

Final

Natural Resources Evaluation

Malabar Road (SR 514) PD&E Study
From East of Babcock Street (SR 507) to US 1
Brevard County, Florida

FPID: 430136-1-22-01

ETDM: 13026

The environmental review, consultation, and other actions required by applicable federal environmental laws for this project are being, or have been, carried out by the Florida Department of Transportation (FDOT) pursuant to 23 U.S.C. §327 and a Memorandum of Understanding (MOU) dated December 14, 2016 and executed by the Federal Highway Administration and FDOT.

April 2018

Final

Natural Resources Evaluation

Malabar Road (SR 514) PD&E Study
From East of Babcock Street (SR 507) to US 1
Brevard County, Florida

FPID: 430136-1-22-01

ETDM: 13026

April 2018

Prepared By

ATKINS

482 South Keller Road
Orlando, Florida 32810

Table of Contents

Executive Summary	ES 1
Section 1.0 Project Summary	1-1
1.1 Project Description	1-1
1.2 Existing Typical Sections	1-3
1.3 Recommended Alternative	1-6
Section 2.0 Existing Environmental Conditions.....	2-1
2.1 Project Area	2-1
2.2 Land Use	2-1
2.2.1 Existing Land Use	2-1
2.2.2 Wetland Communities	2-13
2.2.3 Upland Communities.....	2-13
2.2.4 Property Review.....	2-15
2.2.5 Future Land Use.....	2-17
2.3 Natural and Biological Features	2-17
2.3.1 Listed Species.....	2-17
2.3.2 Soils	2-17
2.3.3 Drainage	2-27
Section 3.0 Wetland Evaluation	3-1
3.1 Wetland Identification, Delineations and Classifications.....	3-1
3.2 Preliminary Agency Coordination	3-8
3.3 Wetland Habitat Descriptions.....	3-11
3.4 UMAM Analysis.....	3-12
3.5 Impact Assessment.....	3-17
3.5.1 Alternatives Analysis	3-17
3.5.2 Recommended Alternative Alignment.....	3-17
3.5.3 Secondary and Cumulative Wetland Impacts	3-19
3.6 Avoidance and Minimization Analysis.....	3-33
3.6.1 Quality Enhancement Strategies (QES).....	3-33
3.7 Conceptual Mitigation Plan	3-34
3.7.1 Mitigation Bank Alternatives.....	3-35
3.7.2 Senate Bill Mitigation	3-35
Section 4.0 Listed Species	4-1
4.1 Preliminary Agency Coordination	4-1
4.2 Desktop Analysis	4-3

4.3	Field Review	4-3
4.4	Federally Listed Species	4-4
4.4.1	Florida Scrub Jay	4-10
4.4.2	Bald Eagle	4-10
4.4.3	Wood Stork	4-11
4.4.4	Audubon’s Crested Caracara	4-17
4.4.5	Eastern Indigo Snake	4-18
4.4.6	Red-cockaded Woodpecker	4-18
4.4.7	Gopher Tortoise	4-19
4.5	State Listed Species	4-20
4.5.1	Florida Burrowing Owl	4-20
4.5.2	Florida Sandhill Crane	4-20
4.5.3	Florida Pine Snake	4-21
4.5.4	Gopher Tortoise	4-21
4.6	Project Effects on Listed Species.....	4-21
4.6.1	Direct Effects to Protected Species.....	4-23
4.6.2	Indirect Effects to Listed Species	4-23
4.6.3	Cumulative Effects	4-23
4.7	Commitments.....	4-24
Section 5.0 Conclusion.....		5-1
Section 6.0 References		6-1

List of Appendices

- Appendix A Recommended Alternative Design Plans
- Appendix B Property Review
- Appendix C Correspondence
- Appendix D UMAM Analysis
- Appendix E Recommended Alternative UMAM Summary Table
- Appendix F Occurrence Records
- Appendix G Guidelines for Species Surveys and Protection Measures

List of Tables

Table 2-1	SJRWMD FLUCCS Categories within Project Study Area.....	2-7
Table 2-2	Soil Classification and Acreage within Project Study Area.....	2-20
Table 3-1	Wetland Acreage Impacts per Build Alternative	3-18
Table 3-2	Wetland Acreage Impacts and UMAM Functional Loss for Recommended Alternative Alignment	3-19
Table 4-1	Federally Listed Species	4-4
Table 4-2	State Listed Species.....	4-20
Table 4-3	Listed Species Potential Occurrence and Federal Effect Determinations ...	4-22

List of Figures

Figure 1-1	Project Location Map	1-2
Figure 1-2	Existing Typical Section Locations.....	1-3
Figure 1-3	Existing Typical Section – Babcock Street to West of Enterprise Avenue	1-4
Figure 1-4	Existing Typical Section – West of Enterprise Avenue to West of Weber Road	1-4
Figure 1-5	Existing Typical Section – West of Weber Road to Marie Street	1-5
Figure 1-6	Existing Typical Section – Marie Street to US 1	1-5
Figure 1-7	Recommended Typical Section – Segment 1	1-6
Figure 1-8	Recommended Typical Section – Segment 2a	1-7
Figure 1-9	Recommended Typical Section – Segment 2b	1-8
Figure 1-10	Recommended Typical Section – Segment 3	1-9
Figure 2-1	Project Study Area	2-2
Figure 2-2	SJRWMD Land Use Map	2-8
Figure 2-3	Town of Malabar, Future Land Use Map	2-18
Figure 2-4	City of Palm Bay, Future Land Use	2-19
Figure 2-5	NRCS Soils Map	2-21
Figure 2-6	SJRWMD Mitigation Basins	2-28
Figure 3-1	Wetlands and Other Surface Waters Map	3-2
Figure 3-2	Recommended Alternative – Wetland and OSW Impacts	3-20
Figure 4-1	Listed Species Occurrence and Potential Habitat Map.....	4-5
Figure 4-2	Wood Stork Foraging Habitat Impacts.....	4-12

Executive Summary

The Florida Department of Transportation (FDOT), District Five, conducted a Project Development and Environment (PD&E) Study to evaluate improvements to Malabar Road (SR 514) in Brevard County, Florida. The study limits begin east of Babcock Street (SR 507) [milepost (MP) 3.102] and extend to US 1 (MP 6.742), a distance of 3.64 miles. The purpose of the study is to provide documented environmental and engineering analyses to determine the type, location, and conceptual design of roadway improvements to Malabar Road (SR 514).

The purpose of this *Natural Resources Evaluation Report* is to provide a wetland evaluation in accordance with Executive Order 11990, "Protection of Wetlands", for the project. Pursuant to the U.S. Department of Transportation (USDOT) Order 5660.1A (Preservation of the Nation's Wetlands, dated August 1978) and *Part 2, Chapter 9 Wetlands of the FDOT PD&E Manual*, an assessment to identify and document habitat type and function of each wetland and other surface water (OSW) features existing within the project study area was conducted by environmental scientists. Sixteen jurisdictional wetlands and 56 OSW features were identified within the study area. Wetland community types were documented and Uniform Mitigation Assessment Method (UMAM) forms completed for each wetland identified during the field reviews conducted in November 2013.

In addition to providing a wetland evaluation, this report presents the findings of the assessment conducted for state and federally protected species within the project study area and to meet the requirements of the Endangered Species Act (ESA) of 1973, as amended. The ESA directs all federal agencies to work to conserve threatened and endangered species and to use their authorities to further the purposes of the ESA. The ESA, called Interagency Cooperation, is the mechanism by which Federal agencies ensure the actions they carry out (i.e. funds, constructs, authorizes through permit, etc.) do not jeopardize the existence of any federally endangered or threatened species or result in the destruction or adverse modification of Critical Habitat of such species. A literature review, Geographic Information System (GIS) analysis, discussions with regulatory agency staff, and field assessments were conducted to identify those listed species that may potentially occur within the project area. The federally protected species with the potential to occur within and adjacent to the project area include Florida scrub jays, eastern indigo snakes, gopher tortoises, red-cockaded woodpeckers, bald eagles, wood storks, and Audubon's crested caracaras. State-only listed species with the potential to occur in or around the project include Florida burrowing owls, Florida sandhill cranes, and Florida pine snakes.

Land use within the study corridor was assessed using GIS aerial photography, St. Johns River Water Management District (SJRWMD) Land Use shapefiles; field reviews to confirm the mapped land use were conducted in November 2013. The existing land uses include transportation facilities; urban areas; agricultural lands; wetlands and open water features (stormwater ditches, ponds, canals); and forested and non-forested uplands. The land use

within the project area is a mosaic of developed and undeveloped areas. There are five publicly owned parcels within the study area; the Malabar Scrub Sanctuary, Malabar Park, Malabar Disc Golf Course, Fern Creek Crossing Park, and the Al Tuttle and Sand Hill linear trails.

Given the engineering analysis, minimalization of environmental impacts, safety concerns, and public input; a Recommended Alternative was selected. Impacts to jurisdictional wetlands for the Recommended Alternative, including pond sites, are estimated at approximately 2.65 acres of direct and 1.30 acres of secondary wetland impacts resulting in a total functional loss (FL) of 1.22 units. Purchase of wetland mitigation credits at an approved wetland mitigation bank has been researched and reasonable mitigation options are available.

Federally protected species that may be directly impacted as a result of the Recommended Alternative, including ponds sites, include the Florida scrub jay and gopher tortoise. No state listed species, other than the gopher tortoise, are expected to be directly impacted by the Recommended Alternative. Indirect impacts to protected species may occur as a result of increased noise levels and increased opportunities for species- vehicle interaction. Minor cumulative impacts are anticipated as a result of the project.

Project commitments to eliminate, reduce, or compensate for any potential adverse environmental impacts include the following:

- During the design and permitting phase of the project, gopher tortoise, Florida sandhill crane, and Florida burrowing owl surveys will be conducted in accordance with applicable state regulatory agency protocols if required. Permitting will be conducted as necessary to comply with all state laws.
- During the design and permitting phase of the project, Florida scrub jay and Audubon's crested caracara surveys will be conducted in accordance with applicable federal regulatory agency protocols if required. If federally listed species are confirmed within the project limits, US Fish and Wildlife Service (USFWS) consultation will be initiated.
- During the design and permitting phase of the project, a formal gopher tortoise survey will be conducted to determine whether USFWS consultation is required for the eastern indigo snake, i.e. if more than 25 active and inactive burrows are proposed to be impacted. If it is determined that less than 25 gopher tortoise burrows will be impacted, FDOT agrees to follow the *USFWS Standard Protection Measures for the Eastern Indigo Snake (Appendix G)* during construction of the project. Technical specifications regarding this commitment will be written into the contractor's bid documents.
- FDOT will ensure that the *Contractor Requirements for Unexpected Interaction with Certain Protected Species During Work Activities* is followed during construction (**Appendix G**).

Section 1.0 Project Summary

The Florida Department of Transportation (FDOT), District Five, conducted a Project Development and Environment (PD&E) Study to evaluate improvements to Malabar Road (SR 514) in Brevard County, Florida. The study limits begin east of Babcock Street (SR 507) [milepost (MP) 3.102] and extend to US 1 (MP 6.742), a distance of 3.64 miles. The purpose of the study was to provide documented environmental and engineering analyses to determine the type, location, and conceptual design of roadway improvements to Malabar Road (SR 514).

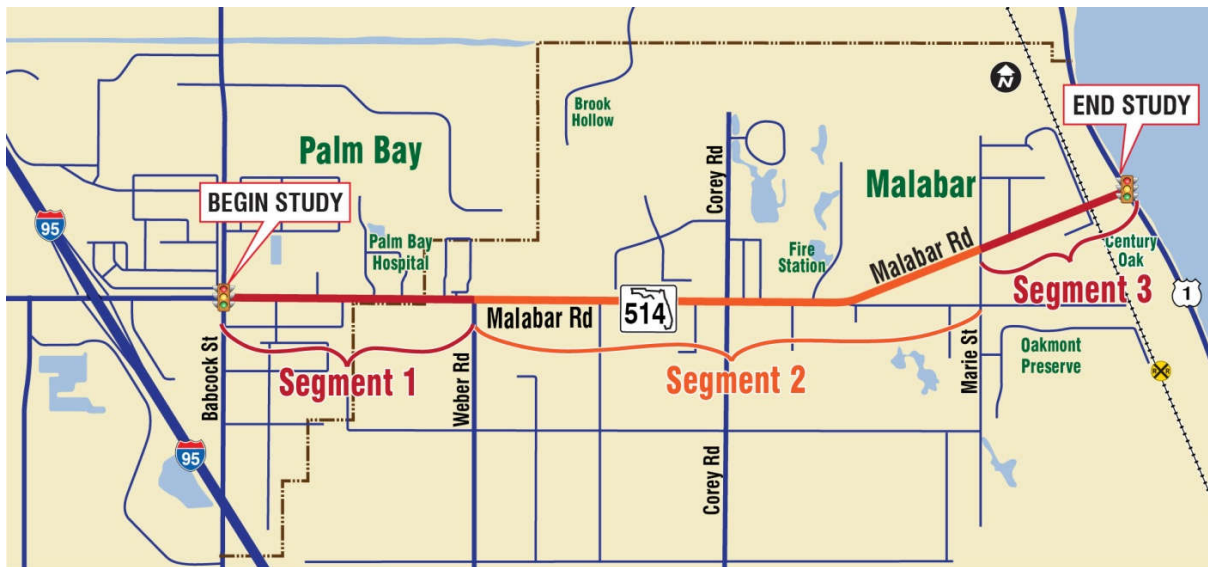
The purpose of this report is to provide an evaluation of the wetlands within the project study area and to satisfy Section 404 of the Clean Water Act of 1972, Protection of Wetlands, Executive Order 11009 (May 1977), U.S. Department of Transportation Order 5660.1A (August, 1978), and Federal Highway Administration (FHWA) Technical Advisory T6640.8A (October, 1987). This report describes each of the jurisdictional wetlands identified in the study area; identifies and quantifies wetland impacts for each of the concept alternatives, including the Recommended Alternative; provides a functional analysis for the wetlands proposed for impact associated with the Recommended Alternative; and identifies reasonable options for mitigating impacts to jurisdictional wetlands.

This report also presents the findings of the biological assessment conducted for state and federally protected species within the study area. It identifies the state and federally listed species that are known to occur or have the potential to occur within the proposed project area and identifies the species-specific surveys that may be required during the permitting phase of the project.

1.1 Project Description

Malabar Road (SR 514) is an east-west urban minor arterial located in Brevard County that begins approximately 7.4 miles west of its interchange with I-95 and continues east to US 1, traversing the City of Palm Bay and the Town of Malabar. East of Babcock Street, the Malabar Road is primarily a two-lane, undivided rural roadway. There are two signalized intersections within the project limits: at Babcock Street (SR 507) and at US 1. Land use within the corridor includes commercial, conservation, recreation, and low-density residential development. The Florida Division of Emergency Management has designated Malabar Road (SR 514) as an evacuation route. There is also a Florida East Coast (FEC) rail crossing approximately 600 feet west of US 1. **Figure 1-1** represents the project location map.

Figure 1-1: Project Location Map



Three project segments were identified based on land use characteristics so the appropriate context sensitive improvements can be identified and developed.

- Segment 1, from Babcock Street to Weber Road, is urban in nature with commercial land uses including the Life Center of Palm Bay and Palm Bay Hospital.
- Segment 2, from Weber Road to Marie Street, is less developed and more rural in nature, with the Malabar Scrub Sanctuary occupying a large portion of the lands abutting, some single-family homes on large parcels, the Malabar Disc Golf Park, Fern Creek Crossing Park, and some churches.
- Segment 3, like Segment 1, is more urban in nature, with smaller residential parcels, commercial land uses, downtown Malabar and Town Hall, the FEC railroad, and US 1 intersection.

Malabar Road (SR 514) is four-lanes from between Milton Road and Babcock Street (SR 507), after which it then transitions to a two-lane facility. Speed limits vary along the corridor, beginning at Babcock Street (SR 507) where it is 45 mph miles per hour (mph), transitioning to 55 mph just east of Weber Road, transitioning to 50 mph to east of Corey Road, then transitioning again to 45 mph west of Marie Street, and finally to 30 mph east of Marie Street to US 1. The existing right-of-way (ROW) width in the corridor varies: typically, 116 feet between Babcock Street (SR 507) and Enterprise Avenue, 83 feet from Enterprise Avenue to Weber Road, 66 feet from Weber Road to west of Marie Street feet, and 50 feet from west of Marie Street to US 1.

Roadway improvements to Malabar Road (SR 514) are identified in the *Town of Malabar Comprehensive Plan* and the *City of Palm Bay Comprehensive Plan*, and are part of the Space Coast Transportation Planning Organization's *2040 Long Range Transportation Plan*. The project is being considered to accommodate projected future traffic demand (Design Year

2045) along Malabar Road. The No-Build Alternative is also under consideration, and will remain a viable alternative through the Public Hearing phase of the project.

1.2 Existing Typical Sections

Malabar Road (SR 514), within the project corridor, consists of four existing typical sections (Figure 1-2).

1. Babcock Street (SR 507) to West of Enterprise Avenue (MP 3.102 to MP 3.303)

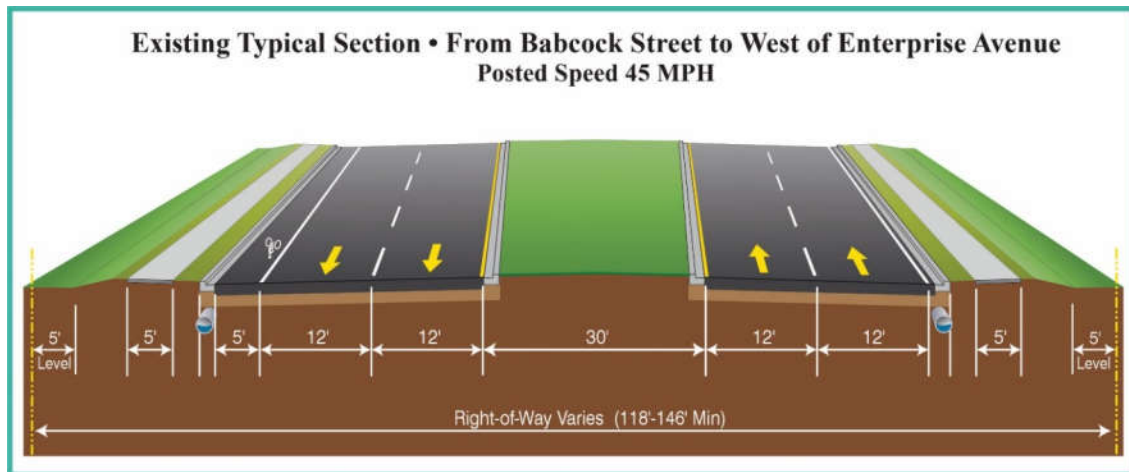
The intersection of Malabar Road (SR 514) and Babcock Street (SR 507), located within this segment, recently underwent intersection improvements and now contains four through lanes (two lanes in each direction, eastbound and westbound, respectively) along with turn lanes. The proposed improvements from this PD&E Study will tie into this recently improved intersection. Florida Power & Light Company (FP&L) has a distribution pole line on the north side of SR 514 from Babcock Street to Weber Road and continues east to US 1. FP&L also has a transmission pole line on south side of SR 514 from Babcock Street to 730 Malabar Road where it crosses over to north side of the roadway.

This typical section (Figure 1-3) consists of four 12-foot travel lanes separated by a 30-foot grass median. Two-foot curb and gutters exist on the inside and outside of the roadway. The posted speed limit is 45 mph. This is the only section within the study limits that contains sidewalks.

Figure 1-2: Existing Typical Section Locations



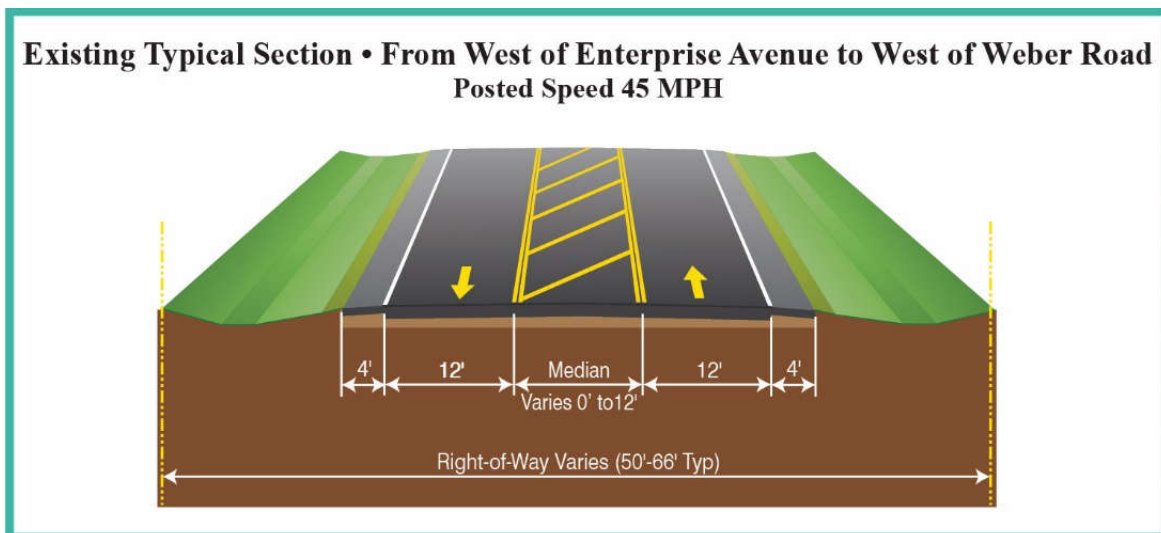
Figure 1-3: Existing Typical Section – Babcock Street to West of Enterprise Avenue



2. West of Enterprise Avenue to West of Weber Road (MP 3.303 to MP 4.087)

This typical section (**Figure 1-4**) consists of two 12-foot travel lanes, a variable width painted median, shallow ditches and a 45-mph posted speed limit. This section contains four-foot paved shoulders, two-foot grass shoulders, and ditches on both sides of the road. From west of Enterprise Avenue to west of Weber Road, there are large concrete transmission poles on the south side of the road just inside the ROW. The transmission poles switch to the north side 900 feet west of Weber Road.

Figure 1-4: Existing Typical Section – West of Enterprise Avenue to West of Weber Road

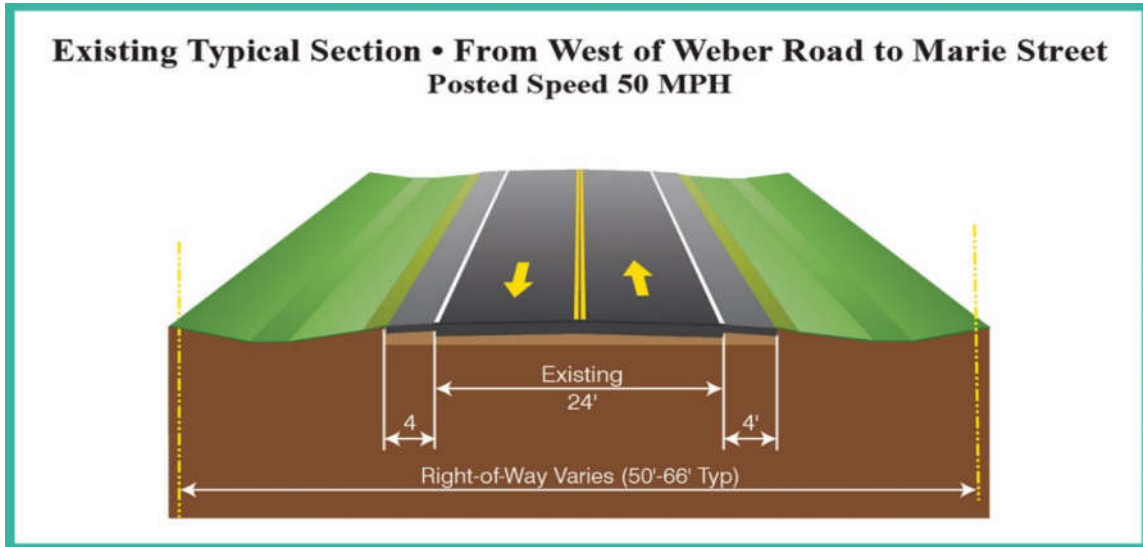


3. West of Weber Road to Marie Street (MP 4.087 to MP 6.129)

Comprising the majority of the corridor (over two miles), this typical section (**Figure 1-5**) also consists of two 12-foot travel lanes, no median, six-foot shoulders (four-foot paved), shallow ditches and a 50-mph posted speed limit. The large concrete transmission poles

are the primary utility on the north side of the road just inside the ROW from Weber Road to Glatter Road, where they follow Glatter Road on the north side.

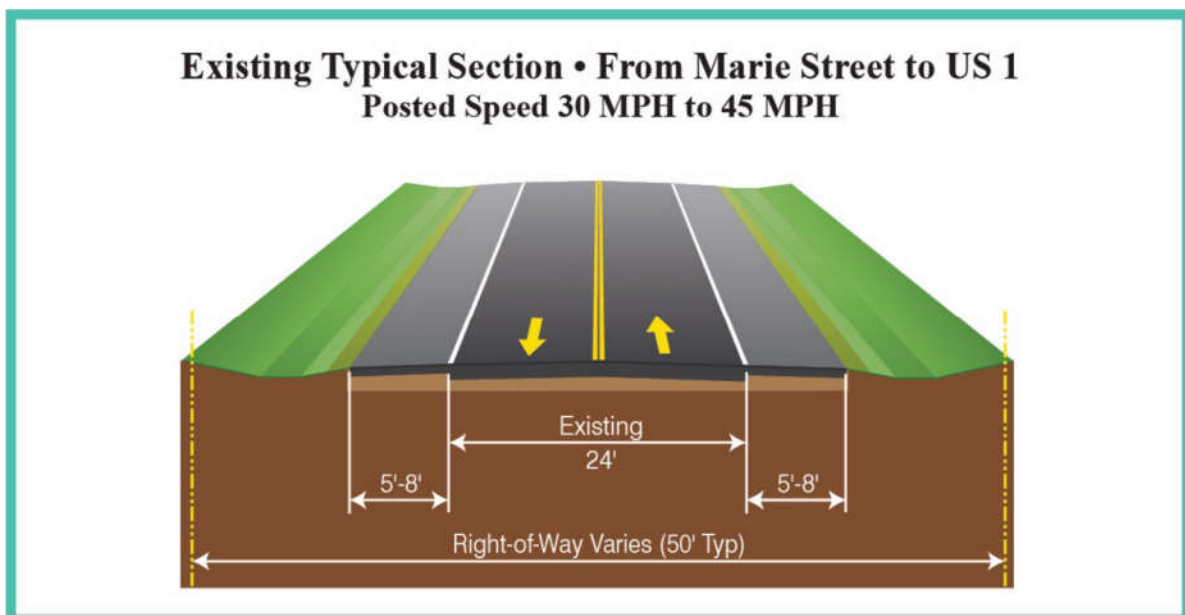
Figure 1-5: Existing Typical Section – West of Weber Road to Marie Street



4. Marie Street to US 1 (MP 6.129 to MP 6.742)

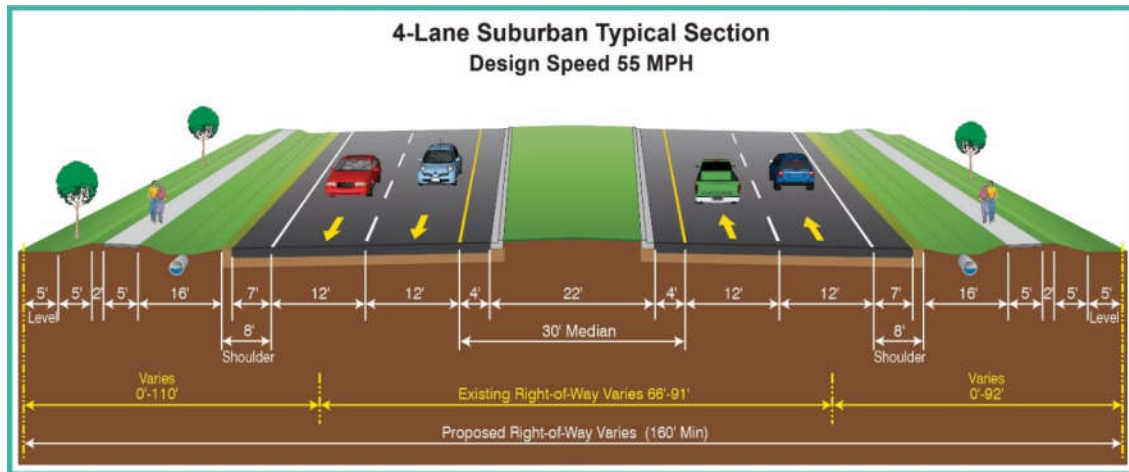
Similar to the previous typical section, this typical section also consists of two 12-foot undivided travel lanes, but contains paved shoulders that vary between five-feet and eight-feet, gutter inlets on the south side of the road, and a 30 mph to 45 mph posted speed limit. The primary utility in this section of the road are wooden power poles on both sides of the road (**Figure 1-6**).

Figure 1-6: Existing Typical Section – Marie Street to US 1



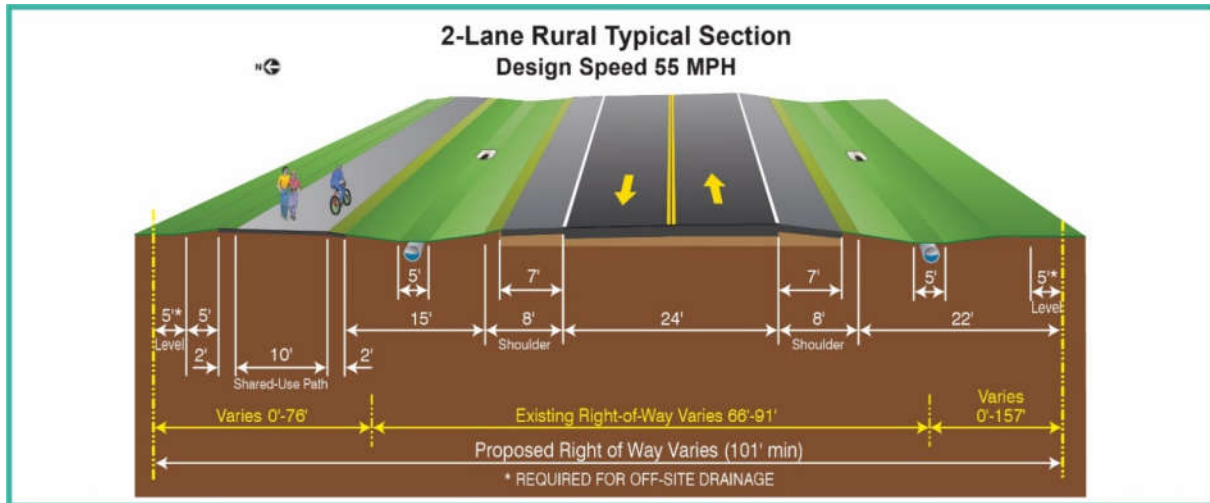
Segment 2a: From Weber Road to Corey Road. Just west of Weber Road, the Recommended Alternative transitions from a four-lane urban typical section to a four-lane suburban typical section (**Figure 1-8**). The four-lane suburban typical section provides two 12-foot travel lanes, an eight-foot shoulder (seven-foot paved which accommodates a bicycle lane), and a five-foot sidewalk in each travel direction. The design speed is 55 mph and the posted speed limit is 50 mph. Travel lanes are separated by a 30-foot wide median which includes a 22-foot raised grass area and two four-foot inside paved shoulders. Drainage swales/ditches are located on both sides of the roadway. Roundabouts are proposed at the Malabar Road (SR 514) intersections at Weber Road and Corey Road. The alignment is a best-fit concept. From west to east after the roundabout at Weber Road, the alignment shifts south then north to align with the proposed Corey Road roundabout. Additional right-of-way will be required from parcels on both sides of Malabar Road (SR 514) including approximately 0.38 acres from the Malabar Scrub Sanctuary and 0.02 acres from Fern Creek Crossing Park.

Figure 1-8: Recommended Typical Section – Segment 2a



Segment 2b: From Corey Road to Marie Street. East of the Corey Road intersection, the typical section transitions from the four-lane suburban typical section into a two-lane rural typical section (**Figure 1-9**) including one 12-foot wide travel lane and eight-foot shoulder (7-foot paved) in each direction, and a 10-foot shared-use path along the north side of Malabar Road (SR 514) which provides a pedestrian and bicycle facility and connects the trailhead at Marie Street to the Malabar Community Park, the Malabar Scrub Sanctuary, and the Disc Golf Course Park. The design speed is 55 mph with a 50-mph posted speed limit. The alignment is a best-fit concept. Between Corey Road and Shiflett Lane, parcels on both sides – with exception of the U.S. Post Office located on the north side – are impacted as the alignment transitions from a four-lane roadway to a two-lane roadway. Between Shiflett Lane and Marie Street the alignment has impacts to both the Malabar Scrub Sanctuary (0.34 acre) and Malabar Disc Golf Park (0.12 acre). The alignment shifts south of the existing roadway on the east side of the Disc Golf Park.

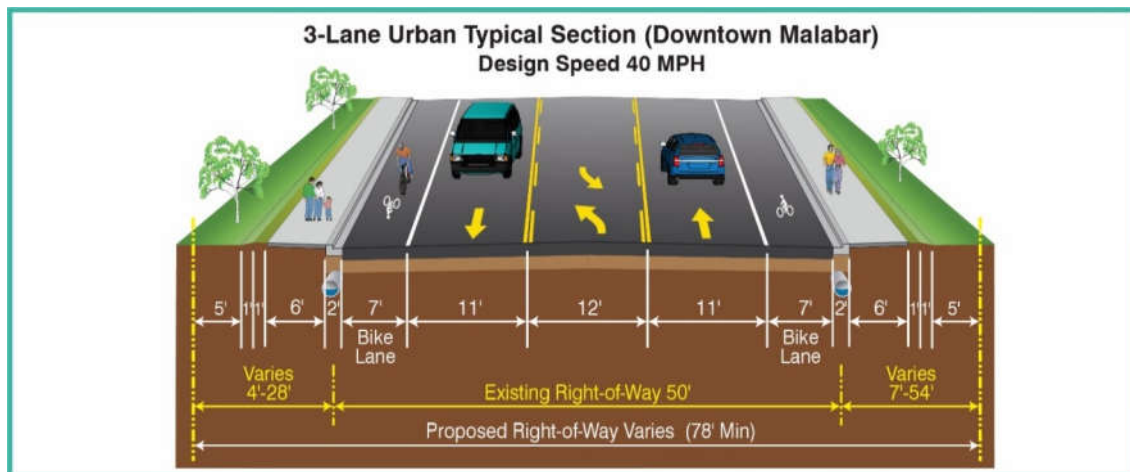
Figure 1-9: Recommended Typical Section – Segment 2b



Segment 3: Marie Street to US 1. East of Marie Street, the Recommended Alternative transitions into a three-lane urban typical section (**Figure 1-10**). The recommended typical section includes one 11-foot travel lane in each direction, a 12-foot center bi-directional left-turn lane, a seven-foot bicycle lane, and a six-foot sidewalk in each direction. Drainage is handled by curb-and-gutter and a closed drainage system to route stormwater runoff to offsite ponds. The design speed is 40 mph with a 35-mph posted speed limit. A best-fit alignment is centered on the existing roadway location, with ROW acquisition from both sides of the roadway. Additional lanes are proposed at the US 1 intersection as warranted by the traffic forecasts.:

- A second northbound left turn lane and a second westbound receiving lane;
- A second eastbound left turn lane;
- Two northbound through lanes; the existing northbound signal bypass lane will be removed, and both northbound through lanes will be signal controlled.

Figure 1-10: Recommended Typical Section – Segment 3



Section 2.0 Existing Environmental Conditions

2.1 Project Area

The project involves the widening of Malabar Road to increase traffic capacity from Babcock Road to US 1. In addition, improvements to traffic operations, intersection safety, and bicycle and pedestrian facilities are also proposed. Existing environmental conditions were assessed within the project study area, defined as those areas within and adjacent to the existing Malabar Road (SR 514) ROW (from Babcock Road to U.S. Highway 1) and within proposed pond sites (**Figure 2-1**).

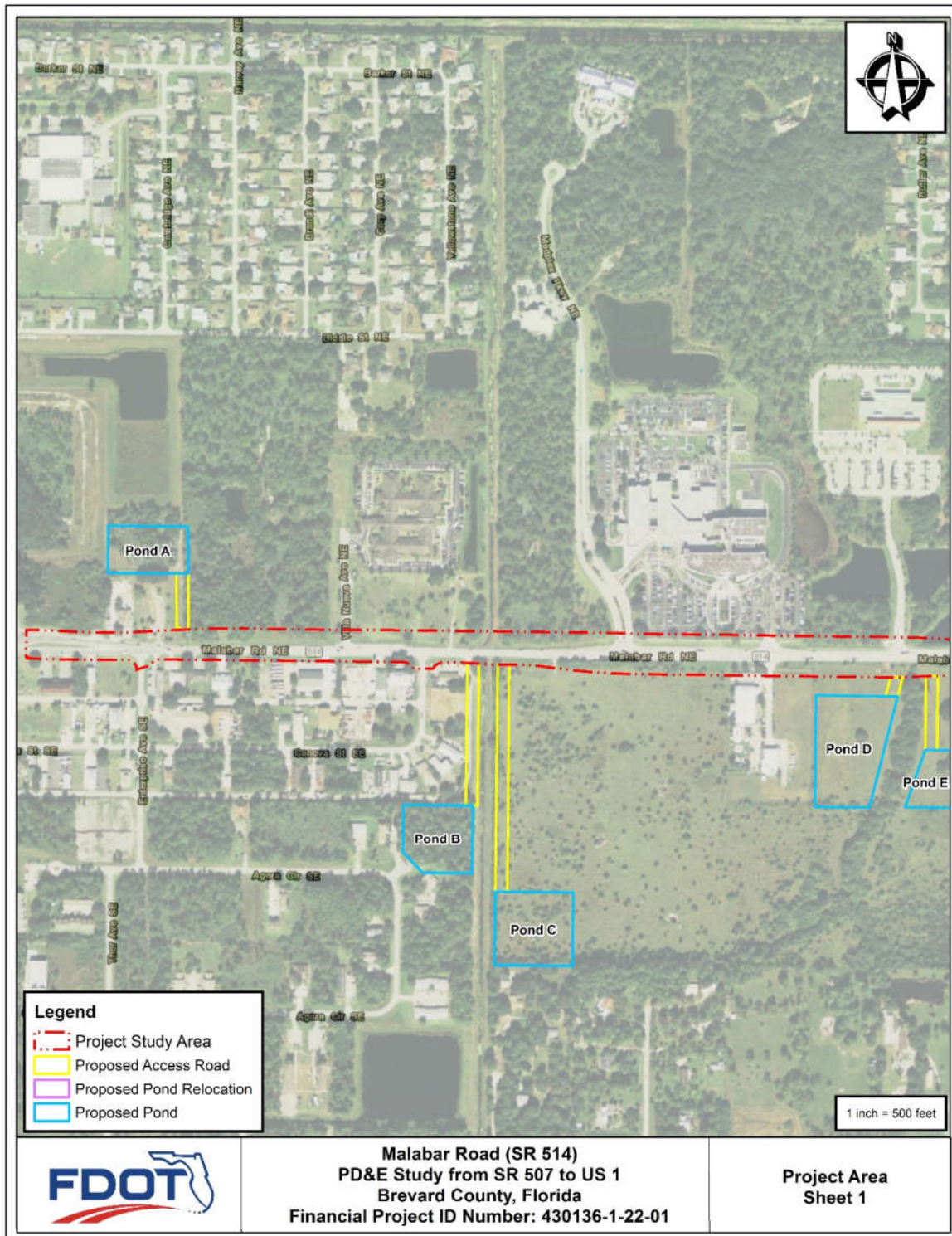
2.2 Land Use

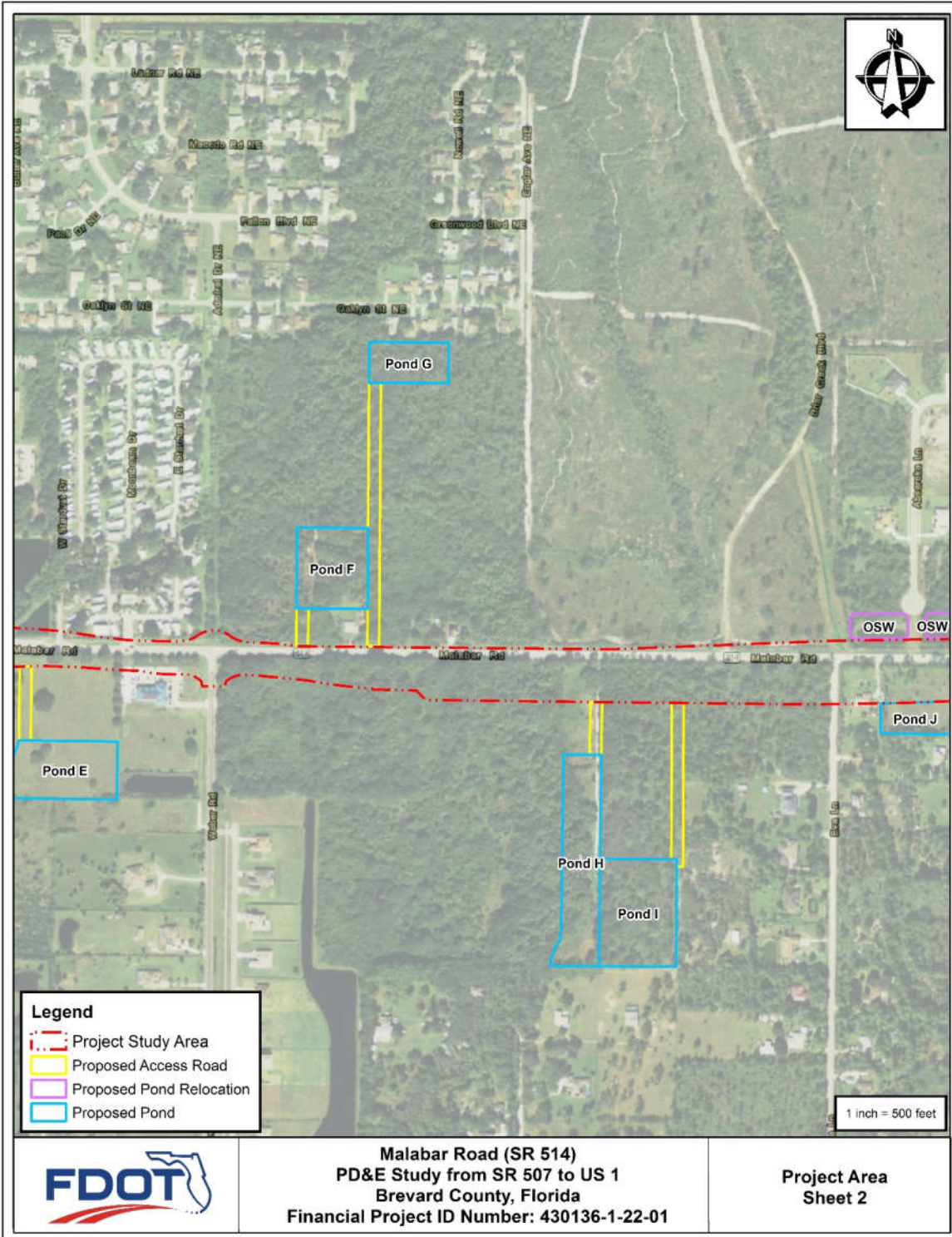
Land use within the project study area was assessed using Geographic Information System (GIS) aerial photography, St. John's River Water Management District's (SJRWMD) Florida Land Use Cover Classification System (FLUCCS) shapefiles and field reviews conducted in November 2013. Descriptions of the existing and future land use within the project study area are provided below.

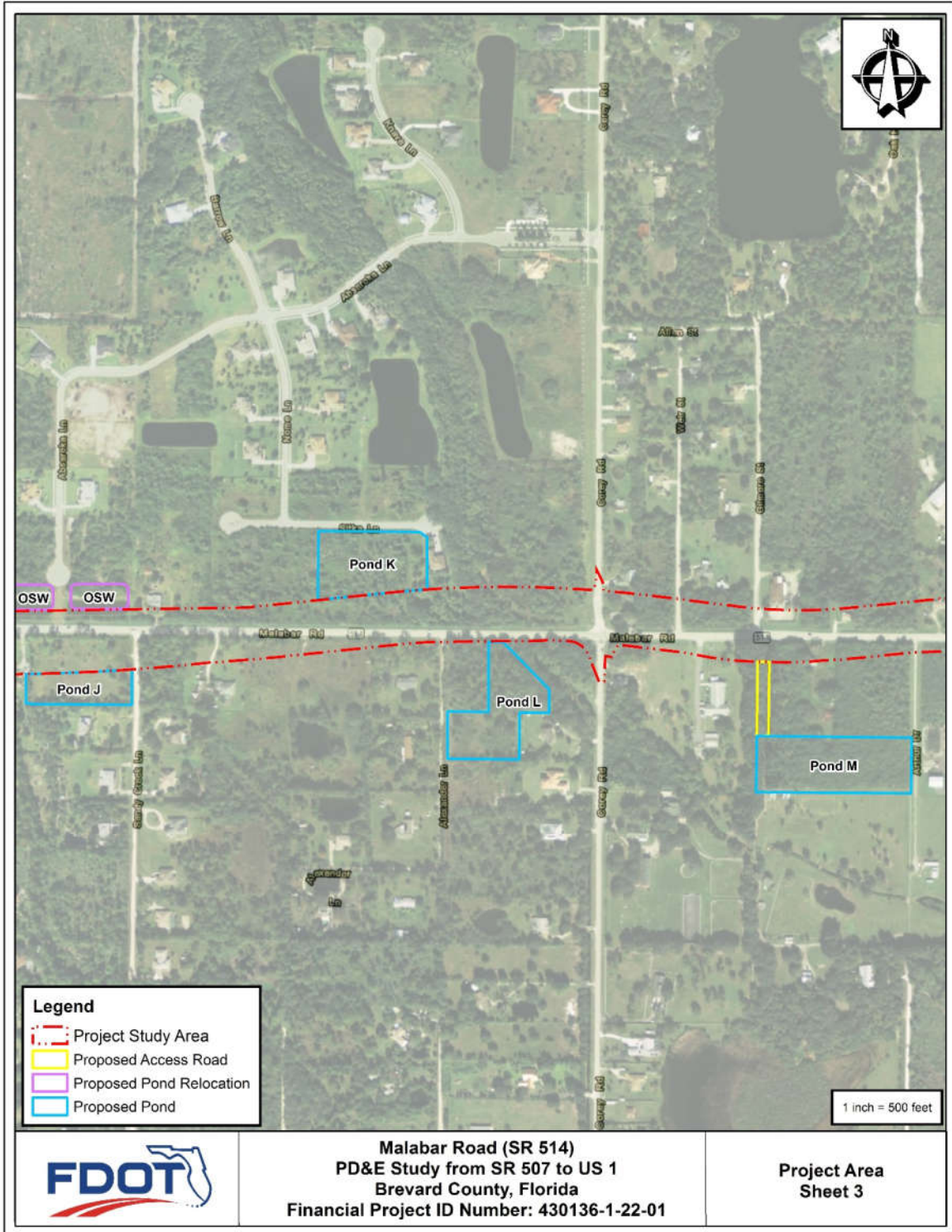
2.2.1 Existing Land Use

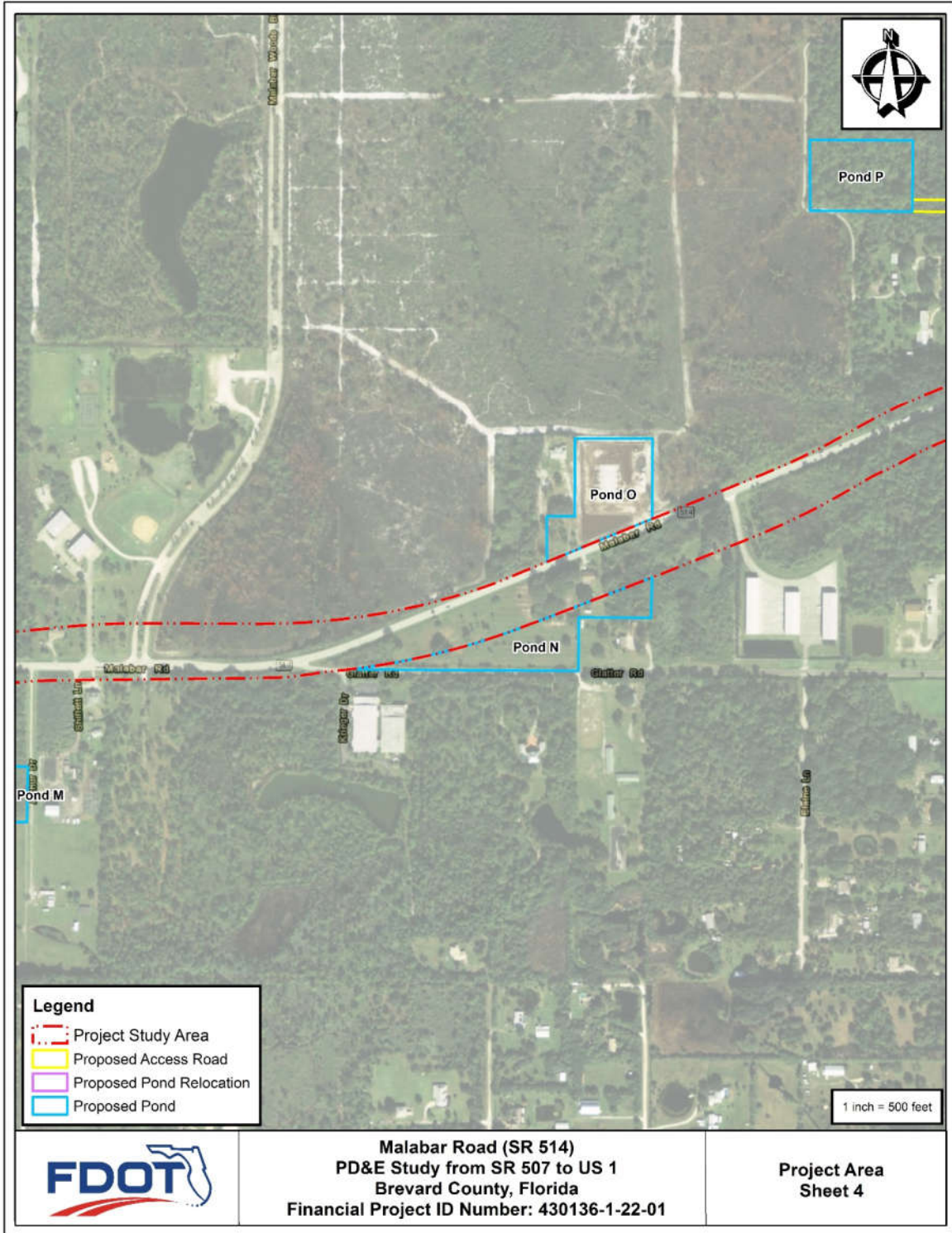
Desk-top reviews utilizing the SJRWMD FLUCCS (**Figure 2-2**) shapefiles were conducted to determine the existing land use within the project study area. A number of forested, scrub-shrub, and herbaceous wetlands exist within the project study area. The upland communities consist of roadways, residential/commercial areas, natural shrub lands/forests, pastures, active/inactive agriculture, and disturbed land. There are five publicly owned parcels that may contain sensitive environmental land areas within the project study area including: the Malabar Scrub Sanctuary, Malabar Park, Fern Creek Crossing Park, the Malabar Disc Golf Course, and the Al Tuttle and Sand Hill linear trail. **Table 2-1** provides the acreage of existing wetland and upland communities within the project study area.

Figure 2-1: Project Study Area









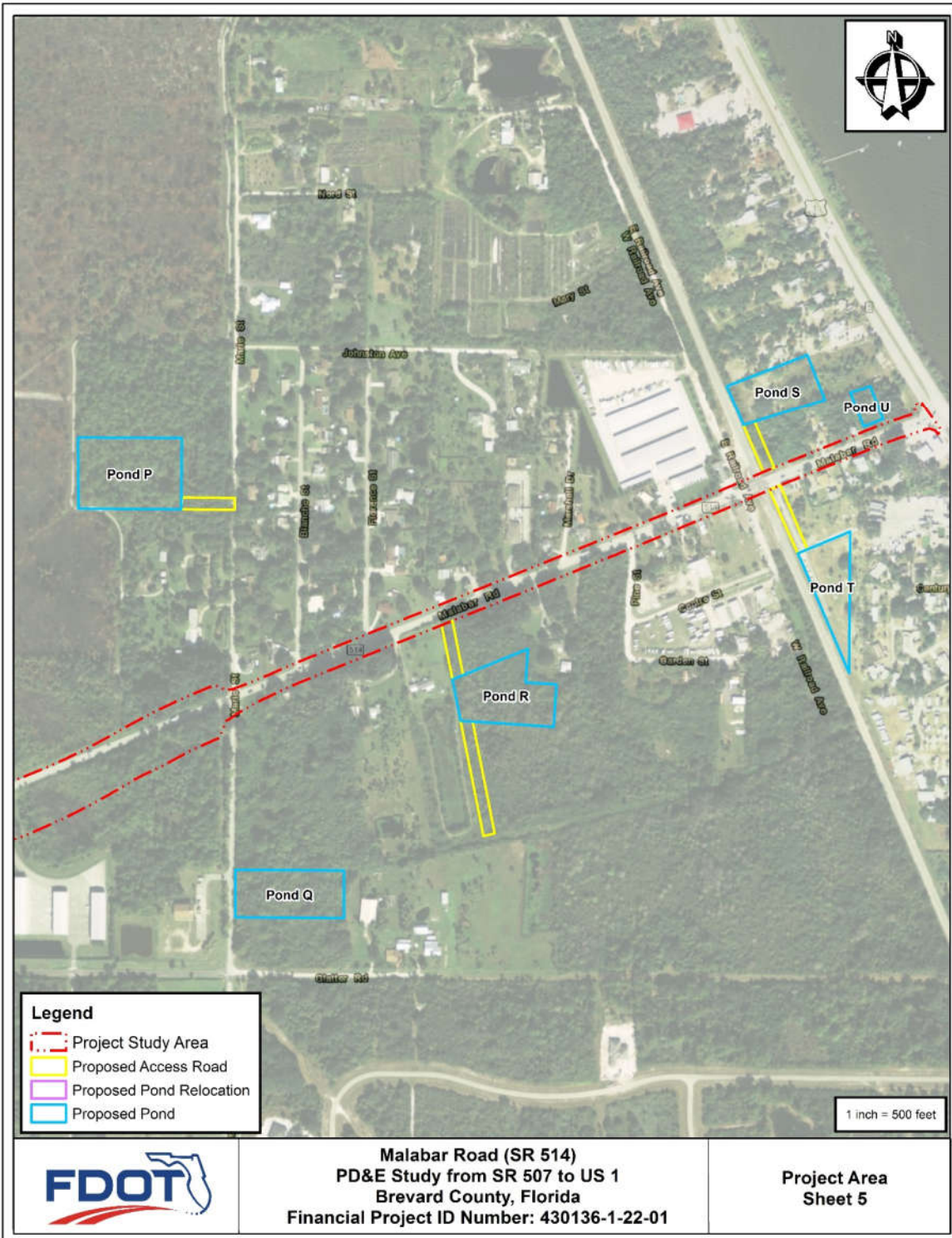
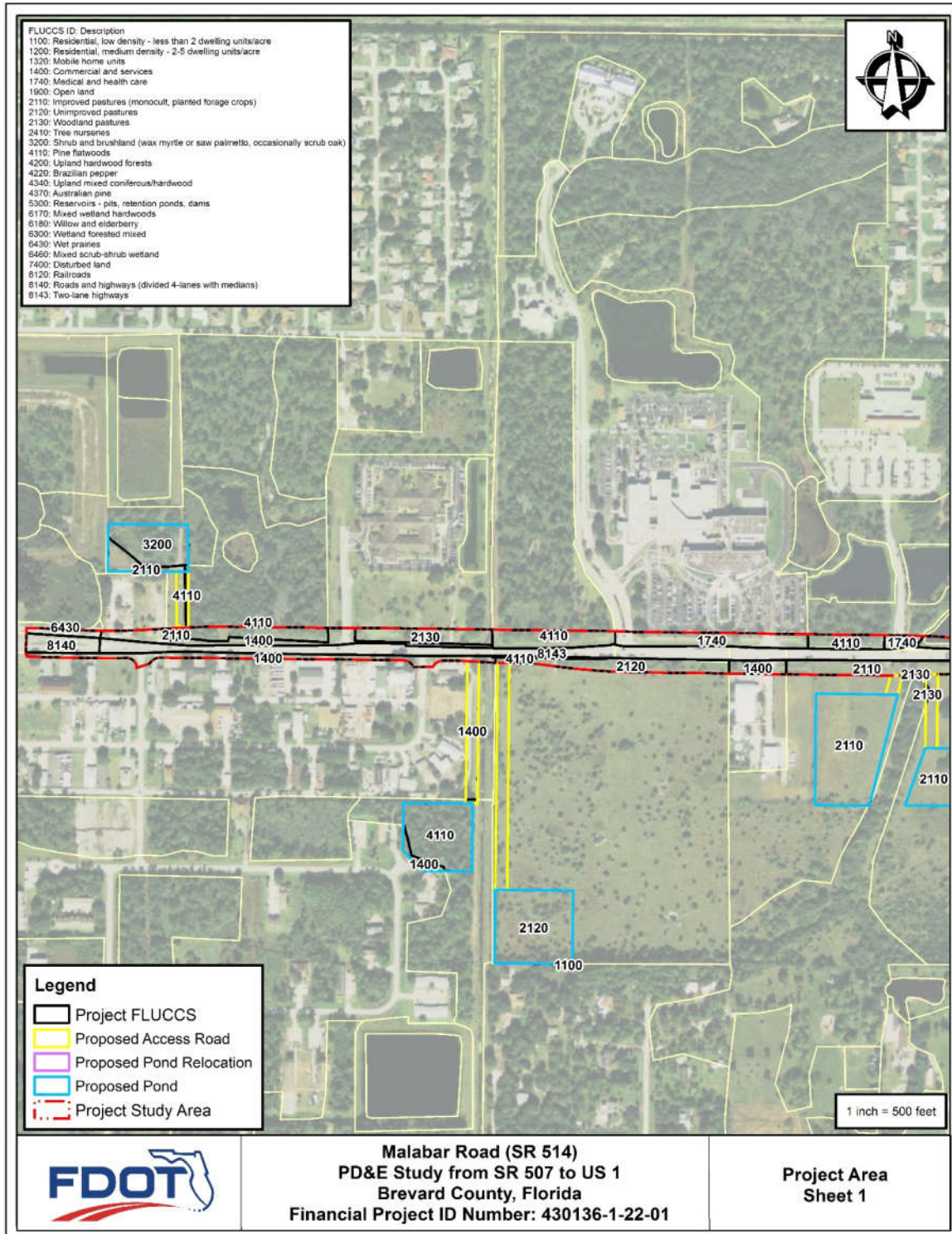
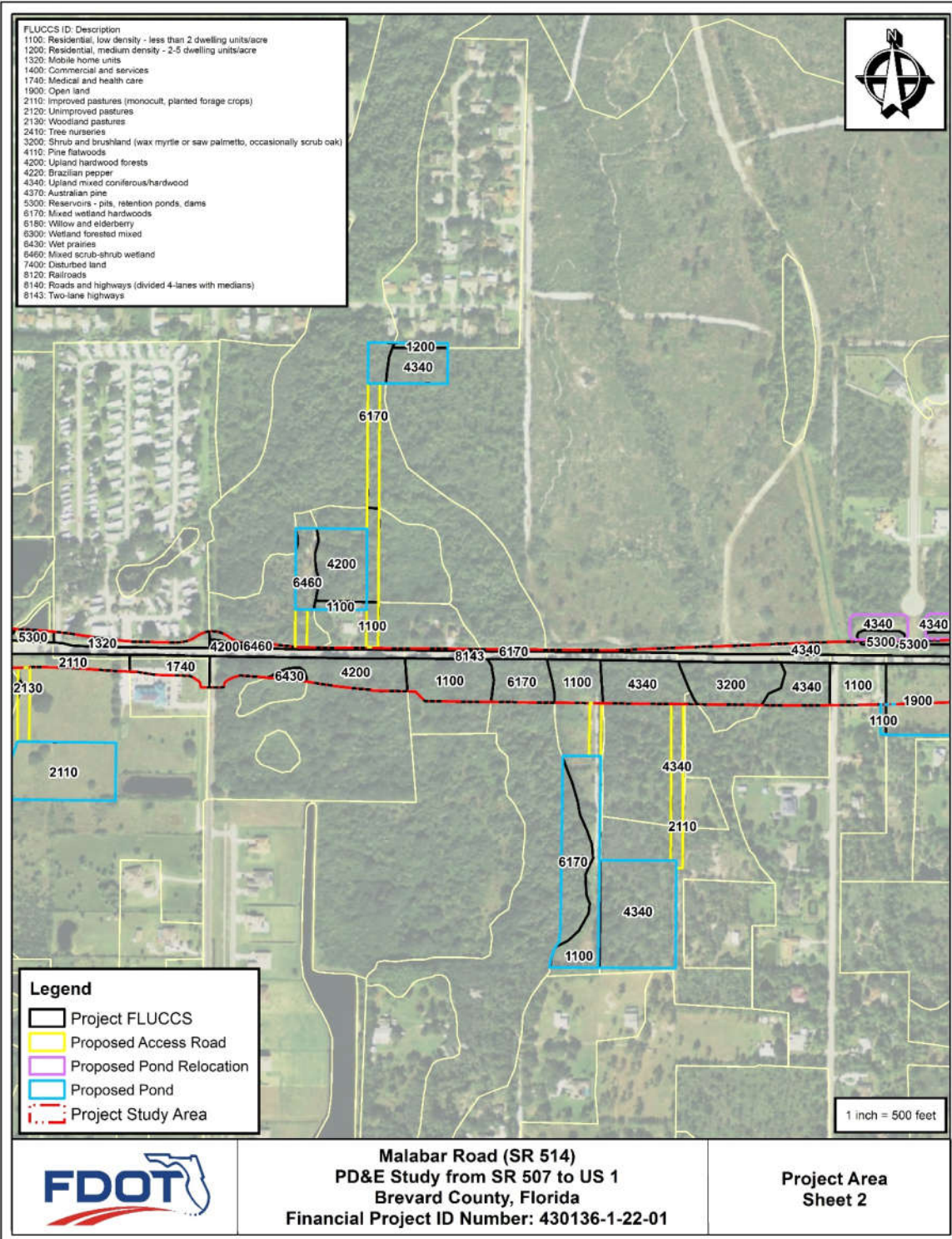


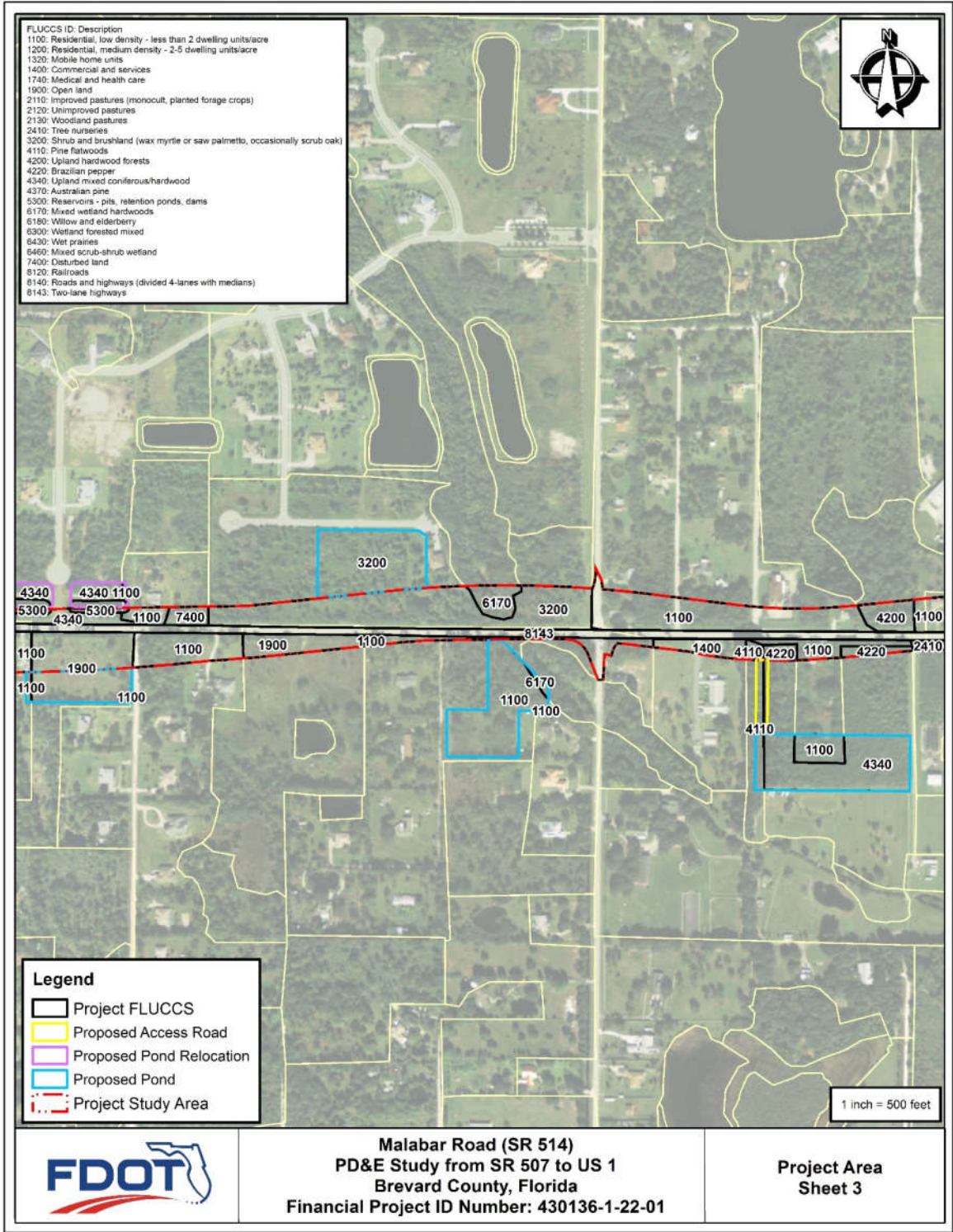
Table 2-1: SJRWMD FLUCCS Categories within Project Study Area

FLUCCS ID: Category	Approximate Acreage
1100: Residential, low density	19.35
1200: Residential, medium density	2.28
1320: Mobile home units	0.53
1400: Commercial and services	4.28
1740: Medical and health care	1.98
1900: Open land	5.55
2110: Improved pastures (monoculture, planted forage crops)	13.74
2120: Unimproved pastures	4.52
2130: Woodland pastures	0.84
2410: Tree nurseries	0.33
3200: Shrub and brushland (wax myrtle or saw palmetto, occasionally scrub oak)	13.35
4110: Pine flatwoods	18.16
4200: Upland hardwood forests	4.70
4220: Brazilian pepper	0.46
4340: Upland mixed coniferous/hardwood	18.63
4370: Australian pine	1.56
5300: Reservoirs - pits, retention ponds, dams	0.69
6170: Mixed wetland hardwoods	4.24
6180: Willow and elderberry	0.33
6300: Wetland forested mixed	2.21
6430: Wet prairies	0.74
6460: Mixed scrub-shrub wetland	1.04
7400: Disturbed land	0.32
8120: Railroads	0.05
8140: Roads and highways (divided 4-lanes with medians)	0.60
8143: Two-lane highways	15.50
TOTAL:	135.98

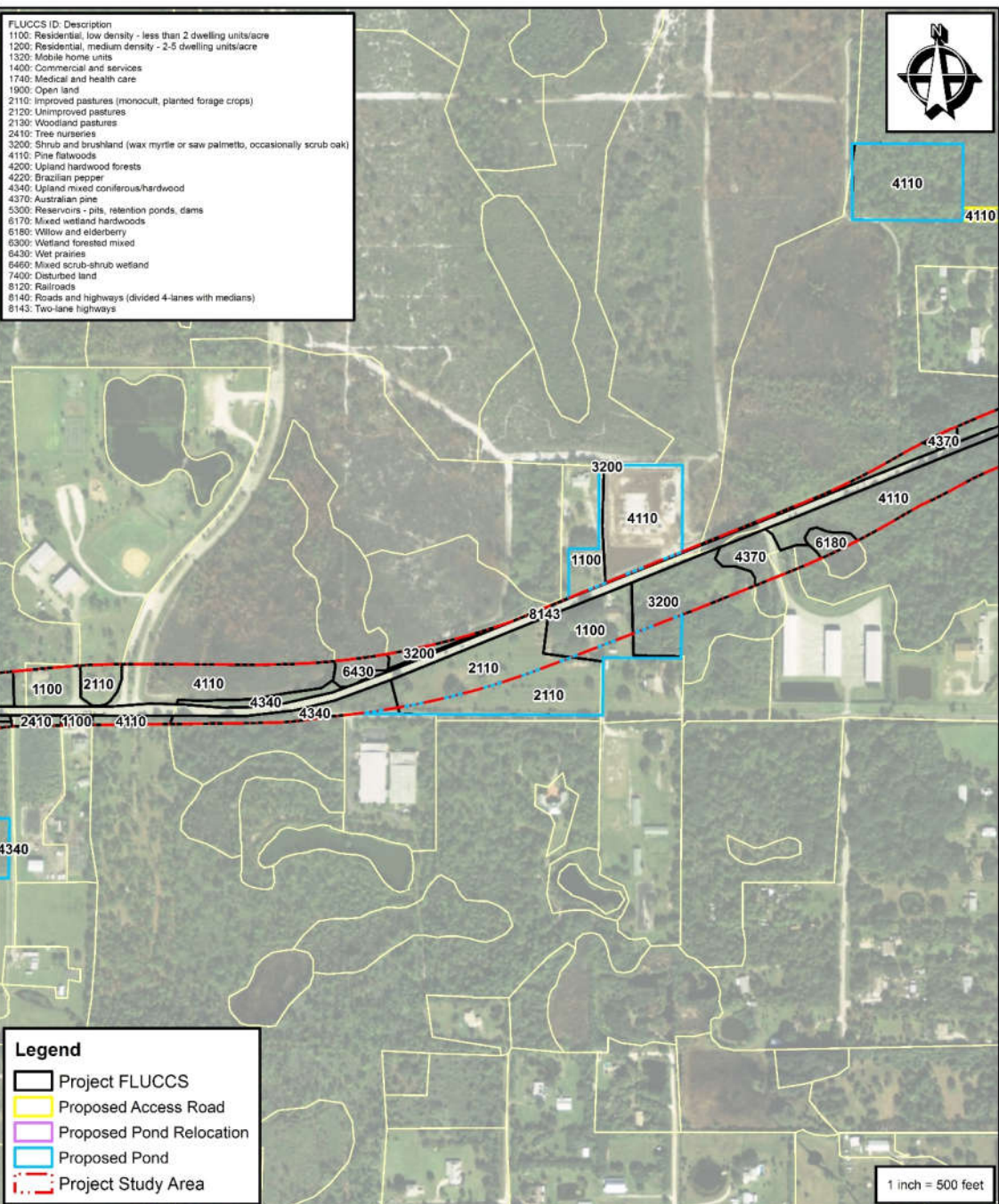
Figure 2-2: SJRWMD Land Use Map







FLUCCS ID	Description
1100	Residential, low density - less than 2 dwelling units/acre
1200	Residential, medium density - 2-5 dwelling units/acre
1300	Mobile home units
1400	Commercial and services
1740	Medical and health care
1900	Open land
2110	Improved pastures (monocult, planted forage crops)
2120	Unimproved pastures
2130	Woodland pastures
2410	Tree nurseries
3200	Shrub and brushland (wax myrtle or saw palmetto, occasionally scrub oak)
4110	Pine flatwoods
4200	Upland hardwood forests
4220	Brazilian pepper
4340	Upland mixed coniferous/hardwood
4370	Australian pine
5300	Reservoirs - pits, retention ponds, dams
6170	Mixed wetland hardwoods
6180	Willow and elderberry
6300	Wetland forested mixed
6430	Wet prairies
6460	Mixed scrub-shrub wetland
7400	Disturbed land
8120	Railroads
8140	Roads and highways (divided 4-lanes with medians)
8143	Two-lane highways

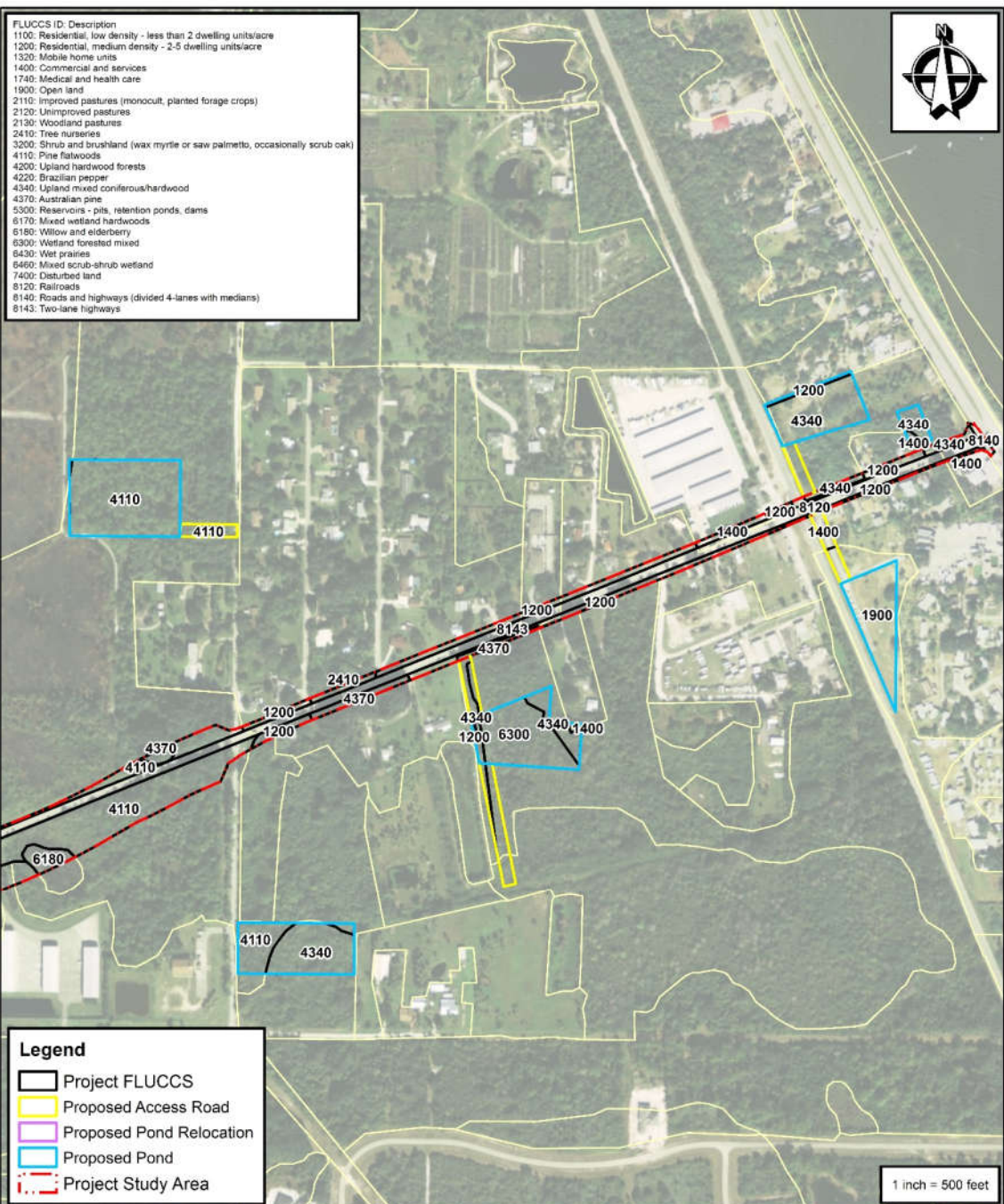


Legend	
	Project FLUCCS
	Proposed Access Road
	Proposed Pond Relocation
	Proposed Pond
	Project Study Area



Malabar Road (SR 514)
PD&E Study from SR 507 to US 1
Brevard County, Florida
Financial Project ID Number: 430136-1-22-01

Project Area
Sheet 4



FLUCCS ID - Description

- 1100: Residential, low density - less than 2 dwelling units/acre
- 1200: Residential, medium density - 2-5 dwelling units/acre
- 1320: Mobile home units
- 1400: Commercial and services
- 1740: Medical and health care
- 1900: Open land
- 2100: Improved pastures (monocult, planted forage crops)
- 2120: Unimproved pastures
- 2130: Woodland pastures
- 2410: Tree nurseries
- 3200: Shrub and brushland (wax myrtle or saw palmetto, occasionally scrub oak)
- 4110: Pine flatwoods
- 4200: Upland hardwood forests
- 4220: Brazilian pepper
- 4340: Upland mixed coniferous/hardwood
- 4370: Australian pine
- 5300: Reservoirs - pits, retention ponds, dams
- 6170: Mixed wetland hardwoods
- 6180: Willow and elderberry
- 6300: Wetland forested mixed
- 6430: Wet prairies
- 6460: Mixed scrub-shrub wetland
- 7400: Disturbed land
- 8120: Railroads
- 8140: Roads and highways (divided 4-lanes with medians)
- 8143: Two-lane highways

Legend

- Project FLUCCS
- Proposed Access Road
- Proposed Pond Relocation
- Proposed Pond
- Project Study Area



Malabar Road (SR 514)
PD&E Study from SR 507 to US 1
Brevard County, Florida
Financial Project ID Number: 430136-1-22-01

Project Area
Sheet 5

2.2.2 Wetland Communities

Please refer to **Section 3.3** of this report.

2.2.3 Upland Communities

In November 2013, Atkins scientists conducted a field review to identify and characterize the upland areas that exist within the project study area. A general description of the upland communities, utilizing the SJRWMD FLUCCS, is described below.

Urban and Built-Up – Residential Low Density (FLUCCS – 1100)

This category includes residential dwellings that have less than two residents per acre. This land use occurs throughout the study area.

Urban and Built-Up – Residential Medium Density (FLUCCS – 1200)

This category consists of residential dwellings that have two to five residents per acre. This land use occurs throughout the study area.

Urban and Built-Up – Mobile Home Units (FLUCCS – 1320)

This category includes include mobile home units with six or more dwellings per acre. Within the project area the Enchanted Lakes mobile home community exists northwest of the intersection of Malabar Road and Weber Road.

Urban and Built-Up – Commercial and Services (FLUCCS – 1400)

This category is predominantly associated with the distribution of products and services. This category occurs primarily towards the eastern and western limits of the proposed project study area.

Urban and Built-up – Medical and Health Care (FLUCCS – 1740)

The Palm Bay Hospital is located on the north side of Malabar Road between Babcock Street and Weber Road. In addition to the hospital, there are a number of smaller health care facilities located in proximity of the hospital on both the north and south sides of the road. These areas have well maintained landscaping consisting of planted trees and shrubs.

Urban and Built-up – Open Land (FLUCCS – 1900)

This category includes undeveloped land within urban areas. This land use type occurs periodically throughout the project study area. The vegetation typically consists of minimal tree and shrub species with various pasture grasses throughout.

Agricultural - Improved Pastures (FLUCCS – 2110)

This category includes land that has been cleared, tilled, reseeded with specific grasses, and is periodically maintained by brush control and fertilizer application. Within the project study area this land use exists on the south side of Malabar Road, west of the intersection of Weber Road. This pasture is dominated by bahiagrass (*Paspalum notatum*) and smutgrass (*Sporobolus indicus*) and is actively grazed by cattle.

Agricultural - Unimproved Pastures (FLUCCS – 2120)

This category includes cleared land with trees and brush present. This land generally is not managed by any maintenance activities. Within the project study area this land use exists on the south side of Malabar Road east of the C-78 canal. This pasture has a number of cabbage palms (*Sabal palmetto*) with typical pasture grasses present and appears to be actively grazed by cattle.

Agricultural - Woodland Pastures (FLUCCS – 2130)

This category includes areas of forest lands that are used as pastures. Strong evidence of cattle use (e.g. trails to feed bunker, watering areas, etc.) is usually present. Within the project study area this land use exists on the north side of Malabar Road east of Villa Nueva Ave. NE. The second areas are located south of Malabar Road west of W. Stardust Drive. Woodlands pastures are typically dominated by a variety of native tree and shrub species, both conifer and deciduous.

Agricultural – Tree Nurseries (FLUCCS – 2410)

This land use consists of nurseries where the trees are primarily used as ornamentals, and not for the timber industry. Within the project study area there are two palm tree nurseries. The first is located on the south side of Malabar Road, west of the intersection with Malabar Woods Boulevard. The second is east of Marie Street, on the north side of the road.

Rangeland – Shrub and Brushland (FLUCCS – 3200)

This category includes an upland community that consists of various shrubs and brush. Generally, saw palmetto (*Serenoa repens*) is the dominant plant species intermixed with a wide variety of other woody shrub species such as Brazilian pepper (*Schinus terebinthifolius*), winged sumac (*Rhus copallina*), wax myrtle (*Morella cerifera*), shiny blueberry (*Vaccinium myrsinites*), and muscadine grape (*Vitis rotundifolia*). This community type exists in upland areas throughout the project study area.

Upland Forests – Pine Flatwoods (FLUCCS – 4110)

Pine flatwoods are upland areas that are typically dominated by slash pine (*Pinus elliottii*) with a variety of understory shrubs and herbs such as saw palmetto, rusty lyonia (*Lyonia ferruginea*), winged sumac, shiny blueberry, and bracken fern (*Pteridium aquilinum var. pseudocaudatum*). Within the project study area, a number of pine flatwood communities exist.

Upland Hardwood Forest (FLUCCS – 4200)

This category is designated forest that contain at least 66 percent dominance by hardwood tree species. Upland hardwood forests are naturally generated, and do not include hardwood plantations, or planted groves of citrus or pecans. Some of the species present consisted of slash pine and live oak (*Quercus virginiana*). This community exists in upland areas throughout the project study area.

Upland Forests - Brazilian Pepper (FLUCCS – 4220)

Brazilian pepper is an aggressive nuisance and exotic plant species. This shrub-like tree establishes itself along roadways and disturbed sites. Within the project study area, there are several upland and wetland areas that fit this community type. Most of these areas appear to have been agriculture in the past that has not been managed for a number of years. These areas are predominantly monocultures of this plant species.

Upland Forests – Hardwood Conifer Mixed (FLUCCS – 4340)

This category consists of forested areas in which neither pines nor hardwoods are the dominant tree species. Some of the species present consisted of slash pine, live oak, laurel oak (*Quercus laurifolia*), southern magnolia (*Magnolia grandiflora*), and Brazilian pepper. This community exists in upland areas throughout the project study area.

Upland Forests – Australian Pine (FLUCCS – 4370)

Australian pine (*Casuarina equisetifolia*) was first introduced to the Florida in the late 1800s and is now considered an aggressive, nuisance plant species. (Morton, 1980) It is common in south Florida, forming thickets on disturbed lands. This community occurs sporadically in the east end of the project study area.

Barren Land – Disturbed Lands (FLUCCS – 7400)

This land use consists of upland areas that have been changed or altered by human activities. With urban build-up in the area, several of these upland areas exist within the project study area.

Transportation – Railroads (FLUCCS – 8120)

At the east end of the project, in the downtown area of Malabar the FEC railroad line crosses Malabar Road. This is a typical single-track railroad bed that parallels US 1 to the east.

Transportation – Roads and Highways (FLUCCS – 8140)

This category includes the ROW of Malabar Road at the western and eastern limits of the project study area. These areas have been cleared of native vegetation and landscaped with trees, shrubs, and seeded or sodded with turf grasses. Most of these areas are routinely maintained by mowing and other landscaping activities.

Transportation – Two Lane Highways (FLUCCS – 8143)

This category includes the ROWs of Malabar Road and all side streets/roads that exist within the project study area. These areas have been cleared of native vegetation and in some cases landscaped with trees, shrubs, and seeded or sodded with turf grasses. However, most of this land use is less maintained and consists of turf grasses and ruderal plant species.

2.2.4 Property Review

A property search for each of the parcels identified within the project study area was conducted utilizing Brevard County's Property Appraisers GIS maps. Several parcels within the

project study area were identified as state, county, town, or privately-owned lands that may have existing building restrictions and/or conservation easements. *It should be noted that conservation easements may still be in the process of being recorded and therefore not identified by the County's GIS maps at this time.* A brief parcel description for properties identified by this application with potential building constraints is provided below. For each identified parcel, a boundary map has been provided in **Appendix B**.

Parcels: 28-37-36-00-500, 28-37-35-00-500 and 28-37-36-00-754

These parcels (92.54, 93.67 and 30.47 acres, respectively) have been identified as owned by the State of Florida, Division of State Lands, Florida Department of Environmental Protection. The Division of State Lands is Florida's lead agency for management and stewardship, serving as staff to the Board of Trustees of the Internal Improvement Trust Fund that purchases land for conservation and recreation (*Florida Forever*). Property Use is coded as 8060 – Vacant State-Owned Land – That Does Not Qualify in Another Code.

Parcel: 28-37-36-00-503

This 1.34-acre parcel is identified as: Part of SE ¼ of SW ¼ as described in ORB 6114, page 596. Property owner is listed as Brevard County. This parcel is directly adjacent to the Division of State Lands property (described below). Property Use is coded as 8020 – Vacant County Owned Land – That Does Not Qualify in Another Code.

Parcel: 28-37-34-00-503

This 8.0-acre parcel is identified as: Part of Lot 7 as described in ORB 2966, page 2570. Property owner is listed as State of Florida Department of Transportation. Property Use is coded as 8060 – Vacant State-Owned Land – That Does Not Qualify in Another Code.

Parcels: 29-37-02-00-72, 28-37-36-00-510 and 29-37-01-00-251

These parcels (1.12, 20.49 and 8.48 acres, respectively) are owned by the Town of Malabar. Property Use is coded as: 8080 - Vacant Municipally Owned Lands, 8910 – Municipally Owned, and 8080 Vacant Municipally Owned Lands, respectively.

Parcels: 28-37-35-75-*-49, 28-37-35-75-*-48, 28-37-35-75-*-47, 28-37-35-75-*-46, 28-37-35-75-*-45, 28-37-35-75-*-44, 28-37-35-75-*-15, Lot 50 (no information at this time)

These parcels have been identified as Lots 50, 49, 48, 47, 46, 45, 44 and 15, platted within the Stillwater Preserve subdivision within the Town of Malabar. Property descriptions for the identified parcels are contained within Plat Book 1, Page 164. These parcels are encumbered by a preservation/conservation easement required as an Environmental Resource Permit (permit # 4-009-95192-1) issued by the SJRWMD. If land encumbered by the preservation/conservation easement is impacted as a result of the proposed project, compensatory mitigation for these impacts may be required. Property Use is coded as 0010 – Vacant Residential Land – Single Family – Platted, for each parcel.

2.2.5 Future Land Use

Future Land Use designations shown on the Town of Malabar’s Future Land Use Map (FLUM) (June 2010) (**Figure 2-3**) that are within the project study area include Residential/Limited Commercial (R/LC), High Density Residential (HDR), Medium Density Residential (MDR), Rural Residential (RR), Commercial General (CG), Commercial Limited (CL), Office Institutional (OI), and Open Space and Recreation (OSR). The City of Palm Bay FLUM (**Figure 2-4**) includes Public/Semi-public, Commercial and Multifamily Residential land uses within the project study area.

The FLUMs show that the primary future land use designations along Malabar Road are as follows:

- West of Weber Road and Weber Road are OI and HDR.
- Between Weber Road and Corey Road is RR with a few OI designations. The Malabar Scrub Sanctuary is designated as MDR.
- The designations between Corey Road and Marie Street are mainly RR with some MDR, CL, and OI. The area where the Malabar Disc Golf Course is located is shown as OI and the Malabar Scrub Sanctuary is shown as CG. Malabar Community Park is designated as OSR.
- The last segment from Marie Street to US 1 has the designations directly abutting Malabar Road is mainly designated as OI, with some CG and R/LC closer to US 1.

2.3 Natural and Biological Features

2.3.1 Listed Species

For information on listed species within the project study area, please refer to **Section 4.0** of this report.

2.3.2 Soils

Soils within the project study area are described based on the Natural Resource Conservation Service (NRCS), Soil Survey for Brevard County, and the “Hydric Soils of Florida Handbook – Fourth Edition” (Hurt, 2007). The project study area contains several soil series including: Anclote, Basinger, EauGallie, Immokalee, Myakka, Oldsmar, Paola, Pomello, Riviera, St. Lucie, and Tomoka. Many of these soils are classified in the “Hydric Soils of Florida Handbook” as hydric soils associated with wetland depressional features. The majority of the project study area contains non-hydric soils (**Table 2-2 and Figure 2-5**). A brief description of each soil series (including typical drainage class, permeability and water table depth) located within the project area is described below.

Figure 2-3: Town of Malabar, Future Land Use Map

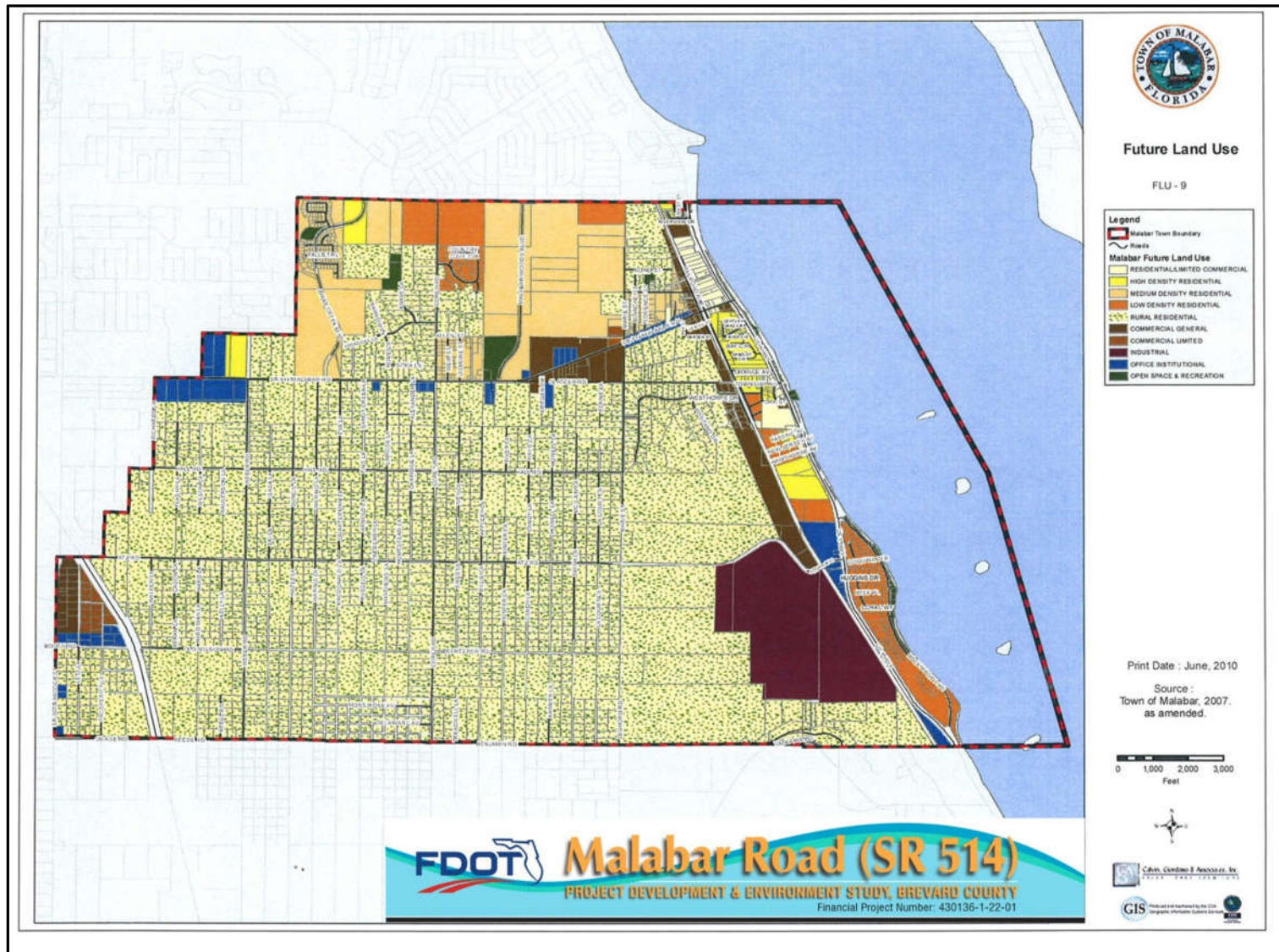


Figure 2-4: City of Palm Bay, Future Land Use

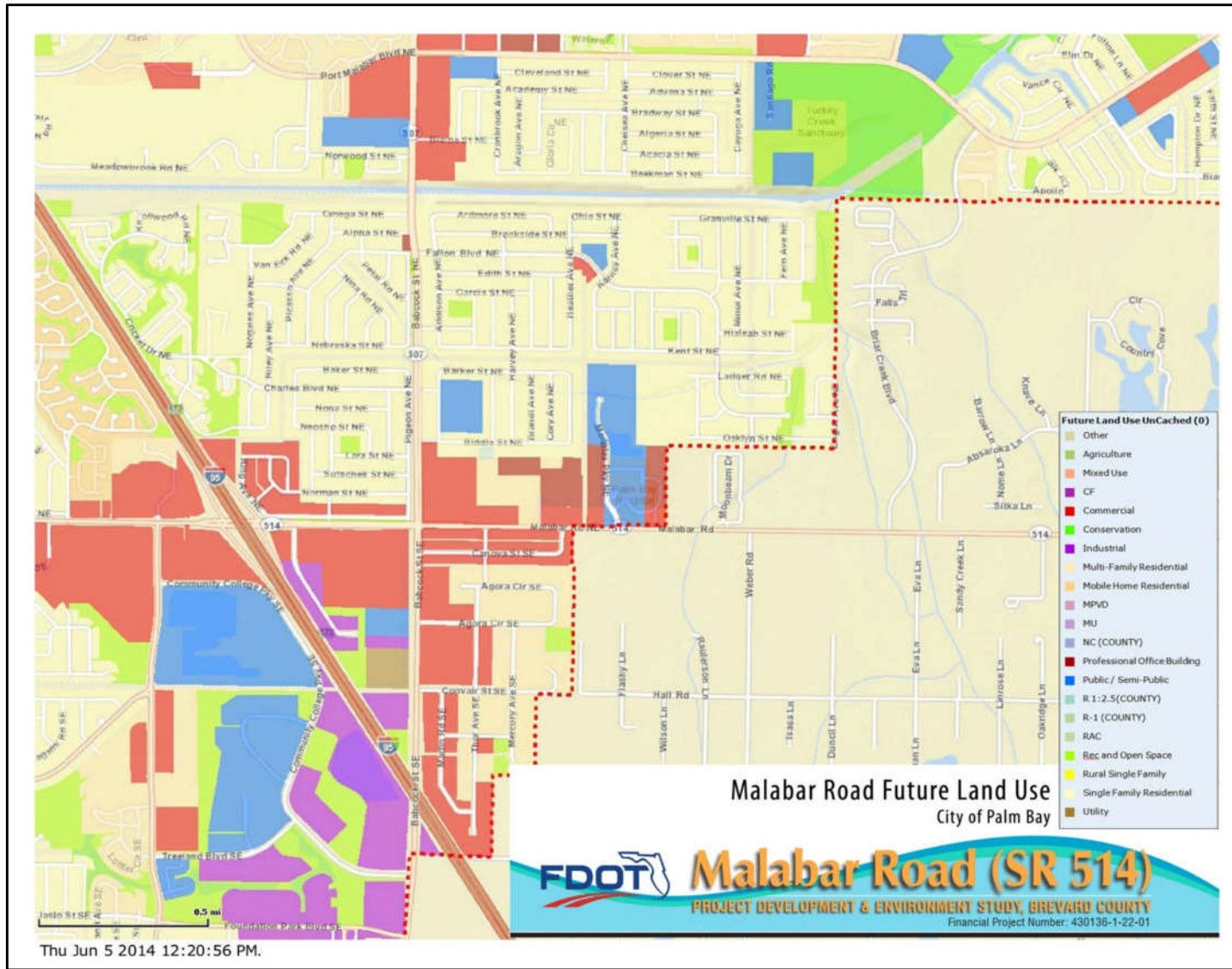


Table 2-2: Soil Classification and Acreage within Project Study Area

Soil Classification	Hydric or Non-Hydric	Approximate Acreage
2: Anclote Sand, Depressional, 0 to 1 Percent Slopes	Hydric	6.14
3: Anclote Sand Depressional, Frequently Flooded	Hydric	4.21
6: Basinger Sand, Depressional	Hydric	1.32
7: Basinger Sand	Hydric	4.58
17: EauGallie Sand	Non-Hydric	38.89
28: Immokalee Sand	Non-Hydric	13.52
36: Myakka Sand, 0 to 2 Percent Slopes	Non-Hydric	44.30
38: Myakka Sand, Depressional	Hydric	1.34
40: Oldsmar Sand	Non-Hydric	4.35
43: Paola Fine Sand, 0 to 8 Percent Slopes	Non-Hydric	4.03
49: Pomello Sand	Non-Hydric	10.79
56: St Lucie Fine Sand, 0 to 5 Percent Slopes	Non-Hydric	1.79
67: Tomoka Muck, Undrained	Hydric	0.71
Total:		135.97

Anclote Sand Depressional

This series consists of poorly drained, rapidly permeable soils associated with poorly defined drainage ways and flood plains. The first ten inches of this soil series contains black, medium granular soil with a high organic content that becomes black sand typically from ten to 19 inches. This series is considered a hydric soil type that can be found in range and woodlands. The water table within this soil series is usually within ten inches of the surface for six or more months of the year and recedes to more than 20 inches during the dry seasons.

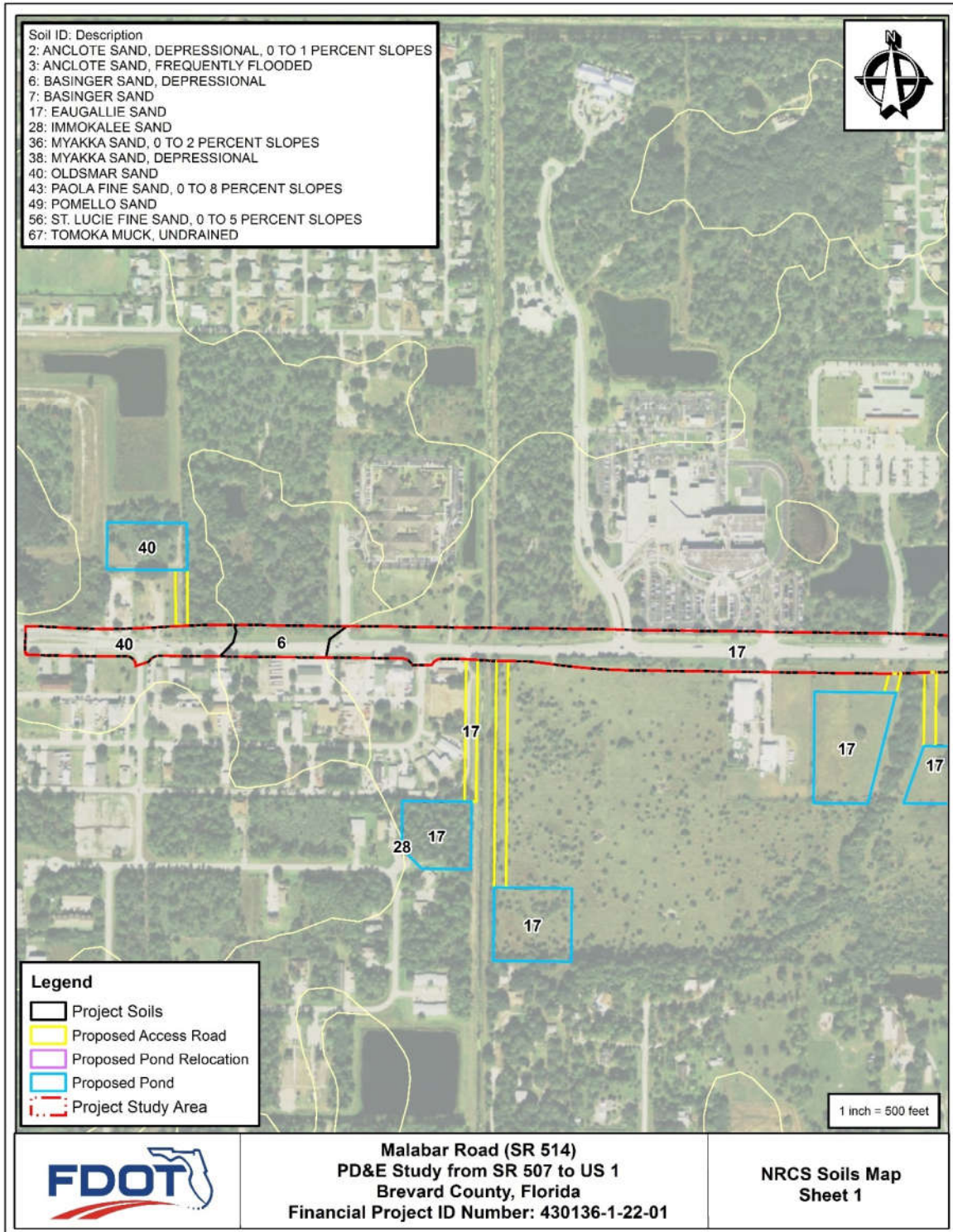
Basinger Sand Depressional

The Basinger series consist of very deep and poorly drained soils located in low flats, sloughs and depressions. This series contains dark to light gray soil within the first 18 inches that contains streaks of organic matter and is strongly acidic. The soils in this series are considered a hydric soil type that can be found in poorly defined drainage ways that are typically used for improved pastures and rangelands.

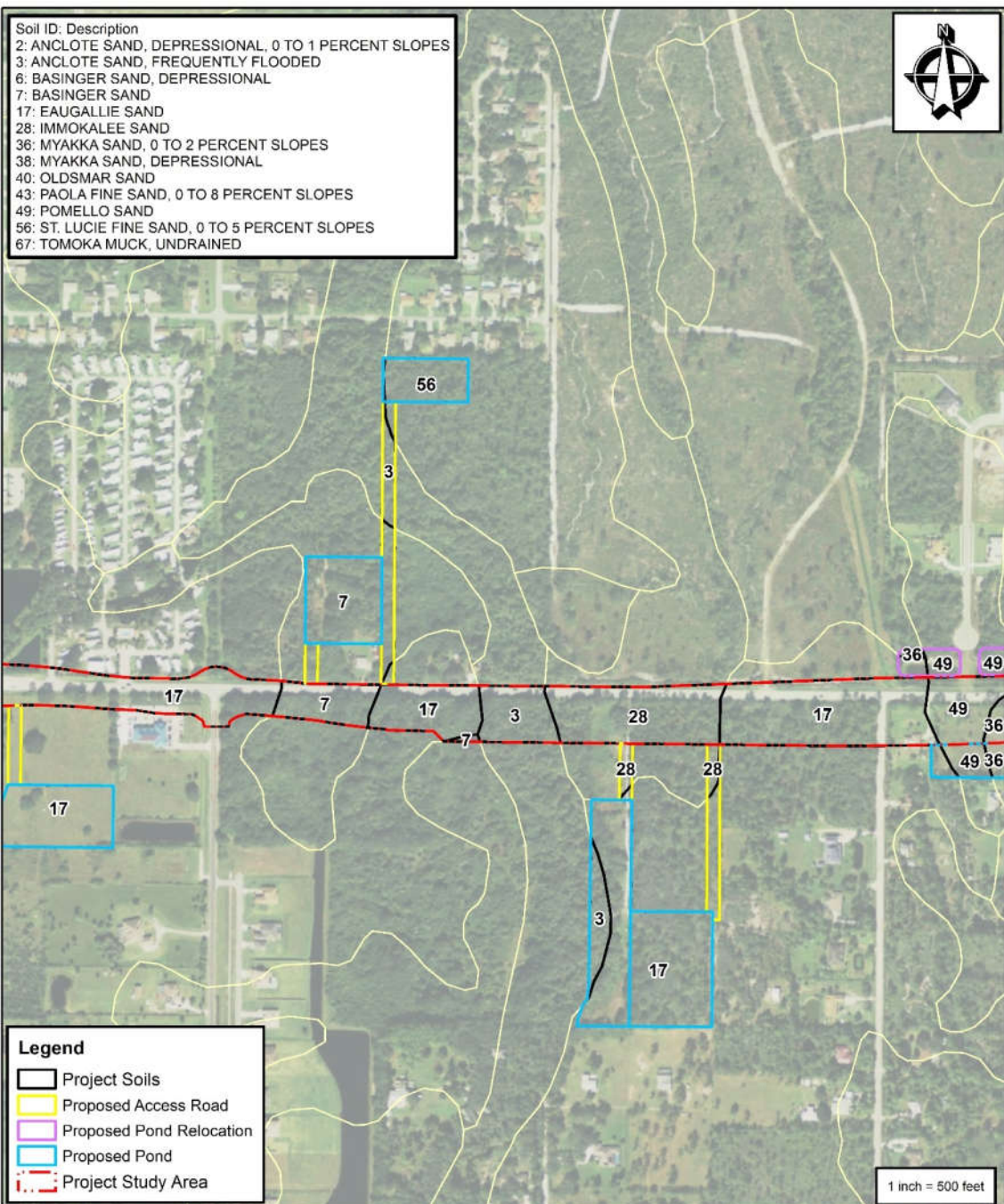
EauGallie Sand

The EauGallie series is typically defined as very deep and very poorly drained soils that are located in sloughs and depressional areas of Southern Florida Lowlands, Atlantic Coast Flatwoods, and the South-Central Florida Ridge. This soil series generally contains black sand mixed with black organic matter within the first five inches and grey, loose, strongly acidic sand from six to twenty-six inches. The series is considered a non-hydric soil type that can be found in flatwoods, floodplains, sloughs and depressional areas of Florida.

Figure 2-5: NRCS Soils Map



Soil ID	Description
2	ANCLOTE SAND, DEPRESSIONAL, 0 TO 1 PERCENT SLOPES
3	ANCLOTE SAND, FREQUENTLY FLOODED
6	BASINGER SAND, DEPRESSIONAL
7	BASINGER SAND
17	EAUGALLIE SAND
28	IMMOKALEE SAND
36	MYAKKA SAND, 0 TO 2 PERCENT SLOPES
38	MYAKKA SAND, DEPRESSIONAL
40	OLDSMAR SAND
43	PAOLA FINE SAND, 0 TO 8 PERCENT SLOPES
49	POMELLO SAND
56	ST. LUCIE FINE SAND, 0 TO 5 PERCENT SLOPES
67	TOMOKA MUCK, UNDRAINED



Legend	
	Project Soils
	Proposed Access Road
	Proposed Pond Relocation
	Proposed Pond
	Project Study Area

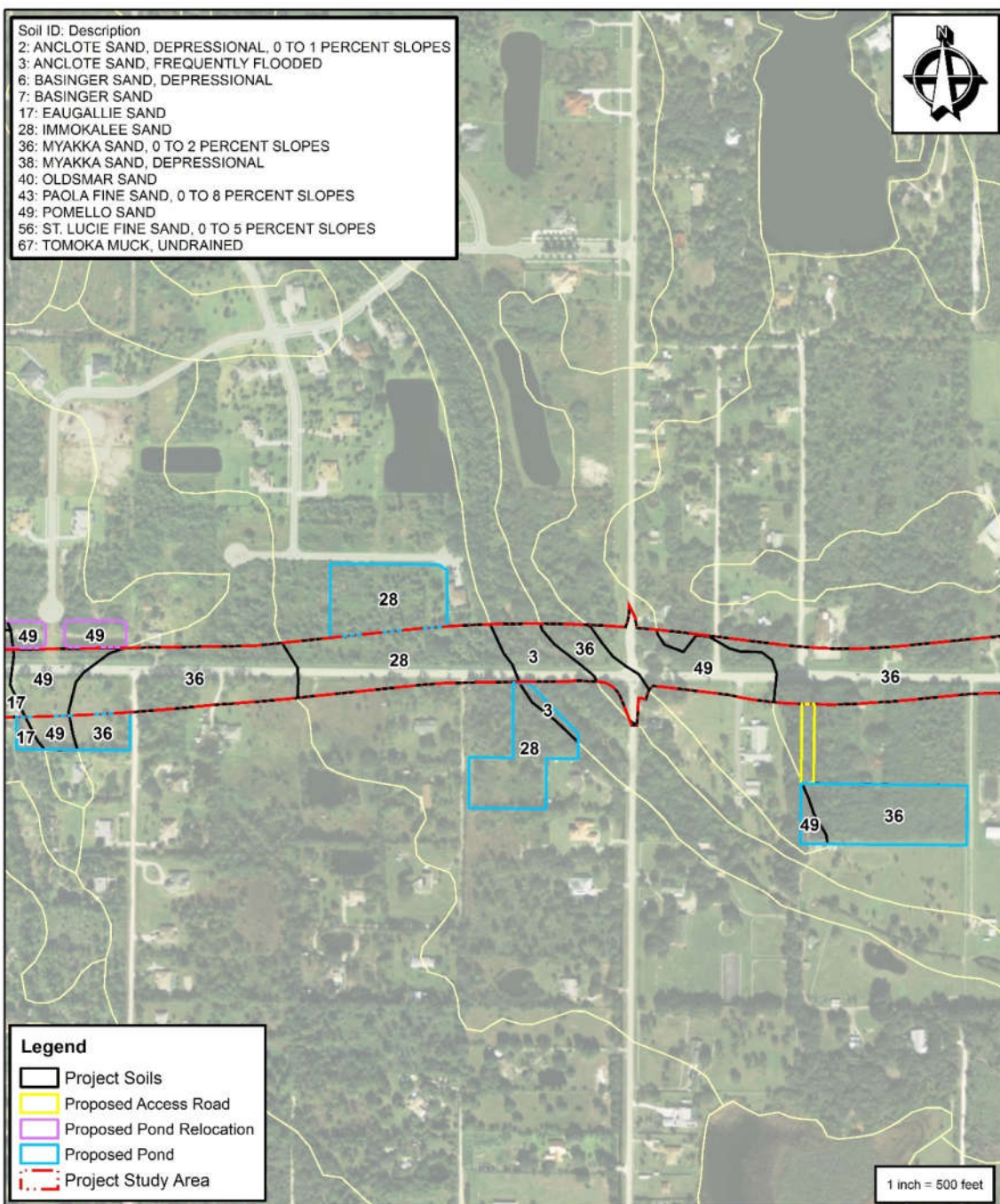
1 inch = 500 feet



Malabar Road (SR 514)
PD&E Study from SR 507 to US 1
Brevard County, Florida
Financial Project ID Number: 430136-1-22-01

NRCS Soils Map
Sheet 2

Soil ID:	Description
2:	ANCLOTE SAND, DEPRESSIONAL, 0 TO 1 PERCENT SLOPES
3:	ANCLOTE SAND, FREQUENTLY FLOODED
6:	BASINGER SAND, DEPRESSIONAL
7:	BASINGER SAND
17:	EAUGALLIE SAND
28:	IMMOKALEE SAND
36:	MYAKKA SAND, 0 TO 2 PERCENT SLOPES
38:	MYAKKA SAND, DEPRESSIONAL
40:	OLDSMAR SAND
43:	PAOLA FINE SAND, 0 TO 8 PERCENT SLOPES
49:	POMELLO SAND
56:	ST. LUCIE FINE SAND, 0 TO 5 PERCENT SLOPES
67:	TOMOKA MUCK, UNDRAINED



Legend	
	Project Soils
	Proposed Access Road
	Proposed Pond Relocation
	Proposed Pond
	Project Study Area

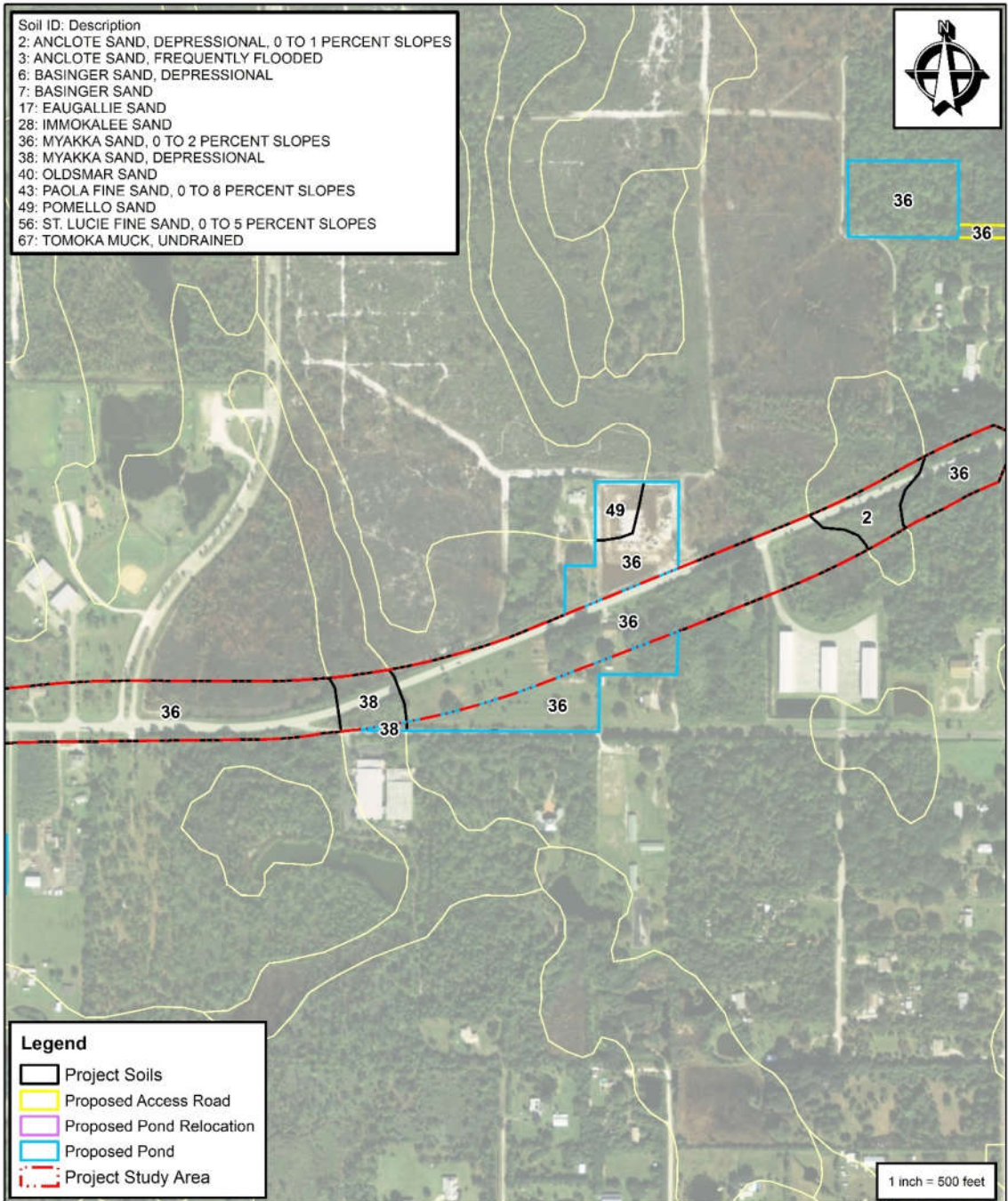
1 inch = 500 feet



Malabar Road (SR 514)
 PD&E Study from SR 507 to US 1
 Brevard County, Florida
 Financial Project ID Number: 430136-1-22-01

NRCS Soils Map
Sheet 3

Soil ID:	Description
2:	ANCLOTE SAND, DEPRESSIONAL, 0 TO 1 PERCENT SLOPES
3:	ANCLOTE SAND, FREQUENTLY FLOODED
6:	BASINGER SAND, DEPRESSIONAL
7:	BASINGER SAND
17:	EAUGALLIE SAND
28:	IMMOKALEE SAND
36:	MYAKKA SAND, 0 TO 2 PERCENT SLOPES
38:	MYAKKA SAND, DEPRESSIONAL
40:	OLDSMAR SAND
43:	PAOLA FINE SAND, 0 TO 8 PERCENT SLOPES
49:	POMELLO SAND
56:	ST. LUCIE FINE SAND, 0 TO 5 PERCENT SLOPES
67:	TOMOKA MUCK, UNDRAINED



Legend	
	Project Soils
	Proposed Access Road
	Proposed Pond Relocation
	Proposed Pond
	Project Study Area

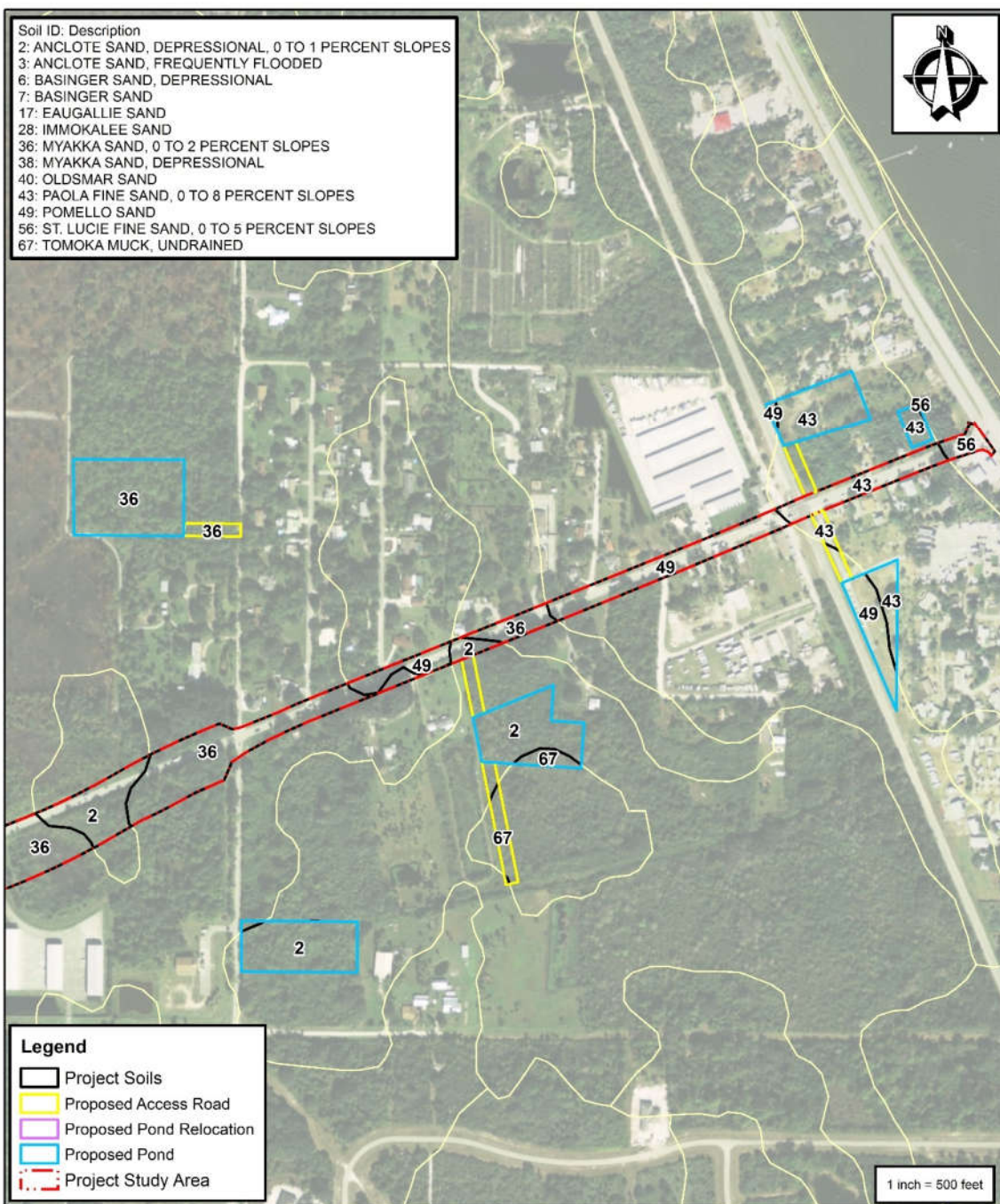
1 inch = 500 feet



Malabar Road (SR 514)
 PD&E Study from SR 507 to US 1
 Brevard County, Florida
 Financial Project ID Number: 430136-1-22-01

NRCS Soils Map
Sheet 4

Soil ID:	Description
2:	ANCLOTE SAND, DEPRESSIONAL, 0 TO 1 PERCENT SLOPES
3:	ANCLOTE SAND, FREQUENTLY FLOODED
6:	BASINGER SAND, DEPRESSIONAL
7:	BASINGER SAND
17:	EAUGALLIE SAND
28:	IMMOKALEE SAND
36:	MYAKKA SAND, 0 TO 2 PERCENT SLOPES
38:	MYAKKA SAND, DEPRESSIONAL
40:	OLDSMAR SAND
43:	PAOLA FINE SAND, 0 TO 8 PERCENT SLOPES
49:	POMELLO SAND
56:	ST. LUCIE FINE SAND, 0 TO 5 PERCENT SLOPES
67:	TOMOKA MUCK, UNDRAINED



Legend	
	Project Soils
	Proposed Access Road
	Proposed Pond Relocation
	Proposed Pond
	Project Study Area



Malabar Road (SR 514)
 PD&E Study from SR 507 to US 1
 Brevard County, Florida
 Financial Project ID Number: 430136-1-22-01

NRCS Soils Map
Sheet 5

Immokalee Sand

The Immokalee series consists of very poorly drained soils located in flatwoods and in depression wetland areas, however they are not classified as a hydric wetland soil. Soil coloration consists of dark gray fine sand component from zero to six inches and gray fine sand from six to 12 inches down. This soil series is typically located in rangeland areas where the water table is at depths of six to 18 inches for one to four months give a typical year.

Myakka Sand Depressional

The Myakka series consists of very poorly / poorly drained, moderately permeable soils that occur in mesic flatwoods. Typical soil colorations consist of black, crushed sand from zero to six inches, turning pale brown sand from six to 20 inches. This series is considered a hydric, wetland soil type that is utilized for forest production or native range lands. The water table is at depths of less than 18 inches for one to four months duration in most years. Depressional areas are covered with standing water for periods of six to nine months or more in most years. The water table is at a depth of less than 18 inches for up to four months in duration during most years and recedes to depths of more than 40 inches during very dry seasons. Depressional areas are covered with standing water for periods of six to nine months or more in most years.

Oldsmar Sand

Oldsmar series contains poorly drained soils that are located within flatwoods and in depressions throughout Florida, however are not considered hydric soils. The top 32 inches of soil contains gray to light greyish brown sand that is smooth and strongly acidic. The water table is typically at depths of 18 inches for one to three months and 18 to 40 inches for periods of more than six months.

Paola Fine Sand

This series consists of excessively drained, permeable soils, which are not considered hydric. Typical cross section of this soil series contains dark to light gray sand within the first 25 inches. The Paola series can be found at depths that exceed 80 inches within upland areas and the Coastal Plain.

Pomello Sand

Pomello soil series consists of moderately well to somewhat poorly drained soils that are sandy to depths of more than 80 inches. Pomello soils are associated with flatwoods areas and are not considered hydric. Soil characterization and colorization from zero to four inches consists of gray fine sand that becomes white fine sand from four to 42 inches. This soils series contains sand, fine sand or coarse sand down to 80 or more inches. The seasonally high-water table typically supports a range of 24 to 42 inches for one to four months.

St. Lucie Fine Sand

St. Lucie series generally consists of excessively drained, rapidly permeable soils located on ridges or isolated upland areas. This soil series generally contains gray to white sand within the first 80 inches of the soil profile and are considered non-hydric soils. Areas that contain St Lucie soils are indicative of scrub forest land types.

Tomoka Muck, Undrained

The Tomoka soil series characteristically contains very poorly drained, moderately permeable – hydric soils. The top five inches of soil contains very dark brown colorations with muck components that turn to a dark reddish-brown coloration from five to 13 inches. Since the soils are very poorly drained, runoff is slow. Typically, in undrained areas, the water table is at or on the surface of the soil except during extended drought like periods.

2.3.3 Drainage

A majority of the drainage features that exist within the project study area are other surface water (OSW) features (drainage ditches) with some roadside swales. The roadside swales are shallow and appear to be nearly level with the existing ground elevation along the corridor. These swale features were not specifically identified in **Section 3.0 Wetland Evaluation** as they are not considered Waters of the U.S. or Waters of the State. A series of culverts under and parallel to Malabar Road hydrologically connect many of the roadside swales and OSW features within the ROW of the road.

The project study area is located within one SJRWMD mitigation basin, the Central Indian River Lagoon Mitigation Basin (Basin 22). (**Figure 2-6**).

