

NATURAL RESOURCE EVALUATION

Florida Department of Transportation

District Five

Neptune Road Project Development and Environment Study

Limits of Project: Partin Settlement Road to US 192

Osceola County, Florida

Financial Management Number: 445415-1

ETDM Number: 14402

Date: July 2020

The environmental review, consultation, and other actions required by applicable federal environmental laws for this project are being, or have been, carried out by FDOT pursuant to 23 U.S.C. § 327 and a Memorandum of Understanding dated December 14, 2016 and executed by FHWA and FDOT.

Natural Resource Evaluation Report

Neptune Road PD&E

FPID: 445415-1

PS-18-9905-DG

ETDM: 14402

Federal Aid Project Number: N/A

Prepared for:



**Osceola County, Florida
Department of Transportation and Transit
1 Courthouse Square, Suite 3100
Kissimmee, FL 34741**

JULY 2020

Prepared by:
Kimley-Horn and Associates, Inc.

TABLE OF CONTENTS

EXECUTIVE SUMMARY	ES-1
1.0 INTRODUCTION	1
2.0 PROJECT DESCRIPTION	2
3.0 PURPOSE AND NEED	4
4.0 ALTERNATIVES ANALYSIS	5
4.1 NO-BUILD ALTERNATIVE	5
4.2 TRANSPORTATION SYSTEM MANAGEMENT AND OPERATIONS ALTERNATIVE	5
4.3 MULTIMODAL ALTERNATIVES	5
4.4 BUILD ALTERNATIVES	6
4.4.1 PARTIN SETTLEMENT ROAD TO OLD CANOE CREEK ROAD	6
4.4.2 OLD CANOE CREEK ROAD TO US 192	8
5.0 EXISTING ENVIRONMENTAL CONDITIONS	10
5.1 METHODOLOGY FOR ACCESSING NATURAL AND BIOLOGICAL FEATURES	10
5.2 EXISTING AND FUTURE LAND USE	10
5.2.1 EXISTING LAND USE	10
5.2.2 FUTURE LAND USE	10
5.2.3 HABITAT AND VEGETATIVE COVER	11
5.2.4 SOILS	22
6.0 WETLANDS EVALUATION	30
6.1 DATA COLLECTION	30
6.2 WETLAND CHARACTERIZATION	31
6.3 WETLAND AND SURFACE WATER IMPACTS ANALYSIS	39
6.3.1 DIRECT IMPACTS	39
6.3.2 SECONDARY IMPACTS	41
6.3.3 STORMWATER POND SCREENING	42
6.4 FUNCTIONAL ASSESSMENT	44
6.4.1 METHODOLOGY	44
6.4.2 UMAM RESULTS	44
6.5 CONCEPTUAL MITIGATION	45
6.6 CUMULATIVE EFFECTS	46
7.0 PROTECTED SPECIES AND HABITAT ASSESSMENT	48
7.1 DATA COLLECTION	48
7.2 LISTED SPECIES	49
7.3 FIELD SURVEYS	51
7.4 HABITAT IMPACTS	53
7.4.1 POTENTIAL PROJECT IMPACTS	53

7.5 LISTED SPECIES SURVEY RESULTS AND IMPACTS..... 53
7.5.1 FEDERAL LISTED FAUNA..... 53
7.5.2 STATE LISTED FAUNA 57
7.5.3 LISTED PLANT SPECIES 60
7.5.4 NON-LISTED SPECIES..... 65
7.6 INDIRECT EFFECTS..... 67
8.0 IMPLEMENTATION MEASURES AND DESIGN CONSIDERATIONS.....70
9.0 PERMITTING REQUIREMENTS AND COORDINATION71
10.0 CONCLUSIONS AND RECOMMENDATIONS.....72
11.0 COMMITMENTS.....74
12.0 REFERENCES75

TABLES

Table ES-1: Direct Wetland and Surface Water Impacts by Alternative (Acres)..... ES-2

Table ES-2: Secondary Wetland Impacts by Alternative (Acres)..... ES-3

Table ES-3: Potential Federal and State Protected Fauna and Flora ES-3

Table ES-4: Federally Listed Species Effects Determinations..... ES-6

Table ES-5: State Listed Species Effects Determinations ES-7

Table 1: Summary of Land Cover/Land Use within the Study Area 12

Table 2: NRCS Soils Identified in the Study Area in Osceola County..... 23

Table 3: Wetland and Surface Water Characteristics within the Study Area 32

Table 4: Direct Wetland and Surface Water Impacts by Alternative (Acres)..... 40

Table 5: Secondary Wetland Impacts by Alternative (Acres)..... 41

Table 6: Summary of Stormwater Pond Screening 42

Table 7: Summary of UMAM Scores 44

Table 8: Potential Wetland Functional Loss..... 45

Table 9: Potential Federal and State Protected Fauna and Flora 49

Table 10: Wildlife Species/Signs Observed Within the Study Area..... 51

Table 11: Habitat Impacts by Alternatives (Acres)..... 53

Table 12: Wood Stork Suitable Foraging Biomass Analysis for the Preferred Alignment 56

Table 13: Direct Wetland and Surface Water Impacts by Alternative (Acres)..... 72

Table 14: Secondary Wetland Impacts by Alternatives (Acres) 73

FIGURES

Figure 1: Project Location 2

Figure 2: Project Limits..... 3

Figure 3: Alternative 1 – Typical Section from Partin Settlement Road to Old Canoe Creek Road 6

Figure 4: Alternative 2 – Typical Section from Partin Settlement Road to Ames Haven Road..... 7

Figure 5: Alternative A – Typical Section from Old Canoe Creek Road to US 192 8

Figure 6: Alternative B – Typical Section from Old Canoe Creek Road to US 192 9

Figure 7A: FLUCFCS Map (1 of 4)..... 14

Figure 7B: FLUCFCS Map (2 of 4)..... 15

Figure 7C: FLUCFCS Map (3 of 4)..... 16

Figure 7D: FLUCFCS Map (4 of 4) 17

Figure 8A: Osceola County FLU Map (1 of 4) 18

Figure 8B: Osceola County FLU Map (2 of 4)..... 19

Figure 8C: Osceola County FLU Map (3 of 4)..... 20

Figure 8D: Osceola County FLU Map (4 of 4) 21

Figure 9A: NRCS Soils Map (1 of 4)..... 25

Figure 9B: NRCS Soils Map (2 of 4)..... 26

Figure 9C: NRCS Soils Map (3 of 4)..... 27

Figure 9D: NRCS Soils Map (4 of 4) 28

Figure 10A: Wetlands and Surface Water Maps (1 of 4) 35

Figure 10B: Wetlands and Surface Water Maps (2 of 4)..... 36

Figure 10C: Wetlands and Surface Water Maps (3 of 4)..... 37

Figure 10D: Wetlands and Surface Water Maps (4 of 4) 38

Figure 11: Potential Stormwater Pond Alternatives Map..... 43

Figure 12: Listed Species Map..... 68

Figure 13: Bald Eagle Nest Map 69

APPENDICES

Appendix A: AN Comments

Appendix B: FNAI Standard Data Report

Appendix C: USFWS IPaC Trust Resources Report

Appendix D: Wetlands and Surface Waters Photographic Log

Appendix E: Uniform Mitigation Assessment Method (UMAM) Data Sheets

Appendix F: Historical Aerials

Appendix G: USFWS Maps of Consultation Areas

Appendix H: Florida Bonneted Bat Survey Report (July 2020)

Appendix I: Crested Caracara Survey Report (May 2019)

Appendix J: South Florida Wood Stork Effect Determination Key

Appendix K: Standard Protection Measures for the Eastern Indigo Snake

Appendix L: Agency Coordination

Appendix M: South Florida Water Management District (SFWMD) Right-of-Way Letter

EXECUTIVE SUMMARY

In accordance with Presidential Executive Order 11990, Federal Highway Administration (FHWA) Technical Advisory T6640.8A, Section 7(c) of the Endangered Species Act (ESA) of 1973 (ESA, P.L. 93-205) and the Florida Department of Transportation (FDOT) *Project Development and Environment (PD&E) Manual*, Part 2, Chapters 9 and 16 (January 14, 2019), a Natural Resources Evaluation (NRE) was conducted for the proposed widening of Neptune Road. The improvements being evaluated include alternatives for the widening from Partin Settlement Road to US 192. The project is in Osceola County, Florida (see **Project Location Map - Figure 1**). The following Natural Resource Evaluation (NRE) summarizes the results of these assessments. An Advance Notification (AN) package was distributed to the agencies on August 31, 2018 and the project was screened through the Efficient Transportation Decision Making (ETDM) process on August 27, 2019 (ETDM #14402).

The purpose of this report is to identify wetlands and other surface waters within the project area, evaluate potential wetland and surface water impacts, identify measures to avoid and minimize impacts, and identify conceptual mitigation options. The purpose of this report is also to determine if the proposed project is likely to adversely affect, will jeopardize the continued existence of, or will result in the destruction or adverse modification of any critical habitat of any endangered or threatened species (listed species).

The proposed “action” under consideration is the widening of Neptune Road from Partin Settlement Road to US 192 including pedestrian and bicyclist facilities and construction of stormwater management facilities. Four alternatives were evaluated and are discussed in Section 2.4.

Wetlands

Per the *Wetlands Evaluation*, two types of surface waters and three types of wetlands were identified within the study area. The following two tables summarize the direct and secondary impacts to surface waters and wetlands for the four alternatives. Alternative A and B had no direct or secondary impacts to wetlands.

Table ES-1: Direct Wetland and Surface Water Impacts by Alternative (Acres)

SW/WL NUMBER	ALT 1	ALT 2	ALT A	ALT B
SW 2	0.18	0.33	-	-
SW 3	1.57	1.54	-	-
SW 5	-	0.06	-	-
SW 6	0.20	0.20	-	-
SW 7	0.22	0.22	-	-
SW 9	0.04	0.04	-	-
SW 10	0.01	0.01	-	-
SW 11	0.01	0.01	-	-
SW 13	-	-	0.03	0.05
Total Surface Water Impacts	2.23	2.41	0.03	0.05
WL1	0.30	1.20	-	-
WL2	0.19	0.52	-	-
WL4	0.22	0.22	-	-
WL5	0.21	0.06	-	-
WL6	0.13	0.04	-	-
WL7	0.15	-	-	-
WL8	0.04	-	-	-
WL9	0.16	-	-	-
WL11	0.05	-	-	-
WL12	0.09	-	-	-
WL15	0.20	0.20	-	-
WL17	0.83	0.83	-	-
Total Wetland Impacts	2.57	3.07	-	-
Grand Total Surface Water and Wetland Impacts	4.80	5.48	0.03	0.05

Table ES-2: Secondary Wetland Impacts by Alternative (Acres)

WL Number	Alt 1	Alt 2
WL1	0.49	0.56
WL2	0.36	0.34
WL4	0.42	0.42
WL5	0.24	0.23
WL6	0.12	0.12
WL7	0.24	0.22
WL8	0.06	0.06
WL9	0.23	0.23
WL11	0.07	0.07
WL12	0.06	0.05
WL15	0.69	0.69
WL17	0.39	0.39
Total Secondary Wetland Impacts	3.37	3.38

Protected Species and Habitat

Per the *Protected Species and Habitat Assessment*, 21 federally-listed species and 22 state-listed species may occur within the study area, as shown in **Table ES-3** below. Pedestrian surveys for gopher tortoise burrows and listed plant species were conducted on November 30, 2018 and February 19, 2019 and no gopher tortoises or listed plant species were observed within the alignments. Audubon’s crested caracara surveys were conducted January through April 2019, documenting that crested caracaras are not nesting within the alignments of any of the alternatives. A Florida bonneted acoustic and roost survey was conducted May 2020 through June 2020, documenting that this species was not recorded within any of the alternatives. Effect determinations made for the federally listed species evaluated are shown in **Table ES-4**.

Table ES-3: Potential Federal and State Protected Fauna and Flora

Common Name	Scientific Name	Federal Status	State Status	Likelihood of Occurrence
MAMMALS				
Florida Panther	<i>Puma concolor coryi</i>	E	FE	Low
Florida Bonneted Bat	<i>Eumops floridanus</i>	E	FE	Medium
Florida Black Bear	<i>Ursus americanus floridanus</i>	NL*	NL*	Low
Southern Fox Squirrel	<i>Sciurus niger niger</i>	NL**	NL**	High
BIRDS				
Audubon's Crested Caracara	<i>Polyborus plancus audubonii</i>	T	FT	Low
Florida Scrub-Jay	<i>Aphelocoma coerulescens</i>	T	FT	Low
Red-cockaded Woodpecker	<i>Picoides borealis</i>	E	FE	Low

Common Name	Scientific Name	Federal Status	State Status	Likelihood of Occurrence
Everglade Snail Kite	<i>Rostrhamus sociabilis plumbeus</i>	E	FE	Low
Wood Stork	<i>Mycteria americana</i>	T	FT	High
Florida Burrowing Owl	<i>Athene cunicularia floridana</i>	NL	ST	Low
Florida Sandhill Crane	<i>Grus canadensis pratensis</i>	NL	ST	High
Southeastern American kestrel	<i>Falco sparverius paulus</i>	NL	ST	High
Tricolored Heron	<i>Egretta tricolor</i>	NL	ST	Medium
Little Blue Heron	<i>Egretta caerulea</i>	NL	ST	High
Roseate Spoonbill	<i>Platalea ajaja</i>	NL	ST	Medium
Bald Eagle	<i>Haliaeetus leucocephalus</i>	NL***	NL***	High
REPTILES				
Eastern Indigo Snake	<i>Drymarchon corais couperi</i>	T	FT	Low
Florida Pine Snake	<i>Pituophis melanoleucus mugitus</i>	NL	ST	Low
Gopher Tortoise	<i>Gopherus polyphemus</i>	C	ST	Low
PLANTS				
Beautiful Pawpaw	<i>Deeringothamnus pulchellus</i>	E	SE	Low
Britton's Beargrass	<i>Nolina brittoniana</i>	E	SE	Low
Florida Blazing Star	<i>Liatris ohlingerae</i>	E	SE	Low
Florida Bonamia	<i>Bonamia grandiflora</i>	T	SE	Low
Lewton's Polygala	<i>Polygala lewtonii</i>	E	SE	Low
Paper-like Nailwort	<i>Paronychia chartacea ssp. chartacea</i>	T	SE	Low
Pygmy Fringe Tree	<i>Chionanthus pygmaeus</i>	E	SE	Low
Scrub Buckwheat	<i>Eriogonum longifolium var. gnaphalifolium</i>	T	SE	Low
Scrub Lupine	<i>Lupinus aridorum</i>	E	SE	Low
Short-leaved Rosemary	<i>Conradina brevifolia</i>	E	SE	Low
Sandlace	<i>Polygonella myriophylla</i>	E	SE	Low
Carter's Mustard	<i>Warea carteri</i>	E	SE	Low
Wide-leaf Warea	<i>Warea amplexifolia</i>	E	FE	Low
Ashe's Savory	<i>Calamintha ashei</i>	NL	ST	Low
Celestial Lily	<i>Nemastylis floridana</i>	NL	SE	Low
Cutthroat Grass	<i>Panicum abscissum</i>	NL	SE	Low
Florida Beargrass	<i>Nolina atopocarpa</i>	NL	ST	Low
Florida Spiny-pod	<i>Matelea floridana</i>	NL	SE	Low
Giant Orchid	<i>Pteroglossaspis ecristata</i>	NL	ST	Low
Hartwrightia	<i>Hartwrightia floridana</i>	NL	ST	Low
Many-flowered Grass-pink	<i>Calopogon multiflorus</i>	NL	ST	Low
Nodding Pinweed	<i>Lechea cernua</i>	NL	ST	Low
Pinewoods Bluestem	<i>Andropogon arctatus</i>	NL	ST	Low

Common Name	Scientific Name	Federal Status	State Status	Likelihood of Occurrence
Sand Butterfly Pea	<i>Centrosema arenicola</i>	NL	SE	Low
Scrub Bluestem	<i>Schizachyrium niveum</i>	NL	SE	Low
Star Anise	<i>Illicium parviflorum</i>	NL	SE	Low
Yellow Fringeless Orchid	<i>Platanthera integra</i>	NL	SE	Low

Based on Florida's Endangered and Threatened Species updated December 2018 available on <http://myfwc.com/wildlifehabitats/imperiled/> and 5B-40.0055 Florida Administrative Code (FAC) Regulated Plant Index.

Federal Status: E = Endangered; T = Threatened; C = Candidate Species; NL = Not Listed

State Status: FE = Federally Endangered; FT = Federally Threatened; FT(S/A) = Federally Threatened due to Similarity of Appearance. ST= State Threatened; SE = State Endangered; SSC = Species of Special Concern. Note: Coordination is not required with FWC for federally listed species.

Bold = observed during field reconnaissance

* The Florida black bear is still protected under Florida Black Bear Conservation Rule 68A-4.009 (F.A.C.) and the FWC Florida Black Bear Management Plan.

**The fox squirrel is still protected under Regulations Relating to the Taking of Mammals 68A-29.002 (F.A.C.).

*** The Bald eagle is still protected under the Bald and Golden Eagle Protection Act, Migratory Bird Treaty Act and FWC Management Plan regulations.

Table ES-4: Federally Listed Species Effects Determinations

Species	Effect Determination
Florida Panther	No effect
Florida Bonneted Bat	No effect
Audubon's Crested Caracara	Not likely to adversely affect
Florida Scrub-Jay	No effect
Red-cockaded Woodpecker	No effect
Everglade Snail Kite	No effect
Wood Stork	Not likely to adversely affect
Eastern Indigo Snake	No effect
Beautiful Pawpaw	No effect
Britton's Beargrass	No effect
Scrub Blazing Star	No effect
Florida Bonamia	No effect
Lewton's Polygala	No effect
Paper-like Nailwort	No effect
Pygmy Fringe Tree	No effect
Scrub Buckwheat	No effect
Scrub Lupine	No effect
Short-leaved Rosemary	No effect
Sandlace	No effect
Carter's Mustard	No effect
Wide-leaf Warea	No effect

Nineteen Florida Fish and Wildlife Conservation Commission (FWC) state-listed species were evaluated in this study. Effect determinations made for the state listed species evaluated are shown in **Table ES-5**. A 100% gopher tortoise survey will be conducted during design and permitting, and any gopher tortoises observed within 25 feet from construction will be relocated. The following additional surveys will be conducted during design and permitting for state listed species: southeastern American kestrel, Florida sandhill crane, and Florida burrowing owl. Osceola County commits to conducting the above-mentioned surveys to minimize impacts to protected species. No adverse effects are anticipated to state listed species.

Table ES-5: State Listed Species Effects Determinations

Species	Effect Determination
Florida Burrowing Owl	No adverse effect anticipated
Florida Sandhill Crane	No adverse effect anticipated
Southeastern American Kestrel	No adverse effect anticipated
Tricolored Heron	No adverse effect anticipated
Little Blue Heron	No adverse effect anticipated
Roseate Spoonbill	No adverse effect anticipated
Florida Pine Snake	No effect anticipated
Gopher Tortoise	No adverse effect anticipated
Ashe's Savory	No adverse effect anticipated
Celestial Lily	No adverse effect anticipated
Cutthroat Grass	No adverse effect anticipated
Florida Beargrass	No effect anticipated
Florida Spiny-pod	No adverse effect anticipated
Giant Orchid	No effect anticipated
Hartwrightia	No effect anticipated
Many-flowered Grass-pink	No effect anticipated
Nodding Pinweed	No effect anticipated
Pinewoods Bluestem	No effect anticipated
Sand Butterfly Pea	No effect anticipated
Scrub Bluestem	No effect anticipated
Star Anise	No adverse effect anticipated
Yellow Fringeless Orchid	No adverse effect anticipated

MITIGATION

Mitigation credits will be purchased from a mitigation bank that is permitted by South Florida Water Management District (SFWMD) and US Army Corps of Engineers (USACE) to service the Lake Tohopekaliga Drainage Basin. The following banks are within the same drainage basin and service the project study area: Reedy Creek Mitigation Bank, Southport Ranch Mitigation Bank, and Florida Mitigation Bank. These three banks have both forested and herbaceous credits available for sale.

EFH ASSESSMENT

National Marine Fisheries Service (NMFS) indicated that Essential Fish Habitat (EFH) would not be impacted and an EFH assessment is not required. Therefore, this NRE does not include an EFH Assessment.

1.0 INTRODUCTION

In accordance with Presidential Executive Order 11990, Federal Highway Administration (FHWA) Technical Advisory T6640.8A, Section 7(c) of the Endangered Species Act (ESA) of 1973 (ESA, P.L. 93-205) and the Florida Department of Transportation (FDOT) Project Development and Environment (PD&E) Manual, Part 2, Chapters 9 and 16 (January 14, 2019), a Natural Resources Evaluation was conducted for the proposed widening of Neptune Road. The improvements being evaluated include alternatives for the widening from Partin Settlement Road to US 192. The project is in Osceola County, Florida (see **Project Location Map - Figure 1**). The following Natural Resource Evaluation (NRE) summarizes the results of these assessments.

An Advance Notification (AN) package was distributed to the agencies on August 31, 2018. Comments were received from several agencies but the only comments pertaining to the natural resources were from the National Marine Fisheries Service (NMFS) and the US Environmental Protection Agency (USEPA). The AN comments from the NMFS and the USEPA are included in **Appendix A**. NMFS indicated that Essential Fish Habitat (EFH) would not be impacted and an EFH assessment is not required. Further, NMFS is unaware of any threatened or endangered species or critical habitat under NMFS' jurisdiction but indicated the project should be coordinated with the US Fish and Wildlife Service (USFWS). NMFS did provide comments regarding the benefits of freshwater wetlands and if wetland impacts are unavoidable, sequential minimization and mitigation should take place pursuant to the Fish and Wildlife Coordination Act. Because there are no EFH resources within the study area, this NRE does not include an EFH Assessment.

The purpose of this report is to identify wetlands and other surface waters within the project area, evaluate potential wetland and surface water impacts, identify measures to avoid and minimize impacts, and identify conceptual mitigation options. The purpose of this report is also to determine if the proposed project is likely to adversely affect, will jeopardize the continued existence of, or will result in the destruction or adverse modification of any critical habitat of any endangered or threatened species (listed species).

The proposed "action" under consideration is the widening of Neptune Road from Partin Settlement Road to US 192 including pedestrian and bicyclist facilities and construction of stormwater management facilities. Four alternatives were evaluated and are discussed in Section 2.4.

2.0 PROJECT DESCRIPTION

This project involves a 3.9-mile segment of Neptune Road extending from Partin Settlement Road to US 192 in Osceola County. The section east of the St. Cloud canal (approximately 1.1 miles in length) is within the City of St. Cloud. From Partin Settlement Road to Old Canoe Creek Road, the proposed project improves the existing 2-lane roadway to a 4-lane, divided roadway with a curbed median, with premium bicycle and pedestrian facilities (i.e., bike lanes, multiuse path(s), and/or sidewalks). From Old Canoe Creek Road to US 192, the project widens the existing 2-lane roadway to 4-lanes with sidewalks. Bridge structures are to be replaced and stormwater management facilities will be evaluated. **Figure 1** illustrates the project location and **Figure 2** illustrates the project limits.

