, and the FPC site would seasonally flood during the wet season. The bottoms of the new ditches will be larger and at the same elevation or slightly below the elevation of the existing ditches.

Wood Stork Foraging Analysis

To determine impacts to wood stork foraging habitat within wetlands, an assessment of wood stork forage biomass lost per wetland hydroperiod class was conducted as per the "Wood Stork Foraging Analysis" methodology found in the USFWS South Florida Programmatic Concurrence Wood Stork Key (2010).

Based on observed conditions during the wetland delineation and protected species surveys, most of the wetlands that would be impacted are forested and are not typically considered suitable foraging habitat. However, for the purposes of this assessment, all wetlands were determined to be suitable foraging habitat and were included in this analysis. In addition, the roadside ditches adjacent to these forested wetlands and the ditches in the developed areas would likely be used by the wood storks for foraging.

The Wood Stork Core Foraging Analysis was conducted to determine biomass of wood stork forage for the impacted wetlands and other surface waters that would be impacted by the preferred alternative (**Table 1**). Impacts were then totaled by hydroperiod class to determine how much biomass of wood stork forage would be lost per hydroperiod class (**Table 1**). This is the biomass that will be needed to be replace by the wetland mitigation for the preferred alternative. As depicted in **Table 1**, a total of 353.29 kilograms (kg) of wood stork forage biomass would be lost due to the impact from the preferred alternative. These impacts are distributed among Hydroperiod Class Rank 1 (0.27 kg lost), Class Rank 2 (4.68 kg lost), Class Rank 4 (7.15 kg lost), Class Rank 5 (69.03 kg lost), Class Rank 6 (53.11 kg lost), and Class Rank 7 (216.06 kg lost). The Wood Stork Foraging Analysis Spreadsheet is located in **Attachment A**.

Table 1: Decrease in Biomass from the Preferred Alternative

Wetland and Other Surface Water ID	Hydroperiod Class Rank	Precent Exotic	Direct Impacts (Acres)	F.S.V*	m^2	m^2 Suitable	Biomass consumed by hydroperiod (g/m2)	Biomass (kg)
WL-19	1	0-25	0.46	1	1,861.56	1,861.56	0.26	0.27
WL-3	2	0-25	4.04	1	16,349.37	16,349.37	0.52	4.68
WL-4								
WL-5								
WL-9								
WL-10								
WL-41								
WL-41A								
WL-17	4	0-25	1.47	1	5,948.90	5,948.90	2.184	7.15
WL-18								
WL-11	5	0-25	11.47	1	46,417.63	46,417.63	2.704	69.03
WL-13								
WL-14								
WL-16								
WL-21	6	0-25	8.08	1	32,698.73	32,698.73	3.12	56.11
WL-16A								
WL-2	7	0	28.72	1	116,226.19	116,226.19	3.38	216.06
WL-2A								
WL-2A								
WL-6								
WL-12								
Total			**54.24**		**219,502.39**	**219,502.39**		**353.29**

***F.S.V = Foraging Suitability Value**

Results

The preferred alternative will result in 4.94 kg of biomass loss from the proposed impacts to the short hydroperiod wetlands (Class Rank 1, 2, and 3), and 348.35 kg of biomass loss

from the proposed impacts to the long hydroperiod wetlands (Class Rank 4, 5, 6, and 7). Compensation for wood stork foraging habitat impacts will be provided by both on-site and off-site sources. On-site, there will be four wet stormwater treatment ponds constructed for the project. The combined area of these ponds is 22.88 acres. These ponds are designed as wet ponds and will hold water for much of the year. The hydroperiod for each of these ponds is likely to fall within the Class Rank 6 (300 to 330 Days). This is advantageous for wood storks because it is during the dry season that wood storks are typically nesting, and young storks are generally fledging (February and March). As the volume of water in the ponds decreases, fish and other prey items will become more concentrated and will be available for foraging storks during this crucial time when they are feeding young at their nests. Unlike the wetlands to be impacted by the project, these stormwater ponds will be maintained completely devoid of tree canopy, so it will be much easier for wood storks to access these areas for foraging.

In addition to the four stormwater ponds, there is a FPC located in the central portion of the preferred alternative. The FPC is approximately 11.22 acres in size, and this area will be cleared and excavated to an elevation to allow floodwater to enter this area during the wet season and storm events. The FPC hydroperiod is assumed to be less than the ponds sites due to this area receiving water during the height of the wet season from May to September, therefore, the hydroperiod would be Class Rank 2 (60 to 120 days). Since this area will be cleared of trees and at a lower elevation, it will be much easier for wood storks to access the floodplain compensation area for foraging.

The proposed roadside ditches will have similar characteristics as the existing ditches. However, they will be slightly larger in order to drain and treat water for the proposed additional roadway lanes. Because the proposed ditches will be in the relatively same location and similar elevation, it can be assumed that they will have a similar Hydroperiod as the existing ditches. The proposed ditches will be maintained, and because they are along the proposed roadway, they will be devoid of tree canopy and available for foraging by wood storks. The proposed project will be re-evaluated for wetland impacts and biomass loss during design and permitting phase.

Lastly, the offsite wetland mitigation for the proposed project will be obtained from an USFWS approved wetland mitigation bank and within a core foraging area of a wood stork colony. Therefore, ensuring no net loss of foraging habitat or biomass from the wetland impacts associated with the preferred alternative.

Conclusions

The offsite source of mitigation for the proposed project will be obtained from an USFWS approved wetland mitigation bank and within a core foraging area of a wood stork colony. For several reasons, it is concluded that wood stork forage biomass impacts are sufficiently compensated by the mitigation provided by the project.

1. All wetland mitigation will be provided from an USFWS approved wetland mitigation bank, such as Reedy Creek Mitigation Bank and Southport Ranch Mitigation Bank. These banks are located within core foraging areas and will compensate for the net loss of foraging biomass as a result of the construction of the preferred alternative.
2. Roadside ditches are fully mitigated onsite by construction of new ditches
3. The proposed onsite ponds and floodplain compensation area will provide partially mitigation of the biomass after the project is constructed.
4. It is anticipated that the onsite stormwater ponds will provide a Hydroperiod Class Rank of 6, and it will be maintained free of canopy coverage.
5. It is anticipated that the FPC will provide a Hydroperiod Class Rank of 3, and it will also be free of canopy coverage.

This analysis was conducted in accordance with USFWS Florida Programmatic Concurrence Wood Stork Key (2010), and the results of this analysis indicate that the preferred alternative will result in a net increase of foraging biomass for wood storks. Therefore, the results support the preferred alternative's effect determination of **May Affect, Not Likely to Adversely Affect** the wood stork.

References

U.S. Fish and Wildlife Service. USFWS South Florida Programmatic Concurrence Wood Stork Key 2010. Available at: https://www.saj.usace.army.mil/Portals/44/docs/regulatory/sourcebook/endangered_species/wood_stork/20100518_letter_ServicetoCorps_FLProgrammaticStorkrevised.pdf

Attachment A
Wood Stork Foraging Analysis Datasheet

Appendix B: Wood Stork Foraging Analysis Methodology

Hydroperiod	Existing Footprint		Preserve Areas				Net Change Per Hydroperiod Class	
			Pre Enhancement		Post Enhancement			
	Acres	Kgrams	Acres	Kgrams	Acres	Kgrams	Acres	Kgrams
Class 1: 0 to 60 Days	0.460	0.27					-0.46	-0.26620331
Class 2: 60 to 120 Days	4.04	4.68					-4.04	-4.67591894
Class 3: 120 to 180 Days							0	0
Class 4: 180 to 240 Days	1.47	7.15					-1.47	-7.14582266
Class 5: 240 to 300 Days	11.470	69.03					-11.47	-69.0323043
Class 6: 300 to 330 Days	8.080	56.11					-8.08	
Class 7: 330 to 365 Days	28.720	216.29					-28.72	-216.290186
TOTAL	54.240	353.52	0.00	0.00	0.00	0.00	-54.24	-297.41

% Exotics	F.S.V	Hydroperiods	fish g/m^2
0-25	1	**Class 1**	0.26
25-50	0.64	**Class 2**	0.52
50-75	0.37	**Class 3**	1.20
75-90	0.03	**Class 4**	2.18
>90	0	**Class 5**	2.704
		Class 6	3.12
		Class 7	3.38

IMPACT AREA

Hydroperiods	Acres	% exotics	F.S.V	m^2	m^2 suitable	fish g/m^2	available fish	55% consum.	Biomass (kg)
Class 1	0.46	0-25	1	1,861.56	1,861.56	0.26	484.01	266.20	0.27
Class 2	4.040	0-25	1	16,349.37	16,349.37	0.52	8,501.67	4,675.92	4.68
Class 4	1.470	0-25	1	5,948.90	5,948.90	2.184	12,992.40	7,145.82	7.15
Class 5	11.470	0-25	1	46,417.63	46,417.63	2.704	125,513.28	69,032.30	69.03
Class 6	8.080	0-25	1	32,698.73	32,698.73	3.12	102,020.05	56,111.03	56.11
Class 7	28.720	0-25	1	116,226.19	116,226.19	3.38	392,844.53	216,064.49	216.06
			FALSE	0.00	0.00	FALSE	0.00	0.00	0.00
			FALSE	0.00	0.00	FALSE	0.00	0.00	0.00
			FALSE	0.00	0.00	FALSE	0.00	0.00	0.00
			FALSE	0.00	0.00	FALSE	0.00	0.00	0.00
			FALSE	0.00	0.00	FALSE	0.00	0.00	0.00
			FALSE	0.00	0.00	FALSE	0.00	0.00	0.00
			FALSE	0.00	0.00	FALSE	0.00	0.00	0.00
			FALSE	0.00	0.00	FALSE	0.00	0.00	0.00
			FALSE	0.00	0.00	FALSE	0.00	0.00	0.00
TOTAL	**54.240**			219,502.39	219,502.39	12.17	642,355.94	353,295.77	**353.30**

Short Hydroperiod Wetlands (Class 1, 2, and 3)

Acres	4.50
Biomass (kg)	4.94

Long Hydroperiod Wetlands (Class 4, 5, 6, and 7)

Acres	49.74
Biomass (kg)	348.35

PRESERVE AREA (PRE)

Hydroperiods	Acres	% exotics	F.S.V	m^2	m^2 suitable	fish g/m^2	available fish	55% consum.	Biomass (kg)
			FALSE	0.00	0.00	FALSE	0.00	0.00	0.00
			FALSE	0.00	0.00	FALSE	0.00	0.00	0.00
			FALSE	0.00	0.00	FALSE	0.00	0.00	0.00
			FALSE	0.00	0.00	FALSE	0.00	0.00	0.00
			FALSE	0.00	0.00	FALSE	0.00	0.00	0.00
			FALSE	0.00	0.00	FALSE	0.00	0.00	0.00
			FALSE	0.00	0.00	FALSE	0.00	0.00	0.00
			FALSE	0.00	0.00	FALSE	0.00	0.00	0.00
			FALSE	0.00	0.00	FALSE	0.00	0.00	0.00
			FALSE	0.00	0.00	FALSE	0.00	0.00	0.00
			FALSE	0.00	0.00	FALSE	0.00	0.00	0.00
			FALSE	0.00	0.00	FALSE	0.00	0.00	0.00
			FALSE	0.00	0.00	FALSE	0.00	0.00	0.00
			FALSE	0.00	0.00	FALSE	0.00	0.00	0.00
			FALSE	0.00	0.00	FALSE	0.00	0.00	0.00
TOTAL	**0.00**								**0.00**

PRESERVE AREA (POST)

Hydroperiods	Acres	% exotics	F.S.V	m^2	m^2 suitable	fish g/m^2	available fish	55% consum.	Biomass (kg)
			FALSE	0.00	0.00	FALSE	0.00	0.00	0.00
			FALSE	0.00	0.00	FALSE	0.00	0.00	0.00
			FALSE	0.00	0.00	FALSE	0.00	0.00	0.00
			FALSE	0.00	0.00	FALSE	0.00	0.00	0.00
			FALSE	0.00	0.00	FALSE	0.00	0.00	0.00
			FALSE	0.00	0.00	FALSE	0.00	0.00	0.00
			FALSE	0.00	0.00	FALSE	0.00	0.00	0.00
			FALSE	0.00	0.00	FALSE	0.00	0.00	0.00
			FALSE	0.00	0.00	FALSE	0.00	0.00	0.00
			FALSE	0.00	0.00	FALSE	0.00	0.00	0.00
			FALSE	0.00	0.00	FALSE	0.00	0.00	0.00
			FALSE	0.00	0.00	FALSE	0.00	0.00	0.00
			FALSE	0.00	0.00	FALSE	0.00	0.00	0.00
			FALSE	0.00	0.00	FALSE	0.00	0.00	0.00
			FALSE	0.00	0.00	FALSE	0.00	0.00	0.00
TOTAL	**0.00**			0.00	0.00	0.00	0.00	0.00	**0.00**

Total Biomass within Existing Footprint	353.5		
Total Biomass within Preserve Area Pre-Enhancement	0.0	**Net Change**	-353.5
Total Biomass within Preserve Area Post-Enhancement	0.0		

Appendix H:

South Florida Programmatic Concurrence Key for Wood Stork

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"

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[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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Cover design by
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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:

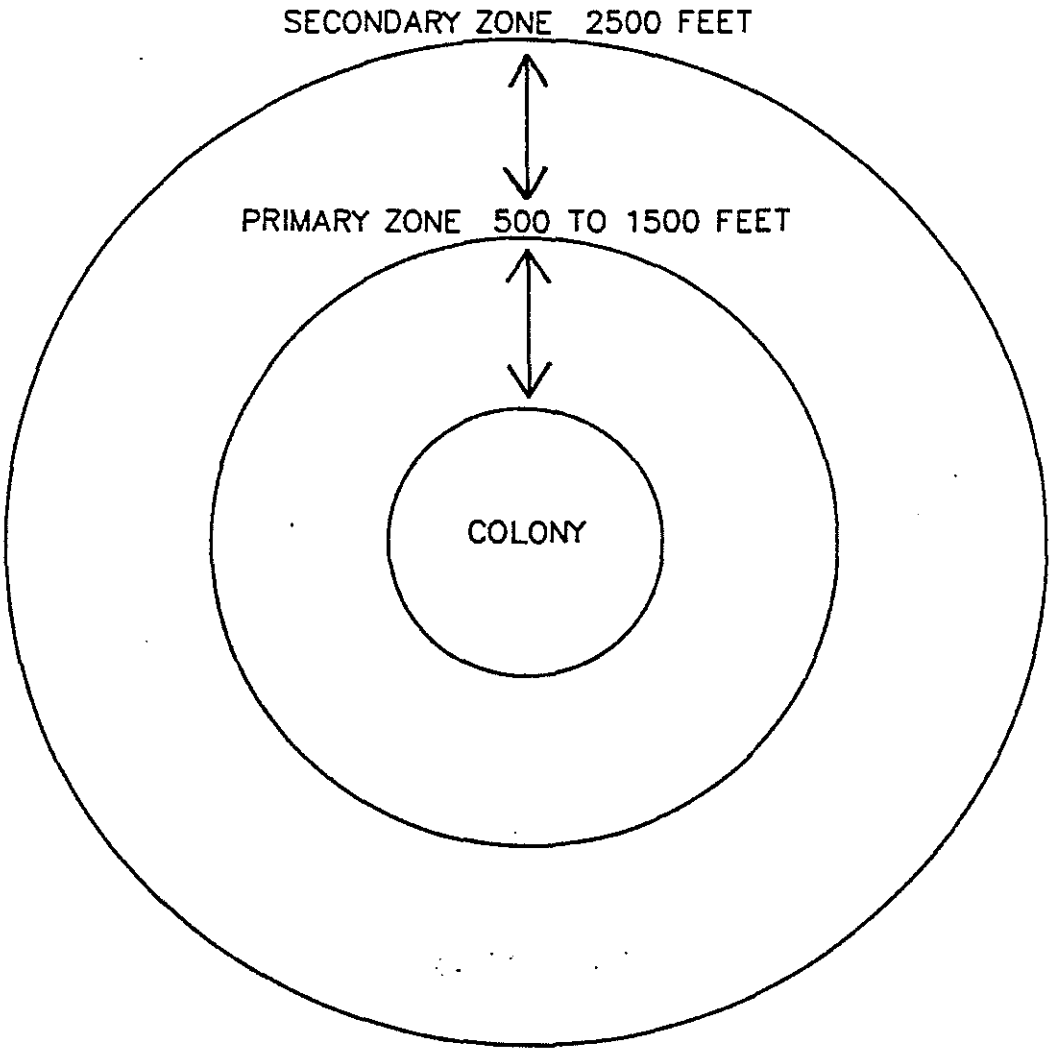
(1) Any lumbering or other removal of vegetation, and

(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...".

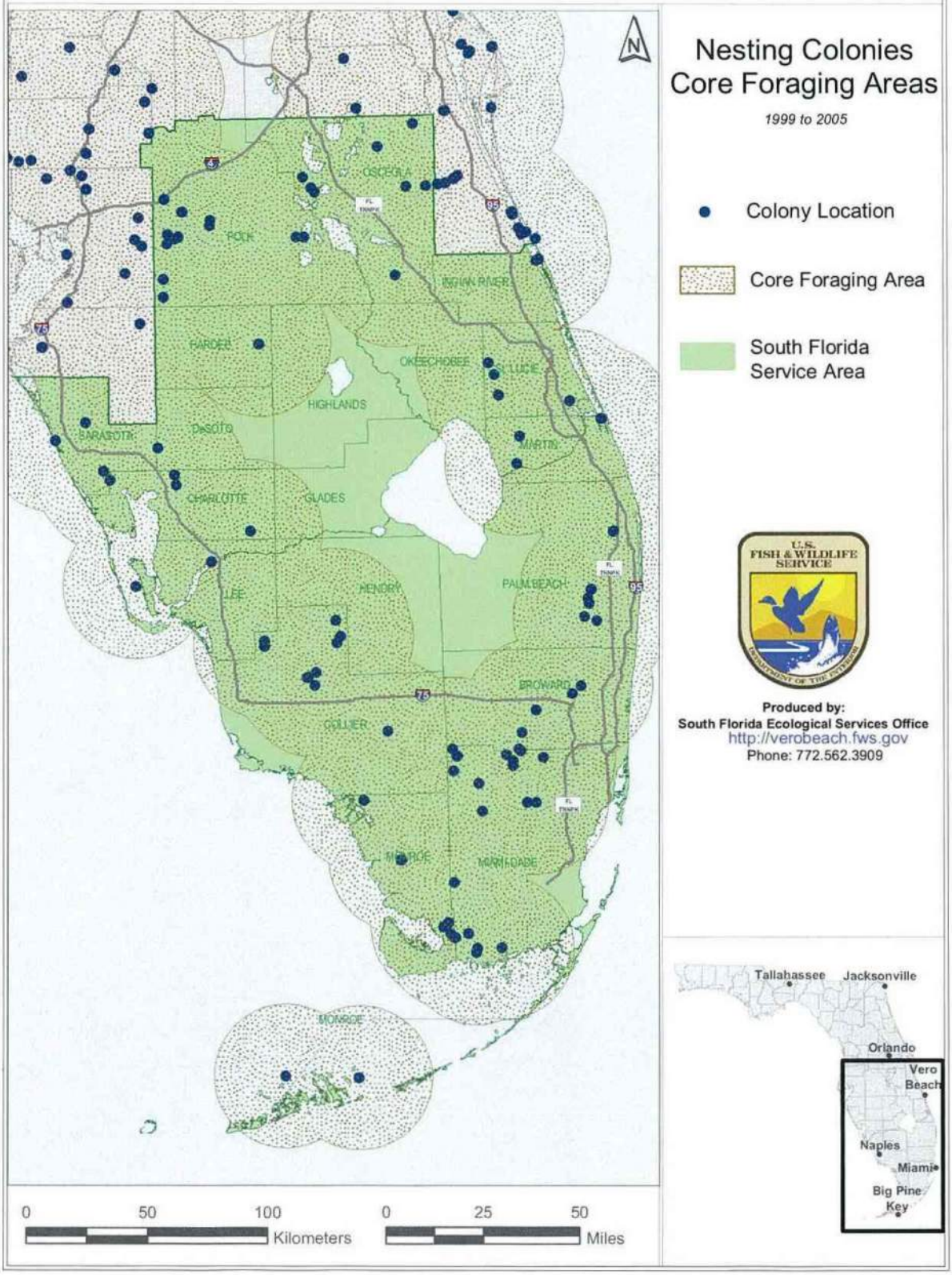
The wood stork is listed as endangered pursuant to the Endangered Wildlife Act of 1973 (Section 27-3-130 of the Code). Section 391-4-13-.06 of the Rules and Regulations of the Georgia Department of Natural Resources prohibits harassment, capture, sale, killing, or other actions which directly cause the 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

Enclosure 3

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 than120 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).

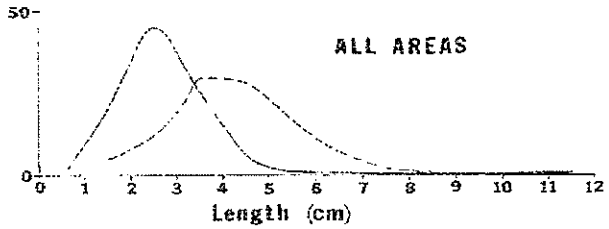


FIGURE 4. Length frequency distribution of fish available to and consumed by Wood Storks in different habitats.

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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Appendix I:

Wetland Uniform Mitigation Assessment Method Datasheets

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
US 17/92		**WL 1**

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
630	**Wetland Forested Mixed**	**Direct Impact**	**0.08** Acres

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

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

Wetland 1 is located south the intersection of Old Tampa Highway and US 17/92 and is located along the project corridor and adjacent to US 17/92.

Assessment area description

These areas are dominated by cypress with slash pine, sweetgum, red maple, sweet bay among the canopy. Understory is made up of wax mytrle, lizard tail, buttonbush, fetterbush, swamp fern, redroot, royal fern, cinnamon fern, pickerel weed, cattail, and saw palmetto.

Significant Nearby Features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Reedy Creek	**Non unique**

Functions	Mitigation for previous permit/other historic use
Water quality, water quantity, conveyance, wildlife habitat	

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)
Various birds, mammals, amphibians	**Significant use by listed wading birds**

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

Mammal tracks

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
Alex Meehean and Hannah Rowe	**March and April 2022**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
US 17/92	**-**	**WL 1**
Impact or Mitigation:	Assessment Conducted by:	Assessment Date:
Impact	**Alex Meehean and Hannah Rowe**	**March and April 2022**

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	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

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

a. Quality and quantity **of habitat support** outside of AA.	High quality wetlands adjacent to south, low quality US17/92 corridor
b. **Invasive plant species** in proximity to AA.	No invasive species observed
c. **Wildlife access** to and from AA (proximity and barriers).	Adjacent roadway may impede wildlife species
d. **Downstream benefits** provided to fish and wildlife.	Moderate
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	Potenital runoff from US17/92
f. **Hydrologic impediments and flow restrictions.**	Some from adjacent roadway
g. **Dependency** of downstream habitats on quantity or quality of discharges.	High
h. Protection of wetland functions provided by uplands (**upland** AAs only).	N/A

Current	With Impact
7	0

Additional Notes: The wetland is located on the edge of a high quality wetland to the south. Impacts may occur as a result of the proximity of the wetland to the US 17/92 corridor from runoff and disturbance.

.500(6)(b) Water Environment (n/a for uplands)

a. Appropriateness of **water levels and flows**.	Appropriate
b. Reliability of **water level indicators**.	Reliable
c. Appropriateness of **soil moisture**.	Appropriate
d. **Soil erosion** or **depositional patterns, flow rates/points of discharge.**	Limited
e. **Fire history** (frequency/severity).	None
f. **Appropriate vegetative and/or benthic zonation**.	Appropriate
g. **Hydrologic stress** on vegetation.	None
h. **Use by animal**s with hydrologic requirements.	Moderate
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	Appropriate
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	Good
k. **Water quality data** for the type of community.	N/A
l. Water depth, wave energy, currents, and light penetration.	Variable, based on rainfall

Current	With Impact
7	0

Additional Notes: Water levels were apporopriate and no signs of hydrologic stress or contamination was observed. Lower quality water may enter system via runoff from adjacent US 17/92 corridor.

.500(6)(c) Community Structure

X Vegetation
____ Benthic
____ Both

I. Appropriate/desirable species	Mostly native and desirable species
II. Invasive/exotic plant species	No exotics observed
III. Regeneration/recruitment	Appropriate
IV. Age, size distribution.	Good
V. Snags, dens, cavity, etc.	None
VI. Plants' condition.	Healthy
VII. Land management practices.	None
VIII. Topographic features (refugia, channels, hummocks).	Appropriate
IX. Submerged vegetation (only score if present).	Appropriate
X. Upland assessment area	N/A

Current	With Impact
7	0

Additional Notes: Good mix of native and desirable species present with no exotic or invasive species.

Raw Score = Sum of above scores/30 (if uplands, divide by 20)

Current	With Impact
0.7	0

Impact Acres =	0.08

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.056

Impact Delta (ID)	
Current - w/Impact	0.7

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

Additional Notes:

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
US 17/92		**WL 1**

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
630	**Wetland Forested Mixed**	**Secondary Impact**	**0.08** Acres

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

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

Wetland 1 is located south the intersection of Old Tampa Highway and US 17/92 and is located along the project corridor and adjacent to US 17/92.

Assessment area description

These areas are dominated by cypress with slash pine, sweetgum, red maple, sweet bay among the canopy. Understory is made up of wax mytrle, lizard tail, buttonbush, fetterbush, swamp fern, redroot, royal fern, cinnamon fern, pickerel weed, cattail, and saw palmetto.

Significant Nearby Features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Reedy Creek	**Non unique**

Functions	Mitigation for previous permit/other historic use
Water quality, water quantity, conveyance, wildlife habitat	

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)
Various birds, mammals, amphibians	**Significant use by listed wading birds**

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

Mammal tracks

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
Alex Meehean and Hannah Rowe	**March and April 2022**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
US 17/92	**-**	**WL 1**
Impact or Mitigation:	Assessment Conducted by:	Assessment Date:
Impact	**Alex Meehean and Hannah Rowe**	**March and April 2022**

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	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

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

a. Quality and quantity **of habitat support** outside of AA.	High quality wetlands adjacent to south, low quality US17/92 corridor
b. **Invasive plant species** in proximity to AA.	No invasive species observed
c. **Wildlife access** to and from AA (proximity and barriers).	Adjacent roadway may impede wildlife species
d. **Downstream benefits** provided to fish and wildlife.	Moderate
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	Potenital runoff from US17/92
f. **Hydrologic impediments and flow restrictions.**	Some from adjacent roadway
g. **Dependency** of downstream habitats on quantity or quality of discharges.	High
h. Protection of wetland functions provided by uplands (**upland** AAs only).	N/A

Current	With Impact
7	6

Additional Notes: The wetland is located on the edge of a high quality wetland to the south. Impacts may occur as a result of the proximity of the wetland to the US 17/92 corridor from runoff and disturbance.

.500(6)(b) Water Environment (n/a for uplands)

a. Appropriateness of **water levels and flows**.	Appropriate
b. Reliability of **water level indicators**.	Reliable
c. Appropriateness of **soil moisture**.	Appropriate
d. **Soil erosion** or **depositional patterns, flow rates/points of discharge.**	Limited
e. **Fire history** (frequency/severity).	None
f. **Appropriate vegetative and/or benthic zonation**.	Appropriate
g. **Hydrologic stress** on vegetation.	None
h. **Use by animal**s with hydrologic requirements.	Moderate
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	Appropriate
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	Good
k. **Water quality data** for the type of community.	N/A
l. Water depth, wave energy, currents, and light penetration.	Variable, based on rainfall

Current	With Impact
7	7

Additional Notes: Water levels were apporopriate and no signs of hydrologic stress or contamination was observed. Lower quality water may enter system via runoff from adjacent US 17/92 corridor.

.500(6)(c) Community Structure

_X_ Vegetation
_____ Benthic
_____ Both

I. Appropriate/desirable species	Mostly native and desirable species
II. Invasive/exotic plant species	No exotics observed
III. Regeneration/recruitment	Appropriate
IV. Age, size distribution.	Good
V. Snags, dens, cavity, etc.	None
VI. Plants' condition.	Healthy
VII. Land management practices.	None
VIII. Topographic features (refugia, channels, hummocks).	Appropriate
IX. Submerged vegetation (only score if present).	Appropriate
X. Upland assessment area	N/A

Current	With Impact
7	6

Additional Notes: Good mix of native and desirable species present with no exotic or invasive species.

Raw Score = Sum of above scores/30 (if uplands, divide by 20)

Current	With Impact
0.7	0.633333333

Impact Acres =	0.08

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.005

Impact Delta (ID)	
Current - w/Impact	0.066666667

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

Additional Notes:

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
US 17/92		**WL2**

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
630	**Wetland Forested Mixed**	**Direct Impact**	**16.78** Acres

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

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

Wetland 2 is located western portion of the study area, along the south side US 17/92. Wetland 2 is contiguous with the larger wetland system outside of the study area and it is directly connected to Reedy Creek.

Assessment area description

These areas are dominated by cypress with slash pine, sweetgum, red maple, sweet bay among the canopy. Understory is made up of elderberry, wax mytrle, lizard tail, buttonbush, fetterbush, swamp fern, redroot, royal fern, cinnamon fern, pickerel weed, cattail, and saw palmetto.

Significant Nearby Features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Reedy Creek	**Not unique**
Functions	Mitigation for previous permit/other historic use
Water quality, water quantity	
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)
Various birds, mammals, amphibians	**Significant use by listed wading birds**

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

Alligators, raccoons, white ibis, great egret, great blue heron

Additional relevant factors:

Reedy Creek flows through Wetland 2

Assessment conducted by:	Assessment date(s):
Alex Meehean and Hannah Rowe	**March and April 2022**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
US 17/92	**-**	**WL2**
Impact or Mitigation:	Assessment Conducted by:	Assessment Date:
Impact	**Alex Meehean and Hannah Rowe**	**March and April 2022**

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	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

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

a. Quality and quantity **of habitat support** outside of AA.	High quality wetland and Reedy Creek, low quality from 17/92 corridor
b. **Invasive plant species** in proximity to AA.	Minimal observed, mainly along edges
c. **Wildlife access** to and from AA (proximity and barriers).	Roadway may impede wildlife access
d. **Downstream benefits** provided to fish and wildlife.	High
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	Potenital runoff from US17/92
f. **Hydrologic impediments and flow restrictions.**	Some from adjacent roadway
g. **Dependency** of downstream habitats on quantity or quality of discharges.	High
h. Protection of wetland functions provided by uplands (**upland** AAs only).	N/A

Additional Notes: Reedy Creek runs through Wetland 2 and continues south. Impacts may occur as a result of the proximity of the wetland to the US17/92 corridor from runoff and disturbance.

Current	With Impact
8	0

.500(6)(b) Water Environment (n/a for uplands)

a. Appropriateness of **water levels and flows**.	Appropriate
b. Reliability of **water level indicators**.	Reliable
c. Appropriateness of **soil moisture**.	Appropriate
d. **Soil erosion** or **depositional patterns, flow rates/points of discharge.**	Limited
e. **Fire history** (frequency/severity).	None
f. **Appropriate vegetative and/or benthic zonation**.	Appropriate
g. **Hydrologic stress** on vegetation.	Limited
h. **Use by animal**s with hydrologic requirements.	High
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	Appropriate
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	Good
k. **Water quality data** for the type of community.	N/A
l. Water depth, wave energy, currents, and light penetration.	Variable, based on rainfall

Additional Notes: Water levels were apporopriate and no signs of hydrologic stress or contamination was observed. Lower quality water may enter the system via runoff from US 17/92.

Current	With Impact
8	0

.500(6)(c) Community Structure

X Vegetation

____ Benthic

____ Both

I. Appropriate/desirable species	Mostly native, desirable species
II. Invasive/exotic plant species	Minimal exotics
III. Regeneration/recruitment	Appropriate
IV. Age, size distribution.	Good
V. Snags, dens, cavity, etc.	None
VI. Plants' condition.	Healthy
VII. Land management practices.	None
VIII. Topographic features (refugia, channels, hummocks).	None
IX. Submerged vegetation (only score if present).	Appropriate
X. Upland assessment area	N/A

Additional Notes: Good mix of native and desirable species present with minimal exotic or invasive species. Reedy Creek may provide quality habitat.

Current	With Impact
8	0

Raw Score = Sum of above scores/30 (if uplands, divide by 20)

Current	With Impact
0.8	0

Impact Delta (ID)	
Current - w/Impact	0.8

Impact Acres =	16.78

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	13.424

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

Additional Notes:

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
US 17/92		**WL2**

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
630	**Wetland Forested Mixed**	**Secondary Impact**	**3.61** Acres

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

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

Wetland 2 is located western portion of the study area, along the south side US 17/92. Wetland 2 is contiguous with the larger wetland system outside of the study area and it is directly connected to Reedy Creek.

Assessment area description

These areas are dominated by cypress with slash pine, sweetgum, red maple, sweet bay among the canopy. Understory is made up of elderberry, wax mytrle, lizard tail, buttonbush, fetterbush, swamp fern, redroot, royal fern, cinnamon fern, pickerel weed, cattail, and saw palmetto.

Significant Nearby Features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Reedy Creek	**Not unique**

Functions	Mitigation for previous permit/other historic use
Water quality, water quantity	

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)
Various birds, mammals, amphibians	**Significant use by listed wading birds**

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

Alligators, raccoons, white ibis, great egret, great blue heron

Additional relevant factors:

Reedy Creek flows through Wetland 2

Assessment conducted by:	Assessment date(s):
Alex Meehean and Hannah Rowe	**March and April 2022**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
US 17/92	**-**	**WL2**
Impact or Mitigation:	Assessment Conducted by:	Assessment Date:
Impact	**Alex Meehean and Hannah Rowe**	**March and April 2022**

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	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

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

a. Quality and quantity **of habitat support** outside of AA.	High quality wetland and Reedy Creek, low quality from 17/92 corridor
b. **Invasive plant species** in proximity to AA.	Minimal observed, mainly along edges
c. **Wildlife access** to and from AA (proximity and barriers).	Roadway may impede wildlife access
d. **Downstream benefits** provided to fish and wildlife.	High
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	Potenital runoff from US17/92
f. **Hydrologic impediments and flow restrictions.**	Some from adjacent roadway
g. **Dependency** of downstream habitats on quantity or quality of discharges.	High
h. Protection of wetland functions provided by uplands (**upland** AAs only).	N/A

Current	With Impact
8	7

Additional Notes: Reedy Creek runs through Wetland 2 and continues south. Impacts may occur as a result of the proximity of the wetland to the US17/92 corridor from runoff and disturbance.

.500(6)(b) Water Environment (n/a for uplands)

a. Appropriateness of **water levels and flows**.	Appropriate
b. Reliability of **water level indicators**.	Reliable
c. Appropriateness of **soil moisture**.	Appropriate
d. **Soil erosion** or **depositional patterns, flow rates/points of discharge.**	Limited
e. **Fire history** (frequency/severity).	None
f. **Appropriate vegetative and/or benthic zonation**.	Appropriate
g. **Hydrologic stress** on vegetation.	Limited
h. **Use by animal**s with hydrologic requirements.	High
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	Appropriate
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	Good
k. **Water quality data** for the type of community.	N/A
l. Water depth, wave energy, currents, and light penetration.	Variable, based on rainfall

Current	With Impact
8	8

Additional Notes: Water levels were apporopriate and no signs of hydrologic stress or contamination was observed. Lower quality water may enter the system via runoff from US 17/92.

.500(6)(c) Community Structure

X Vegetation
____ Benthic
____ Both

I. Appropriate/desirable species	Mostly native, desirable species
II. Invasive/exotic plant species	Minimal exotics
III. Regeneration/recruitment	Appropriate
IV. Age, size distribution.	Good
V. Snags, dens, cavity, etc.	None
VI. Plants' condition.	Healthy
VII. Land management practices.	None
VIII. Topographic features (refugia, channels, hummocks).	None
IX. Submerged vegetation (only score if present).	Appropriate
X. Upland assessment area	N/A

Current	With Impact
8	7

Additional Notes: Good mix of native and desirable species present with minimal exotic or invasive species. Reedy Creek may provide quality habitat.