Figure 2-6: SJRWMD Mitigation Basins



Section 3.0 Wetland Evaluation

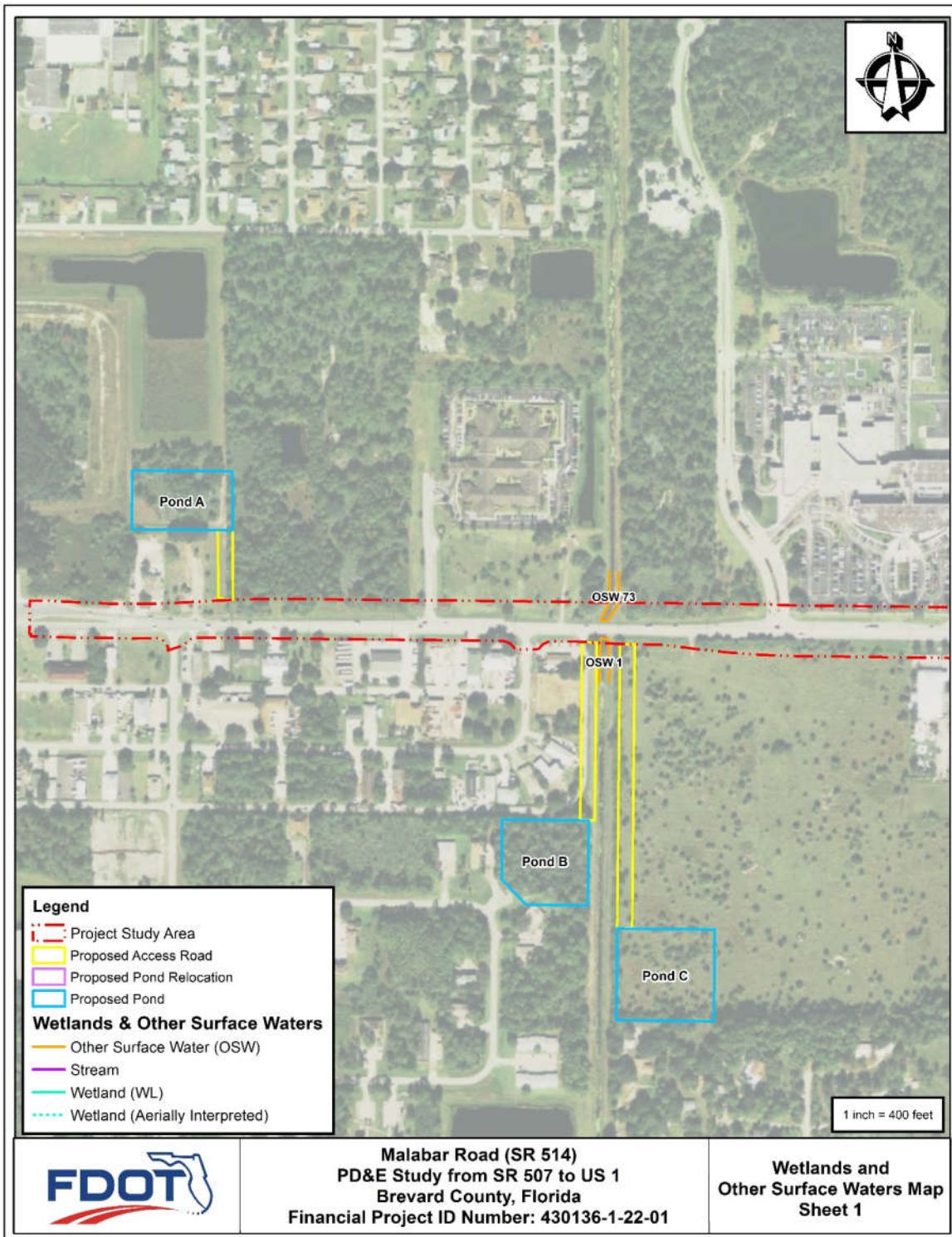
3.1 Wetland Identification, Delineations and Classifications

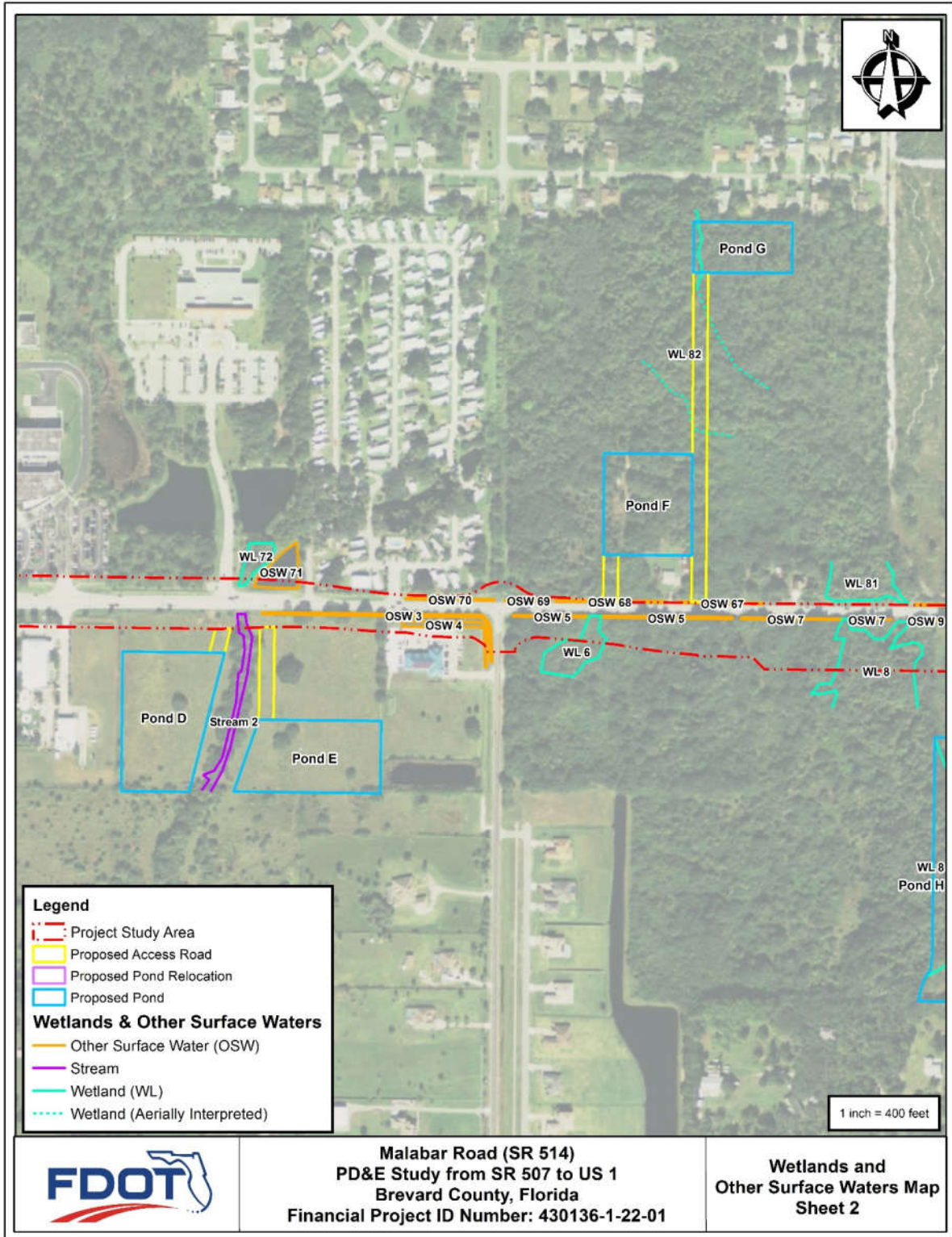
In accordance with the FDOT, *PD&E Manual Part 2, Chapter 9 – Wetlands and Other Surface Waters*, project alternatives have been assessed to determine the potential impacts to wetlands and OSWs. The project study area was evaluated to determine the extent of wetlands and OSW features existing within the project study area. Resources including: U.S. Geological Survey (USGS) topographic maps, National Wetland Inventory (NWI) Maps, SJRWMD FLUCCS shapefiles, United States Department of Agriculture (USDA) NRCS soil maps and current aerial photography, were utilized for desktop and field evaluations of wetlands.

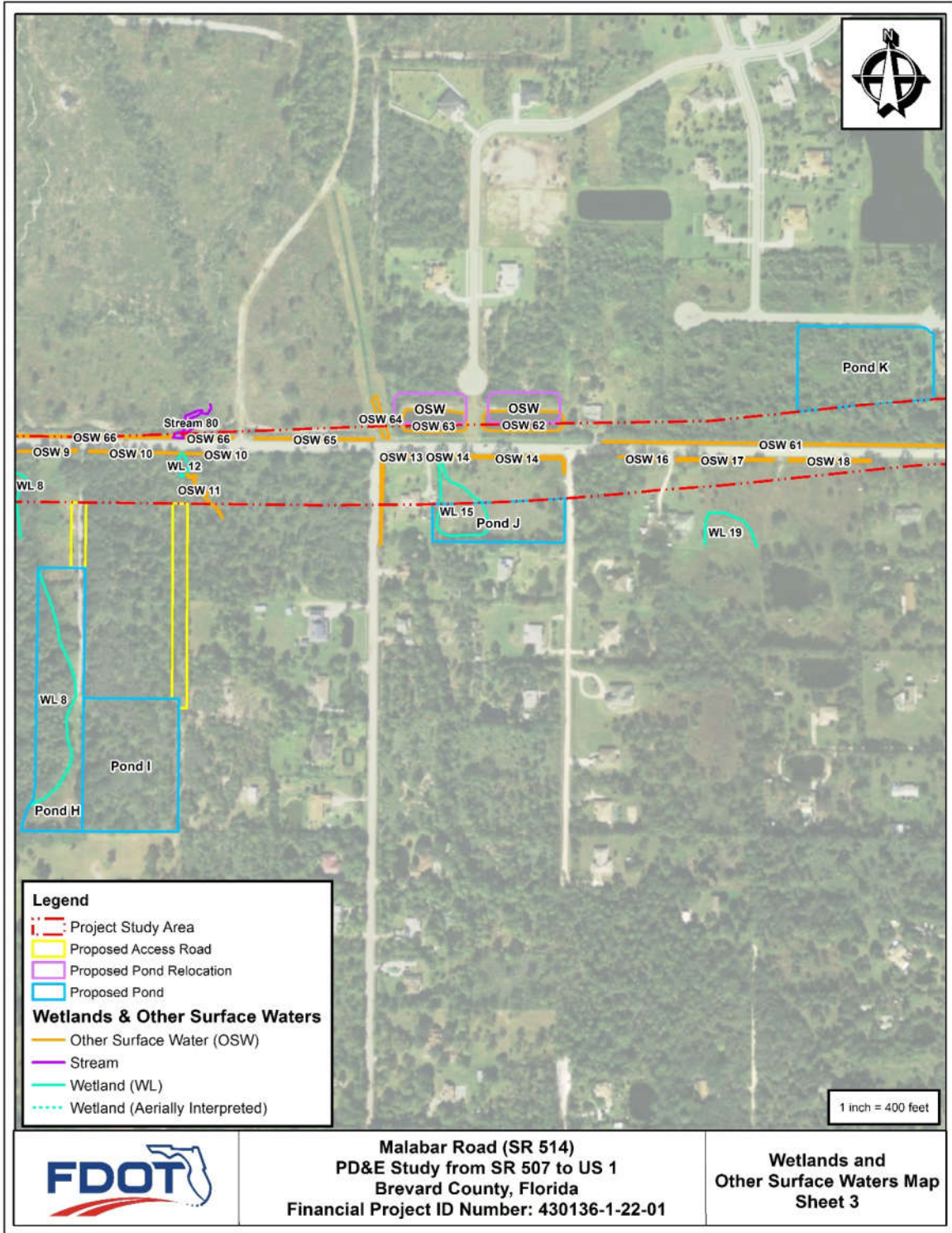
Wetlands and OSWs determined to be jurisdictional to federal and state agencies pursuant to the *Federal Manual for Identifying and Delineating Jurisdictional Wetlands* (US Army Corps of Engineers [ACOE], 1987 (Regional Supplement – November 2010)), and *The Florida Wetlands Delineation Manual* (Florida Department of Environmental Protection [FDEP], 1995), within the project study area (excluding pond sites) were delineated in the field and given a unique ID number; wetlands are denoted with a WL prefix, while other surface waters are denoted with an OSW prefix. Jurisdictional wetlands and OSWs within the proposed pond sites were aerially interpreted using information from the SJRWMD, US Fish and Wildlife Service (USFWS), and NRCS; brief site reconnaissance was conducted to confirm the general limits of the wetlands and OSWs within the pond sites. **Figure 3-1** shows the location of the wetlands and OSWs within the project study area.

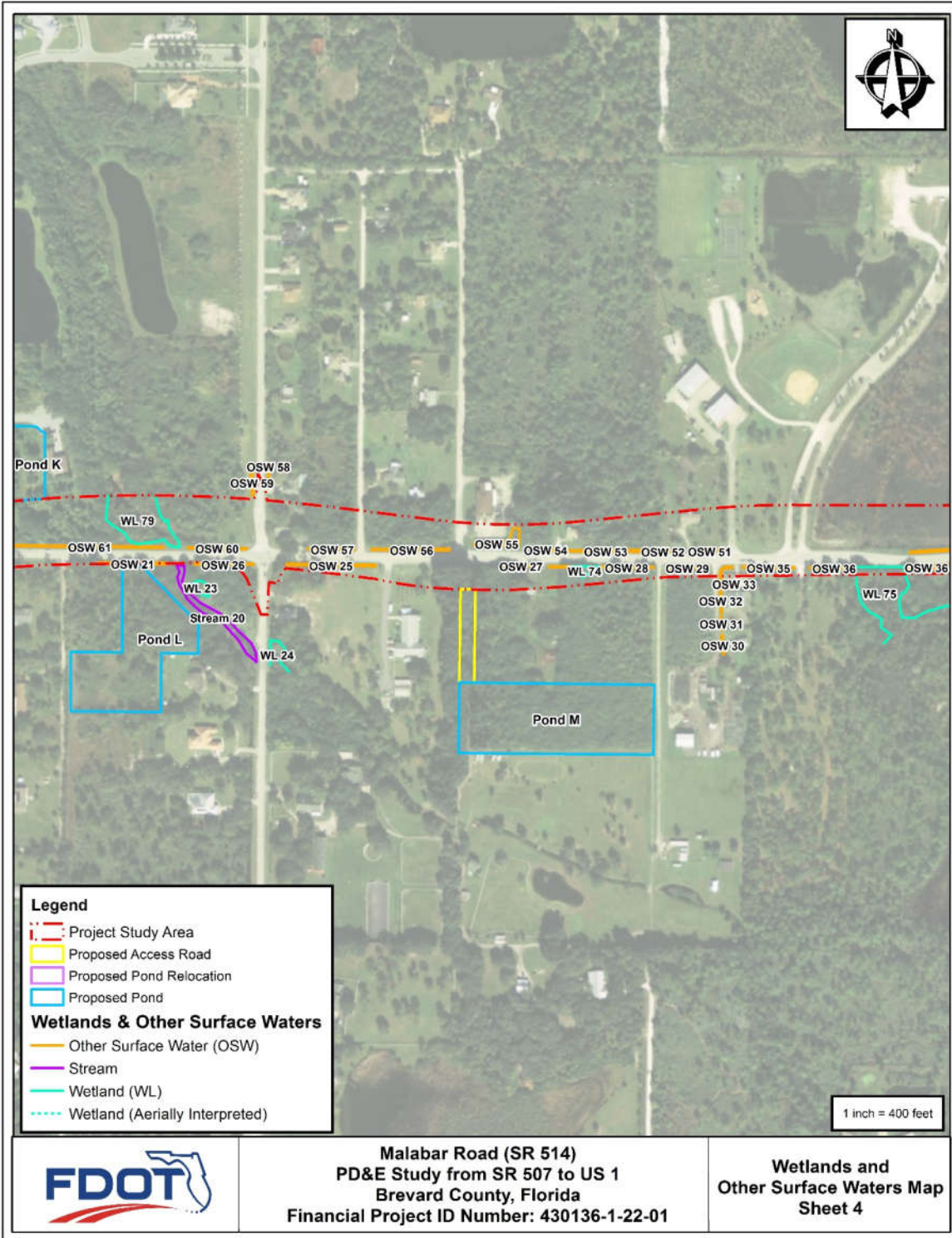
Jurisdictional wetlands were assessed in the field to determine functional value and Uniform Mitigation Assessment Method (UMAM) forms were completed for each wetland identified during the field review conducted in November 2013.

Figure 3-1: Wetlands and Other Surface Waters Map



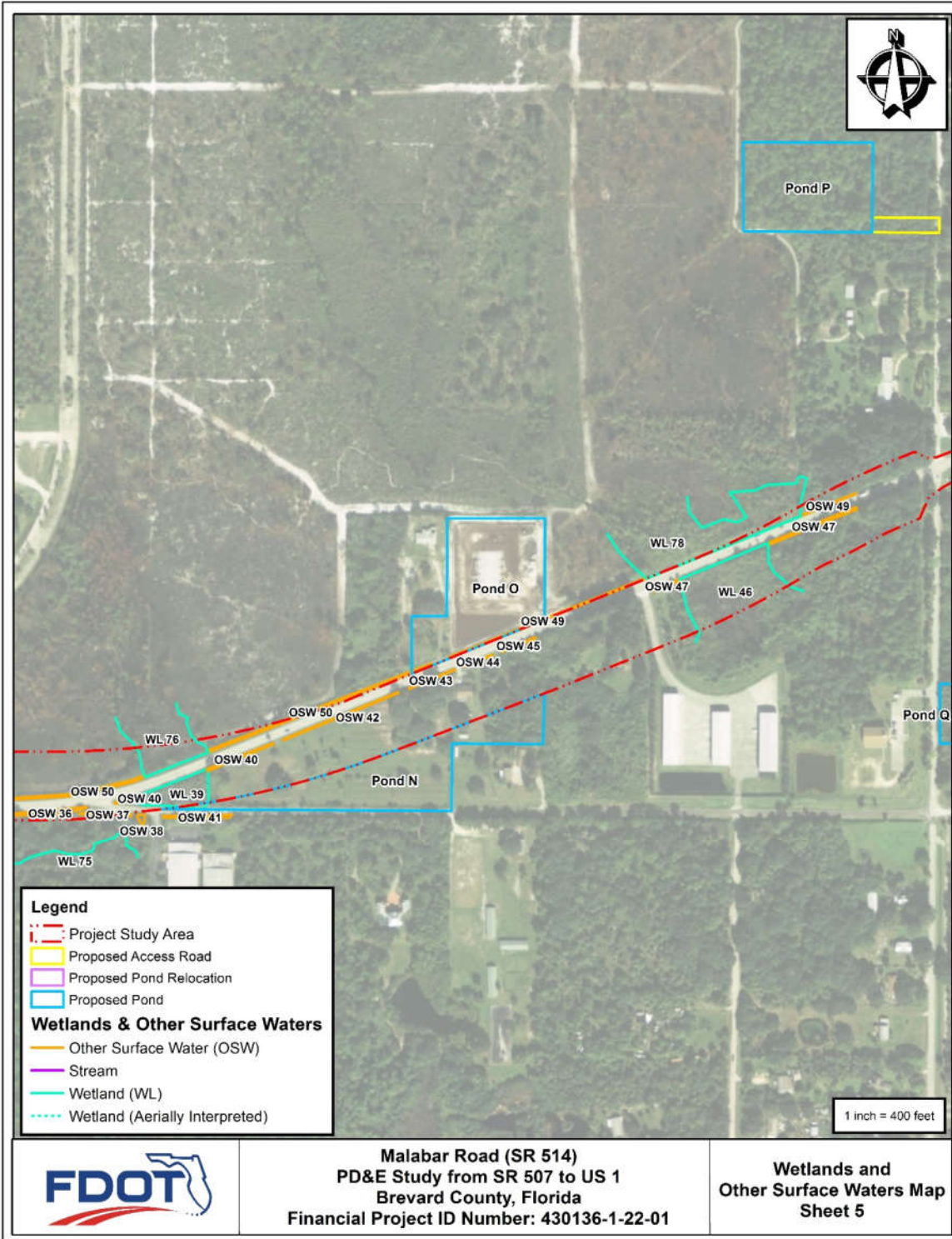


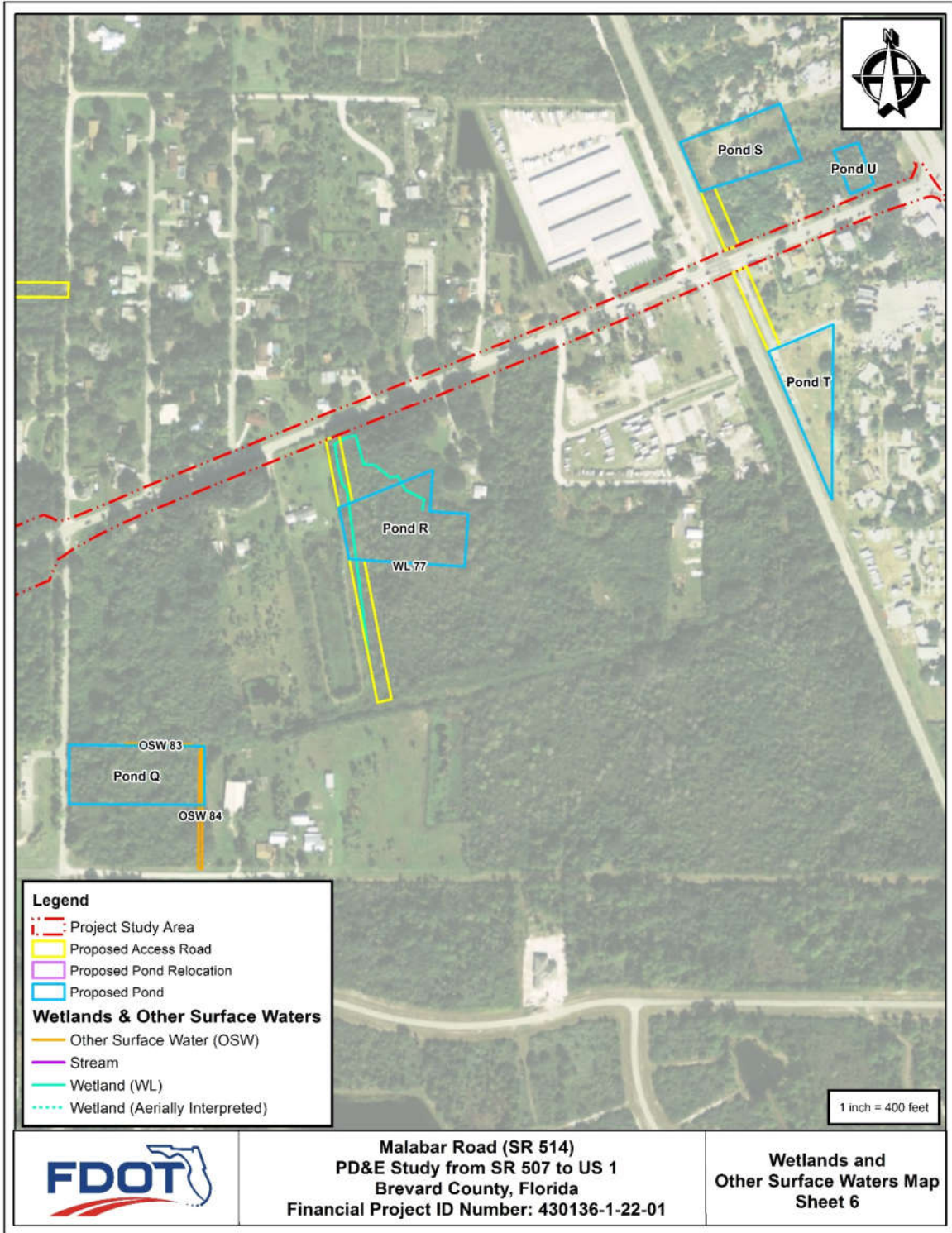




Malabar Road (SR 514)
 PD&E Study from SR 507 to US 1
 Brevard County, Florida
 Financial Project ID Number: 430136-1-22-01

Wetlands and
 Other Surface Waters Map
 Sheet 4





3.2 Preliminary Agency Coordination

FDOT's Efficient Transportation Decision Making (ETDM) tool was used to solicit agency comments on the proposed project. The ETDM comments, received between June and July 2012, as well as additional agency correspondence related to the project can be found in **Appendix C**. A summary of agency comments is included below.

- United States Environmental Protection Agency (EPA) commented in part; "The project will have potential impacts on wetland resources, including wetlands associated with Turkey Creek and associated tributaries. There are several other surface water bodies (such as Little Turkey Creek and Indian River above Sebastian Inlet) along the project corridor which may have wetland systems associated with them and would be impacted by the roadway and surrounding development. The Indian River - Malabar to Vero Beach Aquatic Preserve is listed as an Outstanding Florida Water and the Indian River - Malabar to Vero Beach Aquatic Preserve are also located within close proximity to the project." "Other issues of concern include increased stormwater runoff and the increase of pollutants into surface waters and wetlands as a result of the roadway and other point and nonpoint sources. Every effort should be made to maximize the treatment of stormwater. Stormwater treatment areas/ponds should be designed to protect the function of surrounding wetlands, floodplains, and surface water features." "It is recommended that the environmental phase (PD&E) of the project include delineation of wetlands; functional analysis of wetlands to determine their value and function; an evaluation of stormwater pond sites to determine their impact on wetlands; a review of surface water crossings (such as bridges) to determine their impact on wetlands and floodplains; avoidance and minimization strategies for wetlands; and mitigation plans to compensate for adverse impacts." The Degree of Effect is Moderate (3). **(ETDM)**
- National Marine Fisheries Service (NMFS) commented in part;" Based on the project location, the site inspection, information provided in the ETDM website, and GIS-based analysis of impacts, NMFS concludes that essential fish habitat (EFH) would not be impacted by the proposed road modifications; accordingly, we offer no comments pursuant to the EFH provisions of the Magnuson-Stevens Act (P.L. 104-297); and this project will not require an EFH Assessment. Further consultation on this matter is not necessary unless future modifications are proposed and you believe that the proposed action may result in adverse impacts to EFH." "We are not aware of any threatened or endangered species or critical habitat under the purview of NMFS that occur within the project area. However, it should be noted that a "no effect" determination must be made by the action agency and the reasoning underlying the determination should be documented in a project file. Please coordinate closely with the U.S. Fish and Wildlife Service for other species listed under the Endangered Species Act that may require consultation." "Based on our review of the information provided on the EST website, a site inspection on June 29, 2012, GIS-based effects analysis on wetlands

and interpretation of aerial photographs, NMFS has determined that emergent wetlands, mixed wetland hardwoods, creeks, and ditches are located within the project corridor. These wetlands range from low to moderate in quality. Two creeks intersect Malabar Road within the project area; one just east of Weber Road and the other, just west of Corey Road. The primary purpose of the site inspection was to determine whether these creeks are tidal. Neither creek had a definitive tidal signature.” “The wetlands along the proposed roadway expansion provide water quality functions, such as removal of sediments, excess nutrients, and contaminants, which benefit and support these aquatic ecosystems. Through hydrological connections, these wetlands also contribute plant material and other useable nutrients (both dissolved and particulate organic matter) into aquatic food webs that include recreationally, commercially, and ecologically important species within downstream estuaries. If wetland impacts are unavoidable, sequential minimization and mitigation should take place.” The Degree of Effect is Minimal (2). **(ETDM)**

- ACOE commented; “The project as proposed will impact wetlands and surface waters which are hydrologically connected to the Turkey Creek and regulated by the ACOE pursuant to Section 404 of the Clean Water Act. Five tributaries of Turkey Creek were identified within this section of Malabar Road. Additionally, widening to the north side of the road would impact Malabar Scrub Sanctuary. Additionally, wetlands associated with Stillwater Preserve (Department of the Army SAJ-2004-09015) were avoided and utilized as compensatory mitigation for impacts associated with its development. The wetland systems and tributaries of Turkey Creek play a vital role as habitat for wildlife, flood storage, water quality issues, and drainage for the surrounding areas. These waters and their associated floodplain and tributaries would be considered a high importance. Remnant wetlands scattered throughout the proposed corridor vary in functions and value which may reduce their importance. A functional analysis would determine the extent of high, moderate, and low-quality wetland.” “The project should be designed to avoid important resources on the north side of the roadway. Drainage structures should be designed to encourage continuity of habitats and facilitation of wildlife crossings. Impacts to wetlands associated with Stillwater Preserve will require more than 1:1 compensatory mitigation to functional loss; because they are compensatory mitigation for DA permit SAJ-2004-09015.” The Degree of Effect is Moderate (3). **(ETDM)**
- FDEP commented; “The proposed project will require an environmental resource permit (ERP) from the SJRWMD. The ERP applicant will be required to eliminate or reduce the proposed wetland resource impacts of roadway construction to the greatest extent practicable:
 - Minimization should emphasize avoidance-oriented corridor alignments, wetland fill reductions via pile bridging and steep/vertically retained side slopes, and median width reductions within safety limits.

- Wetlands should not be displaced by the installation of stormwater conveyance and treatment swales; compensatory treatment in adjacent uplands is the preferred alternative.
- After avoidance and minimization have been exhausted, mitigation must be proposed to offset the adverse impacts of the project to existing wetland functions and values. Significant attention is given to forested wetland systems, which are difficult to mitigate.
- The cumulative impacts of concurrent and future transportation improvement projects in the vicinity of the subject project should also be addressed.” The Degree of Effect is Moderate (3). **(ETDM)**
- USFWS commented “According to the Environmental Screening Tool, several large, high quality wetlands, riverine and estuarine ecosystems (Indian River Lagoon, Turkey Creek, Stillwater Preserve) are found within the action area. We recommend that these valuable resources be avoided to the greatest extent practicable. Developing alternatives that avoid any impacts to Stillwater Preserve is preferred since this is already a wetland mitigation site. If impacts to wetlands are unavoidable, FDOT should provide mitigation that fully compensates for the loss of wetland function and wildlife value and maintains habitat connectivity. The roadway drainage system should be upgraded to avoid increased run off of contaminants (oil, gas, grease, trash) into the adjacent conservation lands or wetland ecosystems. Brevard County manages conservation land on the northern side of Malabar Road known as the Malabar Scrub Sanctuary. This area supports oak scrub, scrubby flatwoods, sand pine scrub, and high-quality wetlands. According to the Malabar Scrub website, this land is a refuge for eastern indigo snakes, Florida scrub-jays and gopher tortoise. The Service has determined that this conservation land meets Section 4(f) criteria and any impacts to the Malabar Scrub Sanctuary should be avoided. Habitat fragmentation is already occurring in this area as a result of urban sprawl and can reduce the connectivity and habitat values of the existing conservation lands. There is potential for increased mortality for all wildlife in the area attempting to cross a wider, busier road. Increased noise levels and disturbance may also be detrimental to many species of wildlife on conservation lands.” The Degree of Effect is Moderate (3). **(ETDM)**
- The ACOE commented in part; “My biggest concerns are the fact that waters of the United States which would be impacted by this project discharge to the Indian River. Brevard County, City of Malabar, and City of Palm Bay have created initiatives to restore/enhance Turkey Creek and this project could help and or harm those efforts. The ACOE strongly advises FDOT to utilize bridges/large culverts to reduce impacts to tributaries and mitigate within the Indian River Lagoon watershed not the St. Johns River as previously discussed.” **(E-mail correspondence between Andrew Phillips (ACOE) and Craig Stout (Atkins); June 3, 2014)**
- SJRWMD commented that the Basin 22 Mitigation Bank is currently in Phase 1 of the permitting process. Partial release of credits is anticipated within the next year once a conservation easement is established on the bank. **(Phone communication**

between Reid Hilliard (SJRWMD Mitigation bank permit coordinator) and Craig Stout (Atkins); June 17, 2014)

3.3 Wetland Habitat Descriptions

Each wetland and OSW existing within the project study area is described below, and then more specifically described for the Recommended Alternative in **Section 3.5.2**. Each of the identified wetlands and OSWs were categorized using FLUCCS and the USFWS's NWI classification system (Cowardin et.al., 1979). It should be noted that gradually sloping, manicured and maintained swales exist within the ROW. These upland cut swales are dominated with St. Augustine grass (*Stenotaphrum secundatum*), bahiagrass, centipedegrass (*Eremochloa ophiuroides*), and other ruderal upland plant species.

Streams and Waterways (FLUCCS – 5100/ NWI – Palustrine System Emergent Wetland (PEM))

This category includes river, creeks, canals, and other linear water bodies. Waterbodies within this classification hold aquatic vegetation and/or, maintain a persistent amount of water. There are several OSW features (OSWs 3-5, 7, 9-11, 13, 14, 16-18, 21, 25-38, 40-45, 47, 49-61, 64-70, 83, and 84) which consist of upland cut stormwater ditches and the C-78 Canal (OSW1 and OSW73) within the project study area. In addition to the OSW systems, there are two creek/stream features (Stream 2 and Stream 80) which are systems within the proposed project area. The vegetation in these streams consisted of swamp smartweed (*Persicaria hydropiperoides*), torpedograss (*Panicum repens*), wax myrtle, common dayflower (*Commelina diffusa*), southern umbrellasedge (*Fuirena scirpoidea*), carpetgrass (*Axonopus furcatus*), royal fern (*Osmunda regalis*), red maple (*Acer rubrum*), and pickerelweed (*Pontederia cordata*).

Water - Reservoirs (FLUCCS – 5300/NWI – Open Water)

This category includes all stormwater ponds within the project study area. These waterbodies maintain a persistent amount of water year-round and are utilized for stormwater storage. Generally, these features will have an overflow structure to manage the water levels in the pond. Within the study area three pond features (OSW 62, 63, and 71) exist. These ponds are routinely maintained and have minimal vegetation present. The vegetation is limited to the periphery and includes bahiagrass, manyflower marshpennywort (*Hydrocotyle umbellata*), soft rush (*Juncus effusus*), bulltongue arrowhead (*Sagittaria lancifolia*), spadeleaf (*Centella asiatica*), and waterhyssop (*Bacopa monnieri*).

Willow and Elderberry (FLUCCS – 6180/ NWI – Palustrine System Scrub-Shrub Wetland (PSS))

In this community type, willow (*Salix* spp.) is the pure or predominant plant species. Wetlands in this category, WL39 and WL46 are dominated by Carolina willow (*Salix caroliniana*) with Brazilian pepper around the periphery. Other plant species present included cinnamon fern (*Osmunda cinnamomea*), swamp fern (*Telmatoblechnum serrulatum*), royal fern, and spike rush (*Eleocharis* sp.).

Exotic Wetland Hardwoods (FLUCCS – 6190/ NWI – Palustrine System Forested Wetland (PFO))

This category includes wetlands dominated by exotic species such as Brazilian pepper, melaleuca (*Melaleuca quinquenervia*), or other exotic species. WL6, the west half of WL8 and WL74 are included in this category and are dominated by Brazilian pepper with scattered cabbage palm. In addition, the understory is very sparse with species such as swamp fern, leather fern (*Acrostichum danaeifolium*), and Virginia chain fern (*Woodwardia virginica*) present.

Hydric Pine Flatwoods (FLUCCS – 6250/ NWI - PFO)

This forested community supports a sparse to moderate canopy of slash pine. The understory includes grasses, forbs, and at times scattered saw palmetto. WL78 includes slash pine, swamp fern, bulltongue arrowhead, dog-fennel (*Eupatorium capillifolium*), wax-myrtle, plume-grass (*Saccharum* sp.), broomsedge (*Andropogon* spp.), redroot (*Lachnanthes caroliniana*), and beakrushes (*Rhynchospora* spp.).

Wetland Forested Mix (FLUCCS – 6300/ NWI – PFO)

This category includes a mixture of wetland canopy species in which neither hardwoods nor conifers total 66 percent of the total canopy coverage. The east half of WL8, WL12, WL39, WL72, WL75, WL77, WL79, and WL82 consisted of a mixture of slash pine, cabbage palm, red maple and black gum (*Nyssa sylvatica*), with Brazilian pepper, Carolina willow, and swamp fern in the understory.

Wetland Scrub (FLUCCS – 6310/ NWI – PSS)

This community is associated with topographic depressions and poorly drained soil. It consists of low scrub vegetation with no dominant species. WL72 contained wax-myrtle, Brazilian pepper, swamp fern, pennywort, smartweed, and muscadine grape.

Wet Prairie (FLUCCS - 6430/ NWI – PEM)

This wetland community is composed predominantly of grassy vegetation on hydric soils. WL15 and WL76 generally contain herbaceous vegetation such as: maidencane (*Panicum hemitomon*), swamp smartweed, broomsedge, soft rush, manyflower marshpennywort, redroot, yellow-eyed grass (*Xyris* sp.), St. John's wort (*Hypericum* spp.), and torpedograss (WL15 only).

3.4 UMAM Analysis

A UMAM assessment was prepared for each jurisdictional wetland occurring within the project study area. UMAM was developed by FDEP and the water management districts in order to provide a streamlined method to determine the amount of mitigation needed to offset adverse impacts to jurisdictional wetland systems. OSWs within the project study area that are upland-cut stormwater drainage features were identified in the field; however, because impacts to these systems are exempt from mitigation requirements, UMAM

assessments were not prepared. Below is a brief description of the 16 jurisdictional wetlands that occur within the project study area. The UMAM delta (with project UMAM score – current condition UMAM score) for direct impacts for each wetland is included (delta does not consider acreage of impact); where appropriate the UMAM delta for secondary impacts (50-feet outside the direct impact area) is also included. The completed UMAM datasheet (Part II) for each wetland is included in **Appendix D**.

Stream 2 – Stream and Waterways (FLUCCS - 5100)

This small intermittent stream is located in an active cattle pasture. Wildlife access is substantially limited due to Malabar Road to the north and urban build-up in the area. The water environment is reduced due to the cattle impacts and past land management practices. Approximately 25% of the vegetation consisted of nuisance and exotic plant species. A marginal amount of water detention and flood/erosion control can be provided by this small creek. This wetland extends outside of the project study area. *The delta associated with direct impacts is 0.43; the delta for secondary impacts is 0.03.*

Stream 80 – Stream and Waterways (FLUCCS - 5100)

This stream is located on the north side of Malabar Road, west of the intersection with Briar Creek Blvd. It is located within the ROW of Malabar Road and Tract 2 of the Malabar Scrub Sanctuary. It is hydrologically connected to Wetland 12 on the south side of Malabar Road via culverts under the road. Wildlife access is partially limited by Malabar Road to the south. This feature is an intermittent stream with some standing water observed within this stream. The vegetation cover in this feature consists of both beneficial wetland vegetation and nuisance and exotic plant species. The northern half of this feature within the assessment area consists of a forested stream bank and as it approaches the road becomes herbaceous dominant. *The delta associated with direct impacts is 0.57; the delta for secondary impacts is 0.07.*

Wetland 6 – Exotic Wetland Hardwoods (FLUCCS – 6190)

Wildlife access to this wetland is limited due to Malabar Road to the north and urban build-up in the area. However, wildlife habitats outside the assessment area are fair, but fail to provide support for some wildlife. Hydrologic indicators are fair; however, past land management practices (cut ditches) appear to have an adverse effect on the hydrology in the system. The wetland and adjacent areas are dominated by nuisance and exotic plant species. This wetland provides minimal water detention and flood/erosion control during flood periods. This wetland extends outside of the project study area. *The delta associated with direct impacts is 0.27; the delta for secondary impacts is 0.06.*

Wetland 8 - Exotic Wetland Hardwoods (FLUCCS – 6190)

Wildlife utilization is partially limited by Malabar Road to the north; however, habitats outside the assessment area are available in sufficient quantities for a variety of wildlife species. The hydrology of this system appears appropriate; however, the system is dominated by facultative nuisance and exotic plant species. This wetland does provide water detention and

flood/erosion control during flood periods. This wetland extends outside of the project study area. *The delta associated with direct impacts is 0.33; the delta for secondary impacts is 0.10.*

Wetland 8 - Wetland Forested Mixed (FLUCCS – 6300)

Wildlife utilization is partially limited by Malabar Road to the north; however, habitats outside the assessment area are available in sufficient quantities for a variety of wildlife species. There is a number of nuisance and exotic plant species in the proximity of this wetland. Hydrologic indicators were distinct and appropriate. Nuisance and exotic plant species are minimal. This wetland would be expected to provide water detention and flood/erosion control during flood periods. This wetland continues south outside the project study area. *The delta associated with direct impacts is 0.57; the delta for secondary impacts 0.10.*

Wetland 12 - Wetland Forested Mixed (FLUCCS – 6300)

Wildlife access to this wetland system is limited by Malabar Road to the north. Habitats outside of this wetland feature are available in sufficient quantity and provide support for various wildlife species. The hydrology was adequate to maintain the functions of the wetland. Two cut ditch systems abutting this feature to the north and east appears to have had an effect on the hydrology of this wetland. Within this wetland, the presence of nuisance and exotic plant species is minimal. This small wetland feature does not extend outside of the project study area. *The delta associated with direct impacts is 0.60.*

Wetland 15 – Wet Prairie (FLUCCS – 6430)

Wildlife access to the north is limited by Malabar Road and urban build up surrounding the wetland. Habitats outside of this feature are limited because of the low-density housing in the area. During the assessment, it was observed that this depressional wetland may be experiencing hydrologic issues as evidenced by the lack of distinct water level indicators throughout this system. This feature appears to have been excavated and now maintains hydric soils and hydrophytic vegetation. This wetland has a significant amount of nuisance and exotic plant species. This wetland is hydrologically connected to the stormwater ditch system within the Malabar Road ROW. *The delta associated with direct impacts is 0.30.*

Wetland 39 – Willow and Elderberry (FLUCCS – 6180)

Wildlife access to this wetland is extremely limited by abutting roadways on three sides. The Malabar Scrub Sanctuary which provides good wildlife habitat exists to the north and west of this wetland. However, Malabar Road acts as a barrier and impedes wildlife utilization from those directions. The hydrology was adequate to maintain the hydrology in this wetland. However, due to the construction of the roadways and drainage ditches, this feature has been fragmented and the hydrology appears to have been adversely affected. There was a moderate amount of nuisance and exotic plant species adjacent and within this wetland. *The delta associated with direct impacts is 0.43.*

Wetland 46 – Willow and Elderberry (FLUCCS – 6180)

Wildlife utilization is partially limited by Malabar Road, which borders this feature to the north. Habitats outside of the assessment area are available and provide some support for wildlife. The hydrology of this system is adequate to maintain the functions of this wetland. There was a number of nuisance and exotic plant species within and adjacent to this wetland. This wetland is expected to provide some water detention and flood/erosion control during flood periods. This wetland continues south outside the project study area. *The delta associated with direct impacts is 0.50; the delta for secondary impacts is 0.07.*

Wetland 72 – Wetland Scrub (FLUCCS – 6310)

Wildlife utilization is extremely limited in this wetland because of the roadway and urban build-up in the proximity of this feature. Habitats outside of the assessment area are limited and provide minimal support for wildlife. The hydrology within this system may be adversely affected by stormwater ponds that abut this wetland to the north and east. However, the water levels were distinct and the feature was impounding water at the time of the assessment. There was a moderate amount of nuisance and exotic plant species within and adjacent to this wetland system. *The delta associated with direct impacts is 0.47; the delta for secondary impacts is 0.06.*

Wetland 74 – Exotic Wetland Hardwoods (FLUCCS – 6190)

Wildlife access to this wetland system is limited by Malabar Road to the north. Habitats outside of this feature are limited by urban build-up in the area. The wetland does not support the functions or provide benefits to fish or wildlife. This feature is a marginal wetland with no evidence of a normal hydrologic regime. The vegetative cover in this feature is dominated by nuisance and exotic plant species. It is anticipated that this wetland would not provide water detention or flood/erosion control during flood periods. This small wetland feature does not extend outside of the project study area. *The delta associated with direct impacts is 0.23.*

Wetland 75 – Wetland Forested Mixed (FLUCCS – 6300)

Wildlife utilization is partially limited by Malabar Road, which borders this feature to the north. Habitats outside of the assessment area are available and provide moderate support for most wildlife. The hydrology within this feature is adequate to maintain the functions of this wetland. A number of nuisance and exotic plant species do exist within and adjacent to this feature. This wetland is expected to provide water detention and flood/erosion control during flood periods. This wetland continues south outside the project study area. *The delta associated with direct impacts is 0.60; the delta for secondary impacts is 0.03.*

Wetland 76 – Wet Prairies (FLUCCS – 6430)

This feature is bordered to the south by Malabar Road. Wildlife access in that direction would be partially limited. This wetland is located within the Malabar Scrub Sanctuary which provides good wildlife habitat outside of the assessment area. The hydrology of this feature appeared optimal for the type of system being evaluated. The ditch system that abuts this wetland to the south may have an adverse effect on the overall hydrology of the system.

There was minimal nuisance and exotic plant species present. This wetland continues north outside the project study area. *The delta associated with direct impacts is 0.67; the delta for secondary impacts is 0.06.*

Wetland 77 – Wetland Forested Mixed (FLUCCS – 6300)

Wildlife access to this feature is partially limited by Malabar Road to the north and urban build-up in the proximity of the wetland. Habitats outside of the assessment area are available and provide moderate support for most wildlife. The hydrology within this feature is adequate to maintain the functions of this wetland. A number of nuisance and exotic plant species do exist within and adjacent to this feature. This wetland is expected to provide water detention and flood/erosion control during flood periods. This wetland continues south outside the project study area. *The delta associated with direct impacts is 0.60; the delta for secondary impacts is 0.06.*

Wetland 78 – Hydric Pine Flatwoods (FLUCCS – 6250)

This wetland is located on the north side of Malabar Road. Wildlife access is partially limited in that direction. This wetland is located within the Malabar Scrub Sanctuary which provides good wildlife habitat outside of the assessment area. The hydrology supports the functions and provides benefits to wildlife at a moderate capacity. This hydrology is adequate and maintains the functions of this wetland feature. There was a number of nuisance and exotic plant species present however they were predominantly located around the periphery of this wetland. This wetland is expected to provide water detention and flood/erosion control during flood periods. This wetland continues north outside the project study area. *The delta associated with direct impacts is 0.60; the delta for secondary impacts is 0.07.*

Wetland 79 – Wetland Forested Mixed (FLUCCS – 6300)

Wildlife utilization is partially limited by Malabar Road to the south. Because of the urban build-up in the proximity of this feature, habitats outside of this wetland are limited. This feature is the wetland buffer for Fern Creek. The hydrology within this system supports the functions and provides benefits to fish and wildlife at a moderate capacity. There were a number of nuisance and exotic plant species present, however they are limited to the periphery of this feature. This system would be expected to provide water detention and flood/erosion control during flood periods. This wetland continues north outside the project study area. *The delta associated with direct impacts is 0.60; the delta for secondary impacts is 0.07.*

Wetland 82 – Wetland Forested Mixed (FLUCCS – 6300)

Wildlife utilization is partially limited by a subdivision to the north. However, the Malabar Scrub Sanctuary is located to the east, which provides a good wildlife corridor to the assessment area. Habitats outside of the assessment area are available and provide good support for most wildlife. The hydrology supports the wetland vegetation and provides benefits to wildlife at a good capacity. There are minimal nuisance and exotic plant species; these are limited to the periphery of the wetland. This wetland continues to the north, south,

and west outside of the project study area. *The delta associated with direct impacts is 0.67; the delta for secondary impacts is 0.07.*

3.5 Impact Assessment

A total of 16 wetlands and 56 OSWs (Figure 3-1) were identified within the project study area. Impacts to these wetlands and OSW systems vary between alternatives. Other than the No-Build alternative; impacts to wetlands and OSWs are expected. For the purpose of this report, secondary impacts for wetlands have been calculated utilizing a 50-foot buffer outside of the direct wetland impact area.

Completed UMAM datasheets (Part II) are included in **Appendix D**.

3.5.1 Alternatives Analysis

Wetland impacts were identified and calculated for each of the five alternative alignments in the project study area (**Section 2**). **Table 3-1** lists the wetland ID and acreage of each wetland expected to be impacted per alternative. The No-Build alternative would not have any wetland impacts. Impacts to wetlands associated with stormwater ponds are not included in this analysis.

The total amount of wetland impacts (direct and secondary) associated with Concept A equals 4.58 acres; Concept B equals 6.07 acres of wetland impacts; Concept C equals 2.15 acres; Concept D equals 3.24 acres of wetland impacts and the Recommended Alternative equals 3.95 acres (Table 3-1).

3.5.2 Recommended Alternative Alignment

Based on the engineering review of the project needs, safety, environmental impacts, and public involvement, a Recommended Alternative has been selected (**Appendix A**). Proposed wetland impacts have been assessed and quantified for this Recommended Alternative, including the preferred pond locations. This alternative proposes a total of 3.95 acres of direct and secondary wetland impacts with a UMAM FL of 1.22 units (**Table 3-2 and Appendix E**). In addition, 2.30 acres of OSW features are anticipated to be impacted. The wetland impact acreages include those associated with the preferred pond sites proposed for this alternative. Impacts to wetlands and OSWs by the Recommended Alternative can be found in **Figure 3-2**.

Table 3-1: Wetland Acreage Impacts per Build Alternative

	Wetland Name	Wetland FLUCCS	Concept A		Concept B		Concept C		Concept D		Recommended Alternative		No Build	
			Direct (acres)	*Secondary (acres)	Direct (acres)	*Secondary (acres)	Direct (acres)	*Secondary (acres)	Direct (acres)	*Secondary (acres)	Direct (acres)	*Secondary (acres)	Direct (acres)	*Secondary (acres)
Roadway	Stream 2	510	0.02	0.05	0.02	0.05	0.02	0.05	0.03	0.04	0.03	0.04	0.00	0.00
	Stream 80	510	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.03	0.00	0.00
	WL6	619	0.09	0.18	0.10	0.17	0.09	0.18	0.12	0.18	0.11	0.17	0.00	0.00
	WL8	619/630	0.53	0.32	0.78	0.34	0.53	0.32	0.53	0.29	0.47	0.30	0.00	0.00
	WL12	630	0.04	0.00	0.04	0.00	0.04	0.00	0.04	0.00	0.04	0.00	0.00	0.00
	**WL15	643	0.10	0.00	0.19	0.00	0.10	0.00	0.11	0.00	0.59	0.00	0.00	0.00
	**WL39	618/630	0.36	0.00	0.28	0.00	0.00	0.00	0.18	0.16	0.45	0.00	0.00	0.00
	WL46	618	1.01	0.33	1.29	0.26	0.00	0.00	0.22	0.35	0.44	0.36	0.00	0.00
	WL72	630/631	0.02	0.07	0.02	0.07	0.02	0.07	0.00	0.00	0.00	0.00	0.00	0.00
	WL74	619	0.02	0.00	0.02	0.00	0.02	0.00	0.04	0.00	0.04	0.00	0.00	0.00
	WL75	630	0.05	0.19	0.02	0.19	0.00	0.00	0.08	0.19	0.10	0.20	0.00	0.00
	WL76	643	0.25	0.24	0.38	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	WL78	625	0.00	0.00	0.10	0.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	WL79	630	0.50	0.21	0.64	0.21	0.50	0.21	0.50	0.18	0.37	0.20	0.00	0.00
	Sub-Total Acreage		2.99	1.59	3.88	2.19	1.32	0.83	1.85	1.39	2.65	1.30	0.00	0.00
	Total Acreage		4.58		6.07		2.15		3.24		3.95		0.00	

*Secondary impacts were calculated assuming a 50-foot secondary impact area beyond the limits of direct impact

**Wetland extends outside project study area, but will require full take under Section 10.2.2.1 of ERP Applicant's Handbook

**Table 3-2: Wetland Acreage Impacts and UMAM Functional Loss
for Recommended Alternative Alignment**

	Stream 2	Stream 80	WL6	WL8	WL12	WL15	WL39	WL46	WL74	WL75	WL79	TOTAL
FLUCCS	510	510	619	619/ 630	630	643	618	618	630	630	630	
Roadway (Direct)	0.03	0.01	0.11	0.47	0.04	0.13	0.45	0.44	0.04	0.10	0.37	2.19
Pond Sites (Direct)	0.00	0.00	0.00	0.00	0.00	0.46 (J)	0.00	0.00	0.00	0.00	0.00	0.46
Roadway (*Secondary)	0.04	0.03	0.17	0.30	0.00	0.00	0.00	0.36	0.00	0.20	0.20	1.30
Total Acreage Impacted	0.07	0.04	0.28	0.77	0.04	0.59	0.45	0.80	0.04	0.30	0.57	3.95
Total UMAM FL Units	0.01	0.01	0.04	0.24	0.02	0.18	0.20	0.21	0.01	0.07	0.23	1.22

* Secondary impacts were calculated assuming a 50-foot secondary impact area beyond the limits of direct impact

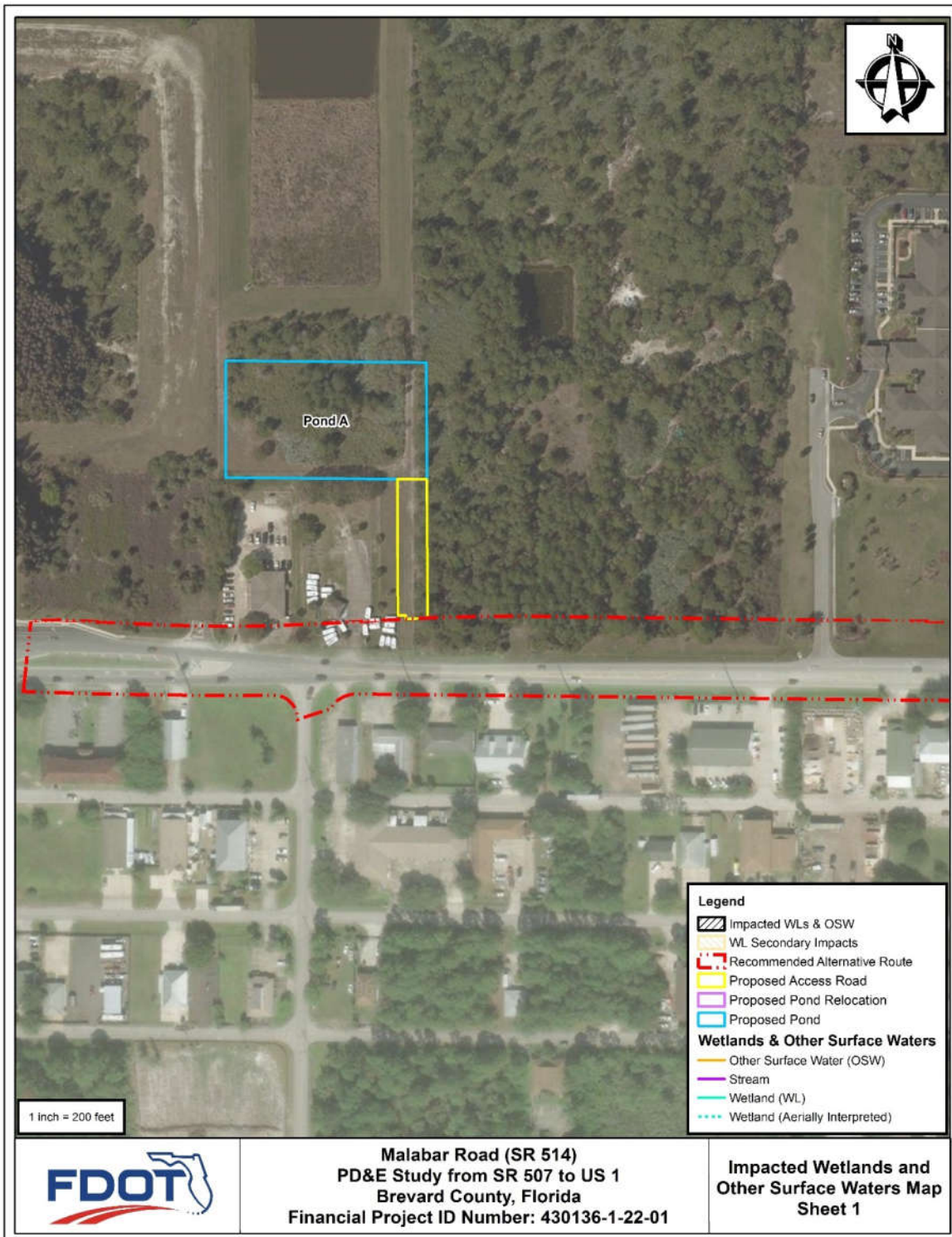
3.5.3 Secondary and Cumulative Wetland Impacts

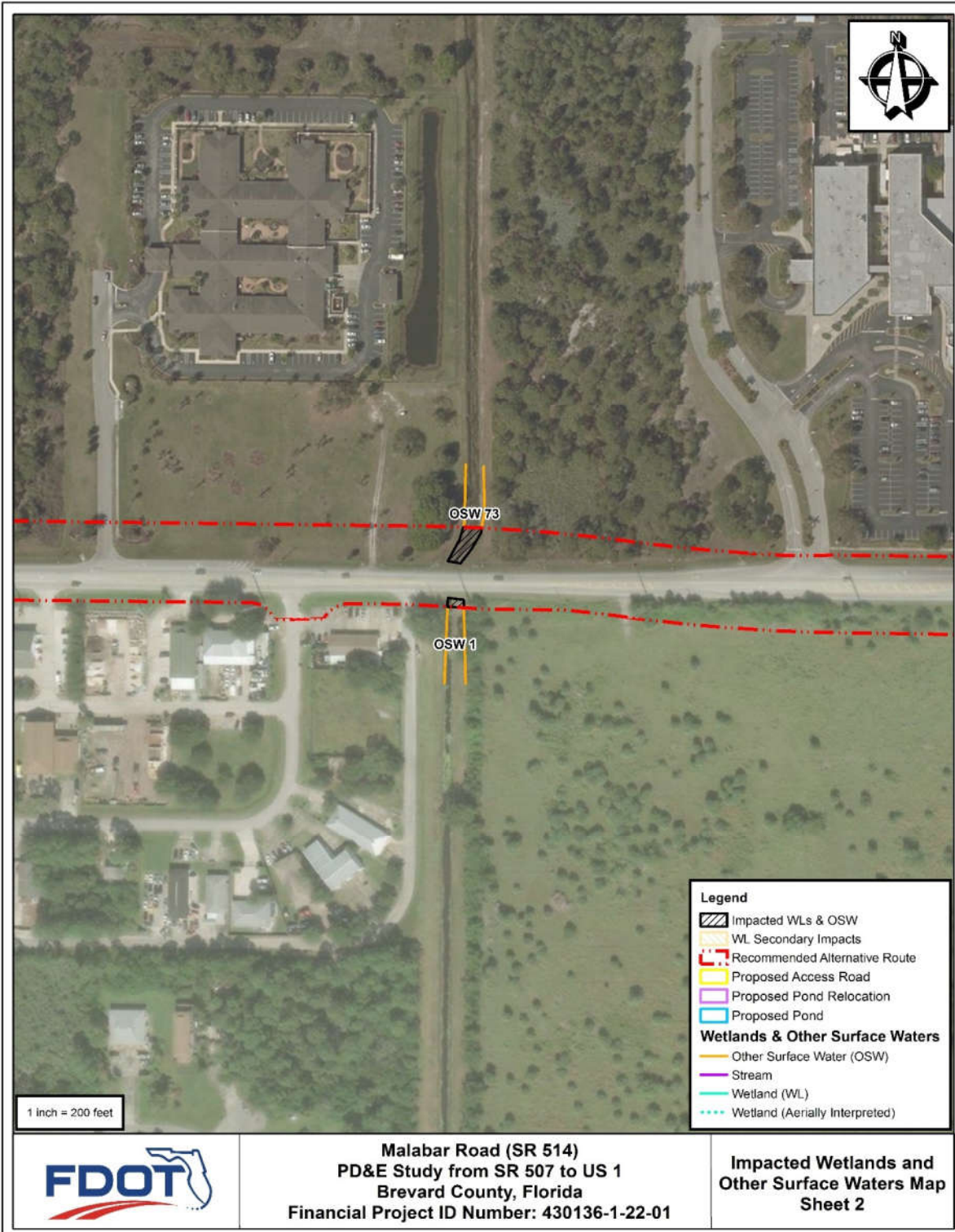
Adverse secondary and cumulative wetland impacts must be considered for those wetland features impacted as a result of the project. Adverse secondary impacts are negative indirect wetland effects that are reasonably expected to occur as a result of a project. Permitting agencies typically assess secondary impacts based on the remaining wetland acreage after construction, how the project will affect future vegetative growth, water quality and wildlife.

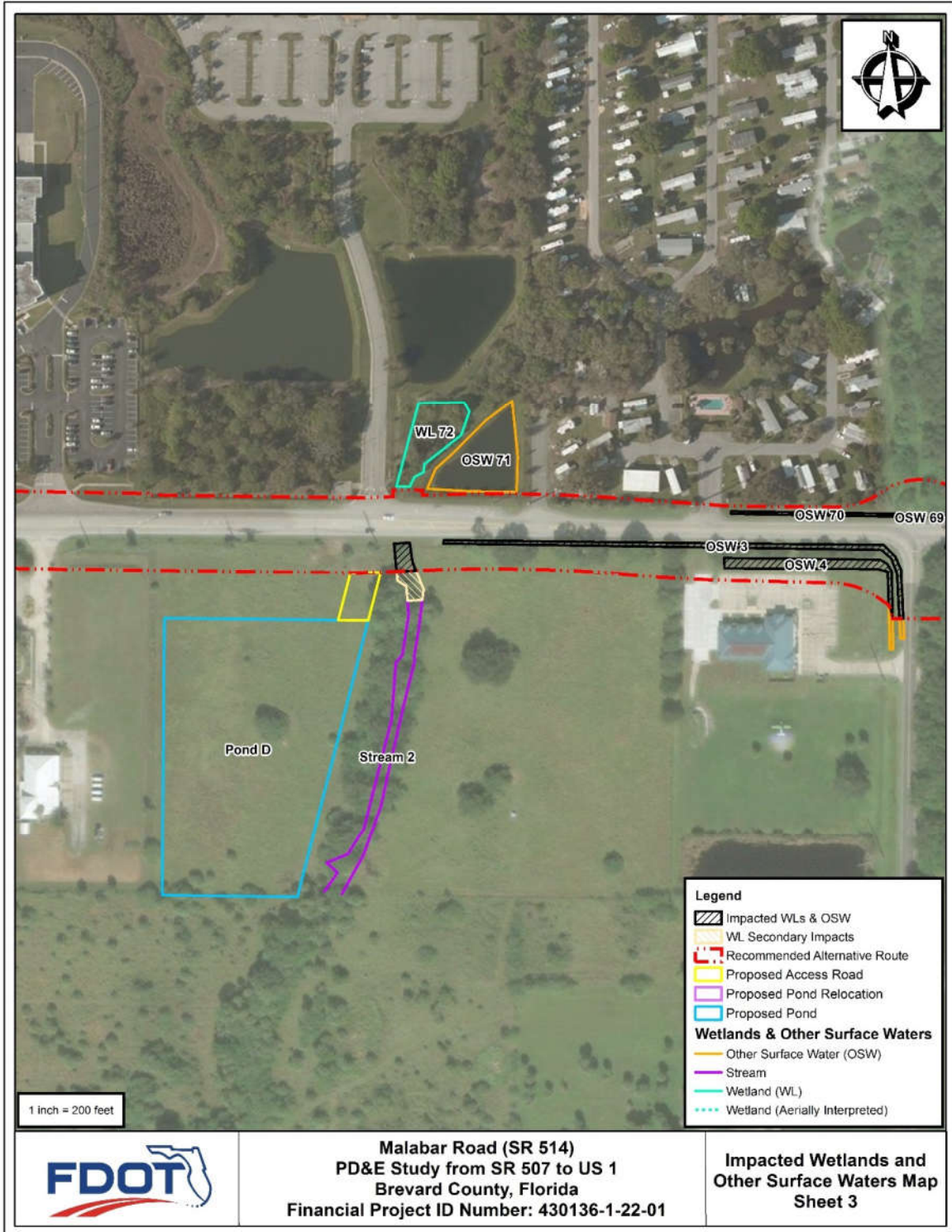
An applicant must provide reasonable assurance that a regulated activity will not cause unacceptable cumulative impacts upon wetlands and other surface waters within the same drainage basin as the regulated activity for which a permit is sought.

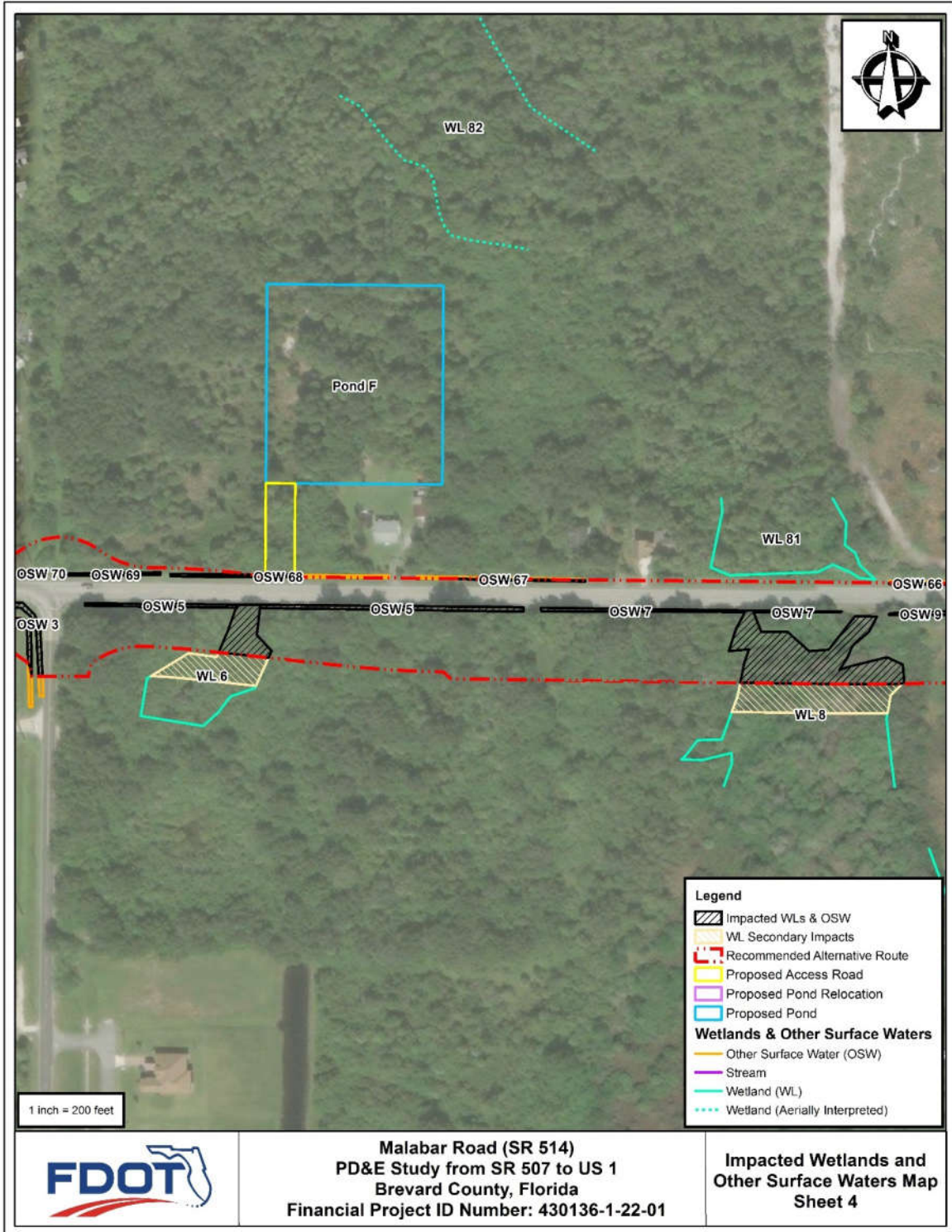
Using a 50-foot buffer, it is anticipated that the Recommended Alternative will incur approximately 1.30 acres of secondary wetland impacts. It is important to note that secondary impact buffer width is generally based upon the discretion of the State and Federal agency reviewer. Once the wetland delineations have been approved, the amount of mitigation acreage required to offset the secondary impacts will need to be negotiated with the permitting agencies during the permitting process.

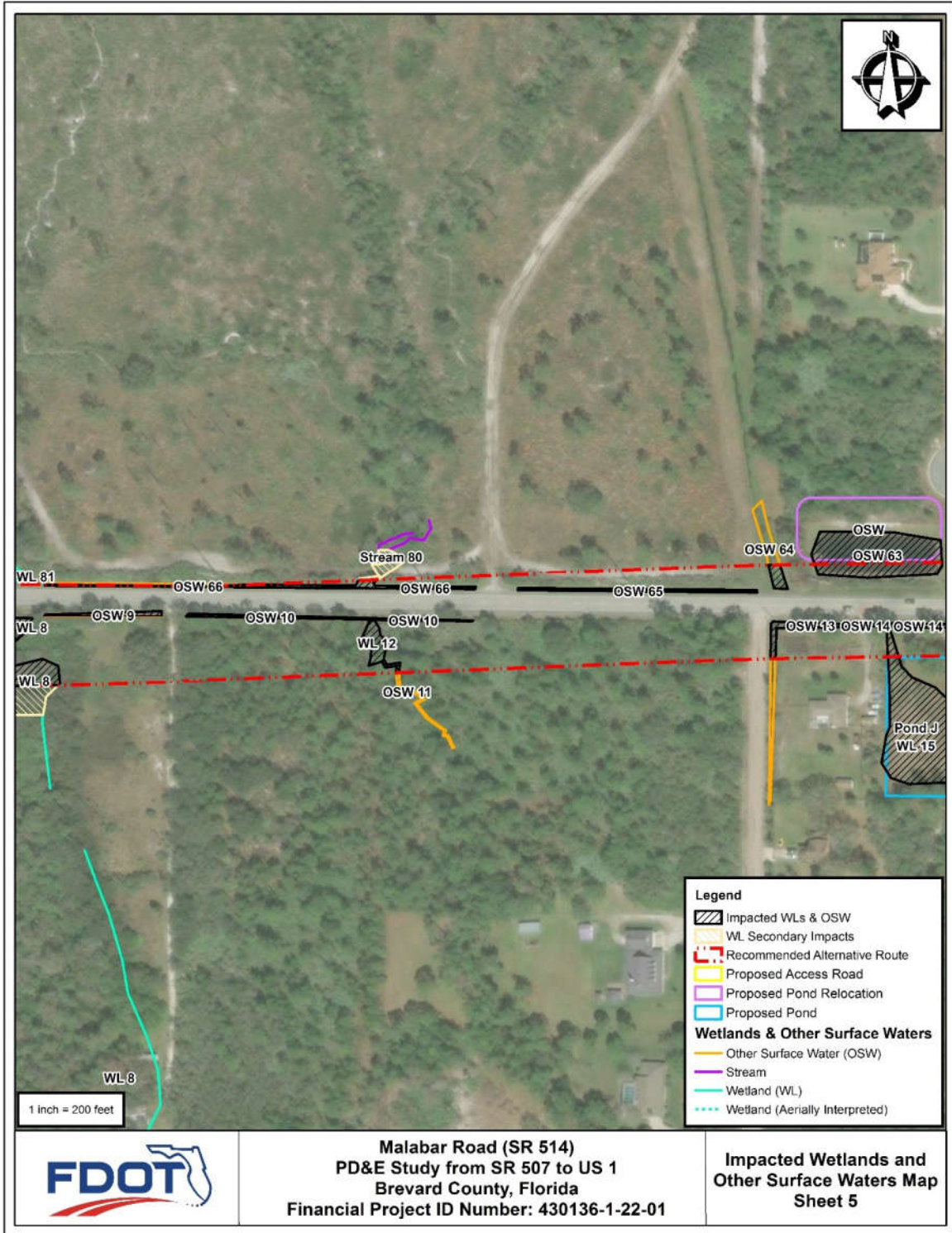
Figure 3-2: Recommended Alternative – Wetland and OSW Impacts

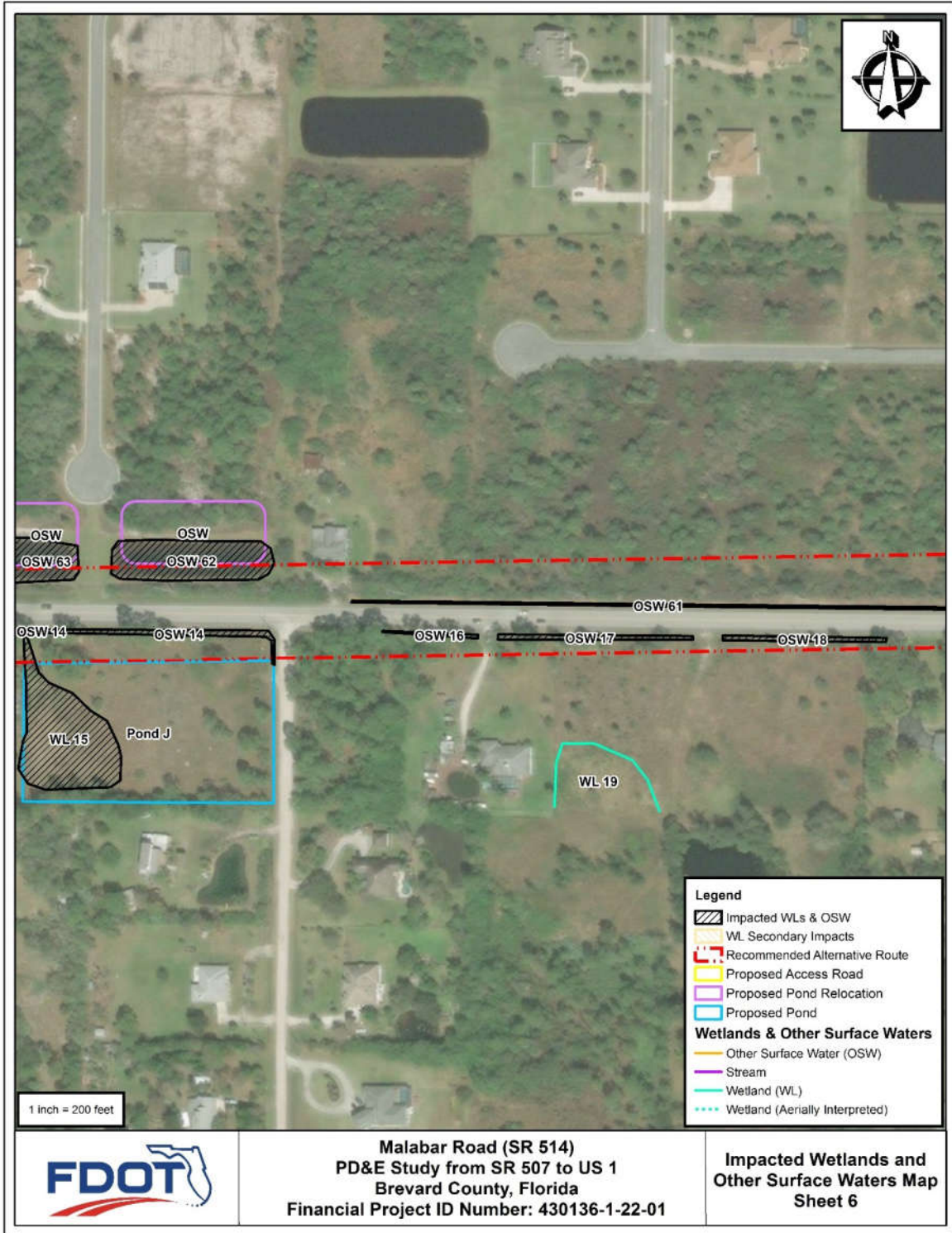


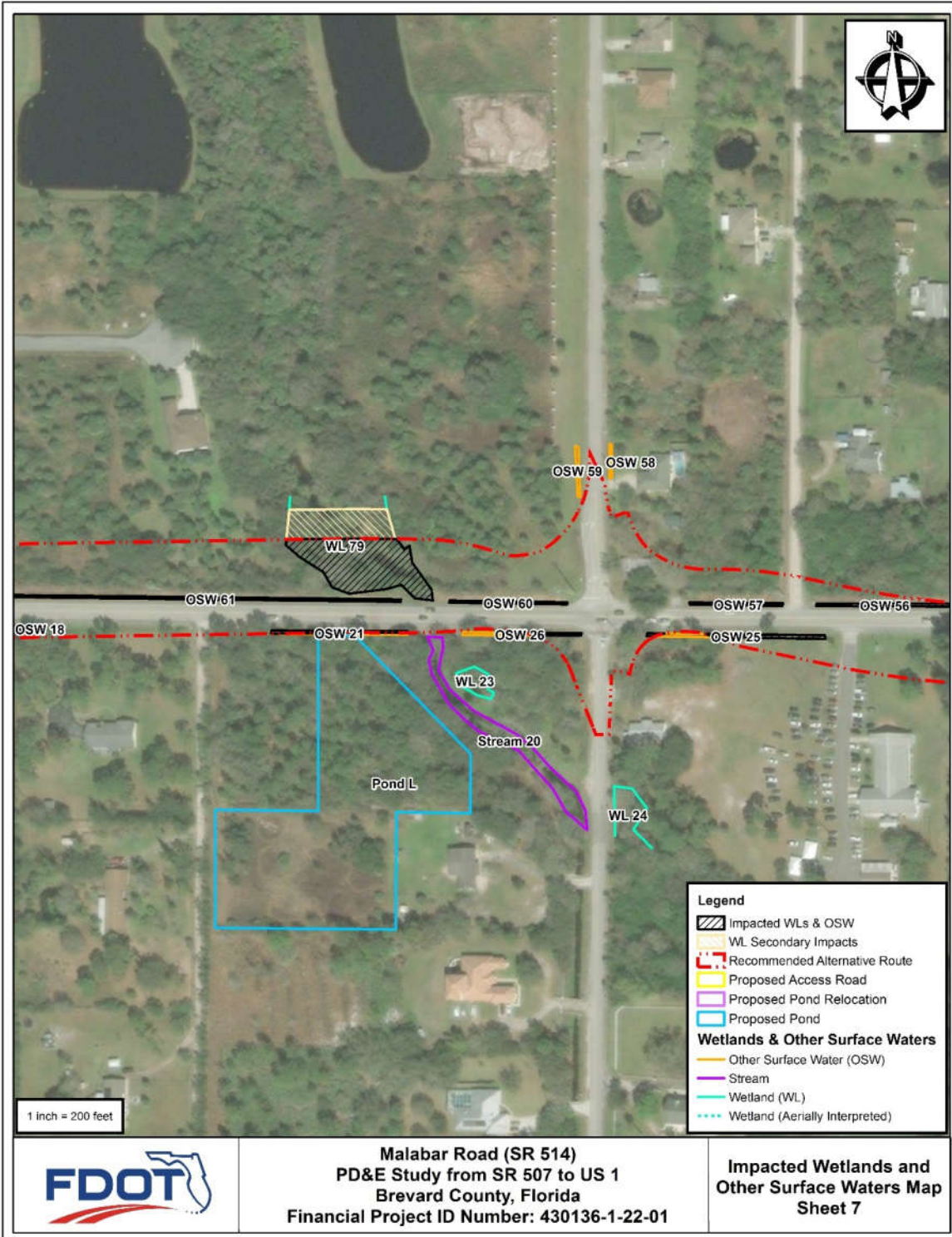


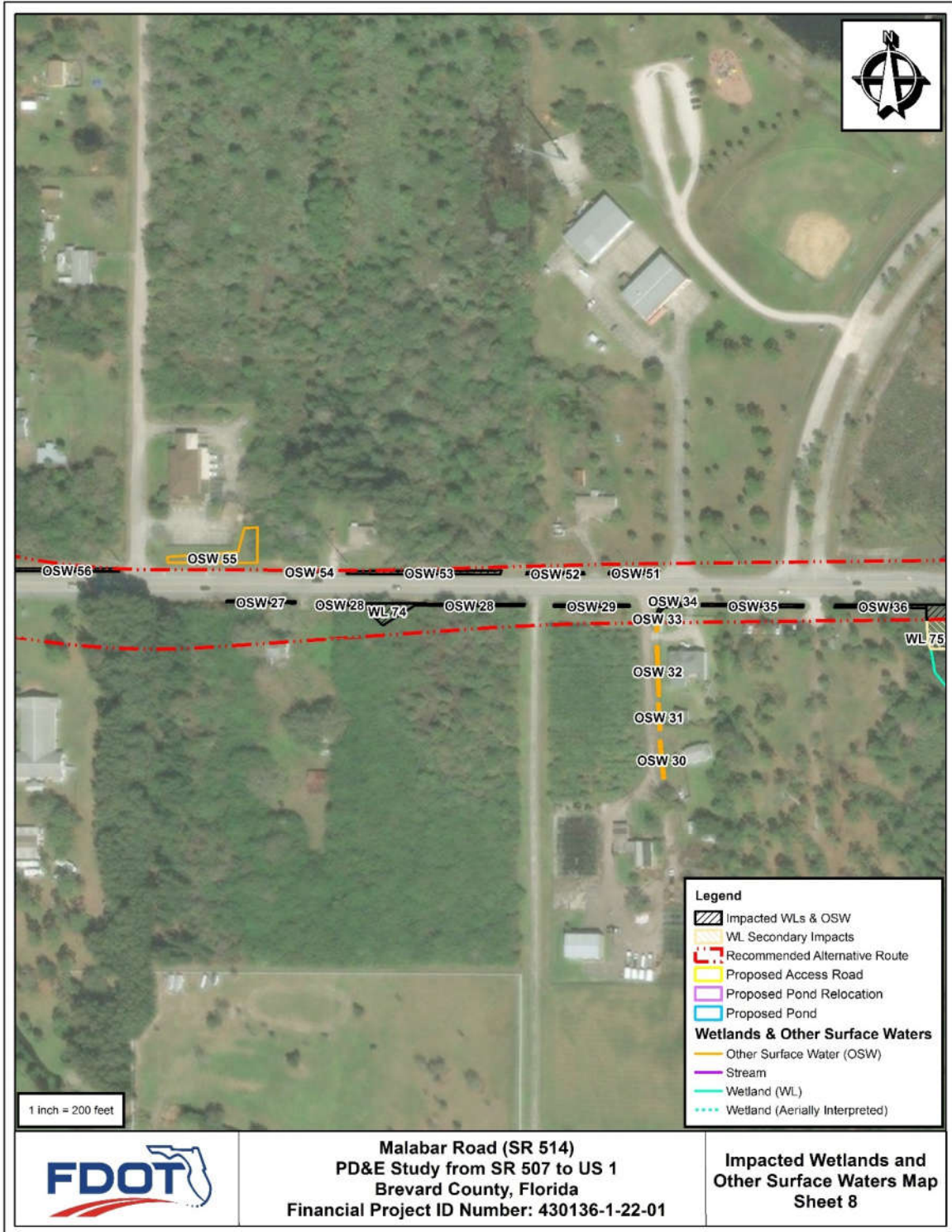


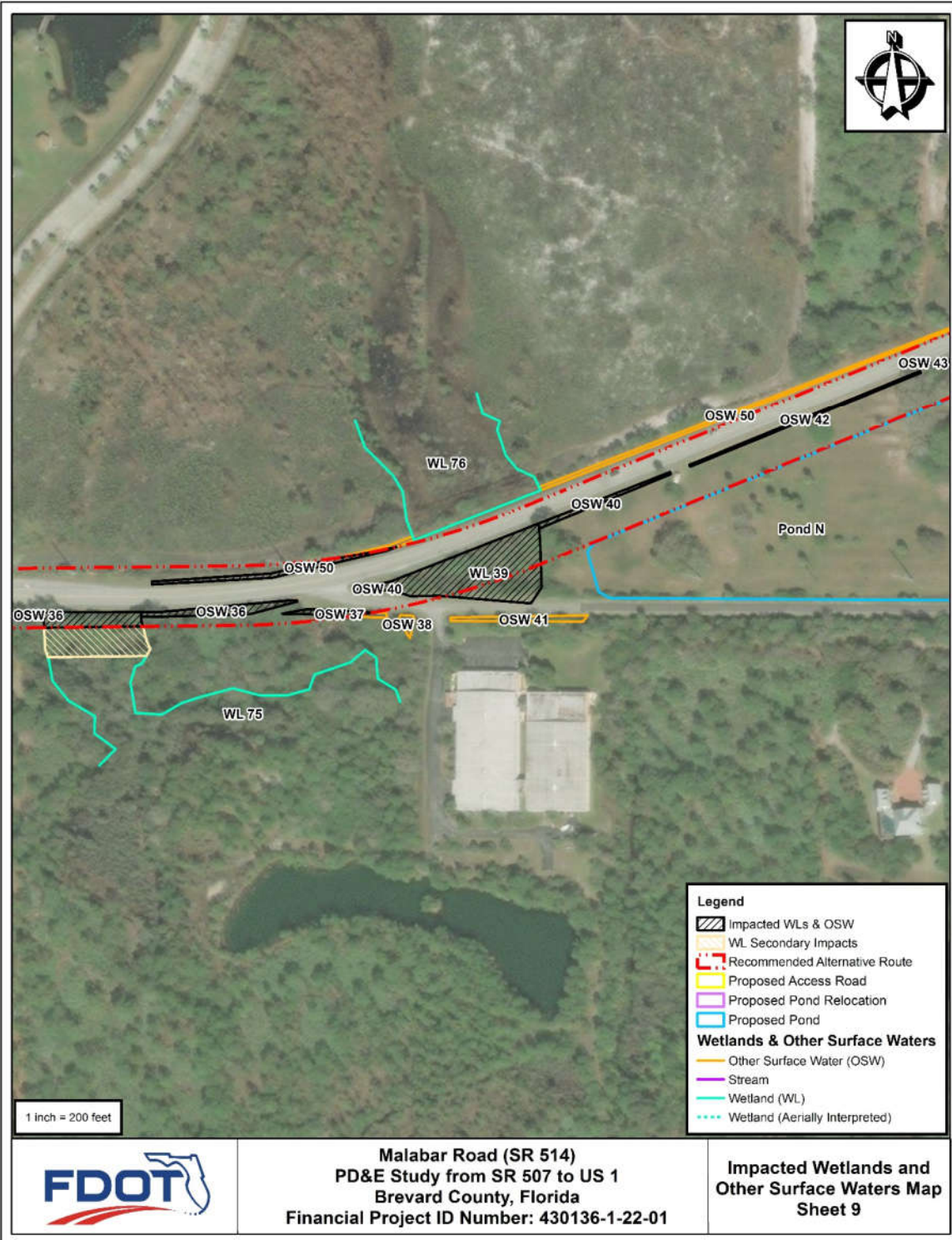


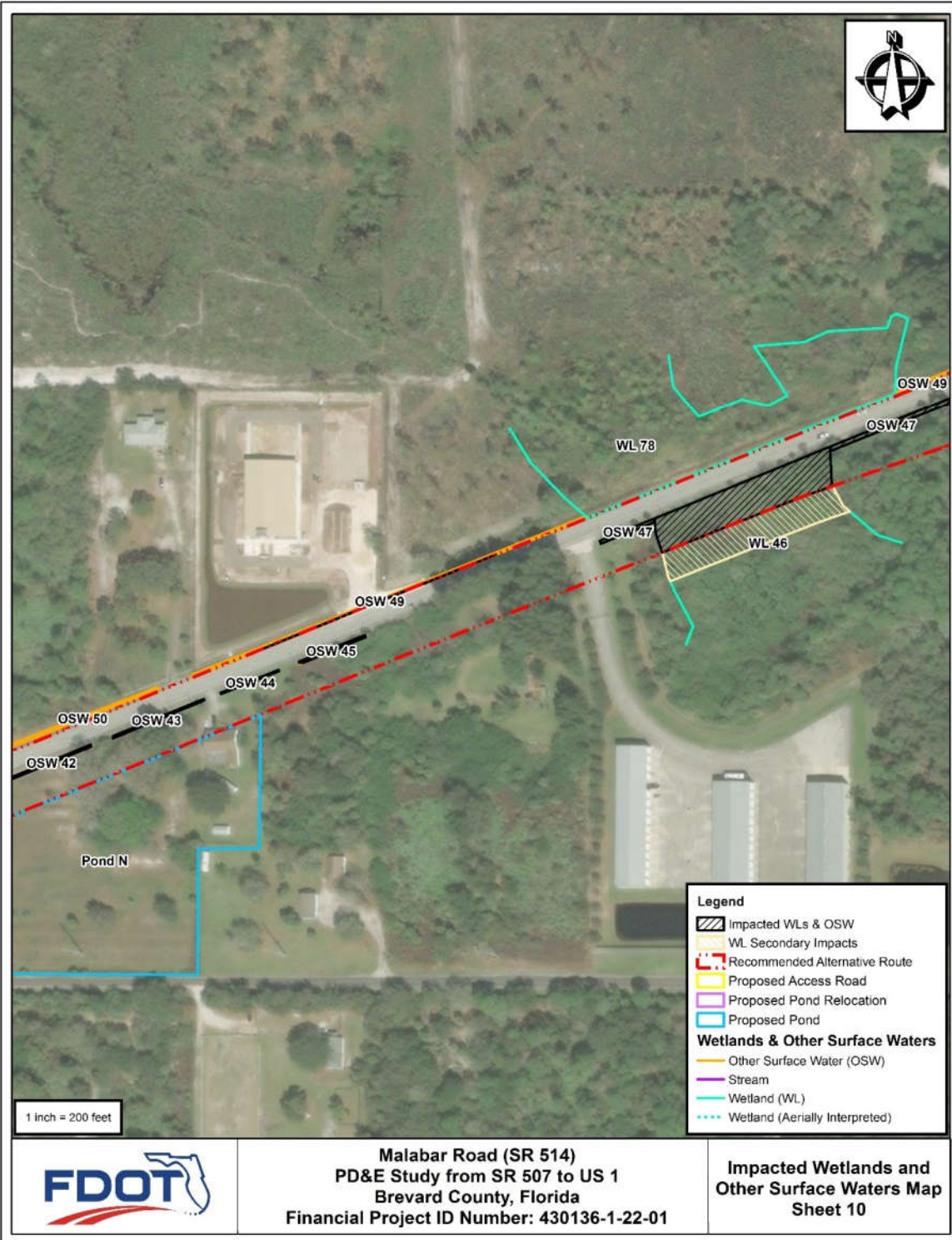


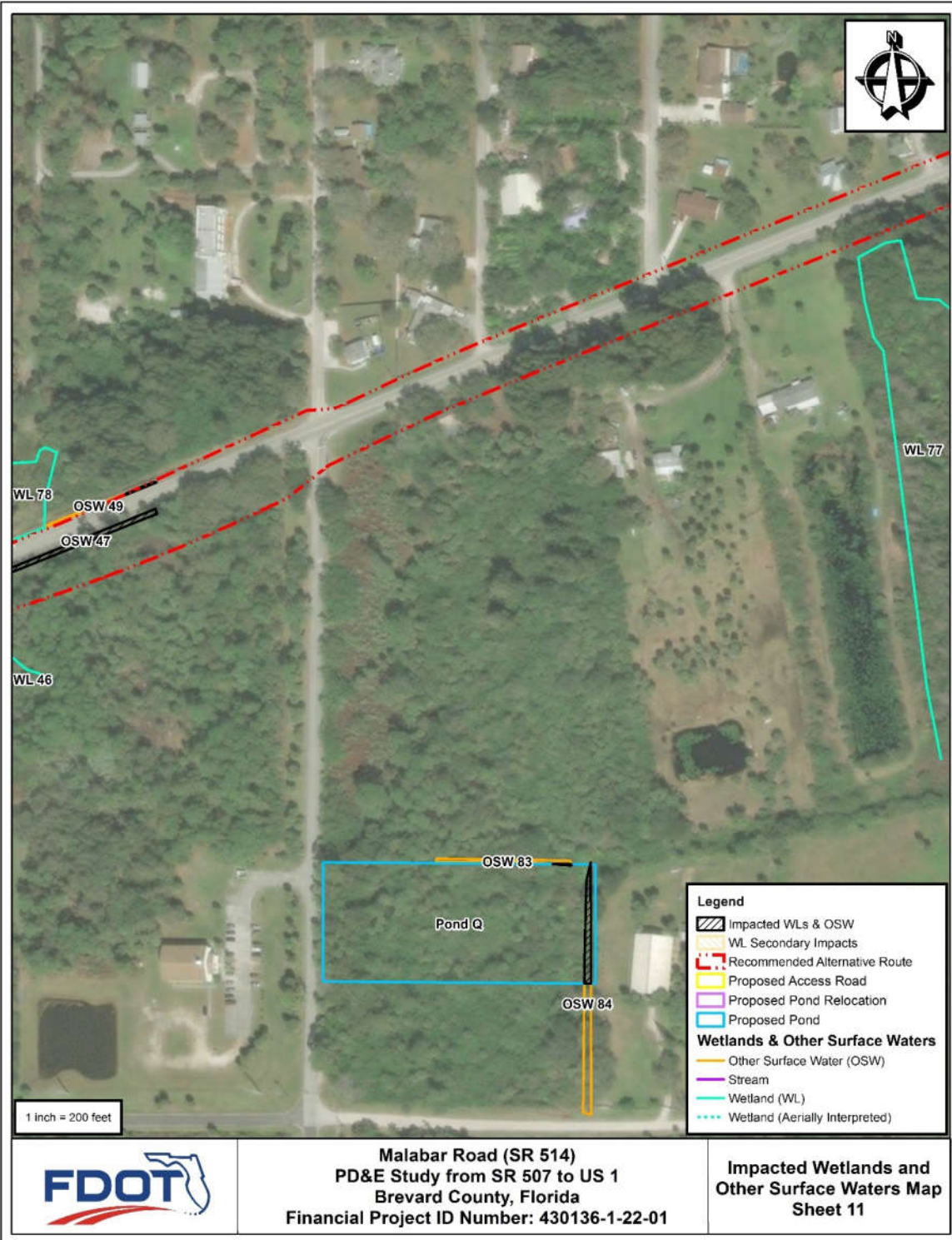
















The project study area is located in one SJRWMD mitigation basin, the Central Indian River Lagoon Mitigation Basin (**Section 2, Figure 2-6**). State regulations provide that if mitigation is offered within the same drainage basin as the direct impacts, the project will not have unacceptable cumulative impacts to wetlands and OSWs. Basin 22 Mitigation Bank is located within the same mitigation basin as the project impacts. If this bank is utilized as mitigation to offset unavoidable wetland impacts associated with the proposed project, no cumulative impacts should be assessed. However, though the state has issued the permit for the bank, credits available for purchase have not been released at this time. In addition, the Federal permit is currently pending on this mitigation bank. As such, if state or federal credits are not available at this bank during the permitting phase of the project and credits must be secured at another bank outside of the mitigation basin, cumulative impacts could be assessed and a cumulative impact analysis may be required. An additional mitigation alternative would be the participation in the SJRWMD “Senate Bill” Mitigation program which would offset impacts within the Central Indian River Lagoon Mitigation Basin (see **Section 3.7.2**) and satisfy SJRWMD cumulative impact criteria.

3.6 Avoidance and Minimization Analysis

In accordance with both state and federal permitting requirements, as well as measures identified in FDOT’s Standard Specifications for Road and Bridge Construction and Order 5660.1A, avoidance and minimization measures have been taken to provide the best fit alternative alignment to satisfy the project’s needs. Multiple alternative roadway alignments were reviewed based on engineering design and impacts to wetlands and OSWs existing within the project study area. Attempts have been made to avoid and reduce impacts to wetlands and OSWs given the existing environmental issues, public utilization, safety and costs. Additional avoidance and minimization measures will be evaluated during the final design and permitting phases of the project. Further avoidance and minimization efforts will be provided through the implementation of Best Management Practices that will help minimize the potential of additional impacts during construction.

3.6.1 Quality Enhancement Strategies (QES)

Pursuant to both Section 10 of the Rivers and Harbours Act of 1899 (33 U.S.C. § 403) and Section 404 of the Clean Water Act (33 U.S.C. § 1344), authority is given to the ACOE for specific construction projects approved by the FHWA, one of which includes FDOT and Florida Turnpike Enterprise Capacity Improvement projects. For Capacity Improvement Projects, a Regional General Permit (RGP) SAJ-92 is authorized for use in non-tidal waters of the United States within the operational areas of FDOT and the Florida Turnpike Enterprise if the proposed project satisfies the Special Conditions outlined within the permit, including appropriate Quality Enhancement Strategies (QES’s) to reduce wetland impacts associated with the project. The alternatives analysis conducted as part of this PD&E Study and described in the *Preliminary Engineering Report* (PER) provides the details regarding the criteria used to

evaluate the project alternatives. The Recommended Alternative was selected based on a variety of criteria such as the minimization of wetland impacts, the avoidance of publicly owned parcels that may contain sensitive environmental lands, and public input. Additional avoidance and minimization measures will be investigated during the permitting phase of the project to ensure that the project qualifies for RGP SAJ-92. Summarized below are the avoidance and minimization strategies associated with the selection of the Recommended Alternative:

- Reduction of roadway footprint to minimize wetland impacts
- All wetland impacts have been avoided or minimized where possible to alleviate the costs of mitigation
- Avoidance of publicly owned parcels and sensitive environmental lands
 - The proposed roadway footprint was designed to avoid all sensitive environmental lands. Within the project corridor five publicly owned parcels that may contain sensitive environmental lands exist: The Malabar Scrub Sanctuary, The Malabar Park, Fern Creek Crossing Park, The Malabar Disc Golf Course, and Al Tuttle/Sandhill linear trail. Impacts to these areas have been avoided and/or minimized, thus alleviating additional costs and public outcry
- The No-Build Alternative was also studied. Long-term benefits accrued from serving future traffic demands would not be realized with this alternative. Continued traffic growth on Malabar Road will result in traffic volumes in excess of capacity, thereby increasing congestion. Limitations associated with the No-Build Alternative are as follows:
 - No improvements to emergency vehicle response time
 - Not compatible with the area's long-range plans and project purpose and need
 - Reduced economic viability and mobility due to traffic congestion
 - Deterioration of air quality caused by traffic congestion and delay
 - Increase in crash potential because of increased congestion
 - Increase in traffic congestion and user cost associated with increased travel time
 - Increase in maintenance costs due to roadway and structure deterioration
 - Increase in evacuation time during weather emergencies as a result of heavy congestion

3.7 Conceptual Mitigation Plan

The No-Build alternative is not a practical alternative as it does not meet the purpose and need; thus, the necessity of the Recommended Alternative. Therefore, after avoidance and minimization measures are exhausted, mitigation will be necessary to compensate for the unavoidable wetland impacts associated with the Recommended Alternative. All wetland

impacts associated with the project will be mitigated pursuant to Section 373.4137, F.S. to satisfy all mitigation requirements of Part IV, Chapter 373, F.S. and 33 USC s. 1344. The purchase of mitigation credits for the project impacts is discussed below.

3.7.1 Mitigation Bank Alternatives

There are 3.95 acres of direct and secondary wetland impacts are anticipated with the Recommended Alternative. All of the wetland impacts are located within the Central Indian River Lagoon Basin (Basin 22). The total UMAM functional loss units associated the impacts is estimated to be 1.22. The proposed project is within the service area of three mitigation banks; Mary A. Mitigation Bank, CGW Mitigation Bank, and Basin 22 Mitigation Bank (FKA Corrigan Ranch Mitigation Bank). However, Mary A. Mitigation Bank is located in a different mitigation basin (Southern St. John's River Basin) than the proposed project impacts. As such, cumulative impacts could be assessed and a cumulative impact analysis may be required if this bank is utilized. In addition, credits purchased at CGW Mitigation Bank only offset tidal/salt marsh impacts, thus this bank would not be an option as the project impacts are all freshwater impacts. Listed below are the two mitigation banks that could be utilized to offset the unavoidable direct and secondary impacts incurred by the proposed project.

Basin 22 Mitigation Bank (FKA Corrigan Ranch Mitigation Bank)

Located in Indian River County, this 5,299-acre mitigation bank is located in the Central Indian River Lagoon Basin (Basin 22). The mitigation bank lies immediately east and adjacent to the Blue Cypress Conservation Area and is in close proximity to the Sand Lakes Conservation Area. It provides a major wildlife corridor along the east side of the Southern St. John's River Basin. The permit for this bank has been approved by the state using UMAM. The federal permit on the Basin 22 Mitigation Bank has also been issued and both state and federal credits are available.

If this bank has no federal credits available when needed, mitigation bank credits may be purchased outside of the mitigation basin where the project impacts are incurred and cumulative impacts may be assessed.

Mary A. Mitigation Bank

Located in Brevard County, Florida, this bank provides a service area that covers the Southern St. John's River Mitigation Basin (Basin 20) and part of the Central Indian River Lagoon Basin (Basin 22). This 2,100-acre bank is located in the heart of the Upper St. John's River Floodplain and is composed of approximately 90 percent wetland restoration and 10 percent upland restoration. This bank provides both state and federal wetland credits. The state wetland credits are ratio based, whereas the federal credits are based on the UMAM assessment process. As stated prior, if this bank is utilized cumulative impacts will be assessed and a cumulative impact analysis may be required.

3.7.2 Senate Bill Mitigation

In accordance with Florida Statute (F.S.) 373.4137, FDOT can participate in a program that allows for regional, long range mitigation rather than a project-by-project mitigation to satisfy both state and federal mitigation requirements. If participating in this program, FDOT will provide to the water management district a list of projects that are proposed to be impacted by the FDOT's plan of construction in the next 3 years. In addition to this list, an environmental impact inventory for each proposed project will also be provided.

Funds are identified quarterly in an escrow account within the State Transportation Trust Fund for environmental mitigation phase of projects budgeted for the current fiscal year. The corresponding water management district will implement a mitigation plan utilizing funds from the escrow account. This plan will be prepared in consultation with FDEP, ACOE, FDOT, other appropriate state, federal and local government entities, and other interested parties including mitigation bank operators. The mitigation plan shall provide a cost-effective way to address significant water resource needs of FDEP and the water management district. Public or private mitigation banks may be considered when preparing the mitigation plan when the purchase of credits would offset the impacts of the transportation project and is determined to be the most cost effective. The mitigation plan must be approved in part or in its entirety by FDEP before it can be implemented.

Wetland impacts associated with the proposed project are eligible for the Senate Bill Mitigation program. Participation in the Senate Bill Mitigation program is contingent on whether credits are available from a mitigation bank within the same basin as the impact area. If no in-basin mitigation bank option exists, FDOT may pursue mitigation through the Senate Bill Mitigation program to offset mitigation within Basin 22 and satisfy SJRWMD cumulative impact criteria. Utilization of this program to offset wetland impacts jurisdictional to the ACOE would require approvals from the ACOE through their "12 step" process or the purchase of separate federal credits outside of Basin 22 from a mitigation bank that has a service area that includes the impact area such as Mary A. Mitigation Bank.

Section 4.0 Listed Species

4.1 Preliminary Agency Coordination

Preliminary agency coordination included FDOT's ETDM process and coordination with USFWS, Florida Fish and Wildlife Conservation Commission (FWC), the Brevard County Natural Resources Management Office, and the Brevard County Environmentally Endangered Lands (EELs) Program. A summary of the preliminary coordination is included below. **Appendix C** includes all preliminary correspondence.

- FWC commented in part; "Primary wildlife issues associated on this project include direct impacts to upland and wetland plant communities resulting in the loss of habitat from expansion of the roadway. Of particular importance is the potential impact to the Brevard Coastal Scrub Ecosystem Florida Forever tract, and the Malabar Scrub Sanctuary. Loss or degradation of quality habitat could adversely affect 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. These impacts could materially be reduced by expanding the roadway to the south along the area of these properties." "Potential water quality degradation could occur as a result of additional stormwater runoff draining into adjacent wetlands from the additional impervious roadway surface when this highway is expanded to four lanes.

Furthermore, the additional lanes and vehicle speed on the expanded roadway lanes will increase the potential for roadkills for many species of wildlife including mammals, amphibians and reptiles including the gopher tortoise, Florida pine snake, eastern indigo snake and other species. The expanded roadway will also further contribute to habitat fragmentation and isolation. Additionally, the important xeric scrub and associated communities along CR-514 which are either in, or proposed for public ownership must be properly managed using prescribed fire. Smoke drift to the roadway can affect public safety therefore hindering the land manager's ability to properly use this management tool to maintain habitat quality. We recommend that FDOT work with Brevard County to install Amber Alert type signs for speed limit reductions and smoke warning messages during periods of necessary management activities." "The proposed roadway expansion may also facilitate increased residential and commercial development in the near regional area of these important and sensitive resource areas resulting in indirect effects including additional upland and wetland habitat loss, along with increases in stormwater runoff downstream which could affect the Indian River Lagoon.

Based on the project information provided, we believe that the direct and indirect effects of this project could be moderate. This is due to the occurrence of good quality wildlife habitat adjacent to the existing ROW; the sensitivity of the adjacent Florida

Forever project lands and the Brevard Scrub Sanctuary; and the potential presence of a moderate number of listed species.” The Degree of Effect is Moderate (3). **(ETDM)**

- USFWS identified wood storks, Florida scrub-jays, and eastern indigo snakes as potentially being affected by the proposed project. The Degree of Effect is Moderate (3). **(ETDM)**
- The Brevard County EELs program provided the most recent Florida scrub jay territory map for the Malabar Scrub Sanctuary. **(E-mail communication between Chris O’Hara (Brevard County EELs) and Ryan Fowler (Atkins) on November 9, 2017)**
- USFWS commented in part; “There is suitable habitat for Florida scrub-jays and these areas will need to be surveyed. Malabar Scrub Sanctuary is adjacent to the roadway on the north side. Brevard County may have current Florida scrub jay information for these public lands. Potential is high for this species.” “If any impacts are proposed to public conservation land, a Section 4(f) evaluation will be needed. Impacts to public lands should always be avoided. The ability to manage public lands with prescribed fire, should be addressed.” “Wood Stork colonies (616119 and 616003-Valkaria) are located within 5 miles of the project.

The determination of effect key developed between the ACOE and USFWS should be utilized and appropriate compensation for wetland impacts should be implemented. USFWS recommends avoiding wetland impacts. Potential for this species to forage in ditches, swales and natural wetlands is high.” “No known Audubon's caracara nest sites (Brevard County 2006 survey) were located within the project corridor. This species can be found west of I-95 in Brevard County. Potential is low.” “Stormwater runoff should be treated appropriately to remove contaminants before entering the Indian River Lagoon to protect seagrass beds, Florida manatees and sea turtles.” “Complete surveys for gopher tortoise burrows will be needed in order to implement the eastern indigo snake effect determination key developed between the USFWS and the ACOE.” “No known red-cockaded woodpecker clusters were found. Mature timber and public lands should be examined to confirm the absence of this species.” **(E-mail communication between Jane Monaghan (USFWS) and Craig Stout (Atkins) on April 1, 2014)**

- Brevard County Natural Resources Management Office commented in part; “So far no Caracara, but the area east of Weber and south of Malabar contains suitable habitat. We think there may be a Bald Eagle nest near the Malabar Fire station since we have adults regularly loafing there in breeding season and sufficient large pines. No one has really looked for any nests, though. I doubt USFWS and FFWCC maps, since we regularly find new nests that, according to locals, have been there for some time and no one reports to FWC or USFWS.” “Gopher tortoises are THICK on that sanctuary also. I have found that we (County) are probably the repository for unwanted tortoises.” **(E-mail communication between Susan Gosselin (Brevard County) and Craig Stout (Atkins); June 3, 2014)**

- The Malabar Scrub Sanctuary responded in regard to listed species in the sanctuary; “No red- cockaded woodpeckers (RCW) on site, Indigos have been documented but not for a few years”. **(E-mail communication between Chris O’Hara (EELs) and Craig Stout (Atkins); June 6, 2014)**
- The Malabar Scrub Sanctuary responded to an inquiry in regard to bald eagle nests; “I have not spotted a nest within Malabar Scrub, there is a nest south of Malabar Road closer to US 1. I do not think the nest is close enough to be a problem.” “It turns out it was reported as an eagle nest but was an osprey nest that has since fallen.” **(E-mail communication between Chris O’Hara (EELs) and Craig Stout (Atkins); June 11, 2014)**
- During the PD&E Study preliminary coordination occurred with USFWS regarding the federally-listed species having the potential to occur in the project area. The FDOT transmitted the NRE, which included project commitments, to the USFWS on April 18, 2017. USFWS consultation will occur through the ACOE permitting process during the design phase.

4.2 Desktop Analysis

The potential for the project to affect protected species and/or their habitat was determined by utilizing a variety of sources including GIS shapefiles, regulatory agency wildlife databases, professional knowledge regarding Florida’s protected wildlife, field observations, and coordination with the USFWS, FWC, NMFS, and Brevard County Natural Resources Management Office and the Brevard County EELs program. Additional literature and data utilized includes:

- USFWS’s Federally Listed Species in Brevard County, Florida (June 4, 2013) **(Appendix G)**
- USFWS’s Critical Habitat Mapper (accessed June 4, 2013)
- USFWS’s National Wetland Inventory shapefile
- USFWS’s Red-cockaded woodpecker colony locator shapefile
- Brevard County’s Online Natural Resources Interactive Map (accessed June 3, 2014)
- SJRWMD Land Use shapefile
- NRCS Soil Survey shapefile
- FWC’s Bald Eagle Nest shapefile
- FWC’s Water Bird Colony shapefile
- Florida Natural Areas Inventory (FNAI) Biodiversity Matrix (FNAI, 2014) **(Appendix F)**
- FNAI County occurrence records
- Aerial photography

4.3 Field Review

Field reviews with the project study area were conducted by Atkins scientists in November 2013, June 2014, and March 2015 to map occupied or potentially occupied protected species

habitat. The project study area is shown in Figures 2-1 and 3-1. Results of the field reviews are presented in **Sections 4.4** and **4.5**.

4.4 Federally Listed Species

After performing the desktop analysis described in **Section 4.2**, assembling the preliminary information, coordinating with the USFWS and Brevard County Natural Resources Management Office, and conducting field assessments and omitting species such as habitat-specific plants that would have an extremely low probability of occurrence within the project area; potential involvement with the species listed in **Table 4-1** was assessed. Low likelihood of occurrence means that no habitat for the species was identified in the project area, moderate likelihood for occurrence means that habitat existed within or adjacent to the project area however it did not appear to be optimal, high likelihood of occurrence means that suitable habitat existed for the species however no individuals were observed, confirmed means that the species was observed in or around the project area.

Table 4-1: Federally Listed Species

Common Name	Scientific Name	Occurrence	Protected Status
Florida scrub jay	<i>Aphelocoma coerulescens</i>	High	FT
Bald eagle	<i>Haliaeetus leucocephalus</i>	Low	BGEPA
Wood stork	<i>Mycteria americana</i>	High	FT
Audubon’s crested caracara	<i>Caracara cheriway</i>	Moderate	FT
Red-cockaded Woodpecker	<i>Picoides borealis</i>	Low	FE
Eastern indigo snake	<i>Drymarchon corais couperi</i>	Moderate	FT
Gopher tortoise	<i>Gopherus polyphemus</i>	Confirmed	FCS/ST

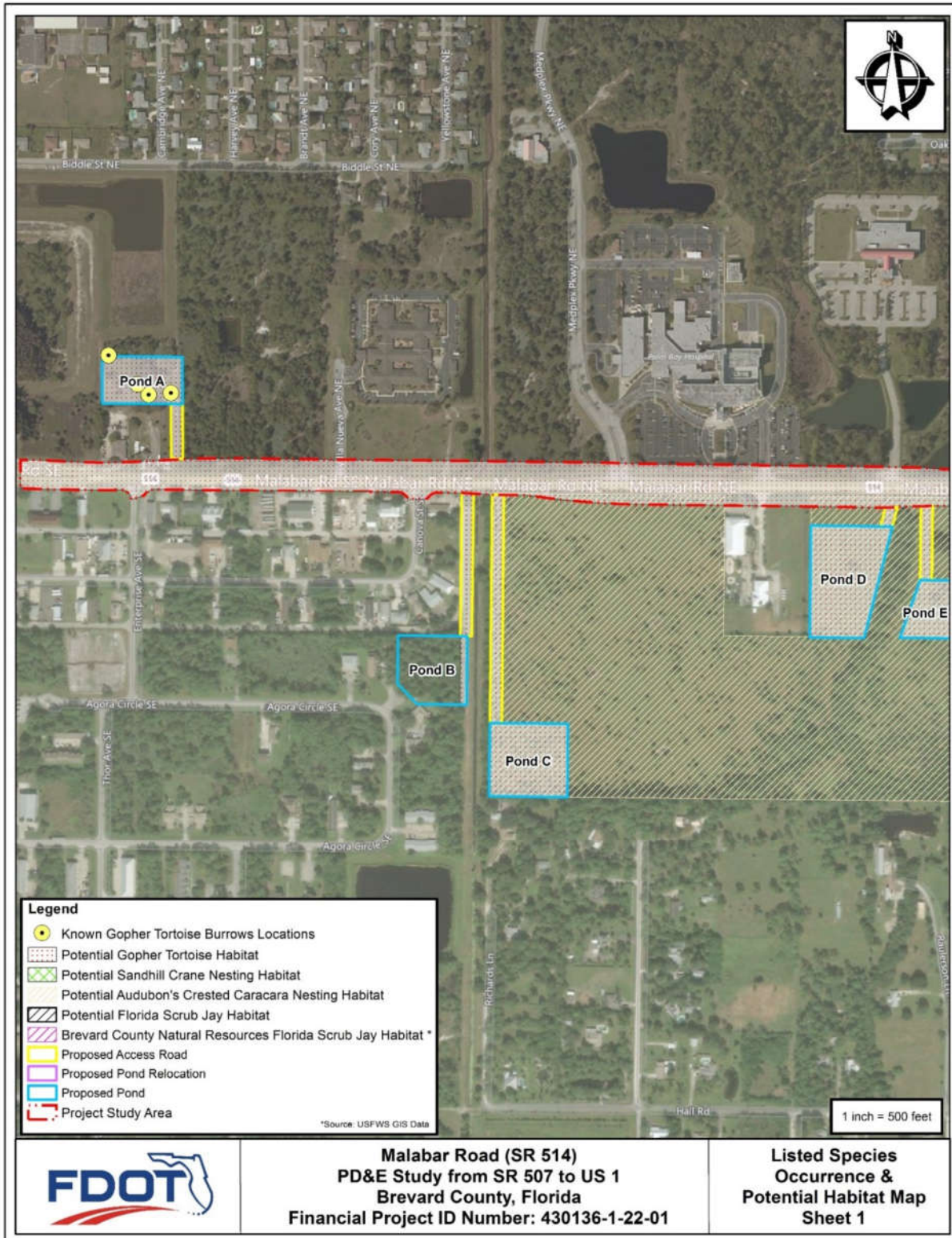
Table Abbreviation Key

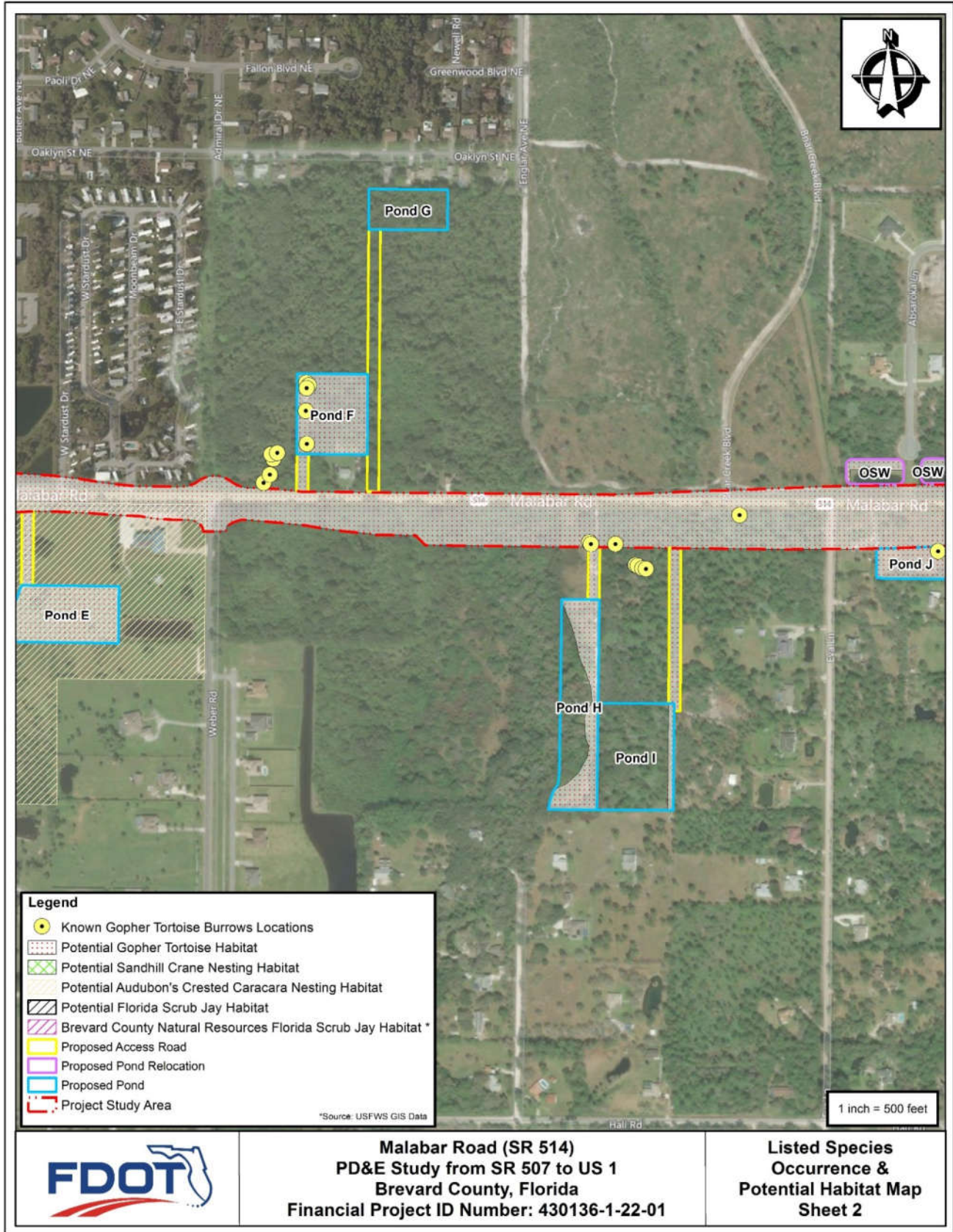
BGEPA = Bald and Golden Eagle Protection Act FT = Federally-designated Threatened
 FCS = Federally-designated Candidate Species ST = State-designated Threatened
 FE = Federally-designated Endangered

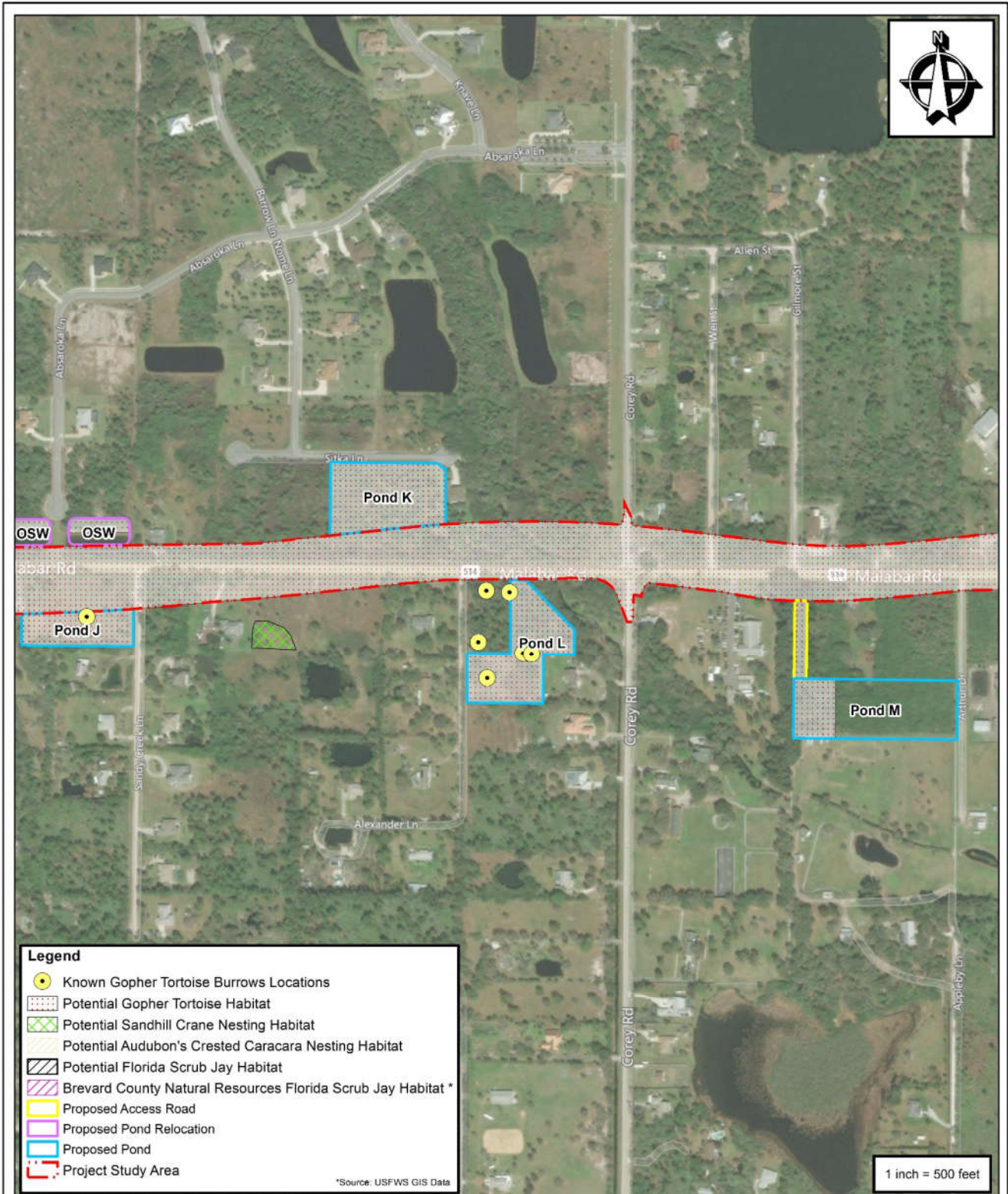
Descriptions of these species including their preferred habitat, potential to occur within the project area and the effect the project may have on each species is included in the following sections. **Figure 4-1** shows the locations where listed species have been documented as well as areas of potential listed species habitat.

The project occurs within the USFWS-designated consultation area for the piping plover, Everglades snail kite, RCW, and the Florida scrub jay. However, habitat for the piping plover and Everglades snail kite does not occur within the project study area. The Indian River at the east end of the project is designated Critical Habitat for West Indian manatees, sea turtles (green, hawksbill, leatherback, Kemp’s ridley, and loggerhead) and seagrasses (turtle, manatee, shoal, Johnson’s, paddle, star, and widgeon). However, there will be no involvement with Critical Habitat for any of the above listed species or any other federally listed species.

Figure 4-1: Listed Species Occurrence and Potential Habitat Map

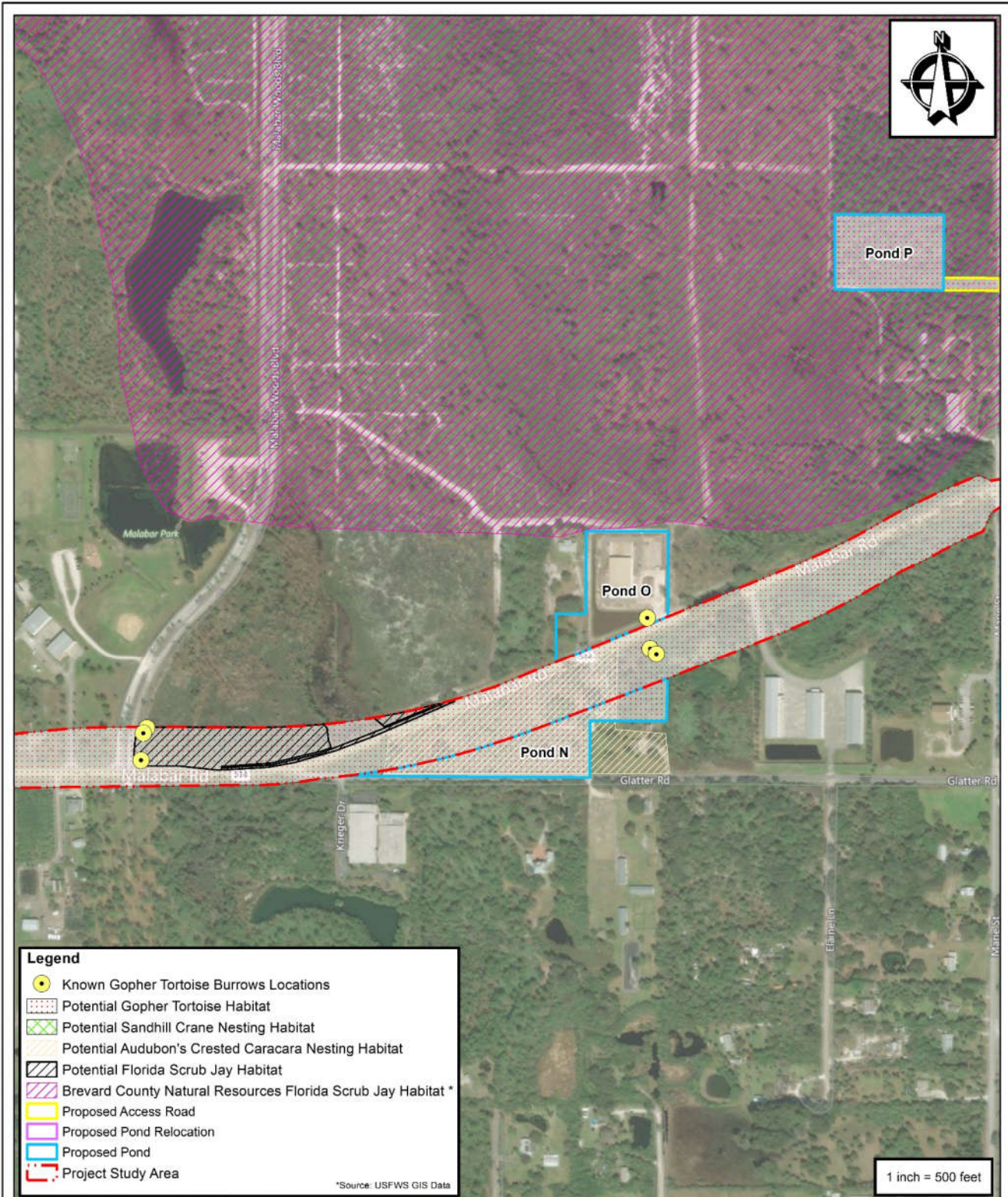






**Malabar Road (SR 514)
 PD&E Study from SR 507 to US 1
 Brevard County, Florida
 Financial Project ID Number: 430136-1-22-01**

**Listed Species
 Occurrence &
 Potential Habitat Map
 Sheet 3**



Legend

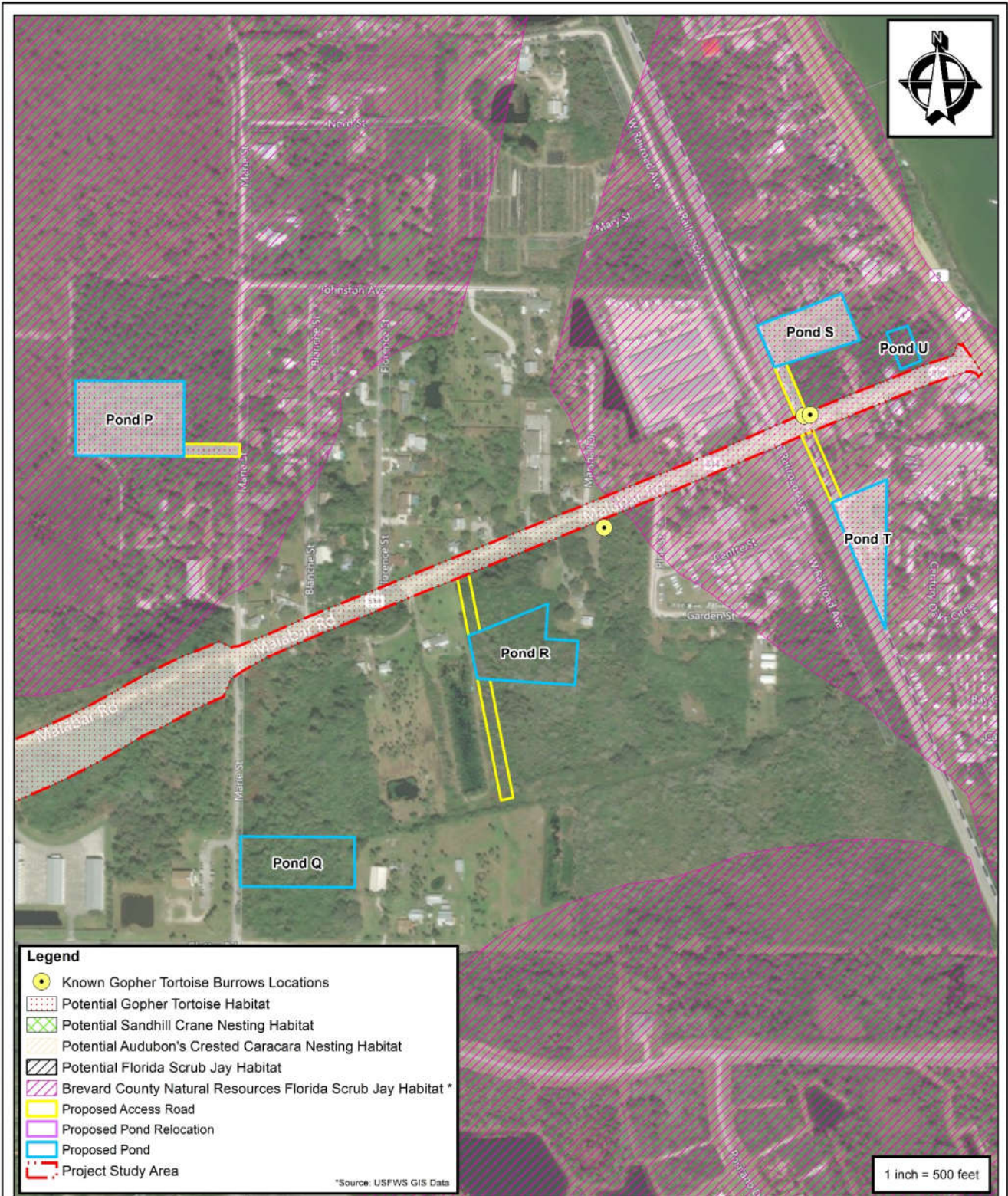
- Known Gopher Tortoise Burrows Locations
- Potential Gopher Tortoise Habitat
- Potential Sandhill Crane Nesting Habitat
- Potential Audubon's Crested Caracara Nesting Habitat
- Potential Florida Scrub Jay Habitat
- Brevard County Natural Resources Florida Scrub Jay Habitat *
- Proposed Access Road
- Proposed Pond Relocation
- Proposed Pond
- Project Study Area

*Source: USFWS GIS Data



Malabar Road (SR 514)
PD&E Study from SR 507 to US 1
Brevard County, Florida
Financial Project ID Number: 430136-1-22-01

Listed Species
Occurrence &
Potential Habitat Map
Sheet 4



**Malabar Road (SR 514)
PD&E Study from SR 507 to US 1
Brevard County, Florida
Financial Project ID Number: 430136-1-22-01**

**Listed Species
Occurrence &
Potential Habitat Map
Sheet 5**

4.4.1 Florida Scrub Jay

Florida scrub jays are endemic to peninsular Florida and live only in scrub or scrubby flatwoods habitat types in Florida. During the field reviews in November 2013 and March 2015, Atkins biologists noted potential Florida scrub jay habitat located within the Malabar Scrub Sanctuary. No individuals were identified during the field reviews for this project. A formal Florida scrub jay survey was conducted from March 30 – April 6, 2015 within the Malabar Scrub Sanctuary property adjacent to the proposed project and no jays were observed within or adjacent to the project corridor.