Figure 1: Project Location

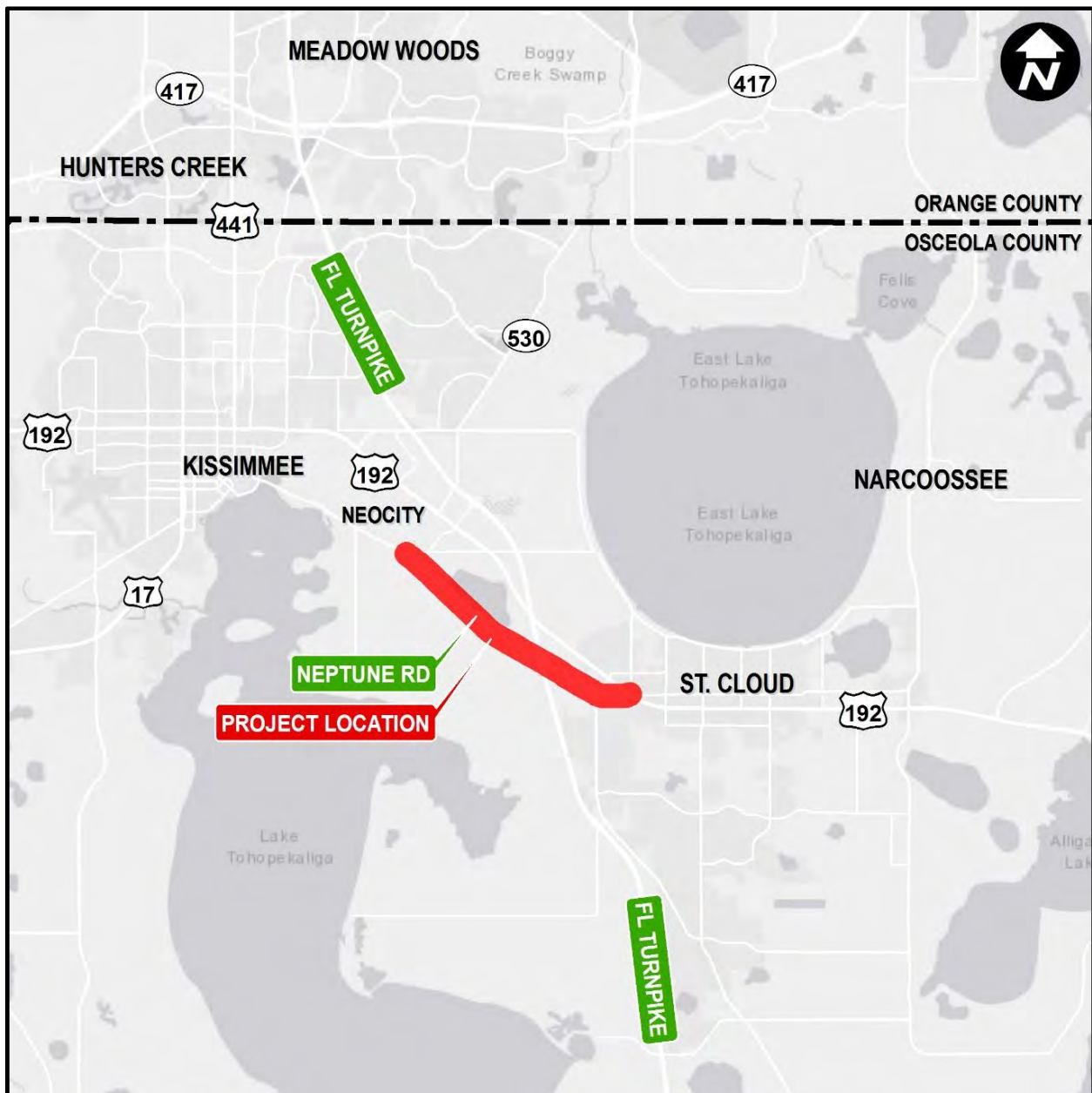
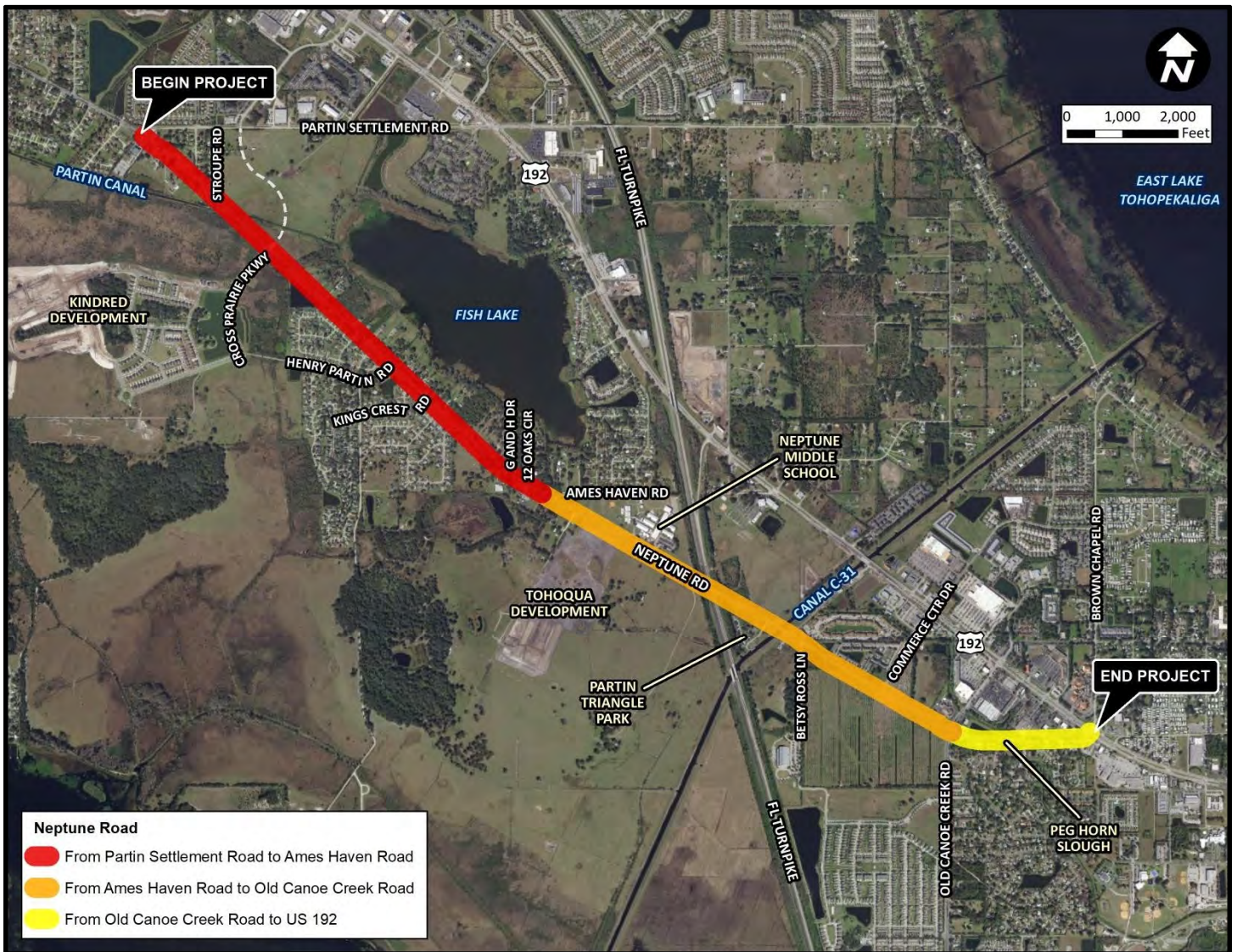


Figure 2: Project Limits



3.0 PURPOSE AND NEED

Purpose

The purpose of the project is to address capacity and safety issues along the 3.9-mile segment of Neptune Road.

Need

The need for the project is based on capacity and safety.

Capacity

The 2017 annual average daily traffic (AADT) volume on Neptune Road, between Partin Settlement and Old Canoe Creek Road was 18,100 resulting in a volume to capacity (V/C) ratio of 1.02, which indicates level of service (LOS) F operating conditions. The 2040 traffic volumes on Neptune Road between Partin Settlement Road to US 192 are projected to range between 27,000 and 55,000 AADT, resulting in LOS F for the entire corridor with V/C ratios ranging from 1.94 to 2.15.

Safety

A total of 195 crashes were reported for the five-year period (January 1st, 2013 through December 31st, 2017), including three fatal crashes and 109 injury crashes, which resulted in three fatalities and 187 injuries. The number of reported crashes per year nearly doubled over the five-year period:

- 28 crashes in 2013
- 22 crashes in 2014
- 33 crashes in 2015
- 57 crashes in 2016
- 55 crashes in 2017

A crash type analysis was conducted and the predominant crash type along the corridor was the rear-end crash (47.7 percent). Approximately 49 percent of the rear-end collisions occurred at-fault in the westbound direction and 30 percent occurred at-fault in the eastbound direction. Rear-end crashes occurred along the entire length of the corridor but were most concentrated along the sections in the vicinity of Ames Haven Road, as well as at the Commerce Center Drive and Stroupe Road intersections. The next most common crash types were left-turn crashes (14.4 percent) and run-off-the-road (ROTR) crashes (13.3 percent). Left-turn crashes were most concentrated at the intersection of Neptune Road at Stroupe Road, and ROTR crashes were most concentrated along the section of Neptune Road near Ames Haven Road.

4.0 ALTERNATIVES ANALYSIS

4.1 NO-BUILD ALTERNATIVE

The No-Build Alternative is an option where the proposed project activity (i.e., widening Neptune Road) would not take place. The No-Build Alternative provides the baseline for establishing environmental impacts of the build alternatives.

4.2 TRANSPORTATION SYSTEM MANAGEMENT AND OPERATIONS ALTERNATIVE

A Transportation System Management and Operations (TSM&O) Alternative generally provides short-term improvements that extend the service life of the facility. TSM&O Alternatives include activities and strategies designed to optimize the performance and utilization of the existing infrastructure through implementation of systems, services, and projects to preserve the capacity and improve the security, safety, and reliability of the transportation system. Example TSM&O strategies include upgrades or additions to the existing facility, such as arterial traffic management systems, traffic incident management, work zone traffic management, road weather management, traveler information services, congestion pricing, parking management, traffic control, commercial vehicle operations, transit priority signals systems, and freight management.

The No-Build Alternative already includes providing the maximum number of lanes (through and turn lanes) at the signalized intersections; therefore, the existing intersections have already been optimized and the analysis of No-Build conditions is representative of a TSM&O Alternative. Additional through lanes will need to be added to provide the needed capacity and transportation demand identified in the purpose and need for the project. Therefore, no TSM&O Alternative was considered.

4.3 MULTIMODAL ALTERNATIVES

All build alternatives include provisions for bicycles, pedestrians and automobiles. Transit is not currently provided along Neptune Road and it is not planned to be provided. Transit (bus) is provided along US 192 which runs parallel to Neptune Road.

4.4 BUILD ALTERNATIVES

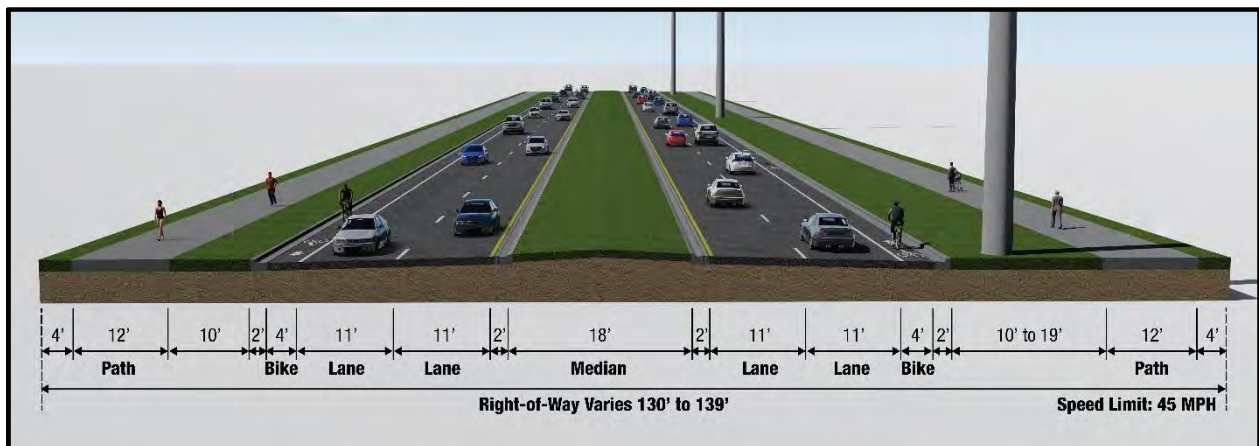
4.4.1 PARTIN SETTLEMENT ROAD TO OLD CANOE CREEK ROAD

4.4.1.1 ALTERNATIVE 1

From Partin Settlement Road to Old Canoe Creek Road, Alternative 1 includes a 4-lane divided roadway (with 11-foot lanes), a 22-foot raised median, 4-foot bicycle lanes in each direction, curb and gutter, a 10-foot planting strip (varies due to existing power transmission pole locations) on both sides, 12-foot multiuse path on both sides, and a 4-foot clear area adjacent to each multiuse path. This typical section will require between 130 and 139 feet of ROW (depending on the location of the existing power transmission poles). **Figure 3** illustrates this typical section between Partin Settlement Road and Old Canoe Creek Road. The posted speed limit for this section will be 45 MPH.

From Partin Settlement Road to west of G and H Drive, the additional ROW for Alternative 1 will be acquired primarily on the north side of the existing roadway. From G and H Drive to Canal C-31, additional ROW will be acquired from both the north and south sides of the road to avoid relocating Kissimmee Utility Authority (KUA) power transmission poles. From Canal C-31 to Old Canoe Creek Road, the additional ROW will be acquired primarily on the south side of the existing roadway.

Figure 3: Alternative 1 – Typical Section from Partin Settlement Road to Old Canoe Creek Road



4.4.1.2 ALTERNATIVE 2

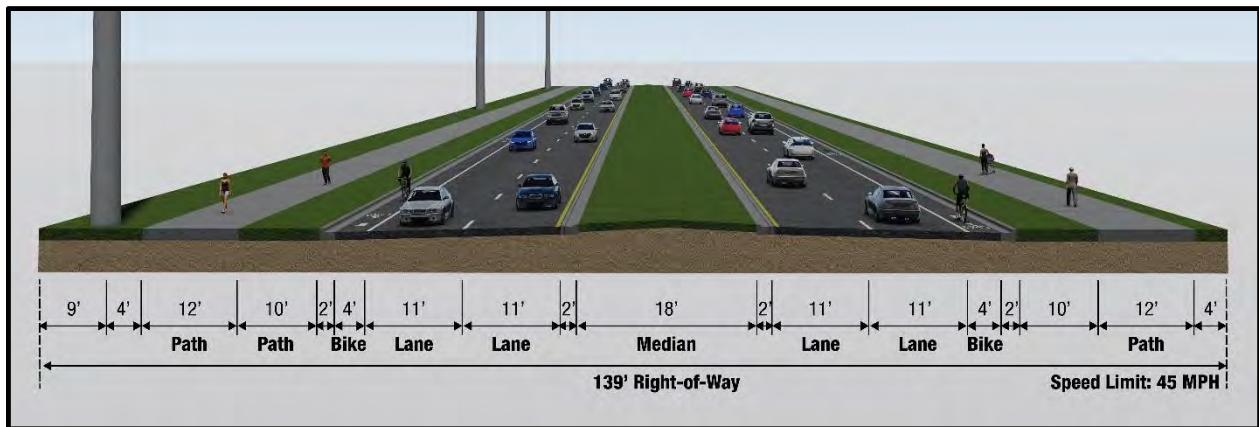
The typical section for Alternative 2 is basically the same as for Alternative 1, with the difference being that Alternative 2 includes relocating power transmission poles from the south side of Neptune Road to the north side of Neptune Road, from Partin Settlement Road to just east of Betsey Ross Lane.

From Partin Settlement Road to Old Canoe Creek Road, Alternative 2 includes a 4-lane divided roadway (with 11-foot lanes), a 22-foot raised median, 4-foot bicycle lanes in each direction, curb and gutter, a 10-foot planting strip on both sides, 12-foot multiuse path on both sides, and a 4-foot clear area adjacent to each multiuse path. The existing power transmission poles will be relocated to the north side of the shared use path within a 9-foot envelope. This typical section will require 139 feet of ROW.

Figure 4 illustrates this typical section between Partin Settlement Road and Old Canoe Creek Road. The posted speed limit for this alternative will be 45 MPH.

From Partin Settlement Road to west of G and H Drive, the additional ROW for Alternative 2 will be acquired primarily on the south side of the existing roadway. From G and H Drive to Canal C-31, additional ROW will be acquired from both the north and south sides of the road to avoid relocating power transmission poles. From Canal C-31 to Old Canoe Creek Road, the additional ROW will be acquired primarily on the south side of the existing roadway.

Figure 4: Alternative 2 – Typical Section from Partin Settlement Road to Ames Haven Road



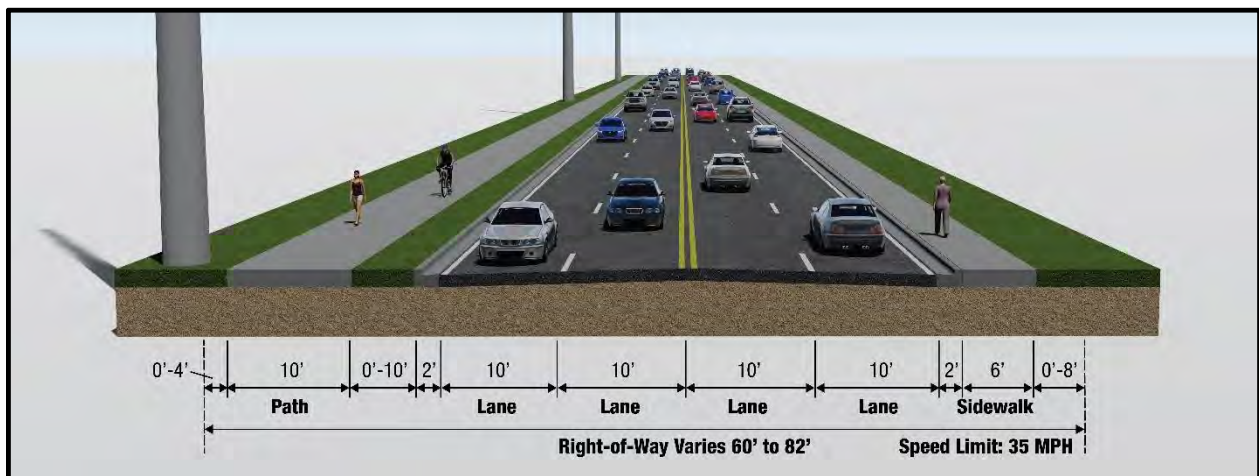
4.4.2 OLD CANOE CREEK ROAD TO US 192

4.4.2.1 ALTERNATIVE A

From Old Canoe Creek Road to US 192, Alternative A includes a 4-lane undivided roadway (with 10-foot lanes), curb and gutter, a 10-foot planting strip on both sides (where possible within the existing ROW), a nine to 10-foot multiuse path with a 4-foot clear area (where possible within the existing ROW) on the north side, and a 6-foot sidewalk on the south side. This typical section will require between 60 and 82 feet of ROW, and is anticipated to be constructed within the existing ROW. **Figure 5** illustrates this typical section between Old Canoe Creek Road and US 192. The posted speed limit for this alternative will be 35 MPH.

From Old Canoe Creek Road to US 192, no additional ROW is anticipated to be acquired for Alternative 1.

Figure 5: Alternative A – Typical Section from Old Canoe Creek Road to US 192



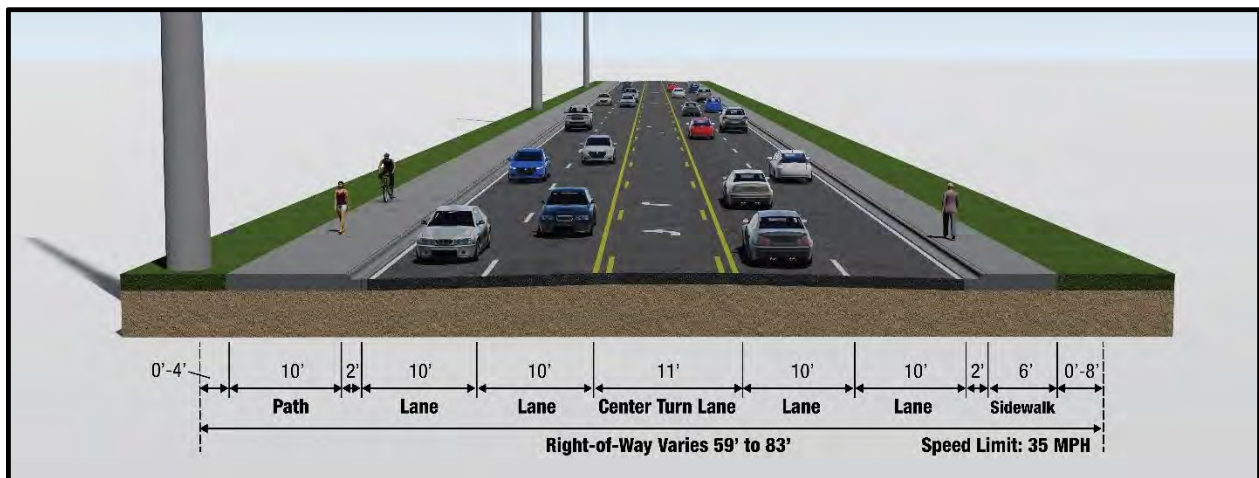
4.4.2.2 ALTERNATIVE B

Whereas Alternative A includes improving this segment without acquiring additional ROW; Alternative B includes providing a two-way center turn lane which will require additional ROW.

From Old Canoe Creek Road to US 192, Alternative B includes a 5-lane roadway (with 10-foot travel lanes and an 11-foot two-way left turn lane), curb and gutter, a 10-foot planting strip on both sides (where possible within existing ROW), a nine to 10-foot multiuse path with a 4-foot clear area (where possible within existing ROW) on the north side, and a 6-foot sidewalk on the south side. This typical section will require between 59 and 83 feet of ROW. **Figure 6** illustrates this typical section between Old Canoe Creek Road and US 192. The posted speed limit for this alternative will be 35 MPH.

From Old Canoe Creek Road to US 192, the additional ROW for Alternative A will be acquired primarily on the north side of the existing roadway.

Figure 6: Alternative B – Typical Section from Old Canoe Creek Road to US 192



5.0 EXISTING ENVIRONMENTAL CONDITIONS

5.1 METHODOLOGY FOR ACCESSING NATURAL AND BIOLOGICAL FEATURES

The assessment of natural and biological features, wetlands, and threatened and endangered species within the study area included a review of the following data and documents within a 500-foot buffer¹ of the existing road:

- United States Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS), *Soil Survey of Osceola County, Florida*
- Historical aerial photography from the FDOT Aerial Photo Look-up System (APLUS) and Publication of Archival Library and Museum Materials (PALMM)
- Habitat and species-specific information obtained from the USFWS, the Florida Fish and Wildlife Conservation Commission (FWC), Florida Fish and Wildlife Research Institute (FWRI), Florida Geographic Data Library (FGDL), and the Florida Natural Areas Inventory (FNAI)
- The Hydric Soils of Florida Handbook (2007)
- The US Geological Survey (USGS) 7.5-Minute Quadrangle maps
- The USFWS National Wetland Inventory (NWI) maps
- The USGS Groundwater Atlas of the United States
- The Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Maps (FIRM)
- FNAI Standard Data Report for the study area included in **Appendix B**
- USFWS Information for Planning and Consultation (IPaC) Trust Resources Report for the study area included in **Appendix C**
- United States Environmental Protection Agency (USEPA) Sole Source Aquifer Program maps
- Review of books and other technical reports for each of the listed species evaluated in this biological assessment
- Review of agency comments on the Advance Notification Package (Distributed on August 31, 2018) and the ETDM screening conducted on August 27, 2019 (ETDM #14402)

In addition to the review of databases, reports and other resources, field reconnaissance was conducted on November 30, 2018 and February 19, 2019. Caracara surveys were conducted from January 2019 through April 2019.

5.2 EXISTING AND FUTURE LAND USE

5.2.1 EXISTING LAND USE

Existing land use within the study area was determined through the interpretation of 1" = 100' scale aerial photography, review of land cover GIS data from SFWMD and field reconnaissance. Existing land use was mapped based on the Florida Land Use, Cover and Forms Classification System (FLUCFCS) (FDOT, 1999) for the study area and is depicted in **Figures 7A-7D**.

5.2.2 FUTURE LAND USE

Future land use (FLU) was determined based on a review of GIS data from Osceola County. FLU for the study area is depicted on **Figures 8A-8D**. The study area is partially developed with residential and commercial land uses. However, there is some agriculture land uses remaining within the study area. The FLU shows these agriculture areas as either mixed use or low density residential. As described in the

¹Habitat was reviewed within a 1500-meter buffer to determine suitable habitat for crested caracara surveys.

purpose and need (Section 3.0 – Transportation Demand), much of the study area is located within the County’s East of Lake Toho Conceptual Master Plan and there are two Development of Regional Impacts (DRIs) under construction adjacent to Neptune Road. The population in Osceola County, specifically in Kissimmee and surrounding communities, is growing which is indicative on the FLU maps.

5.2.3 HABITAT AND VEGETATIVE COVER

Land covers within the study area have been assigned habitat classifications per the FLUCFCS. The study area contains twenty-one land cover classes. A FLUCFCS map is included (see **Figures 7A-7D**), and a description by FLUCFCS type, and calculated total acreages are provided in **Table 1**.

Table 1: Summary of Land Cover/Land Use within the Study Area

FLUCFCS Code	FLUCFCS Type	Description	Acres
111	Fixed single family units, low density	This land use consists of low density, rural single-family residences found in the central portion of the study area, south of Neptune Road.	5.2
121	Fixed single family units, medium density	This land use type consists of medium density, single family residences. This category encompasses most of the residential land use found throughout the study area.	111.4
132	Mobile home units	This land use consists of G & H Mobile Home Park, located between Neptune Road and Fish Lake within the study area.	2.6
133	Multiple dwelling units, low rise	This land use consists of apartment buildings and duplexes scattered between Florida's Turnpike and US 192.	21.4
139	High density under construction	This land use consists of Tohoqua, a residential community which is currently under construction. This site is located on the south side of Neptune Road, facing Neptune Middle School.	14.7
141	Retail sales and services	This land use consists of several shopping centers within the study area, with most being located between Old Canoe Creek Road and US 192.	29.2
171	Educational facilities	This land use designation is for Neptune Middle School, located north of Neptune Road and adjacent to and west of Florida's Turnpike	15.5
172	Religious	This land use encompasses various churches and associated facilities. Religious facilities are found scattered throughout the study area.	12.1
175	Governmental	This land use consists of a St. Cloud Police Department station at the corner of Old Canoe Creek Road and Neptune Road.	4.4
185	Parks and zoos	This category includes two Osceola County parks located within the study area, Partin Triangle Neighborhood Park and Boat Ramp and Neptune Middle School Sports Fields.	15.3
190	Open land	This land use consists of undeveloped, inactive areas within the study area with no structures or indication of intended use. This parcel is located on the eastern end of Neptune Road.	3.9
211	Improved pastures	This land use consists of open prairie utilized by cattle. Vegetation observed was predominated by bahia grass (<i>Paspalum notatum</i>), with scattered cogon grass (<i>Imperata cylindrica</i>) and cabbage palms (<i>Sabal palmetto</i>). This land use occurs throughout the study area.	53.9
245	Floriculture	This land use consists of areas dedicated to the cultivation of decorative flowering plants. Within the study area, this consists of the Tom Ritter Orchids nursery, found adjacent to and south of Neptune Road.	2.2
261	Fallow crop land	This land use type consists of harvested, inactive agricultural fields within the study area.	30.4

FLUCFCS Code	FLUCFCS Type	Description	Acres
434	Hardwood-conifer mixed	This land use consists of various upland forested areas scattered along Florida's Turnpike and Neptune Road. Canopy vegetation included live oak (<i>Quercus virginiana</i>) and slash pine (<i>Pinus elliotti</i>). Other vegetation observed included Brazilian pepper (<i>Schinus terebinthifolius</i>), cabbage palms, and beggarticks (<i>Bidens spp.</i>).	17.8
510	Streams and waterways	This category includes various drainage features that run through the study area, such as roadside ditches and SFWMD canals. Vegetation observed along the banks of these ditches included cattail (<i>Typha spp.</i>), pickerelweed (<i>Pontederia cordata</i>), and torpedograss (<i>Panicum repens</i>).	10.1
534	Reservoirs less than 10 acres	This category includes man-made stormwater pond areas serving various developments along Neptune Road. Vegetation observed included cattail and St. Augustine grass (<i>Stenotaphrum secundatum</i>) along the edges of the ponds.	8.1
617	Mixed wetland hardwoods	This forested wetland community occurs in several areas throughout the study area. The canopy observed included bald cypress (<i>Taxodium distichum</i>) and red maple (<i>Acer rubrum</i>), with a scattered shrub layer consisting of Brazilian pepper, Carolina willow (<i>Salix caroliniana</i>) and elderberry (<i>Sambucus canadensis</i>). The herb stratum includes Virginia chainfern (<i>Woodwardia virginica</i>) and marsh fern (<i>Thelypteris palustris</i>).	18.5
641	Freshwater marshes	This herbaceous wetland community occurs throughout the study area. Vegetation observed included softrush (<i>Juncus spp.</i>), maidencane (<i>Panicum hemitomon</i>), primrose willow (<i>Ludwigia peruviana</i>), elderberry, saltbush (<i>Baccharis hamifolia</i>), and scattered red maple.	26.8
643	Wet prairies	This herbaceous wetland community is located between the Partin canal and Neptune Road. These areas were historically used as cattle pasture. Vegetation observed included maidencane, softrush, torpedograss, and arrowhead (<i>Sagittaria lancifolia</i>).	10.8
814	Roads and highways	This land use consists of roads and associated ROW that are located throughout the study area.	80.1
Grand Total			494.4
Land cover and land uses based on the Florida Land Use, Cover and Forms Classification System (FLUCFCS). Acreage is based on the 500-foot study area boundary.			