Raw Score = Sum of above scores/30 (if uplands, divide by 20)

Current	With Impact
0.8	0.733333333

Impact Delta (ID)	
Current - w/Impact	0.066666667

Impact Acres =	3.61

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.241

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

Additional Notes:

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
US 17/92		**WL 2A**

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
630	**Wetland Forested Mixed**	**Direct Impact**	**4.64** Acres

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

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

Wetland 2A is located western portion of the study area, along the south side US 17/92. Wetland 2A is contiguous with the larger wetland system outside of the study area and it is directly connected to Reedy Creek.

Assessment area description

These areas are dominated by cypress with slash pine, sweetgum, red maple, sweet bay among the canopy. Understory is made up of elderberry, wax mytrle, lizard tail, buttonbush, fetterbush, swamp fern, redroot, royal fern, cinnamon fern, pickerel weed, cattail, and saw palmetto.

Significant Nearby Features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Reedy Creek	**Not unique**

Functions	Mitigation for previous permit/other historic use
Water quality, water quantity	

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)
Various birds, mammals, amphibians	**Significant use by listed wading birds**

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

Alligators, raccoons, white ibis, great egret, great blue heron

Additional relevant factors:

Reedy Creek flows through Wetland 2A

Assessment conducted by:	Assessment date(s):
Alex Meehean and Hannah Rowe	**March and April 2022**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
US 17/92	**-**	**WL 2A**
Impact or Mitigation:	Assessment Conducted by:	Assessment Date:
Impact	**Alex Meehean and Hannah Rowe**	**March and April 2022**

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	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

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

a. Quality and quantity **of habitat support** outside of AA.	High quality wetland and Reedy Creek, low quality from 17/92 corridor
b. **Invasive plant species** in proximity to AA.	Minimal observed, mainly along edges
c. **Wildlife access** to and from AA (proximity and barriers).	Roadway may impede wildlife access
d. **Downstream benefits** provided to fish and wildlife.	High
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	Potenital runoff from US17/92
f. **Hydrologic impediments and flow restrictions.**	Some from adjacent roadway
g. **Dependency** of downstream habitats on quantity or quality of discharges.	High
h. Protection of wetland functions provided by uplands (**upland** AAs only).	N/A

Current	With Impact
8	**0**

Additional Notes: Reedy Creek runs through Wetland 2 and continues south. Impacts may occur as a result of the proximity of the wetland to the US17/92 corridor from runoff and disturbance.

.500(6)(b) Water Environment (n/a for uplands)

a. Appropriateness of **water levels and flows**.	Appropriate
b. Reliability of **water level indicators**.	Reliable
c. Appropriateness of **soil moisture**.	Appropriate
d. **Soil erosion** or **depositional patterns, flow rates/points of discharge.**	Limited
e. **Fire history** (frequency/severity).	None
f. **Appropriate vegetative and/or benthic zonation**.	Appropriate
g. **Hydrologic stress** on vegetation.	Limited
h. **Use by animal**s with hydrologic requirements.	High
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	Appropriate
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	Good
k. **Water quality data** for the type of community.	N/A
l. Water depth, wave energy, currents, and light penetration.	Variable, based on rainfall

Current	With Impact
8	**0**

Additional Notes: Water levels were apporopriate and no signs of hydrologic stress or contamination was observed. Lower quality water may enter the system via runoff from US 17/92.

.500(6)(c) Community Structure

X Vegetation
____ Benthic
____ Both

I. Appropriate/desirable species	Mostly native, desirable species
II. Invasive/exotic plant species	Minimal exotics
III. Regeneration/recruitment	Appropriate
IV. Age, size distribution.	Good
V. Snags, dens, cavity, etc.	None
VI. Plants' condition.	Healthy
VII. Land management practices.	None
VIII. Topographic features (refugia, channels, hummocks).	None
IX. Submerged vegetation (only score if present).	Appropriate
X. Upland assessment area	N/A

Current	With Impact
8	**0**

Additional Notes: Good mix of native and desirable species present with minimal exotic or invasive species. Reedy Creek may provide quality habitat.

Raw Score = Sum of above scores/30 (if uplands, divide by 20)

Current	With Impact
0.8	0

Impact Acres =	4.64

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	3.712

Impact Delta (ID)	
Current - w/Impact	0.8

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

Additional Notes:

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
US 17/92		**WL 2A**

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
630	**Wetland Forested Mixed**	**Secondary Impact**	**0.39** Acres

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

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

Wetland 2A is located western portion of the study area, along the south side US 17/92. Wetland 2A is contiguous with the larger wetland system outside of the study area and it is directly connected to Reedy Creek.

Assessment area description

These areas are dominated by cypress with slash pine, sweetgum, red maple, sweet bay among the canopy. Understory is made up of elderberry, wax mytrle, lizard tail, buttonbush, fetterbush, swamp fern, redroot, royal fern, cinnamon fern, pickerel weed, cattail, and saw palmetto.

Significant Nearby Features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Reedy Creek	**Not unique**

Functions	Mitigation for previous permit/other historic use
Water quality, water quantity	

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)
Various birds, mammals, amphibians	**Significant use by listed wading birds**

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

Alligators, raccoons, white ibis, great egret, great blue heron

Additional relevant factors:

Reedy Creek flows through Wetland 2A

Assessment conducted by:	Assessment date(s):
Alex Meehean and Hannah Rowe	**March and April 2022**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
US 17/92	**-**	**WL 2A**
Impact or Mitigation:	Assessment Conducted by:	Assessment Date:
Impact	**Alex Meehean and Hannah Rowe**	**March and April 2022**

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	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

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

a. Quality and quantity **of habitat support** outside of AA.	High quality wetland and Reedy Creek, low quality from 17/92 corridor
b. **Invasive plant species** in proximity to AA.	Minimal observed, mainly along edges
c. **Wildlife access** to and from AA (proximity and barriers).	Roadway may impede wildlife access
d. **Downstream benefits** provided to fish and wildlife.	High
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	Potenital runoff from US17/92
f. **Hydrologic impediments and flow restrictions.**	Some from adjacent roadway
g. **Dependency** of downstream habitats on quantity or quality of discharges.	High
h. Protection of wetland functions provided by uplands (**upland** AAs only).	N/A

Current	With Impact
8	7

Additional Notes: Reedy Creek runs through Wetland 2 and continues south. Impacts may occur as a result of the proximity of the wetland to the US17/92 corridor from runoff and disturbance.

.500(6)(b) Water Environment (n/a for uplands)

a. Appropriateness of **water levels and flows**.	Appropriate
b. Reliability of **water level indicators**.	Reliable
c. Appropriateness of **soil moisture**.	Appropriate
d. **Soil erosion** or **depositional patterns, flow rates/points of discharge.**	Limited
e. **Fire history** (frequency/severity).	None
f. **Appropriate vegetative and/or benthic zonation**.	Appropriate
g. **Hydrologic stress** on vegetation.	Limited
h. **Use by animal**s with hydrologic requirements.	High
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	Appropriate
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	Good
k. **Water quality data** for the type of community.	N/A
l. Water depth, wave energy, currents, and light penetration.	Variable, based on rainfall

Current	With Impact
8	8

Additional Notes: Water levels were apporopriate and no signs of hydrologic stress or contamination was observed. Lower quality water may enter the system via runoff from US 17/92.

.500(6)(c) Community Structure

X Vegetation
____ Benthic
____ Both

I. Appropriate/desirable species	Mostly native, desirable species
II. Invasive/exotic plant species	Minimal exotics
III. Regeneration/recruitment	Appropriate
IV. Age, size distribution.	Good
V. Snags, dens, cavity, etc.	None
VI. Plants' condition.	Healthy
VII. Land management practices.	None
VIII. Topographic features (refugia, channels, hummocks).	None
IX. Submerged vegetation (only score if present).	Appropriate
X. Upland assessment area	N/A

Current	With Impact
8	7

Additional Notes: Good mix of native and desirable species present with minimal exotic or invasive species. Reedy Creek may provide quality habitat.

Raw Score = Sum of above scores/30 (if uplands, divide by 20)

Current	With Impact
0.8	0.733333333

Impact Delta (ID)	
Current - w/Impact	0.066666667

Impact Acres =	0.39

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.026

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

Additional Notes:

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
US 17/92		**WL3**

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
630	**Wetland Forest Mixed**	**Direct Impact**	**2.37** Acres

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

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

Wetland 3 is located in the western portion of study, north of the Intersection of 17/92 and Osceola Polk Line Road, and this system is connected to Reedy Creek.

Assessment area description

The wetland's canopy is mixed with red maple, cypress, sweetgum, and slash pines. The understory includes lizard's tail, swamp fern, royal fern, spike rushes, and wax myrtle. The wetland also consists areas of open water.

Significant Nearby Features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Reedy Creek	**Not Unique**
Functions	Mitigation for previous permit/other historic use
Water quality, water quantity, conveyance, wildlife habitat	
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)
Various birds, mammals, amphibians	**Intermittent use by listed wading birds**

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

None observed

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
Alex Meehean and Hannah Rowe	**March and April 2022**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
US 17/92	**-**	**WL3**
Impact or Mitigation:	Assessment Conducted by:	Assessment Date:
Impact	**Alex Meehean and Hannah Rowe**	**March and April 2022**

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	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

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

a. Quality and quantity **of habitat support** outside of AA.	High quality wetlands adjacent, low quality US17/92 corridor
b. **Invasive plant species** in proximity to AA.	No invasive species observed
c. **Wildlife access** to and from AA (proximity and barriers).	Adjacent roadway may impede wildlife species
d. **Downstream benefits** provided to fish and wildlife.	Low
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	Potenital runoff from US17/92
f. **Hydrologic impediments and flow restrictions.**	Some from adjacent roadway
g. **Dependency** of downstream habitats on quantity or quality of discharges.	Moderate
h. Protection of wetland functions provided by uplands (**upland** AAs only).	N/A

Current	With Impact
6	0

Additional Notes: The wetland is located by moderate quality uplands and the adjacent US 17/92 roadway corridor. Moderate impacts may occur as a result of the proximity of the wetland to the US 17/92 corridor such as runoff and increased disturbance.

.500(6)(b) Water Environment (n/a for uplands)

a. Appropriateness of **water levels and flows**.	Appropriate
b. Reliability of **water level indicators**.	Reliable
c. Appropriateness of **soil moisture**.	Appropriate
d. **Soil erosion** or **depositional patterns, flow rates/points of discharge.**	Limited
e. **Fire history** (frequency/severity).	None
f. **Appropriate vegetative and/or benthic zonation**.	Appropriate
g. **Hydrologic stress** on vegetation.	None
h. **Use by animal**s with hydrologic requirements.	Moderate
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	Appropriate
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	Good
k. **Water quality data** for the type of community.	N/A
l. Water depth, wave energy, currents, and light penetration.	Variable, based on rainfall

Current	With Impact
7	0

Additional Notes: Water levels were appropriate and no signs of hydrologic stress or contamination was observed. Lower quality water may enter the system via runoff from US 17/92 into the contiguous wetland system.

.500(6)(c) Community Structure

X Vegetation

____ Benthic

____ Both

I. Appropriate/desirable species	Mostly native and desirable species
II. Invasive/exotic plant species	No exotics observed
III. Regeneration/recruitment	Appropriate
IV. Age, size distribution.	Good
V. Snags, dens, cavity, etc.	None
VI. Plants' condition.	Healthy
VII. Land management practices.	None
VIII. Topographic features (refugia, channels, hummocks).	Appropriate
IX. Submerged vegetation (only score if present).	Appropriate
X. Upland assessment area	N/A

Current	With Impact
7	0

Additional Notes: Good mix of native and desirable species present with no exotic or invasive species.

Raw Score = Sum of above scores/30 (if uplands, divide by 20)

Current	With Impact
0.6666667	0

Impact Delta (ID)	
Current - w/Impact	0.666666667

Impact Acres =	2.37

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	1.580

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

Additional Notes:

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
US 17/92		**WL3**

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
630	**Wetland Forest Mixed**	**Secondary Impact**	**0.50** Acres

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

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

Wetland 3 is located in the western portion of study, north of the Intersection of 17/92 and Osceola Polk Line Road, and this system is connected to Reedy Creek.

Assessment area description

The wetland's canopy is mixed with red maple, cypress, sweetgum, and slash pines. The understory includes lizard's tail, swamp fern, royal fern, spike rushes, and wax myrtle. The wetland also consists areas of open water.

Significant Nearby Features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Reedy Creek	**Not Unique**

Functions	Mitigation for previous permit/other historic use
Water quality, water quantity, conveyance, wildlife habitat	

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)
Various birds, mammals, amphibians	**Intermittent use by listed wading birds**

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

None observed

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
Alex Meehean and Hannah Rowe	**March and April 2022**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
US 17/92	**-**	**WL3**
Impact or Mitigation:	Assessment Conducted by:	Assessment Date:
Impact	**Alex Meehean and Hannah Rowe**	**March and April 2022**

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	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

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

a. Quality and quantity **of habitat support** outside of AA.	High quality wetlands adjacent, low quality US17/92 corridor
b. **Invasive plant species** in proximity to AA.	No invasive species observed
c. **Wildlife access** to and from AA (proximity and barriers).	Adjacent roadway may impede wildlife species
d. **Downstream benefits** provided to fish and wildlife.	Low
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	Potenital runoff from US17/92
f. **Hydrologic impediments and flow restrictions.**	Some from adjacent roadway
g. **Dependency** of downstream habitats on quantity or quality of discharges.	Moderate
h. Protection of wetland functions provided by uplands (**upland** AAs only).	N/A

Current	With Impact
6	6

Additional Notes: The wetland is located by moderate quality uplands and the adjacent US 17/92 roadway corridor. Moderate impacts may occur as a result of the proximity of the wetland to the US 17/92 corridor such as runoff and increased disturbance.

.500(6)(b) Water Environment (n/a for uplands)

a. Appropriateness of **water levels and flows**.	Appropriate
b. Reliability of **water level indicators**.	Reliable
c. Appropriateness of **soil moisture**.	Appropriate
d. **Soil erosion** or **depositional patterns, flow rates/points of discharge.**	Limited
e. **Fire history** (frequency/severity).	None
f. **Appropriate vegetative and/or benthic zonation**.	Appropriate
g. **Hydrologic stress** on vegetation.	None
h. **Use by animal**s with hydrologic requirements.	Moderate
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	Appropriate
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	Good
k. **Water quality data** for the type of community.	N/A
l. Water depth, wave energy, currents, and light penetration.	Variable, based on rainfall

Current	With Impact
7	7

Additional Notes: Water levels were appropriate and no signs of hydrologic stress or contamination was observed. Lower quality water may enter the system via runoff from US 17/92 into the contiguous wetland system.

.500(6)(c) Community Structure

X Vegetation
____ Benthic
____ Both

I. Appropriate/desirable species	Mostly native and desirable species
II. Invasive/exotic plant species	No exotics observed
III. Regeneration/recruitment	Appropriate
IV. Age, size distribution.	Good
V. Snags, dens, cavity, etc.	None
VI. Plants' condition.	Healthy
VII. Land management practices.	None
VIII. Topographic features (refugia, channels, hummocks).	Appropriate
IX. Submerged vegetation (only score if present).	Appropriate
X. Upland assessment area	N/A

Current	With Impact
7	6

Additional Notes: Good mix of native and desirable species present with no exotic or invasive species.

Raw Score = Sum of above scores/30 (if uplands, divide by 20)

Current	With Impact
0.6666667	0.633333333

Impact Delta (ID)	
Current - w/Impact	0.033333333

Impact Acres =	0.50

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.017

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

Additional Notes:

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
US 17/92		**WL 4**

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
643	**Wet Prairie**	**Direct Impact**	**0.02** Acres

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

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

Wetland 4 is located in the western portion of the study area, and it is adjacent to Osceola Polk Line Road. A railroad right-of-way also is located to the north of this wetland.

Assessment area description

The dominant vegeation included groundsel tree, cogon grass, dog fennel, spike rush, cattail, and bahia grass

Significant Nearby Features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Reedy Creek	**Not Unique**

Functions	Mitigation for previous permit/other historic use
Water quality, water quantity, conveyance, wildlife habitat	

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)
Various birds, mammals, amphibians	**Intermittent use by listed wading birds**

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

None observed

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
Alex Meehean and Hannah Rowe	**March and April 2022**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
US 17/92	**-**	**WL 4**
Impact or Mitigation:	Assessment Conducted by:	Assessment Date:
Impact	**Alex Meehean and Hannah Rowe**	**March and April 2022**

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	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

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

	Current	With Impact
	6	**0**

a. Quality and quantity **of habitat support** outside of AA.	Low quality from US 17/92 corridor and railroad right-of-way
b. **Invasive plant species** in proximity to AA.	Moderate invasive species
c. **Wildlife access** to and from AA (proximity and barriers).	Adjacent roadway and railroad may impede access
d. **Downstream benefits** provided to fish and wildlife.	Low
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	Potential runoff from US 17/92
f. **Hydrologic impediments and flow restrictions.**	Some from adjacent roadway and railroad
g. **Dependency** of downstream habitats on quantity or quality of discharges.	Low
h. Protection of wetland functions provided by uplands (**upland** AAs only).	N/A

Additional Notes: The wetland is surrounded by low quality uplands and the adjacent US 17/92 roadway corridor. Moderate impacts may occur as a result of the proximity of the wetland to the US 17/92 corridor such as runoff and increased distrubance.

.500(6)(b) Water Environment (n/a for uplands)

	Current	With Impact
	5	**0**

a. Appropriateness of **water levels and flows**.	Appropriate
b. Reliability of **water level indicators**.	Reliable
c. Appropriateness of **soil moisture**.	Appropriate
d. **Soil erosion** or **depositional patterns, flow rates/points of discharge.**	Limited
e. **Fire history** (frequency/severity).	None
f. **Appropriate vegetative and/or benthic zonation**.	Appropriate
g. **Hydrologic stress** on vegetation.	None
h. **Use by animal**s with hydrologic requirements.	Moderate
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	Appropriate
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	Good
k. **Water quality data** for the type of community.	N/A
l. Water depth, wave energy, currents, and light penetration.	Variable, based on rainfall

Additional Notes: Water levels were appropriate and no signs of hydrologic stress or contamination was observed. Lower quality water may enter the system via runoff from US 17/92 into the contiguous wetland system.

.500(6)(c) Community Structure

X Vegetation
____ Benthic
____ Both

	Current	With Impact
	5	**0**

I. Appropriate/desirable species	Some native and desirable species
II. Invasive/exotic plant species	Moderate exotic observed
III. Regeneration/recruitment	Appropriate
IV. Age, size distribution.	Good
V. Snags, dens, cavity, etc.	None
VI. Plants' condition.	Healthy
VII. Land management practices.	Mowing of right-of-way
VIII. Topographic features (refugia, channels, hummocks).	Appropriate
IX. Submerged vegetation (only score if present).	N/A
X. Upland assessment area	N/A

Additional Notes: Invasive and exotic species present and edges of wetland continuously mowed.

Raw Score = Sum of above scores/30 (if uplands, divide by 20)

Current	With Impact
0.5333333	0

Impact Delta (ID)	
Current - w/Impact	0.533333333

Impact Acres =	0.02

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.011

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

Additional Notes:

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
US 17/92		**WL 4**

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
643	**Wet Prairie**	**Secondary Impact**	**0.09** Acres

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

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

Wetland 4 is located in the western portion of the study area, and it is adjacent to Osceola Polk Line Road. A railroad right-of-way also is located to the north of this wetland.

Assessment area description

The dominant vegeation included groundsel tree, cogon grass, dog fennel, spike rush, cattail, and bahia grass

Significant Nearby Features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Reedy Creek	**Not Unique**

Functions	Mitigation for previous permit/other historic use
Water quality, water quantity, conveyance, wildlife habitat	

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)
Various birds, mammals, amphibians	**Intermittent use by listed wading birds**

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

None observed

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
Alex Meehean and Hannah Rowe	**March and April 2022**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
US 17/92	**-**	**WL 4**
Impact or Mitigation:	Assessment Conducted by:	Assessment Date:
Impact	**Alex Meehean and Hannah Rowe**	**March and April 2022**

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	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

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

	Current	With Impact
	6	**5**

a. Quality and quantity **of habitat support** outside of AA.	Low quality from US 17/92 corridor and railroad right-of-way
b. **Invasive plant species** in proximity to AA.	Moderate invasive species
c. **Wildlife access** to and from AA (proximity and barriers).	Adjacent roadway and railroad may impede access
d. **Downstream benefits** provided to fish and wildlife.	Low
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	Potential runoff from US 17/92
f. **Hydrologic impediments and flow restrictions.**	Some from adjacent roadway and railroad
g. **Dependency** of downstream habitats on quantity or quality of discharges.	Low
h. Protection of wetland functions provided by uplands (**upland** AAs only).	N/A

Additional Notes: The wetland is surrounded by low quality uplands and the adjacent US 17/92 roadway corridor. Moderate impacts may occur as a result of the proximity of the wetland to the US 17/92 corridor such as runoff and increased distrubance.

.500(6)(b) Water Environment (n/a for uplands)

	Current	With Impact
	5	**5**

a. Appropriateness of **water levels and flows**.	Appropriate
b. Reliability of **water level indicators**.	Reliable
c. Appropriateness of **soil moisture**.	Appropriate
d. **Soil erosion** or **depositional patterns, flow rates/points of discharge.**	Limited
e. **Fire history** (frequency/severity).	None
f. **Appropriate vegetative and/or benthic zonation**.	Appropriate
g. **Hydrologic stress** on vegetation.	None
h. **Use by animal**s with hydrologic requirements.	Moderate
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	Appropriate
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	Good
k. **Water quality data** for the type of community.	N/A
l. Water depth, wave energy, currents, and light penetration.	Variable, based on rainfall

Additional Notes: Water levels were appropriate and no signs of hydrologic stress or contamination was observed. Lower quality water may enter the system via runoff from US 17/92 into the contiguous wetland system.

.500(6)(c) Community Structure

X Vegetation
____ Benthic
____ Both

	Current	With Impact
	5	**4**

I. Appropriate/desirable species	Some native and desirable species
II. Invasive/exotic plant species	Moderate exotic observed
III. Regeneration/recruitment	Appropriate
IV. Age, size distribution.	Good
V. Snags, dens, cavity, etc.	None
VI. Plants' condition.	Healthy
VII. Land management practices.	Mowing of right-of-way
VIII. Topographic features (refugia, channels, hummocks).	Appropriate
IX. Submerged vegetation (only score if present).	N/A
X. Upland assessment area	N/A

Additional Notes: Invasive and exotic species present and edges of wetland continuously mowed.

Raw Score = Sum of above scores/30 (if uplands, divide by 20)

Current	With Impact
0.5333333	0.466666667

Impact Delta (ID)	
Current - w/Impact	0.066666667

Impact Acres =	0.09

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.006

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

Additional Notes:

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
US 17/92		**WL 5**

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
630	**Wetland Forested Mixed**	**Direct Impact**	**0.27** Acres

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

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

Wetland 5 is located in the western portion of the study area and is adjacent to the southside Osceola Polk Line Road, near intersection of US17/92 and Osceola Polk Line Road. The wetland continues south outside of the study area and ultimately drains to Reedy Creek.

Assessment area description

The wetland's canopy is mixed with red maple, cypress, sweetgum, and slash pines. The understory includes lizard's tail, swamp fern, royal fern, spike rushes, and wax myrtle. The wetland also consists areas of open water.

Significant Nearby Features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Reedy Creek	**Not Unique**

Functions	Mitigation for previous permit/other historic use
Water quality, water quantity, conveyance, wildlife habitat	

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)
Various birds, mammals, amphibians	**Intermittent use by listed wading birds**

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

None observed

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
Alex Meehean and Hannah Rowe	**March and April 2022**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
US 17/92	**-**	**WL 5**
Impact or Mitigation:	Assessment Conducted by:	Assessment Date:
Impact	**Alex Meehean and Hannah Rowe**	**March and April 2022**

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	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

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

Current	With Impact
6	0

a. Quality and quantity **of habitat support** outside of AA.	Low quality road and railroad right-of-way corridor
b. **Invasive plant species** in proximity to AA.	Minimal invasive species observed
c. **Wildlife access** to and from AA (proximity and barriers).	Adjacent roadway and railroad may impede wildlife species
d. **Downstream benefits** provided to fish and wildlife.	Low
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	Potenital runoff from railroad
f. **Hydrologic impediments and flow restrictions.**	Some from adjacent roadway
g. **Dependency** of downstream habitats on quantity or quality of discharges.	Moderate
h. Protection of wetland functions provided by uplands (**upland** AAs only).	N/A

Additional Notes: The wetland is surrounded by moderate quality uplands and the adjacent US 17/92 roadway corridor. Moderate impacts may occur as a result of the proximity of the wetland to the US 17/92 corridor such as runoff and increased disturbance.

.500(6)(b) Water Environment (n/a for uplands)

Current	With Impact
6	0

a. Appropriateness of **water levels and flows**.	Appropriate
b. Reliability of **water level indicators**.	Reliable
c. Appropriateness of **soil moisture**.	Appropriate
d. **Soil erosion** or **depositional patterns, flow rates/points of discharge.**	Limited
e. **Fire history** (frequency/severity).	None
f. **Appropriate vegetative and/or benthic zonation**.	Appropriate
g. **Hydrologic stress** on vegetation.	None
h. **Use by animal**s with hydrologic requirements.	Moderate
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	Appropriate
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	Good
k. **Water quality data** for the type of community.	N/A
l. Water depth, wave energy, currents, and light penetration.	Variable, based on rainfall

Additional Notes: Water levels were appropriate and no signs of hydrologic stress or contamination was observed. Lower quality water may enter the system via runoff from US 17/92 into the contiguous wetland system.

.500(6)(c) Community Structure

X Vegetation
____ Benthic
____ Both

Current	With Impact
6	0

I. Appropriate/desirable species	Mostly native and desirable species
II. Invasive/exotic plant species	Minimal exotics observed, along wetland edges
III. Regeneration/recruitment	Appropriate
IV. Age, size distribution.	Good
V. Snags, dens, cavity, etc.	None
VI. Plants' condition.	Healthy
VII. Land management practices.	None
VIII. Topographic features (refugia, channels, hummocks).	Appropriate
IX. Submerged vegetation (only score if present).	N/A
X. Upland assessment area	N/A

Additional Notes: A good mix of native, desirable species are present, with minimal exotic or invasive species. Exotic and invasive species primarily along the edges of the wetland.

Raw Score = Sum of above scores/30 (if uplands, divide by 20)

Current	With Impact
0.6	0

Impact Delta (ID)	
Current - w/Impact	0.6

Impact Acres =	0.27

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.162

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

Additional Notes:

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
US 17/92		**WL 5**

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
630	**Wetland Forested Mixed**	**Secondary Impact**	**0.07** Acres

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

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

Wetland 5 is located in the western portion of the study area and is adjacent to the southside Osceola Polk Line Road, near intersection of US17/92 and Osceola Polk Line Road. The wetland continues south outside of the study area and ultimately drains to Reedy Creek.

Assessment area description

The wetland's canopy is mixed with red maple, cypress, sweetgum, and slash pines. The understory includes lizard's tail, swamp fern, royal fern, spike rushes, and wax myrtle. The wetland also consists areas of open water.

Significant Nearby Features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Reedy Creek	**Not Unique**
Functions	Mitigation for previous permit/other historic use
Water quality, water quantity, conveyance, wildlife habitat	
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)
Various birds, mammals, amphibians	**Intermittent use by listed wading birds**

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

None observed

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
Alex Meehean and Hannah Rowe	**March and April 2022**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
US 17/92	**-**	**WL 5**
Impact or Mitigation:	Assessment Conducted by:	Assessment Date:
Impact	**Alex Meehean and Hannah Rowe**	**March and April 2022**

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	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

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

	Current	With Impact
	6	**5**

a. Quality and quantity **of habitat support** outside of AA.	Low quality road and railroad right-of-way corridor
b. **Invasive plant species** in proximity to AA.	Minimal invasive species observed
c. **Wildlife access** to and from AA (proximity and barriers).	Adjacent roadway and railroad may impede wildlife species
d. **Downstream benefits** provided to fish and wildlife.	Low
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	Potenital runoff from railroad
f. **Hydrologic impediments and flow restrictions.**	Some from adjacent roadway
g. **Dependency** of downstream habitats on quantity or quality of discharges.	Moderate
h. Protection of wetland functions provided by uplands (**upland** AAs only).	N/A

Additional Notes: The wetland is surrounded by moderate quality uplands and the adjacent US 17/92 roadway corridor. Moderate impacts may occur as a result of the poximity of the wetland to the US 17/92 corridor such as runoff and increased disturbance.

.500(6)(b) Water Environment (n/a for uplands)

	Current	With Impact
	6	**6**

a. Appropriateness of **water levels and flows**.	Appropriate
b. Reliability of **water level indicators**.	Reliable
c. Appropriateness of **soil moisture**.	Appropriate
d. **Soil erosion** or **depositional patterns, flow rates/points of discharge.**	Limited
e. **Fire history** (frequency/severity).	None
f. **Appropriate vegetative and/or benthic zonation**.	Appropriate
g. **Hydrologic stress** on vegetation.	None
h. **Use by animal**s with hydrologic requirements.	Moderate
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	Appropriate
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	Good
k. **Water quality data** for the type of community.	N/A
l. Water depth, wave energy, currents, and light penetration.	Variable, based on rainfall

Additional Notes: Water levels were appropriate and no signs of hydrologic stress or contamination was observed. Lower quality water may enter the system via runoff from US 17/92 into the contiguous wetland system.

.500(6)(c) Community Structure

X Vegetation
____ Benthic
____ Both

	Current	With Impact
	6	**5**

I. Appropriate/desirable species	Mostly native and desirable species
II. Invasive/exotic plant species	Minimal exotics observed, along wetland edges
III. Regeneration/recruitment	Appropriate
IV. Age, size distribution.	Good
V. Snags, dens, cavity, etc.	None
VI. Plants' condition.	Healthy
VII. Land management practices.	None
VIII. Topographic features (refugia, channels, hummocks).	Appropriate
IX. Submerged vegetation (only score if present).	N/A
X. Upland assessment area	N/A

Additional Notes: A good mix of native, desirable species are present, with minimal exotic or invasive species. Exotic and invasive species primarily along the edges of the wetland.

Raw Score = Sum of above scores/30 (if uplands, divide by 20)

Current	With Impact
0.6	0.533333333

Impact Delta (ID)	
Current - w/Impact	0.066666667

Impact Acres =	0.07

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.005

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

Additional Notes:

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
US 17/92		**WL 6**

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
630	**Wetland Forested Mixed**	**Direct Impact**	**7.17** Acres

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

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

Wetland 6 is located in the western portion of the study area and is adjacent to the southside intersection of Osceola Polk Line and US 17/92. Wetland 6 is indirectly connected to Reedy Creek.

Assessment area description

The wetland's canopy is mixed with red maple, cypress, sweetgum, and slash pines. The understory includes lizard's tail, swamp fern, royal fern, spike rushes, and wax myrtle. The wetland also consists areas of open water.

Significant Nearby Features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Reedy Creek	**Not Unique**
Functions	Mitigation for previous permit/other historic use
Water quality, water quantity, conveyance, wildlife habitat	
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)
Various birds, mammals, amphibians	**Significant use by listed wading birds**

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

Little blue heron, great egret, great blue heron, white ibis, alligators

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
Alex Meehean and Hannah Rowe	**March and April 2022**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
US 17/92	**-**	**WL 6**
Impact or Mitigation:	Assessment Conducted by:	Assessment Date:
Impact	**Alex Meehean and Hannah Rowe**	**March and April 2022**

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	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

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

a. Quality and quantity **of habitat support** outside of AA.	High quality wetlands adjacent, low quality US17/92 corridor
b. **Invasive plant species** in proximity to AA.	Minimal invasive species observed
c. **Wildlife access** to and from AA (proximity and barriers).	Adjacent roadway may inpedes wildlife species
d. **Downstream benefits** provided to fish and wildlife.	Moderate
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	Potenital runoff from US 17/92
f. **Hydrologic impediments and flow restrictions.**	Some from adjacent roadway
g. **Dependency** of downstream habitats on quantity or quality of discharges.	Moderate
h. Protection of wetland functions provided by uplands (**upland** AAs only).	N/A

Current	With Impact
7	0

Additional Notes: The wetland is surrounded by mowed uplands and the adjacent US 17/92 roadway corridor. Moderate impacts may occur as a result of the poximity of the wetland to the US 17/92 corridor such as runoff and increased disturbance.

.500(6)(b) Water Environment (n/a for uplands)

a. Appropriateness of **water levels and flows**.	Appropriate
b. Reliability of **water level indicators**.	Reliable
c. Appropriateness of **soil moisture**.	Appropriate
d. **Soil erosion** or **depositional patterns, flow rates/points of discharge.**	Limited
e. **Fire history** (frequency/severity).	None
f. **Appropriate vegetative and/or benthic zonation**.	Appropriate
g. **Hydrologic stress** on vegetation.	None
h. **Use by animal**s with hydrologic requirements.	Moderate
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	Appropriate
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	Good
k. **Water quality data** for the type of community.	N/A
l. Water depth, wave energy, currents, and light penetration.	Variable, based on rainfall

Current	With Impact
7	0

Additional Notes: Water levels were appropriate and no signs of hydrologic stress or contamination was observed. Lower quality water may enter the system via runoff from US 17/92 into the contiguous wetland system.

.500(6)(c) Community Structure

X Vegetation
____ Benthic
____ Both

I. Appropriate/desirable species	Mostly native and desirable species
II. Invasive/exotic plant species	Some exotics observed
III. Regeneration/recruitment	Appropriate
IV. Age, size distribution.	Good
V. Snags, dens, cavity, etc.	None
VI. Plants' condition.	Healthy
VII. Land management practices.	Wetland edges may be treated for exotics
VIII. Topographic features (refugia, channels, hummocks).	Appropriate
IX. Submerged vegetation (only score if present).	Appropriate
X. Upland assessment area	N/A

Current	With Impact
7	0

Additional Notes: A good mix of native, desirable species are present, with minimal exotic or invasive species. Exotic and invasive species primarily along the edges of the wetland.

Raw Score = Sum of above scores/30 (if uplands, divide by 20)

Current	With Impact
0.7	0

Impact Delta (ID)	
Current - w/Impact	0.7

Impact Acres =	7.17

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	5.019

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

Additional Notes:

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
US 17/92		**WL 6**

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
630	**Wetland Forested Mixed**	**Secondary Impact**	**0.93** Acres

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

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

Wetland 6 is located in the western portion of the study area and is adjacent to the southside intersection of Osceola Polk Line and US 17/92. Wetland 6 is indirectly connected to Reedy Creek.

Assessment area description

The wetland's canopy is mixed with red maple, cypress, sweetgum, and slash pines. The understory includes lizard's tail, swamp fern, royal fern, spike rushes, and wax myrtle. The wetland also consists areas of open water.

Significant Nearby Features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Reedy Creek	**Not Unique**
Functions	Mitigation for previous permit/other historic use
Water quality, water quantity, conveyance, wildlife habitat	
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)
Various birds, mammals, amphibians	**Significant use by listed wading birds**

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

Little blue heron, great egret, great blue heron, white ibis, alligators

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
Alex Meehean and Hannah Rowe	**March and April 2022**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
US 17/92	**-**	**WL 6**
Impact or Mitigation:	Assessment Conducted by:	Assessment Date:
Impact	**Alex Meehean and Hannah Rowe**	**March and April 2022**

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	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

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

	Current	With Impact
	7	**6**

a. Quality and quantity **of habitat support** outside of AA.	High quality wetlands adjacent, low quality US17/92 corridor
b. **Invasive plant species** in proximity to AA.	Minimal invasive species observed
c. **Wildlife access** to and from AA (proximity and barriers).	Adjacent roadway may inpedes wildlife species
d. **Downstream benefits** provided to fish and wildlife.	Moderate
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	Potenital runoff from US 17/92
f. **Hydrologic impediments and flow restrictions.**	Some from adjacent roadway
g. **Dependency** of downstream habitats on quantity or quality of discharges.	Moderate
h. Protection of wetland functions provided by uplands (**upland** AAs only).	N/A

Additional Notes: The wetland is surrounded by mowed uplands and the adjacent US 17/92 roadway corridor. Moderate impacts may occur as a result of the poximity of the wetland to the US 17/92 corridor such as runoff and increased disturbance.