Figure 4-1 (Sheets 4 and 5) includes potential Florida scrub jay habitat within the project study area according to the Brevard County Natural Resources online interactive mapping tool. However, field reconnaissance determined that some of the mapped potential habitat within the project area is not conducive for the presence of the Florida scrub jay. During field reviews, additional areas of potential Florida scrub jay habitat were noted. These areas are identified in Figure 4-1.

The 395-acre Malabar Scrub Sanctuary (Sanctuary) borders the proposed project to the north at two different locations. The Sanctuary was deeded to and is managed by the Brevard County EELs Program. Scrub jays are present within the Sanctuary and the most recent territory map created November 2017 (**Appendix G**) indicates that the proposed project will not affect any active Florida scrub jay territories. However, scrub jay territories could expand into the proposed project area since suitable habitat is still present. Florida scrub jay surveys will be conducted during the design and permitting phase of the project to determine whether scrub jays will be impacted.

FDOT commits to conducting species-specific surveys for the Florida scrub jay during the design of the project and reinitiating consultation with the USFWS prior to advancing the project to construction to comply with 23 CFR 771.133. Therefore, FDOT has determined that the project *may affect, but is not likely to adversely affect* the Florida scrub jay. USFWS has provided written guidance regarding the assessment of minimization and mitigation needs for the scrub jay (USFWS, 1999). A memorandum from the State Supervisor amended March 16, 2009 (**Appendix G**) provides the guidance for USFWS Field Supervisors. If mitigation is required, a contribution to the Scrub Jay Mitigation Fund would be proposed as mitigation for the proposed project.

4.4.2 Bald Eagle

Even though bald eagles were delisted under the ESA, they are still protected at the federal level under the Bald and Golden Eagle Protection Act (BGEPA) as well as the Migratory Bird Treaty Act (MBTA) and at the state level under Chapter 68A-16.002 F.A.C. The USFWS is the regulatory agency responsible for overseeing the protection of listed species and enforcing

the law as it relates to BGEPA and MBTA and the FWC is responsible for ensuring compliance with Chapter 68A-16.002 F.A.C.

If a bald eagle nest may be affected by a proposed project, permits from both the USFWS and the FWC may be necessary to protect the Applicant against law enforcement action related to “take” of nesting bald eagles.

The FWC and the USFWS have developed Management Plans (**Appendix G**) that detail the types of activities that they believe could result in a “take”. The Management Plans also describe conservation measures that if implemented would obviate the need to acquire a permit. The FWC Bald Eagle Management Plan is more restrictive than the USFWS, therefore if the FWC issues an Eagle Permit then the USFWS will typically issue a permit fairly quickly and without requiring additional mitigation or protection

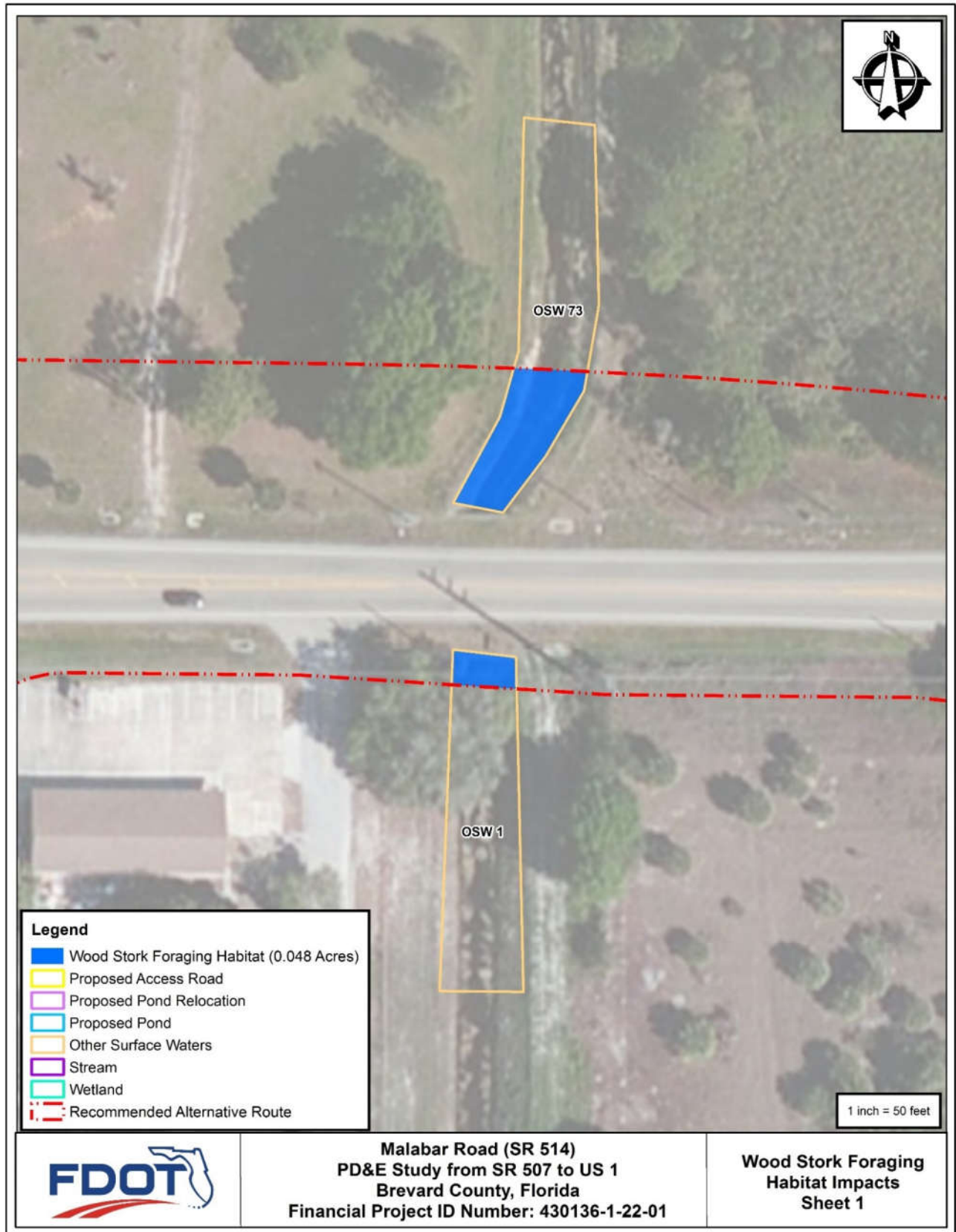
The FWC Bald Eagle Nest Locator online map [<https://public.myfwc.com/FWRI/EagleNests/nestlocator.aspx#search> (last updated with 2015-2016 survey data)] indicates that the closest active nests as of 2016 (BE020 and BE027) are over 2.5 miles away from the project study area. During field reconnaissance, no bald eagle nests were observed within or directly adjacent to the proposed project corridor or the potential pond sites. However, during early coordination, Susan Gosselin with the Brevard County Natural Resource Management Office stated that two adults have been roosting during breeding season in the vicinity of the Malabar Fire Station and was concerned that there may be a nest in that area. Because of this concern, a preliminary nest search was conducted in June 2014. No nests were observed in the proximity to the area in question or within 660-feet of the project study area. This site was re-evaluated during the March-April 2015 Florida scrub jay survey just east of the fire station and no eagles or eagle nests were observed during that time. As proposed, the project would not result in “take” of bald eagles.

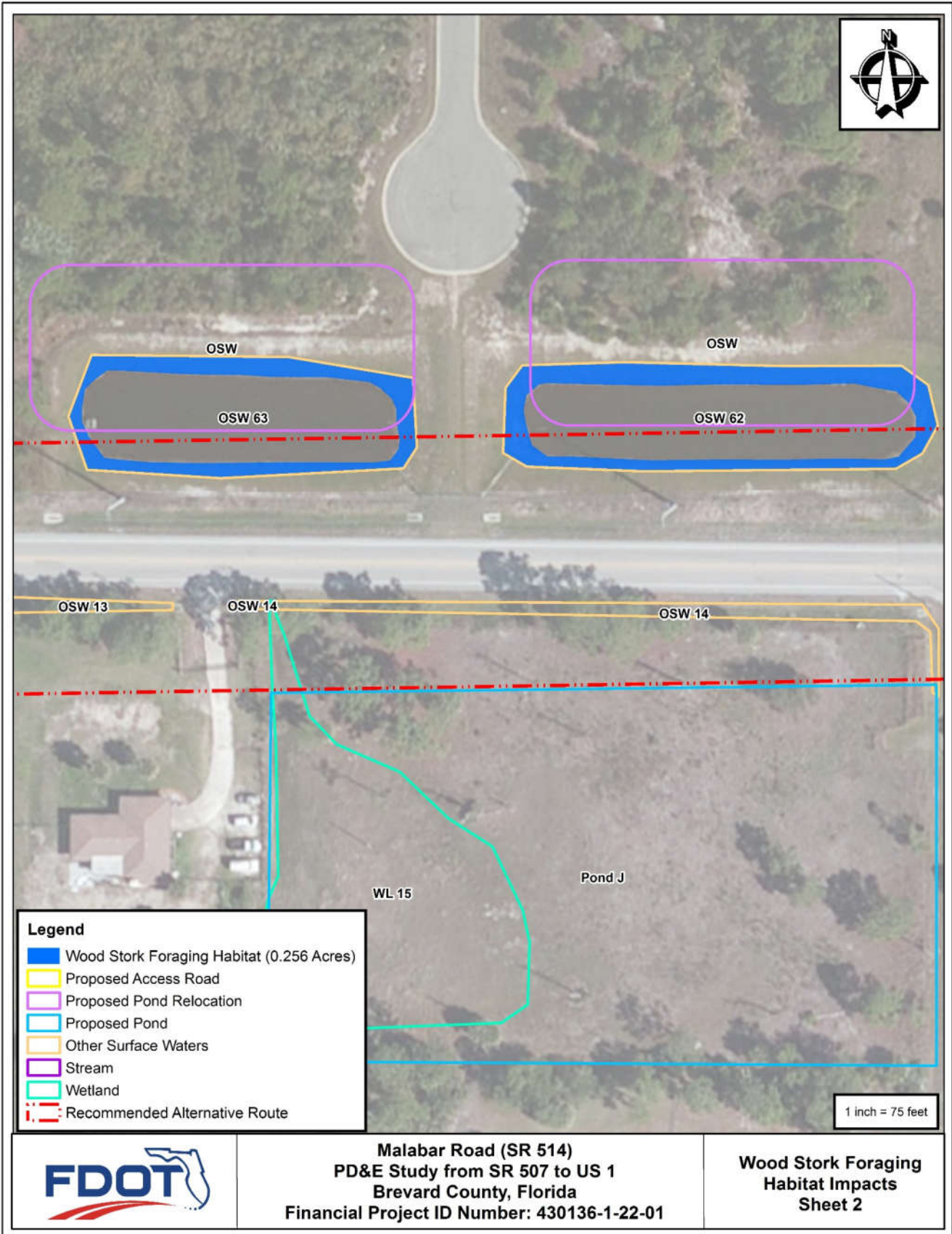
4.4.3 Wood Stork

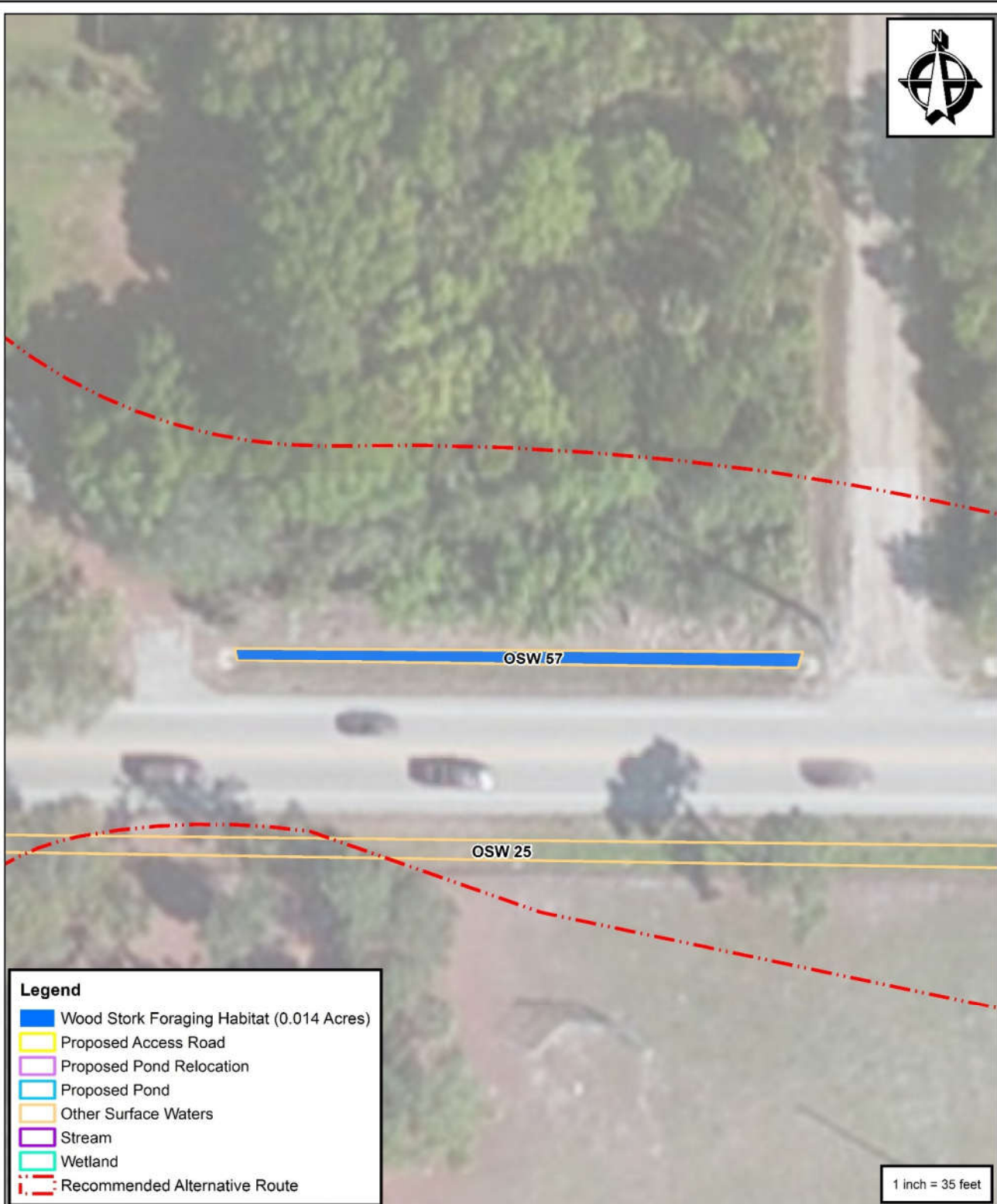
The project is located within the Core Foraging Area (CFA) of two wood stork nesting colonies (616119 and 616003-Valkaria). Based on the field assessments conducted, suitable wood stork foraging habitat was found within the limits of the project study area. Suitable foraging habitat is defined by the USFWS in the *Wood Stork Key for Central and North Peninsular Florida*, dated September 2008 (**Appendix G**), 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.”

Seven of the OSW features meet the criteria for suitable wood stork foraging habitat (**Figure 4-2**). OSW 1 and OSW 73 (C-78 Canal) are located on the west end of the proposed project, on the south and north side of Malabar Road, respectively. OSW 62 and OSW 63 are small stormwater management ponds supporting foraging habitat along the edges. The edges of

Figure 4-2: Wood Stork Foraging Habitat Impacts







Legend

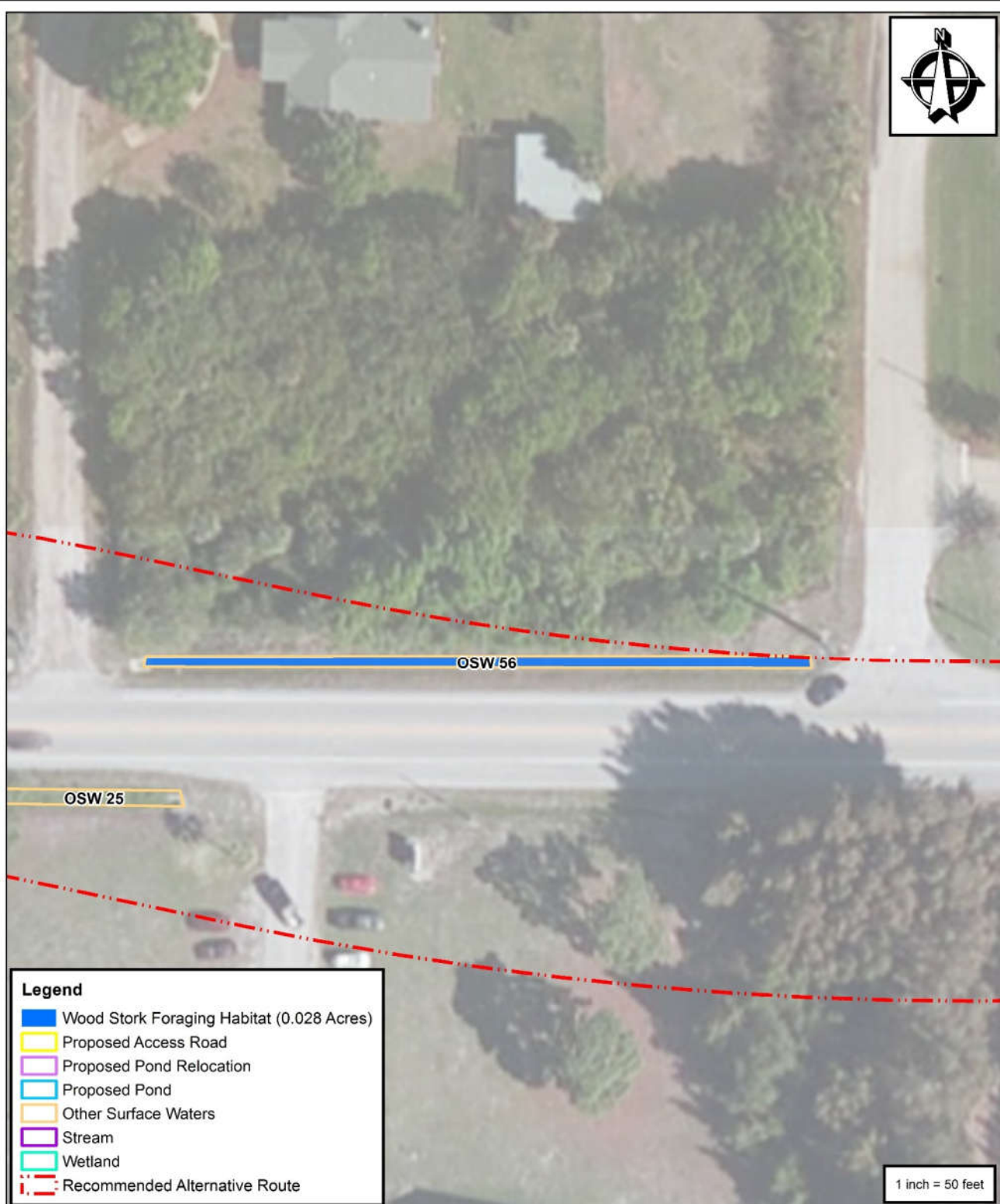
- Wood Stork Foraging Habitat (0.014 Acres)
- Proposed Access Road
- Proposed Pond Relocation
- Proposed Pond
- Other Surface Waters
- Stream
- Wetland
- Recommended Alternative Route

1 inch = 35 feet



Malabar Road (SR 514)
PD&E Study from SR 507 to US 1
Brevard County, Florida
Financial Project ID Number: 430136-1-22-01

Wood Stork Foraging
Habitat Impacts
Sheet 3



Legend

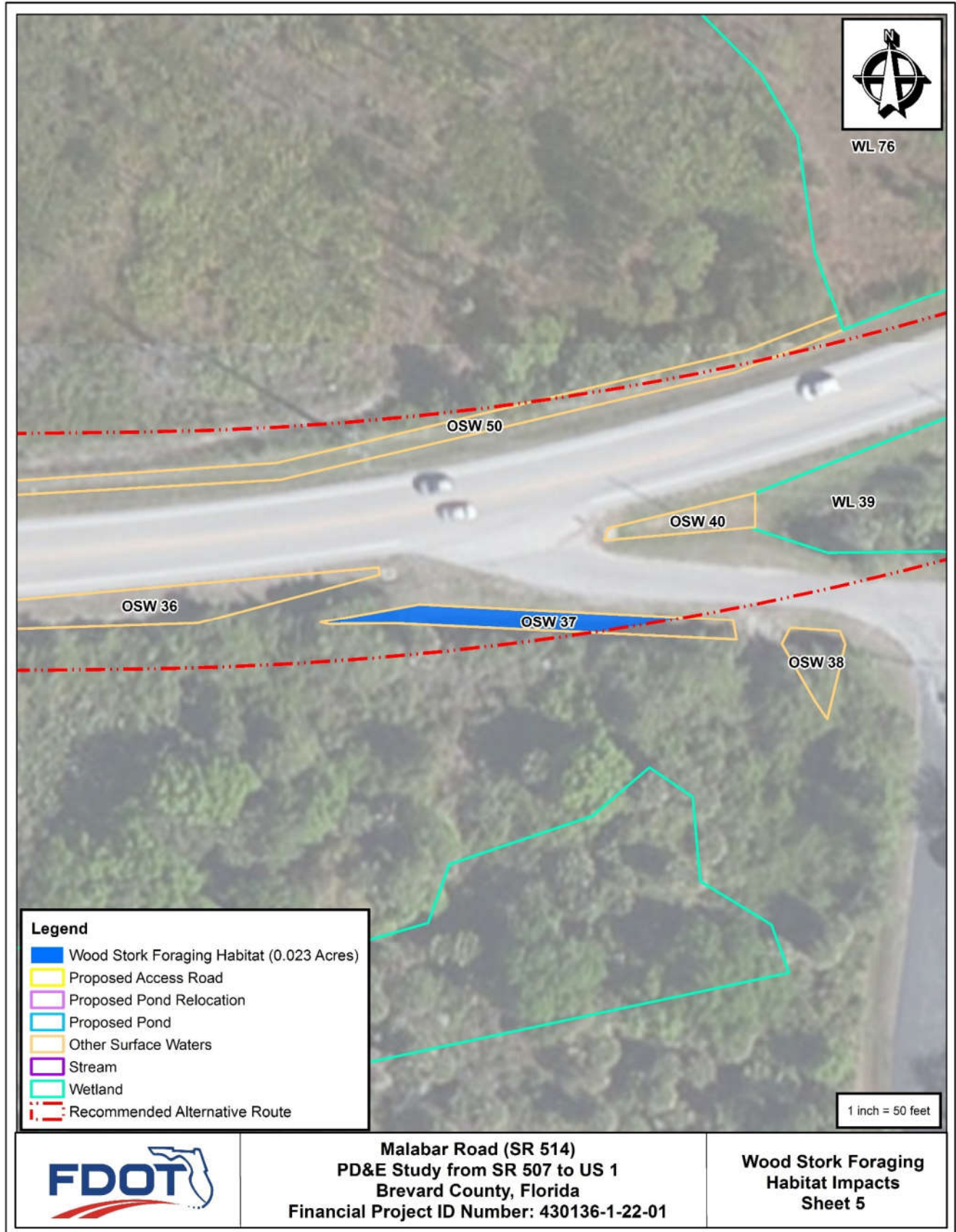
- Wood Stork Foraging Habitat (0.028 Acres)
- Proposed Access Road
- Proposed Pond Relocation
- Proposed Pond
- Other Surface Waters
- Stream
- Wetland
- Recommended Alternative Route

1 inch = 50 feet



Malabar Road (SR 514)
PD&E Study from SR 507 to US 1
Brevard County, Florida
Financial Project ID Number: 430136-1-22-01

Wood Stork Foraging
Habitat Impacts
Sheet 4



these ponds are shallow enough to meet the criteria for suitable wood stork foraging habitat; however, the water depth in the interior of the pond is too deep to be considered suitable wood stork foraging habitat. With the Recommended Alternative, these two ponds will be relocated further north of their current location. OSW 37 is a roadside ditch on the south side of Glatter Road, at the intersection with Malabar Road. OSW 56 and OSW 57 are roadside ditches on the north side of Malabar Road, east of the intersection with Corey Road. These two features contain marginal wood stork foraging habitat only during seasonal high rain events. The majority of the OSW features in the proposed project study area are drainage ditches that parallel Malabar Road in the ROW on the north and south side of the road. These features act as stormwater conveyance systems that do not appear to maintain the water level necessary to support macro-invertebrates or small fish. In addition, the close proximity of Malabar Road to these ditch systems would appear to deter any wading bird from utilizing these features. As such, it is anticipated that a number of these areas would not be considered suitable wood stork foraging habitat.

Wetlands proposed to be impacted by the Recommended Alternative consist of forested, scrub-shrub, and wet prairie systems. The forested and scrub-shrub areas have vegetation that is too dense to be considered wood stork foraging; the wet prairie wetlands do not appear to maintain the water inundation levels that would be conducive for wood stork foraging.

The impacts to wood stork foraging habitat for the Recommended Alternative equals 0.37 acres. Based on the *Wood Stork Key for Central and North Peninsular Florida*, dated September 2008 (**Appendix G**), projects that impact 0.50 acres or less qualify for a *may affect, but not likely to adversely affect* determination.

4.4.4 Crested Caracara

Crested caracaras maintain large home ranges that include nesting and foraging habitat consisting of large expanses of pastures, grasslands, or prairies that include depressional marshes and small clumps of live oaks, cabbage palms, and cypress (Morrison, 2001).

The USFWS has established management zones around caracara nests. The primary zone extends 985 feet and the secondary zone extends 4,920 feet outward from the nest tree. If activities are proposed within the primary or secondary zones of a caracara nest, formal consultation with the USFWS is required to ensure conservation measures are implemented to limit the impact of a project on caracaras.

During the field assessments conducted as a part of the PD&E process, no caracaras or caracara nests were observed. During preliminary coordination with USFWS, it was determined that no active caracara nests occur within the vicinity of project study area according to the latest nest location database. However, within the project study area, potential caracara foraging and nesting habitat exists in the pasture areas south of Malabar

Road between the C-78 Canal and Weber Road. The field assessment conducted for this PD&E Study did not include a caracara nest survey as described by the USFWS's *Crested Caracara Survey Protocol – Additional Guidance*, dated November 2015 (**Appendix G**). If applicable, a formal survey for caracaras will be conducted during the permitting phase of the project and mitigation will be provided if caracaras are affected as a result of the project. Therefore, at this time, a *may affect not likely to adversely affect* determination is appropriate.

4.4.5 Eastern Indigo Snake

The eastern indigo snake occurs in a wide variety of upland habitat types throughout Florida and will often utilize debris piles, stump holes, gopher tortoise and other animal burrows for shelter. Habitat suitable for utilization by indigo snakes occurs adjacent to the project area. The most suitable habitat is the pine-flatwoods communities located within and adjacent to the Malabar Scrub Sanctuary.

Neither the FNAI biodiversity matrix (**Appendix F**) nor the FWC wildlife observation databases document eastern indigo snake occurrence within or near the project area. However, the probability that eastern indigo snakes occur within the project area is moderate due to the presence of gopher tortoise burrows. The USFWS's *Eastern Indigo Snake Programmatic Effect Determination Key* (**Appendix G**) will be followed if more than 25 active and inactive gopher tortoise burrows are impacted, and USFWS consultation will occur. During the PD&E Study, no formal gopher tortoise burrow survey was conducted within the proposed project study area. FDOT commits to conducting species-specific surveys for the gopher tortoise during the design of the project and reinitiating consultation with the Service prior to advancing the project to construction to comply with 23 CFR 771.133. Therefore, at this time, FDOT has determined the project *may affect, but is not likely to adversely affect* the eastern indigo snake.

4.4.6 Red-cockaded Woodpecker

Red cockaded woodpeckers inhabit open, mature pine-dominated communities. USFWS defines suitable foraging habitat in *Red-cockaded Woodpecker South Florida Survey Protocol* (adapted from Service 2003) (**Appendix G**) as “pine or pine/hardwood stand of forest, woodland, or savannah in which 50% or more of the dominant trees are pines and the dominant pine trees are generally 60 years in age or older.” The survey protocol further states that “if no suitable foraging habitat is present within the project area (that is, no pines 60 years or older will be impacted), then further evaluation is unnecessary and the red-cockaded woodpecker can be presumed absent.” A desktop review was conducted and no documented active colonies exist in proximity to the proposed project. During field reconnaissance, no suitable nesting habitat was observed within or near the project corridor. While some pine forest habitat exists with pines appearing 60 years old or greater within the potential pond site P, its midstory cover is much greater than the < 10% preferred by RCWs resulting in native grass/forbs groundcover well below the optimal > 40% for suitable habitat. No formal survey

was conducted for potential RCW nest trees during the PD&E Study and habitat suitability was evaluated by qualitative in situ observations within pine-dominated areas along the corridor. No areas of open, mature pine-dominated communities were found within or proximal to the project corridor. The nearest historic record of RCW activity is more than 13 miles north of the Malabar Road which, if still active, is well outside the species' accepted dispersal distance potential of 10km. Therefore, at this time, a *no effect* determination is appropriate for this species.

4.4.7 Gopher Tortoise

Gopher tortoises are federally listed as Threatened in the western part of its range which includes populations in western Alabama, Louisiana and Mississippi (**Appendix G**). In 2013 the gopher tortoise was listed as a Candidate Species in the eastern part of its range which includes all of Florida, eastern Alabama, Georgia and South Carolina. Gopher tortoises have been listed by the State of Florida since 1975. The FWC has established a rigorous permitting and relocation program to address gopher tortoise impacts.

Gopher tortoises are typically found in areas that have three environmental components, namely: well-drained soils, adequate herbaceous vegetation for foraging, and open sunny areas for nesting. The gopher tortoise's preferred natural habitat is pine flatwoods, longleaf pine /xeric oak, and xeric oak scrub. They can also be found in almost any other natural upland community type and in disturbed sites such as roadsides, fencerows, clearings, and old fields.

A number of gopher tortoise burrows were confirmed within and directly adjacent to the project area (Figure 4-1). A formal survey was not conducted during the PD&E Study; however, a 100% survey of potential gopher tortoise habitat within the project area and pond sites A, D, F, J, L, N and U will be required during the permitting phase of this project. All gopher tortoise burrows that occur within the project impact areas or within 25 feet of impact areas will be permitted for impact and all tortoises relocated in accordance with FWC permitting protocol. At this time, a *may affect not likely to adversely affect* determination is appropriate for this species.

During the design and permitting phase of the project, a formal gopher tortoise survey will be conducted to determine whether USFWS consultation is required for the eastern indigo snake, i.e. if more than 25 active and inactive burrows are proposed to be impacted. If it is determined that less than 25 gopher tortoise burrows will be impacted, FDOT agrees to follow the *USFWS Standard Protection Measures for the Eastern Indigo Snake* (**Appendix G**) during construction of the project. Technical specifications regarding this commitment will be written into the contractor's bid documents.

4.5 State Listed Species

It is the primary intent of this report to address potential impacts to federally protected species. The following additional information regarding the potential impacts to state listed species is included for consideration. Using the FWC and FNAI records of state-listed species that have been documented in Brevard County and the habitat assessments conducted in the project study area, the following state-listed species have been identified as potentially occurring within or adjacent to the project area (**Table 4-2**).

Low likelihood of occurrence means that no habitat for the species was identified in the project area, moderate likelihood for occurrence means that habitat existed within or adjacent to the project area however it did not appear to be optimal, high likelihood of occurrence means that suitable habitat existed for the species however no individuals were observed, confirmed means that the species was observed in or around the project area.

Table 4-2: State Listed Species

Common Name	Scientific Name	Occurrence	Protected Status
Florida burrowing owl	<i>Athene cunicularia</i>	Low	SSC
Florida sandhill crane	<i>Grus canadensis pratensis</i>	High	ST
Florida pine snake	<i>Pituophis melanoleucus mugitus</i>	Low	SSC
Gopher tortoise	<i>Gopherus polyphemus</i>	Confirmed	ST

Table Abbreviation Key

SSC= Species of Special Concern

ST = State-designated Threatened

4.5.1 Florida Burrowing Owl

Florida burrowing owls typically utilize upland areas that are sparsely vegetated with sandy well drained spoils. Natural habitats include dry prairie and sandhills however they will also utilize ruderal habitats such as airports, ball fields, road ROW and vacant lots. The FWC has established a permitting program to allow for burrowing owl nest removal from development sites (**Appendix G**). The permit allows impact to the owl burrow during non-nesting season and only after mitigation measures are established and approved. Based on the information in the FNAI biodiversity matrix (**Appendix F**) and the FWC wildlife observation databases there have been no occurrences of the Florida burrowing owl within or near the project study area. During the field review, no burrowing owls were observed within or adjacent to the project study area. Although burrowing owls are not anticipated to occur within the project boundaries, potential habitat does exist, and a survey should be completed during the permitting phase of the project to ensure no impacts to this species occurs.

4.5.2 Florida Sandhill Crane

Florida sandhill cranes are year-round residents of Florida that utilize freshwater marshes for nesting and prairies, pasture land, and other open lawn areas for foraging. Florida sandhill crane nests are protected and cannot be impacted without authorization from the FWC.

Florida sandhill cranes, although not directly observed within the project area during the field assessments, can reasonably be expected to use project area for foraging. Wetland 19 could potentially be utilized as a nest site for sandhill cranes. Although this wetland is not proposed for impact, it is within 250 of the proposed project limits and should be surveyed for sandhill crane nesting during the permitting phase of the project to ensure that project related activities do not affect the nesting behaviours of sandhill cranes. Guidelines for sandhill crane nest sites and survey methodologies (updated in 2016) are included in **Appendix G**.

4.5.3 Florida Pine Snake

The Florida pine snake requires dry sandy areas for burrowing and is most often found in sand pine - turkey oak communities, abandoned fields, scrub, sandhills and longleaf pine – xeric oak, and pine flatwoods. One of the pine snake’s primary food source is pocket gophers which also use dry, sandy soil for burrowing. Due to difficulties in confirming the presence of this species, pine snakes are assumed to have the highest probability of occurrence in areas where gopher tortoise burrows are found given that loose well-drained soils are preferred by both species.

FWC does not currently have a comprehensive management plan nor survey protocol specifically for the Florida pine snake. No pine snakes were observed during field assessments and no occurrence records for this species have been found within or adjacent to the project area. The likelihood is low that pine snakes occur within the limits of the project and therefore no impacts to this species are anticipated.

4.5.4 Gopher Tortoise

Please see Section 4.4.7 for the discussion regarding gopher tortoises.

4.6 Project Effects on Listed Species

The proposed project was evaluated for potential impacts to federally and state listed species. A literature review, GIS analysis, discussions with regulatory agency staff, existing permit reviews and field assessments were conducted to identify listed species that may potentially occur within the project area. Listed species with the potential to occur with the project area are listed in **Table 4-3**. The table also includes the proposed federally listed species effect determinations.

This report is focused on the federal and state listed species that have been reported to occur, were directly observed, or that have the potential to utilize the habitats found within the project area. A brief discussion on the potential effects that the project may have on these

listed species is provided below. Coordination with USFWS, FWC, ACOE and the SJRWMD regarding listed species will continue throughout the PD&E Study, design, permitting and construction phases of the project.

Table 4-3: Listed Species Potential Occurrence and Federal Effect Determinations

Common Name	Scientific Name	Protected Status	Potential Occurrence	Effect Determination
Florida scrub jay	<i>Aphelocoma coerulescens</i>	FT	High	May Affect Not Likely to Adversely Affect
Florida burrowing owl	<i>Athene cunicularia</i>	SSC	Low	N/A
Eastern indigo snake	<i>Drymarchon couperi</i>	FT	Moderate	May Affect Not Likely to Adversely Affect
Gopher tortoise	<i>Gopherus polyphemus</i>	ST/FCS	Confirmed	May Affect Not Likely to Adversely Affect (Relocation likely required)
Florida sandhill crane	<i>Grus canadensis pratensis</i>	ST	High	May Affect Not Likely to Adversely Affect
Bald eagle	<i>Haliaeetus leucocephalus</i>	BEGPA	Low	May Affect Not Likely to Adversely Affect
Wood stork	<i>Mycteria americana</i>	FT	High	May Affect Not Likely to Adversely Affect
Red-cockaded woodpecker	<i>Picoides borealis</i>	FE	Low	No Effect
Florida pine snake	<i>Pituophis melanoleucus mugitus</i>	SSC	Low	N/A
Audubon's crested caracara	<i>Caracara cheriway</i>	FE	Moderate	May Affect Not Likely to Adversely Affect

Table Abbreviation Key

BEGPA = Bald and Golden Eagle Protection Act

FCS = Federally-designated Candidate Species

FE = Federally-designated Endangered

FT = Federally-designated Threatened

SSC= Species of Special Concern

ST = State-designated Threatened

4.6.1 Direct Effects to Protected Species

Federally protected species that may be directly impacted as a result of the proposed project, include the Florida scrub jay and gopher tortoise. No state listed species, other than the gopher tortoise, are expected to be directly impacted by the proposed project.

Gopher tortoises have been documented within the existing the proposed project area. All tortoises within the project impact areas will be permitted and relocated in accordance with FWC permitting protocols. Surveys to determine the number of tortoises and burrows that will be impacted as a result of the project will be conducted during the design and permitting phases of the project.

Potential Florida scrub jay habitat may be directly impacted by the proposed project. However, until a formal scrub jay survey is conducted to determine their presence or absence within the project area, this determination cannot be concluded. If occupied scrub jay habitat will be impacted by the project, consultation with USFWS will be required.

4.6.2 Indirect Effects to Listed Species

Indirect effects are defined as ‘those effects that are caused by or will result from the proposed action and are later in time, but are still reasonably expected to occur’ [50 CFR §402.02]. Indirect effects to protected species may occur as a result of the project. The project may result in increased opportunities for species mortality associated with vehicle interaction. Increased traffic noise, lighting, and altering of wildlife corridors may also indirectly affect protected species that utilize areas adjacent to the project.

4.6.3 Cumulative Effects

Cumulative effects are defined as the direct and indirect impacts of the proposed project under consideration as well as other projects which may be proposed for the general vicinity in the foreseeable future (FDOT, 1991). Some cumulative effects may occur as a result of other projects in the vicinity; however, the urban build-up and conservation areas adjacent to the proposed project would minimize cumulative effects on listed species. A wider road with increased access may increase development in the area. However, a majority of the developable area that supports listed species in the vicinity of the proposed project is encumbered by conservation easements and managed to ensure continued use by listed species. In addition, a large area northwest of the intersection of Malabar Road and Corey Road is slated for a Stillwater Preserve Development. Several new residences have been constructed in this subdivision and will continue to do so with or without the proposed project. Minor cumulative effects may include development of the privately owned natural areas located sporadically throughout the project corridor, however it is anticipated that the cumulative effect will be minor.

4.7 Commitments

Commitments to eliminate, reduce or compensate for any potential adverse impacts include:

- During the design and permitting phase of the project, gopher tortoise, Florida sandhill crane, and Florida burrowing owl surveys will be conducted in accordance with applicable regulatory agency protocols if required. Permitting will be conducted as necessary to comply with all state laws.
- During the design and permitting phase of the project, Florida scrub jay and Audubon's crested caracara surveys will be conducted in accordance with applicable regulatory agency protocols if required. If federally listed species are confirmed within the project limits, USFWS consultation will be initiated.
- During the design and permitting phase of the project, a formal gopher tortoise survey will be conducted to determine whether USFWS consultation is required for the eastern indigo snake, (i.e. if more than 25 active and inactive burrows are proposed to be impacted). If it is determined that less than 25 gopher tortoise burrows are anticipated to be impacted, FDOT agrees to follow the *USFWS Standard Protection Measures for the Eastern Indigo Snake (Appendix G)* during construction of the project. Technical specifications regarding this commitment will be written into the contractor's bid documents.
- FDOT will ensure that the *Contractor Requirements for Unexpected Interaction with Certain Protected Species During Work Activities* is followed during construction (**Appendix G**).

Section 5.0 Conclusion

The proposed project was evaluated for potential impacts to jurisdictional wetlands. A literature review, GIS analysis, Brevard County Property Appraiser database and field assessments were conducted to identify all jurisdictional wetlands that may potentially occur within the project area. A total of five Build Alternative Alignments were evaluated and UMAM evaluations for each of the potentially impacted wetlands are provided in **Appendix D**.

Given the engineering analysis, cost estimates, environmental impacts, and safety concerns, the 2017 Recommended Alternative is the best option. The 2017 Recommended Alternative provides a reduced amount of publicly owned parcels that may contain sensitive environmental lands, and wetland impacts. Environmental impacts have been avoided and minimized; however, it is estimated that 2.65 acres of direct wetland impacts and 1.30 acres of secondary impacts is anticipated as a result of the Recommended Alternative. Mitigation for these unavoidable impacts can be offset with the purchase of wetland credits at an approved mitigation bank or by the Senate Bill mitigation program.

In addition, the project study area was evaluated for the potential occurrence of federal and state listed species. A literature review, GIS analysis, discussions with regulatory agency staff, and field assessments were conducted to identify those listed species that may potentially occur within the project study area. The state and federally listed species with the potential to occur within and adjacent to the project study area include Florida scrub jays, Florida burrowing owls, eastern indigo snakes, gopher tortoises, Florida sandhill cranes, red-cockaded woodpeckers, bald eagles, wood storks, Florida pine snakes and Audubon's crested caracaras.

As of a result of the proposed project, federally protected species that are likely to be directly impacted as a result of the Recommended Alternative include the Florida scrub jay and gopher tortoise. No state listed species, other than the gopher tortoise, are expected to be directly impacted by the selected alignment. Indirect impacts to protected species may occur as a result of increased noise levels and increased opportunities for species- vehicle interaction. Minor cumulative impacts are anticipated as a result of the project. During the permitting phase of the project, species specific surveys will be required to determine the presence of listed species within the project area. If listed species are encountered, coordination with the FWC and/or the USFWS should be conducted and the appropriate permits should be obtained.

Section 6.0 References

Town of Malabar Comprehensive Plan, Calvin, Giordano & Associates, Inc., August 2009.

City of Palm Bay Comprehensive Plan, City of Palm Bay, August 2006 and updates.

Space Coast TPO 2040 LRTP, Space Coast TPO, October 8, 2015.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of Wetlands and Deepwater Habitats of the United States. U.S. Fish and Wildlife Service, Office of Biological Services, US Government Printing Office. Technical Publication FWS/OSB-79/31.

Florida Department of Environmental Protection. 1995. "The Florida Wetlands Delineation Manual".

Florida Department of Transportation. 2017. Project Development and Environment Manual, Part 2, Chapter 9. Tallahassee, Florida.

Florida Department of Transportation. 2017. Project Development and Environment Manual, Part 2, Chapter 16. Tallahassee, Florida.

Florida Department of Transportation. 1999. Florida Land Use, Cover and Forms Classification System Handbook. Third Edition. Surveying and Mapping Office. Thematic Mapping Section, Tallahassee, Florida.

Florida Department of Transportation. 2011. Efficient Transportation Decision Making Program Screening Tool.

Florida Fish and Wildlife Conservation Commission. 2010. Florida Fish and Wildlife Conservation Commission Bald Eagle (*Haliaeetus leucocephalus*) Management Plan Handbook.

Florida Natural Areas Inventory. 2000. Online Field Guide to Rare Plants and Animals of Florida. Florida Natural Areas Inventory and Florida Department of Environmental Protection. Tallahassee, Florida.

Florida Natural Areas Inventory. 2013. Biodiversity Matrix Map Server. Florida Natural Areas Inventory and Florida Department of Environmental Protection. Tallahassee, Florida.

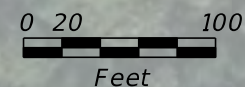
Hurt, Wade. 2007. "Hydric Soils of Florida Handbook." Florida Association of Environmental Soil Scientists.

- Morrison, J.L. 2001. Recommended management practices and survey protocols for Audubon's crested caracaras (*Caracara cheriway audubonii*) in Florida. Technical Report No. 18. Florida Fish and Wildlife Conservation Commission, Tallahassee, Florida.
- Morton, J.F. 1980. "The Australian Pine or Beefwood (*Casuarina equisetifolia* L.), an Invasive "Weed" in Florida." Proc. FL St. Hort. Soc. 93:87-95
- National Wetland Inventory (NWI). 1992. GIS Database. U.S. Fish & Wildlife Service, St. Petersburg, Florida.
- Soil and Water Conservation Society. 1989. "26 Ecological Communities of Florida."
- United States Army Corps of Engineers. 1987. "Federal Manual for Identifying and Delineating Jurisdictional Wetlands."
- United States Army Corps of Engineers. November 2010. Regional Supplemental to the Corps of Engineers Wetland Delineation Manual – Atlantic and Gulf Coastal Plain Region (Version 2.0).
- United States Department of Agriculture Soil Conservation Service. 1974. Soil Survey of Brevard County, Florida.
- U.S. Fish and Wildlife Service. 2007. Scrub-Jay Survey Guidelines. North Florida Ecological Services Office, Southeast Region. Atlanta, Georgia.
- U.S. Fish and Wildlife Service. 2009. Amended Guidance for Assessing Mitigation Needs for the Florida Scrub Jay. North Florida Ecological Services Office, Southeast Region. Atlanta, Georgia.
- U.S. Fish and Wildlife Service. Federally Listed Species in Brevard County, Florida. North Florida Ecological Services Office, Southeast Region. Atlanta, Georgia. Accessed June 2014.

Appendix A

Recommended Alternative Design Plans

POND A
BASIN 2



RACETRAC
BEGIN PROJECT

Q CONSTRUCTION
SR 514

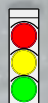
**PALM BAY
MOOSE
LODGE
2311**

**CASTAWAY
MARINE**
B

MALABAR RD 514

110

MATCH LINE STA. 113+00.00



POT STA. 100+00.00
100

PI STA. 104+68.90

105

PROPOSED
RIGHT-OF-WAY

5' SIDEWALK

EXISTING
RIGHT-OF-WAY

**BOOST
MOBILE**

**EASTSIDE
MOWERS**

**ASIAN GLOBAL
MARKET**

**AMERI
PEST**

**LITTLE
IMPRESSIONS
ACADEMY**

BABCOCK ST

507

EXISTING
RIGHT-OF-WAY

6' SIDEWALK

5' SIDEWALK

PC STA. 109+33.30

ENTERPRISE AVE

4

5

6

**MAGICAL
HANDS AUTO**

9

CURVE DATA CL E 991
PI STA. = 111+37.30
Δ = 1° 00' 00" (RT)
D = 0° 14' 42"
T = 204.00
L = 407.98
R = 23,375.64
PC STA. = 109+33.30
PT STA. = 113+41.29

CANOVA ST SE

**PRELIMINARY
SUBJECT TO CHANGE**

	CENTERLINE OF CONSTRUCTION		POTENTIAL CONTAMINATION SITE		CONSERVATION LAND		EXISTING PAVEMENT
	EXISTING ROW		RESIDENTIAL RELOCATION		WETLAND		PROPOSED PAVEMENT
	PROPOSED ROW		BUSINESS RELOCATION		100 YR. FLOODPLAINS		PROPOSED MEDIAN
	PARCEL BOUNDARY		EXISTING TRAFFIC SIGNAL		TRANSMISSION LINE		PROPOSED SIDEWALK
	CITY LIMITS				POWER POLE		

ATKINS
Douglas J. Reed, P.E. # 49291
482 South Keller Road Orlando, FL 32810
(407) 647-7275 www.atkinsglobal.com
Certificate of Authorization No. 24

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 514	BREVARD	430136-1-22-01

**MALABAR ROAD (SR514) PD&E
RECOMMENDED ALTERNATIVE**

SHEET NO.
01

sch2087

sch2087

11/6/2017

4:02:27 PM

T:\PROJECTS\FDOT_D5\SR514_PD&E\Cadd\PLANRD01_ALT-E.dgn

T:\PROJECTS\FDOT_D5\SR514_PD&E\Cadd\PLANRD01_ALT-E.dgn 11/6/2017 4:02:27 PM sch2087



	CENTERLINE OF CONSTRUCTION		POTENTIAL CONTAMINATION SITE		CONSERVATION LAND
	EXISTING ROW		RESIDENTIAL RELOCATION		WETLAND
	PROPOSED ROW		BUSINESS RELOCATION		100 YR. FLOODPLAINS
	PARCEL BOUNDARY		EXISTING TRAFFIC SIGNAL		TRANSMISSION LINE
	CITY LIMITS		POWER POLE		EXISTING PAVEMENT
					PROPOSED PAVEMENT
					PROPOSED MEDIAN
					PROPOSED SIDEWALK

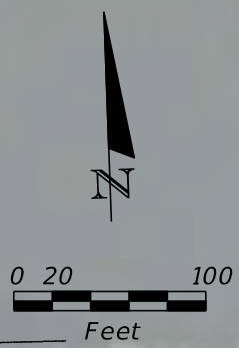
ATKINS
 Douglas J. Reed, P.E. # 49291
 482 South Keller Road Orlando, FL 32810
 (407) 647-7275 www.atkinsglobal.com
 Certificate of Authorization No. 24

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 514	BREVARD	430136-1-22-01

MALABAR ROAD (SR514) PD&E
 RECOMMENDED ALTERNATIVE

SHEET NO.	02
-----------	----

sch2087



CURVE DATA CL E 993
 PI STA. = 129+35.75
 Δ = 7° 03' 53" (LT)
 D = 1° 30' 00"
 T = 235.81
 L = 471.02
 R = 3,820.00
 PC STA. = 126+99.94
 PT STA. = 131+70.96

**PRELIMINARY
SUBJECT TO CHANGE**

100	CENTERLINE OF CONSTRUCTION	#	POTENTIAL CONTAMINATION SITE	CONSERVATION LAND	EXISTING PAVEMENT
---	EXISTING ROW	R	RESIDENTIAL RELOCATION	WETLAND	PROPOSED PAVEMENT
---	PROPOSED ROW	B	BUSINESS RELOCATION	100 YR. FLOODPLAINS	PROPOSED MEDIAN
---	PARCEL BOUNDARY	T	EXISTING TRAFFIC SIGNAL	TRANSMISSION LINE	PROPOSED SIDEWALK
---	CITY LIMITS			POWER POLE	

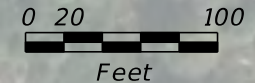
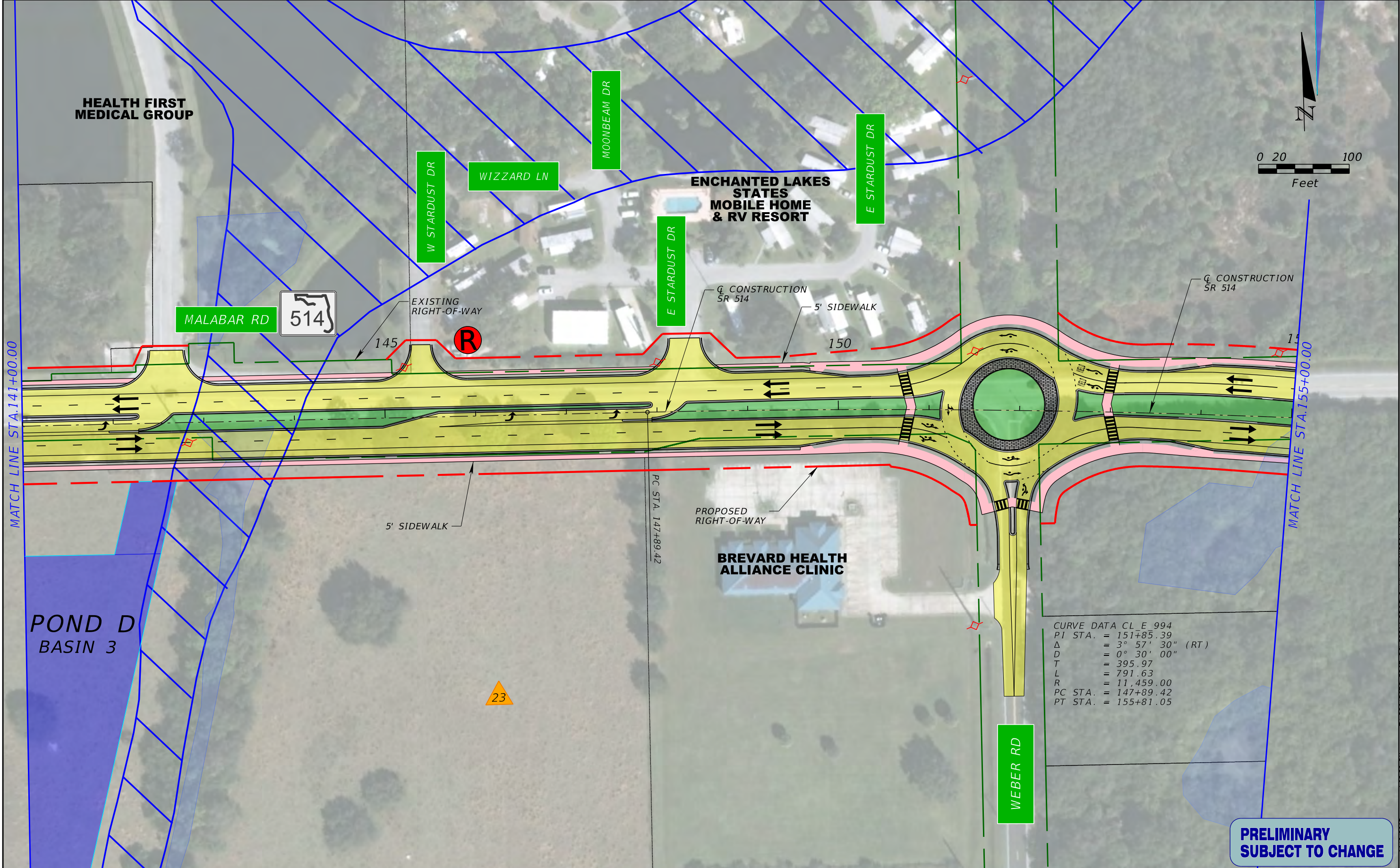
ATKINS
 Douglas J. Reed, P.E. # 49291
 482 South Keller Road Orlando, FL 32810
 (407) 647-7275 www.atkinsglobal.com
 Certificate of Authorization No. 24

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 514	BREVARD	430136-1-22-01

**MALABAR ROAD (SR514) PD&E
RECOMMENDED ALTERNATIVE**

SHEET NO.
03

sch2087



**PRELIMINARY
SUBJECT TO CHANGE**

100	CENTERLINE OF CONSTRUCTION	▲	POTENTIAL CONTAMINATION SITE	▨	CONSERVATION LAND	▨	EXISTING PAVEMENT
---	EXISTING ROW	Ⓡ	RESIDENTIAL RELOCATION	▨	WETLAND	▨	PROPOSED PAVEMENT
---	PROPOSED ROW	Ⓡ	BUSINESS RELOCATION	▨	100 YR. FLOODPLAINS	▨	PROPOSED MEDIAN
---	PARCEL BOUNDARY	Ⓡ	EXISTING TRAFFIC SIGNAL	▨	TRANSMISSION LINE	▨	PROPOSED SIDEWALK
---	CITY LIMITS	Ⓡ		▨	POWER POLE	▨	

ATKINS
 Douglas J. Reed, P.E. # 49291
 482 South Keller Road Orlando, FL 32810
 (407) 647-7275 www.atkinsglobal.com
 Certificate of Authorization No. 24

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 514	BREVARD	430136-1-22-01

**MALABAR ROAD (SR514) PD&E
RECOMMENDED ALTERNATIVE**

SHEET NO.
04

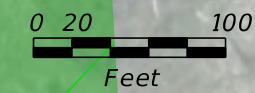
schn2087

T:\PROJECTS\FDOT_D5\SR514 PD&E\Cadd\X_PLANRD04_ALT-E.dgn 4:02:38 PM 11/6/2017

POND F
BASIN 4



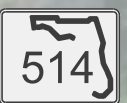
CURVE DATA CL_E_995
 PI STA. = 162+46.86
 Δ = 6° 39' 03" (LT)
 D = 0° 30' 00"
 T = 665.81
 L = 1,330.13
 R = 11,459.00
 PC STA. = 155+81.05
 PT STA. = 169+11.18



MATCH LINE STA.155+00.00

MATCH LINE STA.169+00.00

MALABAR RD



5' SIDEWALK

Q CONSTRUCTION
SR 514

EXISTING
RIGHT-OF-WAY

5' SIDEWALK

PROPOSED
RIGHT-OF-WAY

**PRELIMINARY
SUBJECT TO CHANGE**

	CENTERLINE OF CONSTRUCTION		POTENTIAL CONTAMINATION SITE		CONSERVATION LAND		EXISTING PAVEMENT
	EXISTING ROW		RESIDENTIAL RELOCATION		WETLAND		PROPOSED PAVEMENT
	PROPOSED ROW		BUSINESS RELOCATION		100 YR. FLOODPLAINS		PROPOSED MEDIAN
	PARCEL BOUNDARY		EXISTING TRAFFIC SIGNAL		TRANSMISSION LINE POWER POLE		PROPOSED SIDEWALK
	CITY LIMITS						

ATKINS
 Douglas J. Reed, P.E. # 49291
 482 South Keller Road Orlando, FL 32810
 (407) 647-7275 www.atkinsglobal.com
 Certificate of Authorization No. 24

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 514	BREVARD	430136-1-22-01

**MALABAR ROAD (SR514) PD&E
RECOMMENDED ALTERNATIVE**

SHEET NO.
05

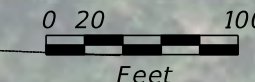
schn2087

T:\PROJECTS\FD01_D5\SR514_PD&E\Cadd\PLANRD05_ALT-E.dgn 11/6/2017 4:02:46 PM

CURVE DATA CL E 995
 PI STA. = 162+46.86
 Δ = 6° 39' 03" (LT)
 D = 0° 30' 00"
 T = 665.81
 L = 1,330.13
 R = 11,459.00
 PC STA. = 153+81.05
 PT STA. = 169+11.18

MALABAR SCRUB SANCTUARY

ABSAROKA LN



MALABAR RD 514

RELOCATED PONDS

RELOCATED PONDS

POND J BASIN 5

CURVE DATA CL E 996
 PI STA. = 177+98.10
 Δ = 1° 18' 42" (RT)
 D = 0° 17' 11"
 T = 228.93
 L = 457.85
 R = 20,000.00
 PC STA. = 175+69.16
 PT STA. = 180+27.01

MATCH LINE STA. 169+00.00

MATCH LINE STA. 183+00.00

	CENTERLINE OF CONSTRUCTION		POTENTIAL CONTAMINATION SITE		CONSERVATION LAND		EXISTING PAVEMENT
	EXISTING ROW		RESIDENTIAL RELOCATION		WETLAND		PROPOSED PAVEMENT
	PROPOSED ROW		BUSINESS RELOCATION		100 YR. FLOODPLAINS		PROPOSED MEDIAN
	PARCEL BOUNDARY		EXISTING TRAFFIC SIGNAL		TRANSMISSION LINE POWER POLE		PROPOSED SIDEWALK
	CITY LIMITS						

ATKINS
 Douglas J. Reed, P.E. # 49291
 482 South Keller Road Orlando, FL 32810
 (407) 647-7275 www.atkinsglobal.com
 Certificate of Authorization No. 24

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 514	BREVARD	430136-1-22-01

MALABAR ROAD (SR514) PD&E
RECOMMENDED ALTERNATIVE

SHEET NO.
06

**PRELIMINARY
SUBJECT TO CHANGE**

sch2087



RELOCATED PONDS

2R

MALABAR RD 514

SITKA LN

SANDY CREEK LN

LINROSE LN

POND J BASIN 5

CURVE DATA CL_E 997
 PI STA. = 196+35.12
 Δ = 1° 27' 11" (RT)
 D = 0° 21' 16"
 T = 204.99
 L = 409.96
 R = 16,164.44
 PC STA. = 194+30.13
 PT STA. = 198+40.09

MATCH LINE STA.183+00.00

MATCH LINE STA.197+00.00

PC STA. 194+30.13

**PRELIMINARY
SUBJECT TO CHANGE**

	CENTERLINE OF CONSTRUCTION		POTENTIAL CONTAMINATION SITE		CONSERVATION LAND		EXISTING PAVEMENT
	EXISTING ROW		RESIDENTIAL RELOCATION		WETLAND		PROPOSED PAVEMENT
	PROPOSED ROW		BUSINESS RELOCATION		100 YR. FLOODPLAINS		PROPOSED MEDIAN
	PARCEL BOUNDARY		EXISTING TRAFFIC SIGNAL		TRANSMISSION LINE		PROPOSED SIDEWALK
	CITY LIMITS				POWER POLE		

ATKINS
 Douglas J. Reed, P.E. # 49291
 482 South Keller Road Orlando, FL 32810
 (407) 647-7275 www.atkinsglobal.com
 Certificate of Authorization No. 24

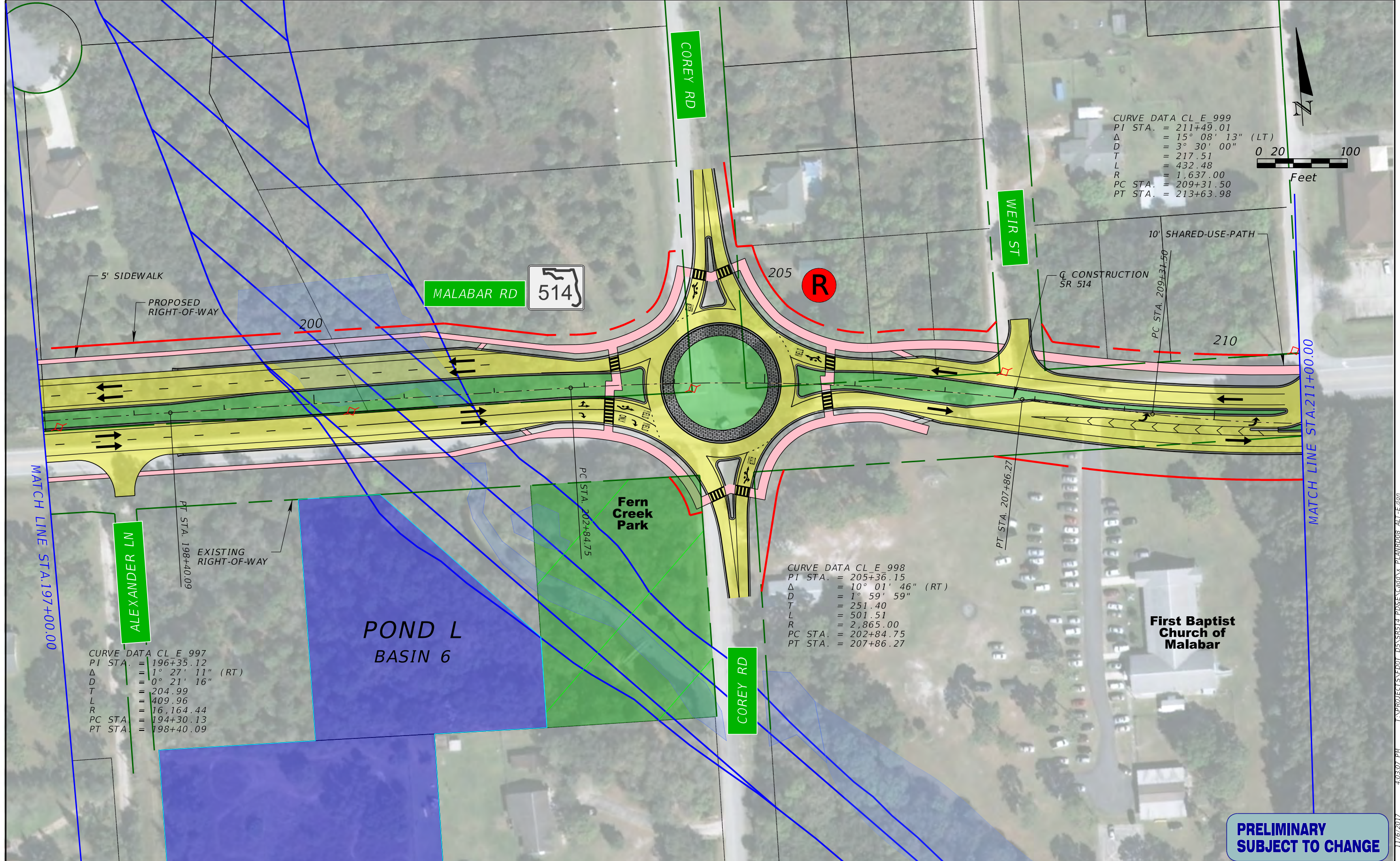
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 514	BREVARD	430136-1-22-01

**MALABAR ROAD (SR514) PD&E
RECOMMENDED ALTERNATIVE**

SHEET NO.
07

sch2087

T:\PROJECTS\FDOT_D5\SR514 PD&E\Cadd\PLANRD07_ALT-E.dgn 11/6/2017 4:03:01 PM



CURVE DATA CL E 999
 PI STA. = 211+49.01
 Δ = 15° 08' 13" (LT)
 D = 3° 30' 00"
 T = 217.51
 L = 432.48
 R = 1,637.00
 PC STA. = 209+31.50
 PT STA. = 213+63.98

CURVE DATA CL E 998
 PI STA. = 205+36.15
 Δ = 10° 01' 46" (RT)
 D = 1° 59' 59"
 T = 251.40
 L = 501.51
 R = 2,865.00
 PC STA. = 202+84.75
 PT STA. = 207+86.27

CURVE DATA CL E 997
 PI STA. = 196+35.12
 Δ = 1° 27' 11" (RT)
 D = 0° 21' 16"
 T = 204.99
 L = 409.96
 R = 16,164.44
 PC STA. = 194+30.13
 PT STA. = 198+40.09

**PRELIMINARY
 SUBJECT TO CHANGE**

100' --- CENTERLINE OF CONSTRUCTION	▲ # POTENTIAL CONTAMINATION SITE	▨ CONSERVATION LAND	▨ EXISTING PAVEMENT
--- EXISTING ROW	Ⓡ RESIDENTIAL RELOCATION	▨ WETLAND	▨ PROPOSED PAVEMENT
--- PROPOSED ROW	Ⓡ BUSINESS RELOCATION	▨ 100 YR. FLOODPLAINS	▨ PROPOSED MEDIAN
--- PARCEL BOUNDARY	Ⓡ EXISTING TRAFFIC SIGNAL	▨ TRANSMISSION LINE	▨ PROPOSED SIDEWALK
--- CITY LIMITS		▨ POWER POLE	

ATKINS
 Douglas J. Reed, P.E. # 49291
 482 South Keller Road Orlando, FL 32810
 (407) 647-7275 www.atkinsglobal.com
 Certificate of Authorization No. 24

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 514	BREVARD	430136-1-22-01

**MALABAR ROAD (SR514) PD&E
 RECOMMENDED ALTERNATIVE**

SHEET NO.
08

sch2087



**PRELIMINARY
SUBJECT TO CHANGE**

	CENTERLINE OF CONSTRUCTION		POTENTIAL CONTAMINATION SITE		CONSERVATION LAND		EXISTING PAVEMENT
	EXISTING ROW		RESIDENTIAL RELOCATION		WETLAND		PROPOSED PAVEMENT
	PROPOSED ROW		BUSINESS RELOCATION		100 YR. FLOODPLAINS		PROPOSED MEDIAN
	PARCEL BOUNDARY		EXISTING TRAFFIC SIGNAL		TRANSMISSION LINE		PROPOSED SIDEWALK
	CITY LIMITS				POWER POLE		

ATKINS
 Douglas J. Reed, P.E. # 49291
 482 South Keller Road Orlando, FL 32810
 (407) 647-7275 www.atkinsglobal.com
 Certificate of Authorization No. 24

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 514	BREVARD	430136-1-22-01

**MALABAR ROAD (SR514) PD&E
RECOMMENDED ALTERNATIVE**

SHEET NO.
09

sch2087

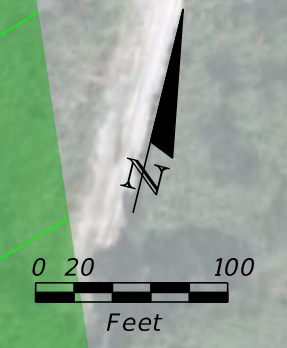
sch2087

11/6/2017

4:03:15 PM

T:\PROJECTS\FDOT_D5\SR514_PD&E\Cadd\X_PLANRD09_ALT-E.dgn

T:\PROJECTS\FDOT_D5\SR514_PD&E\Cadd\X_PLANRD09_ALT-E.dgn 4:03:15 PM 11/6/2017 sch2087



CURVE DATA CL E 9911
 PI STA. = 230+30.92
 Δ = 21° 18' 02" (LT)
 D = 4° 59' 59"
 L = 215.51
 R = 426.04
 PC STA. = 228+15.41
 PT STA. = 232+41.45

MALABAR RD 514

MATCH LINE STA. 225+00.00

MATCH LINE STA. 239+00.00

Malabar Scrub Sanctuary

POND N
BASIN 7

GLATTER RD

**PRELIMINARY
SUBJECT TO CHANGE**

100	CENTERLINE OF CONSTRUCTION	#	POTENTIAL CONTAMINATION SITE	CONSERVATION LAND	EXISTING PAVEMENT
---	EXISTING ROW	R	RESIDENTIAL RELOCATION	WETLAND	PROPOSED PAVEMENT
---	PROPOSED ROW	B	BUSINESS RELOCATION	100 YR. FLOODPLAINS	PROPOSED MEDIAN
---	PARCEL BOUNDARY	T	EXISTING TRAFFIC SIGNAL	TRANSMISSION LINE	PROPOSED SIDEWALK
---	CITY LIMITS			POWER POLE	

ATKINS
 Douglas J. Reed, P.E. # 49291
 482 South Keller Road Orlando, FL 32810
 (407) 647-7275 www.atkinsglobal.com
 Certificate of Authorization No. 24

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 514	BREVARD	430136-1-22-01

**MALABAR ROAD (SR514) PD&E
RECOMMENDED ALTERNATIVE**

SHEET NO.
10

sch2087

T:\PROJECTS\FDOT_D5\SR514 PD&E\Cadd\X_PLANRD10_ALT-E.dgn 11/6/2017 4:03:19 PM

MATCH LINE STA.239+00.00

MATCH LINE STA.253+00.00

CURVE DATA CL E 9912
 PI STA. = 254+87.66
 Δ = 3° 12' 17" (LT)
 D = 0° 29' 22"
 T = 327.55
 L = 654.93
 R = 11,709.00
 PC STA. = 251+60.10
 PT STA. = 258+15.04



Iglesia Cristiana Elohim
Elhoim Christian Church

MALABAR RD 514

Q CONSTRUCTION SR 514

PC STA. 251+60.10

10' SHARED-USE-PATH

240

245

250

POND N
BASIN 7



EXISTING RIGHT-OF-WAY

PROPOSED RIGHT-OF-WAY

RV & Boat Storage

GLATTER RD

**PRELIMINARY
SUBJECT TO CHANGE**

	CENTERLINE OF CONSTRUCTION		POTENTIAL CONTAMINATION SITE		CONSERVATION LAND		EXISTING PAVEMENT
	EXISTING ROW		RESIDENTIAL RELOCATION		WETLAND		PROPOSED PAVEMENT
	PROPOSED ROW		BUSINESS RELOCATION		100 YR. FLOODPLAINS		PROPOSED MEDIAN
	PARCEL BOUNDARY		EXISTING TRAFFIC SIGNAL		TRANSMISSION LINE		PROPOSED SIDEWALK
	CITY LIMITS				POWER POLE		

ATKINS
 Douglas J. Reed, P.E. # 49291
 482 South Keller Road Orlando, FL 32810
 (407) 647-7275 www.atkinsglobal.com
 Certificate of Authorization No. 24

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 514	BREVARD	430136-1-22-01

**MALABAR ROAD (SR514) PD&E
RECOMMENDED ALTERNATIVE**

SHEET NO.
11

sch2087

sch2087

11/6/2017

4:03:29 PM

T:\PROJECTS\FDOT_D5\SR514 PD&E\Cadd\X_PLANRD11_ALT-E.dgn

T:\PROJECTS\FDOT_D5\SR514 PD&E\Cadd\X_PLANRD11_ALT-E.dgn 11/6/2017 4:03:29 PM sch2087

CURVE DATA CL E 9912
 PI STA. = 254+87.66
 Δ = 3° 12' 17" (LT)
 D = 0° 29' 22"
 T = 327.55
 L = 654.93
 R = 11,709.00
 PC STA. = 251+60.10
 PT STA. = 258+15.04



Old Malabar School House

THE AL TURTLE TRAIL AND MALABAR TRAIL HEAD #1

MATCH LINE STA.253+00.00

MATCH LINE STA.267+00.00

10' SHARED-USE-PATH

MALABAR RD 514

MARIE ST

BLANCHE ST

FLORENCE ST

27

6' SIDEWALK

255

260

265

EXISTING RIGHT-OF-WAY

PROPOSED RIGHT-OF-WAY

6' SIDEWALK

PT STA. 264+53.61

God's Healing Holiness Christ Church

THE SAND HILL TRAIL

CURVE DATA CL E 9913
 PI STA. = 261+34.40
 Δ = 3° 07' 29" (RT)
 D = 0° 29' 22"
 T = 319.37
 L = 638.57
 R = 11,709.00
 PC STA. = 258+15.04
 PT STA. = 264+53.61

**PRELIMINARY
SUBJECT TO CHANGE**

	CENTERLINE OF CONSTRUCTION		POTENTIAL CONTAMINATION SITE		CONSERVATION LAND		EXISTING PAVEMENT
	EXISTING ROW		RESIDENTIAL RELOCATION		WETLAND		PROPOSED PAVEMENT
	PROPOSED ROW		BUSINESS RELOCATION		100 YR. FLOODPLAINS		PROPOSED MEDIAN
	PARCEL BOUNDARY		EXISTING TRAFFIC SIGNAL		TRANSMISSION LINE POWER POLE		PROPOSED SIDEWALK
	CITY LIMITS						

ATKINS
 Douglas J. Reed, P.E. # 49291
 482 South Keller Road Orlando, FL 32810
 (407) 647-7275 www.atkinsglobal.com
 Certificate of Authorization No. 24

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 514	BREVARD	430136-1-22-01

**MALABAR ROAD (SR514) PD&E
RECOMMENDED ALTERNATIVE**

SHEET NO.
12

sch2087

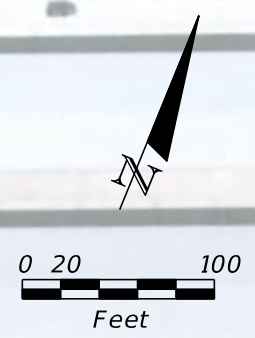
sch2087

11/6/2017

4:03:37 PM

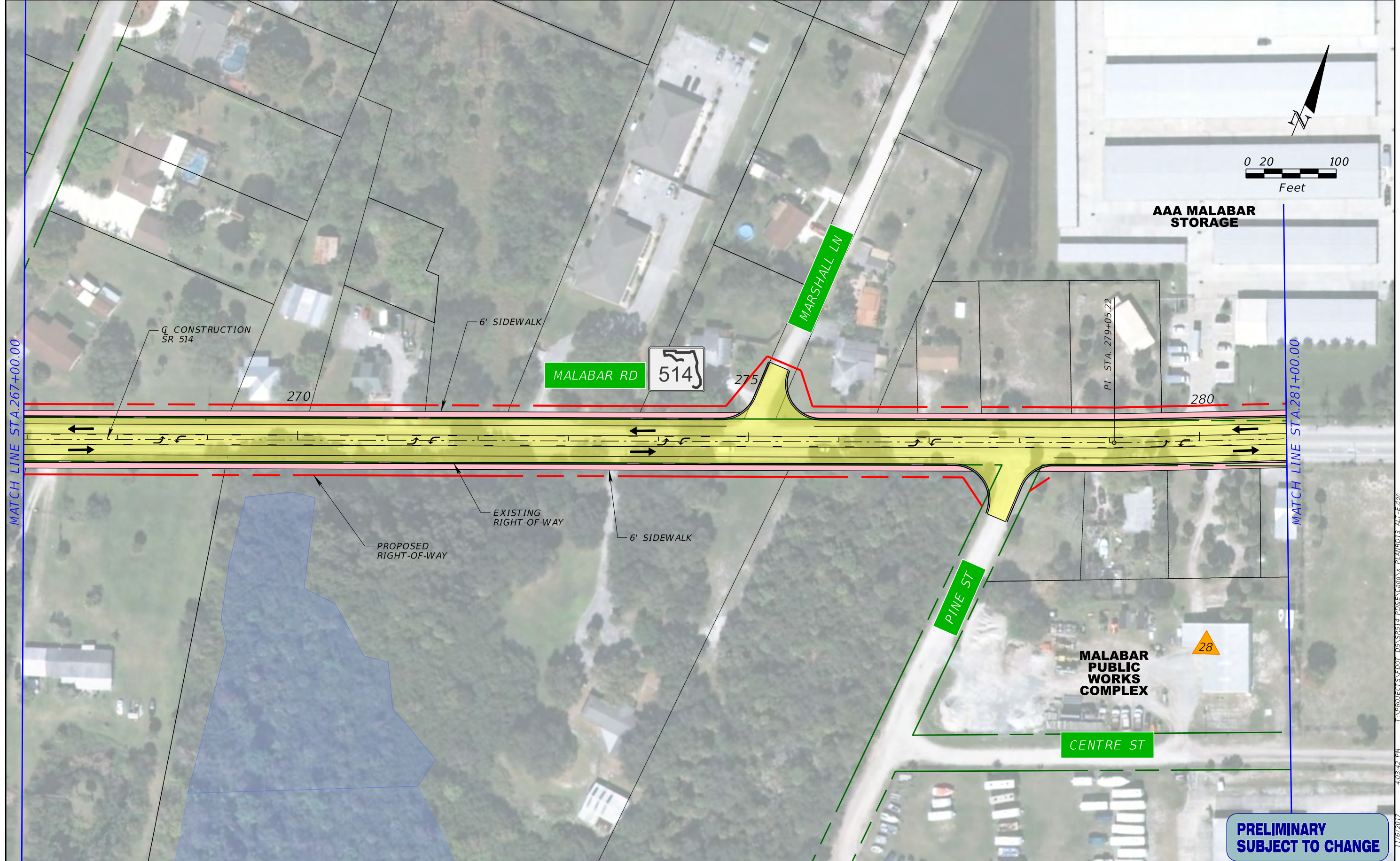
T:\PROJECTS\FDOT_D5\SR514 PD&E\Cadd\PLANRD12_ALT-E.dgn

T:\PROJECTS\FDOT_D5\SR514 PD&E\Cadd\PLANRD12_ALT-E.dgn 11/6/2017 4:03:37 PM sch2087



MATCH LINE STA.267+00.00

MATCH LINE STA.281+00.00



**PRELIMINARY
SUBJECT TO CHANGE**

	CENTERLINE OF CONSTRUCTION		POTENTIAL CONTAMINATION SITE		CONSERVATION LAND		EXISTING PAVEMENT
	EXISTING ROW		RESIDENTIAL RELOCATION		WETLAND		PROPOSED PAVEMENT
	PROPOSED ROW		BUSINESS RELOCATION		100 YR. FLOODPLAINS		PROPOSED MEDIAN
	PARCEL BOUNDARY		EXISTING TRAFFIC SIGNAL		TRANSMISSION LINE		PROPOSED SIDEWALK
	CITY LIMITS				POWER POLE		

ATKINS
 Douglas J. Reed, P.E. # 49291
 482 South Keller Road Orlando, FL 32810
 (407) 647-7275 www.atkinsglobal.com
 Certificate of Authorization No. 24

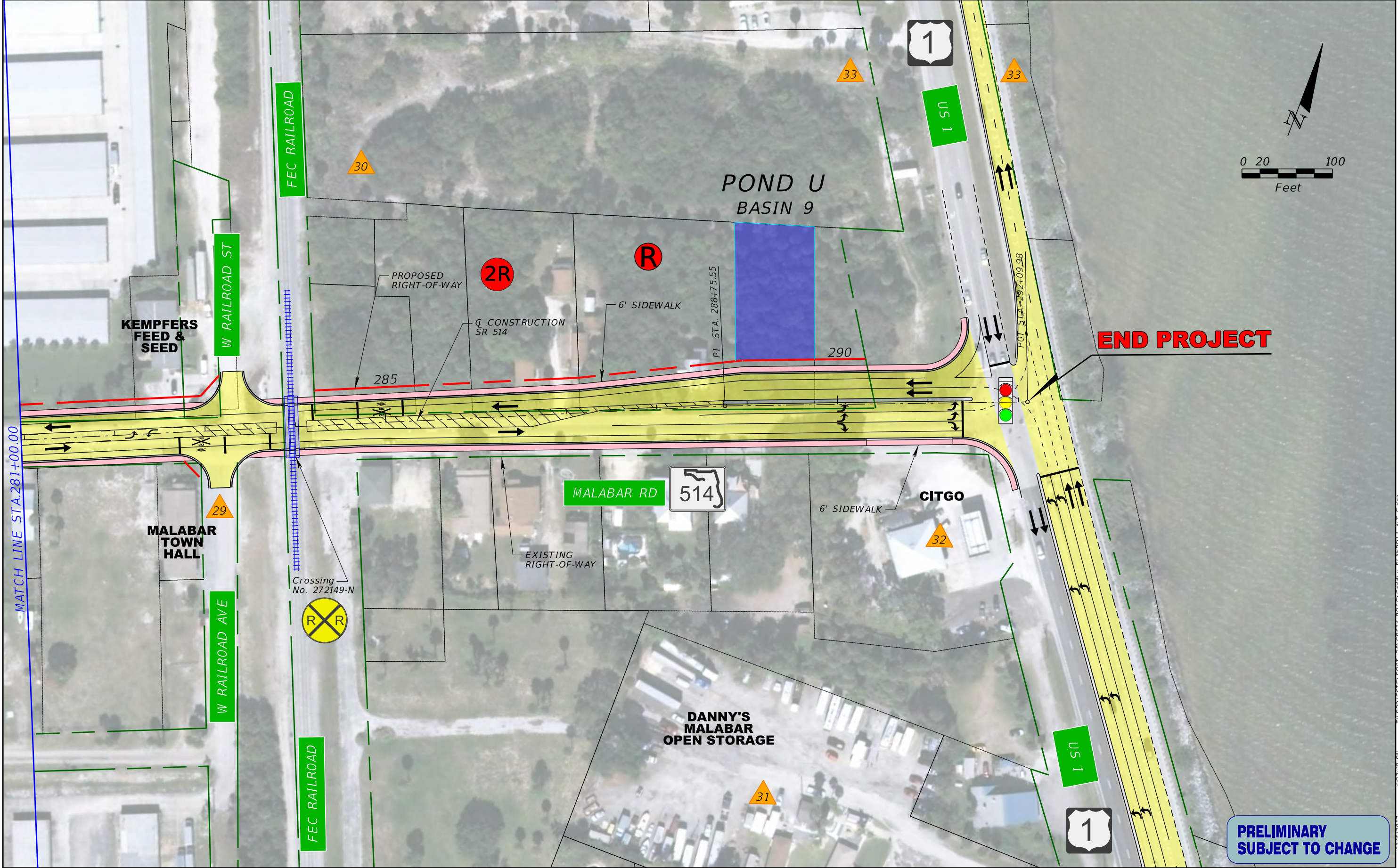
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 514	BREVARD	430136-1-22-01

**MALABAR ROAD (SR514) PD&E
RECOMMENDED ALTERNATIVE**

SHEET NO.
13

sch2087

T:\PROJECTS\FDOT_D5\SR514 PD&E\Cadd\PLANRD13_ALT-E.dgn 11/6/2017 4:03:42 PM sch2087



100' --- CENTERLINE OF CONSTRUCTION	▲ POTENTIAL CONTAMINATION SITE	▨ CONSERVATION LAND	▨ EXISTING PAVEMENT
--- EXISTING ROW	Ⓡ RESIDENTIAL RELOCATION	▨ WETLAND	▨ PROPOSED PAVEMENT
--- PROPOSED ROW	Ⓡ BUSINESS RELOCATION	▨ 100 YR. FLOODPLAINS	▨ PROPOSED MEDIAN
--- PARCEL BOUNDARY	Ⓡ EXISTING TRAFFIC SIGNAL	▨ TRANSMISSION LINE	▨ PROPOSED SIDEWALK
--- CITY LIMITS		▨ POWER POLE	

ATKINS
 Douglas J. Reed, P.E. # 49291
 482 South Keller Road Orlando, FL 32810
 (407) 647-7275 www.atkinsglobal.com
 Certificate of Authorization No. 24

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 514	BREVARD	430136-1-22-01

**MALABAR ROAD (SR514) PD&E
 RECOMMENDED ALTERNATIVE**

SHEET NO.
14

sch2087

T:\PROJECTS\FDOT_D5\SR514 PD&E\Cadd\PLANRD14_ALT-E.dgn 11/6/2017 4:03:48 PM

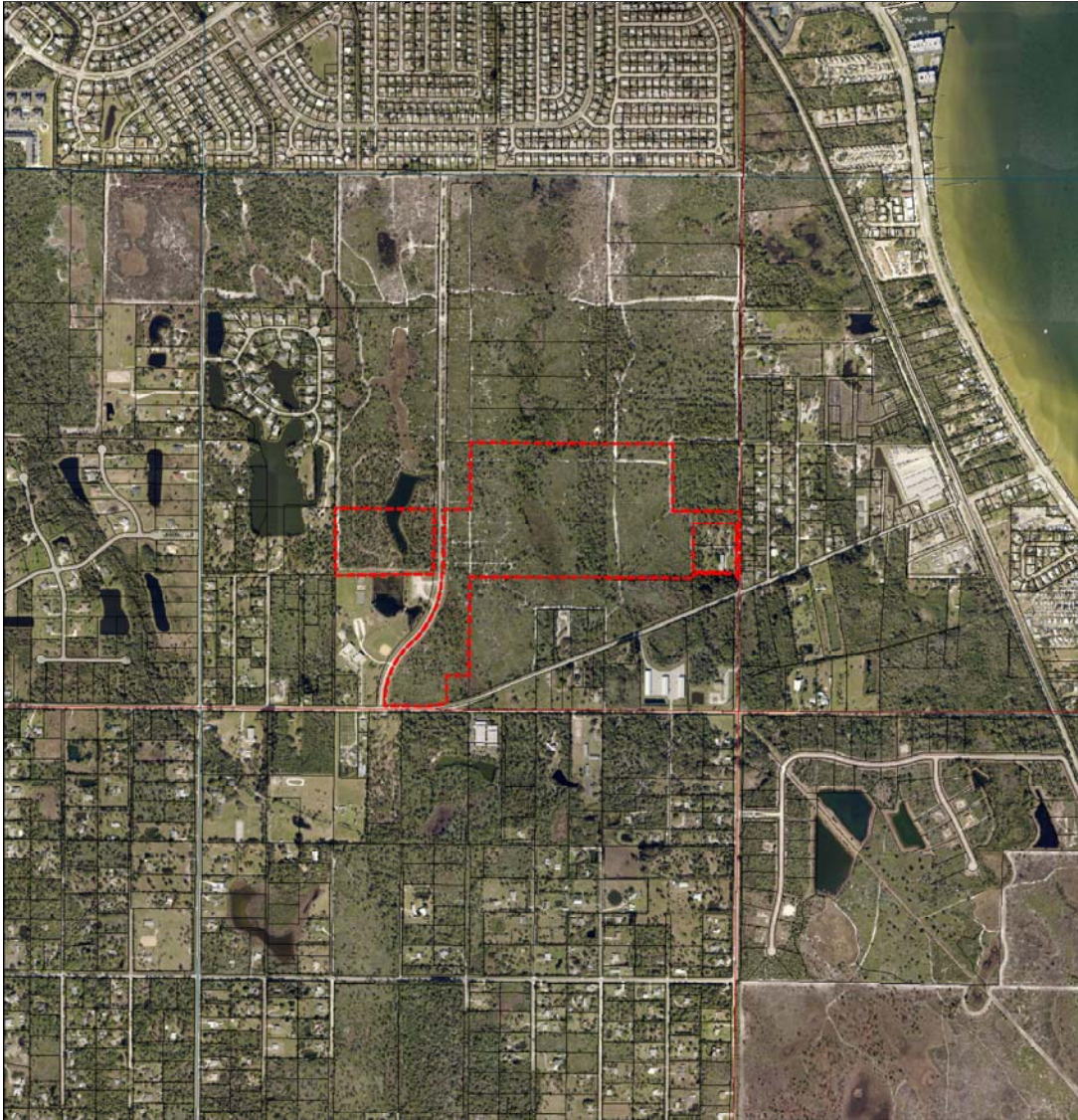
Appendix B

Property Review



Dana Blickley, CFA
Brevard County Property Appraiser

Parcel i.d. 28-37-36-00-500



North Government Complex
400 South St, 5th Floor
Titusville, FL 32780
Phone: (321) 264-6700
Fax: (321) 264-6954

Merritt Island Services Complex
2575 N Courtenay Pkwy
Merritt Island, FL 32953
Phone: (321) 454-6620
Fax: (321) 454-6618

Viera Government Center
2725 Judge Fran Jamieson Wy
Viera, FL 32940
Phone: (321) 690-6880
Fax: (321) 690-6883

South Services Complex
1515 Sarno Rd
Melbourne, FL 32935
Phone: (321) 255-4440
Fax: (321) 255-4439

Palm Bay Service Complex
450 Cogan Dr, SE
Palm Bay, FL 32909
Phone: (321) 952-4574
Fax: (321) 952-4573

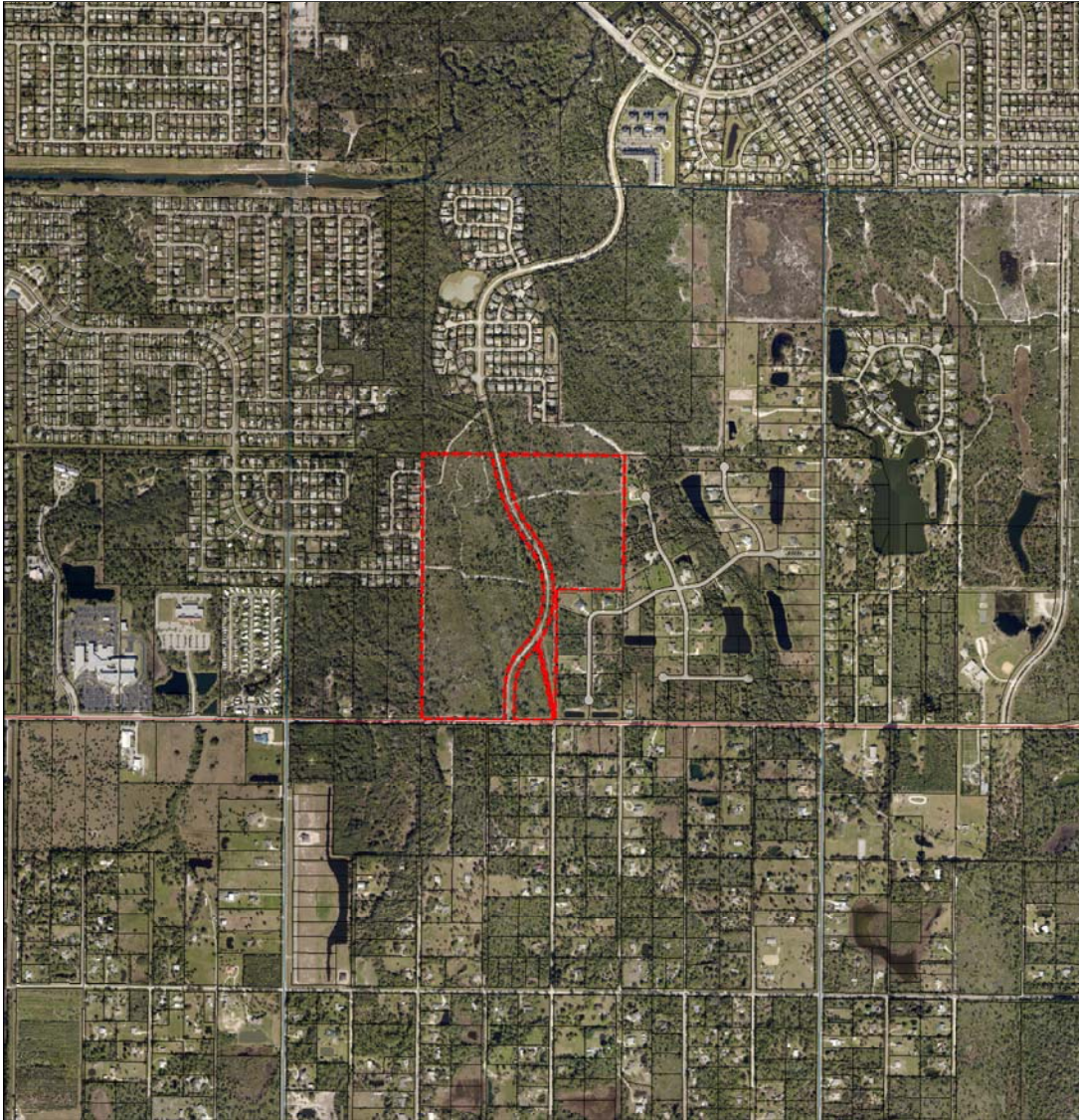
Document content intended for assessment purposes only. Not a survey. Map layers may not precisely align. Other disclaimers apply.

Printed Wednesday, November 26, 2014 at 11:05 PM. www.bcpao.us



Dana Blickley, CFA
Brevard County Property Appraiser

Parcel i.d. 28-37-35-00-500



North Government Complex
400 South St, 5th Floor
Titusville, FL 32780
Phone: (321) 264-6700
Fax: (321) 264-6954

Merritt Island Services Complex
2575 N Courtenay Pkwy
Merritt Island, FL 32953
Phone: (321) 454-6620
Fax: (321) 454-6618

Viera Government Center
2725 Judge Fran Jamieson Wy
Viera, FL 32940
Phone: (321) 690-6880
Fax: (321) 690-6883

South Services Complex
1515 Sarno Rd
Melbourne, FL 32935
Phone: (321) 255-4440
Fax: (321) 255-4439

Palm Bay Service Complex
450 Cogan Dr, SE
Palm Bay, FL 32909
Phone: (321) 952-4574
Fax: (321) 952-4573

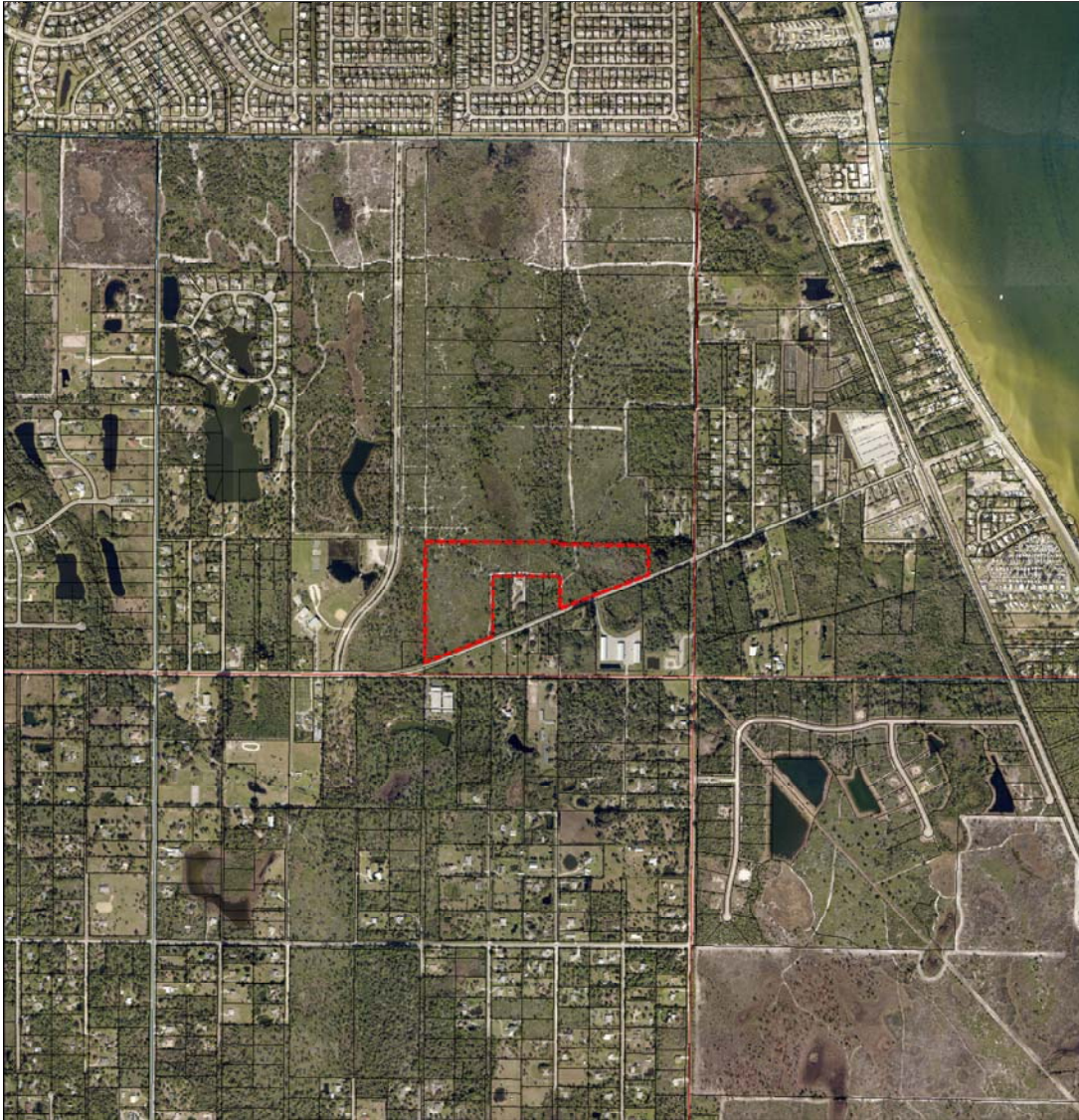
Document content intended for assessment purposes only. Not a survey. Map layers may not precisely align. Other disclaimers apply.

Printed Wednesday, November 26, 2014 at 11:08 PM. www.bcpan.us



Dana Blickley, CFA
Brevard County Property Appraiser

Parcel i.d. 28-37-36-00-754



North Government Complex
400 South St, 5th Floor
Titusville, FL 32780
Phone: (321) 264-6700
Fax: (321) 264-6954

Merritt Island Services Complex
2575 N Courtenay Pkwy
Merritt Island, FL 32953
Phone: (321) 454-6620
Fax: (321) 454-6618

Viera Government Center
2725 Judge Fran Jamieson Wy
Viera, FL 32940
Phone: (321) 690-6880
Fax: (321) 690-6883

South Services Complex
1515 Sarno Rd
Melbourne, FL 32935
Phone: (321) 255-4440
Fax: (321) 255-4439

Palm Bay Service Complex
450 Cogan Dr, SE
Palm Bay, FL 32909
Phone: (321) 952-4574
Fax: (321) 952-4573

Document content intended for assessment purposes only. Not a survey. Map layers may not precisely align. Other disclaimers apply.

Printed Wednesday, November 26, 2014 at 11:09 PM. www.bcpao.us

1 : 8,000



Dana Blickley, CFA
Brevard County Property Appraiser

Parcel i.d. 28-37-36-00-503



North Government Complex
400 South St, 5th Floor
Titusville, FL 32780
Phone: (321) 264-6700
Fax: (321) 264-6954

Merritt Island Services Complex
2575 N Courtenay Pkwy
Merritt Island, FL 32953
Phone: (321) 454-6620
Fax: (321) 454-6618

Viera Government Center
2725 Judge Fran Jamieson Wy
Viera, FL 32940
Phone: (321) 690-6880
Fax: (321) 690-6883

South Services Complex
1515 Sarno Rd
Melbourne, FL 32935
Phone: (321) 255-4440
Fax: (321) 255-4439

Palm Bay Service Complex
450 Cogan Dr, SE
Palm Bay, FL 32909
Phone: (321) 952-4574
Fax: (321) 952-4573

Document content intended for assessment purposes only. Not a survey. Map layers may not precisely align. Other disclaimers apply.

Printed Wednesday, November 26, 2014 at 11:13 PM. www.bcpao.us

1 : 4,000



Dana Blickley, CFA
Brevard County Property Appraiser

Parcel i.d. 28-37-34-00-503



North Government Complex
400 South St. 5th Floor
Titusville, FL 32780
Phone: (321) 264-6700
Fax: (321) 264-6954

Merritt Island Services Complex
2575 N Courtenay Pkwy
Merritt Island, FL 32953
Phone: (321) 454-6620
Fax: (321) 454-6618

Viera Government Center
2725 Judge Fran Jamieson Wy
Viera, FL 32940
Phone: (321) 690-6880
Fax: (321) 690-6883

South Services Complex
1515 Sarno Rd
Melbourne, FL 32935
Phone: (321) 255-4440
Fax: (321) 255-4439

Palm Bay Service Complex
450 Cogan Dr, SE
Palm Bay, FL 32909
Phone: (321) 952-4574
Fax: (321) 952-4573

Document content intended for assessment purposes only. Not a survey. Map layers may not precisely align. Other disclaimers apply.
Printed Wednesday, November 26, 2014 at 11:24 PM. www.bcpao.us



Dana Blickley, CFA
 Brevard County Property Appraiser

Parcel i.d. 29-37-02-00-72



North Government Complex
 400 South St, 5th Floor
 Titusville, FL 32780
 Phone: (321) 264-6700
 Fax: (321) 264-6954

Merritt Island Services Complex
 2575 N Courtenay Pkwy
 Merritt Island, FL 32953
 Phone: (321) 454-6620
 Fax: (321) 454-6618

Viera Government Center
 2725 Judge Fran Jamieson Wy
 Viera, FL 32940
 Phone: (321) 690-6880
 Fax: (321) 690-6883

South Services Complex
 1515 Sarno Rd
 Melbourne, FL 32935
 Phone: (321) 255-4440
 Fax: (321) 255-4439

Palm Bay Service Complex
 450 Cogan Dr, SE
 Palm Bay, FL 32909
 Phone: (321) 952-4574
 Fax: (321) 952-4573

Document content intended for assessment purposes only. Not a survey. Map layers may not precisely align. Other disclaimers apply.

Printed Wednesday, November 26, 2014 at 11:17 PM. www.bcpao.us



Dana Blickley, CFA
Brevard County Property Appraiser

Parcel i.d. 28-37-36-00-510



North Government Complex
400 South St, 5th Floor
Titusville, FL 32780
Phone: (321) 264-6700
Fax: (321) 264-6954

Merritt Island Services Complex
2575 N Courtenay Pkwy
Merritt Island, FL 32953
Phone: (321) 454-6620
Fax: (321) 454-6618

Viera Government Center
2725 Judge Fran Jamieson Wy
Viera, FL 32940
Phone: (321) 690-6880
Fax: (321) 690-6883

South Services Complex
1515 Sarno Rd
Melbourne, FL 32935
Phone: (321) 255-4440
Fax: (321) 255-4439

Palm Bay Service Complex
450 Cogan Dr, SE
Palm Bay, FL 32909
Phone: (321) 952-4574
Fax: (321) 952-4573

Document content intended for assessment purposes only. Not a survey. Map layers may not precisely align. Other disclaimers apply.

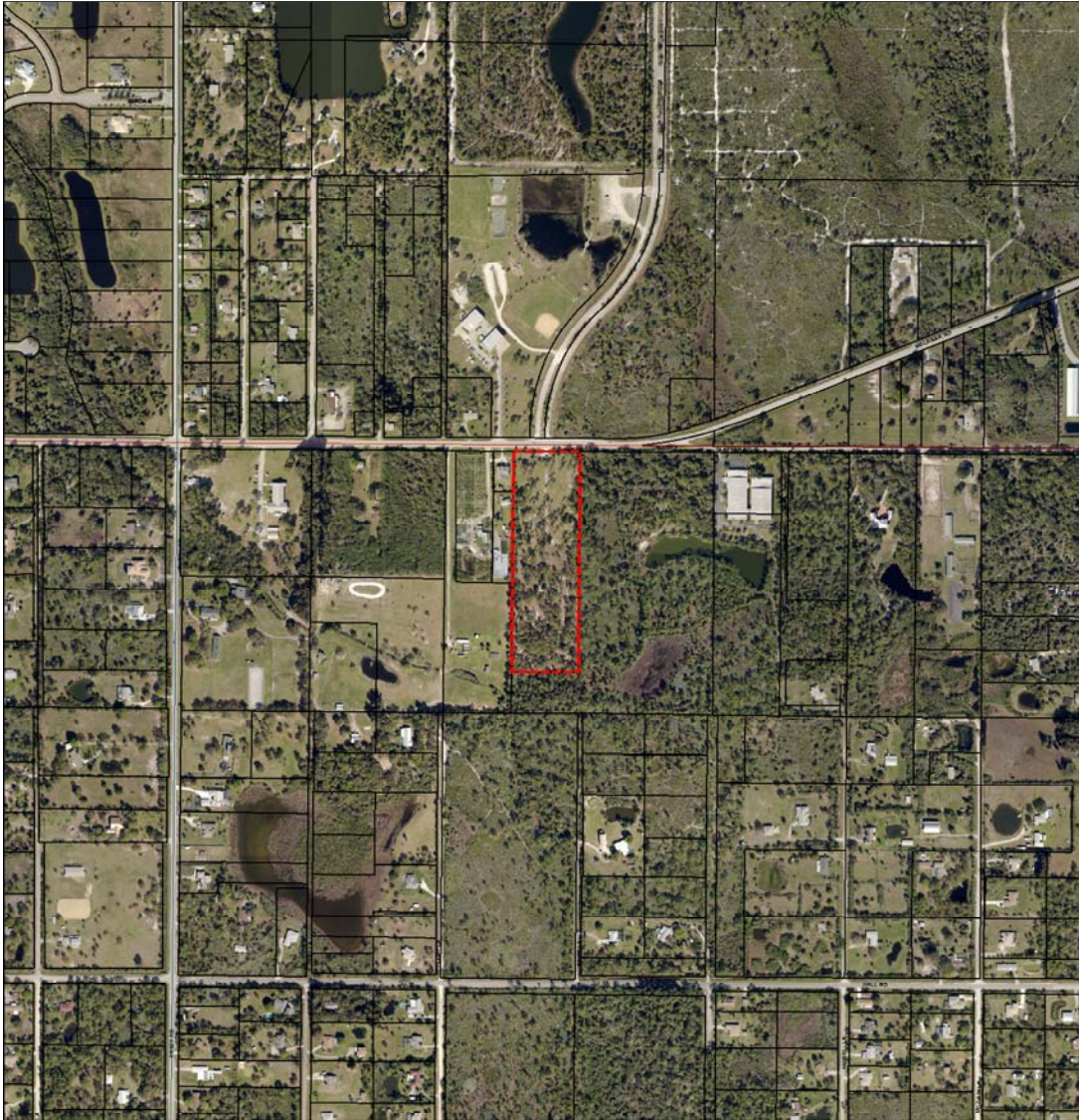
Printed Wednesday, November 26, 2014 at 11:20 PM. www.bcpao.us

1 : 4,000



Dana Blickley, CFA
Brevard County Property Appraiser

Parcel i.d. 29-37-01-00-251



North Government Complex
400 South St, 5th Floor
Titusville, FL 32780
Phone: (321) 264-6700
Fax: (321) 264-6954

Merritt Island Services Complex
2575 N Courtenay Pkwy
Merritt Island, FL 32953
Phone: (321) 454-6620
Fax: (321) 454-6618

Viera Government Center
2725 Judge Fran Jamieson Wy
Viera, FL 32940
Phone: (321) 690-6880
Fax: (321) 690-6883

South Services Complex
1515 Sarno Rd
Melbourne, FL 32935
Phone: (321) 255-4440
Fax: (321) 255-4439

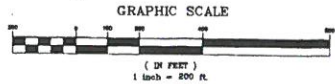
Palm Bay Service Complex
450 Cogan Dr, SE
Palm Bay, FL 32909
Phone: (321) 952-4574
Fax: (321) 952-4573

Document content intended for assessment purposes only. Not a survey. Map layers may not precisely align. Other disclaimers apply.

Printed Wednesday, November 26, 2014 at 11:21 PM. www.bcpao.us

STILLWATER PRESERVE SUBDIVISION

A REPLAT OF PORTIONS OF LOTS 1, 2, 3, 4, 14, 15, AND 16 FLORIDA INDIAN RIVER LAND COMPANY, PLAT BOOK 1, PAGE 164 A SUBDIVISION LYING IN SECTION 35 TOWNSHIP 28 SOUTH, RANGE 37 EAST, TOWN OF MALABAR, BREVARD COUNTY, FLORIDA



NOTICE: THIS PLAT, AS RECORDED IN ITS GRAPHIC FORM, IS THE OFFICIAL DEPICTION OF THE SUBDIVIDED LANDS DESCRIBED HEREIN AND WILL, IN NO CIRCUMSTANCES BE SUPPLANTED IN AUTHORITY BY ANY OTHER GRAPHIC OR DIGITAL FORM OF PLAT.

LEGAL DESCRIPTION
PORTIONS OF LOTS 1, 2, 3, 14, 15, AND 16, SECTION 35, TOWNSHIP 28 SOUTH, RANGE 37 EAST, FLORIDA INDIAN RIVER LAND COMPANY SUBDIVISION, ACCORDING TO THE PLAT THEREOF AS RECORDED IN PLAT BOOK 1, PAGE 164, PUBLIC RECORDS OF BREVARD COUNTY, FLORIDA.

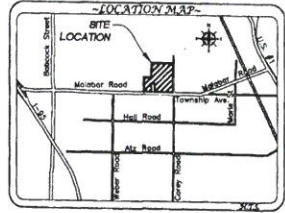
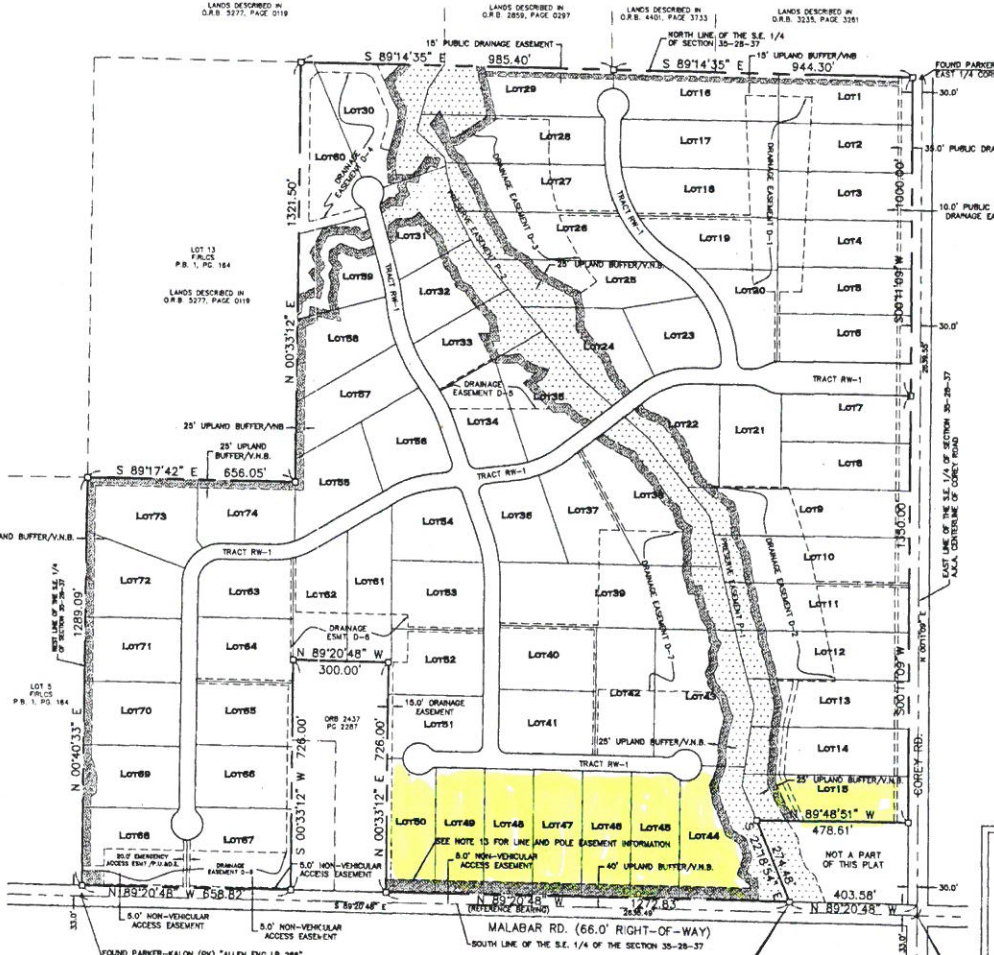
LESS AND EXCEPT THE SOUTH 728 FEET OF THE WEST 300 FEET OF LOT 3, SECTION 35, TOWNSHIP 28 SOUTH, RANGE 37 EAST, FLORIDA INDIAN RIVER LAND COMPANY SUBDIVISION, ACCORDING TO THE PLAT THEREOF AS RECORDED IN PLAT BOOK 1, PAGE 164, PUBLIC RECORDS OF BREVARD COUNTY, FLORIDA, SUBJECT TO RIGHT-OF-WAY OF MALABAR ROAD, FORMERLY KNOWN AS STATE ROAD 191 AND NOW DESIGNATED AS STATE ROAD 514.

TOGETHER WITH LOT 4, SECTION 35, TOWNSHIP 28 SOUTH, RANGE 37 EAST, FLORIDA INDIAN RIVER LAND COMPANY SUBDIVISION, ACCORDING TO THE PLAT THEREOF AS RECORDED IN PLAT BOOK 1, PAGE 164, PUBLIC RECORDS OF BREVARD COUNTY, FLORIDA, LESS AND EXCEPT STATE ROAD RIGHT-OF-WAY.

MORE PARTICULARLY DESCRIBED AS FOLLOWS: COMMENCE FROM THE SOUTHWEST CORNER OF SECTION 35, TOWNSHIP 28 SOUTH, RANGE 37 EAST, THENCE RUN NORTH 11°10'10" E A DISTANCE OF 33.00 FEET, THENCE RUN N89°20'48" W A DISTANCE OF 603.50 FEET TO THE POINT OF BEGINNING, THENCE RUN N89°20'48" W A DISTANCE OF 1722.83 FEET, THENCE RUN N00°32'12" E A DISTANCE OF 728.00 FEET, THENCE RUN N89°20'48" W A DISTANCE OF 300.00 FEET, THENCE RUN S00°32'12" W A DISTANCE OF 728.00 FEET, THENCE RUN N89°20'48" W A DISTANCE OF 658.82 FEET, THENCE RUN N00°45'32" E A DISTANCE OF 1288.00 FEET, THENCE RUN S89°17'42" E A DISTANCE OF 658.05 FEET, THENCE RUN N00°32'12" E A DISTANCE OF 1321.50 FEET, TO THE NORTH LINE OF THE SOUTHWEST 1/4 OF SECTION 35, TOWNSHIP 28 SOUTH, RANGE 37 EAST, THENCE RUN S89°14'35" E A DISTANCE OF 1628.70 FEET ALONG SAID LINE, THENCE RUN S00°32'12" W A DISTANCE OF 2330.00 FEET, THENCE RUN N89°49'51" W A DISTANCE OF 478.81 FEET, THENCE RUN S22°18'54" E A DISTANCE OF 374.48 FEET TO THE POINT OF BEGINNING.

SURVEYOR'S NOTES:

- A STRIP OF LAND 10 FEET IN WIDTH IS HEREBY DEDICATED ALONG, PARALLEL WITH AND ADJACENT TO TRACT RW-1 FOR THE INSTALLATION AND MAINTENANCE OF PUBLIC UTILITIES AND SIDEWALK DRIVEWAY ACCESS IS PERMITTED OVER AND ADJACENT SAID EASEMENT.
- A STRIP OF LAND 7.5 FEET IN WIDTH IS HEREBY DEDICATED ALONG ALL INTERIOR SIDE LOT LINES FOR THE INSTALLATION AND MAINTENANCE OF PUBLIC UTILITIES AND DRAINAGE, UNLESS OTHERWISE NOTED.
- ALL OTHER EASEMENTS ARE AS DEPICTED.
- TRACT RW-1 IS HEREBY DEDICATED AS A PRIVATE ROAD RIGHT OF WAY, HOWEVER, AN EGRESS OVER SAID TRACT RW-1 WILL ALSO BE PROVIDED FOR EMERGENCY UTILITY AND MAINTENANCE PURPOSES. SAID TRACT WILL BE MAINTAINED BY THE STILLWATER PRESERVE HOMEOWNERS ASSOCIATION.
- DRAINAGE EASEMENTS D-1, D-2, D-3, D-4, D-5, D-6, D-7, D-8 ARE HEREBY DEDICATED AND SHALL BE MAINTAINED BY THE STILLWATER PRESERVE HOMEOWNERS ASSOCIATION.
- PRESERVE EASEMENTS P-1 AND P-2 AND THEIR ASSOCIATED UPLAND BUFFERS/VEGETATIVE NATURAL BUFFERS SHOWN HEREON SHALL BEIN AND REFER TO ALL SUCH PROPERTY SO DESIGNATED ON THIS PLAT. THE PURPOSE OF THE PRESERVE TRACTS AND CONSERVATION EASEMENTS IS THAT THE AREAS WILL BE RETAINED FOREVER IN THEIR EXISTING NATURAL CONDITIONS AND TO PREVENT ANY USE OF THESE AREAS THAT WILL IMPAIR OR INTERFERE WITH THE ENVIRONMENTAL VALUE OF THESE AREAS. PRESERVE EASEMENTS P-1, P-2 AND THEIR ASSOCIATED UPLAND BUFFERS/VEGETATIVE NATURAL BUFFERS SHOWN HEREON ARE SUBJECT TO A CONSERVATION EASEMENT IN FAVOR OF THE ST. JOHN'S RIVER WATER MANAGEMENT DISTRICT PURSUANT TO SECTION 704.06, FLORIDA STATUTES. THE DEVELOPER RESERVES THE RIGHT TO ACCESS THESE AREAS FOR THE PURPOSES OF THE INSTALLATION AND MAINTENANCE OF THE DRAINAGE DUTIFUL SYSTEM. NO VEHICULAR OR EQUESTRIAN DRIVEWAY ACCESS SHALL BE ALLOWED OVER VEGETATIVE NATURAL BUFFERS.
- ALL PLATTED PUBLIC UTILITY EASEMENTS DEDICATED HEREON SHALL BE FOR THE INSTALLATION, CONSTRUCTION, MAINTENANCE AND REPAIR OF CABLE TELEVISION SERVICES. PROVIDED HOWEVER, NO SUCH CONSTRUCTION, INSTALLATION, MAINTENANCE AND REPAIR OF CABLE TELEVISION SERVICES SHALL INTERFERE WITH THE FACILITIES AND SERVICES OF AN ELECTRIC, GAS, TELEPHONE OR OTHER PUBLIC UTILITY. IN THE EVENT OF CABLE TELEVISION COMPANY DAMAGES THE FACILITIES OF A PUBLIC UTILITY, IT SHALL BE SOLELY RESPONSIBLE FOR DAMAGES.
- NOTICE: THERE MAY BE ADDITIONAL RESTRICTIONS THAT ARE NOT RECORDED ON THIS PLAT THAT MAY BE FOUND IN THE PUBLIC RECORDS OF BREVARD COUNTY, FLORIDA.
- THE PURPOSE OF THE NON-VEHICULAR ACCESS EASEMENT AS SHOWN ON THE SOUTHWEST CORNER OF SECTION 35, TOWNSHIP 28 SOUTH, RANGE 37 EAST, IS TO PROVIDE AN EGRESS TO AND FROM THE RIGHT-OF-WAY OF MALABAR ROAD. THE PURPOSE OF THIS EGRESS IS TO PROVIDE ACCESS TO THE INSTALLATION AND MAINTENANCE OF THE DRAINAGE EASEMENT AND ROAD/SIDEWALK AREA.
- REMARKS HEREON ARE REFERRED TO AN ASSAILED VALUE OF \$ 8 PER ACRE FOR THE SOUTH LINE OF THE SE 1/4 OF SECTION 35 T88S R37E.
- LOTS 44-80, 87 AND 88 ARE SUBJECT TO A LINE AND POLE EASEMENT IN FAVOR OF FLORIDA POWER AND LIGHT COMPANY AS RECORDED IN D.B.E. 1344 PAGE 5A, PUBLIC RECORDS OF BREVARD COUNTY, FLORIDA.
- NO BUILDINGS OR ANY KIND OF CONSTRUCTION OR TREES OR SHRUBS SHALL BE PLACED ON PUBLIC EASEMENTS WITHOUT WRITTEN APPROVAL OF THE TOWN BOARD.



PLAT BOOK 52 PAGE 100
SHEET 1 OF 5
SECTION 35 TWP. 28 S., RANGE 37 E.

DEDICATION
KNOW ALL MEN BY THESE PRESENTS THAT THE CORPORATION NAMED BELOW, BEING OWNER IN FEE, SAMPLE OF THE LANDS DESCRIBED IN
STILLWATER PRESERVE SUBDIVISION
HEREBY DEDICATES TO THE PUBLIC FOR THE PERPETUAL USE OF THE PUBLIC ALL DRAINAGE AND UTILITY EASEMENTS NOTED AS PUBLIC, SIDEWALK EASEMENTS NOTED AS PUBLIC AND AN EASEMENT GRANTED TO ACCESS FOR EMERGENCY VEHICLES, NO OTHER EASEMENTS OR GRANTED TO THE PUBLIC. IT IS THE INTENTION OF THE UNDERSIGNED THAT ALL STREETS AND OTHER EASEMENTS AND COMMON AREAS BE PRIVATELY OWNED AND MAINTAINED FOR THE STILLWATER PRESERVE SUBDIVISION ONLY AND THAT THE PUBLIC AND THE TOWN OF MALABAR HAVE NO INTEREST THEREIN, UNLESS OTHERWISE NOTED.

FOR JOINDERS IN DEDICATION SEE O.R.B. 5447 PAGE 3723
O.R.B. 3297 PAGE 3722
O.R.B. _____ PAGE _____
OF THE PUBLIC RECORDS OF BREVARD COUNTY, FLORIDA.

IN WITNESS WHEREOF, THE BELOW NAMED CORPORATION HAS CAUSED THESE PRESENTS TO BE SIGNED AND ATTESTED TO BY ITS OFFICERS NAMED BELOW AND ITS CORPORATE SEAL TO BE AFFIXED HERETO ON:
DATE: March 23, 2005

STILLWATER HOLDING COMPANY, LLC
304 N. HARBOR CITY BLVD.
MELBOURNE, FL 32935
BY: C. Douglas Engle
C. DOUGLAS ENGLE

STEVEN J. MORGAN
STATE OF FLORIDA, COUNTY OF BREVARD
THIS IS TO CERTIFY THAT ON March 23, 2005
BEFORE ME, AN OFFICER DULY AUTHORIZED TO TAKE ACKNOWLEDGMENTS IN THE STATE AND COUNTY AFORESAID, PERSONALLY APPEARED:
C. DOUGLAS ENGLE / STEVEN J. MORGAN

RESPECTIVELY AS MANAGING PARTNERS OF THE ABOVE NAMED CORPORATION, INCORPORATED UNDER THE LAWS OF THE STATE OF FLORIDA TO USE, KNOWING TO BE THE INDIVIDUALS AND OFFICERS DESCRIBED IN AND WHO EXECUTED THE FOREGOING DEDICATION AND SEVERALLY ACKNOWLEDGED THE EXECUTION THEREOF TO BE THEIR FREE ACT AND AS SUCH OFFICERS THEREAFTER DULY AUTHORIZED THAT THE OFFICIAL SEAL OF SAID CORPORATION IS DULY AFFIXED HERETO AND THAT THE SAID DEDICATION IS THE ACT AND DEED OF SAID CORPORATION.