Data compiled by Kimley-Horn and Associates, Inc. 2019

Figure 7A: FLUCFCS Map (1 of 4)

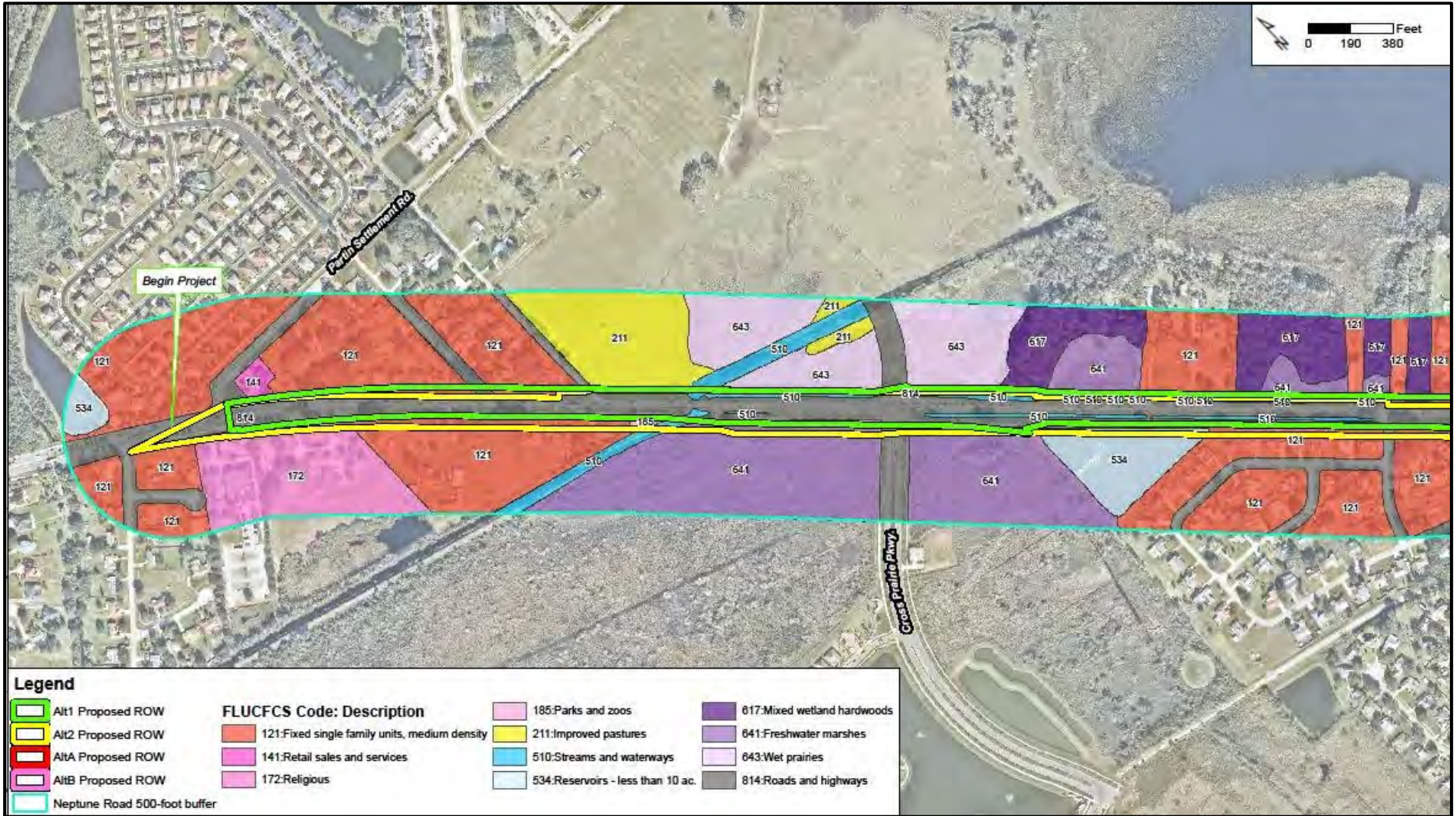


Figure 7B: FLUCFCS Map (2 of 4)

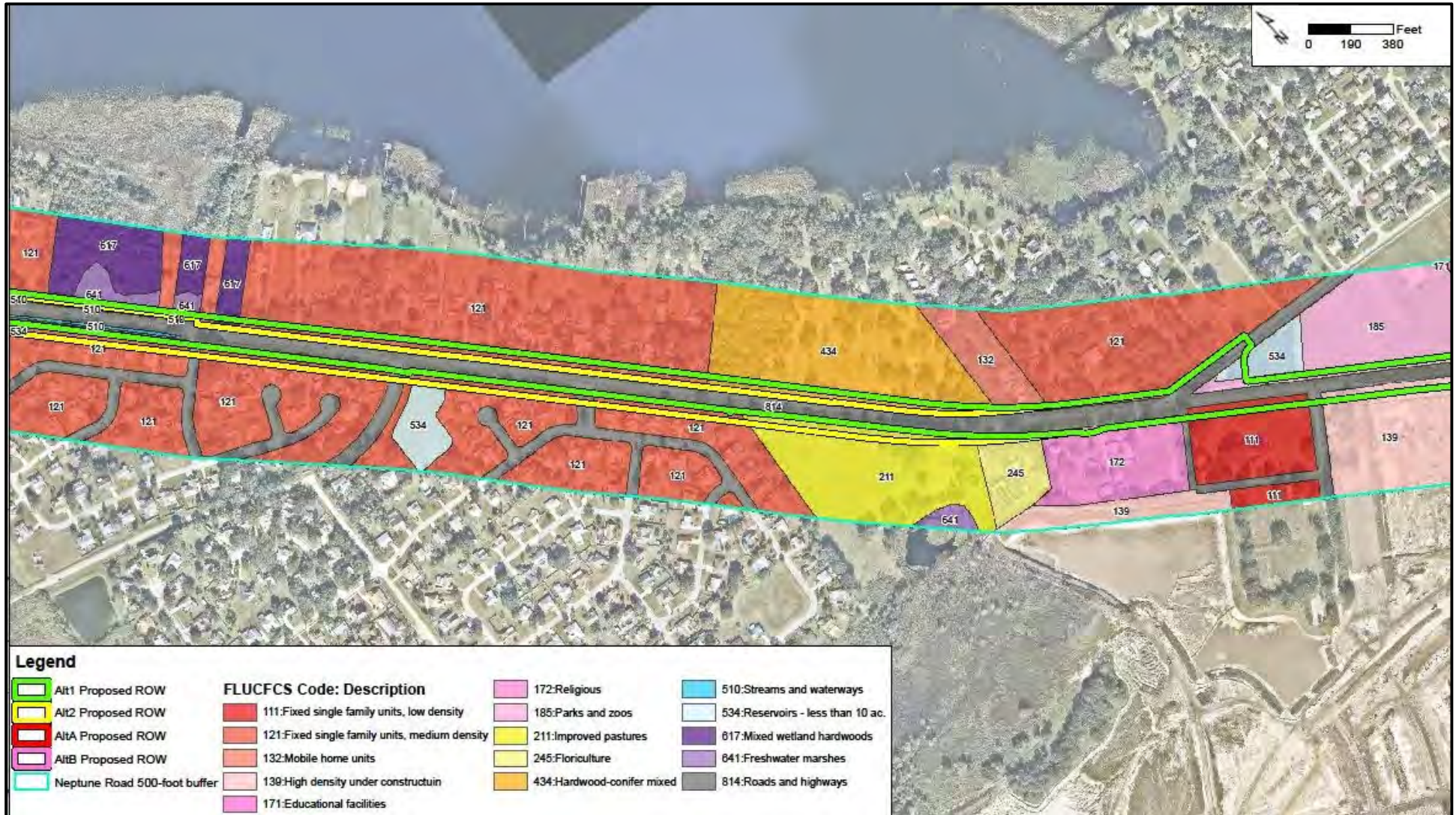


Figure 7C: FLUCFCS Map (3 of 4)

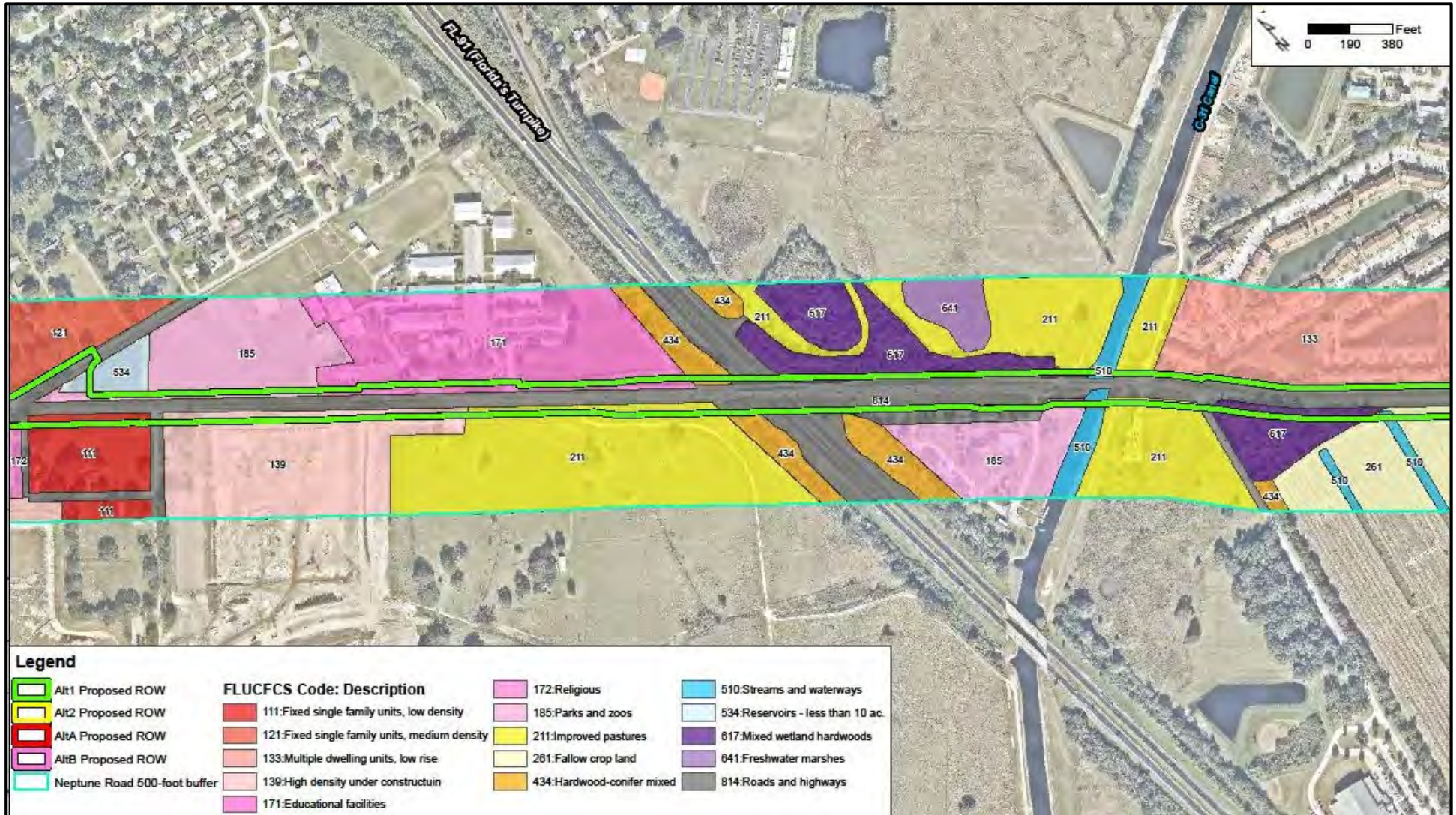


Figure 7D: FLUCFCS Map (4 of 4)

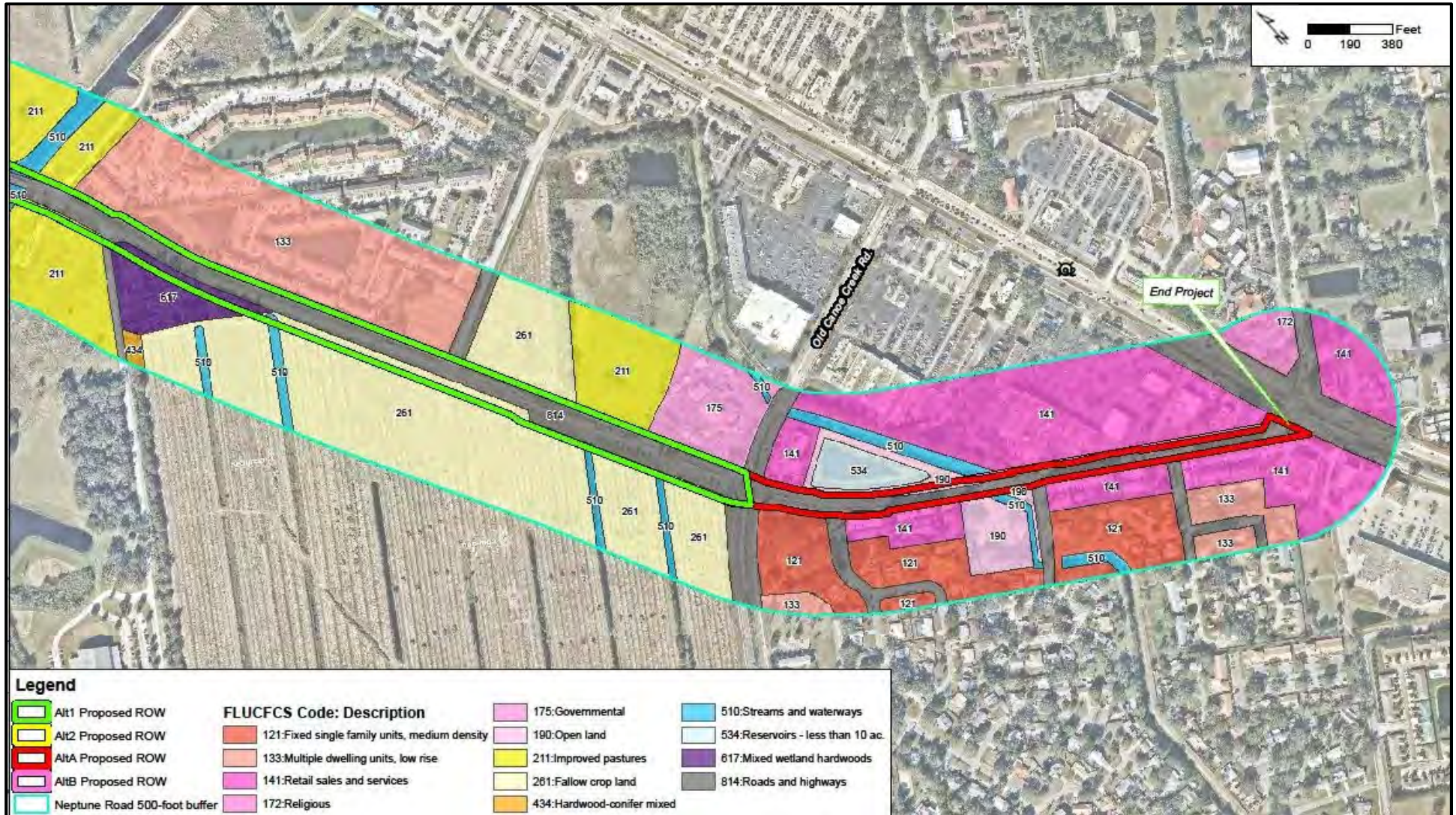


Figure 8A: Osceola County FLU Map (1 of 4)

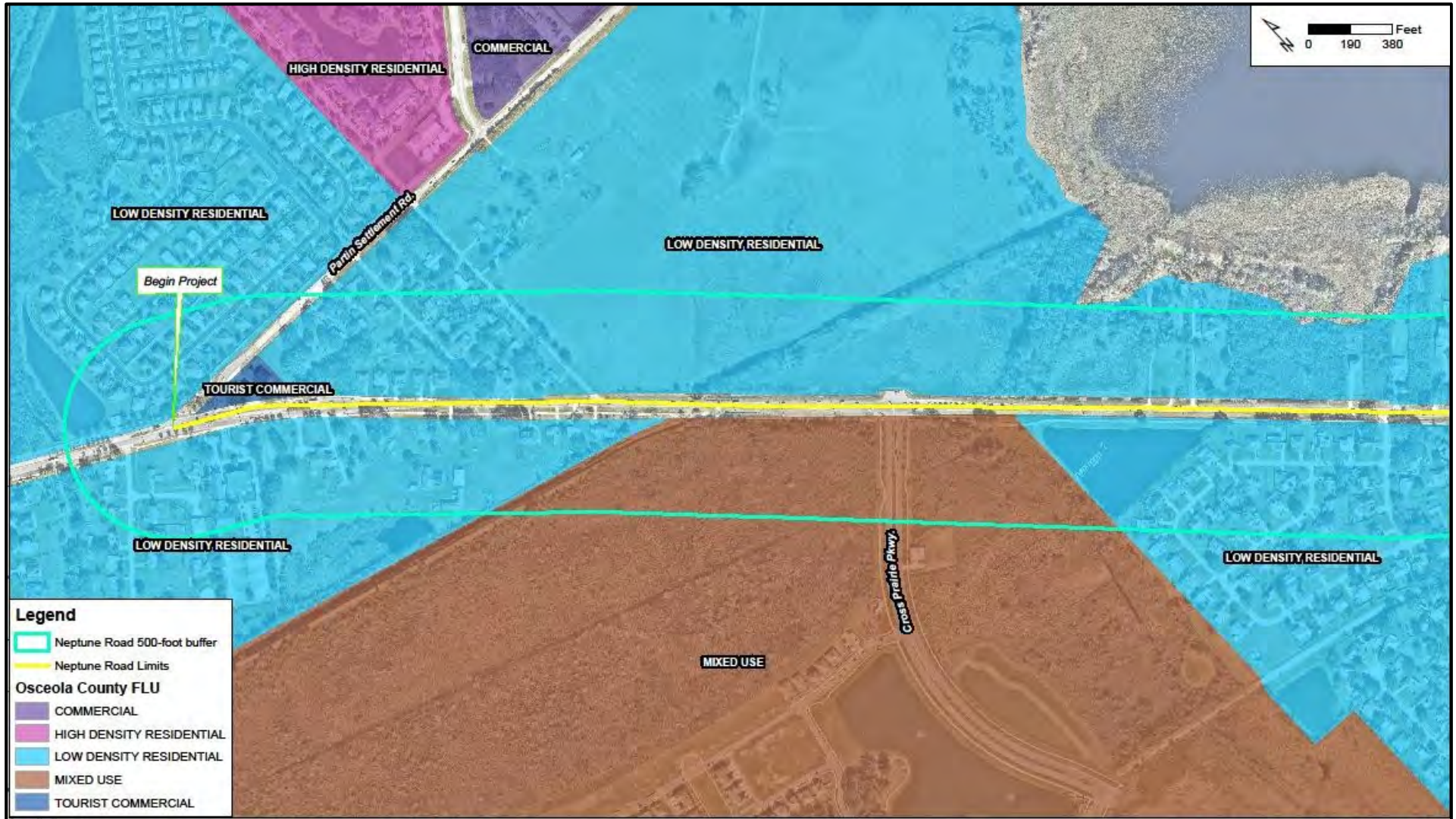


Figure 8B: Osceola County FLU Map (2 of 4)

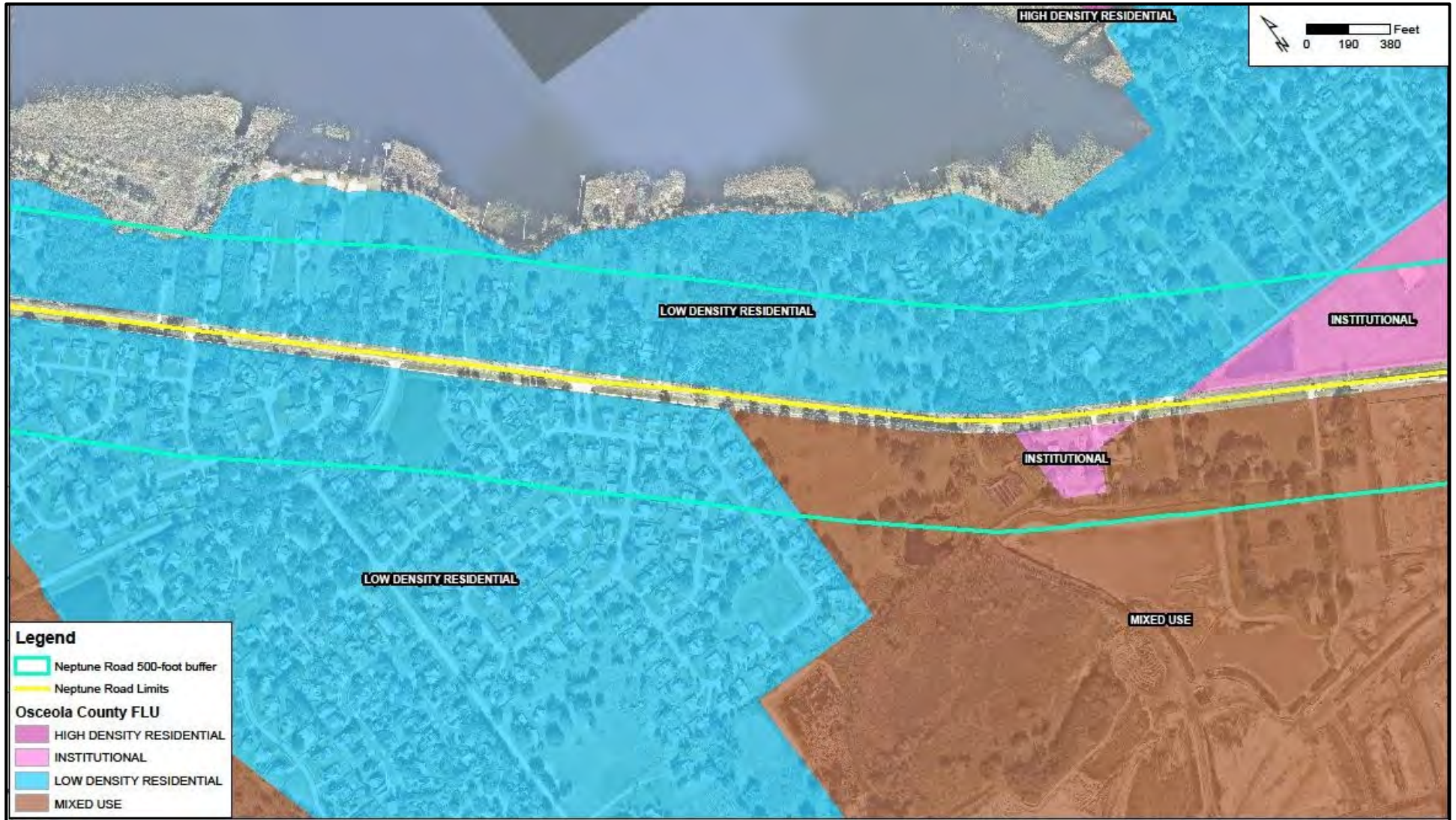


Figure 8C: Osceola County FLU Map (3 of 4)

