

NATURAL RESOURCES EVALUATION

PROJECT DEVELOPMENT AND ENVIRONMENT
STUDY

SR 408 East Extension
From SR 50 to SR 50/SR 520 Intersection
Orange County, Florida

CFX Project Number: 408-254

Prepared for

CENTRAL
FLORIDA
EXPRESSWAY
AUTHORITY

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EXECUTIVE SUMMARY

The Central Florida Expressway Authority (CFX) is presently evaluating the potential to expand State Road (SR) 408 from its current eastern terminus at SR 50, locally known as East Colonial Drive, to the vicinity of the SR 50 and SR 520 interchange in northeastern Orange County. This new seven-mile eastern extension of SR 408 would constitute the first stage towards providing a west-east high-speed corridor with future connectivity to I-95, enhancing safety, capacity and mobility for the region and CFX's customers.

This Natural Resources Evaluation (NRE) identifies and assesses potential protected species occurrences and habitats as well as wetlands and surface water locations. This NRE also identifies potential impacts from proposed alternatives and provides information on avoidance, minimization, and mitigation measures. This document has been prepared in accordance with FDOT's *PD&E Manual, Part 2, Chapter 9 (Wetlands and Other Surface Waters)*, updated June 14, 2017, and *Part 2, Chapter 15 (Protected Species and Habitats)*, updated June 14, 2017, which incorporates the requirements of the National Environmental Policy Act (NEPA) and related federal and state laws.

It is anticipated that the recommended alternative would result in 61.1 acres of wetland impacts, 70.6 acres of impacts to wood stork (*Mycteria americana*) Suitable Foraging Habitat (SFH) and approximately 18 acres of impacts to St. Johns River Water Management District (SJRWMD) Econlockhatchee River Riparian Habitat Protection Zone (RHPZ). Proposed pond locations would impact approximately 7 acres mapped as wetlands, 14.5 acres of wood stork SFH, 31 acres of vegetated uplands, and none of the Econlockhatchee River RHPZ.

Through coordination with U.S. Fish and Wildlife Service (USFWS), field investigations, and data analysis, CFX has determined that **no adverse effects** to federally listed species are anticipated to occur in association with the proposed project. The project occurs in the USFWS consultation areas for Audubon's crested caracara (*Polyborus plancus audubonii*), Everglade snail kite (*Rostrhamus sociabilis plumbeus*), and red-cockaded woodpecker (*Picoides borealis*).

A determination of **no effect** was made for the following federally listed species because none were detected during surveys and no potential habitat is found in the project area: Florida scrub-jay (*Aphelocoma coerulescens*), beautiful pawpaw (*Deeringothamnus pulchellus*), Britton's beargrass (*Nolina brittoniana*), Florida bonamia (*Bonamia grandiflora*), papery whitlow-wort (*Paronychia chartacea*), red-cockaded woodpecker and scrub buckwheat (*Eriogonum longifolium* var. *gnalphalifolium*). A determination of **no effect** was made for the state listed burrowing owl (*Athene cunicularia*).

A determination of **may affect, not likely to adversely affect**, was made for the following federally listed species: American alligator (*Alligator mississippiensis*), Audubon's crested caracara, eastern indigo snake (*Drymarchon corais couperi*), Everglade snail kite and wood stork.

A determination of **may affect, not likely to adversely affect**, was made for the following state listed species: Florida pine snake (*Pituophis melanoleucus mugitus*), Florida sandhill crane (*Grus canadensis pratensis*), gopher tortoise (*Gopherus polyphemus*) (also a candidate for Federal listing), little blue heron (*Egretta caerulea*), roseate spoonbill (*Platalea ajaja*), Sherman's fox squirrel (*Sciurus niger shermani*), southeastern American kestrel (*Falco sparverius paulus*), and tri-colored heron (*Egretta tricolor*).

Bald eagles could occur in the project area and are 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). According to the FWC bald eagle nest locator tool, the nearest reported bald eagle nest (Nest ID OR074) is approximately 1.2 miles north of the project corridor. The project is outside the 660-foot buffer within which project activities may be restricted under the USFWS *Bald Eagle Management Guidelines and Conservation Measures*, so no impacts to bald eagles are anticipated.

Standard BMPs for construction of roads will be implemented during all construction. Staging and stockpiling locations will be coordinated with the construction project manager. BMPs and staging/stockpiling will follow FDOT's *Standard Specifications for*

Road and Bridge Construction. To avoid and minimize impacts during construction, CFX will adhere to the USFWS *Standard Protection Measures for the Eastern Indigo Snake*. CFX will mitigate for any unavoidable impacts to wood stork suitable foraging habitat at an approved mitigation bank and in accordance with the USFWS *Wood Stork Effect Determination Key* (U.S. Army Corps of Engineers and USFWS 2008). CFX will conduct a 100% gopher tortoise burrow survey of potential habitat in the impact area and associated relocations in compliance with FWC guidelines.

An Environmental Resource Permit (ERP) and a dewatering permit from the SJRWMD and a U.S. Army Corps of Engineers dredge and fill permit are anticipated. An Orange County Conservation Area Impact permit is also anticipated for unavoidable impacts to wetlands.

For ERP issuance, the project must meet the Special Basin Criteria and the RHPZ requirements associated with the Econlockhatchee River. Any development of naturally vegetated uplands within the SJRWMD RHPZ requires mitigation. SJRWMD, U.S. Army Corps of Engineers, and Orange County mitigation credits are available from the TM-Econ Mitigation Bank. An easement for crossing Sovereign Submerged Lands will also be required.

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APPENDIX A: USFWS WOOD STORK GUIDELINES

LIST OF ACRONYMS

BMP	Best Management Practice
CFA	Core Foraging Area
CFR	Code of Federal Regulations
CFX	Central Florida Expressway Authority
CR	County Road
DDT	Dichloro-Diphenyl-Trichloroethane
DRA	Drainage Retention Area
EFH	Essential Fish Habitat
EIS	Eastern Indigo Snake
ERHB	Econlockhatchee River Hydrologic Basin
ERP	Environmental Resource Permit
ESA	Endangered Species Act
FDEP	Florida Department of Environmental Protection
FDOT	Florida Department of Transportation
FE	Federally Endangered
FEMA	Federal Emergency Management Agency
FLUCCS	Florida Land Use Cover and Forms Classifications System
FNAI	Florida Natural Areas Inventory
FR	Federal Register
FT	Federally Threatened
FWC	Florida Fish and Wildlife Conservation Commission
GIS	Geographic Information System
LIDAR	Light Detection and Ranging
M-WRAP	Modified-Wetland Rapid Assessment Procedure
NAD 83	North American Datum 1983
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NRE	Natural Resources Evaluation
NRCS	National Resources Conservation Service
NWI	National Wetland Inventory
OFW	Outstanding Florida Water
OSW	Other Surface Waters
PD&E	Project Development and Environment
RHPZ	Riparian Habitat Protection Zone
RIBITS	Regulatory In-lieu Fee and Bank Information Tracking System
ROW	Right-of-Way
SFH	Suitable Foraging Habitat
SFWMD	South Florida Water Management District
SJRWMD	St. Johns River Water Management District
SR	State Road
SSC	State Species of Special Concern
SSL	Sovereignty Submerged Lands
ST	State Threatened

USACE
USEPA
USFWS
USGS
WRAP

United States Army Corps of Engineers
United States Environmental Protection Agency
United States Fish and Wildlife Service
United States Geological Survey
Wetland Rapid Assessment Procedure

1.0 INTRODUCTION

The purpose of the SR 408 East Extension Project Development and Environment (PD&E) Study is to develop a proposed improvement strategy that is technically sound, environmentally sensitive and publicly acceptable. As with every PD&E Study, emphasis has been placed on the development, evaluation and documentation of detailed engineering and environmental studies including data collection, conceptual design, environmental analyses, project documentation and the preparation of a Preliminary Engineering Report.

The Central Florida Expressway Authority (CFX) is presently evaluating the potential to extend State Road (SR) 408 from its current eastern terminus at SR 50, locally known as East Colonial Drive, to the vicinity of the SR 50 and SR 520 interchange in northeastern Orange County. This new approximately seven-mile eastern extension of SR 408 would constitute the first stage towards providing a west-east high-speed corridor with future connectivity to I-95, enhancing safety, capacity and mobility for the region and CFX's customers.

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PROJECT BACKGROUND/DESCRIPTION

The vision of this enhanced west-east corridor has been documented in prior concept studies prepared by CFX including the SR 408 East Extension Concept Development and Evaluation Study completed in 2008. This study evaluated potential corridors for a

new limited access facility between east Orange County and north Brevard County. The original study area generally paralleled SR 50 from east of SR 434 to I-95. After a preliminary corridor evaluation, four viable corridors were determined to meet the criteria and were further evaluated. These corridors are shown on **Figure 1-1**. The results of the previous study indicated that "Corridor 3B (along SR 50) met the transportation need west of SR 520, providing relief of the existing and projected future traffic congestion along SR 50 from Alafaya Trail/SR 434 to SR 520. This alternative diverted the greatest number of trips, had the lowest estimated cost, and had the fewest potential impacts to environmental and community resources of any of the viable corridors considered at that time. This corridor also provided for a potential future extension of the proposed limited access facility southeast along either the SR 520 or SR 50 corridors, affording system linkage between east Orange County and Brevard County."

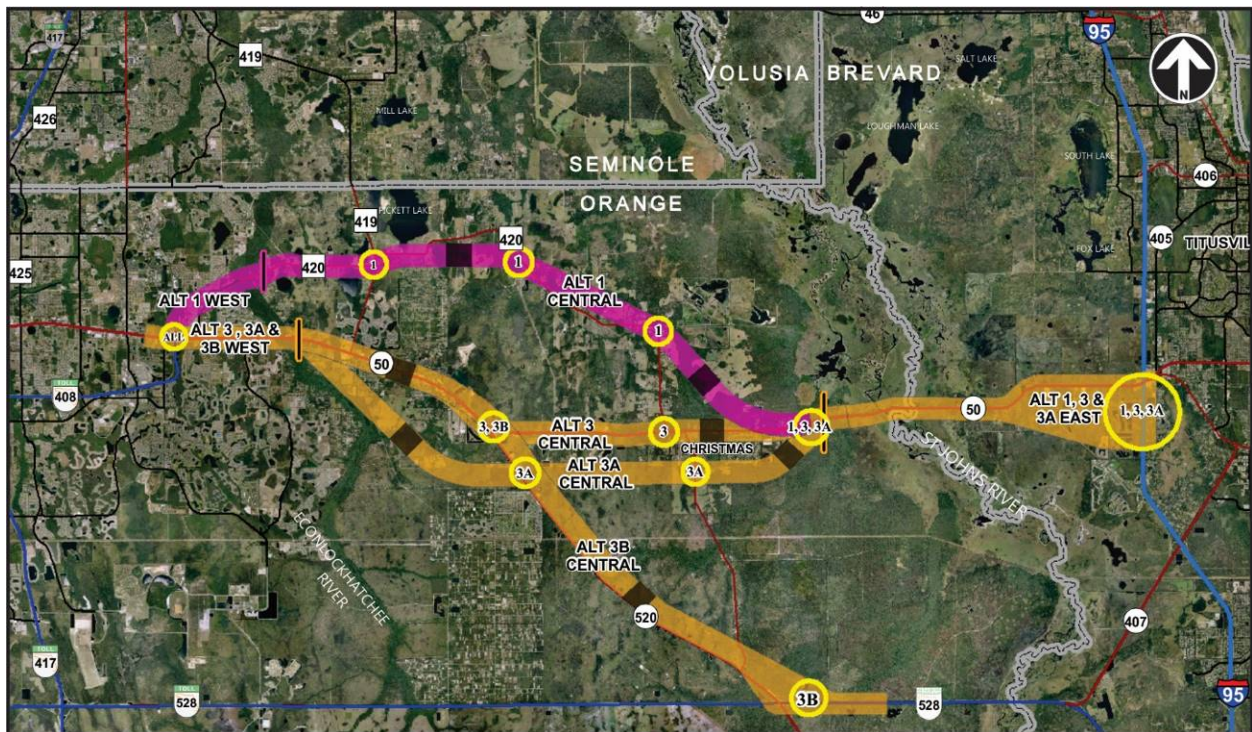


Figure 1-1 2008 Study Previously Identified Viable Corridors

A preliminary corridor evaluation was initially performed in 2015, in which different viable alternatives were considered. Those alternatives that met the basic project objectives were further evaluated and presented in a final report which recommended

that the proposed SR 408 extension be collocated within the existing SR 50 corridor. However, in May 2016, the Florida Department of Transportation (FDOT) notified CFX that there are issues with CFX utilizing FDOT right-of-way for the SR 408 extension. Thus, CFX has initiated a new study to develop a new transportation corridor that will address the transportation needs while minimizing impacts to the natural, physical and cultural environments.

2.0 PURPOSE AND NEED

PROJECT PURPOSE AND NEED

The purpose of the proposed SR 408 Eastern Extension is to construct a tolled limited-access, high-speed facility that will: provide additional west-east capacity within the project area; provide an additional emergency evacuation service option within east-central Florida; improve connectivity and system linkage to existing and future planned facilities that are identified in local long-range transportation plans; and, develop a facility that could enhance transit service and travel times for users wishing to travel from/to eastern Florida to/from Orlando and other areas (see **Figure 2-1**). There are four existing/projected corridor needs that serve as the main justification for the proposed improvements. These needs are: 1) providing *additional capacity* in the west-east direction to mitigate or eliminate capacity deficiencies; 2) providing *additional emergency evacuation service* to supplement the limited number of evacuation routes in this area of Central Florida; 3) providing *improved transportation connectivity/linkage* necessitated by the continued population growth and land use development reflected in various local comprehensive plans; and 4) providing *transit support* and 5) *planning consistency*. A brief description of each of these needs follows.

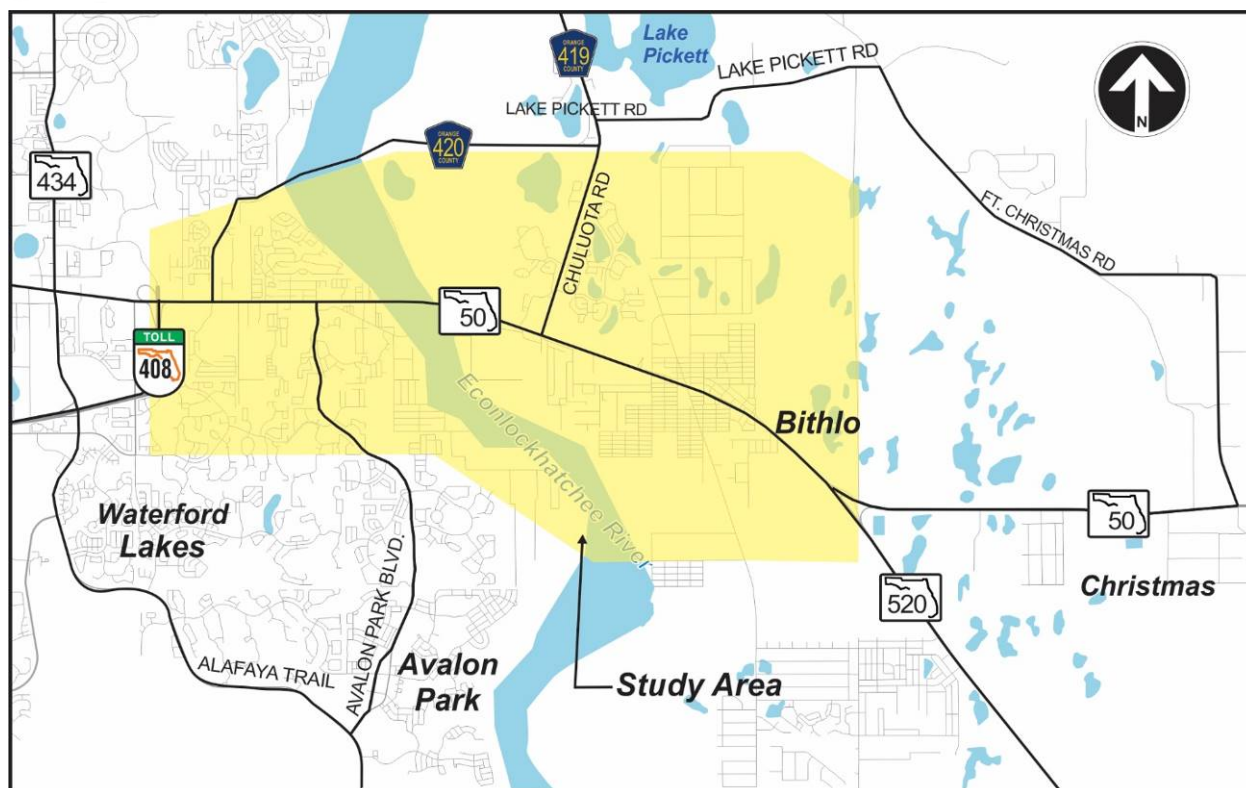


Figure 2-1 Study Area

Capacity Deficiency

The planned project improvements are anticipated to accommodate the expected increase in traffic due to population and employment growth along the corridor. The preliminary No-Build projections were run for years 2025, 2035 and 2045. **Table 2-1** shows the Annual Average Daily Traffic (AADT) volumes for the year 2045.

Results of the preliminary No-Build projections reflect that even with the planned widening of SR 50 to six lanes by FDOT, there is insufficient capacity in 2025 on the segment from SR 408 to County Road (CR) 420 and in 2035 from CR 420 to Avalon Park Boulevard. By the year 2045 even the segment from Avalon Park Boulevard to Chuluota Road, although not over capacity, is projected to reach congested conditions. Unless additional capacity is provided along most project segments the vehicular mobility along this critical transportation link will be compromised.

Table 2-1 Future Traffic Volumes

Roadway	Limits		2045 AADT	
	From	To	SR 408	SR 50
SR 408	SR 408 existing eastern terminus	Bonneville Dr	33,700	66,500
	Bonneville Dr	Lake Pickett Rd	33,700	60,200
	Lake Pickett Rd	Pebble Beach Blvd	33,700	49,800
	Pebble Beach Blvd	Avalon Park Blvd	14,200	47,700-67,100
	Avalon Park Blvd	Tanner Rd	14,200-15,700	54,300-55,700
	Tanner Rd	Future Lake Pickett Development	15,700	47,800
	Future Lake Pickett Development	Chuluota Rd	15,700	41,400-51,800
	Chuluota Rd	N CR 13	3,000	45,300
	N CR 13	SR 50/SR 520 Interchange	3,000	40,700

Emergency Evacuation

The East Central Florida Region has been identified by the National Oceanic and Atmospheric Administration (NOAA) as a high hurricane vulnerable area within the United States and thus requires sufficient and efficient evacuation routes. SR 50 has been designated as a primary evacuation route for the eastern Orange and northern Brevard Counties and together with SR 528 and SR 46 they provide the only east-west evacuation routes for the area.

A recent hurricane evacuation study conducted by the East Central Florida Regional Planning Council estimated that over 220,000 persons would potentially evacuate Brevard County during a Category 3 storm. Any future capacity deficiency along SR 50 (the main evacuation route) could seriously jeopardize the effectiveness of coastal evacuation from north Brevard County. The provision of an additional east-west facility will afford additional redundancy of the highway network and would greatly improve response and recovery efforts.

Another critical issue deals with fire and emergency services. In the recent past, the (open) natural lands generally abutting SR 50 east of SR 520 were known to be an area prone to wildfires, sometimes necessitating the closure of some key east-west facilities

in the area due to visibility or safety concerns. The provision of an additional east-west facility would afford the desirable redundancy to accommodate diverted regional traffic due to natural or man-made emergencies.

Connectivity/Linkage

The results of the East Central Florida Corridor Task Force Final Report recommended preserving and enhancing the existing SR 50/SR 405 (Columbia Boulevard) corridor from downtown Orlando and the University of Central Florida area to Cape Canaveral, including an extension of the State Road 408/East West Expressway from its current terminus. The SR 408 eastern extension is one piece of Florida's strategic transportation investments to support future growth and create connections between global trade activities, from Orlando International Airport and the University of Central Florida, to Cape Canaveral.

Additionally, in 2008, The Orlando-Orange County Expressway Authority (OOCEA) (now known as CFX) completed the 2008 SR 408 East Extension Concept Development and Evaluation Study for an eastward extension of SR 408. The conclusion of the study resulted in a recommendation that SR 408 east extend from SR 50 to SR 520.

Within the project vicinity, SR 50 is functionally classified as a major arterial facility and provides an important connectivity function between the east Orlando area on the west and I-95 just south of Titusville on the east. As traffic continues to grow within the study corridor due to the rapid development projected within the area it is essential to maintain adequate mobility on this critical roadway link. A new expressway facility would not only improve mobility but significantly reduce the existing potential exposure to at-grade conflict points associated with traffic signals, and local access issues. In summary, the proposed SR 408 Extension will greatly enhance Central Florida's regional expressway needs and provide the initial phase of an ultimate vision of an expressway connection from east Orlando to I-95 north of SR 528.

Transit Plan Support

The Central Florida Regional Transit Authority (LYNX) is conducting a study to enhance transit service along SR 50. The current recommended alternative is Bus Rapid Transit (BRT) service along SR 50 from Oakland to SR 434/Alafaya Trail and north to UCF. The BRT corridor is identified in the LYNX 2030 Vision.

A new limited access facility could support inter-agency transit service between Orange and Brevard counties. The benefits of enhanced transit service are frequently lost when the buses must travel on heavily congested roadways. The proposed roadway would support improved regional travel times and provide realistic options for commuters and visitors traveling between the two counties.

Planning Consistency

All proposed improvements are consistent with the Central Florida Expressway Authority's (CFX) 2040 Expressway Master Plan, CFX Five-Year Work Plan, and MetroPlan Orlando 2040 Long Range Transportation Plan (**Table 2-2**).

Table 2-2 Local Transportation Plans

Plan	Improvement
CFX 2040 Central Florida Expressway Master Plan	SR 408 Eastern Extension PD&E Study
CFX 2018-2022 Five-Year Work Plan	Project Development & Environmental Study – Funded 2017-2018 15% Line & Grade – Design Funded 2019-2021
MetroPlan Orlando 2040 Long Range Transportation Plan	Central Florida Expressway Authority (formerly Orlando Expressway Authority) – Funded Needs SR 408 Eastern Extension from SR 408 at SR 50 to SR 520/SR 50
MetroPlan Orlando Transportation Improvement Program (TIP)	SR 408 Eastern Extension from Challenger Pkwy to SR 520 a New 4 Lane Expressway – Funded PD&E/Line & Grade

3.0 PROJECT AREA DESCRIPTION

The project is within Orange County, east of the City of Orlando, and crosses the Econlockhatchee River. Immediately west of the project is the highly developed urban area of University Park. Lands to the east of the project are mostly undeveloped and include several preserves and conservation lands as well as the community of Christmas, FL. East of the Econlockhatchee River the area surrounding the project is predominantly residential, with scattered wetlands and commercial land along SR 50. The area west of the Econlockhatchee River contains a mix of larger undeveloped, agricultural areas and single-family residences. East River High School occurs immediately east of the Econlockhatchee River off East River Falcons Way. Orlando Speed World Dragway, a large racing complex that stages auto racing events, is near the project at its eastern terminus.

The Econlockhatchee River crosses the project approximately 2.2 miles from the western project terminus. The Econlockhatchee River is a 54.5-mile-long tributary of the St. Johns River and the riparian zone around it is predominantly forested, providing a relatively continuous corridor of habitat for wildlife. SR 50 currently contains two bridges across the Econlockhatchee River, one for eastbound and one for westbound traffic. Before the construction of the SR 50 bridge over the Econlockhatchee River, there was a bridge at Old Cheney Highway. A dirt road currently runs down to the river from both east and west at this former crossing. The Econlockhatchee River is considered an Outstanding Florida Water (OFW), is in a St. Johns River Water Management District (SJRWMD) Riparian Habitat Protection Zone (RHPZ), and has associated Special Basin Criteria that must be met for permit issuance.

Another notable feature in the project vicinity is the community of Bithlo. Bithlo is currently an unincorporated area around SR 50 east of Chuluota Road. At one point Bithlo was an incorporated town but financial hardships caused it to cease functioning as a town in 1929. The un-incorporation of Bithlo was finalized in 1982 after resolving

issues with outstanding bonds and legal problems. Bithlo now contains multiple neighborhoods and residences both north and south of SR 50.

In this document, the term “project corridor” describes the footprint of the recommended alternative. The term “project area” describes a larger expanse that encompasses the project corridor and includes all land within 500 feet of the centerline. Land use in the project corridor is shown on **Figures 3-1 to 3-3** along with the location of 40 proposed stormwater ponds. Additional details on the alternatives considered in this PD&E study are provided in Section 4.0.

LAND USE

Land use cover descriptions provided for both uplands and wetlands are classified using the *Florida Land Use Cover and Forms Classifications System* (FLUCCS) designation. Existing land use in the project area was initially determined utilizing United States Geological Survey (USGS) maps, historical images, aerial photographs, and land use mapping from the SJRWMD (2012). Land use categories reported by SJRWMD were verified in the field. Field reviews generally confirmed the SJRWMD land use mapping, with minor updates to account for recent development or where natural land cover type differs from that reported by SJRWMD.

Land use categories mapped by SJRWMD are shown in **Figures 3-1** through **3-3** and land use categories in the project corridor are described below. Descriptions of FLUCCS codes are taken primarily from FDOT (1999) and SFWMD (2009). Land uses in the project area vary from undeveloped natural areas to highly developed residential and commercial areas. Immediately west of the project limits land use types are predominantly Commercial and Services (FLUCCS 1400), Residential Medium density (FLUCCS 1200), and Pine Flatwoods (FLUCCS 4110). Immediately east of the project limits there is less development and predominant land use types are Shrub and Brushland (FLUCCS 3200), Pine Flatwoods (FLUCCS 4110), and Freshwater Marshes (FLUCCS 6410).

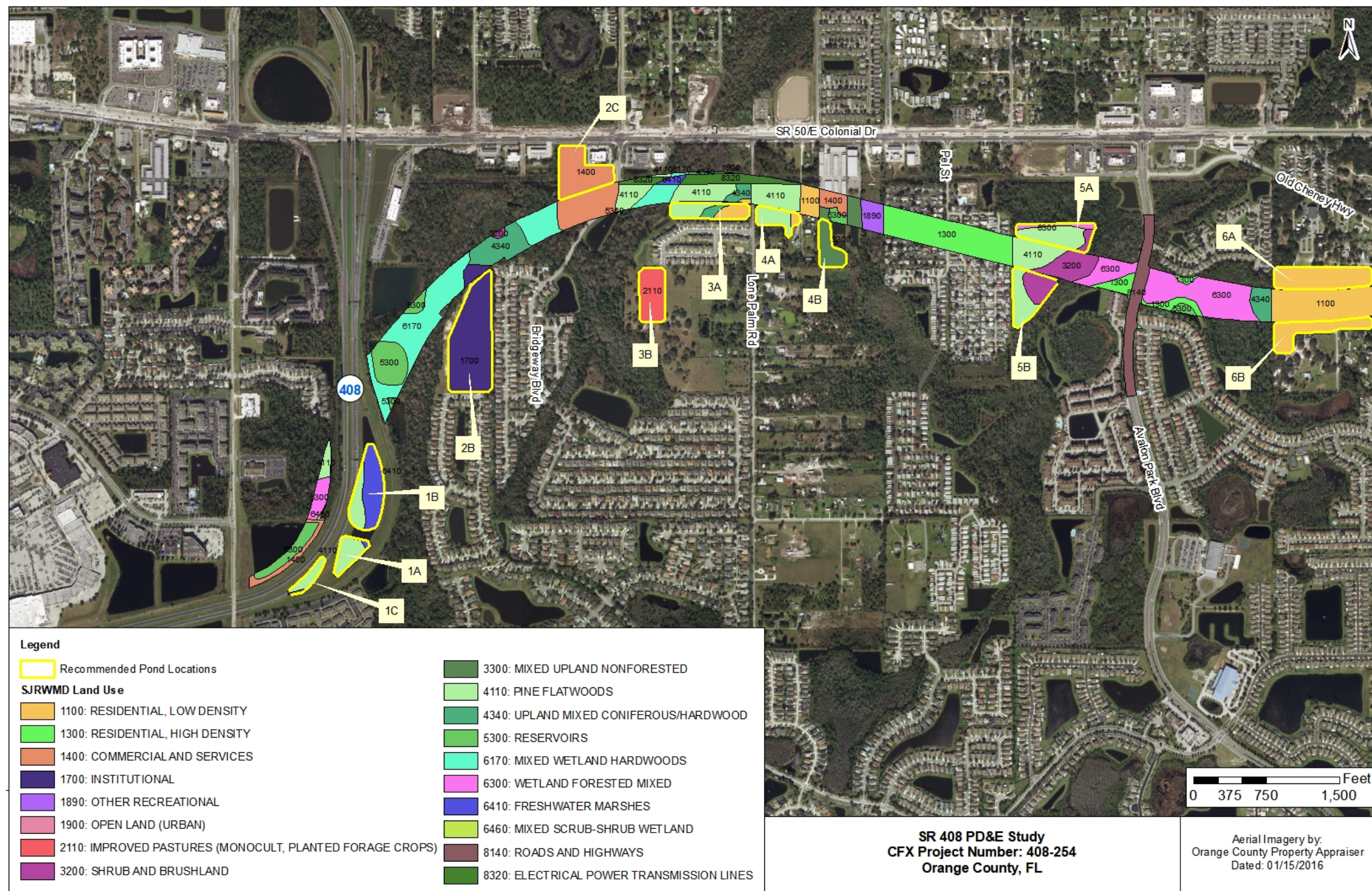


Figure 3-1 Land Use in Western Third of Project Corridor

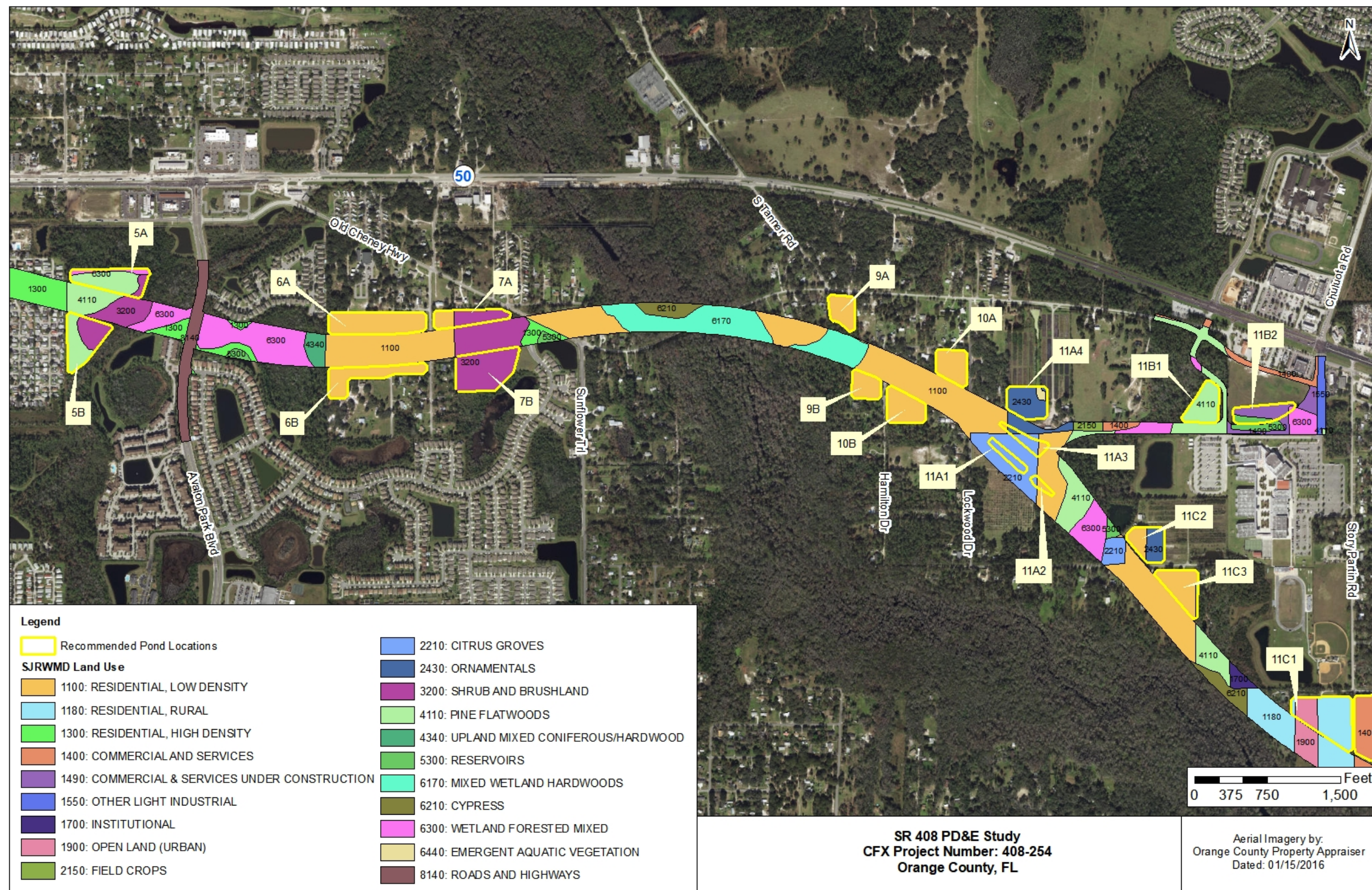


Figure 3-2 Land Use in the Central Third of Project Corridor

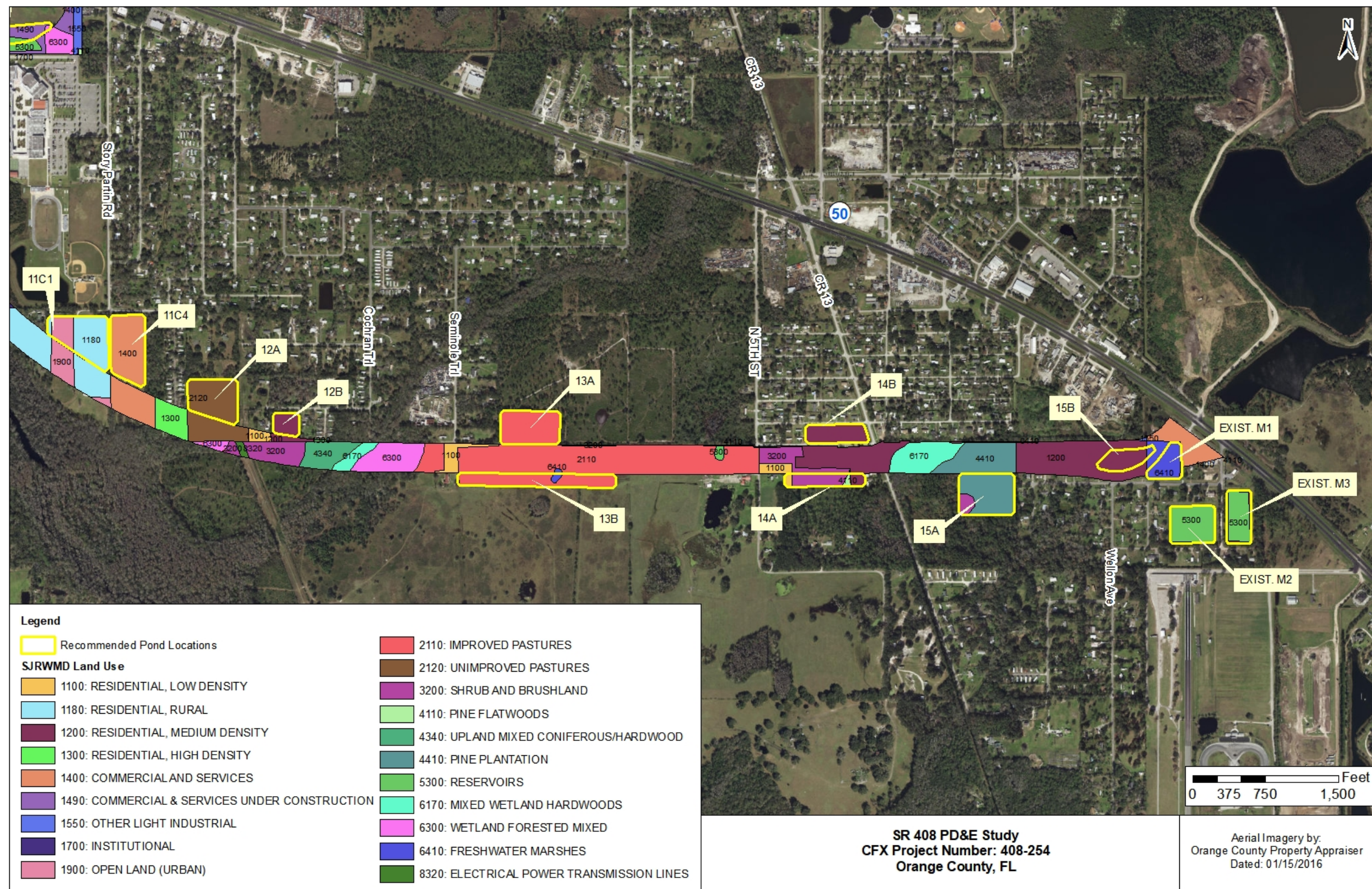


Figure 3-3 Land Use in Eastern Third of Project Corridor

Land use map data was inconsistent with broader conditions encountered during field inspections in three locations. Outside of the project area, north of SR 50 at the eastern project terminus, the area mapped as a phosphate mine (FLUCCS 1633) actually mines fill dirt, not phosphates. Also outside the project area, a broad expanse mapped as Pine Flatwoods (FLUCCS 4110) south of SR 50 at its interchange with SR 520 contains habitat that more closely matches descriptions of mixed forested wetland plant communities. An area adjacent to the project mapped as Freshwater Marsh (FLUCCS 6410), immediately east of the southern part of 9th Street in Bithlo, is a highly-disturbed site that is a designated brownfield. Its elevation is substantially higher than the surrounding areas and it is bordered by canals.