.500(6)(b) Water Environment (n/a for uplands)

	Current	With Impact
	7	**7**

a. Appropriateness of **water levels and flows**.	Appropriate
b. Reliability of **water level indicators**.	Reliable
c. Appropriateness of **soil moisture**.	Appropriate
d. **Soil erosion** or **depositional patterns, flow rates/points of discharge.**	Limited
e. **Fire history** (frequency/severity).	None
f. **Appropriate vegetative and/or benthic zonation**.	Appropriate
g. **Hydrologic stress** on vegetation.	None
h. **Use by animal**s with hydrologic requirements.	Moderate
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	Appropriate
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	Good
k. **Water quality data** for the type of community.	N/A
l. Water depth, wave energy, currents, and light penetration.	Variable, based on rainfall

Additional Notes: Water levels were appropriate and no signs of hydrologic stress or contamination was observed. Lower quality water may enter the system via runoff from US 17/92 into the contiguous wetland system.

.500(6)(c) Community Structure

X Vegetation
____ Benthic
____ Both

	Current	With Impact
	7	**6**

I. Appropriate/desirable species	Mostly native and desirable species
II. Invasive/exotic plant species	Some exotics observed
III. Regeneration/recruitment	Appropriate
IV. Age, size distribution.	Good
V. Snags, dens, cavity, etc.	None
VI. Plants' condition.	Healthy
VII. Land management practices.	Wetland edges may be treated for exotics
VIII. Topographic features (refugia, channels, hummocks).	Appropriate
IX. Submerged vegetation (only score if present).	Appropriate
X. Upland assessment area	N/A

Additional Notes: A good mix of native, desirable species are present, with minimal exotic or invasive species. Exotic and invasive species primarily along the edges of the wetland.

Raw Score = Sum of above scores/30 (if uplands, divide by 20)

Current	With Impact
0.7	0.633333333

Impact Delta (ID)	
Current - w/Impact	0.066666667

Impact Acres =	0.93

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.062

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

Additional Notes:

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
US 17/92		**WL 9**

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
630	**Wetland Forested Mixed**	**Direct Impact**	**0.63** Acres

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

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

Wetland 9 is located near the central portion of the study area, east of the intersection of Old Tampa Highway and US 17/92. Wetland 9 contiguous with the larger wetland system outside of the study area and it is directly connected to Reedy Creek.

Assessment area description

The area has a canopy of cypress, slash pine, red maple, and sweet gum. The majority of the understory is sparse of vegeation but includes saw palmetto, lizard's tail, Virginia chain fern, and several nutsedge species.

Significant Nearby Features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Reedy Creek	**Not unique**
Functions	Mitigation for previous permit/other historic use
Water quality, water quantity, conveyance, wildlife habitat	
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)
Various birds, mammals, amphibians	**Intermittent use by listed wading birds**

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

None observed

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
Alex Meehean and Hannah Rowe	**March and April 2022**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
US 17/92	**-**	**WL 9**
Impact or Mitigation:	Assessment Conducted by:	Assessment Date:
Impact	**Alex Meehean and Hannah Rowe**	**March and April 2022**

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	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

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

a. Quality and quantity **of habitat support** outside of AA.	Moderate quality upland/wetlands adjacent, low quality US 17/92 corridor
b. **Invasive plant species** in proximity to AA.	No invasive species observed
c. **Wildlife access** to and from AA (proximity and barriers).	Adajcent roadway may impede wildlife species
d. **Downstream benefits** provided to fish and wildlife.	Low
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	Potenial runoff from US 17/92
f. **Hydrologic impediments and flow restrictions.**	Some from adjacent roadway
g. **Dependency** of downstream habitats on quantity or quality of discharges.	Moderate
h. Protection of wetland functions provided by uplands (**upland** AAs only).	N/A

Current	With Impact
8	0

Additional Notes: The wetland is surrounded by moderate quality uplands and the adjacent US 17/92 roadway corridor. Moderate impacts may occur as a result of the poximity of the wetland to the US 17/92 corridor such as runoff and increased disturbance.

.500(6)(b) Water Environment (n/a for uplands)

a. Appropriateness of **water levels and flows**.	Appropriate
b. Reliability of **water level indicators**.	Reliable
c. Appropriateness of **soil moisture**.	Appropriate
d. **Soil erosion** or **depositional patterns, flow rates/points of discharge.**	Limited
e. **Fire history** (frequency/severity).	None
f. **Appropriate vegetative and/or benthic zonation**.	Appropriate
g. **Hydrologic stress** on vegetation.	None
h. **Use by animal**s with hydrologic requirements.	Moderate
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	Appropriate
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	Good
k. **Water quality data** for the type of community.	N/A
l. Water depth, wave energy, currents, and light penetration.	Variable, based on rainfall

Current	With Impact
7	0

Additional Notes: Water levels were appropriate and no signs of hydrologic stress or contamination was observed. Lower quality water may enter the system via runoff from US 17/92 into the contiguous wetland system.

.500(6)(c) Community Structure

__X__ Vegetation

_____ Benthic

_____ Both

I. Appropriate/desirable species	Mostly native and desirable species
II. Invasive/exotic plant species	No exotics observed
III. Regeneration/recruitment	Appropriate
IV. Age, size distribution.	Good
V. Snags, dens, cavity, etc.	None
VI. Plants' condition.	Healthy
VII. Land management practices.	None
VIII. Topographic features (refugia, channels, hummocks).	Appropriate
IX. Submerged vegetation (only score if present).	N/A
X. Upland assessment area	N/A

Current	With Impact
7	0

Additional Notes: Most of undercanopy was sparse. However, there is a mix of native and desirable species present with no exotic or invasive species.

Raw Score = Sum of above scores/30 (if uplands, divide by 20)

Current	With Impact
0.7333333	0

Impact Acres =	0.63

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.462

Impact Delta (ID)	
Current - w/Impact	0.733333333

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

Additional Notes:

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
US 17/92		**WL 9**

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
630	**Wetland Forested Mixed**	**Secondary Impact**	**0.06** Acres

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

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

Wetland 9 is located near the central portion of the study area, east of the intersection of Old Tampa Highway and US 17/92. Wetland 9 contiguous with the larger wetland system outside of the study area and it is directly connected to Reedy Creek.

Assessment area description

The area has a canopy of cypress, slash pine, red maple, and sweet gum. The majority of the understory is sparse of vegeation but includes saw palmetto, lizard's tail, Virginia chain fern, and several nutsedge species.

Significant Nearby Features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Reedy Creek	**Not unique**
Functions	Mitigation for previous permit/other historic use
Water quality, water quantity, conveyance, wildlife habitat	
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)
Various birds, mammals, amphibians	**Intermittent use by listed wading birds**

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

None observed

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
Alex Meehean and Hannah Rowe	**March and April 2022**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
US 17/92	**-**	**WL 9**
Impact or Mitigation:	Assessment Conducted by:	Assessment Date:
Impact	**Alex Meehean and Hannah Rowe**	**March and April 2022**

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	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

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

a. Quality and quantity **of habitat support** outside of AA.	Moderate quality upland/wetlands adjacent, low quality US 17/92 corridor
b. **Invasive plant species** in proximity to AA.	No invasive species observed
c. **Wildlife access** to and from AA (proximity and barriers).	Adajcent roadway may impede wildlife species
d. **Downstream benefits** provided to fish and wildlife.	Low
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	Potenial runoff from US 17/92
f. **Hydrologic impediments and flow restrictions.**	Some from adjacent roadway
g. **Dependency** of downstream habitats on quantity or quality of discharges.	Moderate
h. Protection of wetland functions provided by uplands (**upland** AAs only).	N/A

Current	With Impact
8	7

Additional Notes: The wetland is surrounded by moderate quality uplands and the adjacent US 17/92 roadway corridor. Moderate impacts may occur as a result of the poximity of the wetland to the US 17/92 corridor such as runoff and increased disturbance.

.500(6)(b) Water Environment (n/a for uplands)

a. Appropriateness of **water levels and flows**.	Appropriate
b. Reliability of **water level indicators**.	Reliable
c. Appropriateness of **soil moisture**.	Appropriate
d. **Soil erosion** or **depositional patterns, flow rates/points of discharge.**	Limited
e. **Fire history** (frequency/severity).	None
f. **Appropriate vegetative and/or benthic zonation**.	Appropriate
g. **Hydrologic stress** on vegetation.	None
h. **Use by animal**s with hydrologic requirements.	Moderate
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	Appropriate
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	Good
k. **Water quality data** for the type of community.	N/A
l. Water depth, wave energy, currents, and light penetration.	Variable, based on rainfall

Current	With Impact
7	7

Additional Notes: Water levels were appropriate and no signs of hydrologic stress or contamination was observed. Lower quality water may enter the system via runoff from US 17/92 into the contiguous wetland system.

.500(6)(c) Community Structure

__X__ Vegetation

_____ Benthic

_____ Both

I. Appropriate/desirable species	Mostly native and desirable species
II. Invasive/exotic plant species	No exotics observed
III. Regeneration/recruitment	Appropriate
IV. Age, size distribution.	Good
V. Snags, dens, cavity, etc.	None
VI. Plants' condition.	Healthy
VII. Land management practices.	None
VIII. Topographic features (refugia, channels, hummocks).	Appropriate
IX. Submerged vegetation (only score if present).	N/A
X. Upland assessment area	N/A

Current	With Impact
7	6

Additional Notes: Most of undercanopy was sparse. However, there is a mix of native and desirable species present with no exotic or invasive species.

Raw Score = Sum of above scores/30 (if uplands, divide by 20)

Current	With Impact
0.7333333	0.666666667

Impact Acres =	0.06

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.004

Impact Delta (ID)	
Current - w/Impact	0.066666667

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

Additional Notes:

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
US 17/92		**WL 10**

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
630	**Wetland Forested Mixed**	**Direct Impact**	**0.69** Acres

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

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

Wetland 10 is located near the central portion of the study area, east of the intersection of Old Tampa Highway and US 17/92.

Assessment area description

The area has a canopy dominated by cypress with scattered sweet gum and slash pines. The majority of the understory is sparse of vegeation but includes lizard's tail, Virginia chain fern, and maiden cane.

Significant Nearby Features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Reedy Creek	**Non unique**
Functions	Mitigation for previous permit/other historic use
Water quality, water quantity, conveyance, wildlife habitat	
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)
Various birds, mammals, amphibians	**Intermittent use by listed wading birds**

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

None observed

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
Alex Meehean and Hannah Rowe	**March and April 2022**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
US 17/92	**-**	**WL 10**
Impact or Mitigation:	Assessment Conducted by:	Assessment Date:
Impact	**Alex Meehean and Hannah Rowe**	**March and April 2022**

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	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

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

a. Quality and quantity **of habitat support** outside of AA.	Moderate quality upland/wetlands adjacent, low quality US 17/92 corridor
b. **Invasive plant species** in proximity to AA.	No invasive species observed
c. **Wildlife access** to and from AA (proximity and barriers).	Adajcent roadway may impede wildlife species
d. **Downstream benefits** provided to fish and wildlife.	Moderate
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	Potenial runoff from US 17/92
f. **Hydrologic impediments and flow restrictions.**	Some from adjacent roadway
g. **Dependency** of downstream habitats on quantity or quality of discharges.	Moderate
h. Protection of wetland functions provided by uplands (**upland** AAs only).	N/A

Current	With Impact
8	0

Additional Notes: The wetland is surrounded by moderate quality uplands and the adjacent US 17/92 roadway corridor. Moderate impacts may occur as a result of the proximity of the wetland to the US 17/92 corridor such as runoff and increased disturbance.

.500(6)(b) Water Environment (n/a for uplands)

a. Appropriateness of **water levels and flows**.	Appropriate
b. Reliability of **water level indicators**.	Reliable
c. Appropriateness of **soil moisture**.	Appropriate
d. **Soil erosion** or **depositional patterns, flow rates/points of discharge.**	Limited
e. **Fire history** (frequency/severity).	None
f. **Appropriate vegetative and/or benthic zonation**.	Appropriate
g. **Hydrologic stress** on vegetation.	None
h. **Use by animal**s with hydrologic requirements.	Moderate
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	Appropriate
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	Good
k. **Water quality data** for the type of community.	N/A
l. Water depth, wave energy, currents, and light penetration.	Variable, based on rainfall

Current	With Impact
8	0

Additional Notes: Water levels were appropriate and no signs of hydrologic stress or contamination was observed. Lower quality water may enter the system via runoff from US 17/92 into the contiguous wetland system.

.500(6)(c) Community Structure

X Vegetation
_____ Benthic
_____ Both

I. Appropriate/desirable species	Mostly native and desirable species
II. Invasive/exotic plant species	No exotics observed
III. Regeneration/recruitment	Appropriate
IV. Age, size distribution.	Good
V. Snags, dens, cavity, etc.	None
VI. Plants' condition.	Healthy
VII. Land management practices.	None
VIII. Topographic features (refugia, channels, hummocks).	Appropriate
IX. Submerged vegetation (only score if present).	N/A
X. Upland assessment area	N/A

Current	With Impact
7	0

Additional Notes: Most of undercanopy was sparse. However, there is a mix of native and desirable species present with no exotic or invasive species.

Raw Score = Sum of above scores/30 (if uplands, divide by 20)

Current	With Impact
0.7666667	0

Impact Acres =	0.69

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.529

Impact Delta (ID)	
Current - w/Impact	0.766666667

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

Additional Notes:

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
US 17/92		**WL 10**

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
630	**Wetland Forested Mixed**	**Secondary Impact**	**0.14** Acres

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

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

Wetland 10 is located near the central portion of the study area, east of the intersection of Old Tampa Highway and US 17/92.

Assessment area description

The area has a canopy dominated by cypress with scattered sweet gum and slash pines. The majority of the understory is sparse of vegeation but includes lizard's tail, Virginia chain fern, and maiden cane.

Significant Nearby Features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Reedy Creek	**Non unique**

Functions	Mitigation for previous permit/other historic use
Water quality, water quantity, conveyance, wildlife habitat	

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)
Various birds, mammals, amphibians	**Intermittent use by listed wading birds**

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

None observed

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
Alex Meehean and Hannah Rowe	**March and April 2022**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
US 17/92	**-**	**WL 10**
Impact or Mitigation:	Assessment Conducted by:	Assessment Date:
Impact	**Alex Meehean and Hannah Rowe**	**March and April 2022**

Scoring Guidance	**Optimal (10)**	**Moderate(7)**	**Minimal (4)**	**Not Present (0)**
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	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

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

	Current	With Impact
	8	**7**

a. Quality and quantity **of habitat support** outside of AA.	Moderate quality upland/wetlands adjacent, low quality US 17/92 corridor
b. **Invasive plant species** in proximity to AA.	No invasive species observed
c. **Wildlife access** to and from AA (proximity and barriers).	Adajcent roadway may impede wildlife species
d. **Downstream benefits** provided to fish and wildlife.	Moderate
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	Potenial runoff from US 17/92
f. **Hydrologic impediments and flow restrictions.**	Some from adjacent roadway
g. **Dependency** of downstream habitats on quantity or quality of discharges.	Moderate
h. Protection of wetland functions provided by uplands (**upland** AAs only).	N/A

Additional Notes: The wetland is surrounded by moderate quality uplands and the adjacent US 17/92 roadway corridor. Moderate impacts may occur as a result of the proximity of the wetland to the US 17/92 corridor such as runoff and increased disturbance.

.500(6)(b) Water Environment (n/a for uplands)

	Current	With Impact
	8	**8**

a. Appropriateness of **water levels and flows**.	Appropriate
b. Reliability of **water level indicators**.	Reliable
c. Appropriateness of **soil moisture**.	Appropriate
d. **Soil erosion** or **depositional patterns, flow rates/points of discharge.**	Limited
e. **Fire history** (frequency/severity).	None
f. **Appropriate vegetative and/or benthic zonation**.	Appropriate
g. **Hydrologic stress** on vegetation.	None
h. **Use by animal**s with hydrologic requirements.	Moderate
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	Appropriate
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	Good
k. **Water quality data** for the type of community.	N/A
l. Water depth, wave energy, currents, and light penetration.	Variable, based on rainfall

Additional Notes: Water levels were appropriate and no signs of hydrologic stress or contamination was observed. Lower quality water may enter the system via runoff from US 17/92 into the contiguous wetland system.

.500(6)(c) Community Structure

X Vegetation
_____ Benthic
_____ Both

	Current	With Impact
	7	**6**

I. Appropriate/desirable species	Mostly native and desirable species
II. Invasive/exotic plant species	No exotics observed
III. Regeneration/recruitment	Appropriate
IV. Age, size distribution.	Good
V. Snags, dens, cavity, etc.	None
VI. Plants' condition.	Healthy
VII. Land management practices.	None
VIII. Topographic features (refugia, channels, hummocks).	Appropriate
IX. Submerged vegetation (only score if present).	N/A
X. Upland assessment area	N/A

Additional Notes: Most of undercanopy was sparse. However, there is a mix of native and desirable species present with no exotic or invasive species.

Raw Score = Sum of above scores/30 (if uplands, divide by 20)

Current	With Impact
0.7666667	0.7

Impact Acres =	0.14

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.009

Impact Delta (ID)	
Current - w/Impact	0.066666667

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

Additional Notes:

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
US 17/92		**WL 11**

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
630	**Wetland Forested Mixed**	**Direct Impact**	**0.71** Acres

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

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

Wetland 11 is near the central portion of the study area, west of Wetland 12 and on the south of US 17/92.

Assessment area description

The area has a canopy dominated by cypress, red maple, sweet gum and slash pines. The majority of the understory is sparse of vegeation but includes lizard's tail, Virginia chain fern, and maiden cane.

Significant Nearby Features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Reedy Creek	**Not Unique**

Functions	Mitigation for previous permit/other historic use
Water quality, water quantity, conveyance, wildlife habitat	

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)
Various birds, mammals, amphibians	**Intermittent use by listed wading birds**

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

Mammal tracks

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
Alex Meehean and Hannah Rowe	**March and April 2022**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
US 17/92	**-**	**WL 11**
Impact or Mitigation:	Assessment Conducted by:	Assessment Date:
Impact	**Alex Meehean and Hannah Rowe**	**March and April 2022**

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	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

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

a. Quality and quantity **of habitat support** outside of AA.	Moderate quality upland/wetlands adjacent, low quality US 17/92 corridor
b. **Invasive plant species** in proximity to AA.	Minimal invasive species observed
c. **Wildlife access** to and from AA (proximity and barriers).	Adajcent roadway may impede wildlife species
d. **Downstream benefits** provided to fish and wildlife.	Moderate
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	Potenial runoff from US 17/92
f. **Hydrologic impediments and flow restrictions.**	Some from adjacent roadway
g. **Dependency** of downstream habitats on quantity or quality of discharges.	Moderate
h. Protection of wetland functions provided by uplands (**upland** AAs only).	N/A

Current	With Impact
8	0

Additional Notes: The wetland is surrounded by moderate quality uplands and the adjacent US 17/92 roadway corridor. Moderate impacts may occur as a result of the poximity of the wetland to the US 17/92 corridor such as runoff and increased disturbance.

.500(6)(b) Water Environment (n/a for uplands)

a. Appropriateness of **water levels and flows**.	Appropriate
b. Reliability of **water level indicators**.	Reliable
c. Appropriateness of **soil moisture**.	Appropriate
d. **Soil erosion** or **depositional patterns, flow rates/points of discharge.**	Limited
e. **Fire history** (frequency/severity).	None
f. **Appropriate vegetative and/or benthic zonation**.	Appropriate
g. **Hydrologic stress** on vegetation.	None
h. **Use by animal**s with hydrologic requirements.	Moderate
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	Appropriate
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	Good
k. **Water quality data** for the type of community.	N/A
l. Water depth, wave energy, currents, and light penetration.	Variable, based on rainfall

Current	With Impact
8	0

Additional Notes: Water levels were appropriate and no signs of hydrologic stress or contamination was observed. Lower quality water may enter the system via runoff from US 17/92 into the contiguous wetland system.

.500(6)(c) Community Structure

__X__ Vegetation

_____ Benthic

_____ Both

I. Appropriate/desirable species	Mostly native and desirable species
II. Invasive/exotic plant species	Minimal
III. Regeneration/recruitment	Appropriate
IV. Age, size distribution.	Good
V. Snags, dens, cavity, etc.	None
VI. Plants' condition.	Healthy
VII. Land management practices.	None
VIII. Topographic features (refugia, channels, hummocks).	Appropriate
IX. Submerged vegetation (only score if present).	N/A
X. Upland assessment area	N/A

Current	With Impact
7	0

Additional Notes: Most of undercanopy was sparse. However, there is a mix of native and desirable species present with minimal exotic species mainly on the edges of the wetland

Raw Score = Sum of above scores/30 (if uplands, divide by 20)

Current	With Impact
0.7666667	0

Impact Delta (ID)	
Current - w/Impact	0.766666667

Impact Acres =	0.71

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.544

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

Additional Notes:

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
US 17/92		**WL 11**

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
630	**Wetland Forested Mixed**	**Secondary Impact**	**0.13** Acres

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

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

Wetland 11 is near the central portion of the study area, west of Wetland 12 and on the south of US 17/92.

Assessment area description

The area has a canopy dominated by cypress, red maple, sweet gum and slash pines. The majority of the understory is sparse of vegeation but includes lizard's tail, Virginia chain fern, and maiden cane.

Significant Nearby Features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Reedy Creek	**Not Unique**
Functions	Mitigation for previous permit/other historic use
Water quality, water quantity, conveyance, wildlife habitat	
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)
Various birds, mammals, amphibians	**Intermittent use by listed wading birds**

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

Mammal tracks

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
Alex Meehean and Hannah Rowe	**March and April 2022**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
US 17/92	**-**	**WL 11**
Impact or Mitigation:	Assessment Conducted by:	Assessment Date:
Impact	**Alex Meehean and Hannah Rowe**	**March and April 2022**

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	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

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

a. Quality and quantity **of habitat support** outside of AA.	Moderate quality upland/wetlands adjacent, low quality US 17/92 corridor
b. **Invasive plant species** in proximity to AA.	Minimal invasive species observed
c. **Wildlife access** to and from AA (proximity and barriers).	Adajcent roadway may impede wildlife species
d. **Downstream benefits** provided to fish and wildlife.	Moderate
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	Potenial runoff from US 17/92
f. **Hydrologic impediments and flow restrictions.**	Some from adjacent roadway
g. **Dependency** of downstream habitats on quantity or quality of discharges.	Moderate
h. Protection of wetland functions provided by uplands (**upland** AAs only).	N/A

Current	With Impact
8	7

Additional Notes: The wetland is surrounded by moderate quality uplands and the adjacent US 17/92 roadway corridor. Moderate impacts may occur as a result of the proximity of the wetland to the US 17/92 corridor such as runoff and increased disturbance.

.500(6)(b) Water Environment (n/a for uplands)

a. Appropriateness of **water levels and flows**.	Appropriate
b. Reliability of **water level indicators**.	Reliable
c. Appropriateness of **soil moisture**.	Appropriate
d. **Soil erosion** or **depositional patterns, flow rates/points of discharge.**	Limited
e. **Fire history** (frequency/severity).	None
f. **Appropriate vegetative and/or benthic zonation**.	Appropriate
g. **Hydrologic stress** on vegetation.	None
h. **Use by animal**s with hydrologic requirements.	Moderate
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	Appropriate
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	Good
k. **Water quality data** for the type of community.	N/A
l. Water depth, wave energy, currents, and light penetration.	Variable, based on rainfall

Current	With Impact
8	8

Additional Notes: Water levels were appropriate and no signs of hydrologic stress or contamination was observed. Lower quality water may enter the system via runoff from US 17/92 into the contiguous wetland system.

.500(6)(c) Community Structure

X Vegetation
_____ Benthic
_____ Both

I. Appropriate/desirable species	Mostly native and desirable species
II. Invasive/exotic plant species	Minimal
III. Regeneration/recruitment	Appropriate
IV. Age, size distribution.	Good
V. Snags, dens, cavity, etc.	None
VI. Plants' condition.	Healthy
VII. Land management practices.	None
VIII. Topographic features (refugia, channels, hummocks).	Appropriate
IX. Submerged vegetation (only score if present).	N/A
X. Upland assessment area	N/A

Current	With Impact
7	6

Additional Notes: Most of undercanopy was sparse. However, there is a mix of native and desirable species present with minimal exotic species mainly on the edges of the wetland

Raw Score = Sum of above scores/30 (if uplands, divide by 20)

Current	With Impact
0.7666667	0.7

Impact Acres =	0.13

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.009

Impact Delta (ID)	
Current - w/Impact	0.066666667

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

Additional Notes:

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
US 17/92		**WL 12**

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
630	**Wetland Forested Mixed**	**Direct Impact**	**0.13** Acres

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

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

Wetland 12 is in the central portion of the study area, east of Wetland 11, and on the southside US 17/92. Wetland 12 continues outside of study area, and this system collects stormwater from a culvert and drains south toward Reedy Creek.

Assessment area description

The wetland has a canopy dominated by red maple, sweet gum, and slash pines. The understory is made up of mainly primrose willow with scattered lizard's tail, pickerelweed, and nutsedges.

Significant Nearby Features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Reedy Creek	**Not Unique**

Functions	Mitigation for previous permit/other historic use
Water quality, water quantity, conveyance, wildlife habitat	

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)
Various birds, mammals, amphibians	**Intermittent use by listed wading birds**

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

None observed

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
Alex Meehean and Hannah Rowe	**March and April 2022**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
US 17/92	**-**	**WL 12**
Impact or Mitigation:	Assessment Conducted by:	Assessment Date:
Impact	**Alex Meehean and Hannah Rowe**	**March and April 2022**

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	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

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

a. Quality and quantity **of habitat support** outside of AA.	Moderate quality upland/wetlands adjacent, low quality US 17/92 corridor
b. **Invasive plant species** in proximity to AA.	Heavy invasive species observed
c. **Wildlife access** to and from AA (proximity and barriers).	Adajcent roadway may impede wildlife species
d. **Downstream benefits** provided to fish and wildlife.	Low
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	Potenial runoff from US 17/92
f. **Hydrologic impediments and flow restrictions.**	Some from adjacent roadway
g. **Dependency** of downstream habitats on quantity or quality of discharges.	Moderate
h. Protection of wetland functions provided by uplands (**upland** AAs only).	N/A

Current	With Impact
6	**0**

Additional Notes: The wetland is surrounded by developed residential uplands and the adjacent US 17/92 roadway corridor. Moderate impacts may occur as a result of the poximity of the wetland to the US 17/92 corridor such as runoff and increased disturbance.

.500(6)(b) Water Environment (n/a for uplands)

a. Appropriateness of **water levels and flows**.	Appropriate
b. Reliability of **water level indicators**.	Reliable
c. Appropriateness of **soil moisture**.	Appropriate
d. **Soil erosion** or **depositional patterns, flow rates/points of discharge.**	Moderate
e. **Fire history** (frequency/severity).	None
f. **Appropriate vegetative and/or benthic zonation**.	Appropriate
g. **Hydrologic stress** on vegetation.	None
h. **Use by animal**s with hydrologic requirements.	Moderate
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	Appropriate
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	Poor
k. **Water quality data** for the type of community.	N/A
l. Water depth, wave energy, currents, and light penetration.	Variable, based on rainfall

Current	With Impact
6	**0**

Additional Notes: Water levels were appropriate and no signs of hydrologic stress or contamination was observed. Lower quality water may enter the system via runoff from US 17/92 into the contiguous wetland system. Debris from residential yard is found throughout the wetland. Some signs of erosion from residential driveway.

.500(6)(c) Community Structure

X Vegetation
_____ Benthic
_____ Both

I. Appropriate/desirable species	Mainly Invasive species
II. Invasive/exotic plant species	High
III. Regeneration/recruitment	Appropriate
IV. Age, size distribution.	Good
V. Snags, dens, cavity, etc.	None
VI. Plants' condition.	Healthy
VII. Land management practices.	None
VIII. Topographic features (refugia, channels, hummocks).	Appropriate
IX. Submerged vegetation (only score if present).	N/A
X. Upland assessment area	N/A

Current	With Impact
5	**0**

Additional Notes: Exotic species found throughout wetland and blocks growth of native and desireable species. Debris found in wetland also blocking growth of natural species.

Raw Score = Sum of above scores/30 (if uplands, divide by 20)

Current	With Impact
0.5666667	0

Impact Acres =	0.13

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.074

Impact Delta (ID)	
Current - w/Impact	0.566666667

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

Additional Notes:

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
US 17/92		**WL 12**

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
630	**Wetland Forested Mixed**	**Secondary Impact**	**0.04** Acres

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

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

Wetland 12 is in the central portion of the study area, east of Wetland 11, and on the southside US 17/92. Wetland 12 continues outside of study area, and this system collects stormwater from a culvert and drains south toward Reedy Creek.

Assessment area description

The wetland has a canopy dominated by red maple, sweet gum, and slash pines. The understory is made up of mainly primrose willow with scattered lizard's tail, pickerelweed, and nutsedges.

Significant Nearby Features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Reedy Creek	**Not Unique**

Functions	Mitigation for previous permit/other historic use
Water quality, water quantity, conveyance, wildlife habitat	

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)
Various birds, mammals, amphibians	**Intermittent use by listed wading birds**

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

None observed

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
Alex Meehean and Hannah Rowe	**March and April 2022**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
US 17/92	**-**	**WL 12**
Impact or Mitigation:	Assessment Conducted by:	Assessment Date:
Impact	**Alex Meehean and Hannah Rowe**	**March and April 2022**

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	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

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

a. Quality and quantity **of habitat support** outside of AA.	Moderate quality upland/wetlands adjacent, low quality US 17/92 corridor
b. **Invasive plant species** in proximity to AA.	Heavy invasive species observed
c. **Wildlife access** to and from AA (proximity and barriers).	Adajcent roadway may impede wildlife species
d. **Downstream benefits** provided to fish and wildlife.	Low
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	Potenial runoff from US 17/92
f. **Hydrologic impediments and flow restrictions.**	Some from adjacent roadway
g. **Dependency** of downstream habitats on quantity or quality of discharges.	Moderate
h. Protection of wetland functions provided by uplands (**upland** AAs only).	N/A

Current	With Impact
6	5

Additional Notes: The wetland is surrounded by developed residential uplands and the adjacent US 17/92 roadway corridor. Moderate impacts may occur as a result of the poximity of the wetland to the US 17/92 corridor such as runoff and increased disturbance.

.500(6)(b) Water Environment (n/a for uplands)

a. Appropriateness of **water levels and flows**.	Appropriate
b. Reliability of **water level indicators**.	Reliable
c. Appropriateness of **soil moisture**.	Appropriate
d. **Soil erosion** or **depositional patterns, flow rates/points of discharge.**	Moderate
e. **Fire history** (frequency/severity).	None
f. **Appropriate vegetative and/or benthic zonation**.	Appropriate
g. **Hydrologic stress** on vegetation.	None
h. **Use by animal**s with hydrologic requirements.	Moderate
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	Appropriate
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	Poor
k. **Water quality data** for the type of community.	N/A
l. Water depth, wave energy, currents, and light penetration.	Variable, based on rainfall

Current	With Impact
6	6

Additional Notes: Water levels were appropriate and no signs of hydrologic stress or contamination was observed. Lower quality water may enter the system via runoff from US 17/92 into the contiguous wetland system. Debris from residential yard is found throughout the wetland. Some signs of erosion from residential driveway.

.500(6)(c) Community Structure

X Vegetation
_____ Benthic
_____ Both

I. Appropriate/desirable species	Mainly Invasive species
II. Invasive/exotic plant species	High
III. Regeneration/recruitment	Appropriate
IV. Age, size distribution.	Good
V. Snags, dens, cavity, etc.	None
VI. Plants' condition.	Healthy
VII. Land management practices.	None
VIII. Topographic features (refugia, channels, hummocks).	Appropriate
IX. Submerged vegetation (only score if present).	N/A
X. Upland assessment area	N/A

Current	With Impact
5	4

Additional Notes: Exotic species found throughout wetland and blocks growth of native and desireable species. Debris found in wetland also blocking growth of natural species.

Raw Score = Sum of above scores/30 (if uplands, divide by 20)

Current	With Impact
0.5666667	0.5

Impact Acres =	0.04

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.003

Impact Delta (ID)	
Current - w/Impact	0.066666667

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

Additional Notes:

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
US 17/92		**WL 13**

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
630	**Wetland Forested Mixed**	**Direct Impact**	**1.97** Acres

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

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

Wetland 13 is in the central portion of the study area, across from Wetland 17 and on the southside of US 17/92. Wetland 13 continues outside of the study area, and this system collects stormwater from a roadside ditch that ultimately drains toward Reedy Creek.

Assessment area description

These areas are dominated by red maple, sweetgum, American elm, and cypress. Understory is made up of elderberry, wax myrtle, lizard tail, Virginia chain fern, royal fern, bull tongue arrowhead, pickerelweed, swamp fern, and nutsedge.

Significant Nearby Features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Reedy Creek	**Non unique**
Functions	Mitigation for previous permit/other historic use
Water quality, water quantity, conveyance, wildlife habitat	
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)
Various birds, mammals, amphibians	**Significant use by listed wading birds**

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

White ibis, mammal tracks

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
Alex Meehean and Hannah Rowe	**March and April 2022**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
US 17/92	**-**	**WL 13**
Impact or Mitigation:	**Assessment Conducted by:**	**Assessment Date:**
Impact	**Alex Meehean and Hannah Rowe**	**March and April 2022**

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	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

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

a. Quality and quantity **of habitat support** outside of AA.	High quality wetlands adjacent to south, low quality US17/92 corridor
b. **Invasive plant species** in proximity to AA.	Minimal invasive species
c. **Wildlife access** to and from AA (proximity and barriers).	Adjacent roadway may impede wildlife species
d. **Downstream benefits** provided to fish and wildlife.	Moderate
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	Potential runoff from US17/92
f. **Hydrologic impediments and flow restrictions.**	Some from adjacent roadway
g. **Dependency** of downstream habitats on quantity or quality of discharges.	High
h. Protection of wetland functions provided by uplands (**upland** AAs only).	N/A

Current	With Impact
7	0

Additional Notes: The wetland is located on the edge of a high quality wetland to the south. Impacts may occur as a result of the proximity of the wetland to the US 17/92 corridor from runoff and disturbance.

.500(6)(b) Water Environment (n/a for uplands)

a. Appropriateness of **water levels and flows**.	Appropriate
b. Reliability of **water level indicators**.	Reliable
c. Appropriateness of **soil moisture**.	Appropriate
d. **Soil erosion** or **depositional patterns, flow rates/points of discharge.**	Limited
e. **Fire history** (frequency/severity).	None
f. **Appropriate vegetative and/or benthic zonation**.	Appropriate
g. **Hydrologic stress** on vegetation.	None
h. **Use by animal**s with hydrologic requirements.	Moderate
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	Appropriate
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	Good
k. **Water quality data** for the type of community.	N/A
l. Water depth, wave energy, currents, and light penetration.	Variable, based on rainfall

Current	With Impact
7	0

Additional Notes: Water levels were appropriate and no signs of hydrologic stress or contamination was observed. Lower quality water may enter system via runoff from adjacent US 17/92 corridor.

.500(6)(c) Community Structure

X Vegetation

_____ Benthic

_____ Both

I. Appropriate/desirable species	Mostly native and desirable species
II. Invasive/exotic plant species	Minimal exotics
III. Regeneration/recruitment	Appropriate
IV. Age, size distribution.	Good
V. Snags, dens, cavity, etc.	None
VI. Plants' condition.	Healthy
VII. Land management practices.	None
VIII. Topographic features (refugia, channels, hummocks).	Appropriate
IX. Submerged vegetation (only score if present).	Appropriate
X. Upland assessment area	N/A

Current	With Impact
7	0

Additional Notes: Good mix of native and desirable species present with minimal exotics, mainly along the outside ditch of the wetland.

Raw Score = Sum of above scores/30 (if uplands, divide by 20)

Current	With Impact
0.7	0

Impact Acres =	1.97

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	1.379

Impact Delta (ID)	
Current - w/Impact	0.7

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigation bank.

Additional Notes:

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
US 17/92		**WL 13**

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
630	**Wetland Forested Mixed**	**Secondary Impact**	**0.67** Acres

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

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

Wetland 13 is in the central portion of the study area, across from Wetland 17 and on the southside of US 17/92. Wetland 13 continues outside of the study area, and this system collects stormwater from a roadside ditch that ultimately drains toward Reedy Creek.