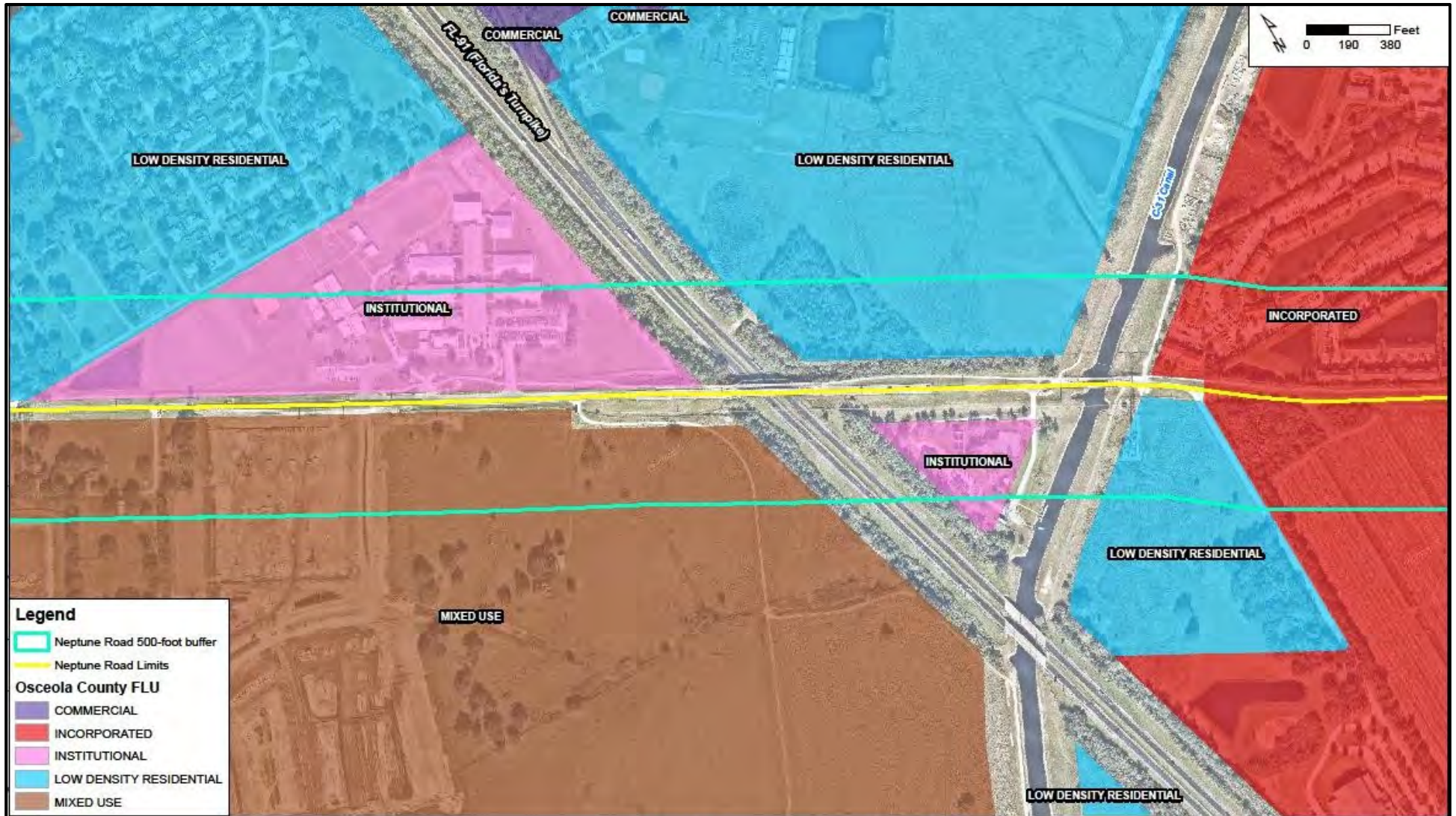
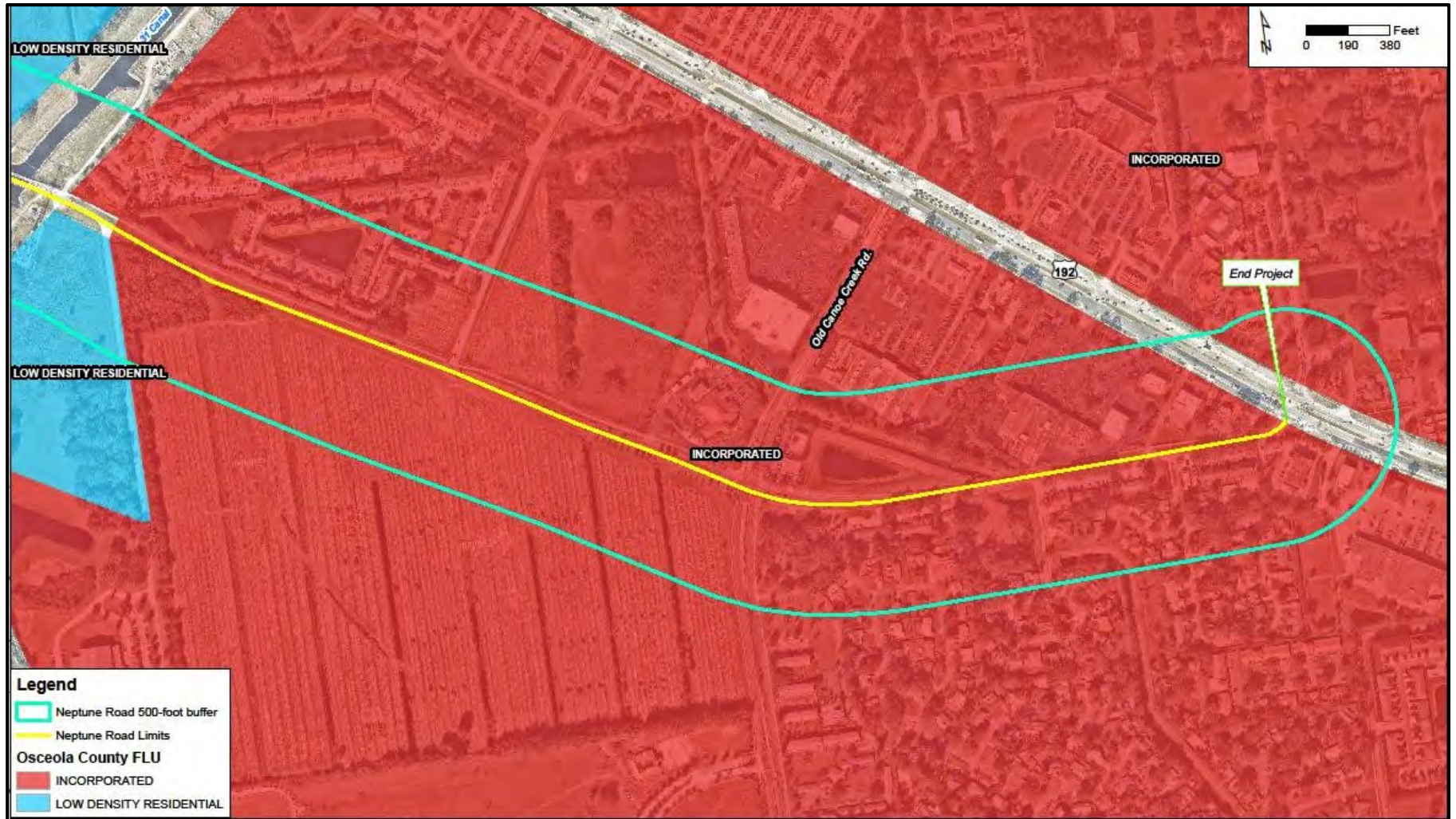


Figure 8D: Osceola County FLU Map (4 of 4)



5.2.4 SOILS

Based on a review of the USDA/NRCS Soil Survey for Osceola County, there are twenty (20) major soil types within the study area. **Table 2** includes a summary of the soil types found in the study area (see **NRCS Soils Map - Figures 9A-9D**).

Table 2: NRCS Soils Identified in the Study Area in Osceola County

Soil ID Number	Soil Name	% of soil within study area	Parent Material	Drainage Class	Water Capacity	Hydraulic Conductivity	Depth to Restrictive Feature	Groundwater Depth
1	Adamsville sand	1.24	Sandy marine deposits	Somewhat poorly drained	Low	rapid	>80 inches	18 to 42 inches
5	Basinger fine sand	3.32	Sandy marine deposits	Poorly drained	Low	Very rapid	>80 inches	6 inches
9	Cassia Fine Sand	0.57	Sandy marine deposits	Somewhat poorly drained	Low	Moderately rapid	>80 inches	18 to 42 inches
10	Delray Loamy Fine Sand, Depressional	5.01	Sandy and loamy marine deposits	Very poorly drained	Low	Moderately rapid	>80 inches	0 inches
15	Hontoon Muck	0.01	Herbaceous organic material	Very poorly drained	Very high	Very rapid	>80 inches	0 inches
16	Immokalee Fine Sand	26.13	Sandy marine deposits	Poorly drained	Low	Moderately rapid	>80 inches	6-18 inches
17	Kaliga Muck	0.38	Herbaceous organic material over stratified loamy marine deposits	Very poorly drained	Very high	Moderately slow to moderately high	>80 inches	0-6 inches
22	Myakka Fine Sand	21.03	Sandy marine deposits	Poorly drained	Very low	Moderately rapid	>80 inches	6-18 inches
23	Myakka-Urban Land Complex	<0.01	Sandy marine deposits	Poorly drained	Very low	Moderately rapid	>80 inches	6-18 inches
24	Narcoossee Fine Sand	0.06	Sandy marine deposits	Moderately well drained	Very low	Rapid	>80 inches	24-42 inches
32	Placid Fine Sand, Depressional	9.99	Sandy marine deposits	Very poorly drained	Low	Rapid	>80 inches	0-6 inches

Soil ID Number	Soil Name	% of soil within study area	Parent Material	Drainage Class	Water Capacity	Hydraulic Conductivity	Depth to Restrictive Feature	Groundwater Depth
33	Placid Variant Fine Sand	0.50	Sandy marine deposits	Somewhat poorly drained	Low	Rapid	>80 inches	18-42 inches
34	Pomello Fine Sand, 0-5% Slopes	0.13	Sandy marine deposits	Moderately well drained	Low	Moderately rapid	>80 inches	24-42 inches
36	Pompano Fine Sand	0.08	Sandy marine deposits	Poorly drained	Low	Rapid	>80 inches	3-18 inches
38	Riviera Fine Sand	0.01	Sandy and loamy marine deposits	Poorly drained	Moderate	Moderately rapid	>80 inches	3-18 inches
39	Riviera Fine Sand, Depressional	0.02	Sandy and loamy marine deposits	Very poorly drained	Low	Moderately rapid	>80 inches	0-6 inches
40	Samsula Muck	10.21	Herbaceous organic material over sandy marine deposits	Very poorly drained	Very high	Rapid	>80 inches	0-6 inches
42	Smyrna Fine Sand	6.38	Sandy marine deposits	Poorly drained	Low	Moderately rapid	>80 inches	6-18 inches
45	Vero Fine Sand	3.41	Sandy and loamy marine deposits	Poorly drained	Moderate	Rapid	>80 inches	6-18 inches
46	Wauchula Fine Sand	11.06	Sandy and loamy marine deposits	Poorly drained	Moderate	Moderately low to moderately rapid	>80 inches	6-18 inches

Bold denotes hydric soils.

There is 0.45% of the project area within water, which was not included in the table.

Data Compiled by Kimley-Horn and Associates, Inc. 2019

Figure 9A: NRCS Soils Map (1 of 4)

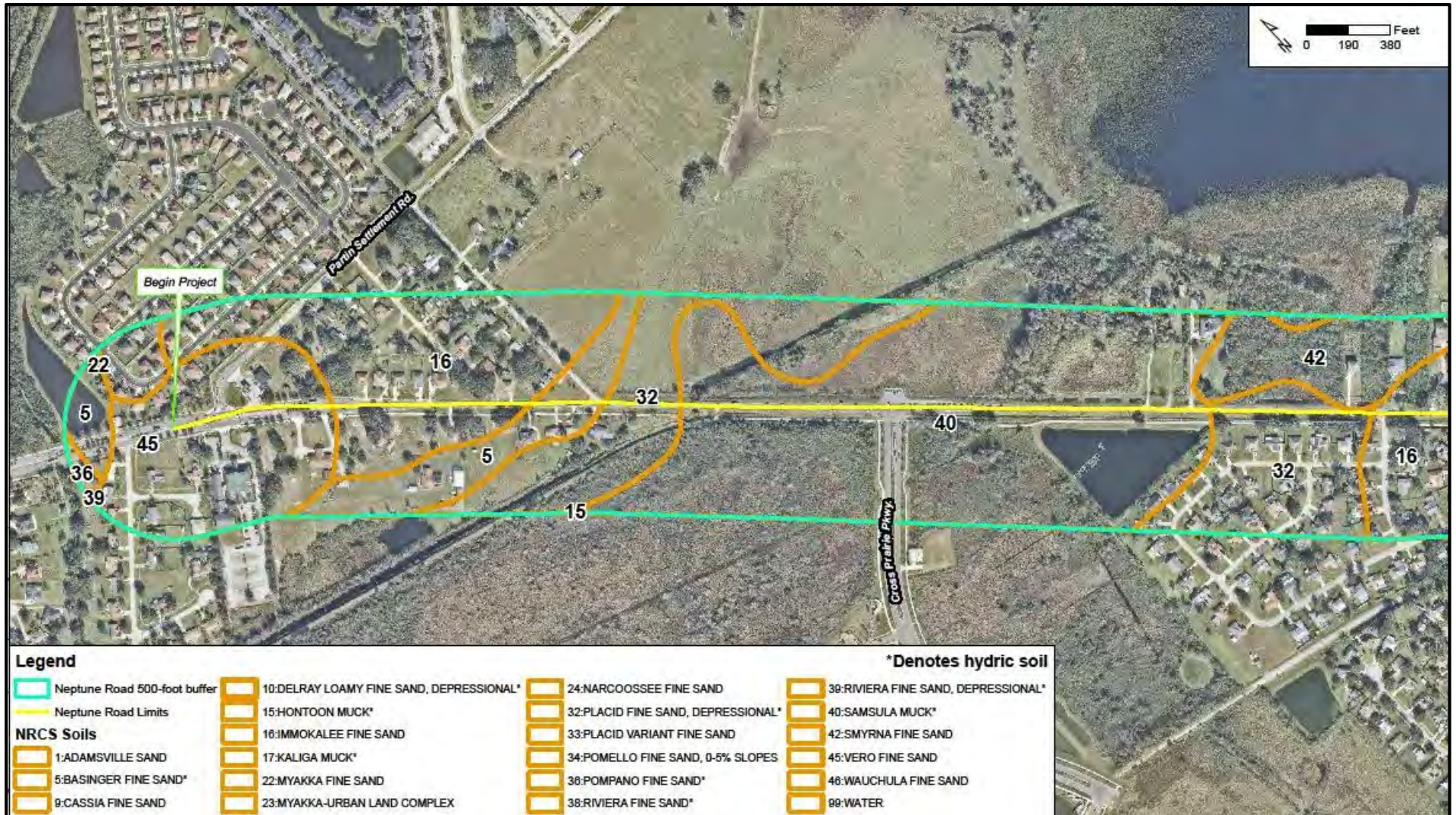


Figure 9B: NRCS Soils Map (2 of 4)

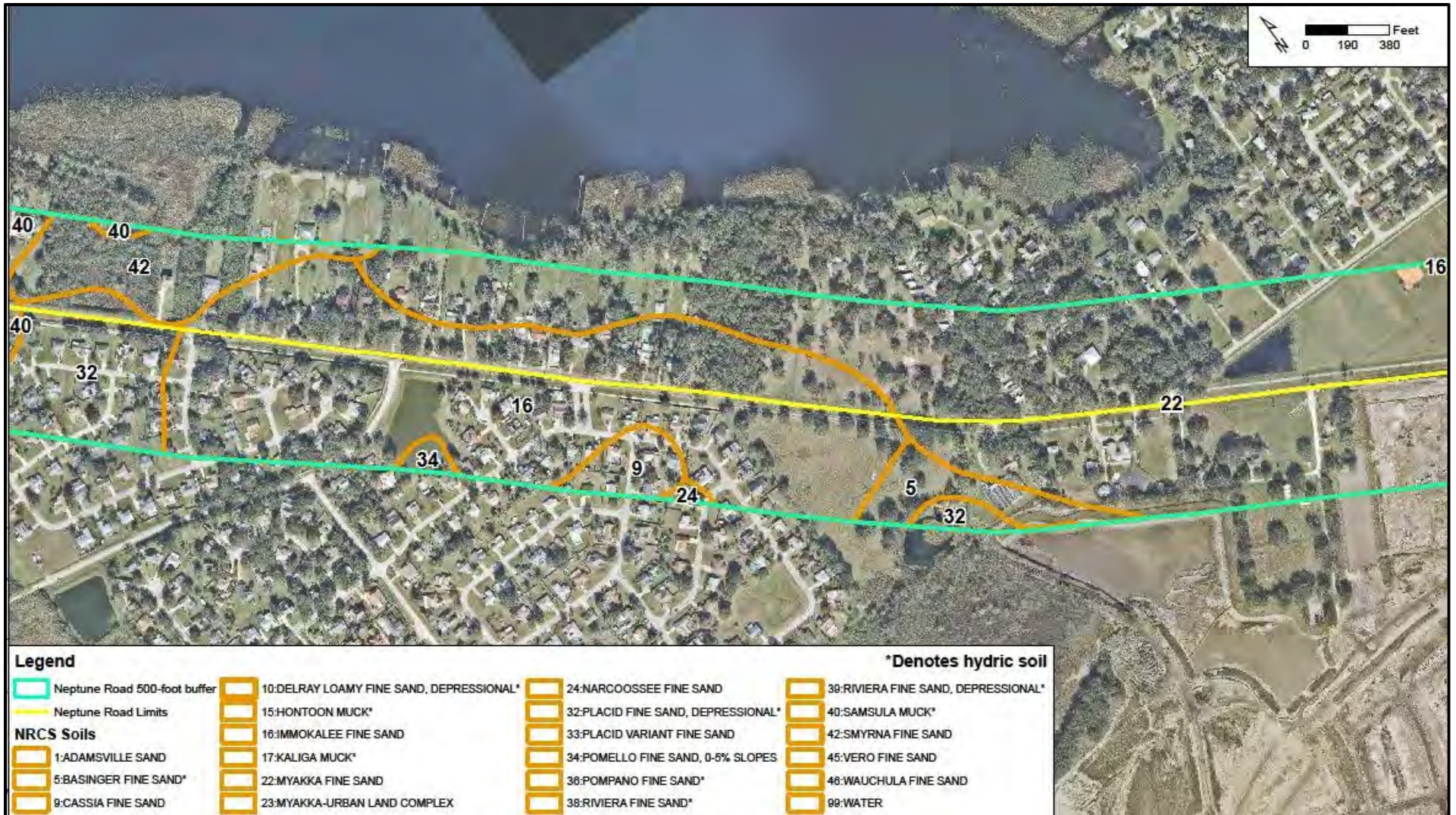


Figure 9C: NRCS Soils Map (3 of 4)

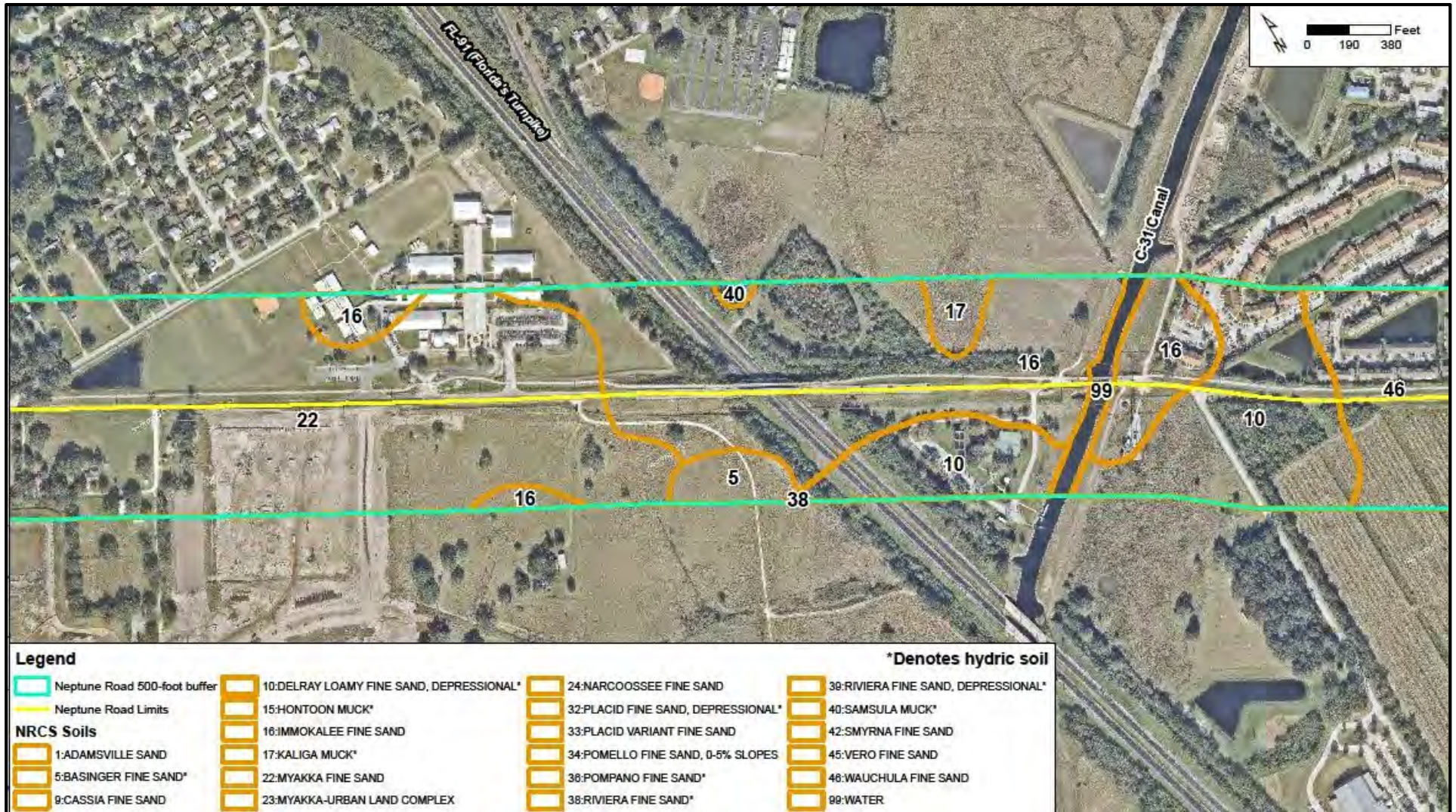
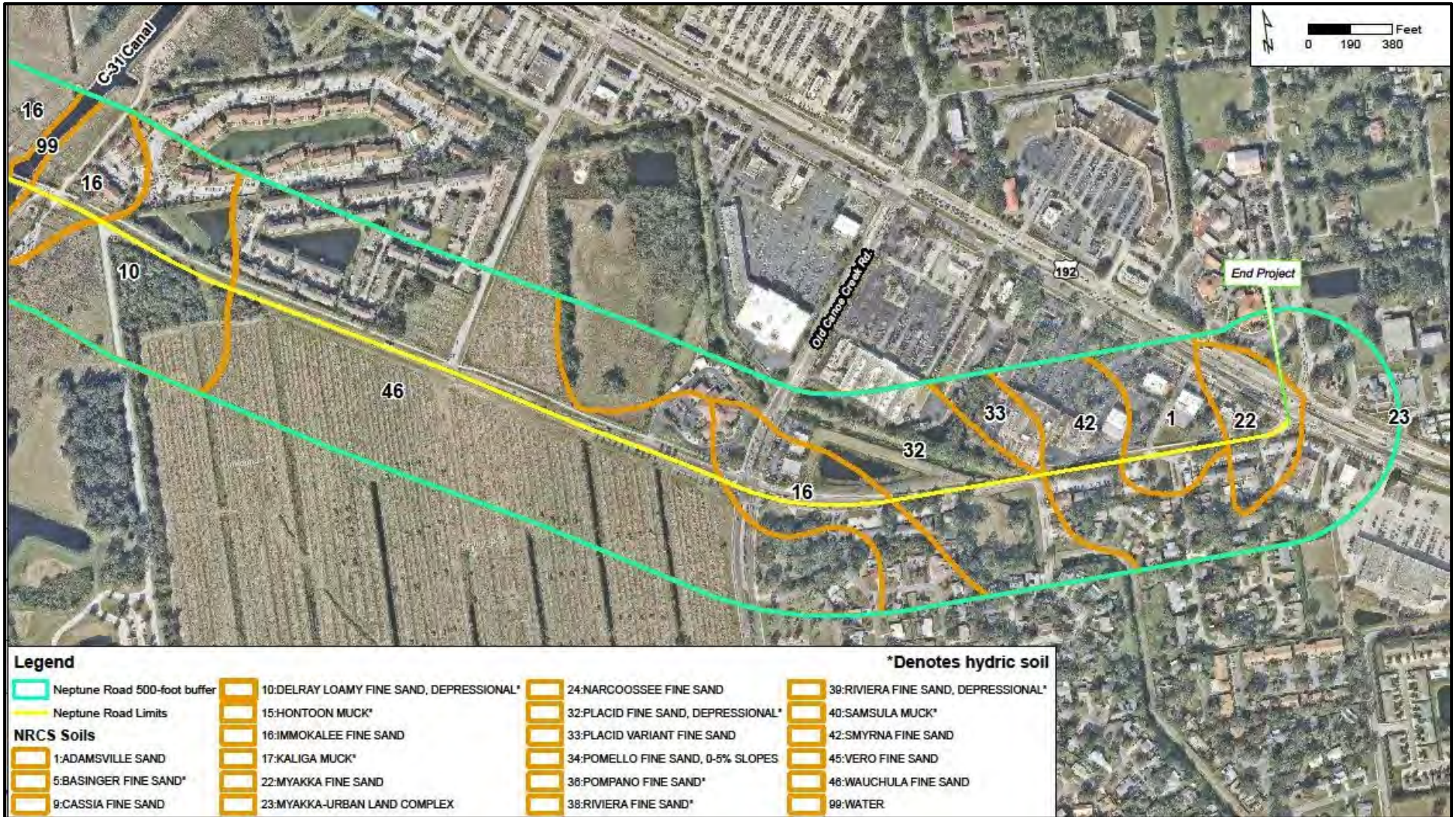


Figure 9D: NRCS Soils Map (4 of 4)



Of the twenty (20) soil types mapped within the study area, nine (9) are designated hydric soils (*Hydric Soils of Florida Handbook, Fourth Edition, 2007*). These soils are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation. In addition, five (5) of the non-hydric soil types within the study area may contain hydric inclusions within the lower elevation areas. These soils include: Adamsville Sand, Immokalee Fine Sand, Placid Variant Fine Sand, Smyrna Fine Sand, and Vero Fine Sand.