Residential Classification

Residential communities in the project area are classified as low density (FLUCCS 1100), rural (FLUCCS 1180), medium density (FLUCCS 1200), or high density (FLUCCS 1300). Low density residential land cover generally has less than two dwelling units per acre. Medium density residential land cover is for areas containing two to five dwelling units per acre. High density residential land cover consists of more than five dwelling units per acre. This class can include single family units, duplexes, townhomes, and mobile home parks. Dwellings are often located in large urban areas or on an urban-rural fringe. These residential communities occur throughout the project area, particularly west of the Econlockhatchee River and around Bithlo.

Commercial and Services (FLUCCS 1400)

Commercial areas are linked with the distribution of products and services and this designation includes a broad spectrum of developed locations. Easily identifiable areas include commercial strip developments, warehouses, and shopping centers. This land use type occurs in multiple locations throughout the project area, particularly associated with businesses along SR 50 and other major streets. Commercial and Services Under Construction (FLUCCS 1490) is a subcategory of Commercial and Services.

Other Light Industrial (FLUCCS 1550)

This classification is used primarily for fabrication industries. These specific facilities use products from other processing and manufacturing industries to make parts and finished products. This land use type occurs in two places in the project area, at the Chulouta Road interchange and at the project terminus along SR 50.

Institutional (FLUCCS 1700)

Educational, religious, health, and military facilities are typical components of this category. It includes all buildings, grounds and parking lots that compose the facility and are specifically related to the purpose of the institution. Institutional land occurs in multiple locations in the project area, particularly East River High School.

Other Recreational (FLUCCS 1890)

This is a subcategory of Recreational (FLUCCS 1800), which are areas whose physical structure indicates that active user-oriented recreation is or could be occurring. Other Recreational applies to areas which do not have a separate specific Recreational FLUCCS code and includes uses such as riding stables, go-cart tracks, skeet ranges and others. Other Recreational land occurs in the project area south of SR 50, approximately one half-mile west of Avalon Park Boulevard.

Open Land (Urban) (FLUCCS 1900)

This category includes open, undeveloped land within urban areas that have transitional or uncertain land use. This land use type occurs in three small parcels in the project area.

Improved Pastures (FLUCCS 2110)

Improved pastures are the most intensively managed of the pastureland classes. They are usually cleared, tilled, reseeded with specific grass types and periodically improved with brush control and fertilizer application. In most cases, they show some direct evidence of cattle, such as watering ponds, feed bunkers, fencing, corrals, barns or cow trails. Large improved pastures occur in the project area east of the Econlockhatchee River, near the southern end of Seminole Trail and extending south and east.

Unimproved Pastures (FLUCCS 2120)

This category includes cleared land with major stands of trees and brush where native grasses have been allowed to develop. Normally, this land will not be managed with brush control and/or fertilizer application. This land use type is found in multiple locations in the project vicinity. One area is immediately east of Pine Isle Drive and a particularly large Unimproved Pasture occurs near the projects eastern terminus, north of SR 50.

Field Crops (FLUCCS 2150)

Wheat, oats, hay and grasses are the primary types identified as field crops. Field crops are mapped in a few small locations in the project area.

Citrus Groves (FLUCCS 2210)

This class is for active tree cropping operations that produce fruit, nuts, or other resources not including wood products. It is mapped in three locations in the project area, but these locations do not appear to currently be under citrus production.

Shrub and Brushland (FLUCCS 3200)

This is one of three land cover classes used for upland nonagricultural, non-forested lands which contain no evidence of cattle grazing. Specifically, the Shrub and Brushland classification is used for areas that have over 67 percent shrub cover and less than 33 percent herbaceous (this proportion ignores any forested patches, which may cover up to 25 percent of the total area). This cover class includes areas where tree species are regenerating naturally after clear cutting or fire, but are less than 20 feet tall. This land use type is found in multiple places in the project area, particularly east of the Econlockhatchee River.

Mixed Upland Non-forested (FLUCCS 3300)

This class is used for upland non-forested landscapes in which neither herbaceous plants nor shrubs cover over two thirds of the area. This cover class may include areas where tree species are regenerating naturally after clear cutting or fire, but are less than 20 feet tall. This includes native hardwood and coniferous species, but does not apply to

plantations. Mixed Upland Non-forested land occurs in one location, west of the Econlockhatchee River.

Pine Flatwoods (FLUCCS 4110)

This class is for naturally generated pine flatwoods. The canopy closure must be 25 percent or more and the trees must average over 20 feet tall. Pine flatwoods are dominated by either slash pine, longleaf pine, or both. Common understory species include saw palmetto, wax myrtle, gallberry and a wide variety of herbs and brush. Pine flatwoods are the most prevalent community in natural areas. Most pine flatwoods in the SJRWMD are on broad, low, flat areas with seasonal high-water tables but not on hydric soils. They transition into mesic flatwoods and hardwood communities on higher ground and into hydric flatwoods, cypress and other wetlands on lower edges. Hydric and mesic areas of this land use type occur throughout the project area in large and small patches.

Upland Mixed Coniferous/Hardwood (FLUCCS 4340)

This designation is used for forested areas that include communities of oak-pine-hickory, wax myrtle-willow, and slash-longleaf-sand pines. Neither upland conifers, nor hardwoods will achieve two thirds canopy dominance in this classification. Mixed forests often occur adjacent to streams or surrounding wetland depressions at upland areas. This land use type occurs throughout the project area in large and small patches.

Pine Plantation (FLUCCS 4410)

Pine plantations are artificially generated by planting seedling stock or seeds. The stands are characterized by high numbers of trees per acre and uniform appearance. Row patterns are almost always apparent. One area, just east of CR 13 is mapped as Pine Plantation.

Reservoirs (FLUCCS 5300)

These are artificial impoundments of water used for irrigation, flood control, municipal or rural water supply, recreation and hydro-electric power generation. Reservoirs occur throughout the project area as stormwater ponds.

Mixed Wetland Hardwoods (FLUCCS 6170)

This classification may have species mixtures ranging from relatively homogeneous stands, such as those dominated by red maple or willows, to a wide diversity of different species. Species in the mixtures may include red maple, black gum, water oak, sweetgum, willows, cabbage palm, water hickory, water tupelo, water ash and bays. Cypress is often present but not dominant (under 67 percent). This land use type is found in several main locations throughout the project area, near the project start, just east of SR 408, in the Econlockhatchee River basin and along its tributaries.

Cypress (FLUCCS 6210)

Cypress is a subcategory of Wetland Coniferous Forests (FLUCCS 6210) which is dominated by cypress trees. It is mapped in the project area in the Econlockhatchee River corridor, its tributaries and in multiple isolated stands.

Wetland Forested Mixed (FLUCCS 6300)

This classification is designated by forested systems composed of hardwood and coniferous tree mixtures. Species adapted to wet environments such as water oak, cabbage palm, red maple, bay trees, and conifers grow well in these habitats. Wetland Forested Mixed areas exist in a variety of moist soil conditions, from permanently wet to seasonally or infrequently wet. This land use type is located throughout the project area in large and small stands. Some are isolated and some are part of the Econlockhatchee River corridor or are along tributaries and major drainageways. These wetlands straddle Avalon Park Drive and occur in a large area just west of Seminole Trail.

Freshwater Marshes (FLUCCS 6410)

This classification is used for wetland communities having a representative suite of plant species such as sawgrass, cattail, arrowhead, maidencane, buttonbush, cordgrass, switchgrass, needlerush, common reed, arrowroot, and bulrush. Freshwater marshes tend to be open expanses of grasses, sedges, rushes and other types of herbaceous plants. Periods of inundation are intermediate between deep marshes (emergent aquatic FLUCCS 6440) and wet prairies (FLUCCS 6430) and these sites are usually

covered with water at least two months of the year, undergoing prolonged periods of soil saturation. Freshwater Marsh is mapped in multiple locations throughout the project area and some of these locations are actually manmade stormwater ponds with relatively little vegetation. An area mapped as Freshwater Marsh immediately east of the southern part of 9th Street in Bithlo is actually a highly disturbed site and is a designated brownfield. Its current elevation is substantially higher than the surrounding areas and it is bordered by canals.

Wet Prairie (FLUCCS 6430)

This category is considered a special classification and some systems have combined it with Freshwater Marshes (FLUCCS 6410). This land use type is mapped at one location near but outside the project corridor, in a shrubby pasture east of Seminole Trail.

Emergent Aquatic Vegetation (FLUCCS 6440)

This category is for flooded areas with emergent or floating vegetation. It includes communities otherwise known as deep marsh or floating marsh. In the absence of vegetation these areas would be classified as water bodies. This category of land use is mapped in two locations in the project area, one west of the Econlockhatchee River and one east of the river in an ornamental nursery.

Mixed Scrub-Shrub Wetland (FLUCCS 6460)

This class is used for wetlands that are dominated by woody vegetation less than 20 feet in height. It is most common in disturbed communities on drier sites. Mixed Scrub-Shrub Wetlands occur at one location in the project area, just west of the existing SR 408.

Roads and Highways (FLUCCS 8140)

This category includes roads and highways that exceed 100 feet in width over long segments and have four or more lanes and median strips. SR 50, Avalon Park Boulevard, and SR 408 within the project area are mapped as Roads and Highways.

ELEVATION AND HYDROLOGIC FEATURES

Figure 3-4 shows elevation maps created with data collected using LIDAR in North American Datum 1983 (NAD 83). The project area has a ground elevation ranging between approximately 25 and 80 feet. The eastern and western ends of the project area sit at elevations ranging from approximately 60 to 80 feet and the elevation dips along the Econlockhatchee River basin.

Hydrologic features and wetland areas mapped by the USFWS National Wetlands Inventory are shown in **Figure 3-5** through **3-6**. The nearest major water features besides the Econlockhatchee River are Lake Tanner and Corner Lake, both located approximately one mile north of the project corridor. According to the groundwater flow-pattern map from SJRWMD, groundwater flow in the project area is generally to the south-southeast.

Based on a review of data from the Florida Department of Health (2015), 71 potable wells are present within or adjacent to the project area. Most of these wells are concentrated in the eastern half on the project area and are associated with residential communities and commercial establishments. The project is not underlain by a Sole Source Aquifer as identified by the U.S. Environmental Protection Agency (USEPA).

According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (updated December 4, 2012), a large portion of the project corridor is located within Flood Zone X, which is a flood zone that has a 0.2% annual flood chance. Small portions of the project area are located within flood zones A and AE, which are flood zones that are inundated by the 100-year flood. There are many naturally occurring streams and drainageways located throughout the project area.

SOILS

The Natural Resources Conservation Service (NRCS) (2015) indicates that twelve soil types occur in the project area (**Table 3-1**, and **Figures 3-7** and **3-8**). Three hydric soil types, Sanibel muck, Samsula muck, and Wauberg fine sand, are mapped in the project area.

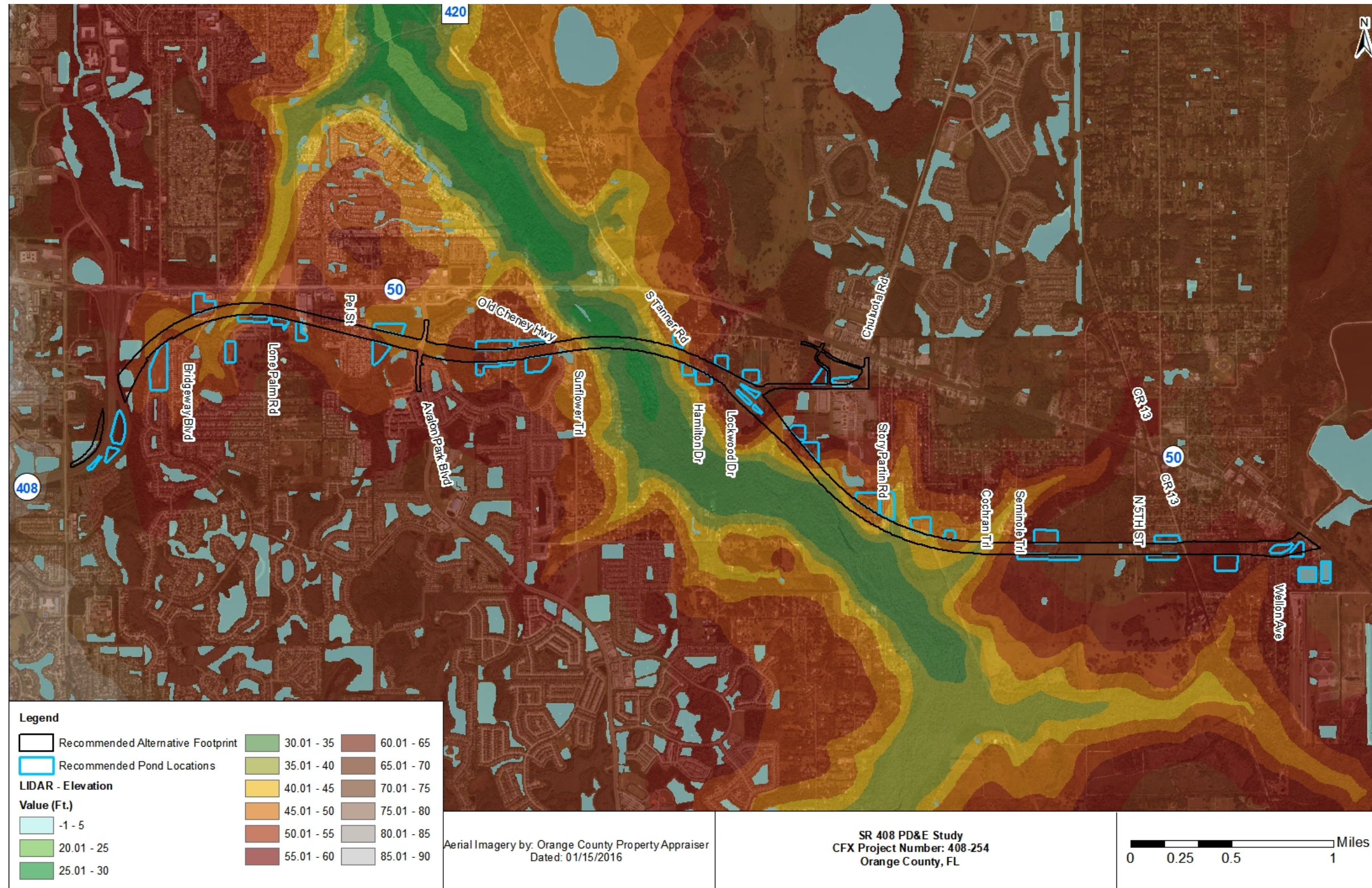


Figure 3-4 Elevation Map

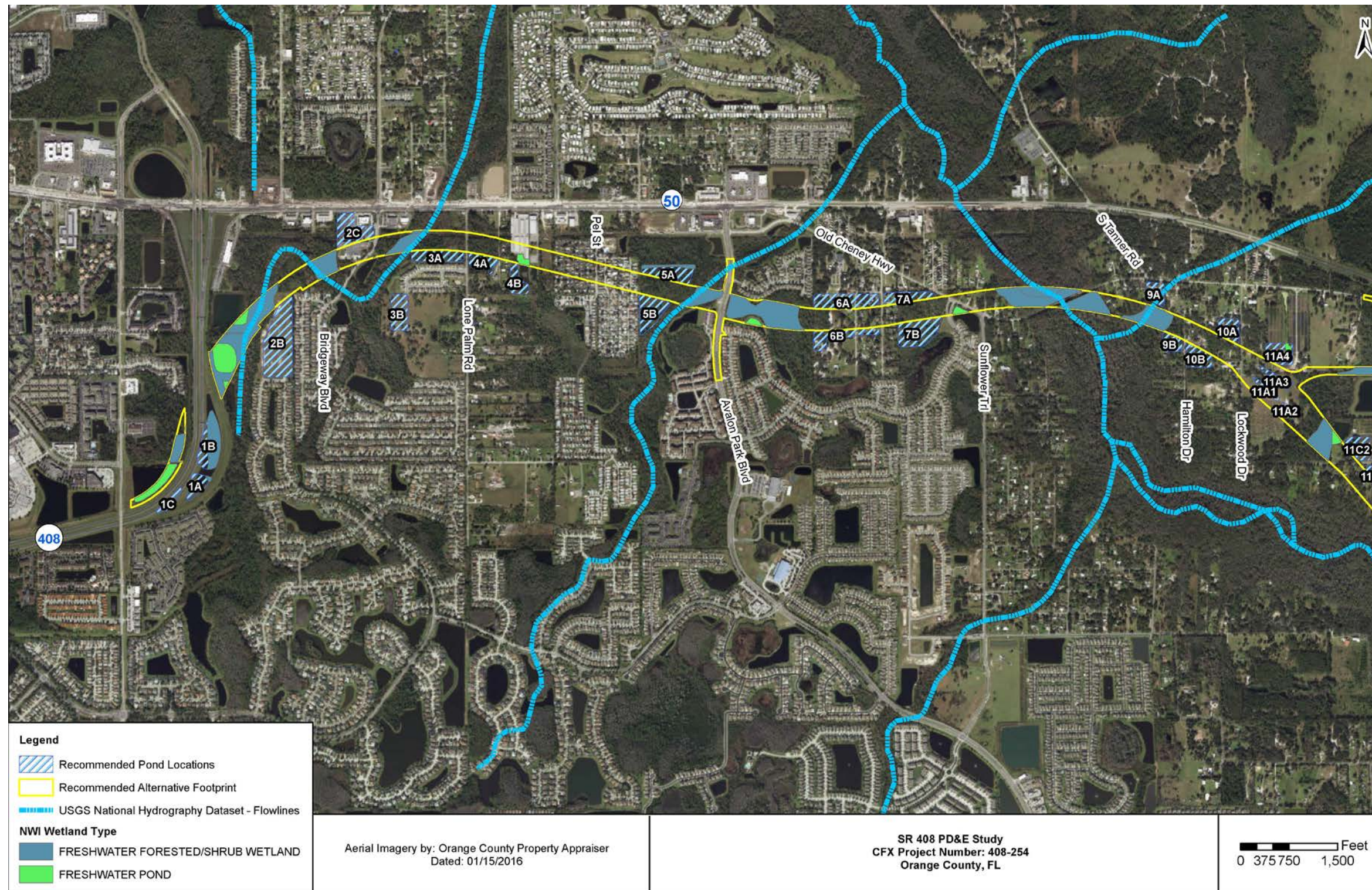


Figure 3-5 Hydrological Features and NWI Wetland Areas Along Western Half of Project Corridor

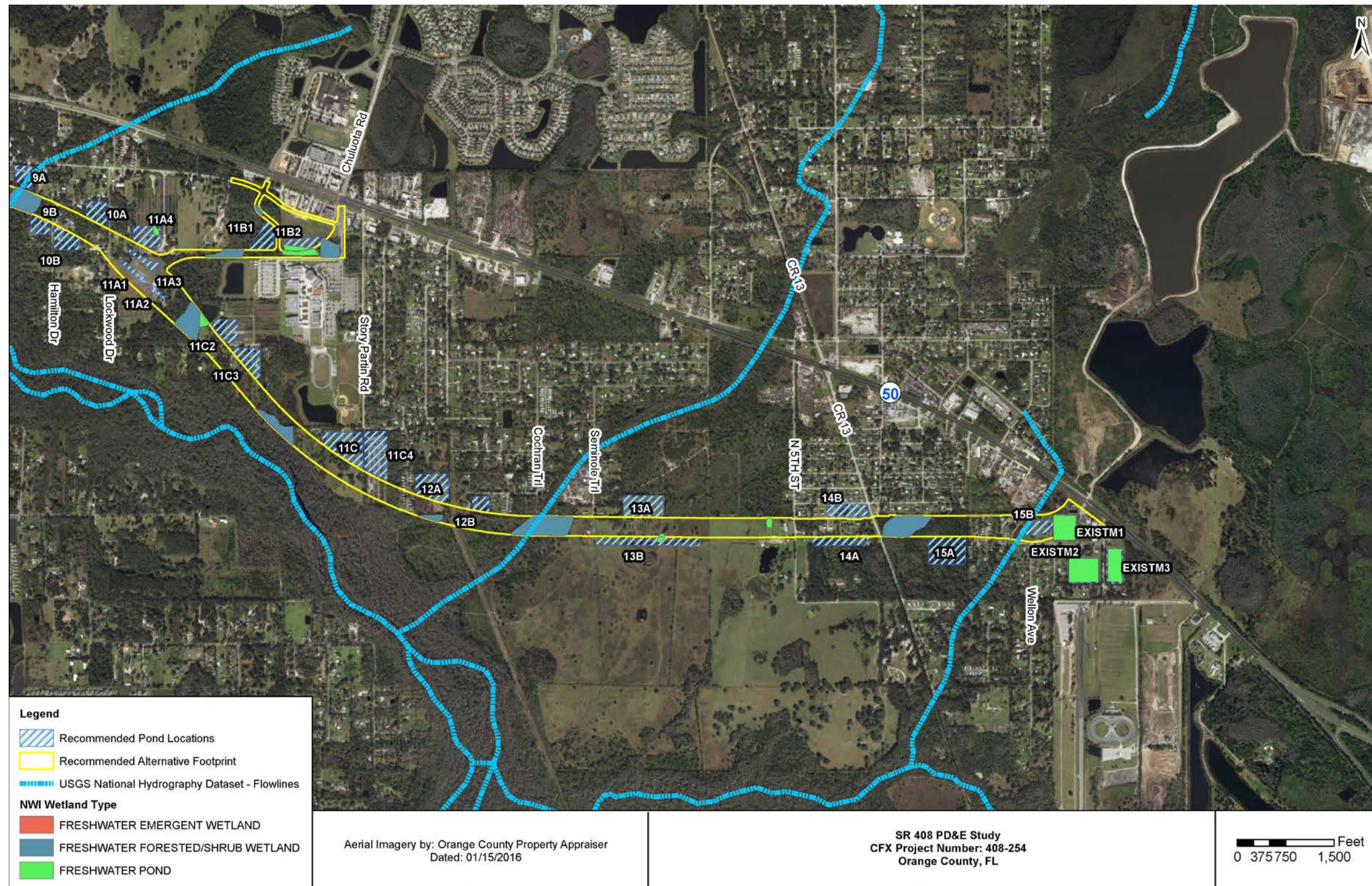


Figure 3-6 Hydrological Features and Wetland Areas Along Eastern Half of Project Corridor

Table 3-1 Soils

Soil Type	Slope	Characteristics
Felda fine sand	0 to 2 Percent	This soil consists of very deep, poorly drained and very poorly drained, moderately permeable soils in drainage ways, sloughs, depressions, flood plains and low flats of the southern flatwoods and the southern central Florida ridge. They formed in sandy and loamy marine deposits. Permeability is rapid to very slow depending on soil horizon. This is not a hydric soil.
Ona fine sand	0 to 2 Percent	This type consists of poorly drained, moderately permeable soils that formed in thick sandy marine sediments. They are in the flatwood areas of central and southern Florida. Permeability is moderate. This is not a hydric soil.
Basigner fine sand	0 to 2 Percent	This type consists of very deep, very poorly and poorly drained, rapidly permeable soil in low flats, sloughs, depressions and poorly defined drainage ways. They formed in sandy marine sediments. Permeability is rapid. This is not a hydric soil.
Pomello-Urban land complex	0 to 2 Percent	This soil type consists of nearly level, moderately well drained sandy soil that has been altered for use as building sites and is urban land or covered by houses, streets, driveways, buildings, and parking lots. Permeability is moderate where infrastructure is absent. This is a not a hydric soil.
St. Johns fine sand	0 to 2 Percent	This soil type consists of very deep, very poorly or poorly drained, moderately permeable soils on broad flats and depressions of the lower Coastal Plain. They formed in sandy marine sediments. Permeability is moderate. This is not a hydric soil.
Smyrna-Smyrna wet fine sand	0 to 2 Percent	This soil type consists of very deep, poorly to very poorly drained soils formed in thick deposits of sandy marine material. Permeability is rapid to moderate. This is not a hydric soil.
Wabasso fine sand	0 to 2 Percent	This soil type consists of very deep, very poorly and poorly drained, slowly permeable soils on flatwoods, flood plains and depressions in the southern Florida flatwoods and to a less extent in the south-central Florida ridge, southern Florida lowlands and Florida Everglades and associated areas. They formed in sandy and loamy marine sediments. Permeability ranges from rapid to slow depending on soil horizon. This is not a hydric soil.
Sanibel muck	>2 Percent	This soil type consists of nearly level, deep, very poorly drained soil that has a muck surface layer over sandy mineral material located in ponds, drainageways and low broad flats. Permeability is rapid. This is a hydric soil.
Zolfo fine sand	0 to 5 Percent	This soil type consists of very deep, somewhat poorly drained soils that formed in thick beds of sandy marine deposits. These soils are on low broad landscapes that are slightly higher than adjacent flatwoods on the lower coastal plain of central Florida. Permeability is rapid to moderate. This is not a hydric soil.
Immokalee fine sand	0 to 5 Percent	This soil type consists of very deep, very poorly and poorly drained soils on flatwoods and in depressions primarily in the southern Florida flatwoods, but also occurs in the south-central Florida ridge, Florida Everglades and associated areas and the southern Florida lowlands of peninsular Florida. They formed in sandy marine sediments. Permeability is very rapid to moderate. This is not a hydric soil.
Samsula muck	>2 Percent	This soil type consists of very deep, very poorly drained, rapidly permeable soils that formed in moderately thick beds of hydrophytic plant remains and are underlain by sandy marine sediments in narrow to broad swamps and depressional areas in the flatwoods. Permeability is rapid. This is a hydric soil.
Wauberg Fine Sand	0 to 2 Percent	This soil type is nearly level, poorly drained, and found in low areas on the flatwoods. Permeability is very slow, forming thick beds of loamy marine sediments within large prairie areas. Water capacity is low to medium in the surface layer, subsoil, and substratum. It is very low to low in the subsurface. This soil is well suited to improved pasture grasses, but has severe limitations for building site development, sanitary facilities, and recreational uses. This is a hydric soil.