IN WITNESS WHEREOF, I HAVE SET MY HAND AND SEAL ON THE ABOVE DATE.
NOTARY PUBLIC: _____
MY COMMISSION EXPIRES: _____

CERTIFICATE OF SURVEYOR
KNOW ALL MEN BY THESE PRESENTS THAT THE UNDERSIGNED, BEING A LICENSED AND REGISTERED SURVEYOR AND MAPPER, DOES HEREBY CERTIFY SHOWN ON THE FOREGOING PLAT AND THAT SAID PLAT WAS PREPARED UNDER HIS DIRECTION AND SUPERVISION AND THAT SAID PLAT COMPLES WITH ALL THE SURVEY REQUIREMENTS OF CHAPTER 177, PART 1, FLORIDA STATUTES, AND THAT SAID LAND IS LOCATED IN BREVARD COUNTY, FLORIDA.
DATE: 3-23-05

CHRISTOPHER S. BOWERS, P.S.M.
REGISTERED FLORIDA SURVEYOR & MAPPER
FOR: MORGAN & ASSOC. CONSULTING ENGINEERS, INC.
304 N. HARBOR CITY BLVD.
MELBOURNE, FLORIDA 32935
FLORIDA (321) 751-6089
FLORIDA COUNCIL OF SURVEYORS CERTIFICATE #7040

CERTIFICATE OF APPROVAL BY MUNICIPALITY
THIS IS TO CERTIFY THAT ON:
THE COUNCIL OF THE TOWN OF MALABAR, FLORIDA APPROVED THE FOREGOING PLAT.
MAYOR: Thomas Washburn
ATTY: _____
CITY CLERK: Susan Kabana

CERTIFICATE OF REVIEWING ATTORNEY FOR THE TOWN OF MALABAR
I HEREBY CERTIFY THAT I HAVE REVIEWED THE FOREGOING PLAT AND FIND THAT IT IS IN CONFORMITY WITH THE TOWN OF MALABAR CODE OF ORDINANCES.
William Stearnson
WILLIAM H. STEARNSON, JR., P.A.
FLORIDA REGISTRATION #21638

CERTIFICATE OF REVIEWING ENGINEER FOR THE TOWN OF MALABAR
I HEREBY CERTIFY THAT I HAVE REVIEWED THE FOREGOING PLAT AND FIND THAT IT IS IN CONFORMITY WITH THE TOWN OF MALABAR CODE OF ORDINANCES.
William Stearnson
WILLIAM H. STEARNSON, JR., P.A.
FLORIDA REGISTRATION #21638

CERTIFICATE OF REVIEWING SURVEYOR FOR THE TOWN OF MALABAR
I HEREBY CERTIFY THAT I HAVE REVIEWED THE FOREGOING PLAT AND FIND THAT IT IS IN CONFORMITY WITH CHAPTER 177, PART 1, FLORIDA STATUTES.
Christopher S. Bowers
CHRISTOPHER S. BOWERS, P.S.M. REGISTERED FLORIDA SURVEYOR & MAPPER #5057

CERTIFICATE OF CLERK
I HEREBY CERTIFY THAT I HAVE EXAMINED THE FOREGOING PLAT AND FIND THAT IT COMPLES, IN FORM, WITH ALL THE REQUIREMENTS OF CHAPTER 177, FLORIDA STATUTES, AND WAS FILED FOR RECORD ON:
4/6/2005
Scott Ellis
CLERK OF CIRCUIT COURT, BREVARD COUNTY, FLORIDA



- LEGEND**
- 4" x 4" CONCRETE MONUMENT (SET) WITH NAIL & DISK STAMPED "TOP PSM 5960"
 - △ = NAIL AND DISK (SET) STAMPED "TOP PSM 5960"
 - CH = CURVE NUMBER FOR CURVE TABLE
 - ESM = LINE NUMBER FOR LINE TABLE
 - PT = POINT-OF-TANGENCY
 - PI = POINT-OF-INTERSECTION
 - POC = POINT-OF-CURVATURE
 - POL = POINT-ON-LINE
 - PC = PERMANENT CONTROL POINT
 - PLS = PROFESSIONAL LAND SURVEYOR
 - PRC = POINT-OF-REVERSE CURVATURE
 - PRM = PERMANENT REFERENCE MONUMENT
 - PSM = PROFESSIONAL SURVEYOR & MAPPER
 - P.U.B.E. = PUBLIC UTILITIES AND DRAINAGE EASEMENT
 - RP = RADIIUS POINT
 - R/W = RIGHT-OF-WAY
 - SEC = SECTION
 - V.N.B. = VEGETATIVE NATURAL BUFFER
 - A.S. = ALSO KNOWN AS
 - O.R.B. = OFFICIAL RECORD BOOK
 - L = LENGTH
 - TAN = TANGENT
 - D = DIAMETER
 - R = RADIIUS

Prepared By:
MORGAN & Associates
Consulting Engineers, Inc.
304 N Harbor City Blvd Melbourne, FL 32935
Phone (321) 751-6089 Fax (321) 751-6089
L.B. # 7040
Prepared By: Christopher S. Bowers P.S.M. #5990

P.O.B.

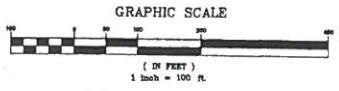
P.O.C.

FOUND PARKER-KALON (PK) PLS 4210"
S.E. CORNER OF SECTION 35-28-37

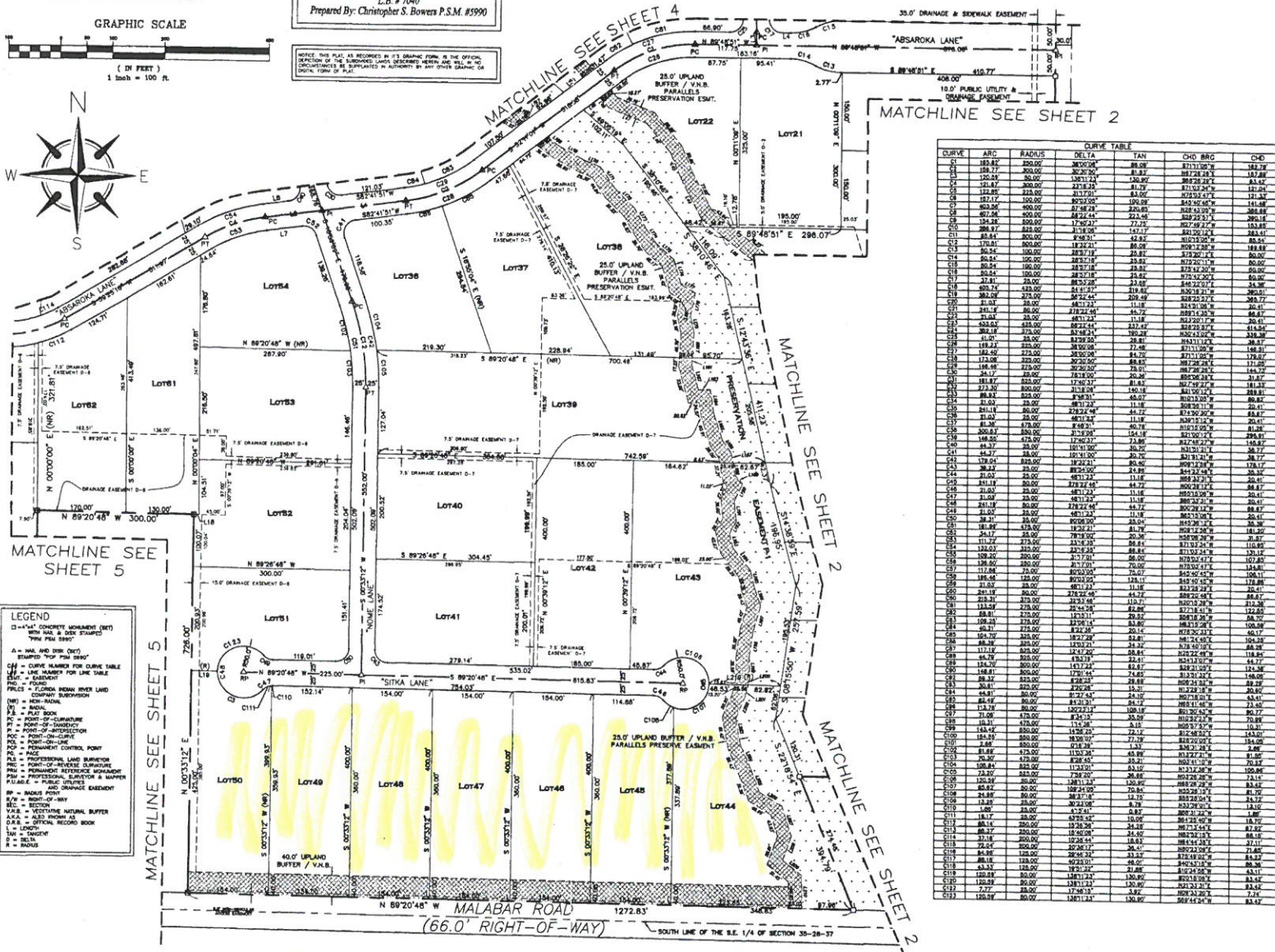
STILLWATER PRESERVE SUBDIVISION

A REPLAT OF PORTIONS OF LOTS 1, 2, 3, 4, 14, 15, AND 16
 FLORIDA INDIAN RIVER LAND COMPANY, PLAT BOOK 1, PAGE 164
 A SUBDIVISION LYING IN SECTION 35
 TOWNSHIP 28 SOUTH, RANGE 37 EAST,
 TOWN OF MALABAR, BREVARD COUNTY, FLORIDA

Prepared By:
MORGAN & Associates
 Consulting Engineers, Inc.
 504 N. Harbor City Blvd. Melbourne, FL 32955
 Phone (321) 751-6088 Fax (321) 751-6089
 L.B. # 7040
 Prepared By: Christopher S. Bowers P.S.M. #5990



NOTICE: THIS PLAN AS SUBMITTED IN ITS ORIGINAL FORM, AND THE OFFICIAL RECORDATION OF THE SUBDIVISION LIES WITHIN THE PUBLIC RECORDS OF BREVARD COUNTY, FLORIDA. ANY CHANGES OR AMENDMENTS TO THIS PLAN MUST BE RECORDED IN THE PUBLIC RECORDS OF BREVARD COUNTY, FLORIDA.



CURVE	ARC	RADIUS	DELTA	TAN	CHD BRG	CHD
C1	189.82	200.00	380.00	88.00	87.1150°	182.70
C2	189.17	200.00	380.00	87.87	87.1150°	182.70
C3	190.24	200.00	380.00	88.00	87.2828°	182.70
C4	189.17	200.00	380.00	87.87	87.2828°	182.70
C5	192.80	200.00	380.00	88.00	87.1150°	182.70
C6	192.80	200.00	380.00	88.00	87.2828°	182.70
C7	190.24	200.00	380.00	87.87	87.2828°	182.70
C8	189.17	200.00	380.00	87.87	87.1150°	182.70
C9	189.17	200.00	380.00	87.87	87.1150°	182.70
C10	188.87	200.00	380.00	87.71	87.1150°	182.70
C11	170.81	200.00	380.00	88.00	87.2828°	182.70
C12	185.84	200.00	380.00	88.00	87.2828°	182.70
C13	185.84	200.00	380.00	88.00	87.2828°	182.70
C14	185.84	200.00	380.00	88.00	87.2828°	182.70
C15	185.84	200.00	380.00	88.00	87.2828°	182.70
C16	185.84	200.00	380.00	88.00	87.2828°	182.70
C17	185.84	200.00	380.00	88.00	87.2828°	182.70
C18	185.84	200.00	380.00	88.00	87.2828°	182.70
C19	185.84	200.00	380.00	88.00	87.2828°	182.70
C20	185.84	200.00	380.00	88.00	87.2828°	182.70
C21	185.84	200.00	380.00	88.00	87.2828°	182.70
C22	185.84	200.00	380.00	88.00	87.2828°	182.70
C23	185.84	200.00	380.00	88.00	87.2828°	182.70
C24	185.84	200.00	380.00	88.00	87.2828°	182.70
C25	185.84	200.00	380.00	88.00	87.2828°	182.70
C26	185.84	200.00	380.00	88.00	87.2828°	182.70
C27	185.84	200.00	380.00	88.00	87.2828°	182.70
C28	185.84	200.00	380.00	88.00	87.2828°	182.70
C29	185.84	200.00	380.00	88.00	87.2828°	182.70
C30	185.84	200.00	380.00	88.00	87.2828°	182.70
C31	185.84	200.00	380.00	88.00	87.2828°	182.70
C32	185.84	200.00	380.00	88.00	87.2828°	182.70
C33	185.84	200.00	380.00	88.00	87.2828°	182.70
C34	185.84	200.00	380.00	88.00	87.2828°	182.70
C35	185.84	200.00	380.00	88.00	87.2828°	182.70
C36	185.84	200.00	380.00	88.00	87.2828°	182.70
C37	185.84	200.00	380.00	88.00	87.2828°	182.70
C38	185.84	200.00	380.00	88.00	87.2828°	182.70
C39	185.84	200.00	380.00	88.00	87.2828°	182.70
C40	185.84	200.00	380.00	88.00	87.2828°	182.70
C41	185.84	200.00	380.00	88.00	87.2828°	182.70
C42	185.84	200.00	380.00	88.00	87.2828°	182.70
C43	185.84	200.00	380.00	88.00	87.2828°	182.70
C44	185.84	200.00	380.00	88.00	87.2828°	182.70
C45	185.84	200.00	380.00	88.00	87.2828°	182.70
C46	185.84	200.00	380.00	88.00	87.2828°	182.70
C47	185.84	200.00	380.00	88.00	87.2828°	182.70
C48	185.84	200.00	380.00	88.00	87.2828°	182.70
C49	185.84	200.00	380.00	88.00	87.2828°	182.70
C50	185.84	200.00	380.00	88.00	87.2828°	182.70
C51	185.84	200.00	380.00	88.00	87.2828°	182.70
C52	185.84	200.00	380.00	88.00	87.2828°	182.70
C53	185.84	200.00	380.00	88.00	87.2828°	182.70
C54	185.84	200.00	380.00	88.00	87.2828°	182.70
C55	185.84	200.00	380.00	88.00	87.2828°	182.70
C56	185.84	200.00	380.00	88.00	87.2828°	182.70
C57	185.84	200.00	380.00	88.00	87.2828°	182.70
C58	185.84	200.00	380.00	88.00	87.2828°	182.70
C59	185.84	200.00	380.00	88.00	87.2828°	182.70
C60	185.84	200.00	380.00	88.00	87.2828°	182.70
C61	185.84	200.00	380.00	88.00	87.2828°	182.70
C62	185.84	200.00	380.00	88.00	87.2828°	182.70
C63	185.84	200.00	380.00	88.00	87.2828°	182.70
C64	185.84	200.00	380.00	88.00	87.2828°	182.70
C65	185.84	200.00	380.00	88.00	87.2828°	182.70
C66	185.84	200.00	380.00	88.00	87.2828°	182.70
C67	185.84	200.00	380.00	88.00	87.2828°	182.70
C68	185.84	200.00	380.00	88.00	87.2828°	182.70
C69	185.84	200.00	380.00	88.00	87.2828°	182.70
C70	185.84	200.00	380.00	88.00	87.2828°	182.70
C71	185.84	200.00	380.00	88.00	87.2828°	182.70
C72	185.84	200.00	380.00	88.00	87.2828°	182.70
C73	185.84	200.00	380.00	88.00	87.2828°	182.70
C74	185.84	200.00	380.00	88.00	87.2828°	182.70
C75	185.84	200.00	380.00	88.00	87.2828°	182.70
C76	185.84	200.00	380.00	88.00	87.2828°	182.70
C77	185.84	200.00	380.00	88.00	87.2828°	182.70
C78	185.84	200.00	380.00	88.00	87.2828°	182.70
C79	185.84	200.00	380.00	88.00	87.2828°	182.70
C80	185.84	200.00	380.00	88.00	87.2828°	182.70
C81	185.84	200.00	380.00	88.00	87.2828°	182.70
C82	185.84	200.00	380.00	88.00	87.2828°	182.70
C83	185.84	200.00	380.00	88.00	87.2828°	182.70
C84	185.84	200.00	380.00	88.00	87.2828°	182.70
C85	185.84	200.00	380.00	88.00	87.2828°	182.70
C86	185.84	200.00	380.00	88.00	87.2828°	182.70
C87	185.84	200.00	380.00	88.00	87.2828°	182.70
C88	185.84	200.00	380.00	88.00	87.2828°	182.70
C89	185.84	200.00	380.00	88.00	87.2828°	182.70
C90	185.84	200.00	380.00	88.00	87.2828°	182.70
C91	185.84	200.00	380.00	88.00	87.2828°	182.70
C92	185.84	200.00	380.00	88.00	87.2828°	182.70
C93	185.84	200.00	380.00	88.00	87.2828°	182.70
C94	185.84	200.00	380.00	88.00	87.2828°	182.70
C95	185.84	200.00	380.00	88.00	87.2828°	182.70
C96	185.84	200.00	380.00	88.00	87.2828°	182.70
C97	185.84	200.00	380.00	88.00	87.2828°	182.70
C98	185.84	200.00	380.00	88.00	87.2828°	182.70
C99	185.84	200.00	380.00	88.00	87.2828°	182.70
C100	185.84	200.00	380.00	88.00	87.2828°	182.70

LINE	LENGTH	BEARING
L1	18.74	S82.31°W
L2	109.57	S82.41°W
L3	25.59	N00.11°E
L4	15.07	N89.25°E
L5	87.51	N00.52°E
L6	87.51	S00.45°E
L7	68.85	S00.45°E
L8	48.17	S82.41°W
L9	24.63	N72.50°E
L10	103.56	N72.50°E
L11	4.96	N72.50°E
L12	109.69	N32.22°E
L13	30.42	N09.12°E
L14	27.85	S00.32°E
L15	55.54	N15.55°E
L16	88.17	N15.55°E
L17	10.00	N82.26°E
L18	50.00	S82.26°E
L19	15.00	S00.32°E
L20	18.13	N09.12°E
L21	125.00	N42.49°E
L22	34.84	S09.12°E
L23	139.95	N15.55°E
L24	99.35	S82.41°W
L25	25.85	N32.22°E
L26	47.87	N28.24°E
L27	83.01	N32.22°E
L28	55.11	N00.32°E
L29	55.11	N00.32°E
L30	10.28	N01.37°E
L31	55.11	N00.32°E
L32	51.18	N00.32°E
L33	32.84	N09.28°E
L34	44.28	N00.32°E
L35	44.28	N07.22°E
L36	56.89	N12.01°E
L37	56.89	N12.01°E
L38	34.80	N11.20°E
L39	56.89	N12.01°E
L40	56.89	N12.01°E
L41	7.18	N09.28°E
L42	48.63	S00.32°E
L43	45.78	S00.32°E
L44	83.26	N00.32°E
L45	45.78	S00.32°E
L46	72.83	N38.18°E
L47	45.78	S00.32°E
L48	27.85	N07.22°E
L49	39.87	N51.10°E
L50	48.63	S00.32°E
L51	38.57	N51.10°E
L52	48.63	S00.32°E
L53	48.63	S00.32°E
L54	57.78	N22.27°E
L55	80.31	N15.55°E
L56	45.78	S00.32°E
L57	48.63	S00.32°E
L58	48.63	S00.32°E
L59	87.77	N63.51°E
L60	48.63	S00.32°E
L61	48.63	S00.32°E
L62	48.63	S00.32°E
L63	48.63	S00.32°E
L64	65.50	N47.58°E
L65	28.58	N00.32°E
L66	48.63	S00.32°E
L67	48.63	S00.32°E
L68	48.63	S00.32°E
L69	48.63	S00.32°E
L70	72.85	N30.00°E
L71	50.70	N36.22°E
L72	48.63	S00.32°E
L73	15.58	N30.00°E
L74	13.76	S45.38°E
L75	32.27	S45.38°E
L76	39.10	S12.28°E
L77	17.36	N70.20°E
L78	120.53	N70.20°E
L79	0.99	N12.28°E
L80	60.17	N12.28°E
L81	7.88	N15.55°E
L82	101.82	N88.14°E
L83	101.82	N88.14°E
L84	79.88	S41.36°E
L85	80.02	S42.50°E
L86	80.02	S42.50°E
L87	80.02	S42.50°E
L88	80.02	S42.50°E
L89	45.57	S00.32°E
L90	45.57	S00.32°E
L91		

STILLWATER PRESERVE SUBDIVISION

A REPLAT OF PORTIONS OF LOTS 1, 2, 3, 4, 14, 15, AND 16
 FLORIDA INDIAN RIVER LAND COMPANY, PLAT BOOK 1, PAGE 164

A SUBDIVISION LYING IN SECTION 35
 TOWNSHIP 28 SOUTH, RANGE 37 EAST,
 TOWN OF MALABAR, BREVARD COUNTY, FLORIDA

PLAT BOOK 52 PAGE 101
 SHEET 2 OF 5
 SECTION 35 TWP. 28 S., RANGE 37 E.



LEGEND

□ 4"x4" CONCRETE MONUMENT (SET)
 WITH NAIL & DEK STAMPED
 "P.M. P.S.M. 2890"

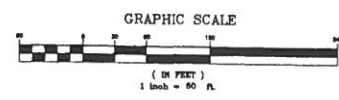
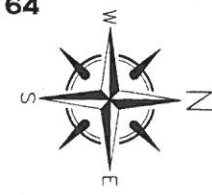
△ = NAIL AND DEK (SET)
 STAMPED "TOP P.S.M. 2890"

= CURVE NUMBER FOR CURVE TABLE
 L# = LINE NUMBER FOR LINE TABLE
 E# = EASEMENT
 F# = FOUND
 F#/C# = FLORIDA INDIAN RIVER LAND
 COMPANY SUBDIVISION

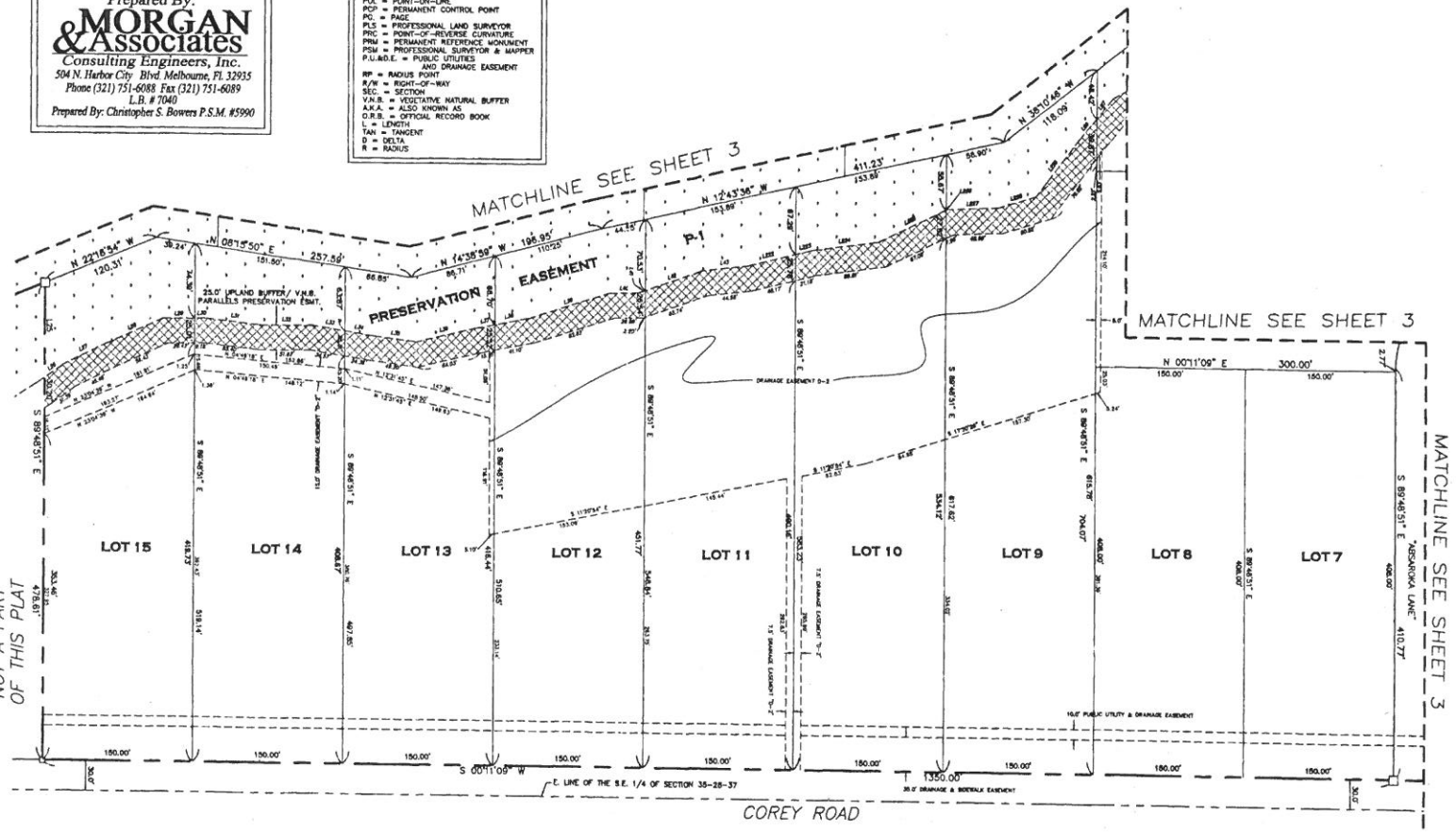
(N#) = NON-RADIAL
 (R) = RADIAL
 P.B. = PLAT BOOK
 PC = POINT-OF-CURVATURE
 PT = POINT-OF-TANGENCY
 PI = POINT-OF-INTERSECTION
 POC = POINT-ON-CURVE
 POL = POINT-ON-LINE
 POC# = PERMANENT CONTROL POINT
 P.C. = PROFESSIONAL LAND SURVEYOR
 P.R.C. = POINT-OF-REVERSE CURVATURE
 P.R.M. = PERMANENT REFERENCE MONUMENT
 P.S.M. = PROFESSIONAL SURVEYOR & MAPPER
 P.L.U.E. = PUBLIC UTILITIES AND DRAINAGE EASEMENT

R# = RADIUS FROM
 R/W = RIGHT-OF-WAY
 SEC. = SECTION
 V.N.B. = VICINITY NATURAL BUFFER
 A.K.A. = ALSO KNOWN AS
 D.L.B. = DEED RECORD BOOK
 L = LENGTH
 T = TANGENT
 Δ = DELTA
 R = RADIUS

NOTICE: THIS PLAT, AS RECORDED IN ITS GRAPHIC FORM, IS THE OFFICIAL DEPICTION OF THE SUBDIVISION DESCRIBED HEREIN AND WILL, IN NO CIRCUMSTANCES BE SUPPLANTED IN AUTHORITY BY ANY OTHER GRAPHIC OR DIGITAL FORM OF PLAT.



Prepared By:
MORGAN & Associates
 Consulting Engineers, Inc.
 504 N. Harbor City Blvd. Melbourne, FL 32915
 Phone (321) 751-6083 Fax (321) 751-6089
 L.B. # 7040
 Prepared By: Christopher S. Bowers P.S.M. #5990



LINE	LENGTH	BEARING
L1	181.74	S82°41'51"W
L2	109.97	S82°41'51"W
L3	25.26	N89°11'00"E
L4	18.07	N89°11'00"E
L5	87.01	N00°45'24"E
L6	87.25	S00°45'24"W
L7	88.85	S82°41'51"W
L8	48.17	S82°41'51"W
L9	24.03	N27°45'31"W
L10	103.58	N27°45'31"W
L11	4.59	N32°42'25"W
L12	108.60	N08°12'20"W
L13	30.42	N08°12'20"W
L14	27.65	S81°20'02"E
L15	55.54	N14°45'10"E
L16	84.42	N14°45'10"E
L17	88.17	N14°45'10"E
L18	10.00	S89°20'48"E
L19	56.00	S89°20'48"E
L20	15.00	N45°42'33"E
L21	18.13	N08°12'20"W
L22	123.00	S27°42'17"E
L23	28.84	S08°12'20"W
L24	139.95	N14°45'10"E
L25	89.36	S08°12'20"W
L26	27.88	N03°12'20"W
L27	47.87	N28°24'40"W
L28	83.01	N43°10'02"W
L29	33.11	N43°10'02"W
L30	10.28	N02°17'46"W
L31	33.84	N08°30'37"E
L32	52.18	N00°10'02"W
L33	39.84	N08°30'37"E
L34	12.83	N02°17'46"W
L35	44.29	N07°24'21"E
L36	29.89	N13°07'11"W
L37	29.82	N11°20'24"W
L38	34.60	N11°20'24"W
L39	28.49	N17°45'07"E
L40	28.91	N03°12'20"W
L41	7.16	N18°24'32"E
L42	83.83	N18°24'32"E
L43	46.78	N06°40'15"W
L44	83.26	N27°27'04"E
L45	53.24	N03°12'20"W
L46	72.83	N38°12'00"W
L47	75.87	N41°10'00"E
L48	25.84	N41°10'00"E
L49	39.87	N52°11'01"E
L50	45.78	N45°10'10"E
L51	78.56	N38°00'40"E
L52	57.76	N24°27'30"E
L53	80.21	N30°50'10"E
L54	55.25	N30°50'10"E
L55	48.77	N30°50'10"E
L56	48.49	N02°24'21"E
L57	18.81	N02°24'21"E
L58	67.77	N33°33'31"E
L59	80.86	N42°10'15"W
L60	45.88	N42°10'15"W
L61	44.78	N02°50'53"E
L62	83.89	N42°10'15"W
L63	68.50	N42°10'15"W
L64	68.50	N42°10'15"W
L65	48.72	N38°00'40"E
L66	69.20	N30°50'10"E
L67	24.07	N22°27'11"E
L68	24.42	N30°50'10"E
L69	72.95	N30°50'10"E
L70	50.70	N38°24'21"W
L71	38.31	N02°17'46"W
L72	15.58	N37°33'04"E
L73	13.78	S45°28'52"E
L74	39.47	S45°28'52"E
L75	39.47	S45°28'52"E
L76	39.10	N14°28'26"E
L77	12.38	N12°28'26"E
L78	120.83	N03°12'20"E
L79	0.99	N12°28'26"E
L80	89.17	N12°28'26"E
L81	78.22	N13°10'01"W
L82	101.81	N88°12'20"W
L83	100.99	N88°12'20"W
L84	79.88	S44°30'15"W
L85	60.77	S44°30'15"W
L86	40.02	S44°30'15"W
L87	60.87	S00°13'27"E
L88	108.44	S00°13'27"E
L89	48.57	S02°41'11"E
L90	53.46	N88°12'21"E
L91	27.50	N88°12'21"E
L92	48.57	S88°12'21"E
L93	30.45	S13°08'21"W
L94	20.05	N18°13'32"E
L95	28.25	S38°21'54"W
L96	78.28	N02°45'24"E
L97	28.28	N52°45'24"E
L98	8.51	S58°21'54"W
L99	10.51	S88°18'18"E
L100	23.83	S12°24'37"W
L101	35.83	N61°10'28"W
L102	15.55	S32°43'57"E
L103	31.01	S45°18'20"E
L104	28.71	S62°12'31"W
L105	19.81	S62°12'31"W
L106	34.38	N88°12'17"E
L107	38.69	S51°30'36"W
L108	33.84	S51°30'36"W
L109	28.49	N47°38'37"E
L110	64.80	N88°12'21"E
L111	32.04	N88°12'21"E
L112	58.97	S47°31'01"W
L113	13.73	S58°00'10"E
L114	30.86	S38°28'57"W
L115	28.87	S43°00'07"E
L116	56.86	S13°10'30"E
L117	18.76	N74°32'56"W
L118	40.81	S65°21'26"W
L119	43.21	S65°21'26"W
L120	14.88	S40°48'44"W
L121	17.48	S02°33'17"E

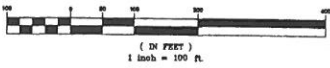
LINE	LENGTH	BEARING
L122	31.70	N83°20'02"E
L123	30.25	N83°20'02"E
L124	86.00	S78°12'17"E
L125	41.81	N02°24'21"E
L126	48.80	N10°10'19"E
L127	29.06	N17°11'11"W
L128	24.09	N08°51'37"E
L129	23.37	N33°17'37"W
L130	31.40	N02°45'24"E
L131	41.37	N02°45'24"E
L132	81.87	S89°31'46"E
L133	44.81	N22°00'00"E
L134	4.80	N55°52'52"E
L135	21.20	N55°52'52"E
L136	23.35	N02°45'24"E
L137	32.32	N00°12'21"E
L138	56.53	N02°45'24"E
L139	28.00	N82°20'24"E
L140	88.83	S42°52'45"E
L141	38.23	S42°52'45"E
L142	48.73	S12°45'15"E
L143	3.57	S18°48'32"E
L144	23.20	S18°48'32"E
L145	23.13	S52°32'22"E
L146	20.35	S18°48'32"E
L147	28.28	S33°30'57"E
L148	28.28	S83°17'28"E
L149	59.81	S43°30'57"E
L150	18.18	S43°30'57"E
L151	58.81	S43°30'57"E
L152	78.74	S08°20'29"E
L153	28.04	S08°20'29"E
L154	47.25	S27°13'17"E
L155	41.81	S08°20'29"E
L156	21.01	S07°28'10"E
L157	35.59	N83°10'28"E
L158	48.56	S07°28'10"E
L159	58.48	S11°44'18"E
L160	27.80	S32°12'27"W
L161	33.58	S32°12'27"W
L162	48.71	S48°40'47"E
L163	43.76	S48°40'47"E
L164	46.22	S45°17'17"E
L165	46.22	S02°13'17"E
L166	46.22	S02°13'17"E
L167	5.56	S02°13'17"E
L168	27.80	S02°13'17"E
L169	63.45	S07°28'10"E
L170	35.38	S88°41'17"E
L171	48.97	S42°24'27"E
L172	50.14	S42°24'27"E
L173	44.15	S30°11'18"E
L174	32.50	S42°24'27"E
L175	22.80	S42°24'27"E
L176	48.81	S18°37'04"E
L177	33.12	S18°37'04"E
L178	44.87	S11°28'31"W
L179	34.35	S11°47'54"E
L180	34.35	S11°47'54"E
L181	14.50	S03°54'13"W
L182	48.33	S14°57'02"E
L183	54.87	S32°50'10"E
L184	48.47	S08°12'38"E
L185	84.87	S17°28'28"E
L186	24.86	S10°28'48"E
L187	24.86	S10°28'48"E
L188	20.83	S10°28'48"E
L189	37.33	S45°37'15"E
L190	37.33	S45°37'15"E
L191	23.33	S03°13'17"E
L192	27.78	S27°28'51"E
L193	27.78	S14°11'17"E
L194	80.14	S17°28'28"E
L195	33.34	S10°28'48"E
L196	30.08	S40°10'30"E
L197	19.86	S19°28'22"E
L198	51.68	S08°12'38"E
L199	38.49	S12°48'16"E
L200	13.83	S01°24'00"E
L201	22.89	S12°48'16"E
L202	45.75	S02°34'10"E
L203	81.16	S02°34'10"E
L204	84.29	S17°28'28"E
L205	48.87	S10°28'48"E
L206	50.58	S03°03'40"E
L207	85.80	S17°28'28"E
L208	48.87	S10°28'48"E
L209	48.87	S03°03'40"E
L210	38.28	S01°24'00"E
L211	136.81	N11°44'25"W
L212	34.28	N11°44'25"W
L213	43.13	N12°28'26"W
L214	48.87	N12°28'26"W
L215	18.29	N12°28'26"W
L216	81.16	N12°28'26"W
L217	75.28	N25°00'18"W
L218	75.28	N25°00'18"W
L219	80.86	N25°00'18"W
L220	80.86	N25°00'18"W
L221	1.15	S48°26'50"E
L222	1.15	S48°26'50"E
L223	1.15	S48°26'50"E
L224	17.22	S43°12'58"E
L225	43.42	S43°12'58"E
L226	84.83	S02°34'10"E
L227	84.83	S02°34'10"E
L228	20.83	S42°52'45"E
L229	28.58	N45°18'21"E
L230	2.04	N25°27'21"E
L231	41.99	N38°50'07"E

STILLWATER PRESERVE SUBDIVISION

A REPLAT OF PORTIONS OF LOTS 1, 2, 3, 4, 14, 15, AND 16
 FLORIDA INDIAN RIVER LAND COMPANY, PLAT BOOK 1, PAGE 164
 A SUBDIVISION LYING IN SECTION 35
 TOWNSHIP 28 SOUTH, RANGE 37 EAST,
 TOWN OF MALABAR, BREVARD COUNTY, FLORIDA

PLAT BOOK 52 PAGE 103
 SHEET 4 OF 5
 SECTION 35 TWP. 28 S., RANGE 37 E.

GRAPHIC SCALE

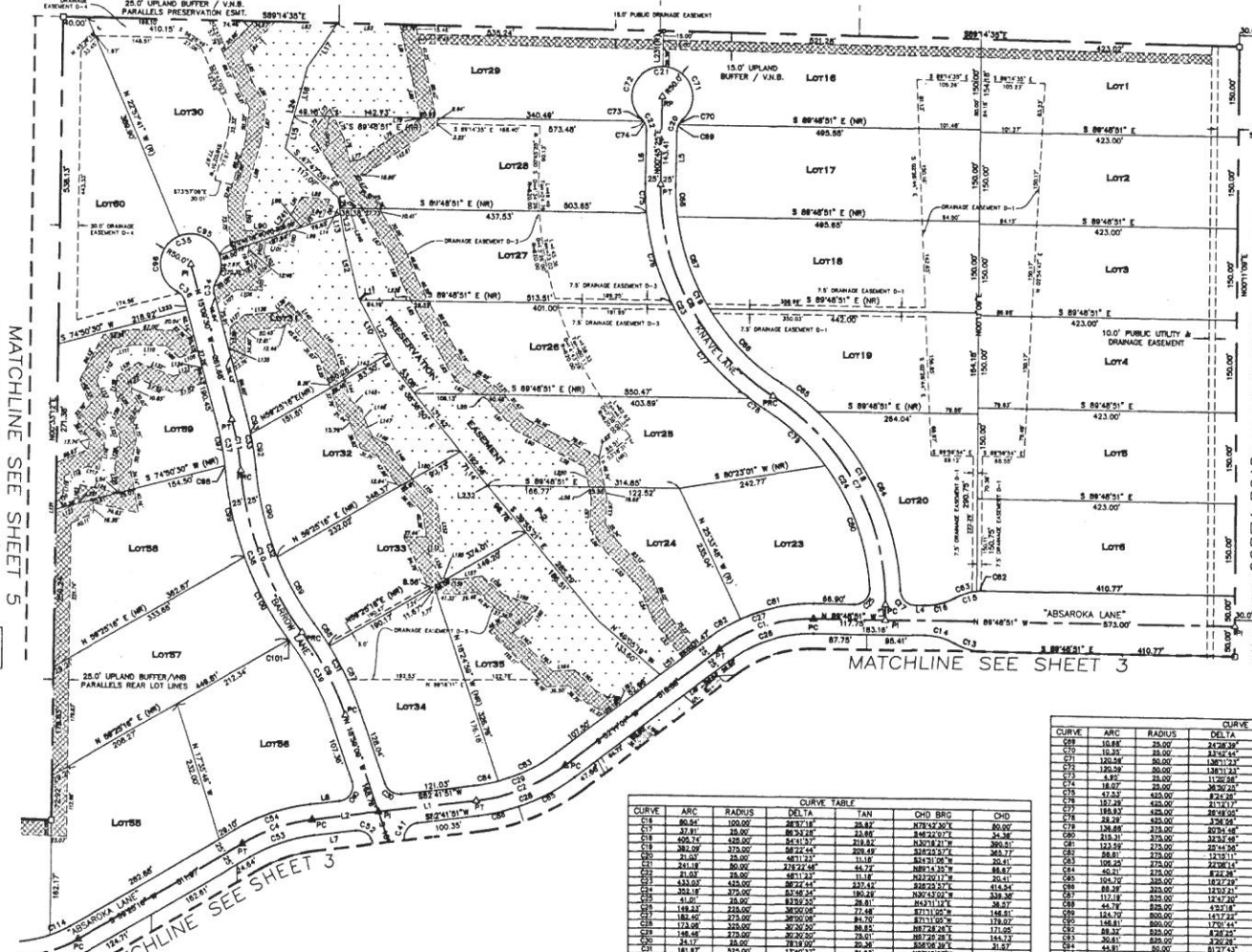


Prepared By:
MORGAN & Associates
 Consulting Engineers, Inc.
 504 N. Harbor City Blvd. Melbourne, FL 32935
 Phone (321) 751-6088 Fax (321) 751-6089
 L.B. # 7040
 Prepared By: Christopher S. Bowers P.S.M. #5990

NOTICE: THIS PLAN AS RECORDED IS THE SHOWN FORM. IN THE OFFICIAL SECTION OF THE SUBDIVISION LINES DESCRIBED HEREIN ARE ALL TO BE ENFORCEABLE AS SUPPLEMENTED BY ANY OTHER DRAWING OR SECTION FORM OF PLAN.

LEGEND

- 4"x4" CONCRETE MONUMENT (SET)
- WITH NAIL & DISK STAMPED "TWP 28 S 35 164"
- △ = NAIL AND DISK (SET) STAMPED "PC PSM 5990"
- FND = FOUND
- ESUM = EASEMENT
- FLS = FLORIDA INDIAN RIVER LAND COMPANY SUBDIVISION
- (NR) = NON-RADIAL
- P.B. = PLAT BOOK
- PC = POINT-OF-CURVATURE
- PT = POINT-OF-TANGENCY
- PI = POINT-OF-INTERSECTION
- POC = POINT-ON-CURVE
- POI = POINT-OF-INTERSECTION
- PR = PERMANENT CONTROL POINT
- PLS = PROFESSIONAL LAND SURVEYOR
- PRC = POINT-OF-REVERSE-CURVATURE
- PRM = PERMANENT REFERENCE MONUMENT
- PSM = PROFESSIONAL SURVEYOR & MAPPER
- P.U.D.C. = PUBLIC UTILITIES AND DRAINAGE EASEMENT
- RP = RADIUS POINT
- R/W = RIGHT-OF-WAY
- SEC = SECTION
- V.N.B. = VEGETATIVE NATURAL BUFFER
- A.K.A. = ALSO KNOWN AS
- O.R.P. = OFFICIAL RECORD BOOK
- D = LENGTH
- T = TANGENT
- Δ = DELTA
- R = RADIUS



LINE TABLE

LINE	LENGTH	BEARING
L1	181.74	S82°41'31" W
L2	198.57	S82°41'31" W
L3	25.59	S82°41'31" W
L4	16.07	N88°45'51" E
L5	87.61	N00°52'23" E
L6	87.31	S00°45'23" E
L7	86.85	S82°41'31" W
L8	48.17	S82°41'31" W
L9	24.03	S27°45'31" E
L10	103.58	S27°45'31" E
L11	4.59	S09°15'00" E
L12	109.60	N15°22'23" E
L13	27.85	N08°12'00" E
L14	56.54	N14°45'18" E
L15	84.42	N14°45'18" E
L16	88.17	S33°23'27" E
L17	10.00	S89°20'48" E
L18	50.00	S89°20'48" E
L19	18.02	N80°45'23" E
L20	18.13	N09°15'00" E
L21	123.00	N09°15'00" E
L22	39.84	S09°15'00" E
L23	159.89	S09°15'00" E
L24	22.86	N30°12'24" E
L25	17.87	S02°45'02" E
L26	82.01	S24°15'02" E
L27	32.11	N01°07'42" E
L28	103.72	N01°07'42" E
L29	55.84	N08°30'37" E
L30	52.64	N08°30'37" E
L31	27.85	N08°30'37" E
L32	27.85	N08°30'37" E
L33	27.85	N08°30'37" E
L34	27.85	N08°30'37" E
L35	27.85	N08°30'37" E
L36	27.85	N08°30'37" E
L37	27.85	N08°30'37" E
L38	27.85	N08°30'37" E
L39	27.85	N08°30'37" E
L40	27.85	N08°30'37" E
L41	27.85	N08°30'37" E
L42	27.85	N08°30'37" E
L43	27.85	N08°30'37" E
L44	27.85	N08°30'37" E
L45	27.85	N08°30'37" E
L46	27.85	N08°30'37" E
L47	27.85	N08°30'37" E
L48	27.85	N08°30'37" E
L49	27.85	N08°30'37" E
L50	27.85	N08°30'37" E
L51	27.85	N08°30'37" E
L52	27.85	N08°30'37" E
L53	27.85	N08°30'37" E
L54	27.85	N08°30'37" E
L55	27.85	N08°30'37" E
L56	27.85	N08°30'37" E
L57	27.85	N08°30'37" E
L58	27.85	N08°30'37" E
L59	27.85	N08°30'37" E
L60	27.85	N08°30'37" E
L61	27.85	N08°30'37" E
L62	27.85	N08°30'37" E
L63	27.85	N08°30'37" E
L64	27.85	N08°30'37" E
L65	27.85	N08°30'37" E
L66	27.85	N08°30'37" E
L67	27.85	N08°30'37" E
L68	27.85	N08°30'37" E
L69	27.85	N08°30'37" E
L70	27.85	N08°30'37" E
L71	27.85	N08°30'37" E
L72	27.85	N08°30'37" E
L73	27.85	N08°30'37" E
L74	27.85	N08°30'37" E
L75	27.85	N08°30'37" E
L76	27.85	N08°30'37" E
L77	27.85	N08°30'37" E
L78	27.85	N08°30'37" E
L79	27.85	N08°30'37" E
L80	27.85	N08°30'37" E
L81	27.85	N08°30'37" E
L82	27.85	N08°30'37" E
L83	27.85	N08°30'37" E
L84	27.85	N08°30'37" E
L85	27.85	N08°30'37" E
L86	27.85	N08°30'37" E
L87	27.85	N08°30'37" E
L88	27.85	N08°30'37" E
L89	27.85	N08°30'37" E
L90	27.85	N08°30'37" E
L91	27.85	N08°30'37" E
L92	27.85	N08°30'37" E
L93	27.85	N08°30'37" E
L94	27.85	N08°30'37" E
L95	27.85	N08°30'37" E
L96	27.85	N08°30'37" E
L97	27.85	N08°30'37" E
L98	27.85	N08°30'37" E
L99	27.85	N08°30'37" E
L100	27.85	N08°30'37" E

LINE TABLE

LINE	LENGTH	BEARING
L128	48.85	N110°07'27" E
L127	28.06	N71°11'11" E
L126	28.06	N71°11'11" E
L125	23.37	N33°17'37" W
L124	31.40	N02°45'27" E
L123	41.37	S25°40'24" E
L122	61.67	S89°33'48" E
L121	44.81	N09°30'22" E
L120	4.90	N17°38'02" E
L119	2.20	N55°50'24" E
L118	32.32	N00°56'24" E
L117	50.53	N00°56'24" E
L116	18.00	S02°12'12" E
L115	88.83	S42°50'40" E
L114	26.22	S44°31'07" E
L113	45.73	S18°45'32" E
L112	3.57	S18°45'32" E
L111	22.13	S18°45'32" E
L110	22.13	S18°45'32" E
L109	22.13	S18°45'32" E
L108	22.13	S18°45'32" E
L107	22.13	S18°45'32" E
L106	22.13	S18°45'32" E
L105	22.13	S18°45'32" E
L104	22.13	S18°45'32" E
L103	22.13	S18°45'32" E
L102	22.13	S18°45'32" E
L101	22.13	S18°45'32" E
L100	22.13	S18°45'32" E
L99	22.13	S18°45'32" E
L98	22.13	S18°45'32" E
L97	22.13	S18°45'32" E
L96	22.13	S18°45'32" E
L95	22.13	S18°45'32" E
L94	22.13	S18°45'32" E
L93	22.13	S18°45'32" E
L92	22.13	S18°45'32" E
L91	22.13	S18°45'32" E
L90	22.13	S18°45'32" E
L89	22.13	S18°45'32" E
L88	22.13	S18°45'32" E
L87	22.13	S18°45'32" E
L86	22.13	S18°45'32" E
L85	22.13	S18°45'32" E
L84	22.13	S18°45'32" E
L83	22.13	S18°45'32" E
L82	22.13	S18°45'32" E
L81	22.13	S18°45'32" E
L80	22.13	S18°45'32" E
L79	22.13	S18°45'32" E
L78	22.13	S18°45'32" E
L77	22.13	S18°45'32" E
L76	22.13	S18°45'32" E
L75	22.13	S18°45'32" E
L74	22.13	S18°45'32" E
L73	22.13	S18°45'32" E
L72	22.13	S18°45'32" E
L71	22.13	S18°45'32" E
L70	22.13	S18°45'32" E
L69	22.13	S18°45'32" E
L68	22.13	S18°45'32" E
L67	22.13	S18°45'32" E
L66	22.13	S18°45'32" E
L65	22.13	S18°45'32" E
L64	22.13	S18°45'32" E
L63	22.13	S18°45'32" E
L62	22.13	S18°45'32" E
L61	22.13	S18°45'32" E
L60	22.13	S18°45'32" E
L59	22.13	S18°45'32" E
L58	22.13	S18°45'32" E
L57	22.13	S18°45'32" E
L56	22.13	S18°45'32" E
L55	22.13	S18°45'32" E
L54	22.13	S18°45'32" E
L53	22.13	S18°45'32" E
L52	22.13	S18°45'32" E
L51	22.13	S18°45'32" E
L50	22.13	S18°45'32" E
L49	22.13	S18°45'32" E
L48	22.13	S18°45'32" E
L47	22.13	S18°45'32" E
L46	22.13	S18°45'32" E
L45	22.13	S18°45'32" E
L44	22.13	S18°45'32" E
L43	22.13	S18°45'32" E
L42	22.13	S18°45'32" E
L41	22.13	S18°45'32" E
L40	22.13	S18°45'32" E
L39	22.13	S18°45'32" E
L38	22.13	S18°45'32" E
L37	22.13	S18°45'32" E
L36	22.13	S18°45'32" E
L35	22.13	S18°45'32" E
L34	22.13	S18°45'32" E
L33	22.13	S18°45'32" E
L32	22.13	S18°45'32" E
L31	22.13	S18°45'32" E
L30	22.13	S18°45'32" E
L29	22.13	S18°45'32" E
L28	22.13	S18°45'32" E
L27	22.13	S18°45'32" E
L26	22.13	S18°45'32" E
L25	22.13	S18°45'32" E
L24	22.13	S18°45'32" E
L23	22.13	S18°45'32" E
L22	22.13	S18°45'32" E
L21	22.13	S18°45'32" E
L20	22.13	S18°45'32" E
L19	22.13	S18°45'32" E
L18	22.13	S18°45'32" E
L17	22.13	S18°45'32" E
L16	22.13	S18°45'32" E
L15	22.13	S18°45'32" E
L14	22.13	S18°45'32" E
L13	22.13	S18°45'32" E
L12	22.13	S18°45'32" E
L11	22.13	S18°45'32" E
L10	22.13	S18°45'32" E
L9	22.13	S18°45'32" E
L8	22.13	S18°45'32" E
L7	22.13	S18°45'32" E
L6	22.13	S18°45'32" E
L5	22.13	S18°45'32" E
L4	22.13	S18°45'32" E
L3	22.13	S18°45'32" E
L2	22.13	S18°45'32" E
L1	22.13	S18°45'32" E

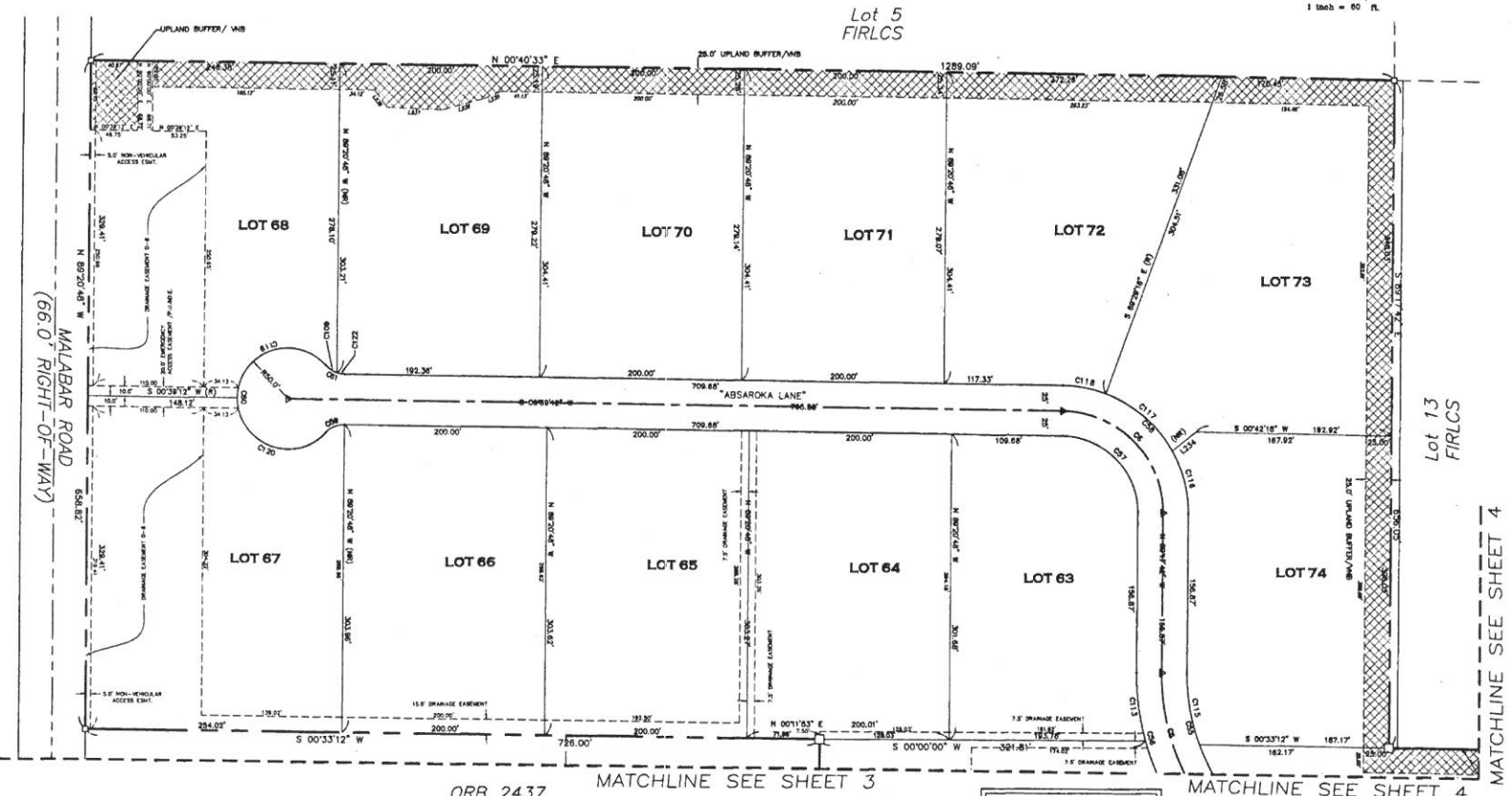
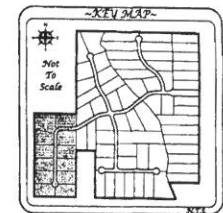
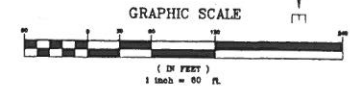
CURVE TABLE

CURVE	ARC	RADIUS	DELTA	TAN	CHD BRG	CHD
C1	80.81	100.00	89.71°	28.87	N78°33'30" E	80.00
C2	32.41	35.00	89.71°	11.87	N82°00'00" E	35.00
C3	490.72	490.00	84.31°	218.82	N30°48'21" E	360.51
C4	38.49	37.00	88.22°	12.68	N89°48'00" E	37.00
C5	21.00	21.00	45.00°	11.18	S45°00'00" E	21.00
C6	21.00	21.00	45.00°	11.18	S45°00'00" E	21.00
C7	21.00	21.00	45.00°	11.18	S45°00'00" E	21.00
C8	21.00	21.00	45.00°	11.18	S45°00'00" E	21.00
C9	21.00	21.00	45.00°	11.18	S45°00'00" E	21.00
C10	21.00	21.00	45.00°	11.18	S45°00'00" E	21.00
C11	21.00	21.00	45.00°	11.18	S45°00'00" E	21.00
C12	21.00	21.00	45.00°	11.18	S45°00'00" E	21.00
C13	21.00	21.00	45.00°	11.18	S45°00'00" E	21.00
C14	21.00	21.00	45.00°	11.18	S45°00'00" E	21.00
C15	21.00	21.00	45.00°	11.18	S45°00'00" E	21.00
C16	21.00	21.00	45.00°	11.18	S45°00'00" E	21.00
C17	21.00	21.00	45.00°	11.18	S45°00'00" E	21.00
C18	21.00	21.00	45.00°	11.18	S45°00'00" E	21.00
C19	21.00	21.00	45.00°	11.18	S45°00'00" E	21.00
C20	21.00	21.00	45.00°	11.18	S45°00'00" E	21.00
C21	21.00	21.00	45.00°	11.18	S45°00'00" E	21.00
C22	21.00	21.00	45.00°	11.18	S45°00'00" E	21.00
C23	21.00	21.00	45.00°	11.18	S45°00'00" E	21.00
C24	21.00	21.00	45.00°	11.18	S45°00'00" E	21.00
C25	21.00	21.00	45.00°	11.18	S45°00'00" E	21.00
C26	21.00	21.00	45.00°	11.18	S45°00'00" E	21.00
C27	21.00	21.00	45.00°	11.18	S45°00'00" E	21.00
C28	21.00	21.00	45.00°	11.18	S45°00'00" E	21.00
C29	21.00	21.00	45.00°	11.18	S45°00'00" E	21.00
C30	21.00	21.00	45.00°	11.18	S45°00'00" E	21.00

STILLWATER PRESERVE SUBDIVISION

A REPLAT OF PORTIONS OF LOTS 1, 2, 3, 4, 14, 15, AND 16
 FLORIDA INDIAN RIVER LAND COMPANY, PLAT BOOK 1, PAGE 164
 A SUBDIVISION LYING IN SECTION 35
 TOWNSHIP 28 SOUTH, RANGE 37 EAST,
 TOWN OF MALABAR, BREVARD COUNTY, FLORIDA

PLAT BOOK 52 PAGE 104
 SHEET 5 OF 5
 SECTION 35 TWP. 28 S., RANGE 37 E.



LINE	LENGTH	BEARING
L1	181.74	S82°41'31" W
L2	108.87	S84°41'51" W
L3	25.59	N00°11'50" E
L4	18.07	N87°48'51" W
L5	81.51	N00°45'25" W
L6	87.51	S00°45'25" W
L7	88.89	S82°41'51" W
L8	48.17	S82°41'51" W
L9	24.03	N27°45'31" W
L10	4.09	N27°45'31" W
L11	103.59	N13°24'38" W
L12	109.80	N00°15'20" W
L13	50.12	S00°15'20" W
L14	27.85	S00°15'20" W
L15	85.54	N14°45'18" E
L16	84.42	N14°45'18" E
L17	88.17	N33°24'17" E
L18	10.00	S89°20'48" E
L19	50.00	S89°20'48" E
L20	15.02	N87°45'23" W
L21	103.00	N00°15'20" W
L22	133.00	N00°15'20" W
L23	39.84	S08°15'20" E
L24	138.89	N11°58'18" E
L25	89.38	S89°48'51" E
L26	22.88	N30°15'28" W
L27	47.87	N30°15'28" W
L28	61.01	N24°15'02" W
L29	32.11	N07°07'40" W
L30	15.28	N07°07'40" W
L31	55.84	N08°30'57" E
L32	52.19	N00°03'07" W
L33	32.84	N09°08'37" E
L34	27.83	N09°08'37" E
L35	44.70	N07°20'27" E
L36	52.89	N13°02'11" E
L37	20.82	N11°20'54" W
L38	54.80	N11°20'54" W
L39	84.89	N17°46'07" W
L40	28.51	N01°27'12" W

ORB 2437
 PG 2287

MATCHLINE SEE SHEET 3

MATCHLINE SEE SHEET 4

LEGEND	
□	1/4" CONCRETE MONUMENT (SET) WITH PIN & DISK STAMPED "TRM PSM 5890"
△	PIN AND DISK (SET) STAMPED "TRM PSM 5890"
C#	CURVE NUMBER FOR CURVE TABLE
LN#	LINE NUMBER FOR LINE TABLE
EAS#	EASEMENT
FND	FOUND
FIRCS	FLORIDA INDIAN RIVER LAND COMPANY SUBDIVISION
(NR)	NON-RADIAL
(R)	RADIUS
(P.B.)	PLAT BOOK
PC	POINT-OF-CURVATURE
PT	POINT-OF-TANGENCY
PI	POINT-OF-INTERSECTION
POC	POINT-ON-CURVE
POI	POINT-ON-LINE
PCP	PERMANENT CONTROL POINT
PL	PL
PLS	PROFESSIONAL LAND SURVEYOR
PC	POINT-OF-CURVATURE
PT	POINT-OF-TANGENCY
PI	POINT-OF-INTERSECTION
POC	POINT-ON-CURVE
POI	POINT-ON-LINE
PCP	PERMANENT CONTROL POINT
RP	RADIUS POINT
R#	RADIUS
SEC.	SECTION
T&E	VEGETATIVE NATURAL BUFFER
A.A.	ALSO KNOWN AS
D.R.	DEPARTMENT OF REVENUE & MAPPING
L	LENGTH
C#	CURVE
D	DELTA
R	RADIUS

Prepared By:
MORGAN & Associates
 Consulting Engineers, Inc.
 504 N. Harbor City Blvd. Melbourne, FL 32915
 Phone (321) 751-6838 Fax (321) 751-6089
 L.B. # 7040
 Prepared By: Christopher S. Bowers P.S.M. #5990

NOTICE: THIS PLAT, AS RECORDED IN ITS GRAPHIC FORM, IS THE OFFICIAL DEPICTION OF THE SURVEYED LANDS DESCRIBED HEREIN AND WILL, IN NO CIRCUMSTANCES BE SUPPLANTED IN AUTHORITY BY ANY OTHER GRAPHIC OR DIGITAL FORM OF PLAT.

CURVE TABLE						
CURVE	ARC	RADIUS	DELTA	TAN	CHD BRG	CHD
C1	188.84	250.00	30300.08	86.00	8711.99° W	182.72
C2	158.77	800.00	30200.86	81.83	8872.88° W	157.89
C3	120.29	80.00	13811.24	130.80	588.28 28° E	93.47
C4	123.87	300.00	2178.25	81.76	87103.24° W	121.04
C5	122.85	225.00	3112.01	83.00	87103.24° W	121.52
C6	127.17	100.00	8032.00	100.00	845.40 45° W	141.45
C7	623.90	600.00	37288.89	87.88	8883.50 45° W	288.88
C8	109.20	800.00	3117.01	50.00	8752.03 47° E	107.80
C9	138.20	250.00	3172.01	70.00	8752.03 47° E	134.81
C10	111.88	75.00	8033.00	78.07	8453.80 45° W	108.11
C11	188.46	125.00	8033.00	125.11	8453.80 45° W	178.88
C12	21.03	25.00	4811.24	11.18	8232.80 20° E	20.41
C13	241.18	80.00	27822.48	44.72	8982.02 60° E	85.87
C14	21.03	25.00	4811.24	11.18	8244.54 74° E	20.41
C15	13.88	25.00	3023.08	8.72	8332.80 01° E	13.10
C16	1.80	25.00	612.51	0.82	8332.80 01° E	1.80
C17	18.17	25.00	4722.52	10.08	8442.50 00° W	18.70
C18	88.44	250.00	1526.98	34.28	8873.54 44° E	87.82
C19	88.37	250.00	1540.00	34.40	8873.54 44° E	88.10
C20	37.18	25.00	1028.24	18.62	8844.54 38° E	37.11
C21	74.04	250.00	2028.47	38.41	8882.02 00° E	71.88
C22	84.88	125.00	2846.26	34.23	8784.02 00° E	84.23
C23	88.18	125.00	4022.01	46.01	8407.51 18° E	86.28
C24	84.82	125.00	1831.24	21.88	8102.50 00° E	83.11
C25	120.29	80.00	13811.24	130.80	5207.50 00° E	83.47
C26	120.29	80.00	13811.24	130.80	8213.21 11° E	83.47
C27	7.77	25.00	1748.34	3.82	8082.02 00° E	7.74
C28	120.29	80.00	13811.24	130.80	8884.54 11° E	83.47

Appendix C

Correspondence



Florida Department of Transportation

**RICK SCOTT
GOVERNOR**

605 Suwannee Street
Tallahassee, FL 32399-0450

**JIM BOXOLD
SECRETARY**

ETDM Summary Report

Project #13026 - Widen Malabar Road (SR 514)

Final Programming Screen - Published on 12/15/2015

Generated by Richard Fowler (on behalf of FDOT District 5)

Printed on: 12/15/2015

Table of Contents

Chapter 1 Overview	2
Chapter 2 Project Details	3
2.1. Purpose and Need	3
Chapter 3 Alternative #1	6
3.1. Alternative Description	6
3.2. Segment Description(s)	6
Chapter 4 Eliminated Alternative Information	29
4.1. Eliminated Alternatives	29
Chapter 5 Project Scope	30
5.1. General Project Recommendations	30
5.2. Required Permits	30
5.3. Required Technical Studies	30
5.4. Class of Action	30
5.5. Dispute Resolution Activity Log	31
Appendices	32
6.1. Preliminary Environmental Discussion Comments	32
6.2. Advance Notification Comments	32
6.3. GIS Analyses	32
6.4. Project Attachments	32
6.5. Degree of Effect Legend	32

Introduction to Programming Screen Summary Report

The Programming Screen Summary Report shown below is a read-only version of information contained in the Programming Screen Summary Report generated by the ETDM Coordinator for the selected project after completion of the ETAT Programming Screen review. The purpose of the Programming Screen Summary Report is to summarize the results of the ETAT Programming Screen review of the project; provide details concerning agency comments about potential effects to natural, cultural, and community resources; and provide additional documentation of activities related to the Programming Phase for the project. Available information for a Programming Screen Summary Report includes:

- Screening Summary Report chart
- Project Description information (including a summary description of the project, a summary of public comments on the project, and community-desired features identified during public involvement activities)
- Purpose and Need information (including the Purpose and Need Statement and the results of agency reviews of the project Purpose and Need)
- Alternative-specific information, consisting of descriptions of each alternative and associated road segments; an overview of ETAT Programming Screen reviews for each alternative; and agency comments concerning potential effects and degree of effect, by issue, to natural, cultural, and community resources.
- Project Scope information, consisting of general project recommendations resulting from the ETAT Programming Screen review, permits, and technical studies required (if any)
- Class of Action determined for the project
- Dispute Resolution Activity Log (if any)

The legend for the Degree of Effect chart is provided in an appendix to the report.

For complete documentation of the project record, also see the GIS Analysis Results Report published on the same date as the Programming Screen Summary Report.

#13026 Widen Malabar Road (SR 514)

District: District 5

County: Brevard

Planning Organization: FDOT District 5

Plan ID: Not Available

Federal Involvement: No federal involvement has been identified.

Phase: Programming Screen

From: Babcock Street

To: US 1

Financial Management No.: 43013612101

Contact Information: Brian Stanger (386) 943-5391 brian.stanger@dot.state.fl.us

Snapshot Data From: Programming Screen Summary Report Re-published on 12/15/2015 by Richard Fowler
Issues and Categories are reflective of what was in place at the time of the screening event.

	Natural										Cultural			Community					Secondary and Cumulative Effects		
	Air Quality	Coastal and Marine	Contaminated Sites	Farmlands	Floodplains	Infrastructure	Navigation	Special Designations	Water Quality and Quantity	Wetlands	Wildlife and Habitat	Historic and Archaeological Sites	Recreation Areas	Section 4(f) Potential	Aesthetics	Economic	Land Use	Mobility		Relocation	Social
Alternative #1 - Malabar Rd. From: Babcock Street To: US 1 Re-Published: 12/15/2015 Reviewed from 05/18/2012 to 07/02/2012	2	2	3	2	2	3	N/A	3	3	3	3	3	3	3	1	1	0	1	3	2	3

Purpose and Need

Purpose and Need

PURPOSE

The purpose of this project is to provide for increased capacity along the two lane section of Malabar Road from Babcock Street east to US 1, a distance of 3.64 miles. Malabar Road is a four lane divided facility from the I-95 Interchange east to Babcock St. but then transitions back to a two lane facility east of Babcock St. The Project Development and Environmental Study will analyze alternatives for widening Malabar Rd. from a two lane to a four lane facility in order to accommodate projected increases in traffic volume.

NEED

The four lane divided section of Malabar Rd. from I-95 to Babcock St. had a traffic volume of 38,500 AADT in 2011. East of Babcock St. the roadway transitions back to a two lane facility and carries 17,200 AADT between Babcock and Weber Rd. Between Weber Rd. and Cory Rd. traffic volume is 11,400 AADT, and between Cory Rd. and US 1 the volume is 11,800 AADT. The traffic volume between Babcock and Weber results in a Level of Service F with the other two sections currently providing a LOS C. Although these eastern two segments currently provide an acceptable Level of Service, all three segments are projected to have a LOS F by the mid-design year of 2025. The projected traffic volumes for the above three segments by the Design Year of 2035 will be 27,500, 18,200 and 18,900 AADT, respectively. These projected traffic volumes demonstrate a need for capacity improvement on Malabar Rd. east of Babcock St.

A Feasibility Study conducted in 2008 analyzed crash data from the years of 2003 to 2007. There were 116 crashes during this time period resulting in 3 fatalities. The analysis determined that the crash ratio was 1.17 per million vehicle miles. The statewide average for this type of roadway facility is 2.726/mvm indicating that safety is not a particular issue.

Project Description

DESCRIPTION

State Road 514, Malabar Rd., between Babcock Street (MP 3.060) and US 1 (MP 6.698) is a two lane roadway classified as a Urban Minor Arterial facility and is a designated hurricane evacuation route as it connects to Interstate 95 west of this project's limits. The posted speed limit is 55 mph. Malabar Road is not part of the Florida Intrastate Highway System nor is it part of the State's Strategic Intermodal System. Malabar Road is four lanes from the I-95 Interchange east to Babcock Street where it then transitions back to a two lane facility. The two lane section consists of 12 foot lanes with four foot paved shoulders, open swale drainage and no sidewalks. The existing right of way width is about 25 feet from the edge of paved shoulder to the right of way line. Additional right of way will be required to accommodate a four lane divided facility.

The horizontal clearance from the edge of travel lanes to fixed objects within the cleared right of way do not meet safety standards under existing conditions and will need to be adjusted to meet clear zone requirements for a four lane facility. Florida Power and Light transmission line poles along the corridor will be a consideration along with the crossing of the Florida East Coast railroad line located about 700 feet west of US 1. The City owned Fern Creek Crossing Park at the SW corner of Corey Rd., Malabar Park, and the Malabar Scrub Sanctuary located on the north side of Malabar between Weber and Marie Streets will also be constraints to be considered during the study.

Summary of Public Comments

Summary of Public Comments is not available at this time.

Federal Consistency Determination

Date: 07/13/2012

Determination: CONSISTENT with Coastal Zone Management Program.

Additional Consistency Information

- Consistency with Air Quality Conformity is unknown.
- Consistency with Local Government Comp Plan is unknown.
- Consistent with MPO Goals and Objectives.

Lead Agency

FL Department of Transportation

Participating and Cooperating Agencies

Participating and Cooperating agencies are not applicable for this class of action.

Exempted Agencies

Agency Name	Justification	Date
Federal Transit Administration	FTA has requested to be exempt from reviewing any non-transit projects.	04/13/2011

Community Desired Features

No desired features have been entered into the database. This does not necessarily imply that none have been identified.

User Defined Communities Within 500 Feet

No user defined communities were found within a 500 ft. buffer distance for this project.

Census Places Within 500 Feet

- Malabar
- Palm Bay

Purpose and Need Reviews

FL Department of Economic Opportunity

Acknowledgment	Date Reviewed	Reviewer	Comments
Understood	06/28/2012	Jeannette Hallock-Solomon (jeannette.hallock-solomon@deo.myflorida.com)	No Purpose and Need comments found.

FL Department of Environmental Protection

Acknowledgment	Date Reviewed	Reviewer	Comments
Understood	06/28/2012	Lauren Milligan (lauren.milligan@dep.state.fl.us)	No Purpose and Need comments found.

FL Department of State

Acknowledgment	Date Reviewed	Reviewer	Comments
Understood	05/31/2012	Ginny Jones (ginny.jones@dos.myflorida.com)	No Purpose and Need comments found.

FL Fish and Wildlife Conservation Commission

Acknowledgment	Date Reviewed	Reviewer	Comments
Understood	06/19/2012	Scott Sanders (scott.sanders@myfwc.com)	No Purpose and Need comments found.

Federal Highway Administration

Acknowledgment	Date Reviewed	Reviewer	Comments
Accepted	06/18/2012	Cathy Kendall (cathy.kendall@dot.gov)	No Purpose and Need comments found.

National Marine Fisheries Service

Acknowledgment	Date Reviewed	Reviewer	Comments
Understood	07/02/2012	Brandon Howard (Brandon.Howard@noaa.gov)	None.

National Park Service

Acknowledgment	Date Reviewed	Reviewer	Comments
Understood	05/25/2012	Anita Barnett (anita_barnett@nps.gov)	No Purpose and Need comments found.

Natural Resources Conservation Service

Acknowledgment	Date Reviewed	Reviewer	Comments
Understood	05/29/2012	Rick Robbins (rick.a.robbins@fl.usda.gov)	No Purpose and Need comments found.

US Army Corps of Engineers

Acknowledgment	Date Reviewed	Reviewer	Comments
Understood	06/08/2012	Andrew Phillips	No Purpose and Need comments found.

(andrew.w.Phillips@us
ace.army.mil)

US Coast Guard

Acknowledgment	Date Reviewed	Reviewer	Comments
Understood	06/26/2012	Evelyn Smart (evelyn.smart@uscg.mil)	No Purpose and Need comments found.

US Environmental Protection Agency

Acknowledgment	Date Reviewed	Reviewer	Comments
Understood	06/29/2012	Madolyn Sanchez (sanchez.madolyn@epa.gov)	No Purpose and Need comments found.

US Fish and Wildlife Service

Acknowledgment	Date Reviewed	Reviewer	Comments
Understood	06/18/2012	Jane Monaghan (Jane_Monaghan@fws.gov)	No Purpose and Need comments found.

The following organizations were notified but did not submit a review of the Purpose and Need:

- FL Department of Agriculture and Consumer Services
- Saint Johns River Water Management District
- Seminole Tribe of Florida

Alternative #1 - Malabar Rd.

Alternative Description

Name	From	To	Type	Status	Total Length	Cost	Modes	SIS
Malabar Rd.	Babcock Street	US 1	Widening	ETAT Review Complete	3.64 mi.	\$49,651,000.00	Roadway	N

Segment Description(s)

Location and Length

Segment Record	Segment Name	Facility Name	Beginning Location	Ending Location	Length (mi.)	Roadway Id	BMP	EMP
S-001	70180000 (MP 3.06 to 6.698)	70180000 (MP 3.06 to 6.698)	Babcock St.	US 1	3.654	70180000		

Jurisdiction and Class

Segment Record	Segment Name	Jurisdiction	Urban Service Area	Functional Class
S-001	70180000 (MP 3.06 to 6.698)	FDOT	In/Out	URBAN: Minor Arterial

Base Conditions

Segment Record	Segment Name	Year	AADT	Lanes	Config
S-001	70180000 (MP 3.06 to 6.698)	2011	17200	2	Lanes Undivided

Interim Plan

Segment Record	Segment Name	Year	AADT	Lanes	Config
S-001	70180000 (MP 3.06 to 6.698)				

Needs Plan

Segment Record	Segment Name	Year	AADT	Lanes	Config
S-001	70180000 (MP 3.06 to 6.698)	2035	27500	4	Lanes Divided

Cost Feasible Plan

Segment Record	Segment Name	Year	AADT	Lanes	Config
S-001	70180000 (MP 3.06 to 6.698)	2035			

Funding Sources

Segment Record	Segment Name	FDOT	Unknown
S-001	70180000 (MP 3.06 to 6.698)	\$1,111,667.00	

Project Effects Overview for Alternative #1 - Malabar Rd.

Issue	Degree of Effect	Organization	Date Reviewed
Natural			
Air Quality	2 Minimal	US Environmental Protection Agency	07/02/2012
Coastal and Marine	2 Minimal	National Marine Fisheries Service	07/02/2012
Contaminated Sites	3 Moderate	US Environmental Protection Agency	07/02/2012
Contaminated Sites	3 Moderate	FL Department of Environmental Protection	06/28/2012
Farmlands	2 Minimal	Natural Resources Conservation Service	05/29/2012
Floodplains	2 Minimal	US Environmental Protection Agency	07/02/2012
Navigation	N/A N/A / No Involvement	US Coast Guard	06/26/2012
Navigation	0 None	US Army Corps of Engineers	06/08/2012

Special Designations	3	Moderate	US Environmental Protection Agency	07/02/2012
Water Quality and Quantity	3	Moderate	US Environmental Protection Agency	07/02/2012
Water Quality and Quantity	3	Moderate	FL Department of Environmental Protection	06/28/2012
Wetlands	3	Moderate	US Environmental Protection Agency	07/02/2012
Wetlands	3	Moderate	National Marine Fisheries Service	07/02/2012
Wetlands	3	Moderate	US Fish and Wildlife Service	06/29/2012
Wetlands	3	Moderate	FL Department of Environmental Protection	06/28/2012
Wetlands	3	Moderate	US Army Corps of Engineers	06/11/2012
Wildlife and Habitat	3	Moderate	US Fish and Wildlife Service	06/29/2012
Wildlife and Habitat	3	Moderate	FL Fish and Wildlife Conservation Commission	06/19/2012
Wildlife and Habitat	3	Moderate	Federal Highway Administration	06/18/2012
Cultural				
Historic and Archaeological Sites	3	Moderate	Seminole Tribe of Florida	06/26/2012
Historic and Archaeological Sites	3	Moderate	Federal Highway Administration	06/18/2012
Historic and Archaeological Sites	3	Moderate	FL Department of State	05/31/2012
Recreation Areas	3	Moderate	US Environmental Protection Agency	07/02/2012
Recreation Areas	3	Moderate	FL Department of Environmental Protection	06/28/2012
Recreation Areas	3	Moderate	Federal Highway Administration	06/18/2012
Recreation Areas	0	None	National Park Service	05/25/2012
Section 4(f) Potential	3	Moderate	Federal Highway Administration	06/18/2012
Community				
Land Use	0	None	FL Department of Economic Opportunity	06/28/2012
Relocation	3	Moderate	Federal Highway Administration	06/18/2012
Social	2	Minimal	US Environmental Protection Agency	07/02/2012
Social	0	None	FL Department of Economic Opportunity	06/28/2012
Secondary and Cumulative				

ETAT Reviews and Coordinator Summary: Natural

Air Quality

Project Effects

Coordinator Summary Degree of Effect: 2 Minimal assigned 08/09/2012 by FDOT District 5

Comments:

An Air Quality Screening Analysis will be conducted during the PD&E study phase. This area is not within a non-attainment area for ozone and we believe the project would have minimal effect on air quality. We are assigning a Minimal degree of effect for this issue.

Degree of Effect: 2 Minimal assigned 07/02/2012 by Madolyn Sanchez, US Environmental Protection Agency

Coordination Document: No Selection

Coordination Document Comments:As population growth and vehicle volumes increase, there is the potential to have air quality conformity and non-attainment issues in the future. FDOT, MPOs, municipalities, and regional planning agencies should conduct air quality modeling as traffic forecasts increase.

Direct Effects

Identified Resources and Level of Importance:

Resources: Air Quality

Level of Importance: Low, due to minimal degree of effect. A minimal degree of effect is being assigned to the air quality issue for the proposed project (ETDM #13026, Widen Malabar Road (SR 514)).

Comments on Effects to Resources:

Brevard County has not been designated non-attainment or maintenance for ozone, carbon monoxide (CO) or particulate matter (PM) in accordance with the Clean Air Act. There are no violations of National Ambient Air Quality Standards (NAAQS). Nevertheless, it is recommended that the environmental review phase of this project consider the need for additional air impact analyses. These types of analyses would include documenting the current pollutant concentrations recorded at the nearest air quality monitors, an evaluation of anticipated emissions, and air quality trend analyses. It is also recommended that environmental reviews of the project include hot spot analyses at the points in time and places where congestion are expected to be greatest or in areas of sensitive receptors. Air quality modeling using an approved software program could be used as a means to determine whether any conformity issues or violations of air quality standards are anticipated within the project area and/or counties. Current and proposed air quality requirements and standards should be used in modeling software programs.

Additional Comments (optional):

As population growth and vehicle volumes increase, there is the potential to have air quality conformity and non-attainment issues in the future. FDOT, MPOs, municipalities, and regional planning agencies should conduct air quality modeling as traffic forecasts increase.

CLC Recommendations:

FDOT District 5 Feedback to US Environmental Protection Agency's Review (08/09/2012): Thank you for your review and comments. An Air Quality Screening Analysis will be conducted during the PD&E study phase. This area is not within a non-attainment area for ozone and we believe the project would have minimal effect on air quality. We are assigning a Minimal degree of effect for this issue.

The following organization(s) were expected to but did not submit a review of the Air Quality issue for this alternative: Federal Highway Administration

Coastal and Marine

Project Effects

Coordinator Summary Degree of Effect: 2 *Minimal* assigned 07/18/2012 by FDOT District 5

Comments:

One agency provided comments on coastal and marine issues citing the potential impact to moderate to low quality wetlands and assigned a minimal degree of effect. We will attempt to avoid wetlands and take measures to minimize impacts if they cannot feasibly be avoided. We are assigning a Minimal degree of effect.

Degree of Effect: 2 *Minimal* assigned 07/02/2012 by Brandon Howard, National Marine Fisheries Service

Coordination Document: No Involvement

Coordination Document Comments:Magnuson-Stevens Act: Based on the project location, the site inspection, information provided in the ETDM website, and GIS-based analysis of impacts, NOAA's National Marine Fisheries Service (NMFS) concludes that essential fish habitat (EFH) would not be impacted by the proposed road modifications; accordingly, we offer no comments pursuant to the EFH provisions of the Magnuson-Stevens Act (P.L. 104-297); and this project will not require an EFH Assessment. Further consultation on this matter is not necessary unless future modifications are proposed and you believe that the proposed action may result in adverse impacts to EFH.

Endangered Species Act: We are not aware of any threatened or endangered species or critical habitat under the purview of NMFS that occur within the project area. However, it should be noted that a "no effect" determination must be made by the action agency and the reasoning underlying the determination should be documented in a project file. Please coordinate closely with the U.S. Fish and Wildlife Service for other species listed under the Endangered Species Act that may require consultation.

Fish and Wildlife Coordination Act: The comments NMFS provided regarding sequential mitigation are in accordance with the Fish and Wildlife Coordination Act.

Direct Effects

Identified Resources and Level of Importance:

Based on our review of the information provided on the EST website, a site inspection on June 29, 2012, GIS-based effects analysis on wetlands and interpretation of aerial photographs, NOAA's National Marine Fisheries Service (NMFS) has determined that emergent wetlands, mixed wetland hardwoods, creeks, and ditches are located within the project corridor. These wetlands range from low to moderate in quality. Two creeks intersect Malabar Road within the project area; one just east of Weber Road and the other, just west of Corey Road. The primary purpose of the site inspection was to determine if these creeks are tidal. Neither creek

had a definitive tidal signature.

Comments on Effects to Resources:

The wetlands along the proposed roadway expansion provide water quality functions, such as removal of sediments, excess nutrients, and contaminants, which benefit and support these aquatic ecosystems. Through hydrological connections, these wetlands also contribute plant material and other useable nutrients (both dissolved and particulate organic matter) into aquatic food webs that include recreationally, commercially, and ecologically important species within downstream estuaries. If wetland impacts are unavoidable, sequential minimization and mitigation should take place.

In addition to the direct impacts from filling wetlands, construction activities may impact adjacent wetlands through sedimentation and runoff.

Additional Comments (optional):

Magnuson-Stevens Act: Based on the project location, the site inspection, information provided in the ETDM website, and GIS-based analysis of impacts, NOAA's National Marine Fisheries Service (NMFS) concludes that essential fish habitat (EFH) would not be impacted by the proposed road modifications; accordingly, we offer no comments pursuant to the EFH provisions of the Magnuson-Stevens Act (P.L. 104-297); and this project will not require an EFH Assessment. Further consultation on this matter is not necessary unless future modifications are proposed and you believe that the proposed action may result in adverse impacts to EFH.

Endangered Species Act: We are not aware of any threatened or endangered species or critical habitat under the purview of NMFS that occur within the project area. However, it should be noted that a "no effect" determination must be made by the action agency and the reasoning underlying the determination should be documented in a project file. Please coordinate closely with the U.S. Fish and Wildlife Service for other species listed under the Endangered Species Act that may require consultation.

Fish and Wildlife Coordination Act: The comments NMFS provided regarding sequential mitigation are in accordance with the Fish and Wildlife Coordination Act.

CLC Recommendations:

FDOT District 5 Feedback to National Marine Fisheries Service's Review (07/18/2012): Thank you for your review and determination that EFH will not be impacted by the project and an EFH Assessment will not be required. We will coordinate with the U.S. Fish and Wildlife Service for potential effects to other listed species.

The following organization(s) were expected to but did not submit a review of the Coastal and Marine issue for this alternative:
Federal Highway Administration, Saint Johns River Water Management District

Contaminated Sites

Project Effects

Coordinator Summary Degree of Effect: 3 *Moderate* assigned 08/09/2012 by FDOT District 5

Comments:

Both the FDEP and the USEPA assigned a Moderate degree of effect for contamination issues, citing existing hazardous waste facilities and underground storage tank contamination monitoring sites. We concur with a Moderate degree of effect for this issue.

Degree of Effect: 3 *Moderate* assigned 07/02/2012 by Madolyn Sanchez, US Environmental Protection Agency

Coordination Document: No Selection

Direct Effects

Identified Resources and Level of Importance:

Resources: Soils, groundwater, surface water which have the potential to be negatively affected by contaminated site features such as underground petroleum storage tanks, industrial/commercial facilities with onsite storage of hazardous materials, solid waste facilities, hazardous waste facilities, etc.

Level of Importance: These resources are of a high level of importance in the State of Florida. A moderate degree of effect is being assigned to the contaminated sites issue for the proposed project.

Comments on Effects to Resources:

There are contaminated sites features (within the 500-foot buffer distance) listed in the GIS analysis data at the programming screen phase of the project, including 1 Brownfield Location Boundary site (Central Interchange S.M.A.R.T.), 3 Hazardous Waste Facilities, and 6 USEPA RCRA Facilities.

Brownfield projects are defined as abandoned, idled or under-utilized property where expansion or redevelopment is complicated by the presence or potential presence of environmental contamination. Previous thriving areas of economic activity are listed as Brownfield if the area is abandoned by contamination from past uses. Areas being unused or under-utilized are impediments to economic development in rural and urban communities. Redeveloped, these Brownfield areas can be catalysts for community revitalization. The Brownfield program brings together federal agencies to address cleanup and redevelopment in a more coordinated approach. Often times, federal grant programs and public/private organizations assist in the cleanup and redevelopment of Brownfield areas. The environmental review phase of the project should evaluate whether the classification of an area as a Brownfield Site will impact the transit project.

The PD&E phase of the project should include a Phase I and possibly a Phase II environmental contamination screening audit. This would include a survey of the area be conducted to confirm the location of current listed contaminated site features, along with other

contaminated site features which may have been previously located in the area. Some of the potential issues relating to contaminated sites include leaking underground storage tanks, leaking above ground storage tanks, improper storage and/or disposal of hazardous material, spills and/or leaks from transportation vehicles (trucks, trains, etc.). Direct and indirect impacts resulting from these issues include contamination of soils, groundwater, and surface water. This type of survey should focus on identifying the contaminated sites areas which may be potentially impacted and what type of additional analyses or remediation may be needed. If any contaminated sites features are to be impacted or removed during the construction phase of the project, sampling and analysis should be conducted to determine if pollutants are present above regulatory levels. If high levels of pollutants are identified, remediation may be required prior to commencement of construction of the project. The project should be designed such that negative impact to/from contaminated sites is avoided or minimized to the best extent practicable.

Additional Comments (optional):

CLC Recommendations:

FDOT District 5 Feedback to US Environmental Protection Agency's Review (08/20/2012): Thank you for your comments. A contamination screening evaluation will take place during the study phase. Any needed remediation within the project corridor will be conducted either prior to or during construction activities.

Degree of Effect: 3 *Moderate* assigned 06/28/2012 by Lauren P. Milligan, FL Department of Environmental Protection

Coordination Document: No Selection

Direct Effects

Identified Resources and Level of Importance:

GIS data indicates that there are three hazardous waste facilities, seven storage tank contamination monitoring sites and six RCRA regulated facilities within the 500-ft. project buffer zone.

Comments on Effects to Resources:

A Contamination Screening Evaluation (similar to Phase I and Phase II Audits) will need to be conducted along the project right-of-way in considering the proximity to potential petroleum and hazardous material handling facilities. The Contamination Screening Evaluation should outline specific procedures that would be followed by the applicant in the event drums, wastes, tanks or potentially contaminated soils are encountered during construction. Special attention should be made in the screening evaluation to historical land uses (such as solid waste disposal) that may have an affect on the proposed project, including stormwater retention and treatment areas.

Additional Comments (optional):

CLC Recommendations:

FDOT District 5 Feedback to FL Department of Environmental Protection's Review (08/09/2012): Thank you for your review. A Contamination Screening Evaluation will be conducted along the project corridor during the study phase. This evaluation will include potential stormwater management sites.

The following organization(s) were expected to but did not submit a review of the Contaminated Sites issue for this alternative:
Federal Highway Administration, Saint Johns River Water Management District

Farmlands

Project Effects

Coordinator Summary Degree of Effect: 2 *Minimal* assigned 08/09/2012 by FDOT District 5

Comments:

The National Resource Conservation Service provided comments on this issue and assigned a Minimal Degree of Effect as the project will not negatively affect existing croplands. We concur with this assessment and are assigning a Minimal degree of effect.

Degree of Effect: 2 *Minimal* assigned 05/29/2012 by Rick Allen Robbins, Natural Resources Conservation Service

Coordination Document: No Selection

Direct Effects

Identified Resources and Level of Importance:

The USDA-NRCS considers soil map units with important soil properties for agricultural uses to be Prime Farmland. In addition, the USDA-NRCS considers any soils with important soil properties and have significant acreages that are used in the production of commodity crops (such as, cotton, citrus, row crops, specialty crops, nuts, etc.) to be considered as Farmlands of Unique Importance or Farmlands of Local Importance. Nationally, there has been a reduction in the overall amount of Prime and Unique Farmlands through conversion to non-farm uses. This trend has the possibility of impacting the nation's food supply and exporting capabilities.

There are 2 soil map units identified as Farmlands of Unique Importance. These are the EauGallie sand and Myakka sand map units.

Comments on Effects to Resources:

Conducting GIS analysis of Prime Farmland (using USDA-NRCS data) and Important Farmland Analysis (using 2008 SJRWMD data and 2010 SSURGO data) has resulted in the determination that there are Farmland Soils of Unique Importance at all buffer widths.

The amount within the scope of this project is 50.6 acres at the 100' buffer width. The amount expands to 232.6 acres at the 500' buffer width, which will be outside of the scope of this project. In addition, there is between 9.2 acres (100' buffer) and 44.8 acres (500' buffer) of cropland and pasture within the project area. However, most of the farmland within the project area is classified as Improved Pasture. It is recommended that the project design be designed to minimize impacts to the soils classified as Farmlands of Unique Importance. Since this project (expanded right-of-way) will not negatively affect existing cropland (citrus, vegetable, etc.) , we are assigning a Minimal Degree of Effect to Important Farmlands.

Additional Comments (optional):

CLC Recommendations:

FDOT District 5 Feedback to Natural Resources Conservation Service's Review (08/09/2012): Thank you for your review. The project is located within the greater Palm Bay-Melbourne Urban Area but existing land uses do include agricultural lands immediately adjacent to the project. A farmlands evaluation will be conducted during the study phase.

The following organization(s) were expected to but did not submit a review of the Farmlands issue for this alternative: Federal Highway Administration

Floodplains

Project Effects

Coordinator Summary Degree of Effect: 2 Minimal assigned 08/09/2012 by FDOT District 5

Comments:

The U.S. EPA commented that there are 100 year floodplains adjacent to the project but that impacts could be minimal. We are assigning a Minimal degree of effect.

Degree of Effect: 2 Minimal assigned 07/02/2012 by Madolyn Sanchez, US Environmental Protection Agency

Coordination Document: No Selection

Direct Effects

Identified Resources and Level of Importance:

Resources: Floodplains

Level of Importance: Development within the 100-year floodplain is of a high level of importance. Construction of roadways within the floodplain should not impede, obstruct or divert the flow of water or debris in the floodplain which would alter the roadway's discharge capacity or otherwise adversely affect public health, safety and welfare, or cause damage to public or private property in the event of a flood. A minimal degree of effect is being assigned for the proposed project (ETDM #13026, Widen Malabar Road (SR 514)).

Comments on Effects to Resources:

A review of GIS analysis data (Special Flood Hazard Areas) in the EST at the programming screen phase of the project indicates acreage within the 100-year floodplain, as designated by Zones A and AE of the flood hazard zone designation (FEMA Special Flood Hazard Areas).

Approximately 5 acres of 100-year floodplain are identified within the 100 foot buffer distance, 10 acres of 100-year floodplain are identified within the 200 foot buffer distance, and 36 acres of 100-year floodplain are identified within the 500 foot buffer distance of the proposed interchange project. This project has the potential to impact floodplains and their functions in the area.

General comments relating to floodplains include the fact that any development within the 100-year floodplain has the potential for placing citizens and property at risk of flooding and producing changes in floodplain elevations and plan view extent. Development (such as roadways, housing developments, strip malls and other commercial facilities) within floodplains increases the potential for flooding by limiting flood storage capacity and exposing people and property to flood hazards. Development also reduces vegetated buffers that protect water quality and destroys important habitats for fish and wildlife.

The PD&E phase of the project should include an evaluation of floodplain impacts. FDOT should consider alternatives to avoid adverse effects and incompatible development in the floodplains. Efforts should be made to avoid or minimize impacts to floodplain resources and functions. Engineering design features and hydrological drainage structures should be such that stormwater transport, flow, and discharge meet or exceed flood control requirements. Consultation and coordination with appropriate flood management agencies should occur relating to regulatory requirements, avoidance, minimization and/or mitigation strategies.

Additional Comments (optional):

CLC Recommendations:

FDOT District 5 Feedback to US Environmental Protection Agency's Review (08/09/2012): Thank you for your review and comments. A Location Hydraulic Report will be prepared during the PD&E Study which will identify 100 year floodplain limits, the adequacy of existing hydrologic structures and potential impacts to the floodplain. The project will seek to minimize impacts to the 100 year floodplain.

The following organization(s) were expected to but did not submit a review of the Floodplains issue for this alternative: FL Department of Environmental Protection, Federal Highway Administration, Saint Johns River Water Management District

Infrastructure

Project Effects

Coordinator Summary Degree of Effect: 3 *Moderate* assigned 08/20/2012 by FDOT District 5

Comments:

No agencies provided comments on Infrastructure issues. There are 9 different utilities located along the corridor either above or below ground. It is likely that some of these utilities will be impacted by reconstruction of the roadway and installation of stormsewer lines. Most notably is the presence of an overhead transmission line within the right of way. Utility impacts are part of the alternatives evaluation matrix and are considered in the selection of the preferred alternative. We are assigning a Moderate degree of effect for infrastructure due to the presence of numerous utilities.

None found

The following organization(s) were expected to but did not submit a review of the Infrastructure issue for this alternative: Federal Highway Administration

Navigation

Project Effects

Coordinator Summary Degree of Effect: N/A *N/A / No Involvement* assigned 08/09/2012 by FDOT District 5

Comments:

Both the Corps of Engineers and the US Coast Guard commented that there are no navigable waters of the US involvement with this project. We are assigning a No Involvement degree of effect for this issue.

Degree of Effect: N/A *N/A / No Involvement* assigned 06/26/2012 by Evelyn Smart, US Coast Guard

Coordination Document: No Involvement

Direct Effects

Identified Resources and Level of Importance:

Turkey Creek - the waterway at the SR 514 crossing is non-navigable waters of the United States. No Coast Guard permit will be required.

Comments on Effects to Resources:

Additional Comments (optional):

CLC Recommendations:

FDOT District 5 Feedback to US Coast Guard's Review (08/09/2012): Thank you.

Degree of Effect: 0 *None* assigned 06/08/2012 by Andrew Phillips, US Army Corps of Engineers

Coordination Document: No Involvement

Direct Effects

Identified Resources and Level of Importance:

A review of the EST and USACE Tools did not reveal the presence of any navigable waterways within the project limits. No impacts are anticipated. No further involvement is required.

Comments on Effects to Resources:

Additional Comments (optional):

CLC Recommendations:

FDOT District 5 Feedback to US Army Corps of Engineers's Review (08/09/2012): Thank you.

The following organization(s) were expected to but did not submit a review of the Navigation issue for this alternative: Federal Highway Administration

Special Designations

Project Effects

Coordinator Summary Degree of Effect: 3 *Moderate* assigned 08/20/2012 by FDOT District 5

Comments:

The USEPA commented on the numerous special designations in the vicinity of this project, urging avoidance of impacts to these resources. We concur with EPS's assignment of Moderate degree of effect for special designations.

Degree of Effect: 3 *Moderate* assigned 07/02/2012 by Madolyn Sanchez, US Environmental Protection Agency

Coordination Document: No Selection

Direct Effects

Identified Resources and Level of Importance:

Resources: Features classified as Special Designations - Brownfield Location Boundaries, Special Flood Hazard Areas, Florida Forever BOT Projects, Florida Scenic Highways and Byways, Aquatic Preserves, Public Lands, Outstanding Florida Waters, Farmland of Unique Importance

Level of Importance: These special designation features are of a high level of importance in the State of Florida and in the project area. A moderate degree of effect is being assigned to this issue for the proposed project (ETDM #13026, Widen Malabar Rd (SR514)).

Comments on Effects to Resources:

A review of GIS analysis data at the programming screen phase of the project indicates that the following features identified as Special Designations are located within proximity of the project:

Brownfield Location Boundaries - See Comments under Contaminated Sites issue regarding Brownfields impacts.

Special Flood Hazard Areas - See Comments under Floodplains issue regarding potential floodplain impacts.

Florida Forever BOT Projects - See Comments under Recreation Areas issue regarding potential impacts to public lands and sensitive recreational/natural resource areas such as the Brevard Coastal Scrub Ecosystem Florida Forever BOT Project.

Florida Scenic Highways and Byways - INDIAN RIVER LAGOON SCENIC HIGHWAY

Aquatic Preserve - INDIAN RIVER - MALABAR TO VERO BEACH AQUATIC PRESERVE

The Indian River - Malabar to Vero Beach Aquatic Preserve is located in Brevard and Indian River Counties. It encompasses 28,000 acres of sovereign submerged lands. Turkey Creek and the St. Sebastian River are the main freshwater tributaries of the aquatic preserve. This aquatic preserve is characterized by the overlap of temperate and subtropical zones along with the convergence of fresh and brackish water systems that create a highly diverse ecosystem. The Indian River Lagoon is America's most diverse estuary with over 400 species of fish, 260 species of mollusks and 479 species of shrimp and crabs. Public uses include boating, swimming, fishing, clamming, sail boarding, kayaking, and manatee, dolphin, and bird watching.

Public Lands - See Comments under Recreation Areas issue regarding potential impacts to public lands and sensitive recreational/natural resource areas such as the Sand Hill Trailhead and the Malabar Scrub Sanctuary.

Outstanding Florida Waters - Indian River - Malabar to Vero Beach Aquatic Preserve

The Indian River - Malabar to Vero Beach Aquatic Preserve is listed as an Outstanding Florida Waters (OFWs). OFWs are provided the highest level of protection under the Florida Administrative Code (F.A.C.). Degradation of water quality in an OFW is prohibited except under certain circumstances. Pollutant discharges must not lower existing ambient water quality. Any activity within an OFW requiring a Florida Department of Environmental Protection (FDEP) Environmental Resource Permit (ERP) must be deemed to be clearly in the public interest. Additional stormwater retention and treatment requirements may be required. FDOT will need to coordinate and consult with FDEP and the Water Management District regarding specific permitting requirements relating to this OFW.

Farmland of Unique Importance - There are between 50 and 235 acres of land classified as "Farmland of Unique Importance" within the 100- to 500-foot buffer distances.

EPA is assigning a moderate degree of effect to this issue due to the fact that there are sensitive environmental and natural resource areas located in the project area. These areas could be impacted by the project. Also, any subsequent development in the area would have significant indirect and cumulative impacts on these types of resources.

FDOT should evaluate direct, indirect, and cumulative impacts to special designation features such as the ones listed above. Opportunities to avoid and or minimize impacts and fragmentation to these types of resources should be evaluated and considered to the greatest extent practicable.

Additional Comments (optional):

CLC Recommendations:

FDOT District 5 Feedback to US Environmental Protection Agency's Review (08/20/2012): Thank you for your review and comments noting the many special designations adjacent to this project. We will attempt to minimize impacts to these resources to the greatest extent practicable if those resources cannot be avoided.

The following organization(s) were expected to but did not submit a review of the Special Designations issue for this alternative: FL Department of Agriculture and Consumer Services, Federal Highway Administration, Saint Johns River Water Management District

Water Quality and Quantity

Project Effects

Coordinator Summary Degree of Effect: 3 *Moderate* assigned 08/09/2012 by FDOT District 5

Comments:

Both the FDEP and USEPA provided comments on water quality issues. Both noted that the receiving waters are impaired waterbodies and that the Indian River Lagoon in this area is an aquatic preserve and as such is considered an Outstanding Florida Water. Both agencies assigned Moderate degrees of effect for this issue. We concur with this assessment and are assigning a Moderate degree of effect.

Degree of Effect: 3 *Moderate* assigned 07/02/2012 by Madolyn Sanchez, US Environmental Protection Agency

Coordination Document: No Selection

Direct Effects

Identified Resources and Level of Importance:

Resources: Surface water, ground water

Level of Importance: These resources are of a high level of importance in the State of Florida. A moderate degree of effect is being assigned to this issue for the proposed project (ETDM #13026, Widen Malabar Rd (SR 514)).

Comments on Effects to Resources:

Both the Indian River Above Sebastian Inlet and Turkey Creek are listed as impaired waters for failure to meet water quality standards. Indian River Above Sebastian Inlet is listed on the 303(d) list of impaired waters for dissolved action silver, lead, cadmium, selenium, thallium, nutrients, and mercury. Turkey Creek is listed for dissolved oxygen and nutrients. Water quality in the watershed, as reported in the Clean Water Act Section 305(b) report, is listed as "Fair" and "Good".

The Indian River - Malabar to Vero Beach Aquatic Preserve is listed as an Outstanding Florida Waters (OFWs). OFWs are provided the highest level of protection under the Florida Administrative Code (F.A.C.). Degradation of water quality in an OFW is prohibited except under certain circumstances. Pollutant discharges must not lower existing ambient water quality. Any activity within an OFW requiring a Florida Department of Environmental Protection (FDEP) Environmental Resource Permit (ERP) must be deemed to be clearly in the public interest. Additional stormwater retention and treatment requirements may be required. FDOT will need to coordinate and consult with FDEP and the Water Management District regarding specific permitting requirements relating to this OFW.

The PD&E study should include a review of water quality standards in the above listed water bodies, sources of water quality impairments, and any associated TDML requirements and how these regulations and/or requirements may affect the proposed project and environmental resource permits.

Potential pollutant sources to surface water quality include stormwater runoff into nearby surface water bodies via drainage ditches or other conveyance systems. Stormwater runoff from urban sources, including roadways, carries pollutants such as volatile organics, petroleum hydrocarbons, heavy metals, and pesticides/herbicides. Proper stormwater conveyance, containment, and treatment will be required in accordance with state and federal regulations and guidelines. Engineering design features and hydrological drainage structures should be such that stormwater transport, flow, and discharge meet or exceed requirements.

Increase in traffic volumes as a result of the roadway project could potentially have both direct and indirect impacts to water quality in surface water bodies, including Turkey Creek and Indian River - Malabar to Vero each Aquatic Preserve.

Additional Comments (optional):

CLC Recommendations:

FDOT District 5 Feedback to US Environmental Protection Agency's Review (08/09/2012): Thank you for your comments. We will coordinate with the St. Johns River Water Management District to determine if TMDLs have been established for Turkey Creek or other criteria for discharge to the impaired water.

Degree of Effect: 3 *Moderate* assigned 06/28/2012 by Lauren P. Milligan, FL Department of Environmental Protection

Coordination Document: Permit Required

Direct Effects

Identified Resources and Level of Importance:

Stormwater runoff from the highway may alter adjacent surface waters through increased pollutant loading. If widened, additional runoff carrying oils, greases, metals, sediment, and other pollutants from the increased impervious surface would be of concern. Natural resource impacts within and adjacent to the proposed road right-of-way may include alteration of the existing surface water hydrology and natural drainage patterns, and reduction in flood attenuation capacity of area creeks, ditches, and sloughs as a result of increased impervious surface within the watershed.

Comments on Effects to Resources:

Every effort should be made to maximize the treatment of stormwater runoff from the proposed roadway construction project, as area stormwater discharges to the Indian River-Malabar to Vero Beach Aquatic Preserve - designated Outstanding Florida Waters (OFW) 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. Pursuant to 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 area 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 40C-4, F.A.C., and the SJRWMD Basis of Review for ERP Applications.

Additional Comments (optional):

CLC Recommendations:

FDOT District 5 Feedback to FL Department of Environmental Protection's Review (08/09/2012): Thank you for your review and comments. Future stormwater treatment facilities will discharge to tributaries of Turkey Creek and ultimately the Indian River-Malabar to Vero Beach Aquatic Preserve, an Outstanding Florida Water. We will coordinate with the SJRWMD as the project progresses to determine treatment criteria.

The following organization(s) were expected to but did not submit a review of the Water Quality and Quantity issue for this alternative: Federal Highway Administration, Saint Johns River Water Management District

Wetlands

Project Effects

Coordinator Summary Degree of Effect: 3 Moderate assigned 08/09/2012 by FDOT District 5

Comments:

Five agencies provided comments in the environmental screening tool on wetland issues citing the presence of various wetland types, proximity of the Aquatic Preserve and OFW and the need to avoid or at least minimize impacts to wetlands. All agencies assigned a Moderate degree of effect for wetland issues. We concur and are assigning a Moderate summary degree of effect.

Degree of Effect: 3 Moderate assigned 07/02/2012 by Madolyn Sanchez, US Environmental Protection Agency

Coordination Document: No Selection

Direct Effects

Identified Resources and Level of Importance:

Resources: Wetlands, wetlands habitat, water quality

Level of Importance: These resources are of a high level of importance in the State of Florida and within the project corridor. Due to the importance of wetlands for water quality enhancement, flood storage capacity, drainage, and wildlife habitat, EPA is assigning a moderate degree of effect to the wetlands issue.

Comments on Effects to Resources:

A review of GIS analysis data (National Wetlands Inventory) in the EST for wetlands indicates that there are wetlands present along the roadway corridor within the 100, 200, and 500 foot buffer distances.

100 foot buffer distance:

Estuarine - < 1 acre

Palustrine - 6 acres

200 foot buffer distance:

Estuarine - < 1 acre

Palustrine - 14 acres

500 foot buffer distance:

Estuarine - 7 acres

Palustrine - 41 acres

The Wetlands 2009 data in the EST classifies the wetlands as bay swamps, mixed scrub-shrub wetland, mixed wetland hardwoods, and wet prairies.

The project will have potential impacts on wetland resources, including wetlands associated with Turkey Creek and associated tributaries. There are several other surface water bodies (such as Little Turkey Creek and Indian River Above Sebastian Inlet) along the project corridor which may have wetland systems associated with them and would be impacted by the roadway and surrounding development. The Indian River - Malabar to Vero Beach Aquatic Preserve is listed as an Outstanding Florida Water and the Indian River - Malabar to Vero Beach Aquatic Preserve are also located within close proximity to the project.

Other issues of concern include increased stormwater runoff and the increase of pollutants into surface waters and wetlands as a result of the roadway and other point and nonpoint sources. Every effort should be made to maximize the treatment of stormwater. Stormwater treatment areas/ponds should be designed to protect the function of surrounding wetlands, floodplains, and surface

water features.

It is recommended that the environmental phase (PD&E) of the project include delineation of wetlands; functional analysis of wetlands to determine their value and function; an evaluation of stormwater pond sites to determine their impact on wetlands; a review of surface water crossings (such as bridges) to determine their impact on wetlands and floodplains; avoidance and minimization strategies for wetlands; and mitigation plans to compensate for adverse impacts.

Additional Comments (optional):

CLC Recommendations:

FDOT District 5 Feedback to US Environmental Protection Agency's Review (08/09/2012): Thank you for your review and comments. Your recommendation of activities to be included in the environmental phase will be adhered to. The following reports will address those recommendations: Wetland Evaluation Report, Pond Sitting Report, Location Hydraulics Report and the Quality Enhancement Strategies developed in concert with the Corps of Engineers.

Degree of Effect: **3** *Moderate* assigned 07/02/2012 by Brandon Howard, National Marine Fisheries Service

Coordination Document: No Involvement

Coordination Document Comments: Magnuson-Stevens Act: Based on the project location, the site inspection, information provided in the ETDM website, and GIS-based analysis of impacts, NOAA's National Marine Fisheries Service (NMFS) concludes that essential fish habitat (EFH) would not be impacted by the proposed road modifications; accordingly, we offer no comments pursuant to the EFH provisions of the Magnuson-Stevens Act (P.L. 104-297); and this project will not require an EFH Assessment. Further consultation on this matter is not necessary unless future modifications are proposed and you believe that the proposed action may result in adverse impacts to EFH.

Endangered Species Act: We are not aware of any threatened or endangered species or critical habitat under the purview of NMFS that occur within the project area. However, it should be noted that a "no effect" determination must be made by the action agency and the reasoning underlying the determination should be documented in a project file. Please coordinate closely with the U.S. Fish and Wildlife Service for other species listed under the Endangered Species Act that may require consultation.

Fish and Wildlife Coordination Act: The comments NMFS provided regarding sequential mitigation are in accordance with the Fish and Wildlife Coordination Act.

Direct Effects

Identified Resources and Level of Importance:

Based on our review of the information provided on the EST website, a site inspection on June 29, 2012, GIS-based effects analysis on wetlands and interpretation of aerial photographs, NOAA's National Marine Fisheries Service (NMFS) has determined that emergent wetlands, mixed wetland hardwoods, creeks, and ditches are located within the project corridor. These wetlands range from low to moderate in quality. Two creeks intersect Malabar Road within the project area; one just east of Weber Road and the other, just west of Corey Road. The primary purpose of the site inspection was to determine if these creeks are tidal. Neither creek had a definitive tidal signature.

Comments on Effects to Resources:

The wetlands along the proposed roadway expansion provide water quality functions, such as removal of sediments, excess nutrients, and contaminants, which benefit and support these aquatic ecosystems. Through hydrological connections, these wetlands also contribute plant material and other useable nutrients (both dissolved and particulate organic matter) into aquatic food webs that include recreationally, commercially, and ecologically important species within downstream estuaries. If wetland impacts are unavoidable, sequential minimization and mitigation should take place.

In addition to the direct impacts from filling wetlands, construction activities may impact adjacent wetlands through sedimentation and runoff.

Additional Comments (optional):

Magnuson-Stevens Act: Based on the project location, the site inspection, information provided in the ETDM website, and GIS-based analysis of impacts, NOAA's National Marine Fisheries Service (NMFS) concludes that essential fish habitat (EFH) would not be impacted by the proposed road modifications; accordingly, we offer no comments pursuant to the EFH provisions of the Magnuson-Stevens Act (P.L. 104-297); and this project will not require an EFH Assessment. Further consultation on this matter is not necessary unless future modifications are proposed and you believe that the proposed action may result in adverse impacts to EFH.

Endangered Species Act: We are not aware of any threatened or endangered species or critical habitat under the purview of NMFS that occur within the project area. However, it should be noted that a "no effect" determination must be made by the action agency and the reasoning underlying the determination should be documented in a project file. Please coordinate closely with the U.S. Fish and Wildlife Service for other species listed under the Endangered Species Act that may require consultation.

Fish and Wildlife Coordination Act: The comments NMFS provided regarding sequential mitigation are in accordance with the Fish and Wildlife Coordination Act.

CLC Recommendations:

FDOT District 5 Feedback to National Marine Fisheries Service's Review (08/09/2012): Thank you for your comments and determination that an essential fish habitat assessment will not be required. We will coordinate with the USF&WS in regards to listed species during the study phase.

Degree of Effect: 3 Moderate assigned 06/29/2012 by Jane Monaghan, US Fish and Wildlife Service

Coordination Document: To Be Determined: Further Coordination Required

Direct Effects

Identified Resources and Level of Importance:

Wetlands provide important habitat for fish and wildlife.

Comments on Effects to Resources:

According to the Environmental Screening Tool, several large, high quality wetlands, riverine and estuarine ecosystems (Indian River Lagoon, Turkey Creek, Stillwater Preserve) are found within the action area. We recommend that these valuable resources be avoided to the greatest extent practicable. Developing alternatives that avoid any impacts to Stillwater Preserve is preferred since this is already a wetland mitigation site. If impacts to wetlands are unavoidable, FDOT should provide mitigation that fully compensates for the loss of wetland function and wildlife value and maintains habitat connectivity. The roadway drainage system should be upgraded to avoid increased run off of contaminants (oil, gas, grease, trash) into the adjacent conservation lands or wetland ecosystems.

Brevard County manages conservation land on the northern side of Malabar Road known as the Malabar Scrub Sanctuary. This area supports oak scrub, scrubby flatwoods, sand pine scrub, and high quality wetlands. According to the Malabar Scrub website, this land is a refuge for eastern indigo snakes, Florida scrub-jays and gopher tortoise. The Service has determined that this conservation land meets Section 4(f) criteria and any impacts to the Malabar Scrub Sanctuary should be avoided. Habitat fragmentation is already occurring in this area as a result of urban sprawl and can reduce the connectivity and habitat values of the existing conservation lands. There is potential for increased mortality for all wildlife in the area attempting to cross a wider, busier road. Increased noise levels and disturbance may also be detrimental to many species of wildlife on conservation lands.

Additional Comments (optional):

CLC Recommendations:

FDOT District 5 Feedback to US Fish and Wildlife Service's Review (08/09/2012): Thank you for pointing out the Stillwater Preserve development and associated wetland mitigation. We are aware of the Malabar Scrub Sanctuary and we thank you for the determination that this is a Section 4(f) resource. This resource will be a constraint in our alternatives analysis and all efforts will be made to avoid impacts to this resource. We will coordinate further with the Service on this resource.

Degree of Effect: 3 Moderate assigned 06/28/2012 by Lauren P. Milligan, FL Department of Environmental Protection

Coordination Document: Permit Required

Direct Effects

Identified Resources and Level of Importance:

The National Wetlands Inventory GIS report indicates that there are 6.9 acres of estuarine wetlands, 40.9 acres of palustrine wetlands and 6 acres of continuous seagrass beds within the 500-ft. project buffer zone. Please note that the adjacent Indian River Lagoon is part of the Indian River-Malabar to Vero Beach Aquatic Preserve and designated Outstanding Florida Waters (OFW). The designations thus reflected in Chapters 253, 258, 373, and 403, Florida Statutes, afford the highest level of state protection to the OFW and estuarine system of the Indian River Lagoon.

Comments on Effects to Resources:

The proposed project will require an environmental resource permit (ERP) from the St. Johns River Water Management District. The ERP applicant will be required to eliminate or reduce the proposed wetland resource impacts of roadway construction to the greatest extent practicable:

- Minimization should emphasize avoidance-oriented corridor alignments, wetland fill reductions via pile bridging and steep/vertically retained side slopes, and median width reductions within safety limits.
- Wetlands should not be displaced by the installation of stormwater conveyance and treatment swales; compensatory treatment in adjacent uplands is the preferred alternative.
- After avoidance and minimization have been exhausted, mitigation must be proposed to offset the adverse impacts of the project to existing wetland functions and values. Significant attention is given to forested wetland systems, which are difficult to mitigate.
- The cumulative impacts of concurrent and future transportation improvement projects in the vicinity of the subject project should also be addressed.

Additional Comments (optional):

CLC Recommendations:

FDOT District 5 Feedback to FL Department of Environmental Protection's Review (08/09/2012): Thank you for your comments. We will look at concepts that meet the needs of the project while also trying to avoid wetland impacts if practicable. Should some wetland impacts be unavoidable then we will address measures to minimize those unavoidable impacts and propose mitigation that would offset those adverse impacts. We will perform a cumulative effects analysis during the study phase.

Degree of Effect: 3 Moderate assigned 06/11/2012 by Andrew Phillips, US Army Corps of Engineers

Coordination Document: Permit Required

Coordination Document Comments: The Quality Enhancement Strategies for Wetland Impact Minimization developed by Florida Department of Transportation-District 5 should be incorporated into this project and District should consider use of regional general permit SAJ-92.

Direct Effects

Identified Resources and Level of Importance:

The project as proposed will impact wetlands and surface waters which are hydrologically connected to the Turkey Creek and regulated by the USACE pursuant to Section 404 of the Clean Water Act. Five tributaries of Turkey Creek were identified within this section of Malabar Road. Additionally, widening to the north side of the road would impact Malabar Scrub Sanctuary. Additionally, wetlands associate with Stillwater Preserve (Department of the Army SAJ-2004-09015) were avoided and utilized as compensatory mitigation for impacts associated with its development. The wetland systems and tributaries of Turkey Creek play a vital role as habitat for wildlife, flood storage, water quality issues, and drainage for the surrounding areas. These waters and their associated floodplain and tributaries would be considered a high importance. Remnant wetlands scattered throughout the proposed corridor vary in functions and value which may reduce their importance. A functional analysis would determine the extent of high, moderate, and low quality wetland.

Comments on Effects to Resources:

The project should be designed to avoid important resources on the north side of the roadway. Drainage structures should be designed to encourage continuity of habitats and facilitation of wildlife crossings. Impacts to wetlands associated with Stillwater Preserve will require more than 1:1 compensatory mitigation to functional loss; due to the fact that they are compensatory mitigation for DA permit SAJ-2004-09015.

Additional Comments (optional):

The Quality Enhancement Strategies for Wetland Impact Minimization developed by Florida Department of Transportation-District 5 should be incorporated into this project and District should consider use of regional general permit SAJ-92.

CLC Recommendations:

FDOT District 5 Feedback to US Army Corps of Engineers's Review (08/09/2012): Thank you for your comments. The Wetland Evaluation Report conducted during the study will provide a functional analysis and an assessment of the quality of wetlands along the corridor. If avoidance of wetlands is not practicable, we will document Quality Enhancement Strategies for minimization of wetland impacts.

The following organization(s) were expected to but did not submit a review of the Wetlands issue for this alternative: Federal Highway Administration, Saint Johns River Water Management District

Wildlife and Habitat

Project Effects

Coordinator Summary Degree of Effect: 3 *Moderate* assigned 08/09/2012 by FDOT District 5

Comments:

Three agencies provided comments on wildlife and habitat issues. Most notable is the presence of coastal scrub conservation lands immediately adjacent to the project and suitable habitat for other listed species. All three agencies assigned a Moderate degree of effect for this issue.

Additionally, the SJRWMD also provided comments via direct e-mail citing the importance of natural resources along the corridor and expressing concern for secondary wildlife impacts due to roadway mortality. The District suggested a design that would facilitate wildlife connectivity and measures to exclude wildlife from the roadway.

Degree of Effect: 3 *Moderate* assigned 06/29/2012 by Jane Monaghan, US Fish and Wildlife Service

Coordination Document: To Be Determined: Further Coordination Required

Direct Effects

Identified Resources and Level of Importance:

Federally listed species and the ecosystems upon which they depend.

Comments on Effects to Resources:

Project description

The purpose of this project is to provide for increased capacity along the two lane section of Malabar Road from Babcock Street east to US 1, a distance of 3.64 miles. Malabar Road is a four lane divided facility from the I-95 Interchange east to Babcock St. but then transitions back to a two lane facility east of Babcock St. The Project Development and Environmental Study will analyze alternatives for widening Malabar Rd. from a two lane to a four lane facility in order to accommodate projected increases in traffic volume

Comments on Effects to Resources:

Wood Stork (*Mycteria americana*)

The proposed widening of Malabar road and subsequent wetland impacts could affect the Core Foraging Areas (CFA=15 mile radius around active colonies) of at least eight active nesting colonies. A map of the colony locations and names/numbers can be found on the North Florida Field Office website (see below). The Service has determined that the loss of wetlands within a CFA due to an action could result in the loss of foraging habitat for the wood stork. To minimize adverse effects to the wood stork, we recommend that any loss of foraging habitat as a result of wetland fill and destruction, be replaced within the CFA of the affected nesting colony. The Service does not consider the preservation of wetlands, by itself, as adequate compensation for impacts to wood stork foraging habitat, because the habitat lost is not replaced. Accordingly, any wetland mitigation plan proposed should include a restoration, enhancement, or creation component. In some cases, the Service accepts wetlands compensation located outside the CFA of the affected wood stork nesting colony. Specifically, wetland credits purchased from a "Service Approved" mitigation bank located outside of the CFA would be acceptable, provided that the impacted wetlands occur within the permitted service area of the bank. To minimize adverse effects to the wood stork and other wetland dependent species, we recommend that impacts to suitable foraging

habitat be avoided. Please refer to the North Florida Field Office website for WOST colony locations, definitions and effect determination key for any wetland impacts: <http://www.fws.gov/northflorida/>
We recommend the use of the wood stork Effect Determination Key that was developed between the Service and the Army COE. FDOT should provide the path taken through the key to reach a "May Affect but Not Likely to Adversely Affect" determination call.

Bald Eagle (*Haliaeetus leucocephalus*)

The nest locator database on the FFWCC (Florida Fish and Wildlife Conservation Commission) website (MyFWC.com/Eagle) should be checked for documented nests. However, new nests may not be in the database and a thorough examination of the proposed impact areas from the air is recommended. Any bald eagle nest within 700 feet of the project should be documented and all future actions should be coordinated with the USFWS Office of Migratory Birds, Bald and Golden Eagle permitting: <https://www.fws.gov/migratorybirds/BaldEagle.htm>

Eastern Indigo Snake (*Drymarchon corais couperi*)

This species can be found in a wide variety of habitats, including urban settings near agricultural land use or conservation lands. It appears that suitable habitat is present and/or gopher tortoise burrows could be found within the impact areas. The gopher tortoise (*Gopherus polyphemus*) has recently been listed as a federal candidate species and will be listed as threatened when funding is available. A complete survey for gopher tortoise burrows within the ROW, potential pond sites or staging areas will facilitate the use of the eastern indigo snake effect determination key that the Service and the Army COE utilize for permitting. There is high potential for this species to be present due to the rural nature of the area, the amount of undeveloped land and the presence of conservation lands adjacent to Malabar road. Consequently, road widening and further habitat fragmentation in a relatively undeveloped area could cause increased mortality for this gopher tortoise and indigo snakes as well as for many snakes and amphibians, for the life of the facility. The eastern indigo snake effect determination key and new survey protocols should be utilized. The Service recommends contacting our office to review the revised conservation guidelines and ensure that the applicant has a full understanding of whether or not they need to implement the new survey protocols. These guidelines can be found on the USFWS website (<http://www.fws.gov/northflorida>)

Florida scrub-jay (*Aphelocoma coerulescens*)

This species may be found within rural or urban areas in Brevard County. Surveys should be done according to guidelines found on the USFWS website (<http://www.fws.gov/northflorida>) if suitable habitat is present. There are several areas along this road that may support Florida scrub-jays. Brevard County manages the Malabar Scrub Sanctuary and may be able to provide FDOT with current Florida scrub-jay (FLSJ) data on conservation lands. Surveys within two years of the construction date are recommended. Survey methodology and results should be submitted to the USFWS office for review. Wider roads with high speed limits near FLSJ territories prove deadly to fledglings and younger birds as they learn how to navigate traffic and crossroads safely. In several studies, these roads have been documented as population sinks.

Brevard County has one federally listed plant, Carter's mustard (*Warea carteri*) which does not occur within the impact area.

The Service has no documentation of Audubon's crested caracara (*Polyborus plancus audubonii*) or Everglade snail kites (*Rostrhamus sociabilis plumbeus*) within the impact area, nor is there suitable habitat along Malabar road for either of these species. Consequently, no surveys are needed. Both species can be found in Brevard County, generally west of I-95, utilizing marshes associated with the St. John's River (snail kites) or open pasturelands (caracara's).

Red-cockaded woodpeckers (*Picoides borealis*) are currently not found in the Malabar Scrub Sanctuary. No known colonies exist within the impact area and the potential for this species to occur near this road are very low.

The Service would concur with a 'No Effect' determination for the piping plover (*Charadrius melodus*) due to the lack of suitable habitat in the area.

If submerged aquatic vegetation (SAV) in the Indian River Lagoon will be impacted directly or indirectly as a result of the project or if storm water runoff is not treated and allowed to enter drainage systems connected to the lagoon, then the Service should be consulted regarding the effects on the Florida manatee (*Trichechus manatus latirostris*).

Additional Comments (optional):

CLC Recommendations:

FDOT District 5 Feedback to US Fish and Wildlife Service's Review (08/09/2012): Thank you for your input. We will utilize the Service's Effect Determination Keys for the Wood Stork and Eastern Indigo Snake and will coordinate with the Service as the project progresses. We will conduct surveys for the Florida Scrub jay during the study phase and again prior to construction. Thank you for the No Effect determination for the piping plover and your input that no Red-cockaded woodpecker, Audubon's crested caracara or listed plant species are present.

Degree of Effect: **3** *Moderate* assigned 06/19/2012 by Scott Sanders, FL Fish and Wildlife Conservation Commission

Coordination Document: To Be Determined: Further Coordination Required

Coordination Document Comments: We recommend that the PD&E Study address natural resources by including the following measures for conserving fish and wildlife and habitat resources that may occur within and adjacent to the project area. Plant community mapping and wildlife surveys for the occurrence of wildlife 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 should be performed, both along the ROW and within sites proposed for Drainage Retention Areas. 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. FDOT's proposed study should be planned to assess center, right, and left ROW expansion to identify the best Alternatives to avoid or minimize resource impacts. If gopher

tortoises or nests of other ST or SSC species are present within any permanent or temporary construction area, a permit should be obtained from the FWC. Drainage Retention Areas and equipment staging areas should be located in previously disturbed or cleared sites to avoid habitat destruction or degradation. A compensatory mitigation plan should include the replacement of any 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. Land acquisition and restoration of appropriate tracts near the project area and adjacent to existing public lands, such as the Malabar Scrub Sanctuary, or the Brevard Coastal Scrub Ecosystem Florida Forever Project area, or tracts placed under conservation easement or located adjacent to large areas of jurisdictional wetlands that currently serve as regional core habitat areas, would be supported by our agency. Protection of the Brevard Coastal Scrub Ecosystem Florida Forever tract, and the Malabar Scrub Sanctuary and the downstream Indian River estuary and tributaries such as Turkey Creek and Little Turkey Creek should be a top priority. Please notify us immediately if the design, extent, or footprint of the current project is modified, as we may choose to provide additional comments and/or recommendations.

We appreciate the opportunity to provide input on highway design and the conservation of fish and wildlife resources. Please contact Terry Gilbert at (850) 728-1103 or email terry.gilbert@MyFWC.com initiate the process for further overall coordination on this project.

Direct Effects

Identified Resources and Level of Importance:

The Office of Conservation Planning Services of the Florida Fish and Wildlife Conservation Commission (FWC) has coordinated an agency review of ETDM #13026, Brevard County, and provides the following comments related to potential effects to fish and wildlife resources on this Programming Phase project.