Assessment area description

These areas are dominated by red maple, sweetgum, American elm, and cypress. Understory is made up of elderberry, wax myrtle, lizard tail, Virginia chain fern, royal fern, bull tongue arrowhead, pickerelweed, swamp fern, and nutsedge.

Significant Nearby Features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Reedy Creek	**Non unique**
Functions	Mitigation for previous permit/other historic use
Water quality, water quantity, conveyance, wildlife habitat	
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)
Various birds, mammals, amphibians	**Significant use by listed wading birds**

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

White ibis, mammal tracks

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
Alex Meehean and Hannah Rowe	**March and April 2022**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
US 17/92	**-**	**WL 13**
Impact or Mitigation:	**Assessment Conducted by:**	**Assessment Date:**
Impact	**Alex Meehean and Hannah Rowe**	**March and April 2022**

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	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

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

a. Quality and quantity **of habitat support** outside of AA.	High quality wetlands adjacent to south, low quality US17/92 corridor
b. **Invasive plant species** in proximity to AA.	Minimal invasive species
c. **Wildlife access** to and from AA (proximity and barriers).	Adjacent roadway may impede wildlife species
d. **Downstream benefits** provided to fish and wildlife.	Moderate
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	Potential runoff from US17/92
f. **Hydrologic impediments and flow restrictions.**	Some from adjacent roadway
g. **Dependency** of downstream habitats on quantity or quality of discharges.	High
h. Protection of wetland functions provided by uplands (**upland** AAs only).	N/A

Current	With Impact
7	6

Additional Notes: The wetland is located on the edge of a high quality wetland to the south. Impacts may occur as a result of the proximity of the wetland to the US 17/92 corridor from runoff and disturbance.

.500(6)(b) Water Environment (n/a for uplands)

a. Appropriateness of **water levels and flows**.	Appropriate
b. Reliability of **water level indicators**.	Reliable
c. Appropriateness of **soil moisture**.	Appropriate
d. **Soil erosion** or **depositional patterns, flow rates/points of discharge.**	Limited
e. **Fire history** (frequency/severity).	None
f. **Appropriate vegetative and/or benthic zonation**.	Appropriate
g. **Hydrologic stress** on vegetation.	None
h. **Use by animal**s with hydrologic requirements.	Moderate
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	Appropriate
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	Good
k. **Water quality data** for the type of community.	N/A
l. Water depth, wave energy, currents, and light penetration.	Variable, based on rainfall

Current	With Impact
7	7

Additional Notes: Water levels were appropriate and no signs of hydrologic stress or contamination was observed. Lower quality water may enter system via runoff from adjacent US 17/92 corridor.

.500(6)(c) Community Structure

X Vegetation

_____ Benthic

_____ Both

I. Appropriate/desirable species	Mostly native and desirable species
II. Invasive/exotic plant species	Minimal exotics
III. Regeneration/recruitment	Appropriate
IV. Age, size distribution.	Good
V. Snags, dens, cavity, etc.	None
VI. Plants' condition.	Healthy
VII. Land management practices.	None
VIII. Topographic features (refugia, channels, hummocks).	Appropriate
IX. Submerged vegetation (only score if present).	Appropriate
X. Upland assessment area	N/A

Current	With Impact
7	6

Additional Notes: Good mix of native and desirable species present with minimal exotics, mainly along the outside ditch of the wetland.

Raw Score = Sum of above scores/30 (if uplands, divide by 20)	
Current	**With Impact**
0.7	0.633333333

Impact Acres =	0.67

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.045

Impact Delta (ID)	
Current - w/Impact	0.066666667

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigation bank.

Additional Notes:

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
US 17/92		**WL 14**

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
630	**Wetland Forested Mixed**	**Direct Impact**	**2.58** Acres

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

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

Wetland 14 is located in the eastern portion of the study, across from Wetland 16 and on the southside US 17/92. Wetland 14 continues outside of the study area, and this system collects stormwater from a roadside ditch and ultimately drains to Reedy Creek.

Assessment area description

These areas are dominated by cypress with slash pine, sweetgum, red maple, sweet bay among the canopy. Understory is made up of elderberry, wax myrtle, lizard tail, buttonbush, fetterbush, swamp fern, redroot, royal fern, cinnamon fern, pickerelweed, cattail, sawgrass, spike rush, and saw palmetto.

Significant Nearby Features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Reedy Creek	**Not unique**

Functions	Mitigation for previous permit/other historic use
Water quality, water quantity	

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)
Various birds, mammals, amphibians	**Significant use by listed wading birds**

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

Alligators, raccoons, white ibis

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
Alex Meehean and Hannah Rowe	**March and April 2022**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
US 17/92	**-**	**WL 14**
Impact or Mitigation:	Assessment Conducted by:	Assessment Date:
Impact	**Alex Meehean and Hannah Rowe**	**March and April 2022**

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	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

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

a. Quality and quantity **of habitat support** outside of AA.	High quality wetland and low quality from 17/92 corridor
b. **Invasive plant species** in proximity to AA.	Minimal observed, mainly along edges
c. **Wildlife access** to and from AA (proximity and barriers).	Roadway may impede wildlife access
d. **Downstream benefits** provided to fish and wildlife.	High
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	Potential runoff from US17/92
f. **Hydrologic impediments and flow restrictions.**	Some from adjacent roadway
g. **Dependency** of downstream habitats on quantity or quality of discharges.	High
h. Protection of wetland functions provided by uplands (**upland** AAs only).	N/A

Current	With Impact
7	0

Additional Notes: The wetland is surrounded by maintained uplands and the adjacent US 17/92 roadway corridor. Moderate impacts may occur as a result of the proximity of the wetland to the US 17/92 corridor such as runoff and increased disturbance.

.500(6)(b) Water Environment (n/a for uplands)

a. Appropriateness of **water levels and flows**.	Appropriate
b. Reliability of **water level indicators**.	Reliable
c. Appropriateness of **soil moisture**.	Appropriate
d. **Soil erosion** or **depositional patterns, flow rates/points of discharge.**	Limited
e. **Fire history** (frequency/severity).	None
f. **Appropriate vegetative and/or benthic zonation**.	Appropriate
g. **Hydrologic stress** on vegetation.	Limited
h. **Use by animal**s with hydrologic requirements.	High
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	Appropriate
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	Good
k. **Water quality data** for the type of community.	N/A
l. Water depth, wave energy, currents, and light penetration.	Variable, based on rainfall

Current	With Impact
7	0

Additional Notes: Water levels were appropriate and no signs of hydrologic stress or contamination was observed. Lower quality water may enter the system via runoff from US 17/92.

.500(6)(c) Community Structure

X Vegetation
____ Benthic
____ Both

I. Appropriate/desirable species	Mostly native, desirable species
II. Invasive/exotic plant species	Minimal exotics
III. Regeneration/recruitment	Appropriate
IV. Age, size distribution.	Good
V. Snags, dens, cavity, etc.	None
VI. Plants' condition.	Healthy
VII. Land management practices.	None
VIII. Topographic features (refugia, channels, hummocks).	None
IX. Submerged vegetation (only score if present).	Appropriate
X. Upland assessment area	N/A

Current	With Impact
7	0

Additional Notes: Good mix of native and desirable species present with minimal exotic or invasive species. Exotics mainly located at roadside ditch.

Raw Score = Sum of above scores/30 (if uplands, divide by 20)

Current	With Impact
0.7	0

Impact Acres =	2.58

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	1.806

Impact Delta (ID)	
Current - w/Impact	0.7

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigation bank.

Additional Notes:

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
US 17/92		**WL 14**

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
630	**Wetland Forested Mixed**	**Secondary Impact**	**1.57** Acres

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

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

Wetland 14 is located in the eastern portion of the study, across from Wetland 16 and on the southside US 17/92. Wetland 14 continues outside of the study area, and this system collects stormwater from a roadside ditch and ultimately drains to Reedy Creek.

Assessment area description

These areas are dominated by cypress with slash pine, sweetgum, red maple, sweet bay among the canopy. Understory is made up of elderberry, wax myrtle, lizard tail, buttonbush, fetterbush, swamp fern, redroot, royal fern, cinnamon fern, pickerelweed, cattail, sawgrass, spike rush, and saw palmetto.

Significant Nearby Features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Reedy Creek	**Not unique**

Functions	Mitigation for previous permit/other historic use
Water quality, water quantity	

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)
Various birds, mammals, amphibians	**Significant use by listed wading birds**

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

Alligators, raccoons, white ibis

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
Alex Meehean and Hannah Rowe	**March and April 2022**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
US 17/92	**-**	**WL 14**
Impact or Mitigation:	Assessment Conducted by:	Assessment Date:
Impact	**Alex Meehean and Hannah Rowe**	**March and April 2022**

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	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

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

a. Quality and quantity **of habitat support** outside of AA.	High quality wetland and low quality from 17/92 corridor
b. **Invasive plant species** in proximity to AA.	Minimal observed, mainly along edges
c. **Wildlife access** to and from AA (proximity and barriers).	Roadway may impede wildlife access
d. **Downstream benefits** provided to fish and wildlife.	High
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	Potential runoff from US17/92
f. **Hydrologic impediments and flow restrictions.**	Some from adjacent roadway
g. **Dependency** of downstream habitats on quantity or quality of discharges.	High
h. Protection of wetland functions provided by uplands (**upland** AAs only).	N/A

Current	With Impact
7	6

Additional Notes: The wetland is surrounded by maintained uplands and the adjacent US 17/92 roadway corridor. Moderate impacts may occur as a result of the proximity of the wetland to the US 17/92 corridor such as runoff and increased disturbance.

.500(6)(b) Water Environment (n/a for uplands)

a. Appropriateness of **water levels and flows**.	Appropriate
b. Reliability of **water level indicators**.	Reliable
c. Appropriateness of **soil moisture**.	Appropriate
d. **Soil erosion** or **depositional patterns, flow rates/points of discharge.**	Limited
e. **Fire history** (frequency/severity).	None
f. **Appropriate vegetative and/or benthic zonation**.	Appropriate
g. **Hydrologic stress** on vegetation.	Limited
h. **Use by animal**s with hydrologic requirements.	High
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	Appropriate
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	Good
k. **Water quality data** for the type of community.	N/A
l. Water depth, wave energy, currents, and light penetration.	Variable, based on rainfall

Current	With Impact
7	7

Additional Notes: Water levels were appropriate and no signs of hydrologic stress or contamination was observed. Lower quality water may enter the system via runoff from US 17/92.

.500(6)(c) Community Structure

X Vegetation
____ Benthic
____ Both

I. Appropriate/desirable species	Mostly native, desirable species
II. Invasive/exotic plant species	Minimal exotics
III. Regeneration/recruitment	Appropriate
IV. Age, size distribution.	Good
V. Snags, dens, cavity, etc.	None
VI. Plants' condition.	Healthy
VII. Land management practices.	None
VIII. Topographic features (refugia, channels, hummocks).	None
IX. Submerged vegetation (only score if present).	Appropriate
X. Upland assessment area	N/A

Current	With Impact
7	6

Additional Notes: Good mix of native and desirable species present with minimal exotic or invasive species. Exotics mainly located at roadside ditch.

Raw Score = Sum of above scores/30 (if uplands, divide by 20)

Current	With Impact
0.7	0.633333333

Impact Acres =	1.57

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.105

Impact Delta (ID)	
Current - w/Impact	0.066666667

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigation bank.

Additional Notes:

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
US 17/92		**WL 16**

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
630	**Wetland Forest Mixed**	**Direct Impact**	**6.21** Acres

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

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

Wetland 16 spreads across the eastern portion of the study area, across from Wetland 14, on the northside of US 17/92. Wetland 16 continues outside of the project area and this system collects stormwater from a roadside ditch and ultimately drains toward Reedy Creek.

Assessment area description

The wetland's canopy is mixed with red maple, cypress, sweetgum, and slash pines. Some areas include open areas that consist of elderberry, wax myrtle, groundsel tree, bushy bluestem, dogfennel, and coffeeweed. The understory includes lizard's tail, swamp fern, royal fern, and spike rushes. The wetland also consists areas of open water. The roadside ditches associated with this wetland is dominated by primrose willow.

Significant Nearby Features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Reedy Creek	**Not Unique**

Functions	Mitigation for previous permit/other historic use
Water quality, water quantity, conveyance, wildlife habitat	

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)
Various birds, mammals, amphibians	**Intermittent use by listed wading birds**

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

Alligators and white ibis

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
Alex Meehean and Hannah Rowe	**March and April 2022**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
US 17/92	**-**	**WL 16**
Impact or Mitigation:	Assessment Conducted by:	Assessment Date:
Impact	**Alex Meehean and Hannah Rowe**	**March and April 2022**

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	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

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

a. Quality and quantity **of habitat support** outside of AA.	High quality wetlands adjacent, low quality US17/92 corridor
b. **Invasive plant species** in proximity to AA.	Minimal invasive species observed
c. **Wildlife access** to and from AA (proximity and barriers).	Adjacent roadway may impede wildlife species
d. **Downstream benefits** provided to fish and wildlife.	Moderate
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	Potential runoff from US17/92
f. **Hydrologic impediments and flow restrictions.**	Some from adjacent roadway
g. **Dependency** of downstream habitats on quantity or quality of discharges.	Moderate
h. Protection of wetland functions provided by uplands (**upland** AAs only).	N/A

Additional Notes: The wetland is located by moderate quality uplands and the adjacent US 17/92 roadway corridor. Moderate impacts may occur as a result of the proximity of the wetland to the US 17/92 corridor such as runoff and increased disturbance.

Current	With Impact
6	0

.500(6)(b) Water Environment (n/a for uplands)

a. Appropriateness of **water levels and flows**.	Appropriate
b. Reliability of **water level indicators**.	Reliable
c. Appropriateness of **soil moisture**.	Appropriate
d. **Soil erosion** or **depositional patterns, flow rates/points of discharge.**	Limited
e. **Fire history** (frequency/severity).	None
f. **Appropriate vegetative and/or benthic zonation**.	Appropriate
g. **Hydrologic stress** on vegetation.	None
h. **Use by animal**s with hydrologic requirements.	Moderate
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	Appropriate
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	Good
k. **Water quality data** for the type of community.	N/A
l. Water depth, wave energy, currents, and light penetration.	Variable, based on rainfall

Additional Notes: Water levels were appropriate and no signs of hydrologic stress or contamination was observed. Lower quality water may enter the system via runoff from US 17/92 into the contiguous wetland system.

Current	With Impact
5	0

.500(6)(c) Community Structure

X Vegetation

____ Benthic

____ Both

I. Appropriate/desirable species	Mostly native and desirable species
II. Invasive/exotic plant species	Minimal exotics observed
III. Regeneration/recruitment	Appropriate
IV. Age, size distribution.	Good
V. Snags, dens, cavity, etc.	None
VI. Plants' condition.	Healthy
VII. Land management practices.	None
VIII. Topographic features (refugia, channels, hummocks).	Appropriate
IX. Submerged vegetation (only score if present).	Appropriate
X. Upland assessment area	N/A

Additional Notes: Good mix of native and desirable species present with minimal exotic species. Exotic species mainly along the roadside ditches.

Current	With Impact
6	0

Raw Score = Sum of above scores/30 (if uplands, divide by 20)

Current	With Impact
0.5666667	0

Impact Delta (ID)	
Current - w/Impact	0.566666667

Impact Acres =	6.21

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	3.519

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigation bank.

Additional Notes:

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
US 17/92		**WL 16**

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
630	**Wetland Forest Mixed**	**Secondary Impact**	**0.82** Acres

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

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

Wetland 16 spreads across the eastern portion of the study area, across from Wetland 14, on the northside of US 17/92. Wetland 16 continues outside of the project area and this system collects stormwater from a roadside ditch and ultimately drains toward Reedy Creek.

Assessment area description

The wetland's canopy is mixed with red maple, cypress, sweetgum, and slash pines. Some areas include open areas that consist of elderberry, wax myrtle, groundsel tree, bushy bluestem, dogfennel, and coffeeweed. The understory includes lizard's tail, swamp fern, royal fern, and spike rushes. The wetland also consists areas of open water. The roadside ditches associated with this wetland is dominated by primrose willow.

Significant Nearby Features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Reedy Creek	**Not Unique**

Functions	Mitigation for previous permit/other historic use
Water quality, water quantity, conveyance, wildlife habitat	

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)
Various birds, mammals, amphibians	**Intermittent use by listed wading birds**

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

Alligators and white ibis

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
Alex Meehean and Hannah Rowe	**March and April 2022**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
US 17/92	**-**	**WL 16**
Impact or Mitigation:	Assessment Conducted by:	Assessment Date:
Impact	**Alex Meehean and Hannah Rowe**	**March and April 2022**

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	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

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

a. Quality and quantity **of habitat support** outside of AA.	High quality wetlands adjacent, low quality US17/92 corridor
b. **Invasive plant species** in proximity to AA.	Minimal invasive species observed
c. **Wildlife access** to and from AA (proximity and barriers).	Adjacent roadway may impede wildlife species
d. **Downstream benefits** provided to fish and wildlife.	Moderate
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	Potential runoff from US17/92
f. **Hydrologic impediments and flow restrictions.**	Some from adjacent roadway
g. **Dependency** of downstream habitats on quantity or quality of discharges.	Moderate
h. Protection of wetland functions provided by uplands (**upland** AAs only).	N/A

Current	With Impact
6	5

Additional Notes: The wetland is located by moderate quality uplands and the adjacent US 17/92 roadway corridor. Moderate impacts may occur as a result of the proximity of the wetland to the US 17/92 corridor such as runoff and increased disturbance.

.500(6)(b) Water Environment (n/a for uplands)

a. Appropriateness of **water levels and flows**.	Appropriate
b. Reliability of **water level indicators**.	Reliable
c. Appropriateness of **soil moisture**.	Appropriate
d. **Soil erosion** or **depositional patterns, flow rates/points of discharge.**	Limited
e. **Fire history** (frequency/severity).	None
f. **Appropriate vegetative and/or benthic zonation**.	Appropriate
g. **Hydrologic stress** on vegetation.	None
h. **Use by animal**s with hydrologic requirements.	Moderate
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	Appropriate
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	Good
k. **Water quality data** for the type of community.	N/A
l. Water depth, wave energy, currents, and light penetration.	Variable, based on rainfall

Current	With Impact
5	5

Additional Notes: Water levels were appropriate and no signs of hydrologic stress or contamination was observed. Lower quality water may enter the system via runoff from US 17/92 into the contiguous wetland system.

.500(6)(c) Community Structure

X Vegetation

____ Benthic

____ Both

I. Appropriate/desirable species	Mostly native and desirable species
II. Invasive/exotic plant species	Minimal exotics observed
III. Regeneration/recruitment	Appropriate
IV. Age, size distribution.	Good
V. Snags, dens, cavity, etc.	None
VI. Plants' condition.	Healthy
VII. Land management practices.	None
VIII. Topographic features (refugia, channels, hummocks).	Appropriate
IX. Submerged vegetation (only score if present).	Appropriate
X. Upland assessment area	N/A

Current	With Impact
6	5

Additional Notes: Good mix of native and desirable species present with minimal exotic species. Exotic species mainly along the roadside ditches.

Raw Score = Sum of above scores/30 (if uplands, divide by 20)

Current	With Impact
0.5666667	0.5

Impact Delta (ID)	
Current - w/Impact	0.066666667

Impact Acres =	0.82

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.055

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigation bank.

Additional Notes:

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
US 17/92		**WL 16A**

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
630	**Wetland Forest Mixed**	**Direct Impact**	**1.08** Acres

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

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

Wetland 16A is located in the eastern portion of the study area, across from Wetland 14, on the northside of US 17/92. This system was permitted for impact under SFWMD Permit Number 171011-17. Wetland 16A continues outside of the project area and this system collects stormwater from a roadside ditch and ultimately drains toward Reedy Creek.

Assessment area description

Wetland 16A is an herbaceous system with a elderberry, wax myrtle, groundsel tree, bushy bluestem, dogfennel, and coffeeweed. The understory includes lizard's tail, swamp fern, royal fern, and soft rush.

Significant Nearby Features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Reedy Creek	**Not Unique**

Functions	Mitigation for previous permit/other historic use
Water quality, water quantity, conveyance, wildlife habitat	

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)
Various birds, mammals, amphibians	**Intermittent use by listed wading birds**

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

Alligators and white ibis

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
Alex Meehean and Hannah Rowe	**March and April 2022**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
US 17/92	**-**	**WL 16A**
Impact or Mitigation:	Assessment Conducted by:	Assessment Date:
Impact	**Alex Meehean and Hannah Rowe**	**March and April 2022**

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	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

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

a. Quality and quantity **of habitat support** outside of AA.	High quality wetlands adjacent, low quality US17/92 corridor
b. **Invasive plant species** in proximity to AA.	Minimal invasive species observed
c. **Wildlife access** to and from AA (proximity and barriers).	Adjacent roadway may impede wildlife species
d. **Downstream benefits** provided to fish and wildlife.	Moderate
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	Potential runoff from US17/92
f. **Hydrologic impediments and flow restrictions.**	Some from adjacent roadway
g. **Dependency** of downstream habitats on quantity or quality of discharges.	Moderate
h. Protection of wetland functions provided by uplands (**upland** AAs only).	N/A

Additional Notes: The wetland is located by moderate quality uplands and the adjacent US 17/92 roadway corridor. Moderate impacts may occur as a result of the proximity of the wetland to the US 17/92 corridor such as runoff and increased disturbance.

Current	With Impact
5	0

.500(6)(b) Water Environment (n/a for uplands)

a. Appropriateness of **water levels and flows**.	Appropriate
b. Reliability of **water level indicators**.	Reliable
c. Appropriateness of **soil moisture**.	Appropriate
d. **Soil erosion** or **depositional patterns, flow rates/points of discharge.**	Limited
e. **Fire history** (frequency/severity).	None
f. **Appropriate vegetative and/or benthic zonation**.	Appropriate
g. **Hydrologic stress** on vegetation.	None
h. **Use by animal**s with hydrologic requirements.	Moderate
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	Appropriate
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	Good
k. **Water quality data** for the type of community.	N/A
l. Water depth, wave energy, currents, and light penetration.	Variable, based on rainfall

Additional Notes: Water levels were appropriate and no signs of hydrologic stress or contamination was observed. Lower quality water may enter the system via runoff from US 17/92 into the contiguous wetland system.

Current	With Impact
5	0

.500(6)(c) Community Structure

X Vegetation
____ Benthic
____ Both

I. Appropriate/desirable species	Mostly native and desirable species
II. Invasive/exotic plant species	Minimal exotics observed
III. Regeneration/recruitment	Appropriate
IV. Age, size distribution.	Good
V. Snags, dens, cavity, etc.	None
VI. Plants' condition.	Healthy
VII. Land management practices.	None
VIII. Topographic features (refugia, channels, hummocks).	Appropriate
IX. Submerged vegetation (only score if present).	Appropriate
X. Upland assessment area	N/A

Additional Notes: Good mix of native and desirable species present with minimal exotic species. Exotic species mainly along the roadside ditches.

Current	With Impact
5	0

Raw Score = Sum of above scores/30 (if uplands, divide by 20)

Current	With Impact
0.5	0

Impact Acres =	1.08

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.540

Impact Delta (ID)	
Current - w/Impact	0.5

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

Additional Notes:

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
US 17/92		**WL 16A**

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
630	**Wetland Forest Mixed**	**Secondary Impact**	**0.43** Acres

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

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

Wetland 16A is located in the eastern portion of the study area, across from Wetland 14, on the northside of US 17/92. This system was permitted for impact under SFWMD Permit Number 171011-17. Wetland 16A continues outside of the project area and this system collects stormwater from a roadside ditch and ultimately drains toward Reedy Creek.

Assessment area description

Wetland 16A is an herbaceous system with a elderberry, wax myrtle, groundsel tree, bushy bluestem, dogfennel, and coffeeweed. The understory includes lizard's tail, swamp fern, royal fern, and soft rush.

Significant Nearby Features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Reedy Creek	**Not Unique**

Functions	Mitigation for previous permit/other historic use
Water quality, water quantity, conveyance, wildlife habitat	

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)
Various birds, mammals, amphibians	**Intermittent use by listed wading birds**

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

Alligators and white ibis

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
Alex Meehean and Hannah Rowe	**March and April 2022**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
US 17/92	**-**	**WL 16A**
Impact or Mitigation:	Assessment Conducted by:	Assessment Date:
Impact	**Alex Meehean and Hannah Rowe**	**March and April 2022**

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	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

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

a. Quality and quantity **of habitat support** outside of AA.	High quality wetlands adjacent, low quality US17/92 corridor
b. **Invasive plant species** in proximity to AA.	Minimal invasive species observed
c. **Wildlife access** to and from AA (proximity and barriers).	Adjacent roadway may impede wildlife species
d. **Downstream benefits** provided to fish and wildlife.	Moderate
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	Potential runoff from US17/92
f. **Hydrologic impediments and flow restrictions.**	Some from adjacent roadway
g. **Dependency** of downstream habitats on quantity or quality of discharges.	Moderate
h. Protection of wetland functions provided by uplands (**upland** AAs only).	N/A

Current	With Impact
5	4

Additional Notes: The wetland is located by moderate quality uplands and the adjacent US 17/92 roadway corridor. Moderate impacts may occur as a result of the proximity of the wetland to the US 17/92 corridor such as runoff and increased disturbance.

.500(6)(b) Water Environment (n/a for uplands)

a. Appropriateness of **water levels and flows**.	Appropriate
b. Reliability of **water level indicators**.	Reliable
c. Appropriateness of **soil moisture**.	Appropriate
d. **Soil erosion** or **depositional patterns, flow rates/points of discharge.**	Limited
e. **Fire history** (frequency/severity).	None
f. **Appropriate vegetative and/or benthic zonation**.	Appropriate
g. **Hydrologic stress** on vegetation.	None
h. **Use by animal**s with hydrologic requirements.	Moderate
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	Appropriate
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	Good
k. **Water quality data** for the type of community.	N/A
l. Water depth, wave energy, currents, and light penetration.	Variable, based on rainfall

Current	With Impact
5	5

Additional Notes: Water levels were appropriate and no signs of hydrologic stress or contamination was observed. Lower quality water may enter the system via runoff from US 17/92 into the contiguous wetland system.

.500(6)(c) Community Structure

X Vegetation

____ Benthic

____ Both

I. Appropriate/desirable species	Mostly native and desirable species
II. Invasive/exotic plant species	Minimal exotics observed
III. Regeneration/recruitment	Appropriate
IV. Age, size distribution.	Good
V. Snags, dens, cavity, etc.	None
VI. Plants' condition.	Healthy
VII. Land management practices.	None
VIII. Topographic features (refugia, channels, hummocks).	Appropriate
IX. Submerged vegetation (only score if present).	Appropriate
X. Upland assessment area	N/A

Current	With Impact
5	4

Additional Notes: Good mix of native and desirable species present with minimal exotic species. Exotic species mainly along the roadside ditches.

Raw Score = Sum of above scores/30 (if uplands, divide by 20)

Current	With Impact
0.5	0.433333333

Impact Delta (ID)	
Current - w/Impact	0.066666667

Impact Acres =	0.43

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.029

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

Additional Notes:

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
US 17/92		**WL 17**

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
630	**Mixed Forested Wetland**	**Direct Impact**	**1.41** Acres

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

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

The wetland is located along the project corridor within and adjacent to the right-of-way. The wetland continues outside of the project corridor to the north.

Assessment area description

The dominant vegeation included red maple, sweet gum, American elm, and cypress with an understory that is made up of elderberry, wax myrtle, lizard tail, Virginia chain fern, royal fern, bull-tongue arrowhead (Sagittaria lancifolia), pickerelweed, swamp fern, and nutsedge.

Significant Nearby Features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Reedy Creek	**Not Unique**

Functions	Mitigation for previous permit/other historic use
Water quality, water quantity, conveyance, wildlife habitat	

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)
Various birds, mammals, amphibians	**Intermittent use by listed wading birds**

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

None observed

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
Alex Meehean and Hannah Rowe	**March and April 2022**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
US 17/92	**-**	**WL 17**
Impact or Mitigation:	Assessment Conducted by:	Assessment Date:
Impact	**Alex Meehean and Hannah Rowe**	**March and April 2022**

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	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

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

	Current	With Impact
	6	**0**

a. Quality and quantity **of habitat support** outside of AA.	Low quality from US 17/92 corridor and railroad right-of-way
b. **Invasive plant species** in proximity to AA.	Moderate invasive species
c. **Wildlife access** to and from AA (proximity and barriers).	Adjacent roadway and railroad may impede access
d. **Downstream benefits** provided to fish and wildlife.	Low
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	Potential runoff from US 17/92
f. **Hydrologic impediments and flow restrictions.**	Some from adjacent roadway and railroad
g. **Dependency** of downstream habitats on quantity or quality of discharges.	Low
h. Protection of wetland functions provided by uplands (**upland** AAs only).	N/A

Additional Notes: The wetland is surrounded by low quality uplands and the adjacent US 17/92 roadway corridor. Moderate impacts may occur as a result of the proximity of the wetland to the US 17/92 corridor such as runoff and increased distrubance.

.500(6)(b) Water Environment (n/a for uplands)

	Current	With Impact
	5	**0**

a. Appropriateness of **water levels and flows**.	Appropriate
b. Reliability of **water level indicators**.	Reliable
c. Appropriateness of **soil moisture**.	Appropriate
d. **Soil erosion** or **depositional patterns, flow rates/points of discharge.**	Limited
e. **Fire history** (frequency/severity).	None
f. **Appropriate vegetative and/or benthic zonation**.	Appropriate
g. **Hydrologic stress** on vegetation.	None
h. **Use by animal**s with hydrologic requirements.	Moderate
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	Appropriate
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	Good
k. **Water quality data** for the type of community.	N/A
l. Water depth, wave energy, currents, and light penetration.	Variable, based on rainfall

Additional Notes: Water levels were appropriate and no signs of hydrologic stress or contamination was observed. Lower quality water may enter the system via runoff from US 17/92 into the contiguous wetland system.

.500(6)(c) Community Structure

X Vegetation
____ Benthic
____ Both

	Current	With Impact
	5	**0**

I. Appropriate/desirable species	Some native and desirable species
II. Invasive/exotic plant species	Moderate exotic observed
III. Regeneration/recruitment	Appropriate
IV. Age, size distribution.	Good
V. Snags, dens, cavity, etc.	None
VI. Plants' condition.	Healthy
VII. Land management practices.	Mowing of right-of-way
VIII. Topographic features (refugia, channels, hummocks).	Appropriate
IX. Submerged vegetation (only score if present).	N/A
X. Upland assessment area	N/A

Additional Notes: Invasive and exotic species present and edges of wetland continuously mowed.

Raw Score = Sum of above scores/30 (if uplands, divide by 20)

Current	With Impact
0.5333333	0

Impact Delta (ID)	
Current - w/Impact	0.533333333

Impact Acres =	1.41

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.752

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

Additional Notes:

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
US 17/92		**WL 17**

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
630	**Mixed Forested Wetland**	**Secondary Impact**	**0.55** Acres

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

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

The wetland is located along the project corridor within and adjacent to the right-of-way. The wetland continues outside of the project corridor to the north.

Assessment area description

The dominant vegeation included red maple, sweet gum, American elm, and cypress with an understory that is made up of elderberry, wax myrtle, lizard tail, Virginia chain fern, royal fern, bull-tongue arrowhead (Sagittaria lancifolia), pickerelweed, swamp fern, and nutsedge.

Significant Nearby Features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Reedy Creek	**Not Unique**

Functions	Mitigation for previous permit/other historic use
Water quality, water quantity, conveyance, wildlife habitat	

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)
Various birds, mammals, amphibians	**Intermittent use by listed wading birds**

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

None observed

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
Alex Meehean and Hannah Rowe	**March and April 2022**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
US 17/92	**-**	**WL 17**
Impact or Mitigation:	Assessment Conducted by:	Assessment Date:
Impact	**Alex Meehean and Hannah Rowe**	**March and April 2022**

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	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

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

a. Quality and quantity **of habitat support** outside of AA.	Low quality from US 17/92 corridor and railroad right-of-way
b. **Invasive plant species** in proximity to AA.	Moderate invasive species
c. **Wildlife access** to and from AA (proximity and barriers).	Adjacent roadway and railroad may impede access
d. **Downstream benefits** provided to fish and wildlife.	Low
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	Potential runoff from US 17/92
f. **Hydrologic impediments and flow restrictions.**	Some from adjacent roadway and railroad
g. **Dependency** of downstream habitats on quantity or quality of discharges.	Low
h. Protection of wetland functions provided by uplands (**upland** AAs only).	N/A

Additional Notes: The wetland is surrounded by low quality uplands and the adjacent US 17/92 roadway corridor. Moderate impacts may occur as a result of the proximity of the wetland to the US 17/92 corridor such as runoff and increased distrubance.

Current	With Impact
6	5

.500(6)(b) Water Environment (n/a for uplands)

a. Appropriateness of **water levels and flows**.	Appropriate
b. Reliability of **water level indicators**.	Reliable
c. Appropriateness of **soil moisture**.	Appropriate
d. **Soil erosion** or **depositional patterns, flow rates/points of discharge.**	Limited
e. **Fire history** (frequency/severity).	None
f. **Appropriate vegetative and/or benthic zonation**.	Appropriate
g. **Hydrologic stress** on vegetation.	None
h. **Use by animal**s with hydrologic requirements.	Moderate
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	Appropriate
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	Good
k. **Water quality data** for the type of community.	N/A
l. Water depth, wave energy, currents, and light penetration.	Variable, based on rainfall

Additional Notes: Water levels were appropriate and no signs of hydrologic stress or contamination was observed. Lower quality water may enter the system via runoff from US 17/92 into the contiguous wetland system.

Current	With Impact
5	5

.500(6)(c) Community Structure

X Vegetation

____ Benthic

____ Both

I. Appropriate/desirable species	Some native and desirable species
II. Invasive/exotic plant species	Moderate exotic observed
III. Regeneration/recruitment	Appropriate
IV. Age, size distribution.	Good
V. Snags, dens, cavity, etc.	None
VI. Plants' condition.	Healthy
VII. Land management practices.	Mowing of right-of-way
VIII. Topographic features (refugia, channels, hummocks).	Appropriate
IX. Submerged vegetation (only score if present).	N/A
X. Upland assessment area	N/A

Additional Notes: Invasive and exotic species present and edges of wetland continuously mowed.

Current	With Impact
5	4

Raw Score = Sum of above scores/30 (if uplands, divide by 20)

Current	With Impact
0.5333333	0.466666667

Impact Delta (ID)	
Current - w/Impact	0.066666667

Impact Acres =	0.55

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.037

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

Additional Notes:

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
US 17/92		**WL 18**

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
630	**Mixed Forested Wetland**	**Direct Impact**	**0.06** Acres

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

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

The wetland is located along the project corridor within and adjacent to the right-of-way. The upland surrounding the wetlands consists of higher quality undeveloped land and the US 17/92 corridor. The wetland collects stormwater from the roadside ditches and drains them to a forested wetland system to the north of the project corridor.

Assessment area description

The wetland's canopy is mixed with red maple, cypress, sweetgum, and slash pines. The understory includes lizard's tail, swamp fern, royal fern, spike rushes, cattail, dogfennel, nutsedge, alligator weed, and wax myrtle. The wetland also consists areas of open water.

Significant Nearby Features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Reedy Creek	**Not Unique**
Functions	Mitigation for previous permit/other historic use
Water quality, water quantity, conveyance, wildlife habitat	
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)
Various birds, mammals, amphibians	**Intermittent use by listed wading birds**

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

None observed

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
Alex Meehean and Hannah Rowe	**March and April 2022**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
US 17/92	**-**	**WL 18**
Impact or Mitigation:	Assessment Conducted by:	Assessment Date:
Impact	**Alex Meehean and Hannah Rowe**	**March and April 2022**

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	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

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

a. Quality and quantity **of habitat support** outside of AA.	Moderate quality upland/wetlands adjacent, low quality US 17/92 corridor
b. **Invasive plant species** in proximity to AA.	Minimal invasive species
c. **Wildlife access** to and from AA (proximity and barriers).	Adajcent roadway may impede wildlife species
d. **Downstream benefits** provided to fish and wildlife.	Moderate
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	Potenial runoff from US 17/92
f. **Hydrologic impediments and flow restrictions.**	Some from adjacent roadway
g. **Dependency** of downstream habitats on quantity or quality of discharges.	Moderate
h. Protection of wetland functions provided by uplands (**upland** AAs only).	N/A

Current	With Impact
8	0

Additional Notes: The wetland is surrounded by moderate quality uplands and the adjacent US 17/92 roadway corridor. Moderate impacts may occur as a result of the poximity of the wetland to the US 17/92 corridor such as runoff and increased disturbance.