*Source NRCS 2015

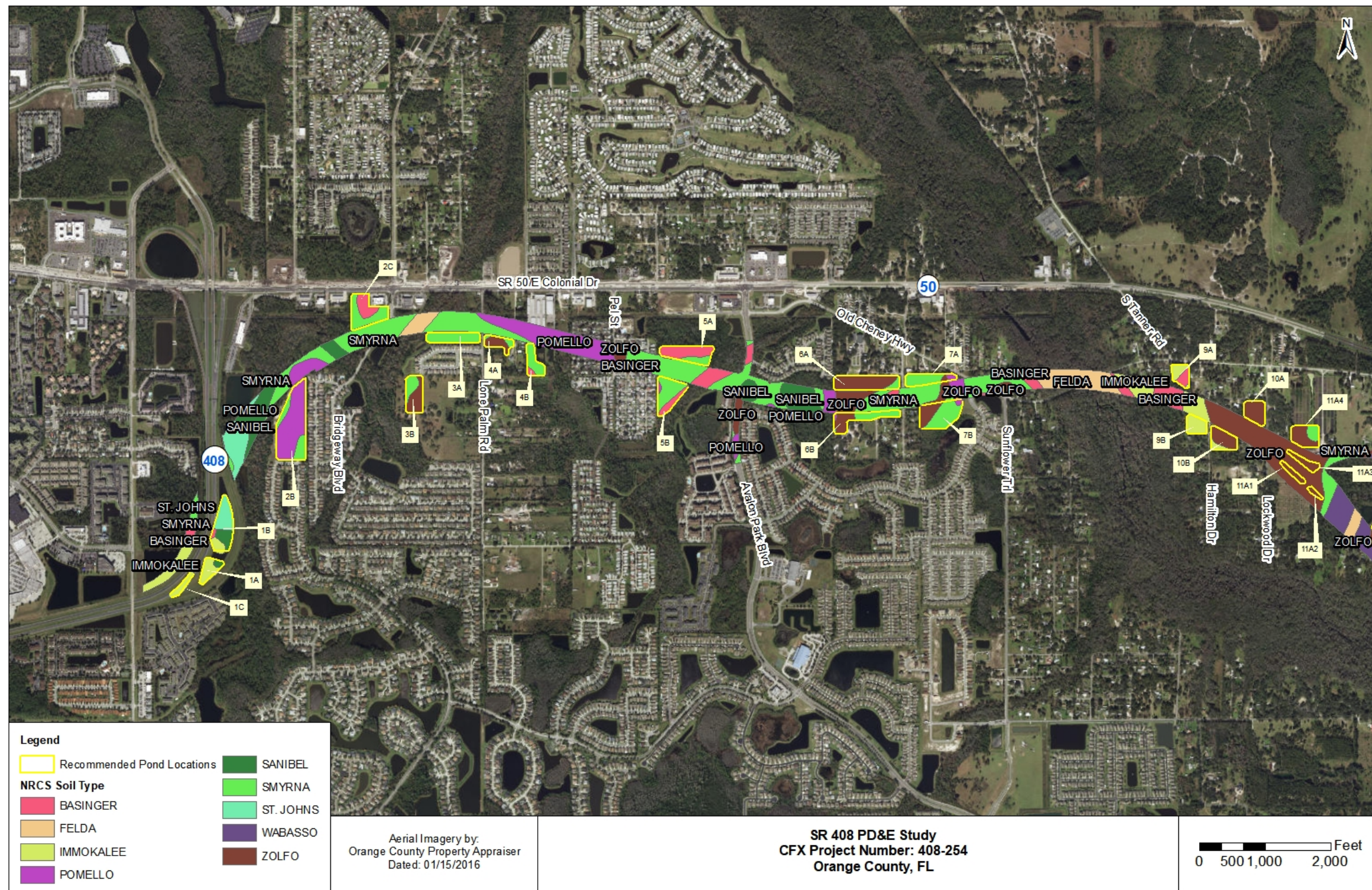


Figure 3-7 Soil Types in the Western Half of the Project Corridor

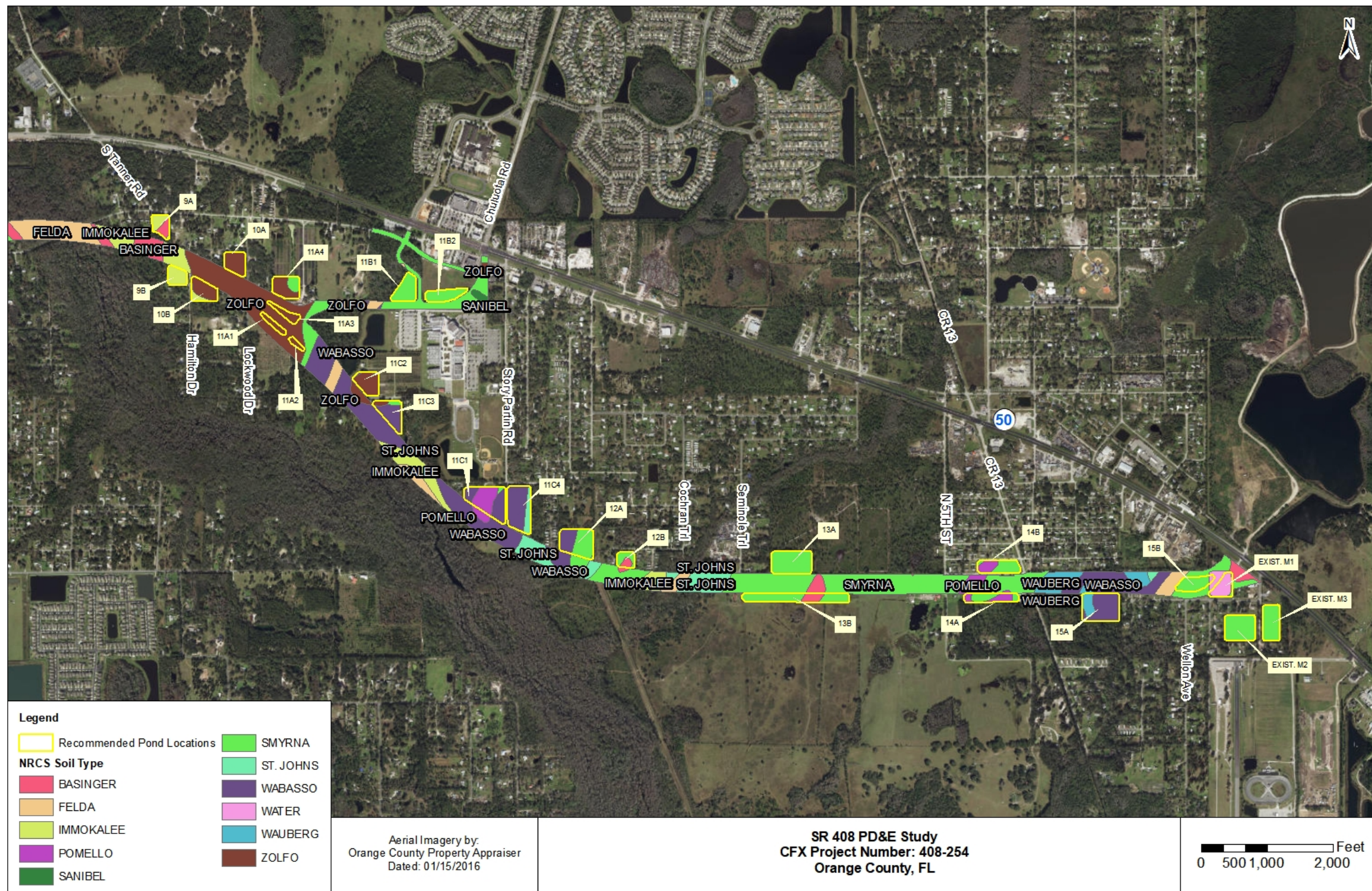


Figure 3-8 Soil Types in the Eastern Half of the Project Corridor

4.0 PROJECT ALTERNATIVES

The alternatives considered for the eastern extension of SR 408 include the No Build Alternative and several Build Alternatives. A multiphase alternative development evaluation and selection process was employed to properly assess all alternatives considered for the proposed SR 408 eastern extension.

NO BUILD ALTERNATIVE

The “No Build” Alternative would result in the retainage of the existing SR 408 facility without providing an eastern extension. The only existing principal arterial facility (i.e., SR 50) within the project confines is inadequate in terms of meeting future capacity needs, and failure to provide a SR 408 eastern extension would not solve any of the stated project goals. These goals include the provision of additional west-east capacity, desirable redundancy in evacuation and emergency response, and the required additional regional connectivity to I-95 on the east. Although the “No Build” Alternative does not solve any of the project deficiencies, it does provide a baseline condition by which other project alternatives can be compared throughout the project alternative selection process.

BUILD ALTERNATIVES

Several alternative corridors were developed based on constraint mapping and input from the Project and Environmental Advisory Groups. Each alternative corridor represents a 400-foot wide area for the purpose of assessing community and environmental impacts. The need for enhancement is related to the predicted unsatisfactory future operating conditions, as reflected in the traffic analysis, if no action is taken. In addition, each alternative corridor was evaluated for its ability to satisfy the purpose and need, and their effect with respect to engineering, cost, socio-economic, and environmental issues.

A preliminary evaluation determined that Alternative Corridors 1, 4, 4-2, 4-3, 4-6, 5 and 5-4 warranted further evaluation (see **Figure 4-1**). In order to check the validity of the

analysis a multi-objective approach using weighted numerical/descriptive technique was used for the remaining 7 alternative corridors. The results obtained showed that Alternative Corridors 1, 4-3, 4-6, and 5 were clearly inferior and thus eliminated from further consideration.

Table 4-1 illustrates the general performance of the three-remaining competing alternative corridors. According to the table, Alternative Corridor 5-4 is the best option in terms of engineering features, but the worst in terms of socio-economic and right-of-way impacts. In addition, it will most likely generate significant controversy due to its high right-of-way and community cohesion impacts. Alternative Corridors 4 and 4-2 are mostly similar within the first two segments with Alternative Corridor 4 performing slightly better within segment 3 in terms of minimizing right-of-way impacts.

In summary, results indicate that Alternative Corridor 4 is the best choice to fulfill the project objectives. This option is generally in close proximity to the SR 50 corridor and could provide an effective limited access eastern extension of SR 408 from its present western terminus just west of SR 434 to the vicinity of the SR 50 and SR 520 junction. Most of the local trips within this alternative corridor would be serviced by SR 50 while the proposed SR 408 extension would greatly enhance the mobility and linkage needs of the project area. It should be noted that this alternative corridor does offer the possibility to provide future extension options, further increasing the system linkage between east Orange County and Brevard County.

The next steps involve the generation of various alternatives within the selected alternative corridor which strive to minimize the projected impacts and deficiencies and optimize the provision of an effective SR 408 eastern extension.

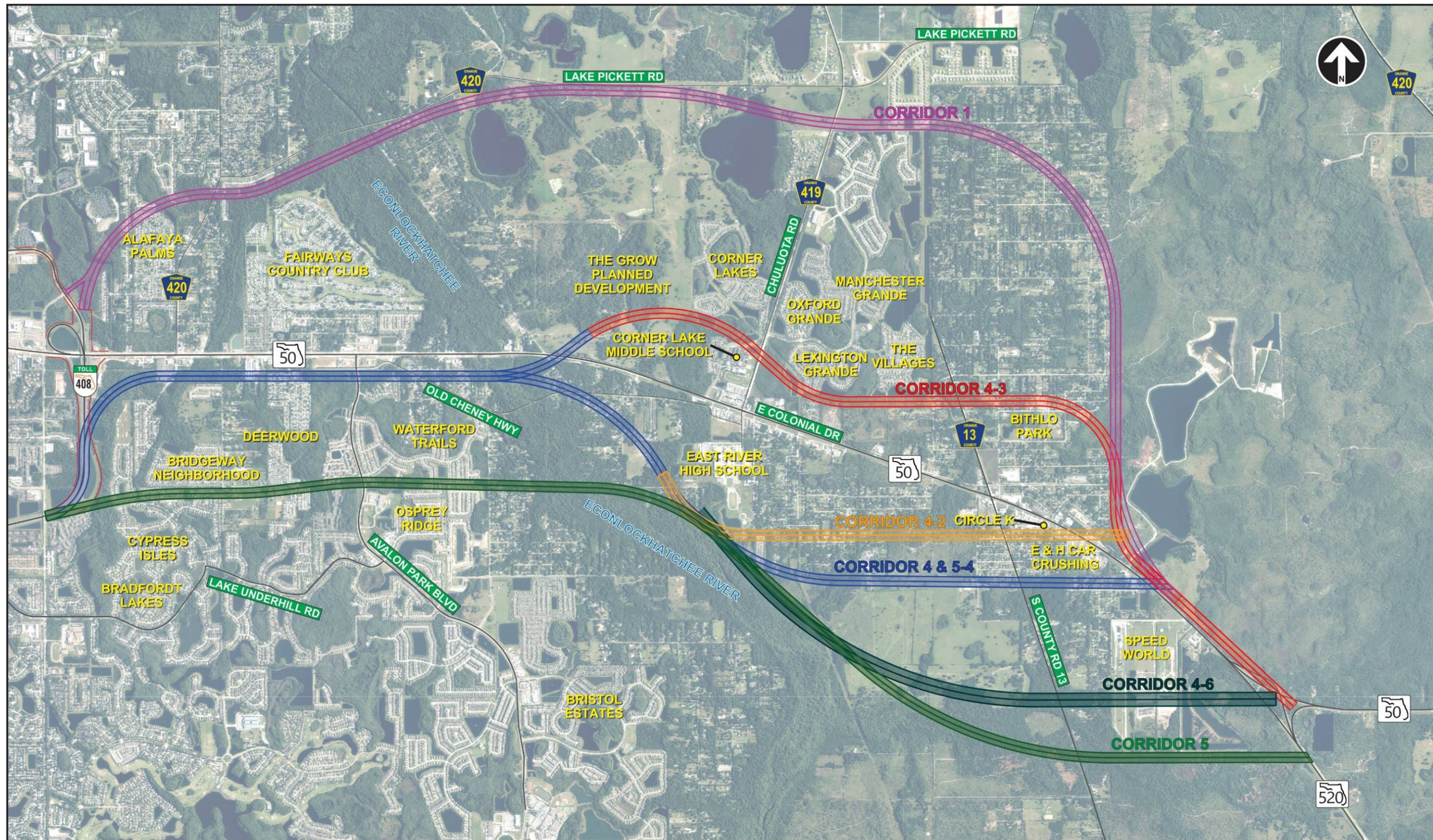


Figure 4-1 Alternative Corridors

Table 4-1 Pre-Final Alternative Corridor Results

DECISIONAL COMPONENTS ALTERNATIVES	ENGINEERING	ENVIRONMENTAL	SOCIO-ECONOMIC	COST
4	<ul style="list-style-type: none"> Provides high traffic attraction and congestion relief to SR 50 Relatively minor utility conflicts 	<ul style="list-style-type: none"> Good alternative with only minor impacts to ecological connectivity, Outstanding Florida Waters, SJRWMD land management easements and water/wastewater/ Solid waste facilities. 	<ul style="list-style-type: none"> Generally, the best option in terms of minimizing or avoiding right-of-way impacts to private and public properties, historic/ archaeological sites, etc. 	<ul style="list-style-type: none"> Modestly higher construction cost than the other two options but with much lower right-of-way impacts (204 total parcel impacts)
4-2	<ul style="list-style-type: none"> Generally similar to Alternative 4 for first two segments. Slightly less effective within Segment 3 in terms of traffic attraction and congestion relief to SR 50. Similar to Alternative 4 in terms of utility conflicts. 	<ul style="list-style-type: none"> Generally, the best option due to minimum impacts to wetlands wildlife and habitat, ecological connectivity, Outstanding Florida Waters, SJRWMD land management and regulatory easements and water/wastewater/ Solid waste facilities. 	<ul style="list-style-type: none"> Generally similar to alternative 4 for first two segments but slightly less effective within Segment 3. Similar to alternative 4 in terms of controversy potential within the first two segments with more right-of-way impacts to private and public properties in Segment 3 due to the slightly northern shift of the corridor. 	<ul style="list-style-type: none"> Lowest construction cost of remaining options, but significant right-of-way impacts to approximately 313 parcels
5-4	<ul style="list-style-type: none"> Generally, the best option in terms of higher traffic attraction and provision of congestion relief to SR 50. Relatively minor utility conflicts 	<ul style="list-style-type: none"> Generally comparable with Alternative 4 	<ul style="list-style-type: none"> Generally, the worst option due to its significant impacts to residential and commercial properties. Corridor negatively affects community cohesion and is contrary to future land use plans. Major Controversy potential expected due to its high right-of-way and cohesion impacts. 	<ul style="list-style-type: none"> Generally similar construction cost than Alternative 4-2 but with the highest right-of-way impacts of all options (343 total parcel impacts)

Project Segmentation

The project area was divided into distinct segments to ensure that the generated alternatives are more responsive to the needs of each segment rather than only to the generalized project's needs. **Figure 4-2** illustrates the project segmental breakdown and description. Each segment has rather unique characteristics as well as potential differences in environmental, engineering and socio-economic features.

- Segment 1 (the study area west of the Econlockhatchee River) is generally more urbanized and exhibits a higher traffic demand than Segments 2 and 3.
- Segment 2 (the area between the Econlockhatchee River and County Road 419 (Chuluota Road)) is more rural in nature and generally serves a lower density area with higher expected development growth.
- Segment 3 (from Chuluota Road to the eastern project terminus) has mostly industrial and low density residential development with a lower traffic demand.

RECOMMENDED ALTERNATIVE

After a comprehensive evaluation process, one alternative was selected as being the most effective option within each of the project's segments. This alternative is illustrated in **Figure 4-3**. In general, the recommended alternative is the result of the generation and evaluation of various typical sections and horizontal and vertical alignment combinations along the three project segments as well as various interchange configurations at each access point.

The typical sections for the recommended alternative are depicted in **Figure 4-4**.

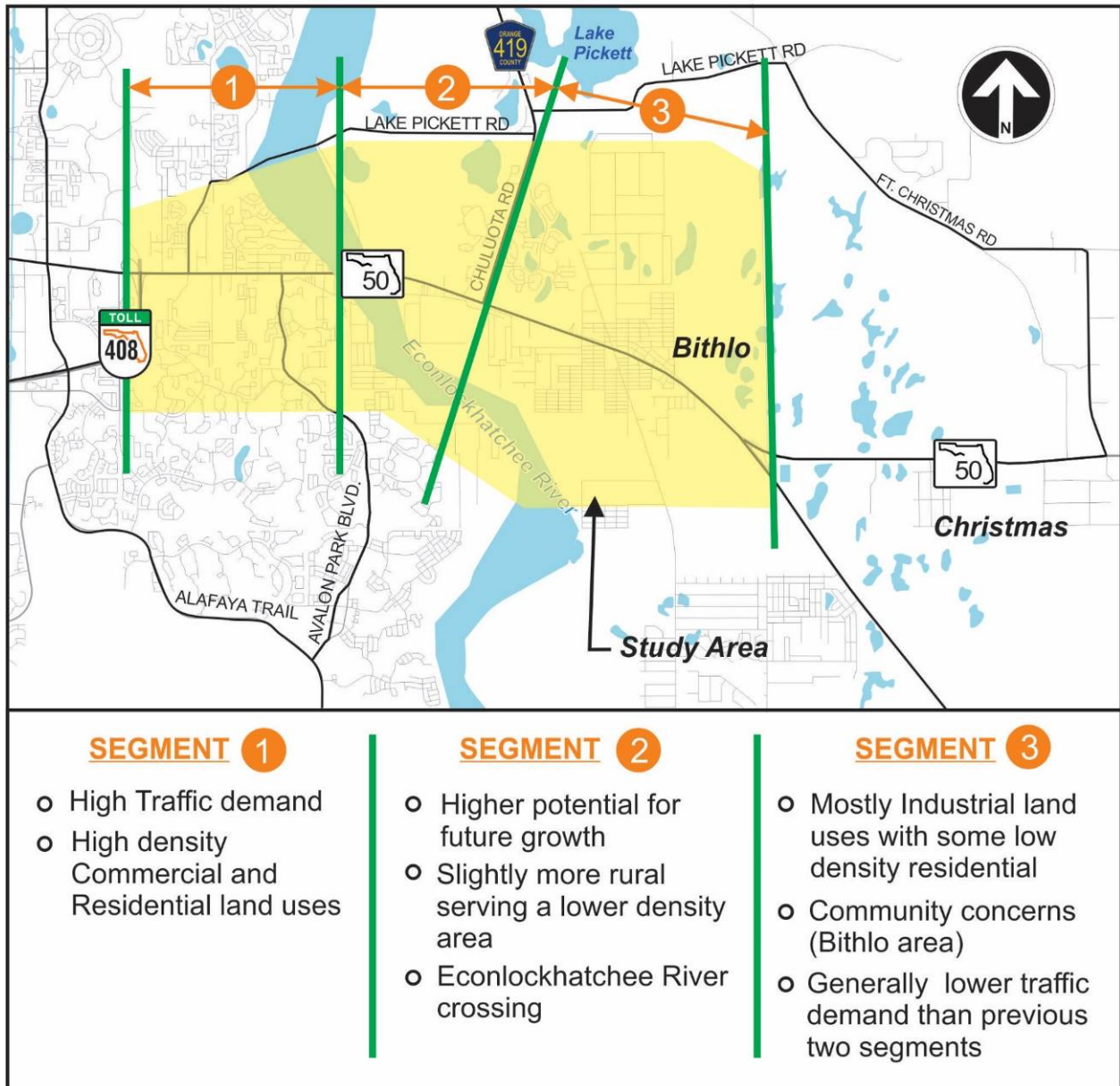


Figure 4-2 Segmental Breakdown

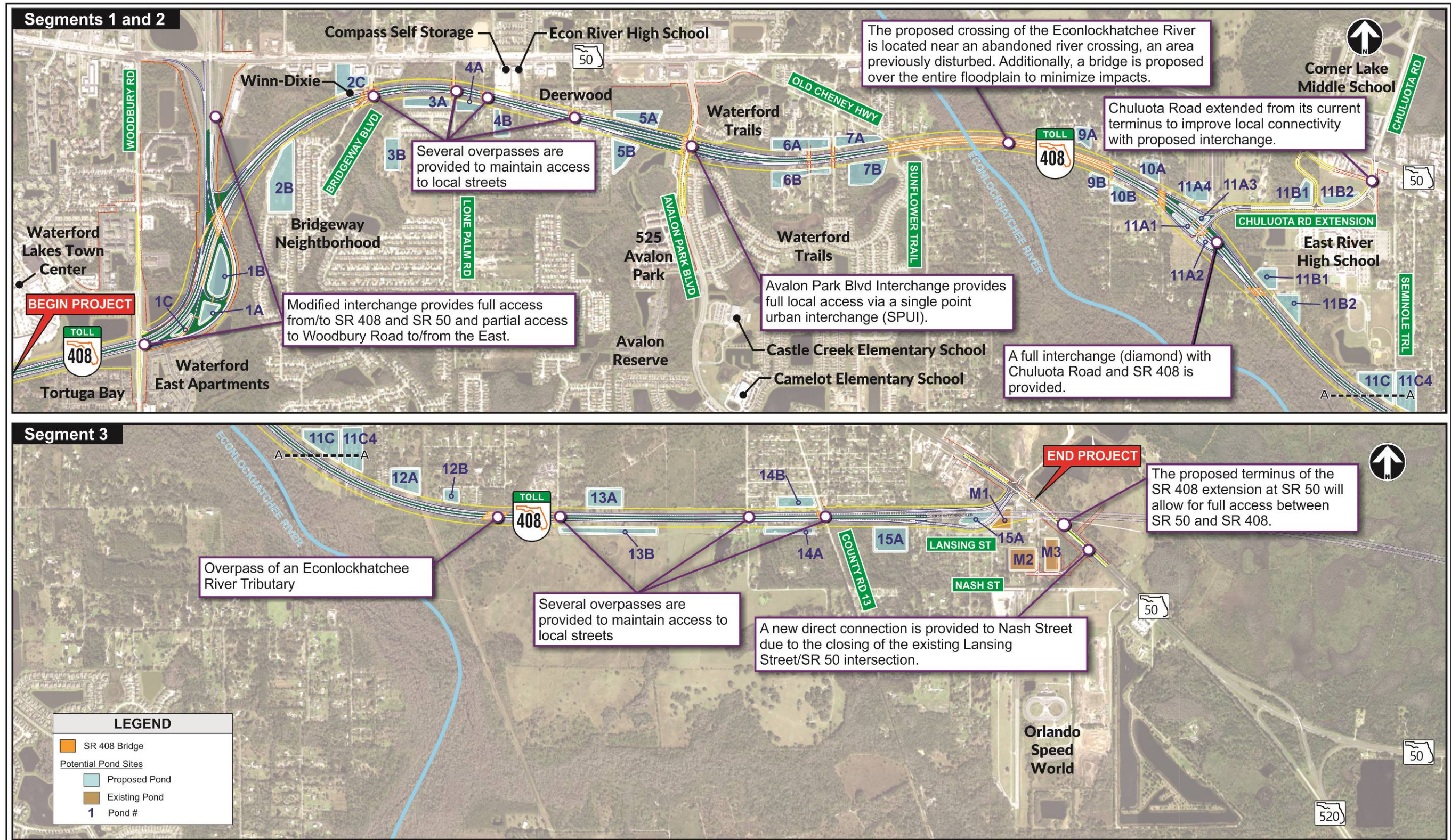


Figure 4-3 Recommended Alternative

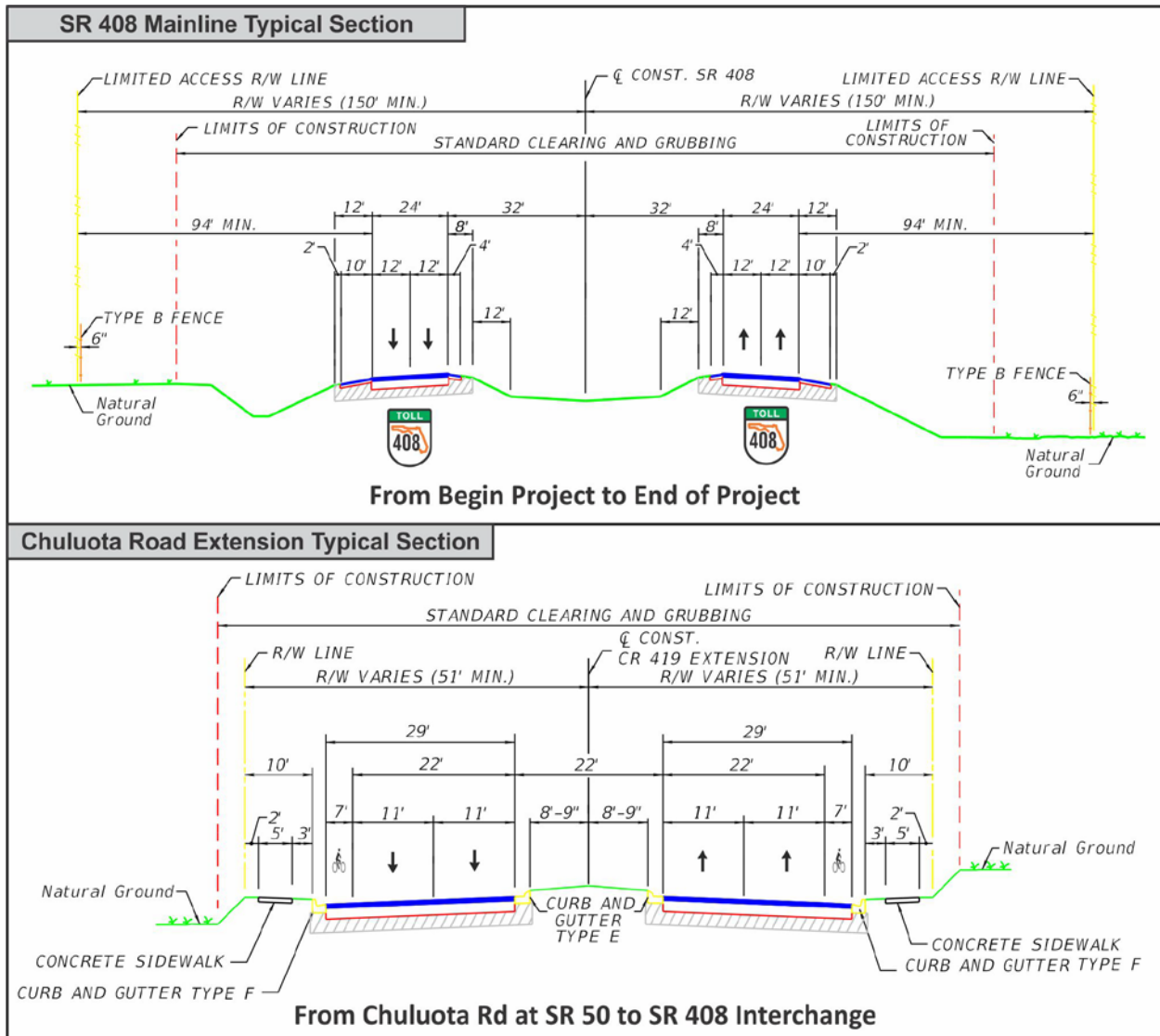


Figure 4-4 Recommended Alternative Typical Sections

A brief description of the recommended alternative per segment follows.

- Segment 1:** Within Segment 1, the recommended alternative features a four-lane rural expressway typical section with 12-foot travel lanes, 12-foot outside shoulders, a 64-foot divided median, and a 94-foot border width. The section will feature several grade separations in order to provide access to local streets. There has also been a modification at the SR 408 at SR 50/Challenger Parkway interchange to provide full access between SR 50/Challenger Parkway and SR 408. In addition, a half interchange at Woodbury Road (Woodbury Road to Eastbound SR 408 and Westbound SR 408 to Woodbury Road) has been

provided. Based on the results of the traffic modeling, a full single point urban interchange is proposed at Avalon Park Boulevard. **Figure 4-3** (top panel) shows some of the most distinctive features of this option within Segment 1, and **Figure 4-4** (top panel) shows the typical section. Sixteen (16) potential pond sites are located in Segment 1 (see **Table 4-2**).

- **Segment 2:** Within Segment 2, the recommended alternative features the same typical section previously described under Segment 1. Based on the results of the traffic modeling, a full diamond interchange as well as extension of Chuluota Road/CR 419 is proposed. The extension of Chuluota Road features an urban typical section with 11-foot travel lanes, curb and gutter, and 5-foot sidewalks on both sides of the roadway. **Figure 4-3** (top panel) shows some of the most distinctive features of the alternative within Segment 2 and **Figure 4-4** (middle panel) shows the typical section for the mainline of SR 408 and **Figure 4-4** (bottom panel) shows the typical section for the Chuluota Road extension. Eleven (11) potential ponds locations are proposed in Segment 2 (see **Table 4-2**).
- **Segment 3:** Within Segment 3, the recommended alternative features the same typical section previously described under Segment 1. Some of the most important attributes within Segment 3 are shown on **Figure 4-3** (bottom panel) and **Figure 4-4** (middle panel) shows the typical section. Seven (7) potential pond locations are proposed in Segment 3 (see **Table 4-2**).

In addition to the recommended alternative, the Pond Siting Report associated with this PD&E study proposed 40 stormwater ponds. Those proposed stormwater pond locations are shown in **Table 4-2** and **Figures 3-1** to **3-8** and are evaluated in this document.

Table 4-2 Summary of Recommended Pond Sites

Pond Number	Approximate Size (acres)		Pond Number	Approximate Size (acres)
1A	2		11A2	0.4
1B	5.1		11A3	1.2
1C	1.1		11A4	3
2B	10.2		11B1	2.6
2C	4.7		11B2	2.3
3B	3.4		11C1	5.7
3A	3.1		11C2	2.6
4A	1.8		11C3	3.1
4B	2		11C4	5.5
5A	4		12A	4.7
5B	4		12B	1.4
6A	5		13A	4.8
6B	3.4		13B	5
7A	2.6		14A	2.6
7B	5.3		14B	2.8
9A	1.9		15A	5.6
9B	1.8		15B	2.3
10A	2.4		Existing M1	2.2
10B	2.7		Existing M2	4
11A1	0.9		Existing M3	3.1
APPROX. TOTAL POND IMPACTS			132.3 acres	

5.0 METHODOLOGY

This project was evaluated for impacts to wildlife, habitat resources, protected species, and wetlands in accordance with 50 Code of Federal Regulations (CFR) Part 402 of the Endangered Species Act (ESA) of 1973, as amended. This document follows the guidance in Chapter 16: Protected Species and Habitat and Chapter 9: Wetlands and Surface Waters in Part 2 of the FDOT PD&E Manual. The following definitions, data sources, and methods were used to evaluate wildlife species, habitats, wetlands, surface waters, and EFH in the project area. No notable data gaps were identified. Pertinent ETDM comments are presented along with responses in Section 9.0.

LISTED SPECIES AND HABITATS

Preliminary data collection utilized literature reviews, agency coordination and database searches to identify federal and state protected species from Orange County with potential to occur in or near the project corridor. Federal and state listed species with potential to occur in the project corridor were identified through coordination with USFWS and FWC as well additional research and field investigations. Known localities were identified using the FNAI element occurrences database as well as additional USFWS and FWC databases and resources. Habitats were mapped primarily using SJRWMD land use data as well as USFWS National Wetlands Inventory (NWI) maps and other resources, then verified in the field. Determinations of wood stork SFH follow the definitions described in the USFWS *Habitat Management Guidelines for the Wood Stork in the Southeast Region* (USFWS 1990) (**Appendix A**).

WETLANDS

Wetlands, as stated in Section 373.019(27) Florida Statute (F.S.) and 33 CFR 328.3(b) and as used by the U.S. Army Corps of Engineers (USACE) in administering Section 404 of the Clean Water Act, are defined as “those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.”

Surface waters are considered by Section 373.019(21) F.S. to be waters on the surface of the earth, contained in bounds created naturally or artificially, including, the Atlantic Ocean, the Gulf of Mexico, bays, bayous, sounds, estuaries, lagoons, lakes, ponds, impoundments, rivers, streams, springs, creeks, branches, sloughs, tributaries, and other watercourses. Regulatory agencies do not typically require mitigation for impacts to surface waters other than wetlands.

The SJRWMD RHPZ in the project corridor includes the Econlockhatchee River and associated wetlands and uplands. It covers wetlands abutting the river as well as uplands within 50 feet landward of the landward extent of those wetlands and uplands within 550 feet landward of the streams edge.

Wetlands, Other Surface Waters (OSW), and EFH were sought in the project area and within the project corridor during field surveys. Wetlands and OSW were delineated using three parameters as indicators of wetlands: presence of hydrophytic vegetation, hydric soils, and hydrology, utilizing methodologies consistent with the USACE *Federal Manual for Identifying and Delineating Jurisdictional Wetlands* (1987), the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region* (2010), Chapter 62-340, Florida Administrative Code, and the *Florida Wetlands Delineation Manual* (FDEP 1995). Wetland map data is provided by FLUCCS code by the SJRWMD and also by the USFWS NWI. Areas mapped as wetlands by the NWI were confirmed to generally be included in the wetland areas mapped by SJRWMD.

DATA COLLECTION

Information sources and databases utilized for assessment of potential impacts to wildlife and wetlands include the following:

- Preliminary Program Screening Report for SR 408 East Extension Project
- U.S. Fish and Wildlife Service (USFWS) Environmental Conservation Online System
- Florida Natural Areas Inventory (FNAI) element occurrences database

- Florida Fish and Wildlife Conservation Commission (FWC) databases
- USFWS NWI maps
- FWC Water Bird Locator (<http://atoll.floridamarine.org/waterBirds/>)
- FWC Bald Eagle Nest Locator
- FWC's Strategic Habitat Conservation Areas
- USFWS wood stork (*Mycteria americana*) nesting colonies map tool
- SJRWMD databases
- NRCS Soil Map Data
- GIS data layer for Orange County Green PLACES (Park Land Acquisition for Conservation and Environmental Protection)
- SJRWMD GIS data layers on SJRWMD easements (<https://www.sjrwmd.com/data/>)

FIELD INVESTIGATIONS

Field investigations were conducted to evaluate habitat potential and species occurrences. Initial field work was conducted as part of an earlier PD&E study along SR 50 on October 20 and 21 and December 17, 2015. Field investigations for wildlife and wetlands were also conducted on May 31 and June 8, 2017. Field maps showing land use/land cover types, wetlands, and wildlife occurrences from preliminary data sources were available during field investigations. Field personnel compared the land cover/land use types reported by SJRWMD to field observations in order to highlight any recent changes in land use/land cover.

6.0 NATURAL RESOURCES INVENTORY

LISTED SPECIES AND WILDLIFE HABITATS

Species addressed in this NRE are listed in **Table 6-1** and discussed below. Federally listed species with potential to occur in the project area include Audubon's crested caracara (*Caracara plancus audubonii*), Everglade snail kite (*Rostrhamus sociabilis plumbeus*), Florida scrub-jay (*Aphelocoma coerulescens*), wood stork (*Mycteria americana*), red-cockaded woodpecker (*Picoides borealis*), eastern indigo snake (*Drymarchon corais couperi*), Britton's beargrass (*Nolina brittoniana*), Florida bonamia (*Bonamia grandiflora*), beautiful pawpaw (*Deeringothamnus pulchellus*), papery whitlow-wort (*Paronychia chartacea*), and scrub wild buckwheat (*Eriogonum longifolium* var. *gnalphalifolium*).