6.0 WETLANDS EVALUATION

6.1 DATA COLLECTION

In accordance with Executive Order 11990, Protection of Wetlands, and FHWA Technical Advisory T6640 8A, the extent and types of wetlands in the study area were documented. Each wetland site was identified in the field using the delineation methods described in the *Federal Manual for Identification and Delineation of Wetlands* (USACE 1987) and *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region (Version 2.0) (November 2010)*, and in accordance with Chapter 62-340, of Florida Administrative Code (FAC), *Delineation of the Landward Extent of Wetlands and Surface Waters*. Wetland classifications occurring within the study area were determined based on FLUCFCS, as well as the USFWS publication *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al. 1979). These methods consider prevalence of wetland vegetation, hydric soil indicators, and wetland hydrology.

All wetlands and surface waters identified in the field were compiled onto digital aerial imagery of the study area. Acreage calculations of the existing area and area of impact were then calculated using ArcGIS Software. It was not practical to obtain total acreage calculations for some of the wetlands and surface waters that extended outside the study area. Formal wetland delineations including field flagging and approval by the SFWMD or USACE have not been conducted but will occur during the design and permitting phase of the project.

ETDM Comments

The NMFS commented that although no essential fish habitat will be impacted by this project, the freshwater marshes within the study area provide water quality functions. If these wetlands cannot be avoided, sequential minimization and mitigation should take place. In addition, construction could cause secondary impacts to adjacent wetlands through sedimentation and runoff.

FDEP commented that every effort should be made to treat stormwater runoff from the proposed road widening to prevent ground and surface water contamination. FDEP also stated that retrofitting of stormwater conveyance systems would help reduce impacts to water quality.

SFWMD also stated that stormwater runoff should be treated, and a Water Quality Impact Analysis should be completed.

The USACE commented that there are several palustrine and riverine wetlands within the project study area. Wetland avoidance and minimization opportunities should continue to be emphasized throughout the planning process. There are three federally approved wetland mitigation banks that service the project study area.

The USEPA commented that the “selected site should avoid and minimize, to the maximum extent practicable, placement of fill into jurisdictional waters of the U.S., which include wetlands and streams. Additionally, consider that the potential increase in impervious surface may increase storm water runoff and may increase pollutants into nearby water bodies and wetlands because of the project”. The USEPA recommended that the PD&E include a discussion of the stormwater collection and treatment mechanisms that would be designed to protect nearby wetlands, best management practices during

construction and compensatory mitigation for unavoidable wetland impacts. It was suggested to prevent further fragmentation, degradation, and loss of wildlife habitat, preservation of the remaining habitat in the project area be considered. USEPA requested a copy of the NRE.

6.2 WETLAND CHARACTERIZATION

Baseline information characterizing the wetlands involved within the study area including contiguity, vegetative structural diversity, edge relationships, wildlife habitat value, hydrologic functions, public use, and integrity is found in **Table 3**. The wetland polygons were individually characterized based on their FLUCFCS type and are depicted in **Figures 10A-10D - Wetlands and Surface Waters Map**. A representative photographic log of wetlands and surface waters is included in **Appendix D**. Due to the large size of the study area, the number of wetland and surface water features that occur and the similarity among the various wetlands observed, the wetlands and surface waters described in **Table 3** are grouped based on FLUCFCS type and each individual wetland is not described.

Table 3: Wetland and Surface Water Characteristics within the Study Area

Wetland ID	FLUCFCS Code	FLUCFCS Description	USFWS Code	Contiguity	Vegetative Structural Diversity	Edge Relationships	Wildlife Habitat Value	Hydrologic Function	Public Use	Integrity	Size (Acres)*
SW-1, SW-4, SW-5, SW-6, SW-12	534	Reservoirs less than 10 acres	PUBHx	Each reservoir is isolated.	Not applicable – open water with little to no vegetation along edges.	These stormwater ponds are adjacent to residential or commercial development.	Provides some foraging opportunities for birds, fish, reptiles, amphibians, invertebrates, and some mammals.	Man-made stormwater pond areas. Hydrologic function is consistent with design and maintenance of each pond.	Not applicable.	Man-made.	4.25
SW-2 (Partin Canal), SW-7 (Canal C-31)	510	Streams and Waterways	PUBHx	Each canal is connected to a large lake (SW-2 is connected to Fish Lake and Lake Tohopekaliga and SW-7 is connected to East Lake Tohopekaliga and Lake Tohopekaliga).	Not applicable – open water with little to no vegetation along edges.	SW-2 is adjacent to herbaceous wetlands and residential development. SW-7 is adjacent to pastures and recreational facilities.	Provides some foraging opportunities for birds, fish, reptiles, amphibians, invertebrates, and some mammals.	Storage, water quality effects on downstream areas.	C-31 canal provides boat access to nearby lakes.	Canals were excavated and are regularly maintained.	4.97
SW-3	510	Streams and Waterways	PUBHx	SW-3 consists of several roadside ditches that were connected to each other via culverts. Some ditches were hydrologically connected to large wetlands.	Mostly open water, however some vegetation was present along edges such as <i>Typha</i> spp.	Surrounding landscape included roadways and other large wetlands.	Provides some foraging opportunities for birds, fish, reptiles, amphibians, invertebrates, and some mammals.	Ditches collect runoff from adjacent roadways.	Provides no recreational use for the public.	Man-made.	1.57
SW-8, SW-9, SW-10, SW-11	510	Streams and Waterways	PUBHx	Agricultural ditches appear to be isolated from each other.	Mostly open water however some <i>Salix caroliniana</i> and <i>Ludwigia</i> spp. were present.	Ditches are surrounded by fallow crop lands.	Provides some foraging opportunities for birds, fish, reptiles, amphibians, invertebrates, and some mammals.	Ditches historically provided drainage for the crop lands.	Not applicable.	Man-made.	1.56
SW-13	510	Streams and Waterways	PUBHx	A culvert under Neptune Road connects these ditches to one another.	Mostly open water, however some vegetation was present along edges such as <i>Typha</i> spp.	Ditches are surrounded by residential and commercial development.	Provides some foraging opportunities for birds, fish, reptiles, amphibians, invertebrates, and some mammals.	Ditches collect runoff from adjacent roadways and development.	Not applicable.	Man-made.	2.07
WL-1, WL-2	641	Freshwater Marshes	PEM1F	Historically one large wetland; however, recent roadway construction of Cross Prairie Parkway has	Vegetation observed included <i>Juncus</i> spp., <i>Panicum hemitomon</i> , <i>Ludwigia peruviana</i> , <i>Baccharis hamifolia</i> .	Adjacent land uses include roadways, however both wetlands extend offsite.	Provides foraging habitat, life cycle support, and refuge opportunities for fish, reptiles, amphibians, invertebrates, wading birds, and aquatic and terrestrial mammals.	Provides nutrient uptake and sediment settling. Also provides water storage capacity.	Not applicable – privately owned.	Due to fragmentation from the construction of Cross Prairie Parkway these wetlands have been bisected resulting in moderate impact.	20.57

Wetland ID	FLUCFCS Code	FLUCFCS Description	USFWS Code	Contiguity	Vegetative Structural Diversity	Edge Relationships	Wildlife Habitat Value	Hydrologic Function	Public Use	Integrity	Size (Acres)*
				bisected these wetlands.							
WL-3, WL-4	643	Wet Prairie	PEM1F	Historically one large wetland system, however recent roadway construction of Cross Prairie Parkway has bisected these wetlands. Additionally, the Partin Canal has also bisected WL-3 and WL-4	These areas were historically used as cattle pasture. Vegetation observed included <i>Juncus</i> spp., <i>Panicum repens</i> , <i>Rhynchospora colorata</i> , and <i>Sagittaria lancifolia</i> .	Adjacent land uses include roadways and improved pastures; however, wetlands extend beyond the study area.	Provides foraging habitat, life cycle support, and refuge opportunities for fish, reptiles, amphibians, invertebrates, wading birds, and aquatic and terrestrial mammals.	Provides nutrient uptake and sediment settling. Also provides water storage capacity.	Not applicable – privately owned.	Due to fragmentation from the construction of Partin Canal and Cross Prairie Parkway these wetlands have been bisected resulting in moderate impact.	6.26
WL-5	643	Wet Prairie	PEM1F	Historically, this wetland was connected to WL-3 and 4.	These areas were historically used as cattle pasture. Vegetation observed is like WL-3 and 4	Adjacent land uses include pastures, Partin Canal, and forested wetlands which connect to Fish Lake.	Provides foraging habitat, life cycle support, and refuge opportunities for fish, reptiles, amphibians, invertebrates, wading birds, and aquatic and terrestrial mammals.	Provides nutrient uptake and sediment settling. Also provides water storage capacity.	Not applicable – privately owned.	Medium due to fragmentation from the construction of Cross Prairie Parkway.	4.62
WL-6, WL-8, WL-10, WL-12	617	Mixed Wetland Hardwoods	PFO1/3 C	Historically, these wetlands were contiguous with each other and with Fish Lake. Residential development has fragmented these wetlands.	Vegetation includes <i>Taxodium distichum</i> , <i>Acer rubrum</i> , <i>Schinus terebinthifolius</i> , <i>Salix caroliniana</i> , <i>Sambucus canadensis</i> , <i>Woodwardia virginica</i> , and <i>Thelypteris palustris</i> .	Adjacent land uses include residential development; however most of the wetlands extend offsite and eventually connect to Fish Lake.	Provides foraging habitat, life cycle support, and refuge opportunities for fish, reptiles, amphibians, invertebrates, wading birds, and aquatic and terrestrial mammals.	Provides nutrient uptake and sediment settling. Also provides water storage capacity.	Some of the wetlands are privately owned, however some fishing opportunities could be available in the wetlands adjacent to Fish Lake.	Due to fragmentation for development, moderate impacts have occurred.	8.25
WL-7, WL-9, WL-11	641	Freshwater Marshes	PEM1F	These wetlands have been fragmented by residential development.	Vegetation observed included <i>Juncus</i> spp., <i>Panicum hemitomon</i> , <i>Ludwigia peruviana</i> , <i>Baccharis hamifolia</i> .	Adjacent land uses include roadways, residential land uses, and wetlands, which connect to Fish Lake.	Provides foraging habitat, life cycle support, and refuge opportunities for fish, reptiles, amphibians, invertebrates, wading birds, and aquatic and terrestrial mammals.	Provides nutrient uptake and sediment settling. Also provides water storage capacity.	Some of the wetlands are privately owned, however some fishing opportunities could be available in the wetlands adjacent to Fish Lake.	Due to fragmentation for residential development, moderate impacts have occurred. However, adjacent wetlands are still connected to Fish Lake.	3.73
WL-13	641	Freshwater Marshes	PEM1F	Wetland appears to be connected to larger wetland to the south and has not been historically manipulated.	Vegetation observed included <i>Juncus</i> spp., <i>Panicum hemitomon</i> , <i>Ludwigia peruviana</i> , <i>Baccharis hamifolia</i> .	Adjacent land uses include pastures, wetlands, and some commercial development (nursery).	Provides foraging habitat, life cycle support, and refuge opportunities for fish, reptiles, amphibians, invertebrates, wading birds, and aquatic and terrestrial mammals.	Provides nutrient uptake and sediment settling. Also provides water storage capacity.	Not applicable – privately owned.	This wetland appears relatively intact and still connects to a larger wetland to the south.	0.52

Wetland ID	FLUCFCS Code	FLUCFCS Description	USFWS Code	Contiguity	Vegetative Structural Diversity	Edge Relationships	Wildlife Habitat Value	Hydrologic Function	Public Use	Integrity	Size (Acres)*
WL-14, WL-15 WL-17	617	Mixed Wetland Hardwoods	PFO1/3 C	These wetlands have been historically manipulated for agricultural purposes and also roadway construction (Florida's Turnpike and Neptune Road).	Vegetation includes <i>Taxodium distichum</i> , <i>Acer rubrum</i> , <i>Schinus terebinthifolius</i> , <i>Salix caroliniana</i> , <i>Sambucus canadensis</i> , <i>Woodwardia virginica</i> , and <i>Thelypteris palustris</i> .	Adjacent land uses include pastures/agricultural uses and roadways. There are some wetlands and/or surface waters nearby, but none appear to be connected to WL-14, 15 and/or 17.	Provides foraging habitat, life cycle support, and refuge opportunities for fish, reptiles, amphibians, invertebrates, wading birds, and aquatic and terrestrial mammals.	Provides nutrient uptake and sediment settling. Also provides water storage capacity.	Not applicable – privately owned.	These wetlands may have been historically manipulated for agricultural purposes and/or roadway construction.	10.25
WL-16	641	Freshwater Marshes	PEM1F	Wetland appears to be isolated.	Vegetation observed included <i>Juncus spp.</i> , <i>Panicum hemitomon</i> , <i>Ludwigia peruviana</i> , <i>Baccharis hamifolia</i> .	Adjacent land use includes pastures. There are some wetlands to the south and the west, however there does not appear to be a connection.	Provides foraging habitat, life cycle support, and refuge opportunities for fish, reptiles, amphibians, invertebrates, wading birds, and aquatic and terrestrial mammals.	Provides nutrient uptake and sediment settling. Also provides water storage capacity.	Not applicable – privately owned.	This wetland may have been manipulated historically for agricultural purposes, however, this wetland has not been impacted by roadway construction or residential development.	2.05

*Size (acreage) is only the area included within the study area. Many of the wetlands and surface waters extend offsite, outside the limits of the study area.

Figure 10A: Wetlands and Surface Water Maps (1 of 4)

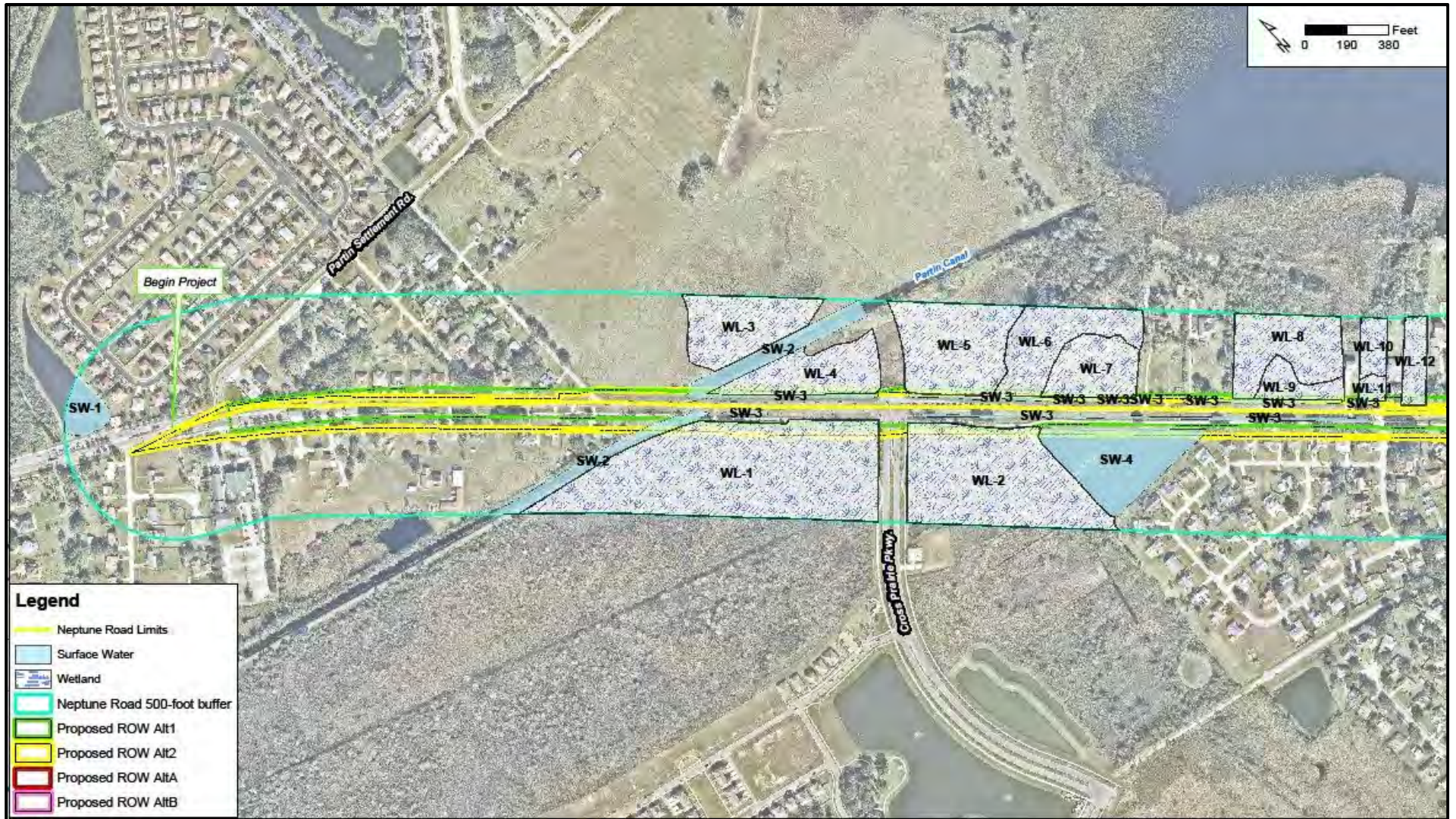


Figure 10B: Wetlands and Surface Water Maps (2 of 4)



Figure 10C: Wetlands and Surface Water Maps (3 of 4)

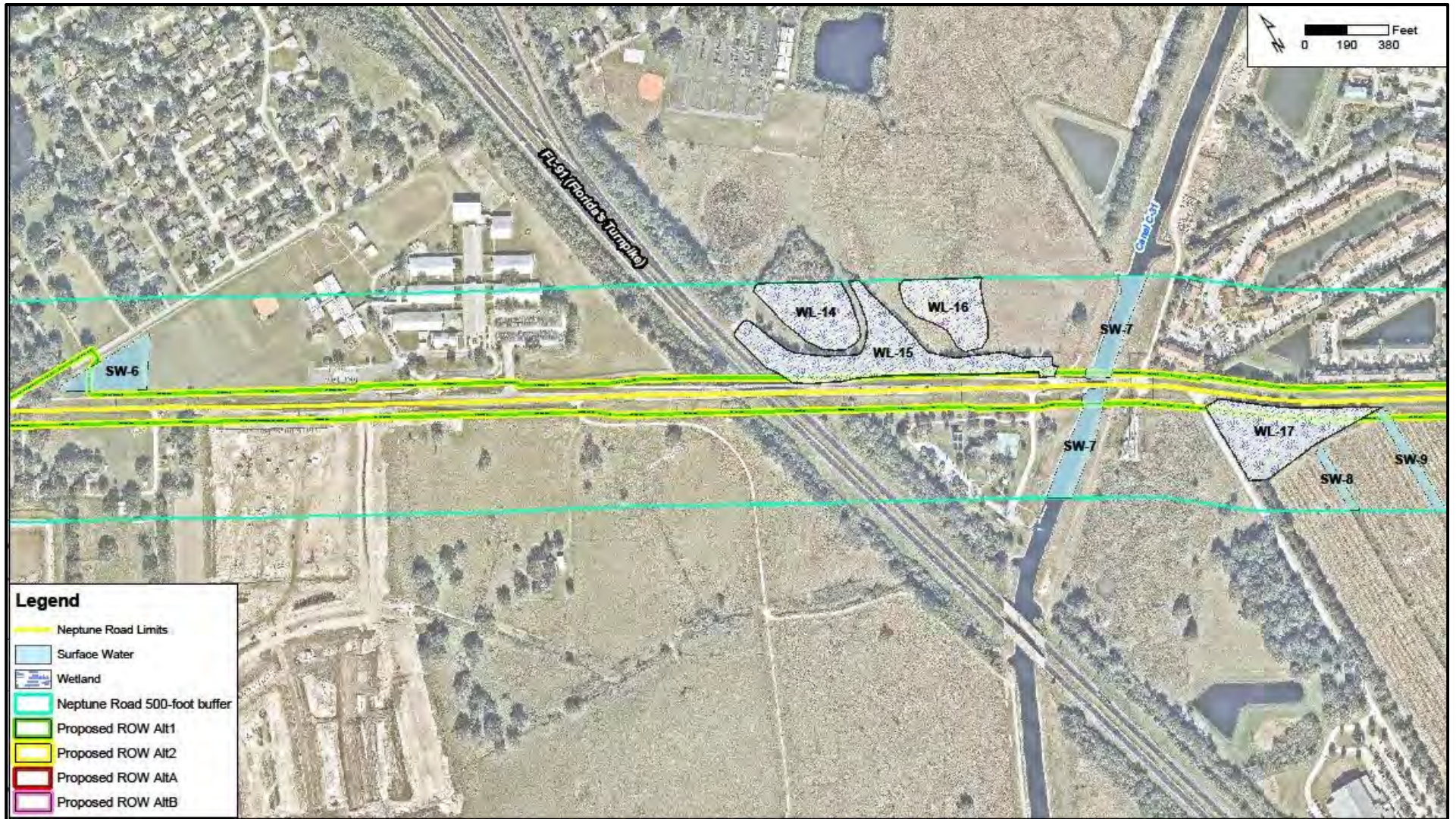


Figure 10D: Wetlands and Surface Water Maps (4 of 4)



6.3 WETLAND AND SURFACE WATER IMPACTS ANALYSIS

Within the study area, impacts to wetlands and surface waters are anticipated to occur for all proposed build alternatives because the wetland and surface water systems in most cases extend to the existing road ROW. Impacts are discussed in the following sections.

6.3.1 DIRECT IMPACTS

The approximate wetland and surface water direct impacts were calculated based on the total footprint of the proposed build alternative alignments.

The proposed direct impacts (fill) are shown in **Table 4**. Based upon the proposed typical sections described and shown in Section 2.4, Alternatives 1 and 2 from Partin Settlement Road to Old Canoe Creek Road have ROW varying from 130' to 139'. Alternative A from Old Canoe Creek Road to US 192 has ROW varying from 60' to 82', while Alternative B has ROW varying from 59' to 83'. The maximum footprint was utilized for all alternatives when calculating wetland and surface water impacts. The No Build Alternative results in no impacts to wetlands or surface waters.

Table 4: Direct Wetland and Surface Water Impacts by Alternative (Acres)

SW/WL Number	Alt 1	Alt 2	Alt A	Alt B
SW 2	0.18	0.33		-
SW 3	1.57	1.54		-
SW 5	-	0.06		-
SW 6	0.20	0.20		-
SW 7	0.22	0.22		-
SW 9	0.04	0.04		-
SW 10	0.01	0.01		-
SW 11	0.01	0.01		-
SW 13	-	-	0.03	0.05
Total Surface Water Impacts	2.23	2.41	0.03	0.05
WL1	0.30	1.20	-	-
WL2	0.19	0.52	-	-
WL4	0.22	0.22	-	-
WL5	0.21	0.06	-	-
WL6	0.13	0.04	-	-
WL7	0.15	-	-	-
WL8	0.04	-	-	-
WL9	0.16	-	-	-
WL11	0.05	-	-	-
WL12	0.09	-	-	-
WL15	0.20	0.20	-	-
WL17	0.83	0.83	-	-
Total Wetland Impacts	2.57	3.07	-	-
Grand Total Surface Water and Wetland Impacts	4.80	5.48	0.03	0.05

6.3.2 SECONDARY IMPACTS

The approximate secondary impacts to wetlands and surface waters were calculated for the proposed build alternatives. Impact values were calculated based on a 25-foot construction impact zone that was established around the alignment. This would include grading for harmonization. **Table 5** provide a summary of the potential secondary impacts from construction to wetlands for each alternative. Alternative A and B did not have any direct wetland impact and there are no wetlands within 25 feet of the alternatives; thus, assessment of secondary impacts to wetlands was not required.