The Project Description Summary states that the project involves widening Malabar Road (SR-514) from two to four lanes over a distance of 3.64 miles from Babcock Street east to US-1. Currently, Malabar Road is a four-lane facility from Babcock Street west to I-95 and the posted speed limit is 55 miles per hour. Malabar Road is a designated hurricane evacuation route. Issues to be addressed in the project Alternatives include the crossing of the Florida East Coast Railroad line, and the roadway expansion in the area of Fern Creek Crossing Park, Malabar Park, and the Malabar Scrub Sanctuary which is located adjacent to the existing roadway. The eastern terminus of the project is immediately adjacent to the Indian River Lagoon and Aquatic Preserve. FDOT is now requesting input from state and federal resource and permit agencies at this early stage of the project in order to define the scope of the PD&E Study so that potential natural resource issues can be addressed and resolved. Additional Right-of-way (ROW) will be needed for the project.

The project area was evaluated for potential fish, wildlife, and habitat resources within 500 feet of the proposed alignment. Our assessment reveals that the project area is characterized by approximately 42.7 percent (196.8 acres) of High and Low Impact Urban Lands, 7.5 percent (34.5 acres) wetlands, and 42.7 percent (196.8 acres) of upland forests. Upland plant communities are represented by dry prairie (9.8 percent, 45.0 acres), upland hardwood hammocks (8.5 percent, 39.0 acres), mixed hardwood-pine forests (5.4 percent, 24.7 acres), pinelands (18.2 percent, 83.7 acres), shrub and brushland (0.92 percent, 4.2 acres), and xeric oak scrub (0.05 percent (0.2 acres).

Based on known range and preferred mix of habitat types, the following 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 along the project area: Sherman's fox squirrel (SSC), Florida mouse (SSC), gopher tortoise (ST), gopher frog (SSC), American alligator (FT), Eastern indigo snake (FT), Florida pine snake (SSC), little blue heron (SSC), tricolored heron (SSC), snowy egret (SSC), white ibis (SSC), reddish egret (SSC), wood stork (FE), Southeastern kestrel (ST), Florida sandhill crane (ST), Florida burrowing owl (SSC), Florida scrub jay (FT), and possibly the red-cockaded woodpecker (FE).

In addition, the following species, although not officially listed, are considered by our Agency as Species of Greatest Conservation Need and may also occur within the project area: striped skunk, spotted skunk, Florida long-tailed weasel, river otter, Eastern cottontail rabbit, Eastern diamondback rattlesnake, Southern hognose snake, Eastern hognose snake, common kingsnake, Florida scrub lizard, Florida box turtle, Cooper's hawk, Northern bobwhite, ground dove, hairy woodpecker, red-headed woodpecker, Northern flicker, swallow-tail kite, loggerhead shrike, brown-headed nuthatch, bald eagle, and the peregrine falcon.

The GIS analysis and other sources revealed several specific characteristics associated with lands along the project alignment that provide an indication of potential habitat quality or sensitivity that will require field studies to verify the presence or absence of listed wildlife species and to assess the quality of wildlife habitat. The FWC's Integrated Wildlife Habitat Ranking System rates approximately 46.0 percent (211.9 acres) of the upland and wetland habitat within the assessment area as low quality, 32.1 percent (147.8 acres) as medium quality, and 15.9 percent (73.2 acres) as moderately high quality. Also, 38.1 percent (175.4 acres) of the area is ranked as medium quality and 6.4 percent (29.4 acres) as moderately high quality by the FWC's Potential Habitat Richness Data Base. In addition, a portion of the assessment area is also mapped as an FWC Strategic habitat Conservation Area (SHCA) for the Cooper's hawk (6.5 percent, 29.8 acres), and the Florida scrub jay (2.4 percent (10.9 acres). Occurrence records from the Florida Natural Areas Inventory (FNAI) also shows that the gopher tortoise (ST) and Florida long-tailed weasel have been observed within 500 feet of the existing roadway, while the Florida Scrub jay and the following State Listed plants including Nodding pinweed (ST), giant orchid (ST), and pine pinweed (SE) have been officially recorded within one mile.

The project area wetlands are also within Wood Stork Core Foraging Areas as designated by the U.S. Fish and Wildlife Service which partially support the following 10 rookeries: SW Lake Washington, Pelican Island, US-192 East, Valkaria, 616119, 616301, Grant Island Farm, Lake Washington, Micco South, and Micco North. The project area is within the Consultation area for the following species as established by the U.S. Fish and Wildlife Service: West Indian Manatee (FE), piping plover (FT), red-cockaded woodpecker (FE), Florida scrub jay (FT), crested caracara (FT), and the Florida snail kite (FE). The project area crosses an un-named tributary of Turkey Creek, and is within the drainage basin of, and could possibly affect the following nearby water bodies via stormwater runoff: the freshwater segment of Turkey Creek, Little Turkey Creek and the Indian River above Sebastian Inlet.

Importantly, a sizable tract of the much larger Brevard Coastal Scrub Ecosystem Florida Forever Project occurs along the northern

ROW boundary of CR-514. The entire 17,768-acre regional Florida Forever cooperative project was initiated in 1996 to protect numerous disjoint sites representing some of the best remaining fragments of Atlantic Coastal scrub which provide habitat for state and federally listed species including the Florida scrub jay and many other scrub dependent animal and plant species. The 408.2-acre Malabar Scrub Sanctuary, managed by Brevard County, also occurs along the northern portion of the ROW and was acquired as part of the larger Florida Forever Project. The Brevard Coastal Scrub Ecosystem Florida Forever project area, along with the Malabar Park Scrub Sanctuary and Fern Creek Crossing Park could be adversely affected by the proposed work.

Comments on Effects to Resources:

Primary wildlife issues associated on this project include direct impacts to upland and wetland plant communities resulting in the loss of habitat from expansion of the roadway. Of particular importance is the potential impact to the Brevard Coastal Scrub Ecosystem Florida Forever tract, and the Malabar Scrub Sanctuary. Loss or degradation of quality habitat could adversely affect 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. These impacts could materially be reduced by expanding the roadway to the south along the area of these properties.

Potential water quality degradation could occur as a result of additional stormwater runoff draining into adjacent wetlands from the additional impervious roadway surface when this highway is expanded to four lanes. Furthermore, the additional lanes and vehicle speed on the expanded roadway lanes will increase the potential for roadkills for many species of wildlife including mammals, amphibians and reptiles including the gopher tortoise, Florida pine snake, Eastern indigo snake and other species. The expanded roadway will also further contribute to habitat fragmentation and isolation. Additionally, the important xeric scrub and associated communities along CR-514 which are either in, or proposed for public ownership must be properly managed using prescribed fire. Smoke drift to the roadway can affect public safety therefore hindering the land manager's ability to properly use this management tool to maintain habitat quality. We recommend that FDOT work with Brevard County to install Amber Alert type signs for speed limit reductions and smoke warning messages during periods of necessary management activities.

The proposed roadway expansion may also facilitate increased residential and commercial development in the near regional area of these important and sensitive resource areas resulting in indirect effects including additional upland and wetland habitat loss, along with increases in stormwater runoff downstream which could affect the Indian River Lagoon. Based on the project information provided, we believe that the direct and indirect effects of this project could be moderate. This is due to the occurrence of good quality wildlife habitat adjacent to the existing ROW; the sensitivity of the adjacent Florida Forever project lands and the Brevard Scrub Sanctuary; and the potential presence of a moderate number of listed species.

Additional Comments (optional):

We recommend that the PD&E Study address natural resources by including the following measures for conserving fish and wildlife and habitat resources that may occur within and adjacent to the project area. Plant community mapping and wildlife surveys for the occurrence of wildlife 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 should be performed, both along the ROW and within sites proposed for Drainage Retention Areas. 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. FDOT's proposed study should be planned to assess center, right, and left ROW expansion to identify the best Alternatives to avoid or minimize resource impacts. If gopher tortoises or nests of other ST or SSC species are present within any permanent or temporary construction area, a permit should be obtained from the FWC. Drainage Retention Areas and equipment staging areas should be located in previously disturbed or cleared sites to avoid habitat destruction or degradation. A compensatory mitigation plan should include the replacement of any 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. Land acquisition and restoration of appropriate tracts near the project area and adjacent to existing public lands, such as the Malabar Scrub Sanctuary, or the Brevard Coastal Scrub Ecosystem Florida Forever Project area, or tracts placed under conservation easement or located adjacent to large areas of jurisdictional wetlands that currently serve as regional core habitat areas, would be supported by our agency. Protection of the Brevard Coastal Scrub Ecosystem Florida Forever tract, and the Malabar Scrub Sanctuary and the downstream Indian River estuary and tributaries such as Turkey Creek and Little Turkey Creek should be a top priority. Please notify us immediately if the design, extent, or footprint of the current project is modified, as we may choose to provide additional comments and/or recommendations.

We appreciate the opportunity to provide input on highway design and the conservation of fish and wildlife resources. Please contact Terry Gilbert at (850) 728-1103 or email terry.gilbert@MyFWC.com initiate the process for further overall coordination on this project.

CLC Recommendations:

FDOT District 5 Feedback to FL Fish and Wildlife Conservation Commission's Review (08/09/2012): Thank you for your review, comments and recommendations. Avoidance of impacts to wildlife conservation lands will be a priority of the alternatives selection process. Surveys for listed species will be conducted during the study for all potential new right of way including future water detention areas. Further coordination with the Commission and the Service will take place as the project progresses.

Degree of Effect: 3 *Moderate* assigned 06/18/2012 by Cathy Kendall, Federal Highway Administration

Coordination Document: PD&E Support Document As Per PD&E Manual

Direct Effects

Identified Resources and Level of Importance:

Coordination needed for potential impacts to species such as the piping plover, snail kite, scrub jay, and wood stork (core foraging area).

Comments on Effects to Resources:

FDOT should seek concurrence for Section 7 findings for listed species that may be located in or forage in the area. If a "no adverse

effect determination" is not likely, nor not applicable, then please coordinate with FHWA so that we may request the initiation of formal Section 7 consultation with USFWS or NMFS, as appropriate.

Additional Comments (optional):

CLC Recommendations:

FDOT District 5 Feedback to Federal Highway Administration's Review (08/09/2012): Thank you for your comments. As a result of this screening event, the USF&WS has issued a "No Effect" determination for the Piping plover due to lack of suitable habitat along the project corridor. In addition, the Service has determined that no surveys will be required for the Audubon's Crested caracara or the Red-cockaded woodpecker. However, effect determinations will be required for the Wood stork and Eastern indigo snake following appropriate surveys. Further coordination with the Service will take place as the study progresses and Section 7 findings will be conveyed to FHWA.

ETAT Reviews and Coordinator Summary: Cultural

Historic and Archaeological Sites

Project Effects

Coordinator Summary Degree of Effect: 3 *Moderate* assigned 08/09/2012 by FDOT District 5

Comments:

Three entities provided comments on cultural issues with all three requesting that a cultural resource survey be performed. All three assigned a Moderate degree of effect. Due to lack of a complete and recent survey and for the potential of historic and unknown archaeological resources, we are assigning a Moderate degree of effect for cultural issues.

Degree of Effect: 3 *Moderate* assigned 06/26/2012 by Elliott York, Seminole Tribe of Florida

Coordination Document: No Selection

Direct Effects

Identified Resources and Level of Importance:

Due to the absence of a systematic Cultural Resources Assessment Survey for the proposed project corridor, the STOF-THPO would like to request a CRAS be conducted in order to determine effects, if any, to archaeological sites within the project area.

Comments on Effects to Resources:

The STOF-THPO would like to review the results of the CRAS before commenting on possible effects to archaeological sites in the project area.

Additional Comments (optional):

CLC Recommendations:

FDOT District 5 Feedback to Seminole Tribe of Florida's Review (08/09/2012): A professional Cultural Resource Assessment Survey will be conducted along the project corridor within the Potential Area of Effect. Results of this survey will be shared with the Tribe and we will solicit comments from you at that time.

Degree of Effect: 3 *Moderate* assigned 06/18/2012 by Cathy Kendall, Federal Highway Administration

Coordination Document: PD&E Support Document As Per PD&E Manual

Direct Effects

Identified Resources and Level of Importance:

Cultural Resource Assessment Survey needed to evaluate the known and unknown historic and archaeological sites that may be eligible for the NRHP, per Section 106. Possible resources include, but are not limited to, the Florida East Coast Railroad, a shell midden, and the Malabar Elementary School.

Comments on Effects to Resources:

If any of the identified resources are NRHP eligible, then coordination with FHWA and SHPO is needed to assess the level of impact, and potential mitigation options that should first seek to avoid or minimize such impacts.

Additional Comments (optional):

CLC Recommendations:

FDOT District 5 Feedback to Federal Highway Administration's Review (08/09/2012): Thank you. A CRAS will be conducted to determine potential affects to historic or archaeological resources.

Degree of Effect: 3 *Moderate* assigned 05/31/2012 by Ginny Leigh Jones, FL Department of State

Coordination Document: PD&E Support Document As Per PD&E Manual

Coordination Document Comments:The Malabar Road corridor in the project area was most recently surveyed in 1988/89 (FDHR Project No. 1989-1297). However, the survey deviated from the current Malabar Road alignment for some distance due to the anticipated shifting of the roadway (the project was never completed).

A historic aerial from 1943 shows some scattered agricultural development west of the Malabar Road/Gladder Road split. The land use remains largely agricultural but includes some residential development nearer the coast. A grouping of roughly 15 buildings face Malabar Road from just west of the Florida East Coast Rail line to the Indian River. Some development associated with the railroad is also located at the intersection of Malabar Road and the Florida East Coast Rail line (8BR1870). The 1951 and 1958 aerials show very little additional development along the Malabar Road corridor. Some of the development in the 1924, 1951, and 1958 maps are visible in the current aerials (2012).

Since the project area has not been surveyed since 1988/1989 (and that survey did not include the entire current alignment) this office is requesting that prior to initiating any project-related land clearing or ground disturbing activities within the project area it should be subjected to a systematic archaeological and architectural survey. All historic-age resources, including potential historic districts, within the area of potential effects should be documented and assessed for NRHP eligibility. The resultant survey report shall conform to the specifications set forth in Chapter 1A-46 Florida Administrative Code and need to be forwarded to this agency for review and comment.

Direct Effects

Identified Resources and Level of Importance:

Historic Bridges:

GIS analysis reveals one historic-age bridge. Bridge no. 700185 was constructed in 1962 and reconstructed in 1991. Depending on the degree of reconstruction, this bridge may need to be recorded and evaluated for eligibility for the National Register of Historic Places (NRHP).

Resource Groups:

GIS analysis reveals three resource groups located within 500 ft of the project area. The project intersects with the Florida East Coast Railroad (8BR1870). This resource has been determined eligible for the NRHP by the State Historic Preservation Officer (SHPO). The project area terminates at US Highway 1 (8BR2697). Sections of this roadway in Broward County have been determined not significant. The third resource group, a historic canal (8BR1868) is located between 200 and 500 ft from the project corridor. This resource has not been evaluated for its eligibility for listing on the NRHP.

Standing Structures:

GIS analysis reveals one structure, the Old Malabar Elementary School (8BR1925) located between 100 and 200 ft from the project corridor. The building was constructed in 1927 and has not been evaluated for its significant. Current aerials (2012) show some structures that appear on historic aerials (1943, 1951, 1958) but that have not been recorded.

Archaeological Sites:

The proposed project corridor intersects with an archaeological site (8BR53). The site has not been evaluated for its eligibility for the NRHP. Some sections of the project area have not been surveyed for archaeological sites, so there is a potential for unrecorded sites.

Comments on Effects to Resources:

Bridges:

It is unlikely that the proposed project will impact any significant historic bridges.

Resource Groups:

It is unlikely that any significant resource groups will be impacted by the proposed project.

Standing Structures:

It is likely that the Old Malabar Elementary School structure (8BR1925) will be impacted by the proposed project due to its close proximity to the roadway and the proposed improvements. There is a high potential for unrecorded historic structures along the project corridor.

Archaeological Sites:

Archaeological site 8BR53 has not been tested since 1949. Since the project will intersect with this site, it is highly likely that the site will be impacted by the project. There is a high potential for unrecorded archaeological along the proposed project corridor.

Additional Comments (optional):

The Malabar Road corridor in the project area was most recently surveyed in 1988/89 (FDHR Project No. 1989-1297). However, the survey deviated from the current Malabar Road alignment for some distance due to the anticipated shifting of the roadway (the project was never completed).

A historic aerial from 1943 shows some scattered agricultural development west of the Malabar Road/Gladder Road split. The land use remains largely agricultural but includes some residential development nearer the coast. A grouping of roughly 15 buildings face Malabar Road from just west of the Florida East Coast Rail line to the Indian River. Some development associated with the railroad is also located at the intersection of Malabar Road and the Florida East Coast Rail line (8BR1870). The 1951 and 1958 aerials show very little additional development along the Malabar Road corridor. Some of the development in the 1924, 1951, and 1958 maps are visible in the current aerials (2012).

Since the project area has not been surveyed since 1988/1989 (and that survey did not include the entire current alignment) this office is requesting that prior to initiating any project-related land clearing or ground disturbing activities within the project area it should be subjected to a systematic archaeological and architectural survey. All historic-age resources, including potential historic districts, within the area of potential effects should be documented and assessed for NRHP eligibility. The resultant survey report shall conform to the specifications set forth in Chapter 1A-46 Florida Administrative Code and need to be forwarded to this agency for review and comment.

CLC Recommendations:

FDOT District 5 Feedback to FL Department of State's Review (08/09/2012): Thank you for your comments. A CRAS will be conducted along the corridor during the upcoming study phase.

Recreation Areas

Project Effects

Coordinator Summary Degree of Effect: **3** *Moderate* assigned 08/09/2012 by FDOT District 5

Comments:

Four agencies provided comments on recreational issues. Only the National Park Service indicated No Involvement while the other three agencies assigned Moderate degrees of effect. Due to the presence of conservation and recreational lands we are assigning a Moderate degree of effect.

Degree of Effect: **3** *Moderate* assigned 07/02/2012 by Madolyn Sanchez, US Environmental Protection Agency

Coordination Document: No Selection

Direct Effects

Identified Resources and Level of Importance:

Resources: Recreation and conservation areas such as Florida Forever BOT Projects and Florida Managed Areas

Level of Importance: These resources are of a high level of importance in the State of Florida and in Brevard County. The proposed project has the potential to impact these resources. A moderate degree of effect is being assigned to this issue.

Comments on Effects to Resources:

The following features are identified within proximity of the proposed project and are likely to be impacted as a result of construction and operation of the project and any future development within the area:

Florida Forever BOT Projects:

BREVARD COASTAL SCRUB ECOSYSTEM FLORIDA FOREVER BOT PROJECT - 100, 200, and 500-foot buffer distance

Florida Managed Areas:

SAND HILL TRAILHEAD - 500-foot buffer distance

MALABAR SCRUB SANCTUARY - 100, 200, and 500-foot buffer distance

Florida Forever Board of Trustees (BOT) projects are lands that have been proposed for acquisition because of outstanding natural resources, opportunity for natural resource-based recreation, or historical and archaeological resources. These areas may not be currently managed for their resource value. Portions of these projects may have already been acquired by the State and/or its acquisition partners. The Brevard Coastal Scrub Ecosystem Florida Forever BOT Project is located within close proximity to the proposed project.

The proposed project is located near these environmentally sensitive recreation and conservation areas. The PD&E study should evaluate the project to determine the degree of impact to these resources. Impacts should be documented in environmental reports. The project may require a Section 4(f) review. Impact to environmentally sensitive and valuable resources such as the ones listed above should be avoided or minimized to the best extent practicable.

Additional Comments (optional):

CLC Recommendations:

FDOT District 5 Feedback to US Environmental Protection Agency's Review (08/09/2012): Thank you. Section 4(f) applicability will be determined as alternative are developed. Further coordination on Section 4(f) issues may be warranted but we will attempt to have no Section 4(f) involvement.

Degree of Effect: **3** *Moderate* assigned 06/28/2012 by Lauren P. Milligan, FL Department of Environmental Protection

Coordination Document: No Selection

Direct Effects

Identified Resources and Level of Importance:

The following public recreational areas are located within 500 ft. of the proposed project: Sand Hill Trailhead and Malabar Scrub Sanctuary, part of the Brevard Coastal Scrub Ecosystem Florida Forever BOT Project.

Comments on Effects to Resources:

The Department is interested in preserving the area's natural communities, wildlife corridor functions, natural flood control, stormwater runoff filtering capabilities, aquifer recharge potential and recreational trail opportunities. Therefore, future environmental documentation should include an evaluation of the primary, secondary and cumulative impacts of roadway expansion on the above public lands and any proposed acquisition sites.

Additional Comments (optional):

CLC Recommendations:

FDOT District 5 Feedback to FL Department of Environmental Protection's Review (08/09/2012): Thank you. We shall strive to avoid impacts to public lands, especially recreational lands as such impacts are a primary consideration in our alternatives evaluation matrix. Should it be determined that avoidance of all public lands is not feasible, further coordination will take place.

Degree of Effect: **3** *Moderate* assigned 06/18/2012 by Cathy Kendall, Federal Highway Administration

Coordination Document: PD&E Support Document As Per PD&E Manual

Direct Effects**Identified Resources and Level of Importance:**

Local park, and the Florida Forever project are located adjacent to this corridor.

Comments on Effects to Resources:

Impacts to these recreational resources (including safe access) should be addressed in the environmental document.

Additional Comments (optional):**CLC Recommendations:**

FDOT District 5 Feedback to Federal Highway Administration's Review (08/09/2012): Thank you. Potential impacts to public recreational lands will be assessed and will become a factor in the alternatives evaluation.

Degree of Effect: **0** *None* assigned 05/25/2012 by Anita Barnett, National Park Service

Coordination Document: No Involvement

Direct Effects**Identified Resources and Level of Importance:****Comments on Effects to Resources:****Additional Comments (optional):****CLC Recommendations:**

FDOT District 5 Feedback to National Park Service's Review (08/09/2012): Thank you.

The following organization(s) were expected to but did not submit a review of the Recreation Areas issue for this alternative: Saint Johns River Water Management District

Section 4(f) Potential**Project Effects**

Coordinator Summary Degree of Effect: **3** *Moderate* assigned 08/20/2012 by FDOT District 5

Comments:

Although only one agency provided comments under Section 4(f) issues, comments received under Recreation Areas and Cultural Resources are also applicable to Section 4(f). We are assigning a Moderate degree of effect for this issue.

Degree of Effect: **3** *Moderate* assigned 06/18/2012 by Cathy Kendall, Federal Highway Administration

Coordination Document: To Be Determined: Further Coordination Required

Direct Effects**Identified Resources and Level of Importance:**

There are a number of resources along the corridor that could be protected by Section 4(f). These include a public park, the Malabar Scrub Sanctuary, and several potential historic resources such as the Florida East Coast Railroad, the Malabar Elementary School, and a shell midden.

Comments on Effects to Resources:

The environmental study should address whether these resources would be protected under Section 4(f), and if so, seek to avoid impacts to these resources. Any impacts to these resources should be coordinated with FHWA as a Section 4(f) evaluation, which may be done as an individual Section 4(f) analysis, or possibly a programmatic analysis or de minimis determination, depending on the degree of impact.

Additional Comments (optional):

CLC Recommendations:

FDOT District 5 Feedback to Federal Highway Administration's Review (08/20/2012): Thank you. Section 4(f) applicability will be determined as alternative are developed. Further coordination on Section 4(f) issues may be warranted but we will attempt to have no Section 4(f) involvement.

ETAT Reviews and Coordinator Summary: Community

Aesthetics

Project Effects

Coordinator Summary Degree of Effect: 1 *Enhanced* assigned 08/20/2012 by FDOT District 5

Comments:

No agencies provided comments on aesthetics. The project has the opportunity to improve aesthetics along the corridor as the new roadway will meet all current design standards for clear zones, access management, improved sight distances and provisions for pedestrian and bicycle users and some amount of landscaping. Opportunities for additional landscaping or improved aesthetic treatments will be available to the local government. We are assigning an Enhanced degree of effect for aesthetics.

None found

The following organization(s) were expected to but did not submit a review of the Aesthetics issue for this alternative: Federal Highway Administration

Economic

Project Effects

Coordinator Summary Degree of Effect: 1 *Enhanced* assigned 08/20/2012 by FDOT District 5

Comments:

No comments were received for economic issues. The improved level of service that a widened roadway would provide could lead to enhanced economics due to the improved movement of goods and services. We are assigning an Enhanced degree of effect for economic issues.

None found

The following organization(s) were expected to but did not submit a review of the Economic issue for this alternative: Federal Highway Administration

Land Use

Project Effects

Coordinator Summary Degree of Effect: 0 *None* assigned 08/20/2012 by FDOT District 5

Comments:

The project is compatible with the local governments Comprehensive Plans. We do not believe the project will lead to changes in land use. We are assigning a None degree of effect for land use.

Degree of Effect: 0 *None* assigned 06/28/2012 by Jeannette Hallock-Solomon, FL Department of Economic Opportunity

Coordination Document: No Selection

Direct Effects

Identified Resources and Level of Importance:

The proposed project is located in the following comprehensive plans: Brevard County Comprehensive Plan - March 1, 2011; Palm Bay Comprehensive Plan - January 20, 2011; Malabar Comprehensive Plan - August 17, 2009.

Comments on Effects to Resources:

The project is compatible with the communities' development goals as discussed with the local governments and the local governments' comprehensive plans.

Future Transportation Maps:

The proposed project is either referenced by policy or on the Future Transportation Maps in all the local governments. The proposed project is adopted in Space Coast TPO's LRTP and adopted by reference in Brevard County (CIE Policy 6.2 and TE Policy 2.1), the City of Malabar (TC Policy 2-1.3.1) and the City of Palm Bay (Future Transportation Map) Comprehensive Plans.

Future Land Use Categories:

The proposed project is adjacent to the following land uses: Residential, Industrial, Commercial, Conservation and Public/Semipublic

future land use categories.

Economic Development:

The proposed project has the potential to attract new development and to generate new jobs through construction.

Miscellaneous:

Malabar Road is a designated Hurricane Evacuation Route, so the proposed project will help to alleviate congestion during evacuation events. The proposed project is not located in an Area of Critical State Concern, not located in a Rural Area of Critical Economic Concern, not located in the Coastal High Hazard Area, and is not located near a military base.

Additional Comments (optional):

CLC Recommendations:

FDOT District 5 Feedback to FL Department of Economic Opportunity's Review (08/20/2012): Thank you for your determination of compatibility with local government's Comprehensive Plans and Future Transportation Maps. We do not believe that the project will alter future land uses and are assigning a None degree of effect.

The following organization(s) were expected to but did not submit a review of the Land Use issue for this alternative: Federal Highway Administration

Mobility

Project Effects

Coordinator Summary Degree of Effect: 1 *Enhanced* assigned 08/20/2012 by FDOT District 5

Comments:

No comments were received for mobility issues. We believe the project will result in Enhanced mobility for all users.

None found

The following organization(s) were expected to but did not submit a review of the Mobility issue for this alternative: Federal Highway Administration

Relocation

Project Effects

Coordinator Summary Degree of Effect: 3 *Moderate* assigned 08/20/2012 by FDOT District 5

Comments:

The presence of wildlife conservation lands will limit viable alternatives which may increase the likelihood of relocations. We are assigning a Moderate degree of effect for relocations.

Degree of Effect: 3 *Moderate* assigned 06/18/2012 by Cathy Kendall, Federal Highway Administration

Coordination Document: PD&E Support Document As Per PD&E Manual

Direct Effects

Identified Resources and Level of Importance:

Although the area is sparsely developed, there may be relocations required in order to avoid impacts to environmentally sensitive areas.

Comments on Effects to Resources:

Please ensure that the Federal requirements for relocation are followed, and that rights are explained to the public during the appropriate public involvement activities associated with the project.

Additional Comments (optional):

CLC Recommendations:

FDOT District 5 Feedback to Federal Highway Administration's Review (08/20/2012): Given the presence of conservation lands, relocations are a possibility. The requirements under the federal Relocation and Assistance Act will be followed.

Social

Project Effects

Coordinator Summary Degree of Effect: 2 Minimal assigned 08/20/2012 by FDOT District 5

Comments:

The USEPA assigned a Minimal degree of effect for this issue. We are assigning a Minimal degree of effect.

Degree of Effect: 2 Minimal assigned 07/02/2012 by Madolyn Sanchez, US Environmental Protection Agency

Coordination Document: No Selection

Direct Effects

Identified Resources and Level of Importance:

Resources: Social impacts such as residential populations, commuter populations, residential communities, minority or low-income populations, disadvantaged populations, archeological and historic areas or structures, etc.

Level of Importance: These resources are of a high level of importance. Impacts to these types of resources, both positive and negative, should be evaluated and documented in the PD&E phase of the project.

Comments on Effects to Resources:

EPA is assigning a minimal degree of effect to this issue. There will be social benefits resulting from the project due to an improvement in safety with the roadway widening project and resulting capacity increase on Malabar Road. There are social issues to be considered such as a disruption in traffic patterns (lane reductions, detours, etc) during the project construction, an increase in noise to surrounding businesses and residents, and increase in traffic volumes. There are also natural resource areas directly adjacent to and within close proximity of this project. These areas provide recreational opportunities for the public. These issues should be addressed during the PD&E phase of the project. Project impacts to sensitive populations such as minority, elderly, or disabled populations should be avoided or minimized to the best extent practicable. EPA recommends that public involvement activities be conducted throughout the PD&E phase of the project

Additional Comments (optional):

CLC Recommendations:

FDOT District 5 Feedback to US Environmental Protection Agency's Review (08/20/2012): Thank you for your comments. The issues you raised will be addressed and documented in the Environmental Document. Public involvement will take place at several stages of the PD&E study and will continue throughout design and into construction.

Degree of Effect: 0 None assigned 06/28/2012 by Jeannette Hallock-Solomon, FL Department of Economic Opportunity

Coordination Document: No Selection

Direct Effects

Identified Resources and Level of Importance:

The proposed project is located in the following local governments' comprehensive plans: Brevard County Comprehensive Plan - March 1, 2011; Palm Bay Comprehensive Plan - January 20, 2011; Malabar Comprehensive Plan - August 17, 2009.

Comments on Effects to Resources:

Local Parks:

There are no local parks located within a quarter mile of the proposed project.

Additional Comments (optional):

CLC Recommendations:

FDOT District 5 Feedback to FL Department of Economic Opportunity's Review (08/20/2012): Thank you.

The following organization(s) were expected to but did not submit a review of the Social issue for this alternative: Federal Highway Administration

ETAT Reviews and Coordinator Summary: Secondary and Cumulative

Secondary and Cumulative Effects

Project Effects

Coordinator Summary Degree of Effect: 3 Moderate assigned 08/20/2012 by FDOT District 5

Comments:

No reviews were provided specifically for secondary and cumulative effects. However, numerous agencies commented about cumulative effects under other issues such as wetlands, wildlife and habitat, special designations and recreation. As all of these issues had Moderate degrees of effect, we are assigning a Moderate degree of effect for Secondary and Cumulative.

None found

Eliminated Alternatives

There are no eliminated alternatives for this project.

Project Scope

General Project Recommendations

There are no general project recommendations identified for this project in the EST.

Anticipated Permits

Permit	Type	Conditions	Assigned By	Date
Large Construction (>= 5 AC)	Stormwater	NPDES permit will be required	FDOT District 5	08/20/12
Department of the Army Corps of Engineers State Programmatic General Permit	USACE	SAJ-92 may be used	FDOT District 5	08/20/12
Environmental Resource Permit	State		FDOT District 5	08/20/12

Anticipated Technical Studies

Technical Study Name	Type	Conditions	Assigned By	Date
Design Traffic Technical Memorandum	ENGINEERING		FDOT District 5	08/20/2012
Final Preliminary Engineering Report (signed and sealed)	ENGINEERING		FDOT District 5	08/20/2012
Location Hydraulics Report	ENGINEERING		FDOT District 5	08/20/2012
Drainage/Pond Siting Report	ENGINEERING		FDOT District 5	08/20/2012
Typical Section Package	ENGINEERING		FDOT District 5	08/20/2012
Value Engineering Information Report	ENGINEERING		FDOT District 5	08/20/2012
Public Involvement Plan	ENVIRONMENTAL		FDOT District 5	08/20/2012
Noise Study Report	ENVIRONMENTAL		FDOT District 5	08/20/2012
Contamination Screening Evaluation Report	ENVIRONMENTAL		FDOT District 5	08/20/2012
Conceptual Stage Relocation Plan	ENVIRONMENTAL		FDOT District 5	08/20/2012
Public Hearing Transcript	ENVIRONMENTAL		FDOT District 5	08/20/2012
Endangered Species Biological Assessment	ENVIRONMENTAL		FDOT District 5	08/20/2012
Wetlands Evaluation Report	ENVIRONMENTAL		FDOT District 5	08/20/2012
Access Management Report	ENGINEERING		FDOT District 5	08/20/2012
Alternatives Evaluation Report	ENGINEERING		FDOT District 5	08/20/2012
Section 4f Evaluation	ENVIRONMENTAL	adjacent wildlife conservation lands	FDOT District 5	08/20/2012
Essential Fish Habitat Assessment	ENVIRONMENTAL	NOT REQUIRED	FDOT District 5	08/20/2012
Air Quality Technical Memorandum	ENVIRONMENTAL		FDOT District 5	08/20/2012
Water Quality Impact Evaluation (WQIE)	ENVIRONMENTAL		FDOT District 5	08/20/2012
Farmland Protection Policy Act	ENVIRONMENTAL	farmland soils of unique importance are present	FDOT District 5	08/20/2012
Cultural Resource Assessment Survey	ENVIRONMENTAL		FDOT District 5	08/20/2012

Class of Action

Class of Action Determination

Class of Action	Other Actions	Lead Agency	Cooperating Agencies	Participating Agencies
-----------------	---------------	-------------	----------------------	------------------------

Class of Action Signatures

Name	Agency	Review Status	Date	ETDM Role
Bill Walsh	FDOT District 5	ACCEPTED	12/09/2015	FDOT DEA
Richard C. Fowler	FDOT District 5	ACCEPTED	12/01/2015	FDOT ETDM Coordinator

Comments:

This project (FM 430136-1) has been changed to be State funded only for all phases. As such, FHWA will no longer be the Lead Agency and a State Environmental Impact Report (SEIR) will be the environmental document.

Dispute Resolution Activity Log

There are no dispute actions identified for this project in the EST.

Appendices

Preliminary Environmental Discussion Comments

The Preliminary Environmental Discussion (PED) was not implemented until 10/12/2012, and this project was last screened on 05/18/2012.

Advance Notification Comments

FL Department of State Comment -- no comments/consistent

--Ginny Leigh Jones, 5/31/2012

No response

GIS Analyses

Since there are so many GIS Analyses available for Project #13026 - Widen Malabar Road (SR 514), they have not been included in this ETDM Summary Report. GIS Analyses, however, are always available for this project on the Public ETDM Website. Please click on the link below (or copy this link into your Web Browser) in order to view detailed GIS tabular information for this project:

<http://etdmpub.fl.a-etat.org/est/index.jsp?tpID=13026&startPageName=GIS%20Analysis%20Results>

Special Note: Please be sure that when the GIS Analysis Results page loads, the **Programming Screen Summary Report Re-published on 12/15/2015 by Richard Fowler Milestone** is selected. GIS Analyses snapshots have been taken for Project #13026 at various points throughout the project's life-cycle, so it is important that you view the correct snapshot.

Project Attachments

There are no attachments for this project.

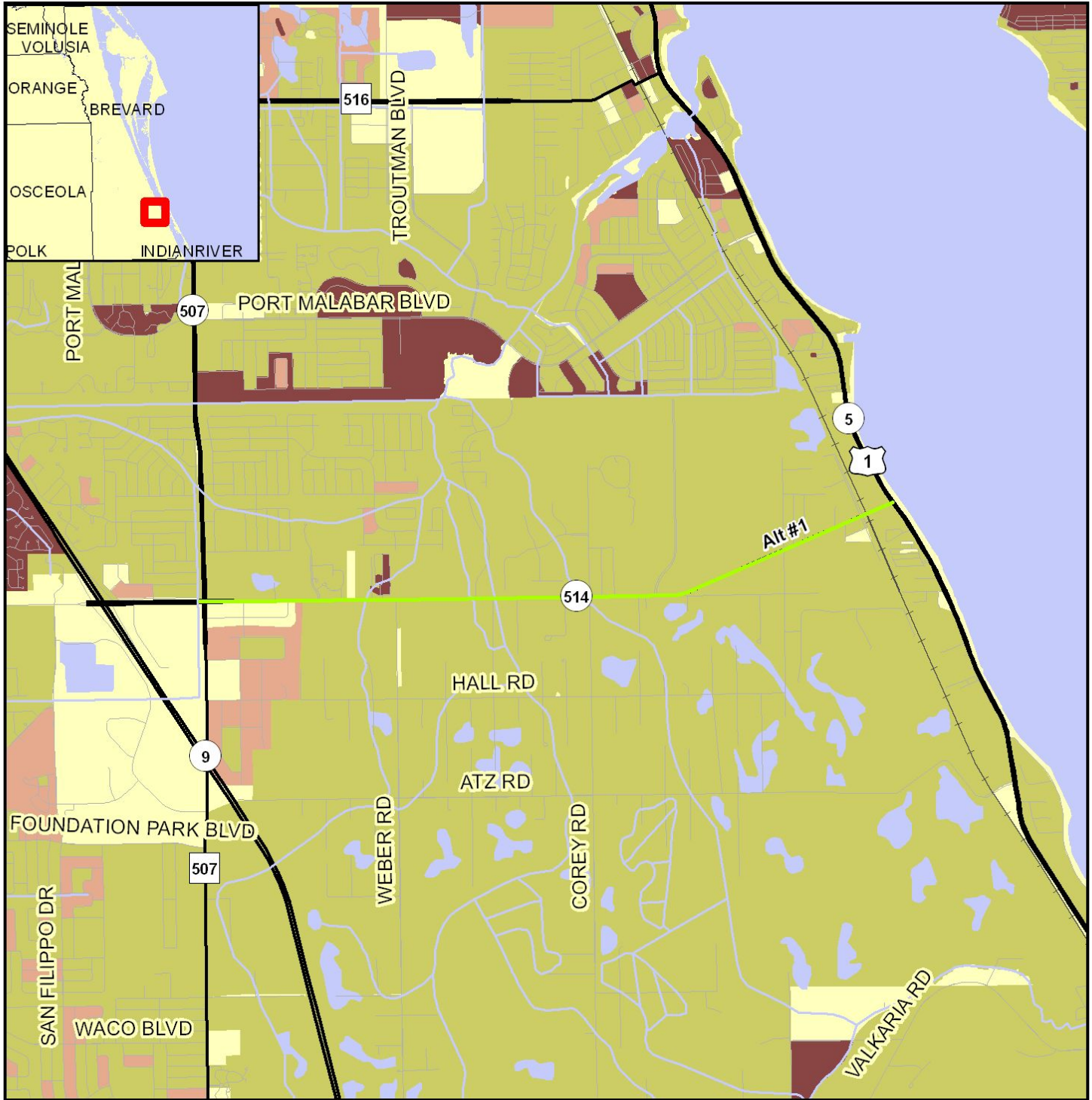
Degree of Effect Legend

Color Code	Meaning	ETAT	Public Involvement
N/A	Not Applicable / No Involvement	There is no presence of the issue in relationship to the project, or the issue is irrelevant in relationship to the proposed	
0	None (after 12/5/2005)	The issue is present, but the project will have no impact on the issue; project has no adverse effect on ETAT resources; permit issuance or consultation involves routine interaction with the agency. The <i>None</i> degree of effect is new as of 12/5/2005.	No community opposition to the planned project. No adverse effect on the community.
1	Enhanced	Project has positive effect on the ETAT resource or can reverse a previous adverse effect leading to environmental improvement.	Affected community supports the proposed project. Project has positive effect.
2	Minimal	Project has little adverse effect on ETAT resources. Permit issuance or consultation involves routine interaction with the agency. Low cost options are available to address concerns.	Minimum community opposition to the planned project. Minimum adverse effect on the community.
2	Minimal to None (assigned prior to 12/5/2005)	Project has little adverse effect on ETAT resources. Permit issuance or consultation involves routine interaction with the agency. Low cost options are available to address concerns.	Minimum community opposition to the planned project. Minimum adverse effect on the community.
3	Moderate	Agency resources are affected by the proposed project, but avoidance and minimization options are available and can be addressed during development with a moderated amount of agency involvement and moderate cost impact.	Project has adverse effect on elements of the affected community. Public Involvement is needed to seek alternatives more acceptable to the community. Moderate community interaction will be required during project development.
4	Substantial	The project has substantial adverse effects but ETAT understands the project need and will be able to seek avoidance and minimization or mitigation options during project development. Substantial interaction will be required during project development and permitting.	Project has substantial adverse effects on the community and faces substantial community opposition. Intensive community interaction with focused Public Involvement will be required during project development to address community concerns.

5	Potential Dispute (Planning Screen)	Project may not conform to agency statutory requirements and may not be permitted. Project modification or evaluation of alternatives is required before advancing to the LRTP Programming Screen.	Community strongly opposes the project. Project is not in conformity with local comprehensive plan and has severe negative impact on the affected community.
5	Dispute Resolution (Programming Screen)	Project does not conform to agency statutory requirements and will not be permitted. Dispute resolution is required before the project proceeds to programming.	Community strongly opposes the project. Project is not in conformity with local comprehensive plan and has severe negative impact on the affected community.
	No ETAT Consensus	ETAT members from different agencies assigned a different degree of effect to this project, and the ETDM coordinator has not assigned a summary degree of effect.	
	No ETAT Reviews	No ETAT members have reviewed the corresponding issue for this project, and the ETDM coordinator has not assigned a summary degree of effect.	

Project-Level Hardcopy Maps

13026 Widen Malabar Road (SR 514) Babcock Street to US 1



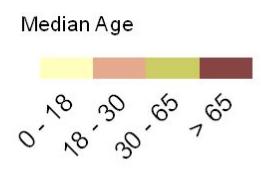
0 2 Miles

Population Age Distribution Map



Data Sources:
 US Geological Survey
 FL Department of Transportation
 NAVTEQ
 US Census Bureau (2000)

- ETDM Alternative Point
- ETDM Alternative Terminus
- ETDM Alternative Segment
- ETDM Alternative Polygon
- Major Road
- Local Road or Trail
- Railroad
- River, Stream or Canal
- Water Body



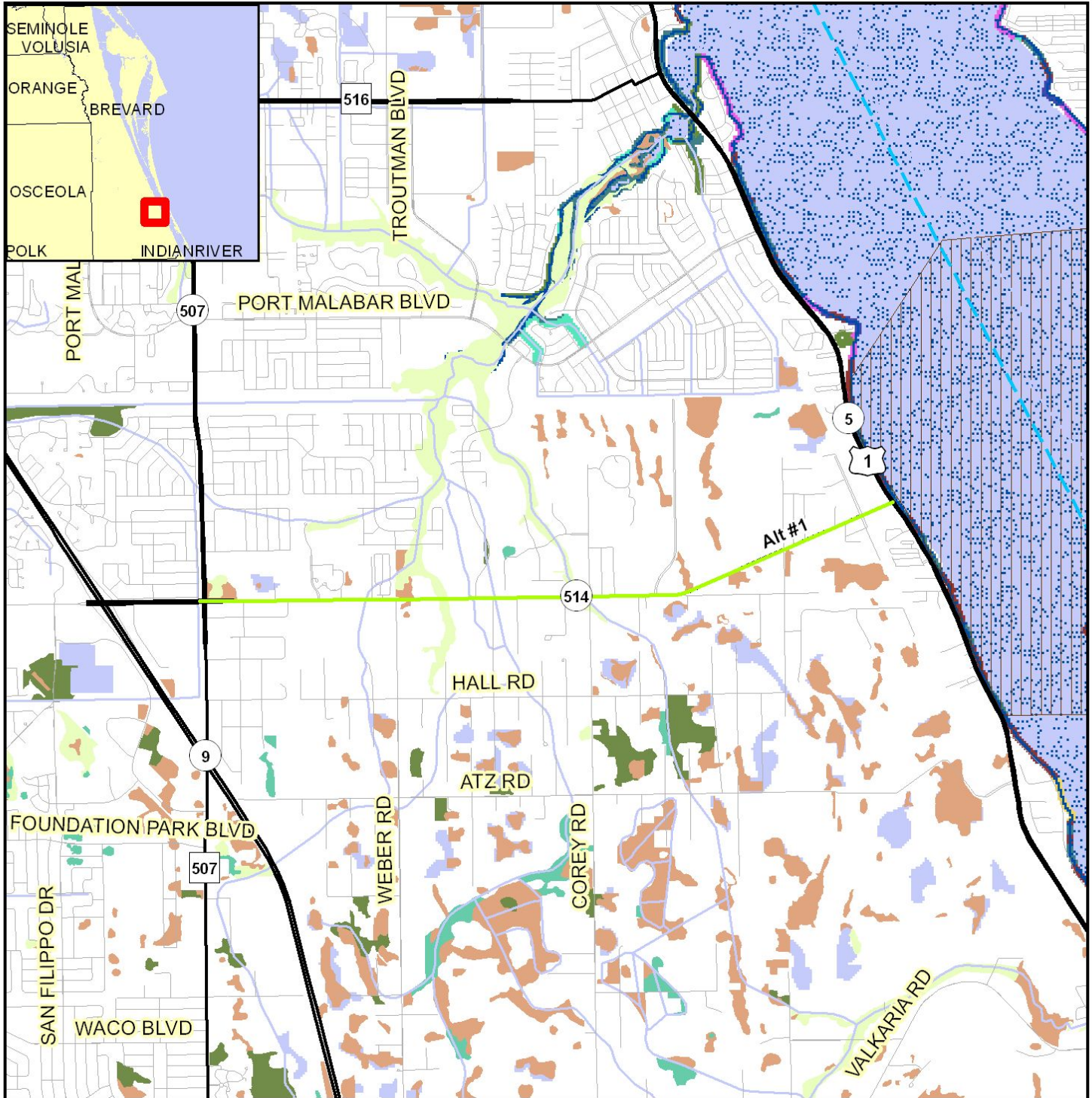
This map and its content is made available by the Florida Department of Transportation on an "as is," "as available" basis without warranties of any kind, express or implied.



Map Generated on: 5/18/2012



13026 Widen Malabar Road (SR 514) Babcock Street to US 1



0 0.9 Miles



- | | | | |
|---------------------------|------------------------|-------------------------------|--------------------------------------|
| ETDM Alternative Point | Major Road | Continuous Seagrass | Gravel Beach/Riprap |
| ETDM Alternative Terminus | Local Road or Trail | Discontinuous Seagrass | Exposed Tidal Flat |
| ETDM Alternative Segment | River, Stream or Canal | Coastal Barrier Resource Area | Sheltered Tidal Flat |
| ETDM Alternative Polygon | Water Body | Swamp or Marsh | Mixed Sand And Gravel Beach |
| | Aquatic Preserve | Exposed Rocky Platform | Sheltered Rock/Seawall/Vegetated |
| | Navigable Water Way | Sand Beach | Exposed Vertical Rocky Shore/Seawall |

Coastal and Marine Resource Map

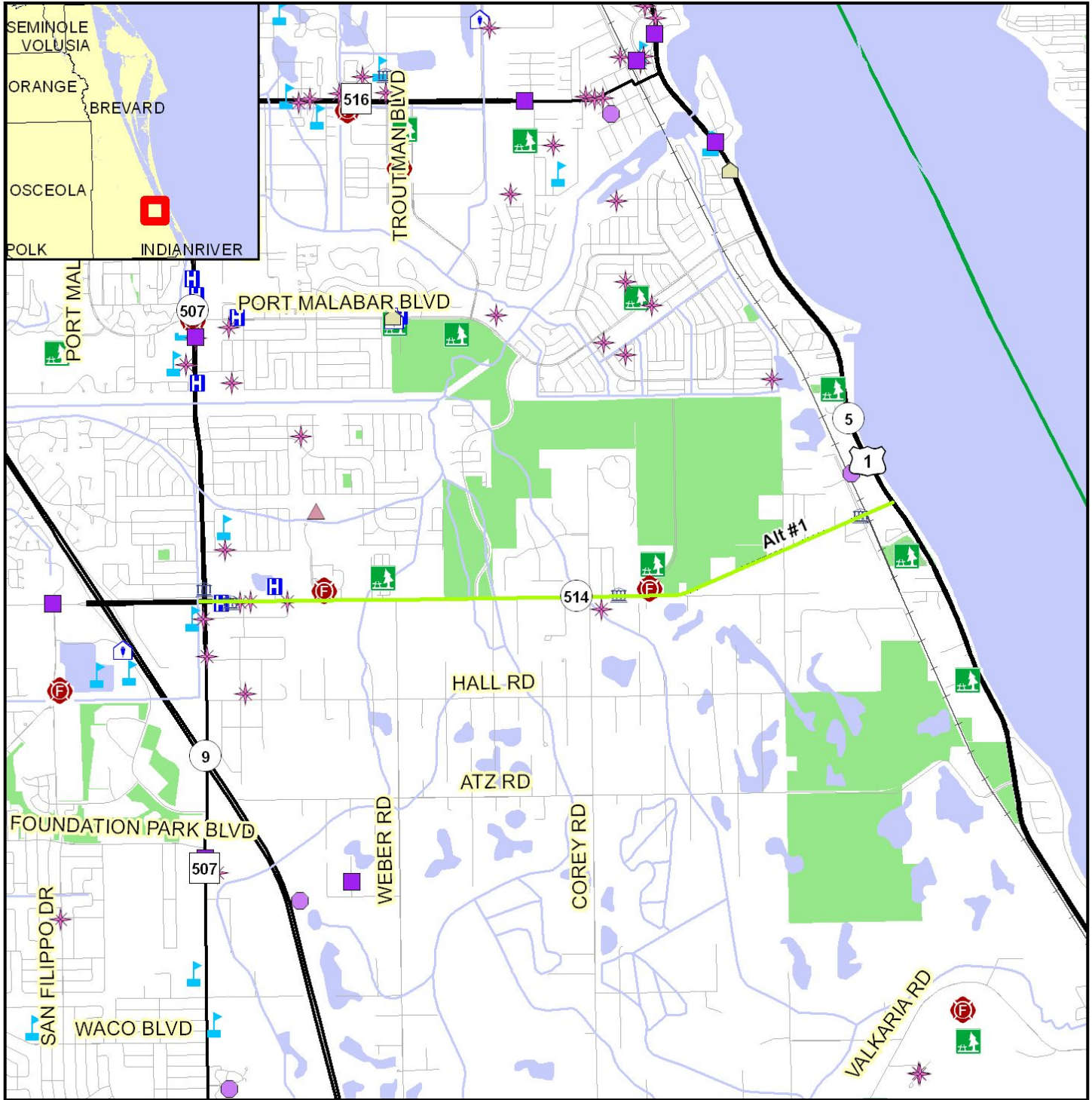
Data Sources: NAVTEQ; US Geological Survey; Florida Marine Research Institute; Florida Department of Transportation; Florida Department of Environmental Protection; National Oceanic and Atmospheric Association; Florida Water Management Districts
 This map and its content is made available by the Florida Department of Transportation on an "as is," "as available" basis without warranties of any kind, express or implied.



Map Generated on: 5/18/2012



13026 Widen Malabar Road (SR 514) Babcock Street to US 1



0 0.1 Miles



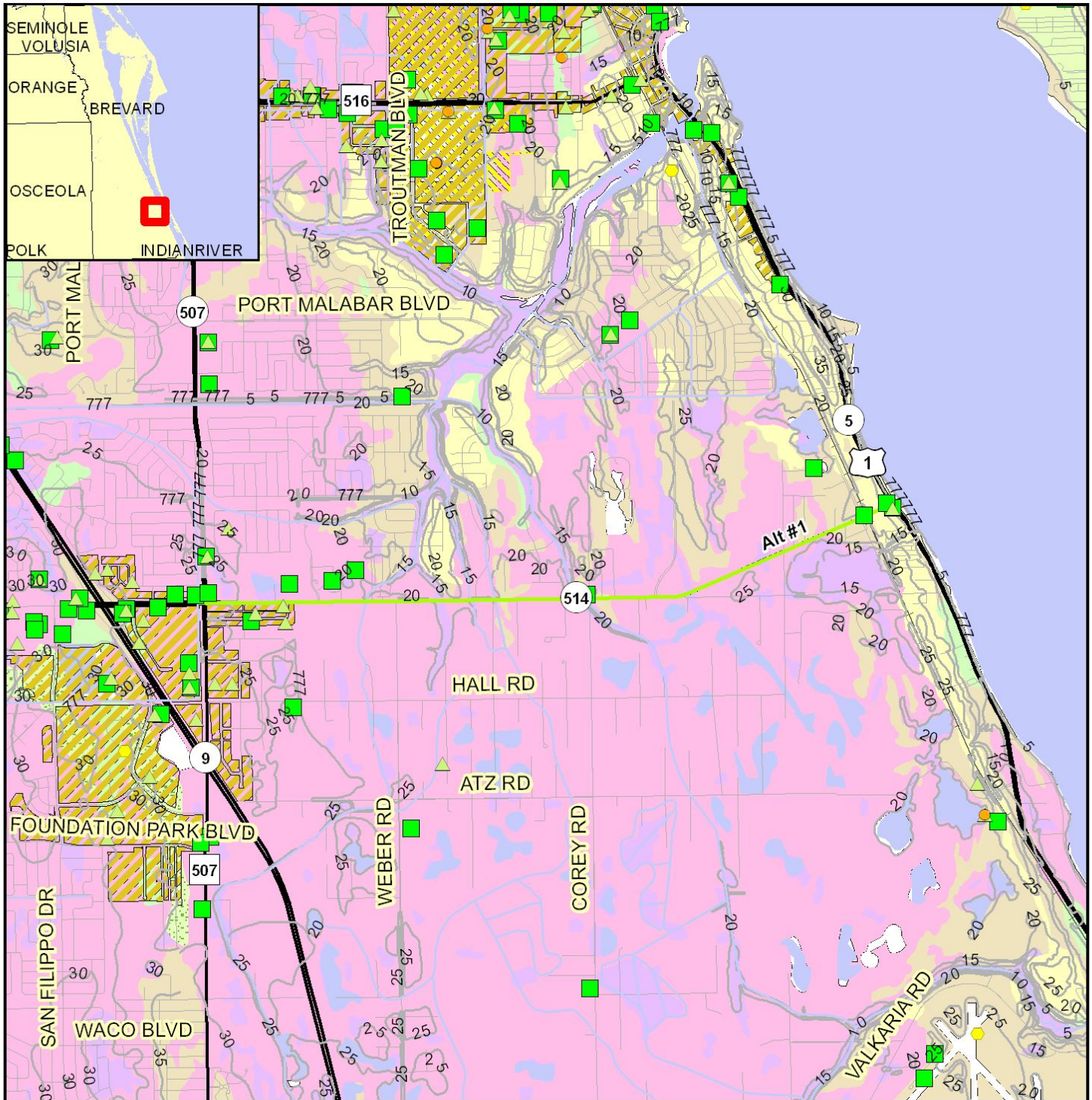
- | | | | |
|---------------------------|------------------|-----------------|---------------------------------|
| ETDM Alternative Point | Government | Cultural Center | River, Stream or Canal |
| ETDM Alternative Terminus | Civic Center | Fire Station | Recreational Trail |
| ETDM Alternative Segment | Cemetery | Health Care | Railroad |
| ETDM Alternative Polygon | Social Service | School | Community Boundary |
| Major Road | Community Center | Water Body | Conservation or Recreation Area |
| Local Road or Trail | Law Enforcement | Park | |
| | Place of Worship | | |

Community Facilities and Services Map

Data Sources:
US Geological Survey; FL Department of Transportation; NAVTEQ; FL Property Appraisers; FL Natural Areas Inventory



13026 Widen Malabar Road (SR 514) Babcock Street to US 1



Potential Contamination Assessment Map

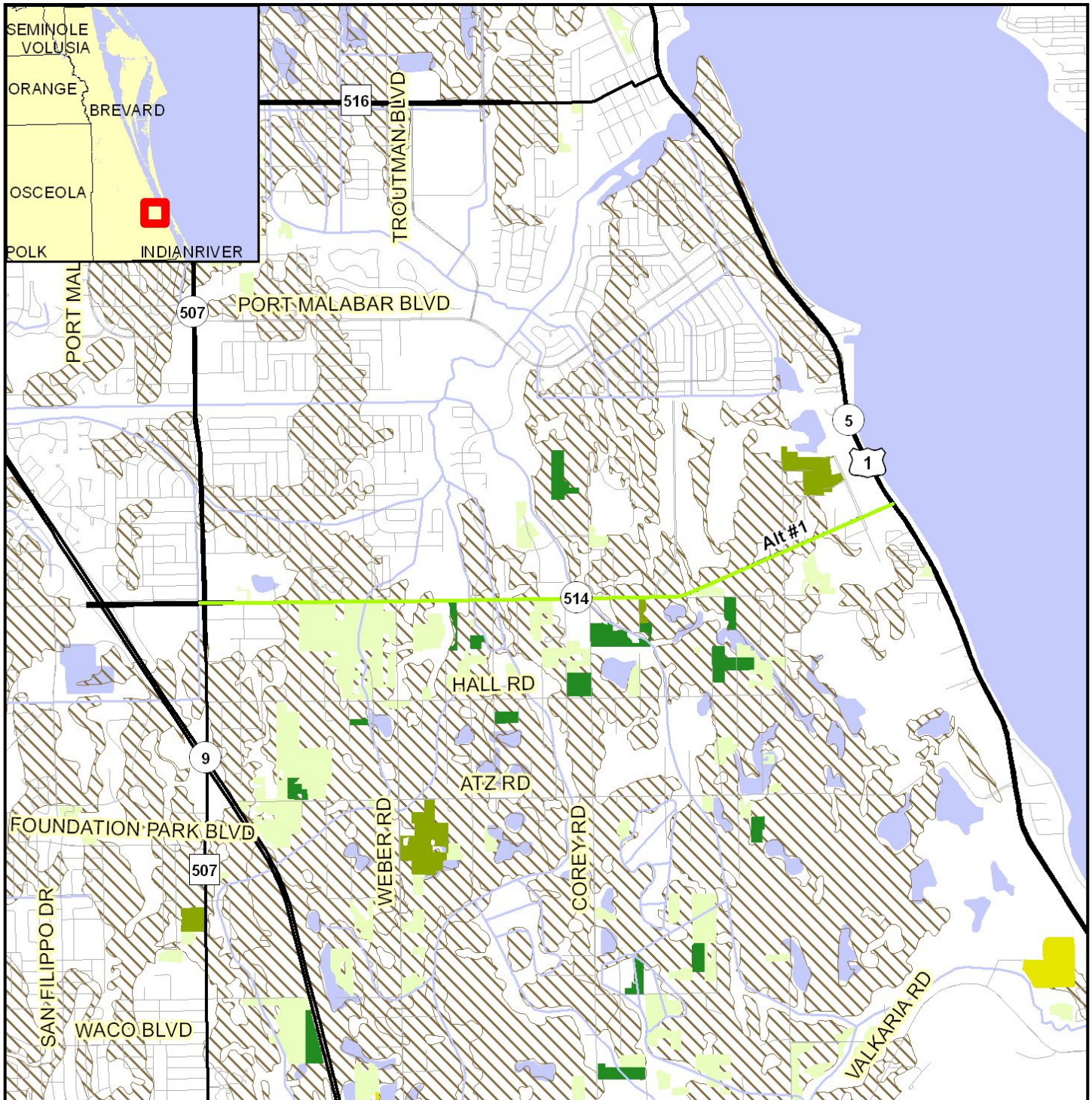
- ETDM Alternative Point
- ETDM Alternative Terminus
- ETDM Alternative Segment
- ▭ ETDM Alternative Polygon
- Major Road
- Local Road or Trail
- Railroad
- River, Stream or Canal
- Toxic Release Inventory
- ★ Dry Cleaning Facility
- Solid Waste Facility
- ▨ NPL Remediation Site
- ▭ FDEP Tanks
- ▭ Hazardous Material Site
- ▭ Brownfield Area
- ▭ Power Plant
- Superfund Site
- ▭ Nuclear Site
- 5 FT Contour
- ▭ Water Body
- ▭ Swamp/Marsh

Data Sources:
 NAV/TEQ; US Geological Survey; FL Department of Transportation; FL Department of Environmental Protection;
 FL Water Management Districts; US Environmental Protection Agency; Natural Resource Conservation Service

This map and its content is made available by the Florida Department of Transportation on an "as is," "as available" basis without warranties of any kind, express or implied.



13026 Widen Malabar Road (SR 514) Babcock Street to US 1



Farmlands Resource Map

0 1 Miles



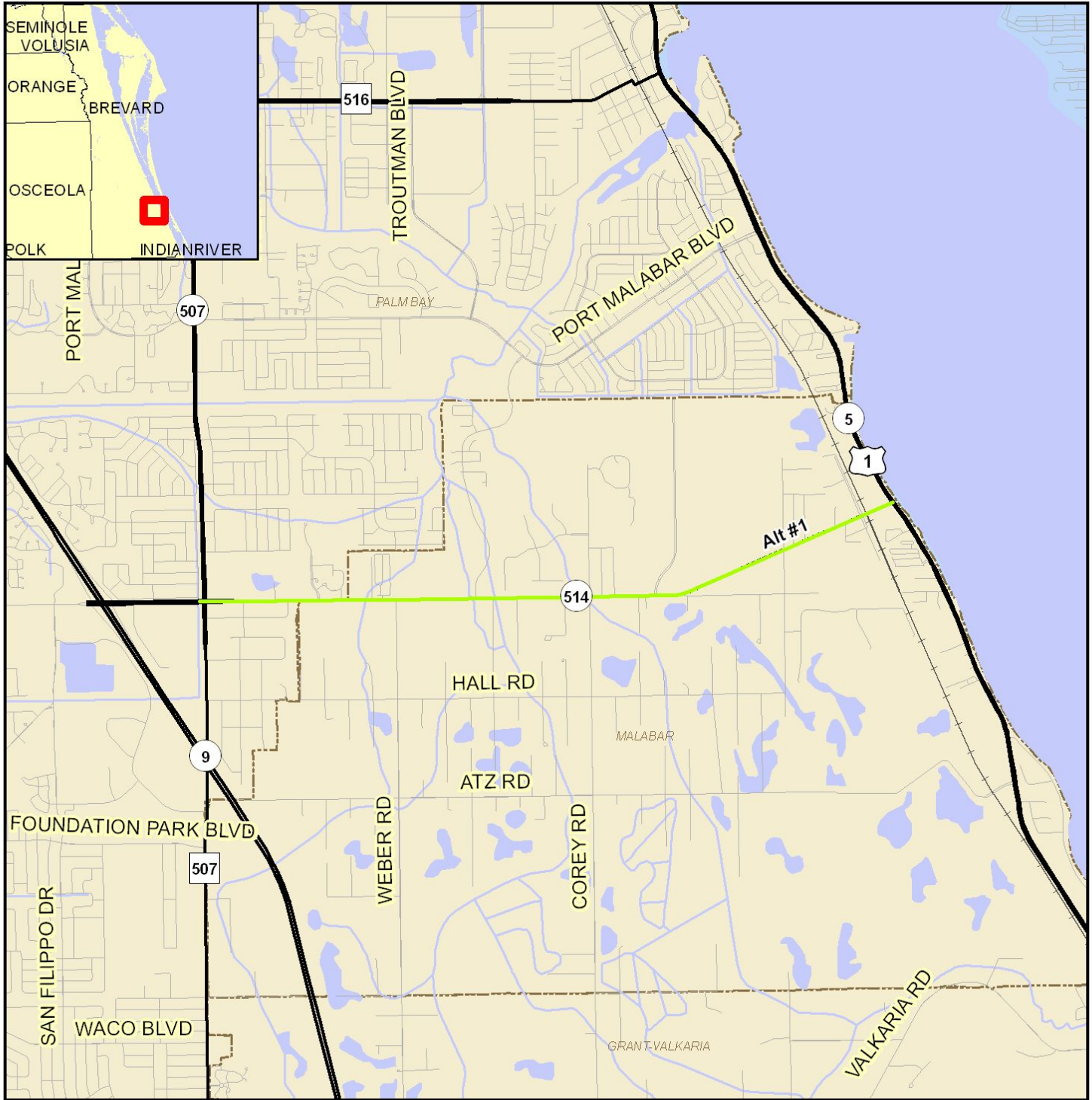
- ETDM Alternative Point
- ETDM Alternative Terminus
- ETDM Alternative Segment
- ETDM Alternative Polygon
- Major Road
- Local Road or Trail
- River, Stream or Canal
- Water Body
- Nurseries/Vineyards
- Specialty Farms
- Tree Crops
- Cropland/Pastureland
- Rural Open Lands
- Prime Farmland Soils

Data Sources: NAVTEQ, Florida Water Management Districts, US Geological Survey, Natural Resources Conservation Services

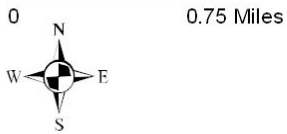
This map and its content is made available by the Florida Department of Transportation on an "as is," "as available" basis without warranties of any kind, express or implied



13026 Widen Malabar Road (SR 514) Babcock Street to US 1



Floodplain Resource Map



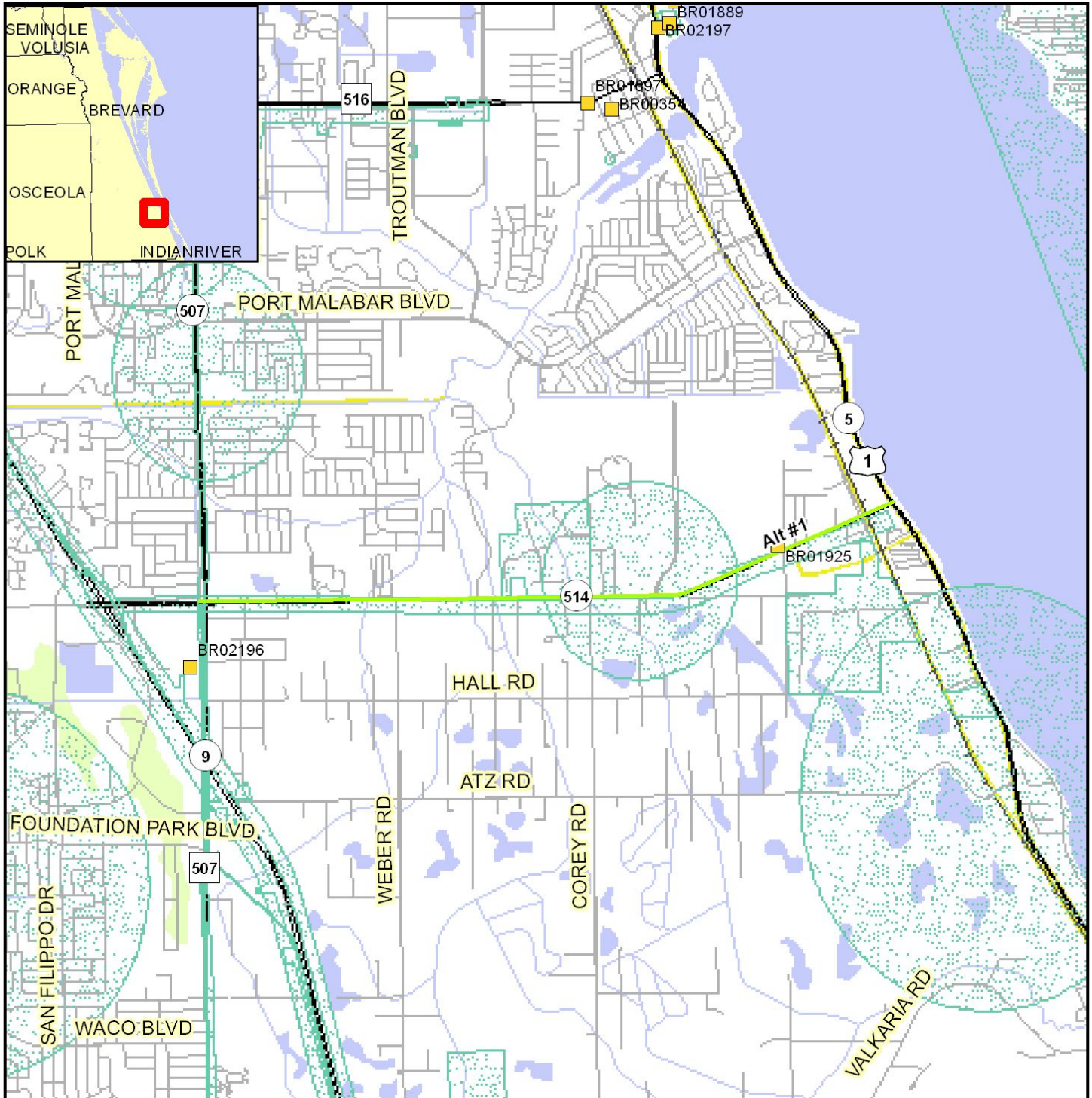
- ETDM Alternative Point
- ETDM Alternative Terminus
- ETDM Alternative Segment
- ETDM Alternative Polygon
- Major Road
- Local Road or Trail
- Railroad
- River, Stream or Canal
- Water Body
- City Limits
- County Boundaries
- Special Flood Hazard Area

Data Sources:
NAVTEQ
US Geological Survey
Federal Emergency Management Agency

This map and its content is made available by the Florida Department of Transportation on an "as is," "as available" basis without warranties of any kind, express or implied.



13026 Widen Malabar Road (SR 514) Babcock Street to US 1



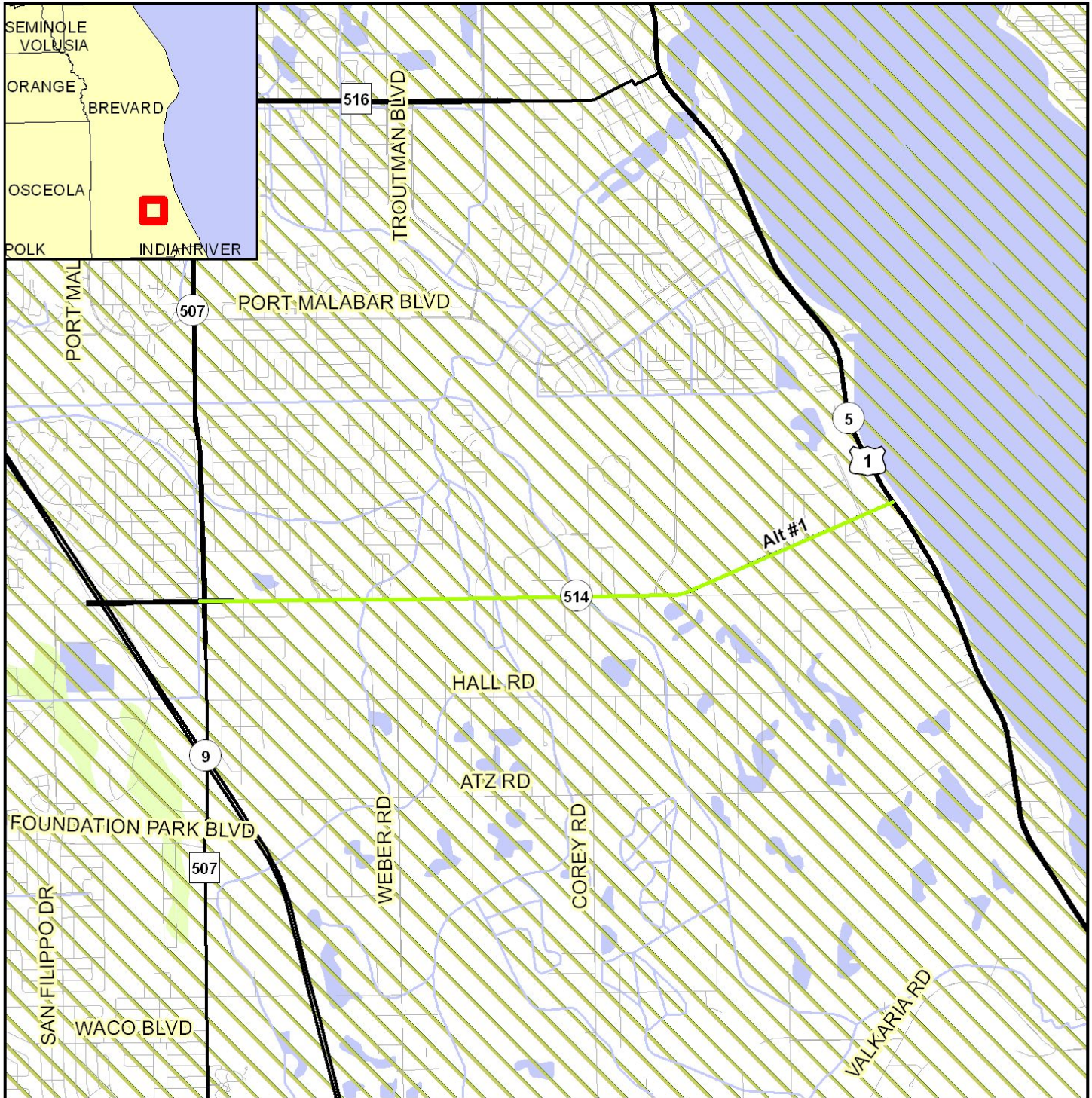
Historic Resources Map

0 2 Miles

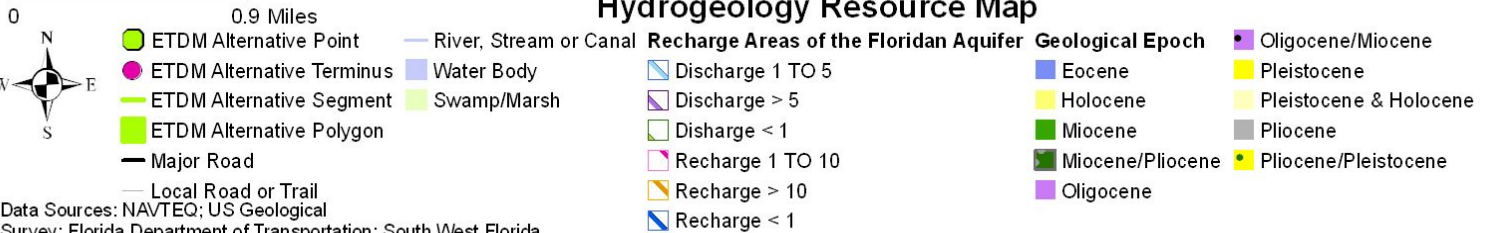
<p>Data Sources: NAVTEQ US Geological Survey Florida Department of Transportation Florida Department of State, Bureau of Archaeological Research</p>	ETDM Alternative Point	River, Stream or Canal	Historic Bridge
	ETDM Alternative Terminus	Water Body	Historic Resource Group
	ETDM Alternative Segment	Swamp/Marsh	Cultural Resource Field Survey Area
	ETDM Alternative Polygon	Railroad	State Historic Highway
Major Road	Historic Structure	Historic Cemetery	
Local Road or Trail			

Note: Historic properties depicted on this map represent resources listed in the Florida Master Site File excluding archeological site locations, which, pursuant to Chapter 267.135, Florida Statutes, may be exempt from public record (Chapter 119.07, Florida Statutes). Absence of features on the map does not necessarily indicate an absence of resources in the project vicinity.

13026 Widen Malabar Road (SR 514) Babcock Street to US 1



Hydrogeology Resource Map

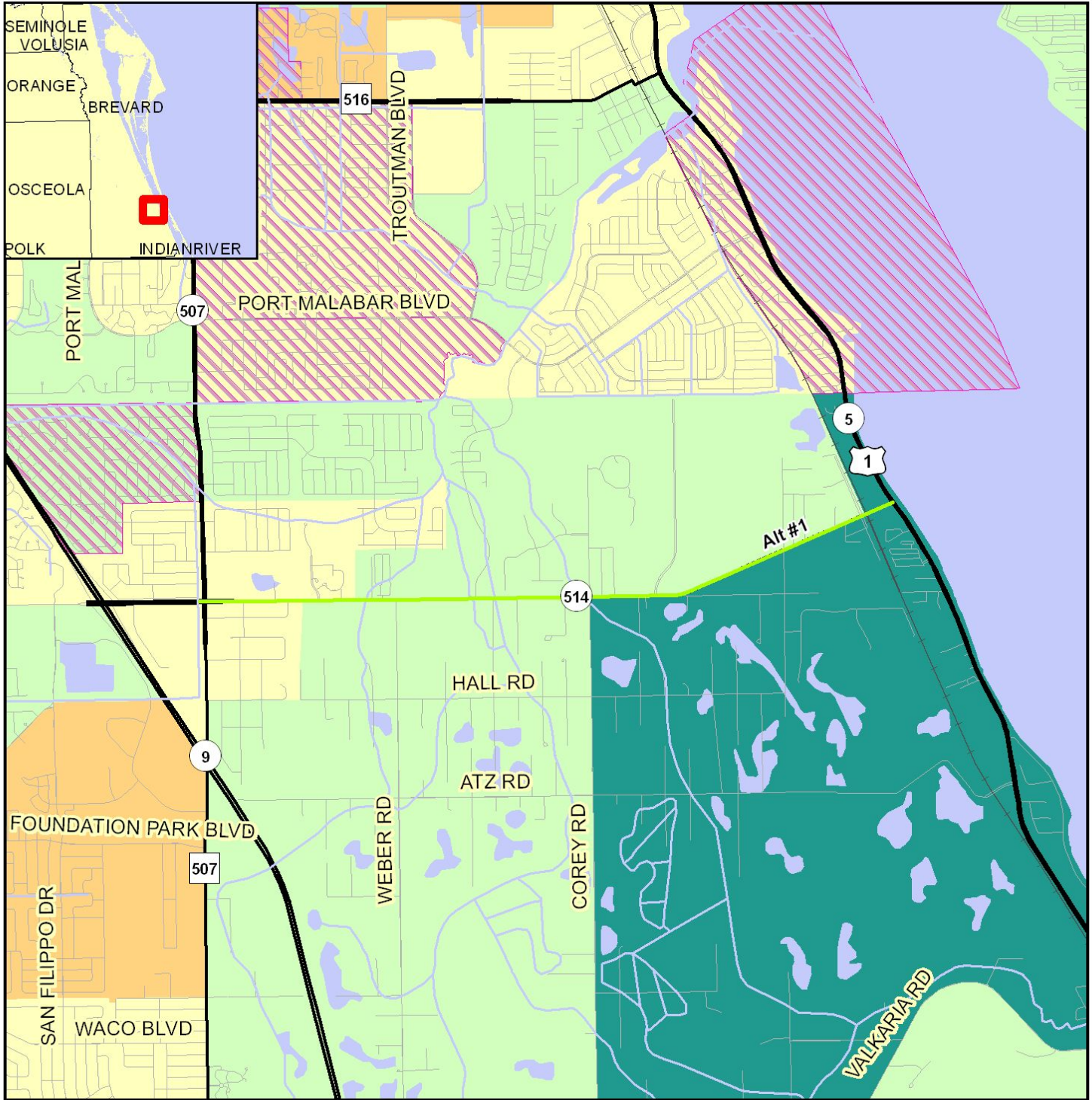


Data Sources: NAVTEQ; US Geological Survey; Florida Department of Transportation; South West Florida Water Management District; Florida Geological Survey

This map and its content is made available by the Florida Department of Transportation on an "as is," "as available" basis without warranties of any kind, express or implied.



13026 Widen Malabar Road (SR 514) Babcock Street to US 1

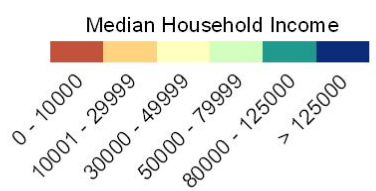


Data Sources:
 US Geological Survey
 FL Department of Transportation
 NAVTEQ
 US Census Bureau (2010)

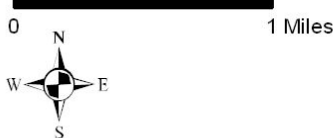
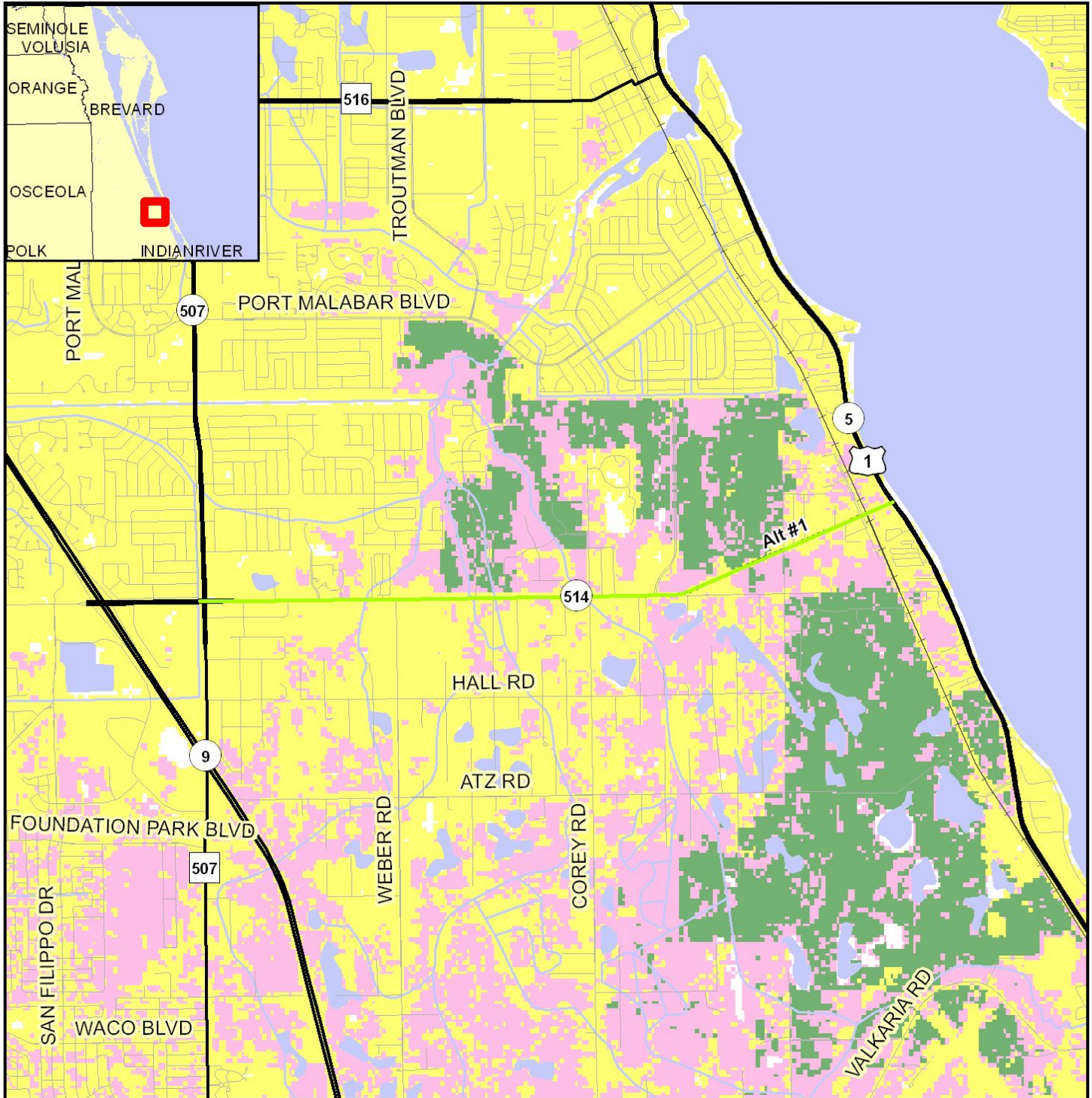
This map and its content is made available by the Florida Department of Transportation on an "as is," "as available" basis without warranties of any kind, express or implied.

Income Distribution Map

- ETDM Alternative Point
- ETDM Alternative Terminus
- ETDM Alternative Segment
- ETDM Alternative Polygon
- Major Road
- Local Road or Trail
- Railroad
- River, Stream or Canal
- > 20% Below Poverty
- Water Body



13026 Widen Malabar Road (SR 514) Babcock Street to US 1



Integrated Wildlife Habitat Ranking System Map

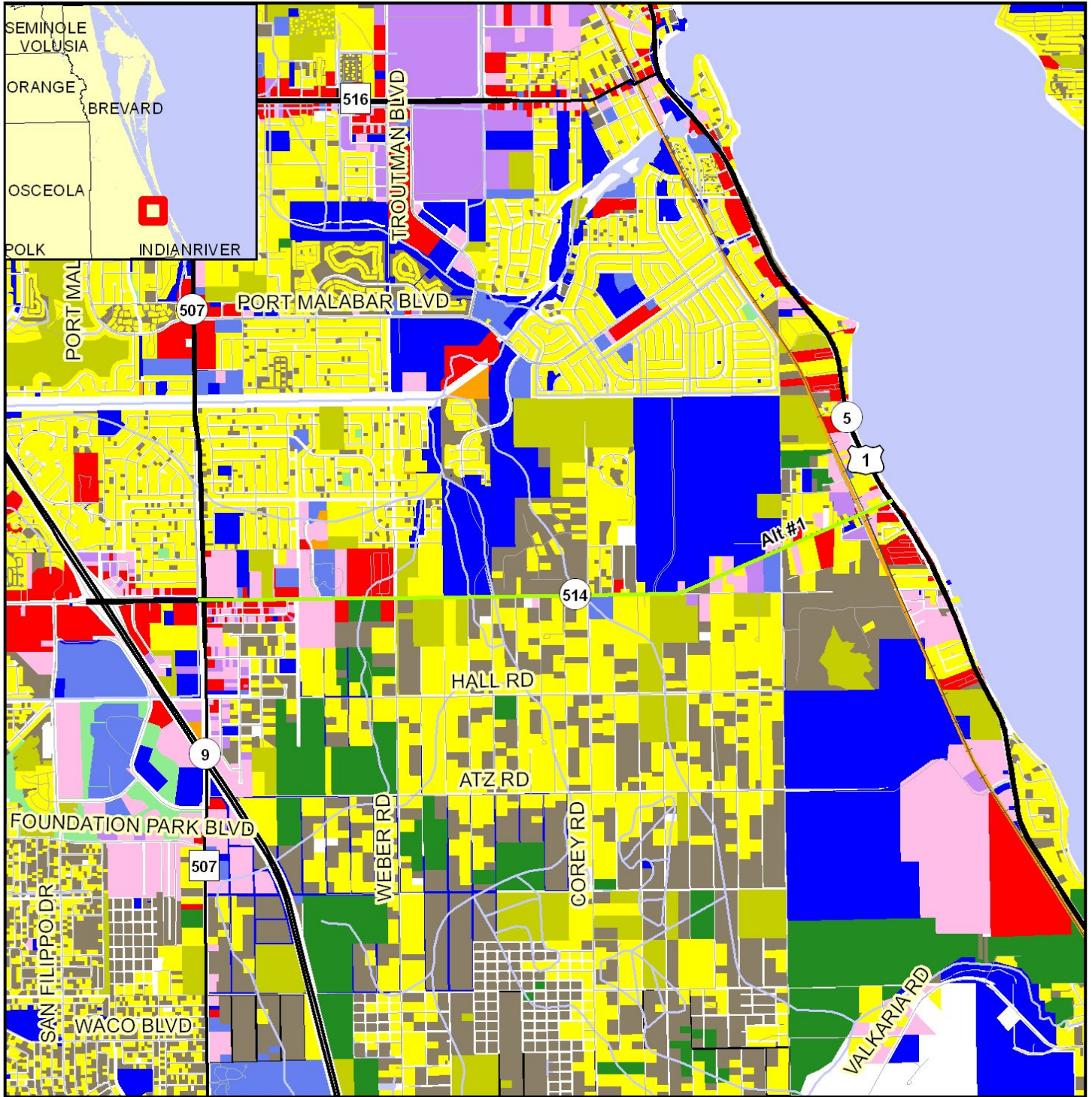
- ETDM Alternative Point
- ETDM Alternative Terminus
- ETDM Alternative Segment
- Low Habitat Quality
- Medium Habitat Quality
- High Habitat Quality
- Railroad
- River, Stream or Canal
- Water Body
- ETDM Alternative Polygon
- Major Road
- Local Road or Trail

Data Sources:
 NAVTEQ
 US Geological Survey
 Florida Department of Transportation
 Florida Fish & Wildlife Conservation Commission

This map and its content is made available by the Florida Department of Transportation on an "as is," "as available" basis without warranties of any kind, express or implied.



13026 Widen Malabar Road (SR 514) Babcock Street to US 1



0 0.4 Miles



Data Sources:
 NAVTEQ
 US Geological Survey
 Florida Department of Revenue
 Florida Department of Transportation
 Florida County Property Appraiser Offices

Land Use Map

- | | | | |
|---------------------------|------------------------|-------------------------|-------------------------|
| ETDM Alternative Point | Railroad | Open (Not Agricultural) | Retail/Office |
| ETDM Alternative Terminus | River, Stream or Canal | Other | Vacant (Residential) |
| ETDM Alternative Segment | Agricultural | Public | Vacant (Nonresidential) |
| ETDM Alternative Polygon | Industrial | Right-of-Way | Water |
| Major Road | Institutional | Recreational | No Data |
| Local Road or Trail | Mining | Residential | |

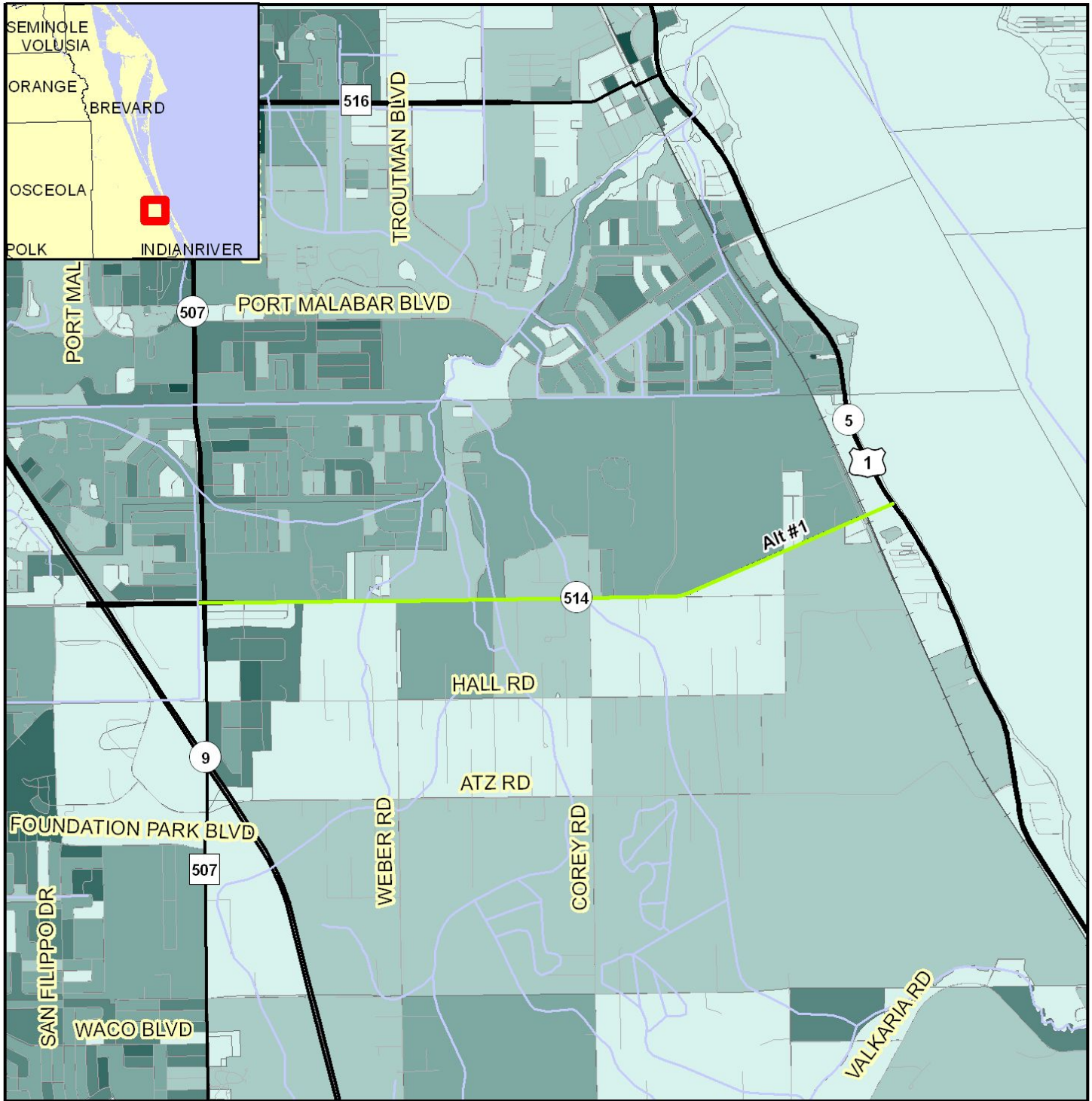
This map and its content is made available by the Florida Department of Transportation on an "as is." "as available" basis without warranties of any kind, express or implied.



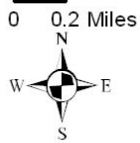
Map Generated on: 5/18/2012



13026 Widen Malabar Road (SR 514) Babcock Street to US 1

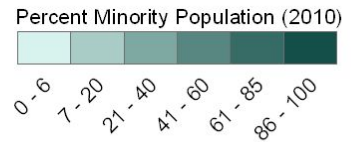


Minority Population Distribution Map



Data Sources:
 US Geological Survey
 FL Department of Transportation
 NAVTEQ
 US Census Bureau (2010)

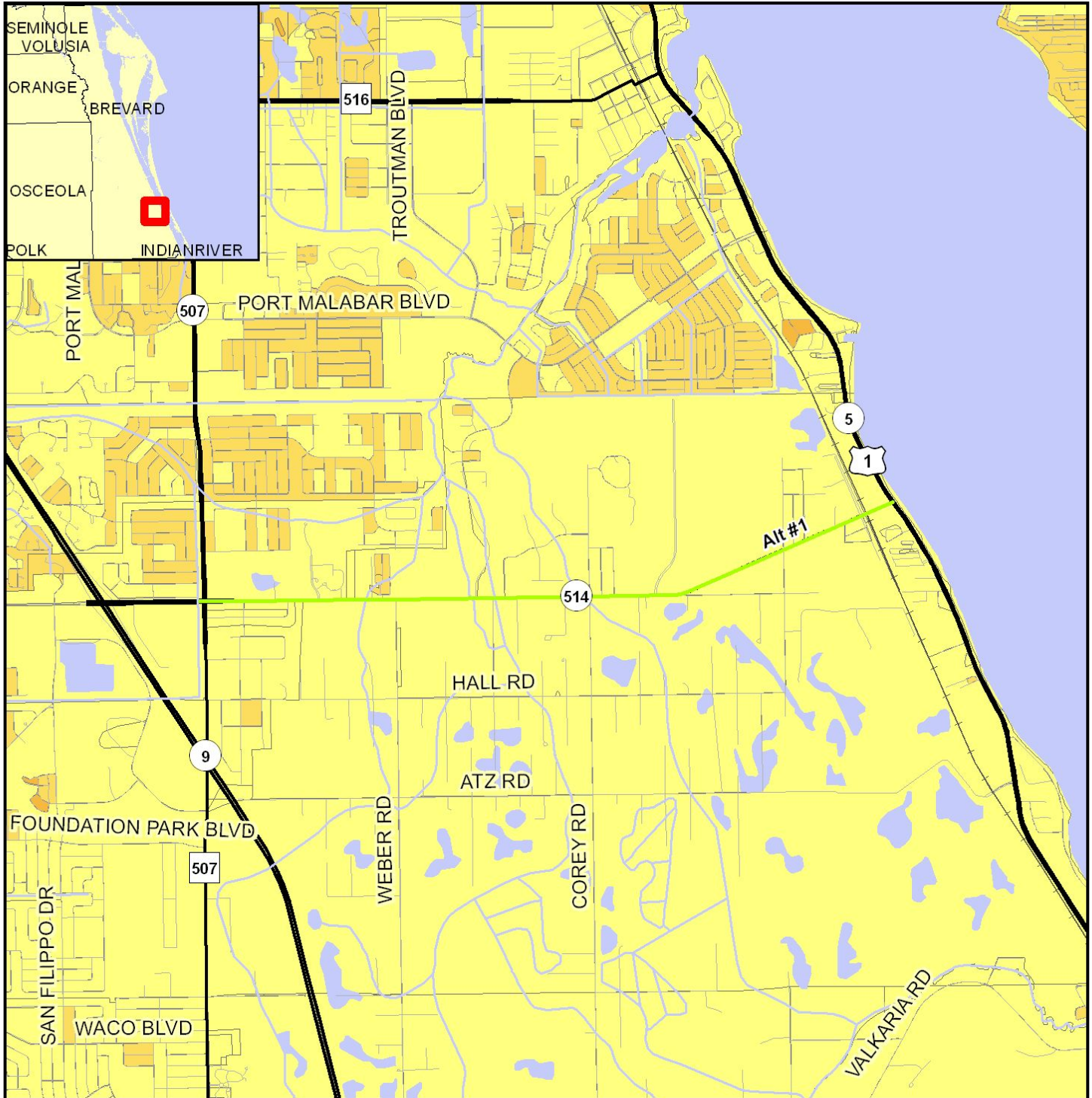
- ETDM Alternative Point
- ETDM Alternative Terminus
- ETDM Alternative Segment
- ▨ ETDM Alternative Polygon
- Major Road
- Local Road or Trail
- Railroad
- River, Stream or Canal
- Water Body



This map and its content is made available by the Florida Department of Transportation on an "as is," "as available" basis without warranties of any kind, express or implied.



13026 Widen Malabar Road (SR 514) Babcock Street to US 1

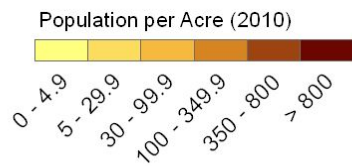


0.09 Miles

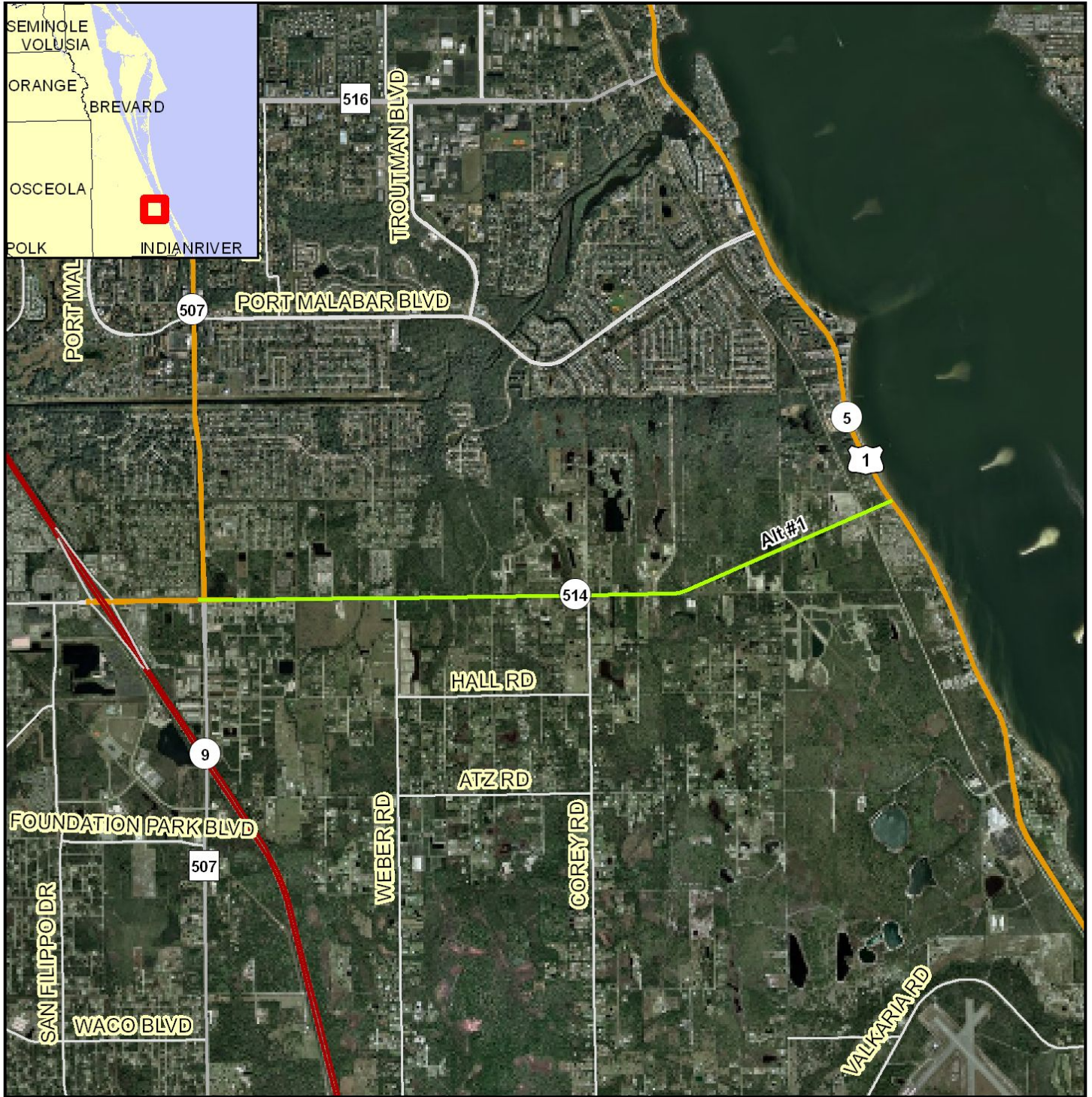


Data Sources:
 US Geological Survey
 FL Department of Transportation
 NAVTEQ
 US Census Bureau (2010)

- Population Density Map**
- ETDM Alternative Point
 - ETDM Alternative Terminus
 - ETDM Alternative Segment
 - ▨ ETDM Alternative Polygon
 - Major Road
 - Local Road or Trail
 - Railroad
 - River, Stream or Canal
 - Water Body



13026 Widen Malabar Road (SR 514) Babcock Street to US 1



Project Aerial Map



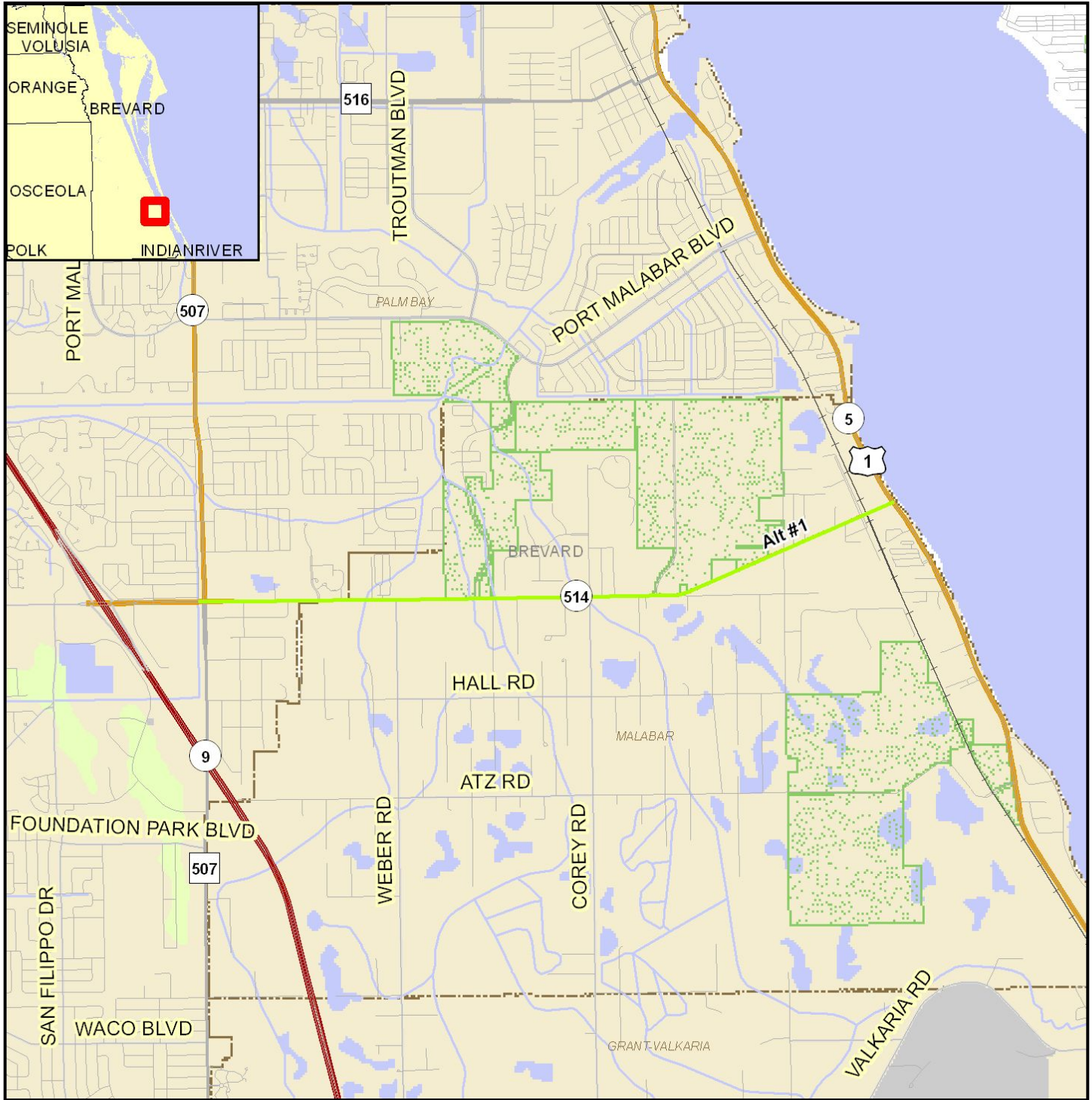
- ETDM Alternative Point
- Primary and Limited Access Highway
- ETDM Alternative Terminus
- Secondary, Unlimited Access Highway
- ETDM Alternative Segment
- Other Highway Feature
- ETDM Alternative Polygon
- Local Road

Data Sources:
Highways - NAVTEQ
Digital Orthophotograph - US Geological Survey

This map and its content is made available by the Florida Department of Transportation on an "as is," "as available" basis without warranties of any kind, express or implied.



13026 Widen Malabar Road (SR 514) Babcock Street to US 1



Project Location Map

0 0.7 Miles

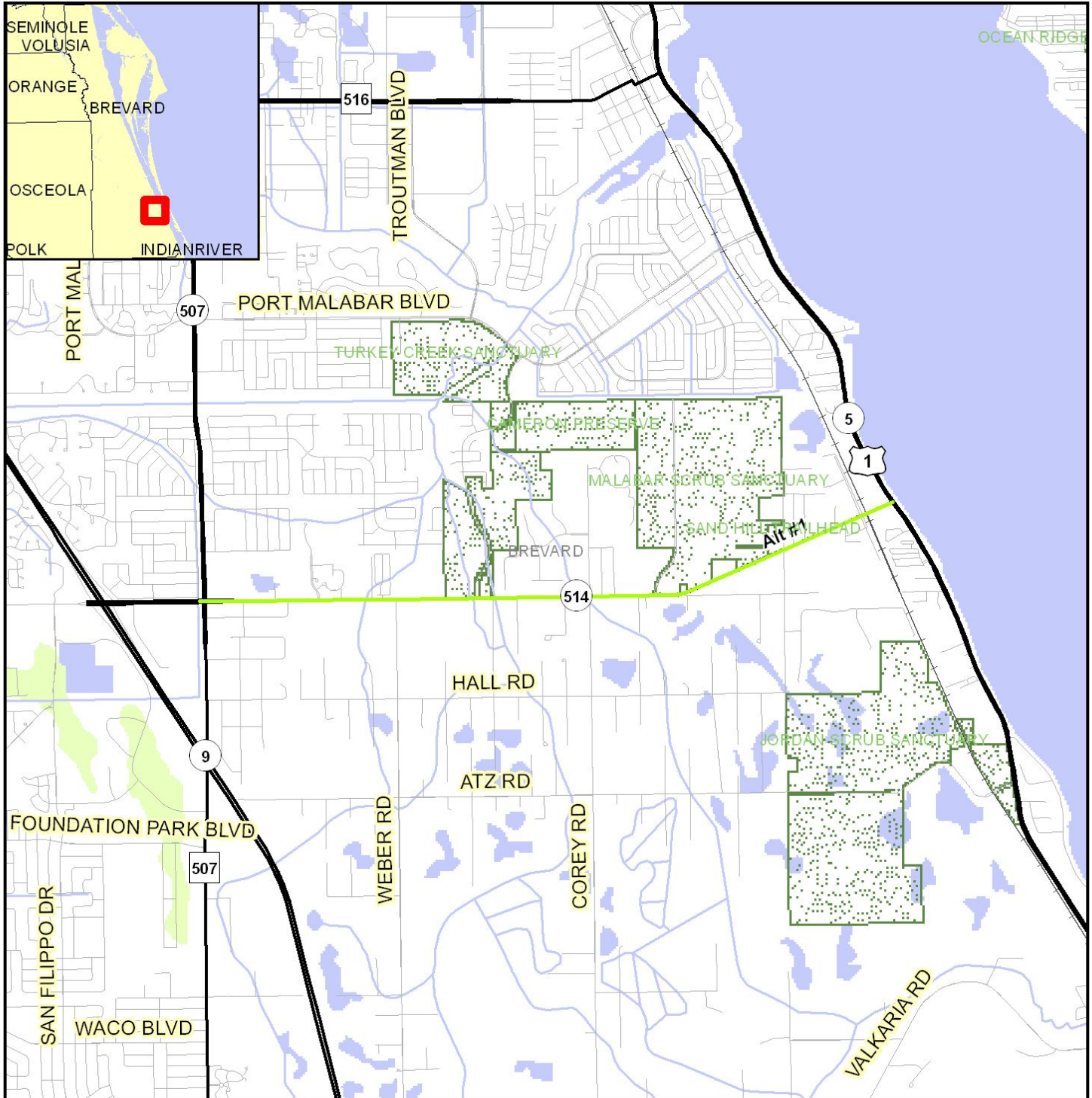


Data Sources:
 NAVTEQ
 US Geological Survey
 US Census Bureau
 County Property Appraisers
 Florida Natural Areas Inventory

- ETDM Alternative Point
- ETDM Alternative Terminus
- ETDM Alternative Segment
- ETDM Alternative Polygon
- River, Stream or Canal
- Water Body
- Swamp/Marsh
- Managed Conservation Lands
- Toll Road
- Railroad
- Airport
- City Limits
- County Boundaries



13026 Widen Malabar Road (SR 514) Babcock Street to US 1



Conservation and Recreation Area Map



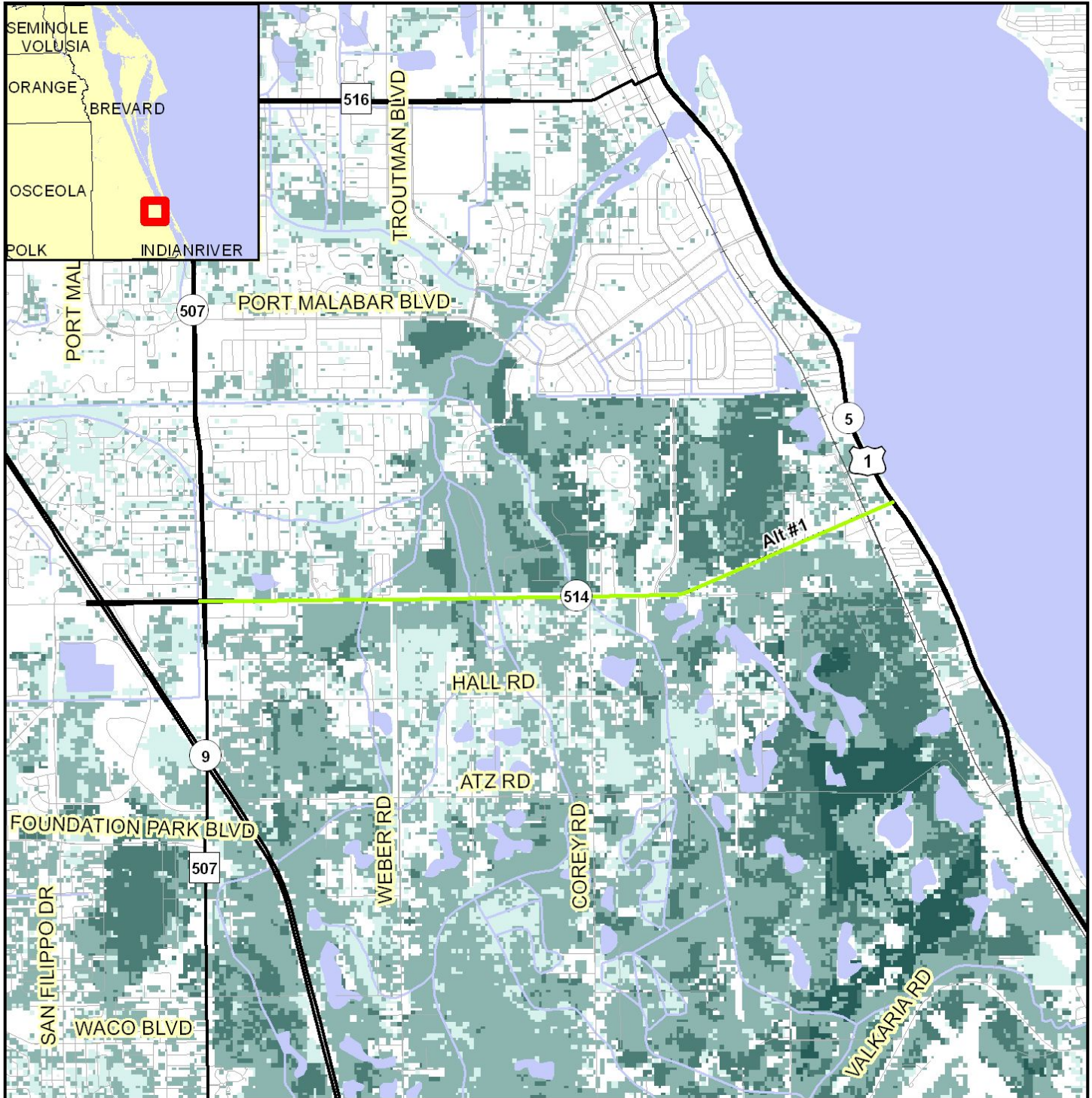
- ETDM Alternative Point
- ETDM Alternative Segment
- ETDM Alternative Polygon
- ETDM Alternative Terminus
- Major Road
- Local Road or Trail
- River, Stream or Canal
- Water Body
- Swamp/Marsh
- Railroad
- County Boundary
- Conservation or Recreation Area

Data Sources:
 NAVTEQ
 US Geological Survey
 Florida Natural Areas Inventory

This map and its content is made available by the Florida Department of Transportation on an "as is," "as available" basis without warranties of any kind, express or implied.



13026 Widen Malabar Road (SR 514) Babcock Street to US 1



Species Potential Habitat Model Map

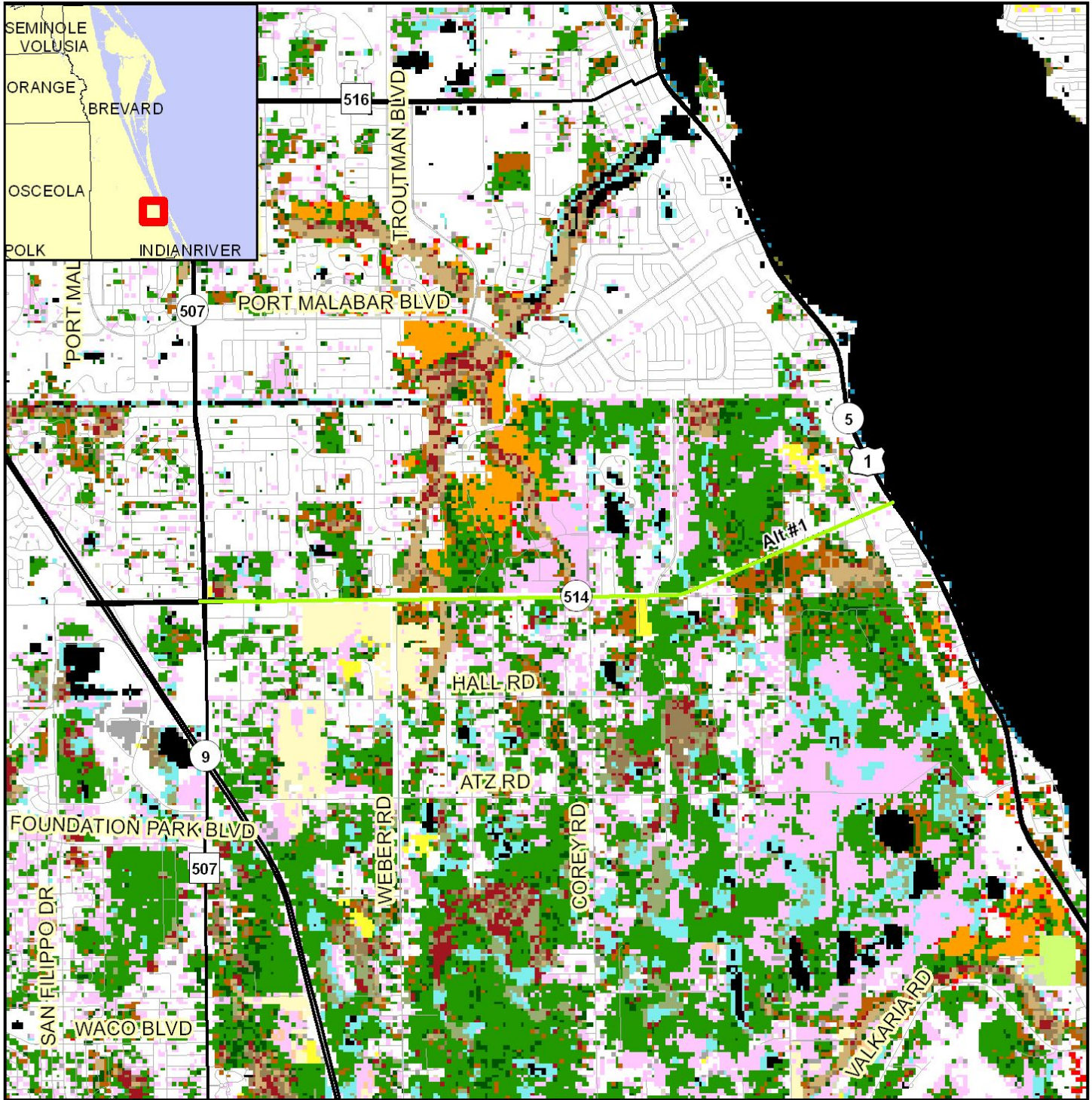
- | | | |
|---------------------------|------------------------|-----------------------------------|
| ETDM Alternative Point | Railroad | Potential Habitat Richness |
| ETDM Alternative Terminus | River, Stream or Canal | |
| ETDM Alternative Segment | Water Body | |
| ETDM Alternative Polygon | 1 - 2 Species | |
| Major Road | 3 - 5 Species | |
| Local Road or Trail | 6 - 8 Species | 9 - 10 Species |
| | | 11 - 13 Species |

Data Sources:
 NAVTEQ
 US Geological Survey
 Florida Department of Transportation
 Florida Fish & Wildlife Conservation Commission

This map and its content is made available by the Florida Department of Transportation on an "as is," "as available" basis without warranties of any kind, express or implied.



13026 Widen Malabar Road (SR 514) Babcock Street to US 1



0 1 Miles

Vegetation and Land Cover Map

- | | | | | | | |
|---------------------------|----------------------------|----------------------------------|----------------------------|---------------------|---------------------|-------------------|
| ETDM Alternative Polygon | Not Classified | Hardwood Hammocks and Forests | Bay Swamp | Mangrove Swamp | Unimproved Pasture | Brazilian Pepper |
| ETDM Alternative Segment | Coastal Strand | Pinelands | Cypress Swamp | Scrub Mangrove | Sugarcane | High Impact Urban |
| ETDM Alternative Terminus | Sand/Beach | Cabbage Palm-live Oak Hammock | Cypress/Pine/Cabbage Palm | Tidal Flats | Citrus | Low Impact Urban |
| ETDM Alternative Point | Xeric Oak Scrub | Tropical Hardwood Hammock | Mixed Wetland Forest | Open Water | Row and Field Crops | Extractive |
| Major Road | Sand Pine Scrub | Freshwater Marsh and Wet Prairie | Hardwood Swamp | Shrub and Brushland | Other Agriculture | |
| Local Road or Trail | Sandhill | Sawgrass Marsh | Hydric Hammock | Grassland | Exotic Plants | |
| | Dry Prairie | Cattail Marsh | Bottomland Hardwood Forest | Bare Soil/Clearcut | Australian Pine | |
| | Mixed Hardwood-pine Forest | Shrub Swamp | Salt Marsh | Improved Pasture | Melaleuca | |

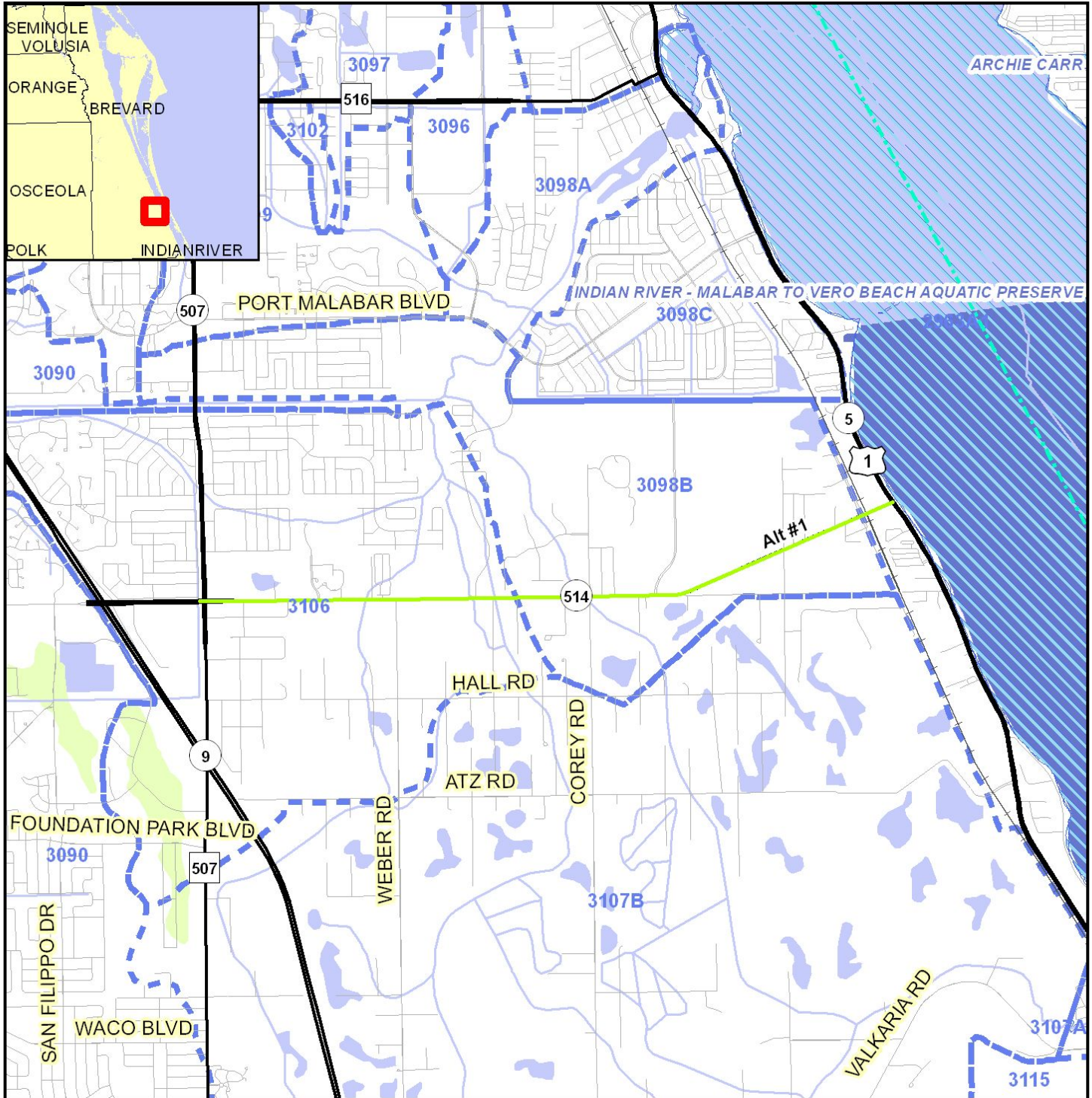
Data Sources:

NAVTEQ; Florida Department of Transportation; Florida Fish and Wildlife Conservation Commission

This map and its content is made available by the Florida Department of Transportation on an "as is," "as available" basis without warranties of any kind, express or implied.



13026 Widen Malabar Road (SR 514) Babcock Street to US 1



- ### Water Resources Map
- ETDM Alternative Point
 - ETDM Alternative Terminus
 - ETDM Alternative Segment
 - ETDM Alternative Polygon
 - Railroad
 - ▲ 1st Magnitude Spring
 - River, Stream or Canal
 - Navigable Water Way
 - SFWMD Canals
 - Drainage Basin
 - Outstanding Florida Water
 - Surface Water Class I
 - Surface Water Class II
 - Water Body
 - Swamp/Marsh

Data Sources: — Major Road
 NAVTEQ — Local Road or Trail
 US Geological Survey Florida Department of Transportation Florida Geological Survey
 Florida Department of Environmental Protection US Bureau of Transportation Statistics

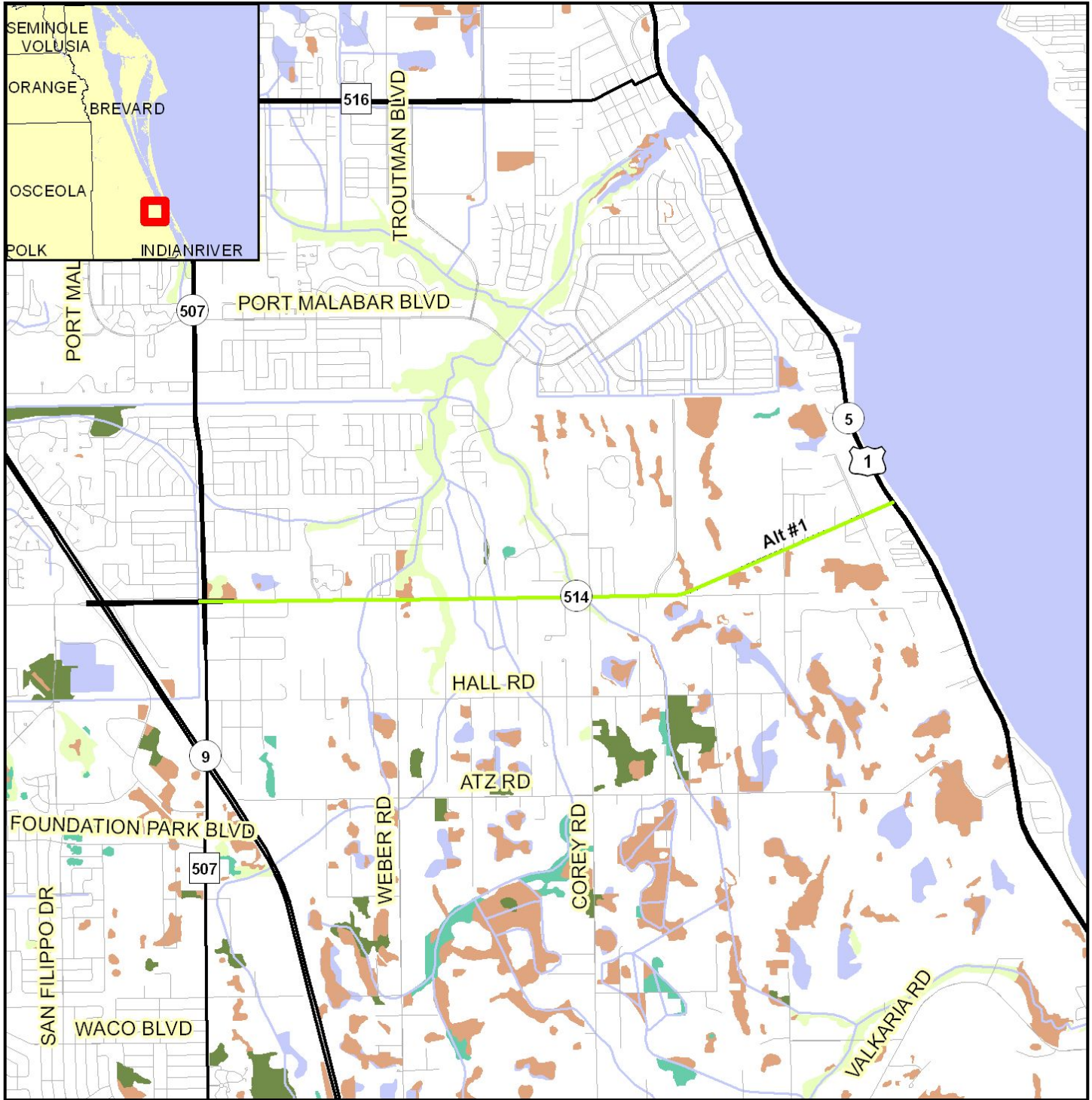
This map and its content is made available by the Florida Department of Transportation on an "as is," "as available" basis without warranties of any kind, express or implied.