State listed species with potential to occur in the project area include burrowing owl (*Athene cunicularia*), Florida pine snake (*Pituophis melanoleucus mugitus*), Florida sandhill crane (*Grus canadensis pratensis*), gopher tortoise (*Gopherus polyphemus*) (also a candidate for Federal listing), little blue heron (*Egretta caerulea*), roseate spoonbill (*Platalea ajaja*), Sherman's fox squirrel (*Sciurus niger shermani*), southeastern American kestrel (*Falco sparverius paulus*) and tri-colored heron (*Egretta tricolor*). In 2016, FWC delisted the Florida mouse (*Podomys floridanus*), gopher frog (*Lithobates capito*), limpkin (*Aramus guarauna*), snowy egret (*Egretta thula*), and white ibis (*Eudocimus albus*) (FWC 2016a). Because they were delisted, those species are not specifically addressed in this NRE.

The eastern diamondback rattlesnake (*Crotalus adamanteus*) was included in this NRE because in 2012 the USFWS announced a 90-day finding in response to a petition to list the eastern diamondback rattlesnake. The USFWS has initiated a status review to determine if the species warrants listing under the Endangered Species Act. Sand skinks are not addressed in this NRE because the elevation, range, and habitat types in the project area do not meet the requirements described in the *USFWS Peninsular Florida Species Conservation and Consultation Guide, Sand Skink and Blue-tailed Mole Skink* (USFWS 2015a). The striped newt (*Notophthalmus perstriatus*) is a candidate for

Federal listing and its range includes Orange County; however, it was not included in this NRE because the project corridor lacks suitable habitat, particularly shallow, isolated, ephemeral ponds required for breeding. Sandlace (*Polygonella myriophylla*) was not addressed in this NRE because the project area lacks suitable habitat and their known range does not extend as far east as the project area. Scrub lupine (*Lupinus aridorum*) was not included in this NRE because the project is east of its native range and does not include the Lakewood or St. Lucie series soils where it occurs. The bald eagle (*Haliaeetus leucocephalus*) is protected under the Bald and Golden Eagle Protection Act of 1940 and could occur in the project area.

No known listed species occurrences within the project corridor were noted in the FNAI element occurrences database or through the Advanced Notification process. Little blue herons, a tri-colored heron, a wood stork, sandhill cranes, and gopher tortoise burrows were observed during field investigations (**Figures 6-1** through **6-3**).

The project crosses the transition from urban sprawl associated with Orlando to the west, to broad and relatively undeveloped natural areas stretching from Bithlo east into Brevard County. Most of the natural habitats in the project area have been developed or heavily impacted, especially west of the Econlockhatchee River and around Bithlo.

The Econlockhatchee River corridor contains the river as well as associated riparian forest, wetland, and upland vegetation. It is high quality habitat for many wildlife species and is an important corridor assisting wildlife movements and continuity between habitat patches, including the St. Johns River corridor. South of the project the Econlockhatchee River corridor expands and is protected by various conservation lands in relatively large blocks of natural habitats.

Below is a description of each species presented in **Table 6-1** along with pertinent aspects of their ecology and conservation. The following sections also note any detections of listed species during field surveys and discuss presence and quality of potential habitat.

Table 6-1 Listed Species Potentially Occurring in or Near Project Corridor

Common Name	Scientific Name	Federal Status	State Status	Documented Occurrence in Project area
American alligator	<i>Alligator mississippiensis</i>	FT*	-	No
Audubon's crested caracara	<i>Polyborus plancus audubonii</i>	FT	-	No
Bald eagle	<i>Haliaeetus leucocephalus</i>	-	-	No
Burrowing owl	<i>Athene cunicularia</i>		ST	No
Eastern diamondback rattlesnake	<i>Crotalus adamanteus</i>	PFL	-	No
Eastern indigo snake	<i>Drymarchon corais couperi</i>	FT	-	No
Everglade snail kite	<i>Rostrhamus sociabilis plumbeus</i>	FE	-	No
Florida pine snake	<i>Pituophis melanoleucus mugitus</i>	-	T	No
Florida sandhill crane	<i>Grus canadensis pratensis</i>	-	ST	Yes
Florida scrub-Jay	<i>Aphelocoma coerulescens</i>	FT	-	No
Gopher tortoise	<i>Gopherus polyphemus</i>	FC	ST	Yes
Little blue heron	<i>Egretta caerulea</i>	-	T	No
Red-cockaded woodpecker	<i>Picoides borealis</i>	FE	-	No
Roseate spoonbill	<i>Platalea ajaja</i>	-	ST	No
Sherman's fox squirrel	<i>Sciurus niger shermani</i>	-	SSC	No
Southeastern American kestrel	<i>Falco sparverius paulus</i>	-	ST	No
Tri-colored heron	<i>Egretta tricolor</i>	-	T	Yes
Wood stork	<i>Mycteria americana</i>	FE	-	Yes
Beautiful pawpaw	<i>Deeringothamnus pulchellus</i>	FE	-	No
Britton's beargrass	<i>Nolina brittoniana</i>	FE	-	No
Florida bonamia	<i>Bonamia grandiflora</i>	FT	-	No
Papery whitlow-wort	<i>Paronychia chartacea</i>	FT	-	No
Scrub buckwheat	<i>Eriogonum longifolium</i> var. <i>gnaphalifolium</i>	FT	-	No

Notes: PFL= Petitioned for Federal Listing, FE= Federally Endangered, FT= Federally Threatened, FT*= Federally Threatened due to Similarity of Appearance, FC= Federal Candidate, ST= State-Threatened, SSC= State Species of Special Concern, SC- Federal Species of Concern

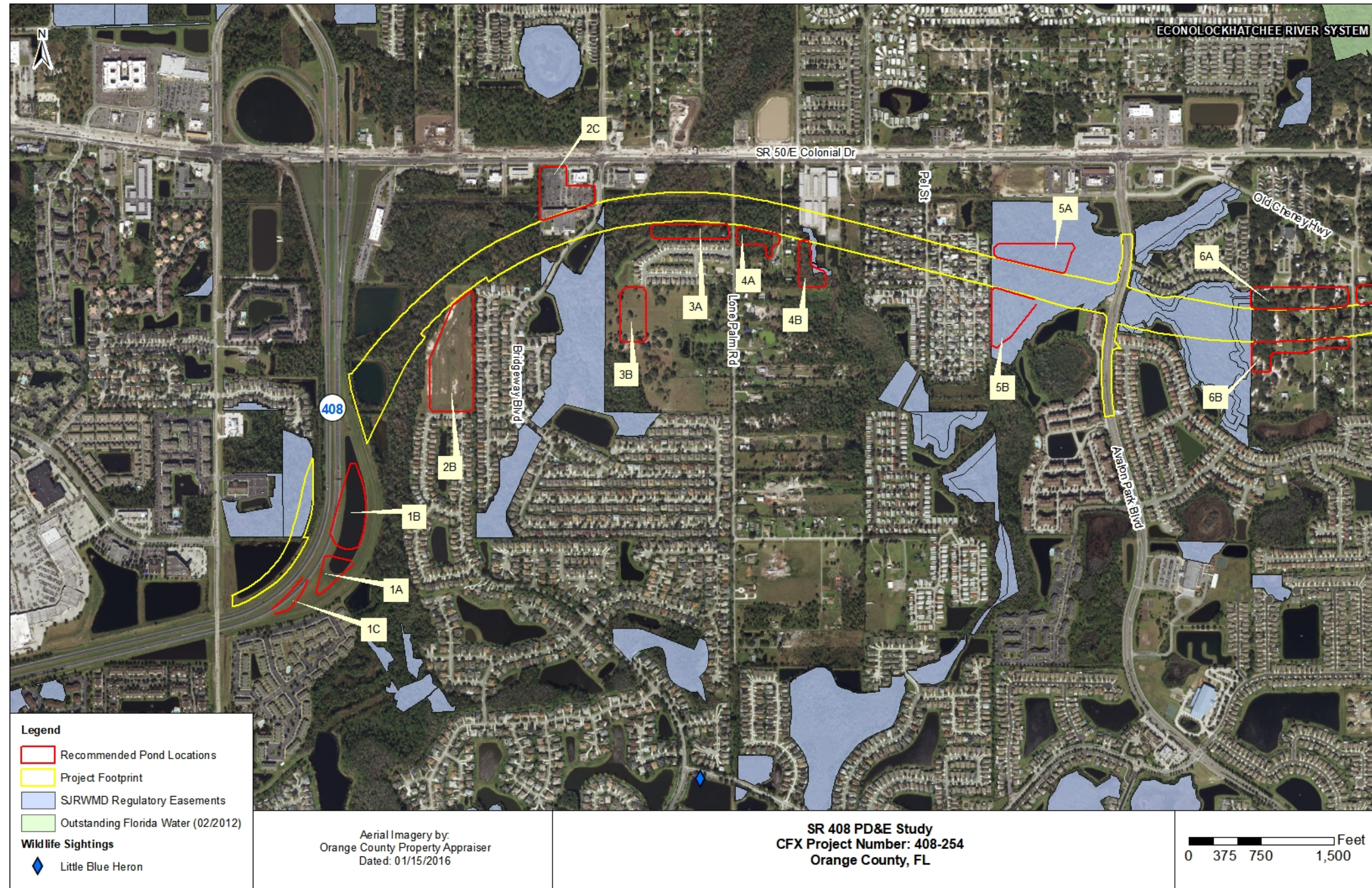


Figure 6-1 Special Designations in Western Third of Project

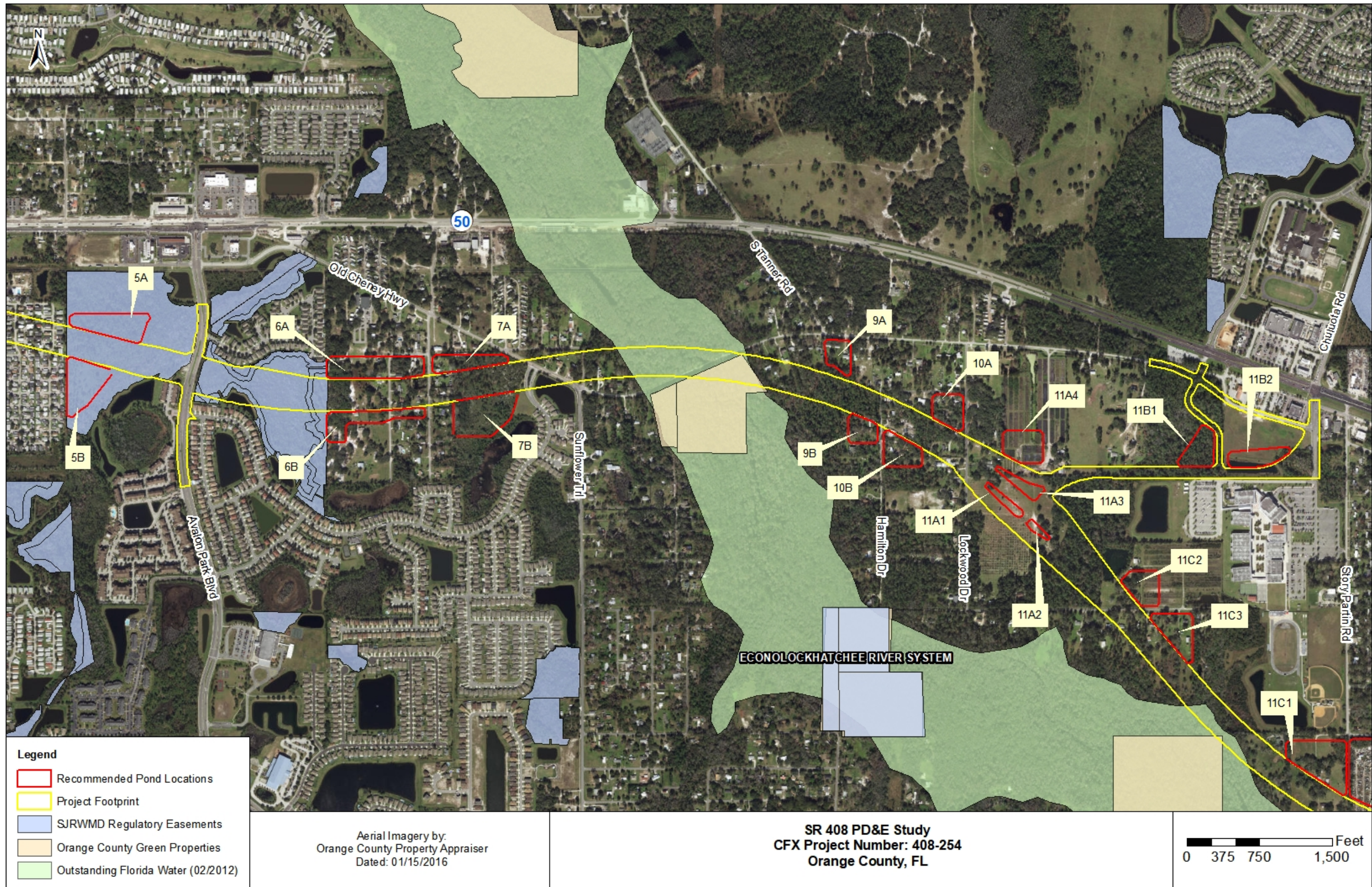


Figure 6-2 Special Designations in Central Third of Project

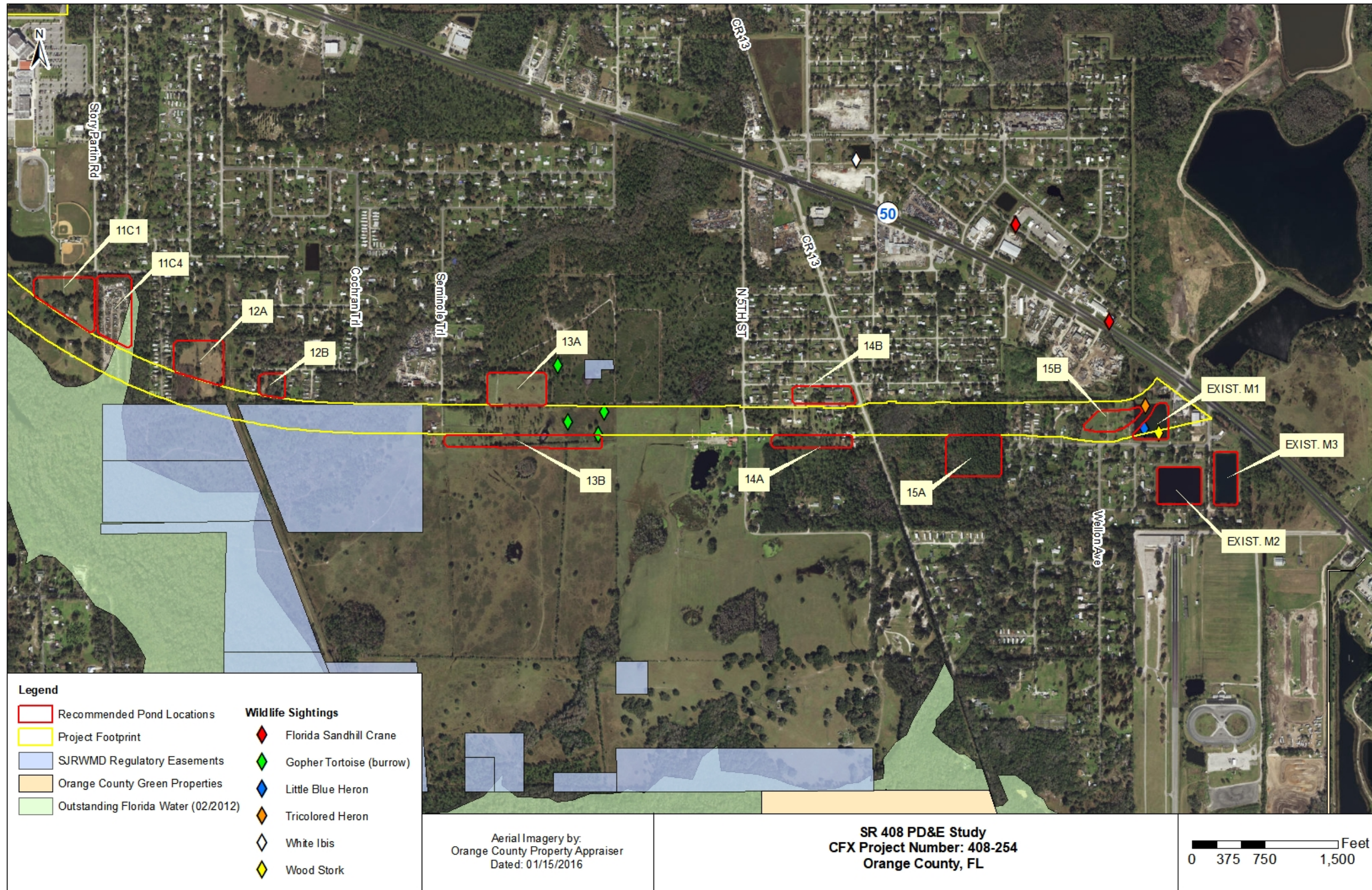


Figure 6-3 Special Designations in Eastern Third of Project

Federally Listed Animal Species

American alligator (Threatened due to similarity of appearance- Federal)

The American alligator is a large, semi-aquatic reptile that is listed due to its similarity of appearance with the American crocodile (*Crocodylus acutus*). American alligators primarily inhabit freshwater swamps and marshes, but also live in rivers, lakes, and smaller bodies of water. Crocodiles typically inhabit saltwater environments. American alligators range from coastal North Carolina to the Florida Keys, as far west as southern Texas, and north to southeastern Oklahoma and Arkansas (Florida Museum of Natural History, 2011).

The main threat facing the American alligator is the destruction and degradation of wetland habitat. Destruction of wetlands often occurs in conjunction with human development, and increased development also leads to increased negative human-alligator interactions that can result in mortality for alligators. American alligator eggs face predation from raccoons, bears, and other mammals, and juveniles also face danger from wading birds and bigger alligators (FWC 2016b). The American alligator was initially federally listed in 1967 as “endangered” and was later down-listed to “threatened”. In 1985, the American alligator was reclassified from “threatened” to “threatened due similarity of appearance” to the American crocodile. American alligator populations are now stable.

The project area contains potential habitat for American alligators in wetter areas including Reservoirs (FLUCCS 5300), Mixed Wetland Hardwoods (FLUCCS 6170), Cypress (FLUCCS 6210), Wetland Forested Mixed (FLUCCS 6300), Freshwater Marshes (FLUCCS 6410), and Mixed Scrub-Shrub Wetland (FLUCCS 6460). The Econlockhatchee River corridor is high quality potential habitat for American alligators. Alligators typically inhabit freshwater marshes and lakes and could occur in the project area; however, American crocodiles prefer saltwater habitats, which do not occur in the project area. No American alligators were observed during field surveys. There are no instances reported by FNAI of an American crocodile occurring anywhere in Orange

County and their range in the United States is restricted to south Florida. Because of a lack of sightings and because American alligators are mobile and able to leave areas of construction, a determination of ***may affect, not likely to adversely affect*** is recommended for this species.

Audubon's crested caracara (Threatened-Federal)

Audubon's crested caracara is a large raptor with a black body, buffy-white neck with black stripes, a grey bill, and exposed orange skin on its face. It bears a black "cap" with a prominent dark crest and has a long neck and legs. Audubon's crested caracara is a non-migratory subspecies that occurs in Florida and is isolated from other crested caracara populations (USFWS 2014a) in the southwestern United States (U.S.), Mexico, and Central America.

Audubon's crested caracara is most abundant in a five-county region (Glades, DeSoto, Highlands, Okeechobee, and Osceola counties) in central Florida. (USFWS 1989, USFWS 2017). The *USFWS Multi-Species Recovery Plan for South Florida* (USFWS 2017) notes the contraction in the species range and states that caracara are now rarely found as far north as Orlando in Orange County. The project occurs within but on the very edge of the caracara range as defined by the USFWS consultation area map for caracara.

Caracara inhabit dry and wet prairies with scattered cabbage palms (*Sabal palmetto*), lightly wooded areas, and pasturelands (USFWS 2014a). Audubon's crested caracara nest in the winter and early spring, with peak nesting in January and February. They often feed on carrion and will forage on the ground for insects, turtles, snakes, frogs, or fish. They occasionally eat larger animals like rabbits and cattle egrets and may perch on tall structures and scan for prey.

Audubon's crested caracara are primarily threatened by habitat loss through urbanization and conversion to agriculture. Caracaras are drawn to roadkill and vehicle collisions are another threat, especially as traffic on Florida roads increases (USFWS

1989). Because of a relatively small geographic range and small population size, a catastrophic event could cause significant declines in the population.

Caracara foraging habitat occurs throughout open vegetated portions of the project area as well as on the roads that are a source of roadkill. The project area contains potential nesting habitat for caracaras in pastures near the eastern project terminus, north of SR 50, opposite Orlando Speed World Dragway. There are no occurrences of caracaras in Orange County reported by FNAI or through interviews with Audubon Society members and other local bird enthusiasts. The nearest reported occurrence is from 9.8 miles east of the project, in Brevard County. No caracaras were detected during field investigations; however, breeding season nest surveys following USFWS protocols were not conducted because they were beyond the scope of the project. No caracaras were observed during surveys and the project is on the edge of their primary range (as identified by the USFWS caracara consultation area). For these reasons, a determination of ***may affect, not likely to adversely affect*** was made for this species.

Eastern diamondback rattlesnake (Petitioned for Federal Listing as Threatened)

The eastern diamondback rattlesnake has a diamond pattern on its dorsal side and a yellowish underbelly with a dark tail tipped with a rattle (Federal Register [FR] 2012). They inhabit pine flatwoods, longleaf pine and turkey oak, sand pine scrub, and coastal barrier islands. Displaced eastern diamondback rattlesnakes may occur in backyards and other developed areas. Historically the range of the eastern diamondback rattlesnake closely matched the extent of the longleaf pine savanna ecosystem and extended across the coastal plain of the southeastern U.S., from North Carolina to Florida and as far west as Mississippi and Louisiana (FR 2012). Populations of the eastern diamondback have been declining, predominantly due to habitat loss through conversion to agriculture, silviculture, urbanization, and from alterations to habitat resulting from fire suppression (FR 2012).

There are no known occurrences of eastern diamondback rattlesnakes in the project area. The nearest occurrence reported in the FNAI database is from 6.1 miles to the southeast. Within the project area, pine flatwoods, palmetto thickets, and other uplands,

particularly east of the Econlockhatchee River, are potential habitat for eastern diamondback rattlesnakes. The habitat in the project corridor is generally of low to medium quality because most of the natural upland habitats have been developed or used for ranching. If the eastern diamondback rattlesnake were to be listed, a determination of *may affect, not likely to adversely affect* would be anticipated.

Eastern indigo snake (Threatened- Federal)

The eastern indigo snake is a long, thick-bodied snake with glossy black, smooth scales that have iridescent blue highlights (USFWS 2014b). The eastern indigo snake preys on small mammals, birds, frogs, snakes, and lizards. It is not venomous but is also not a constrictor. Instead it overpowers its prey with its muscular jaws and often larger size, consuming the prey head-first.

The eastern indigo snake can be found in upland, sandhill, and flatland habitats dominated by mature longleaf pines, turkey oaks, and wiregrass in southern Georgia and in northern/northwestern Florida. In central, south central, and coastal Florida, the eastern indigo snake inhabits hammocks, coastal scrub, dry glades, palmetto flats, prairie, brushy riparian areas, canal corridors, and wet fields. Occupied sites in northern Florida are often near wetlands and frequently associated with gopher tortoise burrows. Habitat loss is the primary threat to eastern indigo snakes and the most recent five-year status review of the species reported that the population is declining.

Undeveloped portions of the project corridor and proposed pond locations are generally located on mesic or hydric areas, no xeric habitats are present. The Econlockhatchee River corridor is heavily vegetated and contains potential foraging habitat for eastern indigo snakes, most of which is forested wetlands. Uplands within the project area are also potential habitat. The largest expanse of potential upland habitat occurs on ranches east of the river between Seminole Trail and South 5th Street. Three active gopher tortoise burrows were encountered in pastures southeast of Seminole Trail (**Figure 6-3**). Fewer than 25 active and inactive gopher tortoise burrows were encountered in the project corridor; however, a gopher tortoise burrow survey of 100% of the proposed

area of impact was not conducted. The nearest reported occurrence of an eastern indigo snake in the FNAI database is approximately one mile to the southeast.

Following the effect determination key (USFWS 2013), because the project will be conditioned on the most current USFWS *Standard Protection Measures for Eastern Indigo Snake*, fewer than 25 active and inactive gopher tortoise burrows were found, and the project will impact less than 25 acres of xeric habitat, a determination of **may affect, not likely to adversely affect** is made for this species. This determination and any permit would be conditioned on the evacuation of all gopher tortoise burrows. Concurrence from the USFWS will be necessary for any USACE wetland permitting.

Everglade snail kite (Endangered- Federal)

The Everglade snail kite (*Rostrhamus sociabilis*) is a raptor ranging throughout tropical and subtropical America. The subspecies that occurs in Florida and Cuba (*Rostrhamus sociabilis plumbeus*) is federally listed as endangered and is the subject of all references to “Everglade snail kite” in this document. The Everglade snail kite is a medium-sized raptor with a strongly decurved bill for extracting their primary prey, apple snails. Snail kite habitat consists of freshwater marshes and the shallow vegetated edges of lakes where apple snails occur. These habitats are characterized as palustrine-emergent, long hydroperiod wetlands with water depths of 0.2 to 1.3 meters. (USFWS 2017). The Everglade snail kite is threatened by loss or degradation of wetland habitats, including conversion to urban development or agriculture and impacts to water quality and disruption of natural flow regimes.

The original range of the Everglade snail kite included wetland and marsh areas across south Florida, extending as far north as Crescent Lake and Lake Panasoffkee in north-central Florida (USFWS 2017). The current range is limited to central and southern Florida and has contracted substantially. The USFWS consultation area for Everglade snail kite extends into Orange County. However, the USFWS Multi-Species Recovery Plan for South Florida (USFWS 2017) does not show Orange County within the distribution range of Everglade snail kite, though it does include Osceola County to the south and Brevard and Volusia counties to the east. Wetlands and marsh in the project

area are low quality potential habitat for Everglade snail kite due to limited emergent vegetation in aquatic habitats of appropriate depth and extent. Because there are no documented sightings of Everglade snail kite in the project area, the potential habitat is relatively low quality and limited in extent, and the project area occurs outside the normal range described by USFWS (2017), a determination of **may affect, not likely to adversely affect** is made for this species.

Florida scrub-jay (Threatened- Federal)

Florida scrub-jays inhabit sandpine scrub, scrubby flatwoods, oak scrub, and coastal scrub habitats of peninsular Florida where the canopy is less than 10 feet tall. These habitat types require well-drained sandy soils and occur along the coastlines, ridges, and dry portions of the central Florida peninsula (FWC 2016b). Shrub and Brushland (FLUCCS 3200) north of SR 50 at the eastern terminus of the project has some of these characteristics but does not contain the dense scrub vegetation typical of suitable scrub-jay habitat.

Florida scrub-jay populations continue to show decreasing trends. The two major threats to the Florida scrub-jay are habitat loss and habitat degradation through fire suppression (FWC 2016b). No indications of Florida scrub-jays were detected during field investigations; however, surveys following USFWS protocols were not conducted because suitable habitat is lacking. The nearest occurrence of a Florida scrub-jay reported by FNAI is 5.7 miles to the south. Due to the lack of suitable quality habitat, no sightings during field surveys, and the distance to known scrub-jay territories, a determination of **no effect** was made for the Florida scrub-jay.

Red-cockaded woodpecker (Threatened- Federal)

Red-cockaded woodpeckers are medium-sized birds approximately 7 inches long with a wingspan of 15 inches (FWC 2016b). They have a barred, black and white back and a black cap and nape that encircle large white cheek patches. Males also have small red streaks on the sides of their head.

The red-cockaded woodpecker lives in mature pine forest, predominantly longleaf pine, and excavates nest cavities in live trees. The primary threat to red-cockaded woodpeckers is loss of habitat. Logging of old growth forest followed by planting of more commercially desirable species of pine trees destroyed much of the historic red-cockaded woodpecker habitat.

Today timber management practices, fire suppression, and conversion of forest to agricultural or urban uses threaten red-cockaded woodpecker habitat. No suitable habitat for red-cockaded woodpeckers occurs in the project corridor because of a lack of old growth longleaf pine forest. The nearest reported occurrence of a red-cockaded woodpecker is approximately 4.7 miles to the south. Due to the lack of suitable habitat and the distance to known occurrences, a determination of **no effect** was made for this species.

Wood stork (Threatened- Federal)

The wood stork is a long-legged wading bird with a dark-gray, bare head with a long, thick, and down-curved bill. They occur from South America north into Florida, Georgia, and southeastern South Carolina (Rogers et. al, 1996, USFWS 2014c). Wood storks appear to be experiencing human population pressure throughout their range. Though specific data on population trends range-wide is not available, information suggests a decline in the area and quality of breeding and foraging habitats range-wide. However, data from 1991 to 1995 suggest an increasing number of nests within the U.S. breeding range (USFWS 2014c). The main threat to wood storks stems from the loss, fragmentation, and modification of habitat, typically through urban encroachment and alterations of hydrology (USFWS 2014c).

Wood storks are found mostly in freshwater environments such as marshes, swamps, lagoons, ponds, flooded fields, depressions in marshes during droughts, and in brackish wetlands. Wood storks form nesting colonies, usually in isolated areas by open water.

According to the USFWS *Wood Stork Effect Determination Key for Central and North Peninsular Florida* (U.S. Army Corps of Engineers and USFWS 2008) (Wood Stork

Key), in central Florida the core foraging area (CFA) of a wood stork colony includes all suitable foraging habitat (SFH) within a 15-mile radius of the nest colony. The entire project occurs within the CFAs of the Lake Mary Jane and the Orlando Wetlands Park wood stork colonies, which are approximately 12.5 miles south and 5.6 miles east of the project, respectively. The westernmost approximately 600 feet of the project also overlaps the CFA of the Lawne Lake wood stork colony. The USACE and USFWS Wood Stork Effect Determination Key (2008) was used to evaluate potential impacts to wood storks from the proposed project. SFH for wood storks in the project area occurs in Reservoirs (FLUCCS 5300), Mixed Wetland Hardwoods (FLUCCS 6170), Cypress (FLUCCS 6210), Wetland Forested Mixed (FLUCCS 6300), Freshwater Marshes (FLUCCS 6410) and Mixed Scrub-Shrub Wetlands (FLUCCS 6460) as well as in open stormwater management systems like roadside ditches and swales. Shallow waters in the Econlockhatchee River corridor are also potential foraging habitat for wood storks. A wood stork was observed foraging at a stormwater detention pond immediately north of Lansing Street on May 31, 2017 (**Figure 6-3**).

Unavoidable impacts to wood stork SFH will be mitigated during the permitting phase of this project. The amount of required mitigation will be based on a wood stork foraging analysis and can likely be achieved through the purchase of Federal credits or potentially through project design improvements to OSW. Anticipating mitigation for impacts to wood stork SFH in accordance with the *USFWS Wood Stork Key* (U.S. Army Corps of Engineers and USFWS 2008), a determination of ***may affect, not likely to adversely affect*** is made for this species.

Federally Listed Plant Species

Beautiful pawpaw (Endangered- Federal)

Beautiful pawpaw is a small shrub native to longleaf and slash pine flatwoods where periodic fires remove understory vegetation. It can be found in xeric, mesic, and hydric pine flatwoods in eastern Orange County as well as in Charlotte and Lee Counties. Conversion of its habitat to agricultural, residential, and commercial uses led to population declines. The exclusion of fire has further degraded remaining patches of

habitat. Beautiful pawpaw will not persist in areas where it must compete with tall grasses or shrubs for light. In Charlotte County, it occurs in mowed areas and road rights-of-way (USFWS 2015). Potential habitat as defined as mowed roadsides occurs in the project corridor; however, this habitat is extremely low-quality due to fragmentation and a history of land clearing associated with development. The project corridor does not contain habitats typically occupied by beautiful pawpaw. The nearest occurrence of beautiful pawpaw reported in the FNAI database is from 6.8 miles southeast of the project corridor. Due to a lack of traditional habitat, a lack of sightings during field surveys, and no records of this species in the project area, a determination of **no effect** is made for this species.

Britton's beargrass (Endangered- Federal)

Britton's beargrass is an agave (Agavaceae) that is perennial and grows leaves approximately three to six feet long. A similar species, Florida beargrass (*Nolina atopocarpa*), may occur in the same areas as Britton's beargrass but is distinguishable by shorter leaves, greenish flowers and asymmetric fruits (USFWS 2015). Britton's beargrass occurs from the south end of the Lake Wales Ridge north to Orange County and records indicate its historic range extended north to Marion County. It may be found in a wide range of habitats, from open scrub to closed canopy hammocks, though only where the soil is drought prone and infertile. These are typically upland sites and occur in fire dependent ecosystems that become replaced by hardwoods in the absence of fire. Conversion of land for agriculture and development threatens Britton's beargrass and it is reported that two-thirds to three-quarters of the original scrub habitat in its range was destroyed (USFWS 2015). No scrub habitat occurs in the project area and most undeveloped portions of the project area occur on wetlands or heavily forested tracts. In the project area, Unimproved Pastures (FLUCCS 2120), Shrub and Brushland (FLUCCS 3200), Mixed Upland Non-forested (FLUCCS 3300), Pine Flatwoods (FLUCCS 4110), and Upland Mixed Coniferous/Hardwoods (FLUCCS 6170) contain some habitat characteristics required of Britton's beargrass; however, these areas lack the fire or disturbance regime and xeric conditions of typical Britton's beargrass habitat. No Britton's beargrass was detected during field surveys. The nearest occurrence of

Britton's beargrass reported by FNAI is from 20.5 miles to the southwest. Due to a lack of suitable habitat and no records or detections of this species in the project area, a determination of **no effect** is made for this species.