.500(6)(b) Water Environment (n/a for uplands)

a. Appropriateness of **water levels and flows**.	Appropriate
b. Reliability of **water level indicators**.	Reliable
c. Appropriateness of **soil moisture**.	Appropriate
d. **Soil erosion** or **depositional patterns, flow rates/points of discharge.**	Limited
e. **Fire history** (frequency/severity).	None
f. **Appropriate vegetative and/or benthic zonation**.	Appropriate
g. **Hydrologic stress** on vegetation.	None
h. **Use by animal**s with hydrologic requirements.	Moderate
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	Appropriate
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	Good
k. **Water quality data** for the type of community.	N/A
l. Water depth, wave energy, currents, and light penetration.	Variable, based on rainfall

Current	With Impact
7	0

Additional Notes: Water levels were appropriate and no signs of hydrologic stress or contamination was observed. Lower quality water may enter the system via runoff from US 17/92 into the contiguous wetland system.

.500(6)(c) Community Structure

X Vegetation

____ Benthic

____ Both

I. Appropriate/desirable species	Mostly native and desirable species
II. Invasive/exotic plant species	Minimal exotics observed, along wetland edges
III. Regeneration/recruitment	Appropriate
IV. Age, size distribution.	Good
V. Snags, dens, cavity, etc.	None
VI. Plants' condition.	Healthy
VII. Land management practices.	None
VIII. Topographic features (refugia, channels, hummocks).	Appropriate
IX. Submerged vegetation (only score if present).	N/A
X. Upland assessment area	N/A

Current	With Impact
6	0

Additional Notes: A good mix of native, desirable species are present, with minimal exotic or invasive species. Exotic and invasive species primarily along the roadside ditches. Some debris along road stunting vegeation growth.

Raw Score = Sum of above scores/30 (if uplands, divide by 20)

Current	With Impact
0.7	0

Impact Delta (ID)	
Current - w/Impact	0.7

Impact Acres =	0.06

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.042

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

Additional Notes:

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
US 17/92		**WL 18**

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
630	**Mixed Forested Wetland**	**Secondary Impact**	**0.08** Acres

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

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

The wetland is located along the project corridor within and adjacent to the right-of-way. The upland surrounding the wetlands consists of higher quality undeveloped land and the US 17/92 corridor. The wetland collects stormwater from the roadside ditches and drains them to a forested wetland system to the north of the project corridor.

Assessment area description

The wetland's canopy is mixed with red maple, cypress, sweetgum, and slash pines. The understory includes lizard's tail, swamp fern, royal fern, spike rushes, cattail, dogfennel, nutsedge, alligator weed, and wax myrtle. The wetland also consists areas of open water.

Significant Nearby Features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Reedy Creek	**Not Unique**
Functions	Mitigation for previous permit/other historic use
Water quality, water quantity, conveyance, wildlife habitat	
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)
Various birds, mammals, amphibians	**Intermittent use by listed wading birds**

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

None observed

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
Alex Meehean and Hannah Rowe	**March and April 2022**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
US 17/92	**-**	**WL 18**
Impact or Mitigation:	Assessment Conducted by:	Assessment Date:
Impact	**Alex Meehean and Hannah Rowe**	**March and April 2022**

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	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

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

a. Quality and quantity **of habitat support** outside of AA.	Moderate quality upland/wetlands adjacent, low quality US 17/92 corridor
b. **Invasive plant species** in proximity to AA.	Minimal invasive species
c. **Wildlife access** to and from AA (proximity and barriers).	Adajcent roadway may impede wildlife species
d. **Downstream benefits** provided to fish and wildlife.	Moderate
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	Potenial runoff from US 17/92
f. **Hydrologic impediments and flow restrictions.**	Some from adjacent roadway
g. **Dependency** of downstream habitats on quantity or quality of discharges.	Moderate
h. Protection of wetland functions provided by uplands (**upland** AAs only).	N/A

Current	With Impact
8	7

Additional Notes: The wetland is surrounded by moderate quality uplands and the adjacent US 17/92 roadway corridor. Moderate impacts may occur as a result of the poximity of the wetland to the US 17/92 corridor such as runoff and increased disturbance.

.500(6)(b) Water Environment (n/a for uplands)

a. Appropriateness of **water levels and flows**.	Appropriate
b. Reliability of **water level indicators**.	Reliable
c. Appropriateness of **soil moisture**.	Appropriate
d. **Soil erosion** or **depositional patterns, flow rates/points of discharge.**	Limited
e. **Fire history** (frequency/severity).	None
f. **Appropriate vegetative and/or benthic zonation**.	Appropriate
g. **Hydrologic stress** on vegetation.	None
h. **Use by animal**s with hydrologic requirements.	Moderate
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	Appropriate
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	Good
k. **Water quality data** for the type of community.	N/A
l. Water depth, wave energy, currents, and light penetration.	Variable, based on rainfall

Current	With Impact
7	7

Additional Notes: Water levels were appropriate and no signs of hydrologic stress or contamination was observed. Lower quality water may enter the system via runoff from US 17/92 into the contiguous wetland system.

.500(6)(c) Community Structure

X Vegetation
____ Benthic
____ Both

I. Appropriate/desirable species	Mostly native and desirable species
II. Invasive/exotic plant species	Minimal exotics observed, along wetland edges
III. Regeneration/recruitment	Appropriate
IV. Age, size distribution.	Good
V. Snags, dens, cavity, etc.	None
VI. Plants' condition.	Healthy
VII. Land management practices.	None
VIII. Topographic features (refugia, channels, hummocks).	Appropriate
IX. Submerged vegetation (only score if present).	N/A
X. Upland assessment area	N/A

Current	With Impact
6	5

Additional Notes: A good mix of native, desirable species are present, with minimal exotic or invasive species. Exotic and invasive species primarily along the roadside ditches. Some debris along road stunting vegeation growth.

Raw Score = Sum of above scores/30 (if uplands, divide by 20)

Current	With Impact
0.7	0.633333333

Impact Delta (ID)	
Current - w/Impact	0.066666667

Impact Acres =	0.08

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.005

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

Additional Notes:

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
US 17/92		**WL 19**

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
630	**Wetland Forested Mixed**	**Direct Impact**	**0.46** Acres

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

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

Wetland 19 is located in the western portion of the study area, southeast of from Wetland 2, and on the eastside of US 17/92. Wetland 19 continues south outside of the study area and this system collects stormwater from a roadside ditch.

Assessment area description

The wetland's canopy is mainly sweetgum with red maple and slash pine. The understory includes groundsel tree, cattail, primrose willow, beggar's ticks, poison ivy, and blackberry.

Significant Nearby Features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Reedy Creek	**Not Unique**

Functions	Mitigation for previous permit/other historic use
Water quality, water quantity, conveyance, wildlife habitat	

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)
Various birds, mammals, amphibians	**Limited use by listed wading birds**

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

None observed

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
Alex Meehean and Hannah Rowe	**March and April 2022**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
US 17/92	**-**	**WL 19**
Impact or Mitigation:	Assessment Conducted by:	Assessment Date:
Impact	**Alex Meehean and Hannah Rowe**	**March and April 2022**

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	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

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

a. Quality and quantity **of habitat support** outside of AA.	low quality wetlands adjacent, low quality US17/92 corridor
b. **Invasive plant species** in proximity to AA.	Moderate invasive species observed
c. **Wildlife access** to and from AA (proximity and barriers).	Adjacent roadway and mowed uplands may inpedes wildlife species
d. **Downstream benefits** provided to fish and wildlife.	Low
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	Potenital runoff from US 17/92
f. **Hydrologic impediments and flow restrictions.**	Some from adjacent roadway
g. **Dependency** of downstream habitats on quantity or quality of discharges.	Low
h. Protection of wetland functions provided by uplands (**upland** AAs only).	N/A

Current	With Impact
5	**0**

Additional Notes: The wetland is surrounded by mowed uplands and the adjacent US 17/92 roadway corridor. Moderate impacts may occur as a result of the poximity of the wetland to the US 17/92 corridor such as runoff and increased disturbance.

.500(6)(b) Water Environment (n/a for uplands)

a. Appropriateness of **water levels and flows**.	Appropriate
b. Reliability of **water level indicators**.	Reliable
c. Appropriateness of **soil moisture**.	Appropriate
d. **Soil erosion** or **depositional patterns, flow rates/points of discharge.**	Limited
e. **Fire history** (frequency/severity).	None
f. **Appropriate vegetative and/or benthic zonation**.	Appropriate
g. **Hydrologic stress** on vegetation.	None
h. **Use by animal**s with hydrologic requirements.	Moderate
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	Appropriate
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	N/A
k. **Water quality data** for the type of community.	N/A
l. Water depth, wave energy, currents, and light penetration.	Variable, based on rainfall

Current	With Impact
5	**0**

Additional Notes: Water levels were appropriate and no signs of hydrologic stress was observed. Lower quality water may enter the system via runoff from US 17/92 into the contiguous wetland system. Heavy debris litter the edges of the wetland.

.500(6)(c) Community Structure

X Vegetation
____ Benthic
____ Both

I. Appropriate/desirable species	Mixture of desirable species and exotic
II. Invasive/exotic plant species	Moderate exotics observed
III. Regeneration/recruitment	Appropriate
IV. Age, size distribution.	Good
V. Snags, dens, cavity, etc.	None
VI. Plants' condition.	Healthy
VII. Land management practices.	Wetland edges may be treated for exotics
VIII. Topographic features (refugia, channels, hummocks).	Appropriate
IX. Submerged vegetation (only score if present).	N/A
X. Upland assessment area	N/A

Current	With Impact
5	**0**

Additional Notes: Mixture of native species with exotics. Moderate amount of exotic species observed throughout wetland.

Raw Score = Sum of above scores/30 (if uplands, divide by 20)

Current	With Impact
0.5	0

Impact Acres =	0.46

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.230

Impact Delta (ID)	
Current - w/Impact	0.5

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

Additional Notes:

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
US 17/92		**WL 21**

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
630	**Wetland Forested Mixed**	**Direct Impact**	**7.00** Acres

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

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

Wetland 21 is located in the central portion of the study area between Old Tampa Highway and US 17/92. Wetland 21 continues outside of the study area to the west and this system collects stormwater from a roadside ditch and ultimately drains towards Reedy Creek.

Assessment area description

The area has a canopy dominated by sweetgum and slash pine with scattered red maple and cypress. Some of the wetland has a canopy of willow. The understory is a mixture of elderberry, willow, wax myrtle, cogon grass, cattail, lizard's tail, Ceasarweed, dogfennel, primrose willow, bog button, bushy bluestem, coffee weed, spike rush, alligator weed, bull-tongue arrowhead, pickerelweed, and redroot.

Significant Nearby Features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Reedy Creek	**Not unique**
Functions	Mitigation for previous permit/other historic use
Water quality, water quantity, conveyance, wildlife habitat	
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)
Various birds, mammals, amphibians	**Intermittent use by listed wading birds**

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

None observed

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
Alex Meehean and Hannah Rowe	**March and April 2022**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
US 17/92	**-**	**WL 21**
Impact or Mitigation:	Assessment Conducted by:	Assessment Date:
Impact	**Alex Meehean and Hannah Rowe**	**March and April 2022**

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	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

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

a. Quality and quantity **of habitat support** outside of AA.	Moderate quality upland/wetlands adjacent, low quality US 17/92 corridor
b. **Invasive plant species** in proximity to AA.	Moderate invasive species observed
c. **Wildlife access** to and from AA (proximity and barriers).	Adajcent roadway may impede wildlife species
d. **Downstream benefits** provided to fish and wildlife.	Moderate
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	Potenial runoff from US 17/92
f. **Hydrologic impediments and flow restrictions.**	Some from adjacent roadway
g. **Dependency** of downstream habitats on quantity or quality of discharges.	Moderate
h. Protection of wetland functions provided by uplands (**upland** AAs only).	N/A

Current	With Impact
7	0

Additional Notes: The wetland is surrounded by moderate quality uplands and the adjacent US 17/92 roadway corridor. Moderate impacts may occur as a result of the poximity of the wetland to the US 17/92 corridor such as runoff and increased disturbance.

.500(6)(b) Water Environment (n/a for uplands)

a. Appropriateness of **water levels and flows**.	Appropriate
b. Reliability of **water level indicators**.	Reliable
c. Appropriateness of **soil moisture**.	Appropriate
d. **Soil erosion** or **depositional patterns, flow rates/points of discharge.**	Limited
e. **Fire history** (frequency/severity).	None
f. **Appropriate vegetative and/or benthic zonation**.	Appropriate
g. **Hydrologic stress** on vegetation.	None
h. **Use by animal**s with hydrologic requirements.	Moderate
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	Appropriate
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	Good
k. **Water quality data** for the type of community.	N/A
l. Water depth, wave energy, currents, and light penetration.	Variable, based on rainfall

Current	With Impact
7	0

Additional Notes: Water levels were appropriate and no signs of hydrologic stress was observed. Lower quality water may enter the system via runoff from US 17/92 into the contiguous wetland system. Debris and land clearing activities may cause impedement of flow on south boundary.

.500(6)(c) Community Structure

__X__ Vegetation

_____ Benthic

_____ Both

I. Appropriate/desirable species	Mixture of native and desirable species
II. Invasive/exotic plant species	Moderate exotics observed
III. Regeneration/recruitment	Appropriate
IV. Age, size distribution.	Good
V. Snags, dens, cavity, etc.	None
VI. Plants' condition.	Healthy
VII. Land management practices.	None
VIII. Topographic features (refugia, channels, hummocks).	Appropriate
IX. Submerged vegetation (only score if present).	N/A
X. Upland assessment area	N/A

Current	With Impact
7	0

Additional Notes: Most of the wetland had native and desirable species. Moderate amount of exotic species located in south section of wetland and along roadside ditches.

Raw Score = Sum of above scores/30 (if uplands, divide by 20)

Current	With Impact
0.7	0

Impact Acres =	7.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	4.900

Impact Delta (ID)	
Current - w/Impact	0.7

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

Additional Notes:

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
US 17/92		**WL 21**

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
630	**Wetland Forested Mixed**	**Secondary Impact**	**0.69** Acres

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

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

Wetland 21 is located in the central portion of the study area between Old Tampa Highway and US 17/92. Wetland 21 continues outside of the study area to the west and this system collects stormwater from a roadside ditch and ultimately drains towards Reedy Creek.

Assessment area description

The area has a canopy dominated by sweetgum and slash pine with scattered red maple and cypress. Some of the wetland has a canopy of willow. The understory is a mixture of elderberry, willow, wax myrtle, cogon grass, cattail, lizard's tail, Ceasarweed, dogfennel, primrose willow, bog button, bushy bluestem, coffee weed, spike rush, alligator weed, bull-tongue arrowhead, pickerelweed, and redroot.

Significant Nearby Features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Reedy Creek	**Not unique**
Functions	Mitigation for previous permit/other historic use
Water quality, water quantity, conveyance, wildlife habitat	
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)
Various birds, mammals, amphibians	**Intermittent use by listed wading birds**

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

None observed

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
Alex Meehean and Hannah Rowe	**March and April 2022**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
US 17/92	**-**	**WL 21**
Impact or Mitigation:	Assessment Conducted by:	Assessment Date:
Impact	**Alex Meehean and Hannah Rowe**	**March and April 2022**

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	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

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

a. Quality and quantity **of habitat support** outside of AA.	Moderate quality upland/wetlands adjacent, low quality US 17/92 corridor
b. **Invasive plant species** in proximity to AA.	Moderate invasive species observed
c. **Wildlife access** to and from AA (proximity and barriers).	Adajcent roadway may impede wildlife species
d. **Downstream benefits** provided to fish and wildlife.	Moderate
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	Potenial runoff from US 17/92
f. **Hydrologic impediments and flow restrictions.**	Some from adjacent roadway
g. **Dependency** of downstream habitats on quantity or quality of discharges.	Moderate
h. Protection of wetland functions provided by uplands (**upland** AAs only).	N/A

Current	With Impact
7	6

Additional Notes: The wetland is surrounded by moderate quality uplands and the adjacent US 17/92 roadway corridor. Moderate impacts may occur as a result of the poximity of the wetland to the US 17/92 corridor such as runoff and increased disturbance.

.500(6)(b) Water Environment (n/a for uplands)

a. Appropriateness of **water levels and flows**.	Appropriate
b. Reliability of **water level indicators**.	Reliable
c. Appropriateness of **soil moisture**.	Appropriate
d. **Soil erosion** or **depositional patterns, flow rates/points of discharge.**	Limited
e. **Fire history** (frequency/severity).	None
f. **Appropriate vegetative and/or benthic zonation**.	Appropriate
g. **Hydrologic stress** on vegetation.	None
h. **Use by animal**s with hydrologic requirements.	Moderate
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	Appropriate
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	Good
k. **Water quality data** for the type of community.	N/A
l. Water depth, wave energy, currents, and light penetration.	Variable, based on rainfall

Current	With Impact
7	7

Additional Notes: Water levels were appropriate and no signs of hydrologic stress was observed. Lower quality water may enter the system via runoff from US 17/92 into the contiguous wetland system. Debris and land clearing activities may cause impedement of flow on south boundary.

.500(6)(c) Community Structure

__X__ Vegetation
_____ Benthic
_____ Both

I. Appropriate/desirable species	Mixture of native and desirable species
II. Invasive/exotic plant species	Moderate exotics observed
III. Regeneration/recruitment	Appropriate
IV. Age, size distribution.	Good
V. Snags, dens, cavity, etc.	None
VI. Plants' condition.	Healthy
VII. Land management practices.	None
VIII. Topographic features (refugia, channels, hummocks).	Appropriate
IX. Submerged vegetation (only score if present).	N/A
X. Upland assessment area	N/A

Current	With Impact
7	6

Additional Notes: Most of the wetland had native and desirable species. Moderate amount of exotic species located in south section of wetland and along roadside ditches.

Raw Score = Sum of above scores/30 (if uplands, divide by 20)

Current	With Impact
0.7	0.633333333

Impact Acres =	0.69

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.046

Impact Delta (ID)	
Current - w/Impact	0.066666667

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

Additional Notes:

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
US 17/92		**WL 41**

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
630	**Wetland Forest Mixed**	**Direct Impact**	**0.04** Acres

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

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

Wetland 41 is located in the central portion of the study area between Old Tampa Highway and US 17/92. Wetland 41 continues outside of the study area to the east and collects stormwater from a roadside ditch and ultimately drains towards Reedy Creek.

Assessment area description

The area has a canopy dominated by sweetgum and slash pine with scattered red maple and cypress. Some of the wetland has a canopy of willow. The understory is a mixture of elderberry, willow, wax myrtle, cogon grass, cattail, lizard's tail, primrose willow, bogbutton, and bushy bluestem.

Significant Nearby Features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Reedy Creek	**Not Unique**
Functions	Mitigation for previous permit/other historic use
Water quality, water quantity, conveyance, wildlife habitat	
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)
Various birds, mammals, amphibians	**Limited use by listed wading birds**

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

None observed

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
Alex Meehean and Hannah Rowe	**March and April 2022**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
US 17/92	**-**	**WL 41**
Impact or Mitigation:	Assessment Conducted by:	Assessment Date:
Impact	**Alex Meehean and Hannah Rowe**	**March and April 2022**

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	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

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

a. Quality and quantity **of habitat support** outside of AA.	Low quality Old Tampa Highway corridor and US 17/92 corridor.
b. **Invasive plant species** in proximity to AA.	Some invasive species observed
c. **Wildlife access** to and from AA (proximity and barriers).	Adjacent roadways prevent access for wildlife
d. **Downstream benefits** provided to fish and wildlife.	Moderate
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	Potential runoff from US 17/92 and Old Tampa Highway
f. **Hydrologic impediments and flow restrictions.**	Some from adjacent roadways
g. **Dependency** of downstream habitats on quantity or quality of discharges.	Low
h. Protection of wetland functions provided by uplands (**upland** AAs only).	N/A

Current	With Impact
6	0

Additional Notes: The wetland is adjacent to the US 17/92 and Old Tampa Highway roadway corridors. Moderate impacts may occur as a result of the proximity of the wetland to the roadway corridors, such as runoff and increased disturbance.

.500(6)(b) Water Environment (n/a for uplands)

a. Appropriateness of **water levels and flows**.	Appropriate, high
b. Reliability of **water level indicators**.	Reliable
c. Appropriateness of **soil moisture**.	Appropriate
d. **Soil erosion** or **depositional patterns, flow rates/points of discharge.**	Limited
e. **Fire history** (frequency/severity).	None
f. **Appropriate vegetative and/or benthic zonation**.	Appropriate
g. **Hydrologic stress** on vegetation.	None
h. **Use by animal**s with hydrologic requirements.	Moderate
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	Appropriate
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	N/A
k. **Water quality data** for the type of community.	N/A
l. Water depth, wave energy, currents, and light penetration.	Variable, based on rainfall

Current	With Impact
7	0

Additional Notes: Water levels were high and no signs of hydrologic stress was observed. Lower quality water may enter the system via runoff from Old Tampa Highway and US 17/92 into the contiguous wetland system. Debris litters the edge of the wetland along Old Tampa Highway.

.500(6)(c) Community Structure

X Vegetation
____ Benthic
____ Both

I. Appropriate/desirable species	Mixture of desirable species, with some exotic
II. Invasive/exotic plant species	Some exotics observed
III. Regeneration/recruitment	Appropriate
IV. Age, size distribution.	Good
V. Snags, dens, cavity, etc.	None
VI. Plants' condition.	Healthy
VII. Land management practices.	Wetland edges may be treated for exotics
VIII. Topographic features (refugia, channels, hummocks).	Appropriate
IX. Submerged vegetation (only score if present).	N/A
X. Upland assessment area	N/A

Current	With Impact
6	0

Additional Notes: Good mix of native and desirable species present with minimal exotic species. Exotic species mainly along the roadside ditches.

Raw Score = Sum of above scores/30 (if uplands, divide by 20)

Current	With Impact
0.6333333	0

Impact Acres =	0.04

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.025

Impact Delta (ID)	
Current - w/Impact	0.633333333

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

Additional Notes:

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		WL 41

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
630	**Wetland Forest Mixed**	**Secondary Impact**	**0.11** Acres

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

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

Wetland 41 is located in the central portion of the study area between Old Tampa Highway and US 17/92. Wetland 41 continues outside of the study area to the east and collects stormwater from a roadside ditch and ultimately drains towards Reedy Creek.

Assessment area description

The area has a canopy dominated by sweetgum and slash pine with scattered red maple and cypress. Some of the wetland has a canopy of willow. The understory is a mixture of elderberry, willow, wax myrtle, cogon grass, cattail, lizard's tail, primrose willow, bogbutton, and bushy bluestem.

Significant Nearby Features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Reedy Creek	**Not Unique**
Functions	Mitigation for previous permit/other historic use
Water quality, water quantity, conveyance, wildlife habitat	
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)
Various birds, mammals, amphibians	**Limited use by listed wading birds**

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

None observed

Additional relevant factors:

Assessment conducted by:	Assessment date(s):

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	**WL 41**
Impact or Mitigation:	**Assessment Conducted by:**	**Assessment Date:**
Impact	-	-

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	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

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

a. Quality and quantity **of habitat support** outside of AA.	Low quality Old Tampa Highway corridor and US 17/92 corridor.
b. **Invasive plant species** in proximity to AA.	Some invasive species observed
c. **Wildlife access** to and from AA (proximity and barriers).	Adjacent roadways prevent access for wildlife
d. **Downstream benefits** provided to fish and wildlife.	Moderate
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	Potential runoff from US 17/92 and Old Tampa Highway
f. **Hydrologic impediments and flow restrictions.**	Some from adjacent roadways
g. **Dependency** of downstream habitats on quantity or quality of discharges.	Low
h. Protection of wetland functions provided by uplands (**upland** AAs only).	N/A

Current	With Impact
6	5

Additional Notes: The wetland is adjacent to the US 17/92 and Old Tampa Highway roadway corridors. Moderate impacts may occur as a result of the proximity of the wetland to the roadway corridors, such as runoff and increased disturbance.

.500(6)(b) Water Environment (n/a for uplands)

a. Appropriateness of **water levels and flows**.	Appropriate, high
b. Reliability of **water level indicators**.	Reliable
c. Appropriateness of **soil moisture**.	Appropriate
d. **Soil erosion** or **depositional patterns, flow rates/points of discharge.**	Limited
e. **Fire history** (frequency/severity).	None
f. **Appropriate vegetative and/or benthic zonation**.	Appropriate
g. **Hydrologic stress** on vegetation.	None
h. **Use by animal**s with hydrologic requirements.	Moderate
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	Appropriate
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	N/A
k. **Water quality data** for the type of community.	N/A
l. Water depth, wave energy, currents, and light penetration.	Variable, based on rainfall

Current	With Impact
7	7

Additional Notes: Water levels were high and no signs of hydrologic stress was observed. Lower quality water may enter the system via runoff from Old Tampa Highway and US 17/92 into the contiguous wetland system. Debris litters the edge of the wetland along Old Tampa Highway.

.500(6)(c) Community Structure

X Vegetation
____ Benthic
____ Both

I. Appropriate/desirable species	Mixture of desirable species, with some exotic
II. Invasive/exotic plant species	Some exotics observed
III. Regeneration/recruitment	Appropriate
IV. Age, size distribution.	Good
V. Snags, dens, cavity, etc.	None
VI. Plants' condition.	Healthy
VII. Land management practices.	Wetland edges may be treated for exotics
VIII. Topographic features (refugia, channels, hummocks).	Appropriate
IX. Submerged vegetation (only score if present).	N/A
X. Upland assessment area	N/A

Current	With Impact
6	5

Additional Notes: Good mix of native and desirable species present with minimal exotic species. Exotic species mainly along the roadside ditches.

Raw Score = Sum of above scores/30 (if uplands, divide by 20)

Current	With Impact
0.6333333	0.566666667

Impact Delta (ID)	
Current - w/Impact	0.066666667

Impact Acres =	0.11

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.007

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

Additional Notes:

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
US 17/92		**WL 41A**

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
630	**Wetland Forested Mixed**	**Direct Impact**	**0.02** Acres

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

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

Wetland 41A is located in the central portion of the study area between Old Tampa Highway and a railway. Wetland 41A flows from a wetland located north of the railway and flows the south under Old Tampa Highway into Wetland 41 to the south. This system collects stormwater from a roadside ditch and ultimately drains towards Reedy Creek.

Assessment area description

The area has a canopy dominated by sweetgum with scattered red maple. Some of the wetland has a canopy of willow. The understory is a mixture of elderberry, willow, wax myrtle, Caesarweed, dogfennel, primrose willow, bull-tongue arrowhead, pickerelweed, and redroot.

Significant Nearby Features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Reedy Creek	**Not Unique**

Functions	Mitigation for previous permit/other historic use
Water quality, water quantity, conveyance, wildlife habitat	

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)
Various birds, mammals, amphibians	**Limited use by listed wading birds**

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

None observed

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
Alex Meehean and Hannah Rowe	**March and April 2022**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
US 17/92	**-**	**WL 41A**
Impact or Mitigation:	Assessment Conducted by:	Assessment Date:
Impact	**Alex Meehean and Hannah Rowe**	**March and April 2022**

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	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

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

a. Quality and quantity **of habitat support** outside of AA.	Low quality Old Tampa Highway corridor and adjacent railway.
b. **Invasive plant species** in proximity to AA.	Moderate invasive species observed
c. **Wildlife access** to and from AA (proximity and barriers).	Adjacent roadway and railroad prevent access for wildlife
d. **Downstream benefits** provided to fish and wildlife.	Low
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	Potential runoff from US 17/92 and railway
f. **Hydrologic impediments and flow restrictions.**	Moderate from adjacent roadway and railway
g. **Dependency** of downstream habitats on quantity or quality of discharges.	Low
h. Protection of wetland functions provided by uplands (**upland** AAs only).	N/A

Current	With Impact
5	0

Additional Notes: The wetland is adjacent to a railway and Old Tampa Highway roadway corridor. Moderate impacts may occur as a result of the proximity of the wetland to the Old Tampa Highway corridor, such as runoff and increased disturbance.

.500(6)(b) Water Environment (n/a for uplands)

a. Appropriateness of **water levels and flows**.	Appropriate, high
b. Reliability of **water level indicators**.	Reliable
c. Appropriateness of **soil moisture**.	Appropriate
d. **Soil erosion** or **depositional patterns, flow rates/points of discharge.**	Limited
e. **Fire history** (frequency/severity).	None
f. **Appropriate vegetative and/or benthic zonation**.	Appropriate
g. **Hydrologic stress** on vegetation.	None
h. **Use by animal**s with hydrologic requirements.	Moderate
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	Appropriate
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	N/A
k. **Water quality data** for the type of community.	N/A
l. Water depth, wave energy, currents, and light penetration.	Variable, based on rainfall

Current	With Impact
6	0

Additional Notes: Water levels were high and no signs of hydrologic stress was observed. Lower quality water may enter the system via runoff from Old Tampa Highway and the railway into the contiguous wetland system. Debris litters the edges of the wetland.

.500(6)(c) Community Structure

X Vegetation
____ Benthic
____ Both

I. Appropriate/desirable species	Mixture of desirable species and exotic
II. Invasive/exotic plant species	Moderate exotics observed
III. Regeneration/recruitment	Appropriate
IV. Age, size distribution.	Good
V. Snags, dens, cavity, etc.	None
VI. Plants' condition.	Healthy
VII. Land management practices.	Wetland edges may be treated for exotics
VIII. Topographic features (refugia, channels, hummocks).	Appropriate
IX. Submerged vegetation (only score if present).	N/A
X. Upland assessment area	N/A

Current	With Impact
5	0

Additional Notes: Mixture of native species with exotics. Moderate amount of exotic species observed throughout wetland.

Raw Score = Sum of above scores/30 (if uplands, divide by 20)

Current	With Impact
0.5333333	0

Impact Acres =	0.02

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.011

Impact Delta (ID)	
Current - w/Impact	0.533333333

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigation bank.

Additional Notes:

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		WL 41A

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
630	**Wetland Forested Mixed**	**Secondary Impact**	**0.12** Acres

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

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

Wetland 41A is located in the central portion of the study area between Old Tampa Highway and a railway. Wetland 41A flows from a wetland located north of the railway and flows the south under Old Tampa Highway into Wetland 41 to the south. This system collects stormwater from a roadside ditch and ultimately drains towards Reedy Creek.

Assessment area description

The area has a canopy dominated by sweetgum with scattered red maple. Some of the wetland has a canopy of willow. The understory is a mixture of elderberry, willow, wax myrtle, Caesarweed, dogfennel, primrose willow, bull-tongue arrowhead, pickerelweed, and redroot.

Significant Nearby Features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Reedy Creek	**Not Unique**
Functions	Mitigation for previous permit/other historic use
Water quality, water quantity, conveyance, wildlife habitat	
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)
Various birds, mammals, amphibians	**Limited use by listed wading birds**

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

None observed

Additional relevant factors:

Assessment conducted by:	Assessment date(s):

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	**WL 41A**
Impact or Mitigation:	**Assessment Conducted by:**	**Assessment Date:**
Impact	-	-

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	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

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

a. Quality and quantity **of habitat support** outside of AA.	Low quality Old Tampa Highway corridor and adjacent railway.
b. **Invasive plant species** in proximity to AA.	Moderate invasive species observed
c. **Wildlife access** to and from AA (proximity and barriers).	Adjacent roadway and railroad prevent access for wildlife
d. **Downstream benefits** provided to fish and wildlife.	Low
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	Potential runoff from US 17/92 and railway
f. **Hydrologic impediments and flow restrictions.**	Moderate from adjacent roadway and railway
g. **Dependency** of downstream habitats on quantity or quality of discharges.	Low
h. Protection of wetland functions provided by uplands (**upland** AAs only).	N/A

Current	With Impact
5	4

Additional Notes: The wetland is adjacent to a railway and Old Tampa Highway roadway corridor. Moderate impacts may occur as a result of the proximity of the wetland to the Old Tampa Highway corridor, such as runoff and increased disturbance.

.500(6)(b) Water Environment (n/a for uplands)

a. Appropriateness of **water levels and flows**.	Appropriate, high
b. Reliability of **water level indicators**.	Reliable
c. Appropriateness of **soil moisture**.	Appropriate
d. **Soil erosion** or **depositional patterns, flow rates/points of discharge.**	Limited
e. **Fire history** (frequency/severity).	None
f. **Appropriate vegetative and/or benthic zonation**.	Appropriate
g. **Hydrologic stress** on vegetation.	None
h. **Use by animal**s with hydrologic requirements.	Moderate
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	Appropriate
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	N/A
k. **Water quality data** for the type of community.	N/A
l. Water depth, wave energy, currents, and light penetration.	Variable, based on rainfall

Current	With Impact
6	6

Additional Notes: Water levels were high and no signs of hydrologic stress was observed. Lower quality water may enter the system via runoff from Old Tampa Highway and the railway into the contiguous wetland system. Debris litters the edges of the wetland.

.500(6)(c) Community Structure

X Vegetation
____ Benthic
____ Both

I. Appropriate/desirable species	Mixture of desirable species and exotic
II. Invasive/exotic plant species	Moderate exotics observed
III. Regeneration/recruitment	Appropriate
IV. Age, size distribution.	Good
V. Snags, dens, cavity, etc.	None
VI. Plants' condition.	Healthy
VII. Land management practices.	Wetland edges may be treated for exotics
VIII. Topographic features (refugia, channels, hummocks).	Appropriate
IX. Submerged vegetation (only score if present).	N/A
X. Upland assessment area	N/A

Current	With Impact
5	4

Additional Notes: Mixture of native species with exotics. Moderate amount of exotic species observed throughout wetland.

Raw Score = Sum of above scores/30 (if uplands, divide by 20)

Current	With Impact
0.5333333	0.466666667

Impact Delta (ID)	
Current - w/Impact	0.066666667

Impact Acres =	0.12

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.008

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigation bank.

Additional Notes:

Appendix J:

Existing Sovereign Submerged Lands Easement for US 17/92 Bridge

SAE2

BOARD OF TRUSTEES OF THE INTERNAL IMPROVEMENT TRUST FUND OF THE STATE OF FLORIDA

EASEMENT

Easement Number 30211

THIS EASEMENT, made and entered into this 14th day of April, 1999, between the BOARD OF TRUSTEES OF THE INTERNAL IMPROVEMENT TRUST FUND OF THE STATE OF FLORIDA, acting pursuant to its authority set forth in Section 253.03, Florida Statutes, hereinafter referred to as "GRANTOR", and STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION, hereinafter referred to as "GRANTEE".

WHEREAS, GRANTOR is the owner of the hereinafter described real property; and

WHEREAS, GRANTEE desires an easement across the hereinafter described real property for public road right-of-way.

NOW THEREFORE, GRANTOR, for and in consideration of mutual covenants and agreements hereinafter contained, has granted, and by these presents does grant, a non-exclusive easement unto GRANTEE over and across the following described real property in Osceola County, Florida, to-wit:

(See Exhibit "A" Attached)

subject to the following terms and conditions:

1. DELEGATIONS OF AUTHORITY: GRANTOR'S responsibilities and obligations herein shall be exercised by the Division of State Lands, Department of Environmental Protection.

2. TERM: GRANTOR does hereby grant to the GRANTEE an easement for as long as the Easement is used and maintained for public road right-of-way. If the Easement is ever abandoned for public road right-of-way, all right, title, and interest conveyed under this instrument shall automatically revert to GRANTOR, unless sooner terminated pursuant to the provisions of this easement.

3. USE OF PROPERTY AND UNDUE WASTE: This easement shall be limited to the construction and maintenance of State Road Number

TFI 033021100000000

600 upon and across the property described in Exhibit "A" during the term on this easement. This easement shall be non-exclusive. GRANTOR retains the right to engage in any activities on, over, across or below the easement area which do not unreasonably interfere with GRANTEE'S exercise of this easement and further retains the right to grant compatible uses to third parties during the term of this easement.