Table 5: Secondary Wetland Impacts by Alternative (Acres)

WL Number	Alt 1	Alt 2
WL1	0.49	0.56
WL2	0.36	0.34
WL4	0.42	0.42
WL5	0.24	0.23
WL6	0.12	0.12
WL7	0.24	0.22
WL8	0.06	0.06
WL9	0.23	0.23
WL11	0.07	0.07
WL12	0.06	0.05
WL15	0.69	0.69
WL17	0.39	0.39
Total Secondary Wetland Impacts	3.37	3.38

6.3.3 STORMWATER POND SCREENING

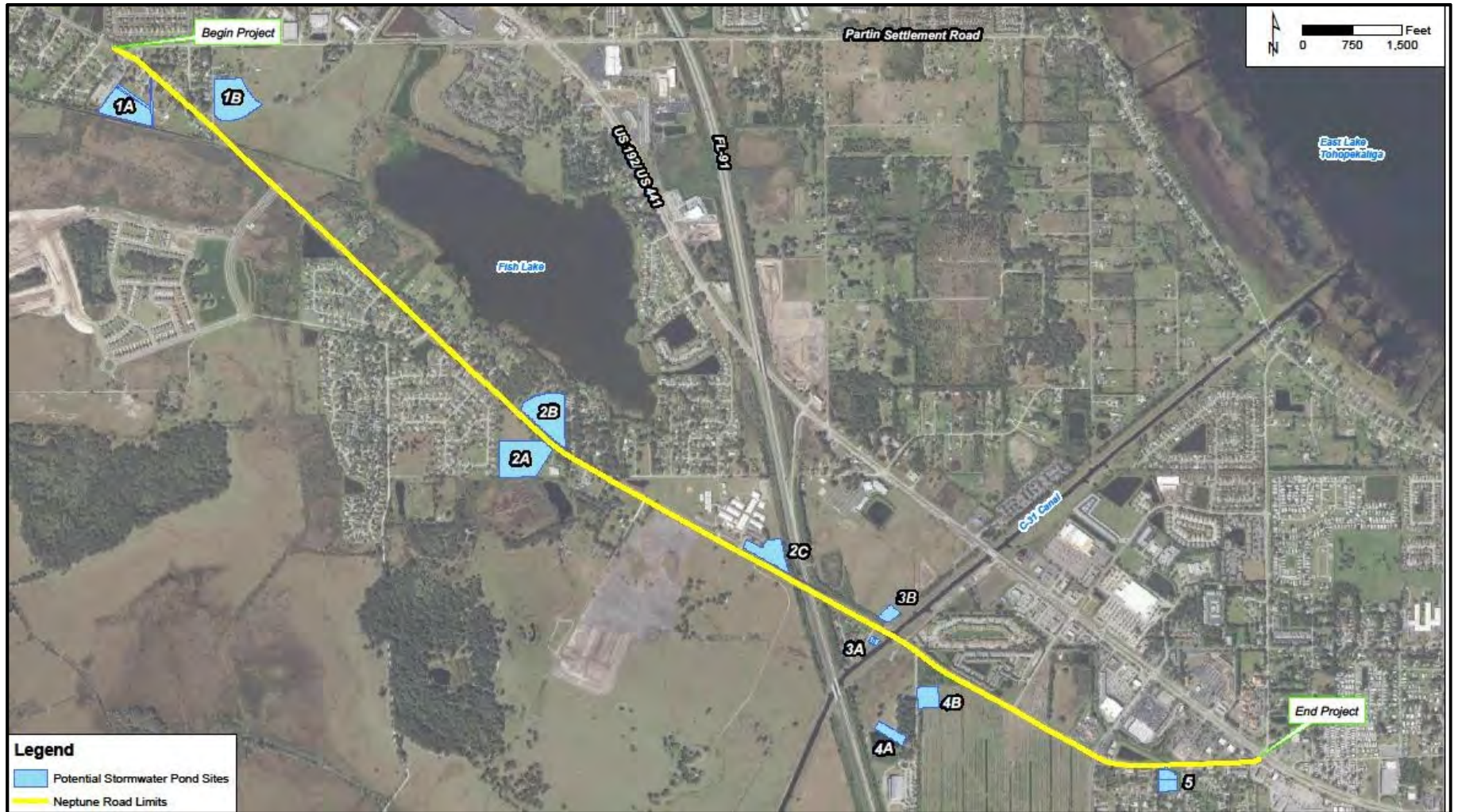
A stormwater pond screening analysis was conducted, and the results are included in **Table 6**. Multiple potential pond site alternatives were evaluated per basin. Additional detail regarding the pond sites is included in the *Pond Siting Report* (June 2019). The stormwater pond site alternatives are included on **Figure 11**. Wetland impacts would occur if pond number 1A or 2A were selected as the preferred alternative.

Table 6: Summary of Stormwater Pond Screening

Pond Number	Acreage ¹	FLUCFCS Description	Vegetative Description	Wetland or Surface Water (SW) Impacts
1A	6.57	190/641	Open land and freshwater marsh	3.84 acres of impacts to freshwater marsh
1B	7.67	211	Improved pasture	N/A
2A	8.61	211/641	Improved pasture and freshwater marsh	1.51 acres of impacts to freshwater marsh
2B	7.69	434	Hardwood-conifer mixed	N/A
2C	3.70	171	Educational facilities; No impacts to school; pond would be in bahia grass/existing dry detention area	N/A
3A	0.32	185	Recreational; No impacts to park facilities; pond would be in bahia grass	N/A
3B	1.00	211	Improved pasture	N/A
4A	1.48	211/434	Improved pasture and hardwood-conifer mixed	N/A
4B	2.32	261/434	Fallow crop land and hardwood-conifer mixed	N/A
5	1.97	190	Open land	N/A

¹: Acreage listed includes the entire pond ROW acquisition requirement.

Figure 11: Potential Stormwater Pond Alternatives Map



6.4 FUNCTIONAL ASSESSMENT

6.4.1 METHODOLOGY

The Uniform Mitigation Assessment Methodology (UMAM), as established by the FAC, Chapter 62-345, was used to complete a functional assessment of the wetlands within the study area. The UMAM is a rating index that assists in evaluating the functions and values of a wetland system. It establishes a numerical ranking for a wetland based on various ecological or anthropogenic variables known to influence the functional value of a wetland. UMAM scores are based on the total of three categories, scored from zero (0) (lowest) to ten (10) (highest), divided by the total maximum score for the variables (30). The UMAM value is expressed as a number between zero (0) and one (1), with one being assigned to the highest valued/functioning wetlands. The three (3) categories are described as follows:

6.4.1.1 LOCATION AND LANDSCAPE SUPPORT

Location and landscape support evaluates the location of the assessment area in relation to the connectivity and landscape position for the utilization of fish and wildlife. The potential for use by wildlife (i.e. availability of cover, food, and nesting areas) is also evaluated in this category.

6.4.1.2 WATER ENVIRONMENT

The water environment evaluates the quantity of water in an assessment area, including timing, frequency, depth, duration and quality. These characteristics may compromise the ability of the area to support wildlife.

6.4.1.3 COMMUNITY STRUCTURE

Community structure evaluates the vegetation and benthic habitat present in an assessment area. This evaluation includes the presence, abundance, health, condition, appropriateness, and distribution of plant communities and benthic habitats.

6.4.2 UMAM RESULTS

The wetlands and surface waters identified within the study area were assessed based on the UMAM criteria and a summary of the scores are provided in **Table 7**. UMAM data forms and comments for each wetland type within the study area are included in **Appendix E**.

Table 7: Summary of UMAM Scores

FLUCFCS	Wetland Number	Location & Landscape Support	Water Environment	Community Structure	UMAM Composite Score
617	WL-6, WL-8, WL-12	5	6	6	0.57
617	WL-15, WL-17	4	5	6	0.50
641	WL-1, WL-2	5	5	5	0.50
641	WL-7, WL-9, WL-11	6	6	5	0.57
641	WL-13	5	5	5	0.50
641	WL-16	5	5	5	0.50
643	WL-4	2	3	3	0.27

FLUCFCS	Wetland Number	Location & Landscape Support	Water Environment	Community Structure	UMAM Composite Score
643	WL-5	3	4	4	0.37

Potential wetland functional loss based on the composite UMAM scores was calculated for each habitat type and is presented in **Table 8**.

Table 8: Potential Wetland Functional Loss

Alternative	FLUCFCS	Wetland Number	Direct Impacts (Acres)	UMAM Composite Score	Potential Functional Loss	Sum of Potential Functional Loss by Alternative by Habitat Type
Alt 1	617	WL-6, WL-8, WL-12	0.26	0.57	-0.15	Forested: -0.67
	617	WL-15, WL-17	1.03	0.50	-0.52	
	641	WL-1, WL-2	0.49	0.50	-0.25	Herbaceous: -0.60
	641	WL-7, WL-9, WL-11	0.36	0.57	-0.21	
	643	WL-4	0.22	0.27	-0.06	
	643	WL-5	0.21	0.37	-0.08	
Alt 2	617	WL-6	0.04	0.57	-0.02	Forested: -0.54
	617	WL-15, WL-17	1.03	0.50	-0.52	
	641	WL-1, WL-2	1.72	0.50	-0.86	Herbaceous: -0.94
	643	WL-4	0.22	0.27	-0.06	
	643	WL-5	0.06	0.37	-0.02	

Alternative 1 will have an approximate functional loss of 0.67 acres of forested wetlands and 0.60 acres of herbaceous wetlands. Alternative 2 will have an approximate functional loss of 0.54 acres of forested wetlands and 0.94 acres of herbaceous wetlands.

After review of the project’s potential impacts to wetlands, it has been determined that the proposed project will have no significant short-term or long-term adverse impacts to wetlands, there is no practical alternative to construction in wetlands as the project is the widening of an already existing roadway, and measures have been taken to minimize harm to wetlands along the project corridor.

6.5 CONCEPTUAL MITIGATION

Avoidance and minimization of potential wetland and surface water impacts were incorporated throughout the development of the proposed build alternative alignments, where possible. Most of the project has been designed to occur within existing ROW, which reduces impacts to adjacent wetlands and surface waters.

Avoidance and minimization of wetland and surface water impacts will continue to be evaluated during the final design, permitting and construction phases of this project and all possible and practicable measures to avoid or minimize these impacts during design, construction and operation will be incorporated. Appropriate mitigation options will be provided for unavoidable impacts. Mitigation is expected to consist of purchase of mitigation credits. The project occurs within the Lake Tohopekaliga Cumulative Impact Basin and several mitigation banks have service areas that include the project study area. The following mitigation banks will be considered for wetland mitigation: Reedy Creek Mitigation Bank, Southport Ranch Mitigation Bank, and Florida Mitigation Bank. These banks currently have both forested and herbaceous, state and federal credits available.

All UMAM scores, UMAM calculations, preliminary wetland lines and determinations discussed are subject to revision and approval by regulatory agencies during the permitting process. The exact type of mitigation used to offset wetland impacts from the proposed widening of Neptune Road will be coordinated with the USACE and the SFWMD during the permitting phase of this project.

As required by Executive Order 11990 and USDOT Order 5660.1A, the proposed project will have no significant short-term or long-term adverse impacts to wetlands, there is no practical alternative to construction in wetlands as the project includes the widening of an already existing roadway, and measures have been taken to minimize harm to wetlands along the project corridor. Wetland impacts which will result from the construction of this project will be mitigated pursuant to Section 373.4137, F.S. to satisfy all mitigation requirements of Part IV. Chapter 373, F.S. and 33 U.S.C. s. 1344.

6.6 CUMULATIVE EFFECTS

Cumulative effects of a project result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time (Council on Environmental Quality (CEQ) (40CFR Section 1508.7)). Cumulative effects are also largely dependent upon the size of the road/bridge corridor, the relative position of the project within the landscape, and the relative condition of the habitats being traversed (pristine vs. degraded).

Historical aeriels were obtained and reviewed from 1969 to the present (see **Appendix F – Historical Aeriels**). The 1969 aerial shows much of the study area consisting of pastures, some rural development, wetlands, and the adjacent lakes (Fish Lake, Lake Tohopekaliga, and East Lake Tohopekaliga). The Partin Canal, C-31 Canal, US 441, Neptune Road, and the Florida's Turnpike are all evident in this aerial. Thus, some conversion of land primarily for agriculture had already begun in the early 1960s with land clearing appearing to be mostly within uplands. By 1973, there was a slight increase in residential development. Development significantly increased in the 80s and 90s, which included the construction of Neptune Middle School. Additionally, more residential development was occurring especially around Fish Lake and near the intersection of Neptune Road and Partin Settlement Road. Construction within the wetland systems surrounding the lakes were avoided, much like present day. The preserved wetland systems were not connected even in the 1960s and today still remain unconnected, which prohibits movement of wildlife between wetland systems.

When evaluating cumulative impacts to wetlands, a watershed approach is often utilized. The study area is located within the Kissimmee River Watershed and more specifically within the Lake Tohopekaliga Drainage Basin. Using GIS, the total area of the watershed and drainage basin areas were calculated as well as the total protected wetlands. The protected wetlands were based on an analysis of data layers

showing Florida Managed Lands and SFWMD conservation easements. Due to the size of the watershed and drainage basin, this study did not include a review of every individual permit to determine if the wetlands are preserved or not, but from aerial review there are other areas of wetlands that are not in easement but appear to be protected wetlands that were not included in the overall numbers. Thus, the acreage of protected wetlands is a conservative number and may be greater than determined in this analysis.

The Kissimmee River Watershed is approximately 1,946,927 acres with approximately 609,785 acres of wetlands. Approximately 199,836 acres of wetlands are protected within conservation easements or a Florida managed lands program. The wetland impacts for the alternatives range from approximately 2.6 acres to 3.1 acres. These impacts are negligible within the context of the watershed.

The Lake Tohopekaliga Drainage Basin is approximately 84,360 acres. For this basin, there is approximately 29,132 acres of wetlands of which approximately 3,235 acres are protected. The wetland impacts of the project are negligible within the context of the overall drainage basin.

As discussed in the Section 6.5 Conceptual Mitigation, it is anticipated that mitigation will be conducted through purchase of credits within the same watershed. Therefore, cumulative wetland impacts are not expected to occur from this project.

7.0 PROTECTED SPECIES AND HABITAT ASSESSMENT

7.1 DATA COLLECTION

Information on the potential occurrence of federal and state listed species within the project study area was qualitatively assessed based on a review of available literature, database review, and based on field surveys that were conducted within the study area. The results of the database and GIS review are as follows:

FWC

FWC documents five bald eagle nests within a half mile from the study area buffer (OS083, OS084, OS130, OS169, and OS206). The 660-foot buffers for OS083, OS130, and OS206 lie outside of the study area buffer for this project, while the 660-foot buffer for OS084 and OS169 lie within the study area buffer for the project. OS084 and OS169 are discussed further in section 7.5.3 below.

There are several nuisance reports of the Florida black bear within 1 mile from the study area. Florida black bears are discussed further in section 7.5.3 below.

FNAI

FNAI reported only two bald eagle nests within one mile from the study area buffer (OS083 and OS130). OS130 is shown within an existing subdivision with last known active date of 2012. OS 083 is shown as last survey/last active 2015. OS169 is shown as active in 2015 and 2016. Additionally, the study area is outside of the 660-foot buffer for both nests. There were no other documented occurrences of listed wildlife.

USFWS

The project is located within the following consultation areas: Audubon's crested caracara, red-cockaded woodpecker, Everglade snail kite, Florida scrub-jay, Florida bonneted bat, and Lake Wales Ridge Plants. The project is not located within any USFWS-designated critical habitat.

The study area is located within four Core Foraging Areas (CFA) for wood stork nesting colonies (Lake Conlin, Lake Russell, Gatorland, and Lake Mary Jane). The center point for both Lake Conlin and Lake Russell nesting colonies are located within Osceola County, while the center point for Gatorland and Lake Mary Jane nesting colonies are located within Orange County. The CFA in south Florida counties (Osceola) is defined as 18.6 miles from an active nesting colony, while the CFA in central Florida counties (Orange) is 15 miles.

Several species were included in the IPaC Trust Resources Report because USFWS includes historic data. However, when comparing current conditions for the study area as well as current extent of the listed species, it was determined that many of these species would not occur in the study area (Florida grasshopper sparrow and ivory-billed woodpecker). Therefore, these species are not discussed further in the document.

AN Comments

No comments were received regarding listed species during the Advance Notification review process.

ETDM Comments

FWC commented that the following species could occur within the project area: Eastern indigo snake, American alligator, Audubon's crested caracara, wood stork, Florida pine snake, gopher tortoise, Southeastern American kestrel, Florida burrowing owl, Florida sandhill crane, little blue heron, tricolored heron, and roseate spoonbill. Two eagle nests (OS084 and OS169) are within the recommended buffer distance of 660 feet from the project site. New or irregular activities planned within 660 feet of a bald eagle nest should follow the USFWS Eagle Management Guidelines.

USFWS commented that the following species could occur within the project area: wood stork, eastern indigo snake, Everglade snail kite, Florida scrub-jay, red-cockaded woodpecker, and federally listed plants.

Maps of USFWS Consultation Areas and wood stork CFAs are included in **Appendix G**.

7.2 LISTED SPECIES

Pursuant to Section 7(c) of the Endangered Species Act of 1973, the study area was evaluated for the potential occurrence of federal listed threatened and endangered species, and species classified by federal agencies as candidates for listing. In addition, the study area was evaluated for potential occurrence of state listed threatened, endangered and species of special concern. The likelihood of species occurrences considered for the study area were determined based on several factors including whether the species were positively identified by project biologists during field surveys, suitable habitat was observed or is known to occur, species life history, and local knowledge. Species were given a ‘Low’ likelihood of occurrence if they were not observed during field surveys and/or have no or limited suitable habitat within the study area. Species were given a ‘Medium’ likelihood of occurrence if they were not observed during field surveys, but suitable habitat exists within the study area. Species were given a ‘High’ likelihood of occurrence if they were observed during field surveys and/or if there is suitable habitat throughout the study area. Based on the data and literature review and subsequent field surveys, state and federally listed species that may occur in the study area are identified in **Table 9**.

Table 9: Potential Federal and State Protected Fauna and Flora

Common Name	Scientific Name	Federal Status	State Status	Likelihood of Occurrence
MAMMALS				
Florida Panther	<i>Puma concolor coryi</i>	E	FE	Low
Florida Bonneted Bat	<i>Eumops floridanus</i>	E	FE	Medium
Florida Black Bear	<i>Ursus americanus floridanus</i>	NL*	NL*	Low
Southern Fox Squirrel	<i>Sciurus niger niger</i>	NL**	NL**	High
BIRDS				
Audubon's Crested Caracara	<i>Polyborus plancus audubonii</i>	T	FT	Low
Florida Scrub-Jay	<i>Aphelocoma coerulescens</i>	T	FT	Low
Red-cockaded Woodpecker	<i>Picoides borealis</i>	E	FE	Low
Everglade Snail Kite	<i>Rostrhamus sociabilis plumbeus</i>	E	FE	Low

Common Name	Scientific Name	Federal Status	State Status	Likelihood of Occurrence
Wood Stork	<i>Mycteria americana</i>	T	FT	High
Florida Burrowing Owl	<i>Athene cunicularia floridana</i>	NL	ST	Low
Florida Sandhill Crane	<i>Grus canadensis pratensis</i>	NL	ST	High
Southeastern American kestrel	<i>Falco sparverius paulus</i>	NL	ST	High
Tricolored Heron	<i>Egretta tricolor</i>	NL	ST	Medium
Little Blue Heron	<i>Egretta caerulea</i>	NL	ST	High
Roseate Spoonbill	<i>Platalea ajaja</i>	NL	ST	Medium
Bald Eagle	<i>Haliaeetus leucocephalus</i>	NL***	NL***	High
REPTILES				
Eastern Indigo Snake	<i>Drymarchon corais couperi</i>	T	FT	Low
Florida Pine Snake	<i>Pituophis melanoleucus mugitus</i>	NL	ST	Low
Gopher Tortoise	<i>Gopherus polyphemus</i>	C	ST	Low
PLANTS				
Beautiful Pawpaw	<i>Deeringothamnus pulchellus</i>	E	SE	Low
Britton's Beargrass	<i>Nolina brittoniana</i>	E	SE	Low
Florida Blazing Star	<i>Liatris ohlingerae</i>	E	SE	Low
Florida Bonamia	<i>Bonamia grandiflora</i>	T	SE	Low
Lewton's Polygala	<i>Polygala lewtonii</i>	E	SE	Low
Paper-like Nailwort	<i>Paronychia chartacea ssp. chartacea</i>	T	SE	Low
Pygmy Fringe Tree	<i>Chionanthus pygmaeus</i>	E	SE	Low
Scrub Buckwheat	<i>Eriogonum longifolium var. gnaphalifolium</i>	T	SE	Low
Scrub Lupine	<i>Lupinus aridorum</i>	E	SE	Low
Short-leaved Rosemary	<i>Conradina brevifolia</i>	E	SE	Low
Sandlace	<i>Polygonella myriophylla</i>	E	SE	Low
Carter's Mustard	<i>Warea carteri</i>	E	SE	Low
Wide-leaf Warea	<i>Warea amplexifolia</i>	E	FE	Low
Ashe's Savory	<i>Calamintha ashei</i>	NL	ST	Low
Celestial Lily	<i>Nemastylis floridana</i>	NL	SE	Low
Cutthroat Grass	<i>Panicum abscissum</i>	NL	SE	Low
Florida Beargrass	<i>Nolina atopocarpa</i>	NL	ST	Low
Florida Spiny-pod	<i>Matelea floridana</i>	NL	SE	Low
Giant Orchid	<i>Pteroglossaspis ecristata</i>	NL	ST	Low
Hartwrightia	<i>Hartwrightia floridana</i>	NL	ST	Low
Many-flowered Grass-pink	<i>Calopogon multiflorus</i>	NL	ST	Low
Nodding Pinweed	<i>Lechea cernua</i>	NL	ST	Low
Pinewoods Bluestem	<i>Andropogon arctatus</i>	NL	ST	Low

Common Name	Scientific Name	Federal Status	State Status	Likelihood of Occurrence
Sand Butterfly Pea	<i>Centrosema arenicola</i>	NL	SE	Low
Scrub Bluestem	<i>Schizachyrium niveum</i>	NL	SE	Low
Star Anise	<i>Illicium parviflorum</i>	NL	SE	Low
Yellow Fringeless Orchid	<i>Platanthera integra</i>	NL	SE	Low

Based on Florida's Endangered and Threatened Species updated December 2018 available on <http://myfwc.com/wildlifehabitats/imperiled/> and 5B-40.0055 Florida Administrative Code (FAC) Regulated Plant Index.

Federal Status: E = Endangered; T = Threatened; C = Candidate Species; NL = Not Listed

State Status: FE = Federally Endangered; FT = Federally Threatened; FT(S/A) = Federally Threatened due to Similarity of Appearance. ST= State Threatened; SE = State Endangered; SSC = Species of Special Concern. Note: Coordination is not required with FWC for federally listed species.

Bold = observed during field reconnaissance

* The Florida black bear is still protected under Florida Black Bear Conservation Rule 68A-4.009 (F.A.C.) and the FWC Florida Black Bear Management Plan.

**The fox squirrel is still protected under Regulations Relating to the Taking of Mammals 68A-29.002 (F.A.C.).

*** The Bald eagle is still protected under the Bald and Golden Eagle Protection Act, Migratory Bird Treaty Act and FWC Management Plan regulations.

7.3 FIELD SURVEYS

Habitat mapping, gopher tortoise surveys, and plant surveys were conducted on November 30, 2019 and February 19, 2019. A Florida bonneted acoustic and roost survey was conducted May 2020 through June 2020 and the results are summarized in the *Florida Bonneted Bat Acoustic Survey Report* dated July 2020 and is included in **Appendix H**. Crested caracara surveys were conducted January 2019 through April 2019. The results of the crested caracara surveys are summarized in the *Crested Caracara Report* dated May 2019 and is included in **Appendix I**

Additionally, observations of flora and fauna or indicators of wildlife within the corridor were noted such as tracks, burrows, scat, calls (avian), and evidence of foraging activities, in addition to actual observations of plants and animals. The results of plant and animal surveys are summarized in the following sections. **Table 10** lists wildlife species/signs that were observed within the study area during field reconnaissance.

Table 10: Wildlife Species/Signs Observed Within the Study Area

Scientific Name	Common Name
<i>Corvus brachyrhynchos</i>	American Crow
<i>Falco sparverius</i>	American Kestrel
<i>Turdus migratorius</i>	American Robin
<i>Pelecanus erythrorhynchos</i>	American White Pelican
<i>Anhinga anhinga</i>	Anhinga
<i>Megaceryle alcyon</i>	Belted Kingfisher
<i>Dendrocygna autumnalis</i>	Black-bellied Whistling Duck
<i>Coragyps atratus</i>	Black Vulture
<i>Poliophtila caerulea</i>	Blue-gray Gnatcatcher
<i>Cyanocitta cristata</i>	Blue Jay
<i>Spatula discors</i>	Blue-winged Teal
<i>Quiscalus major</i>	Boat-tailed Grackle

Scientific Name	Common Name
<i>Molothrus ater</i>	Brown-headed Cowbird
<i>Bubulcus ibis</i>	Cattle Egret
<i>Quiscalus quiscula</i>	Common Grackle
<i>Phalacrocorax auritus</i>	Double-crested Cormorant
<i>Dryobates pubescens</i>	Downy Woodpecker
<i>Sialia sialis</i>	Eastern Bluebird
<i>Sturnella magna</i>	Eastern Meadowlark
<i>Sayornis phoebe</i>	Eastern Phoebe
<i>Streptopelia decaocto</i>	Eurasian Collared Dove
<i>Sturnus vulgaris</i>	European Starling
<i>Corvus ossifragus</i>	Fish Crow
<i>Plegadis falcinellus</i>	Glossy Ibis
<i>Ardea herodias</i>	Great Blue Heron
<i>Ardea alba</i>	Great Egret
<i>Larus argentatus</i>	Herring Gull
<i>Passer domesticus</i>	House Sparrow
<i>Charadrius vociferus</i>	Killdeer
<i>Aramus guarauna</i>	Limpkin
<i>Egretta caerulea</i>	Little Blue Heron
<i>Lanius ludovicianus</i>	Loggerhead Shrike
<i>Zenaida macroura</i>	Mourning Dove
<i>Anas fulvigula</i>	Mottled Duck
<i>Cairina moschata</i>	Muscovy Duck
<i>Cardinalis cardinalis</i>	Northern Cardinal
<i>Mimus polyglottos</i>	Northern Mockingbird
<i>Pandion haliaetus</i>	Osprey
<i>Setophaga palmarum</i>	Palm Warbler
<i>Melanerpes carolinus</i>	Red-bellied Woodpecker
<i>Buteo lineatus</i>	Red-shouldered Hawk
<i>Agelaius phoeniceus</i>	Red-winged Blackbird
<i>Buteo jamaicensis</i>	Redtail Hawk
<i>Larus delawarensis</i>	Ring-billed Gull
<i>Columba livia</i>	Rock Pigeon
<i>Antigone canadensis</i>	Sandhill Crane
<i>Passerculus sandwichensis</i>	Savannah Sparrow
<i>Haliaeetus leucocephalus</i>	Southern Bald Eagle
<i>Tachycineta bicolor</i>	Tree Swallow
<i>Cathartes aura</i>	Turkey Vulture
<i>Eudocimus albus</i>	White Ibis
<i>Mycteria americana</i>	Wood Stork
<i>Setophaga coronata</i>	Yellow-rumped Warbler

Scientific Name	Common Name
<i>Sciurus carolinensis</i>	Eastern Gray Squirrel
<i>Didelphis virginiana</i>	Opossum
<i>Sciurus niger niger</i>	Southern Fox Squirrel

7.4 HABITAT IMPACTS

7.4.1 POTENTIAL PROJECT IMPACTS

Uplands and wetlands were mapped based on the FLUCFCS (FDOT, 1999) and FLUCFCS Maps are included as **Figure 7**. Wetland habitat descriptions and upland habitat descriptions were discussed in Section 5.4.2.

A summary of the proposed impacts to upland habitat within the project study area are presented in **Table 11**. There are no native uplands remaining in the area of Alternatives A and B.