Florida bonamia (Threatened- Federal)

Florida bonamia is a member of the morning glory family (Convolvulaceae) and the only native species in its genus. It grows as a perennial vine and has deep blue or bluish-purple flowers with white throats. Flowers bloom in the morning and wilt by afternoon. It is endemic to dry scrub areas of central and south Florida. Loss of scrub habitat to residential and agricultural expansion is the chief cause of decline of the Florida bonamia (USFWS 2014d). There is no suitable scrub habitat in the project area. In rarer instances, Florida bonamia has been documented on mowed roadsides in some locations in Florida. No Florida bonamia was detected during field investigations and the project area does not contain habitat typical of Florida bonamia. Open roadsides in the project corridor were dominated by turf grasses. The nearest occurrence of Florida bonamia is from 16.3 miles southwest of the project corridor. Due to a lack of traditional potential habitat combined with no records or detections of this species in the project area, a determination of **no effect** is anticipated for this species.

Papery whitlow-wort (Threatened- Federal)

Papery whitlow-wort is a short-lived herb that forms small mats. There are two geographically distinct subspecies and both are federally listed as threatened. *P. chartacea* ssp. *chartacea* occurs in Orange County and central Florida and *P. chartacea* ssp. *minima* occurs in northwest Florida. *P. chartacea* ssp. *chartacea* is endemic to scrub communities of the Lake Wales Ridge, particularly rosemary scrub. Development has destroyed much of the former habitat of papery whitlow-wort; however, it may persist in fire lanes and along roadsides (USFWS 2015). Suitable dry scrub habitat does not occur in the project corridor and the Lake Wales Ridge does not extend as eastward as the project. The nearest occurrence of papery whitlow-wort reported by FNAI is from 16.4 miles to the southwest of the project. Due to a lack of potential habitat, and no

records or detections of this species in the project area, a determination of **no effect** is anticipated for this species.

Scrub buckwheat (Threatened- Federal)

Scrub buckwheat is a perennial herb growing up to one meter tall with leaves that are 15 to 20 centimeters long. The leaves are green or bronze-green above and densely wooly and white underneath. Scrub buckwheat lives in intermediate habitats between dry scrub and sandhills or high pine and in turkey oak barrens in central Florida. Habitat loss through conversion of land to agriculture and for residential development, combined with habitat changes resulting from a lack of fire, continue to threaten scrub buckwheat. Typical habitat does not occur in the project corridor, but roadsides are known to serve as potential habitat in some Florida locations. No scrub buckwheat was detected during field investigations and the project corridor does not contain habitat typical of scrub buckwheat. Open roadsides in the project corridor were dominated by turf grasses. The nearest occurrence of scrub buckwheat reported by FNAI is from 29.5 miles to the southwest of the project. Due to a lack of potential habitat, and no records or detections of this species in the project area, a determination of **no effect** is anticipated for this species.

State Listed Species

Burrowing owl (Threatened- Florida)

The burrowing owl is a small bird that lives in burrows in open, treeless areas and spends the majority of its time on the ground. They traditionally inhabited native prairies and now can be found in a variety of cleared areas such as pastures, agricultural fields, golf courses and airports. They are active both day and night and are present throughout the year. Recently, populations in central Florida have declined while populations in south Florida coastal areas have increased (FWC 2015b). The Improved Pastures (FLUCCS 2110) and Unimproved Pastures (FLUCCS 2120) south of Seminole Trail and west of North 5th Street, as well as on the north side of SR 50 at the project terminus are potential habitat, though no burrowing owls were detected during surveys.

The nearest occurrence reported by FNAI of a burrowing owl to the project is 24.7 miles to the northwest. Therefore, a determination of **no effect** is made for this species.

Florida pine snake (Threatened- Florida)

The Florida pine snake has a brown back with darker blotches, a white underside, ridged scales, and a small head with a pointed snout (FWC 2014a). They range from South Carolina west to Mobile Bay and south to Florida excluding the Everglades. Florida pine snakes inhabit areas with a moderate to open tree canopy and well-drained, sandy soils, which can include dry scrub habitat or longleaf pine communities (FWC 2014a).

Florida pine snakes chief threat is habitat loss and fragmentation resulting from urbanization, timber management practices, mining, and road construction. The suppression of fire also threatens Florida pine snakes by allowing encroachment of hardwoods (FWC 2014a). The most recent Biological Status Review of Florida Pine Snake is from 2011 and predicts a continued decline in populations.

Potential habitat occurs in the project area on Improved Pastures (FLUCCS 2110), Unimproved Pastures (FLUCCS 2120), Shrub and Brushland (FLUCCS 3200), Mixed Upland Non-forested (FLUCCS 3300), Pine Flatwoods (FLUCCS 4110), and Upland Mixed Coniferous/Hardwood (FLUCCS 4340). This habitat is low quality because most of it is fragmented, is heavily forested or was cleared for ranching. None of the scrub or longleaf pine communities preferred by Florida pine snakes are present in the project area. No Florida pine snakes were observed during field surveys. The nearest occurrence reported by FNAI of a Florida pine snake is from 19.6 miles to the northwest. Therefore, a determination of **may affect, not likely to adversely affect** is made for this species.

Florida sandhill crane (State Threatened)

Florida sandhill cranes, a subspecies of sandhill crane, are tall birds with long necks and legs. Sandhill cranes range across most of North America; however, Florida

sandhill cranes are a subspecies with a more limited range that includes Florida and extends as far north as the Okefenokee Swamp in Georgia. Florida sandhill cranes are non-migratory and usually nest over freshwater ponds and marshes.

Florida sandhill cranes inhabit freshwater marshes, prairies, and pastures throughout the state. Their wide-ranging diet includes grain, berries, seeds, insects, worms, mice, small birds, snakes, lizards, and frogs (FWC 2016b). The drainage of wetlands and conversion of prairies to agriculture are the primary threats to Florida sandhill cranes. Their former range included parts of coastal Texas, Alabama, and Louisiana, but habitat loss and overhunting greatly diminished the populations in the 20th century, and their range shrank to its current area (FWC 2016b). The most recent Biological Status Review of Florida Sandhill Cranes, from 2011, indicates continuing population declines from 1974 to 2003.

Suitable foraging habitat for Florida sandhill cranes occurs throughout vegetated portions of the project area. Nesting habitat for sandhill cranes is typically found in secluded areas where nests are built on mats of floating vegetation protected by shallow water. The project area contains only extremely low-quality nesting habitat because it lacks the seclusion, emergent vegetation, and protective cover more commonly observed in occupied nesting habitats. Sandhill cranes were observed foraging along SR 50 on October 20, 2015, and again near the intersection of Claredon Street and Old Cheney Highway on December 17, 2015 (**Figure 6-3**). However, because the observations occurred during fall and winter it is not possible to definitively conclude those individuals were from the federally listed subspecies. They could be sandhill cranes that belong to a migratory population which overwinters in Florida. All sandhill cranes are protected by the Migratory Bird Treaty Act. For the purposes of this document and the related assessment of impacts to Florida sandhill crane, sandhill cranes observed during surveys are considered to be members of the Florida subspecies. Because the potential long-term impacts would be to such a small proportion of the available foraging habitat, a determination of ***may affect, not likely to adversely affect*** is made for this species.

Gopher tortoise (Federal Candidate; State Threatened)

The gopher tortoise is the only of five species of tortoise in the U.S. that occurs east of the Mississippi River. They range from south-central Florida, north into Georgia and southern South Carolina, and west through Mississippi and into part of eastern Louisiana. Gopher tortoises live in areas with well drained, sandy soils and a sparse tree canopy that allows sunlight to reach the ground and support abundant herbaceous vegetation. They are commonly found in sandhill, pine flatwoods, dry scrub, scrubby flatwoods, dry prairies, xeric hammock, pine-mixed hardwoods, and coastal dunes. In habitats where fire is suppressed, encroachment of woody vegetation makes it more difficult for gopher tortoises to move around and restricts the low growing plants that they eat. Gopher tortoises excavate burrows which offer a refuge from fire, extreme temperatures, and predators. These burrows are often co-inhabited by other species, which has caused the gopher tortoise to be considered a keystone species in some Florida ecosystems (FWC 2016b).

The primary threat to gopher tortoises is habitat loss, degradation, and fragmentation. Urbanization, agriculture, and mining have all caused habitat loss, and suppression of fire and silviculture methods that allow a closed canopy has reduced habitat quality in some forests. Gopher tortoises were once threatened due to over-collecting by humans. Mortality from pets and other predators is a continuing problem. The most recent Biological Status Report, from 2006, cites a population size reduction in Florida between 50 and 60 percent in the past 60 to 93 years and notes that increasing habitat fragmentation and destruction will affect the long-term viability of remaining populations.

Gopher tortoises require deep, sandy, well-drained soils for burrowing, but may also occur in lower numbers on somewhat poorly drained soils (USACE 2009). Most of the project area contains such soils, with the exception of areas of Sanibel and Samsala Muck, which are hydric soils. In Florida, gopher tortoise habitat is typically designated by natural communities instead of soils (USACE 2009). Potential gopher tortoise habitat occurs throughout the project area on Improved Pastures (FLUCCS 2110), Unimproved Pastures (FLUCCS 2120), Shrub and Brushland (FLUCCS 3200), Mixed Upland Non-

forested (FLUCCS 3300), Pine Flatwoods (FLUCCS 4110), and Upland Mixed Coniferous/Hardwood (FLUCCS 4340). Three active gopher tortoise burrows were identified in pastures south of Seminole Trail and west of N. 5th Street (**Figures 6-2 and 6-3**). Another large area of potential gopher tortoise habitat is in pastures across SR 50 from Orlando Speed World Dragway.

In subsequent project phases, gopher tortoise burrow surveys and relocation following FWC protocols will be conducted prior to initiating construction. Excavation of gopher tortoise burrows will also be required to minimize potential impacts to eastern indigo snake, which commonly take refuge in burrows. Given these conditions, a determination of ***may affect, not likely to adversely affect*** is made for gopher tortoise.

Little blue heron (Threatened- Florida)

Little blue herons occur along the entire eastern and Gulf coasts of the U.S. as well as throughout the Mississippi River Valley, southern California, and into central and South America. The threats to little blue heron are poorly understood (FWC 2015) but likely include coastal development, disturbance at foraging and breeding sites, environmental issues, degradation of feeding habitat, reduced prey availability, and predators. Other threats may include exposure to pesticides, toxins, and infection by parasites (FWC 2015, Rodgers et al. 1996). According to the Biological Status Report published in 2011, little blue heron populations increased gradually throughout the 20th Century until the 1990s, when a slow but steady decline was observed.

Little blue herons inhabit a variety of aquatic environments including fresh, salt, and brackish water systems like swamps, estuaries, ponds, lakes, and rivers (Rodgers et al. 1996). Their nests are typically built in trees and shrubs on islands, emergent vegetation, or in dense thickets near water. The Econlockhatchee River corridor is high quality potential habitat for little blue heron. In the project area, potential foraging habitat occurs in Reservoirs (FLUCCS 5300), Mixed Wetland Hardwoods (FLUCCS 6170), Cypress (FLUCCS 6210), Wetland Forested Mixed (FLUCCS 6300), Freshwater Marshes (FLUCCS 6410) and Mixed Scrub-Shrub Wetland (FLUCCS 6460) as well as in open stormwater management systems like roadside ditches and swales. The project

area does not contain habitat typical of nesting little blue herons because it lacks expanses of open water or sufficient concealing vegetation and because of the proximity to a major roadway and development. Little blue herons were observed near the project at two locations on May 31, 2017. A little blue heron was sighted at the intersection of Waterford Chase and Lake Underhill Road as well as in a stormwater retention pond north of Lansing Street (**Figures 6-1** and **6-3**). Little blue herons are highly mobile and may avoid construction activities, potentially resulting in temporary impacts from avoidance. Therefore, a determination of ***may affect, not likely to adversely affect*** is made for this species.

Roseate spoonbill (Threatened- Florida)

Roseate spoonbills are large birds with pink wings and underparts, a white neck and back, and pinkish legs and feet (FWC 2016b). Their heads are bare of feathers and they have a large, spoon-shaped bill that they sweep back in forth in shallow water to detect and capture prey. They can be found in South America, generally east of the Andes, and coastal areas of Central America, the Caribbean, and the Gulf of Mexico. In Florida, the species is also found in Florida Bay, Tampa Bay, and Brevard County, though population estimates are unreliable due to high variability between survey years (FWC 2016b). Nesting habitats include coastal mangroves and dredge spoil islands.

The primary historical threat to roseate spoonbills was hunting for their feathers; however, this practice was prohibited, allowing populations to rebound. Current threats include reduced prey availability and general habitat degradation or loss, pesticide exposure, and illegal shooting (FWC 2016b).

Roseate spoonbills were not detected during field surveys. The project area does not contain flats, tidal areas, or large expanses of shallow water typical of high quality potential foraging habitat, but low quality potential foraging habitat occurs in Reservoirs (FLUCCS 5300), Mixed Wetland Hardwoods (FLUCCS 6170), Cypress (FLUCCS 6210), Wetland Forested Mixed (FLUCCS 6300), Freshwater Marshes (FLUCCS 6410) and Mixed Scrub-Shrub Wetlands (FLUCCS 6460) as well as in open stormwater management systems like roadside ditches and swales in the project area. The project

area lacks potential nesting areas that offer the seclusion and protection from predators by open water that is typical of nesting habitat. The nearest reported occurrence of a roseate spoonbill is from 10.6 miles southeast of the project corridor. Roseate spoonbills are highly mobile and may avoid construction activities, potentially resulting in temporary impacts from avoidance. Therefore, a determination of ***may affect, not likely to adversely affect*** is anticipated for this species.

Sherman's fox squirrel (State Species of Special Concern)

Sherman's fox squirrel is a large rodent that can reach up to 27 inches in length and weigh up to three pounds (FWC 2016a). Its body color varies from black to brown, with a black head, white ears, and white snout. They have long, bushy tails and well-developed hind legs.

Sherman's fox squirrels generally inhabit open, fire-maintained woodlands and the population ranges from peninsular Florida, north to central Georgia, and west to the Apalachicola River. Their diet is primarily composed of seeds, particularly longleaf pine seeds and/or turkey oak acorns, but they are also known to eat fungi, fruit, and plant buds (FWC 2016a). In many areas, they depend on a variety of oak trees for seasonal food and nest material (FNAI 2017) and can also be found in mature oak hammocks. Destruction of fire-maintained woodland habitat is the primary threat to Sherman's fox squirrels and protection of old-growth, longleaf pine forests is paramount for survival of the species. The majority of historic habitat has been logged, converted to pasture, degraded by lack of fire, or used for agriculture or commercial/residential purposes. Today, an estimated 10 to 20 percent of the original Sherman's fox squirrel habitat remains (FWC 2016a). Improper burning and inappropriate silviculture techniques may make remaining forest less suited to supporting Sherman's fox squirrels, and collisions with vehicles are a threat because Sherman's fox squirrels have an especially low gait when on the ground.

Low-quality potential habitat occurs in Improved Pastures (FLUCCS 2110), Unimproved Pastures (FLUCCS 2120), Shrub and Brushland (FLUCCS 3200), Mixed Upland Non-forested (FLUCCS 3300), Pine Flatwoods (FLUCCS 4110), and Upland Mixed

Coniferous/Hardwood (FLUCCS 4340). This potential habitat is low quality because it is generally either completely open and lacks protective cover, as in the case of pastures, or is too densely wooded and lacks longleaf pines or turkey oaks typical of higher quality habitats. No Sherman's fox squirrels were detected during field surveys. The nearest reported occurrence of a Sherman's fox squirrel is from 5.9 miles northeast of the project corridor. Therefore, a determination of **may affect, not likely to adversely affect** is anticipated for this species.

Southeastern American kestrel (Threatened- Florida)

The southeastern American kestrel is a non-migratory subspecies that can be found throughout Florida as well as the coastal plains of Louisiana, Georgia, and South Carolina. A northern subspecies of American kestrel, *Falco sparverius*, also occurs in Florida, but is migratory. Any American kestrel seen in Florida in May or June is assumed to be a southeastern American kestrel (FWC 2016a).

In Florida, southeastern American kestrels inhabit open woodlands, sandhill, fire maintained savannah pine forests, as well as pastures and open fields near residential areas. They primarily nest in dead trees, using cavities that they do not construct themselves. They are also known to use nest boxes (FWC 2016a). The primary threat to southeastern American kestrels is loss of nesting and foraging habitat. Habitat is lost primarily through development of residential areas and farmland, removal of trees in agricultural fields, and through the suppression of fire that maintains open pine habitats. Southeastern American kestrels are also vulnerable to pollutants, predation, collision with vehicles and aircraft, and the West Nile Virus (FWC 2016a). According to the Biological Status Review published in 2011, southeastern American kestrels have been experiencing significant population declines that appear to be ongoing.

Suitable foraging habitat occurs throughout the project area and potential nesting habitat occurs in trees the project area. No southeastern American kestrels were observed during field surveys. No nest cavities were detected during surveys, but a survey specifically for potential nesting cavities in trees was not performed. Therefore, a

determination of ***may affect, not likely to adversely affect*** is anticipated for this species.

Tri-colored heron (Threatened- Florida)

Tri-colored herons are medium-sized wading birds that inhabit fresh- and saltwater marshes, lagoons, estuaries, mangrove swamps, and river deltas. They range from Massachusetts, south throughout the gulf coast, and as far south as northern Brazil. They also inhabit the Pacific coast from Baja California to Ecuador. Nests are typically found on protected islands or in trees overhanging water. Tri-colored herons are permanent residents in Florida and are most common in south and central Florida regions. According to the Biological Status Review published in 2011, tri-colored heron population trends are difficult to detect because of high variability between survey years, though a significant decline was documented across the 1970's and 1980's.

The major threat facing tri-colored heron populations is loss of habitat through development and draining of wetlands. Other threats include pesticides and pollutants (Rogers 1997, Spalding et al. 1997), alterations to the hydrology of foraging areas, reduced prey abundance, and oil spill impacts to critical breeding, foraging and roosting sites (FWC 2016a).

Potential foraging habitat for tri-colored herons in the project area occurs in Reservoirs (FLUCCS 5300), Mixed Wetland Hardwoods (FLUCCS 6170), Cypress (FLUCCS 6210), Wetland Forested Mixed (FLUCCS 6300), Freshwater Marshes (FLUCCS 6410), and Mixed Scrub-Shrub Wetland (FLUCCS 6460) as well as in open stormwater management systems like roadside ditches and swales in the project area. The project area does not contain potential nesting habitat protected by open water that is typical of tri-colored herons. A tri-colored heron was observed at a stormwater retention pond north of Lansing Street on May 31, 2017. Tri-colored heron are highly mobile and may avoid construction activities, potentially resulting in temporary impacts. Therefore, a determination of ***may affect, not likely to adversely affect*** is anticipated for this species.

Other Protected Species

Bald Eagle

The bald eagle was removed from the Federal endangered species list in 2007 and from the State of Florida endangered species list in 2008. The species is 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). Bald eagles roost and nest in trees and are typically found close to fresh or salt water where the eagles can catch fish. Nests are usually constructed in large trees isolated from human disturbance. The project corridor does not contain the expanses of open water typical of bald eagle foraging habitat.

Adult bald eagles typically remain within Florida year-round, though sub-adults may migrate and wander further north. Bald eagles eat a wide variety of prey, often scavenging road kill and carrion or capturing fish and waterfowl from the water surface. Bald eagles once ranged across North America, except for the desert southwest, and were especially abundant in Florida. Populations in North America began to decline as early as the 18th Century due to habitat loss and direct killing through shooting, trapping and poisoning. Widespread use of DDT in the 20th century greatly exacerbated these declines by causing heavy nesting failures. DDT was banned in the U.S. in 1972 and the number of eagle nesting territories in Florida has steadily increased since then, reaching approximately 1,200 in 2006.

No bald eagles or nests were detected in the project area during field surveys. According to the FWC bald eagle nest locator tool, the nearest reported bald eagle nest (Nest ID OR074) is approximately 1.2 miles (FWC 2014b) north of the project corridor. That nest was active when it was last surveyed in 2014. The project is outside the 660-foot nest buffer within which project activities may be restricted under the USFWS *Bald Eagle Management Guidelines and Conservation Measures*, so no additional restrictions or conservation measures are anticipated.

Special Designations, Critical Habitat, and Conservation Lands

Maps of special designations are provided as **Figures 6-1** through **6-3**. They show the locations of Outstanding Florida Waters associated with the Econlockhatchee River system, SJRWMD Regulatory Easements, Orange County Green PLACES, and the locations of listed species (and gopher tortoise burrow) observations from field surveys. Habitat types, as classified by SJRWMD, are provided in **Figures 3-1** through **3-3**.

The USFWS Critical Habitat Portal was used to locate designated Critical Habitat and assess potential impacts from the project. No designated Critical Habitat occurs in or adjacent to the project area, so no impacts to critical habitat are anticipated. The nearest designated Critical Habitat is for the West Indian manatee and occurs in the St. Johns River approximately 8.6 miles east of the project.

Reviews of the NOAA Essential Fish Habitat (EFH) Mapper, other existing data, and conditions observed in the field did not identify any resources or potential impacts to EFH that might require an EFH Assessment or additional coordination with National Marine Fisheries Service.

According to the FWC Water Bird Locator, the nearest reported active water bird colony (Colony Number 612320) is approximately 2.65 miles west of the project corridor, in a wetland area just south of Mary Lou Drive and just west of Monteburg Drive. The next nearest reported active water colony (Colony Number 612303) is approximately 6.5 miles from the project corridor. The project is outside the 300-foot buffer FWC proposes as a standardized buffer around high priority wading bird nesting colonies (FWC 2013), so no impacts to these colonies are anticipated.

The entire project occurs within the CFAs of the Lake Mary Jane and the Orlando Wetlands Park wood stork colonies, which are approximately 12.5 miles south and 5.6 miles east of the project, respectively. The westernmost approximately 600 feet of the project also overlaps the CFA of the Lawne Lake wood stork colony.

WETLANDS AND SURFACE WATERS

The locations of wetlands in the project area identified by SJRWMD land use data are shown on **Figures 3-1** through **3-3**. They include Mixed Wetland Hardwoods (FLUCCS 6170; six locations within the project area), Cypress (FLUCCS 6210; four locations in the project area), Wetland Forested Mixed (FLUCCS 6300; nine locations within the project area), Freshwater Marsh (FLUCCS 6410; seven locations within the project area), Wet Prairie (FLUCCS 6430; one location in project area), Emergent Aquatic Vegetation (FLUCCS 6440; two locations in project area), and Mixed Scrub-Shrub Wetland (FLUCCS 6460; one location in project area). Reservoirs (FLUCCS 5300) and ditches and swales also occur in the project area and are considered Other Surface Waters (OSW). The locations of wetlands and OSW in the project area as mapped by the USFWS NWI are shown in **Figures 3-5** through **3-6** and include Freshwater Emergent Wetlands, Freshwater Forested/Shrub Wetlands, Freshwater Ponds, and Riverine.

Wetland and Surface Water Assessment Areas

Wetlands and Surface Waters that may be directly impacted by the proposed project or that are adjacent to the Build Alternative were each assigned a unique Assessment Area (AA) number to aid analysis and ease discussion. There are a total of 29 AAs and each is described below, listed in **Table 6-2**, and shown on **Figures 6-4** and **6-5**. In some instances, an AA contains multiple FLUCCS code wetland types that occur in close association.

Table 6-2 Wetland and OWS Assessment Areas

AA #	FLUCCS Code	USFWS NWI Classification	Contiguity	Edge Relationships	Wildlife Habitat Value	Hydrologic Functions	Public Use	Integrity
1	5300	Freshwater Pond	Isolated	Bordered by residential, commercial, and roadways	Low	water quality enhancement / pollution abatement, water detention / flood and erosion control	None	Manmade
2	8370	Freshwater Pond	Isolated	Bordered by residential and roadways	Low	water quality enhancement / pollution abatement, water detention / flood and erosion control	None	Manmade
3	5300, 6300, 6460	Freshwater Pond/Fresh water Forested Shrub/Scrub-Shrub	Connected to local wetlands and ponds	Bordered by residential and roadways	Medium	water quality enhancement / pollution abatement, water detention / flood and erosion control	None	Manmade and natural but human-impacted wetlands
4	4110/6410 (Incorrectly mapped)	Freshwater Forested Shrub	Isolated	Border by roadways	Low	water quality enhancement / pollution abatement, water detention / flood and erosion control	None	Manmade
5	3200/5300/6170/6460	Freshwater Pond/Fresh water Forested Shrub	Contains tributary of Econlockhatchee River	Bordered by residential/commercial and roadways	Medium	water quality enhancement / pollution abatement, water detention / flood and erosion control	None	High Quality mature wetlands with three manmade ponds
6	5300	Freshwater Pond	Isolated	Commercial and Undeveloped	Low	water quality enhancement / pollution abatement, water detention / flood and erosion control	None	Manmade
7	6300	Freshwater Forested Shrub	Connected to larger network of wetlands	Bordered by residential, other wetland and vegetated uplands	Medium	water quality enhancement / pollution abatement, water detention / flood and erosion control	None	Natural but degraded due to proximity to development
8	5300/6300	Freshwater Pond/Fresh water Forested Shrub	Isolated	Vegetated uplands and commercial/residential	Low	water quality enhancement / pollution abatement, water detention / flood and erosion control	None	Natural but degraded due to proximity to development
9	5300/6300	Freshwater Pond/Fresh water Forested Shrub	Connected to larger network of wetlands	Residential, vegetated uplands and other wetlands	Medium	water quality enhancement / pollution abatement, water detention / flood and erosion control	None	Natural wetlands of medium quality
10	5300	Freshwater Pond	Isolated	Residential	Low	water quality enhancement / pollution abatement, water detention / flood and erosion control	None	Manmade
11	5300	Freshwater Pond	Isolated	Residential	Low	water quality enhancement / pollution abatement, water detention / flood and erosion control	None	Manmade
12	5300	Freshwater Pond	Isolated	Residential	Low	water quality enhancement / pollution abatement, water detention / flood and erosion control	None	Manmade
13	6210/6170	Freshwater	In Major river	Residential and river	High	water quality enhancement / pollution abatement, water	Recreatio	Natural riparian area,

AA #	FLUCCS Code	USFWS NWI Classification	Contiguity	Edge Relationships	Wildlife Habitat Value	Hydrologic Functions	Public Use	Integrity
		Forested Shrub	corridor	corridor		detention / flood and erosion control	nal use	medium to high integrity
14	6440	Freshwater Pond	Isolated	Surrounded by plant nursery	Low	water quality enhancement / pollution abatement, water detention / flood and erosion control	None	Manmade
15	5300/6300	Freshwater Pond/Fresh water Forested Shrub	Near Econlockhatchee River corridor	Residential, pine flatwoods, and pasture	Medium	water quality enhancement / pollution abatement, water detention / flood and erosion control	None	Fragmented and human impacted
16	6210	Freshwater Forested Shrub	Contiguous with Econlockhatchee River	River, school, residential	High	water quality enhancement / pollution abatement, water detention / flood and erosion control	None	High integrity
17	5300/6300	Freshwater Pond/Fresh water Forested Shrub	Isolated	School, empty field	Low	water quality enhancement / pollution abatement, water detention / flood and erosion control	None	Highly disturbed, low integrity
18	5300	Freshwater Pond	Isolated	School	Low	water quality enhancement / pollution abatement, water detention / flood and erosion control	None	Manmade
19	6170/6300	Freshwater Forested Shrub	Connected to Econlockhatchee River corridor	Pasture, residential, junkyard, shrub and brushland, mixed upland forest	High	water quality enhancement / pollution abatement, water detention / flood and erosion control	None	Medium-High
20	6210	Freshwater Forested Shrub	Isolated	Pasture	Low-Medium	water quality enhancement / pollution abatement, water detention / flood and erosion control	None	Low-Medium
21	6410	Freshwater Pond	Isolated	Pasture	Low-Medium	water quality enhancement / pollution abatement, water detention / flood and erosion control	None	Highly impacted
22	6430	Freshwater Emergent	Isolated	Shrub and brushland	Medium	water quality enhancement / pollution abatement, water detention / flood and erosion control	None	Medium-High
23	5300/6210/6410	Freshwater Emergent/Freshwater Pond	Isolated	Cattle pasture and pine flatwoods	Medium	water quality enhancement / pollution abatement, water detention / flood and erosion control	None	Low-Medium
24	6170	Freshwater Forested Shrub	Narrow connection to larger wetland network	Residential, cattle pasture	Low-Medium	water quality enhancement / pollution abatement, water detention / flood and erosion control	None	Low-Medium
25	-	Freshwater Emergent	Narrow connection to larger wetland	Residential, auto salvage yard	Low	water quality enhancement / pollution abatement, water detention / flood and erosion control	None	Heavily impacted, channelized

AA #	FLUCCS Code	USFWS NWI Classification	Contiguity	Edge Relationships	Wildlife Habitat Value	Hydrologic Functions	Public Use	Integrity
			network					
26	6410	Freshwater pond	Isolated	Residential	Low	water quality enhancement / pollution abatement, water detention / flood and erosion control	None	Manmade
27	6410	Freshwater pond	Isolated	Residential	Medium	water quality enhancement / pollution abatement, water detention / flood and erosion control	None	Manmade
28	5300	Freshwater Pond	Near wetlands and other reservoirs	Mining, wetlands	Low	water detention / flood and erosion control	None	Manmade
29	6410	Freshwater pond	Isolated	Residential, pine flatwoods	Low	water quality enhancement / pollution abatement, water detention / flood and erosion control	None	Manmade

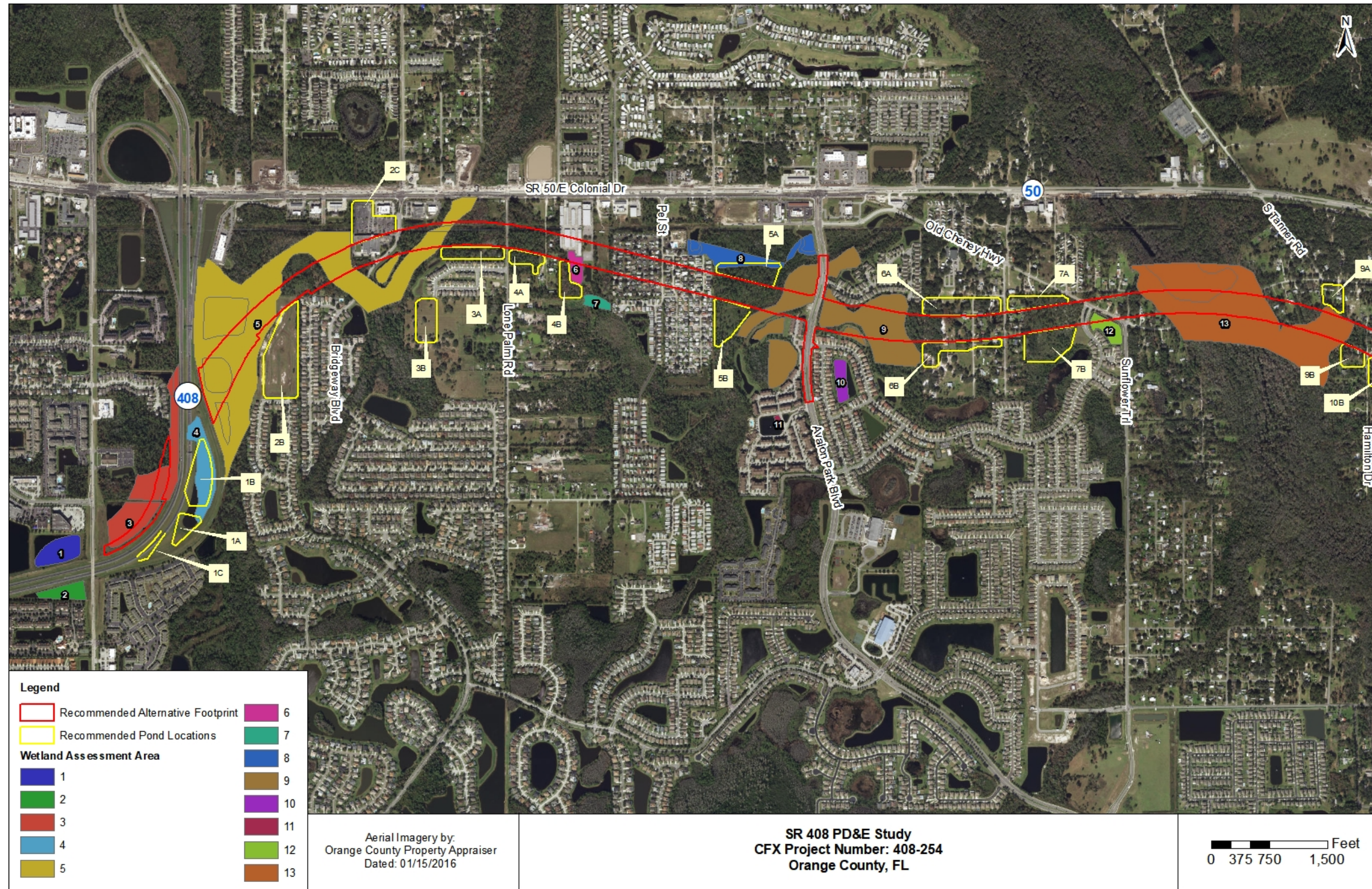


Figure 6-4 Wetland and Surface Water Assessment Areas in Western Half of Project

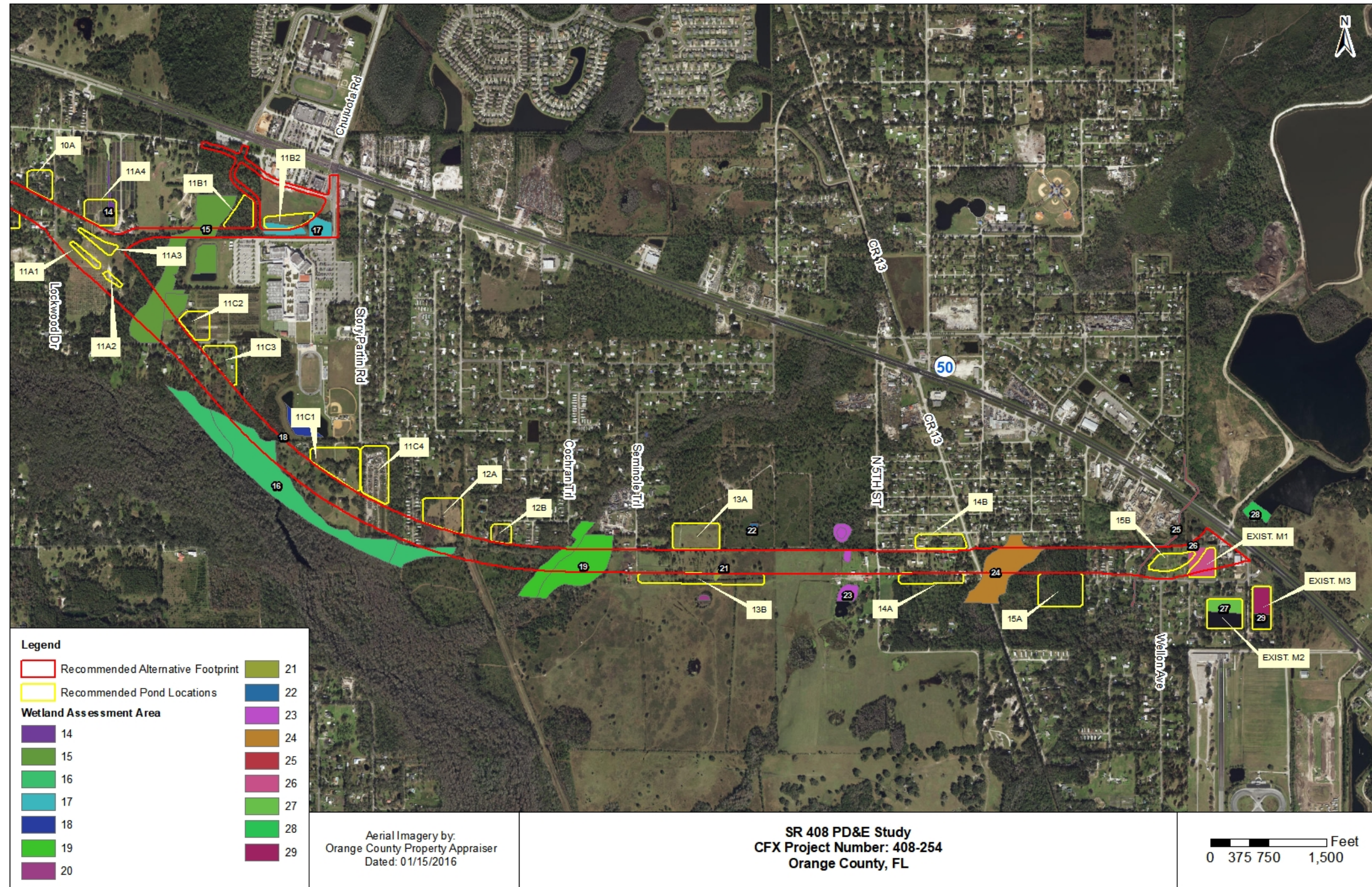


Figure 6-5 Wetland and Surface Water Assessment Areas in Eastern Half of Project

AA-1

This is a stormwater pond in the northwest quadrant of the intersection of Woodbury Road and SR 408, outside existing right-of-way. It is manmade and has relatively little vegetation and low value to wildlife. This AA would not be impacted under the recommended alternative.