GRANTEE shall dispose of, to the satisfaction of GRANTOR all brush and refuse resulting from the clearing of the land for the uses authorized hereunder. If timber is removed in connection with clearing easement, the net proceeds from the sale of such timber shall accrue to GRANTOR. GRANTEE shall take all reasonable precautions to control soil erosion and to prevent any other degradation of the real property described in Exhibit "A" during the term of this easement. GRANTEE, shall not remove water from any source on this easement including, but not limited to, a water course, reservoir, spring, or well, without the prior written approval of GRANTOR. GRANTEE agrees to clear, remove and pick up all debris including, but not limited to, containers, papers, discarded tools and trash foreign to the work locations and dispose of the same in a satisfactory manner as to leave the work locations clean and free of any such debris. GRANTEE, its agents, successors, or assigns, shall not dispose of any contaminants including, but not limited to, hazardous or toxic substances, petroleum, fuel oil, or petroleum by-products, chemicals or other agents produced or used in GRANTEE'S operations, on this easement or on any adjacent state land or in any manner not permitted by law. GRANTEE shall be liable for all costs associated with any cleanup of the subject property which is a result of GRANTEE'S operations and use of the subject property.

Upon termination or expiration of this easement GRANTEE shall restore the lands over which this easement is granted to substantially the same condition as existed on the effective date of this easement. GRANTEE agrees that upon termination of this

easement all authorization granted herein shall cease and terminate.

If the lands described in Exhibit "A" are under lease to another agency, GRANTEE shall obtain the consent of such agency prior to engaging in any use of the real property authorized herein.

4. ASSIGNMENT: This easement shall not be assigned in whole or in part without the prior written consent of GRANTOR. Any assignment made either in whole or in part without the prior written consent of GRANTOR shall be void and without legal effect.

5. RIGHT OF INSPECTION: GRANTOR or its duly authorized agents, representatives or employees shall have the right at any and all times to inspect this easement and the works of GRANTEE in any matter pertaining to this easement.

6. COMPLIANCE WITH LAWS: GRANTEE agrees that this easement is contingent upon and subject to GRANTEE obtaining all applicable permits and complying with all applicable permits, regulations, ordinances, rules, and laws of the State of Florida or the United States or of any political subdivision or agency of either.

7. ARCHAEOLOGICAL AND HISTORIC SITES: Execution of this easement in no way affects any of the parties' obligations pursuant to Chapter 267, Florida Statutes. The collection of artifacts or the disturbance of archaeological and historic sites on state-owned lands is prohibited unless prior authorization has been obtained from the Department of State, Division of Historical Resources.

8. PROHIBITIONS AGAINST LIENS OR OTHER ENCUMBRANCES: Fee title to the lands underlying this easement is held by GRANTOR. GRANTEE shall not do or permit anything to be done which purports to create a lien or encumbrance of any nature against the real property of GRANTOR including, but not limited to, mortgages or construction liens against the real property described in Exhibit "A" or against any interest of GRANTOR therein.

9. PARTIAL INVALIDITY: If any term, covenant, condition or provision of this easement shall be ruled by a court of competent jurisdiction to be invalid, void, or unenforceable, the remainder shall remain in full force and effect and shall in no way be affected, impaired or invalidated.

10. ENTIRE UNDERSTANDING: This easement sets forth the entire understanding between the parties and shall only be amended with the prior written approval of GRANTOR.

11. TIME: Time is expressly declared to be of the essence of this easement.

12. LIABILITY: GRANTEE shall assist in the investigation of injury or damage claims either for or against GRANTOR or the State of Florida pertaining to GRANTEE'S respective areas of responsibility under this easement or arising out of GRANTEE'S respective management programs or activities and shall contact GRANTOR regarding the legal action deemed appropriate to remedy such damage or claims. GRANTEE is responsible for all personal injury and property damage attributable to the negligent acts or omissions of GRANTEE, and its officers, employees, and agents.

13. RIGHT OF AUDIT: GRANTEE shall make available to GRANTOR all financial and other records relating to this easement and GRANTOR shall have the right to audit such records at any reasonable time during the term of this easement. This right shall be continuous until this easement expires or is terminated. This easement may be terminated by GRANTOR should GRANTEE fail to allow public access to all documents, papers, letters or other materials made or received in conjunction with this easement, pursuant to Chapter 119, Florida Statutes.

14. PAYMENT OF TAXES AND ASSESSMENTS: GRANTEE shall assume full responsibility for and shall pay all liabilities that accrue to the easement area or to the improvements thereon including any and all drainage and special assessments or taxes of every kind and all mechanic's or materialman's liens which may be hereafter lawfully assessed and levied against this easement.

15. RECORDING OF EASEMENT: The grantee, at its own expense, shall record this fully executed easement in its entirety in the public records of the county within which the easement site is located within fourteen days after receipt, and shall provide to the grantor within ten days following the recordation a copy of the recorded easement in its entirety which contains the O.R. book and pages at which the easement is recorded. Failure to comply with this paragraph shall constitute grounds for immediate termination of this easement agreement at the option of the Grantor.

16. AUTOMATIC REVERSION: This easement is subject to automatic termination and reversion to GRANTOR when, in the opinion of GRANTOR, this easement is not used for the purposes outlined herein, and any costs or expenses arising out of the implementation of this clause shall be borne completely, wholly and entirely by GRANTEE.

17. GOVERNING LAW: This easement shall be governed by and interpreted according to the laws of the State of Florida.

18. SECTION CAPTIONS: Articles, subsections and other captions contained in this easement are for reference purposes only and are in no way intended to describe, interpret, define, or limit the scope, extent or intent of this easement or any provisions thereof.

19. SPECIAL CONDITIONS: Removal of any trees within the easement area by GRANTEE shall be limited to the eleven trees which are identified and depicted as #1067, #681, #894, #709, #671, #660, #671, #843, #787, #737, and #650 on sheets 15, 16, 17, and 18, of the State of Florida Department of Transportation Plan of Proposed State Highway, State Project No. 92010-3520 Phase IV Submittal, dated November 1977, attached hereto as Exhibit "B" and by reference made a part hereof.

IN WITNESS WHEREOF, the parties have caused this easement to be executed the day and year first above written.

BOARD OF TRUSTEES OF THE INTERNAL IMPROVEMENT TRUST FUND OF THE STATE OF FLORIDA

By: Daniel T. Crabb (SEAL)
DANIEL T. CRABB, CHIEF
BUREAU OF PUBLIC LAND ADMINISTRATION, DIVISION OF STATE LANDS, FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION

"GRANTOR"

Panagiota D. Krassas
Witness
Panagiota D. Krassas
Print/Type Witness Name

Lori L. Bryant
Witness
Lori L. Bryant
Print/Type Witness Name

STATE OF FLORIDA
COUNTY OF LEON

The foregoing instrument was acknowledged before me this 9th day of April, 1999, by Daniel T. Crabb as Chief, Bureau of Public Land Administration, Division of State Lands, Florida Department of Environmental Protection, acting as agent for and on behalf of the Board of Trustees of the Internal Improvement Trust Fund of the State of Florida. He is personally known to me.

Keith E. Clayton
Notary Public, State of Florida

Print/Type Notary Name

Commission Number:

Commission Expires:

Keith E. Clayton
MY COMMISSION # CC677553 EXPIRES
September 4, 2001
BONDED THRU TROY FAIN INSURANCE, INC.

Approved as to Form and Legality

By: [signature]
DEP Attorney

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

George S Lovell
Witness
George S. Lovell
Print/Type Witness Name

Linda S. Underhill
Witness
Linda S. Underhill
Print/Type Witness Name

By: Nancy M Houston (SEAL)
for Nancy M. Houston
Print/Type Name

Title: District Secretary

"GRANTEE"

STATE OF FLORIDA
COUNTY OF Volusia

The foregoing instrument was acknowledged before me this 19 day of Feb., 1999, by Nancy M. Houston as Dist. Secretary of the State of Florida Department of Transportation. He/she is personally known to me or produced _____ as identification.

Linda S. Underhill
Notary Public, State of Florida

Linda S. Underhill
Print/Type Notary Name

NOTARY PUBLIC STATE OF FLORIDA
Linda S. Underhill
Commission # CC 759710
Expires Sep. 30, 1999
BONDED THRU
ATLANTIC BONDING CO., INC.

Commission Number:

Commission Expires:

EXHIBIT "A"

LEGAL DESCRIPTION OF THE EASEMENT

PARCEL NO. 800

DESCRIPTION OF LANDS TO BE ACQUIRED FROM THE TRUSTEES OF THE INTERNAL IMPROVEMENT TRUST FUND BY THE FLORIDA DEPARTMENT OF TRANSPORTATION FOR A PERPETUAL RIGHT OF WAY EASEMENT.

THAT PART OF: "ALL THAT PORTION OF THE SOUTHWEST ONE-QUARTER (SW 1/4), OF THE SOUTHWEST ONE-QUARTER (SW 1/4), OF SECTION THIRTY-TWO (32), TOWNSHIP TWENTY-FIVE (25) SOUTH, RANGE TWENTY-EIGHT (28) EAST, LYING TO THE SOUTH AND EAST OF THE ATLANTIC COAST LINE RAILROAD RIGHT OF WAY".

BEING THE LANDS DESCRIBED IN DEED BOOK 95, PAGE 194, PUBLIC RECORDS OF OSCEOLA COUNTY, FLORIDA.

LYING WITHIN:

BEGINNING AT THE INTERSECTION OF THE CENTERLINE OF SURVEY OF STATE ROAD 600, AS SHOWN ON FLORIDA DEPARTMENT OF TRANSPORTATION RIGHT OF WAY MAP, SECTION 92010-2520, WITH THE WEST LINE OF THE SOUTHWEST 1/4 OF SECTION 32, TOWNSHIP 25 SOUTH, RANGE 28 EAST, OSCEOLA COUNTY, FLORIDA, AT A POINT 216.995 METERS (711.92 FEET), NORTH 00° 36' 31" EAST OF THE SOUTHWEST CORNER THEREOF; THENCE NORTH 63° 28' 52" EAST, ALONG SAID CENTERLINE, 457.267 METERS (1500.22 FEET) TO THE EAST LINE OF THE NORTHWEST 1/4 OF THE SOUTHWEST 1/4 OF SECTION 32 AT A POINT 421.284 METERS (1382.16 FEET), NORTH 00° 35' 52" EAST OF THE SOUTHEAST CORNER OF THE SOUTHWEST 1/4 OF THE SOUTHWEST 1/4; THENCE DEPARTING SAID CENTERLINE RUN SOUTH 00° 35' 52" WEST, ALONG SAID EAST LINE, 12.018 METERS (39.43 FEET) TO THE NORTHEAST CORNER OF THE SOUTHWEST 1/4 OF THE SOUTHWEST 1/4 OF SAID SECTION 32; THENCE CONTINUE SOUTH 00 35' 52" WEST, ALONG SAID EAST LINE, 44.237 METERS (145.13 FEET) TO A POINT 10.070 METERS (33.04 FEET) SOUTHERLY OF, WHEN MEASURED PERPENDICULAR TO, THE CENTERLINE OF CONSTRUCTION AS SHOWN ON SAID MAP; THENCE DEPARTING SAID EAST LINE RUN SOUTH 63° 28' 52" WEST, PARALLEL TO THE CENTERLINE OF CONSTRUCTION, 381.989 METERS (1253.24 FEET) TO THE BEGINNING OF A CURVE CONCAVE SOUTHEASTERLY, HAVING A CENTRAL ANGLE OF 05° 23' 58", A RADIUS OF 819.930 METERS (2690.05 FEET) AND A CHORD BEARING OF SOUTH 60° 46' 53" WEST; THENCE SOUTHWESTERLY ALONG THE ARC OF SAID CURVE AND CONCENTRIC TO SAID CENTERLINE OF CONSTRUCTION, 77.269 METERS (253.51 FEET) TO THE WEST LINE OF SAID SOUTHWEST 1/4 OF SECTION 32; THENCE NORTH 00° 36' 31" EAST, ALONG SAID WEST LINE, 60.349 METERS (197.99 FEET) TO THE POINT OF BEGINNING; EXCEPTING THEREFROM THE EXISTING RIGHT OF WAY OF STATE ROAD 600.

CONTAINING 1.6018 HECTARES (172,416 SQUARE FEET) (3.958 ACRES), MORE OR LESS.

Exhibit A
Page 1 of 19
Easement No. 30211

THIS CONTRACT PLAN SET INCLUDES

ROADWAY PLANS
SUMMARY OF PAY ITEMS
SIGNING AND PAVEMENT MARKING PLANS
STRUCTURE PLANS

A DETAILED INDEX APPEARS ON THE KEY SHEET OF EACH COMPONENT SET OF PLANS

INDEX OF ROADWAY PLANS

SHEET NO.	SHEET DESCRIPTION
1	KEY SHEET
2 - 3	DRAINAGE MAP
4 - 5	TYPICAL SECTIONS
6 - 7	SUMMARY OF QUANTITIES
8	SUMMARY OF DRAINAGE STRUCTURES
9 - 10	PROJECT LAYOUT
11 - 24	PLAN AND PROFILE - S.R 600
25 - 29	INTERSECTION LAYOUT / DETAIL
30 - 36	DRAINAGE STRUCTURES
37	GRADING PLAN - POND NO. 1
38	DETAILS - POND NO. 1
39	GRADING PLAN - POND NO. 2
40	DETAILS - POND NO. 2
41	SPECIAL DETAILS
42	CROSS SECTION PATTERN
43	ROADWAY SOIL SURVEY
44 - 78	CROSS SECTIONS
79	OMITTED
80 - 81	EROSION CONTROL
82 - 90	TRAFFIC CONTROL SHEETS
91	APPROACH SLAB DETAILS
92 - 93	TRAFFIC COUNT STATION

THESE PLANS HAVE BEEN PREPARED IN ACCORDANCE WITH AND ARE GOVERNED BY THE STATE OF FLORIDA, DEPARTMENT OF TRANSPORTATION, ROADWAY AND TRAFFIC DESIGN STANDARDS (BOOKLET DATED JANUARY, 1995).

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

PLANS OF PROPOSED STATE HIGHWAY

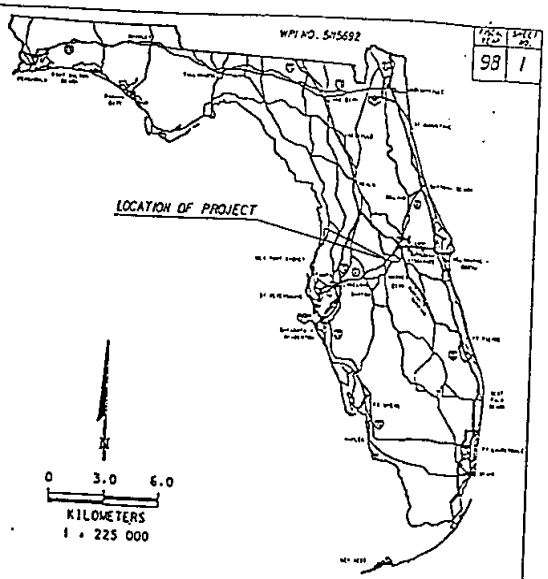
STATE PROJECT NO. 92010-3520 (FEDERAL FUNDS)
OSCEOLA COUNTY

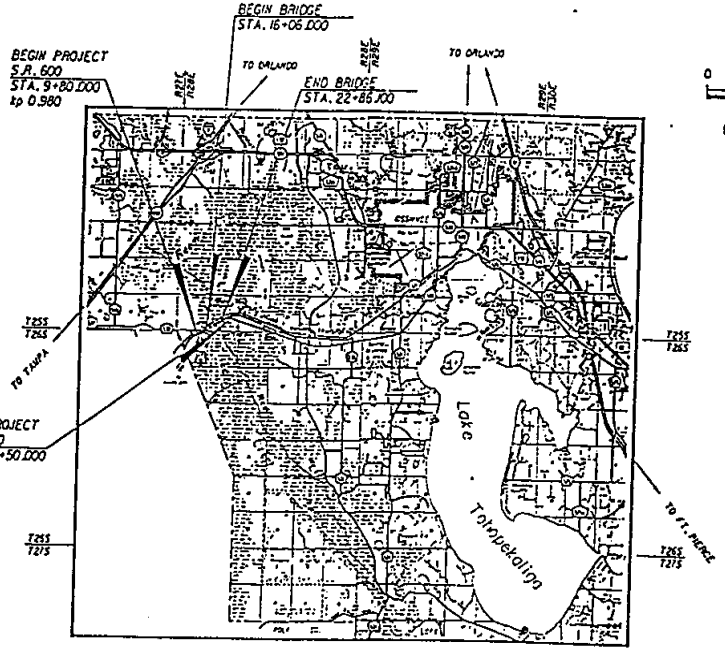
STATE ROAD NO. 600

WPI NO. 5115692

SHEET NO.	SHEET NO.
98	1

LOCATION OF PROJECT





0 3.0 6.0
KILOMETERS
1 : 225 000

NOTE: LENGTH OF PROJECT IS BASED ON CENTERLINE OF CONSTRUCTION.

LENGTH OF PROJECT	METERS
ROADWAY	1439.900
BRIDGES	680.100
NET LENGTH OF PROJ.	2120.000
EXCEPTIONS	-0-
GROSS LENGTH OF PROJ.	2120.000

FDOT PROJECT MANAGER : DAVID COOKE

PHASE IV SUBMITTAL
NOVEMBER, 1997

ROADWAY PLANS
ENGINEER OF RECORD
W. NEIL AIKENHEAD P.E. NO. 14566

PLANS PREPARED BY

AIKENHEAD & ODOM inc.
CONSULTING ENGINEERS
5730 BONDEN RD., SUITE 200
JACKSONVILLE, FL 32216
(904)636-5432 FAX (904)636-5433
VENDOR NUMBER 59-3143040

ATTENTION IS DIRECTED TO THE FACT THAT THESE PLANS MAY HAVE BEEN ALTERED IN SIZE BY REPRODUCTION. THIS MUST BE CONSIDERED WHEN OBTAINING SCALED DATA.

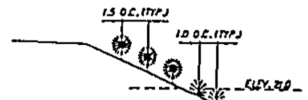
GOVERNING SPECIFICATIONS: STATE OF FLORIDA, DEPARTMENT OF TRANSPORTATION, STANDARD SPECIFICATIONS, DATED 1996, SUPPLEMENTS AND SPECIAL PROVISIONS THERETO AS NOTED IN THE CONTRACT SPECIFICATIONS FOR THIS PROJECT.

NOTE: THIS IS A METRIC UNIT PROJECT

REVISIONS		
DATE	BY	DESCRIPTION

ROADWAY PLANS APPROVED BY: _____
DATE: _____
P.E. NO.: _____

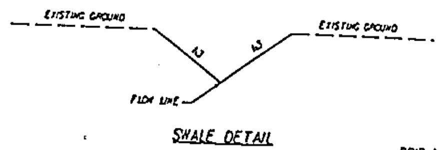
EXHIBIT "B"

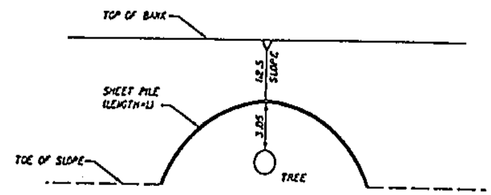


1:2.5 SLOPES SHALL BE PLANTED AS DETAILED ABOVE WHERE INDICATED IN THE PLANS. SPARTINA BAKERIS TO BE PLANTED BELOW THE 21.0 ELEVATION AT A NOMINAL SPACING OF 1.0 LONGITUDINALLY AND TRANSVERSLY. SERENOA REPENS IS TO BE PLANTED ABOVE THE 21.0 ELEVATION AT A NOMINAL SPACING OF 1.5 LONGITUDINALLY AND TRANSVERSLY.

SLOPE PLANTING DETAIL

TYPE OF GRASS COVER		
ITEM NO.	GROUND COVER	EA.
258-2	SPARTINA BAKERI	955
258-2	SERENOA REPENS	2078
TOTAL		3033

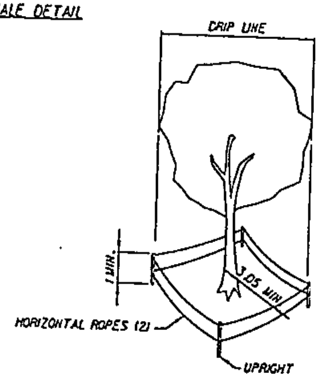




PLAN VIEW

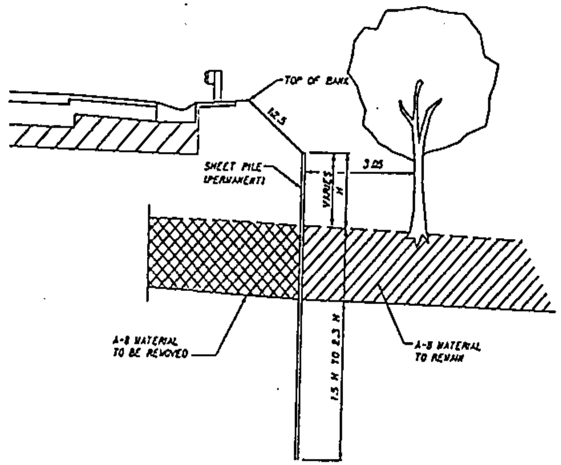
TREE PROTECTION NOTES

1. NO HEAVY EQUIPMENT ALLOWED INSIDE ROPES. ONLY HAND LABOR.
2. NO CONSTRUCTION MATERIALS OR TEMPORARY SOIL DEPOSITS ALLOWED INSIDE THIS AREA.
3. MINIMUM RADIUS TO BE PROTECTED IS ENTIRE DRIPLINE ON PROJECT SIDE OF TREE. AVOID EXCESS PLACEMENT OF PROTECTION WITHIN WETLANDS ON SIDE(S) AWAY FROM PROJECT.
4. UPRIGHTS SHALL BE A MINIMUM OF 1.0m IN HEIGHT.
5. UPRIGHTS - THE EQUIVALENT OF 5 x 1.2 LUMBER ON 2.0m MAXIMUM CENTERS.
6. HORIZONTAL - THE EQUIVALENT OF TWO COURSES OF 12mm (1/2") ROPING WITH YELLOW PLASTIC TAPE FLAGGING.
7. BARRIERS TO BE ERECTED AROUND TREES TO REMAIN BEFORE CONSTRUCTION ON NEARBY TREES ARE REMOVED.
8. BARRIERS TO REMAIN IN PLACE UNTIL ALL PAVING, CONSTRUCTION AND HEAVY EQUIPMENT IS OUT OF AREA.



TREE PROTECTION DETAIL

NOTES:
APPLIES TO CAUSEWAY FILL AREAS, NOT REQUIRED AT BRIDGE-ONLY AREAS. PROTECTED TREES NOTED TO REMAIN IN BRIDGE AREAS SHALL BE "BANDED" WITH YELLOW OR ORANGE FLAGGING ON 0.3 (1') INTERVALS 1.5 (5') BELOW TO 1.5 (5') ABOVE FINAL BRIDGE DECK ELEVATION. BRIDGE CONTRACTOR SHALL USE CAUTION WITH ALL EQUIPMENT TO AVOID ANY SCARRING OF PROTECTED TREES.
SEE GENERAL NOTES FOR LEGEND, AND PLAN SHEETS FOR LOCATION OF TREES TO BE PROTECTED.



TREE PROTECTION FOR REMOVAL OF A-8 MATERIAL

SHEET PILE WALLS FOR TREE PROTECTION

CONSTRUCTION INFORMATION (4)								DESIGN PARAMETERS (4)						
WALL LOCATION		(6) MINIMUM WALL TIP ELEVATION (METERS, NGVD)	MINIMUM SECTION MODULUS (mm^3)		MAXIMUM ALLOWABLE BENDING MOMENT (kN-m)	MINIMUM REQUIRED MOMENT OF INERTIA (mm^4)	(3) MAXIMUM SCALED DEFLECTION ($kN\text{-}mm^3$)	WALL TOP ELEV. (METERS, NGVD)	SOIL ELEVATION		WATER ELEVATION		DESIGN LIVE LOAD (kPa)	(5) BOTTOM ELEVATION OF CORROSION PROTECTION (METERS, NGVD)
STATION	OFFSET (METER)		(2) A-328 (F_y=270MPa)	(2) A-572 (F_y=345MPa)					FRONT OF WALL (METERS, NGVD)	(1) BACK OF WALL (METERS, NGVD)	FRONT OF WALL (METERS, NGVD)	BACK OF WALL (METERS, NGVD)		
13+17	14.5RT	17.7	1.22×10^4	0.95×10^4	2,140	1.0×10^6	5.29×10^{12}	21.3	20.2	21.3 to 22.8	19.5	19.5	12.0	17.8
14+03	12.0RT	16.5	12.7×10^4	9.9×10^4	22,307	30×10^6	1.56×10^{14}	22.6	20.2	22.6 to 23.2	19.8	19.8	12.0	17.7
15+27	17.0LT	15.2	24.1×10^4	18.3×10^4	42,175	163×10^6	8.59×10^{14}	23.4	20.4	23.4 to 23.7	19.9	19.9	12.0	18.8
15+60	19.5LT	15.6	27.7×10^4	16.1×10^4	34,232	109×10^6	5.55×10^{14}	22.9	20.4	22.9 to 23.7	19.8	19.8	12.0	17.8

NOTES:
(1) START AND END ELEVATIONS OF 2.5H:1V SLOPE.
(2) ALLOWABLE DESIGN STRESS, BASED ON 65% OF THE YIELD STRESS (F_y).
(3) DIVIDE MAXIMUM SCALED DEFLECTION BY MODULUS OF ELASTICITY ON N/mm^2) TIMES MOMENT OF INERTIA (IN mm^4) TO OBTAIN DEFLECTION IN MILLIMETERS. WALL DEFLECTIONS SHALL BE LIMITED TO 25 mm OR LESS. WALL DEFLECTIONS IN EXCESS OF 25mm MAY CAUSE DISTRESS OF THE ADJACENT PAVEMENT. THE ADJACENT PAVEMENT CONDITIONS BEHIND THE SHEET PILE WALLS SHALL BE MAINTAINED BY THE CONTRACTOR DURING CONSTRUCTION. THE COST OF MAINTAINING ROADWAY PAVEMENT SHALL BE INCLUDED IN THE COST OF STEEL SHEET PILE (TEMPORARY) PAY ITEM 2455-133-1.
(4) THE DESIGN PARAMETERS INDICATED IN THIS TABLE WERE USED IN THE SHEET PILE WALL ANALYSIS. IF THE CONTRACTOR ANTICIPATES DESIGN PARAMETERS WHICH DIFFER FROM THOSE SHOWN ABOVE, IT WILL BE THE CONTRACTOR'S RESPONSIBILITY TO REDESIGN AND CONSTRUCT THE WALLS ACCORDINGLY.
(5) ALL STEEL SHEET PILES SHALL RECEIVE ONE COAT OF INORGANIC ZINC PRIMER AND TWO COATS OF COAL TAR EPOXY FROM THE TOP OF THE PILE TO THE ELEVATIONS SHOWN, AS DESCRIBED IN THE SPECIAL PROVISIONS.
(6) MINIMUM WALL TIP ELEVATIONS SHOULD BE IN ACCORDANCE WITH SECTION 455-3.3.

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

FLORIDA DEPARTMENT OF TRANSPORTATION

AIKENHEAD & ODOM Inc. Consulting Engineers

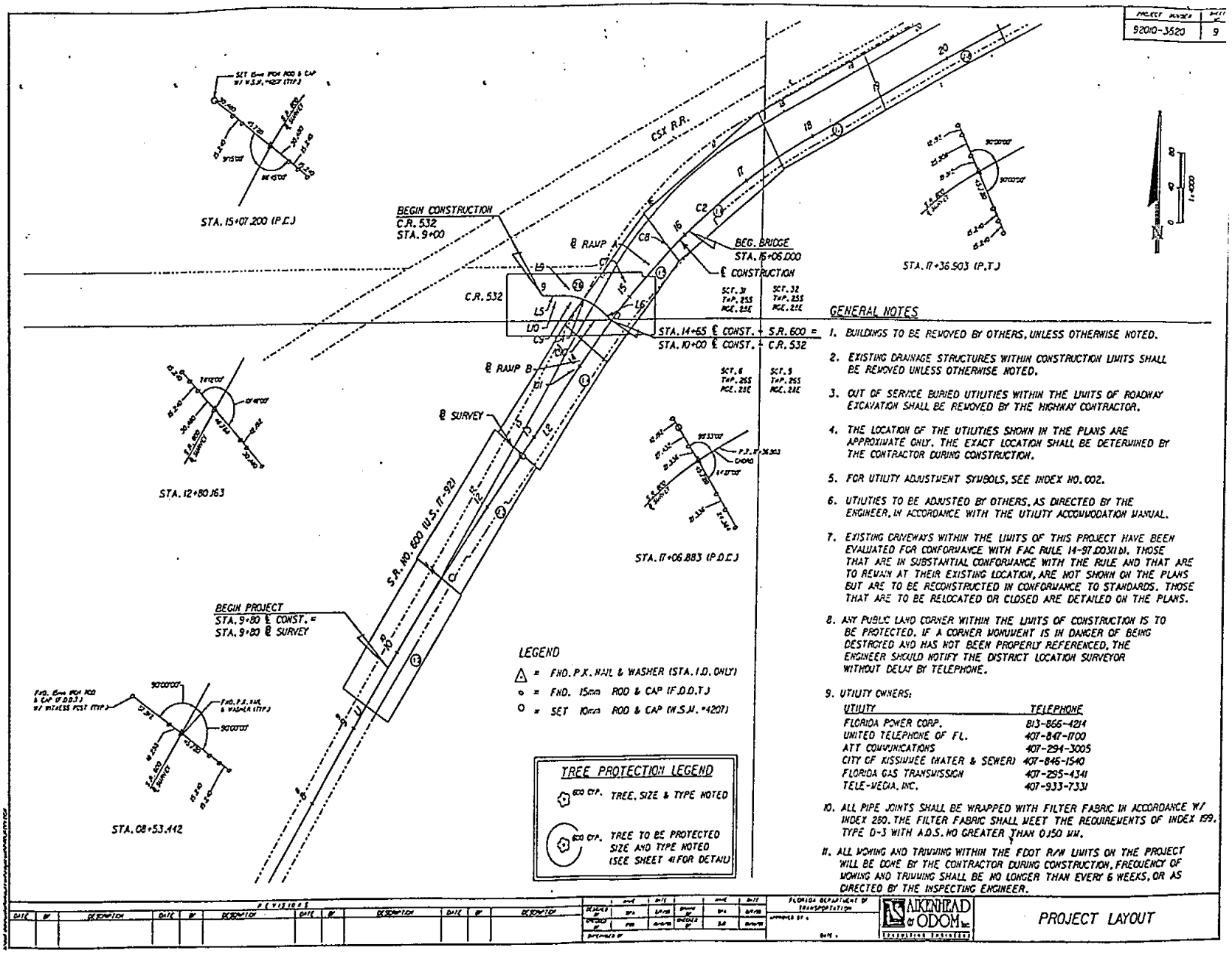
SPECIAL DETAILS

PROJECT NUMBER 92010-3520 | 4

Exhibit A
Page 2 of 19
Easement No. 30211

Exhibit A
Page 3 of 19
Easement No. 30211

PROJECT NUMBER	SHEET NO.
92010-3520	9



GENERAL NOTES

1. BUILDINGS TO BE REMOVED BY OTHERS, UNLESS OTHERWISE NOTED.
2. EXISTING DRAINAGE STRUCTURES WITHIN CONSTRUCTION LIMITS SHALL BE REMOVED UNLESS OTHERWISE NOTED.
3. OUT OF SERVICE BURIED UTILITIES WITHIN THE LIMITS OF ROADWAY EXCAVATION SHALL BE REMOVED BY THE HIGHWAY CONTRACTOR.
4. THE LOCATION OF THE UTILITIES SHOWN IN THE PLANS ARE APPROXIMATE ONLY. THE EXACT LOCATION SHALL BE DETERMINED BY THE CONTRACTOR DURING CONSTRUCTION.
5. FOR UTILITY ADJUSTMENT SYMBOLS, SEE INDEX NO. 002.
6. UTILITIES TO BE ADJUSTED BY OTHERS, AS DIRECTED BY THE ENGINEER, IN ACCORDANCE WITH THE UTILITY ACCOMMODATION MANUAL.
7. EXISTING DRIVEWAYS WITHIN THE LIMITS OF THIS PROJECT HAVE BEEN EVALUATED FOR CONFORMANCE WITH FAC RULE 14-97.003(1)(b), THOSE THAT ARE IN SUBSTANTIAL CONFORMANCE WITH THE RULE AND THAT ARE TO REMAIN AT THEIR EXISTING LOCATION, ARE NOT SHOWN ON THE PLANS BUT ARE TO BE RECONSTRUCTED IN CONFORMANCE TO STANDARDS. THOSE THAT ARE TO BE RELOCATED OR CLOSED ARE DETAILED ON THE PLANS.
8. ANY PUBLIC LAND CORNER WITHIN THE LIMITS OF CONSTRUCTION IS TO BE PROTECTED. IF A CORNER MONUMENT IS IN DANGER OF BEING DESTROYED AND HAS NOT BEEN PROPERLY REFERENCED, THE ENGINEER SHOULD NOTIFY THE DISTRICT LOCATION SURVEYOR WITHOUT DELAY BY TELEPHONE.
9. UTILITY OWNERS:

UTILITY	TELEPHONE
FLORIDA POWER CORP.	813-866-4214
UNITED TELEPHONE OF FL.	407-847-1700
ATT COMMUNICATIONS	407-294-3005
CITY OF KISSIMMEE (WATER & SEWER)	407-846-1540
FLORIDA GAS TRANSMISSION	407-295-4341
TELE-MEDIA, INC.	407-933-7331

10. ALL PIPE JOINTS SHALL BE WRAPPED WITH FILTER FABRIC IN ACCORDANCE W/ INDEX 280. THE FILTER FABRIC SHALL MEET THE REQUIREMENTS OF INDEX 199, TYPE D-3 WITH A.O.S. NO GREATER THAN 0.150 MM.
11. ALL MOWING AND TRIMMING WITHIN THE FDOT R/W LIMITS ON THE PROJECT WILL BE DONE BY THE CONTRACTOR DURING CONSTRUCTION, FREQUENCY OF MOWING AND TRIMMING SHALL BE NO LONGER THAN EVERY 6 WEEKS, OR AS DIRECTED BY THE INSPECTING ENGINEER.