Table 11: Habitat Impacts by Alternatives (Acres)

FLUCFCS CODE	Description	Alt 1	Alt 2	Alt A	Alt B
211	Improved Pastures	1.64	2.72	0	0
261	Fallow Crop Land	1.89	1.89	0	0
434	Hardwood-Conifer Mixed	1.40	0.14	0	0

Avoidance and minimization of potential upland habitat impacts were incorporated throughout the development of the proposed build alternative alignments, where possible. Most of the project has been designed to occur within existing ROW, which reduces impacts to adjacent upland habitats.

Avoidance and minimization of upland habitats will continue to be evaluated during the final design, permitting and construction phases of this project and all possible and practicable measures to avoid or minimize these impacts during design, construction and operation will be incorporated.

7.5 LISTED SPECIES SURVEY RESULTS AND IMPACTS

Provided below is a discussion of the listed species that may occur within the study area and the potential impacts to each species resulting from project implementation. The descriptions of the species and their habitat requirements were excerpted from multiple resources. Listings of the resources used in these descriptions are provided in Section 12.0 – References.

7.5.1 FEDERAL LISTED FAUNA

Florida Panther

The main threats to the Florida panther populations include habitat loss and degradation and human conflict, including road kills. Preservation of large natural landscapes and increased public awareness are included in the Florida Panther Recovery Plan (2008) to help maintain and increase the survival of the

Florida panther. This species is a large feline with a long tail. Fur is dark buff to tawny above and light buff to white below. This species requires large tracts of forested habitats with dense understory vegetation and large wetlands to be used for diurnal refuge. Panthers select habitat based on prey availability. In Florida, the panther is found year-round predominately in Collier, Glades, Lee, Monroe, and Miami-Dade counties. However, dispersing individuals can be found well north in the peninsula of Florida searching for new territories.

The study area does not fall within the USFWS consultation area for this species. There have been no known records of Florida panthers occurring within the study area. Additionally, the project is not within a Panther Focus Area (Primary, Secondary or Dispersal Zones or Primary Dispersal/Expansion Area). Based on the USFWS Panther Key (February 19, 2007), a project is considered to have an effect on panthers if there has been documented physical evidence of panthers within a two-mile radius of a project within the past two years. Documented evidence includes telemetry locations, photographs, tracks, prey kills or other verifiable evidence. Currently, the study area does not meet these criteria; thus, the project is considered to have **no effect** on the Florida panther.

Florida Bonneted Bat

The Florida bonneted bat is the largest bat species endemic to Florida. This species has a wide ranging USFWS consultation area but has only been recorded to occur in south Florida (Miami-Dade, Broward, Collier, Hendry, Lee, Charlotte, Glades, Highlands, Desoto, and Polk counties). This species is known to roost in natural tree cavities and tree cavities created by woodpeckers and other species as well as in man-made structures. The project study area is within the USFWS consultation area for the Florida bonneted bat and based on coordination with USFWS suitable foraging and roosting habitat for this species were surveyed. An acoustic and roost survey was conducted from May to June 2020 and the results of the surveys are summarized in **Appendix H – Florida Bonneted Bat Acoustic Survey Report (July 2020)**. No Florida bonneted bats were detected during the acoustic and roost survey; therefore, a determination of **no effect** has been made for the Florida bonneted bat.

Birds

Audubon's Crested Caracara

Audubon's crested caracara (caracara) are year-round residents in Florida. The species has been reported from the Kissimmee, Caloosahatchee and Upper St. Johns River basins, and the Kissimmee prairie. The crested caracara is strongly associated with open habitats, preferring large expanses of pastures, grasslands, or prairies with numerous shallow ponds and sloughs and single or small clumps of cabbage palms, live oaks, and cypress. Notable changes in land use patterns have occurred throughout central Florida. As a result, the caracara's range in Florida is now smaller than historically documented. Caracara now occurs almost exclusively on privately owned cattle ranches in the south-central part of the state.

The caracara is an opportunistic feeder with a broad diet consisting of carrion and live prey, including invertebrates associated with carrion and dung in pastures. They forage in a wide variety of habitats including pastures, along roads, wetlands and agricultural lands including citrus groves.

Following a desktop review of crested caracara related resources, field reconnaissance was conducted to verify existing conditions and identify areas of potential habitat. Suitable habitat was documented within the study area during the November 30, 2018 site visit. Based on this site visit, three survey stations were established within the study area. Crested caracara surveys were conducted January

through April 2019. The results of the surveys are summarized in **Appendix I – Audubon’s Crested Caracara Survey Report (May 2019)** and is incorporated here by reference. Suitable habitats for the crested caracara within the project study area were surveyed in accordance with the USFWS Crested Caracara Survey Protocol (USFWS, 2016). No caracaras were observed during the survey. However, due to the presence of suitable habitat, a determination of **may affect, not likely to adversely affect** has been made for the crested caracara.

Florida Scrub-Jay

The Florida scrub-jay (scrub-jay) prefers low growing oak scrub habitats, including sand pine and scrubby flatwoods. Optimal habitat includes scrub oak with most of the oaks and other shrubs limited to 1-4 meters in height, interspersed with numerous small patches of bare sand. Fire is a frequent natural event in scrub habitats and serves to maintain the habitat. Fire suppression and development of the habitat has made this species vulnerable to extinction.

Scrub-jays are similar in size and shape to their relative, the blue jay, but they differ strikingly in color pattern and exhibit subtle markings as opposed to the blue jay. They have a pale blue head, nape, wings and tail and are pale gray on the back and belly. A white eyebrow blends with a frosted white forehead. The throat and upper breast are faintly striped and bordered by pale blue, forming a distinct bib. The scrub-jay is relatively sedentary and rarely sustains a flight of more than a kilometer. The Florida scrub-jay is a non-migratory species.

Although the project is within the USFWS consultation area for the scrub-jay, there is no suitable habitat for this species within the study area. Additionally, no scrub-jays were observed within the study area. Therefore, a determination of **no effect** has been made for the scrub-jay.

Red-Cockaded Woodpecker

Red-cockaded woodpeckers inhabit open, mature pine woodlands that have a diversity of grass and shrub species. Preferred habitat includes old growth longleaf pine flatwoods in north and central Florida and mixed longleaf pine and slash pine in south-central Florida. The red-cockaded woodpecker creates cavities in within the longleaf pine tree and rely on the trees production of resin to protect them from predators. Development of longleaf pine habitat as well as fire exclusion in this fire-dependent ecosystem has led to a large decrease in populations of red-cockaded woodpeckers.

The study area is located within the USFWS consultation area for the red-cockaded woodpecker; however, habitat for the red-cockaded woodpecker does not occur within the study area. Additionally, no red-cockaded woodpeckers or evidence of red-cockaded woodpeckers have been observed within the study area. Thus, the project will have **no effect** on the red-cockaded woodpecker.

Everglade Snail Kite

The Everglade snail kite has experienced degradation of its foraging habitat. This species has a highly specific diet, which is made up almost exclusively of apple snails (*Pomacea paludosa*). Snail kites typically prefer large, open, freshwater marshes and shallow lakes (< 4 ft. deep) with a low density of emergent vegetation and typically nest in low trees or shrubs over water (commonly willow, wax myrtle, pond apple, or buttonbush, but also in non-woody vegetation like cattail or sawgrass).

The study area does fall within the USFWS Consultation Area for the snail kite; however, there is no USFWS critical habitat within the study area. No apple snails, apple snail eggs, or snail kites were

observed during field reconnaissance. Although there are several lakes within 3 miles from the study area (Fish Lake, Lake Tohopekaliga and East Lake Tohopekaliga) and snail kites have been documented in Lake Tohopekaliga, these lakes and the marsh edges, will not be impacted by this project. Thus, the project will have **no effect** on the Everglade snail kite.

Wood Stork

Wood storks are typically found in marshes, cypress swamps, and mangrove swamps, but their presence in artificial ponds, seasonally flooded roadside or agricultural ditches, and managed impoundments has become common. Wood stork breeding areas extend from South Florida through Georgia and along the coastal areas of South Carolina. Large, colonial nesting areas are typically established in swamps or islands surrounded by broad, open water areas. The same colony site may be used over many years, provided the site remains undisturbed and sufficient foraging habitat is available. Wood storks are known to nest with other wading bird species, including white ibis, tricolored herons, snowy egrets, and great blue herons. Foraging habitat consists of nearly any calm, shallow water area (between 10 and 25 centimeters) or wetland depression that concentrates fish and is not overgrown with dense, aquatic vegetation. Some examples of foraging sites include freshwater marshes, stocked ponds, shallow ditches, narrow tidal creeks, shallow tidal pools, and depressional areas of cypress heads and swamp sloughs provide foraging habitat.

The shallow surface waters within the study area are man-made swales and stormwater ponds that may provide some minimal opportunistic foraging habitat, but no nesting habitat was present, and no wood storks were observed. The following are surface water impact acreages for each alignment: Alternative 1 – 2.24 acres, Alternative 2 – 2.89 acres, Alternative A – 0.03 acres and Alternative B – 0.05 acres. The preferred alignment including stormwater management facilities is anticipated to include 4.86 acres of wetlands and surface waters. A wood stork suitable foraging analysis (SFH) was conducted to determine the amount of biomass lost from these impacts. **Table 12** shows the amount of biomass lost based on impacts to wetlands and surface waters that contain suitable foraging habitat within the preferred alignment. A total of 2.53 kg of biomass will be lost based on impacts to short hydroperiod wetlands/surface waters and a 5.44 kg of biomass lost for long hydroperiod wetlands. The total biomass loss for impacts from the preferred alignment to suitable foraging habitat in wetlands and surface waters is 7.97 kg.

Table 12: Wood Stork Suitable Foraging Biomass Analysis for the Preferred Alignment

Hydroperiods	Acres	% exotics	Biomass (kg)
Class 1 (0-60 days)	1.68	0-25	0.68
Class 1 (0-60 days)	0.44	50-75	0.07
Class 3 (120-180 days)	1.60	25-50	1.78
Class 7 (330-365 days)	1.14	0-25	5.44
Total Short Hydroperiod (Classes 1, 2, and 3)	3.72		2.53
Total Long Hydroperiod (Classes 4, 5, 6 and 7)	1.14		5.44
Total	4.86		7.97

Based upon the *South Florida Wood Stork Effect Determination Key* (May 2010), the project is not within 0.47 miles from an active colony site, the project will impact greater than 0.50 acres of SFH, SFH is within the CFA of a colony site, and mitigation will be provided for lost SFH by creation of stormwater ponds, therefore, a determination of **may affect, not likely to adversely affect** has been made for the wood stork. See **Appendix I** for the *South Florida Wood Stork Effect Determination Key* (May 2010) and the path to the appropriate effect determination highlighted.

Reptiles

Eastern Indigo Snake

The eastern indigo snake occurs in a range of habitats, including pine flatwoods, scrubby flatwoods, high pine, dry prairie, tropical hardwood hammocks, edges of freshwater marshes, agricultural fields, coastal dunes, and human-altered habitats. Eastern indigo snakes are often found in strong association with gopher tortoises, though this is more prevalent where temperatures drop to below 50 degrees regularly in the winter but are also known to use the burrows of armadillos, cotton rats, and land crabs (in coastal areas). These snakes require large tracts of land for survival and are typically restricted to xeric habitats on pine-oak sandhills. Indigo snakes forage in hydric habitats, often along wetland ecotones. Gopher tortoise burrows provide this species with shelter from cold winter temperatures and relief from desiccation. Habitat for this species is limited and no indigo snakes were observed during field reconnaissance. Much of the project is taking place within previously disturbed right-of-way and no alternative will have more than 25 acres of impact to eastern indigo snake habitat. Additionally, the *Standard Protection Measures for the Eastern Indigo Snake* (**Appendix J**) will be implemented during construction to minimize potential impacts to this snake. Based on agency coordination with John Wrublik, USFWS, there are no records indicating that the indigo snake occurs on or within several miles of the project site and that there is a lack of credible information that would show this species reasonably occurs on or near the project site (**Appendix L**). Therefore, a determination of **no effect** has been made for this species.

7.5.2 STATE LISTED FAUNA

Birds

Florida Burrowing Owl

The Florida burrowing owl is a small, ground-dwelling owl that is boldly spotted and barred with brown and white. They often dig their own burrow and line the entrance with decorative materials prior to laying eggs at the bottom of the burrow. They inhabit high, sparsely vegetated, sandy ground and can be found in ruderal areas such as pastures, airports, ball fields, and road ROW.

Although no burrowing owls were observed, marginal habitat exists within the study area. Therefore, a burrowing owl survey should be completed during design and permitting to determine if any burrows exist within the limits of construction. If burrowing owls are documented during pre-construction surveys, a permit will be required from the Florida Fish and Wildlife Conservation Commission to impact inactive burrows. Due to the limited habitat within the study area, no burrowing owls documented during field surveys and the commitment to conduct pre-construction surveys and any necessary permits from FWC, no adverse effect is anticipated for the burrowing owl.

Florida Sandhill Crane

The Florida sandhill crane is a tall grey bird with a red forehead, and long neck and legs. The Florida sandhill crane is non-migratory and inhabits open grasslands, freshwater marshes, swampy edges of lakes and ponds, river banks, prairies, pasture lands and occasionally pine savanna throughout the state. Florida sandhill cranes typically start nesting on the margins of marshes and wet grasslands in late

December and continue into June. The nests, which are built by both adults, generally consist of sticks, reeds, grasses and mosses. Sandhill cranes are omnivorous and have been known to feed on seeds, grains, berries, insects, earthworms, mice, small birds, snakes, lizards, frogs, and crayfish.

Potential nesting habitat occurs within the study area and sandhill cranes were observed foraging adjacent to a stormwater pond (**Figure 12 – Listed Species Map**); however, no nests were observed. A nest survey should be conducted during design and permitting to determine if any nests exist within the proposed limits of construction or within 400-feet from the limits of construction. If a nest exists within the construction limits, further coordination with FWC will be required. Based on the current surveys and the lack of sandhill crane nests within or in proximity to the study area, no adverse effect is anticipated for the sandhill crane.

Southeastern American Kestrel

The southeastern American kestrel is the smallest falcon in United States. The male kestrel has blue-gray wings, while the female is larger and has more uniformly rufous back and wings. Both sexes have a mustached black-and white facial pattern with strong perpendicular lines extending below the eye and ear, and a black band at the base of the rufous tail. The alarm call is highly distinguishable and given frequently in flight.

The Kestrel's range is limited by a combination of nest and perch site availability, food supply and suitable foraging habitat. Kestrels require all these elements near one another. Kestrels are secondary cavity nesters using abandoned woodpecker cavities. Kestrels nest in open pine habitats, woodland edges, prairies, and pastures throughout much of Florida. Nest sites are in tall dead trees or utility poles generally with an unobstructed view of surroundings. Sandhill habitats seem to be preferred, but kestrels have been observed in flatwoods settings. Open patches of grass or bare ground are necessary for kestrels to effectively utilize flatwoods settings, since thick palmettos may prevent detection of prey.

Habitat for the southeastern American kestrel is located scattered throughout the study area. Cavity trees were not observed during field reconnaissance; however, kestrels were observed perched along powerlines along Neptune Road. These observations were conducted during a period when the migratory populations of the American kestrel would be present in Florida. During the survey period for southeastern American kestrels (April through September), the migratory populations of American kestrels leave Florida. The remaining kestrels are assumed to be the southeastern subspecies. As this is a highly mobile species pre-construction surveys will be updated during design and permitting. No one alternative would result in more or less impact to this species. Mitigation may be required to replace lost nest sites. With the commitment to conduct updated surveys and permit and mitigate any impacts, no adverse effect is anticipated for this species.

Tricolored Heron

The tricolored heron is a medium-sized heron with a slender neck. The body color appears two-toned with dark slate coloration on the head, neck, and body that contrasts with a white rump, belly, and under tail. A reddish-brown and white streak extends along the front of the neck. During breeding season, adults have white head plumes and rufous to whitish shoulders. Young birds have more reddish-brown on head, neck, and mantle but otherwise similar to adults. This species' nesting season is from late February to August and nesting typically occurs in mangrove or willow trees in mixed or single species rookeries. The tricolored heron feeds on small fish, frogs, tadpoles, crustaceans, snails, worms, and aquatic insects. Suitable roosting, foraging, and nesting habitat can be found within the freshwater marshes and forested wetlands within the study area. This species was not observed during field reconnaissance. Temporary impacts from construction may occur and limit use of the area by tricolored

herons and other wading birds. However, due to availability of suitable habitat surrounding the study area (habitat surrounding Lake Tohopekaliga and East Lake Tohopekaliga), no adverse effect is anticipated for the tricolored heron.

Little Blue Heron

The little blue heron is a medium-sized heron, with a purplish to maroon-brown head and neck. There is a small white patch on the throat and the upper neck. The body is slate-blue. The bill is black towards the tip, especially during breeding season, with the other exposed areas on the head appearing dark gray to cobalt blue. The legs are grayish to green, becoming black in breeding season. Immature birds are mostly white with pale slate- gray tips on primary wing feathers. Legs of young birds are yellowish green. Suitable roosting, foraging, and nesting habitat can be found within the freshwater marshes and forested wetlands within the study area. This species was observed foraging during field reconnaissance. Temporary impacts from construction may occur and limit use of the area by little blue herons and other wading birds. However, due to availability of suitable habitat surrounding the study area (habitat surrounding Lake Tohopekaliga and East Lake Tohopekaliga), no adverse effect is anticipated for the little blue heron.

Roseate Spoonbill

These wading birds are characterized by their bright pink bodies, white necks, and spoon-like bills. Immature birds are whitish, acquiring the pink coloration as they mature. Roseate spoonbills are the only spoonbill native to the Western Hemisphere and the only pink bird that breeds in Florida. Their primary nesting sites include coastal mangrove islands or in Brazilian pepper on man-made dredge spoil islands near suitable foraging habitat. Roseate spoonbills typically forage in shallow water of variable salinity, including marine tidal flats and ponds, coastal marshes, mangrove-dominated inlets and pools, and freshwater sloughs and marshes.

Most of the known breeding sites occur within federally owned national parks and wildlife refuges and National Audubon Society sanctuaries. Nests are found in Florida from Tampa Bay on the Gulf coast and Brevard County on the Atlantic coast, south to northern Florida Bay. Suitable roosting, foraging, and nesting habitat can be found within the freshwater marshes and forested wetlands within the study area. This species was not observed during field reconnaissance. Temporary impacts from construction may occur and limit use of the area by roseate spoonbills and other wading birds. However, due to availability of suitable habitat surrounding the study area (habitat surrounding Lake Tohopekaliga and East Lake Tohopekaliga), no adverse effect is anticipated for the roseate spoonbill.

Reptiles

Florida Pine Snake

This snake is large, stocky, and tan or rusty colored with darker blotches. The Florida pine snake prefers relatively open canopies with dry soils in which it burrows. The Florida pine snake is a fossorial snake that typically utilizes pocket gopher burrows and occasionally gopher tortoise burrows. Habitat for this species is limited within the study area and there are no known occurrences of this species. This species was not observed within the study area. Therefore, no effect is anticipated for the Florida pine snake.

Gopher Tortoise

The gopher tortoise ranges throughout the southeastern U.S. and occurs in suitable habitat in all Florida counties. The gopher tortoise excavates extensive underground burrows and spends much of its life in these burrows. Gopher tortoise habitat typically includes well drained, sandy soils, abundant groundcover, relatively open canopy and sparse shrub cover.

These habitat characteristics occur in a variety of Florida's native upland communities, including scrub communities, coastal strand and pine flatwoods. Development pressures on many of the upland communities in Florida have been increasing resulting in suboptimal habitat such as fence rows, old fields, range lands, and canal banks providing a higher potential for gopher tortoise occupancy. Gopher tortoise burrows are important shelter for a variety of species including the eastern indigo snake, gopher frog and Florida mouse.

Surveys for this species were conducted whenever appropriate habitat was encountered. Preferred habitat for this species was observed within the study area; however, no gopher tortoises or their burrows were observed within the study area. Due to the presence of suitable gopher tortoise habitat, a 100% gopher tortoise survey should occur within 90 days from the start of construction. If a gopher tortoise burrows are observed and will be impacted by the proposed improvements, a gopher tortoise relocation permit from FWC will be required. A gopher tortoise relocation permit allows the permittee to relocate gopher tortoises to a protected certified recipient site by an authorized agent per the *FWC Gopher Tortoise Permitting Guidelines* (April 2008, revised January 2017). As no gopher tortoises or their burrows were observed and the commitment to complete pre-construction surveys, permit and relocate gopher tortoises, no adverse effect is anticipated for this species.

7.5.3 LISTED PLANT SPECIES

The following federally-listed plant descriptions are excerpted from the *Multi-Species Recovery Plan for South Florida* (USFWS 1999).

Federally-Listed Plants

Beautiful Pawpaw

The beautiful pawpaw is a low-lying shrub located in two disjunct locations in central and southwest Florida. Within the central Florida locations, this species is only documented with the xeric, mesic, and hydric pine flatwoods of eastern Orange County and generally considered outside the range of the proposed project site. However, the project site is located within the historical range of the species, and in proximity of recent documented locations of the species, therefore the potential for occurrence was considered. Habitat does not exist within the study area and no individuals were observed during field reconnaissance. Therefore, a determination of **no effect** has been made for this species.

Britton's Beargrass

This clump-forming perennial grows from a short, thick, fleshy, bulblike rootstock. The leaves are 1 to 2 m long and 6 to 13 mm wide, forming a rosette. When in bloom, these branches are covered with small white six-parted flowers. This species occurs in scrub, high pine, and even occasionally in hammocks and sandhills. Habitat does not exist within the study area and no individuals were observed during field reconnaissance. Therefore, a determination of **no effect** has been made for this species.

Scrub Blazing Star

FNAI refers to this plant as Florida blazing star. This plant is a long-lived perennial herb with erect stems, usually unbranched, which can grow up to 1 m tall. Flower heads are well separated on the stem with individual disc flowers up to 1 cm broad; the inflorescences are up to 3 cm across. The corollas are bright purplish-pink in color. This species is one of the endemic plants found in rosemary balds. It is also found along the ecotone between these balds and surrounding scrub habitats. Habitat does not exist within the study area and no individuals were observed during field reconnaissance. Therefore, a determination of **no effect** has been made for this species.

Florida Bonamia

This perennial vine has leathery leaves up to 4 cm in length and ovate in shape. The flowers are solitary and sessile in the leaf axils. The funnel-shaped corolla is 7 to 10 cm long and 7 to 8 cm across. It has a deep blue or bluish-purple color with a white throat. This species occurs within or near scrub in the central Florida ridge. Habitat does not exist within the study area and no individuals were observed during field reconnaissance. Therefore, a determination of **no effect** has been made for this species.

Lewton's Polygala

This perennial herb produces one to several annual stems, which are spreading, upward-curving or erect, and are often branched. The leaves are small, rather succulent, broader toward the tip, and are borne upright, tending to overlap along the stem, like shingles. The normally opening flowers are in erect, loosely flowered racemes about 1.5 cm or 3.3 cm long. The flowers are about 0.5 cm long and bright pink. This species is found in widely scattered populations that frequently occur in transitional habitats between high pine and turkey oak barrens. Habitat does not exist within the study area and no individuals were observed during field reconnaissance. Therefore, a determination of **no effect** has been made for this species.

Paper-like Whitlow-wort

The paper-like whitlow-wort is mat-forming with many bright yellowish-green branches radiating flatly from a strong taproot. The stems are 5 to 20 cm long and are wiry. The leaf blades are sessile, 1.5 to 3.0 mm long, ovate to triangular-ovate in shape, and strongly revolute. It has numerous small cream-colored to greenish flowers. This species is endemic to the scrub community on the Lake Wales Ridge in Highlands, Polk, Osceola, Orange, and Lake counties. Habitat does not exist within the study area and no individuals were observed during field reconnaissance. Therefore, a determination of **no effect** has been made for this species.

Pygmy Fringe Tree

This shrub or small tree, usually less than 10 feet tall, has somewhat leathery leaves 2 to 4 inches long. The flowers are less than 0.5 inches long, each with four narrow petals with white, fragrant, showy clusters. This species is found in scrub, sandhill, and xeric hammock, primarily on the Lake Wales Ridge. Habitat does not exist within the study area and no individuals were observed during field reconnaissance. Therefore, a determination of **no effect** has been made for this species.

Scrub buckwheat

Scrub buckwheat is a perennial herb with a taproot and one to three above-ground stems up to one meter tall. It has a basal rosette of leaves that are 15 to 20 centimeters (cm) long, narrow, and white-woolly on the underside. The flowers are green with pink anthers. This species is endemic to central Florida and found within sandhill, turkey oak barrens, oak-hickory scrub, and high pinelands. Habitat does not exist within the study area and no individuals were observed during field reconnaissance. Therefore, a determination of **no effect** has been made for this species.

Scrub Lupine

This species is a woody, perennial herb, with sprawling stems up to 1 m long. The leaves are obovate-elliptic, with the base and end of the leaves rounded with a sharp point at the leaf's end. A silvery pubescence covers the leaves and stems. The flowers are a pale flesh-colored pink and are 4 to 5

cm long. Habitat for this species includes sand pine and rosemary scrub. Habitat does not exist within the study area and no individuals were observed during field reconnaissance. Therefore, a determination of **no effect** has been made for this species.

Short-leaved Rosemary

Short-leaved rosemary is an erect, woody, perennial shrub that can grow to about 1 meter in height. This shrub has alternate leaves and contains large leaves (6.0 to 8.2 mm long) on the well-developed flowering branches. This shrubby mint is only found at 30 sites on the Lake Wales Ridge in the Polk and Highland Counties. This species prefers white sand scrub with evergreen scrub oaks and sand pine. Habitat is not located within the study area and no individuals were observed during field reconnaissance. Therefore, a determination of **no effect** has been made for this species.