AA-2

AA2 is a stormwater pond in the southwest quadrant of the intersection of Woodbury Road and SR 408, outside the project area. It is manmade and has relatively little vegetation and low value to wildlife. Under the recommended alternative AA2 would be within FDOT right-of-way but would not be impacted.

AA-3

AA-3 (**Photograph 6-1**) contains part of two stormwater ponds as well as areas mapped by SJRWMD as Wetland Forested Mixed and Mixed Scrub/Shrub Wetlands. The ponds are manmade, sparsely vegetated, and of relatively little wildlife use. The Mixed Scrub-Shrub Wetlands component of AA-3 is located immediately west of SR 408, predominantly within the right-of-way, and runs in a narrow band north to south. The Wetland Forested Mixed component of AA-3 is outside the existing right-of-way, to the west of the Mixed Scrub-Shrub Wetlands. Under the recommended alternative there would be approximately five acres of direct impacts to AA-3 affecting the southernmost pond and areas mapped as Wetland Forested Mixed and Mixed Scrub/Shrub Wetlands. Part of AA-3 is under a SJRWMD regulatory easement.

AA-4

This is a stormwater pond that is incorrectly mapped by SJRWMD as Pine Flatwoods and Freshwater Marsh. It is actually a manmade stormwater pond associated with SR 408 and is within the existing SR 408 right-of-way. It is unvegetated and of relatively little use to wildlife. Under the recommended alternative a ramp would bisect this stormwater pond, creating two separate ponds (Ponds 1A and 1B) and approximately one acre of direct impacts.



Photograph 6-1 View of AA-3 from SR 408 right-of-way, facing north

AA-5

This wetland (**Photograph 6-2** through **6-4**) contains four stormwater ponds, Freshwater Marsh, and Mixed Wetland Hardwoods following a stream course. The stormwater ponds are manmade and are predominantly surrounded by trees. The Mixed Wetland Hardwoods are high quality wildlife habitat and contain many mature trees with relatively few invasive species. The most common vegetation includes bald cypress, red maple, live oak, muscadine vine, royal fern, slash pine, saw palmetto, button bush, and maiden fern. There is some invasive wild taro near the crossing of Bridgeway Boulevard, but few invasive species further west in AA-5. A stream runs north through these wetlands. It is fed by a canal running under SR 50 near the intersection with SR 408. The stream passes beneath a bridge on Bridgeway Boulevard then through a culvert under SR 50 before connecting with the Econlockhatchee River north of SR 50.

One parcel in AA-5, parcel number 23-22-31-0000-00-046, was previously owned by the estate of Coy A. Koontz. It is located immediately north of the vacant lot to the north

of Jade Forest Avenue and northwest of Cherry Valley Way, near the southeast quadrant of the intersection of SR 408 and SR 50. Following the denial of a permit from SJRWMD to develop on wetlands on this 14.13-acre parcel, the matter became the subject of a lawsuit. *Koonts v. St. Johns River Water Management District* stemmed from permit approval being contingent in part on deeding a conservation easement to the SJRWMD. This case was appealed and ruled on by the Supreme Court of the United States in October 2012. The property is currently owned by Di Development LLC.

Because of its larger size, continuity with the Econlockhatchee River corridor, and mature vegetation with few invasive species, wetlands in AA-5 are considered high quality and of high value to wildlife. Under the recommended alternative there would be approximately 18 acres of direct impacts to AA-5. A small portion of these impacts to AA-5 occur to a SJRWMD regulatory easement immediately east of Bridgeway Boulevard.



Photograph 6-2 View of AA-5 from near Cherry Valley Way, facing west.



Photograph 6-3 AA-5 near Bridgeway Boulevard, facing west



Photograph 6-4 AA-5 beneath Bridgeway Boulevard, facing northeast

AA-6

This assessment area is composed of two adjacent stormwater ponds located behind a commercial property that faces SR 50 (**Photograph 6-5**). They are located between Fricke Avenue and Woody Woody Street. These ponds are isolated and lack substantial natural vegetation, making them of relatively little use to wildlife. Under the recommended alternative, there would be approximately 0.5 acres of impacts to Reservoirs (FLUCCS 5300).

AA-7

These Wetland Forested Mixed wetlands at the south end of Woody Woody Street are on the edge of the project area at this location. They connect to wetlands further east that are denoted as AA-8 and AA-9, but are separated by a residential development and Birch Creek Drive. Because they connect with a large drainageway and wetlands



Photograph 6-5 AA-6 Aerial view of two stormwater ponds

leading to the Econlockhatchee River, AA-7 is of medium value to wildlife. This AA would not be impacted under the recommended alternative.

AA-8

This area includes a stormwater pond as well as Wetland Forested Mixed. It is closely associated with AA-9, but is separated by a narrow shoulder of Shrub and Brushland. Because it is isolated and borders residential and commercial properties AA-8 is considered to be a low quality wetlands. Because it is hydrologically separated from AA-9 but connected via naturally vegetated uplands, AA-8 is of low to medium value to wildlife. This AA would not be impacted under the recommended alternative. It is part of a SJRWMD regulatory easement.

AA-9

This area includes two stormwater ponds as well as Wetland Forested Mixed (**Photograph 6-6**). It is closely associated with AA-8 but is separated by a narrow shoulder of Shrub and Brushland. AA-9 is part of a larger network of wetlands spanning Avalon Park Boulevard and extending northwards, through a culvert underneath SR 50 before connecting to the Econlockhatchee River. Common plant species in AA-9 include button bush, swamp bay, red maple, live oak, and wax myrtle. Invasive primrose willow were present but not relatively abundant. The stormwater ponds contain little natural vegetation. Under the recommended alternative, there would be approximately 0.42 acres of impacts to Reservoirs (FLUCCS 5300) and approximately 10.49 acres of impacts to Wetland Forested Mixed. There would be a total of approximately 11 acres of direct impacts to AA-9. AA-9 is part of a SJRWMD regulatory easement.



Photograph 6-6 AA-9 from Avalon Park Boulevard, facing east

AA-10

This is a stormwater pond surrounded by residential development. It is just east of Avalon Park Boulevard. AA-10 lacks natural vegetation and is of low value to wildlife due to its isolation and surrounding development. This AA would not be impacted under the recommended alternative.

AA-11

This stormwater pond is completely surrounded by residential development and is located just west of Avalon Park Boulevard. It lacks natural vegetation is of low value to wildlife due to isolation and surrounding development. This AA would not be impacted under the recommended alternative.

AA-12

This stormwater pond it located immediately south and east of the intersection of Old Cheney Highway and Sunflower Trail. It is of low value to wildlife due to lacking native

vegetation, isolation by roadways, and nearby development. Under the recommended alternative, there would be 0.3 acres of direct impacts to Reservoirs (FLUCCS 5300).

AA-13

These wetlands are mapped as Mixed Wetlands Hardwood and Cypress. They are part of a much larger corridor of wetlands following the Econlockhatchee River (**Photograph 6-7**) and are relatively high quality. The area where Old Cheney Highway and a powerline cross the river is degraded by human use, including erosion from vehicles, disturbed vegetation, and trash and debris (**Photographs 6-8** and **6-9**). Trees in this area have boards nailed to them as a ladder and some rope swings were present. Common plant species in AA-13 include bald cypress, cabbage palm, pond cypress, red maple, button bush, live oak, slash pine, and air potato (an invasive species). Within AA-13, the recommended alternative would directly impact approximately 13 acres of Mixed Wetland Hardwoods (FLUCCS 6170) and approximately one acre of Cypress (FLUCCS 6210), for a total of approximately 14 acres.



Photograph 6-7 AA13 showing Econlockhatchee River, facing south



Photograph 6-8 AA-13 Econlockhatchee River and power line corridor adjacent to Old Cheney Road, facing north



Photograph 6-9 AA-13 where Old Cheney Highway crosses the Econlockhatchee River, facing west

AA-14

This is a pond that is entirely surrounded by the grounds of an ornamental nursery. Much of the pond was covered in duck weed and its perimeter contains many native and exotic trees, including bald cypress, wax myrtle, red maple, and date palms (**Photograph 6-10**). Because it is isolated and the surrounding land contains many exotic species, this pond is considered low value to wildlife. This AA would not be impacted under the recommended alternative.



Photograph 6-10 AA-14 Pond surrounded by ornamental nursery, facing east

AA-15

This area contains two stormwater ponds as well as Wetland Forested Mixed. It almost reaches the Econlockhatchee River but is separated by Hamilton Drive and developed uplands. Common species observed include maiden fern, royal fern, muscadine vine, slash pine, live oak, saw palmetto, slash pine, and live oak. There were relatively few obligate wetland groundcover species and few invasives. This wetland is considered to be medium to high quality. It appeared relatively dry during field investigations (**Photograph 6-11**) but is large and near other wetlands. The actual wetland limits appear to be much smaller than the area mapped by SJRWMD. Trash was abundant in adjacent uplands and the area appears to be frequently used by people. Within AA-15, the recommended alternative would directly impact approximately 0.4 acres of Reservoirs (FLUCCS 5300) and approximately 4.6 acres of Wetland Forested Mixed (FLUCCS 6300), for a total of approximately 5 acres.



Photograph 6-11 AA-15 vegetation, facing west

AA-16

This Cypress wetland lies between the Econlockhatchee River and nearby development, including a high school, residences, and pasture. It is dominated by bald cypress and contains relatively few invasive species. Because it is contiguous with a major river corridor and is naturally vegetated, AA-16 is of high value to wildlife. It is immediately south of a junkyard and a small, open water treatment facility at the southern end of Pine Isle Drive. There is an relatively open portion of the river channel that is not overhung by tree canopy immediately south of AA-16. Within AA-16, under the recommended alternative there would be approximately one acre of impacts to Wetland Forested Mixed and approximately two acres of direct impacts to Cypress (FLUCCS), for a total of approximately three acres of direct impacts. AA-16 contains part of the Sunflower Property, an Orange County Green PLACE, and a SJRWMD regulatory easement.

AA-17

This area contains a stormwater pond and an isolated, small, low quality wetland immediately north of East River High School (**Photograph 6-12**). The area mapped as Wetland Forested Mixed appeared to be relatively dry during field investigations. Common plant species observed include red cedar, red maple, live oak, saw palmetto, maiden fern, dahoon holly, slash pine, and salt bush. Within AA-17, there would be approximately one acre of impacts to Reservoirs (FLUCCS 5300) and approximately two acres of impacts to Wetland Forested Mixed (FLUCCS 6300), for a total of three acres of direct impacts.



Photograph 6-12 AA-17 vegetation, facing southeast

AA-18

This stormwater pond is on the southwest corner of East River High School property (**Photograph 6-13**). It lacks natural vegetation and is of low value to wildlife. This AA would not be impacted under the recommended alternative.



Photograph 6-13 AA-18 Stormwater pond on school grounds, aerial view

AA-19

AA -19 includes a tributary of the Econlockhatchee River that runs from north of SR 50 to the river. This high quality wetland area is mapped as Mixed Wetland Hardwoods and Wetland Forested Mixed (**Photographs 6-14** through **6-16**). Its western perimeter is bordered by mixed upland hardwood forest and shrubs/brushland. To the east AA-19 borders pastures, most of which are under conservation easement. There are several residences on the edges of AA-19 and to the immediate north is an auto salvage yard as well as the main drainage of the river tributary. To the south the drainage crosses a powerline easement then reaches the Econlockhatchee River. Because of this direct connection to the river and the buffer of lands around AA-19, it is considered of high value to wildlife. Common species observed in the field include bald cypress, maple species, live oak, royal fern, cabbage palm, American beauty berry, and saw palmetto, with relatively few invasive species besides one patch of large wild taro. Some trash and debris was observed in AA-19 near adjacent residences. Within AA-19 there would be approximately one acre of direct impacts to Mixed Wetland Hardwoods (FLUCCS 6170) and approximately four acres of direct impacts to Wetland Forested Mixed (FLUCCS 6300), for a total of five acres. AA-19 contains part of a SJRWMD regulatory easement.



Photograph 6-14 AA-19 Mixed Wetland Hardwoods and river tributary, facing southwest



Photograph 6-15 AA-19 wetlands and trash, facing south



Photograph 6-16 AA-19 Wetland Forested Mixed, facing southeast

AA-20

This isolated Cypress wetland is surrounded by cow pasture (**Photograph 6-17**) that is under conservation easement. It is completely isolated but does provide some cover and habitat for wildlife in an otherwise open area. The dominant species is bald cypress (**Photograph 6-18**), with some live oak and little understory vegetation except for occasional wax myrtle. This AA would not be impacted under the recommended alternative.



Photograph 6-17 AA-20 Cypress wetland surrounded by pasture, facing southwest



Photograph 6-18 AA-20 Understory, facing west

AA-21

This AA is surrounded by cattle pasture and has been excavated for use as a cattle pond (**Photograph 6-19**). The landowner claimed the pond has not completely dried during previous droughts. Though it contains little vegetation now due the excavation and heavy use by cattle, it is mapped by SJRWMD as Freshwater Marsh. A slight drainage connection between AA-21 and AA-20 was evident in some historical photographs. Due to its heavy use by cattle and impacts from earthmoving, but since it provides a constant source of water, AA-21 is considered of low to medium value to wildlife. Gopher tortoise burrows were discovered in the surrounding pasture. Under the recommended alternative, within AA-21 there would be approximately 0.1 acres of direct impacts to Freshwater Marsh (FLUCCS 6410).



Photograph 6-19 AA-21 Cattle pond, facing south

AA-22

This Wet Prairie is surrounded by lowgrowing shrubs and is circular in shape (**Photograph 6-20**). It is within a large area of shrubland with occasional slash pines and is near large cattle pastures. Because of the surrounding vegetation and undeveloped surrounding area, AA-22 is of medium value to wildlife. There was extensive saw palmetto and few invasive plant species. A gopher tortoise burrow was discovered nearby. This AA would not be impacted under the recommended alternative.



Photograph 6-20 AA-22 Wet Prairie

AA-23

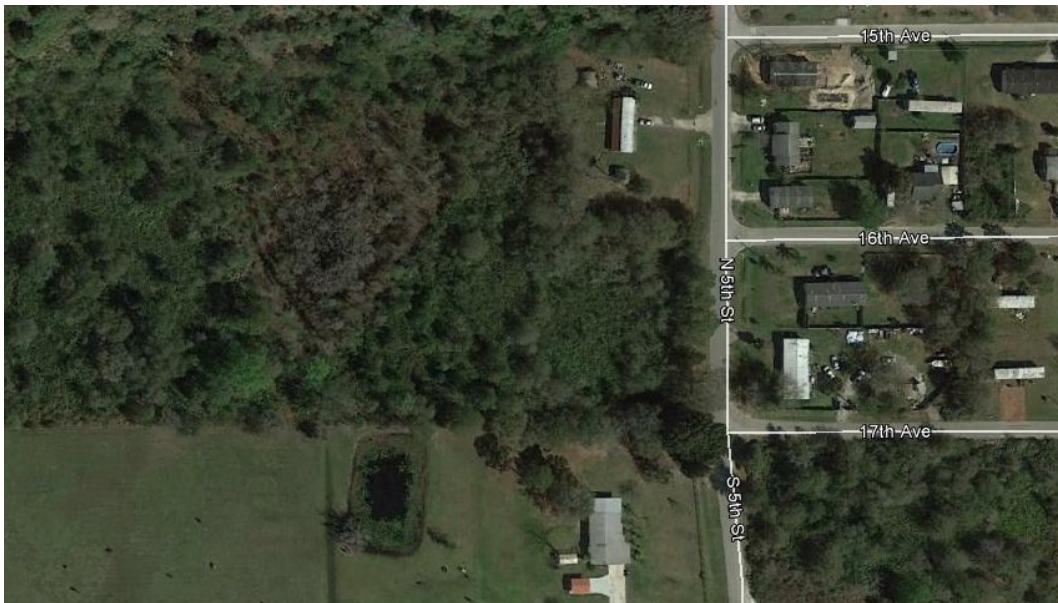
This area contains two stock ponds and a small freshwater marsh/cypress wetland in close proximity (**Photographs 6-21** through **6-23**). The stock ponds, one north and one south, are surrounded by cattle pasture. The freshwater marsh/cypress is surrounded by pine flatwoods adjacent to cattle pasture and is approximately 100 feet from the north stock pond. Because the freshwater marsh/cypress is within a larger undeveloped area with natural vegetation, it is of medium value to wildlife. The stock ponds are of lower value to wildlife due to less natural vegetation and use by cattle. Within AA-23 under the recommended alternative, there would be approximately 0.3 acres of direct impacts to Reservoirs (FLUCCS 5300).



Photograph 6-21 AA-23 Southern stock pond



Photograph 6-22 AA-23 Northern stock pond



Photograph 6-23 AA-23 North stock pond and freshwater marsh/cypress wetlands, aerial view

AA-24

These Mixed Wetland Hardwoods occur in a larger patch of wooded uplands (**Photograph 6-24**). They are connected to extensive wetlands far to the northeast by a narrow ditch that passes beneath SR 50. Common plant species observed include many bald cypress, royal fern, red maple, salt bush, swamp bay, wax myrtle, sweet bay magnolia, maiden fern, and elderberry. There are relatively few invasive plant species, including sword fern. This wetland spans both sides of CR 13. Under the recommended alternative, within AA-24 there would be approximately 4 acres of direct impacts to Mixed Wetland Hardwoods (FLUCCS 6170).



Photograph 6-24 AA-24 Vegetation, facing west

AA-25

This area is a small, channelized drainage ditch that has a narrow band of mature vegetation bordering it. It flows northwards through residential areas under Lansing Street (**Photograph 6-25**), past an auto salvage yard, and under SR 50 via a culvert. North of SR 50 this ditch becomes substantially larger with a straight course and engineered morphology more typical of a small canal (**Photograph 6-26**). In the narrow band of vegetation beside the ditch there is a mixture of oaks, pines, and various trees associated with residential landscaping as well as manicured lawns and fields. In some places an understory of ferns and elephant ears grows in the ditch and its banks. Because it is so narrow but links to other areas and contains vegetative cover, AA-25 is considered low value to wildlife. Under the recommended alternative, within AA-25, there would be approximately 0.2 acres of direct impacts to Mixed Wetland Hardwoods (FLUCCS 6170).



Photograph 6-25 AA-25 from Lansing Street, facing south



Photograph 6-26 AA-25 drainage north of SR 50, connecting to canal, facing northwest

AA-26

This manmade stormwater pond is located immediately north of Lansing Street and is surrounded by a chain-link fence and residential land. It has little vegetation, and is periodically dry (**Photograph 6-27**). AA-26 is mapped by SJRWMD as Freshwater Marsh (FLUCCS 6410) and by NWI as Freshwater Pond. During field investigations a wood stork, a tri-colored heron, and other wading birds were observed at AA-26. Under the recommended alternative, within AA-26 there would be approximately three acres of direct impacts to lands mapped by SJRWMD as Freshwater Marsh (FLUCCS 6410).



Photograph 6-27 AA-26 Stormwater pond with wading birds

AA-27

This stormwater pond is south of Lansing Street and is surrounded by residential land. Due to the isolation and lack of vegetation it is of relatively little value to wildlife. This AA would not be impacted under the recommended alternative.

AA-28

This reservoir was created from the pit left by a dirt mining operation. There are two additional, larger reservoirs to the north and wetlands to the east of AA-28. The borders of the reservoir are mostly forested with live oaks, cypress, wax myrtle, and slash pine. Because it is relatively large, vegetated, and near other extensive wetlands, it is of medium value to wildlife. This AA would not be impacted under the recommended alternative.

AA-29

This stormwater pond is east of Avenue C Union and is surrounded by residential land and pine flatwoods. Due to the isolation and lack of vegetation, it is of relatively little value to wildlife. This AA would not be impacted under the recommended alternative.

7.0 IMPACTS EVALUATION

The “No-Build” alternative would have no impacts on wildlife, habitats, wetlands or other surface waters; however, the “No-Build” alternative would not address the needs of the proposed project. The extent of potential impacts to wildlife habitats and wetlands was assessed by overlaying land use types (as mapped by SJRWMD and supplemented with data collected in the field) with proposed project alternatives. Typical sections for the Build Alternative, along with illustrations and an aerial view of the roadway are provided in Section 3.0.

DIRECT IMPACTS

Potential direct impacts to wetlands and OSW, wood stork SFH, vegetated uplands, and the Econlockhatchee River RHPZ are summarized in **Table 7-1** for the recommended alternative and proposed ponds. Direct impacts for the recommended alternative are summarized by FLUCCS code in **Table 7-2** and for proposed ponds in **Table 7-3**. Acreages of impacts were rounded to the nearest whole number, except that impacts less than one acre were expressed to the tenth of an acre. The directly impacted wetlands include areas mapped by SJRWMD as Mixed Wetland Hardwoods (FLUCCS 6170), Cypress (FLUCCS 6210), Wetland Forested Mixed (FLUCCS 6300), and Freshwater Marshes (FLUCCS 6410). OSW include areas mapped as Reservoirs (FLUCCS 5300) and an estimated 0.5 acre of roadside ditches and swales. Jurisdictional determinations of wetland limits will be made during the permitting phase and may potentially reduce the extent of direct wetland impacts.

Wood stork SFH includes wetlands and shallow surface waters like roadside swales/ditches and stormwater ponds where wood storks can wade and forage. The total current acreage of SFH in the form of swales and ditches is estimated to be no more than 0.5 acre. That was added to the acreage of wetland and OSW impacts to estimate a maximum total of approximately 70.6 acres of potential impacts to wood stork SFH (**Table 7-1**). The precise amount of required mitigation for impacts to wood stork SFH will be determined during the design and permitting processes and could potentially be offset by recreating SFH on site.

Impacts to vegetated uplands are calculated to estimate the acreage of potential impacts to terrestrial habitats, this includes uplands outside the RHPZ. Under the recommended alternative, there would be approximately 86 acres of direct impacts to vegetated uplands. Vegetated uplands include areas mapped by SJRWMD as Improved Pasture (FLUCCS 2110), Unimproved Pasture (FLUCCS 2120), Field Crops (2150), Citrus Groves (FLUCCS 2210), Ornamentals (FLUCCS 2430), Shrub and Brushland (FLUCCS 3200), Mixed Upland Non-forested (FLUCCS 3300), Pine Flatwoods (FLUCCS 4110), Upland Mixed Coniferous/Hardwood (FLUCCS 4340), and Pine Plantation (FLUCCS 4410).

Table 7-1 Approximate Potential Direct Impacts

Alternative	Wetlands (acres)	OSW (acres)	Wood Stork SFH (acres)	Vegetated Uplands (acres)	RHPZ (acres)	
					Wetlands	Uplands
No Build	-	-	-	-	-	
Recommended Alternative	61.1	9.5	70.6	86	17	1
All Ponds Combined	7	7.5	14.5	31	-	-

SJRWMD does not publish any maps or provide GIS data layers that delineate the boundaries of the Econlockhatchee River RHPZ. The Econlockhatchee River RHPZ encompasses wetlands abutting the main river channel as well as 11 tributaries, including the Long Branch. The Long Branch is approximately 0.65 miles south of the project and no direct impacts to the Long Branch portion of the RHPZ are anticipated.

The RHPZ includes uplands within 50 feet landward of the landward extent of the RHPZ wetlands and uplands that are within 550 feet landward of the streams edge. Impacts to the RHPZ are estimated based on the location of the Econlockhatchee River provided by the USGS and shown in **Figures 3-5** and **3-6**. Associated RHPZ wetland and vegetated upland locations were based on data reported in SJRWMD land use data (**Figures 3-1** through **3-3**) and examined in the field and on aerial imagery.

Table 7-2 Direct Impacts from Recommended Alternative by FLUCCS Code

Land Cover	FLUCCS CODE	Approximate Acres of Direct Impacts
Residential Low Density	1100	48
Residential Rural	1180	7
Residential Medium Density	1200	18
Residential High Density	1300	16
Commercial and Services	1400	16
Commercial and Services Under Construction	1490	2
Other Light Industrial	1550	2
Phosphates	1633	-
Institutional	1700	2
Race Tracks	1830	-
Other Recreational	1890	2
Open Land (Urban)	1900	2
Improved Pasture	2110	22
Unimproved Pasture	2120	3
Field Crops	2150	0.6
Citrus Groves	2210	8
Ornamentals	2430	2
Shrub and Brushland	3200	14
Mixed Upland Non-forested	3300	1
Pine Flatwoods	4110	21
Upland Mixed Coniferous/Hardwood	4340	9
Pine Plantation	4410	5
Reservoirs	5300	9
Mixed Wetland Hardwoods	6170	31
Cypress	6210	4
Wetland Forested Mixed	6300	23
Freshwater Marshes	6410	3
Wet Prairie	6430	-
Emergent Aquatic Vegetation	6440	-
Mixed Scrub Shrub Wetland	6460	0.1
Roads and Highways	8140	5
Electrical Power Lines	8320	3
	TOTAL	277

Table 7-3 Direct Impacts from Proposed Pond Locations by FLUCCS Code

Pond	FLUCCS Code	Approximate Impacts (acre)	Other Environmental Concerns
1A	4110: Pine Flatwoods	2	Impacts existing stormwater pond incorrectly mapped as Freshwater Marsh
	6410: Freshwater Marshes	0.11	
	8140: Roads and Highways	0.03	
1B	4110: Pine Flatwoods	2	Impacts existing stormwater pond incorrectly mapped as Freshwater Marsh
	6410: Freshwater Marshes	3	
1C	4110: Pine Flatwoods	0.96	-
	8140: Roads and Highways	0.13	
2B	1700: Institutional	10	-
2C	1400: Commercial and Services	5	-
	8320: Electrical Power Transmission Lines	0.01	
3A	1100: Residential, Low Density	1	-
	4110: Pine Flatwoods	1	
	4340: Upland Mixed Coniferous/Hardwood	0.74	
3B	2110: Improved Pastures	3	-
4A	1100: Residential, Low Density	0.31	-
	4110: Pine Flatwoods	1.5	
4B	3300: Mixed Upland Nonforested	2	Adjacent to SJRWMD regulatory easement
5A	3200: Shrub and Brushland	0.46	Impacts wetlands and SJRWMD regulatory easement
	4110: Pine Flatwoods	2.79	
	6300: Wetland Forested Mixed	0.78	
5B	3200: Shrub and Brushland	2	Impacts SJRWMD regulatory easement
	4110: Pine Flatwoods	2	
6A	1100: Residential, Low Density	5	Adjacent to SJRWMD regulatory easement
6B	1100: Residential, Low Density	3	Adjacent to SJRWMD regulatory easement
7A	1100: Residential, Low Density	0.91	-
	3200: Shrub and Brushland	2	
7B	3200: Shrub and Brushland	5	-
9A	1100: Residential, Low Density	2	-
9B	1100: Residential, Low Density	2	-
10A	1100: Residential, Low Density	2	-
10B	1100: Residential, Low Density	3	-
11A1	2210: Citrus Groves	0.91	-
11A2	1100: Residential, Low Density	0.31	-
	2210: Citrus Groves	0.13	
11A3	1100: Residential, Low Density	0.34	-
	2210: Citrus Groves	0.66	
11A4	2430: Ornamentals	0.16	Wetland impacts
	1100: Residential, Low Density	0.02	
	2430: Ornamentals	3	
11B1	6440: Emergent Aquatic Vegetation	0.24	-
	4110: Pine Flatwoods	3	
11B2	1490: Commercial and Services, Under Construction	2	Surface water impacts Wetland Impacts
	5300: Reservoirs	0.59	
	6300: Wetland Forested Mixed	0.06	
11C1	1900: Open Land	2	-
	1180: Residential, Rural	4	
11C2	1100: Residential, Low Density	1	-
	2430: Ornamentals	1	
	2210: Citrus Groves	0.02	
11C3	1100: Residential, Low Density	3	-
	4110: Pine Flatwoods	0.12	
11C4	1400: Commercial and Services	5	-
	1180: Residential, Rural	0.01	
12A	2120: Unimproved Pastures	5	-
12B	1200: Residential, Medium Density	1.41	Adjacent to SJRWMD regulatory easement
13A	2110: Improved Pastures	5	High potential for gopher tortoise burrows
	3200: Shrub and Brushland	0.01	
13B	1100: Residential, Low Density	0.02	High potential for gopher tortoise burrows
	2110: Improved Pastures	5	
14A	6410: Freshwater Marshes	0.16	-
	1100: Residential, Low Density	0.23	
	1200: Residential, Medium Density	0.46	

Table 7-3 Cont.

Pond	FLUCCS Code	Approximate Impacts (acre)	Other Environmental Concerns
	3200: Shrub and Brushland	2	
	4110: Pine Flatwoods	0.18	
14B	1200: Residential, Medium Density	3	-
15A	3200: Shrub and Brushland	0.68	
	4110: Pine Flatwoods	0.00	-
	4410: Pine Plantation	5	
15B	1200: Residential, Medium Density	2	Stormwater pond incorrectly mapped as Freshwater Marsh
	6410: Freshwater Marshes	0.19	
EXIST M1	1200: Residential, Medium Density	0.01	Existing Stormwater Pond Little Blue Heron, Tricolor heron, Wood stork Stormwater pond incorrectly mapped as Freshwater Marsh
	1400: Commercial and Services	0.11	
	6410: Freshwater Marshes	2.04	
EXIST M2	1200: Residential, Medium Density	0.18	Existing Stormwater Pond
	5300: Reservoirs	4	
EXIST M3	1200: Residential, Medium Density	0.60	Existing Stormwater Pond
	5300: Reservoirs	3	
	APPROXIMATE TOTAL POND IMPACTS	132.3	

POTENTIAL DIRECT IMPACTS TO LISTED SPECIES

For each listed species, the conservation status, typical habitat, and potential to occur in the project area are described in Section 6.0 along with effect determinations. **Table 7-4** presents each species and lists those effect determinations.