Map Generated on: 5/18/2012



13026 Widen Malabar Road (SR 514) Babcock Street to US 1



Wetland Resource Map

0 0.6 Miles



- | | | |
|---------------------------|------------------------|--------------------------------|
| ETDM Alternative Polygon | Major Road | Non-vegetated Wetland |
| ETDM Alternative Segment | Local Road or Trail | Vegetated Non-forested Wetland |
| ETDM Alternative Terminus | River, Stream or Canal | Wetland Forested Mixed |
| ETDM Alternative Point | Water Body | Wetland Coniferous Forest |
| | | Wetland Hardwood Forest |

Data Sources: NAVTEQ; Florida Water Management Districts; US Geological Survey

This map and its content is made available by the Florida Department of Transportation on an "as is," "as available" basis without warranties of any kind, express or implied.





Florida Department of Transportation

**RICK SCOTT
GOVERNOR**

719 S. Woodland Blvd.
DeLand, FL 32720

**MIKE DEW
SECRETARY**

April 18, 2018

U.S. Fish & Wildlife Service
North Florida Ecological Services Field Office
7915 Baymeadows Way, Suite 200
Jacksonville, FL 32256-7517

Attn: Ms. Zakia Williams, Fish and Wildlife Biologist

RE: SR 514 (Malabar Road) Project Development and Environment (PD&E) Study
From East of SR 507 (Babcock Street) to US 1
Brevard County, Florida
ETDM# 13026
Financial Project ID: 430136-1-22-01

Dear Ms. Williams:

Enclosed is the Natural Resources Evaluation (NRE) prepared for this PD&E Study, which has been analyzed and documented by Florida Department of Transportation (FDOT) District Five as a State Environmental Impact Report (SEIR). The study limits begin east of Babcock Street (SR 507) and extend to US 1, a distance of 3.64 miles. The purpose of the study is to provide documented environmental and engineering analyses to assist the FDOT in reaching a decision as to the type, location, and conceptual design of roadway improvements to Malabar Road (SR 514). The Recommended Alternative for this project was presented at a Public Hearing on February 28, 2018 and consists of four different typical sections that vary between two, three, and four lanes based on project need and avoidance of impacts. The Recommended Alternative typical sections can be reviewed in Section 1.3 of the NRE. It should be noted that there is a reduced typical section adjacent to the Malabar Scrub Sanctuary between Corey Street and Marie Street to avoid impacts to this resource.

Preliminary coordination occurred with US Fish and Wildlife Service (USFWS) regarding the federally-listed species having the potential to occur in the project area. As a result of that coordination, research, and the field assessments conducted in November 2013, June 2014, and March 2015, the FDOT anticipates the following determinations of effect: *May Affect, Not Likely to Adversely Affect* for Audubon's crested caracara, Florida scrub-jay, wood stork, Eastern indigo snake; and *No Effect* for the red-cockaded woodpecker. It should be noted that no Audubon's crested caracara was observed within the project area during the PD&E Study. Also, no active bald eagle nests exist within one mile of the project study area.

Ms. Zakia Williams, USFWS
April 18, 2018
Page 2

We understand that USFWS cannot provide concurrence or non-concurrence with these determinations of effect at this time. However, the FDOT is committing to the following actions which will occur in consultation with USFWS during the design/permitting phase:

- During the design and permitting phase of the project, Florida scrub jay and Audubon's crested caracara surveys will be conducted in accordance with applicable federal regulatory agency protocols if required. If federally listed species are confirmed within the project limits, USFWS consultation will be initiated.
- During the design and permitting phase of the project, a formal gopher tortoise survey will be conducted to determine whether USFWS consultation is required for the eastern indigo snake, i.e. if more than 25 active and inactive burrows are proposed to be impacted. If it is determined that less than 25 gopher tortoise burrows will be impacted, FDOT agrees to follow the *USFWS Standard Protection Measures for the Eastern Indigo Snake* during construction of the project. Technical specifications regarding this commitment will be written into the contractor's bid documents.
- FDOT will ensure that the *Contractor Requirements for Unexpected Interaction with Certain Protected Species During Work Activities* is followed during construction.


These commitments are identified and detailed in the NRE, as well as the SEIR that is anticipated to be finalized in May 2018.

Because the design phase is currently not scheduled to occur until at least 2022, it is anticipated that USFWS consultation (through the Corps permitting process) would not occur until at least 2024. However, at this time, we would appreciate it if you could provide a coordination letter in this regard, to be included in the SEIR Appendix, with its provisions documented in the SEIR for commitment compliance during the design phase.

Please do not hesitate to contact me at 386-943-5411 or Catherine Owen at 386-943-5383 if you need additional information.

Sincerely,



 William G. Walsh
Environmental Manager
FDOT, District Five

ACOE FDOT Malabar Rd PDE.txt

From: Phillips, Andrew W SAJ [Andrew.W.Phillips@usace.army.mil]
Sent: Tuesday, June 03, 2014 7:43 AM
To: Stout, Craig
Cc: Casey Lyon (Casey.Lyon@dot.state.fl.us)
Subject: RE: FDOT Malabar Rd PD&E (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

Craig,

I have discussed this project many times with Hannah and other FDOT folks. My biggest concerns are the fact that waters of the United States which would be impacted by this project discharge to the Indian River. Brevard County, City of Malabar, and City of Palm Bay have created initiatives to restore/enhance Turkey Creek and this project could help and or harm those efforts. The Corps strongly advises FDOT to utilize bridges/large culverts to reduce impacts to tributaries and mitigate within the Indian River Lagoon watershed not the St. Johns River as previously discussed.

Respectfully,

AWP

Andrew Phillips
Project Manager

USACE
400 High Point Drive, Suite 600
Cocoa, Florida 32926

321-504-3771 ex 14
321-504-3803 fax

Please assist us in better serving you! Please complete the customer survey by clicking on the following link:
http://corpsmapu.usace.army.mil/cm_apex/f?p=regulatory_survey

-----Original Message-----

From: Stout, Craig [mailto:Craig.Stout@atkinsglobal.com]
Sent: Monday, June 02, 2014 4:10 PM
To: Phillips, Andrew W SAJ
Subject: [EXTERNAL] FDOT Malabar Rd PD&E

Andrew,

I wanted to touch base with you in regards to the above listed project that I am currently working on. Attached is the project area with the proposed roadway corridor and potential pond sites limits. I know we have some wood stork foraging and jurisdictional wetland impacts. I was wanting to know if there is anything outside of the normal ACOE permitting protocol that I will have to be concerned with. If you could get back to me at your earliest convenience, it would be much appreciated.

Craig S. Stout, PWS

ACOE FDOT Malabar Rd PDE.txt

Senior Scientist II, Central Florida Ecological Sciences

ATKINS

Find out more about what we do and how we do it - www.atkinsglobal.com
<<http://www.atkinsglobal.com>>

482 South Keller Road, Orlando, FL., 32810-6101 | Tel: +1 (407) 806 4347 |
Fax: +1 (407) 806 4500 | Cell: +1 (407) 227 5598 |

Email: craig.stout@atkinsglobal.com | web: www.atkinsglobal.com/northamerica
<<http://www.atkinsglobal.com/northamerica>> | Careers:
www.atkinsglobal.com/careers <<http://www.atkinsglobal.com/careers>>

This email and any attached files are confidential and copyright protected. If you are not the addressee, any dissemination of this communication is strictly prohibited. Unless otherwise expressly agreed in writing, nothing stated in this communication shall be legally binding.

The ultimate parent company of the Atkins Group is WS Atkins plc. Registered in England No. 1885586. Registered Office Woodcote Grove, Ashley Road, Epsom, Surrey KT18 5BW. A list of wholly owned Atkins Group companies registered in the United Kingdom and locations around the world can be found at <http://www.atkinsglobal.com/site-services/group-company-registration-details>

Consider the environment. Please don't print this e-mail unless you really need to.

Classification: UNCLASSIFIED
Caveats: NONE

The IS team in Atkins has scanned this email and any attachments for viruses and other threats; however no technology can be guaranteed to detect all threats. Always exercise caution before acting on the content of an email and before opening attachments or following links contained within the email.

Communication record

Person spoken with: REID HILLIARD
 Representing: SJRWMD
 Subject: BASIN 22 BANK (MITIGATION) Date and time: 6/17/19 2 pm
 Atkins representative: CRAIG STOUT Phone: 407 806-4347

Details:

REID HILLIARD RETURNED A PHONE CALL IN REGARDS TO CREDIT AVAILABILITY IN THE BASIN 22 MITIGATION BANK. HE ADVISED C. STOUT THAT THE BANK IS CURRENTLY IN PHASE 1 OF THE PERMITTING PROCESS WITH THE STATE. THE BANK IS CURRENTLY WORKING ON A CONSERVATION EASEMENT AND ~~BY~~ WITHIN THE NEXT YEAR, SOME CREDITS WILL BE RELEASED FOR PURCHASE.

Action required: DocActionRequired
 Distribute to: DocDistributeTo cc: DocCC

Malabar Scrub Sanctuary scrub-jays.txt

From: Lyon, Casey P
Sent: Friday, December 20, 2013 4:16 PM
To: Lasher, Wendy G
Cc: Munsch, Lisa M; Stout, Craig
Subject: FW: Malabar Scrub Sanctuary scrub-jays
Attachments: MalabarJays.pdf; ATT00001.htm

Hi Wendy, it does appear that the scrub-jays are not right against the road but with that being said they are not too far away from it either. And notice the caveat highlighted below...

Casey Lyon, M.S.
Senior Scientist, Environmental Sciences

?TKINS

75 years of design, engineering and project management excellence

482 South Keller Road, Orlando, Florida 32810 | Tel: +1 (407) 806 4518 | Cell: +1 (407) 448 9441 | Fax: +1 (407) 806 4500
Email: casey.lyon@atkinglobal.com | Web: www.atkinglobal.com/northamerica
www.atkinglobal.com
Twitter: www.twitter.com/atkinglobal | Facebook: www.facebook.com/atkinglobal
LinkedIn: www.linkedin.com/company/atkins | YouTube: www.youtube.com/wsatkinsplc

From: Chris O'Hara [mailto:chris.ohara@brevardparks.com]
Sent: Friday, December 20, 2013 3:22 PM
To: Lyon, Casey P
Cc: Mike Knight
Subject: Re: Malabar Scrub Sanctuary scrub-jays

Casey,
I have attached a map of Scrub Jay territories to the best of our knowledge. We have not tried any calls or recordings to find the true edges. The territories are based on staff observations of the last year or so. Please let me know if you have any questions.
Thank you,
Chris

Under Florida Law, email addresses are Public Records. If you do not want your e-mail address released in response to public record requests, do not send electronic mail to this entity. Instead, contact this office by phone or in writing.

USFWS Early consultation for SR 514-Malabar Rd PDE.txt

From: Monaghan, Jane [jane_monaghan@fws.gov]
Sent: Tuesday, April 01, 2014 12:04 PM
To: Stout, Craig
Subject: Re: Early consultation for FDOT D5 - SR 514-Malabar Rd PD&E

USFWS (Service) has reviewed the proposed project area, the widening of SR 514 (Malabar road) for the potential presence of federally listed species. We provide the following recommendations:

There is suitable habitat for Florida scrub-jays (FLSJ) and these areas will need to be surveyed.

Malabar Scrub Sanctuary is adjacent to the roadway on the north side. Brevard County may have current FLSJ information for these public lands. Potential is high for this species.

If any impacts are proposed to public conservation land, a Section 4f evaluation will be needed.

Impacts to public lands should always be avoided. The ability to manage public lands with prescribed fire, should be addressed.

Wood stork colonies (616119 and 616003-Valkearia) are located within 5 miles of the project.

The determination of effect key developed between the USACE and USFWS should be utilized

and appropriate compensation for wetland impacts should be implemented. USFWS recommends

avoiding wetland impacts. Potential for this species to forage in ditches, swales and natural wetlands is high.

No known Audubon's caracara nest sites (Brevard County 2006 survey) were located within the project corridor. This species can be found west of I-95 in Brevard county. Potential is low.

Stormwater runoff should be treated appropriately to remove contaminants before entering the Indian River Lagoon to protect seagrass beds, Florida manatees and sea turtles.

Complete surveys for gopher tortoise burrows will be needed in order to implement the eastern

indigo snake (EIS) effect determination key developed between the Service and the USACE.

New EIS guidelines can be found on our website (<http://www.fws.gov/northflorida/>) and should

be followed. Potential is high for the presence of EIS and gopher tortoises.

No known red-cockaded woodpecker clusters were found. Mature timber and public lands should be examined to confirm the absence of this species.

It is possible that this project went through the online ETDM screening (#13026) process. I do

not have access to any old files at this time due to ongoing issues with our server and drives. I

will attempt to find this project on the ETDM website for you. Please let me know if you have

any questions, and I apologize again for the delay.

USFWS Early consultation for SR 514-Malabar Rd PDE.txt

On Mon, Mar 31, 2014 at 9:51 AM, Stout, Craig <Craig.Stout@atkinsglobal.com> wrote:
Jane,

I wanted to check on the status of the early coordination for the above listed project. At your earliest convenience can you please let me know how we look and if any T&E surveys will be required at the PD&E level. Thanks

Craig S. Stout, PWS
Senior Scientist II, Central Florida Ecological Sciences

ATKINS

482 South Keller Road, Orlando, FL., 32810-6101 | Tel: +1 (407) 806 4347 | Fax: +1 (407) 806 4500 | Cell: +1 (407) 227 5598

Email: craig.stout@atkinsglobal.com | Web: www.atkinsglobal.com/northamerica |
Careers: www.atkinsglobal.com/careers

From: Monaghan, Jane [mailto:jane_monaghan@fws.gov]
Sent: Wednesday, February 19, 2014 12:16 PM
To: Stout, Craig
Subject: Re: Early consultation for FDOT D5 - SR 514-Malabar Rd PD&E

Craig,
Can you please send me the shapefile or kmz for the pdf map that you attached.
Thanks!

On Tue, Feb 4, 2014 at 2:04 PM, Stout, Craig <Craig.Stout@atkinsglobal.com> wrote:
Jane,

I left you a voicemail earlier today in regards to early consultation for the above listed FDOT project. Please find attached the location map of the projects extents. The proposed project is a widening of SR 514 (Malabar Road) in Brevard County, Florida. In addition to the widening, new pond sites will also be created in adjacent properties. In the attachment, I have included all potential pond sites as well as the project corridor.

We reviewed the USFWS county species list for Brevard County as well as field reconnaissance and determined that there is the potential for the following federally listed species within the project limits: wood stork, indigo snake, gopher tortoise, scrub jay, and Audubon's crested caracara. The project is in the consultation area for the piping plover, snail kite, red cockaded woodpecker, however no habitat for these species was observed during field surveys.

The east end of the project does abut the Indian River which is designated as critical habitat for the West Indian Manatee. However, no impacts to the river or open bodies of water that directly connect to the river are anticipated from the project.

Please advise if species specific surveys will be required for the species above or any additional

USFWS Early consultation for SR 514-Malabar Rd PDE.txt
species during the PD&E phase or prior to construction, so we can notify FDOT early in the process.

If you need any other information or additional maps, please let me know.

Thank you so much for your help with this.

Craig S. Stout, PWS
Senior Scientist II, Central Florida Ecological Sciences

ATKINS
Find out more about what we do and how we do it - www.atkinsglobal.com

482 South Keller Road, Orlando, FL., 32810-6101 | Tel: +1 (407) 806 4347 | Fax: +1 (407) 806 4500 | Cell: +1 (407) 227 5598

|
Email: craig.stout@atkinsglobal.com | web: www.atkinsglobal.com/northamerica |
Careers: www.atkinsglobal.com/careers

This email and any attached files are confidential and copyright protected. If you are not the addressee, any dissemination of this communication is strictly prohibited. Unless otherwise expressly agreed in writing, nothing stated in this communication shall be legally binding.

The ultimate parent company of the Atkins Group is WS Atkins plc. Registered in England No. 1885586. Registered Office Woodcote Grove, Ashley Road, Epsom, Surrey KT18 5BW. A list of wholly owned Atkins Group companies registered in the United Kingdom and locations around the world can be found at <http://www.atkinsglobal.com/site-services/group-company-registration-details>

Consider the environment. Please don't print this e-mail unless you really need to.

--
Jane Monaghan
Fish and Wildlife Biologist
USFWS
7915 Baymeadows Way, Suite 200
Jacksonville, FL 32256-7517
904-731-3119
904-731-3116 (main office)

The IS team in Atkins has scanned this email and any attachments for viruses and other threats; however no technology can be guaranteed to detect all threats. Always exercise caution before acting on the content of an email and before opening attachments or following links contained within the email.

USFWS Early consultation for SR 514-Malabar Rd PDE.txt

--

Jane Monaghan
Fish and Wildlife Biologist
USFWS
7915 Baymeadows Way, Suite 200
Jacksonville, FL 32256-7517
904-731-3119
904-731-3116 (main office)

The IS team in Atkins has scanned this email and any attachments for viruses and other threats; however no technology can be guaranteed to detect all threats. Always exercise caution before acting on the content of an email and before opening attachments or following links contained within the email.

Brevard -Natural Resource Mgmt FDOT Malabar Rd PDE Study.txt
From: Gosselin, Sue [Susan.Gosselin@brevardcounty.us]
Sent: Tuesday, June 03, 2014 6:20 AM
To: Stout, Craig
Subject: RE: FDOT Malabar Rd PD&E Study

Craig,

So far no Caracara, but the area east of Weber and south of Malabar contains suitable habitat. We think there may be a Bald Eagle nest near the Malabar Fire station since we have adults regularly loafing there in breeding season and sufficient large pines. No one has really looked for any nests, though. I doubt USFWS and FFWCC maps since we regularly find new nests that, according to locals, have been there for some time and no one reports to FFWCC or USFWS. That is what happened with the Viera overpass eagle.

I'm waiting for a response to an email to Chris O'hara with the EEL program. He manages the Malabar scrub sanctuary where we have several families of jays. I have asked for any recent territory maps that he may know of. I will get back with you as soon as I know.

Gopher tortoises are THICK on that sanctuary also. I have found that we (County)are probably the repository for unwanted tortoises.

Sue

From: Stout, Craig [mailto:Craig.Stout@atkinsglobal.com]
Sent: Monday, June 02, 2014 3:55 PM
To: Gosselin, Sue
Subject: FDOT Malabar Rd PD&E Study

Susan,

Per my phone message that I left you on Monday June 2nd, I was wanting to get early consultation on any listed species that may be impacted with the proposed project. Please find attached a project map that includes the road widening and potential pond sites limits. From field surveys and desk top review, we have concluded that there is the potential for occurrence of these species within the proposed project limits: wood stork, indigo snake, gopher tortoise, and the Florida scrub jay.

Per USFWS, no active Bald eagle or Audubon's Crested Caracara nest are within the vicinity of the project. The east end of the project does abut the Indian River which is designated as critical habitat for the West Indian Manatee. However, no impacts to the river or open bodies of water that directly connect to the river are anticipated from the project. In addition, do you have any up to date Florida scrub jay information on the Malabar Scrub sanctuary or any of the other public lands within the corridor? It would be helpful if you can think of any other listed species issues we might encounter, if you could please let me know, it would be much appreciated

Brevard -Natural Resource Mgmt FDOT Malabar Rd PDE Study.txt
Again, thank you for your help with this.

Craig S. Stout, PWS
Senior Scientist II, Central Florida Ecological Sciences

ATKINS
Find out more about what we do and how we do it - www.atkinsglobal.com

482 South Keller Road, Orlando, FL., 32810-6101 | Tel: +1 (407) 806 4347 | Fax: +1
(407) 806 4500 | Cell: +1 (407) 227 5598

|
Email: craig.stout@atkinsglobal.com | web: www.atkinsglobal.com/northamerica |
Careers:
www.atkinsglobal.com/careers

This email and any attached files are confidential and copyright protected. If you are not the addressee, any dissemination of this communication is strictly prohibited. Unless otherwise expressly agreed in writing, nothing stated in this communication shall be legally binding.

The ultimate parent company of the Atkins Group is WS Atkins plc. Registered in England No. 1885586. Registered Office Woodcote Grove, Ashley Road, Epsom, Surrey KT18 5BW. A list of wholly owned Atkins Group companies registered in the United Kingdom and locations around the world can be found at <http://www.atkinsglobal.com/site-services/group-company-registration-details>

Consider the environment. Please don't print this e-mail unless you really need to.

Under Florida Law, email addresses are Public Records. If you do not want your e-mail address released in response to public record requests, do not send electronic mail to this entity. Instead, contact this office by phone or in writing.

The IS team in Atkins has scanned this email and any attachments for viruses and other threats; however no technology can be guaranteed to detect all threats. Always exercise caution before acting on the content of an email and before opening attachments or following links contained within the email.

Brevard EELS Malabar Scrub Sanctuary.txt
From: O'HARA, CHRISTOPHER [chris.ohara@brevardparks.com]
Sent: Wednesday, June 11, 2014 3:34 PM
To: Stout, Craig
Subject: RE: Malabar Scrub Sanctuary scrub-jays

Craig,
It turns out it was reported as an eagle nest but was a osprey nest that has since fallen.
Sorry for the worry,
Chris

From: Stout, Craig [Craig.Stout@atkingglobal.com]
Sent: Wednesday, June 11, 2014 1:00 PM
To: O'HARA, CHRISTOPHER
Subject: RE: Malabar Scrub Sanctuary scrub-jays
Chris,

Thanks for the information. How far south of Malabar Road is it? Is there a street intersection that you could reference, so I can narrow down the location. Thanks again

Craig S. Stout, PWS
Senior Scientist II, Central Florida Ecological Sciences

ATKINS

482 South Keller Road, Orlando, FL., 32810-6101 | Tel: +1 (407) 806 4347 | Fax: +1 (407) 806 4500 | Cell: +1 (407) 227 5598
|
Email: craig.stout@atkingglobal.com | web: www.atkingglobal.com/northamerica |
Careers: www.atkingglobal.com/careers

From: O'HARA, CHRISTOPHER [mailto:chris.ohara@brevardparks.com]
Sent: Wednesday, June 11, 2014 12:56 PM
To: Stout, Craig
Subject: RE: Malabar Scrub Sanctuary scrub-jays

Craig,
I have no spotted a nest within Malabar Scrub, there is a nest south of Malabar Rd closer to US1. I do not think the nest is close enough to be a problem.
Thank you,
Chris

From: Stout, Craig [Craig.Stout@atkingglobal.com]
Sent: Wednesday, June 11, 2014 8:47 AM
To: O'HARA, CHRISTOPHER
Subject: RE: Malabar Scrub Sanctuary scrub-jays
Good morning Chris,

Sue Gosselin with the Brevard County Natural Resources Management office mentioned that she has spotted a few adult bald eagles hanging around the fire station during breeding season next to the Malabar Scrub Sanctuary. Have you spotted any nests in or directly adjacent to your sanctuary? I didn't notice any when I was out doing the field review, however I wanted to get your input just to confirm. As always, I appreciate you help with this.

Brevard EELS Malabar Scrub Sanctuary.txt

Craig S. Stout, PWS
Senior Scientist II, Central Florida Ecological Sciences

ATKINS

482 South Keller Road, Orlando, FL., 32810-6101 | Tel: +1 (407) 806 4347 | Fax: +1 (407) 806 4500 | Cell: +1 (407) 227 5598

|
Email: craig.stout@atkinglobal.com | web: www.atkinglobal.com/northamerica |
Careers: www.atkinglobal.com/careers

From: O'HARA, CHRISTOPHER [mailto:chris.ohara@brevardparks.com]
Sent: Friday, June 06, 2014 11:16 AM
To: Stout, Craig
Subject: RE: Malabar Scrub Sanctuary scrub-jays

Craig,
No RCW's on site, Indigo's have been documented but not for a few years.
Thanks,
Chris

From: Stout, Craig [Craig.Stout@atkinglobal.com]
Sent: Friday, June 06, 2014 8:14 AM
To: O'HARA, CHRISTOPHER
Subject: RE: Malabar Scrub Sanctuary scrub-jays
Thanks Chris.

By the way, do you have any RCW populations that you know of within or directly adjacent to the scrub sanctuary? I noticed some fairly decent habitat on the east side near the old school house.

Craig S. Stout, PWS
Senior Scientist II, Central Florida Ecological Sciences

ATKINS

482 South Keller Road, Orlando, FL., 32810-6101 | Tel: +1 (407) 806 4347 | Fax: +1 (407) 806 4500 | Cell: +1 (407) 227 5598

|
Email: craig.stout@atkinglobal.com | web: www.atkinglobal.com/northamerica |
Careers: www.atkinglobal.com/careers

From: O'HARA, CHRISTOPHER [mailto:chris.ohara@brevardparks.com]
Sent: Thursday, June 05, 2014 9:27 AM
To: Stout, Craig
Subject: RE: Malabar Scrub Sanctuary scrub-jays

Craig,
I generated this map in 2013, I have not conducted a more recent study.
Let me know if you need anything further.
Thank you,
Chris

From: Stout, Craig [Craig.Stout@atkinglobal.com]
Sent: Wednesday, June 04, 2014 8:16 AM
To: O'HARA, CHRISTOPHER
Subject: FW: Malabar Scrub Sanctuary scrub-jays
Chris,

Brevard EELS Malabar Scrub Sanctuary.txt

I am currently working on the PD&E study for the proposed Malabar Rd widening project. At the end of last year my associate Casey Lyon received the attached Florida scrub jay territory map for the Malabar Scrub Sanctuary. Do you know what year this information was generated?

If you could get back to me at your earliest convenience, it would be much appreciated.

Craig S. Stout, PWS
Senior Scientist II, Central Florida Ecological Sciences

ATKINS

482 South Keller Road, Orlando, FL., 32810-6101 | Tel: +1 (407) 806 4347 | Fax: +1 (407) 806 4500 | Cell: +1 (407) 227 5598

|
Email: craig.stout@atkinsglobal.com | web: www.atkinsglobal.com/northamerica |
Careers: www.atkinsglobal.com/careers

From: Lyon, Casey P
Sent: Friday, December 20, 2013 4:16 PM
To: Lasher, Wendy G
Cc: Munsch, Lisa M; Stout, Craig
Subject: FW: Malabar Scrub Sanctuary scrub-jays

Hi Wendy, it does appear that the scrub-jays are not right against the road but with that being said they are not too far away from it either. And notice the caveat highlighted below...

Casey Lyon, M.S.
Senior Scientist, Environmental Sciences

?TKINS

75 years of design, engineering and project management excellence

482 South Keller Road, Orlando, Florida 32810 | Tel: +1 (407) 806 4518 | Cell: +1 (407) 448 9441 | Fax: +1 (407) 806 4500

Email: casey.lyon@atkinsglobal.com | web: www.atkinsglobal.com/northamerica
www.atkinsglobal.com

Twitter: www.twitter.com/atkinsglobal | Facebook: www.facebook.com/atkinsglobal
LinkedIn: www.linkedin.com/company/atkins | YouTube: www.youtube.com/wsatkinsplc

From: Chris O'Hara [<mailto:chris.ohara@brevardparks.com>]
Sent: Friday, December 20, 2013 3:22 PM
To: Lyon, Casey P
Cc: Mike Knight
Subject: Re: Malabar Scrub Sanctuary scrub-jays

Casey,
I have attached a map of Scrub Jay territories to the best of our knowledge. We have not tried any calls or recordings to find the true edges. The territories are based on staff observations of the last year or so. Please let me know if you have any questions.
Thank you,
Chris

Under Florida Law, email addresses are Public Records. If you do not want your e-mail

Brevard EELS Malabar Scrub Sanctuary.txt
address released in response to public record requests, do not send electronic mail to this entity. Instead, contact this office by phone or in writing.

This email and any attached files are confidential and copyright protected. If you are not the addressee, any dissemination of this communication is strictly prohibited. Unless otherwise expressly agreed in writing, nothing stated in this communication shall be legally binding.

The ultimate parent company of the Atkins Group is WS Atkins plc. Registered in England No. 1885586. Registered Office Woodcote Grove, Ashley Road, Epsom, Surrey KT18 5BW. A list of wholly owned Atkins Group companies registered in the United Kingdom and locations around the world can be found at <http://www.atkingsglobal.com/site-services/group-company-registration-details>

Consider the environment. Please don't print this e-mail unless you really need to.

Under Florida Law, email addresses are Public Records. If you do not want your e-mail address released in response to public record requests, do not send electronic mail to this entity. Instead, contact this office by phone or in writing.

The IS team in Atkins has scanned this email and any attachments for viruses and other threats; however no technology can be guaranteed to detect all threats. Always exercise caution before acting on the content of an email and before opening attachments or following links contained within the email.

Under Florida Law, email addresses are Public Records. If you do not want your e-mail address released in response to public record requests, do not send electronic mail to this entity. Instead, contact this office by phone or in writing.

The IS team in Atkins has scanned this email and any attachments for viruses and other threats; however no technology can be guaranteed to detect all threats. Always exercise caution before acting on the content of an email and before opening attachments or following links contained within the email.

Under Florida Law, email addresses are Public Records. If you do not want your e-mail address released in response to public record requests, do not send electronic mail to this entity. Instead, contact this office by phone or in writing.

The IS team in Atkins has scanned this email and any attachments for viruses and other threats; however no technology can be guaranteed to detect all threats. Always exercise

Page 4



Florida Department of Transportation

**RICK SCOTT
GOVERNOR**

719 S. Woodland Blvd.
DeLand, FL 32720

**MIKE DEW
SECRETARY**

April 18, 2018

U.S. Fish & Wildlife Service
North Florida Ecological Services Field Office
7915 Baymeadows Way, Suite 200
Jacksonville, FL 32256-7517

Attn: Ms. Zakia Williams, Fish and Wildlife Biologist

RE: SR 514 (Malabar Road) Project Development and Environment (PD&E) Study
From East of SR 507 (Babcock Street) to US 1
Brevard County, Florida
ETDM# 13026
Financial Project ID: 430136-1-22-01

Dear Ms. Williams:

Enclosed is the Natural Resources Evaluation (NRE) prepared for this PD&E Study, which has been analyzed and documented by Florida Department of Transportation (FDOT) District Five as a State Environmental Impact Report (SEIR). The study limits begin east of Babcock Street (SR 507) and extend to US 1, a distance of 3.64 miles. The purpose of the study is to provide documented environmental and engineering analyses to assist the FDOT in reaching a decision as to the type, location, and conceptual design of roadway improvements to Malabar Road (SR 514). The Recommended Alternative for this project was presented at a Public Hearing on February 28, 2018 and consists of four different typical sections that vary between two, three, and four lanes based on project need and avoidance of impacts. The Recommended Alternative typical sections can be reviewed in Section 1.3 of the NRE. It should be noted that there is a reduced typical section adjacent to the Malabar Scrub Sanctuary between Corey Street and Marie Street to avoid impacts to this resource.

Preliminary coordination occurred with US Fish and Wildlife Service (USFWS) regarding the federally-listed species having the potential to occur in the project area. As a result of that coordination, research, and the field assessments conducted in November 2013, June 2014, and March 2015, the FDOT anticipates the following determinations of effect: *May Affect, Not Likely to Adversely Affect* for Audubon's crested caracara, Florida scrub-jay, wood stork, Eastern indigo snake; and *No Effect* for the red-cockaded woodpecker. It should be noted that no Audubon's crested caracara was observed within the project area during the PD&E Study. Also, no active bald eagle nests exist within one mile of the project study area.

Ms. Zakia Williams, USFWS
April 18, 2018
Page 2

We understand that USFWS cannot provide concurrence or non-concurrence with these determinations of effect at this time. However, the FDOT is committing to the following actions which will occur in consultation with USFWS during the design/permitting phase:

- During the design and permitting phase of the project, Florida scrub jay and Audubon's crested caracara surveys will be conducted in accordance with applicable federal regulatory agency protocols if required. If federally listed species are confirmed within the project limits, USFWS consultation will be initiated.
- During the design and permitting phase of the project, a formal gopher tortoise survey will be conducted to determine whether USFWS consultation is required for the eastern indigo snake, i.e. if more than 25 active and inactive burrows are proposed to be impacted. If it is determined that less than 25 gopher tortoise burrows will be impacted, FDOT agrees to follow the *USFWS Standard Protection Measures for the Eastern Indigo Snake* during construction of the project. Technical specifications regarding this commitment will be written into the contractor's bid documents.
- FDOT will ensure that the *Contractor Requirements for Unexpected Interaction with Certain Protected Species During Work Activities* is followed during construction.


These commitments are identified and detailed in the NRE, as well as the SEIR that is anticipated to be finalized in May 2018.

Because the design phase is currently not scheduled to occur until at least 2022, it is anticipated that USFWS consultation (through the Corps permitting process) would not occur until at least 2024. However, at this time, we would appreciate it if you could provide a coordination letter in this regard, to be included in the SEIR Appendix, with its provisions documented in the SEIR for commitment compliance during the design phase.

Please do not hesitate to contact me at 386-943-5411 or Catherine Owen at 386-943-5383 if you need additional information.

Sincerely,



 William G. Walsh
Environmental Manager
FDOT, District Five

Brevard EELS Malabar Scrub Sanctuary.txt

caution before
acting on the content of an email and before opening attachments or following links
contained
within the email.

Under Florida Law, email addresses are Public Records. If you do not want your
e-mail
address released in response to public record requests, do not send electronic mail
to this
entity. Instead, contact this office by phone or in writing.

The IS team in Atkins has scanned this email and any attachments for viruses and
other threats;
however no technology can be guaranteed to detect all threats. Always exercise
caution before
acting on the content of an email and before opening attachments or following links
contained
within the email.

Appendix D

UMAM Analysis

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

Site/Project Name SR 514 (Malabar Road) PD&E	Application Number	Assessment Area Name or Number Stream 2
Impact or Mitigation Impact	Assessment conducted by: CS,CL	Assessment date: 11/5/2013

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

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

<p>.500(6)(a) Location and Landscape Support</p> <p>v/o pres or current with</p> <table border="1"> <tr> <td>4</td> <td>0</td> </tr> </table>	4	0	<p>This stream is located on the south side of Malabar Road (Rd), west of the intersection with Weber Rd. It is located in an active cattle pasture and is hydrologically to Wetland (WL) 7 on the north side of Malabar Rd by culverts under the road. This stream feature continues south outside of the assessment area. Habitats outside of the assessment area are available, however it provides minimal support for most wildlife. Wildlife access is partially limited by Malabar Rd to the north and low density development that surrounds the cattle pasture.</p>
4	0		
<p>.500(6)(b)Water Environment (n/a for uplands)</p> <p>v/o pres or current with</p> <table border="1"> <tr> <td>4</td> <td>0</td> </tr> </table>	4	0	<p>Within the assessment area the hydrology and water quality supports the functions and provides benefits to fish and wildlife at a marginal capacity. This feature appears to be an intermittent stream for no standing water was observed within this stream. The soils were saturated with a high organic content. Vegetation zonation appeared appropriate within this system. The bed of this stream is highly disturbed by cattle utilization.</p>
4	0		
<p>.500(6)(c)Community structure</p> <p>1. Vegetation and/or 2. Benthic Community</p> <p>v/o pres or current with</p> <table border="1"> <tr> <td>5</td> <td>0</td> </tr> </table>	5	0	<p>The vegetation cover in this feature consists of both beneficial wetland vegetation and nuisance and exotic plant species. The southern half of this feature within the assessment area consists of a forested stream bank and as it approaches the road becomes herbaceous dominant. The vegetation in the assessment area does incur cattle impacts. Some of the beneficial plant species consist of smartweed (<i>Polygonum hydropiperoides</i>), dayflower (<i>Commelina diffusa</i>), soft-rush (<i>Juncus effusus</i>), pennywort (<i>Hydrocotyle umbellata</i>), and carpet-grass (<i>Axonopus furcatus</i>). Approximately 25% of the vegetation consisted of nuisance and exotic plant species such as Brazilian pepper (<i>Schinus terebinthifolius</i>) and torpedo-grass (<i>Panicum repens</i>).</p>
5	0		

Score = sum of above scores/30 (if uplands, divide by 20)
current or w/o pres with
0.43 0

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

For impact assessment areas
FL = delta x acres =

Delta = [with-current]
0.43

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

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

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

Site/Project Name SR 514 (Malabar Road) PD&E	Application Number	Assessment Area Name or Number Stream 2 -Secondary
Impact or Mitigation Impact	Assessment conducted by: CS,CL	Assessment date: 11/5/2013

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

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

.500(6)(a) Location and Landscape Support	This stream is located on the south side of Malabar Road (Rd), west of the intersection with Weber Rd. It is located in an active cattle pasture and is hydrologically to Wetland (WL) 7 on the north side of Malabar Rd by culverts under the road. This stream feature continues south outside of the assessment area. Habitats outside of the assessment area are available, however it provides minimal support for most wildlife. Wildlife access is partially limited by Malabar Rd to the north and low density development that surrounds the cattle pasture.
v/o pres or current	
4	
with	
4	

.500(6)(b)Water Environment (n/a for uplands)	Within the assessment area the hydrology and water quality supports the functions and provides benefits to fish and wildlife at a marginal capacity. This feature appears to be an intermittent stream for no standing water was observed within this stream. The soils were saturated with a high organic content. Vegetation zonation appeared appropriate within this system. The bed of this stream is highly disturbed by cattle utilization.
v/o pres or current	
5	
with	
4	

.500(6)(c)Community structure	The vegetation cover in this feature consists of both beneficial wetland vegetation and nuisance and exotic plant species. The southern half of this feature within the assessment area consists of a forested stream bank and as it approaches the road becomes herbaceous dominant. The vegetation in the assessment area does incur cattle impacts. Some of the beneficial plant species consist of smartweed (<i>Polygonum hydropiperoides</i>), dayflower (<i>Commelina diffusa</i>), soft-rush (<i>Juncus effusus</i>), pennywort (<i>Hydrocotyle umbellata</i>), and carpet-grass (<i>Axonopus furcatus</i>). Approximately 25% of the vegetation consisted of nuisance and exotic plant species such as Brazilian pepper (<i>Schinus terebinthifolius</i>) and torpedo-grass (<i>Panicum repens</i>).
1. Vegetation and/or	
2. Benthic Community	
v/o pres or current	
6	
with	
6	

Score = sum of above scores/30 (if uplands, divide by 20)
current or w/o pres
0.5
with
0.47

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

For impact assessment areas
FL = delta x acres =

Delta = [with-current]
0.03

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

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

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

Site/Project Name SR 514 (Malabar Road) PD&E	Application Number	Assessment Area Name or Number Wetland 6
Impact or Mitigation Impact	Assessment conducted by: CS,CL	Assessment date: 11/5/2013

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

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

<p>.500(6)(a) Location and Landscape Support</p> <p>v/o pres or current with</p> <table border="1"> <tr> <td>3</td> <td>0</td> </tr> </table>	3	0	<p>This wetland is located on the south side of Malabar Road (Rd), east of the intersection with Weber Rd. The north edge ties into Other Surface Water 6 (OSW 6) that runs in an east/west direction paralleling Malabar Rd. This wetland feature continues south outside of the assessment area. Habitats outside of the assessment area are available, however it provides minimal support for most wildlife. The majority of the plant community consists of invasive exotics that has adversely affect the functions provided in the assessment area. Wildlife access is partially limited by Malabar Rd to the north and low density development that surround the area.</p>
3	0		
<p>.500(6)(b)Water Environment (n/a for uplands)</p> <p>v/o pres or current with</p> <table border="1"> <tr> <td>3</td> <td>0</td> </tr> </table>	3	0	<p>Within the assessment area the hydrology and water quality supports the functions and provides benefits to fish and wildlife at a marginal capacity. This feature appears to have impounded some water during the wet season for a low area in the center of the wetland has a an area of dead fish that were trapped when the feature dried up. The soils were moist to saturated with a high organic content. Vegetation zonation appeared did not appear appropriate within this system for the system as a whole is dominated by facultative species. Relic drainage ditches were present within the wetland from past agriculture utilization, which appear to have an adverse effect on the hydrology</p>
3	0		
<p>.500(6)(c)Community structure</p> <p>1. Vegetation and/or 2. Benthic Community</p> <p>v/o pres or current with</p> <table border="1"> <tr> <td>2</td> <td>0</td> </tr> </table>	2	0	<p>The vegetation cover in this feature is dominated by nuisance and exotic plant species. Approximately 90% of the vegetation consisted of nuisance and exotic plant species such as Brazilian pepper (<i>Schinus terebinthifolius</i>). Some of the beneficial plant species consist of cabbage palm (<i>Sabal palmetto</i>), wax-myrtle (<i>Myrica cerifera</i>), swamp fern (<i>Blechnum serrulatum</i>), and leather fern (<i>Acrostichum danaeifolium</i>). Past land management practices have resulted in partial removal or alteration of natural structures with the introduction of ditches.</p>
2	0		

Score = sum of above scores/30 (if uplands, divide by 20)
current or w/o pres with
0.27 0

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

For impact assessment areas
FL = delta x acres =

Delta = [with-current]
0.27

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

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

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

Site/Project Name SR 514 (Malabar Road) PD&E	Application Number	Assessment Area Name or Number Wetland 6 -Secondary
Impact or Mitigation Impact	Assessment conducted by: CS,CL	Assessment date: 11/5/2013

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

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

<p>.500(6)(a) Location and Landscape Support</p> <p>v/o pres or current</p> <table border="1"> <tr> <td>4</td> <td>with</td> <td>3</td> </tr> </table>	4	with	3	<p>This wetland is located on the south side of Malabar Road (Rd), east of the intersection with Weber Rd. The north edge ties into Other Surface Water 6 (OSW 6) that runs in an east/west direction paralleling Malabar Rd. This wetland feature continues south outside of the assessment area. Habitats outside of the assessment area are available, however it provides minimal support for most wildlife. The majority of the plant community consists of invasive exotics that has adversely affect the functions provided in the assessment area. Wildlife access is partially limited by Malabar Rd to the north and low density development that surround the area.</p>
4	with	3		
<p>.500(6)(b)Water Environment (n/a for uplands)</p> <p>v/o pres or current</p> <table border="1"> <tr> <td>4</td> <td>with</td> <td>3</td> </tr> </table>	4	with	3	<p>Within the assessment area the hydrology and water quality supports the functions and provides benefits to fish and wildlife at a marginal capacity. This feature appears to have impounded some water during the wet season for a low area in the center of the wetland has a an area of dead fish that were trapped when the feature dried up. The soils were moist to saturated with a high organic content. Vegetation zonation appeared did not appear appropriate within this system for the system as a whole is dominated by facultative species. Relic drainage ditches were present within the wetland from past agriculture utilization, which appear to have an adverse effect on the hydrology</p>
4	with	3		
<p>.500(6)(c)Community structure</p> <p>1. Vegetation and/or 2. Benthic Community</p> <p>v/o pres or current</p> <table border="1"> <tr> <td>2</td> <td>with</td> <td>2</td> </tr> </table>	2	with	2	<p>The vegetation cover in this feature is dominated by nuisance and exotic plant species. Approximately 90% of the vegetation consisted of nuisance and exotic plant species such as Brazilian pepper (<i>Schinus terebinthifolius</i>). Some of the beneficial plant species consist of cabbage palm (<i>Sabal palmetto</i>), wax-myrtle (<i>Myrica cerifera</i>), swamp fern (<i>Blechnum serrulatum</i>), and leather fern (<i>Acrostichum danaeifolium</i>). Past land management practices have resulted in partial removal or alteration of natural structures with the introduction of ditches.</p>
2	with	2		

Score = sum of above scores/30 (if uplands, divide by 20)	
current or w/o pres	with
0.33	0.27

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

For impact assessment areas
FL = delta x acres =

Delta = [with-current]
0.06

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

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

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

Site/Project Name SR 514 (Malabar Road) PD&E	Application Number	Assessment Area Name or Number Wetland 8 - Brazilian pepper
Impact or Mitigation Impact	Assessment conducted by: CS,CL	Assessment date: 11/5/2013

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

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

<p>.500(6)(a) Location and Landscape Support</p> <p>v/o pres or current with</p> <table border="1"> <tr> <td>3</td> <td>0</td> </tr> </table>	3	0	<p>This wetland is located on the south side of Malabar Road (Rd), east of the intersection with Weber Rd. The north edge ties into Other Surface Water 7 (OSW 7) that runs in an east/west direction paralleling Malabar Rd. This wetland feature continues south outside of the assessment area. This wetland has been broken into two habitats; Brazilian pepper (<i>Schinus terebinthifolius</i>) wetland and mixed forested wetland. A creek in the middle of the wetland is the dividing line for the two habitats. This creek and wetland is hydrologically connected to Wetland 81 (WL 81) on the north side of Malabar Rd by a culvert under the road. Habitats outside of the assessment area are available, and provides sufficient support for wildlife. The majority of the plant community consists of invasive exotics that has adversely affect the functions provided in the assessment area. Wildlife access is partially limited by Malabar Rd to the north.</p>
3	0		
<p>.500(6)(b)Water Environment (n/a for uplands)</p> <p>v/o pres or current with</p> <table border="1"> <tr> <td>5</td> <td>0</td> </tr> </table>	5	0	<p>Within the wetland the hydrology and water quality supports the functions and provides benefits to fish and wildlife at a marginal capacity. The stream feature on the east edge of this habitat does provide adequate benefits to fish and other wildlife. Throughout the wetland soils were moist to saturated with a high organic content. Vegetation zonation did not appear appropriate within this system, for this part of the wetland is dominated by facultative species. Relic drainage ditches were present within the wetland from past land management practices, appear to have an adverse effect on the hydrology.</p>
5	0		
<p>.500(6)(c)Community structure</p> <p>1. Vegetation and/or 2. Benthic Community</p> <p>v/o pres or current with</p> <table border="1"> <tr> <td>2</td> <td>0</td> </tr> </table>	2	0	<p>The vegetation cover in this feature is dominated by nuisance and exotic plant species. Approximately 90% of the vegetation consisted of nuisance and exotic plant species such as Brazilian pepper. Some of the beneficial plant species consist of cabbage palm (<i>Sabal palmetto</i>), wax-myrtle (<i>Myrica cerifera</i>), swamp fern (<i>Blechnum serrulatum</i>), and leather fern (<i>Acrostichum danaeifolium</i>). Past land management practices have resulted in partial removal or alteration of natural structures with the introduction of ditches.</p>
2	0		

Score = sum of above scores/30 (if uplands, divide by 20)
current or v/o pres with
0.33 0

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

For impact assessment areas
FL = delta x acres =

Delta = [with-current]
0.33

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

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

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

Site/Project Name SR 514 (Malabar Road) PD&E	Application Number	Assessment Area Name or Number Wetland 8 - Secondary - Brazilian pepper
Impact or Mitigation Impact	Assessment conducted by: CS,CL	Assessment date: 11/5/2013

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

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

.500(6)(a) Location and Landscape Support	This wetland is located on the south side of Malabar Road (Rd), east of the intersection with Weber Rd. The north edge ties into Other Surface Water 7 (OSW 7) that runs in an east/west direction paralleling Malabar Rd. This wetland feature continues south outside of the assessment area. This wetland has been broken into two habitats; Brazilian pepper (<i>Schinus terebinthifolius</i>) wetland and mixed forested wetland. A creek in the middle of the wetland is the dividing line for the two habitats. This creek and wetland is hydrologically connected to Wetland 81 (WL 81) on the north side of Malabar Rd by a culvert under the road. Habitats outside of the assessment area are available, and provides sufficient support for wildlife. The majority of the plant community consists of invasive exotics that has adversely affect the functions provided in the assessment area. Wildlife access is partially limited by Malabar Rd to the north.			
		<table border="1"> <tr> <td>v/o pres or current</td> <td>with</td> </tr> <tr> <td>4</td> <td>3</td> </tr> </table>	v/o pres or current	with
v/o pres or current	with			
4	3			
.500(6)(b)Water Environment (n/a for uplands)	Within the wetland the hydrology and water quality supports the functions and provides benefits to fish and wildlife at a marginal capacity. The stream feature on the east edge of this habitat does provide adequate benefits to fish and other wildlife. Throughout the wetland soils were moist to saturated with a high organic content. Vegetation zonation did not appear appropriate within this system, for this part of the wetland is dominated by facultative species. Relic drainage ditches were present within the wetland from past land management practices, appear to have an adverse effect on the hydrology.			
		<table border="1"> <tr> <td>v/o pres or current</td> <td>with</td> </tr> <tr> <td>6</td> <td>5</td> </tr> </table>	v/o pres or current	with
v/o pres or current	with			
6	5			
.500(6)(c)Community structure 1. Vegetation and/or 2. Benthic Community	The vegetation cover in this feature is dominated by nuisance and exotic plant species. Approximately 90% of the vegetation consisted of nuisance and exotic plant species such as Brazilian pepper. Some of the beneficial plant species consist of cabbage palm (<i>Sabal palmetto</i>), wax-myrtle (<i>Myrica cerifera</i>), swamp fern (<i>Blechnum serrulatum</i>), and leather fern (<i>Acrostichum danaeifolium</i>). Past land management practices have resulted in partial removal or alteration of natural structures with the introduction of ditches.			
		<table border="1"> <tr> <td>v/o pres or current</td> <td>with</td> </tr> <tr> <td>3</td> <td>2</td> </tr> </table>	v/o pres or current	with
v/o pres or current	with			
3	2			

Score = sum of above scores/30 (if uplands, divide by 20)	
current	with
0.43	0.33

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

For impact assessment areas
FL = delta x acres =

Delta = [with-current]
0.10

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

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

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

Site/Project Name SR 514 (Malabar Road) PD&E	Application Number	Assessment Area Name or Number Wetland 8 - Mixed Forested
Impact or Mitigation Impact	Assessment conducted by: CS,CL	Assessment date: 11/5/2013

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

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

<p>.500(6)(a) Location and Landscape Support</p> <p>v/o pres or current with</p> <table border="1"> <tr> <td>5</td> <td>0</td> </tr> </table>	5	0	<p>This wetland is located on the south side of Malabar Road (Rd), east of the intersection with Weber Rd. The north edge ties into Other Surface Water 9 (OSW 9) that runs in an east/west direction paralleling Malabar Rd. This wetland feature continues south outside of the assessment area. This wetland has been broken into two habitats; Brazilian pepper wetland and mixed forested wetland. A creek in the middle of the wetland is the dividing line for the two habitats. This creek and wetland is hydrologically connected to Wetland 81 (WL 81) on the north side of Malabar Rd by a culvert under the road. Habitats outside of the assessment area are available and provide moderate support for most wildlife. Wildlife access is partially limited by Malabar Rd to the north.</p>
5	0		
<p>.500(6)(b)Water Environment (n/a for uplands)</p> <p>v/o pres or current with</p> <table border="1"> <tr> <td>6</td> <td>0</td> </tr> </table>	6	0	<p>Within the wetland the hydrology and water quality supports the functions and provides benefits to fish and wildlife at a marginal capacity. The stream feature on the west edge of this habitat does provide adequate benefits to fish and other wildlife. Throughout the wetland soils were moist to saturated with a high organic content. Vegetation zonation appeared appropriate within this system. Evidence of subsidence was minimal within this mixed forested system.</p>
6	0		
<p>.500(6)(c)Community structure</p> <p>1. Vegetation and/or 2. Benthic Community</p> <p>v/o pres or current with</p> <table border="1"> <tr> <td>6</td> <td>0</td> </tr> </table>	6	0	<p>The majority of the vegetation cover is by appropriate and desirable plant species. Invasive and undesirable plant species make up approximately 15% of the total plant composition and is limited to the periphery of the wetland. Some of the beneficial plant species consist of sweet bay (<i>Magnolia virginiana</i>), cabbage palm (<i>Sabal palmetto</i>), dahoon holly (<i>Ilex cassine</i>), red-maple (<i>Acer rubrum</i>), wax-myrtle (<i>Myrica cerifera</i>), swamp fern (<i>Blechnum serrulatum</i>), chain fern (<i>Woodwardia virginica</i>), royal fern (<i>Osmunda regalis</i>), and millet beakrush (<i>Rhynchospora miliacea</i>). The nuisance and exotic plant species consisted of Brazilian pepper (<i>Schinus terebinthifolius</i>) and torpedo-grass (<i>Panicum repens</i>). .</p>
6	0		

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

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

For impact assessment areas
FL = delta x acres =

Delta = [with-current]
0.57

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

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

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

Site/Project Name SR 514 (Malabar Road) PD&E	Application Number	Assessment Area Name or Number Wetland 8 - Mixed Forested
Impact or Mitigation Impact	Assessment conducted by: CS,CL	Assessment date: 11/5/2013

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

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

.500(6)(a) Location and Landscape Support	This wetland is located on the south side of Malabar Road (Rd), east of the intersection with Weber Rd. This wetland feature continues south outside of the assessment area. This wetland has been broken into two habitats; Brazilian pepper wetland and mixed forested wetland. A creek in the middle of the wetland is the dividing line for the two habitats. This creek and wetland is hydrologically connected to Wetland 81 (WL 81) on the north side of Malabar Rd by a culvert under the road. Habitats outside of the assessment area are available and provide moderate support for most wildlife. Wildlife access is partially limited by Malabar Rd to the north.
v/o pres or current	
6	
with	5

.500(6)(b)Water Environment (n/a for uplands)	Within the wetland the hydrology and water quality supports the functions and provides benefits to fish and wildlife at a marginal capacity. The stream feature on the west edge of this habitat does provide adequate benefits to fish and other wildlife. Throughout the wetland soils were moist to saturated with a high organic content. Vegetation zonation appeared appropriate within this system. Evidence of subsidence was minimal within this mixed forested system.
v/o pres or current	
7	
with	6

.500(6)(c)Community structure	The majority of the vegetation cover is by appropriate and desirable plant species. Invasive an exotic plant species werelimited to the periphery. Some of the beneficial plant species consist of sweet bay (<i>Magnolia virginiana</i>), cabbage palm (<i>Sabal palmetto</i>), dahoon holly (<i>Ilex cassine</i>), red-maple (<i>Acer rubrum</i>), wax-myrtle (<i>Myrica cerifera</i>), swamp fern (<i>Blechnum serrulatum</i>), chain fern (<i>Woodwardia virginica</i>), royal fern (<i>Osmunda regalis</i>), and millet beakrush (<i>Rhynchospora millicaea</i>). The nuisance and exotic plant species consisted of Brazilian pepper (<i>Schinus terebinthifolius</i>).
1. Vegetation and/or	
2. Benthic Community	
v/o pres or current	7
with	6

Score = sum of above scores/30 (if uplands, divide by 20)
current or w/o pres
0.67
with
0.57

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

For impact assessment areas
FL = delta x acres =

Delta = [with-current]
0.10

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

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

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

Site/Project Name SR 514 (Malabar Road) PD&E	Application Number	Assessment Area Name or Number Wetland 8 - Mixed Forested (Pond H)
Impact or Mitigation Impact	Assessment conducted by: CS,CL	Assessment date: 11/5/2013

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

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

.500(6)(a) Location and Landscape Support	This wetland is located on the south side of Malabar Road (Rd), east of the intersection with Weber Rd. The north edge ties into Other Surface Water 9 (OSW 9) that runs in an east/west direction paralleling Malabar Rd. This wetland feature continues south outside of the assessment area. This wetland has been broken into two habitats; Brazilian pepper wetland and mixed forested wetland. A creek in the middle of the wetland is the dividing line for the two habitats. This creek and wetland is hydrologically connected to Wetland 81 (WL 81) on the north side of Malabar Rd by a culvert under the road. Habitats outside of the assessment area are available and provide moderate support for most wildlife. Wildlife access is partially limited by Malabar Rd to the north.			
		<table border="1"> <tr> <td>w/o pres or current</td> <td>with</td> </tr> <tr> <td align="center">6</td> <td align="center">0</td> </tr> </table>	w/o pres or current	with
w/o pres or current	with			
6	0			

.500(6)(b)Water Environment (n/a for uplands)	Within the wetland the hydrology and water quality supports the functions and provides benefits to fish and wildlife at a marginal capacity. The stream feature on the west edge of this habitat does provide adequate benefits to fish and other wildlife. Throughout the wetland soils were moist to saturated with a high organic content. Vegetation zonation appeared appropriate within this system. Evidence of subsidence was minimal within this mixed forested system.			
		<table border="1"> <tr> <td>w/o pres or current</td> <td>with</td> </tr> <tr> <td align="center">7</td> <td align="center">0</td> </tr> </table>	w/o pres or current	with
w/o pres or current	with			
7	0			

.500(6)(c)Community structure 1. Vegetation and/or 2. Benthic Community	The majority of the vegetation cover is by appropriate and desirable plant species. Invasive and undesirable plant species make up approximately 15% of the total plant composition and is limited to the periphery of the wetland. Some of the beneficial plant species consist of sweet bay (<i>Magnolia virginiana</i>), cabbage palm (<i>Sabal palmetto</i>), dahoon holly (<i>Ilex cassine</i>), red-maple (<i>Acer rubrum</i>), wax-myrtle (<i>Myrica cerifera</i>), swamp fern (<i>Blechnum serrulatum</i>), chain fern (<i>Woodwardia virginica</i>), royal fern (<i>Osmunda regalis</i>), and millet beakrush (<i>Rhynchospora miliacea</i>). The nuisance and exotic plant species consisted of Brazilian pepper (<i>Schinus terebinthifolius</i>) and limited to the periphery.			
		<table border="1"> <tr> <td>w/o pres or current</td> <td>with</td> </tr> <tr> <td align="center">6</td> <td align="center">0</td> </tr> </table>	w/o pres or current	with
w/o pres or current	with			
6	0			

Score = sum of above scores/30 (if uplands, divide by 20)	
current or w/o pres	with
0.63	0

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

For impact assessment areas
FL = delta x acres =

Delta = [with-current]
0.63

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

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

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

Site/Project Name SR 514 (Malabar Road) PD&E	Application Number	Assessment Area Name or Number Wetland 8 - Secondary- Mixed Forested (Pond H)
Impact or Mitigation Impact	Assessment conducted by: CS,CL	Assessment date: 11/5/2013

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

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

<p>.500(6)(a) Location and Landscape Support</p> <p>v/o pres or current with</p> <table border="1"> <tr> <td>7</td> <td>6</td> </tr> </table>	7	6	<p>This wetland is located on the south side of Malabar Road (Rd), east of the intersection with Weber Rd. This wetland feature continues south outside of the assessment area. This wetland has been broken into two habitats; Brazilian pepper wetland and mixed forested wetland. A creek in the middle of the wetland is the dividing line for the two habitats. This creek and wetland is hydrologically connected to Wetland 81 (WL 81) on the north side of Malabar Rd by a culvert under the road. Habitats outside of the assessment area are available and provide moderate support for most wildlife. Wildlife access is partially limited by Malabar Rd to the north.</p>
7	6		
<p>.500(6)(b)Water Environment (n/a for uplands)</p> <p>v/o pres or current with</p> <table border="1"> <tr> <td>7</td> <td>5</td> </tr> </table>	7	5	<p>Within the wetland the hydrology and water quality supports the functions and provides benefits to fish and wildlife at a marginal capacity. The stream feature on the west edge of this habitat does provide adequate benefits to fish and other wildlife. Throughout the wetland soils were moist to saturated with a high organic content. Vegetation zonation appeared appropriate within this system. Evidence of subsidence was minimal within this mixed forested system. The construction of the pstormwater pond is anticipated to have an advesr effect on the hydrology.</p>
7	5		
<p>.500(6)(c)Community structure</p> <p>1. Vegetation and/or 2. Benthic Community</p> <p>v/o pres or current with</p> <table border="1"> <tr> <td>7</td> <td>6</td> </tr> </table>	7	6	<p>The majority of the vegetation cover is by appropriate and desirable plant species. Invasive an exotic plant species werelimited to the periphery. Some of the beneficial plant species consist of sweet bay (<i>Magnolia virginiana</i>), cabbage palm (<i>Sabal palmetto</i>), dahoon holly (<i>Ilex cassine</i>), red-maple (<i>Acer rubrum</i>), wax-myrtle (<i>Myrica cerifera</i>), swamp fern (<i>Blechnum serrulatum</i>), chain fern (<i>Woodwardia virginica</i>), royal fern (<i>Osmunda regalis</i>), and millet beakrush (<i>Rhynchospora miliacea</i>). The nuisance and exotic plant species consisted of Brazilian pepper (<i>Schinus terebinthifolius</i>).</p>
7	6		

Score = sum of above scores/30 (if uplands, divide by 20)	
current	with
0.7	0.57

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

For impact assessment areas
FL = delta x acres =

Delta = [with-current]
0.13

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

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

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

Site/Project Name SR 514 (Malabar Road) PD&E	Application Number	Assessment Area Name or Number Wetland 12
Impact or Mitigation Impact	Assessment conducted by: CS,CL	Assessment date: 11/5/2013

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

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

<p>.500(6)(a) Location and Landscape Support</p> <p>v/o pres or current with</p> <table border="1"> <tr> <td>5</td> <td>0</td> </tr> </table>	5	0	<p>This small wetland (>0.5 acres) is located on the south side of Malabar Road (Rd), west of the intersection with Eva Lane (Ln). The north edge ties into Other Surface Water (OSW) 10 and the east edge ties into and is hydrologically connected to OSW 11. Habitats outside of the assessment area are available and provide moderate support for most wildlife. Wildlife access is partially limited by Malabar Rd to the north, Eva Ln to the east and urban build-up to the south. There is a natural upland area to the west that does provide good support and access for wildlife in that direction.</p>
5	0		
<p>.500(6)(b)Water Environment (n/a for uplands)</p> <p>v/o pres or current with</p> <table border="1"> <tr> <td>6</td> <td>0</td> </tr> </table>	6	0	<p>Within the wetland the hydrology and water quality supports the functions and provides benefits to fish and wildlife at a marginal capacity. The cut ditch feature on the east and north edge of this habitat appears to have an effect on the hydrology of this wetland. Throughout the wetland soils were moist to saturated with a high organic content. Vegetation zonation appeared appropriate within this system. Evidence of subsidence was minimal within this wetland.</p>
6	0		
<p>.500(6)(c)Community structure</p> <p>1. Vegetation and/or 2. Benthic Community</p> <p>v/o pres or current with</p> <table border="1"> <tr> <td>7</td> <td>0</td> </tr> </table>	7	0	<p>The majority of the vegetation cover is by appropriate and desirable plant species. Some of the beneficial plant species consist of Carolina willow (<i>Salix caroliniana</i>), dahoon holly (<i>Ilex cassine</i>), red-maple (<i>Acer rubrum</i>), wax-myrtle (<i>Myrica cerifera</i>), swamp fern (<i>Blechnum serrulatum</i>), cinnamon fern (<i>Osmunda cinnamomea</i>), royal fern (<i>Osmunda regalis</i>), and muscadine grape (<i>Vitis rotundifolia</i>). The nuisance and exotic plant species was minimal and limited to the north edge along the interface with OSW 10. These species consisted of torpedo-grass (<i>Panicum repens</i>) and Peruvian primrose willow (<i>Ludwigia peruviana</i>).</p>
7	0		

Score = sum of above scores/30 (if uplands, divide by 20)
current or w/o pres with
0.6 0

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

For impact assessment areas
FL = delta x acres =

Delta = [with-current]
0.6

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

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

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

Site/Project Name SR 514 (Malabar Road) PD&E	Application Number	Assessment Area Name or Number Wetland 15
Impact or Mitigation Impact	Assessment conducted by: CS,CL	Assessment date: 11/5/2013

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

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

<p>.500(6)(a) Location and Landscape Support</p> <p>v/o pres or current with</p> <table border="1"> <tr> <td>3</td> <td>0</td> </tr> </table>	3	0	<p>This herbaceous wetland is located on the south side of Malabar Road (Rd), east of the intersection with Eva Lane (Ln). The northwest corner ties into Other Surface Water 14 (OSW 14) that runs in an east to west direction and parallels Malabar Rd. This wetland appears to have been excavated by landowner and now maintains hydric vegetation and soils. Habitats outside of the assessment area are limited and provide marginal support for some wildlife. Wildlife access is partially limited by Malabar Rd to the north and low density residential to the west and south. Some of the vegetation in the proximity of the wetland does consist of nuisance and exotic plant species.</p>
3	0		
<p>.500(6)(b)Water Environment (n/a for uplands)</p> <p>v/o pres or current with</p> <table border="1"> <tr> <td>4</td> <td>0</td> </tr> </table>	4	0	<p>Within the wetland the hydrology and water quality provides no benefits to fish and very minimal support for wildlife. A natural hydrologic regime is absent within this system for this wetland has been excavated by landowner. Throughout the wetland soils were moist to saturated with a high organic content. Vegetation zonation appeared appropriate within this system.</p>
4	0		
<p>.500(6)(c)Community structure</p> <p>1. Vegetation and/or 2. Benthic Community</p> <p>v/o pres or current with</p> <table border="1"> <tr> <td>2</td> <td>0</td> </tr> </table>	2	0	<p>The vegetation cover is dominated (approximately 90%) by nuisance and exotic plant species. These species consisted of torpedo-grass (<i>Panicum repens</i>), Peruvian primrose willow (<i>Ludwigia peruviana</i>), and Brazilian pepper (<i>Schinus terebinthifolius</i>). Very little desirable plant species were present within the assessment area. These species consisted of beakrush (<i>Rhynchospora spp.</i>), softrush (<i>Juncus effusus</i>), wax-myrtle (<i>Myrica cerifera</i>), pennywort (<i>Hydrocotyle umbellata</i>), yellow-eyed grass (<i>Xyris caroliniana</i>), broomsedge (<i>Andropogon spp.</i>), and red-root (<i>Lachnanthes caroliniana</i>). Past land management practices have had an adverse effect on the vegetation within this system.</p>
2	0		

Score = sum of above scores/30 (if uplands, divide by 20)
current or w/o pres with
0.3 0

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

For impact assessment areas
FL = delta x acres =

Delta = [with-current]
0.3

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

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

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

Site/Project Name SR 514 (Malabar Road) PD&E	Application Number	Assessment Area Name or Number Wetland 39
Impact or Mitigation Impact	Assessment conducted by: CS,CL	Assessment date: 11/6/2013

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

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

.500(6)(a) Location and Landscape Support	This shrubby wetland is located east of the intersection of Malabar Road (Rd) and Glatter Rd. This wetland is hydrologically connected to Wetland 76 by culverts under Malabar Rd. In addition, this feature is hydrologically connected to a OSW 40 that runs parallel to Malabar Rd in the southern ROW of the road . This feature is bordered to the north, south, and west by roadways, to the east the wetland is bordered by a pasture. Habitats outside of the assessment area are available, however it provides marginal support for wildlife. Wildlife access is limited by Malabar Rd to the north and west, and Glatter Road to the south. There is a moderate amount of nuisance and invasive plant species in the proximity of this wetland			
		<table border="1"> <tr> <td>v/o pres or current</td> <td>with</td> </tr> <tr> <td align="center">3</td> <td align="center">0</td> </tr> </table>	v/o pres or current	with
v/o pres or current	with			
3	0			

.500(6)(b)Water Environment (n/a for uplands)	Within the assessment area the hydrology and water quality provide little benefits to fish and wildlife. Historically, the wetland area was part of a much larger system that continued to the north and south. However, with the construction of Malabar Rd and Glatter Rd the wetland was fragmented and the size has been reduced The construction of these roads appears to have had an adverse effect on the hydrology in the assessed wetland area. Water level indicators are not distinct and are not consistent with the expected hydrologic conditions for the type of system being evaluated. The soils were moist and had high organic content.			
		<table border="1"> <tr> <td>v/o pres or current</td> <td>with</td> </tr> <tr> <td align="center">5</td> <td align="center">0</td> </tr> </table>	v/o pres or current	with
v/o pres or current	with			
5	0			

.500(6)(c)Community structure	The vegetation cover within this feature has a number of nuisance and exotic plant species present. However, the majority of the plant species are appropriate and desirable plant species. Some of the beneficial plant species consisted of Carolina willow (<i>Salix caroliniana</i>), cabbage palm (<i>Sabal palmetto</i>), button-bush (<i>Cephalanthus occidentalis</i>), swamp fern (<i>Blechnum serrulatum</i>), pennywort (<i>Hydrocotyle umbellata</i>), shield fern (<i>Thelypteris sp.</i>), royal fern (<i>Osmunda regalis</i>), and muscadine grape (<i>Vitis rotundifolia</i>). The nuisance an undesirable plant species that consisted of Brazilian pepper (<i>Schinus terebinthifolius</i>), Chinese tallow (<i>Sapium sebiferum</i>), torpedo-grass (<i>Panicum repens</i>) and Peruvian primrose willow (<i>Ludwigia peruviana</i>).			
		<table border="1"> <tr> <td>v/o pres or current</td> <td>with</td> </tr> <tr> <td align="center">5</td> <td align="center">0</td> </tr> </table>	v/o pres or current	with
v/o pres or current	with			
5	0			

Score = sum of above scores/30 (if uplands, divide by 20)	
current or v/o pres	with
0.43	0

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

For impact assessment areas
FL = delta x acres =

Delta = [with-current]
0.43

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

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

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

Site/Project Name SR 514 (Malabar Road) PD&E	Application Number	Assessment Area Name or Number Wetland 39 -Secondary
Impact or Mitigation Impact	Assessment conducted by: CS,CL	Assessment date: 11/6/2013

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

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

.500(6)(a) Location and Landscape Support	This shrubby wetland is located east of the intersection of Malabar Road (Rd) and Glatter Rd. This wetland is hydrologically connected to Wetland 76 by culverts under Malabar Rd. In addition, this feature is hydrologically connected to a OSW 40 that runs parallel to Malabar Rd in the southern ROW of the road . This feature is bordered to the north, south, and west by roadways, to the east the wetland is bordered by a pasture. Habitats outside of the assessment area are available, however it provides marginal support for wildlife. Wildlife access is limited by Malabar Rd to the north and west, and Glatter Road to the south. There is a moderate amount of nuisance and invasive plant species in the proximity of this wetland			
	<table border="1"> <tr> <td>w/o pres or current</td> <td>with</td> </tr> <tr> <td>4</td> <td>3</td> </tr> </table>	w/o pres or current	with	4
w/o pres or current	with			
4	3			
.500(6)(b)Water Environment (n/a for uplands)	Within the assessment area the hydrology and water quality provide little benefits to fish and wildlife. Historically, the wetland area was part of a much larger system that continued to the north and south. However, with the construction of Malabar Rd and Glatter Rd the wetland was fragmented and the size has been reduced. The construction of these roads appears to have had an adverse effect on the hydrology in the assessed wetland area. Water level indicators are not distinct and are not consistent with the expected hydrologic conditions for the type of system being evaluated. The soils were moist and had high organic content.			
	<table border="1"> <tr> <td>w/o pres or current</td> <td>with</td> </tr> <tr> <td>5</td> <td>5</td> </tr> </table>	w/o pres or current	with	5
w/o pres or current	with			
5	5			
.500(6)(c)Community structure 1. Vegetation and/or 2. Benthic Community	The vegetation cover within this feature has a number of nuisance and exotic plant species present. However, the majority of the plant species are appropriate and desirable plant species. Some of the beneficial plant species consisted of Carolina willow (<i>Salix caroliniana</i>), cabbage palm (<i>Sabal palmetto</i>), button-bush (<i>Cephalanthus occidentalis</i>), swamp fern (<i>Blechnum serrulatum</i>), pennywort (<i>Hydrocotyle umbellata</i>), shield fern (<i>Thelypteris sp.</i>), royal fern (<i>Osmunda regalis</i>), and muscadine grape (<i>Vitis rotundifolia</i>). The nuisance an undesirable plant species that consisted of Brazilian pepper (<i>Schinus terebinthifolius</i>), Chinese tallow (<i>Sapium sebiferum</i>), torpedo-grass (<i>Panicum repens</i>) and Peruvian primrose willow (<i>Ludwigia peruviana</i>).			
	<table border="1"> <tr> <td>w/o pres or current</td> <td>with</td> </tr> <tr> <td>6</td> <td>5</td> </tr> </table>	w/o pres or current	with	6
w/o pres or current	with			
6	5			

Score = sum of above scores/30 (if uplands, divide by 20)	
current or w/o pres	with
0.50	0.43

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

For impact assessment areas
FL = delta x acres =

Delta = [with-current]
0.07

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

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

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

Site/Project Name SR 514 (Malabar Road) PD&E	Application Number	Assessment Area Name or Number Wetland 46
Impact or Mitigation Impact	Assessment conducted by: CS,CL	Assessment date: 11/6/2013

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

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

.500(6)(a) Location and Landscape Support v/o pres or current	This shrubby wetland is located west of the intersection of Malabar Road (Rd) and Marie Street (St). This wetland is hydrologically connected to Wetland 78 to the north by a culvert under Malabar Rd. In addition, this feature is hydrologically connected to a OSW 47 that runs parallel to Malabar Rd in the southern ROW of the road . This feature is bordered to the north by Malabar Rd, to the east the wetland is bordered by a forested natural area, and to the west and south, a driveway for a business exists . Habitats outside of the assessment area are available and provide some support for wildlife. Wildlife access is limited by Malabar Rd to the north and the driveway and business to the west and south. There is a moderate amount of nuisance and invasive plant species in the proximity of this wetland
4	0

.500(6)(b)Water Environment (n/a for uplands) v/o pres or current	Within the assessment area the hydrology and water quality provide little benefits to fish and wildlife. Historically, the wetland area was part of a much larger system that continued to the north. However, with the construction of Malabar Rd, the wetland was fragmented and the size has been reduced The construction of the road and the urban build-up has had an adverse effect on the hydrology in the assessed wetland area. Water level indicators are distinct, however they appear slightly lower than what is expected. The soils were moist to saturated and had high organic content.
6	0

.500(6)(c)Community structure 1. Vegetation and/or 2. Benthic Community v/o pres or current	The vegetation cover within this feature has a number of nuisance and exotic plant species present. However, the majority of the plant species are appropriate and desirable plant species. Some of the beneficial plant species consisted of Carolina willow (<i>Salix caroliniana</i>), cabbage palm (<i>Sabal palmetto</i>), button-bush (<i>Cephalanthus occidentalis</i>), swamp fern (<i>Blechnum serrulatum</i>), pennywort (<i>Hydrocotyle umbellata</i>), royal fern (<i>Osmunda regalis</i>), spike rush (<i>Eleocharis sp.</i>), and muscadine grape (<i>Vitis rotundifolia</i>). The nuisance and undesirable plant species that consisted of Brazilian pepper (<i>Schinus terebinthifolius</i>), torpedo-grass (<i>Panicum repens</i>) and Peruvian primrose willow (<i>Ludwigia peruviana</i>).
5	0

Score = sum of above scores/30 (if uplands, divide by 20)
current or w/o pres
0.5
with
0

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

For impact assessment areas FL = delta x acres =

Delta = [with-current]
0.5

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

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

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

Site/Project Name SR 514 (Malabar Road) PD&E	Application Number	Assessment Area Name or Number Wetland 46 - Secondary
Impact or Mitigation Impact	Assessment conducted by: CS,CL	Assessment date: 11/6/2013

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

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

.500(6)(a) Location and Landscape Support	This shrubby wetland is located west of the intersection of Malabar Road (Rd) and Marie Street (St). This wetland is hydrologically connected to Wetland 78 to the north by a culvert under Malabar Rd. In addition, this feature is hydrologically connected to a OSW 47 that runs parallel to Malabar Rd in the southern ROW of the road . This feature is bordered to the north by Malabar Rd, to the east the wetland is bordered by a forested natural area, and to the west and south, a driveway for a business exists . Habitats outside of the assessment area are available and provide some support for wildlife. Wildlife access is limited by Malabar Rd to the north and the driveway and business to the west and south. There is a moderate amount of nuisance and invasive plant species in the proximity of this wetland
w/o pres or current	
5	
with	4

.500(6)(b)Water Environment (n/a for uplands)	Within the assessment area the hydrology and water quality provide little benefits to fish and wildlife. Historically, the wetland area was part of a much larger system that continued to the north. However, with the construction of Malabar Rd, the wetland was fragmented and the size has been reduced The construction of the road and the urban build-up has had an adverse effect on the hydrology in the assessed wetland area. Water level indicators are distinct, however they appear slightly lower than what is expected. The soils were moist to saturated and had high organic content.
w/o pres or current	
6	
with	6

.500(6)(c)Community structure	The vegetation cover within this feature has a number of nuisance and exotic plant species present. However, the majority of the plant species are appropriate and desirable plant species. Some of the beneficial plant species consisted of Carolina willow (<i>Salix caroliniana</i>), cabbage palm (<i>Sabal palmetto</i>), button-bush (<i>Cephalanthus occidentalis</i>), swamp fern (<i>Blechnum serrulatum</i>), pennywort (<i>Hydrocotyle umbellata</i>), royal fern (<i>Osmunda regalis</i>), spike rush (<i>Eleocharis sp.</i>), and muscadine grape (<i>Vitis rotundifolia</i>). The nuisance and undesirable plant species that consisted of Brazilian pepper (<i>Schinus terebinthifolius</i>).
1. Vegetation and/or	
2. Benthic Community	
w/o pres or current	6
with	5

Score = sum of above scores/30 (if uplands, divide by 20)
current or w/o pres
0.57
with
0.5

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

For impact assessment areas
FL = delta x acres =

Delta = [with-current]
0.07

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

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

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

Site/Project Name SR 514 (Malabar Road) PD&E	Application Number	Assessment Area Name or Number Wetland 72
Impact or Mitigation Impact	Assessment conducted by: CS,CL	Assessment date: 11/6/2013

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

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

.500(6)(a) Location and Landscape Support	This shrubby wetland is located west of the intersection of Malabar Road (Rd) and West Stardust Street (St). This wetland is hydrologically connected to Wetland 2 to the south by a culvert under Malabar Rd. This feature continues northeast outside of the proposed project area. This feature is bordered to the south by Malabar Rd, to the north and east by stormwater ponds, and to the west a driveway for a medical office. Habitats outside of the assessment area are limited and provide minimal support for wildlife. Wildlife access is limited by Malabar Rd to the south, the ponds to the north and east, and the driveway to the west. There is a moderate amount of nuisance and invasive plant species in the proximity of this wetland				
<table border="1"> <tr> <td>v/o pres or current</td> <td>with</td> </tr> <tr> <td>3</td> <td>0</td> </tr> </table>	v/o pres or current	with	3	0	
v/o pres or current	with				
3	0				

.500(6)(b)Water Environment (n/a for uplands)	Within the assessment area the hydrology and water quality provide little benefits to fish and wildlife. Historically, the wetland area was part of a much larger system that continued to the north and south. However, with the construction of Malabar Rd, the wetland was fragmented and the size has been reduced. The construction of the road and the stormwater ponds may have an adverse effect on the hydrology in the assessed wetland area. Water level indicators are distinct, and the feature was impounding water at the time of this assessment. The soils were saturated and had high organic content.				
<table border="1"> <tr> <td>v/o pres or current</td> <td>with</td> </tr> <tr> <td>6</td> <td>0</td> </tr> </table>	v/o pres or current	with	6	0	
v/o pres or current	with				
6	0				

.500(6)(c)Community structure	The vegetation cover within this feature has a number of nuisance and exotic plant species present. However, the majority of the plant species are appropriate and desirable plant species. Some of the beneficial plant species consisted of wax-myrtle (<i>Morella cerifera</i>), swamp fern (<i>Blechnum serrulatum</i>), pennywort (<i>Hydrocotyle umbellata</i>), smartweed (<i>Polygonum hydroppiperoides</i>), spike rush (<i>Eleocharis sp.</i>), and muscadine grape (<i>Vitis rotundifolia</i>). The nuisance and undesirable plant species that consisted of Brazilian pepper (<i>Schinus terebinthifolius</i>), para-grass (<i>Urochloa mutica</i>), and Peruvian primrose willow (<i>Ludwigia peruviana</i>).				
<table border="1"> <tr> <td>v/o pres or current</td> <td>with</td> </tr> <tr> <td>5</td> <td>0</td> </tr> </table>	v/o pres or current	with	5	0	
v/o pres or current	with				
5	0				

Score = sum of above scores/30 (if uplands, divide by 20)				
<table border="1"> <tr> <td>current or w/o pres</td> <td>with</td> </tr> <tr> <td>0.47</td> <td>0</td> </tr> </table>	current or w/o pres	with	0.47	0
current or w/o pres	with			
0.47	0			

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

For impact assessment areas
FL = delta x acres =

Delta = [with-current]
0.47

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

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

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

Site/Project Name SR 514 (Malabar Road) PD&E	Application Number	Assessment Area Name or Number Wetland 72 - Secondary
Impact or Mitigation Impact	Assessment conducted by: CS,CL	Assessment date: 11/6/2013

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

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

.500(6)(a) Location and Landscape Support	This shrubby wetland is located west of the intersection of Malabar Road (Rd) and West Stardust Street (St). This wetland is hydrologically connected to Wetland 2 to the south by a culvert under Malabar Rd. This feature continues northeast outside of the proposed project area. This feature is bordered to the south by Malabar Rd, to the north and east by stormwater ponds, and to the west a driveway for a medical office. Habitats outside of the assessment area are limited and provide minimal support for wildlife. Wildlife access is limited by Malabar Rd to the south, the ponds to the north and east, and the driveway to the west. There is a moderate amount of nuisance and invasive plant species in the proximity of this wetland.			
		<table border="1"> <tr> <td>v/o pres or current</td> <td>with</td> </tr> <tr> <td align="center">4</td> <td align="center">3</td> </tr> </table>	v/o pres or current	with
v/o pres or current	with			
4	3			

.500(6)(b)Water Environment (n/a for uplands)	Within the assessment area the hydrology and water quality provide little benefits to fish and wildlife. Historically, the wetland area was part of a much larger system that continued to the north and south. However, with the construction of Malabar Rd, the wetland was fragmented and the size has been reduced. The construction of the road and the stormwater ponds may have an adverse effect on the hydrology in the assessed wetland area. Water level indicators are distinct, and the feature was impounding water at the time of this assessment. The soils were saturated and had high organic content.			
		<table border="1"> <tr> <td>v/o pres or current</td> <td>with</td> </tr> <tr> <td align="center">6</td> <td align="center">6</td> </tr> </table>	v/o pres or current	with
v/o pres or current	with			
6	6			

.500(6)(c)Community structure	The vegetation cover within this feature has a number of nuisance and exotic plant species present. However, the majority of the plant species are appropriate and desirable plant species. Some of the beneficial plant species consisted of wax-myrtle (<i>Morella cerifera</i>), swamp fern (<i>Blechnum serrulatum</i>), pennywort (<i>Hydrocotyle umbellata</i>), smartweed (<i>Polygonum hydroppiperoides</i>), spike rush (<i>Eleocharis sp.</i>), and muscadine grape (<i>Vitis rotundifolia</i>). The nuisance and undesirable plant species that consisted of Brazilian pepper (<i>Schinus terebinthifolius</i>), para-grass (<i>Urochloa mutica</i>), and Peruvian primrose willow (<i>Ludwigia peruviana</i>).			
		<table border="1"> <tr> <td>v/o pres or current</td> <td>with</td> </tr> <tr> <td align="center">6</td> <td align="center">5</td> </tr> </table>	v/o pres or current	with
v/o pres or current	with			
6	5			

Score = sum of above scores/30 (if uplands, divide by 20)	
current or w/o pres	with
0.53	0.47

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

For impact assessment areas
FL = delta x acres =

Delta = [with-current]
0.06

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

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

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

Site/Project Name SR 514 (Malabar Road) PD&E	Application Number	Assessment Area Name or Number Wetland 74
Impact or Mitigation Impact	Assessment conducted by: CS,CL	Assessment date: 11/6/2013

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

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

<p>.500(6)(a) Location and Landscape Support</p> <p>v/o pres or current with</p> <table border="1"> <tr> <td>3</td> <td>0</td> </tr> </table>	3	0	<p>This wetland is located on the south side of Malabar Road (Rd), west of the intersection with Arthur Drive (Dr). The north edge ties into Other Surface Water 28 (OSW 28) that runs in an east/west direction paralleling Malabar Rd on the south side of the road. Habitats outside of the assessment area are available, however it provides minimal support for most wildlife. The majority of the plant community consists of invasive exotics that has adversely affect the functions provided in the assessment area. Wildlife access is partially limited by Malabar Rd to the north and low density development that surround the area.</p>
3	0		
<p>.500(6)(b)Water Environment (n/a for uplands)</p> <p>v/o pres or current with</p> <table border="1"> <tr> <td>2</td> <td>0</td> </tr> </table>	2	0	<p>Within the assessment area the hydrology and water quality does not support the functions or provides benefits to fish and supports wildlife at a minimal capacity. The soils were moist with a high organic content. Vegetation zonation appeared did not appear appropriate within this system for the system as a whole is dominated by facultative species. Relic drainage ditches were present in the proximity of the wetland from past agriculture utilization, which appear to have an adverse effect on the hydrology. No evidence of a normal hydrologic regime exists and this system is a marginal wetland at best.</p>
2	0		
<p>.500(6)(c)Community structure</p> <p>1. Vegetation and/or 2. Benthic Community</p> <p>v/o pres or current with</p> <table border="1"> <tr> <td>2</td> <td>0</td> </tr> </table>	2	0	<p>The vegetation cover in this feature is dominated by nuisance and exotic plant species. Approximately 90% of the vegetation consisted of nuisance and exotic plant species such as Brazilian pepper (<i>Schinus terebinthifolius</i>). Some of the beneficial plant species consist of cabbage palm (<i>Sabal palmetto</i>), wax-myrtle (<i>Myrica cerifera</i>), and swamp fern (<i>Blechnum serrulatum</i>). Past land management practices have resulted in partial removal or alteration of natural structures with the introduction of ditches in the area.</p>
2	0		

Score = sum of above scores/30 (if uplands, divide by 20)	
current	with
0.23	0

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

For impact assessment areas
FL = delta x acres = 0.23 x 0.02 = 0.005

Delta = [with-current]
0.23

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

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

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

Site/Project Name SR 514 (Malabar Road) PD&E	Application Number	Assessment Area Name or Number Wetland 75
Impact or Mitigation Impact	Assessment conducted by: CS,CL	Assessment date: 11/5/2013

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

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

<p>.500(6)(a) Location and Landscape Support</p> <p>v/o pres or current</p> <table border="1"> <tr> <td>6</td> <td>0</td> </tr> </table>	6	0	<p>This wetland is located on the south side of Malabar Road (Rd), east of the intersection with Malabar Woods Boulevard (Blvd). This wetland is hydrologically connected to Other Surface Water 36 (OSW 36) that runs in an east/west direction paralleling Malabar Rd. This wetland feature continues south outside of the assessment area. Habitats outside of the assessment area are available and provide moderate support for most wildlife. Wildlife access is partially limited by Malabar Rd to the north.</p>
6	0		
<p>.500(6)(b)Water Environment (n/a for uplands)</p> <p>v/o pres or current</p> <table border="1"> <tr> <td>6</td> <td>0</td> </tr> </table>	6	0	<p>Within the wetland the hydrology and water quality supports the functions and provides benefits to fish and wildlife at a marginal capacity. Throughout the wetland soils were moist to saturated with a high organic content. The presence of ditch systems within and adjacent to the wetland could have an adverse effect on the hydrology in the wetland. In addition, the presence of melaleuca (<i>Melaleuca quinquenervia</i>) within the wetland could also be detrimental to the overall hydrology of this system. Vegetation zonation appeared appropriate within this system. Evidence of subsidence was minimal within this mixed forested system.</p>
6	0		
<p>.500(6)(c)Community structure</p> <p>1. Vegetation and/or 2. Benthic Community</p> <p>v/o pres or current</p> <table border="1"> <tr> <td>6</td> <td>0</td> </tr> </table>	6	0	<p>The majority of the vegetation cover is by appropriate and desirable plant species, however a number of nuisance and exotic plant species were present. Some of the beneficial plant species consist of sweet bay (<i>Magnolia virginiana</i>), cabbage palm (<i>Sabal palmetto</i>), dahoon holly (<i>Ilex cassine</i>), red-maple (<i>Acer rubrum</i>), wax-myrtle (<i>Myrica cerifera</i>), swamp fern (<i>Blechnum serrulatum</i>), chain fern (<i>Woodwardia virginica</i>), royal fern (<i>Osmunda regalis</i>), red root (<i>Lachnanthes caroliniana</i>) and beakrush (<i>Rhynchospora spp</i>). The nuisance and exotic plant species consisted of Brazilian pepper (<i>Schinus terebinthifolius</i>), melaleuca, sword fern (<i>Nephrolepis cordifolia</i>), and torpedo-grass (<i>Panicum repens</i>).</p>
6	0		

Score = sum of above scores/30 (if uplands, divide by 20)
current or w/o pres
0.6
with
0

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

For impact assessment areas
FL = delta x acres =

Delta = [with-current]
0.6

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

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

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

Site/Project Name SR 514 (Malabar Road) PD&E	Application Number	Assessment Area Name or Number Wetland 75 - Secondary
Impact or Mitigation Impact	Assessment conducted by: CS,CL	Assessment date: 11/5/2013

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

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

<p>.500(6)(a) Location and Landscape Support</p> <p>v/o pres or current</p> <table border="1"> <tr> <td>6</td> <td>with</td> <td>6</td> </tr> </table>	6	with	6	<p>This wetland is located on the south side of Malabar Road (Rd), east of the intersection with Malabar Woods Boulevard (Blvd). This wetland is hydrologically connected to Other Surface Water 36 (OSW 36) that runs in an east/west direction paralleling Malabar Rd. This wetland feature continues south outside of the assessment area. Habitats outside of the assessment area are available and provide moderate support for most wildlife. Wildlife access is partially limited by Malabar Rd to the north.</p>
6	with	6		
<p>.500(6)(b)Water Environment (n/a for uplands)</p> <p>v/o pres or current</p> <table border="1"> <tr> <td>7</td> <td>with</td> <td>6</td> </tr> </table>	7	with	6	<p>Within the wetland the hydrology and water quality supports the functions and provides benefits to fish and wildlife at a marginal capacity. Throughout the wetland soils were moist to saturated with a high organic content. The presence of ditch systems within and adjacent to the wetland could have an adverse effect on the hydrology in the wetland. In addition, the presence of melaleuca (<i>Melaleuca quinquenervia</i>) within the wetland could also be detrimental to the overall hydrology of this system. Vegetation zonation appeared appropriate within this system. Evidence of subsidence was minimal within this mixed forested system.</p>
7	with	6		
<p>.500(6)(c)Community structure</p> <p>1. Vegetation and/or 2. Benthic Community</p> <p>v/o pres or current</p> <table border="1"> <tr> <td>6</td> <td>with</td> <td>6</td> </tr> </table>	6	with	6	<p>The majority of the vegetation cover is by appropriate and desirable plant species, however a number of nuisance and exotic plant species were present. Some of the beneficial plant species consist of sweet bay (<i>Magnolia virginiana</i>), cabbage palm (<i>Sabal palmetto</i>), dahoon holly (<i>Ilex cassine</i>), red-maple (<i>Acer rubrum</i>), wax-myrtle (<i>Myrica cerifera</i>), swamp fern (<i>Blechnum serrulatum</i>), chain fern (<i>Woodwardia virginica</i>), royal fern (<i>Osmunda regalis</i>), red root (<i>Lachnanthes caroliniana</i>) and beakrush (<i>Rhynchospora spp</i>). The nuisance and exotic plant species consisted of Brazilian pepper (<i>Schinus terebinthifolius</i>), melaleuca, sword fern (<i>Nephrolepis cordifolia</i>), and torpedo-grass (<i>Panicum repens</i>).</p>
6	with	6		

Score = sum of above scores/30 (if uplands, divide by 20)	
current or w/o pres	with
0.63	0.6

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

For impact assessment areas
FL = delta x acres =

Delta = [with-current]
0.03

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

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

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

Site/Project Name SR 514 (Malabar Road) PD&E	Application Number	Assessment Area Name or Number Wetland 76
Impact or Mitigation Impact	Assessment conducted by: CS,CL	Assessment date: 11/5/2013

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

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

<p>.500(6)(a) Location and Landscape Support</p> <p>v/o pres or current with</p> <table border="1"> <tr> <td>6</td> <td>0</td> </tr> </table>	6	0	<p>This wetland is located on the north side of Malabar Road (Rd), east of the intersection with Glatter Rd. This wetland is hydrologically connected by culverts to Wetland 39 on the south side of the road. In addition, it is connected to Other Surface Water 50 (OSW 50) that parallels Malabar Rd on the north side of the road. This wetland feature continues north outside of the assessment area. Habitats outside of the assessment area are available and provide good support for most wildlife. Wildlife access is partially limited by Malabar Rd to the south. This wetland is located within the Malabar Scrub Sanctuary.</p>
6	0		
<p>.500(6)(b)Water Environment (n/a for uplands)</p> <p>v/o pres or current with</p> <table border="1"> <tr> <td>7</td> <td>0</td> </tr> </table>	7	0	<p>Within the wetland the hydrology and water quality supports the functions and provides benefits to wildlife at a moderate capacity. Throughout the wetland soils were moist to saturated with a high organic content. The presence of the ditch system (OSW 50) adjacent to the wetland could have an adverse effect on the hydrology in the wetland. At the time of this assessment this wetland feature was dry, however water level indicators were distinct. Vegetation zonation appeared appropriate within this system. Evidence of subsidence was minimal within this wetland feature.</p>
7	0		
<p>.500(6)(c)Community structure</p> <p>1. Vegetation and/or 2. Benthic Community</p> <p>v/o pres or current with</p> <table border="1"> <tr> <td>7</td> <td>0</td> </tr> </table>	7	0	<p>The majority of the vegetation cover is by appropriate and desirable plant species. Some of the beneficial plant species consist of dahoon holly (<i>Ilex cassine</i>), wax-myrtle (<i>Myrica cerifera</i>), St. John's wort (<i>Hypericum spp.</i>), swamp fern (<i>Blechnum serrulatum</i>), plume grass (<i>Saccharum sp.</i>) chain fern (<i>Woodwardia virginica</i>), broomsedge (<i>Andropogon spp.</i>), red root (<i>Lachnanthes caroliniana</i>) and beakrush (<i>Rhynchospora spp.</i>). The nuisance and exotic plant species coverage was minimal and consisted of sword fern (<i>Nephrolepis cordifolia</i>), downy rose apple (<i>Rhodomyrtus tomentosa</i>). Para-grass (<i>Urochloa mutica</i>) and torpedo-grass (<i>Panicum repens</i>) do exist within the ditch portion that borders Malabar Rd.</p>
7	0		

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

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

For impact assessment areas
FL = delta x acres =

Delta = [with-current]
0.67

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

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

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

Site/Project Name SR 514 (Malabar Road) PD&E	Application Number	Assessment Area Name or Number Wetland 76 - Secondary
Impact or Mitigation Impact	Assessment conducted by: CS,CL	Assessment date: 11/5/2013

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

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

<p>.500(6)(a) Location and Landscape Support</p> <p>v/o pres or current with</p> <table border="1"> <tr> <td>7</td> <td>6</td> </tr> </table>	7	6	<p>This wetland is located on the north side of Malabar Road (Rd), east of the intersection with Glatter Rd. This wetland is hydrologically connected by culverts to Wetland 39 on the south side of the road. In addition, it is connected to Other Surface Water 50 (OSW 50) that parallels Malabar Rd on the north side of the road. This wetland feature continues north outside of the assessment area. Habitats outside of the assessment area are available and provide good support for most wildlife. Wildlife access is partially limited by Malabar Rd to the south. This wetland is located within the Malabar Scrub Sanctuary.</p>
7	6		
<p>.500(6)(b)Water Environment (n/a for uplands)</p> <p>v/o pres or current with</p> <table border="1"> <tr> <td>7</td> <td>7</td> </tr> </table>	7	7	<p>Within the wetland the hydrology and water quality supports the functions and provides benefits to wildlife at a moderate capacity. Throughout the wetland soils were moist to saturated with a high organic content. The presence of the ditch system (OSW 50) adjacent to the wetland could have an adverse effect on the hydrology in the wetland. At the time of this assessment this wetland feature was dry, however water level indicators were distinct. Vegetation zonation appeared appropriate within this system. Evidence of subsidence was minimal within this wetland feature.</p>
7	7		
<p>.500(6)(c)Community structure</p> <p>1. Vegetation and/or 2. Benthic Community</p> <p>v/o pres or current with</p> <table border="1"> <tr> <td>8</td> <td>7</td> </tr> </table>	8	7	<p>The majority of the vegetation cover is by appropriate and desirable plant species. Some of the beneficial plant species consist of dahoon holly (<i>Ilex cassine</i>), wax-myrtle (<i>Myrica cerifera</i>), St. John's wort (<i>Hypericum spp.</i>), swamp fern (<i>Blechnum serrulatum</i>), plume grass (<i>Saccharum sp.</i>) chain fern (<i>Woodwardia virginica</i>), broomsedge (<i>Andropogon spp.</i>), red root (<i>Lachnanthes caroliniana</i>) and beakrush (<i>Rhynchospora spp.</i>). The nuisance and exotic plant species coverage was minimal and consisted of sword fern (<i>Nephrolepis cordifolia</i>), downy rose apple (<i>Rhodomyrtus tomentosa</i>). Para-grass (<i>Urochloa mutica</i>) and torpedo-grass (<i>Panicum repens</i>) do exist within the ditch portion that borders Malabar Rd.</p>
8	7		

Score = sum of above scores/30 (if uplands, divide by 20)	
current	with
0.73	0.67

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

For impact assessment areas
FL = delta x acres =

Delta = [with-current]
0.06

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

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

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

Site/Project Name SR 514 (Malabar Road) PD&E	Application Number	Assessment Area Name or Number Wetland 77 (Pond R)
Impact or Mitigation Impact	Assessment conducted by: CS,CL	Assessment date: 11/5/2013

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

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

.500(6)(a) Location and Landscape Support	This wetland is located on the south side of Malabar Road (Rd), west of the intersection with Pine Street (St). It is bordered by Malabar Rd to the north, low-density residential to the east and west, and a forested wetland to the south. The assessment area is part of a much bigger system that extends to the south outside of the project area. Habitats outside of the assessment area are available and provide moderate support for most wildlife. Wildlife access is partially limited by Malabar Rd to the north and urban build-up in the area.
v/o pres or current	
6	
with	0

.500(6)(b)Water Environment (n/a for uplands)	Within the wetland the hydrology and water quality supports the functions and provides benefits to fish and wildlife at a marginal capacity. Throughout the wetland soils were moist to saturated with a high organic content. A large stormwater pond to the west may have an adverse effect on the hydrology in the system. Vegetation zonation appeared appropriate within this system. Evidence of subsidence was minimal within this mixed forested system.
v/o pres or current	
6	
with	0

.500(6)(c)Community structure	The majority of the vegetation cover is by appropriate and desirable plant species, however a number of nuisance and exotic plant species were present. Some of the beneficial plant species consist of sweet bay (<i>Magnolia virginiana</i>), cabbage palm (<i>Sabal palmetto</i>), dahoon holly (<i>Ilex cassine</i>), red-maple (<i>Acer rubrum</i>), wax-myrtle (<i>Morella cerifera</i>), swamp fern (<i>Blechnum serrulatum</i>), chain fern (<i>Woodwardia virginica</i>), royal fern (<i>Osmunda regalis</i>), and red root (<i>Lachnanthes caroliniana</i>). The nuisance and exotic plant species consisted of Brazilian pepper (<i>Schinus terebinthifolius</i>), and Australian pine (<i>Casuarina equisetifolia</i>). In addition, there was stands of bamboo (<i>Bambusa sp.</i>) within this wetland feature.
1. Vegetation and/or	
2. Benthic Community	
v/o pres or current	6
with	0

Score = sum of above scores/30 (if uplands, divide by 20)
current or w/o pres
0.6
with
0

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

For impact assessment areas
FL = delta x acres =

Delta = [with-current]
0.6

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

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

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

Site/Project Name SR 514 (Malabar Road) PD&E	Application Number	Assessment Area Name or Number Wetland 77 - Secondary (Pond R)
Impact or Mitigation Impact	Assessment conducted by: CS,CL	Assessment date: 11/5/2013

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

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

.500(6)(a) Location and Landscape Support	This wetland is located on the south side of Malabar Road (Rd), west of the intersection with Pine Street (St). It is bordered by Malabar Rd to the north, low-density residential to the east and west, and a forested wetland to the south. The assessment area is part of a much bigger system that extends to the south outside of the project area. Habitats outside of the assessment area are available and provide moderate support for most wildlife. Wildlife access is partially limited by Malabar Rd to the north and urban build-up in the area.
v/o pres or current	
6	
with	
6	

.500(6)(b)Water Environment (n/a for uplands)	Within the wetland the hydrology and water quality supports the functions and provides benefits to fish and wildlife at a marginal capacity. Throughout the wetland soils were moist to saturated with a high organic content. A large stormwater pond to the west may have an adverse effect on the hydrology in the system. Vegetation zonation appeared appropriate within this system. Evidence of subsidence was minimal within this mixed forested system. It is anticipated that with the construction of a stormwater pond, the hydrology will be adversely affected.
v/o pres or current	
7	
with	
5	

.500(6)(c)Community structure	The majority of the vegetation cover is by appropriate and desirable plant species, however a number of nuisance and exotic plant species were present. Some of the beneficial plant species consist of sweet bay (<i>Magnolia virginiana</i>), cabbage palm (<i>Sabal palmetto</i>), dahoon holly (<i>Ilex cassine</i>), red-maple (<i>Acer rubrum</i>), wax-myrtle (<i>Morella cerifera</i>), swamp fern (<i>Blechnum serrulatum</i>), chain fern (<i>Woodwardia virginica</i>), royal fern (<i>Osmunda regalis</i>), and red root (<i>Lachnanthes caroliniana</i>). The nuisance and exotic plant species consisted of Brazilian pepper (<i>Schinus terebinthifolius</i>), and Australian pine (<i>Casuarina equisetifolia</i>). In addition, there was stands of bamboo (<i>Bambusa sp.</i>) within this wetland feature.
1. Vegetation and/or	
2. Benthic Community	
v/o pres or current	
6	
with	
6	

Score = sum of above scores/30 (if uplands, divide by 20)
current or w/o pres
0.63
with
0.57

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

For impact assessment areas
FL = delta x acres =

Delta = [with-current]
0.06

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

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

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

Site/Project Name SR 514 (Malabar Road) PD&E	Application Number	Assessment Area Name or Number Wetland 78
Impact or Mitigation Impact	Assessment conducted by: CS,CL	Assessment date: 11/5/2013

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

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

<p>.500(6)(a) Location and Landscape Support</p> <p>v/o pres or current with</p> <table border="1"> <tr> <td>6</td> <td>0</td> </tr> </table>	6	0	<p>This wetland is located on the north side of Malabar Road (Rd), west of the intersection with Marie Street (St). This wetland is hydrologically connected by culverts to Wetland 46 on the south side of the road. In addition, it is connected to Other Surface Water 49 (OSW 49) that parallels Malabar Rd on the north side of the road. This wetland feature continues north outside of the assessment area. Habitats outside of the assessment area are available and provide good support for most wildlife. Wildlife access is partially limited by Malabar Rd to the south. This wetland is located within the Malabar Scrub Sanctuary.</p>
6	0		
<p>.500(6)(b)Water Environment (n/a for uplands)</p> <p>v/o pres or current with</p> <table border="1"> <tr> <td>6</td> <td>0</td> </tr> </table>	6	0	<p>Within the wetland the hydrology and water quality supports the functions and provides benefits to wildlife at a moderate capacity. Throughout the wetland soils were moist to saturated with a high organic content. The presence of the cut ditch systems adjacent and within to the wetland could have an adverse effect on the hydrology in the wetland. Vegetation zonation appeared appropriate within this system. Evidence of subsidence was minimal within this mixed forested system.</p>
6	0		
<p>.500(6)(c)Community structure</p> <p>1. Vegetation and/or 2. Benthic Community</p> <p>v/o pres or current with</p> <table border="1"> <tr> <td>6</td> <td>0</td> </tr> </table>	6	0	<p>The majority of the vegetation cover is by appropriate and desirable plant species. However, a number of transitional plant species were present. Some of the beneficial plant species consist of slash pine (<i>Pinus elliottii</i>), dahoon holly (<i>Ilex cassine</i>), wax-myrtle (<i>Morella cerifera</i>), St. John's wort (<i>Hypericum spp.</i>), swamp fern (<i>Blechnum serrulatum</i>), plume grass (<i>Saccharum sp.</i>) chain fern (<i>Woodwardia virginica</i>), broomsedge (<i>Andropogon spp.</i>), red root (<i>Lachnanthes caroliniana</i>) and beakrush (<i>Rhynchospora spp.</i>). The nuisance and exotic plant species consisted of primrose willow (<i>Ludwigia peruviana</i>) and Brazilian pepper (<i>Schinus terebinthifolius</i>). Para-grass (<i>Urochloa mutica</i>) and torpedo-grass (<i>Panicum repens</i>) do exist within and adjacent to the ditch portion that borders Malabar Rd.</p>
6	0		

Score = sum of above scores/30 (if uplands, divide by 20)	
current	with
0.6	0

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

For impact assessment areas
FL = delta x acres =

Delta = [with-current]
0.6

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

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

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

Site/Project Name SR 514 (Malabar Road) PD&E	Application Number	Assessment Area Name or Number Wetland 78 - Secondary
Impact or Mitigation Impact	Assessment conducted by: CS,CL	Assessment date: 11/5/2013

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

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

<p>.500(6)(a) Location and Landscape Support</p> <p>v/o pres or current</p> <table border="1"> <tr> <td>7</td> <td>with</td> <td>6</td> </tr> </table>	7	with	6	<p>This wetland is located on the north side of Malabar Road (Rd), west of the intersection with Marie Street (St). This wetland is hydrologically connected by culverts to Wetland 46 on the south side of the road. In addition, it is connected to Other Surface Water 49 (OSW 49) that parallels Malabar Rd on the north side of the road. This wetland feature continues north outside of the assessment area. Habitats outside of the assessment area are available and provide good support for most wildlife. Wildlife access is partially limited by Malabar Rd to the south. This wetland is located within the Malabar Scrub Sanctuary.</p>
7	with	6		
<p>.500(6)(b)Water Environment (n/a for uplands)</p> <p>v/o pres or current</p> <table border="1"> <tr> <td>6</td> <td>with</td> <td>6</td> </tr> </table>	6	with	6	<p>Within the wetland the hydrology and water quality supports the functions and provides benefits to wildlife at a moderate capacity. Throughout the wetland soils were moist to saturated with a high organic content. The presence of the cut ditch systems adjacent and within to the wetland could have an adverse effect on the hydrology in the wetland. Vegetation zonation appeared appropriate within this system. Evidence of subsidence was minimal within this mixed forested system.</p>
6	with	6		
<p>.500(6)(c)Community structure</p> <p>1. Vegetation and/or 2. Benthic Community</p> <p>v/o pres or current</p> <table border="1"> <tr> <td>7</td> <td>with</td> <td>6</td> </tr> </table>	7	with	6	<p>The majority of the vegetation cover is by appropriate and desirable plant species. However, a number of transitional plant species were present. Some of the beneficial plant species consist of slash pine (<i>Pinus elliottii</i>), dahoon holly (<i>Ilex cassine</i>), wax-myrtle (<i>Morella cerifera</i>), St. John's wort (<i>Hypericum spp.</i>), swamp fern (<i>Blechnum serrulatum</i>), plume grass (<i>Saccharum sp.</i>) chain fern (<i>Woodwardia virginica</i>), broomsedge (<i>Andropogon spp.</i>), red root (<i>Lachnanthes caroliniana</i>) and beakrush (<i>Rhynchospora spp.</i>). The nuisance and exotic plant species consisted of primrose willow (<i>Ludwigia peruviana</i>) and Brazilian pepper (<i>Schinus terebinthifolius</i>).</p>
7	with	6		

Score = sum of above scores/30 (if uplands, divide by 20)	
current	with
0.67	0.6

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

For impact assessment areas
FL = delta x acres =

Delta = [with-current]
0.07

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

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

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

Site/Project Name SR 514 (Malabar Road) PD&E	Application Number	Assessment Area Name or Number Wetland 79
Impact or Mitigation Impact	Assessment conducted by: CS,CL	Assessment date: 11/5/2013

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

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

<p>.500(6)(a) Location and Landscape Support</p> <p>v/o pres or current with</p> <table border="1"> <tr> <td>5</td> <td>0</td> </tr> </table>	5	0	<p>This wetland is located on the north side of Malabar Road (Rd), west of the intersection with Corey Rd. The south edge ties into Other Surface Water 60 (OSW 60) and OSW 61 that runs in an east/west direction paralleling Malabar Rd. This wetland is bordered by Malabar Rd to the south and disturbed undeveloped land to the east and west. This wetland feature continues north outside of the assessment area. This wetland feature is the wetland buffer for Fern Creek. Fern Creek connects to Wetland 20 on the south side of Malabar Rd by a box-culvert under the road. Habitats outside of the assessment area are available and provide moderate support for most wildlife. Wildlife access is partially limited by Malabar Rd to the south. There is a major amount of nuisance/exotic vegetation (Cogon-grass (<i>Imperata cylindrica</i>)) adjacent to this system to the east.</p>
5	0		
<p>.500(6)(b)Water Environment (n/a for uplands)</p> <p>v/o pres or current with</p> <table border="1"> <tr> <td>7</td> <td>0</td> </tr> </table>	7	0	<p>Within the wetland the hydrology and water quality supports the functions and provides benefits to wildlife at a moderate capacity. The stream feature (Fern Creek) provides optimal benefits to fish. Throughout the wetland soils were moist to saturated with a high organic content. Vegetation zonation appeared appropriate within this system. Evidence of subsidence was minimal within this mixed forested system.</p>
7	0		
<p>.500(6)(c)Community structure</p> <p>1. Vegetation and/or 2. Benthic Community</p> <p>v/o pres or current with</p> <table border="1"> <tr> <td>6</td> <td>0</td> </tr> </table>	6	0	<p>The majority of the vegetation cover is by appropriate and desirable plant species. However there is a number of nuisance/exotic plant species present. Some of the beneficial plant species consist of sweet bay (<i>Magnolia virginiana</i>), cabbage palm (<i>Sabal palmetto</i>), dahoon holly (<i>Ilex cassine</i>), red-maple (<i>Acer rubrum</i>), wax-myrtle (<i>Myrica cerifera</i>), swamp fern (<i>Blechnum serrulatum</i>), chain fern (<i>Woodwardia virginica</i>), royal fern (<i>Osmunda regalis</i>), and poison ivy (<i>Toxicodendron radicans</i>). The nuisance and exotic plant species consisted of Brazilian pepper (<i>Schinus terebinthifolius</i>), climbing fern (<i>Lygodium sp.</i>), and Caesarweed (<i>Urena lobata</i>).</p>
6	0		

Score = sum of above scores/30 (if uplands, divide by 20)
current or w/o pres with
0.6 0

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

For impact assessment areas
FL = delta x acres =

Delta = [with-current]
0.6

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

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

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

Site/Project Name SR 514 (Malabar Road) PD&E	Application Number	Assessment Area Name or Number Wetland 79 - Secondary
Impact or Mitigation Impact	Assessment conducted by: CS,CL	Assessment date: 11/5/2013

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

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

.500(6)(a) Location and Landscape Support	<p>This wetland is located on the north side of Malabar Road (Rd), west of the intersection with Corey Rd. The south edge ties into Other Surface Water 60 (OSW 60) and OSW 61 that runs in an east/west direction paralleling Malabar Rd. This wetland is bordered by Malabar Rd to the south and disturbed undeveloped land to the east and west. This wetland feature continues north outside of the assessment area. This wetland feature is the wetland buffer for Fern Creek. Fern Creek connects to Wetland 20 on the south side of Malabar Rd by a box-culvert under the road. Habitats outside of the assessment area are available and provide moderate support for most wildlife. Wildlife access is partially limited by Malabar Rd to the south. There is a major amount of nuisance/exotic vegetation (Cogon-grass (<i>Imperata cylindrica</i>)) adjacent to this system to the east.</p>	
w/o pres or current		with
6		5

.500(6)(b)Water Environment (n/a for uplands)	<p>Within the wetland the hydrology and water quality supports the functions and provides benefits to wildlife at a moderate capacity. The stream feature (Fern Creek) provides optimal benefits to fish. Throughout the wetland soils were moist to saturated with a high organic content. Vegetation zonation appeared appropriate within this system. Evidence of subsidence was minimal within this mixed forested system.</p>	
w/o pres or current		with
7		7

.500(6)(c)Community structure	<p>The majority of the vegetation cover is by appropriate and desirable plant species. However there is a number of nuisance/exotic plant species present. Some of the beneficial plant species consist of sweet bay (<i>Magnolia virginiana</i>), cabbage palm (<i>Sabal palmetto</i>), dahoon holly (<i>Ilex cassine</i>), red-maple (<i>Acer rubrum</i>), wax-myrtle (<i>Myrica cerifera</i>), swamp fern (<i>Blechnum serrulatum</i>), chain fern (<i>Woodwardia virginica</i>), royal fern (<i>Osmunda regalis</i>), and poison ivy (<i>Toxicodendron radicans</i>). The nuisance and exotic plant species consisted of Brazilian pepper (<i>Schinus terebinthifolius</i>), climbing fern (<i>Lygodium sp.</i>), and Caesarweed (<i>Urena lobata</i>).</p>	
1. Vegetation and/or		with
2. Benthic Community		6
w/o pres or current	7	

Score = sum of above scores/30 (if uplands, divide by 20)	
current or w/o pres	with
0.67	0.6

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

For impact assessment areas
FL = delta x acres =

Delta = [with-current]
0.07

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

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

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

Site/Project Name SR 514 (Malabar Road) PD&E	Application Number	Assessment Area Name or Number Stream 80
Impact or Mitigation Impact	Assessment conducted by: CS,CL	Assessment date: 11/19/2013

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

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

<p>.500(6)(a) Location and Landscape Support</p> <p>v/o pres or current with</p> <table border="1"> <tr> <td>6</td> <td>0</td> </tr> </table>	6	0	<p>This stream is located on the north side of Malabar Road (Rd), west of the intersection with Briar Creek Blvd. It is located within the ROW of Malabar Rd., Tract 2 of the Malabar Scrub Sanctuary. It is hydrologically connected to Wetland (WL) 12 on the south side of Malabar Rd. via culverts under the road. This stream feature is part of a larger system that continues north outside of the assessment area. Habitats outside of the assessment area are available, however it provides support for most, but not all, wildlife. Wildlife access is partially limited by Malabar Rd to the south.</p>
6	0		
<p>.500(6)(b)Water Environment (n/a for uplands)</p> <p>v/o pres or current with</p> <table border="1"> <tr> <td>5</td> <td>0</td> </tr> </table>	5	0	<p>Within the assessment area the hydrology and water quality supports the functions and provides benefits to fish and wildlife at a marginal capacity. This feature is an intermittent stream with some standing water observed within this stream. The soils were saturated with a high organic content. Vegetation zonation appeared appropriate within this system. A portion of the stream bed crosses a firebreak filled with gravel.</p>
5	0		
<p>.500(6)(c)Community structure</p> <p>1. Vegetation and/or 2. Benthic Community</p> <p>v/o pres or current with</p> <table border="1"> <tr> <td>6</td> <td>0</td> </tr> </table>	6	0	<p>The vegetation cover in this feature consists of both beneficial wetland vegetation and nuisance and exotic plant species. The northern half of this feature within the assessment area consists of a forested stream bank and as it approaches the road becomes herbaceous dominant. Some of the beneficial plant species consist of royal fern (<i>Osmunda regalis</i>), red maple (<i>Acer rubrum</i>), Sabal palm (<i>Sabal palmetto</i>), water oak (<i>Quercus nigra</i>) and dahoon holly (<i>Ilex cassine</i>). Saw palmetto (<i>Serenoa repens</i>) and wax myrtle (<i>Morella cerifera</i>) can be found along the stream banks. Some vegetation consisted of nuisance and exotic plant species such as Brazilian pepper (<i>Schinus terebinthifolius</i>) and torpedo-grass (<i>Panicum repens</i>), but the numbers were minimal.</p>
6	0		

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

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

For impact assessment areas
FL = delta x acres =

Delta = [with-current]
0.57

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

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

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

Site/Project Name SR 514 (Malabar Road) PD&E	Application Number	Assessment Area Name or Number Stream 80 - Secondary
Impact or Mitigation Impact	Assessment conducted by: CS,CL	Assessment date: 11/19/2013

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

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

<p>.500(6)(a) Location and Landscape Support</p> <p>v/o pres or current with</p> <table border="1"> <tr> <td>6</td> <td>5</td> </tr> </table>	6	5	<p>This stream is located on the north side of Malabar Road (Rd), west of the intersection with Briar Creek Blvd. It is located within the ROW of Malabar Rd.and Tract 2 of the Malabar Scrub Sanctuary. It is hydrologically connected to Wetland (WL) 12 on the south side of Malabar Rd. via culverts under the road. This stream feature is part of a larger system that continues north outside of the assessment area. Habitats outside of the assessment area are available, however it provides support for most, but not all, wildlife. Wildlife access is partially limited by Malabar Rd to the south.</p>
6	5		
<p>.500(6)(b)Water Environment (n/a for uplands)</p> <p>v/o pres or current with</p> <table border="1"> <tr> <td>6</td> <td>5</td> </tr> </table>	6	5	<p>Within the assessment area the hydrology and water quality supports the functions and provides benefits to fish and wildlife at a marginal capacity. This feature is an intermittent stream with some standing water observed within this stream. The soils were saturated with a high organic content. Vegetation zonation appeared appropriate within this system.</p>
6	5		
<p>.500(6)(c)Community structure</p> <p>1. Vegetation and/or 2. Benthic Community</p> <p>v/o pres or current with</p> <table border="1"> <tr> <td>7</td> <td>7</td> </tr> </table>	7	7	<p>The vegetation cover in this feature consists of both beneficial wetland vegetation and nuisance and exotic plant species. The northern half of this feature within the assessment area consists of a forested stream bank and as it approaches the road becomes herbaceous dominant. Some of the beneficial plant species consist of royal fern (<i>Osmunda regalis</i>), red maple (<i>Acer rubrum</i>), water oak (<i>Quercus nigra</i>), swamp dogwood (<i>Cornus foeminal</i>) and dahoon holly (<i>Ilex cassine</i>). Saw palmetto (<i>Serenoa repens</i>) and wax myrtle (<i>Morella cerifera</i>) can be found along the stream banks.</p>
7	7		

Score = sum of above scores/30 (if uplands, divide by 20)	
current or w/o pres	with
0.63	0.57

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

For impact assessment areas
FL = delta x acres =

Delta = [with-current]
0.07

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

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

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

Site/Project Name SR 514 (Malabar Road) PD&E	Application Number	Assessment Area Name or Number Wetland 82 (Pond G)
Impact or Mitigation Impact	Assessment conducted by: CS,CL	Assessment date: 11/5/2013

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

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

<p>.500(6)(a) Location and Landscape Support</p> <p>v/o pres or current with</p> <table border="1"> <tr> <td>7</td> <td>0</td> </tr> </table>	7	0	<p>This wetland is located between Malabar Road (Rd) and Oaklyn Street (St). This wetland feature continues north, south, and west outside of the proposed pond site. To the east the wetland is bordered by a mixed forested upland area. Habitats outside of the assessment area are available and provide good support for most wildlife. Wildlife access is partially limited by a subdivision to the north. However, the Malabar Scrub Sanctuary is located to the east, which would provide wildlife a good corridor for access to the assessment area.</p>
7	0		
<p>.500(6)(b)Water Environment (n/a for uplands)</p> <p>v/o pres or current with</p> <table border="1"> <tr> <td>6</td> <td>0</td> </tr> </table>	6	0	<p>Within the wetland the hydrology and water quality supports the functions and provides benefits to wildlife at a good capacity. Throughout the wetland soils were moist to saturated with a high organic content. Vegetation zonation appeared appropriate within this system. Evidence of subsidence was minimal within this mixed forested system. Past land management practices may have an adverse effect on the hydrology in this system.</p>
6	0		
<p>.500(6)(c)Community structure</p> <p>1. Vegetation and/or 2. Benthic Community</p> <p>v/o pres or current with</p> <table border="1"> <tr> <td>7</td> <td>0</td> </tr> </table>	7	0	<p>The majority of the vegetation cover is by appropriate and desirable plant species. Invasive and undesirable plant species are limited to the periphery of the wetland. Some of the beneficial plant species consist of sweet bay (<i>Magnolia virginiana</i>), cabbage palm (<i>Sabal palmetto</i>), dahoon holly (<i>Ilex cassine</i>), red-maple (<i>Acer rubrum</i>), wax-myrtle (<i>Morella cerifera</i>), swamp fern (<i>Blechnum serrulatum</i>), chain fern (<i>Woodwardia virginica</i>), royal fern (<i>Osmunda regalis</i>), and beakrush (<i>Rhynchospora sp.</i>). The nuisance and exotic plant species consisted of Brazilian pepper (<i>Schinus terebinthifolius</i>).</p>
7	0		

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

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

For impact assessment areas
FL = delta x acres =

Delta = [with-current]
0.67

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

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

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

Site/Project Name SR 514 (Malabar Road) PD&E	Application Number	Assessment Area Name or Number Wetland 82 (Pond G) - Secondary
Impact or Mitigation Impact	Assessment conducted by: CS,CL	Assessment date: 11/5/2013

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

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

<p>.500(6)(a) Location and Landscape Support</p> <p>v/o pres or current</p> <table border="1"> <tr> <td>7</td> <td>with</td> <td>7</td> </tr> </table>	7	with	7	<p>This wetland is located between Malabar Road (Rd) and Oaklyn Street (St). This wetland feature continues north, south, and west outside of the proposed pond site. To the east the wetland is bordered by a mixed forested upland area. Habitats outside of the assessment area are available and provide good support for most wildlife. Wildlife access is partially limited by a subdivision to the north. However, the Malabar Scrub Sanctuary is located to the east, which would provide wildlife a good corridor for access to the assessment area.</p>
7	with	7		
<p>.500(6)(b)Water Environment (n/a for uplands)</p> <p>v/o pres or current</p> <table border="1"> <tr> <td>6</td> <td>with</td> <td>4</td> </tr> </table>	6	with	4	<p>Within the wetland the hydrology and water quality supports the functions and provides benefits to wildlife at a good capacity. Throughout the wetland soils were moist to saturated with a high organic content. Vegetation zonation appeared appropriate within this system. Evidence of subsidence was minimal within this mixed forested system. Past land management practices may have an adverse effect on the hydrology in this system. The construction of the stormwater pond is anticipated to have an adverse effect on the hydrology.</p>
6	with	4		
<p>.500(6)(c)Community structure</p> <p>1. Vegetation and/or 2. Benthic Community</p> <p>v/o pres or current</p> <table border="1"> <tr> <td>7</td> <td>with</td> <td>7</td> </tr> </table>	7	with	7	<p>The majority of the vegetation cover is by appropriate and desirable plant species. Invasive and undesirable plant species are limited to the periphery of the wetland. Some of the beneficial plant species consist of sweet bay (<i>Magnolia virginiana</i>), cabbage palm (<i>Sabal palmetto</i>), dahoon holly (<i>Ilex cassine</i>), red-maple (<i>Acer rubrum</i>), wax-myrtle (<i>Morella cerifera</i>), swamp fern (<i>Blechnum serrulatum</i>), chain fern (<i>Woodwardia virginica</i>), royal fern (<i>Osmunda regalis</i>), and beakrush (<i>Rhynchospora sp.</i>). The nuisance and exotic plant species consisted of Brazilian pepper (<i>Schinus terebinthifolius</i>).</p>
7	with	7		

Score = sum of above scores/30 (if uplands, divide by 20)	
current	with
0.67	0.6

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

For impact assessment areas
FL = delta x acres =

Delta = [with-current]
0.07

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

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

Appendix E

Recommended Alternative UMAM Summary Table

UMAM Summary Table for Recommended Alternative

WETLAND I.D.	Habitat Type / Impact Type FLUCCS/ Direct or Secondary	Location and Landscape Support		Water Environment		Community Structure		Acres	Functional Loss
		before	after	before	after	before	after		
Stream 2	510/Direct	4	0	4	0	5	0	0.03	0.01
Stream 2	510/Secondary	4	4	5	4	6	6	0.04	0.00
Stream 80	510/Direct	6	0	5	0	6	0	0.01	0.01
Stream 80	510/Secondary	6	5	6	5	7	7	0.03	0.00
WL 6	619/Direct	3	0	3	0	2	0	0.11	0.03
WL 6	619/Secondary	4	3	4	3	2	2	0.17	0.01
WL 8	619/Direct	3	0	5	0	2	0	0.25	0.08
WL 8	619/Secondary	4	3	6	5	3	2	0.14	0.01
WL 8	630/Direct	5	0	6	0	6	0	0.22	0.12
WL 8	630/Secondary	6	5	7	6	7	6	0.16	0.02
WL 12	630/Direct	5	0	6	0	7	0	0.04	0.02
WL 15	643/Direct/Roadway	3	0	4	0	2	0	0.13	0.04
WL 15	643/Direct/Pond J	3	0	4	0	2	0	0.46	0.14
WL 39	618/Direct	3	0	5	0	5	0	0.45	0.20
WL 46	618/Direct	4	1	6	1	5	0	0.44	0.19
WL 46	618/Secondary	5	4	6	6	6	5	0.36	0.02
WL 74	630/Direct	3	0	2	0	2	0	0.04	0.01
WL 75	630/Direct	6	0	6	0	6	0	0.10	0.06
WL 75	630/Secondary	6	6	7	6	6	6	0.20	0.01
WL 79	630/Direct	5	0	7	0	6	0	0.37	0.22
WL 79	630/Secondary	6	5	7	7	7	6	0.20	0.01
TOTAL WETLAND IMPACTS:								3.95	1.22

Appendix F

Occurrence Records



FLORIDA
Natural Areas
INVENTORY

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

Florida Natural Areas Inventory

Biodiversity Matrix Query Results

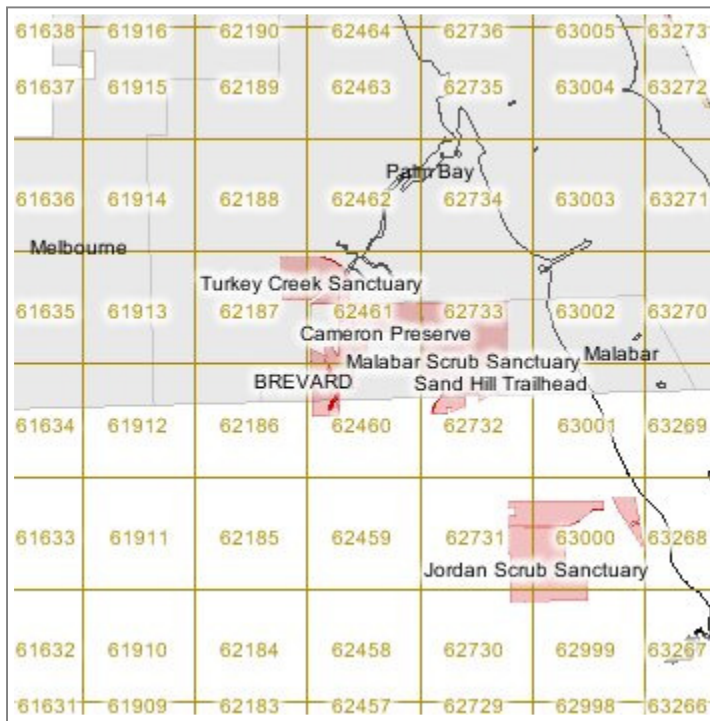
UNOFFICIAL REPORT

Created 6/4/2014

(Contact the FNAI Data Services Coordinator at 850.224.8207 ☎ for information on an official Standard Data Report)

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

Report for 7 Matrix Units: 61912 , 62186 , 62460 , 62732 , 62733 , 63001 , 63002



Descriptions

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

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

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

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

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

Matrix Unit ID: 61912

0 **Documented** Elements Found

0 **Documented-Historic** Elements Found

3 **Likely** Elements Found

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
Grus canadensis pratensis Florida Sandhill Crane	G5T2T3	S2S3	N	ST
<i>Mesic flatwoods</i>	G4	S4	N	N

Mycteria americana Wood Stork	G4	S2	LE	FE
--	----	----	----	----

Matrix Unit ID: 62186

0 **Documented** Elements Found

0 **Documented-Historic** Elements Found

6 **Likely** Elements Found

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
Grus canadensis pratensis Florida Sandhill Crane	G5T2T3	S2S3	N	ST
<i>Mesic flatwoods</i>	G4	S4	N	N
<i>Mustela frenata peninsulæ</i> Florida Long-tailed Weasel	G5T3	S3	N	N
Mycteria americana Wood Stork	G4	S2	LE	FE
Picooides borealis Red-cockaded Woodpecker	G3	S2	LE	FE
<i>Scrub</i>	G2	S2	N	N

Matrix Unit ID: 62460

2 **Documented** Elements Found

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
<i>Aethecerinus hornii</i> Horn's Aethecerinus Long-Horned Beetle	G2	S2	N	N
<i>Conradina grandiflora</i> Large-flowered Rosemary	G3	S3	N	LT

0 **Documented-Historic** Elements Found

6 **Likely** Elements Found

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
Grus canadensis pratensis Florida Sandhill Crane	G5T2T3	S2S3	N	ST
<i>Mesic flatwoods</i>	G4	S4	N	N
<i>Mustela frenata peninsulæ</i> Florida Long-tailed Weasel	G5T3	S3	N	N
Mycteria americana Wood Stork	G4	S2	LE	FE
Picooides borealis Red-cockaded Woodpecker	G3	S2	LE	FE
<i>Scrub</i>	G2	S2	N	N

Matrix Unit ID: 62732

1 **Documented** Element Found

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
Lechea divaricata	G2	S2	N	LE

Pine Pinweed

0 **Documented-Historic** Elements Found11 **Likely** Elements Found

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
<i>Aethecerinus hornii</i> Horn's Aethecerinus Long-Horned Beetle	G2	S2	N	N
Aphelocoma coerulescens Florida Scrub-Jay	G2	S2	LT	FT
Drymarchon couperi Eastern Indigo Snake	G3	S3	LT	FT
Gopherus polyphemus Gopher Tortoise	G3	S3	C	ST
Grus canadensis pratensis Florida Sandhill Crane	G5T2T3	S2S3	N	ST
<i>Mesic flatwoods</i>	G4	S4	N	N
<i>Mustela frenata peninsulæ</i> Florida Long-tailed Weasel	G5T3	S3	N	N
Mycteria americana Wood Stork	G4	S2	LE	FE
Pituophis melanoleucus mugitus Florida Pine Snake	G4T3	S3	N	SSC
Rana capito Gopher Frog	G3	S3	N	SSC
<i>Scrub</i>	G2	S2	N	N

Matrix Unit ID: 627336 **Documented** Elements Found

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
Aphelocoma coerulescens Florida Scrub-Jay	G2	S2	LT	FT
<i>Lechea cernua</i> Nodding Pinweed	G3	S3	N	LT
Lechea divaricata Pine Pinweed	G2	S2	N	LE
<i>Nolina atopocarpa</i> Florida Beargrass	G3	S3	N	LT
Pteroglossaspis ecristata Giant Orchid	G2G3	S2	N	LT
<i>Scrub</i>	G2	S2	N	N

0 **Documented-Historic** Elements Found9 **Likely** Elements Found

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
<i>Aethecerinus hornii</i> Horn's Aethecerinus Long-Horned Beetle	G2	S2	N	N
Drymarchon couperi Eastern Indigo Snake	G3	S3	LT	FT
Gopherus polyphemus	G3	S3	C	ST

Gopher Tortoise				
Grus canadensis pratensis	G5T2T3	S2S3	N	ST
Florida Sandhill Crane				
<i>Mesic flatwoods</i>	G4	S4	N	N
<i>Mustela frenata peninsulæ</i>				
Florida Long-tailed Weasel	G5T3	S3	N	N
Mycteria americana				
Wood Stork	G4	S2	LE	FE
Pituophis melanoleucus mugitus				
Florida Pine Snake	G4T3	S3	N	SSC
Rana capito				
Gopher Frog	G3	S3	N	SSC

Matrix Unit ID: 63001

1 **Documented** Element Found

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
<i>Scrub</i>	G2	S2	N	N

0 **Documented-Historic** Elements Found

5 **Likely** Elements Found

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
Aphelocoma coerulescens	G2	S2	LT	FT
Florida Scrub-Jay				
Gopherus polyphemus	G3	S3	C	ST
Gopher Tortoise				
Grus canadensis pratensis	G5T2T3	S2S3	N	ST
Florida Sandhill Crane				
<i>Mesic flatwoods</i>	G4	S4	N	N
Mycteria americana	G4	S2	LE	FE
Wood Stork				

Matrix Unit ID: 63002

0 **Documented** Elements Found

0 **Documented-Historic** Elements Found

3 **Likely** Elements Found

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
Aphelocoma coerulescens	G2	S2	LT	FT
Florida Scrub-Jay				
Mycteria americana	G4	S2	LE	FE
Wood Stork				
<i>Scrub</i>	G2	S2	N	N

Matrix Unit IDs: 61912 , 62186 , 62460 , 62732 , 62733 , 63001 , 63002

33 **Potential** Elements Common to Any of the 7 Matrix Units

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

<i>Acipenser oxyrinchus oxyrinchus</i> Atlantic Sturgeon	G3T3	S1	PS:LE,LT	SSC
<i>Aphelocoma coerulescens</i> Florida Scrub-Jay	G2	S2	LT	FT
<i>Athene cunicularia floridana</i> Florida Burrowing Owl	G4T3	S3	N	SSC
<i>Calopogon multiflorus</i> Many-flowered Grass-pink	G2G3	S2S3	N	LE
<i>Centrosema arenicola</i> Sand Butterfly Pea	G2Q	S2	N	LE
<i>Chamaesyce cumulicola</i> Sand-dune Spurge	G2	S2	N	LE
<i>Cladonia perforata</i> Perforate Reindeer Lichen	G1	S1	LE	LE
<i>Conradina grandiflora</i> Large-flowered Rosemary	G3	S3	N	LT
<i>Ctenogobius stigmaturus</i> Spottail Goby	G2	S2	N	N
<i>Dicerandra immaculata</i> Lakela's Mint	G1	S1	LE	LE
<i>Drymarchon couperi</i> Eastern Indigo Snake	G3	S3	LT	FT
<i>Eretmochelys imbricata</i> Hawksbill	G3	S1	LE	FE
<i>Glandularia maritima</i> Coastal Vervain	G3	S3	N	LE
<i>Gopherus polyphemus</i> Gopher Tortoise	G3	S3	C	ST
<i>Halophila johnsonii</i> Johnson's Seagrass	G2	S2	LT	N
<i>Harrisia simpsonii</i> Simpson's Prickly Apple	G2	S2	N	LE
<i>Heterodon simus</i> Southern Hognose Snake	G2	S2	N	N
<i>Lechea cernua</i> Nodding Pinweed	G3	S3	N	LT
<i>Lechea divaricata</i> Pine Pinweed	G2	S2	N	LE
<i>Mustela frenata peninsulæ</i> Florida Long-tailed Weasel	G5T3	S3	N	N
<i>Nemastylis floridana</i> Celestial Lily	G2	S2	N	LE
<i>Nolina atopocarpa</i> Florida Beargrass	G3	S3	N	LT
<i>Panicum abscissum</i> Cutthroat Grass	G3	S3	N	LE
<i>Picoides borealis</i> Red-cockaded Woodpecker	G3	S2	LE	FE
<i>Pteroglossaspis ecristata</i> Giant Orchid	G2G3	S2	N	LT
<i>Rana capito</i> Gopher Frog	G3	S3	N	SSC
<i>Rivulus marmoratus</i> Mangrove Rivulus	G4G5	S3	SC	SSC
<i>Rostrhamus sociabilis plumbeus</i> Snail Kite	G4G5T2	S2	LE	FE
<i>Sceloporus woodi</i> Florida Scrub Lizard	G3	S3	N	N
<i>Schizachyrium niveum</i> Scrub Bluestem	G1G2	S1S2	N	LE

<i>Setophaga discolor paludicola</i> Florida Prairie Warbler	G5T3	S3	N	N
Trichechus manatus Manatee	G2	S2	LE	FE
Warea carteri Carter's Warea	G3	S3	LE	LE

Disclaimer

The data maintained by the Florida Natural Areas Inventory represent the single most comprehensive source of information available on the locations of rare species and other significant ecological resources statewide. However, the data are not always based on comprehensive or site-specific field surveys. Therefore, this information should not be regarded as a final statement on the biological resources of the site being considered, nor should it be substituted for on-site surveys. FNAI shall not be held liable for the accuracy and completeness of these data, or opinions or conclusions drawn from these data. FNAI is not inviting reliance on these data. Inventory data are designed for the purposes of conservation planning and scientific research and are not intended for use as the primary criteria for regulatory decisions.