Sandlace

FNAI refers to this plant as Small's jointweed. This sprawling shrub forms low mats on the ground from its many zig zagging branches. The leaves are needle-like and are from 0.3 to 10.0 mm long. The small, white or cream-colored flowers have white petal-like sepals up to 3.4 mm long. This species thrives in bare white or yellow sands on the central Florida ridge. Habitat does not exist within the study area and no individuals were observed during field reconnaissance. Therefore, a determination of **no effect** has been made for this species.

Carter's Mustard

FNAI refers to this plant as Carter's warea. This annual herb contains several branching stems that are slender and up to 40 inches tall. The leaves are up to 2 inches long near the base of the stem and decrease in size upwards. The leaves are alternate, are pale yellow-green, and have rounded tips. The flowers are in clusters and contain up to 60 white flowers. Habitat for this species includes sandhill, scrubby flatwoods, and inland and coastal scrub. Habitat does not exist within the study area and no individuals were observed during field reconnaissance. Therefore, a determination of **no effect** has been made for this species.

Wide-leaf Warea

This annual herb has stems that are 12 to 40 inches tall with leaves that are 2 inches long. Flowers are usually 0.5 inches wide and are pink to purple in color. Flowers contain 4 paddle-shaped petals and 6 stamens. Preferred habitat is limited to sunny openings with exposed sand in longleaf pine/turkey oak/wiregrass sandhills. Habitat for this species does not exist with the study area and no individuals were observed during field reconnaissance. Therefore, a determination of **no effect** has been made for this species.

State Listed Plants

Ashe's Savory

This perennial shrub grows up to 5 m tall and has narrow grey-green leaves mostly 1 cm long or somewhat less. This plant produces inflorescence flowers that are a whitish to pale lavender-rose color. This species is most commonly found in openings in sand pine scrub but can also be found in disturbed areas such as fire lanes, road shoulders, and abandoned fields. Habitat for this species exists throughout the study area; however, no individuals were observed during field reconnaissance. Therefore, no adverse effect is anticipated for this species.

Celestial Lily

Celestial lily is a perennial herb forming from a bulb with a single, tall slender stem. The flower has six dark blue petals and it opens around 4:00 pm and closes by dusk. Preferred habitat includes wet flatwoods, prairies, marshes, and cabbage palm hammock edges. Burning of flatwoods and prairie habitat every two to three years helps for management of this species. This species is endemic to eastern and central counties in Florida, primarily in the St. Johns River drainage basin. Habitat for this species exists throughout the study area; however, no individuals were observed during field reconnaissance. Therefore, no adverse effect is anticipated for this species.

Cutthroat Grass

Cutthroat grass is a robust grass that grows 50-70 cm tall and has leaf blades which grow 15-25 cm long. This species is densely tufted and compressed. This species is found in herbaceous wetlands, scrub/shrub wetlands, and temporary pools; which are found throughout the study area. However, no individuals were observed during field reconnaissance. Therefore, no adverse effect is anticipated for this species.

Florida Beargrass

Florida beargrass is a perennial herb that is approximately 2.5 feet to 4.5 feet tall. Leaves are simple and alternate. Flowers are white and they bloom during the summer months. Preferred habitat includes pine flatwoods, which is not available within the study area. Additionally, no individuals were observed during field reconnaissance. Therefore, no effect is anticipated for this species.

Florida Spiny-pod

This perennial vine has slender stems that are variable in length. The leaves are opposite and pubescent, usually 2-6 cm in length. Clusters of flowers ranging in color from greenish-yellow to deep maroon bloom during spring and early summer. Habitat for this species includes upland hardwood forests and can tolerate fairly moist woods. Habitat does exist within the study area; however, no plants were documented during field surveys. Therefore, no adverse effect is anticipated for this species.

Giant Orchid

Giant orchid is a perennial herb with 2 to 4 basal leaves that are 6-28 inches long. The flower stalk can be as tall as 5.5 feet tall and contains 5-30 flowers on a terminal spike. The sepals of the flowers are yellow-green and are folded forward over the lip. Preferred habitat includes sandhill, scrub, pine flatwoods and pine rocklands. Habitat for this species does not exist within the study area and no individuals were observed during field reconnaissance. Therefore, no effect is anticipated for this species.

Hartwrightia

This aromatic, herbaceous perennial has solitary, erect stems that grow an average of 1 m high. The small flower heads are produced on a branched flat-topped inflorescence covered with club-shaped scales. These flower heads are white to pinkish-lavender and bloom in late September to November. Typical habitat for this species is slash and longleaf pine forests, flatwoods, and pineland swamps and bogs. Habitat does not exist within the study area and no plants were documented during field surveys. Therefore, no effect is anticipated for this species.

Many-flowered Grass-pink

Many-flowered grass-pink is an herb belonging to the orchid family and has 1 to 2 basal, grass-like leaves. Leaves are 0.1 m long and less than 0.5 cm wide. The flower stalk is leafless and up to 0.4 m long.

There can be up to 15 dark pink flowers at one time. The preferred habitat is dry to moist flatwoods with longleaf pine, wiregrass, and saw palmetto. Management for this species includes prescribed burning. Habitat for this species does exist within the study area, however, no many-flowered grass-pink was observed during field reconnaissance. Therefore, no effect is anticipated for this species.

Nodding Pinweed

Nodding pinweed is a perennial herb that has slender, erect, flowering stems, rising from a dense mat of spreading branches. Leaves are short (>0.4 inches), narrowly oval and alternating, with pointed tips, disappearing by flowering time. Nodding pinweed flowers in tight clusters at the ends of short branches with 3 tiny purple or green petals. The entire plant is covered with spreading, gray hairs and has a tiny, hard capsule fruit. Habitat includes scrub and scrubby flatwoods. No habitat exists within the study area and this species was not observed during field surveys. Therefore, no effect is anticipated for this species.

Pinewoods Bluestem

This perennial herb is native to both Florida and southern Alabama. This grass species grows up to 5 feet tall with long narrow leaves. Flowers are densely covered with tawny hairs and are light brown in color. Preferred habitat includes flatwoods and scrub and possibly flatwoods that have converted to unimproved pasture. No habitat exists within the study area and this species was not observed during field surveys. Therefore, no effect is anticipated for this species.

Sand Butterfly Pea

Sand butterfly pea is a perennial vine with stems up to 10 feet long and is commonly found intertwined with other species of bushes. Leaves are dark green and somewhat leathery. The flowers are 1.5 in wide and are purplish-blue. This species prefers sandhills, scrubby flatwoods, and dry upland woods. No habitat exists within the study area, and this species was not observed during field surveys. Therefore, no effect is anticipated for this species.

Scrub Bluestem

This small, strongly tufted perennial grass grows from slender fibrous roots, which is perennating by short lateral offshoot buds from the base. The leaves are 6-10 cm long and hairless except for a few hairs at their bases. It is very narrow, flat, and held horizontal to the stem. Flowering stalk are erect to 75 cm tall, then loosely branched at the top with only 1 inflorescence at the tip of each branch. Joints of the flowering stalk are covered with silvery-white hairs. This species is found in sandhills scrub communities, rosemary scrub, also sand pine scrub and oak scrub. No habitat exists within the study area, and this species was not observed during field surveys. Therefore, no effect is anticipated for this species.

Star Anise

This perennial evergreen shrub/small understory tree sometimes reaches 7 m tall. The smooth bark is grayish/brown and the leathery leaves have a dark, glossy green upper surface and a pale, dotted lower surface. This species is restricted to habitats with continually moist soils in forested wetlands. Habitat is limited for this species and no plants were documented during field surveys. Therefore, no adverse effect is anticipated for this species.

Yellow Fringeless Orchid

Yellow fringeless orchid is a perennial herb with 1 to 3 leaves on each stem. Leaves are alternate. The

plant is 10 to 30 inches tall. The flowers are yellow or orange and appear in late summer and early fall. Preferred habitat includes wet forested hardwoods and sandy soils. Habitat for this species is limited within the study area and no individuals were observed during field reconnaissance. Therefore, no adverse effect is anticipated for this species.

7.5.4 NON-LISTED SPECIES

Florida Black Bear

The Florida black bear was removed from the FWC list of state-threatened species in August 2012, however, the Florida black bear remains protected under other laws, primarily the Florida Black Bear Conservation Rule 68A-4.009 (F.A.C.) and the FWC Florida Black Bear Management Plan. Based on these regulations, pursuing, hunting, molesting, capturing, killing, or attempting those actions, whether or not such actions result in possession of the bear is unlawful. In addition, Rule 68A-4.009, F.A.C., generally prohibits anyone from possessing, injuring, shooting, wounding, trapping, collecting, or selling bears or their parts or attempting to engage in such actions without prior authorization from FWC. Black Bear Management Units (BMU) have also been established based on the seven geographically distinct bear subpopulations in Florida. The study area is located within the South Central BMU. Black bears are adaptable and inhabit a variety of forested habitats including seasonally inundated pine flatwoods, tropical hammocks, hardwood swamps and xeric sand pine-scrub oak communities. Based on a review of GIS databases, there are several reported nuisance bears in the vicinity of the project study area (see **Figure 12 – Listed Species Map**). Impacts to habitat that could potentially be utilized by the Florida black bear are not anticipated because of the proposed improvements. It is anticipated that Florida black bears could occur in the project study area; though none were observed, and no sign of bear activity was observed.

Although no black bear habitat will be impacted by the project, consistent with the June 2012 FWC Black Bear Management Plan, garbage and food debris will need to be properly removed during construction to eliminate possible sources of food that could encourage and attract bears. Nuisance bears should be reported to the FWC at the Wildlife Alert Hotline at 1-888-404-3922.

No adverse effect is anticipated for the Florida black bear.

Southern Fox Squirrel

The fox squirrel was removed from the FWC list of state-threatened species; however, the fox squirrel remains protected under the Regulations Relating to the Taking of Mammals Rule 68A-29.002 (F.A.C.). Based on these regulations, fox squirrels or their young, homes, dens or nests shall be taken, transported, stored, served, bought, sold or possessed in any matter unless specifically permitted by FWC.

Preferred habitat for the fox squirrel includes mature, open, fire-maintained longleaf pine and turkey oak sandhills and pine flatwoods. They also can be found in mixed hardwood pine, mature pine forests, cypress domes, pastures, the ecotone between bayheads and pine flatwood and other open lands with pines and oaks. Fox squirrels usually nest in turkey oak trees but also use longleaf pine, live oak, post oak, laurel oak and slash pine, though slash pine are used less frequently. Habitat for this species can be found in the pastures adjacent to Neptune Road. Additionally, this species was observed during field surveys.

There is no habitat within the existing ROW for this species. There is marginal habitat (improved pastures) adjacent to the corridor, but these areas are small and fragmented by development.

Furthermore, there is no management of these areas. Although fox squirrels were observed within the study area, no nests were observed. Thus, no adverse effect is anticipated for this species. The project is not expected to have adverse effects on this species.

Bald Eagle

As of 2008, the bald eagle is no longer listed by the USFWS or FWC as endangered or threatened. Bald eagles are still protected under the Bald and Golden Eagle Protection Act, Migratory Bird Treaty Act, and FWC's bald eagle rule (F.A.C. 68A-16.002). Potential habitat for bald eagles (e.g. tall pine trees) occurs throughout the project study area, and commonly includes areas in proximity to bays, rivers, lakes, or other bodies of water that provide concentrated prey availability. Eagles usually nest in tall trees (mostly live pines) that provide clear views of the surrounding area. Two bald eagle nests are located within the study area, Nest OS084 and OS169, as shown on **Figure 13 – Bald Eagle Nest Map**. An adult bald eagle was spotted inside Nest OS084 during a site visit conducted on November 30, 2018. Updated surveys are recommended during design to determine the current status of both nests. Coordination will be required with USFWS during design and permitting.

Based on the USFWS National Bald Eagle Management Guidelines and the FWC Bald Eagle Management Plan, construction activities proposed at least 660 feet from an eagle nest do not require an Eagle Permit from the USFWS. FWC also defines a 330-foot buffer and a 100-foot buffer for protection particularly in more urban environments. For OS169, neither Alternative 1 or Alternative 2 will encroach upon the 330 or the 100-foot buffers. Additionally, this nest's status or exact location was not confirmed during field reconnaissance because it is on a private residential property. During design and permitting, the status and location of this nest should be confirmed.

For OS084, both Alternative A and Alternative B will encroach slightly upon the 330-foot buffer, but not the 100-foot buffer. An adult bald eagle was observed within this nest during field reconnaissance. The nest is on the south edge of a group of live oaks and slash pines, which provide a vegetative buffer between the nest and Neptune Road. Outside of this vegetative buffer, the nest is surrounded by Neptune Road, Old Canoe Creek Road and a residential neighborhood. Therefore, it is reasonable to assume that the eagles have acclimated to the presence of existing roadway infrastructure and people. A bald eagle survey will be completed during design and permitting to determine current status of the nests. Further coordination would occur with USFWS. Technical assistance and possible permitting would occur following the updated survey, when the current condition of the nest is known.

USFWS has defined some potential minimization measures which should be implemented during construction:

- Restrictions on construction timing.
- Contractor education to avoid impacts.
- Nest monitoring during construction.
- Create a visual buffer between the construction activities and the nest by planting appropriate native pines or hardwoods.
- Shielding of lights so they do not shine directly on the nest.

7.6 INDIRECT EFFECTS

Indirect effects “are caused by the action and are later in time or farther removed in distance but are still reasonably foreseeable” (Council on Environmental Quality (CEQ) 1986, 40 Code of Federal Regulations (CFR) 1508.8). encroachment/alteration effects could be an indirect effect for native upland habitats and listed species.

Habitat and Wildlife Effects

Encroachment/alteration effects could include habitat fragmentation, degradation of habitat from pollution, water quality degradation from stormwater runoff or roadway spills, changes in hydrology, and exotic/invasive species range expansion. This project includes the widening of an already existing roadway and will include construction of stormwater ponds to help reduce indirect effects of roadway runoff. The indirect effects resulting from fragmentation and edge effects are the same for all alternatives.

For the proposed alternatives, potential indirect effects to listed species are expected to be temporary in nature and can be avoided or minimized by incorporation of BMPs as described in *FDOT Standard Specifications for Road and Bridge Construction*. BMPs could include the use of turbidity curtains, silt fencing, hay bales. etc.

Figure 12: Listed Species Map

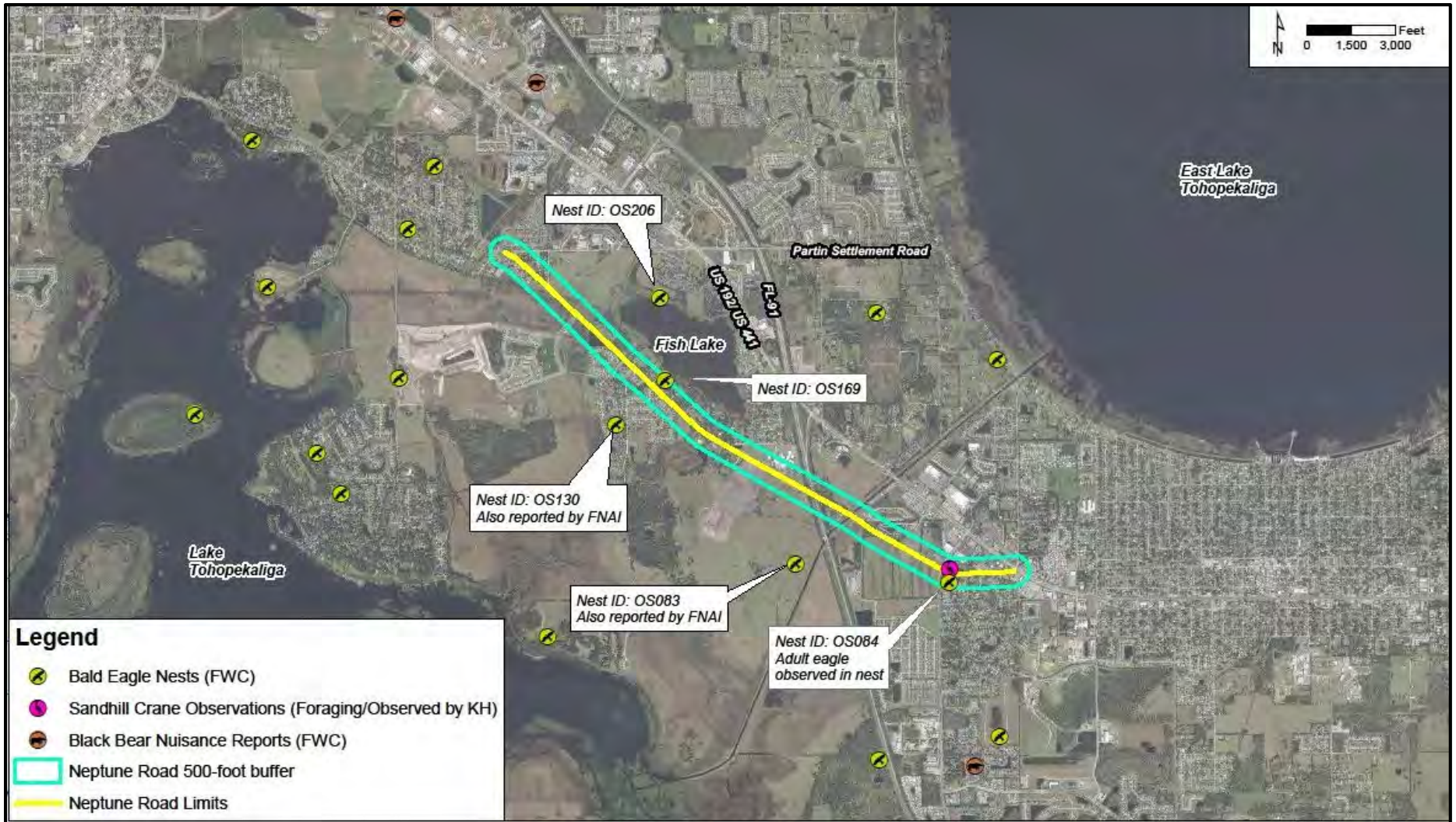


Figure 13: Bald Eagle Nest Map



8.0 IMPLEMENTATION MEASURES AND DESIGN CONSIDERATIONS

The following measures to avoid and minimize impacts to listed species potentially occurring within the study area have also been considered and are included as commitments in Section 11.0 – Commitments:

- The *Standard Protection Measures for the Eastern Indigo Snake* during construction will be implemented (**Appendix K**).
- Eagle nest monitoring will take place during design and permitting to determine the current location and status of the two nests documented along the corridor and to confirm no new nests are present. Coordination with USFWS Migratory Bird Division will occur following the updated survey, when the current condition of the nests is known. Minimization measures for the bald eagle should include restrictions on construction timing, contractor education to avoid impacts to nests, creating a visual buffer between construction activities and the nest, and shielding of lights so they do not shine directly on the nest.
- Pre-construction surveys for Florida sandhill crane, southeastern American kestrel, Florida burrowing owl, and gopher tortoises will be conducted and impacts, if any, coordinated with the FWC.
- Consistent with the June 2012 FWC Black Bear Management Plan, garbage and food debris will be properly removed during construction to eliminate possible sources of food that could encourage and attract bears. Nuisance bears will be reported to the FWC at the Wildlife Alert Hotline at 1-888-404-3922.

For the proposed alternatives, potential indirect effects to wetlands and managed species are expected to be temporary in nature and can be avoided or minimized by incorporation of BMPs as described in *FDOT Standard Specifications for Road and Bridge Construction*. BMPs could include the use of turbidity curtains, silt fencing, hay bales. etc.

9.0 PERMITTING REQUIREMENTS AND COORDINATION

Both the USACE and SFWMD regulate impacts to wetlands within the project area. Other agencies, including the USFWS, NMFS, U.S. Environmental Protection Agency (EPA), and the FWC, review and comment on wetland permit applications. The FWC permits gopher tortoise relocation activities and nest take for state protected avian species and the USFWS is the lead agency for eagle nest take permitting or coordination. In addition, the FDEP regulates stormwater discharges from construction sites. Additionally, coordination was conducted with the SFWMD Right-of-Way Permitting staff to obtain concurrence on required permits and design considerations for the proposed bridges over the C-31 canal. A copy of this correspondence is included in **Appendix L**. Based on this coordination and the ETDM comments, it is anticipated that the following permits will be required for this project:

<u>Permit</u>	<u>Issuing Agency</u>
Section 404 Dredge and Fill Permit – SAJ-92 or NW 14	USACE
Section 408 Review	USACE
Individual Environmental Resource Permit (ERP)	SFWMD
Right of Way Occupancy Permit	SFWMD
National Pollutant Discharge Elimination System (NPDES)	FDEP
Eagle Permit (if necessary)	USFWS
Species Permits (if necessary)	FWC

In addition to the permits listed above, USACE Section 408 review will be required for impacts associated with the bridge(s) over the C-31 canal. The US Coast Guard (USCG) assigned a degree of effect of “No Involvement” in the ETDM programming screening.

10.0 CONCLUSIONS AND RECOMMENDATIONS

Wetlands

Per the *Wetlands Evaluation*, two types of surface waters and three types of wetlands were identified within the study area. The following two tables summarize the direct and secondary impacts to surface waters and wetlands for the four alternatives. Alternative A and B had no direct or secondary impacts to wetlands. A summary of the approximate wetland impacts, and functional loss are shown in **Table 13**. Approximate secondary wetland impacts are shown in **Table 14**.

Table 13: Direct Wetland and Surface Water Impacts by Alternative (Acres)

SW/WL Number	Alt 1	Alt 2	Alt A	Alt B
SW 2	0.18	0.33		-
SW 3	1.57	1.54		-
SW 5	-	0.06		-
SW 6	0.20	0.20		-
SW 7	0.22	0.22		-
SW 9	0.04	0.04		-
SW 10	0.01	0.01		-
SW 11	0.01	0.01		-
SW 13	-	-	0.03	0.05
Total Surface Water Impacts	2.23	2.41	0.03	0.05
WL1	0.30	1.20	-	-
WL2	0.19	0.52	-	-
WL4	0.22	0.22	-	-
WL5	0.21	0.06	-	-
WL6	0.13	0.04	-	-
WL7	0.15	-	-	-
WL8	0.04	-	-	-
WL9	0.16	-	-	-
WL11	0.05	-	-	-
WL12	0.09	-	-	-
WL15	0.20	0.20	-	-
WL17	0.83	0.83	-	-
Total Wetland Impacts	2.57	3.07	-	-
Grand Total Surface Water and Wetland Impacts	4.80	5.48	0.03	0.05

Table 14: Secondary Wetland Impacts by Alternatives (Acres)

WL Number	Alt 1	Alt 2
WL1	0.49	0.56
WL2	0.36	0.34
WL4	0.42	0.42
WL5	0.24	0.23
WL6	0.12	0.12
WL7	0.24	0.22
WL8	0.06	0.06
WL9	0.23	0.23
WL11	0.07	0.07
WL12	0.06	0.05
WL15	0.69	0.69
WL17	0.39	0.39
Total Secondary Wetland Impacts	3.39	3.39

Protected Species and Habitat

Per the *Protected Species and Habitat Assessment*, 21 federally listed species and 22 state listed species may occur within the study area. The following effect determinations have been made for the federally listed species:

Species	Effect Determination
Florida Panther	No effect
Florida Bonneted Bat	No effect
Audubon's Crested Caracara	May affect, not likely to adversely affect
Florida Scrub-Jay	No effect
Red-cockaded Woodpecker	No effect
Everglade Snail Kite	No effect
Wood Stork	May affect, not likely to adversely affect
Eastern Indigo Snake	No effect
Beautiful Pawpaw	No effect
Britton's Beargrass	No effect
Scrub Blazing Star	No effect
Florida Bonamia	No effect
Lewton's Polygala	No effect
Paper-like Nailwort	No effect

Species	Effect Determination
Pygmy Fringe Tree	No effect
Scrub Buckwheat	No effect
Scrub Lupine	No effect
Short-leaved Rosemary	No effect
Sandlace	No effect
Carter’s Mustard	No effect
Wide-leaf Warea	No effect

Mitigation credits will be purchased from a mitigation bank within the Lake Tohopekaliga Drainage Basin that is permitted by SFWMD and USACE. The following banks are within the same drainage basin: Reedy Creek Mitigation Bank, Southport Ranch Mitigation Bank, and Florida Mitigation Bank. These three banks have both forested and herbaceous credits available for sale.

11.0 COMMITMENTS

Osceola County makes the following commitments to minimize impacts to wetlands and protected species:

- The *Standard Protection Measures for the Eastern Indigo Snake* during construction will be implemented (**Appendix K**).
- Eagle nest monitoring will take place during design and permitting to determine the current location and status of the two nests documented along the corridor and to confirm no new nests are present. Coordination with USFWS Migratory Bird Division will occur following the updated survey, when the current condition of the nests is known. Minimization measures for the bald eagle should include restrictions on construction timing, contractor education to avoid impacts to nests, creating a visual buffer between construction activities and the nest, and shielding of lights so they do not shine directly on the nest.
- Pre-construction surveys for Florida sandhill crane, southeastern American kestrel, Florida burrowing owl, and gopher tortoises will be conducted and impacts, if any, coordinated with the FWC.
- Consistent with the June 2012 FWC Black Bear Management Plan, garbage and food debris will be properly removed during construction to eliminate possible sources of food that could encourage and attract bears. Nuisance bears will be reported to the FWC at the Wildlife Alert Hotline at 1-888-404-3922.

12.0 REFERENCES

Cowardin *et. al.* U.S. Department of Interior - Fish and Wildlife Service. Classification of Wetlands and Deepwater Habitats of the United States. USFWS/OBS-79/31, December 1979.

South Florida Multi-Species Recovery Plan. 1999. U.S. Fish and Wildlife Service, Southeast Region.

USFWS Concurrence in U.S. Army Corps of Engineers use of Eastern Indigo Snake Programmatic Effect Determination Key (North Florida). 2013.

USFWS Standard Protection Measures for the Eastern Indigo Snake. 2013.

MetroPlan Orlando Cost Feasible 2040 Long Range Transportation Plan (LRTP). Technical Report 3: Plan Development & Cost Feasible Projects. August 2016.