No adverse impacts to listed species are anticipated from the proposed project. Federally listed species that may be affected but would not be adversely affected by the proposed project are American alligator, Audubon's crested caracara, eastern indigo snake, Everglade snail kite, and wood stork. A determination of No Effect was made for Florida scrub-jay, beautiful pawpaw, Britton's beargrass, Florida bonamia, papery whitlow-wort, red-cockaded woodpecker and scrub buckwheat.

State listed species that may be affected but would not be adversely affected are Florida pine snake, Florida sandhill crane, gopher tortoise, little blue heron, roseate spoonbill, Sherman's fox squirrel, southeastern American kestrel, and tri-colored heron. A determination of No Effect was made for the state listed burrowing owl.

POTENTIAL DIRECT IMPACTS TO WETLANDS AND RHPZ

Table 7-5 lists the approximate acres of potential direct impacts to each wetland AA as mapped by SJRWMD FLUCCS code. According to SJRWMD data confirmed in the field, approximately 61.1 total acres of impacts to wetlands and 9.5 total acres of impacts to OSW are anticipated under the recommended alternative. Impacts to OSW include an estimated approximately one half-acre of impact to local ditches and swales (not mapped by FLUCCS code) as well as approximately 9 acres of impacts to Reservoirs (FLUCCS 5300). These wetlands and OSW fall within the jurisdiction of the USACE and SJRWMD.

The Econlockhatchee River would be spanned under the recommended alternative near the location of Old Cheney Road. The proposed bridge over the Econlockhatchee River would span or directly impact approximately 12 acres of Mixed Wetland Hardwoods (FLUCCS 6170) and 2 acres of Cypress (FLUCCS 6210).

Table 7-4 Effect Determinations for Recommended Alternative

Common Name	Scientific Name	Effect Determination
ANIMALS		
American alligator	<i>Alligator mississippiensis</i>	MANLAA
Audubon's crested caracara	<i>Polyborus plancus audubonii</i>	MANLAA
Bald eagle	<i>Haliaeetus luecocephalus</i>	MANLAA
Burrowing owl	<i>Athene cunicularia</i>	No Effect
Eastern diamondback rattlesnake	<i>Crotalus adamanteus</i>	MANLAA
Eastern indigo snake	<i>Drymarchon corais couperi</i>	MANLAA
Everglade snail kite	<i>Rostrhamus sociabilis plumbeus</i>	MANLAA
Florida pine snake	<i>Pituophis melanoleucus mugitus</i>	MANLAA
Florida sandhill crane	<i>Grus canadensis pratensis</i>	MANLAA
Florida scrub-Jay	<i>Aphelocoma coerulescens</i>	No Effect
Gopher tortoise	<i>Gopherus polyphemus</i>	MANLAA
Little blue heron	<i>Egretta caerulea</i>	MANLAA
Red-cockaded woodpecker	<i>Picoides borealis</i>	No Effect
Roseate spoonbill	<i>Platalea ajaja</i>	MANLAA
Sherman's fox squirrel	<i>Sciurus niger shermani</i>	MANLAA
Southeastern American kestrel	<i>Falco sparverius paulus</i>	MANLAA
Tri-colored heron	<i>Egretta tricolor</i>	MANLAA
Wood stork	<i>Mycteria americana</i>	MANLAA
PLANTS		
Beautiful pawpaw	<i>Deeringothamnus pulchellus</i>	No Effect
Britton's beargrass	<i>Nolina brittoniana</i>	No Effect
Florida bonamia	<i>Bonamia grandiflora</i>	No Effect
Papery whitlow-wort	<i>Paronychia chartacea</i>	No Effect
Scrub buckwheat	<i>Eriogonum longifolium</i> var. <i>gnalphalifolium</i>	No Effect

MANLAA= May affect not likely to adversely affect

Under the recommended alternative it is anticipated that up to approximately 18 total acres of SJRWMD RHPZ would be directly impacted. Those impacts include

approximately 17 acres of impacts to wetland RHPZ and one acre of impacts to vegetated uplands within the RHPZ (**Table 7-1**). None of the proposed ponds would impact the RHPZ.

The project encompasses approximately 13 acres mapped as OFW for the Econlockhatchee River. However, one area at the southern end of Story Partin Road is mapped as OFW, but currently contains a mobile home park. This area and the adjacent drainage to the east are not mapped as wetlands by the USFWS NWI or the SJRWMD, but are mapped as OFW.

POTENTIAL DIRECT IMPACTS TO SJRWMD EASEMENTS AND ORANGE COUNTY GREEN PLACES

SJRWMD easements in the project area were located using GIS data layers from the SJRWMD Data and Tools website. Coordination occurred with Orange County staff to locate county-owned conservation lands and resulted in Orange County providing a GIS layer showing Orange County Green PLACES. Those SJRWMD regulatory easements and Orange County Green PLACES are shown in **Figure 7-1**. SJRWMD can hold two different types of relevant easements on lands in their jurisdiction, Conservation Easements and Regulatory Easements. Under the recommended alternative, there would be no impacts to any SJRWMD Conservation Easements, so they are not displayed on **Figure 7-1**. However, SJRWMD holds Regulatory Easements on 13 parcels that would be directly impacted by the proposed project, for a total of approximately 34 acres of direct impacts (**Figure 7-1** and **Table 7-6**). Some of these Regulatory Easements include wetlands as well as vegetated uplands within the RHPZ.

Impacts to properties under a SJRWMD Regulatory Easement will require a vote by the SJRWMD governing board to release the easements, along with compensatory mitigation, and regulatory action. The governing board typically requires equal compensation at the highest wetland value (either current or when the easement was established) for the impacted easements. To vote on release of easements, the governing board requires a request for release of the easement from the property owner, a sketch of the property, the original easement documents, and a proposal for

establishing another easement or a plan to purchase mitigation credits. The TM-Econ Mitigation Bank offers suitable wetland and RHPZ credits (all credit types are equal in price) and is the only available mitigation bank approved by SJRWMD.

In addition to impacts to two SJRWMD Regulatory Easements, two Orange County Green PLACES would be directly impacted under the recommended alternative (**Figure 7-1** and **Table 7-6**). Orange County Green PLACES are part of a program to preserve, enhance, and restore environmentally sensitive lands. Potential impacts include approximately 2.61 acres of the Nunnally Evans property (Parcel No. 19-22-32-7876-05-170) and 0.07 acres of the Sunflower property (No. 29-22-32-7882-00-280). The Nunnally Evans property is approximately 15 total acres and was acquired in 2005. The Sunflower property is approximately 34 total acres and was acquired in 1998. There are no known Cooperative Agreements, leases, or concessions on either property, and Orange County has indicated these properties are intended for environmental preservation only, not public recreation. The Nunnally Evans and Sunflower properties are managed by Orange County Environmental Protection Division. Impacts to Orange County Green PLACES will require an Orange County Conservation Area Impact permit. That permit is valid for five years and carries a fee of \$2,016 for 10 to 50 acres of wetland impacts and \$4,456 for 50 or more acres of impacts.

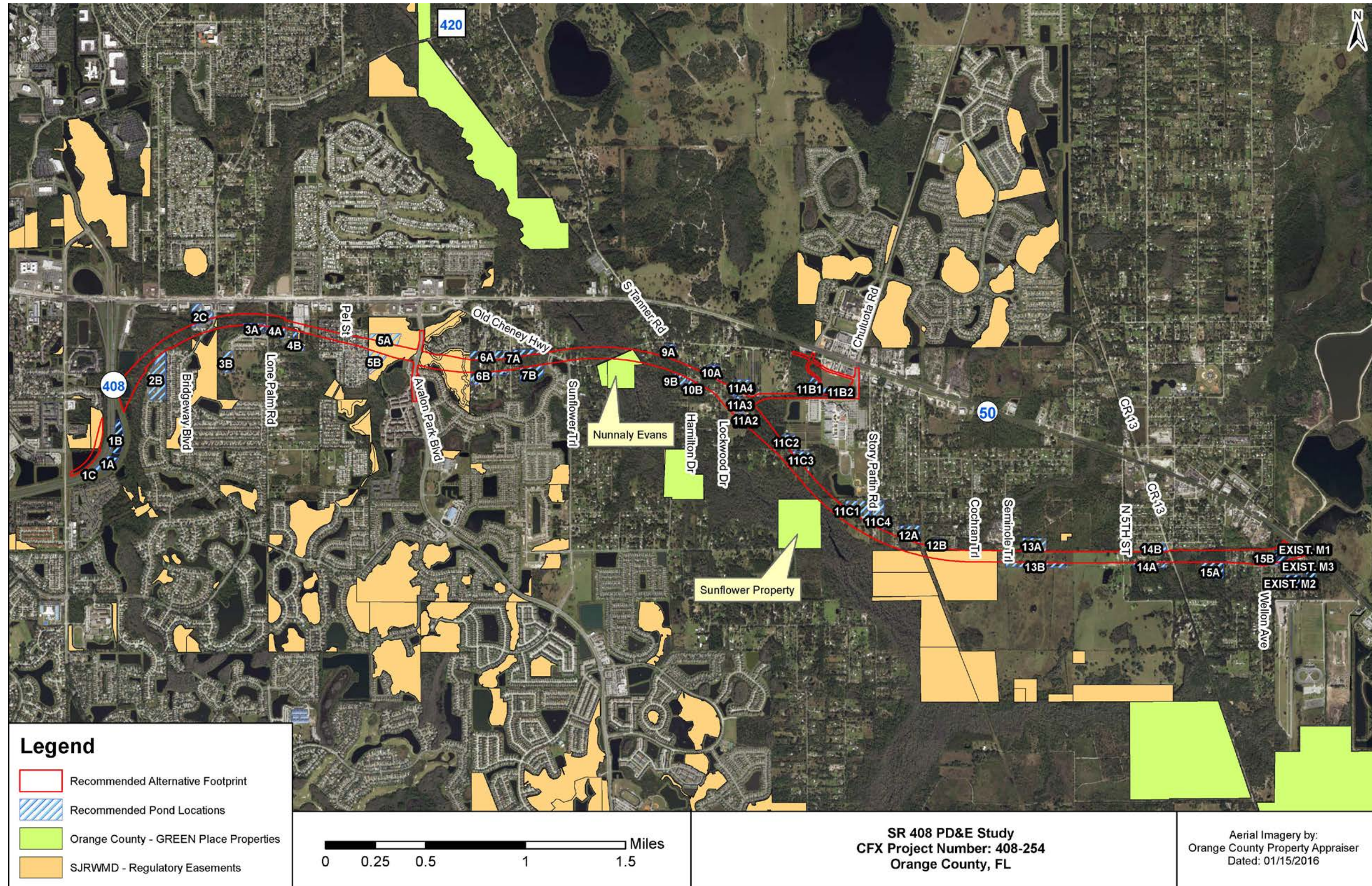


Figure 7-1 SJRWMD Regulatory Easements and Orange County Green PLACES

Table 7-5 Wetland Assessment Area Potential Direct Impacts

AA #	FLUCCS Code	USFWS NWI Classification	Approximate acres of FLUCCS Impact from Recommended Alternative
1	5300	Freshwater Pond	-
2	8370	Freshwater Pond	-
3	5300	Freshwater Pond/Freshwater Forested Shrub/Scrub-Shrub	5
4	4110/6410 (Incorrectly mapped)	Freshwater Forested Shrub	1
5	5300/6170/6460	Freshwater Pond/Freshwater Forested Shrub	18
6	5300	Freshwater Pond	0.5
7	6300	Freshwater Forested Shrub	-
8	5300/6300	Freshwater Pond/Freshwater Forested Shrub	-
9	5300/6300	Freshwater Pond/Freshwater Forested Shrub	11
10	5300	Freshwater Pond	-
11	5300	Freshwater Pond	-
12	5300	Freshwater Pond	0.3
13	6210/6170	Freshwater Forested Shrub	14
14	6440	Freshwater Pond	-
15	5300/6300	Freshwater Pond/Freshwater Forested Shrub	5
16	6210	Freshwater Forested Shrub	3
17	5300/6300	Freshwater Pond/Freshwater Forested Shrub	3
18	5300	Freshwater Pond	-
19	6170/6300	Freshwater Forested Shrub	5
20	6210	Freshwater Forested Shrub	-
21	6410	Freshwater Pond	0.1
22	6430	Freshwater Emergent	-
23	5300/6210/6410	Freshwater Emergent/Freshwater Pond	0.3
24	6170	Freshwater Forested Shrub	4
25	-	Freshwater Emergent	0.2
26	6410	Freshwater pond	3
27	6410	Freshwater pond	-
28	5300	Freshwater Pond	-
29	6410	Freshwater pond	-

Table 7-6 Potential Impacts to SJRWMD Easements and County Green PLACES

Easement Type	Parcel Number	Approximate Acres of Impact
Segment 1		
SJRWMD Conservation Easement	-	-
SJRWMD Regulatory Easement	31-22-23-9462-00-006	21.9
	31-22-23-0891-00-006	
	31-22-24-0000-00-049	
	31-22-24-8971-00-002	
	31-22-24-9064-02-007	
	31-22-24-9064-18-005	
	31-22-24-9064-02-006	
	31-22-24-9064-02-006	
	31-22-24-9064-02-007	
	31-22-24-9064-02-006	
	31-22-24-9064-02-006	
	31-22-24-9064-03-009	
31-22-24-9064-02-006		
Orange County Green PLACES	-	-
Segment 2		
SJRWMD Conservation Easement	-	-
SJRWMD Regulatory Easement	-	-
Orange County Green PLACES	19-22-32-7876-05-170 (Nunnally Evans Property)	2.61
Segment 3		
SJRWMD Conservation Easement	-	-
SJRWMD Regulatory Easement	32-22-28-0000-00-008	12.4
	32-22-28-0000-00-008	
Orange County Green PLACES	29-22-32-7882-00-280 (Sunflower Property)	0.07

INDIRECT IMPACTS

Indirect Impacts are those impacts that are caused by or will result from the proposed action and are later in time, but are still reasonably certain to occur. For transportation projects, indirect impacts typically include disturbance to areas adjacent to the project area. These impacts include the short-term impacts associated with road construction activities as well as other long-term impacts due to the proximity of the roadway to wildlife habitat and wetlands. Indirect impacts are typically mitigated at a reduced rate compared to direct impacts.

Potential short-term indirect impacts for the recommended alternative could result from the use of heavy equipment (and avoidance of construction areas by wildlife) and sedimentation resulting from increased erosion associated with soil disturbance. Best Management Practices (BMPs) typically associated with road construction projects will be implemented and maintained throughout all construction activities to minimize indirect impacts. Staging and stockpiling locations will be coordinated with the construction project manager and environmental staff in order to avoid and minimize impacts to any of the aforementioned species.

Potential longer-term indirect impacts include habitat fragmentation. Bridges along the project, including the span over the Econlockhatchee River, provide for wildlife movement and help reduce habitat fragmentation. Another indirect impact would be development on vacant land that is spurred by improvements to an adjacent roadway. This project would be limited access, and the only entrance/exit points to the SR 408 east extension are in developed areas; therefore, no secondary impacts are anticipated from the proposed project.

CUMULATIVE IMPACTS

A “cumulative impact”, according to the definition in the Council of Environmental Quality Regulations (40 CFR 1508.) and the FDOT *Cumulative Effects Evaluation Handbook*, “results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person

undertakes such other actions.” Cumulative impacts are the combined effects of the direct and indirect impacts over time.

Cumulative effects considerations under NEPA are slightly different than those under Section 404 of the Clean Water Act or the FDEP (or as delegated to SJRWMD) Environmental Resource Permitting program. Clean Water Act Section 404 permits guidelines focus on the discharge of dredge and fill materials and related effects on aquatic ecosystems. The USACE evaluates cumulative effects of numerous piecemeal changes to wetlands that can result in impairment to and changes in floodplain values and functions that may result in significant degradation of the floodplain and increased potential for harm to upstream and downstream activities (33 CFR 320).

FDEP considers cumulative impacts in the context of surface waters and wetlands within a drainage basin (Section 373.414(8) F.S.). The FDEP definition for cumulative impacts is “residual adverse impacts to wetlands and other surface waters in the same drainage basin that have or are likely to result from similar activities (to that under review) that have been built in the past, that are under current review, or that can reasonably be expected to be located in the same drainage basin as the activity under review. Mitigation that fully offsets impacts within the drainage basin where the project impacts occur is assumed to not have any adverse cumulative impacts.” One key distinction is that the FDEP definition of cumulative impacts assumes mitigated impacts do not contribute to cumulative impacts while the NEPA definition does not make this assumption.

Under the Endangered Species Act, cumulative impacts “are those effects of future state or private activities, not involving federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation.” (50 CFR 402.02). The key differences between this and the NEPA definition are that future federal actions are not considered, and that the impacts must be “reasonably certain” to occur, not just “reasonably foreseeable.”

Direct impacts from the recommended alternative would include 86 acres of impacts to vegetated uplands and 61.1 acres of impacts to wetlands. None of these areas contain

designated Critical Habitat for listed species and no adverse impacts to listed species are anticipated from the proposed project. Unavoidable impacts to wetlands will be mitigated. BMPs will be implemented to reduce potential indirect impacts from construction, runoff and sedimentation. Mitigation will be provided for impacts to wood stork SFH, as applicable, during the design/permitting phase of the project. Gopher tortoise impacts will be minimized through surveys and potential relocations in accordance with FWC protocols. Orange County and the SJRWMD require mitigation for unavoidable impacts to wetlands as well as to the SJRWMD Econlockhatchee River RHPZ. For these reasons, cumulative impacts to wetlands and listed species are not anticipated as a result of the proposed project.

AVOIDANCE AND MINIMIZATION MEASURES

Sensitive environmental features, such as riparian areas, nesting areas, and known species occurrences were identified early during the PD&E process so that alternatives could be developed that avoid and minimize impacts as much as practicable. To minimize impacts to wildlife habitats, the project crosses the Econlockhatchee River at a previous river crossing, where the natural conditions are degraded from human use. Proposed stormwater pond sites will be further evaluated to minimize impacts to environmental resources to the maximum extent practicable, and unavoidable impacts from pond sites will be mitigated. Standard BMPs for construction of roads and bridges will be observed during all construction activities. The *USFWS Standard Protection Measures for the Eastern Indigo Snake* will be implemented as minimization measures and require the excavation of gopher tortoise burrows and other refugia where eastern indigo snakes could be trapped or injured. Gopher tortoise burrow surveys, relocations, and permitting will be performed in accordance with FWC protocols to avoid and minimize potential impacts.

8.0 AGENCY COORDINATION

Representatives from USFWS and FWC attended the project meetings and were involved in the Advanced Notification and preliminary screening processes. No listed species under the jurisdiction of NMFS is likely to occur in the project corridor, so no further coordination with the NMFS is anticipated. Additional coordination with the SJRWMD and Orange County occurred through Environmental Advisory Group meetings regarding data sharing, land use mapping, and regulatory compliance/permitting. The Advanced Notification package was reviewed by Jennifer Goff, Land Use Planning Program Administrator in the Office of Conservation Planning Services at FWC. Below is the response to the Advanced Notification reiterated by FWC on December 21, 2016:

“Our GIS analysis revealed that the area within 0.5 miles of the SR 50 project limits is over 56% developed in High or Low Intensity Urban (47.84%, 1,496.5 acres), Agriculture (7.73%, 241.6 acres), and Extractive (0.87%, 27.2 acres) land uses. Wetlands comprise over 18% of the study area and include Other Wetland Forested Mixed (7.51 %, 234.8 acres), Hydric Pine Flatwoods (2.36%, 73.8 acres), Cypress Swamp (2.29%, 71.6 acres), Other Hardwood Wetlands (1.84%, 57.5 acres), Wet Prairie (1.47%, 45.9 acres), Freshwater Marshes (0.84%, 26.3 acres), Mixed Scrub-Shrub Wetland (0.32%, 10.0 acres), and Floating/Emergent Aquatic Vegetation (0.05%, 1.6 acres). Other landcover types include Mesic Flatwoods (14.60%, 456.2 acres), Shrub and Brushland (2.98%, 93.1 acres), Open Water (2.64%, 82.5 acres), Mixed Hardwood Coniferous (2.05%, 64.1 acres), Upland Hardwood Forest (0.34%, 10.8 acres), and Scrubby Flatwoods (0.04%, 1.4 acres). The most valuable wild life habitats within the corridor are the Econlockhatchee River floodplain and the mosaic of wetlands and uplands at the eastern terminus with SR 520.

Based on range and preferred habitat type, the following animal species listed by the Federal Endangered Species Act and the State of Florida as

Federally Endangered (FE), Federally Threatened (FT), State-Threatened (ST), or State Species of Special Concern (SSC) may occur within the study area: Eastern indigo snake (FT), American alligator (FT due to similarity to American crocodile), Audubon's crested caracara (FT), Florida scrub jay (FT), red-cockaded woodpecker (FT), wood stork (FE), gopher frog (SSC), Florida pine snake (SSC), gopher tortoise (ST), Southeastern American kestrel (ST), burrowing owl (SSC), Florida sandhill crane (ST), limpkin (SSC), little blue heron (SSC), tricolored heron (SSC), snowy egret (SSC), roseate spoonbill (SSC), white ibis (SSC), Sherman's fox squirrel (SSC), and Florida mouse (SSC).

Primary wildlife issues associated with this project include: the direct destruction of wildlife habitat via the construction of the new expressway extension, and drainage retention areas (DRAs) outside of the right-of-way (ROW); increasing the habitat fragmentation effect of SR 50; potential adverse effects to a moderate number of species listed by the Federal Endangered Species Act as Endangered or Threatened, or by the State of Florida as Threatened or Species of Special Concern; potential water quality degradation as a result of storm water runoff from the new roadway surface draining into adjacent wetlands and the Econlockhatchee River; and potential increase in wildlife road kill.

The Advanced Notification package referenced a commitment to prepare an Endangered Species Biological Assessment Report. We recommend that general wildlife surveys be conducted within the study area prior to selection of the roadway alignment, with detailed surveys conducted within and adjacent to the ROW, as appropriate, once an alignment has been selected. All surveys should follow protocols established by the U.S. Fish and Wildlife Service and the FWC. These surveys should be conducted by qualified individuals with recent documented experience. Basic survey guidance and protocols can be found in the Florida Wildlife Conservation Guide (<http://myfwc.com/conservation/value/fwcg/>). Based on the survey results, a

plan should be developed to address direct, indirect, and cumulative effects of the project on wildlife and habitat resources, including listed species. Avoidance, minimization, and mitigation measures should also be formulated and implemented. DRAs and equipment staging areas should be located in previously disturbed sites to avoid habitat destruction or degradation. The plan should address specific habitat needs which are biologically compatible with the recovery of the target species. For guidance in this effort, FWC's Draft Species Action Plans should be consulted at <http://myfwc.com/wildlifehabitats/imperiled/species-action-plans/>.

A compensatory mitigation plan should include the replacement of any native wetland, upland, or aquatic habitat lost as a result of the project. This could be achieved by purchasing land, or securing conservation easements over lands adjacent to existing public lands, and by habitat restoration. Replacement habitat for mitigation should be type for type, as productive, and equal to or of higher functional value.

Gopher tortoises have been documented in the project area. If gopher tortoises or nests of other state threatened (ST) or state species of special concern (SSC) species are present within any permanent or temporary construction area, a permit may be necessary from the FWC. For gopher tortoise survey methodology and permitting guidance, we recommend that FDOT refer to the FWC's Gopher Tortoise Permitting Guidelines (Revised February 2015) at: [http://myfwc.com/media/2984206/GT -Permitting-Guidelines-FrN A L-Feb20 15.pdf](http://myfwc.com/media/2984206/GT-Permitting-Guidelines-FrN%20A%20L-Feb20%2015.pdf)

The Florida pine snake is a highly fossorial species, thereby making it difficult to detect through ordinary methods, such as drift fence arrays. We recommend educating the workforce involved in road construction so they can recognize a Florida pine snake and, if one is encountered, allow it to vacate the area on its own. A photograph and information on the Florida pine snake can be found at

<http://myfwc.com/wildlifehabitats/imperiled/profiles/reptiles/florida-pine-snake/>.

The potential exists for colonial water birds like the little blue heron, white ibis, and snowy egret to occur within the study area. We recommend that surveys be conducted for water bird nesting colonies prior to any construction activities. If nesting is observed, FWC staff recommends the applicant maintain a minimum distance of 330 feet between the edge of the nesting area and any disturbance activity during the breeding season (Rodgers and Smith 1995). If maintaining the recommended buffer is impracticable or the removal of nesting habitat is necessary for the project, please contact FWC staff prior to construction activities to discuss minimization and permitting alternatives. Florida sandhill cranes may also occur within the study area and we recommend that surveys be conducted for this species. If nesting is observed in the right-of-way vicinity, we recommend maintaining a minimum distance of 400 feet between the edge of the nesting area and any disturbance activity during the breeding season (Stys 1997). If maintaining the recommended buffer is impracticable or the removal of nesting habitat is necessary for the project, the applicant should contact FWC staff prior to construction activities to discuss minimization and permitting alternatives.

Although limited in area, habitats within the study area may be suitable for the Sherman's fox squirrel. We recommend that fox squirrel nest surveys be conducted in appropriate habitats prior to any construction activities. This species nests in winter (October to February) and in summer (April to August). We recommend avoiding active fox squirrel nests until the young have left the nest. If an active nest tree cannot be avoided, then the applicant should coordinate with FWC staff to discuss minimization and permitting alternatives. When fox squirrels are observed within a project area, project activities should cease until the squirrels have dispersed from the area.”

In response to the FWC comment, direct, indirect, and cumulative impacts from the proposed project were evaluated for all listed animal species identified by FWC except those that were subsequently removed from the list of threatened and endangered species. On January 11, 2017, FWC finalized delisting of the Florida mouse (*Podomys floridanus*), gopher frog (*Lithobates capito*), limpkin (*Aramus guarauna*), snowy egret (*Egretta thula*), and white ibis (*Eudocimus albus*) (FWC 2016a). Because they were delisted, those species are not addressed in this NRE. Potential impacts to individual listed species are described in Section 6.0 and avoidance and minimization measures are described in Section 7.0. Drainage retention areas and staging areas will occur on previously disturbed sites as much as possible to further minimize impacts. As of the date on this document, no additional written comments have been received from FWC.

The U.S. Environmental Protection Agency (USEPA) made the following comments on January 11, 2017:

Wetlands: The proposed project area has several small wetland and mitigation areas that are located throughout the undeveloped portions of the project area which will be reasonably impacted by future development. Furthermore, the proposed project is a portion of a greater 20-mile SR 408 extension to U.S. I-95 and the resulting development will have further impacts to jurisdictional waters of the U.S. due to the increased residential and commercial development along the entire corridor. Consequently, the EPA recommends that future environmental documentation include wetland avoidance and minimization efforts that will be taken in compliance with the Clean Water Act Section 404(b)(1) guidelines.

Cumulative Impacts: The EPA recommends that the environmental document include a cumulative impacts analysis to address past, present, and reasonably foreseeable future social and natural resources impacts that will result from the SR 408 roadway extension. The proposed project is a portion of a greater 20-mile SR 408 extension to U.S. I-95 and the resulting residential and commercial development will have potential impacts due to

the increased development and construction. The Central Florida Expressway Authority may also wish to identify and document the independent utility of the proposed segment with respect to the 20-mile SR 408 extension and any other planned roadway improvements in the project study area.

In response to the USEPA comments, wetland avoidance and minimization measures were incorporated into this project and cumulative impacts were evaluated. As of the date on this document, no additional written comments have been received from USEPA.

The USACE made the following comments on December 21, 2016:

The Corps concurs with the Purpose and Need of the proposed project, however, the Corps will also need to determine the Least Environmental Damaging Practical Alternative if a Department of the Army Standard Permit is required.

The Corps understands from the review of the AN that the selected alternative corridor for the SR 408 extension will be along and an expansion of the existing SR 50. The Econlockhatchee River is an OFW and the wetlands associated with the Econlockhatchee River are high quality wetlands. Other wetlands along the proposed corridor have already been secondarily impacted and should result in being lower quality. The Corps also exercises Section 10 authority over the Econlockhatchee River in accordance with the River and Harbors Act of 1899, however, this segment of the river doesn't appear to be navigable.

The Corps recommends a continued emphasis on wetland avoidance and minimization opportunities throughout the planning process. A wetland survey should be conducted within the study area to identify the wetlands and a jurisdictional determination should be completed. The proposed project will have to be permitted using a Standard Individual Permit review,

therefore, adjacent property owners along the project corridor and Federal and State Resource Agencies will have to be Public Noticed.

Any unavoidable wetland impacts should be assessed using Modified-Wetland Rapid Assessment Procedure (M-WRAP) or WRAP dependent on the functional assessment of the bank that is proposed. A review of the Corps Regulatory In-lieu Fee and Bank Information Tracking System (RIBITS) indicates that the proposed project corridor would traverse the geographical service areas of the Colbert/Cameron Mitigation Bank (M-WRAP Assessed Credits) that currently has 341.13 palustrine credits available; Crosby Island Marsh Mitigation Bank (WRAP Assessed Credits) currently has 122.40 palustrine emergent credits and 14.54 palustrine forested credits available; East Central Florida - Eco Bank (M-WRAP Assessed Credits) that currently has 4.96 palustrine credits available; Farmton Mitigation Bank (WRAP Assessed Credits) currently has 3,975.19 palustrine credits available; and TM Econ Mitigation Bank (WRAP Assessed Credits) that currently has 824.95 palustrine credits available.

In response to USACE comments, wetlands were mapped and impacts will be avoided and minimized as much as practicable. Unavoidable wetland impacts will be mitigated at an approved mitigation bank. The current project involves extending SR 408 along a new corridor, not along the SR 50 corridor as was considered during earlier studies. In addition to the Advanced Notification and public involvement efforts, this difference in corridor location was also explicitly communicated to USACE in November 2017 and any additional comments or concerns were requested. As of the date on this document, no additional written comments have been received from USACE.

USFWS made the following comments on January 26, 2017:

Wood Stork (*Mycteria americana*)

The surrounding project area is mainly made up of some residential and commercial developments, with some undeveloped areas that could potentially be suitable wildlife habitat. The action area falls within the Core Foraging Areas (CFA) of at least 2 nesting colonies (Lawne Lake and Lake Mary Jane) of the endangered wood stork. The closest colony is over 12 miles south of the project area.

To minimize adverse effects to the wood stork and other wetland dependent species, we recommend that impacts to suitable foraging habitat be avoided. If avoidance is not possible, minimization measures should be employed and best management practices to avoid further degradation of the site. Mitigation for wetland impacts should be discussed with USFWS and will require further coordination. Please refer to the North Florida Field Office website for WOST colony locations. <http://www.fws.gov/northflorida>

Eastern Indigo Snakes (*Drymarchon corais couperi*)

Undisturbed uplands and wetlands within the proposed corridor are suitable habitat for the threatened eastern indigo snake (EIS). It is very likely that this species may occur within the action area. The addition of a new roads, road widening and associated infrastructure will likely increase the risks to this species from direct mortality and indirectly from habitat fragmentation and noise disturbance. Individual snakes may have large home ranges of 200 to 250 acres. Direct impacts from vehicles, loss and fragmentation of habitat would contribute to the further decline of this species. Implementing the current standard construction conditions and protection measures for EIS will reduce the direct risks to snakes during the construction phase but not the long-term impacts from habitat fragmentation and loss of individuals from interactions with vehicles for the life of the road. Complete surveys for

gopher tortoise burrows (currently a federal candidate species, which may be listed as Threatened before construction begins) should be conducted. Protection guidelines can be found on the North Florida Ecological Services website: <http://www.fws.gov/northflorida>. Surveys for gopher tortoise burrows will also facilitate the use of the EIS Effect determination key utilized by the Army COE.

Wetlands provide important habitat for fish and wildlife. Data provided in the Advance Notification indicated that wetlands occur within the project area. We recommend that the project be designed to avoid these valuable resources to the greatest extent practicable. Best Management Practices (BMPs) should be used to prevent degradation of wetland and other aquatic resources from erosion, siltation, and nutrient discharges associated with the project site. If impacts to wetlands are unavoidable, we recommend that the CFX provide mitigation that fully compensates for the loss of wetland resources.

Dependent on the alternative(s) selected, the proposed project is expected to result in minimal to moderate involvement with wildlife and habitat resources. If it is determined that the project will affect any federally listed species and/or their habitat, the CFX will initiate consultation with the FWS during the Project Development process.

In response to USFWS comments, wood stork SFH was mapped and impacts were avoided and minimized as much as practicable. Unavoidable impacts to wood stork SFH will be mitigated. The locations of active gopher tortoise burrows were noted during field investigations and the Eastern Indigo Snake Effect Determination Key (USFWS 2013) was used to assess potential impacts. Fewer than 25 active and inactive gopher tortoise burrows were detected in the project corridor and the habitats are mesic and hydric but not xeric. Wetland impacts were avoided and minimized as much as practicable and unavoidable impacts will be mitigated. Additional coordination occurred over the phone with USFWS in December 2017. The project was described, with

emphasis on it being a new corridor, and anticipated permitting and listed species issues were discussed. As of the date on this document, no additional written comments have been received from USFWS.