Unofficial Report

These results are considered unofficial. FNAI offers a [Standard Data Request](#) option for those needing certifiable data.



- [Welcome](#)
- [Our Strategic Plan](#)
- [Area of Responsibility](#)
- [Our Office Location](#)
- [Contact Us](#)
- [Current News Releases](#)
- [News Archives](#)
- [Landowner Tools](#)
- [Programs and Resources](#)
- [Partners for Fish and Wildlife](#)
- [Coastal Program](#)
- [Habitat Conservation Plans](#)
- [Federally-listed Species in Florida](#)
- [Students & Teachers](#)
- [Related Sites of Interest](#)
- **Key North Florida Species**
- [Bald Eagle](#)
- [Florida Manatee](#)
- [Eastern Indigo Snake](#)
- [Florida Scrub-Jay](#)
- [Sand Skinks](#)
- [Sea Turtles](#)
- [Whooping Crane](#)
- [Wood Stork](#)
- **General Information**
- [Hunting-Fishing Licenses & Permits](#)
- [Injured/Nuisance Wildlife](#)
- [Wildlife Law Violations](#)
- **Other USFWS Resources**
- [Service Office Finder](#)
- [Office Directory](#)
- [Southeast Region Contacts](#)
- [Federal Register Notices](#)
- [Regional Five-Year Reviews](#)

Federally Listed Species in Brevard County, Florida

This information is provided as a guide to project planning, and is not a substitute for site-specific surveys. Such surveys may be needed to assess species' presence or absence, as well as the extent of project effects on listed species and/or designated critical habitat.

The following table lists those federally-listed species known to be present in the county.
Code Key: E = Endangered, T = Threatened, CH = Critical Habitat Designated, C=Candidate ^{Note 1}

Category	Species Common Name	Species Scientific Name	Code
Mammals	West Indian (Florida) Manatee	<i>Trichechus manatus latirostris</i>	E/CH
	Southeastern Beach Mouse	<i>Peromyscus polionotus nineiventris</i>	T
Birds	Audubon's Crested Caracara	<i>Polyborus plancus audubinii</i>	T
	Florida Scrub-jay	<i>Aphelocoma coerulescens</i>	T
	Piping Plover	<i>Charadrius melodus</i>	T
	Wood Stork	<i>Mycteria americana</i>	E
	Red-cockaded Woodpecker	<i>Picoides borealis</i>	E
Fish	None		
Reptiles	Atlantic Salt Marsh Snake	<i>Nerodia clarkii (=fasciata)taeniata</i>	T
	Eastern Indigo Snake	<i>Dymarchon corais couperi</i>	T
	Green Sea Turtle	<i>Chelonia mydas</i>	E
	Hawksbill Sea Turtle	<i>Eremochelys imbricata</i>	E
	Leatherback Sea Turtle	<i>Dermochelys coriacea</i>	E
	Kemp's ridley Sea Turtle	<i>Lepidochelys kempii</i>	E
	Loggerhead Sea Turtle	<i>Caretta caretta</i>	T
	Gopher Tortoise	Gopherus polyphemus	C
Amphibians	None		
Mollusks	None		
Crustaceans	None		
Plants	Carter's Mustard	<i>Warea carteri</i>	E

► [Home](#) ► [Species: North Florida County](#) ► [Species: South Florida County](#) ► [Species: Panhandle County](#)

For a list of State species by county use the Florida Natural Areas Inventory's Tracking Lists at <http://www.fnai.org/trackinglist.cfm>

For State listed species details, please go to <http://myfwc.com/imperiledspecies/>

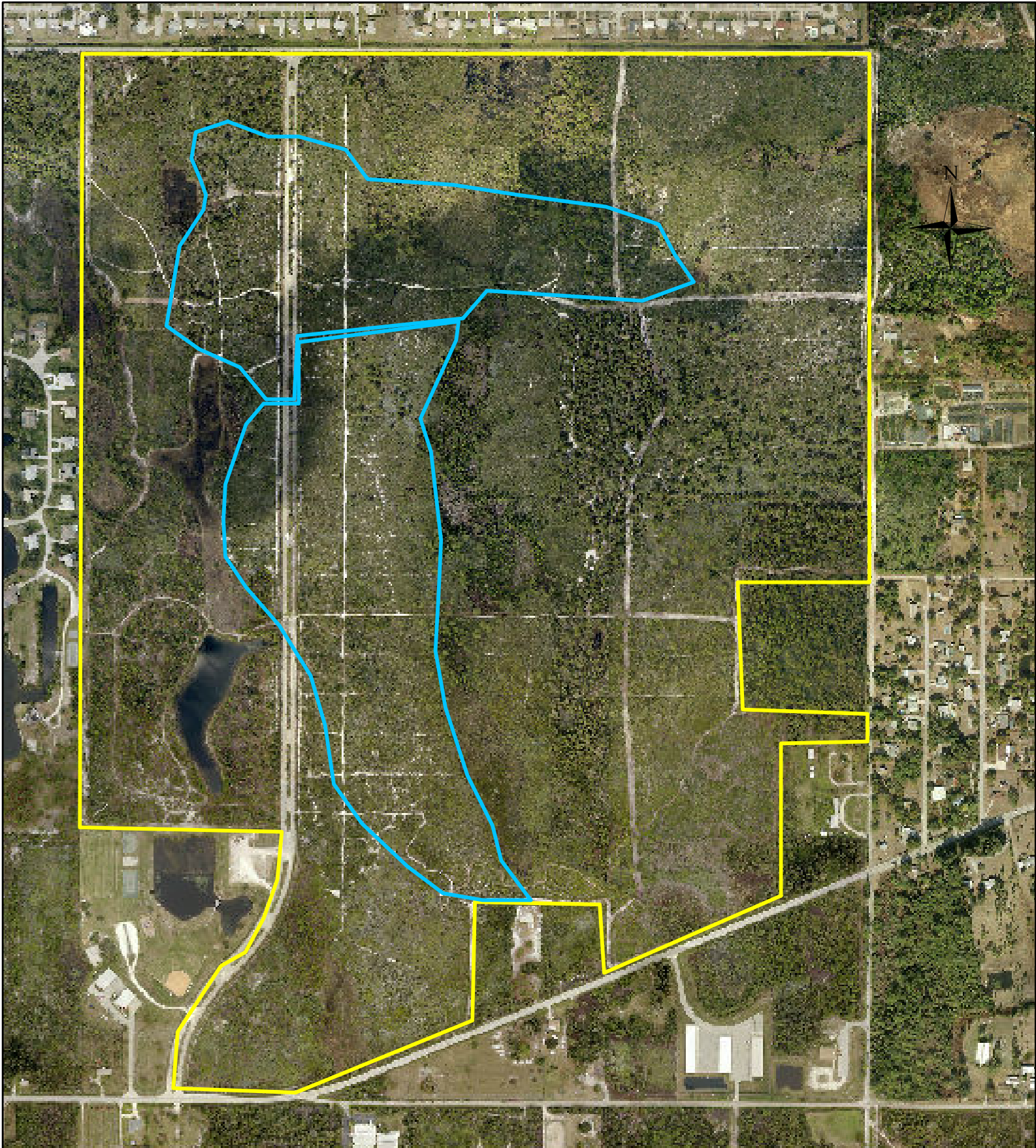
Note 1. [Candidate species](#) receive no statutory protection under the ESA. The FWS encourages cooperative conservation efforts for these species because they are, by definition, species that may warrant future protection under the ESA.

NOTE: Bald eagles were removed from the endangered species list in June 2007 because their populations recovered sufficiently. However, the protections under the Bald and Golden Eagle Act (Eagle Act) continue to apply. Please see the eagle information on our [Landowner Tools](#) page or our national website at <http://www.fws.gov/migratorybirds/baldeagle.htm> for information regarding new permit requirements under the Eagle Act.



Appendix G

Guidelines for Species Surveys and Protection Measures

Malabar Scrub Sanctuary - Brevard County



Legend

-  Scrub Jay Territories
-  EEL Acquired Lands

The Scrub Jay territories are based on staff observation.





United States Department of the Interior

FISH AND WILDLIFE SERVICE
Jacksonville Field Office

7915 Baymeadows Way Suite 200
Jacksonville, FL 32256

IN REPLY REFER TO:
FWS/R4/ES-JAFL

March 16, 2009

MEMORANDUM

To: Staff

From: Field Supervisor, Jacksonville Field Office
Field Supervisor, South Florida Ecological Services Office

Subject: Amended Guidance for Assessing Mitigation Needs for the Florida Scrub-jay

The attached guidance supersedes similar guidance provided on July 2, 1999, and July 10, 2003, and is to be used when assessing minimization/mitigation needs for the Florida scrub-jay relative to applications for Incidental Take Permits for Florida scrub-jays. The Service will pursue similar minimization goals for scrub-jay conservation in section 7 actions, subject to acceptability by the action agency. This guidance is intended to provide interim direction until the scrub-jay recovery plan is revised.

Certain sections of the attached guidance may be modified without Field Supervisor review provided concurrence from staff of both offices. Proposed changes to the amount or extent of mitigation (section D) will require review and approval of the Field Supervisors. Future revisions will be reflected in a change in the effective date of the attachment to this memorandum.

In the event Field Supervisors agree to a revision(s) of recommended mitigation, we will update this cover memorandum and the effective date of the attachment.

Florida Scrub-jay Mitigation Guidance
Effective March 16, 2009

The primary underlying principle embraced by this guidance is that future mitigation efforts by the Service will enhance existing scrub-jay populations occurring on publicly and privately protected lands. To evaluate conservation opportunities for scrub-jays under this guidance, the Service assessed all available data sources to determine current and expected habitat availability, and current and expected scrub-jay distribution. Results of a spatially-explicit model in combination with published metapopulation data, GIS coverages of public lands and scrub habitat, published and unpublished biological data, and knowledge of local scrub-jay populations were used to identify and delineate areas within which future mitigation needs would result in the highest conservation benefit to scrub-jays. This assessment is based on the work of Stith et al. (1996) and Stith (1999).

These analyses resulted in the delineation of mitigation service areas (MSAs) throughout the range of the species (Figure 1). MSAs encompass areas that: (1) contain one or more public or protected private lands that, when combined, have one or more populations of scrub-jays that are anticipated to persist long-term, (2) have at least one population with a minimum of 10 pairs of scrub-jays, and (3) minimize the potential for demographic fragmentation. To maximize the effectiveness of this guidance, impacts to scrub-jays within MSAs should be mitigated within the same MSA. Impacts to scrub-jays occurring outside of a defined MSA should be mitigated to the closest MSA.

A. General Mitigation Strategies (in order of preference)

1. Expand existing preserves and protect and manage occupied and unoccupied habitat that is contiguous with managed public or private lands where the extant population of scrub-jays is viable.
2. Protect and manage occupied and unoccupied habitat within 2 miles of protected and managed occupied habitat where the extant population of scrub-jays is viable, provided proposed mitigation lands are sufficient to support at least one family of scrub-jays. Ensure that dispersal barriers (such as open water exceeding 200 yards, densely urbanized areas, heavily canopied pine forests or plantations, open pasture, or croplands) do not predominate the landscape between mitigation sites and occupied scrub-jay habitat. Composition of the habitat proposed for mitigation should maximize continuity of habitat and minimize the edge effect of the suitable or restorable habitat. In this respect, a circular parcel of land with contiguous suitable or restorable habitat would be more beneficial

(biologically), whereas a linear strip of land with interspersed patches of suitable and unsuitable habitat would be of low benefit.

3. Protect and manage occupied and unoccupied habitat that is within 5 miles of protected and managed occupied scrub-jay habitat where the extant population of scrub-jays is viable, provided proposed mitigation lands are sufficient to support at least one family of scrub-jays. Ensure that, in addition to the dispersal barriers identified above, other barriers (such as heavily canopied suburbs, unbroken citrus groves, treeless or nearly treeless suburbs, or pine flatwoods) do not predominate the landscape between mitigation sites and occupied habitat. The relative biological benefit of mitigation lands with respect to its composition should be assessed as described above.

B. Determine Population Viability

Ensure that a minimum of 10 families of demographically connected scrub-jays are present or will be present following mitigation **OR** sufficient unoccupied but restorable scrub-jay habitat (unoccupied habitat) is, or will be (after restoration, as set forth in the proposed action and concurred to by the Service) available to support at least 10 scrub-jay families. Viable groups of scrub-jays require about 200 acres of scrub habitat which may be contiguous or composed of patches of scrub habitat at least 25 acres in size (Fitzpatrick et al., 1991). The spatial orientation of habitat patches must not lead to demographic isolation, as described in A.2 and A.3 above, and must provide for the successful dispersal of scrub-jays between habitat patches.

C. Determine Demographic Priority

Demographic considerations in selecting mitigation locations within the MSA are described in order of preference below:

1. Mitigate on the site if conditions in B. (above) exist or can be achieved through management.
2. Mitigate off the site but within affected viable population, as defined in B.
3. Mitigate off the site to the nearest viable population, as defined in B.

D. Determine Habitat Mitigation Need (in order of preference)

1. Contribute to an established Habitat Conservation Plan and associated fund within the appropriate county or service area.

2. If D.1 is not available, purchase credits at a Service-approved conservation bank sufficient to achieve mitigation needs identified in D.3.b.
3. If neither D.1 nor D.2 are available, applicants may select any one of the following:
 - a. Deposit funding into the Florida Scrub-jay Conservation Fund sufficient to achieve mitigation needs identified in D.3.b.
 - b. Purchase (or otherwise acquire fee title) two acres of occupied scrub-jay habitat for each acre of affected occupied scrub-jay habitat^{1,2}.
 - c. Purchase (or otherwise acquire fee title) two acres of unoccupied, but restorable³ habitat for each acre of affected occupied habitat provided the unoccupied, restorable habitat is immediately contiguous to occupied scrub-jay habitat under public ownership that is managed for conservation purposes^{1,2}.
 - d. Secure perpetual conservation easement and land management agreement on sufficient lands to achieve mitigation needs identified in D.3.b. and/or D.3.c. above^{1,2}. Holder of any agreement must be approved by the Service.
 - e. Purchase (or otherwise acquire fee title) or secure perpetual conservation easement and land management agreement on three acres of unoccupied, but restorable habitat for each acre of affected habitat, provided the unoccupied, but restorable habitat lies within two miles of occupied scrub-jay habitat under public ownership that is managed for conservation purposes^{1,2,4}.
 - f. Purchase/acquire fee title (at a ratio of five acres of habitat for each acre of affected occupied habitat) lands adjoining publicly-owned occupied or unoccupied but restorable scrub-jay habitat to provide buffer from adjacent urban activities and to buffer adjacent urban areas from land management activities (e.g., prescribed fire).

E. Applicant Protocols

1. A through D above will be discussed and reviewed with applicants as soon as sufficient information is provided to determine the extent of project impacts.

2. The Service will provide the applicant a list of mitigatory options following initial discussion of a project. Written updates will be provided if the project changes scope.
3. If D.3.a is selected, notify applicant that mitigation cost will be based on the cost to conduct work at the most appropriate MSA as determined above. Mitigation costs include land, administration, and management costs. Field offices will maintain written cost estimates on file for applicant review as requested. Mitigation cost will be obtained primarily through assessments of comparative sales of land within the scrub-jay group (as defined in B above) to which mitigation will be directed. Where such data are lacking, broader assessments of comparative sales data may be needed. These values will be updated as necessary considering changes in land values and inflation. Mitigation cost will be based on estimates available at the time of final application for an incidental take permit, unless the applicant can demonstrate comparative land sales data resulting in a lower mitigation cost.

Literature Cited

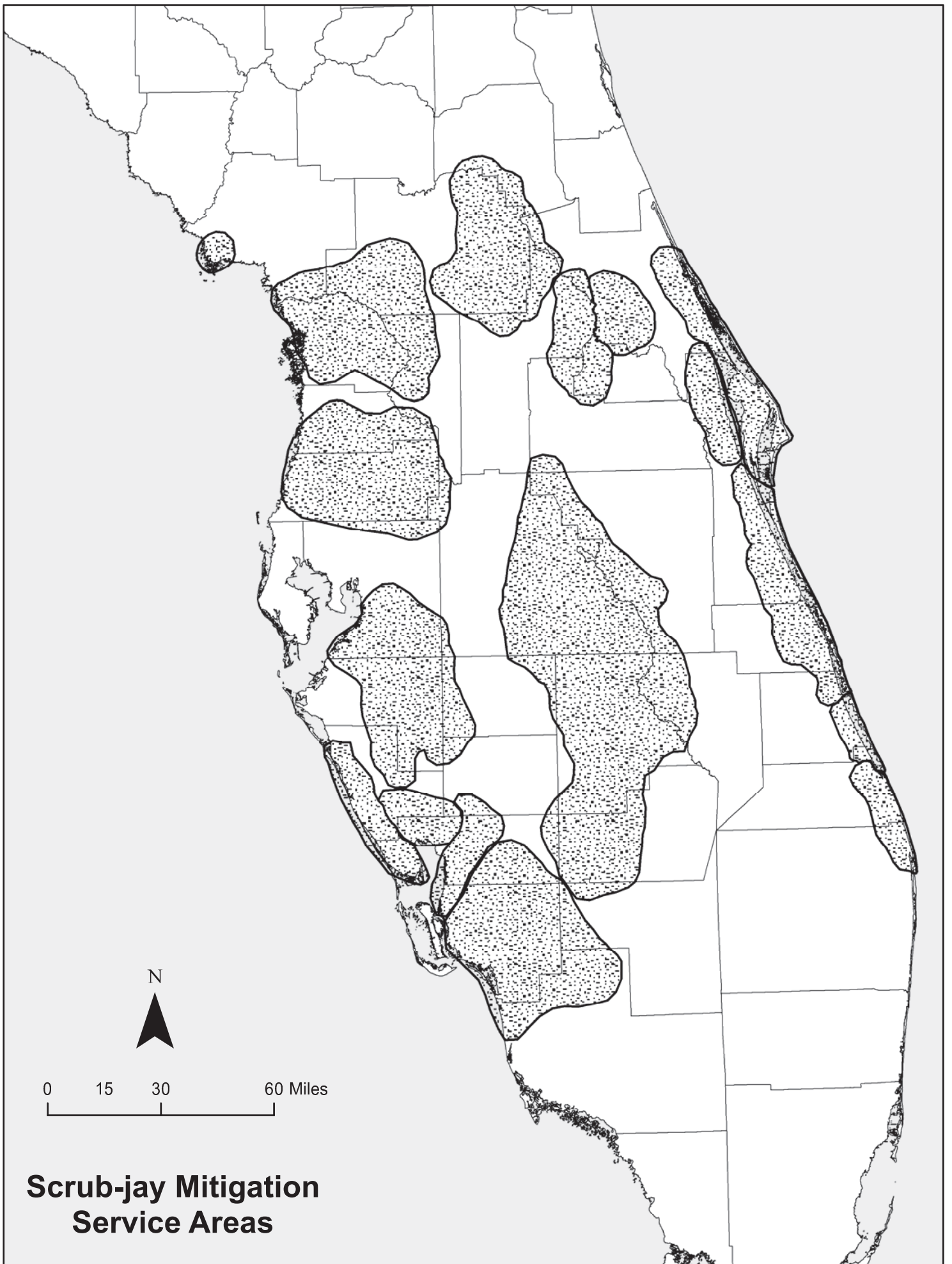
- Fitzpatrick, J.W., G.E. Woolfenden, and M.T. Kopeny. 1991. Ecology and development-related habitat requirements of the Florida scrub jay (*Aphelocoma coerulescens coerulescens*). Nongame Wildlife Program Technical Report No. 8. Florida Game and Fresh Water Fish Commission; Tallahassee, Florida.
- Stith, B.M. 1999. Metapopulation viability analysis of the Florida scrub-jay (*Aphelocoma coerulescens*): a statewide assessment. Final Report to the U.S. Fish and Wildlife Service; Jacksonville, Florida.
- Stith, B.M., J.W. Fitzpatrick, G.E. Woolfenden, and B. Pranty. 1996. Classification and conservation of metapopulations: a case study of the Florida scrub jay. Pages 187-215 in D.R. McCullough, editor. Metapopulations and wildlife conservation. Island Press; Washington, D.C.

¹ Areas within or abutting scrub-jay conservation areas are considered essential to long-term survival of the Florida scrub-jay. These areas are more beneficial (biologically speaking and in terms of the ease of management) than other areas. Impacts to these areas should be mitigated at a higher level by purchase or otherwise acquiring fee title to four acres of occupied habitat for each acre of occupied habitat affected.

² All acquisition and easements must be accompanied by a cash endowment sufficient to provide perpetual management of preserved lands and any other funds identified by a prospective title or easement recipient that may be necessary for that entity to accept title or easement (e.g., contaminants surveys, fencing, trash removal, etc.).

³ Restorable habitat refers to areas with appropriate soil and vegetation types that require implementation of land management actions to provide the vegetative structure and diversity typical of suitable scrub-jay habitat.

⁴ The Service requires a higher ratio in the case of restored habitat not contiguous to public lands managed for and occupied by scrub-jays to address the uncertainties inherent in habitat restoration and recolonization by scrub-jays, and the temporal loss of habitat.



**Scrub-jay Mitigation
Service Areas**

BALD EAGLE MANAGEMENT PLAN

Haliaeetus leucocephalus

**Adopted:
April 9, 2008**



**FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION
620 South Meridian Street
Tallahassee, Florida 32399-1600**

BALD EAGLE MANAGEMENT PLAN TEAM

Sponsors: Timothy A. Breault, Director
Division of Habitat and Species Conservation

Gil McRae, Director
Fish and Wildlife Research Institute

Sponsor Representative: Elsa M. Haubold, Section Leader
Division of Habitat and Species Conservation

Team Leader: Robin Boughton, Avian Coordinator
Division of Habitat and Species Conservation

Team Members: Janell Brush, Fish and Wildlife Research Institute
Dave Eggeman, Division of Habitat and Species Conservation
Don Holway, Division of Law Enforcement
Glenn Lowe, St. Johns Water Management District
Annemarie Prince, Division of Habitat and Species Conservation
Dan Sullivan, Division of Habitat and Species Conservation
Rebecca Trudeau, St. Johns Water Management District

Team Resources:	Facilitator:	Steve Zukowsky
	Stakeholder Coordination:	Bill Pranty, Perran Ross
	Editor:	Bill Pranty
	Community Relations:	Beth Scott
	Legal:	Michael Yaun
	Recorder:	Terri Tiffany
	Education and Outreach:	Judy Gillan
	Eagle Research and Surveys:	Stephen B. Nesbitt
	Executive Director's Office:	Dennis David

EXECUTIVE SUMMARY

The dramatic recovery of the bald eagle (*Haliaeetus leucocephalus*) in the past 35 years represents one of the great conservation success stories in our nation's history. This management plan provides the framework for the conservation and management of the bald eagle in Florida to ensure its continued recovery. This plan meets the requirements of the Florida Fish and Wildlife Conservation Commission's (FWC) listing process (Rule 68A-27.0012, *Florida Administrative Code* [F.A.C.]). The listing process was initiated in July 2002, when the FWC was petitioned to reevaluate the status of the bald eagle, which was considered a threatened species in Florida (Rule 68A-27.004, F.A.C.). Action on the petition was delayed due to a listing moratorium, which was lifted in April 2005.

Following the guidance of FWC's listing process, a five-member biological review panel was approved in June 2005. The panel assessed the eagle's population and distribution data against species-imperilment criteria (Rule 68A-1.004, F.A.C.), and determined that the bald eagle no longer met the criteria for state listing at any level. As a result, the panel unanimously recommended that the bald eagle be removed from Florida's list of imperiled species. The panel also acknowledged the importance of protecting nest sites, and suggested that continued protection of nesting habitats was necessary to sustain recovery of the species (Sullivan *et al.* 2006). The decision to delist the bald eagle in Florida is based on the following biological data: (1) bald eagles occur throughout the state; (2) the population does not experience extreme fluctuations in distribution or numbers; (3) the estimated number of adults has increased more than 300% during the past three eagle generations (defined in this document as a total of 24 years); and (4) the population is not expected to experience significant declines over the next 24 years.

The continental bald eagle population began to decline in the 18th century as a result of habitat loss and direct persecution. The decline intensified during the mid-20th century with widespread use of organochlorine pesticides such as DDT compounding the losses from habitat destruction and shooting. DDT was used widely in the U.S. until it was banned in 1972, in part because it caused eggshell thinning in raptors, resulting in widespread reproductive failure.

Bald eagles reclaimed their entire historic range by the late 1990s, and their estimated population in the Lower 48 states increased from an estimated 417 pairs in 1963 to 9,789 pairs by 2007. Bald eagles have met or exceeded the population goals established in each of the five regional recovery plans, and in August 2007, the U.S. Fish and Wildlife Service (USFWS) removed the species from the list of species protected by the Endangered Species Act. The USFWS recovery plan for the southeastern United States established 400 bald eagle nesting territories as the number necessary to down-list the Florida population from endangered to threatened, and 1,000 nesting territories in the state as one criterion for delisting the eagle nationally. By early 2007, there were 1,218 active bald eagle nesting territories in Florida (FWC unpublished data).

The goal of this management plan is to maintain a stable or increasing population of bald eagles throughout Florida in perpetuity. To achieve this goal, bald eagles and their nests must continue to be protected through science-based management, regulation, public education, and law enforcement. Continued conservation efforts are required to prevent a population decline of 10% or more that might trigger a re-evaluation for relisting the bald eagle. To maintain the

conservation goal, this management plan establishes four conservation objectives that will be calculated annually as five-year running averages. All of these objectives have already been met, and maintaining these objectives will assure that the goal of this management plan is met: (1) a minimum of 1,020 nesting territories per year over the next 24 years; (2) an average of 68% of nesting territories producing ≥ 1 nestling per year; (3) an average reproductive success of ≥ 1.5 fledglings per active nest; and (4) maintain the current area of occupancy (>770 mi²) and extent of occurrence (52,979 mi²) of eagles statewide.

In addition to being our national symbol, reasons for continued conservation, management, and monitoring of Florida's bald eagles include the following: (1) Florida supports 11% of the nesting population in the Lower 48 states, more than any state other than Alaska and Minnesota; (2) 67% of all eagle nests in the state are located on private lands; (3) disturbance can negatively affect the reproductive success of nesting eagles; (4) growth of Florida's human population assures continued encroachment into eagle nesting and foraging habitats; and (5) the public insists on continued conservation of this magnificent species. The FWC's biological review panel determined that Florida's eagle population would not experience significant declines over the next three generations, but acknowledged that protection of nest sites should continue. This plan proposes continued regulation of nesting habitats during the first five years following delisting. The FWC will monitor Florida's eagle population and will study the effects of human activities near eagle nests. After five years, results of this research will be evaluated and regulations will be adjusted as appropriate.

To ensure that the conservation goal and objectives continue to be met, this management plan recommends a suite of conservation actions. These actions are best accomplished by applying an adaptive management approach that allows adjustment to policies, guidelines, and techniques based on science and observed responses to implemented conservation measures. The conservation actions are organized into the following sections or sub-sections: Habitat Management, Land Acquisition, Private Lands Incentives, Law Enforcement, Proposed Regulations, Permitting Framework April 2008, Local Government Coordination, Monitoring Plan, Education and Outreach, and Ongoing and Future Research.

Management of bald eagles in Florida through the implementation of this plan requires the cooperation of local, state, and federal governmental agencies; non-governmental organizations; business, agricultural, and forestry interests; universities; and the public. This plan was developed by the FWC in collaboration with a diverse group of stakeholders, and its successful implementation requires the cooperation of and coordination with other agencies, organizations, private interests, and individuals. Any significant changes to this management plan will be made with the involvement of our stakeholders.

The FWC formally solicited public comment and peer-review on the proposed delisting action of the bald eagle in Florida at several junctures of the delisting process and the writing of this management plan. Comment periods were noticed in the *Florida Administrative Weekly* to solicit: (1) information on the bald eagle's biological status to be considered during the development of the Biological Status Report for the Bald Eagle (Sullivan *et al.* 2006); (2) information on the management needs of the eagle and any economic, social, and ecological factors to consider as part of its management; and (3) public and stakeholder input on drafts of

the management plan. Public comments also were received following release of the Biological Status Report for the Bald Eagle in 2006, and at the September 2007 FWC Commission meeting when a draft of this Bald Eagle Management Plan and its associated rule changes were presented to the Commissioners and received conceptual approval. Following this meeting, the FWC created an “ad-hoc” committee of some of its most active bald eagle stakeholders, and this committee met several times into early 2008 to assist the FWC in resolving issues remaining with regulation and management of the state’s bald eagle population.

Five years following approval of this plan, the FWC and its stakeholders will re-evaluate the biological status of the bald eagle in Florida. If nest-monitoring data suggest that modification of guidelines for the regulation of land uses surrounding eagle nests may be appropriate, then this management plan will be revised accordingly.

TABLE OF CONTENTS

BALD EAGLE MANAGEMENT PLAN TEAM ii

EXECUTIVE SUMMARY iii

LIST OF FIGURES viii

LIST OF TABLES viii

GLOSSARY AND ACRONYMS ix

CHAPTER 1: BIOLOGICAL BACKGROUND 1

Distinguishing Characteristics 1

Taxonomy 1

Life History and Habitat 1

Breeding Behavior 1

Movements 2

Food 3

Longevity 3

Habitat 3

Distribution and Population Status 4

Historical Distribution 4

Population Trends 5

Current Distribution 6

Historic and Ongoing Conservation Efforts 8

CHAPTER 2: THREAT ASSESSMENT 10

Reasons for Delisting 10

Present and Anticipated Threats 10

Human-caused Threats 10

Natural Threats 11

CHAPTER 3: CONSERVATION GOAL AND OBJECTIVES 13

Conservation Goal 13

Conservation Objectives 13

CHAPTER 4: RECOMMENDED CONSERVATION ACTIONS 15

Strategies to Achieve the Conservation Objectives 15

Land Acquisition 16

Private Lands Incentives 17

Law Enforcement 19

Proposed Regulations 19

Permitting Framework April 2008 22

A. FWC Eagle Management Guidelines (Activities That Do Not Require a FWC Eagle Permit) 23

B. Activities That Do Not Require a FWC Eagle Permit if Federally Authorized 29

C. Activities That Require a FWC Eagle Permit 30

D. Activities That May Require a FWC Eagle Permit 32

Local Government Coordination 36

Monitoring Plan 38

Education and Outreach 41

Research 43

CHAPTER 5: IMPLEMENTATION STRATEGY 46

Priority Actions 46

Required Resources and Other Costs Associated with Implementation 47

Implementation Schedule..... 48

Management Plan Review and Revision..... 51

CHAPTER 6: ANTICIPATED IMPACTS 52

Economic Impacts..... 52

Social Impacts..... 52

Ecological Impacts 53

LITERATURE CITED 54

APPENDIX 1: LINKS TO ONLINE USFWS DOCUMENTS..... 58

APPENDIX 2: LIST OF FWC STAKEHOLDERS 59

LIST OF FIGURES

Figure 1. Distribution of bald eagle nests in Florida, 2005–20064
Figure 2. Number of bald eagle nesting territories in Florida, 1973–2007.....5
Figure 3. Location of bald eagle “core nesting areas” in Florida, 2005–20067
Figure 4. Process map for determining whether or not a FWC Eagle Permit would be recommended for a proposed activity near a bald eagle nest24

LIST OF TABLES

Table 1. Number of bald eagle nesting territories in the top 10 counties in Florida, 2004–2005 .. 7
Table 2. Landowner assistance programs that may be used to promote the conservation of bald eagles in Florida.....18
Table 3. The minimum allowed distances from an active or alternate bald eagle nest that a Category A or Category B activity can occur without the need for a FWC bald eagle permit.26

GLOSSARY AND ACRONYMS

Abandoned Nest: A bald eagle nest that is intact or partially intact but has been inactive through six or more consecutive nesting seasons. While the buffer zone surrounding the nest is no longer protected, the nest itself may not be altered. *Compare with Alternate Nest.*

Active Nest: A nest that shows or showed evidence of breeding by bald eagles, such as an adult attending the nest or in incubating position, a clutch of eggs, or a brood of nestlings, at any time during the current or most recent nesting season.

Active Territory: A bald eagle nesting territory that contains or contained an active nest at any time during the current or most recent nesting season.

Adaptive Management: A decision process that promotes flexible decision-making that can be adjusted as outcomes from management actions and other events are better understood. Adaptive management recognizes the importance of natural variability in contributing to ecological resilience and productivity. It is not a “trial and error” process, but rather emphasizes “learning while doing.”

Alternate Nest: A bald eagle nest that is intact or partially intact and has been used by bald eagles at any time during the past five nesting seasons, but that was not used during the current or most recent nesting season. An inactive nest is considered to be an alternate nest until it has been inactive for five consecutive nesting seasons, at which time it becomes an Abandoned Nest. Bald eagles often build multiple nests within their territory, but usually only one will be used for nesting in any given nesting season. *Compare with Abandoned Nest.*

Area of Occupancy: The smallest area of suitable habitats essential at any stage to the survival of bald eagles in Florida, based on the presumption that each active nesting territory contains 397–794 acres (1–2 km²). Based on 1,101 known active territories, the Area of Occupancy of bald eagles in Florida was estimated to be between 658 and 1,275 mi² in early 2005 (Sullivan *et al.* 2006, Figure 2). To qualify for listing as a species of special concern in Florida, a species must have an area of occupancy of <700 square miles. *See also Extent of Occurrence.*

Bald and Golden Eagle Protection Act: The federal law enacted in 1940 that now serves as the primary protection for bald eagles nationally now that the eagle has been removed from protection under the U.S. Endangered Species Act.

Bald Eagle Conservation Fund: A fund to be established between the FWC and the Wildlife Foundation of Florida to collect “monetary contributions” (conservation funds) from the issuing of FWC Eagle Permits to applicants whose projects impact buffer zones of active or alternate bald eagle nests. Each year, the amount charged will change by an amount equal to the annual Consumer Price Index for the Southeast region, and will be based on changes during the CPU calendar year (1 January–31 December). The appropriate change to the monetary contribution should take effect on 1 March of each year because the CPI

for the previous year is usually not available until mid-February. The contribution will be calculated based on the date that a completed application is received by FWC.

Breeding Productivity: The number of nestlings produced by an eagle pair or population. Nestlings should be surveyed just before they fledge. The recommended procedure for determining breeding productivity is to divide the number of nestlings produced by the number of active nesting territories. *Compare with Reproductive Success.*

Communal Roost: An area where bald eagles gather and perch overnight, or and sometimes during the day during inclement weather. Communal roosts are usually in large trees (alive or dead) that are close to foraging areas. Communal roosts are rare in Florida.

Conservation Measures: One or more actions provided by landowners to benefit bald eagles in exchange for a permit to conduct an activity within the buffer zone of an active or alternate bald eagle nest in Florida..

Core Nesting Area: One of 16 regions in Florida that contains a high density of bald eagle nesting territories (Figure 3, page 7). Together, the core areas support a majority of the state's known active nesting territories. The core nesting areas are numbered chronologically from the year of discovery and are located in the following regions: (1) lakes Lochloosa, Newnans, and Orange in Alachua County; (2) Lake George in Lake, Marion, Putnam, and Volusia counties; (3) the middle St. Johns River in Brevard, Seminole, and Volusia counties; (4) the Kissimmee chain of lakes in Osceola and Polk counties; (5) the Placida Peninsula in Charlotte and Sarasota counties; (6) the Harris chain of lakes in Lake, Marion, and Sumter counties; (7) the Lee County coast; (8) St. Vincent National Wildlife Refuge in Franklin County; (9) St. Marks National Wildlife Refuge in Wakulla County; (10) the Lower St. Johns River in Clay, Flagler, and St. Johns counties; (11) Rodman Reservoir in Marion and Putnam counties; (12) the central Gulf Coast in Citrus, Hernando, and Pasco counties; (13) central Polk County; (14) Lake Istokpoga in Highlands County; (15) the northeast shore of Lake Okeechobee in Martin and Okeechobee counties; and (16) coastal Charlotte County.

Development of Regional Impact: A development that is likely to have regional effects beyond the local government jurisdiction in which it is located.

Disturb: (as defined by USFWS (2007b): "To agitate or bother a bald or golden eagle to the degree that causes, or is likely to cause, based on the best scientific information available, 1) injury to an eagle, 2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or 3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior."

Endangered Species Act: The federal law enacted in 1973 that offered primary protection nationally to bald eagles. When the bald eagle was removed from the list of species protected under the Endangered Species Act on 8 August 2007, the Bald and Golden Eagle Protection Act became the primary protection to eagles nationwide.

Extent of Occurrence: The area contained within a minimum convex polygon encompassing all known nesting territories. Based on 1,101 known active territories, the Extent of Occurrence of bald eagles in Florida was estimated to be 52,979 mi² in early 2005 (Sullivan *et al.* 2006). To qualify for listing as a species of special concern in Florida, a species must have an extent of occurrence of <7,700 mi². *See also Area of Occupancy.*

Exterior Construction: All construction and related work for homes or other buildings, including roads, sewer and water lines, powerlines, fill, or excavation work.

F.A.C.: Florida Administrative Code.

Fledgling: A young eagle that is capable of flight and that has left the nest, usually at 10–12 weeks of age. Fledglings may return to the nest for several weeks to be fed or to roost. *Compare with Nestling.*

FWC: The Florida Fish and Wildlife Conservation Commission, the state agency legally mandated to protect and manage Florida's native wildlife resources.

FWC Eagle Permit: A permit issued by the FWC to allow for activities that would otherwise be prohibited by law, such as disturbance, nest removal, capture for rehabilitation, or scientific collection. Some activities require conservation measures to be conducted before a permit will be issued. Because the USFWS has yet to finalize its permitting process, the relationship between state and federal permits remains to be determined, but the need for duplicative permits will be minimized to the greatest extent possible.

Harass: *see Disturb.*

Harm: *see Disturb.*

Inactive Nest: A bald eagle nest that was not used during the current or most recent nesting season. *See Abandoned Nest and Alternate Nest.*

Inactive Territory: A bald eagle nesting territory that does not contain an active nest during the current or most recent nesting season.

Interior Construction: Any activity or related work for homes or other buildings that is carried out inside a building that has completed exterior walls, roof, windows, and doors.

Land Development Code: Any ordinance that regulates development.

Local Government: Any agency or governmental body including state agencies such as the Florida Department of Environmental Protection and the five water management districts.

Lost Nest: A nest that is no longer present from natural causes (*e.g.*, one that fell apart or was blown out of a tree). In some cases, the nest tree itself may be lost. The FWC recommendations in the section entitled Permitting Framework April 2008 section apply

to lost nests through two complete, consecutive nesting seasons. *Compare with Abandoned Nest.*

Nest: A structure of sticks created, modified, or used by bald eagles for reproduction, whether or not reproduction was successful. Most nests are in living trees, but some nests are built in snags, on communication towers or other artificial structures, or on the ground. Most eagle territories contain more than one nest; the average across the eagle's range is 1.5 nests/territory. *See also Abandoned Nest, Active Nest, Alternate Nest, Lost Nest, and Unknown Nest.*

Nesting Season: In Florida, the period 1 October–15 May, unless the young fledge before or after 15 May.

Nesting Success: *See Breeding Productivity and Reproductive Success.*

Nesting Territory: The area associated with one breeding pair of bald eagles and that contains one or more nests. In rare cases, a nesting territory may lack a nest at the time of the survey, as when the nest is destroyed by severe weather.

Nestling: A young eagle (eaglet) that is incapable of flight and that is dependent on its parents. Once an eaglet fledges (*i.e.*, leaves the nest), it becomes a fledgling.

Non-Injurious Disturbance: Persistent and intentional disturbance to disperse bald eagles from a site, such as an airport or a fish hatchery, without physical capture or direct handling, or by any means likely to cause injury.

Permanent Activity: Any activity expected to disturb bald eagles during two or more nesting seasons.

Reproductive Success: The number of fledglings produced annually by a bald eagle pair. *Compare with Breeding Productivity.*

Scientific Collection Permit: A permit issued for activities that include salvage, voucher, bird banding, wildlife possession, or special purpose. Applications must demonstrate a scientific or educational benefit for bald eagles, and must identify the purpose, scope, objective, methodology, location, and duration of the project.

Similar scope: A measure comparing activities near bald eagle nests. An existing activity near a bald eagle nest is of similar scope to a proposed activity, when the project is similar in nature, size, and use.

Site Work: Construction activities such as land clearing or road building that precede construction of homes or other building.

Successful Nest: A bald eagle nest that produces at least one fledgling.

“Take” (as defined in 68A-1.004 F.A.C.): “Taking, attempting to take, pursuing, hunting, molesting, capturing, or killing any wildlife or freshwater fish, or their nests or eggs by any means whether or not such actions result in obtaining possession of such wildlife or freshwater fish or their nests or eggs.”

Temporary Activity: 1) Outside the nesting season: any activity that will leave no permanent structure or have any permanent effect. 2) During the nesting season: any activity expected to disturb bald eagles during only one nesting season.

Unknown Nest: A bald eagle nest that was surveyed (usually only once) during the current or most recent nesting season, but that its status could not be determined.

U.S.C.: United States Code.

USFWS: The United States Fish and Wildlife Service, the federal agency mandated to protect and manage the nation’s native wildlife resources.

CHAPTER 1: BIOLOGICAL BACKGROUND

The bald eagle (*Haliaeetus leucocephalus*) is the symbol of the United States and one of North America's most spectacular birds. It is also one of the most thoroughly studied birds, with perhaps 2,500 articles published on its biology or management (Buehler 2000). This chapter summarizes some aspects of the bald eagle's biology, primarily in Florida. Detailed information on the biology of bald eagles throughout their range is found in Stalmaster (1987), Gerrard and Bortolotti (1988), and Buehler (2000).

Distinguishing Characteristics

The bald eagle is the largest raptor (bird of prey) that occurs in North America, ranging from 28 to 38 inches in length and with a wingspan from 66 to 96 inches. The largest eagles are found in Alaska and the smallest occur in the southern United States and Mexico (Buehler 2000). The sexes are indistinguishable by plumage, but females are as much as 25% larger than males. Adults are dark brown with a white head and tail. The eyes, bill, legs, and feet are yellow. Juveniles are dark brown overall with white mottling on the belly, tail, and underwings. The eyes are dark brown and the bill is gray to black. The plumage of sub-adults is highly variable, according to age, with a decreasing amount of white on the body and an increasing amount of white on the head and tail attained with each successive molt. The eyes and bill turn yellow during the eagle's fourth year, and full adult plumage is attained during the bird's fifth or (usually) sixth year (Buehler 2000).

Taxonomy

The bald eagle is a member of the family Accipitridae and the order Falconiformes. It is one of eight members of the genus *Haliaeetus*, which is from the Greek and means *sea eagle*; the bald eagle's full scientific name means *white-headed sea eagle*. The bald eagle is the only member of its genus that occurs regularly in North America. Two other species, the white-tailed eagle (*H. albicilla*) of Eurasia and the Steller's sea-eagle (*H. pelagicus*) of Asia, have strayed to the United States, and the white-tailed eagle has bred in Alaska (AOU 1998). Fossil evidence of bald eagles dates back at least one million years and comes from several sites, including three from Florida (Buehler 2000). Two subspecies are recognized by some ornithologists, the larger *H. l. alascanus* breeding north of 40° N latitude and the smaller *H. l. leucocephalus* to the south. However, the bald eagle may have no subspecies, with its size and mass differences merely representing a decrease along a north-to-south gradient (Curnutt 1996, Buehler 2000). The only other eagle that occurs regularly in North America is the golden eagle (*Aquila chrysaetos*), which in Florida is a rare non-breeding winter resident, primarily of the panhandle (Stevenson and Anderson 1994).

Life History and Habitat

Breeding Behavior

Bald eagles are highly social outside of the nesting season, but are extremely territorial when nesting. They are capable of breeding in their fourth year, while still in sub-adult plumage, but may not breed until their sixth or seventh year where breeding competition is intense (Buehler

2000). Bald eagles are thought to be monogamous, with pair bonds persisting for several years, but this is largely unproven. Eagles are single-brooded, although pairs may renest if the first clutch is lost.

Bald eagles in Florida begin nest building or nest maintenance activities in late September or early October. The nesting season is prolonged, with egg-laying beginning as early as October or as late as April (later nests are mostly renesting attempts; Millsap *et al.* 2004). For purposes of this management plan, the bald eagle nesting season is defined as the period 1 October–15 May. Nest sites tend to be built near habitat edges (McEwan and Hirth 1980) in a living tree that offers a view of the surrounding area and that can support the eagle's often sizeable nest. Substrates used in Florida vary according to local conditions, and include pines (*Pinus palustris* and *P. elliottii*), cypress (*Taxodium* spp.), mangroves (*Avicennia germinans* and *Rhizophora mangle*), great blue heron (*Ardea herodias*) nests, artificial structures such as communication towers, transmission towers, and raptor nesting platforms, and even—very rarely—on the ground (Broley 1947, Shea *et al.* 1979, Curnutt and Robertson 1994, Curnutt 1996, Millsap *et al.* 2004). However, bald eagles in Florida strongly prefer living native pines to all other substrates; 75% of all eagle nests surveyed during 2006 were built in living native pines (FWC unpublished data).

The bald eagle nesting season in Florida is defined as 1 October–15 May.

Nearly all bald eagle nests in Florida are built within 1.8 miles of water (Wood *et al.* 1989). Territory size varies depending on habitat and prey density but is thought to encompass 0.6–1.2 square miles (Buehler 2000). Bald eagle nests are spaced apart to ensure sufficient food resources for nestlings and to raise young with minimal disturbance from other eagles. Eagle pairs often build more than one nest, which allows them to move to an alternate nest while remaining in their territory. Throughout their range, eagles maintain an average of 1.5 nests per territory, ranging from one nest to five nests (Stalmaster 1987, Buehler 2000).

Bald eagles in Florida strongly prefer live, native pines to all other nesting substrates.

Most clutches of eggs in Florida are laid between December and early January. Mean clutch size throughout the bald eagle's range is 1.87 eggs, with most nests containing two eggs. Incubation lasts about 35 days. Average brood size in Florida is 1.56 nestlings per nest (FWC unpublished data). Nestlings in Florida fledge at around 11 weeks of age and remain with their parents near the nest for an additional 4–11 weeks (Wood 1992, Wood *et al.* 1998). Fledglings begin widespread local movements before initial dispersal, which occurs from April to July (Millsap *et al.* 2004). Based on a sample of 18,838 nests in Florida during 1973–2004, average annual breeding productivity was 70.6%, ranging from 52.2% in 1974 to 82.7% in 1996 (Nesbitt 2005). Average reproductive success during 1973–2004 was 1.16 fledglings for all nests and 1.54 fledglings per successful nest.

Movements

Most of Florida's breeding bald eagles, especially those nesting in the extreme southern peninsula, remain in the state year-round, but most sub-adults and non-breeding adults migrate out of Florida (Stevenson and Anderson 1994, Curnutt 1996, Mojica 2006). Eagles migrate

northward between April and August and return southward from late July through late December. Juveniles migrate northward later than older sub-adults (Broley 1947, Wood and Collopy 1995, Mojica 2006). Most juveniles disperse at about 128 days of age and spend their first summer as far north as Newfoundland, with peak numbers summering around Chesapeake Bay and the coastal plain of North Carolina (Broley 1947, Millsap *et al.* 2004, Mojica 2006). Florida's bald eagles use three migration flyways—the Atlantic coast, Appalachian Mountains, and the Mississippi River valley—with equal frequency, and they use stopover sites for resting or foraging (Mojica 2006). Eagles also exhibit nomadic wandering, mostly by sub-adults. Northern-breeding *alascanus* bald eagles winter in Florida at least occasionally (Stevenson and Anderson 1994).

Food

Bald eagles are opportunistic foragers, feeding or scavenging on a wide variety of prey. Primary prey of eagles in Florida includes various fish and waterfowl species. Prey from one study in north-central Florida was composed of 78% fish (mostly catfish, especially brown bullhead; *Ictalurus nebulosus*), 17% birds (mainly American coot; *Fulica americana*), 3% mammals, and 1% amphibians and reptiles combined (McEwan and Hirth 1980). Most prey is captured from the surface of the water, but bald eagles often harass ospreys (*Pandion haliaetus*) in flight to drop fish that they have captured. Bald eagles in Florida often scavenge carcasses along roadways or garbage at landfills (Millsap *et al.* 2004).

Longevity

The record lifespan for a bald eagle in the wild is 28 years. Eagles follow a pattern typical of raptors, with lower juvenile survival followed by increasing survival to adulthood (Buehler 2000, Millsap *et al.* 2004).

Habitat

Throughout their range, bald eagles use forested habitats for nesting and roosting, and expanses of shallow fresh or salt water for foraging. Nesting habitat generally consists of densely forested areas of mature trees that are isolated from human disturbance (Buehler 2000). Daytime roosts are generally in “super-canopy” trees adjacent to shorelines, and are typically located away from human disturbance (Buehler 2000). Communal roosts, which are rare in Florida, are located within three miles of water (Mojica 2006). The quality of foraging habitat is characterized by the diversity, abundance, and vulnerability of eagle prey, the structure of the aquatic habitat (*e.g.*, presence of shallow water), and the extent of human disturbance (Buehler 2000). Bald eagle nesting habitats are protected by law, but little or no emphasis has yet been placed on the preservation of roosting or foraging habitats (Mojica 2006). The greatest numbers of bald eagle nesting territories in Florida are found along the Gulf coast and around some of the larger inland lakes and river systems in the peninsula (Figure 1).

Bald eagles use forested habitats for nesting and roosting, and expanses of shallow fresh or salt water for foraging.

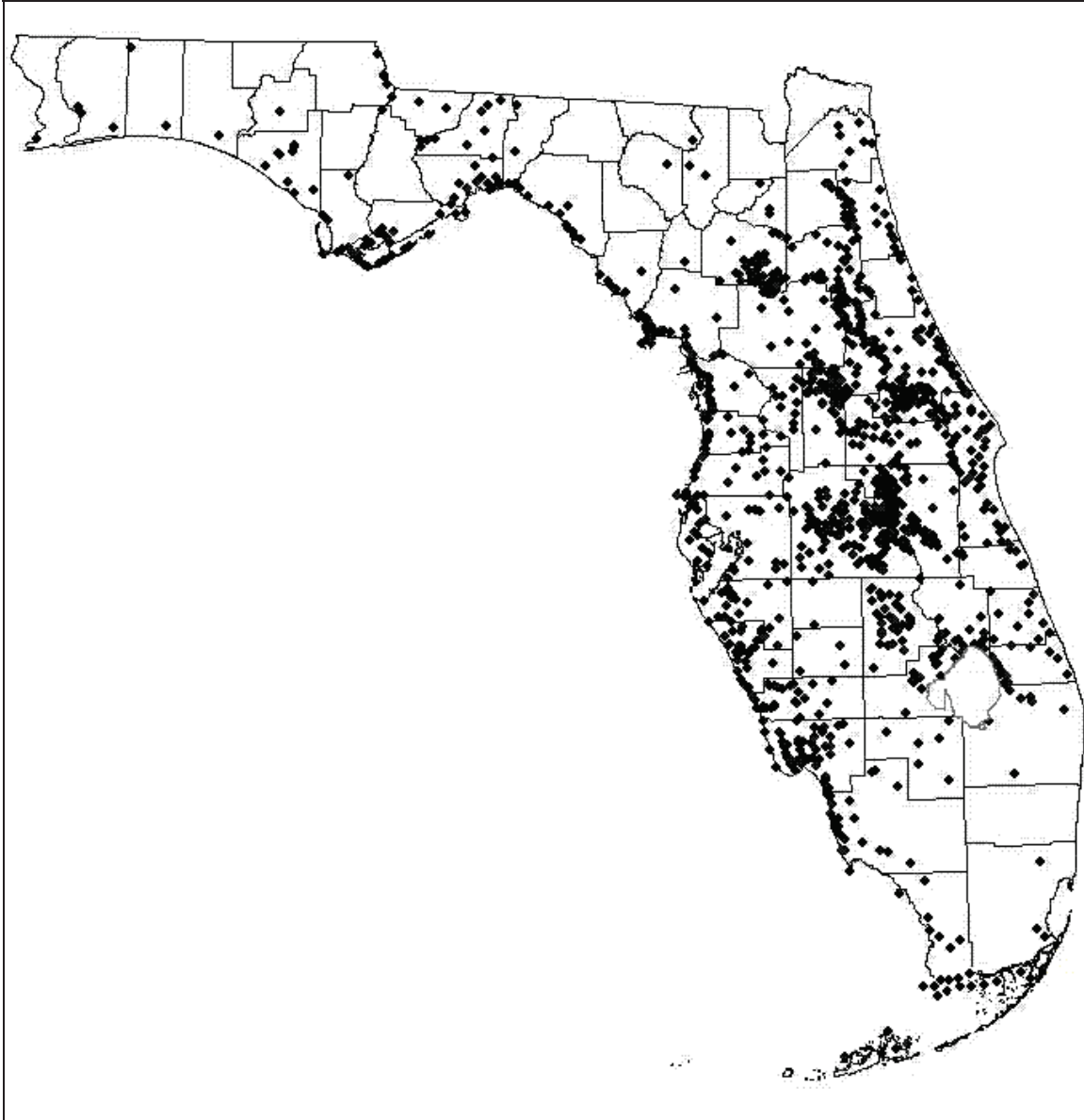


Figure 1. The distribution of active bald eagle nesting territories in Florida, 2005–2006.

Distribution and Population Status

Historical Distribution

Bald eagles formerly bred from central Alaska and the Maritime Provinces south to Baja California and Florida. It is widely believed that eagles were abundant in areas with high quality forested and aquatic habitats, both coastally and inland. In Florida, the eagle was called “abundant” (Bailey 1925) and “common” (Howell 1932) during the early 20th century. The size of Florida’s historic bald eagle population is unknown but it “must have been well in excess of

1,000 nesting pairs,” with numbers around Tampa Bay and Merritt Island thought to be “among the densest breeding concentrations of a large raptor known anywhere on earth” (Peterson and Robertson 1978).

Population Trends

The continental eagle population began to decline during the 18th century from loss of breeding habitat and from direct persecution—more than 128,000 bald eagles were shot in Alaska between 1917 and 1952 (Buehler 2000). The population decline intensified during the mid-20th century with widespread use of DDT compounding the continuing losses from habitat destruction and direct persecution. DDT is an organochlorine pesticide that was widely used in agriculture and mosquito control beginning in the 1940s.

Widespread use of DDT was banned in the United States in 1972, partially because it

disrupted calcium metabolism in raptors. This calcium reduction resulted in eggshells that ruptured during incubation, causing significant and widespread reproductive failure in bald eagles and other raptors (Stalmaster 1987, Buehler 2000). Broley (1950) documented “heavy nesting failures” of eagles in Florida, and Cruickshank (1980) wrote of their “alarming decrease” and near-extirpation as a breeding species in Brevard County after 1950.

Substantial recovery of the bald eagle, continentally and in Florida, began in the 1970s, following the banning of DDT and a reduction in persecution brought on in part by passage of the U.S. Endangered Species Act of 1973. The Florida eagle population has increased greatly since statewide breeding season surveys began in 1972–1973, and especially since the early 1990s (Figure 2). The federal recovery plan for bald eagles in the southeastern states (USFWS 1989) established a “recommended recovery level” for Florida of 1,000 nesting territories, an average of 0.9 fledglings per active nest and ≥ 1.5 fledglings per successful nest, and $\geq 50\%$ breeding productivity. Eagles in Florida have exceeded each of these parameters for the past 20 years (Nesbitt 2005). One reason for the recovery of the eagle in Florida has been the continued availability of appropriate nesting and foraging habitats, thought to be the result of adherence to management guidelines for construction activities near eagle nests (Nesbitt *et al.* in review).

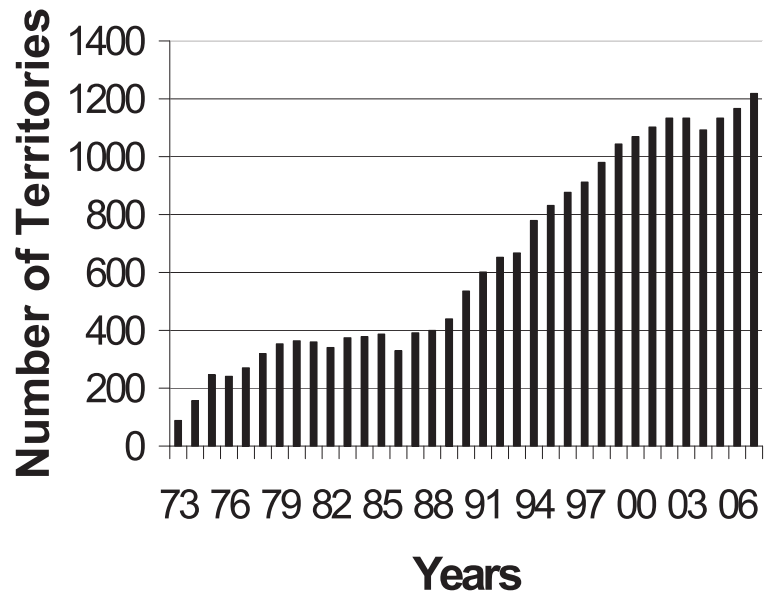


Figure 2. The number of bald eagle nesting territories in Florida, 1973–2007.

By 1997, Florida's bald eagle population was thought to exceed 4000 individuals, including sub-adults and other non-breeders (Buehler 2000). The increase in the breeding population appears to have slowed recently, from 1,043 nesting territories in early 1999 to 1,218 territories in early 2007 (Nesbitt 2005, Figure 2). The actual number of territories present in Florida is not known; the USFWS will conduct a survey in Florida in 2009 to determine the proportion of nests that are undetected during annual surveys. The Biological Status Report for the Bald Eagle (Sullivan *et al.* 2006) reported that "recent studies indicate 24% of bald eagle nests go undetected" and that "based on this correction factor, it is estimated there were 1,405 active nests in Florida in 2005." However, the analysis on which this figure was based was flawed (M. Otto, pers. comm.). A new analysis is currently being conducted at Patuxent Wildlife Research Center to develop an accurate estimate of the number of nests.

The apparent slower growth of the number of bald eagle nesting territories in Florida since 1999 (Figure 2) may suggest that eagles are reaching their current carrying capacity in the state. If this is the case, then a slight population decline in the future might eventually be expected as the population adjusts to carrying capacity. However, because carrying capacity diminishes with habitat loss, it may be difficult to distinguish a decline caused by habitat loss from a decline due to an adjustment of carrying capacity.

Current Distribution

Bald eagles reclaimed their entire historic range by the late 1990s (Buehler 2000). Recovery in the Lower 48 states has been dramatic, increasing from an estimated 417 pairs in 1963 to an estimated 9,789 pairs by 2007 (USFWS 2007a). Bald eagles have met or exceeded the population goals established in all five regional recovery plans, and on 8 August 2007, the USFWS removed the species from the list of federally endangered and threatened species.

Bald eagles were known to breed in 59 of Florida's 67 counties by 2005, the exceptions being Baker, Broward, Calhoun, Gilchrist, Holmes, Lafayette, Madison, and Nassau (Nesbitt 2005; Figure 1). Most nests are found on privately-owned lands (67% in 2003; Nesbitt *et al.* in review; unpublished GIS data), underscoring the importance of private lands in the conservation of eagles in Florida. The growth of the state's eagle population during the 1990s, when the human population grew at a high rate, shows that bald eagle populations can flourish even when faced with development pressures, if appropriate habitat protections are in place.

Bald eagles were breeding in 59 of Florida's 67 counties by 2005.

Concentrations of nesting territories are clustered around several significant wetland systems. The FWC has identified 16 areas of concentrated bald eagle nesting activity that contain a majority of the known nesting territories in Florida (Figure 3, Table 1). Many of these "core nesting areas" have persisted for decades, suggesting the presence of high-quality breeding and foraging habitats (Nesbitt *et al.* in review). These core nesting areas are located along the Gulf coast from St. Vincent Island to Lee County, and inland from the lower St. Johns River to Lake Okeechobee (Figure 3). Changes in the size, configuration, and location of these core nesting areas are monitored, and their importance to the overall population of bald eagles in Florida will be determined as new data become available.

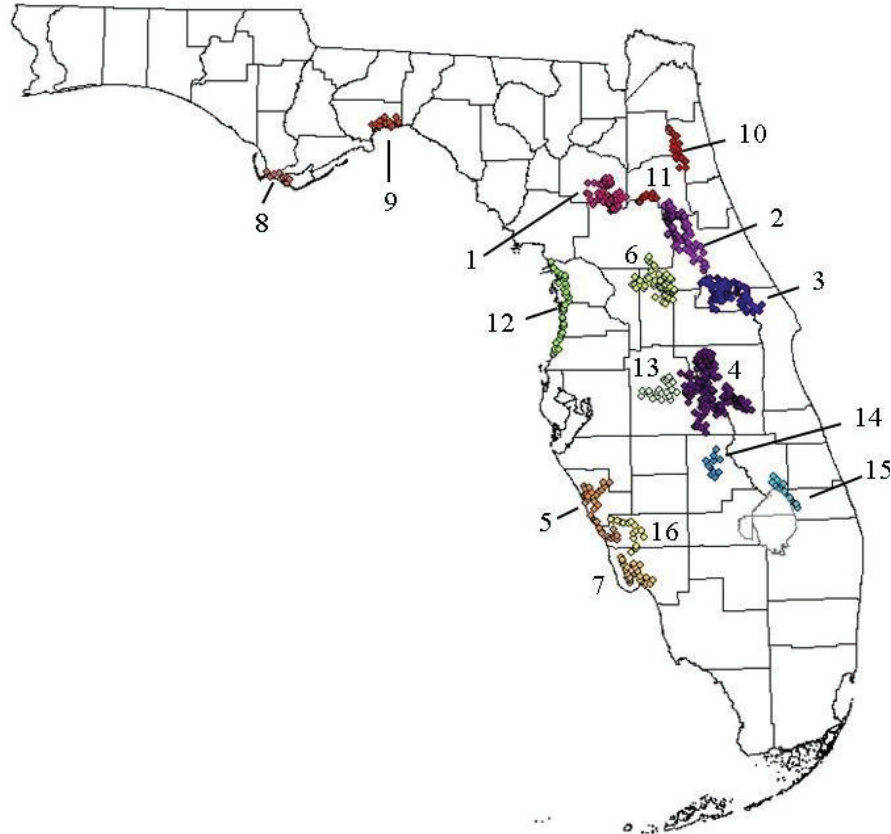


Figure 3. Location of bald eagle core nesting areas in Florida, 2005–2006. These core nesting areas, which are numbered chronologically from their discovery, are found in the following sites: (1) lakes Lochloosa, Newnans, and Orange; (2) Lake George; (3) the middle St. Johns River; (4) the Kissimmee chain of lakes; (5) the Placida Peninsula; (6) the Harris chain of lakes; (7) the Lee County coast; (8) St. Vincent National Wildlife Refuge; (9) St. Marks National Wildlife Refuge; (10) the lower St. Johns River; (11) Rodman Reservoir; (12) the central Gulf coast; (13) central Polk County; (14) Lake Istokpoga; (15) northeast Lake Okeechobee; and (16) coastal Charlotte County.

Table 1. The number of bald eagle nesting territories in the top 10 counties in Florida, 2004–2005. Data source is Nesbitt (2005).

County	Territories	County	Territories
Osceola	113	Seminole	45
Polk	112	Lee	42
Volusia	68	Brevard	41
Lake	63	Monroe	40
Putnam	56	Alachua	39

Historic and Ongoing Conservation Efforts

Substantial monitoring, management, and research activities have been conducted on Florida's bald eagles for more than 60 years, and many journal articles and reports have been produced. Since the 1972–1973 nesting season, all known nesting territories are monitored annually by use of aircraft to determine reproductive parameters such as territory occupancy, brood size, breeding productivity, and reproductive success. Eggs laid by eagles in Florida were used to successfully reestablish populations in other states during the 1970s and 1980s (Nesbitt and Collopy 1985). Wildlife rehabilitation centers in Florida have successfully treated and released hundreds of sick or injured bald eagles, while eagles with permanent injuries have provided opportunities for public education, lobbying, and fund-raising. Many of these conservation activities are anticipated to continue following delisting.

Several federal and state laws have directly or indirectly protected bald eagles. The most important laws include the federal Migratory Bird Treaty Act, the federal Bald and Golden Eagle Protection Act, and the federal Endangered Species Act, as well as state regulations noted in this document. The bald eagle was first protected nationally in 1918 under the Migratory Bird Treaty Act (16 U.S.C. 703–711), which protected nearly all native birds and their nests. The Bald and Golden Eagle Protection Act of 1940 (16 U.S.C. 668a–668c) offered additional protection against take and disturbance of bald eagles and their nests. In 1972, the U.S. Environmental Protection Agency banned all domestic use of DDT, and this prohibition allowed bald eagle populations to recover from pesticide poisoning. The following year, the Endangered Species Act of 1973 (16 U.S.C. 1531–1544) was passed, and the bald eagle was added to the list of federally endangered and threatened species in 1978.

Bald eagle nesting habitats in Florida have been protected primarily through the Endangered Species Act in accordance with habitat management guidelines in the southeastern United States (USFWS 1987). These federal guidelines created buffers around eagle nests in which activities such as development or logging were restricted. Two buffer zones were recommended: a primary zone (0 to 750–1500 feet from the nest) and a secondary zone (1,500 feet to one mile beyond the end of the primary zone). Recently, the USFWS (2007b) published new federal guidelines that recommend a buffer zone that extends up to 660 feet from the nest depending upon whether a visual screen of vegetation exists around the nest, and the presence of existing activities in the vicinity of the nest, with additional recommendations for proposed activities occurring during the nesting season.

Florida also had state regulations that protected the bald eagle. The eagle was listed as threatened and therefore received protections afforded it by Rule 68A-27.004 of the Florida Administrative Code (F.A.C.), which prohibited the non-permitted take or harassment of eagles or their nests. There are local and state regulations tied to the listing category of a species. The Florida Land and Water Management Act of 1972 indirectly protected some eagle habitats by establishing two state programs: Development of Regional Impact and Area of Critical State Concern. The Area of Critical State Concern Program regulates development in areas of regional or statewide natural significance, such as Apalachicola Bay, the Green Swamp, Big Cypress Swamp, and the Florida Keys. The bald eagle is listed as a species of “greatest conservation need” in the Florida Comprehensive Wildlife Conservation Strategy (FWC 2005). This is not a legal designation but

rather makes conservation work on the bald eagle eligible to receive State Wildlife Grant funds to address the need for continued management and monitoring activities.

State water management districts and local governments provided additional layers of protection for bald eagles. Local regulations emphasize listed species (endangered, threatened, or species of special concern) and their habitats when considering comprehensive planning, zoning, development review, and permitting activities. Prioritization of listed species, requirements for surveys and documentation, increased buffer zones, protection of upland habitats, additional mitigation requirements, more intensive levels of review, and coordination and compliance with appropriate federal and state wildlife agencies are some of the procedures that local governments and state wildlife agencies apply to listed species.

During 2006, the USFWS proposed removing the bald eagle from the list of federally endangered and threatened species, and this action was finalized in August 2007. Although the bald eagle is no longer protected under the Endangered Species Act, it is still protected under the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act. The USFWS (2007b) has redefined some of the terminology included in the Bald and Golden Eagle Protection Act, which prohibits the unpermitted “take” of bald eagles, including their nests or eggs. The act defines “take” to mean to “pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb” an eagle. The new definition of “disturb” is to “agitate or bother a bald or golden eagle to the degree that causes, or is likely to cause, based on the best scientific information available, 1) injury to an eagle, 2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or 3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior” (USFWS 2007b). This management plan adopts the federal definition of “disturb” in 50 C.F.R. § 22.3 and Florida’s definition of “take” in Rule 68A-1.004, F.A.C.

CHAPTER 2: THREAT ASSESSMENT

Reasons for Delisting

In response to a petition filed in 2002, the FWC convened a panel to review the biological status of the bald eagle in Florida (Sullivan *et al.* 2006). The panel concluded that bald eagles in Florida did not meet the criteria for listing at any level and had not met the criteria for the previous five years. Consequently, the panel unanimously recommended that the bald eagle be removed from Florida's list of imperiled species. This decision was based on the following facts: (1) the bald eagle population occurs throughout Florida; (2) the population has not experienced extreme fluctuations in range or numbers; (3) the estimated number of adults had increased >300% during the past three eagle generations (defined here as a total of 24 years); and (4) the population is not projected to experience significant declines over the next 24 years (Sullivan *et al.* 2006).

Present and Anticipated Threats

Threats to the bald eagle in Florida include both natural and human-related causes that individually or in combination could cause reductions in reproductive or survival rates. This section highlights the most serious threats known to impact bald eagles in Florida currently, as well as a few threats that may potentially affect Florida's eagles in the future. This section emphasizes human-caused threats, which are more likely to be controlled via a management plan. Some sources of eagle mortality in Florida—natural as well as human-caused—have no clear remedy. Forrester and Spalding (2003) is an excellent reference for causes of injury and mortality to Florida's eagles. Other than intraspecific aggression, most natural mortalities probably go undetected. Human-related mortality is known from sick or injured eagles or eagle carcasses examined by the National Human Health Center, eagles brought to Audubon's Center for Birds of Prey, or other veterinary or rehabilitation centers (Forrester and Spalding 2003), as well as recent radio-telemetry studies of eagles in the wild (*e.g.*, Millsap *et al.* 2004, Mojica 2006).

The greatest cause of documented mortality to bald eagles in Florida during 1963–1994 was trauma, representing 59% of diagnosed mortalities (Forrester and Spalding 2003). Other causes of eagle mortality were electrocution (16%), poisoning (10%), infectious diseases (6%), emaciation (4%), and other (2%). Among 182 eagle deaths from trauma, vehicle collision accounted for 44%, gunshot 10%, intraspecific aggression 7%, powerline collision 4%, six other causes accounted for a total of 9%, and the causes of 26% of deaths were unknown (Forrester and Spalding 2003).

Human-caused Threats

Although the bald eagle population has grown concurrently with the growth of the human population in Florida, the continued conversion of nesting or foraging habitats to development can be expected to reduce the amount and quality of eagle habitats. Some of the most intense development pressure in peninsular Florida is occurring along the shores of large inland lakes that support core nesting areas (Figure 3), such as Lake Tohopekaliga in Osceola County.

Some eagles in Florida have shown great tolerance for nesting in suburban or urban areas—in some cases even establishing new territories in these habitats (Millsap *et al.* 2004). In one study, survival rates were similar for juveniles from rural and suburban nests, however mortality of those from suburban areas was almost always a result of direct or indirect human interactions while no mortality of rural birds were known to be associated with human interactions. Bald eagles raised in suburban habitats seem to become acclimated to human-related landscape features and do not regard these features with the same amount of caution that is shown by eagles raised from rural nests (Millsap *et al.* 2004). Nevertheless, more research is needed to determine effects of human activities in close proximity to eagle nests (Millsap *et al.* 2004).

Bald eagles often scavenge road-kills along roadways and are therefore susceptible to being struck by vehicles. Collision with motor vehicles represents the most frequent cause of documented eagle mortality in Florida, representing 19–44% of all eagles' deaths due to trauma, 1963–1994 and 1997–2001 (Forrester and Spalding 2003, Millsap *et al.* 2004).

Although protected from direct persecution for more than 50 years, bald eagles are occasionally still shot in Florida. Audubon's Birds of Prey Center received seven bald eagles with gunshot wounds during 2001–2006 (L. White, pers. comm.).

Powerlines cause eagle mortality in two ways, by electrocution and collision. Powerlines accounted for 19% of the mortality of bald eagles in Florida during 1963–1994, with electrocution representing more than 86% of this total (Forrester and Spalding 2003). Power companies in Florida have not yet retrofitted older distribution lines with modern features to reduce the incidence of eagle electrocutions.

The deaths of 19 bald eagles in Florida during 1973–1994 were attributed to lead poisoning, which usually affects eagles after they feed on waterfowl imbedded with lead shot. The use of lead shot for waterfowl hunting was banned in 1991. Pentobarbital poisoning of eagles occurs mostly at landfills, where eagles feed on the carcasses of euthanized animals, such as from a veterinary clinic or animal shelter. Forrester and Spalding (2003) discussed eight such eagle deaths in Florida, mostly at landfills. Bald eagles that breed in Florida forage heavily at landfills throughout the eastern United States, and are therefore exposed to this threat over a wide area (Millsap *et al.* 2004). Mercury contamination is another threat to eagles, although no known mortality has occurred (Forrester and Spalding 2003). However, the bioaccumulation of mercury in fish ingested by eagles suggests that sub-lethal effects will continue to be a potential threat.

Natural Threats

Bald eagles are extremely territorial when establishing or defending their nesting territories and may be badly injured or even killed during territorial battles. Intraspecific aggression accounts for 7% of documented eagle mortality in the state (Forrester and Spalding 2003). Along with food availability and inclement weather, intraspecific aggression is thought to be one of the primary regulators of eagle populations where human interactions are limited, especially in areas that are close to their carrying capacity (Buehler 2000). Mortality from intraspecific aggression may be expected to increase as Florida's eagle population approaches carrying capacity.

Hurricanes and other severe storms can damage or blow down eagle nests or nest trees, and storms that occur during the eagle nesting season can break eggs or kill nestlings. Forrester and Spalding (2003) detail several instances of storm-related mortality of bald eagles in Florida. Nesbitt (2005) determined that more than one-third of all eagle nesting territories monitored in Florida during 2004–2005 were within the paths of Hurricanes *Charley*, *Frances*, and *Jeanne*. Although there was significant local damage (*e.g.*, five of the six nests in DeSoto County were destroyed), overall effects of the storms were minimal. Fewer than 10% of the nests within the paths of the storms showed any lasting impacts, and most destroyed nests were rebuilt in the same or a nearby tree within weeks (Nesbitt 2005). Nevertheless, the loss of trees large enough to support eagle nests may cause local shortages of nesting sites in developed areas, where such trees may be scarce. Meteorologists are warning that we have recently entered a 25- to 50-year cycle of greater hurricane activity and intensity (Landsea *et al.* 1996), and, coupled with anticipated longer-term climate change associated with global warming (McCarthy *et al.* 2001), inclement weather may in the future have a greater impact on Florida's bald eagle population.

Forrester and Spalding (2003) list 112 diseases or parasites that have been found on or in the bodies of bald eagles in Florida. Most parasites are not lethal, but several infectious diseases have been implicated in the deaths of bald eagles. One suburban-raised eagle fledgling from Florida died from a chlamydial infection that was most likely transmitted by non-native monk parakeets (*Myiopsitta monachus*) that built their nest at the bottom of the eagle's nest (Millsap *et al.* 2004). Avian vacuolar myelinopathy (AVM) is a recently discovered neurological disease that attacked bald eagles and American coots in Arkansas during 1994. It has since been implicated in more than 100 bald eagle deaths in Georgia, North Carolina, and South Carolina (Wilde *et al.* 2005). AVM has yet to be detected in Florida, but it may eventually spread here, or Florida's eagles may contract the disease while summering out of state. West Nile virus colonized much of the continental United States within a few years of its discovery in 1999, and has been documented in 285 species of birds in North America, including bald eagles (Centers for Disease Control and Prevention 2006). However, the degree to which West Nile virus is a threat to Florida's eagles is unknown. Likewise, avian influenza is another potential threat to Florida's eagles.

CHAPTER 3: CONSERVATION GOAL AND OBJECTIVES

Conservation Goal

The goal of this management plan is to establish conservation actions that will maintain a stable or increasing population of bald eagles in Florida in perpetuity. To achieve this goal, a decline of 10% of the number of eagle nesting territories in Florida over a period of 24 years (three eagle generations) must be prevented through science-based management, regulations, public education, and law enforcement. The FWC anticipates that without continued protection of eagle nesting habitats, the number of nesting territories in Florida could decline by 10% or more over the next 24 years, which could trigger a relisting effort. The FWC has therefore set a conservation goal for bald eagles that is higher than the minimum threshold to avoid a need for relisting.

The data for the conservation objectives are from the annual nest surveys conducted by FWC biologists for the past 35 years.

Conservation Objectives

Conservation objectives are benchmarks used to measure progress toward the conservation goal. The following conservation objectives have been met or exceeded in Florida, and maintaining these objectives will help to ensure that the conservation goal is sustained. Annual nest surveys conducted by FWC biologists since 1972 provide the data used to establish the following objectives. Determining annual reproductive success will provide the information needed to monitor the population and to measure the success of the objectives. The FWC listing process has five criteria—three based on population size or trend, one on geographic range, and one on quantitative analysis of the probability of extinction (see Sullivan *et al.* 2006). The first three conservation objectives below provide a means by which changes in population size or trend can be detected, while the fourth objective is intended to ensure that the bald eagle maintains its current geographic distribution. Maintaining a stable or increasing population of eagles throughout their current distribution will ensure a healthy bald eagle population in Florida, and will prevent the need to relist eagles under FWC's imperiled-species regulations. The following conservation objectives will be calculated annually from five-year running averages, beginning with data collected during the period 2002–2006. We use five-year averages to avoid the possibility that one or two years of poor reproductive success might trigger a relisting effort. These numbers are subject to revision based on changes in monitoring data and/or methods.

1. Maintain a minimum of 1020 active territories per year over the next 24 years (i.e., through 2032).

The listing criterion that seems most likely to trigger a future listing petition for the bald eagle in Florida is Criterion C: Small Population with Compounding Problems. To trigger this criterion, a species must be below the threshold of 10,000 mature individuals **and** must meet one of two possible sub-criteria, more likely sub-criterion C1 (a 10% decline over three generations). The Biological Status Report for the Bald Eagle (Sullivan *et al.* 2006)

The conservation objectives will be calculated annually from five-year running averages of bald eagle population data.

defined 8–12 years as the length of one bald eagle generation. The FWC believes that it is acceptable to use eight years as the generation length, as this number is compatible with USFWS's Draft Post-delisting Monitoring Plan (2007c). The Biological Status Report estimated that the population in Florida numbered 3,372 mature individuals during 2005. That same year, there were 1,133 active bald eagle nesting territories in the state (Nesbitt 2005), so Florida must maintain a breeding population of ≥ 1020 nesting territories (*i.e.*, 90% of 1,133) to avoid triggering sub-criterion C1 of the listing process.

2. Maintain an average of 68% of the active territories producing ≥ 1 nestling per year.

Because bald eagles require 4–5 years to reach sexual maturity, it is important to monitor breeding productivity to determine potential future impacts to the population. A decrease in reproduction may provide an early warning for a pending population decline. The value of 68% represents the current five-year average of bald eagle nesting territories in Florida producing ≥ 1 nestling per year. As it appears that the eagle population has slowed its increase since 2000, it is appropriate to use the most recent five-year average available (2002-2006) of breeding productivity as the benchmark, since this level has resulted in an apparently stable population.

3. Maintain an average reproductive success of ≥ 1.5 fledglings per active nest over five years.

Since FWC surveys began in 1972, reproductive success of bald eagles in Florida has averaged 1.54 fledglings per active nest. Five-year running averages were calculated for all survey years, and fledgling production never dropped below 1.5 fledglings per nest, so this number was chosen to ensure a stable population.

4. Maintain the current area of occupancy ($>770 \text{ mi}^2$) and extent of occurrence (52,979 mi^2) of bald eagles statewide.

Maintaining the current area of occupancy and extent of occurrence of bald eagles statewide will help maintain a stable or increasing population. Further, the Biological Status Report (Sullivan *et al.* 2006) indicated that bald eagles in Florida may be near the threshold for listing as a species of special concern, based on which figure is used for the Area of Occupancy. While this criterion can be triggered only in combination with two sub-criteria, the FWC believes that the prudent benchmark is to maintain an area of occupancy in excess of the threshold, as calculated in the Biological Status Report (Sullivan *et al.* 2006).

CHAPTER 4: RECOMMENDED CONSERVATION ACTIONS

Strategies to Achieve the Conservation Objectives

This chapter describes the strategies to be undertaken to maintain Florida's bald eagle population at or above the levels specified by the conservation objectives. Virtually all of the conservation actions address each of the objectives. These actions are best accomplished by using an adaptive management approach that allows for adjustments to policies, guidelines, and techniques based on science and observed responses to implemented conservation measures. New biological information will be used to adjust bald eagle conservation actions as it becomes available. The FWC will monitor the eagle population and will study the effects of human activities near eagle nests. Results of this research will be evaluated and the FWC will propose adjustments in regulations, minimization, and conservation measures as appropriate. Any substantive changes to FWC policies or guidelines will be made with stakeholder involvement and Commission approval.

Habitat Management

This management plan relies in part on the ability of public lands to support bald eagles. Currently, approximately 33% of all known bald eagle nests in Florida occur on public lands (Sullivan *et al.* 2006, Nesbitt *et al.* in review). Public lands provide a high level of security for wildlife because of statutory provisions for long-term management funding and for guiding habitat management on those lands (Florida Statutes 259.105 and 259.032).

The FWC encourages land management practices that benefit bald eagles by decreasing the risk of catastrophic wildfire, by maintaining healthy forests, and by providing suitable nest trees. These management practices include the use of prescribed fire, removal of exotic species, reduction of excess fuel loads, thinning of overstocked stands, replanting with native species (primarily pines), and uneven-aged timber management. Retaining large-diameter native pines will ensure that suitable potential nest trees may be available in the future. All of these land-management activities should use the appropriate protections outlined in the Permitting Framework. The FWC recommends siting high-impact recreational activities away from any active or alternate bald eagle nest and restricting activity and/or posting signs during the nesting season, where appropriate. The FWC will provide to managers of Florida's public lands the resources to identify bald eagle nests on lands they manage. The FWC will also provide technical assistance in managing habitats within nest buffers, and will ensure that future Conceptual Management Plans of lands managed by FWC include a component that follows recommended management practices of habitats surrounding bald eagle nests.

The FWC encourages land management practices that decrease the risk of catastrophic wildfire or an outbreak of timber disease, and that retain old-growth native pines.

Nesting Habitat

The USFWS (2007b) Bald Eagle Management Guidelines help the public comply with the Bald and Golden Eagle Protection Act by avoiding activities that disturb bald eagles. These federal guidelines serve as the basis for the FWC Habitat Management Guidelines recommended in this management plan to ensure compliance with Florida wildlife laws concerning bald eagles (see Permitting Framework), and to minimize potentially harmful activities conducted within 660 feet of active or alternate bald eagle nests. In addition, the FWC recommends that nesting habitat be managed as described in the preceding section on habitat management.

Foraging Habitat

Aquatic habitats that support fish and waterfowl are essential to maintaining healthy prey populations for bald eagles. The FWC monitors and manages freshwater habitats and fish populations in more than one million acres of lakes, rivers, and streams, and provides funding to restore and enhance these habitats. Several federal and state agencies in Florida work together to maintain quality aquatic habitats. The U.S. Environmental Protection Agency, Florida Department of Environmental Protection (DEP) and the five water management districts monitor and regulate water quality (nutrient input) and quantity (minimum flows and levels) to maintain healthy conditions for aquatic plants, fish, and other wildlife. The FWC and DEP also work together to monitor, restore, and control aquatic plants through permit reviews, chemical, mechanical, or biological control of invasive exotic species, and through enhancement projects to improve habitats for fish and other wildlife. These combined habitat management efforts are expected to provide suitable eagle foraging habitats in Florida in perpetuity.

Bald eagles frequently feed at landfills, and some eagles have been killed by secondary pentobarbital poisoning from feeding on carcasses of euthanized animals. For this reason, it is imperative to incinerate or quickly bury the bodies of euthanized animals.

Land Acquisition

Continued acquisition of private lands is one of several strategies for preserving bald eagle habitats in Florida. Approximately 28% of Florida's land area is publicly owned or protected under perpetual conservation easements, and these lands support about 33% of the bald eagle nests in the state. Conservation easements can be used to set aside private lands from future development and are an important component of the conservation of bald eagles. The FWC, local governments, other state agencies, and private organizations acquire habitat through a variety of programs. The FWC will support legislation as part of the Florida Forever successor program to allocate sufficient funds necessary to acquire and manage suitable or potentially suitable habitat for imperiled species and bald eagles. Acquiring, managing, and restoring additional lands that support bald eagle habitats should remain a state priority so long as the acquisitions are compatible with priorities for imperiled species.

Private Lands Incentives

Private lands play an important role in the long-term conservation of bald eagles in Florida, currently supporting about 67% of all currently known nests. To promote the enhancement of bald eagles and eagle habitats on private lands in Florida, the FWC will:

1. **Inform private landowners of existing land-use incentive programs.** Incentive programs that can be used to promote conservation of bald eagles are listed in Table 2 (following page). FWC staff will work with owners of private lands who wish to manage their lands for the benefit of bald eagles to determine the most appropriate incentive programs.
2. **Inform private landowners of opportunities to sell conservation easements around bald eagle nests on their properties.** A developer whose activity is not conducted consistent with the FWC Eagle Management Guidelines (page 23) may elect to purchase a conservation easement around an eagle nest offsite or other suitable bald eagle habitat as a conservation measure. This action will provide another landowner the opportunity to be compensated for permanently conserving a bald eagle nest or nesting habitat.
3. **Work with local governments to encourage expedited permit-review and/or reduced development-review fees in exchange for voluntarily following the FWC Eagle Management Guidelines.** The FWC recommends that developers who voluntarily avoid potential disturbance of bald eagles by following the FWC Eagle Management Guidelines be granted financial incentives or expedited project review. This recommendation will require the cooperation of local governments.

Table 2. Landowner assistance programs that may be used to promote the conservation of bald eagles in Florida.

Program	Description	Contact
Common Species Common (CSC)	Administered by FWC. Improves wildlife habitat by focusing conservation on high-priority habitats outlined in FWC's Comprehensive Wildlife Conservation Strategy.	FWC Habitat Conservation Scientific Services (HCSS) biologist*
Conservation Reserve Program (CRP)	Administered by U.S. Department of Agriculture's (USDA) Farm Service Agency (FSA). Provides annual payments and cost-share assistance to establish long-term, resource-conserving landcover on eligible farmland.	Local FSA office through the nearest USDA center
Environmental Quality Incentives Program (EQIP)	Administered by USDA's Natural Resources Conservation Service (NRCS). Provides technical assistance and up to 50% of the cost to farmers and ranchers who face threats to soil, water, air, or natural resources.	USDA district conservationist
Forest Stewardship Program (FSP)	Administered by FWC. Helps landowners to increase the economic value of their forestland while maintaining its environmental integrity. Stewardship is based on the multiple-use land strategy.	Local forester or a HCSS biologist
Partners for Fish and Wildlife Program (PFW)	Administered by USFWS. Provides technical assistance and up to 50% of the cost-sharing to landowners who conduct habitat restoration or improvement activities on their lands. The focus in Florida is on restoration of native habitats, restoration of degraded streams or other wetlands, and eradication of exotic species.	HCSS biologist
Wetlands Reserve Program (WRP)	Administered by NRCS. Provides technical and financial assistance to restore wetlands and purchase conservation easements.	USDA district conservationist
Wildlife Habitat Incentives Program (WHIP)	Administered by NRCS. Provides technical assistance and up to 75% of the cost-sharing to establish or improve wildlife habitat.	USDA district conservationist

* Regional HCSS biologists can be contacted through FWC's regional offices;
 <<http://myfwc.com/Contact/regnoffc.htm>>.

Law Enforcement

The FWC's Division of Law Enforcement, in conjunction with federal, state, and local partners, is responsible for enforcing Florida's wildlife and fisheries laws. From 2003 through 2006, FWC officers responded to more than 400 incidents involving bald eagles, and this effort will not diminish upon delisting. Efforts to protect bald eagles include the following actions: patrolling areas where eagles and eagle nests occur; responding to calls of illegal activity in progress; investigating reports of illegal activity; documenting and referring illegal acts for prosecution; picking up sick or injured eagles for transport to rehabilitation facilities; retrieving and storing carcasses of non-evidentiary eagles; and providing proactive, public guidance about bald eagle conservation.

One of the most important components of the enforcement strategy is ensuring compliance through education. The FWC's law enforcement officers understand the importance of explaining wildlife laws to the public to avoid unintentional violations. However, FWC law enforcement officers actively pursue and refer for prosecution those who intentionally violate wildlife laws.

The FWC law enforcement officers also educate the public on how to identify and report violations. The FWC's Division of Law Enforcement administers the Wildlife Alert program, which receives information via a toll-free number (1-888-404-3922) that is answered 24 hours a day, seven days a week. Cash rewards are offered to callers who provide information about any illegal activity that results in an arrest. Callers may remain anonymous and are not required to testify in court.

Potential wildlife violations should be reported to FWC's Wildlife Alert toll-free number (1-888-404-3922), which is answered 24 hours a day.

The FWC law enforcement officers and USFWS special agents partner to protect Florida's wildlife and fisheries resources via a Cooperative Law Enforcement Agreement. This Agreement grants FWC officers the authority to enforce federal laws, including the Bald and Golden Eagle Protection Act. Additionally, FAC 68A-13.002 adopts the federal Migratory Bird Treaty Act as state law and applies state penalties for violations. The FWC officers provide most of the routine patrol of eagle habitats and nests. Agents from USFWS and FWC often jointly investigate wildlife violations to decide whether to prosecute in state or federal court.

Proposed Regulations

Even though the FWC proposes to remove the bald eagle from the state's list of imperiled species under Rule 68A-27.004 (F.A.C.), management of bald eagles remains important to maintain the recovered status of the species. The FWC will gradually modify protections and conservation measures, if population trends warrant such actions, while monitoring the impacts of these actions.

Management guidelines established for bald eagles by the U.S. Fish and Wildlife Service (1987) consisted primarily of recommending that buffer zones be established around active and alternate eagle nests, and then providing biological opinions and technical assistance under provisions of Section 7 of the Endangered Species Act regarding land-use activities within these zones. These

buffer zones were effective in assuring that development activities did not significantly affect nesting eagles in Florida. When reproductive success was compared between rural eagle nests and nests subject to regulated development (recommendations were followed within 750 feet of the nest), no differences were detected, regardless of whether the development was residential or commercial (Nesbitt *et al.* 1993). This study demonstrates that when management guidelines were followed, bald eagle nesting was not significantly affected, and therefore the 750-foot buffer zone around eagle nests was considered effective and sufficient for minimizing the effects of development. Two other reviews of eagle nests in Florida have suggested that occupation rates of nests by eagles did not change following construction activities (T. Logan, S. Godley, pers. comm.). Nevertheless, observations by others have suggested that eagles have been substantially affected by construction activities (L. White, pers. comm.).

The National Bald Eagle Management Guidelines (USFWS 2007b) recommend the establishment of a single buffer zone 660 feet or less from the nest, depending on the presence or absence of existing activities (of “similar scope”) and the visibility of the activity from the nest. The guidelines also recommend minimization measures to reduce the potential for human activities to affect nesting bald eagles. When the bald eagle was listed by the USFWS as threatened, the recommended buffers around bald eagle nests were larger than those now adopted under the National Bald Eagle Management Guidelines (USFWS 2007b). The Southeastern Bald Eagle Habitat Management Guidelines (USFWS 1987) recommended against most activities within 750 feet of an active or alternate bald eagle nest (the primary zone), and added a suite of seasonal recommendations for activities up to 1,500 feet (the secondary zone).

The USFWS and FWC have approved the installation of infrastructure and external residential/commercial construction within the secondary zone (750–1,500 feet) of bald eagle nests during the nesting season in Florida since the mid-1990s, with the provision that monitoring be conducted to evaluate the response of the eagles to authorized activities. These joint monitoring guidelines were formalized in 2002 to ensure that nest monitoring was conducted consistently, and to serve as a database for evaluating the ongoing and future changes in management recommendations. Results of this monitoring indicate that actions that occurred in the secondary zone were not likely to have a direct negative impact on bald eagles. The Bald Eagle Monitoring Guidelines subsequently were modified on three occasions to obtain data used to evaluate eagles’ response to the revised buffer-zone distances already implemented in Florida and incorporated into the National Bald Eagle Management Guidelines (USFWS 2007b) and to reflect current USFWS policy and regulatory changes in Florida. Initial review of the information in these more recent monitoring reports suggests the current USFWS guidelines are appropriate.

Some bald eagle pairs in Florida tolerate disturbance much closer than 660 feet from the nest, and the behavior of eagles nesting close to or within developed areas seems to be increasing in Florida. Bald eagle use of urban areas is a relatively new event, and the long-term stability of urban eagle territories has not been documented fully. Although some eagles have demonstrated tolerance for intensive human activity, this does not mean that all eagles will do so (Millsap *et al.* 2004). A minimum of five years of post-impact data is needed to study the long-term effects of development within regulated nest buffer zones (Nesbitt *et al.* 1993). Both studies described above (Nesbitt *et al.* 1993, Millsap *et al.* 2004) recommended retaining buffer zones around bald

eagle nests. Therefore, the conservation of active or alternate bald eagle nests and the retention of recommended buffer zones (USFWS 2007b) are recommended to sustain the bald eagle population in Florida at or above its current level.

To better organize existing rules and to provide a location for eagle-specific rules, the FWC proposes to establish a new section within F.A.C. Chapter 68A for nongame birds (Rules Relating to Birds, F.A.C. 68A-16). Currently there are specific sections of Chapter 68A that regulate the “take” of game species, freshwater fish, fur-bearing animals, reptiles, amphibians, and many saltwater species. F.A.C. 68A-16 will create one location for existing rules pertaining to all non-listed, nongame birds. The FWC proposes moving F.A.C. 68A-13.002, “Migratory Birds; Adoption of Federal Statutes and Regulations,” to this new section (Rules Relating to Birds, F.A.C. 68A-16.001). A review of current FWC rules will likely identify other rules that should be moved to this new section. Other than the eagle specific rule proposed below, the FWC is not proposing any new rules, only the reorganization of existing rules.

One rule change is necessary to implement the removal of the bald eagle from the list of threatened species (68A-27.004 F.A.C.). This management plan recommends that 68A-27.004 F.A.C. be amended by removing the bald eagle from the list simultaneously with the addition of the bald eagle rule language proposed below.

Following is draft language for a proposed Florida regulation to protect bald eagles:

F.A.C. 68A-16.002 Bald Eagle (*Haliaeetus leucocephalus*).

(1) No person shall take, feed, disturb, possess, sell, purchase or barter, or attempt to engage in any such conduct, any bald eagle or parts thereof, or their nests or eggs, except:

- (a) As authorized from the executive director by specific permit, which will be issued based upon whether the permit would advance the management plan goal and objectives;
- (b) When such conduct is consistent with the FWC Eagle Management Guidelines;
- (c) When such conduct is consistent with a previously issued permit, exemption, or authorization issued by the FWC under imperiled species regulations (Chapter 68A-27, F.A.C.) or by the USFWS under the Endangered Species Act (U.S.C. 1531 et seq.)

(2) For purposes of this section, the term “disturb” is defined as, “To agitate or bother a bald eagle to the degree that causes, or is likely to cause (a) injury to an eagle, (b) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or (c) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior.”

(3) On public land, it is unlawful for any person to knowingly enter any area posted as closed for the protection of bald eagles, their nests, or their nest trees, except the staff or authorized agents of the managing public entity for that area, or as authorized pursuant to subsection 1.

(4) The section of the Bald Eagle Management Plan entitled “Permitting Framework April 2008,” which includes the FWC Eagle Management Guidelines, is incorporated herein by reference.

Permitting Framework April 2008

To advance the conservation goal and objectives of this management plan, the proposed regulations listed above and this Permitting Framework are intended to assist land-use planning to minimize the potential for certain actions to disturb or “take” nesting bald eagles. This Permitting Framework clarifies (1) those activities that are not likely to result in a “take” or disturbance of bald eagles, and (2) those activities for which permits are available to assure compliance with the rules. A FWC Eagle Permit is not required to conduct any particular activity occurring near a bald eagle nest, but such a permit may be necessary to avoid liability for “take” or disturbance caused by the activity. Because the rule standard for any permit issued is “would advance the management plan goal and objectives”, this section establishes criteria that meet the standard. This Permitting Framework and the FWC Eagle Management Guidelines, contained herein should be used together. Individuals who cannot follow the Guidelines and want to avoid liability for a possible disturbance or take can apply for a permit. A FWC Eagle Permit can only be issued when acceptable minimization and conservation measures are provided as permit conditions.

The Permitting Framework applies to all activities within 660 feet of any active or alternate bald eagle nest.

The FWC intends for this management plan to be compatible with the USFWS Bald and Golden Eagle Protection Act (BGEPA) and the associated National Bald Eagle Management Guidelines (USFWS 2007b). The FWC will work with the USFWS to implement a single permit framework for bald eagles. The FWC is already coordinating with the USFWS on an agreement that will clarify under what circumstances federal authorization will be required to conduct activities that cannot be conducted consistent with the Bald and Golden Eagle Protection Act. Development of such an agreement will take time in part because the USFWS has not yet developed a draft permitting framework under BGEPA. Additionally, as new information becomes available on the effectiveness of the proposed conservation measures, this permitting framework may be revised. Changes to this Permitting Framework section will require stakeholder involvement and Commission approval. Any change in policy, including any revisions to this Permitting Framework, will be posted to the FWC website <<http://www.myfwc.com>>, after consultation with stakeholders and the public and upon approval by the Commission.

Unless otherwise specified, this section provides guidelines for activities that occur within 660 feet of any active or alternate bald eagle nest. The framework does not apply to lost or abandoned nests. An **active** nest shows evidence of breeding by a bald eagle pair during the current or most recent nesting season. An **alternate** nest has been used for nesting during the past five nesting seasons, but was not used during the current or most recent nesting season. An **abandoned** nest has not been used for nesting for more than five consecutive nesting seasons. The recommendations in the FWC Eagle Management Guidelines (below) no longer apply to abandoned nests, but the nest itself cannot be altered. A nest is considered **lost** if the nest tree is destroyed, or if the nest is destroyed by natural causes and is not rebuilt in the same tree within two nesting seasons. The USFWS (2006b) recommends protecting lost nests for three years, but the FWC uses a two-breeding-season period because this duration has been in place in Florida for several years. Future research on nest reactivation may provide information to justify revising these recommended protection periods.

The bald eagle nesting season is 1 October–15 May unless the young fledge before or after 15 May. The following sections identify activities that should not occur within 660 feet of a bald eagle nest during the nesting season unless monitoring is conducted. Nest monitoring must follow the protocol outlined in the Bald Eagle Monitoring Guidelines (USFWS 2007d), or subsequent versions.

A. FWC Eagle Management Guidelines (Activities That Do Not Require a FWC Eagle Permit)

Activities that can be undertaken consistent with the FWC Eagle Management Guidelines do not require a FWC Eagle Permit. A process map (Figure 4) clarifies when application for a permit is recommended. Activities that do not require a permit include (1) those conducted at any time more than 660 feet from an eagle nest, (2) any temporary activity (defined below) conducted at any distance from a nest outside the nesting season, or (3) any activity conducted consistent with the FWC Eagle Management Guidelines.

Activities that do not require a FWC eagle permit include (1) those conducted more than 660 feet from a bald eagle nest, (2) any temporary activity conducted outside the nesting season, or (3) any activity that follows the FWC Eagle Management Guidelines.

The FWC recommends that the FWC Eagle Management Guidelines be followed unless a permit is issued. The FWC will not issue citations to or seek prosecution of persons whose activities are conducted consistent with the FWC Eagle Management Guidelines, even if the activity results in a “take” or disturbance of bald eagles. If it is unclear whether a proposed activity can be undertaken consistent with the FWC Eagle Management Guidelines, then the local FWC regional nongame biologist should be contacted <<http://myfwc.com/Contact/regnoffc.htm>> for guidance.

The FWC will not seek to prosecute persons whose activities are conducted consistent with the FWC Eagle Management Guidelines, even if the activity results in a “take” or disturbance to bald eagles.

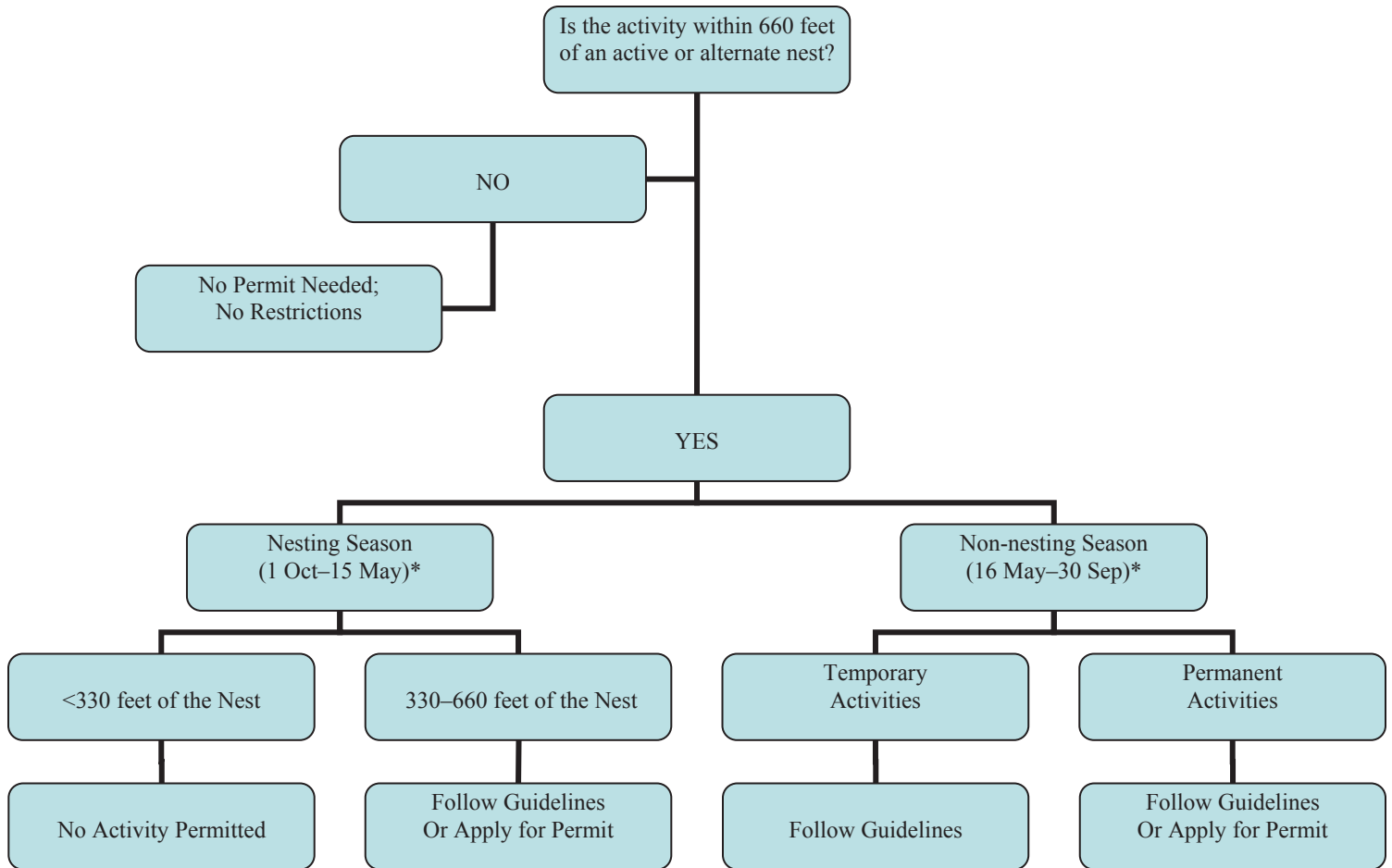


Figure 4. Process map for determining whether or not a FWC Eagle Permit would be recommended for a proposed activity near a bald eagle nest. For ongoing activities that are conducted at the historic rate, or for activities that may fall under similar scope to existing activities, refer to the FWC Eagle Management Guidelines for more detail.

* Unless nestlings fledge before or after these dates.

Existing Uses Within 660 Feet of an Eagle Nest.—Eagles are not likely to be disturbed by routine use of roads, homes and other infrastructure, routine agricultural operations, or pre-existing vegetation management of linear utilities occurring within 660 feet of an active or alternate bald eagle nest.

Therefore, in most cases, existing activities of the same degree (“similar scope”) may continue with little risk of disturbing nesting bald eagles and a FWC Eagle permit is not needed. However, some *intermittent, occasional, or irregular* activities may disturb eagles. For example, activities associated with auctions, field dog trials, or other sporting events may disturb a pair of bald eagles even though the events have been held at the same location for several years. In such situations, the activity should be adjusted or relocated to minimize potential disturbance to the eagles.

Existing activities can continue at the same intensity with little risk of disturbing eagles.

Any artificial structure that contains a bald eagle nest may be maintained, repaired, or upgraded when conducted consistent with the guidelines if: (1) the work will not remove or substantially alter the nest to the extent that further use for nesting is affected; **and** (2) the work is conducted outside the nesting season or when nest monitoring in accordance with the Bald Eagle Monitoring Guidelines (2007d) documents that the nest is not being used by eagles when the work occurs.

New Activities Proposed Within 660 Feet of an Eagle Nest.—The FWC Eagle Management Guidelines provided here describe measures to avoid disturbing bald eagles caused by new activities. To determine if an activity can be conducted consistent with these Guidelines, the FWC proposes to design a system to provide voluntary, self-service technical assistance through a web-based format. This format will provide data that will assist the FWC in evaluating the effectiveness of current rules and Guidelines. If proposed activities cannot be conducted consistent with the FWC Eagle Management Guidelines, then the local FWC regional nongame biologist should be contacted for guidance.

If special circumstances that might increase or diminish the likelihood of disturbing nesting bald eagles apply to a project, or if these FWC Eagle Management Guidelines cannot be followed, then the local FWC regional nongame biologist should be contacted for guidance.

The buffer zones around eagle nests that are provided in this section are based on those recommended in the National Bald Eagle Management Guidelines (USFWS 2007b). A distance of 1,500 feet is used to evaluate the degree to which a nesting pair of bald eagles has been exposed to human-related activities (Table 3). The National Bald Eagle Management Guidelines (USFWS 2007b) use a distance of one mile from the nest to evaluate this distance, but the FWC uses 1,500 feet because this distance has been used in Florida for several years. Recommendations for nests that are distant from human activities are subject to larger buffer zones (660 feet) because eagles in these nests are more likely to be disturbed by activities near the nest.

Activities that may disturb nesting bald eagles are divided into nine categories (A–I) based on their nature and magnitude:

Category A

- Building construction of one or two stories, and with a project footprint of ≤0.5 acre;
- Construction of roads, trails, canals, powerlines, or other linear utilities;
- New or expanded agriculture or aquaculture operations;
- Alteration of shorelines, aquatic habitat, or other wetlands;
- Installation of docks or moorings;
- Water impoundment.

Category B

- Building construction of one or two stories, and with a project footprint of >0.5 acre;
- Building construction of three or more stories;
- Installation or expansion of marinas with a capacity of six or more boats;
- Mining;
- Oil or natural gas drilling or refining.

Table 3. The minimum allowed distances from an active or alternate bald eagle nest that a Category A or Category B activity can occur without the need for a FWC bald eagle permit. Activities proposed to occur closer to an eagle nest than the distances designated here should apply for a FWC Eagle Permit.

	<i>No Similar activity within 1,500 feet of the nest</i>	<i>Similar activity closer than 1,500 feet from the nest</i>
<i>There is no visual buffer between the nest and the activity</i>	Categories A and B: 660 feet.	Categories A and B: 660 feet, or as close as existing activities of similar scope.
<i>There is a visual buffer between the nest and the activity</i>	Category A: 330 feet. Site work and exterior construction between 330-660 feet should be conducted outside the nesting season unless the Bald Eagle Monitoring Guidelines (USFWS 2007d) are followed. Category B: 660 feet.	Categories A and B: 330 feet, or as close as existing activity of similar scope. Site work and exterior construction between 330-660 feet should be performed outside the nesting season.

For projects in categories A or B, exterior construction activities and site work within 330 feet of an active or alternate bald eagle nest should be conducted during the non-nesting season (16 May–30 September). Site work and exterior construction activities between 330 and 660 feet from the nest may be conducted during the nesting season when the Bald Eagle Monitoring Guidelines (USFWS 2007d) are followed. The use of dump trucks within 660 feet of an eagle nest should occur during the nesting season only when the Bald Eagle Monitoring Guidelines (USFWS 2007d) are followed. Minimize noise and human activity associated with interior construction during the nesting season.

Construction activities may occur during the nesting season if nest monitoring, following the Bald Eagle Monitoring Guidelines (USFWS 2007d), confirms that eagles have not returned to the nest by 1 October, or that nestlings have fledged before 15 May. In either situation, the regional FWC nongame biologist should be notified.

Managers of any project that follows these guidelines and use nest monitoring to allow construction within 660 feet during the nesting season must provide monitoring reports to the FWC. In addition to ensuring that the eagles are not disturbed while nesting, this will also provide data to analyze the appropriateness of the protective measures.

Category C: Land Management Practices, including Forestry

Certain land management practices benefit bald eagles and their habitats. Land management practices that retain old-growth native pines and that decrease the risk of catastrophic wildfire or an outbreak of timber disease are recommended. However, some management practices could “take” or disturb nesting bald eagles. A FWC Eagle Permit is not needed for land management practices occurring near an active or alternate bald eagle nest when undertaken consistent with the following guidelines.

The FWC encourages land management practices that decrease the risk of catastrophic wildfire or an outbreak of timber disease, and that retain old-growth native pines.

- Avoid clear-cutting within 330 feet of the nest at any time. This restriction may be lifted outside the nesting season for emergency provisions, such as to control disease outbreak or an insect infestation, especially when the health of the nest tree may be at risk. The regional FWC nongame biologist should be notified prior to initiating any emergency activities within 330 feet of the nest.
- Avoid construction of log transfer facilities and in-water log storage areas within 330 feet of the nest. Use of any existing road may continue at the historic rate, but avoid routing logging traffic within 330 feet of an active nest during the nesting season.
- Avoid timber harvesting, replanting, or other silvicultural operations, including road construction and chain saw and yarding operations, within 660 feet of the nest tree during the nesting season. If the Nest Monitoring Guidelines (USFWS 2007d) are applied, then activities between 330 and 660 feet may be allowed during the nesting season. If nest monitoring confirms that the nest is inactive, then the seasonal restrictions would not

apply. Selectively thin to retain at least 50% of the total canopy and the largest native pines within 660 feet of the nest. Take precautions to protect the nest tree.

- Prescribed burning within 330 feet of the nest or the installation or maintenance of firelines within 660 feet of the nest should be undertaken outside the nesting season. Precautions such as hand-raking of leaf litter and hand removal of excess fuel loads near the nest tree should be taken to decrease the threat of crown fire or fire climbing the nest tree, but these actions should not occur when eagles are present. If it is determined that a burn during the eagle nesting season would be beneficial, then these activities must be conducted when eagles are absent (*e.g.*, before eggs are laid or after the young have fledged). When appropriate to reduce fuel loads, land managers should consider mechanical treatment of the area within 330 feet outside the nesting season to allow for a safer growing-season burn. Smoke screening should be implemented to avoid impacting an active nest.
- Contact the regional FWC biologist if the use of heavy equipment within 50 feet of the nest tree is planned for an activity.

Category D: Agriculture and Linear Utilities (Existing Operations)

No buffer is necessary outside the nesting season. During the nesting season, routine agriculture or linear utility vegetation management are not anticipated to result in disturbance as long as those activities are conducted consistent with these guidelines (also see “Existing Uses Within 660 of an Eagle Nest”). For new or expanded agricultural operations, see Category A.

Category E: Off-road Vehicles

No buffer is necessary outside the nesting season. During the nesting season, off-road vehicles should not be operated within 330 feet of the nest or within 660 feet where visibility and exposure to noise are increased.

Category F: Motorized Watercraft

No buffer is necessary outside the nesting season. During the nesting season, loud vessels and concentrations of vessels (*e.g.*, commercial fishing boats or tour boats) should not be operated within 660 feet of the nest. Other motorized boat traffic within 330 feet of the nest should be minimized, and stopping should be avoided.

Category G: Non-motorized Recreation such as Hiking, Camping, Birding, Fishing, Hunting, or Canoeing

No buffer is necessary outside the nesting season. Activities visible or highly audible from the nest should not occur within 330 feet of the nest during the nesting season.

The bald eagle nesting season in Florida is 1 October–15 May, unless the young fledge before or after 15 May.

Category H: Aircraft (Including Helicopters)

No buffer is necessary outside the nesting season. During the nesting season, aircraft should not be intentionally operated within 1,000 vertical or horizontal feet of an eagle nest, except for authorized biologists trained in survey techniques and aircraft at airports or operating in prescribed landing and departure patterns. This guidance also does not apply to through-flights operating within FAA rules that unintentionally encounter eagle nests, but rather to intentional harassment of nests and eagles such as repeated passes of a nest for sight-seeing.

Category I: Blasting or Other Loud, Intermittent Noises

No buffer is necessary outside the nesting season for blasting activities that do not alter the landscape. During the nesting season, no blasting should occur within 660 feet of an active nest. Loud noises (including Class B fireworks) or blasting activities that alter the landscape within 660 of the nest should not occur during the nesting season, except where eagles have demonstrated tolerance for such activity.

B. Activities That Do Not Require a FWC Eagle Permit if Federally Authorized

In 2007, the USFWS proposed a draft permitting process under the Bald and Golden Eagle Protection Act. Because the FWC seeks to avoid duplication of effort, then the following actions permitted by USFWS will not need a FWC bald eagle permit provided that the federal permit is available for inspection while the permitted activity is being conducted. If federal rules defer to states or require proof of state authorization, then the actions listed below may need to be reevaluated.

1. *Modifications within the buffer zone of a lost nest.*—The FWC Eagle Management Guidelines prescribe protection buffers for lost nests for two consecutive nesting seasons. If federal authorization in the form of a “take” permit is obtained for an activity within the recommended buffer of a naturally-destroyed bald eagle nest prior to the nest being declared lost (*i.e.*, prior to two nesting seasons post-destruction), then no state permit will be required. Once a nest meets the definition of lost (see Glossary, p. ix: has been missing for more than two consecutive nesting seasons), then the buffer zone no longer applies, and therefore no eagle permit is necessary.
2. *Destruction of a bald eagle nest.*—Notwithstanding anything to the contrary herein, no state permit is needed if a federal “take” permit is obtained to destroy an abandoned nest.
3. *Previously permitted projects.*—The FWC will not refer the “take” of a bald eagle or parts thereof, or its nests or eggs, for prosecution if such “take” is in compliance with the terms and conditions of any USFWS bald eagle Technical Assistance Letter or any Biological Opinion or Incidental Take Permit issued under Sections 7 or 10 of the Endangered Species Act of 1973, as amended. Such letters, opinions, and permits shall serve as state authorization provided that the authorizations are issued prior to the effective date of the proposed state bald eagle rule, and that the FWC is provided with a copy of the federal authorization upon request.

4. *Salvage*.—Federal authorization to handle bald eagle carcasses, parts, or eggs for salvage purposes functions as state authorization, provided that the authorized individual carries a copy of the federal authorization.
5. *Possession for religious or cultural purposes*.—Federal authorization for the possession of bald eagles or their parts for religious or cultural purposes functions as state authorization, provided that the authorized individual carries a copy of the federal authorization.
6. *Possession of eagle parts for educational purposes*.—Federal authorization for the possession of bald eagle parts, nests, or eggs for educational purposes functions as state authorization, provided that the authorized individual carries a copy of the federal authorization, and all requirements of the federal authorization are being fulfilled.
7. *Airports*.—If federally authorized, eagles that pose an imminent jeopardy to aircraft safety and human life may be harassed by persistent, non-injurious disturbance without physical capture or direct handling by airport operators or their agents on airport property in order to prevent collisions.

C. Activities That Require a FWC Eagle Permit

Except for the federally-authorized actions listed above, any action that cannot be undertaken consistent with the FWC Eagle Management Guidelines may require a FWC Eagle Permit to avoid a violation of rule. As such, any action that results in the taking, feeding, disturbing, possessing, selling, purchasing, or bartering of eagles or eagle parts requires a permit. As defined in 68A-1.004, F.A.C., “take” includes pursuing, hunting, molesting, capturing, or killing. Under the appropriate conditions (described in this section) the FWC will issue several types of permits for bald eagles including disturbance, scientific collection, and nest removal. Other, more general permits may be issued for certain activities listed below.

Eagle Depredation at Agriculture or Aquaculture Facilities.—Non-injurious disturbance of bald eagles that are depredating agriculture or aquaculture resources requires a FWC Eagle Permit. These permits will be issued solely in accordance with appropriate federal law. Permit provisions should include required husbandry techniques that reduce or prevent future problems when applicable or reasonable. No conservation measures are required, as these permits authorize only non-injurious harassment. Permits should be issued solely for persistent depredations rather than occasional events. If federal rules adequately protect bald eagles at agriculture or aquaculture facilities, then the need for a state permit will be reevaluated.