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

DESIGNED BY	DATE	DRAWN BY	DATE	CHECKED BY	DATE
CHECKED BY		DATE		APPROVED BY	DATE

FLORIDA DEPARTMENT OF TRANSPORTATION
APPROVED BY
DATE

AKERMAN & ODOM, Inc.
Consulting Engineers

PROJECT LAYOUT

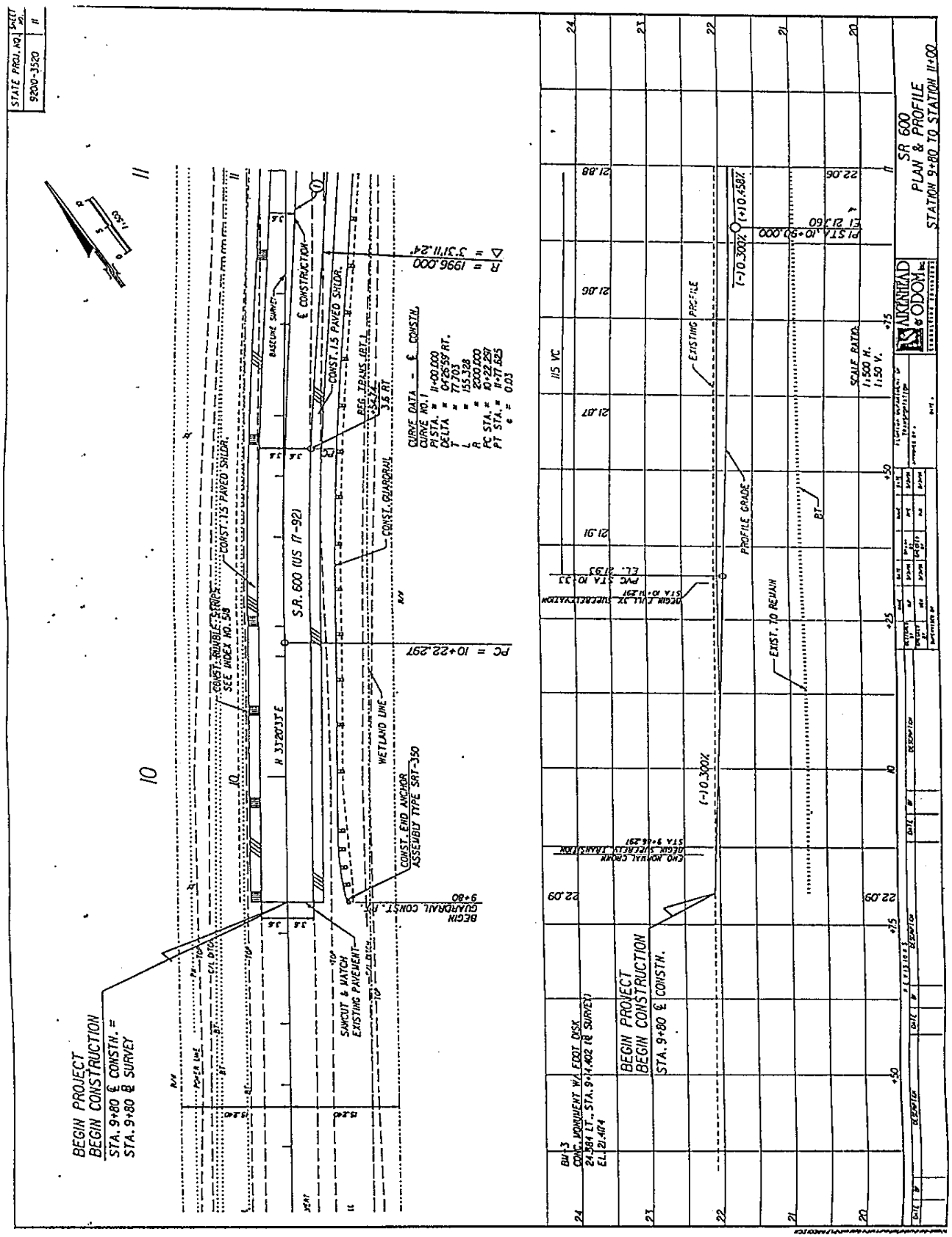
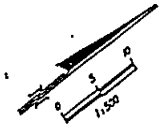
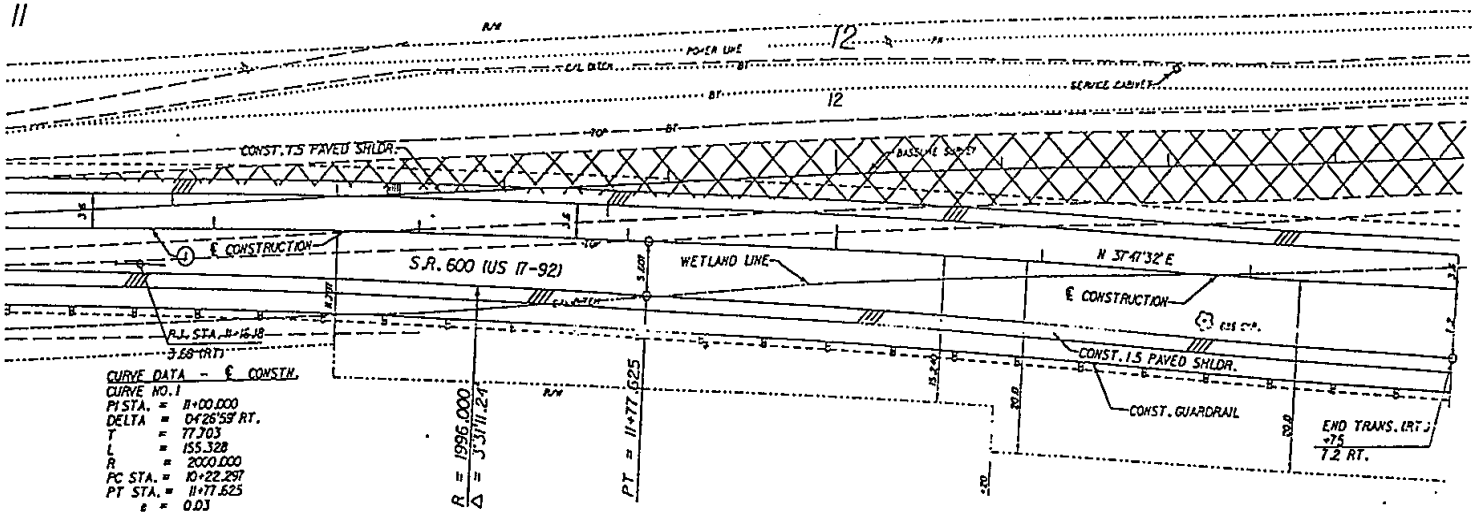

STATE PROJ. NO.
9200-3520
SHEET NO.
11
BEGIN PROJECT
BEGIN CONSTRUCTION
STA. 9+80 ℄ CONSTN. =
STA. 9+80 ℄ SURVEY
CONST. 15' PAVED SHLDR.
SEE INDEX NO. 508
CONST. 15' PAVED SHLDR.
BASELINE SURVEY
℄ CONSTRUCTION
S.R. 600 (US 17-92)
N 352033 E
CONST. 15' PAVED SHLDR.
REG. TRANS. DET.
3.5 RT
CONST. GUARDRAIL
WETLAND LINE
CONST. END ANCHOR
ASSEMBLY TYPE SAT-350
SAWCUT & MATCH
EXISTING PAVEMENT
BEGIN
GUARDRAIL CONST.
9+80
PC = 10+22.297
R = 1996.000
Δ = 3°31'11.24"
CURVE DATA - ℄ CONSTN.
CURVE NO.1
PI STA. = 11+00.000
DELTA = 04°26'59" RT.
T = 77.703
L = 155.328
D = 2°00'000
PC STA. = 10+22.297
PT STA. = 11+77.625
e = 0.03
BUT-3
CONC. MONUMENT W/ FDOT DISK
24.364 LT., STA. 9+14.402 (℄ SURVEY)
EL. 21.414
BEGIN PROJECT
BEGIN CONSTRUCTION
STA. 9+80 ℄ CONSTN.
115 VC
EXISTING PROFILE
PROFILE GRADE
EXIST. TO REMAIN
BT
(-)10.300%
(+)10.458%
PI STA. 10+90.000
PI EL. 21.60
SCALE RATIO
1:500 H.
1:50 V.
SR 600
PLAN & PROFILE
STATION 9+80 TO STATION 11+00
ARKANSAS
ODOM Inc

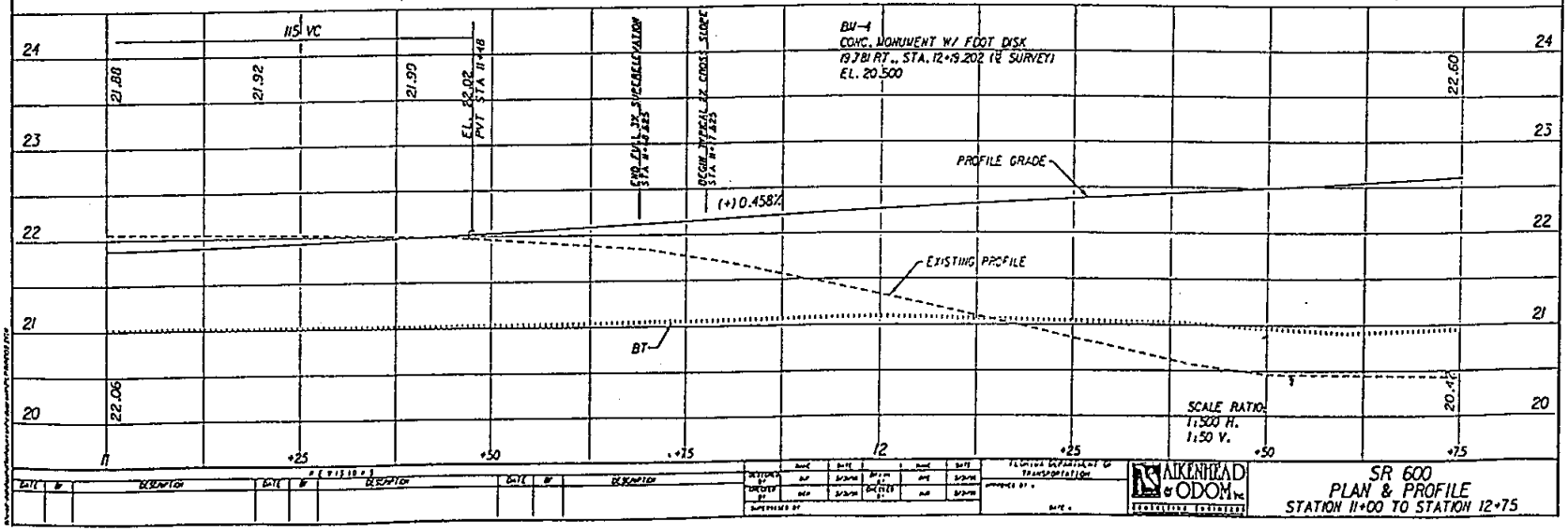
Exhibit A
Page 5 of 19
Easement No. 30211

STATE PROJ. NO.	SHEET NO.
92010-3520	12

EXISTING ASPHALT PAVEMENT TO BE REMOVED, REFER TO MOT PLANS FOR PHASING (SEE GENERAL NOTE 3)







DATE	BY	DESCRIPTION

DESIGNED BY
DRAWN BY
CHECKED BY
QUANTITIES BY
CHECKED BY
APPROVED BY
DATE

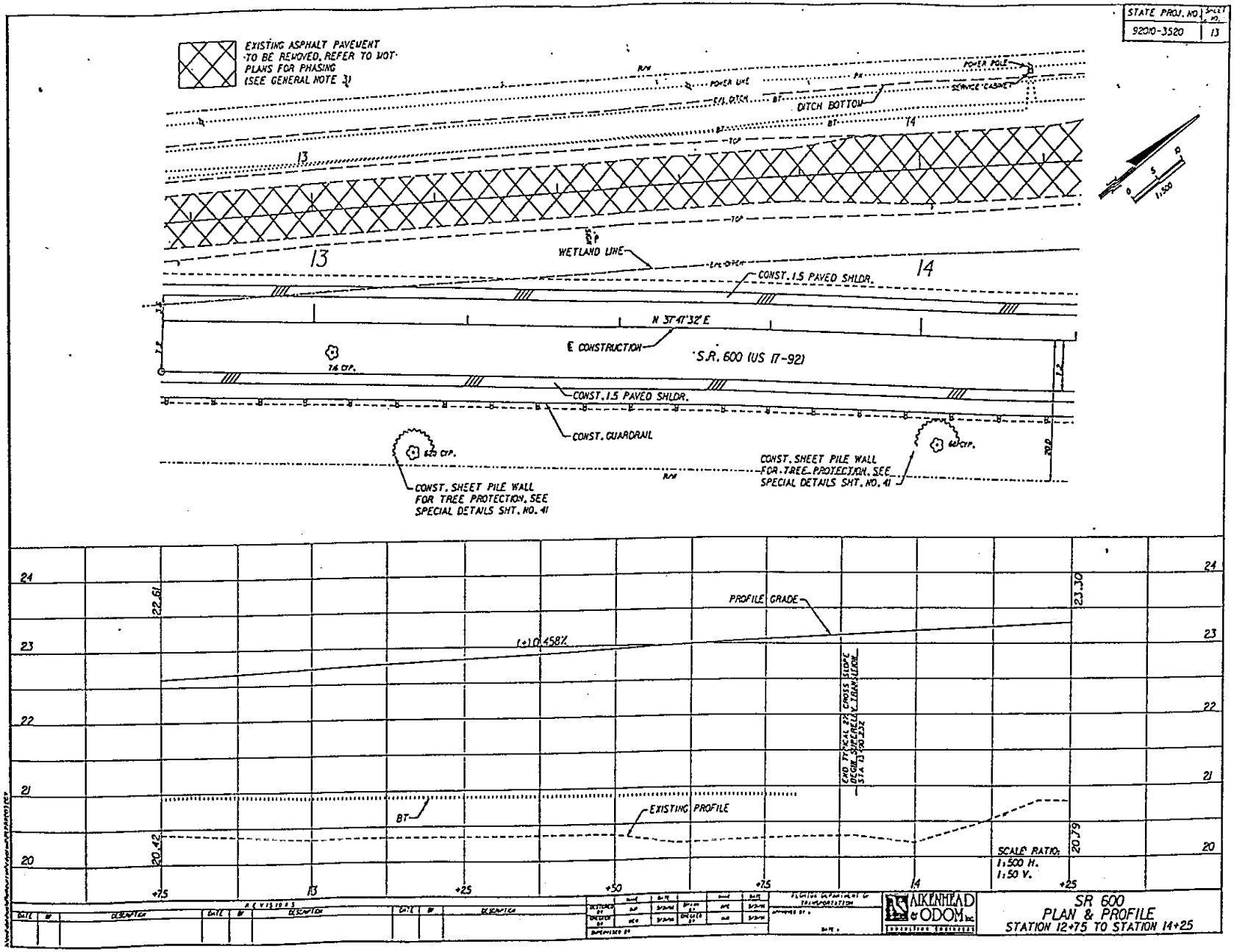
FLORIDA DEPARTMENT OF TRANSPORTATION

AKENHEAD & ODOM INC.
CONSULTING ENGINEERS

SR 600
PLAN & PROFILE
STATION 11+00 TO STATION 12+75

Exhibit A
Page 6 of 19
Easement No. 30211

STATE PROJ. NO.	SHEET NO.
92010-3520	13



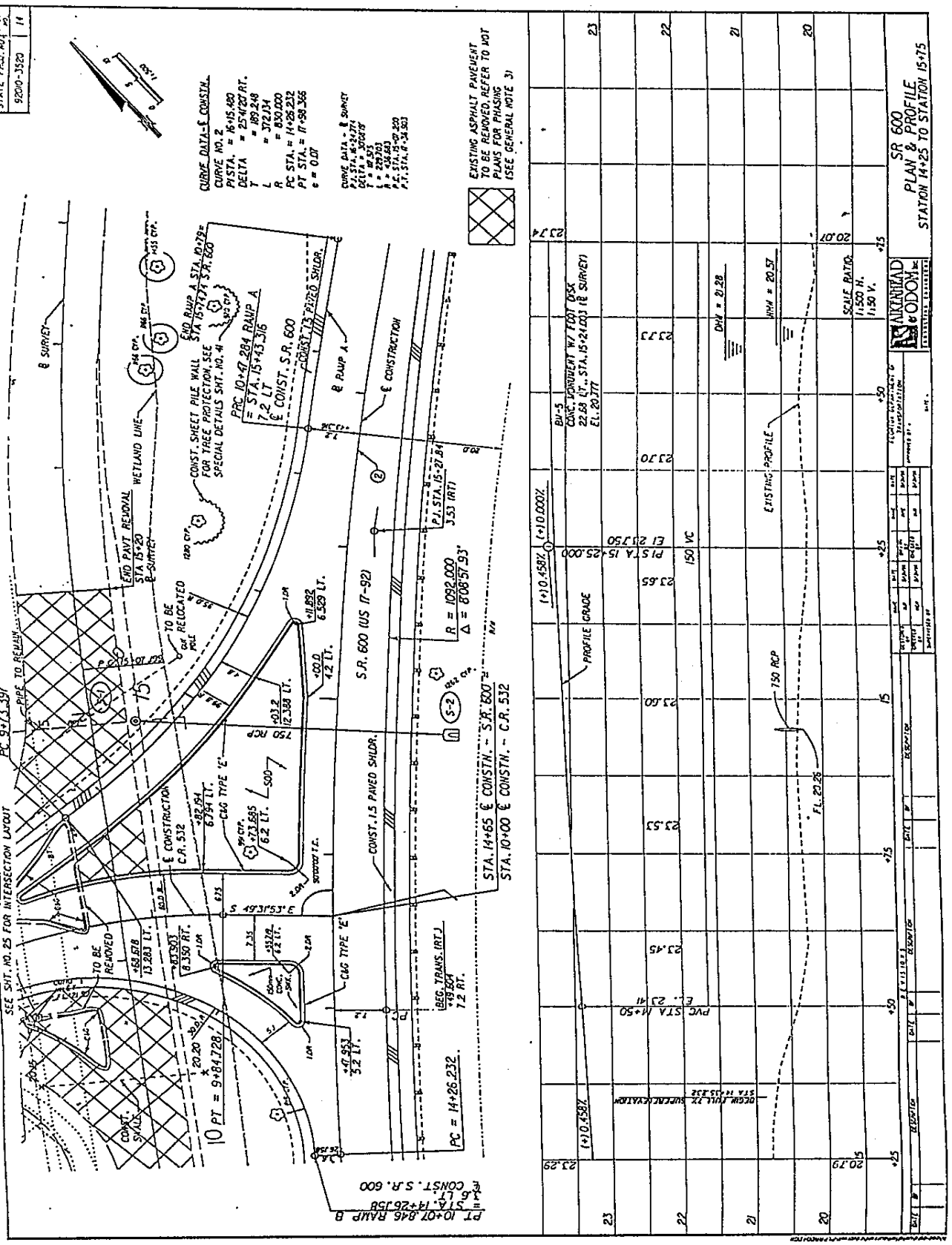
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

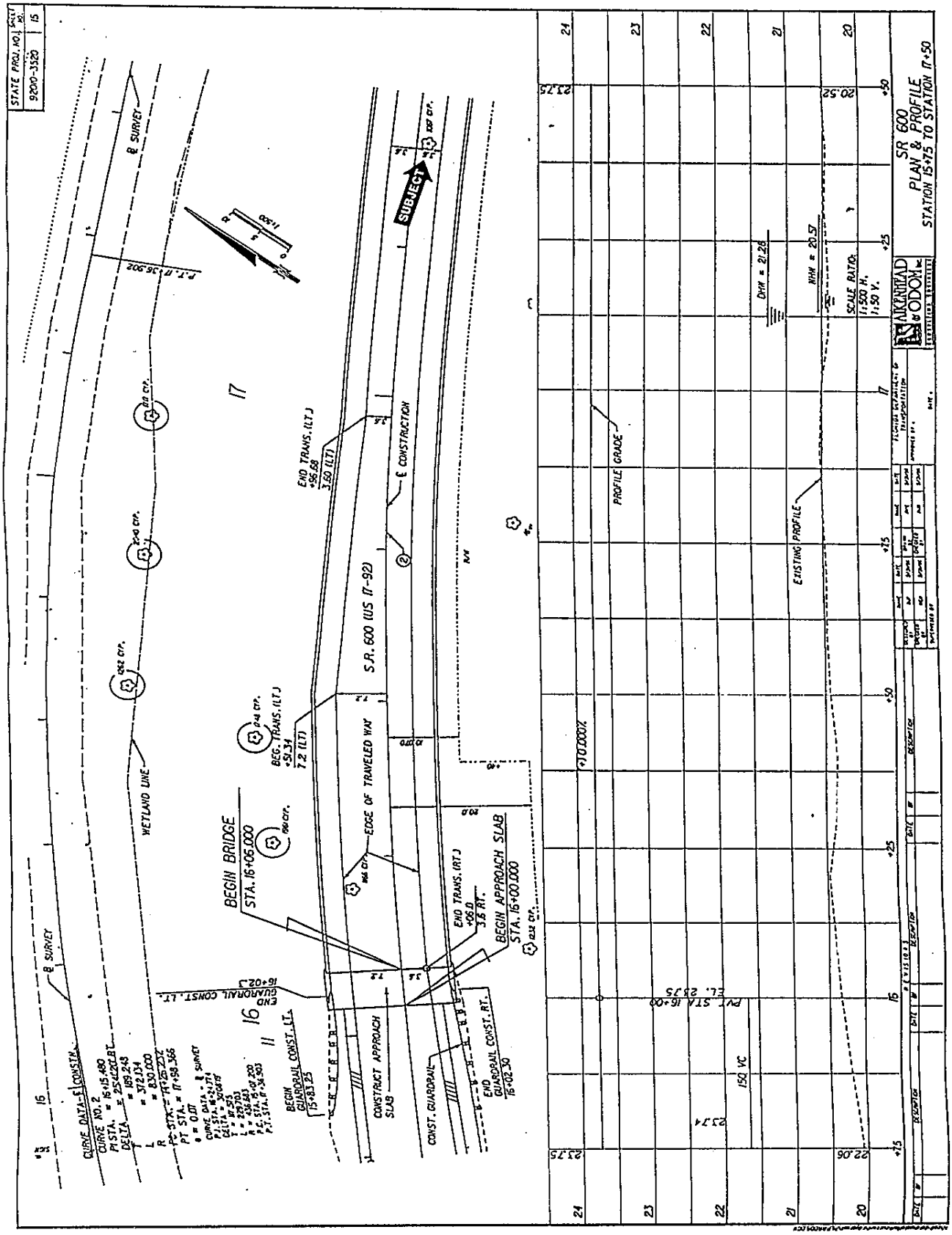
DESIGNED BY	DATE	CHECKED BY	DATE
DRAWN BY	DATE	CHECKED BY	DATE
QUANTITIES BY	DATE	APPROVED BY	DATE

FLORIDA DEPARTMENT OF TRANSPORTATION

ATKINS HEAD & ODOM Inc.
CONSULTING ENGINEERS

SR 600
PLAN & PROFILE
STATION 12+75 TO STATION 14+25


SR 600
PLAN & PROFILE
STATION 14+25 TO STATION 15+75
AKENHEAD & ODOM INC.
SCALE RATIO
1:500 H.
1:50 V.
EXISTING PROFILE
PROFILE GRADE
EXISTING ASPHALT PAVEMENT TO BE REMOVED, REFER TO MOT PLANS FOR PHASING (SEE GENERAL NOTE 31)
CURVE DATA - ℄ CONSTN.
CURVE NO. 2
PI STA. = 16+15.480
DELTA = 25°47'27" RT.
T = 189.248
L = 372.134
R = 850.000
PC STA. = 14+26.232
PT STA. = 17+98.366
e = 0.07
℄ CONSTRUCTION
℄ SURVEY
S.R. 600 (US 17-92)
S 49°31'53" E
PC = 14+26.232
PT = 9+84.728
STA. 14+65 ℄ CONSTN. - S.R. 600
STA. 10+00 ℄ CONSTN. - C.R. 532
SEE SHT. NO. 25 FOR INTERSECTION LAYOUT


STATE PROJ. NO.
9200-3320
SHEET NO.
15
SR 600
PLAN & PROFILE
STATION 15+75 TO STATION 17+50
SUBJECT
BEGIN BRIDGE
STA. 16+06.000
BEGIN APPROACH SLAB
STA. 16+00.000
S.R. 600 (US 17-92)
EDGE OF TRAVELED WAY
PROFILE GRADE
EXISTING PROFILE
CONSTRUCT APPROACH SLAB
CONST. GUARDRAIL
BEGIN GUARDRAIL CONST. LT.
END GUARDRAIL CONST. LT.
END GUARDRAIL CONST. RT.
END TRANS. (LT.)
BEG. TRANS. (LT.)
END TRANS. (RT.)
WETLAND LINE
SCALE RATIO:
1:500 H.
1:50 V.
DHW = 21.26
MHW = 20.57
PVT STA 16+00
EL. 23.75
150 VC
ODOM
AIKENHEAD

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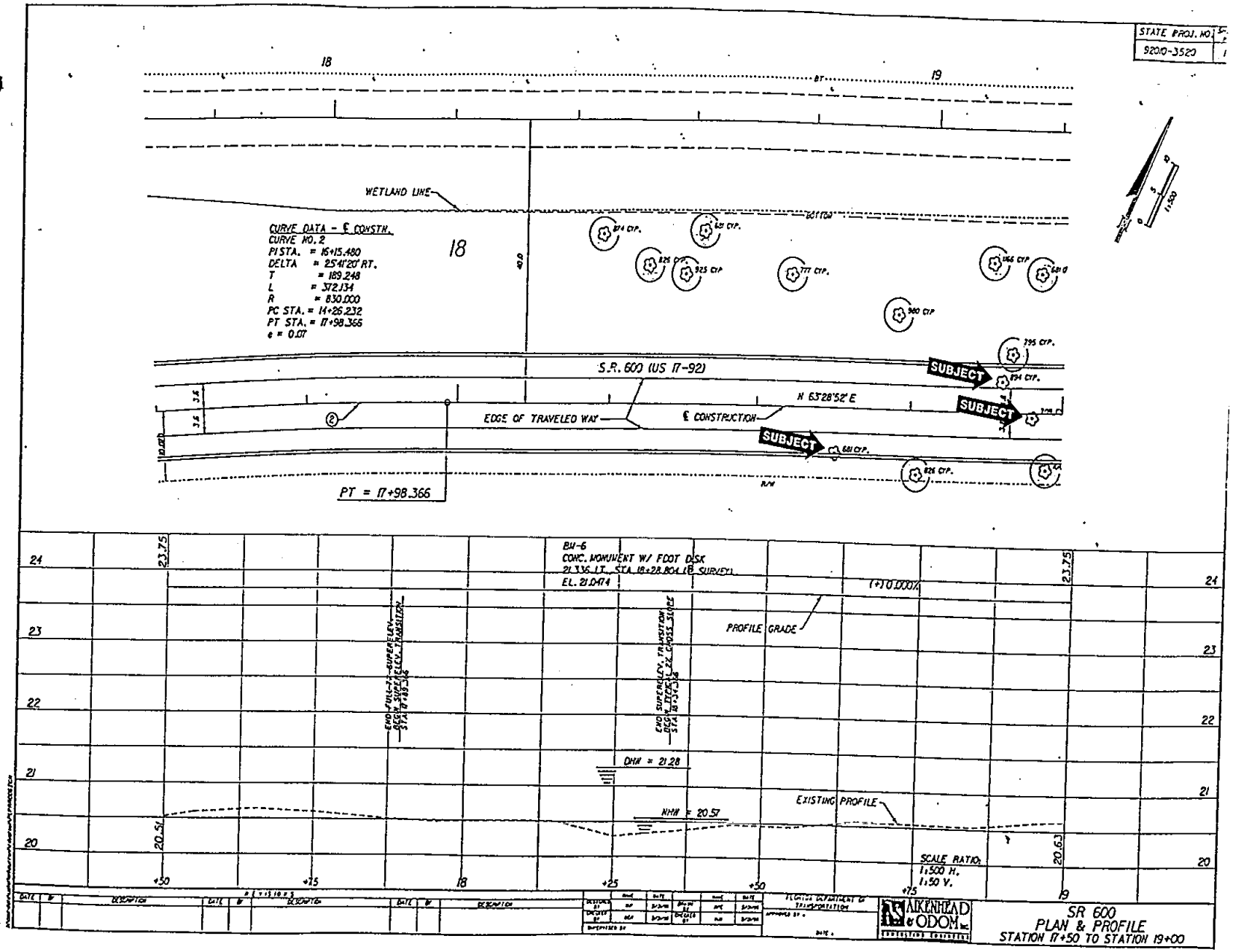
Easement No. 30211



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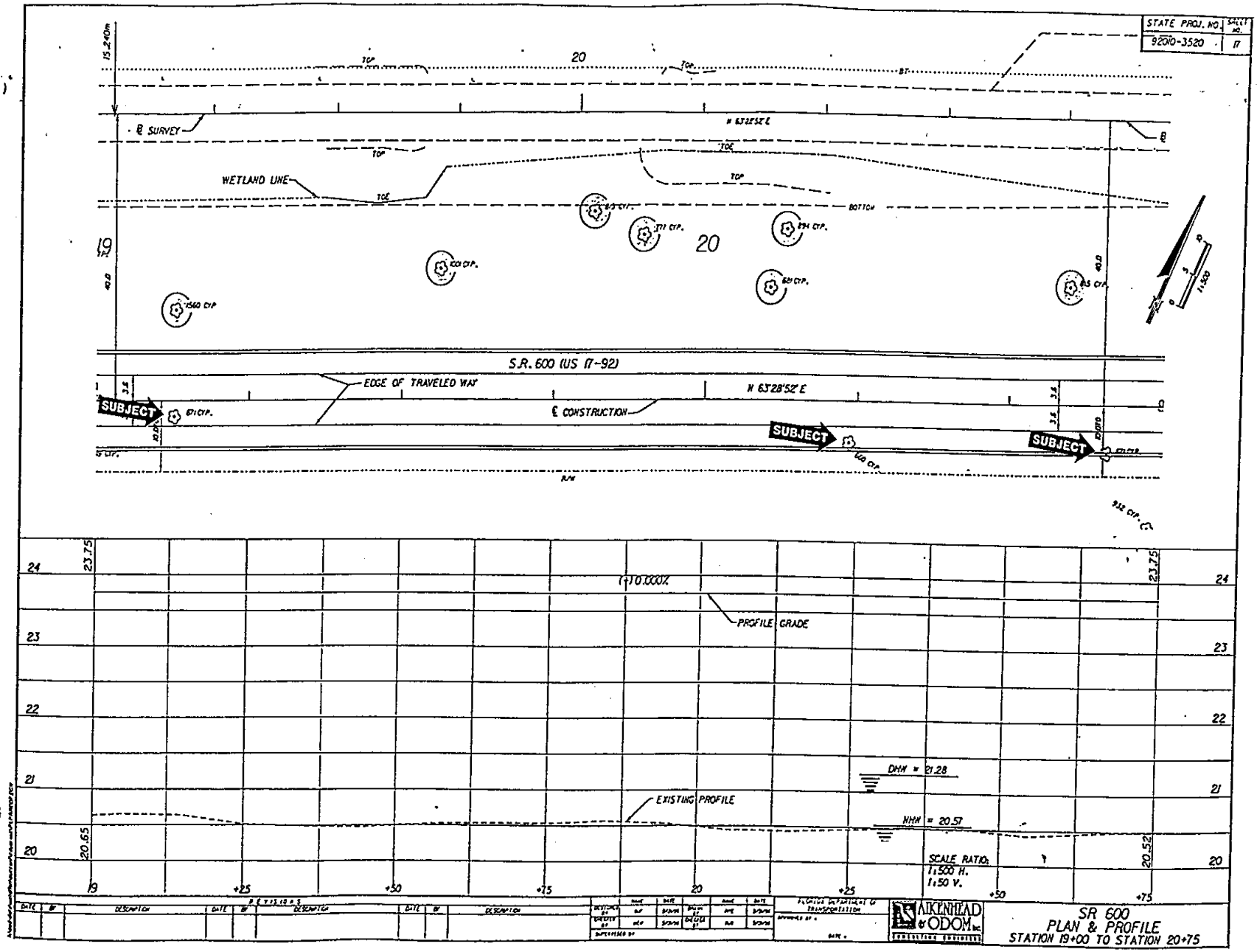

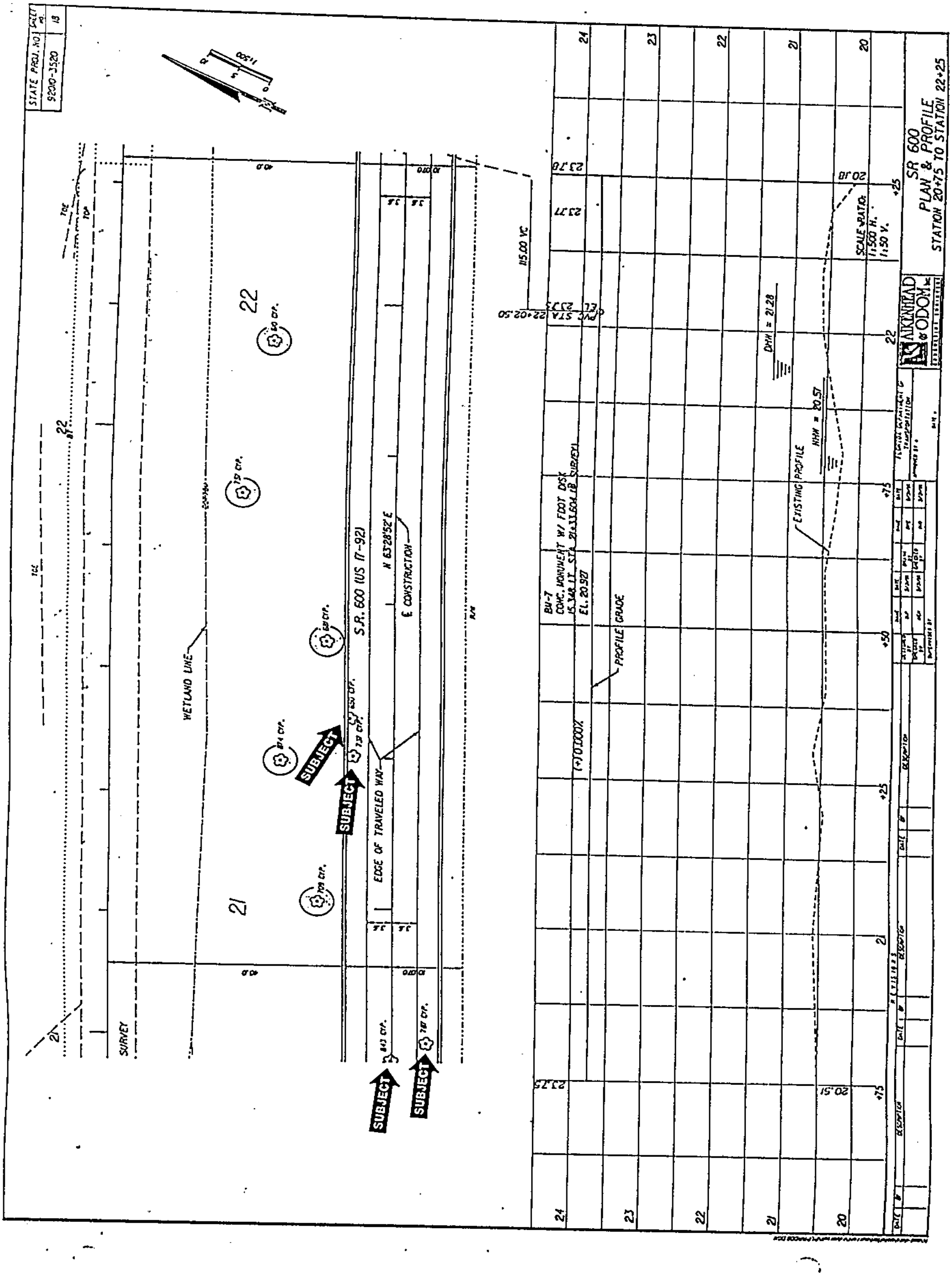

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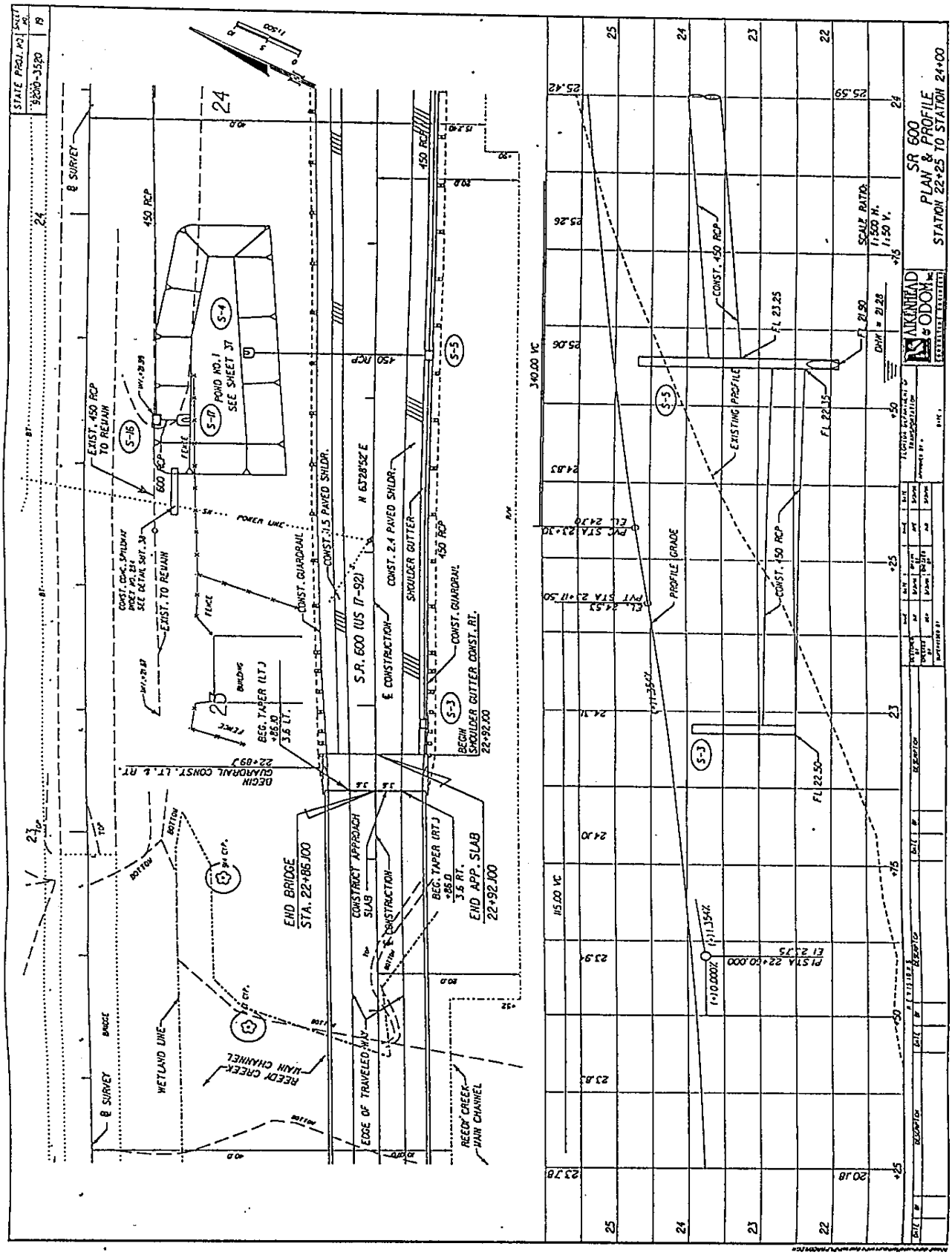
Easement No. 30211