During a previous PD&E study considering an extension of SR 408 along the SR 50 corridor, the SJRWMD returned the following comments on July 17, 2015 regarding the proposed project:

“The project will require an Individual Environmental Resource Permit (ERP) under the new statewide ERP Rule 62-330, F.A.C. SJRWMD staff previously issued permits in the project area (Permits Nos. 4-095-20868-3, 4-095-140805-1 and 4-09586445-7). Some associated conservation easements may be located in the project area and may require release pursuant to Rule 40C-1.1101, F.A.C. A portion of the project is located within the Econlockhatchee River Hydrologic Basin (ERHB). ERP applications for such projects must meet additional surface water management basin criteria found in Rule 40C-41, F.A.C. Stormwater runoff treatment and attenuation will need to meet criteria in the ERP Applicant’s Handbook, Volume II. ERHB special basin criteria are in Section 13.4.2 and criteria concerning floodplains with respect to roadway projects are in Section 3.2. The Econlockhatchee River (and certain tributaries) is also designated Outstanding Florida Waters, and considered sovereignty submerged lands (SSL). Proprietary authorization for bridge crossings over SSL typically require a public easement, in accordance with Rule 18-21, F.A.C. Depending on the proposed roadway alignment, there may be direct and/or secondary impacts to wetlands or surface waters, which may require mitigation. If adverse wetland and surface water impacts occur, the project will have to meet the Elimination or Reduction of Impacts criteria in Section 10.2.1.1 and Cumulative Impacts criteria in Section 10.2.8 of the ERP Applicant’s Handbook, Volume I. In addition, there may be direct impacts to wetlands and uplands within the Riparian Habitat Project Zone. Roads and traversing works which cross the zone have the potential to adversely affect

the habitat value for aquatic and wetland dependent species pursuant to Sections 13.4.3(b) and (f) of the Applicant's Handbook, Volume II. For further information, please contact Ms. Victoria Nations at (407) 659-4858 or vnations@sjrwmd.com."

Through additional coordination the SJRWMD made the following comments on May 27, 2016:

"Based on the review of the aerial it appears there will be impacts to wetland within the Econ River Riparian Habitat Protection Zone (RHPZ), Uplands within the RHPZ, possible wetland mitigation areas, (Non RHPZ) wetlands and storm water ponds. The impacts to wetlands (RHPZ & Non RHPZ), mitigation areas and upland RHPZ areas that provide habitat for wetland depended species will require mitigation."

In response to comments from the SJRWMD and analysis of potential impacts, this report notes that an ERP as well as mitigation for unavoidable impacts to wetlands and the RHPZ are anticipated. An easement for crossing Sovereign Submerged Lands is also anticipated. As of the date on this document, no additional written comments have been received from SJRWMD.

During a previous PD&E study considering an extension of SR 408 along the SR 50 corridor FDEP provided the following comment on July 8, 2015. No additional written comments were provided by FDEP:

"If widening or new lane construction is proposed, the project will require an environmental resource permit (ERP) from the St. Johns River Water Management District (SJRWMD). The ERP applicant will be required to eliminate or reduce the proposed wetland resource impacts of highway construction to the greatest extent practicable. As noted in the AN, the project area crosses the Econlockhatchee River, designated Outstanding Florida Waters under section 62-302.700(9), F.A.C., and afforded a high level of protection under sections 62-4.242(2) and 62-302.700, F.A.C. In

accordance with section 373.414(1), F.S., direct impacts to these waterbodies and associated wetlands must be demonstrated to be "clearly in the public interest" as part of the ERP permitting process. We recommend that the PD&E study include an evaluation of existing stormwater treatment adequacy and details on the future stormwater treatment facilities. The permit applicant may be required to demonstrate that the proposed stormwater system meets the design and performance criteria established for the treatment and attenuation of discharges to OFWs, pursuant to rule 62-330, F.A.C., and the SJRWMD ERP Applicant's Handbook."

An ERP from the SJRWMD is anticipated and will comply with the SJRWMD ERP Applicant Handbook, particularly where it concerns special basin criteria and OFW. In addition to the above comments, at the Environmental Advisory Group meeting SJRWMD expressed an interest in exploring the use of recaptured stormwater to support landscaping. SJRWMD and FWC also expressed an interest in using native species for landscaping. Recapturing stormwater will be considered further and can be implemented during the design phase. The use of native landscaping plants is recommended.

9.0 CONCLUSIONS

The No Build and the recommended alternative were evaluated for impacts to listed species and habitats using a review of existing project literature and data, GIS resources, agency coordination, and field surveys. No adverse impacts to listed species are anticipated from the proposed project. Federally listed species that may be affected but would not be adversely affected by the proposed project are American alligator, Audubon's crested caracara, eastern indigo snake, Everglade snail kite and wood stork. A determination of No Effect was made for Florida scrub-jay, beautiful pawpaw, Britton's beargrass, Florida bonamia, papery whitlow-wort, and scrub buckwheat.

State listed species that may be affected but would not be adversely affected are Florida pine snake, Florida sandhill crane, gopher tortoise, little blue heron, roseate spoonbill, Sherman's fox squirrel, southeastern American kestrel, and tri-colored heron. A determination of No Effect was made for the burrowing owl.

It is anticipated that the recommended alternative would result in 61.1 acres of wetland impacts, 70.6 acres of impacts to wood stork SFH and approximately 18 total acres of impacts to the Econlockhatchee River RHPZ. Proposed pond locations would impact approximately 7 acres mapped as wetlands, 14.5 acres of wood stork SFH, 31 acres of vegetated uplands, and none of the Econlockhatchee River RHPZ.

Any take of jurisdictional wetlands, wood stork SFH, or naturally vegetated uplands or wetlands within the Riparian Habitat Protection Zone requires mitigation. Unavoidable impacts to wetlands will require mitigation through the USACE, SJRWMD, and Orange County. An ERP from the SJRWMD will be necessary and for permit issuance the project must meet the Special Basin Criteria and the RHPZ requirements associated with the Econlockhatchee River. The TM-Econ Mitigation Bank is the only existing mitigation bank in the Econlockhatchee River Basin approved by SJRWMD. The TM-Econ Mitigation Bank offers state and Federal wetland credits for herbaceous or forested wetlands as well as RHPZ credits for vegetated uplands, which are the same cost as wetland credits. Multiple additional mitigation banks exist that offer Federal wetland mitigation credits. A SJRWMD dewatering permit will likely be necessary and

an easement for crossing Sovereign Submerged Lands in the Econlockhatchee River will also be required. An Orange County Conservation Area Impact permit will also be required.

COMMITMENTS

CFX has concluded that the effect determinations listed in **Table 9-1** are appropriate. CFX commitments are listed below.

- To minimize adverse impacts to the eastern indigo snake, during construction, CFX will adhere to the *USFWS Standard Protection Measures for the Eastern Indigo Snake*
- Standard BMPs for construction of roads will be implemented during all construction and will follow FDOT's *Standard Specifications for Road and Bridge Construction*
- Staging and stockpiling locations will be coordinated with the construction project manager and will follow FDOT's *Standard Specifications for Road and Bridge Construction*
- CFX will mitigate for any unavoidable impacts to wood stork SFH at an approved mitigation bank and in accordance with the *USFWS Wood Stork Effect Determination Key* (U.S. Army Corps of Engineers and USFWS 2008)
- A preconstruction gopher tortoise burrow survey and any resultant permitting will be conducted in accordance with FWC protocols

Table 9-1 Effect Determinations

Common Name	Scientific Name	Effect Determination (All Alternatives)
ANIMALS		
American alligator	<i>Alligator mississippiensis</i>	MANLAA
Audubon's crested caracara	<i>Polyborus plancus audubonii</i>	MANLAA
Bald eagle	<i>Haliaeetus leucocephalus</i>	MANLAA
Burrowing owl	<i>Athene cunicularia</i>	No Effect
Eastern diamondback rattlesnake	<i>Crotalus adamanteus</i>	MANLAA
Eastern indigo snake	<i>Drymarchon corais couperi</i>	MANLAA
Everglade snail kite	<i>Rostrhamus sociabilis plumbeus</i>	MANLAA
Florida pine snake	<i>Pituophis melanoleucus mugitus</i>	MANLAA
Florida sandhill crane	<i>Grus canadensis pratensis</i>	MANLAA
Florida scrub-Jay	<i>Aphelocoma coerulescens</i>	No Effect
Gopher tortoise	<i>Gopherus polyphemus</i>	MANLAA
Little blue heron	<i>Egretta caerulea</i>	MANLAA
Red-cockaded woodpecker	<i>Picoides borealis</i>	No Effect
Roseate spoonbill	<i>Platalea ajaja</i>	MANLAA
Sherman's fox squirrel	<i>Sciurus niger shermani</i>	MANLAA
Southeastern American kestrel	<i>Falco sparverius paulus</i>	MANLAA
Tri-colored heron	<i>Egretta tricolor</i>	MANLAA
Wood stork	<i>Mycteria americana</i>	MANLAA
PLANTS		
Beautiful pawpaw	<i>Deeringothamnus pulchellus</i>	No Effect
Britton's beargrass	<i>Nolina brittoniana</i>	No Effect
Florida bonamia	<i>Bonamia grandiflora</i>	No Effect
Papery whitlow-wort	<i>Paronychia chartacea</i>	No Effect
Scrub buckwheat	<i>Eriogonum longifolium</i> var. <i>gnalphalifolium</i>	No Effect

MANLAA= May Affect Not Likely to Adversely Affect

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APPENDIX A: USFWS WOOD STORK GUIDELINES

**THE CORPS OF ENGINEERS, JACKSONVILLE DISTRICT, U. S. FISH AND
WILDLIFE SERVICE, JACKSONVILLE ECOLOGICAL SERVICES FIELD
OFFICE AND STATE OF FLORIDA EFFECT DETERMINATION KEY FOR
THE WOOD STORK IN CENTRAL AND NORTH PENINSULAR FLORIDA
September 2008**

Purpose and Background

The purpose of this document is to provide a tool to improve the timing and consistency of review of Federal and State permit applications and Federal civil works projects, for potential effects of these projects on the endangered wood stork (*Mycteria americana*) within the Jacksonville Ecological Services Field Office (JAFL) geographic area of responsibility (GAR see below). The key is designed primarily for Corps Project Managers in the Regulatory and Planning Divisions and the Florida Department of Environmental Protection or its authorized designee, or Water Management Districts. The tool consists of the following dichotomous key and reference material. The key is intended to be used to evaluate permit applications and Corps' civil works projects for impacts potentially affecting wood storks or their wetland habitats. At certain steps in the key, the user is referred to graphics depicting known wood stork nesting colonies and their core foraging areas (CFA), footnotes, and other support documents. The graphics and supporting documents may be downloaded from the Corps' web page at <http://www.saj.usace.army.mil/permit> or at the JAFL web site at <http://www.fws.gov/northflorida/WoodStorks>. We intend to utilize the most recent information for both the graphics and supporting information; so should this information be updated, we will modify it accordingly. **Note: This information is provided as an aid to project review and analysis, and is not intended to substitute for a comprehensive biological assessment of potential project impacts. Such assessments are site-specific and usually generated by the project applicant or, in the case of civil works projects, by the Corps or project co-sponsor.**

Explanatory footnotes provided in the key must be closely followed whenever encountered.

Scope of the key

This key should only be used in the review of permit applications for effects determinations on wood storks within the JAFL GAR, and not for other listed species. Counties within the JAFL GAR include Alachua, Baker, Bradford, Brevard, Citrus, Clay, Columbia, Dixie, Duval, Flagler, Gilchrist, Hamilton, Hernando, Hillsborough, Lafayette, Lake, Levy, Madison, Manatee, Marion, Nassau, Orange, Pasco, Pinellas, Putnam, St. Johns, Seminole, Sumter, Suwannee, Taylor, Union, and Volusia.

The final effect determination will be based on project location and description, the potential effects to wood storks, and any measures (for example project components, special permit conditions) that avoid or minimize direct, indirect, and/or cumulative

impacts to wood storks and/or suitable wood stork foraging habitat. Projects that key to a “no effect” determination do not require additional consultation or coordination with the JAFL. Projects that key to “NLAA” also do not need further consultation; however, the JAFL staff will assist the Corps if requested, to answer questions regarding the appropriateness of mitigation options. Projects that key to a “may affect” determination equate to “likely to adversely affect” situations, and those projects should not be processed under the SPGP or any other programmatic general permit. For all “may affect” determinations, Corps Project Managers should request the JAFL to initiate formal consultation on the Wood stork.

Summary of General Wood Stork Nesting and Foraging Habitat Information

The wood stork is primarily associated with freshwater and estuarine habitats that are used for nesting, roosting, and foraging. Wood storks typically nest colonially in medium to tall trees that occur in stands located either in swamps or on islands surrounded by relatively broad expanses of open water (Ogden 1991; Rodgers et al. 1996). Successful breeding sites are those that have limited human disturbance and low exposure to land based predators. Nesting sites protected from land-based predators are characterized as those surrounded by large expanses of open water or where the nest trees are inundated at the onset of nesting and remain inundated throughout most of the breeding cycle. These colonies have water depths between 0.9 and 1.5 meters (3 and 5 feet) during the breeding season.

In addition to limited human disturbance and land-based predation, successful nesting depends on the availability of suitable foraging habitat. Such habitat generally results from a combination of average or above-average rainfall during the summer rainy season, and an absence of unusually rainy or cold weather during the winter-spring breeding season (Kahl 1964; Rodgers et al. 1987). This pattern produces widespread and prolonged flooding of summer marshes that tends to maximize production of freshwater fishes, followed by steady drying that concentrate fish during the season when storks nest (Kahl 1964). Successful nesting colonies are those that have a large number of foraging sites. To maintain a wide range of foraging opportunities, a variety of wetland habitats exhibiting short and long hydroperiods should be present. In terms of wood stork foraging, the Service (1999) describes a short hydroperiod as one where a wetland fluctuates between wet and dry in 1 to 5-month cycles, and a long hydroperiod where the wet period is greater than five consecutive months. Wood storks during the wet season generally feed in the shallow water of short-hydroperiod wetlands and in coastal habitats during low tide. During the dry season, foraging shifts to longer hydroperiod interior wetlands as they progressively dry down (though usually retaining some surface water throughout the dry season).

Because of their specialized feeding behavior, wood storks forage most effectively in shallow-water areas with highly concentrated prey. Typical foraging sites for the wood stork include freshwater marshes, depressions in cypress heads, swamp sloughs, managed impoundments, stock ponds, shallow-seasonally flooded roadside or agricultural ditches, and narrow tidal creeks or shallow tidal pools. Good foraging conditions are characterized by water that is relatively calm, open, and having water depths between 5 and 15 inches (5 and 38 cm). Preferred foraging habitat includes wetlands exhibiting a mosaic of submerged and/or emergent aquatic vegetation, and shallow, open-water areas subject to hydrologic

regimes ranging from dry to wet. The vegetative component provides nursery habitat for small fish, frogs, and other aquatic prey, and the shallow, open-water areas provide sites for concentration of the prey during daily or seasonal low water periods.

WOOD STORK KEY

Although designed primarily for use by Corps Project Managers in the Regulatory and Planning Divisions, and State Regulatory agencies or their designees, project permit applicants and co-sponsors of civil works projects may find this key and its supporting documents useful in identifying potential project impacts to wood storks, and planning how best to avoid, minimize, or compensate for any identified adverse effects.

- A. Project within 2,500 feet of an active colony site¹.....*May affect*
Project more than 2,500 feet from a colony site.....go to B
- B. Project does not affect suitable foraging habitat² (SFH).....*no effect*
Project impacts SFH².....go to C
- C. Project impacts to SFH are less than or equal to 0.5 acre³.....*NLAA*⁴
Project impacts to SFH are greater than or equal to 0.5 acre.....go to D
- D. Project impacts to SFH not within a Core Foraging Area⁵ (see attached map) of a colony site, and no wood storks have been documented foraging on site.....*NLAA*⁴
Project impacts to SFH are within the CFA of a colony site, or wood storks have been documented foraging on a project site outside the CFAgo to E
- E. Project provides SFH compensation within the Service Area of a Service-approved wetland mitigation bank or wood stork conservation bank preferably within the CFA, or consists of SFH compensation within the CFA consisting of enhancement, restoration or creation in a project phased approach that provides an amount of habitat and foraging function equivalent to that of impacted SFH (see *Wood Stork Foraging Habitat Assessment Procedure*⁶ for guidance), is not contrary to the Service's *Habitat Management Guidelines For The Wood Stork In The Southeast Region* and in accordance with the CWA section 404(b)(1) guidelines.....*NLAA*⁴
Project does not satisfy these elements.....*May affect*

¹ An active nesting site is defined as a site currently supporting breeding pairs of wood storks, or has supported breeding wood storks at least once during the preceding 10-year period.

² Suitable foraging habitat (SFH) is described as any area containing patches of relatively open (< 25% aquatic vegetation), calm water, and having a permanent or seasonal water depth between 2 and 15 inches (5 to 38 cm). SFH supports and concentrates, or is capable of supporting and concentrating small fish, frogs, and other aquatic prey. Examples of SFH include, but are not limited to, freshwater marshes and stock ponds, shallow, seasonally flooded roadside or agricultural ditches, narrow tidal creeks or shallow tidal pools, managed impoundments, and depressions in cypress heads and swamp sloughs. See above *Summary of General Wood Stork Nesting and Foraging Habitat Information*.

³ On an individual basis, projects that impact less than 0.5 acre of SFH generally will not have a measurable effect on wood storks, although we request the Corps to require mitigation for these losses when appropriate. Wood Storks are a wide ranging species, and individually, habitat change from impacts to less than 0.5 acre of SFH is not likely to adversely affect wood storks. However, collectively they may have an effect and therefore regular monitoring and reporting of these effects are important.

⁴ Upon Corps receipt of a general concurrence issued by the JAFL through the Programmatic Concurrence on this key, "NLAA" determinations for projects made pursuant to this key require no further consultation with the JAFL.

⁵ The U.S. Fish and Wildlife Service (Service) has identified core foraging area (CFA) around all known wood stork nesting colonies that is important for reproductive success. In Central Florida, CFAs include suitable foraging habitat (SFH) within a 15-mile radius of the nest colony; CFAs in North Florida include SFH within a 13-mile radius of a colony. The referenced map provides locations of known colonies and their CFAs throughout Florida documented as active within the last 10 years. The Service believes loss of suitable foraging wetlands within these CFAs may reduce foraging opportunities for the wood stork.

⁶This draft document, *Wood Stork Foraging Habitat Assessment Procedure*, by Passarella and Associates, Incorporated, may serve as further guidance in ascertaining wetland foraging value to wood storks and compensating for impacts to wood stork foraging habitat.

Monitoring and Reporting Effects

For the Service to monitor cumulative effects, it is important for the Corps to monitor the number of permits and provide information to the Service regarding the number of permits issued that were determined "may affect, not likely to adversely affect." It is requested that information on date, Corps identification number, project acreage, project wetland acreage, and latitude and longitude in decimal degrees be sent to the Service quarterly.

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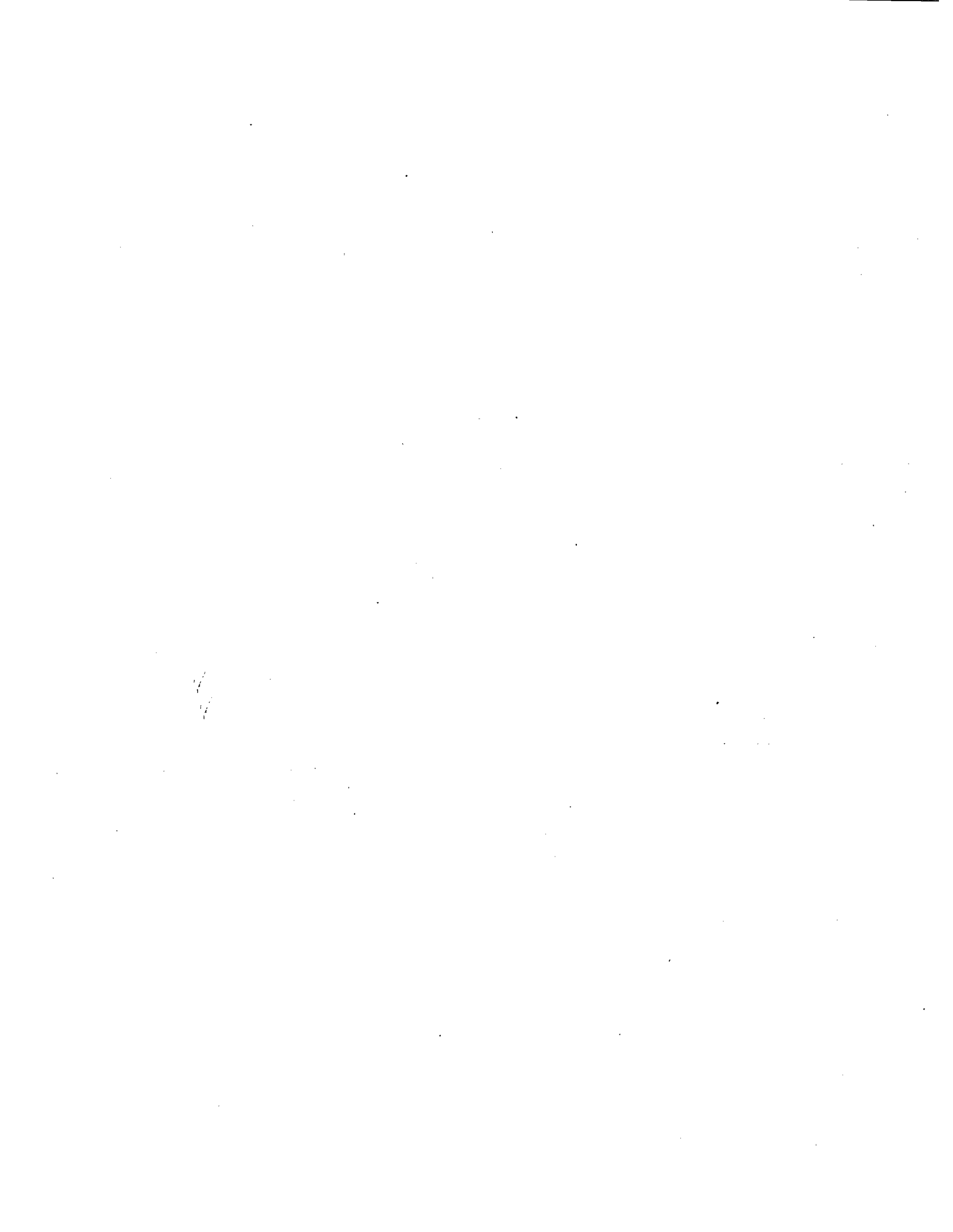
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HABITAT MANAGEMENT GUIDELINES FOR THE WOOD STORK IN THE SOUTHEAST REGION





**HABITAT MANAGEMENT GUIDELINES
FOR THE WOOD STORK IN THE
SOUTHEAST REGION**

Prepared by

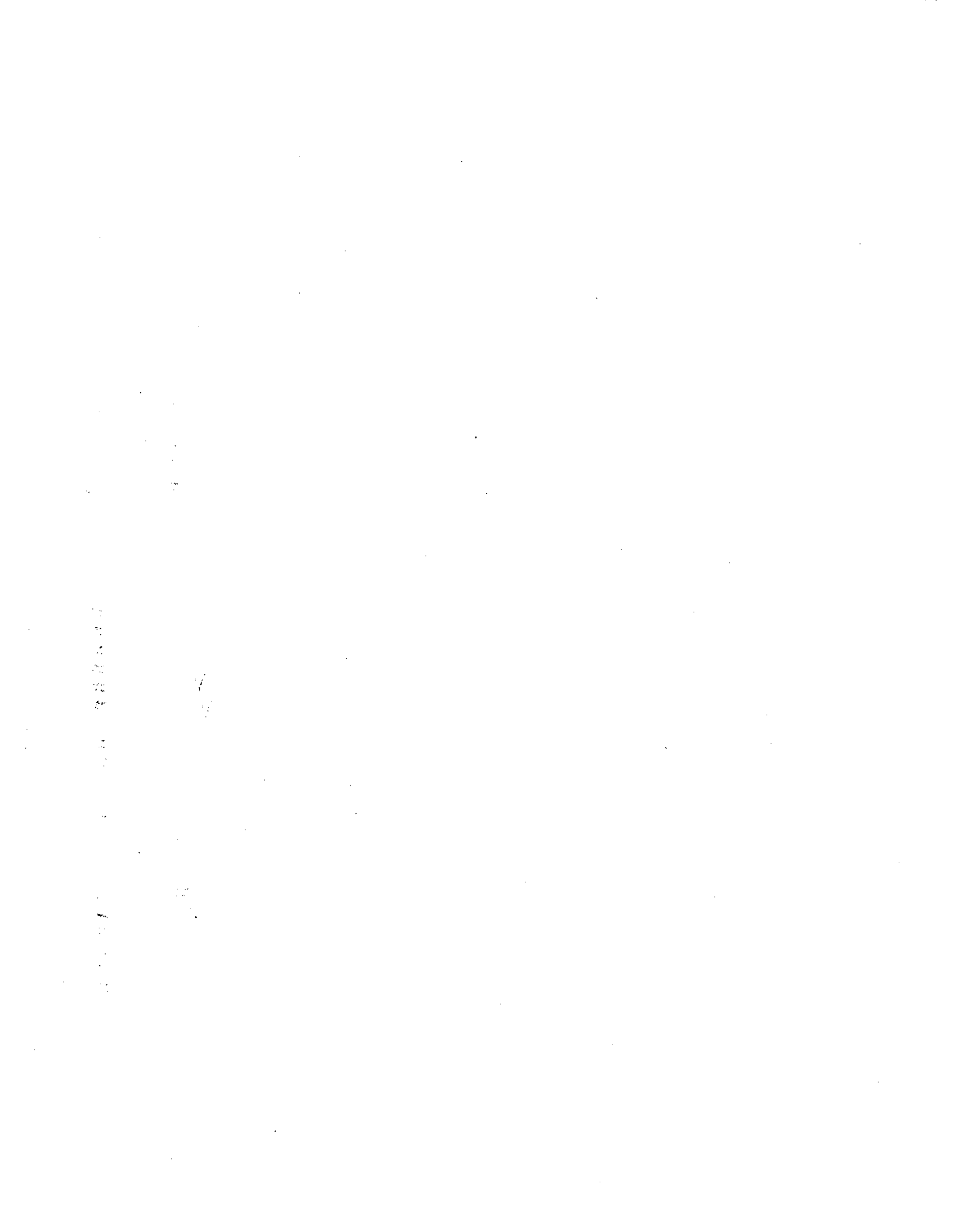
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**Southeast Region
U.S. Fish and Wildlife Service**

January 1990

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HABITAT MANAGEMENT GUIDELINES FOR THE WOOD STORK IN THE SOUTHEAST REGION

Introduction

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

General

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

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

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

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

I. Feeding habitat.

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

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

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

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

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

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

II. Nesting habitat.

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

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

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

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

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

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

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

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

III. Roosting habitat.

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

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

IV. Management zones and guidelines for feeding sites.

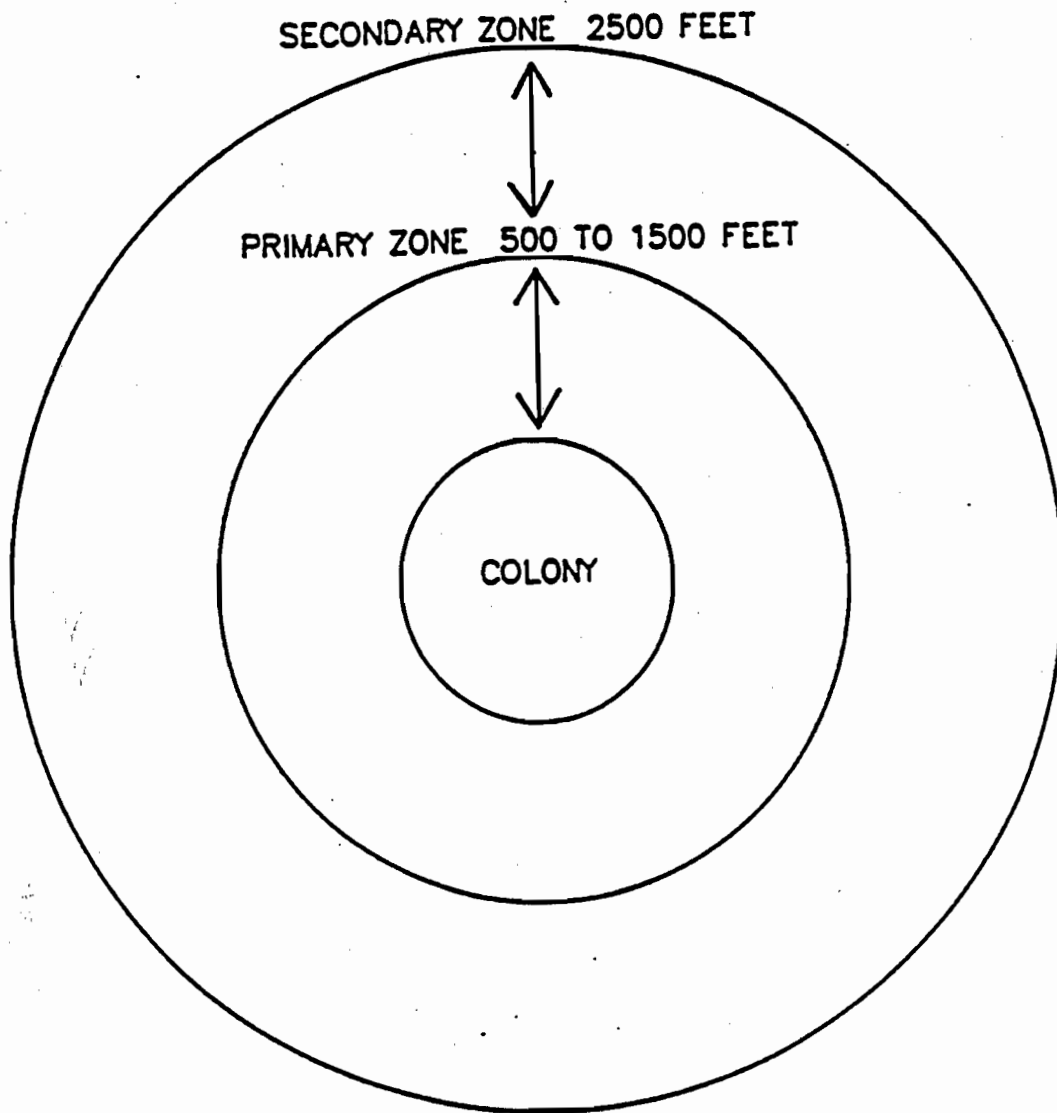
To the maximum extent possible, feeding sites should be protected by adherence to the following protection zones and guidelines:

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

- B. Feeding sites should not be subjected to water management practices that alter traditional water levels or the seasonally normal drying patterns and rates. Sharp rises in water levels are especially disruptive to feeding storks.
- C. The introduction of contaminants, fertilizers, or herbicides into wetlands that contain stork feeding sites should be avoided, especially those compounds that could adversely alter the diversity and numbers of native fishes, or that could substantially change the characteristics of aquatic vegetation. Increase in the density and height of emergent vegetation can degrade or destroy sites as feeding habitat.
- D. Construction of tall towers (especially with guy wires) within three miles, or high power lines (especially across long stretches of open country) within one mile of major feeding sites should be avoided.

V. **Management zones and guidelines for nesting colonies.**

- A. **Primary zone:** This is the most critical area, and must be managed according to recommended guidelines to insure that a colony site survives.
 - 1. **Size:** The primary zone must extend between 1000 and 1500 feet in all directions from the actual colony boundaries when there are no visual or broad aquatic barriers, and never less than 500 feet even when there are strong visual or aquatic barriers. The exact width of the primary zone in each direction from the colony can vary within this range, depending on the amount of visual screen (tall trees) surrounding the colony, the amount of relatively deep, open water between the colony and the nearest human activity, and the nature of the nearest human activity. In general, storks forming new colonies are more tolerant of existing human activity, than they will be of new human activity that begins after the colony has formed.
 - 2. **Recommended Restrictions:**
 - a. Any of the following activities within the primary zone, at any time of the year, are likely to be detrimental to the colony:
 - (1) Any lumbering or other removal of vegetation, and
 - (2) Any activity that reduces the area, depth, or length of flooding in wetlands under and surrounding the colony, except where periodic (less than annual) water control may be required to maintain the health of the aquatic, woody vegetation, and
 - (3) The construction of any building, roadway, tower, power line, canal, etc.
 - b. The following activities within the primary zone are likely to be detrimental to a colony if they occur when the colony is active:
 - (1) Any unauthorized human entry closer than 300 feet of the colony, and



- (2) Any increase or irregular pattern in human activity anywhere in the primary zone, and
 - (3) Any increase or irregular pattern in activity by animals, including livestock or pets, in the colony, and
 - (4) Any aircraft operation closer than 500 feet of the colony.
- B. **Secondary Zone:** Restrictions in this zone are needed to minimize disturbances that might impact the primary zone, and to protect essential areas outside of the primary zone. The secondary zone may be used by storks for collecting nesting material, for roosting, loafing, and feeding (especially important to newly fledged young), and may be important as a screen between the colony and areas of relatively intense human activities.
- 1. **Size:** The secondary zone should range outward from the primary zone 1000-2000 feet, or to a radius of 2500 feet of the outer edge of the colony.
 - 2. **Recommended Restrictions:**
 - a. **Activities in the secondary zone which may be detrimental to nesting wood storks include:**
 - (1) Any increase in human activities above the level that existed in the year when the colony first formed, especially when visual screens are lacking, and
 - (2) Any alteration in the area's hydrology that might cause changes in the primary zone, and
 - (3) Any substantial (>20 percent) decrease in the area of wetlands and woods of potential value to storks for roosting and feeding.
 - b. In addition, the probability that low flying storks, or inexperienced, newly-fledged young will strike tall obstructions, requires that high-tension power lines be no closer than one mile (especially across open country or in wetlands) and tall transmission towers no closer than 3 miles from active colonies. Other activities, including busy highways and commercial and residential buildings may be present in limited portions of the secondary zone at the time that a new colony first forms. Although storks may tolerate existing levels of human activities, it is important that these human activities not expand substantially.

VI. Roosting site guidelines.

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

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

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

VII. Legal Considerations.

A. Federal Statutes

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

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

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

B. State Statutes

1. State of Alabama

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

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

2. State of Florida

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

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

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

3. State of Georgia

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

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

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

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

4. State of South Carolina

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