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Easement No. 30211

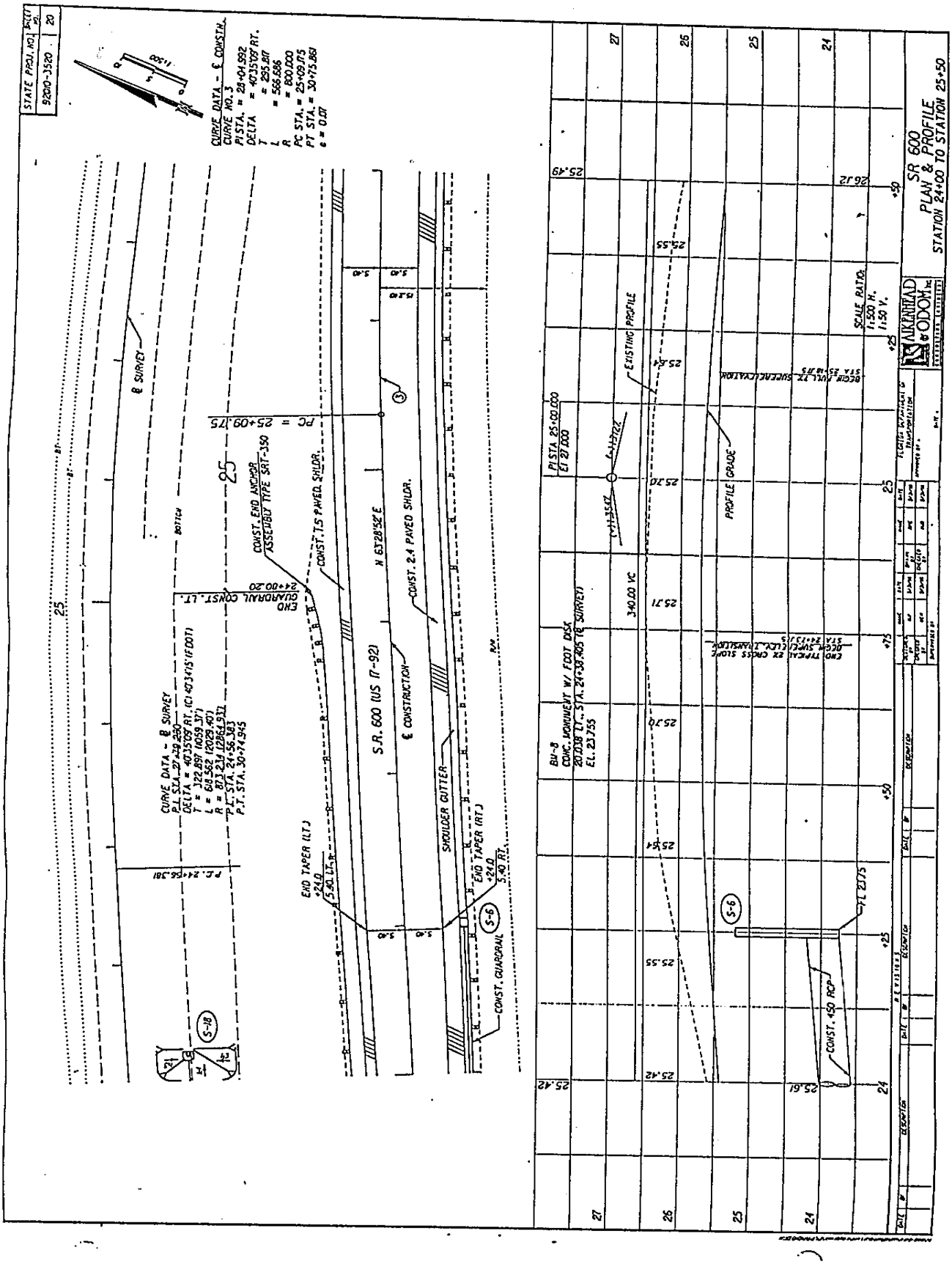

Exhibit A
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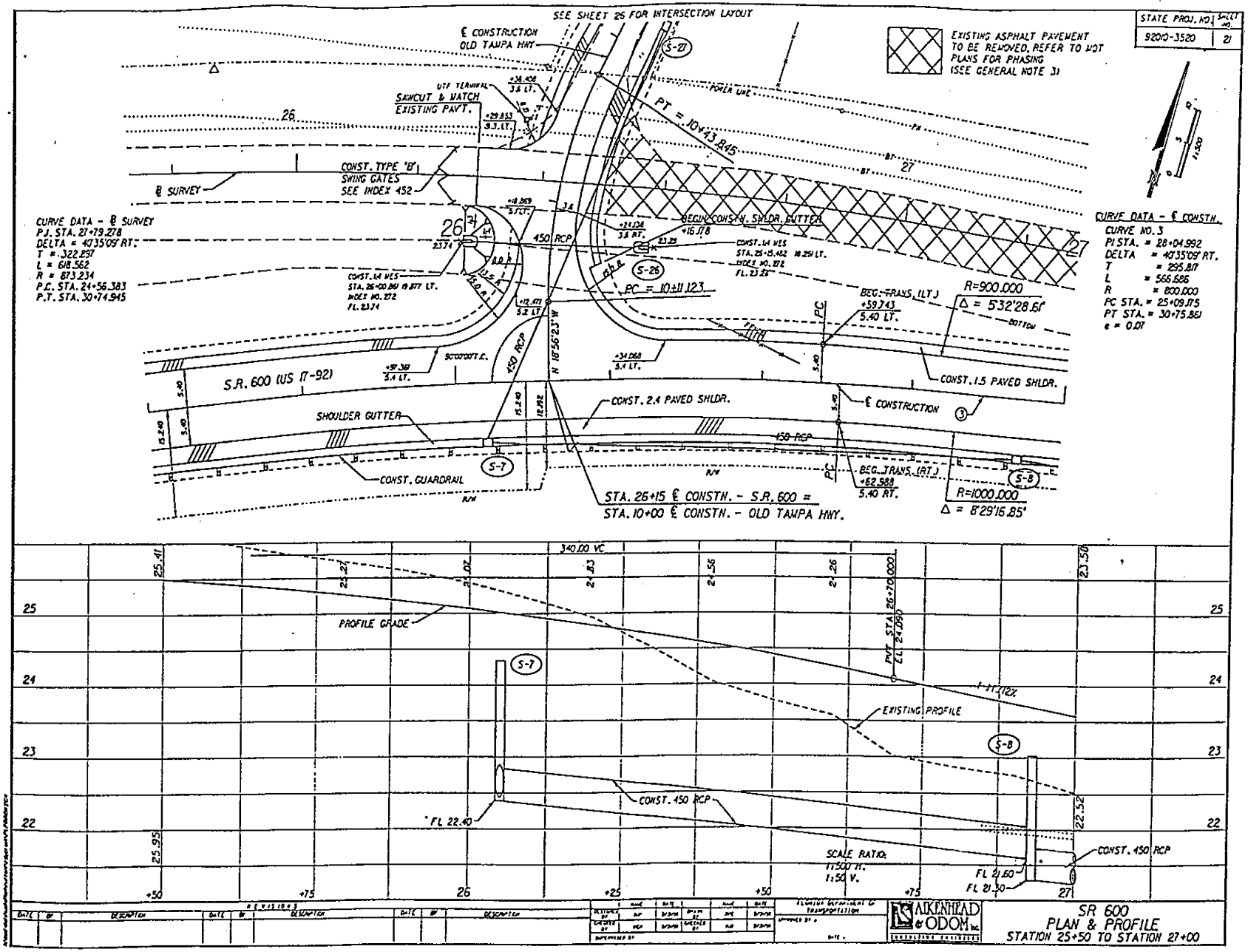
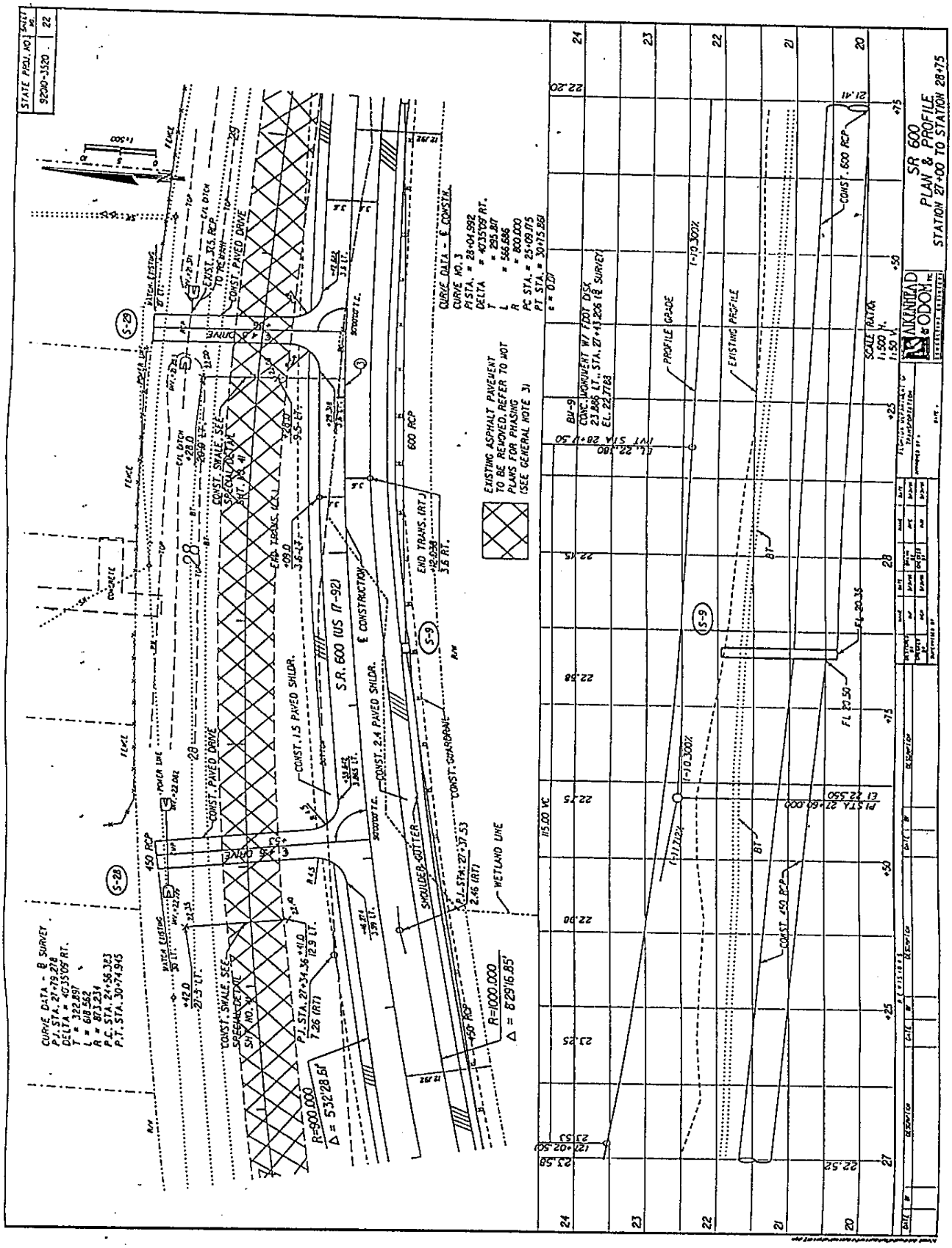
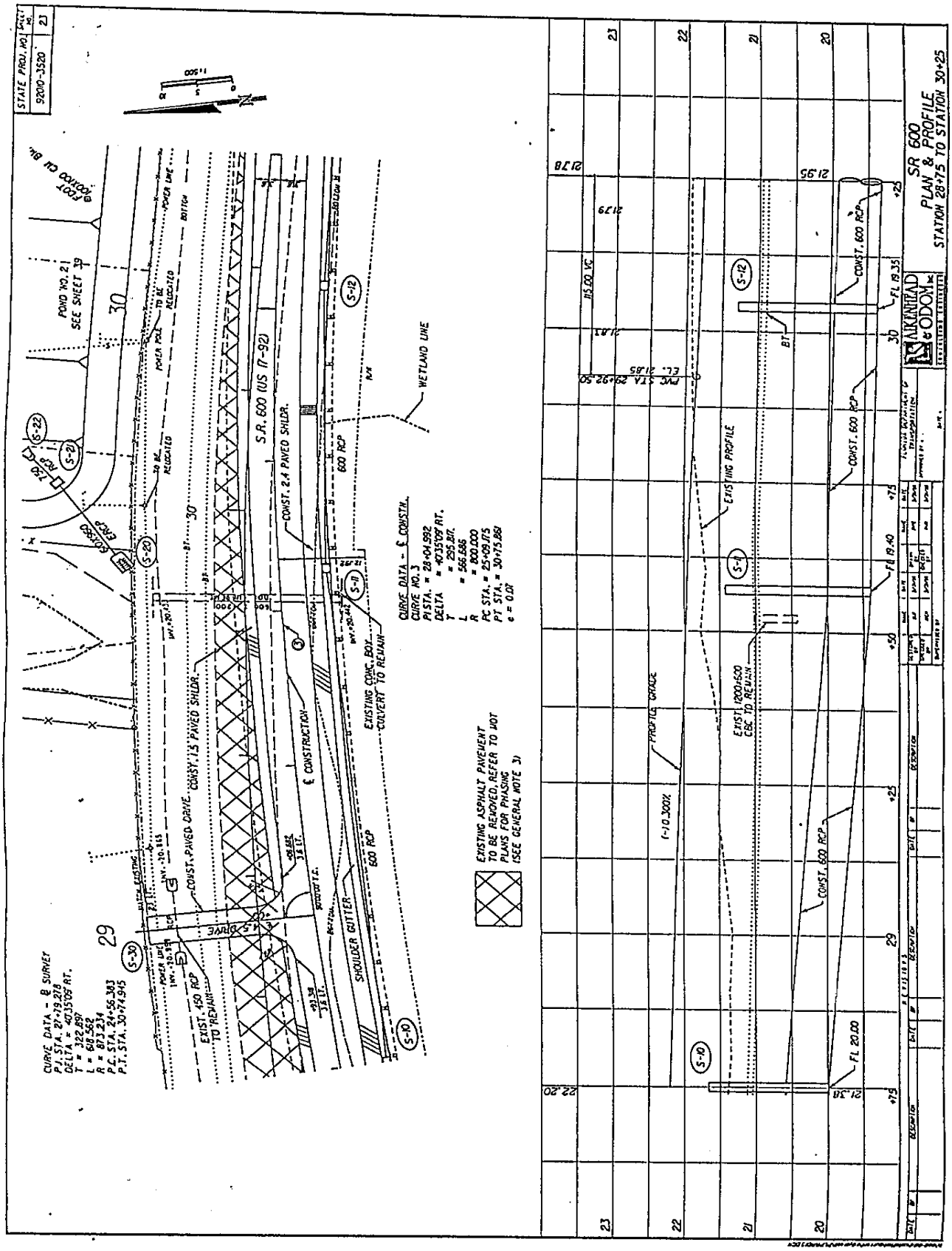
Easement No. 30211


SEE SHEET 26 FOR INTERSECTION LAYOUT
℄ CONSTRUCTION OLD TAMPA HWY
EXISTING ASPHALT PAVEMENT TO BE REMOVED, REFER TO MOT PLANS FOR PHASING (SEE GENERAL NOTE 31
STATE PROJ. NO.
92010-3520
SHEET NO.
21
SAWCUT & MATCH EXISTING PAVT.
CONST. TYPE 'B' SWING GATES SEE INDEX 452
℄ SURVEY
PT = 10+43.845
POWER LINE
CURVE DATA - ℄ SURVEY
PJ. STA. 27+79.278
DELTA = 40°35'09" RT.
T = 322.257
L = 618.562
R = 873.234
P.C. STA. 24+56.383
P.T. STA. 30+74.945
CURVE DATA - ℄ CONSTN.
CURVE NO. 3
PI STA. = 28+04.992
DELTA = 40°35'09" RT.
T = 295.817
L = 566.686
R = 800.000
PC STA. = 25+09.175
PT STA. = 30+75.861
e = 0.01
BEGIN CONST'N. SHLDR. GUTTER
450 RCP
CONST. 1:4 WES
CONST. 1:4 WES
INDEX NO. 272
FL 23.25
PC = 10+11.123
R=900.000
Δ = 5°32'28.6"
BEG. TRANS. (LT.)
BEG. TRANS. (RT.)
R=1000.000
Δ = 8°29'16.85"
S.R. 600 (US 17-92)
SHOULDER GUTTER
CONST. 2:4 PAVED SHLDR.
CONST. 1:5 PAVED SHLDR.
CONST. GUARDRAIL
STA. 26+15 ℄ CONSTN. - S.R. 600 =
STA. 10+00 ℄ CONSTN. - OLD TAMPA HWY.
340.00 VC
PROFILE GRADE
EXISTING PROFILE
CONST. 450 RCP
FL 22.40
SCALE RATIO:
1":50' H.
1":5 V.
FL 21.60
FL 21.30
SR 600
PLAN & PROFILE
STATION 25+50 TO STATION 27+00
AIKENHEAD & ODOM INC.


SR 600
PLAN & PROFILE
STATION 27+00 TO STATION 28+75
SCALE RATIO
1:500 H.
1:50 V.
EXISTING ASPHALT PAVEMENT TO BE REMOVED, REFER TO MOT PLANS FOR PHASING (SEE GENERAL NOTE 31)
PROFILE GRADE
EXISTING PROFILE
SR. 600 (US 17-92)
CONST. 600 RCP
CONST. 450 RCP
CONST. 2.4 PAVED SHLDR.
CONST. 1.5 PAVED SHLDR.
CONST. PAVED DRIVE
CONST. SWALE, SEE SPECIAL DETAIL SHT. NO. 41
SHOULDER GUTTER
WETLAND LINE
R=900.000
Δ = 53°28'51"
R=1000.000
Δ = 8°29'16.85"
CURVE DATA - ℄ SURVEY
P.I. STA. 27+79.278
DELTA = 40°35'09" RT.
T = 332.897
L = 608.582
R = 871.234
P.C. STA. 24+56.383
P.T. STA. 30+74.965
CURVE DATA - ℄ CONSTR.
CURVE NO. 3
P.I STA. = 28+04.592
DELTA = 40°35'09" RT.
T = 295.87
L = 565.686
R = 800.000
PC STA. = 23+08.715
PT STA. = 30+15.851
e = 0.07
CONC. MONUMENT W/ 4" DIA. DISK
23.886 LT., STA. 27+43.206 ℄ SURVEY
EL. 22.7783
ANKENBRAD & ODOM INC.



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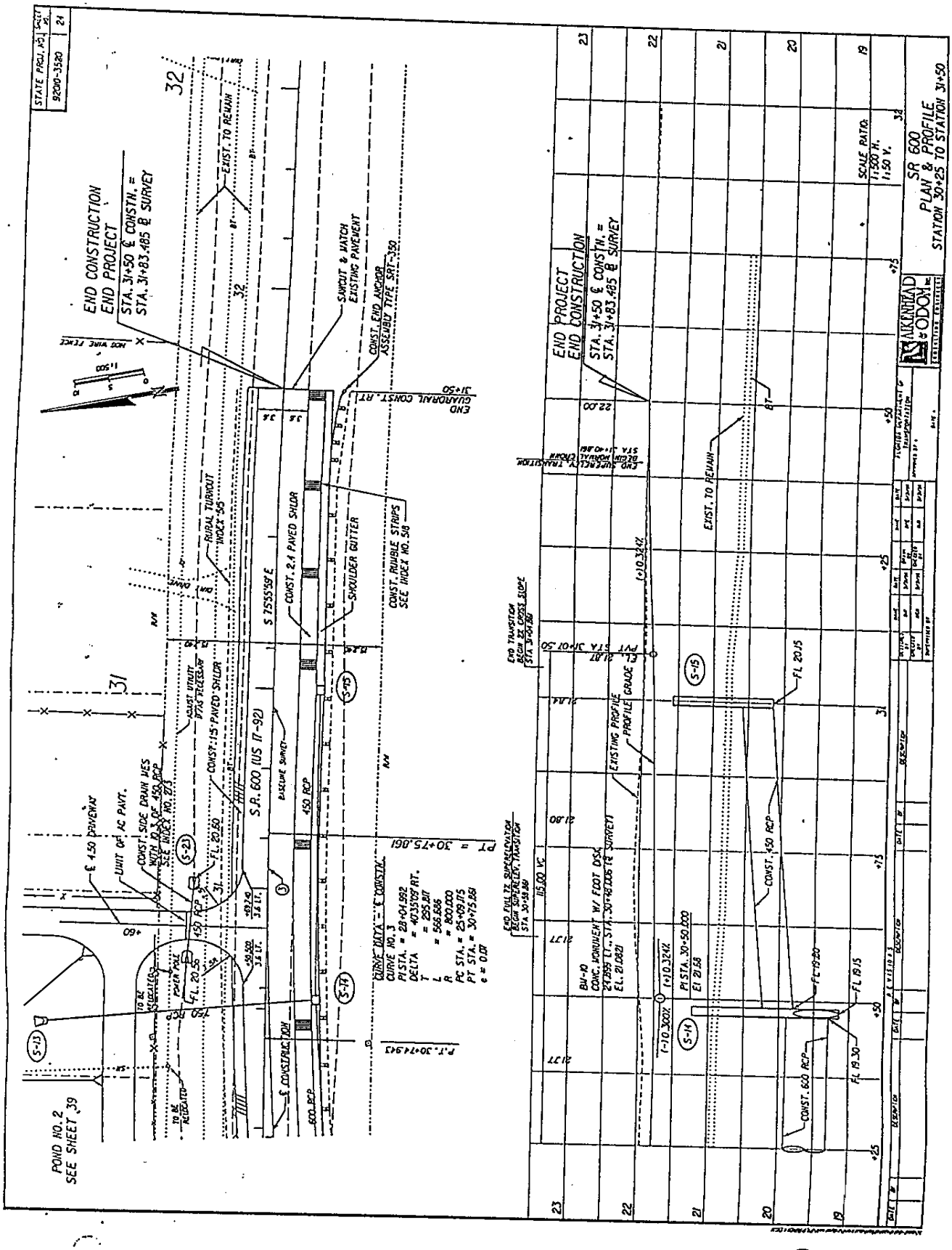
STATE PROJ. NO.
9200-3520
SHEET NO.
21
END CONSTRUCTION
END PROJECT
STA. 31+50 ℄ CONSTN. =
STA. 31+83.485 ℄ SURVEY
EXIST. TO REMAIN
SHOULDER GUTTER
CONST. RUBBLE STRIPS
SEE INDEX NO. 518
CONST. 2:1 PAVED SHLDR
CONST. 1:1.5 PAVED SHLDR
S.R. 600 (US 17-92)
S 75°55'58" E
RURAL TURNOUT
INDEX 545
CONST. END ANCHOR
ASSEMBLY TYPE SRT-350
SAWCUT & MATCH
EXISTING PAVEMENT
END GUARDRAIL CONST. RT.
STA. 31+50
UNIT OF AC PAVT.
℄ 45° DRIVEWAY
CONST. SIDE DRAIN YES
WITH ID 3 OF 453.RCP
SEE INDEX NO. 273
CONST. UTILITY
VITAS TELECOM
TO BE RELOCATED
TO BE REMOVED
450 RCP
FL 20.60
FL 20.55
PAVT
PAVT
PAVT
PAVT
600 RCP
℄ CONSTRUCTION
PT = 30+75.061
PT. 30+74.943
CURVE DATA - ℄ CONSTR.
CURVE NO. 3
PI STA. = 28+04.592
DELTA = 4°35'09" RT.
T = 285.88
L = 566.86
R = 800.000
PC STA. = 25+09.175
PT STA. = 30+75.86
e = 0.07
POND NO. 2
SEE SHEET 39
END TRANSITION
BEGIN SUPERELEV. TRANSITION
STA. 30+89.86
END FULL SUPERELEVATION
BEGIN SUPERELEV. TRANSITION
STA. 30+89.86
END TRANSITION
BEGIN 2% CROSS SLOPE
STA. 30+01.50
115.00 VC
EXISTING PROFILE
PROFILE GRADE
(+)10.324%
(-)10.300%
PI STA. 30+50.000
EL 21.58
BU-10
CONC. MONUMENT W/ FOOT DISC
21.2895 LT., STA. 30+48.006 ℄ SURVEY
EL. 21.0821
CONST. 450 RCP
CONST. 600 RCP
FL 20.15
FL 19.20
FL 19.15
FL 19.30
END FACILITY TRANSITION
BEGIN NORMAL CROWN
STA. 31+40.86
22.00
SCALE RATIO
1:500 H.
1:50 V.
AKENHEAD & ODOM INC
SR 600
PLAN & PROFILE
STATION 30+25 TO STATION 31+50

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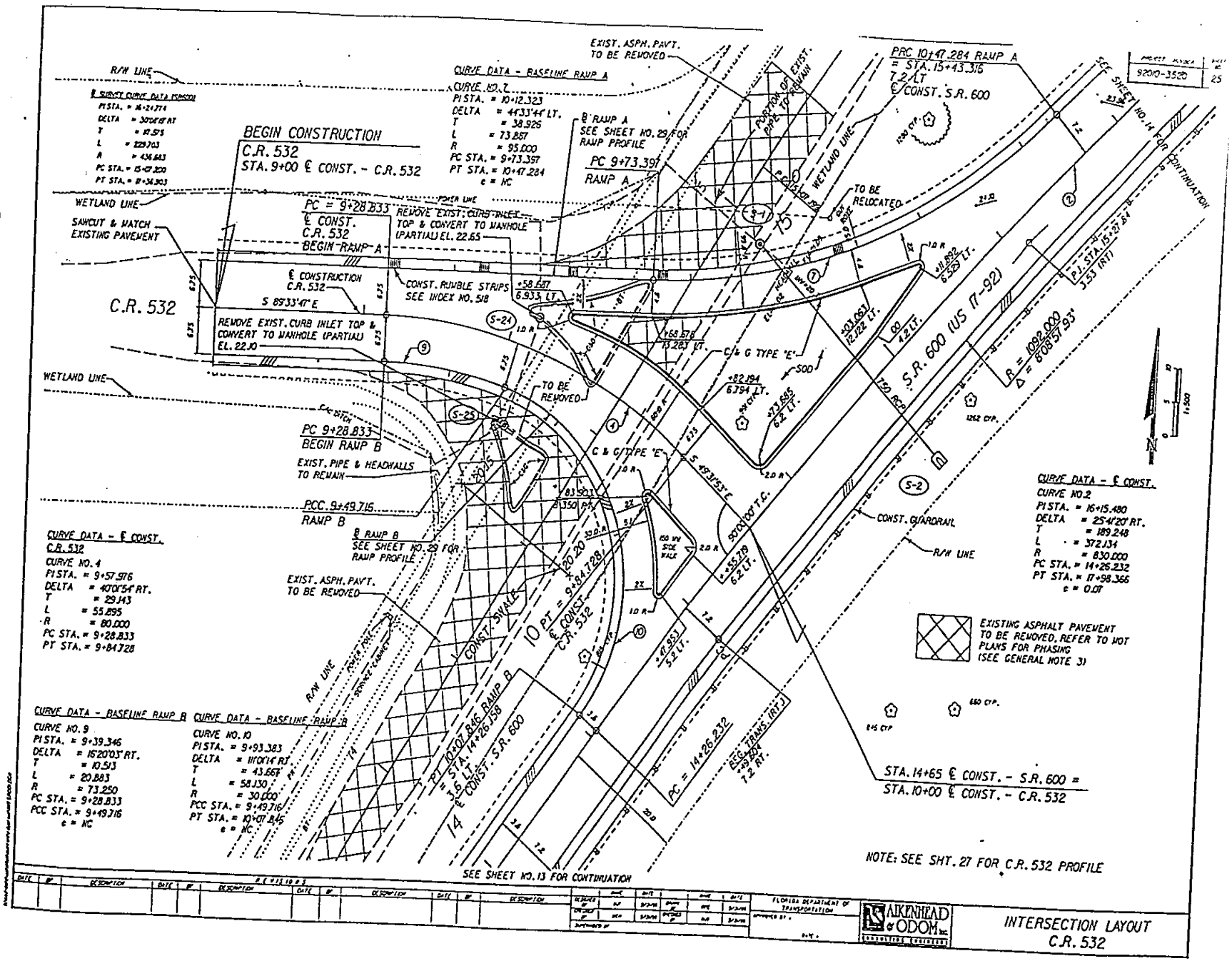

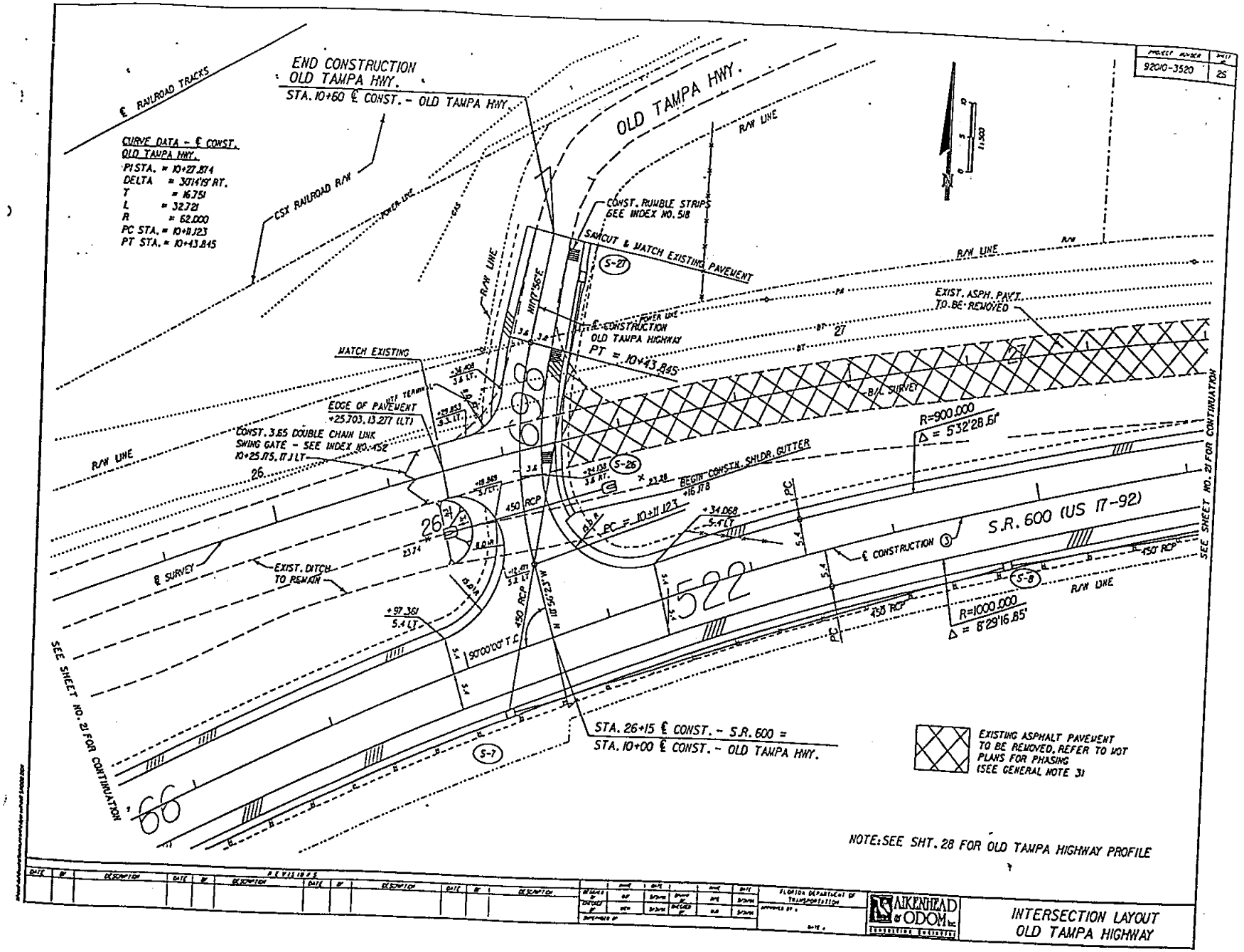
END CONSTRUCTION
OLD TAMPA HWY.
STA. 10+60 ℄ CONST. - OLD TAMPA HWY.
℄ RAILROAD TRACKS
CSX RAILROAD R/W
CURVE DATA - ℄ CONST. OLD TAMPA HWY.
PI STA. = 10+27.874
DELTA = 30°14'15" RT.
T = 16.751
L = 32.721
R = 62.000
PC STA. = 10+10.123
PT STA. = 10+43.845
OLD TAMPA HWY.
R/W LINE
CONST. RUMBLE STRIPS SEE INDEX NO. 518
SAWCUT & MATCH EXISTING PAVEMENT
EXIST. ASPH. PAVT. TO BE REMOVED
℄ CONSTRUCTION OLD TAMPA HIGHWAY
PT = 10+43.845
MATCH EXISTING
EDGE OF PAVEMENT
+25.703, 13.277 (LT)
CONST. 3.65 DOUBLE CHAIN LINK SWING GATE - SEE INDEX NO. 452
10+25.175, 17.1 LT
B/L SURVEY
R=900.000
Δ = 5°32'28.61"
BEGIN CONSTR. SHLDR. GUTTER
PC = 10+11.123
450 RCP
℄ SURVEY
EXIST. DITCH TO REMAIN
℄ CONSTRUCTION
S.R. 600 (US 17-92)
R=1000.000
Δ = 8°29'16.85"
SEE SHEET NO. 21 FOR CONTINUATION
STA. 26+15 ℄ CONST. - S.R. 600 =
STA. 10+00 ℄ CONST. - OLD TAMPA HWY.
EXISTING ASPHALT PAVEMENT TO BE REMOVED, REFER TO MOT PLANS FOR PHASING (SEE GENERAL NOTE 31
NOTE: SEE SHT. 28 FOR OLD TAMPA HIGHWAY PROFILE
PROJECT NUMBER 92010-3520
SHEET 25
AIKENHEAD & ODOM, Inc.
INTERSECTION LAYOUT
OLD TAMPA HIGHWAY