Activities That Involve Possession

The following activities involve possession and therefore require a FWC permit. Existing rules and permitting programs for possession will not change. Applicants should be aware that federal permits for these actions are required unless federal rules or a FWC/USFWS agreement defers

the need for a federal permit when the action is authorized by the state. No conservation measures are necessary for educational display, rehabilitation, or scientific collection because these activities provide a conservation benefit to eagles.

1. *Educational Display*.—Any facility that wishes to possess live bald eagles for educational purposes must abide by caging requirements (Rule 68A-6, F.A.C.) and obtain a license for exhibition/public sale (372.921 Florida Statutes). Federal authorization for the possession of bald eagle parts, nests, or eggs for educational purposes functions as state authorization, provided that the authorized individual carries a copy of the federal authorization, and that all requirements of the federal authorization are met.
2. *Rehabilitation*.—Wildlife rehabilitators who possess a FWC Wildlife Rehabilitation permit (Rules 68A-6 and 68A-9, F.A.C.) for migratory birds also require federal authorization to possess bald eagles for rehabilitation purposes. No eagle nestling or fledgling that is attended by adult eagles should be handled for rehabilitation without first consulting the FWC regional nongame biologist, except when an emergency exists and inaction may endanger the nestling or fledgling.
3. *Scientific Collection*.—Research that might result in disturbance to bald eagles requires a Scientific Collection permit (Rule 68A-9.002, F.A.C.). Scientific Collection permits will be issued solely for projects with a sound scientific design and those that demonstrate scientific or educational benefits to the bald eagle. Federal authorization may also be required.
4. *Falconry*.—Rules pertaining to the use of birds of prey in Florida for falconry purposes are found in 68A-9, F.A.C. While the bald eagle currently may not be used in falconry, its status in falconry may change upon delisting. If the joint federal-state falconry rules provide for the possession of bald eagles for falconry purposes, then a falconry permit will be required. Conservation measures, if any, will be determined at a later date.

Activities That Require Emergency Authorization

Declared emergency.—Emergency activities associated with recovery from a federal- or state-declared disaster will require an after-the-fact FWC Eagle Permit if the activities cannot be undertaken consistent with the FWC Eagle Management Guidelines. Such activities may include operation of equipment associated with rescue, road or utility repair, or clearing of debris in transportation or utility corridors. The FWC regional non-game biologist should be contacted within 30 days to discuss possible minimization measures, and conservation measures will be assessed on a case-by-case basis on the extent of the emergency and the impacts to eagles.

Activities That Require Nest Removal

Except for the federally-authorized activities listed above, a FWC nest removal permit is required for authorization to remove or destroy any bald eagle nest, even when eagles are not present. Nest removal may be necessary because the nest presents a threat to human safety or a threat to the safety of bald eagles or their eggs or nestlings. Minimization and conservation

measures for these permits will be based on the extent of the emergency and the impacts to eagles.

An abandoned nest as defined in this management plan is still considered a nest by FWC for the purposes of state rule and it also remains protected under the Bald and Golden Eagle Protection Act. If the federal permitting process adequately provides for the conservation of Florida's bald eagles, then the need for a state nest-removal permit could be waived.

A FWC Eagle Permit is required to remove or destroy any bald eagle nest, even an abandoned nest.

Airports.—Bald eagle nests on or adjacent to airports could increase the risk of an aircraft/avian strike, and are therefore considered hazardous to human safety and to nesting bald eagles and their young. Federal law requires airports to develop and implement a Wildlife Hazard Management Plan (WHMP) to manage and control wildlife that presents a risk to public safety from aircraft collisions. These plans include techniques to avoid attracting eagles, and non-injurious harassment to prevent eagles from frequenting the property. Both a FWC nest removal permit and federal authorization are required for the removal of eagle nests on or adjacent to airports.

Nest removal from artificial structures.—When maintenance of an artificial structure requires the removal of an active or alternate bald eagle nest that is *not* an immediate threat to human safety, then the nest may be removed only outside the nesting season and only after a FWC nest-removal permit has been issued. Federal authorization may also be required. Minimization and conservation measures will be assessed on a project-by-project basis.

D. Activities That May Require a FWC Eagle Permit

A permit is not required to conduct any particular activity, but is necessary to avoid liability for take or disturbance caused by the activity. Therefore, any land-altering activity within 660 feet of an active or alternate bald eagle nest that cannot be undertaken consistent with the FWC Eagle Management Guidelines may require a FWC eagle permit. Activities beyond 660 feet do not ever require a FWC Eagle Permit. The FWC will issue an eagle permit where the applicant provides minimization and/or conservation measures that will advance the goal and objectives of this management plan.

No FWC Eagle Permit is required for any activity that is conducted consistent with the FWC Eagle Management Guidelines.

Minimization Measures

The following minimization measures are intended to reduce the potential for disturbing eagles and may be required as part of a FWC Eagle Permit.

Construction-related Activities Within 660 Feet of an Eagle Nest

For projects that receive a FWC Eagle Permit, the following minimization efforts may be required:

1. Implement the Bald Eagle Monitoring Guidelines (USFWS 2007d) for all site work or exterior construction activities. Avoid exterior construction activities within 330 feet of the nest during the nesting season.
2. Avoid construction activity (except those related to emergencies) within 100 feet of an eagle nest during any time of the year except for nests built on artificial structures, or when similar scope may allow construction activities to occur closer than 100 feet.
3. Avoid the use or placement of heavy equipment within 50 feet of the nest tree at any time to avoid potential impacts to the tree roots. This minimization does not apply to existing roads, trails, or other linear facilities near an eagle nest, or to nests built on artificial structures.
4. Schedule construction activities so that construction farther from the nest occurs before construction closer to the nest.
5. Shield new exterior lighting so that lights do not shine directly onto the nest.
6. Create, enhance, or expand the visual vegetative buffer between construction activities and the nest by planting appropriate native pines or hardwoods.
7. Site stormwater ponds no closer than 100 feet from the eagle nest, and construct them outside the nesting season. Consider planting native pines or hardwoods around the pond to create, enhance, or expand the visual buffer.
8. Incorporate industry-approved avian-safe features for all new utility construction [<www.fws.gov/migratorybirds/issues/APP/AVIAN%20PROTECTION%20PLAN%20FINAL%204%2019%2005.pdf>](http://www.fws.gov/migratorybirds/issues/APP/AVIAN%20PROTECTION%20PLAN%20FINAL%204%2019%2005.pdf).
9. Retain the largest native pines for use as potential roost or nest sites.

Land-Management Activities Within 660 Feet of an Eagle Nest

Most land management activities can be planned to comply with the FWC Eagle Management Guidelines and will not require a permit. For land management activities that receive a FWC Eagle Permit, the following minimization efforts are recommended:

1. Avoid the use or placement of heavy equipment within 50 feet of the nest tree to avoid potential impacts to tree roots. This minimization does not apply to existing roads, trails, or other linear facilities near an eagle nest or to nests built on artificial structures.
2. Plan the activity to avoid the nesting season to the greatest extent possible. Avoid disruptive activities when eagles are incubating eggs or when nestlings are close to fledging.
3. Schedule activities so that activities farther from the nest occur before activities closer to the nest.
4. Maintain the greatest possible vegetative buffer between land management activities and the nest.
5. Retain the largest native pines for use as potential roost or nest trees.

Conservation Measures

The conservation measures listed below will advance the management plan goal and objectives by (1) continuing to provide suitable eagle nesting habitats throughout Florida, and (2) funding monitoring, research, and management activities.

When an activity cannot be undertaken consistent with the FWC Eagle Management Guidelines (e.g., when disturbance or take may occur), then a FWC Eagle Permit is recommended to avoid a possible violation of the FWC eagle rule.

Conservation measures apply to any active or alternate bald eagle nest.

When construction activities are planned inside the recommended buffer zone of an active or alternate bald eagle nest, then issuance of a FWC Eagle Permit will require conservation measures. The following conservation measures are considered to advance the goal of the management plan; alternatives submitted under option 5 will be reviewed by FWC staff to determine if they will advance the goal of the management plan. The number of conservation measures will depend upon the distance that the activity will occur from a bald eagle nest. For activities between 330 and 660 feet, one conservation measure is sufficient. For activities within 330 feet of a nest, two conservation measures should be included with the application and one of the two measures should be a \$35,000 contribution to the Bald Eagle Conservation Fund (#1, below). When activities would likely cause disturbance during only one nesting season, conservation measures need not be provided if they would only affect an alternate nest, but conservation measures should be provided if they will affect an active nest.

1. Contribute \$35,000 to the Bald Eagle Conservation Fund to support bald eagle monitoring and research.
2. Provide a financial assurance (such as a bond) in the amount of \$50,000.
3. Grant a conservation easement over the 330-foot buffer zone of an active or alternate bald eagle nest within the same or an adjacent county, or within the same core nesting area (Figure 3). When the buffer is only partially owned by the applicant, contribute an onsite easement over the portion of the 330-foot buffer zone to which the applicant holds title.
4. Grant a conservation easement over suitable bald eagle nesting habitat (see #5, below) onsite or offsite.
5. Propose an alternate conservation measure that advances the goal of the management plan based upon the particular facts and circumstances presented by the applicant.

Conservation measures are based on the following guidelines:

1. Conservation easements and financial assurances can be terminated, released, or returned to the landowner if the nest for which an activity is permitted is successful (produces at least one fledgling) for at least one of the three years after the permitted activity is completed; the burden of proof is upon the applicant. If a nest is lost to natural causes (i.e. strong winds, fire), the easement or bond may be released on the third year if eagles have not built a new nest within the buffer. Financial assurances that

are not returned to the landowner will be turned over to the Bald Eagle Conservation Fund.

2. Fee structure is based on the likelihood of disturbance to eagles; activities closer to a nest provide more conservation measures than activities farther away. As such, activities permitted within 330 feet of an active or alternate bald eagle nest should contribute \$35,000 to the Bald Eagle Conservation Fund as one of two conservation measures **and** provide an additional conservation measure.
3. The amount of fees paid outright is lower than fees paid as a bond because costs for FWC administration (including site visits) are less.
4. The fee amount is for calendar year 2008; the fee will be adjusted in subsequent years as specified below in the Monetary Contribution section (next page).
5. Suitable habitat for bald eagles will be evaluated based upon the following characteristics: within 1.86 miles of a permanent water body ≥ 0.2 square miles in size; contain a canopy of mature native pines or cypresses with several perch trees and an unimpaired line of sight (habitat in southern Florida may include mangrove or other native species); few land-use features (low density housing, industrial, etc.) and linear and point features (roads, powerlines, railroads, etc.) within 0.5 mile; ideally should be located in a previously identified bald eagle core nesting area.
6. Conservation easements must include at least the 330-foot buffer around an active or alternate eagle nest. Where the buffer is only partially owned by the applicant, an onsite easement may be placed over that portion of the property to which the applicant holds title. Easements may be placed only around nests that are in suitable habitat as described above.
7. Conservation easements must include provision of funds for management practices for the life of the easement. Management practices should include all activities listed under “Category C: Land Management Practices, including Forestry” and must be conducted by the landowner or other entity. The FWC will hold all easements and will ensure compliance with minimization and conservation measures.
8. Bald eagles often build multiple nests that are used alternately. Projects that either avoid potential take by avoiding impacts within the buffer zone or that receive a permit to conduct activities within the buffer zone may later be affected if an eagle pair initiates construction of a new nest within the project boundary. The FWC believes that projects that follow proper procedures for bald eagles should not have to provide additional conservation measures for any new eagle nest built on the site after the planning and permitting procedures have been completed. Therefore, other than the fact that the nest itself cannot be destroyed, such projects will not be expected to provide further conservation measures if bald eagles choose to move their nest location within the project site.

Monetary Contribution

The Conservation Measures portion of this management plan references a contribution to the Bald Eagle Conservation Fund. The fund was created by a Memorandum of Understanding between the USFWS, the FWC, and the Wildlife Foundation of Florida. The fund collects monetary contributions from the issuance of FWC Eagle Permits to applicants whose projects impact the buffer zones of active or alternate bald eagle nests. Funds may be spent on surveys,

monitoring, other research needs, or any other activity that promotes the conservation goal of bald eagles. The contribution amount will be adjusted over time to ensure that conservation funding keeps pace with inflation. Tying the change to the Consumer Price Index will ensure the contribution is adjusted relative to actual price increases or decreases. The FWC will use the “All Urban Consumers Consumer Price Index” (CPI-U), which is a reflection of the highest percentage of the population, and the CPI-U for the Southeast region. Information on the Consumer Price Index is available at www.bls.gov/cpi.

In the first year following the effective date of the FWC bald eagle rule, the monetary contribution will be as specified above. In each subsequent year, this amount will change by an amount equal to the annual CPI-U for the Southeast region, and will be based on changes during the CPU calendar year (1 January–31 December). Adjustments to the contribution amount should take effect on 1 March of each year because the CPI for the previous year is usually not available until mid-February. The contribution will be calculated based on the date that a completed application is received by FWC.

For example, if the FWC bald eagle rule takes effect during April 2008, and if the appropriate contribution to the Bald Eagle Conservation Fund through February 2009 is \$35,000, then on 1 March 2009, the amount would change at the same rate as the CPI-U for the Southeast Region for the 2009 calendar year. If the CPI-U for the Southeast Region increased by 3%, then the appropriate contribution would be \$36,050 (3% of 35,000 = 1,050; 35,000 + 1,050 = 36,050).

The amount of the monetary contribution is due prior to conducting the permitted activities. Contributions may be applied toward annual monitoring surveys, research, purchase of eagle habitat, or other conservation activities. To offset local impacts of projects, preference will be given to land purchases within the same county or core nesting area.

Local Government Coordination

The FWC has the constitutional authority and duty in Florida to manage wildlife in the state. The role of local government and other agencies in the regulation and management of wildlife must be well-defined. Local governments are statutorily required to include a conservation element in their comprehensive plans for the conservation, use, and protection of natural resources, including fisheries and wildlife, pursuant to Chapter 163, F.S. Coordination between the FWC and local governments in implementing components of this plan is essential for the successful conservation and management of bald eagles in Florida.

Local governments and regional or state agencies (e.g. water management districts) often are the first to conduct site inspections of properties where land-clearing or building permits are sought. These on-site inspections typically occur early in the permit process and provide the opportunity to confirm the presence or absence of bald eagles, and to inform landowners and developers about required FWC permits and authorizations. This action by local governments or other agencies provides a mechanism to assure that necessary FWC permits can be issued earlier in the permit approval process, prior to issuance of local government land-clearing or building permits.

Local governments and other agencies also play a substantial role in bald eagle conservation and management by providing protected and managed areas for eagles. Many local governments have created habitat-acquisition and management programs, which can provide important assistance in achieving the goal and objectives of this management plan. The FWC will coordinate with local governments and other agencies to help ensure that local land-acquisition programs and their implementing ordinances and policies are: (1) consistent with the goal and objectives of this management plan; and (2) focus on acquisition priorities for bald eagles and other important wildlife species.

Coordination between the FWC and local governments is crucial in efforts to increase funding for land acquisition and management. The FWC will encourage local governments and other agencies to support the FWC's efforts to assure adequate funding within the successor to the Florida Forever program.

Effective cooperation between the FWC and local governments can streamline the permit review process, improve regulatory compliance, and improve management of locally owned or managed lands that support bald eagles and other species of conservation concern. The FWC will assist and encourage local governments to perform the following activities:

- Remain current with FWC regulations related to the management of the bald eagles.
- Provide information to landowners, builders, and the general public about this management plan and regulatory prohibitions and permit options. These efforts will help promote compliance with FWC regulations and understanding of FWC incentives available to landowners.
- Include on permit applications for land-clearing or building activities a questionnaire to determine whether surveys have been conducted for bald eagles.
- Inspect parcels that are undergoing development review for the presence or absence of bald eagles, and when eagles are present (as confirmed through site visits by trained county staff, or environmental consultant reports/data) notify FWC staff to assure compliance with FWC eagle rules and guidelines.
- Consider requiring the issuance of a FWC Eagle Permit early in a project's permit-approval process before issuing local land-clearing or development permits.
- Notify the FWC of wildlife complaints or potential FWC rule violations through the Wildlife Alert number (1-888-404-3922). Coordinate with FWC law enforcement in providing supporting information for law enforcement investigations.
- Use Memoranda of Understanding with FWC to implement any of the above actions.

The FWC will:

- Create outreach materials for local governments, landowners, and the general public to foster better understanding of and compliance with this management plan and with other FWC regulations.
- Provide to managers of Florida's public lands the locations of all active and alternate bald eagle nests to allow for proper management of surrounding habitats.

- Cooperate with the Prescribed Fire Strike Team program set up as part of implementation of the Gopher Tortoise Management Plan and other fire strike teams to assist with management of bald eagle habitats on public lands.
- Lead efforts to attain additional funding through the successor to the Florida Forever program to allow local and state governments to acquire and manage additional conservation lands for bald eagles.
- Identify and prioritize through the FWC management-needs database potentially suitable sites on publicly owned or controlled lands that are in need of habitat restoration.
- Assist in establishing incentives in land development codes to better manage and restore publicly owned or controlled land to provide habitat for bald eagles and other wildlife.
- Schedule workshops with local governments and other agencies to provide information on this plan and FWC regulations applicable to bald eagles and information on the role of local governments and other agencies in providing compliance assistance with FWC rules.

Monitoring Plan

Population Monitoring

FWC staff and others have monitored bald eagle nests in Florida since 1972. The information gathered during the past 35 years includes the locations of thousands of eagle nests and nesting territories, breeding productivity, core nesting areas, reproductive success, and population trends. Current information pertaining to the status and trends of the eagle population in Florida, as well as the current status of all known active eagle nests, is available online at www.myfwc.com/imperiledspecies/eagle. An online database for reporting new or previously undiscovered eagle nests in the state is anticipated to be available during spring 2008. Continued monitoring of bald eagle nests in Florida will provide the scientific data necessary to evaluate whether the objectives of this management plan are being achieved, and to determine whether future modification of this management plan and its guidelines may be warranted.

A survey of all known bald eagle nests in Florida is conducted annually between November and March of each nesting season. Surveys are flown by FWC biologists or contractors, and, for Everglades National Park, by National Park Service staff. New or previously undiscovered nests are searched for opportunistically during the regular survey flights. Replication of the survey methodology ensures that effort is comparable among years. All nesting and productivity data for bald eagles in Florida are compiled and analyzed to generate annual population estimates that are used to determine population trends.

Additional surveys were conducted during the 2006–2007 nesting season to determine the efficiency of the current protocol for finding previously undiscovered bald eagle nests and to locate new nests in potential bald eagle habitat.

FWC researchers have identified 16 core areas of bald eagle nesting activity (Figure 3). Changes in size, configuration, and location of these areas will be monitored, and their importance to the overall bald eagle population in Florida will be determined as new data become available.

The Draft Post-Delisting Monitoring Plan (USFWS 2007c) recommends that bald eagle nests be monitored every five years for three eagle generations (24 years). Monitoring eagle nests and nesting territories in Florida at a five-year interval would not provide adequate information to verify that the conservation objectives of this plan were being maintained. Additionally, annual surveys provide to contractors, consultants, land owners, and other interested parties the status of all known active and alternate eagle nests in the state, and provide a basis for declaring nests to be lost or abandoned. To ensure that the conservation objectives of this management plan are being maintained, the FWC recommends that annual surveying continues for the next 24 years (*i.e.*, until 2032). In addition to existing information about the status of eagle nests, biologists characterize the habitat and land-use changes within each nesting territory in Florida. This information may help to identify the factors that affect population changes, movements patterns, habitat changes, and other trends.

The continuation of FWC surveys of all known eagle nests and nesting territories is dependent on securing funding. If funding is limited, then the FWC may choose to survey only a sample of the eagle nests and nesting territories statewide annually, and to develop methods to estimate the overall population. This sub-sampling approach, if developed, will reduce funding costs while continuing to monitor the status of bald eagle nests and nesting territories statewide on an annual basis.

The FWC may partner with other agencies, colleges or universities, or non-governmental organizations in Florida (*e.g.*, Audubon's Eagle Watch program) to assist in the monitoring of bald eagle nests and nesting territories. Such partnering would be another way to possibly reduce monitoring costs while assuring that the appropriate data are collected. Every five years, the FWC will ensure that the data collected in Florida are comparable with data from other states to contribute to the national breeding population estimate.

Project-Specific Nest Monitoring

The Bald Eagle Monitoring Guidelines (USFWS 2007d) recommend monitoring an eagle nest if construction activities occur within 660 feet of the nest during the nesting season (1 October–15 May). These federal guidelines standardize the method for gathering data to evaluate eagle responses to activities that may cause disturbance. The guidelines are designed to: (1) describe normal nesting behavior of bald eagles; (2) identify specific behavioral responses of adult and young eagles that may warrant cessation of development activities; (3) propose the type and level of monitoring necessary to detect a change in normal eagle behavior; (4) prescribe a procedure for reporting to the USFWS and the FWC the observations that may be used to halt or modify construction activities; and (5) provide data to the FWC to evaluate the effectiveness of the current FWC Eagle Management Guidelines. The FWC has adopted the Bald Eagle Monitoring Guidelines (USFWS 2007d). To ensure compliance with these guidelines, the FWC may conduct random spot-checks of projects that are following the guidelines, as resources allow. The information obtained from these monitoring efforts may provide additional insight into the tolerance of bald eagles to human activities near their nests.

Mortality Monitoring

The FWC will evaluate the sources and extent of bald eagle mortality in Florida. These data, coupled with population monitoring, will aid in determining the cause or causes of any decline in the eagle population. An increased mortality rate or a rapid change in the causes of mortality may trigger a management action to address the problem. The FWC's Division of Law Enforcement and the USFWS have worked cooperatively to develop protocols for salvaging and storing eagle carcasses that are sent to the National Eagle Repository in Denver, Colorado. The USFWS has purchased freezers for FWC to store these carcasses until shipments to Colorado can be made. The FWC and USFWS have developed a mortality database that includes the cause of each eagle death.

Education and Outreach

An active conservation education and outreach program will help ensure that the public understands the status of the bald eagle's recovery, knows what protections and management strategies maintain the population, and, most importantly, what citizens can do to aid the eagle's recovery.

Key messages for education and outreach efforts include:

- The bald eagle is an Endangered Species Act success story that is no longer threatened with extinction;
- Delisting does not mean that the bald eagle is no longer protected—state and federal regulations will continue to protect bald eagles, their nests, and their nesting territories; and
- The bald eagle's recovery is a result of prescribed management efforts that will continue, so that a population decline does not occur and trigger a need for future relisting of the species.

This education and outreach plan includes an emphasis on the following audiences:

- Local government planning and permitting staff
- Other federal or state governmental agencies
- Development professionals and private land owners
- Environmental consulting firms
- Conservation-oriented public and groups
- Media representatives
- Local, state, and federal law-enforcement personnel
- Managers of public lands
- Land-acquisition organizations
- Agricultural, silvicultural, ranching, and aquacultural interests
- Power companies
- Communication tower managers
- Landfill managers
- Veterinary associations
- Airport managers and Federal Aviation Authority representatives

Although some of these efforts may be concentrated within bald eagle core nesting areas, efforts will be statewide when possible to maximize benefits to eagle conservation in Florida. All education and outreach efforts such as handbooks, brochures, and PowerPoint presentations will be available for downloading from the FWC's bald eagle website <www.myfwc.com/imperiledspecies/eagle>. Bald eagle interest groups, stakeholders, and the media will be notified when these materials are available online. FWC staff will give presentations about bald eagle conservation in Florida to various interest groups.

All Audiences:

- Create and distribute a brochure that contains key messages about bald eagle recovery, provisions of this management plan, and actions that citizens can take to continue the conservation of eagles in Florida.
- Develop and maintain web pages that contain popular, scientific, legal, and permitting information on bald eagles.
- Create a PowerPoint presentation that is adaptable to different audiences.
- Create a 2-minute video about bald eagle recovery.
- Promote FWC's Wildlife Alert Program in all materials.

Developers, Consultants, Government Agencies, Private Landowners, and Land-Use Planners:

- Create a handbook that describes new regulations, permit options, and management guidelines. This will include bald eagle biology and recovery status, effects of development on nesting eagles, conservation and minimization measures of this management plan, landowner stewardship incentives, and how to comply with state and federal laws and guidelines.

Conservation-oriented Citizens:

- Publish articles in appropriate print and electronic media that highlight key messages about bald eagle biology, recovery status, new rules and guidelines, how and where to observe eagles, and what citizens can do to aid eagle conservation.

Law Enforcement Personnel:

- Provide information on the management implications of federal and state delisting efforts on conservation of bald eagles in Florida. Emphasize that regulations and guidelines will continue to protect eagles, their nests, and their nesting territories.

Land Managers and Land-Acquisition Agents:

- Provide information on the need for continued acquisition of bald eagle habitats, particularly parcels within core breeding areas. Give presentations to inform managers about the FWC's bald eagle website <www.myfwc.com/imperiledspecies/eagle> and technical assistance available from the FWC to properly manage habitats around eagle nests.

Agricultural, Silvicultural, Ranching, and Aquacultural Interests:

- Prepare a fact sheet that includes information on land-use regulations, industry-specific management recommendations, and stewardship incentives.

Power Companies and Communication Tower Managers:

- Provide information on threats posed to eagles by powerlines and communication towers from electrocution or collision, and include recommendations for retrofitting utilities with "avian-friendly" hardware. Provide information on how to discourage eagles and other large raptors from perching on or near hazardous towers. Focus on areas with high raptor mortality, and near core bald eagle nesting areas

Landfill Managers and Veterinary Associations:

- Provide information about the importance of incinerating or quickly burying the carcasses of euthanized animals to prevent the deaths of eagles from secondary barbitol poisoning.

Airport Managers, Federal Aviation Administration Officials:

- Provide information on rules and regulations pertaining to bald eagles and their nests on or adjacent to airports. Provide information on how to discourage eagles from frequenting areas around airports.

Research

Much information concerning the life history and habitat requirements of the bald eagle is known from previous studies. Among numerous other topics published from Florida are the following: research on bald eagle nesting requirements (Broley 1947, McEwan and Hirth 1979, Wood *et al.* 1989); effects of habitat protection (Nesbitt *et al.* 1993); analyses of setback distances and disturbance levels (Nesbitt *et al.* 1993, Millsap *et al.* 2004); and habitat use and movements (Wood 1992, Wood *et al.* 1998, Mojica 2006). Despite the wealth of information gathered previously, much information remains to be obtained or refined to ensure the long-term conservation of bald eagles in Florida.

Current or Planned Research

The FWC has already secured funding for the following projects.

Maximize effort to locate new or previously unreported bald eagle nests.

The FWC is using Geographic Information System (GIS) software to evaluate potential bald eagle nesting habitat to locate new nesting territories. This project will determine the precision of the current survey and what modifications need to be made.

Determine the number of nests on properties that are protected.

Although only about 33% of all known bald eagle nesting territories in Florida occur on public lands (Sullivan *et al.* 2006, Nesbitt *et al.* in review), it is thought that many more territories are located on privately-owned lands that are protected via perpetual conservation easements or similar instruments. The FWC will analyze the protection status of lands surrounding all bald eagle nesting territories in the state.

Evaluate the effectiveness of the FWC Eagle Management Guidelines and determine the long-term effects of development near eagle nests.

As additional residential, commercial, or industrial developments encroach on previously undisturbed bald eagle nesting territories, it would be beneficial to test not only the proximate effects of encroachment on eagle nests, but also the long-term post-construction history of nesting territories. Data supplied via nest monitoring and through the self-service, technical assistance website will assist in this effort. The FWC will determine the population trends and demographic characteristics of bald eagles in Florida, and will assess the long-term effects of human activities on eagle productivity and survivorship. Results of these and other analyses will

guide future research, and may result in lessening of regulations related to buffer zones around eagle nests, should population trends warrant such changes.

Future Research

The FWC needs to identify funding sources for the following proposed projects.

Determine the appropriateness of the FWC Eagle Management Guidelines.

Upon delisting the bald eagle in Florida, the FWC proposes to determine the level of protection needed to ensure a stable or increasing eagle population. This would include evaluating the need for and if needed, the required size of buffer zones around active or alternate bald eagle nests, and how many nesting territories need to be protected to ensure a stable or increasing population.

Determine the frequency of nest reoccupation.

Current guidelines provide for buffer zones to be maintained around abandoned eagle nests for five consecutive nesting seasons. The FWC proposes to determine to what degree abandoned eagle nests may be reoccupied.

Determine success of the delisting protection measures.

The FWC proposes to compare bald eagle data from Florida collected post-delisting with data collected pre-delisting to determine changes in population trends, management effects, and territory occupancy potentially resulting from the delisting protections or modifications.

Investigate the utility of a population viability analysis (PVA) to address specific questions about bald eagles in Florida.

A PVA can be of great use to modeling anticipated threats to bald eagles, such as those from continued encroachment of nest buffers by human activities. A PVA may also allow the determination of a conservation “end point,” after which regulation of land-use of private lands that support eagle nests may no longer be necessary. Many components and parameters need to be considered to conduct an accurate PVA, including data on bald eagle survivorship, movements, and reproductive rates. The usefulness of a PVA will be evaluated based on questions that may be answered with available data.

Test the Bald Eagle Habitat Index of Viability (BEHIV) model to determine its value and accuracy as a tool for management.

The BEHIV analysis (Nesbitt *et al.* in review) uses GIS to score bald eagle nests in Florida based on several site-specific parameters. This analysis may identify the long-term stability of eagle nesting habitats, and could be used to aid the decision-making process when considering whether to regulate land-use within eagle nesting territories.

Study use of landfills by bald eagles in Florida.

Many eagles forage or loaf at landfills, where they may be exposed to secondary pentobarbital poisoning or other dangers. The FWC proposes to monitor the use of landfills by bald eagles in Florida, examining non-nesting roost populations, temporal use, age-class, land use, and other topics.

Study the use of artificial nesting structures by bald eagles in Florida.

The use of artificial structures as nesting substrates by bald eagles in Florida seems to be increasing. The FWC proposes to monitor the use and success of bald eagles nesting on these structures, and will determine if this behavior is a result of the increased availability of artificial substrates, an increasing willingness of bald eagles to nest in urban areas, and/or a decrease in the availability of suitable natural structures. Because most structures are not built to support bald eagle nests, and the nests may be considered hazards to human safety or property (as well as to the eagles and their eggs or nestlings), then the FWC will also examine ways to discourage eagles from nesting on these structures.

Study the movements of post-breeding adult bald eagles from Florida.

The FWC proposes to identify areas that support Florida's breeding bald eagles during the non-nesting season. This information is not well known and is important for understanding the risks and hazards posed to Florida's nesting eagles during migration and on their summering grounds. The FWC will partner with wildlife agencies in other states because most of Florida's nesting eagles summer outside the state.

Study how, when, and where Florida-produced eagles enter the breeding population.

The FWC proposes to study the tendency of eagles to return to their natal areas, sex ratios of adult eagles in the population, and habitat choices of eagles during their initial breeding attempt.

CHAPTER 5: IMPLEMENTATION STRATEGY**Priority Actions**

A prioritized approach to this management plan will help maintain the conservation objectives and will facilitate the coordination necessary to successfully implement the plan. The actions in the summary list below are described in more detail in Chapter 4.

Priority Actions to be Undertaken by the FWC

- Approve and implement the proposed rule to protect bald eagles (68A-16.002, F.A.C.), simultaneously with removing the bald eagle from 68A-27.004 F.A.C.
- Implement the proposed permitting framework.
- Design a technical assistance system that operates effectively and efficiently to minimize FWC staffing requirements and provides optimal customer service and conservation benefit.
- Prepare press releases and print- or web-based materials to communicate to the concerned, conservation-oriented public and other stakeholders the new protection rules and FWC Eagle Management Guidelines.
- Develop and maintain a website to centralize information on bald eagles.
- Create a handbook for development professionals, local governments, water management districts, and private landowners that describes new regulations, stewardship incentives, and FWC Eagle Management Guidelines to be followed upon delisting of the bald eagle in Florida. Concentrate efforts to circulate the handbook and other presentations in regions that support bald eagle core nesting areas.
- Work with local governments to make them aware of FWC wildlife regulations.
- Work with water management districts and DEP to make them aware of FWC's regulation and habitat management guidelines for eagles.
- Work with Florida state agencies such as the Department of Transportation to develop agreements to streamline permitting and provide suitable conservation actions when needed.
- Apply for grants to fund implementation of additional conservation actions.
- Continue aerial surveys to monitor the reproductive success of bald eagles in Florida and the locations and status of their nests, and convey this information annually to stakeholders and other interested parties.

- Increase efforts to locate new or previously undiscovered bald eagle nests.
- Reevaluate the distance at which nesting bald eagles are disturbed.

Priority actions to be undertaken by other agencies with assistance from FWC

- Adopt language in land development codes and/or comprehensive plans to include wildlife protected under FWC rules, whether or not classified as imperiled.

Priority actions for private citizens

- Report new or previously undiscovered bald eagle nests to the FWC.
- Report violations of the bald eagle rule to the Wildlife Alert number (1-888-404-3922).
- Manage habitats on private lands to benefit bald eagles and other species of conservation concern.
- Support bald eagle conservation actions.

Required Resources and Other Costs Associated with Implementation

Many of the conservation actions identified in this management plan have been in place for many years; the FWC has been actively managing Florida's bald eagle population since the early 1970s. Ongoing conservation actions include annual monitoring of all known bald eagle nests and nesting territories, investigating and prosecuting illegal activities, recovering eagle carcasses, and maintaining a website for inquiries about bald eagles, their nests, and their nesting territories. The FWC will continue these activities upon delisting of the bald eagle.

Many FWC staff will assist with implementation of this plan. The FWC may require additional staff and funding to perform some or all of the following activities: continue the annual aerial nest surveys; update and expand the bald eagle website to provide information on permitting, the FWC Eagle Management Guidelines, and nest locations; implement incentive programs; work with local governments; and provide public education and outreach. Funds paid into the Bald Eagle Conservation Fund to compensate for permitted activities within buffer zones around eagle nests will provide the funding necessary for some of these activities. Expected annual costs of implementing the plan (in 2007 dollars) are as follows:

- \$ 6,950 – salary and benefits for Avian Taxa Coordinator for 10% time
- \$ 8,700 – salary and benefits for 5 Regional Nongame Biologists for 2.5% time each
- \$ 13,900 – salary and benefits for Avian Research Biologist for 25% time
- \$ 17,300 – salary for OPS Biological Scientist II 50% time
- \$ 14,800– salary for OPS Fish and Wildlife Technician 50% time
- \$ 14,000 – salary for OPS Biological Scientist (database manager) for 25% time
- \$ 40,800 – salary and benefits for one new Law Enforcement officer

\$ 60,000 – salary and expenses for OPS Biological Scientist III to lead plan implementation
 \$ 80,500 – aerial survey costs (two years of funding is secured)
 \$ 5,000 – field and office equipment and supplies
 \$ 5,500 – salary for one Public Information Coordinator for 10% time
 \$ 8,000 – salary for Conservation Stewardship Coordinator for 20% time
\$315,080 – Total Annual Recurring Cost

Expected one-time costs over five years are as follows:

\$ 17,500 – development and production of brochures, handbooks, and fact sheets
 \$ 25,000 – startup costs for plan implementation

Efforts to effectively implement the plan will be greatly enhanced by cooperation with and active participation of external agencies. In particular, local governments, water management districts, DEP, and the USFWS will play important roles in implementing this plan, and numerous other stakeholders have expressed an interest in bald eagle issues.

Implementation Schedule

As noted above, conservation of the bald eagle through implementation of this management plan requires the cooperation of an array of agencies, managers, universities, landowners, and stakeholders. The following list is divided into priorities to be initiated in the first year and those to be initiated within the next five years to maintain the conservation goal and objectives for bald eagles.

Actions that the FWC should begin within the next 12 months

- Approve and implement the proposed rule to protect bald eagles and their nests;
- Implement a permitting framework as described in Chapter 4;
- Prepare press releases and print -or web-based materials to communicate to all audiences the key messages, new protection rules and guidelines, and ways that citizens can contribute to maintaining recovery;
- Continue law enforcement activities such as patrol, enforcement, and education;
- Develop a website to centralize all available information on bald eagles;
- Create resources (*e.g.*, a handbook or PowerPoint presentation) for development professionals, county governments, water management districts, and private landowners that describe new regulations, stewardship incentives, and FWC eagle management guidelines developed to protect bald eagles upon delisting. Concentrate efforts to circulate the handbook and make presentations in regions that support bald eagle core nesting areas (Figure 3, page 7);

- Continue aerial surveys to monitor the reproductive success of bald eagles in Florida and the locations and status of their nests and nesting territories;
- Expand efforts to locate new and previously undiscovered eagle nests;
- Reevaluate the distance at which some nesting bald eagles may be disturbed;
- Work to enhance and manage bald eagle habitats on state-owned and state-managed lands;
- Apply for grants to fund priority actions/research;
- Initiate random spot-checks of construction projects that are following the FWC Eagle Management Guidelines;
- Review the information provided during nest-monitoring events and evaluate the annual nest-monitoring protocol to ensure that the information collected can assist in answering some of the most pressing management questions.

Actions that local governments and other state agencies should begin within the next 12 months with assistance from the FWC

- Adopt procedures within ordinances to assist and assure consistency with management guidelines and policies for bald eagles.
- Work to enhance and manage bald eagle habitat on state-owned and state-managed state-owned lands.

Actions that the FWC should continue or implement during the next five years with assistance from outside entities

- Continue aerial surveys to monitor the reproductive success of bald eagles in Florida and to update the locations and status of eagle nests and nesting territories;
- Determine the percentage of bald eagle nests that are protected on public lands or by perpetual conservation easements, or otherwise unlikely to be further developed;
- Continue to monitor and manage fish populations and aquatic habitats;
- Continue law enforcement activities such as patrol, enforcement, and education;
- Develop and maintain funding sources for continued monitoring and data analysis of bald eagle nests and nesting territories;
- Study long-term trends in the statewide bald eagle population;

- Study the frequency at which bald eagles reactivate an abandoned nest, and after how many years of non-use;
- Study the effectiveness of post-delisting regulations and recommendations;
- Test the value and accuracy of the BEHIV model (Nesbitt *et al.* in review) as a tool for habitat management;
- Study the long-term effects of development near bald eagle nests;
- Study the use of artificial nesting structures by bald eagles in Florida;
- Study the movements of post-breeding bald eagles after they migrate out of Florida;
- Study how, when, and where Florida-produced bald eagles enter the breeding population;
- Monitor the sources and extent of bald eagle mortality;
- Prepare a fact sheet that describes the need for continued acquisition of bald eagle habitats, particularly within core nesting areas;
- Create and distribute a brochure with key messages about bald eagle biology and recovery status, observing eagles, and what citizens can do to aid recovery;
- Prepare a fact sheet that includes information on land-use regulations, the threat posed to eagles by power lines, industry-specific management recommendations, and stewardship incentives;
- Create a video highlighting key messages and citizen involvement, and post this to FWC's website.

Priority action to be undertaken by local governments with assistance from the FWC within the next five years

- Offer expedited permit review and/or reduced development review fees to developers who voluntarily follow the FWC Eagle Management Guidelines.
- Adopt procedures within ordinances to assist and assure consistency with science-based management guidelines and policies for bald eagles.

Management Plan Review and Revision

To ensure that the conservation goal of this management plan is maintained, the FWC will review the status of Florida's bald eagle population based upon annual surveys of nests and nesting territories. This management plan will be reviewed and revised after five years (*i.e.*, in 2013). Significant changes to the management plan will be made with public input and Commission approval.

CHAPTER 6: ANTICIPATED IMPACTS

Economic Impacts

This preliminary assessment of economic impacts of delisting the bald eagle in Florida was based on the conservation strategies and actions proposed in this management plan.

Estimated cost to the FWC of implementing proposed conservation strategies and actions.

Resources required to implement this bald eagle management plan are described in Chapter 5. The conservation actions proposed in the management plan will require a commitment of staff time to review applications for FWC Eagle Permits, develop landowner-incentive programs, coordinate research and monitoring programs, and develop and implement appropriate education and outreach programs. One-time costs associated with producing informational brochures over five years are estimated to be \$17,500. Annual costs for staff to implement the management plan are estimated to be \$315,080. Of these totals, the one-time cost to produce brochures (\$17,500), start-up costs (\$25,000), and approximately \$60,000 of annual costs represent new costs to the FWC, for which funding sources must be secured.

It is unlikely that the FWC can conduct additional activities with existing staff and resources. Management actions proposed in this plan will need to be prioritized along with other agency programs, species needs, and available resources. New funding and personnel dedicated to implementation of this plan are necessary to accomplish all outlined strategies and tasks. The exact costs will depend on the amount of resources that local governments and landowners can devote to bald eagle conservation in Florida.

Estimated cost to potentially affected parties of implementing the proposed conservation strategies and actions.

The permits required under the proposed rules are no-cost permits. Conservation and minimization measures recommended under FWC Eagle Permits may increase costs incurred by permit applicants. The exact costs would vary from site to site depending on the size of the project, the size of the recommended buffer, and potential impacts to bald eagles. Sale of conservation easements around an active or alternate bald eagle nest will financially benefit some owners of private lands, and may also increase their eligibility to receive funds through state and federal land-management incentive programs.

Actions listed in the FWC Eagle Management Guidelines may lower costs to private landowners. By providing the option of following these guidelines instead of applying for a FWC Eagle Permit, developers can conserve bald eagle habitats rather than having to compensate for construction activities.

Social Impacts

The bald eagle was chosen as the national symbol of the United States on 20 June 1782 because of its longevity, great strength, and majestic bearing. The bald eagle appears on the Great Seal of

the United States and represents freedom. President John F. Kennedy wrote that, “The Founding Fathers made an appropriate choice when they selected the bald eagle as the emblem of the nation. The fierce beauty and proud independence of this great bird aptly symbolize the strength and freedom of America.”

During the public comment period of this management plan, one social theme was repeatedly expressed: That delisting of the bald eagle could create the perception that there is less need for conservation and management. This misperception could potentially lead to an increase in the illegal take of or disturbance to eagles, which may negatively impact the population. If this were to happen, it would erode public confidence in the FWC’s ability to manage the state’s wildlife.

Conversely, successfully managing the public’s perception about the delisting of bald eagles in Florida will help to accomplish the goals of this management plan, and will enhance public confidence in the agency. The bald eagle has successfully recovered from its imperiled status. The FWC has the opportunity to make the public aware of this success story, and to assure the public that conservation of bald eagles will continue.

This management plan includes an Education and Outreach section that identifies the need to explain to key audiences the rules and guidelines that remain in place for the protection of bald eagles, their nests, and their nesting territories. This plan also commits that the current level of law enforcement will not decrease upon delisting of the eagle. These actions should create public awareness of the continuance of actions that protect bald eagles in Florida, and should generate support for this management plan.

The delisting process will place responsibility on local governments to remain involved with regulations and guidelines that protect bald eagles and their habitats under the guidance of this management plan. This responsibility will create a closer working relationship between FWC and local governments.

Ecological Impacts

Upland and aquatic habitats that support bald eagles in Florida also support a large number of other species. Acquiring lands that support eagle nests, or placing buffer zones around eagle nests into perpetual conservation easements, will benefit a host of other plant and animal species. Continued conservation and management of aquatic habitats will provide healthy feeding areas for bald eagles and will benefit a multitude of other species that depend on Florida’s aquatic environments. Electrocution-related mortality of bald eagles and other birds may be reduced as a result of power companies incorporating “avian-friendly” devices and fittings on their equipment.

LITERATURE CITED

- AOU [American Ornithologists' Union]. 1998. *Check-list of North American Birds*. 7th edition. American Ornithologists' Union, Washington, D.C.
- Bailey, H.H. 1925. *The Birds of Florida*. Williams and Wilkins, Baltimore, MD.
- Broley, C.L. 1947. Migration and nesting of Florida bald eagles. *Wilson Bulletin* 59:3–20.
- Broley, C.L. 1950. The plight of the Florida bald eagle. *Audubon* 52(1): 42–49.
- Buehler, D.A. 2000. Bald eagle (*Haliaeetus leucocephalus*). Number 506 in *The Birds of North America* (A. Poole, P. Stettenheim, and F. Gill, editors). The Academy of Natural Sciences, Philadelphia, PA, and the American Ornithologists' Union, Washington, D.C.
- Centers for Disease Control and Prevention. 2006. West Nile Virus website <www.cdc.gov/ncidod/dvbid/westnile/index.htm>. Accessed 11 May 2007.
- Cruikshank, A.D. 1980. *The Birds of Brevard County, Florida*. Florida Press. Orlando, FL.
- Curnutt, J.L. 1996. Southern bald eagle (*Haliaeetus leucocephalus leucocephalus*). Pages 179–187 in *Rare and Endangered Biota of Florida, Volume V. Birds* (J.A. Rodgers, H.W. Kale, and H.T. Smith, editors). University Press of Florida, Gainesville, FL.
- Curnutt, J.L., and W.B. Robertson. 1994. Bald eagle nest site characteristics in south Florida. *Journal of Wildlife Management* 58: 218–221.
- Forrester, D.J., and M.G. Spalding. 2003. *Parasites and Diseases of Wild Birds in Florida*. University Press of Florida, Gainesville, FL.
- FWC [Florida Fish and Wildlife Conservation Commission]. 2005. Wildlife legacy initiative: Comprehensive wildlife conservation strategy. Florida Fish and Wildlife Conservation Commission, Tallahassee, FL.
- Gerrard, J.M., and G.R. Bortolotti. 1988. *The Bald Eagle: Haunts and Habits of a Wilderness Monarch*. Smithsonian Institution Press, Washington, D.C.
- Howell, A.H. 1932. *Florida Bird Life*. Coward-McCann, New York, NY.
- Landsea, C.W., N. Nicholls, and L.A. Avila. 1996. Downward trends in the frequency of intense Atlantic hurricanes during the past five decades. *Geophysical Research Letters* 23: 1697–1700.
- McCarthy, J.J., O.F. Canziani, N.A. Leary, D.J. Dokken, and K.S. White, editors. 2001. Climate change 2001: Impacts, adaptation, and vulnerability. Contributions of Working Group II

- to the Third Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge, UK.
- McEwan, L.C., and D.H. Hirth. 1980. Food habits of the bald eagle in north-central Florida. *Condor* 82: 229–231.
- Millsap, B., T. Breen, E. McConnell, T. Steffer, L. Phillips, N. Douglass, and S. Taylor. 2004. Comparative fecundity and survival of bald eagles fledged from suburban and rural natal areas in Florida. *Journal of Wildlife Management* 68: 1,018–1,031.
- Mojica, E.K. 2006. Migration, home range, and important use areas of Florida sub-adult bald eagles. Master's thesis, University of Georgia, Athens, GA.
- Nesbitt, S.A. 2005. Bald eagle annual report 2005. Florida Fish and Wildlife Conservation, Tallahassee, FL.
- Nesbitt, S.A., and M.W. Collopy. 1985. Raptor research and management in Florida: Bald eagles. *Eyas* 8: 26–28.
- Nesbitt, S.A., G.L. Holder, D.A. Mager, and S.T. Schwikert. 1990. Use of aerial surveys to evaluate bald eagle nesting in Florida. Pages 207–210 in *Proceedings of the Southeast Management Symposium and Workshop*. National Wildlife Federation, Washington, D.C.
- Nesbitt, S.A., M.J. Folk, and D.A. Wood. 1993. Effectiveness of bald eagle habitat protection guidelines in Florida. *Proceedings of the Annual Conference of Southeastern Associated Fish and Wildlife Agencies* 47: 333–338.
- Nesbitt, S.A., J.L. Hatchitt, T.H. Logan, J.H. White, and P.S. Kubilis. In review. Geographic Information System used to score Florida bald eagle nest sites. Submitted to *Journal of Wildlife Management*.
- Peterson, D.W., and W.B. Robertson. 1978. Southern bald eagle. Pages 27–30 in *Rare and Endangered Biota of Florida, Volume 2, Birds* (H.W. Kale, editor). University Presses of Florida, Gainesville, FL.
- Robertson, W.B., and G.E. Woolfenden. 1992. *Florida Bird Species: An Annotated List*. Special Publication Number 6, Florida Ornithological Society, Gainesville, FL.
- Shea, D.S., R.E. Shea, and W.B. Robertson. 1979. Unusual observations of nesting bald eagles in south Florida. *Florida Field Naturalist* 7: 3–5.
- Stalmaster, M.V. 1987. *The Bald Eagle*. Universe Books, New York, NY.
- Stevenson, H.M., and B.H. Anderson. 1994. *The Birdlife of Florida*. University Press of Florida, Gainesville, FL.

- Sullivan, D., T.H. Logan, C.M. Martino, S.[A.] Nesbitt, and T. Steffer. 2006. Biological Status Report for the Bald Eagle. Florida Fish and Wildlife Conservation Commission, Tallahassee, FL.
- USFWS [United States Fish and Wildlife Service]. 1987. Habitat management guidelines for the bald eagle in the southeast region. United States Fish and Wildlife Service, Washington, D.C.
- USFWS. 1989. Southeastern states bald eagle recovery plan. United States Fish and Wildlife Service, Washington, D.C.
- USFWS. 1999. Proposed rule to remove the bald eagle in the Lower 48 states from the list of endangered and threatened wildlife. *Federal Register* 64: 36,454–36,464.
- USFWS. 2006a. Removing the bald eagle in the Lower 48 states from the list of endangered and threatened wildlife, 16 February 2006. *Federal Register* 71: 8,238–8,251.
- USFWS. 2006b. Clearance to proceed with construction activities adjacent to bald eagle nests – 2006 revision. FWS/R4/ES-JAFL, 5 June 2006. United States Fish and Wildlife Service, Jacksonville, FL.
- USFWS. 2007a. Questions and answers for Bald and Golden Eagle Protection Act actions. United States Fish and Wildlife Service, Washington, D.C.
- USFWS. 2007b. National Bald Eagle Management Guidelines. United States Fish and Wildlife Service, Washington, D.C.
- USFWS. 2007c. Draft post-delisting monitoring plan for the bald eagle (*Haliaeetus leucocephalus*). United States Fish and Wildlife Service, Washington, D.C.
- USFWS. 2007d. Bald Eagle Monitoring Guidelines. United States Fish and Wildlife Service, Washington, D.C.
- Wilde, S.B., T.M. Murphy, C.P. Hope, S.K. Habrun, J. Kempton, A. Birrenkott, F. Wiley, W.W. Bowerman, and A.J. Lewitus. 2005. Avian vacuolar myelinopathy linked to exotic aquatic plants and a novel cyanobacterial species. *Environmental Toxicology* 20: 348–353.
- Wood, P.B. 1992. Habitat use, movements, migration patterns, and survival rates of sub-adult bald eagles in north Florida. Ph.D. dissertation. University of Florida, Gainesville, FL.
- Wood, P.B., and M.W. Collopy. 1995. Population ecology of sub-adult southern bald eagles in Florida: Post-fledging ecology, migration patterns, habitat use, and survival. Nongame Wildlife Program. Florida Game and Fresh Water Fish Commission, Tallahassee, FL.

Wood, P.B., M.W. Collopy, and C.M. Sekerak. 1998. Postfledging nest dependence period for bald eagles in Florida. *Journal of Wildlife Management* 62: 333–339.

Wood, P.B., T.C. Edwards, and M.W. Collopy. 1989. Characteristics of bald eagle nesting habitat in Florida. *Journal of Wildlife Management* 53: 441–449.

APPENDIX 1: LINKS TO ONLINE USFWS DOCUMENTS

- USFWS.1999. Proposed rule to remove the bald eagle in the Lower 48 states from the list of endangered and threatened wildlife.
<[http://www.fws.gov/southwest/es/arizona/Documents/SpeciesDocs/BaldEagle/baldeagle delisting99.pdf](http://www.fws.gov/southwest/es/arizona/Documents/SpeciesDocs/BaldEagle/baldeagle%20delisting99.pdf)>.
- USFWS. 2006. Removing the bald eagle in the Lower 48 states from the list of Endangered and Threatened wildlife, 16 February 2006.
<http://www.fws.gov/southwest/es/arizona/Documents/SpeciesDocs/BaldEagle/BE_Delisting_Reopening.pdf>.
- USFWS. 2006. Bald eagle monitoring guidelines (Florida).
<<http://www.fws.gov/northflorida/BaldEagles/2007-BE-Monitoring-Guidelines-without-figures.htm>>.
- USFWS. 2007. Protection of bald eagles; definition of “disturb.”
<http://www.fws.gov/pacific/eagle/definitions/disturb_def.html>.
- USFWS. 2007. National Bald Eagle Management Guidelines.
<<http://www.fws.gov/migratorybirds/issues/BaldEagle/NationalBaldEagleManagementGuidelines.pdf>>.
- USFWS. 2007. Bald eagle monitoring guidelines.
<http://www.fws.gov/northflorida/BaldEagles/2007-BE-Monitoring-Guidelines-without-figures.htm> .
- USFWS. 2007. Draft post-delisting monitoring plan for the bald eagle (*Haliaeetus leucocephalus*). <<http://www.fws.gov/midwest/eagle/protect/DraftBAEAPDM.html>>.
- USFWS 2007. Proposal to create a permit process for bald and golden eagles.
<<http://www.fws.gov/policy/library/07-2697.pdf>>.

APPENDIX 2: LIST OF FWC STAKEHOLDERS

Individuals on the FWC’s stakeholder contact list, some of whom provided comments or other assistance to the bald eagle management team. *A member of the “ad-hoc” bald eagle committee who participated in meetings, November 2007–January 2008.

STAKEHOLDER	AFFILIATION
Yvette Alger	St. Lucie County
Bonnie Basham	Standing Watch
Teresa Bishop	St. Johns County
Jan Brewer	St. Johns County
Karl Bullock	Golder Associates
Barbara Burgeson	Collier County
Gail Carmody	U.S. Fish and Wildlife Service
Resee Collins	U.S. Fish and Wildlife Service
Ron Concoby	Independent scientist
Lori Cunniff	Orange County
Amy Dierolf	Progress Energy
Seth Drawdy	Foley Land and Timber Company
Michael Drummond	Alachua County
Todd Engstrom	Florida Ornithological Society
Susan Farnsworth	Citrus County
Sammi Fitch	City of Cape Coral
*Monica Folk	The Nature Conservancy
Jerris Foote	Sarasota County Parks and Recreation
Shane Fuller	St. Joe Company
*Steve Godley	Biological Research Associates, Inc.
Phil Gornicki	Florida Forestry Association
Mary Ann Gosa	Florida Farm Bureau
Richard Hamann	Center for Governmental Responsibility
Dennis Hardin	Florida Division of Forestry
David Hartgrove	Halifax River Audubon Society
Clay Henderson	Holland and Knight LLP
Rob Hicks	Plum Creek Timber Company
Stephen Hofstetter	Alachua County
Wade Hopping	Wade Hopping Associates
Kim Iverson	South Atlantic Fisheries Management Council
Steve Kintner	Volusia County
*Tom Logan	Breedlove, Dennis & Associates, Inc.
*Laurie Macdonald	Defenders of Wildlife

*Candace Martino	U.S. Fish and Wildlife Service
Matt Osterhoudt	Sarasota County
Franklin Percival	Florida Cooperative Fish & Wildlife Research Unit
Barbara Jean Powell	Everglades Coordinating Council
*Doug Rillstone	FL Chamber Commerce/Developers Assoc.
Preston Robertson	Florida Wildlife Federation
Vicki Sharpe	Florida Department of Transportation
Arnette Sherman	West Volusia Audubon Society
Stan Simpkins	U.S. Fish and Wildlife Service
Parks Small	Florida Department of Environmental Protection
Caroline Stahala	U.S. Fish and Wildlife Service
*Tony Steffer	Raptor Management Consultants
Andy Stevens	Charlotte County
Becky Sweigert	Lee County
Tim Telfer	Flagler County
Kim Trebatoski	Lee County
Tom Trettis	Wilson Miller Engineering
Christina Uranowski	Osceola County
Carol Wehle	South Florida Water Management District
*Lynda White	Audubon of Florida
*Julie Wraithmell	Audubon of Florida

**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 JAFI through the Programmatic Concurrence on this key, "NLAA" determinations for projects made pursuant to this key require no further consultation with the JAFI.

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.

Literature Cited

Kahl, M.P., Jr. 1964. Food ecology of the wood stork (*Mycteria americana*) in Florida. *Ecological Monographs* 34:97-117.

Ogden, J.C. 1991. Nesting by wood storks in natural, altered, and artificial wetlands in central and northern Florida. *Colonial Waterbirds* 14:39-45.

Rodgers, J.A. Jr., A.S. Wenner, and S.T. Schwikert. 1987. Population dynamics of wood storks in northern and central Florida, USA. *Colonial Waterbirds* 10:151-156.

Rodgers, J.A., Jr., S.T. Schwikert, and A. Shapiro-Wenner. 1996. Nesting habitat of wood storks in north and central Florida, USA. *Colonial Waterbirds* 19:1-21.

U.S. Fish and Wildlife Service. 1999. South Florida multi-species recovery plan. Fish and Wildlife Service; Atlanta, Georgia. Available from:
<http://verobeach.fws.gov/Programs/Recovery/vbms5.html>.

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

The northern crested caracara (*Caracara cheriway*) is a resident, diurnal, and non-migratory raptor that occurs primarily in Florida, Texas, Arizona, Cuba, Mexico, Central America, and the northern portions of South America (Morrison and Dwyer 2012). Only the Florida population, which is isolated from the remainder of the species, is listed as threatened under the Endangered Species Act.

In order to avoid the potential for unauthorized take, future project sites within the caracara consultation area (Figure 1) containing habitats (same or similar) as described below should undergo a formal caracara survey to determine site utilization by caracaras. The intent of caracara surveys is three-fold: (1) to determine the location(s) of active caracara nest(s) that could be adversely affected by the proposed project; (2) to determine the presence and use of the project area by breeding and non-breeding caracaras, including the approximate boundaries of breeding territories, if possible; and (3) to determine the fate and productivity of any caracara nest found.

We recommend coordinating with the U.S. Fish and Wildlife Service (Service) prior to conducting surveys, including submittal of a proposed survey plan and list of observers which follows the guidance below. Following the guidance will ensure that the surveys are timed during the period of greatest detection to document caracaras within or adjacent to the proposed project. The Service has caracara observation and nest location data as well as designated caracara congregation areas that may be of use for planning surveys. For project consultations under the Endangered Species Act, surveys must follow this protocol and must be no older than the previous caracara nesting season (January – April) in order to be considered valid. In the event that construction or vegetation clearing activity will occur more than one year after permitting is completed, contact the Service to discuss the need for follow-up surveys.

Foraging and Nesting Habitat

The Florida caracara population commonly occurs on dry or wet prairies with scattered cabbage palms (*Sabal palmetto*). It may also be found in lightly wooded areas. Scattered saw palmetto (*Serenoa repens*), scrub oaks (*Quercus geminata*, *Q. minima*, *Q. pumila*), and cypress (*Taxodium* spp.) may also be present. Widespread changes in land use may have caused a change in habitat use in this species. Morrison and Humphrey (2001) found a strong association of caracara home ranges with improved pasture. The presence of seasonal wetlands, which may serve as foraging habitat, is an important factor in the attractiveness of these pastures to caracaras (Service 1999). Therefore, today we recognize caracara foraging habitat (and nesting territories) as those areas with short herbaceous vegetation. This includes native wet and dry prairies, but also improved, unimproved, and woodland pastures, sod farms, row crops, levees, and rangeland. Juvenile caracaras may also use citrus and tree farms.

The primary nesting substrate is cabbage palm, although there have been rare reports of nesting in slash pine (pers. obs.), cypress, oak, red cedar (Morrison 2007), Australian pine

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

(*Casuarina* sp.), saw palmetto, and black gum (*Nyssa sylvatica*), and even more atypical locations such as an electrical substation, radio tower, and billboard (Dwyer and DallaRosa 2015).

Survey Design and Planning

The protective area for a caracara nest is a radius of about 1,500 meters (m) (4,920 feet) from the nest. Therefore, the survey area should include the project area and a 1,500-m buffer zone around the perimeter of the project area (including access roads) to account for off-site nest trees in territories that might overlap onto the project area. A recent aerial photograph depicting the project boundary and buffer zone should be used to identify all areas of suitable habitat and to preliminarily map observation blocks. An observation block is defined as an area easily observable from one vantage point. Enough observation blocks must be identified to cover all suitable habitats within the project boundary and 1,500-m buffer. Surveyors should try to obtain legal access to non-project property within the survey area where suitable habitat exists; these efforts should be documented (e.g., copy of letter, email, etc.). If permission cannot be obtained, contact the Service for additional guidance prior to initiating surveys.

Prior to the first survey, a site visit should be conducted to confirm suitable habitat and the location of observation blocks. Based on this site assessment (e.g., presence of visual obstructions), observation blocks may need to be revised. During the site visit, also identify observer survey stations (at least one per observation block). Survey stations should be located to allow full, unobstructed view of the observation block – strategic points are those where caracaras are more likely to be seen going to and from potential nesting or foraging sites. Based on the site assessment, update the aerial photo to show suitable habitat, and labeled observation blocks and their respective survey stations. The location of survey stations may be adjusted if needed based on initial survey results in order to obtain a different/better view of caracara activity. Any adjustments to the survey design should be documented via revised maps.

Observer Qualifications

Information from a recent study (Dwyer *et al.* 2012) suggested that the probability that a visit or series of visits (*i.e.*, a survey) would lead to the discovery of an existing caracara nest increases with an experienced observer. Due to their cryptic nest site locations and unorthodox method of foraging (walking on the ground), successful nest site surveys require a specific skillset acquired by conducting numerous surveys under the supervision of an experienced caracara surveyor. In addition, caracaras can be hard to find and identify at long distances, especially under low-light conditions. Caracaras may also be wary of humans and will change their behavior in the presence of people, which can make locating nests extremely difficult for less experienced observers. Due to these factors, surveys must be conducted by a qualified biologist having at least two years of experience conducting bird surveys and at least 40 hours of caracara survey experience (*i.e.*, equivalent to one survey season) under the supervision of an experienced caracara surveyor. If an observer does not meet these minimum qualifications,

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

the observer should be accompanied by a qualified observer who will serve as the primary observer. Even in cases of qualified observers, and where staff resources allow it, having two observers at the same station can increase the probability of finding a nest.

Conducting Foraging and Nesting Surveys

The highest probability of success in finding caracara nests is during the period of January through March. This period covers the time when adult caracaras are foraging to feed nestlings and therefore, become more visible to observers. As such, surveys must start no later than January 10 and continue through April 30 to provide adequate data to conclude whether or not the site contains an active caracara nest and/or foraging habitat. If the survey starts after January 10, and no nest are found, the survey may not be considered valid by the Service. Surveys considered invalid should be repeated the following nesting season using the latest Service protocol to ensure that early nesting birds were not missed. Surveys should not be conducted in November or December without additional coordination with the Service to avoid disturbing nesting caracaras during nest initiation or incubation, when they are more prone to disturbance.

A complete survey of the project area consists of one survey session every two weeks of each observation block within the project area and the 1,500-m buffer from early January (i.e., Jan 1 - 10) through April 30 (unless a nest is found within the observation block prior to April 30; in that event, begin Productivity Surveys as described below). A survey session is defined as a single survey within an identified observation block initiated at least 15 minutes prior to sunrise and lasting 3 hours (Dwyer et al. 2012). The entire 3-hour survey session must be spent viewing the one observation block – observers cannot rotate between stations, cruise roads, or leave the observation block unless following a flying caracara. If the survey area is large or includes obstructed views, and multiple observation blocks are required, then multiple observers (preferred) or additional survey sessions will be needed to complete the survey of the entire project area. Afternoon or evening surveys are optional, but cannot be substituted for early morning surveys (in the event of not finding a nest). More frequent morning surveys (i.e., more than one during any two-week period) of an observation block are also optional, and can increase the probability of finding a nest, but cannot replace the subsequent “once per two-week surveys” through April 30 (in the event of not finding a nest).

Surveys should be conducted from inside a vehicle (best option is a truck or similar vehicle to maximize height and minimize view obstructions) or an appropriate wildlife blind using high-power binoculars. This minimizes caracara disturbance and behavior alteration, and increases the probability of finding nest locations. Depending on the distance being surveyed, or the proximity of the caracara/nest being observed, it may also be acceptable for the observer to be adjacent to the vehicle if that affords better viewing. A spotting scope is essential when documenting behavior of caracaras and confirming nest tree locations that are far away. If this cannot be accomplished (e.g., due to visibility or vehicle access restrictions), the Service should be contacted to provide site-specific guidance.

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

Weather conditions must be adequate to clearly view the whole area. Surveys should not be conducted when it is rainy or foggy (Dwyer *et al.* 2012). Wind speed should be less than 12 miles per hour (19 kilometers per hour; Beaufort Number 3). Weather conditions and other important information must be recorded on field data sheets as itemized below (see Reporting).

During the survey, from a stationary position, search for caracara activity, including birds perched in trees or on sentinel posts, flying along roads or levees, or carrying nesting material or food. Watch for other birds, such as American crows (*Corvus brachyrhynchos*), red-tailed hawks (*Buteo jamaicensis*), red-shouldered hawks (*Buteo lineatus*), bald eagles (*Haliaeetus leucocephalus*), and turkey vultures (*Cathartes aura*), that might elicit an aggressive response from caracaras. Nesting caracaras will often chase potential predators away from the nest, thus revealing their presence. Also, vultures can indicate the presence of carrion that may attract caracaras. If the observer is near or on a road, pay attention to road-killed animals that may serve as forage for caracaras. If in a pasture, look for cow or calf carcasses on which caracaras may forage.

If a caracara is sighted, document its activity (*i.e.*, foraging, roosting, preening, territorial behavior, etc.) and location on an aerial map. If a caracara is in flight, document on the aerial map the direction the bird came from, the direction it is flying in, and if it is carrying nesting material or food. Make all reasonable efforts to track the bird to a potential nest location. If a potential nest tree is detected, then the observer can reposition to improve observation of the bird's behavior. All observer locations during a survey should be marked on the aerial. All caracara observations must be recorded on the field data sheets, including time of observation, number of birds, plumage (adult/juvenile), activity/behavior (*e.g.*, perching, foraging, feeding, preening, courtship or territorial display, etc.), and nest stage (building, incubating, nestlings, fledglings), if applicable. Corresponding caracara locations and flight paths must be marked and labeled on the aerial map. Also mark any potential or confirmed nest tree locations on the aerial photo, with GPS coordinates of the observation site and an estimate of the direction and distance of the nest from the observation point (a rangefinder may help to measure distance). Do not try to approach the nest as this may cause the caracara to abandon their nesting attempt. It may be possible to use a compass bearing from two different locations to triangulate the location of a nest tree that may be too far away and not near recognizable landmarks.

Survey sessions of each observation block must be repeated at two week intervals. Once a nest tree location is confirmed, report the location to the Service and transition to Productivity Surveys. In addition to location of nest trees, the survey data described above can be used to understand the use of the survey area (*e.g.*, as foraging or roosting habitat) by both breeding and non-breeding caracaras. Non-breeding caracaras can include both juveniles and adults. Detailed survey data are also useful in approximating boundaries of breeding territories, which is typically important to identifying the number of territories that may be impacted by a proposed project and the anticipated effect that proposed activities may have on a breeding

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

caracara pair. This is especially true for projects which are large in size or include habitat conversion. For more details on caracaras, see Service (1999) and Morrison and Dwyer (2012).

Conducting Productivity Surveys

Once a nest tree is confirmed or highly suspected, begin productivity surveys. These surveys involve the same repeated, two-week visits, but the surveyor need only observe the nest for the amount of time necessary to determine nest status (*i.e.*, incubating, nestlings, fledglings, or failed) and may survey the nest tree at any time during the day (assuming the weather conditions are appropriate). This will likely require much less effort per day than nest surveys. Many times, a spotting scope can be more useful than binoculars in observing activity in the nest that will indicate the nest status. As nesting progresses, the nestlings will become more active and easier to observe. Record the bird activity and number of nestlings. Record the fledging date and number of fledglings. From the fledging date, and previous observations, estimate the egg-laying date. If the nest appears to fail, continue surveying the nest tree area until April 30 as re-nesting may occur. If nests are deemed active on April 30, continue surveying those nest trees until they are either successful or have failed.

Reporting

An example field data sheet is provided at the end of this document, but observers may use their own data sheet format as long as the required information is collected. Requirements for final reports are as follows:

1. Map of field-verified habitat types within the project area and 1,500-m buffer;
2. Copies of marked aerial photo(s) showing all suitable habitat, with labeled observation blocks and their respective survey stations (including any alternate station locations used);
3. For each survey station, copies of any photos taken that document the field of view, nest tree or caracaras;
4. Documentation of efforts to contact adjacent landowners, and copies of access agreements, if applicable;
5. A summary table with the following information for each observer: name, hours of experience conducting caracara surveys (as of January 1), approximate number of caracara nests previously found, and whether the observer served as a primary or secondary observer;
6. Copies of all individual field data sheets which include the following information for each survey:
 - observation block/survey station identification,
 - survey date,
 - observer name(s),
 - observer location (*e.g.*, in a vehicle, blind, on foot),
 - start and end times,

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

- start and end weather conditions (temperature, wind speed and direction, cloud cover, visibility, and precipitation),
 - caracara location/activity details including (for each observation):
 - time of observation,
 - number of birds,
 - plumage,
 - activity/behavior, and
 - nesting stage, if applicable, and
 - an aerial map showing all observed caracara locations and flight paths (labeled to correspond with activity details) and any potential/confirmed nest tree locations; and
7. Location data (*e.g.*, latitude/longitude) for all caracara observations and potential/confirmed nest trees in Excel, projected shapefile (the preferred projection is Florida Albers NAD83 in meters), or .kml/.kmz format and attributed to include the information in (6) above.

Additional survey or reporting requirements may exist if the caracara surveys are required by a Service Biological Opinion (BO)(in this event, refer to the Terms and Conditions of the BO). For questions or additional guidance regarding the above survey protocol, please contact the Service's caracara lead biologist, Steve Schubert, at 772-469-4249 or 772-562-3909.

Literature Cited

- Dwyer, J.F., and J.P. Dalla Rosa. 2015. Use of anthropogenic nest substrates by crested caracaras. *Southeastern Naturalist* 12(1):N10-N15.
- Dwyer, J. F., J. L. Morrison, and J. D. Fraser. 2012. Factors influencing detection of nesting crested caracaras. *The Journal of Wildlife Management* 76(4):857–862.
- Morrison, J. L. 2001. Recommended management practices and survey protocols for Audubon's crested caracaras (*Polyborus plancus audubonii*) in Florida. Technical Report No. 18. Florida Fish and Wildlife Conservation Commission. Tallahassee, Florida.
- Morrison, J. L. 2007. Characteristics of nest sites used by crested caracaras in South-Central Florida. *Florida Field Naturalist* 35(1):1-8.
- Morrison, J. L. and J. F. Dwyer. 2012. Crested Caracara (*Caracara cheriway*), *The Birds of North America* (P. G. Rodewald, Ed.). Ithaca: Cornell Lab of Ornithology. Retrieved from the Birds of North America: <https://birdsna.org/Species-Account/bna/species/crecar1>
- U.S. Fish and Wildlife Service (Service). 1999. South Florida multi-species recovery plan. Atlanta, Georgia.
<http://www.fws.gov/verobeach/MSRPPDFs/AudubonsCrestedCaracara.pdf>

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

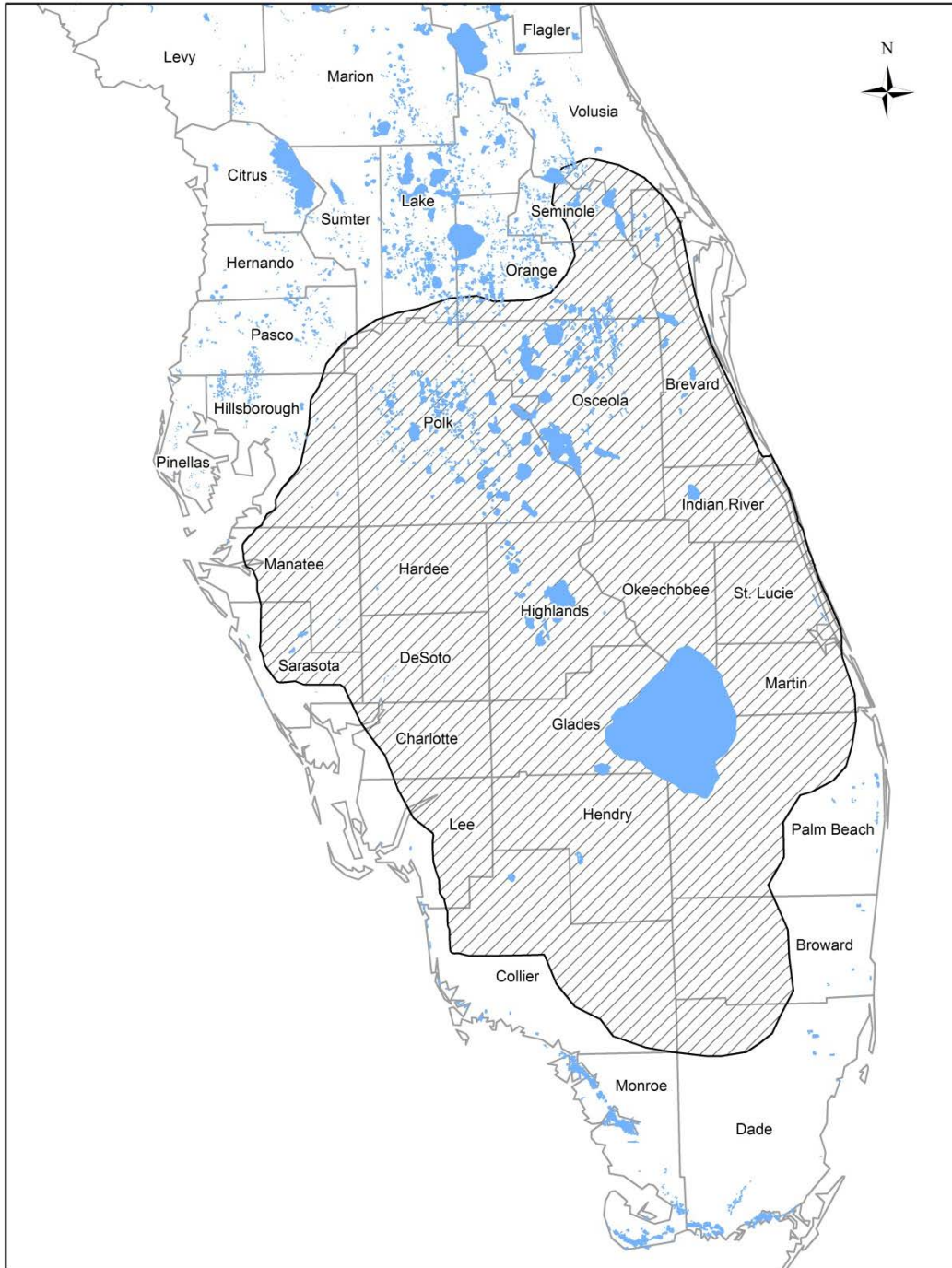


Figure 1. USFWS consultation area for crested caracara.

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

Caracara Survey Form (updated 12/9/2016)

Project Name: _____

Location/Observation Block/Lat-Long: _____

Date	Start Time	Stop Time	Observer Name(s) and Experience Level(s)

Weather

Time	Air Temp	Wind Speed and Direction	% Cloud Cover	Cloud Type	Rain/Fog
Start:					
Finish:					

Observation Point Information

General Site and Habitat Conditions; Other Activities in the Area

Observations

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

Observer Location	Age A/Im	Time	Description of behavior, flight path, etc

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

Species Conservation Guidelines
South Florida

Audubon's Crested Caracara

The Species Conservation Guidelines (Guidelines) for Audubon's crested caracara (*Polyborus plancus audubonii* (= *Caracara cheriway audubonii*)) (caracara) provides a tool to assist the user in determining if their project may adversely affect caracaras. Here we describe actions which might have a detrimental impact on the caracara and how these effects can be avoided or minimized.

The Fish and Wildlife Service (Service) suggests review of the following papers for synopses of caracara ecology: *South Florida Multi-Species Recovery Plan* (Service 1999) and the *Recommended Management Practices and Survey Protocols for Audubon's Crested Caracara* (*Caracara cheriway audubonii*) (Morrison 2001). Below is a summary of some life history aspects of this species which are pertinent to the Guidelines process.

Life History

The caracara is a resident, diurnal, and non-migratory species that occurs in Florida as well as the southwestern U.S. and Central America. Only the Florida population, which is isolated from the remainder of the species, is listed as threatened under the Endangered Species Act. This large long-lived raptor breeds from September through June with the primary season being November through April (Morrison 1999). Morrison and Humphrey (2001) found that caracaras prefer to nest in cabbage palms (*Sabal palmetto*) surrounded by open habitats with low ground cover and low density of tall or shrubby vegetation in Florida. Peak egg laying takes place from late December through early February (Morrison 1999). Incubation lasts for about 32-33 days and young fledge at 43-56 days after hatching (Layne 1996, Morrison 1996). Juveniles leave the natal area and can be found roosting in large groups (50 or more) in large palm and oak trees (Morrison 2001).

Habitat

The Florida population commonly occurs in dry or wet prairie areas with scattered cabbage palms (*Sabal palmetto*). It may also be found in lightly wooded areas. Scattered saw palmetto (*Serenoa repens*), scrub oaks (*Quercus geminata*, *Q. minima*, *Q. pumila*), and cypress (*Taxodium* spp.) may also be present. Widespread changes in land use may have caused a change in habitat use in this subspecies. Morrison and Humphrey (2001) found a strong association of caracara home ranges with improved pasture. The presence of seasonal wetlands may be an important factor in the attractiveness of these pastures to caracaras (Service 1999). There is no critical

habitat designated for this species.

Distribution

Historically, this subspecies was a common resident in Florida from northern Brevard County, south to Lake Okeechobee. It has been reported as far north as Nassau County, and as far south as Collier County and the lower Florida Keys in Monroe County. Caracara may be found in Charlotte, Collier, Hardee, Hendry, Martin, Monroe, Palm Beach, Polk, and St. Lucie Counties, but the region of greatest abundance for this subspecies is a five-county area north and west of Lake Okeechobee, including Desoto, Glades, Highlands, Okeechobee, and Osceola Counties. Figure 1 shows the consultation area where we primarily expect projects to impact the caracara.

Telemetry data (Morrison, unpubl. data) show several communal gathering areas for juvenile caracaras in south-central Florida. These gathering areas are not always at the same location, but are known to occur in a several general areas marked on Figure 1. The largest gathering area includes the floodplains and adjacent pasture lands on both sides of the Kissimmee River. Other smaller areas were identified in Highlands and Glades Counties (Fig. 1). Both the consultation and gathering areas are important in determining whether a project may affect caracaras.

Determination

A flowchart is provided to guide you in determining your project's impacts on the caracara (Fig. 2). You should have a project description and a habitat maps. The map should have the project boundaries and a 1,500-m (4,920 ft) buffer surrounding the property. This buffer will help identify any off-site caracara territories that may overlap onto the property. Compare your project location with the consultation area map (Fig. 1). If the project is not in the caracara consultation area then the project should have no effect on the caracara and the Federal action can proceed.

Within the consultation area, there are special gathering areas used by juvenile caracara (Fig. 1). If the project is within a gathering area, then activities may affect the caracara and conservation measures may be needed (see below). Major habitat modification in these areas may require formal consultation.

It is important to determine whether a project site has suitable habitat. Suitable habitat for the caracara includes wet and dry prairies with scattered saw palmetto, scrub oak, or cypress. In addition, improved and semi-improved pastures and range lands may be considered suitable habitat. Heavily forested areas are not considered a suitable habitat. If the project is within the consultation area, and no suitable habitat is present, then no effect is anticipated to the caracara and Federal action can proceed.

DRAFT
April 20, 2004

If the project occurs within the consultation area, and suitable habitat is present, the Service presumes the habitat is occupied and activities in this area may affect the caracara. In this case a caracara nest survey will confirm whether or not caracaras nest on the property. Guidelines on how to survey for caracara nests can be found in Appendix B. If the survey does not detect caracara nests, then no effect from the project is anticipated on the caracara.

If the surveys detected a caracara nest or available information indicates the presence of a nest at the project site, then the project may affect the caracara and further consultation with the Service is warranted. If appropriate conservation measures are implemented by the project then the project is not likely to adversely affect the caracara. If conservation measures can not be implemented or take of a caracara may occur then the project is likely to adversely affect the caracara and formal consultation should be initiated.

Conservation Measures

When a nest is present a series of conservation measures for activities in primary and secondary zones are provided below. These Guidelines can be used to modify project activities to avoid or minimize impacts and result in the project not likely adversely affecting the caracara.

Management Zones

In evaluating project impacts to the caracara in south Florida, the Service defines a primary zone as 300 m (985 ft), and a secondary zone as 1,500 m (4,920 ft) outward from the nest tree. Protection of the primary zone is very important particularly during the nesting season, and must be maintained in order to provide conditions for successful reproduction. Impacts during the active nesting period can be avoided by timing of activities near the nest site. Conservation measures that help reduce the impact of a project on the caracara and that are compatible with caracara survival are as follows:

Non-nesting Season (May to October)

- Maintain nest tree and other trees in the zone. This should include dead trees that are often used for perching and roosting. The nest and the nest tree are protected year-round by both Federal and State law and removal or other means of physical damage is prohibited.
- Maintain ground vegetation to provide cover for fledglings as they learn to fly.
- Maintain pasture, grassland, and wetlands that are necessary for caracara foraging. Typical land management practices, such as, cattle grazing, burning, and mowing are allowed during the non-nesting season. Man-made wetlands, such as, ditches and canals, are important feeding sites and also should be maintained. New construction that will increase the level of

disturbance may adversely affect caracaras.

- Avoid use of chemicals toxic to wildlife, including pesticides, fertilizers, or herbicides.

Nesting Season (November to April)

Caracaras are most sensitive to disturbance during nest building, incubation, and early nestling stages (first 3 to 4 weeks). There are additional conservation measures during this time to minimize impacts to the caracara.

- Normal agricultural activities should be limited during this season. Once the nestlings fledge normal activities can resume.
- In general, human activities in this zone should be limited including low flyovers by aircraft.

Secondary Zone - The secondary zone encompasses an area extending outward from the end of the primary zone (300 m (984 ft) from the nest) to 1,500 m (4,920 ft). This zone is generally defined as the foraging territory in which the nest site is located. This secondary zone is used by caracaras for the collection of nest material, roosting, and feeding. The average caracara home range is 1250 ha (Humphrey and Morrison 1997). This amount of suitable habitat contiguous to the nest site may be required to maintain the ecologic function of the nesting territory. Conservation measures for this zone are directed at maintaining the foraging capacity of the area.

- Maintain pasture, grassland, and wetlands that are necessary for caracara foraging. Typical land management practices, such as, cattle grazing, burning, and mowing can be done throughout the year. Man-made wetlands, such as, ditches and canals, are important feeding sites and also should be maintained. Conversion of pasture and wetland habitats in this zone to row crops, sugarcane, citrus groves, pine plantations, or hardwood forest may adversely affect caracaras. Normal ranching and agricultural operations (including sod farming), hiking, bird watching, fishing, camping, picnicking, hunting, and recreational off-road vehicle use are allowed in the secondary zone.
- Limit use of chemicals toxic to wildlife, including pesticides, fertilizers, or herbicides, as they may impact the caracara through it's food supply.

Habitat Enhancements

If potential nest trees are lacking in an otherwise suitable habitat, planting of cabbage palms can improve the habitat for caracaras. Caracaras prefer open grasslands or unimproved pasture. Tall, thick, or scrubby ground cover can be improved through prescribed burning or mechanical vegetation removal.

Gathering Areas

Though no specific locations within these gathering areas are used continuously, they are important staging areas for caracaras during the first year after leaving their natal territory. The following are recommended guidelines for activities within these areas:

- habitat conversion other than traditional agricultural and ranching activities should be limited within the gathering area;
- large trees, both living and dead, should be retained as roost and perch trees;
- incorporate land management practices that keep ground cover vegetation short, which may include cattle grazing, burning, mowing, or roller chopping; and
- plant cabbage palm tree clusters (minimum of three trees spaced close together) in areas lacking potential nest and perch trees.

Examples of how conservation measures may be implemented are as follows:

Non-nesting Season

The project avoids habitat modification in the primary and secondary zones, with any acceptable land uses in these zones occurring outside the nesting season. These zones were formulated to protect the caracara from excessive human disturbance. Ideally the project footprint can be modified not to impact the conservation zones. If the primary zone can be set aside by conservation easement, or other protective covenant as an environmentally sensitive area then we can assure the use of the site by the caracara throughout its life. Within the primary zone, it is important to retain suitable trees for nesting, such as cabbage palms, and other large trees for perching and roosting. Also, maintain natural ground cover that can be used by fledglings as cover.

In both zones, suitable habitat such as grasslands, pasture, and man-made wetlands (ditches and ponds) within pastures, should be maintained. New buildings, roads, power lines or canals, in the zones may adversely affect caracaras. As the secondary zone is important to foraging, conversion of pasture and wetland habitats to row crops, sugarcane, citrus groves, pine plantations, or hardwood forest may adversely affect caracaras. Chemicals harmful to wildlife should be avoided in the conservation zones. During the non-nesting season, normal agricultural operations, exotic species control, and other wildlife enhancement activities can occur in both zones. If the above conservation measures are incorporated into a caracara management plan the project is not likely to adversely affect the caracara.

DRAFT
April 20, 2004

Nesting Season

Caracaras are most sensitive to human disturbance during the nesting season between November and April (Morrison 2001). As such, unnecessary human entry and aircraft flyovers should be avoided within the primary zone and flyovers should be prohibited during this period. If necessary, project activities can occur during the nesting season, after the hatchlings have fledged. It can take as little as 11 weeks from egg laying to fledging. A site monitor should be used to determine when fledging occurs and project activities can begin. During the nesting season, normal agricultural operations, exotic species control, and other wildlife enhancement activities can occur in the secondary zone. If the above conservation measures are incorporated into a caracara management plan the project is not likely to adversely affect the caracara.

Modifications to Conservation Measures

The Service believes that there are very few circumstances that biologically justify modification of the conservation measures. However, some caracaras are very tolerant of human activity. In these cases, biological data, such as habitat use, flight patterns, and foraging areas can be used to justify modifications to conservation measures. This data must include a biological evaluation of the monitoring data and why the proposed modifications would not adversely affect the nesting caracaras. This information should be incorporated as a component of the caracara management plan. If the data in the caracara management plan biologically support the request to modify the conservation measures, then the project is not likely to adversely affect the caracara and concurrence of this determination may be requested from the Service.

On-site Habitat Enhancement

For projects that propose modification to habitat in the primary or secondary zones, the Service would normally require formal consultation. But if surveys indicate that the habitat quality has degraded as a result of exotic species invasion, lack of fire, or other anthropogenic actions, then on-site habitat enhancement may be possible to offset loss of function that would result from project impacts.

If the habitat modification is small, and on-site habitat enhancements are proposed to improve habitat quality in the remainder of the zones, then a determination could be made that the project is not likely to adversely affect the caracara. Proposed modifications and enhancements should be incorporated in a caracara management plan. This plan also needs a monitoring program to document the success of the enhancement actions.

Nest Abandoned or Blown Down

Caracara nests are protected both by Federal and State laws. In situations where nests are blown down, or damaged during storm events, the caracara will usually rebuild the nest during the next

DRAFT
April 20, 2004

nesting season in the same tree or in an adjacent tree. In certain circumstances, several years may pass before a new nest is constructed. A nest should not be considered abandoned until it is not used for three consecutive breeding seasons or no other active nests are found within 0.5 km (0.31 mi) of the nest. The nest site should be protected as per the non-nesting season conservation measures. These should be documented in a caracara management plan. If a nest is found to be abandoned by the above criteria, then the project is not likely to adversely affect the caracara.

Nest off-site, but secondary zone overlaps onto the project

Caracaras may nest off-site but within 1,500 m (4,920 ft) of the project boundary. The secondary zone area that overlaps onto the site should be protected by measures listed above. If possible, the off-site management zone area should be protected through conservation easements. A survey of activity patterns could be completed to determine if the birds make use of resources on the property. If the birds do not make use of the project area or if conservation measures for the area of overlap were included in a caracara management plan, then the project is not likely to adversely affect the caracara.

Habitat Protection in Gathering Areas

Within gathering areas, if the conservation measures listed above are incorporated into a caracara management plan then the project is not likely to adversely affect the caracara. Major habitat modification such as conversion of pasture and wetland habitats to row crops, sugarcane, citrus groves, pine plantations, or hardwood forest may be harmful and therefore warrant formal consultation. Prudent modification of the project with the aforementioned conservation measures will reduce the potential for harm to the point that formal consultation will not be necessary. The Service recommends early consultation to identify issues and options available to reduce the project's impact on the caracara.

Habitat Modification in the Conservation Zones

If the project:

- modifies substantial habitat within the conservation zones;
- requires intrusion into the primary zone; or
- could result in loss of eggs in the nest, nestlings, or nest tree, then formal consultation is required.

During construction, an on-site monitor will be required to determine if project activities are disturbing the caracara. There are many options to minimize adverse effects and reduce incidental take. Actions that may be appropriate to minimize harmful effects could include habitat enhancement, muffling of equipment, less intrusive construction methods, and other project-specific recommendations. Prudent modification of the project with these

recommendations can avoid formal consultation and expedite the project's completion. The Service recommends early consultation to identify issues and options available to reduce the project's impact on the caracara.

Reports

Survey Report

Survey protocols for caracara can be found in Appendix B and Morrison (2001). The goal of the survey is to provide a complete count of all caracara nesting pairs within the project area and develop an approximate territory or home range map for each nesting pair. The survey report should include the following, as applicable:

- A. Field data sheets with:
 - 1. dates with starting and ending times of all surveys conducted;
 - 2. weather conditions during all surveys, including average temperature, wind speed and direction, visibility, and precipitation; and
 - 3. total number of caracara nests found and number of caracaras observed in each location.

- B. An aerial photograph or vegetation map depicting:
 - 1. the entire area of interest;
 - 2. nest locations, primary and secondary zones;
 - 3. habitat descriptions; and
 - 4. locations of all caracaras seen or heard while conducting the survey or at any other time, including flight direction.

Biological Evaluation Report

If the project may affect the caracara, a biological evaluation will be helpful for determining whether formal consultation is necessary. Guidelines for this report can be found in Service (2004).

Caracara Management Plan

If a project may adversely affect the caracara, a management plan can identify conservation measures, habitat enhancements, and monitoring that will help minimize adverse effects to caracaras. The following should be considered when assessing project effects to the caracara:

- What is the level of use of the project area by the caracara? You may need to conduct surveys.

DRAFT
April 20, 2004

- How is the area used? Why is the caracara there? Are they transient, foraging, perching, roosting, or nesting, etc?
- What effect will the project have on the caracara's foraging areas in all areas influenced by the project?
- What actions are proposed to minimize potential effects to the caracara? This should include monitoring and enhancement actions, if any.

The management plan should be a component of the initiation package (Service 2004).

Literature Cited

- Humphrey, S.R. and J.L. Morrison. 1997. Habitat associations, reproduction, and foraging ecology of Audubon's crested caracara in south-central Florida. Florida Game and Freshwater Fish Commission Nongame Program Project No. NG91-007. Tallahassee, Florida.
- Layne, J.N. 1996. Audubon's crested caracara. Pages 197-210 in J.A. Rodgers, H.W. Kale, and H.T. Smith, editors. Rare and endangered biota of Florida. vol. 5: birds. University Press of Florida; Gainesville, Florida.
- Morrison, J.L. 1996. Crested caracara (*Caracara plancus*) in A. Poole and F. Gill, editors. The birds of North America, No. 249. The Academy of Natural Sciences, Philadelphia, Pennsylvania, and the American Ornithologists' Union, Washington, DC.
- Morrison, J.L. 1999. Breeding biology and productivity of the crested caracara in Florida. Condor 101:505-517.
- Morrison, J.L. 2001. Recommended management practices and survey protocols for Audubon's crested caracaras (*Caracara cheriway audubonii*) in Florida. Technical Report No. 18. Florida Fish and Wildlife Conservation Commission, Tallahassee, Florida, (Appendix A).
- Morrison, J.L. and S.R. Humphrey. 2001. Conservation value of private lands for Crested Caracaras in Florida. Conservation Biology 15(3):675-684.
- U.S. Fish and Wildlife Service (Service). 1999. South Florida multi-species recovery plan. Atlanta, Georgia. <http://verobeach.fws.gov/Programs/Recovery/vbms5.html>
- U.S. Fish and Wildlife Service (Service). 2004. Guide to a complete initiation package. South Florida Ecological Services Office, Vero Beach, Florida. (see SLOPES Introduction Appendix A). <http://verobeach.fws.gov/index.htm>.

GIS Layers

Consultation Area	Caracara_ca	shape file
Gathering Areas	Caracara_ga	shape file

South Florida Ecological Services
DRAFT
April 20, 2004

APPENDIX A

**Recommended Management Practices and Survey Protocols
for Audubon's Crested Caracaras (*Caracara cheriway audubonii*) in Florida**

**Recommended Management Practices
and Survey Protocols for Audubon's
Crested Caracara (*Caracara cheriway
audubonii*) in Florida**

TECHNICAL REPORT NO. 18

Joan L. Morrison



September 2001



Bureau of Wildlife Diversity Conservation
Florida Fish and Wildlife Conservation Commission
620 South Meridian Street
Tallahassee, FL 32399-1600

This report is the result of a project supported by the Florida Fish and Wildlife Conservation Commission's Nongame Wildlife Trust Fund. It has been reviewed for clarity, style, and typographical errors, but has not received peer review. Any opinions or recommendations in this report are those of the authors and do not represent policy of the Commission.

Suggested citation:

Morrison, J. L. 2001. Recommended management practices and survey protocols for Audubon's crested caracara (*Caracara cheriway audubonii*) in Florida. Technical Report No. 18. Florida Fish and Wildlife Conservation Commission, Tallahassee, Florida, USA.

**Recommended Management Practices
and Survey Protocols for Audubon's
Crested Caracara (*Caracara cheriway
audubonii*) in Florida**

TECHNICAL REPORT NO. 18

Joan L. Morrison

Department of Biology
Trinity College
300 Summit Street
Hartford, Connecticut 06106

Florida Fish and Wildlife Conservation Commission
Project NG96-021
Contract Number 96115

September 2001

TABLE OF CONTENTS

INTRODUCTION 1

BIOLOGICAL INFORMATION ABOUT THE SPECIES 2

 Home Range 3

 Nesting 4

 Feeding 5

 Roosting 6

 The Juvenile Period 6

 Gathering Areas 7

 Tolerance of Human Activity and Disturbance 7

**RECOMMENDED MANAGEMENT PRACTICES
FOR CRESTED CARACARA HABITAT IN FLORIDA** 9

SURVEY PROTOCOL FOR FINDING CARACARA NESTS 11

 Timing of Surveys 11

 Duration of Surveys 12

 Searching for Nests 12

 Nest Monitoring 13

**MONITORING PROTOCOL FOR KNOWN
CARACARA TERRITORIES** 14

 Nest Finding and Monitoring Reproductive Success 14

 Monitoring for Habitat Use 15

 Other Monitoring Considerations 16

 Reporting Banded Individuals 16

**CURRENT STATUS OF THE CRESTED CARACARA
IN FLORIDA** 17

LITERATURE CITED 18

INTRODUCTION

This document was published and issued by the Florida Fish and Wildlife Conservation Commission (FFWCC) but was prepared in consultation with experts on the crested caracara and with biologists from both the FFWCC and the U.S. Fish and Wildlife Service. The purpose of this document is to provide recommendations for management practices that would benefit the caracara in Florida by developing, maintaining, and/or enhancing environmental conditions required for the species' survival and well being. The management practices recommended here are advisory in nature, to be used by a variety of constituents including private landowners and land managers who may have an interest in managing their lands in ways compatible with the caracara's survival. These management practices, if carried out, should avoid or minimize detrimental human-related impacts on crested caracaras and should foster persistence of the species in Florida. This document also provides general biological information about the species and protocols for surveying for nests and for monitoring known nest sites.

BIOLOGICAL INFORMATION ABOUT THE SPECIES

The crested caracara (*Caracara cheriway*; hereafter, caracara), is a unique raptor/scavenger from the family Falconidae that reaches the northern limit of its geographic range in the southern U.S. (Fig. 1). The subspecies occurring in the U.S. is Audubon's crested caracara (*C. c. audubonii*) (Brown and Amadon 1968, American Ornithologists' Union 1983). In Florida, this raptor occurs as an isolated population in the south-central region of the state.

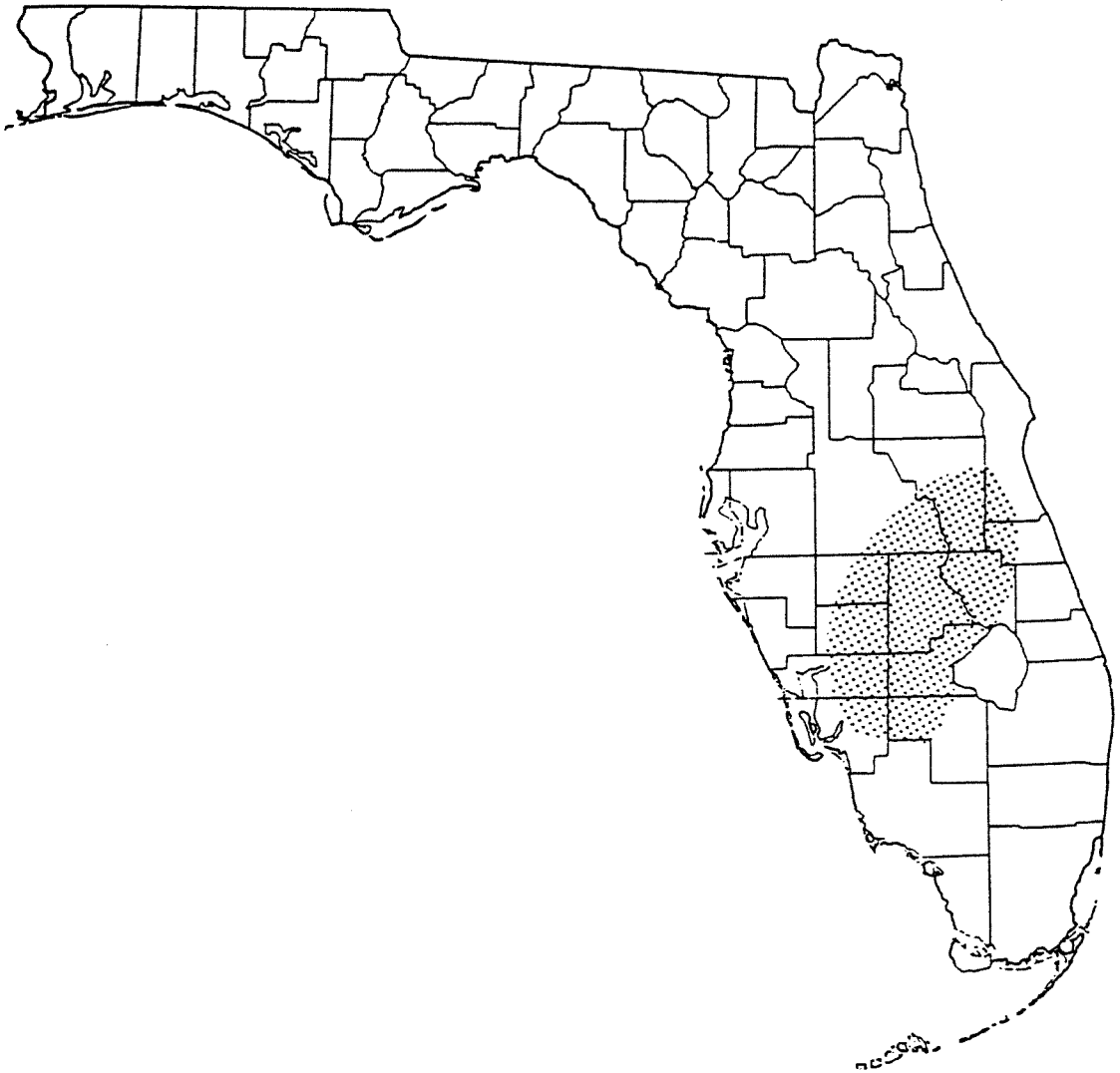


Fig. 1. Currently known breeding range of the crested caracara in Florida.

Caracaras in Florida were formerly documented to inhabit native prairie in Florida's central region. The species has been reported from the Kissimmee, Caloosahatchee, and upper St. Johns river basins, and the Kissimmee prairie (Bryant 1859, Scott 1892, Phelps 1912, Bailey 1925, Nicholson 1929, Howell 1932, Bent 1938, Sprunt 1954). Few historic nesting records are available, however. Notable changes in land use patterns have occurred throughout central Florida in recent years and, as a result, the status of this population has become a subject of concern. The caracara's range in Florida is now considerably smaller than was historically reported (Stevenson and Anderson 1994, Layne 1996), and this raptor apparently now occurs almost exclusively on privately owned cattle ranches in the south-central part of the state (Morrison and Humphrey 2001). The size of this population is unknown but is probably at least 500 (Layne 1996) or greater (J. Morrison, unpublished data). Populations comprised of 500 or fewer individuals may be more susceptible to extinction due to stochastic demographic or environmental events (Shaffer 1981).

All available evidence suggests that the most serious threat to Florida's caracara population is loss or degradation of nesting and feeding habitat. Such loss is most commonly due to conversion of pasture and other grassland habitats and wetlands to citrus, sugar cane, other agriculture, and urban development. Adult caracaras exhibit high site- and mate-fidelity; therefore, extensive loss of habitat within the home range, particularly of the nesting site itself, may cause the pair to abandon that home range, or at least the nesting site. Caracaras use some agricultural lands for foraging (J. Morrison, unpublished data); however, these habitats will not support resident, breeding caracaras if nesting habitat is not available. It is currently not known what degree of nesting or foraging habitat loss within a home range will cause permanent movement of a pair out of their home range.

Home Range

Florida's caracaras are resident, remaining year-round on home ranges that consist of the nesting territory and feeding habitat. Home ranges of caracaras in Florida average approximately 1,200 ha (3,000 acres) in size (Morrison 1997a) and represent an area within a radius of approximately 2–3 km (1.2–1.9 miles) from the nest. Adult caracaras typically forage throughout their home range during both nesting and non-nesting seasons. The nesting territory itself may be considered to be approximately the 25% core area of the home range, within an average radius of 1.0 km (0.6 mile) from the nest. This core area is where the resident pair spends most of its time during the nesting season (Morrison 1997a). The nesting territory is strongly defended by the pair during the nesting season. Adult caracaras spend more time farther from the nest and are rarely defensive around the nesting site during the non-nesting

season (Morrison 1997a). Other areas within the home range that are not near the nest itself are regularly used by the caracaras for collecting nesting material, roosting, loafing, and feeding.

Nesting

The crested caracara has a nesting ecology similar to that of bald eagles (*Haliaeetus leucocephalus*). Caracara pairs are generally monogamous and highly territorial, and exhibit strong fidelity to their breeding site, even nesting in the same tree year after year. Long-term observational data on occupancy of home ranges by caracaras in Florida indicate that as long as the nesting site and surrounding feeding habitat are not substantially altered, the home range will remain continuously occupied (J. Layne, unpublished data) and the pair will make an annual breeding attempt (Morrison 1999). Adult caracaras are highly intolerant of other adult caracaras within the nesting territory and particularly near the nest site, although caracaras of the juvenile age classes (fledgling to 3 years of age) may be tolerated at feeding areas that are not near the nest tree.

Timing.—Breeding activity can occur from September through June in Florida, with the primary season being November through April. Peak egg laying occurs from late December through early February, and incubation ranges from 31 to 33 days (Morrison 1999). The total breeding cycle (nest building, egg laying, incubation, nestling, and post-fledging dependency periods) is approximately 25 weeks in length, although sometimes up to 2 months elapse between completion of nest building and commencement of egg laying. The nestling period covers approximately 7–8 weeks, and the post-fledging dependency period is approximately 8 weeks (Morrison 1999).

Crested caracaras are capable of making more than 1 nesting attempt during a single breeding season. Pairs frequently produce a replacement clutch following nest failure in the incubation or early nestling stages (Morrison 1999). Early-season nesting pairs (those that lay their first clutch before March 1) may raise a second brood, but this occurs in less than 10% of the population, annually (Morrison 1998). Second-brood clutches may be laid as late as March and April. Second-brood young fledge as late as July and may remain with their parents through the rest of the summer and into the fall.

Nesting Habitat.—The crested caracara is primarily a bird of open habitats. Its nesting habitat in Florida consists of large expanses of pastures, grasslands, or prairies dotted with numerous shallow ponds and sloughs and single or small clumps of live oaks (*Quercus virginiana*), cabbage palms (*Sabal palmetto*), and cypress (*Taxodium* spp.). Cabbage palms are favored as

nest trees; equally chosen are single, isolated trees or trees within a group of 3–10. Caracaras nest only occasionally in oak and cypress trees. Most striking about caracara nesting habitat is the physical structure of the landscape—low, short, ground vegetation; scattered trees; and minimal or absent understory or shrub layer. Caracaras in Florida historically nested in native wet prairie habitat, particularly adjacent to marshes associated with the Kissimmee and St. Johns rivers (Nicholson 1929, Bent 1938). Caracaras are now found regularly in “improved” pastures, grasslands heavily managed for forage production for cattle (Morrison 1997a). Exotic forage grasses dominate these improved pastures, and regular mowing, burning, and high-density grazing maintain the low vegetative structure.

The Nest.—Caracara nests can generally be seen by looking up directly into the nest tree from alongside the trunk. Nests are bulky, loosely woven structures typically composed of long, slender, dried pieces of vines, weed stalks, briars, twigs, and fruiting clusters of palm. Nests are round or oval in shape and are about 2 feet in diameter. Nests typically face south to southeast within the nest tree.

Number of Nest Trees Used.—The nest site that originally attracts the pair of breeding caracaras is of critical importance. Pairs may use the same tree year after year, even if the old nest is lost. It is not uncommon for nests to be blown from trees by storms, after which the resident pair typically rebuilds a new structure in the same tree. If an old structure remains, the pair typically builds a new structure on top of it. Caracara pairs sometimes have 2 or 3 alternate nest trees that may be used in different years or for a second nesting effort within the same year. All nest trees used by a given pair are typically situated in the same general vicinity (usually within 0.5 km [0.3 mile] of each other). A new pair will often use one of the originally used nest trees when a member of a pair dies or is replaced (J. Morrison, unpublished data).

Feeding

Crested caracaras obtain their food from a variety of habitats, including improved pastures, newly plowed or burned fields, dairies, and around dwellings and farm buildings. They scavenge along roads and at slaughterhouses, poultry houses, and urban dumps. Caracaras also forage regularly in a variety of wetland habitats. The types of wetlands that provide good feeding conditions for caracaras include the extensive networks of drainage ditches and small ponds and wetlands found within improved pastures, drying marshes or stock ponds, shallow roadside or agricultural ditches, and marshes associated with river oxbows. Caracaras occasionally forage in agricultural lands including sod and cane fields and citrus groves but

do not spend most of their foraging time in these habitats (J. Morrison, unpublished data). Groups of up to 20 juvenile caracaras are often seen feeding in citrus groves during the fall, although the seasonality of this behavior is not understood.

The crested caracara is considered a scavenger because it is most easily observed feeding on carrion along roadsides. However, this raptor actually exhibits a broad diet, feeding on insects associated with carrion and dung in pastures as well as on a wide variety of vertebrate and invertebrate prey, much of which it captures live. Prey includes rats, mice, skunks, rabbits, squirrels, piglets, snakes, frogs, lizards, sirens, nestling birds, birds' eggs, turtles, fish, crayfish, beetles, grasshoppers, and worms.

Roosting

Adult caracaras frequently perch on the tallest trees or snags or on telephone poles within their home range. Breeding adult caracaras typically roost in trees near or within the nest stand. Groups of up to 50 or more juvenile caracaras roost in groups of palm and oak trees. These roosts occur on ranches or they may be near gathering areas (see below), particularly along the Kissimmee River floodplain. During the non-breeding season, roosts containing up to 30 juveniles may even be found within the home range of a nesting pair, although not generally within the nesting territory itself.

The Juvenile Period

Young caracaras fledge from January through July with the peak of fledging occurring in March and April. Juvenile caracaras have a long fledgling dependency period, remaining dependent on their parents for the first 2–3 months after fledging from the nest (Morrison 1996). Beginning about 3 months post-fledging, juveniles begin to explore locations outside the natal home range but continue to return to that home range. Following the exploratory phase, juveniles become nutritionally independent but are tolerated by the adults and may remain on their natal home range until the adults begin another breeding effort the following year. The home range used by juvenile caracaras until permanent departure mirrors that of their parents. Permanent departure from the natal home range can occur from 11 to 45 weeks post-fledging.

Age at first reproduction for Florida's crested caracaras is 3 years, although probably not all 3-year-olds attain a territory and begin breeding. Juvenile caracaras are characterized by a medium to dark brown and buffy white plumage (Wheeler and Clark 1995). They do not attain the black and

white adult plumage until about 4 years of age. Juvenile caracaras primarily use improved pasture and grassland habitats and associated wetlands for foraging.

Gathering Areas

After departing from their natal home ranges, young caracaras are nomadic throughout the population's range in south-central Florida, but they regularly use temporary settling areas called gathering areas. Juvenile caracaras typically travel between gathering areas and may remain for days to weeks at any one site (J. Morrison, unpublished data). Juvenile caracaras explore throughout the population's range, then return to spend varying lengths of time in the gathering areas. Even individuals from home ranges on the periphery of the population's range eventually find their way to these gathering areas. Because individuals move between areas it is difficult to monitor numbers at the gathering areas; therefore, the numbers of juveniles and floaters (adult non-breeders) in this population are not known.

Tolerance of Human Activity and Disturbance

Caracaras exhibit a wide range of tolerance of human activities. Some may be quite tolerant of buildings and of the occasional presence of people, livestock, machinery, and vehicles in their home range. Particular pairs may endure a wide range of potential impacts to their habitat resulting from altered patterns of human activity. The nature and extent of impacts on nesting and feeding habitat or on the birds themselves will depend largely on the current situation within each home range and on previous exposure of the resident pair to human activity. Whether or not a caracara pair will be affected by an activity generally depends on the patterns of activity. Some human influence may already be present in any particular home range. If the caracaras have been nesting successfully at these sites, it would be mainly altered patterns of activity that might impact their nesting behaviors and success.

Caracaras are most sensitive to human disturbance during the nesting season, particularly during the late incubation and early nestling stages, although pairs may abandon a nest if disturbed frequently during the nest-building stage. More nests fail during the last week of incubation and the first 2 weeks of the nestling stage than at any other time during the nesting cycle, at least prior to fledging (Morrison 1999). Nests may be abandoned if disturbed during hatching. Increased activity around the nest at hatching may also attract predators such as American crows (*Corvus brachyrhynchos*), which can take small chicks.

Nesting occurs during the winter months; therefore, eggs and small chicks may die quickly from exposure if adults are frequently forced off the nest or are kept off for long periods. Adults are more tolerant of human activity occurring near the nest after the chicks have hatched and become partially feathered than during the period between nest construction and the third or fourth week of the nestling stage. Adult caracaras are particularly sensitive to human disturbance when attempting to deliver food to nestlings. They will not approach the nest if human activity is occurring nearby. Prevention of food deliveries has the most potential for serious consequences when nestlings are very young and must be fed frequently.

Caracaras generally flush from nests during incubation or early nestling stages when the disturbance source is within 300 m (1,000 feet) of the nest (J. Morrison, unpublished data). Flushing occurs at greater distances as the amount and frequency of disturbance increases, for example with subsequent visits to the nest area. If certain activities occur within approximately 300 m of the nest during the nesting season (November through April), they may have detrimental impacts on caracara nesting activities and success. Significant changes in activity levels or in habitat near the nest could result in the breeding pair leaving that nest site and moving to another site, even if these activities occur during the non-breeding season. If habitat changes occur over a wide area within the overall home range, the breeding pair might abandon the home range altogether.

RECOMMENDED MANAGEMENT PRACTICES FOR CRESTED CARACARA HABITAT IN FLORIDA

Following are recommendations for management practices that would benefit the crested caracara in Florida. These practices could be used by landowners and land managers interested in developing, maintaining, and enhancing habitat suitable for caracaras, and they pertain to habitat both near the nest site and throughout the home range. Objectives of these management practices are to (1) protect the nest site itself, (2) minimize disturbance around the nest that might compromise the nest site, (3) conserve important feeding areas nearby and away from the nest site, (4) protect important areas of cover for the fledglings during the post-fledging dependency period, and (5) improve and enhance habitat, when possible.

- 1) Retain pasture and grassland habitats and natural and man-made wetlands (i.e., ditches and ponds) within pastures.
- 2) Do not remove nest trees or other live trees within 300 m (1,000 feet) of a nest tree. Harvest of palm trees for human consumption should occur farther than 300 m from a known nest tree.
- 3) Retain dead trees, which are often used for perching and roosting, within 300 m (1,000 feet) of a nest tree.
- 4) Planting palm trees in areas lacking potential nest trees might attract new caracara pairs into an area. Potential nest trees should be at least 5 m (16 feet) in height and have full, closed crowns. At least 3 trees should be planted close together in a group.
- 5) Retain ground vegetation within 300 m (1,000 feet) of a nest tree. Clumps of taller grasses and small shrubs are regularly used as cover by chicks after they fledge from the nest. Chicks are vulnerable for the first few weeks after fledging because they do not fly well. They spend most of their time on the ground hiding under vegetation and perching on low branches in trees. Limiting disturbance to ground vegetation near a nest tree will ensure adequate cover for fledglings.
- 6) Cattle grazing, burning, mowing, and roller chopping are land management activities that are compatible with caracara survival. These activities keep ground cover vegetation short, which allows the caracaras to easily walk through grassland habitats when foraging. Caracaras are quite terrestrial compared to other raptors and frequently walk in grassland and along wetland habitats in search of food. Caracaras frequently walk behind tractors during plowing and feed on insects disturbed by the activity. They follow the front of grass fires and remain at burned sites for several days, feeding on animals killed by the fire. Continuing the above

management activities will enhance foraging habitat by limiting growth of tall, thick, or shrubby ground vegetation that is not used as frequently by foraging caracaras. Reductions in these management activities may cause widespread growth of thick, tall, or shrubby ground vegetation.

- 7) Wetland maintenance and ditch cleaning are management activities compatible with caracara survival. Caracaras are attracted by ditch-cleaning operations and feed on fish, turtles, sirens, and other animals exposed by these activities. They also steal food from wading birds that feed along these ditches.
- 8) In a known home range, particularly near a nest site, care should be taken to avoid use of chemicals toxic to wildlife, including pesticides, fertilizers, or herbicides. Care should also be taken to keep these chemicals from being introduced into wetlands and waterways.
- 9) Construction activities (including increased vehicle traffic other than normal agricultural operations; earth stockpiling; vehicle parking; equipment or materials storage; or development of new agricultural, commercial, industrial, or residential sites) typically cause changes in human activity levels and in habitat that may affect nesting caracaras. Although roads, canals, and some agricultural lands may provide seasonal food resources, their construction near the nest, particularly during the early phases of the nesting cycle (nest building, egg laying, incubation, early nestling), could disturb the pair and cause them to abandon the nesting territory.
- 10) Some activities such as fence-building, moving cattle, and normal vehicle and agricultural operations can occur in the home range year-round. Careful timing of these activities within 300 m (1,000 feet) of the nest can minimize the impacts of such activities during the nesting season. These activities should be limited near the nest, particularly during nest building, incubation, and early nestling (first 2–3 weeks) stages.
- 11) Mortality of juvenile caracaras is particularly high along roads, which they frequent in search of carrion. Increasing the number of roads within a home range increases risk of collision with vehicles. Care should be taken along all roads to minimize mortality of caracaras by posting signs, lowering speeds, and watching for birds.

SURVEY PROTOCOL FOR FINDING CARACARA NESTS

As land use changes continue in south-central Florida, the need increases for a standardized and effective protocol for assessing the presence of nesting caracaras or of gathering areas at targeted project sites. Survey techniques for caracaras must provide accurate information on territorial occupancy and breeding. This protocol is intended for use by individuals required to survey new habitat for breeding pairs.

Caracaras are not often visible to a casual observer even in known occupied, active, nesting territories, particularly during certain times of the day and of the year. Casual roadside surveys can grossly underestimate occupancy rates for caracara territories. The probability of seeing a caracara on a roadside survey in a known occupied territory can be as low as 30%, even during the breeding season (Morrison 1995). This protocol is intended to assist individuals in maximizing opportunities for finding nesting pairs and determining breeding status. If possible, surveys should be conducted by a qualified biologist, hereby defined as one who has had previous experience with caracaras, including observations and, preferably, radio tracking. Ideally, this person will have been trained by a qualified caracara researcher in monitoring, observation, and data collection techniques for caracaras, so that surveys will be carried out in a standardize manner.

Timing of Surveys

The timing of nesting activity can vary greatly from year to year; nesting can occur any time during September through June. Surveys for territory occupancy or to find new breeding pairs are best conducted during the months of January, February, and March, when nesting within the overall population is at its peak and adults are most likely to be feeding nestlings. Surveys made earlier than January could unduly disturb the birds and result in nest abandonment. Caracaras are most sensitive during the nest building, incubation, and early nestling stages of the nesting cycle. Caracaras can also be easily observed in the territory after the chicks fledge from the nest. The peak of fledging for this population occurs during March and April.

Surveys are best conducted early in the morning or late in the afternoon. Caracaras are most actively nest building, foraging, and feeding young between sunrise and about 1100 hours, and again, between about 1600 hours and sunset. Caracaras are rarely active during the heat of midday, especially in the summer months. They roost in trees that are often far from the nest site; thus they are rarely visible. Surveys conducted from May through October, particularly in new habitat for the purpose of finding new breeding pairs, are

not likely to be productive because of the caracaras' reduced activity levels during these months. Nests from even the most recent nesting season may be hard to find because they may have blown out of the nest tree. Any rain that occurred after nesting season would likely destroy most signs of activity around the nest tree. Also, after the chicks fledge, the family spends less time near the nest site, making them more difficult to find and observe. Surveys conducted during November and December may be productive, but probably will be more so in known territories. Pairs are most likely to be building nests during these months, but do not spend as much time near the nest as they do after egg laying. Additionally, pairs are quite sensitive to disturbance during the nest building and incubation stages, so surveys conducted early in the breeding season have the potential to excessively disturb nesting pairs.

Duration of Surveys

When surveying for caracaras in areas where the nest site is not known, observers should remain in each area for 2–4 hours during each visit. Observers should remain in the vehicle and watch for caracaras over a wide area of suspected habitat. Observations may be made on consecutive days, but ideally should be conducted at least 2 weeks apart and during the months of January through March. Observations made in this manner will usually yield information on territorial occupancy and even the nest site after only 3 visits, if the site is active. If the entire territory cannot be surveyed from a road, areas containing palm trees should be searched by foot if access is feasible. Observations should be conducted in an area at least twice a month for at least 3 consecutive months before it is considered to be unoccupied by caracaras.

Searching for Nests

Caracaras are very site faithful, even to particular nest trees. Most caracaras nest in cabbage palms (Morrison 1997*b*). The nest structure can easily be seen by looking up directly into the palm from alongside the trunk. Signs that a suspected nest is active are feces and prey remains below the nest, chicks calling from the nest, or defensive behavior by the adults when the observer is near the tree. Nests will most likely be facing south to southeast within the nest tree. Nest trees are generally over 5 m (16 feet) in height; have large, full, closed crowns; and are typically on the southeastern to southwestern edge of a group of trees. Nests may also be in lone, free-standing palm trees, in groups of 2–10 palms, or (rarely) in tall, emergent palms in the middle of a large hammock. Oaks and cypress should be checked also, but these are likely to be used as nest trees only if few palms are available within a large area of otherwise suitable pasture and wetland habitat.

When searching for new breeding pairs, efforts should first concentrate on areas of large contiguous pasture habitat containing scattered palms and oaks and numerous wetlands. Observations should be conducted from a position where a large area of suitable habitat can be viewed. If possible, observations should also be made from cover, such as a vehicle, so that disturbance to the pair can be minimized. Searching should focus on observing adult behavior (e.g., carrying sticks or food) that would suggest nesting activity. Caracaras exhibit little size and no plumage dimorphism (Morrison and Maltbie 1999), and these behaviors are not gender specific.

Other behaviors of adults can be used to find nests. During incubation, the adult not currently incubating often will perch high and visibly in a tall tree within 300 m (1,000 feet) of the nest. Adult caracaras exhibit little defense behavior near their nest, but if the chicks are large (5–8 weeks), adults may remain close to the nest and exhibit rattle and cackle vocalizations and the head-throwback display (Morrison 1996). Nest searching using playback tapes, a technique used successfully for surveys of other raptors, is not likely to be effective for caracaras because they do not respond to such tapes. Their vocalizations do not carry far in open habitats. Most vocalizations are used in situations of immediate contact or proximity of individuals, such as copulation, aggression towards a nest predator, or when feeding alongside other caracaras or vultures.

When a nest is found, the contents can be checked using an extendible pole with a mirror attached or by direct observation. If a nest is not found immediately in an area where adult caracaras are known to occur, another visit should be made to that territory within 1 month after the first visit. Use of carrion as bait can also facilitate nest finding, determining territory occupancy, and determining the breeding status of a known pair. A carcass or other large piece of carrion can be set in a suspected area the night before a planned observation period. If caracaras are in the area, they will usually find and begin feeding upon the carcass just after sunrise the following morning. Individuals can then be observed when they return to the nest site.

Nest Monitoring

Subsequent to finding a caracara nest in a new area, monitoring of the nest may be required to obtain information on breeding chronology and reproductive success. If a monitoring program is initiated in conjunction with a land development program, refer to the monitoring protocol which follows.

MONITORING PROTOCOL FOR KNOWN CARACARA TERRITORIES

Because a major management goal is to monitor the status of Florida's caracara population, it is important to monitor known caracara territories as well as attempt to find new ones. Objectives of monitoring known territories are (1) determining whether territories remain occupied year after year, (2) determining whether the same individuals occupy and breed in the same territories year after year, (3) determining whether pairs successfully fledge young year after year, (4) determining how many young are fledged per pair per year, and (5) for long-term monitoring programs, evaluating any changes in habitat use by resident caracaras in conjunction with habitat changes in their home range. Procedures for monitoring in known territories are similar to those for surveying for nesting pairs in new habitat, but the difference is that monitoring occurs in areas where nest and foraging locations may already be known.

For any monitoring program for crested caracaras in Florida, a qualified biologist should visit the territory on a regular basis (i.e., at least once per month). A qualified biologist is one who has had previous experience with caracaras, including observations and, preferably, radio tracking. Ideally, this person would be trained by a qualified caracara researcher in monitoring, observation, and data collection techniques for caracaras, so that any monitoring program initiated in conjunction with a land development project would be standardized with respect to other ongoing long-term monitoring of crested caracaras in south-central Florida.

Nest Finding and Monitoring Reproductive Success

Timing of Monitoring to Determine Territorial Occupancy and Breeding Status.—Monitoring at known caracara territories is best conducted during January, February, and March, when nesting within the overall population is at its peak and adults are most likely to be feeding nestlings. Caracaras can also be easily observed in the territory after chicks fledge from the nest, which peaks for this population during March and April.

Monitoring is best conducted early in the morning or late in the afternoon. Caracaras are most actively nest building, foraging, and feeding young between sunrise and about 1100 hours and again between about 1600 hours and sunset. Caracaras are rarely active during the heat of midday, especially during the summer months. They roost in trees and often far from the nest site, thus they are rarely visible. Monitoring conducted from May through October may be more difficult because of the caracaras' reduced activity levels during

these months. After the chicks fledge, the family spends less time near the nest site so the observer may have to visit more areas within the home range to find and observe the caracaras. Whereas surveying for new nests is not likely to be as productive in November and December, monitoring during these times may be productive in territories with known nest locations. Pairs are most likely to be building nests during these months.

Duration of Monitoring Sessions.—To find active nests in known territories, all known nest trees should be checked first. If a nest is not immediately found, observers should position themselves where known nest trees can be observed and then remain in the vehicle while watching for caracaras over a wide area of suspected habitat. Observations made in this manner will usually yield information on territorial occupancy and even the nest site after only 3 visits, if the site is active. When a nest is found, nest contents can be checked using an extendible pole with a mirror attached or by direct observation.

Additional monitoring sessions may be needed if the nest is not found during the first monitoring session. Each session should span approximately 2–4 hours and ideally should be conducted at least 2 weeks apart from December through March. During the second visit, the search area for the nest should be broadened to include all potential nest sites within 0.5 km (0.3 mile) of the traditional site. Sometimes a pair moves its nest site, particularly if habitat degradation has occurred within the nesting territory or near the traditional nest site, or if one member of the pair dies. Usually, however, if the home range remains occupied, adults will be seen within 3 visits to the nesting territory. A third visit should be made, if necessary, within 2 weeks of the second visit. If no adults are seen or no nest is found after 3 visits, with at least 1 visit made in each of 3 consecutive months from November through April, the home range may be considered temporarily unoccupied. However, if both members of a pair die, the site would likely be taken over by another pair if no habitat degradation occurs, so an apparently unoccupied site should be monitored the following breeding season.

Monitoring for Habitat Use

To evaluate habitat use by caracaras in known territories, monitoring sessions should occur at least monthly year-round for a minimum of 3 years when associated with habitat conversion or a land development project. Because caracaras are site faithful, responses to habitat changes or noticeable changes in nesting behaviors or success may not become apparent within only 1, 2, or even 3 years of observation. During each visit the biologist should remain in the territory for at least 4 hours beginning at sunrise, or beginning in

late afternoon and extending into early evening, but before dark. Any radio-tagged individuals should be tracked during this period and foraging activity, habitats used, and locations recorded. If no individuals are radio tagged, the observer should search for caracaras within the project area. These individuals should be followed and observed during the monitoring period and their foraging activity, habitats used, and locations recorded.

Other Monitoring Considerations

The major limitation to finding new nesting territories and monitoring known nests is the fact that most caracaras in Florida now occur on privately owned land. Permission must always be obtained from the landowner before entering the property of interest. Private lands and the requests of landowners, such as not driving in certain areas and observing gate closures, must always be respected. Less restricted access facilitates nest searching on public lands, but searching may be more difficult because of habitat differences such as smaller areas of short-grass pasture habitats and larger areas of thick, tall, or shrubby ground vegetation, which caracaras typically do not use.

Reporting Banded Individuals

Sightings of banded caracaras made during any survey or monitoring period provide valuable information regarding individual survival and habitat use. Sightings, along with supporting information, may be reported to the Florida Fish and Wildlife Conservation Commission or the U.S. Fish and Wildlife Service. If a banded caracara is found dead, the band number and color combination should be reported to the U.S. Fish and Wildlife Service.

CURRENT STATUS OF THE CRESTED CARACARA IN FLORIDA

Currently, Florida's population of Audubon's crested caracaras is listed as Threatened both federally (U.S. Fish and Wildlife Service 1987) and by the state of Florida (Logan 1997). This listing was afforded primarily because this population is believed to be isolated from any other caracara populations and of small size, therefore is of evolutionary and conservation concern, and because suitable caracara habitat in Florida has been declining rapidly in recent years. Under this listing, the caracara is protected from activities that would directly harm an individual or its habitat.

Persons with further interest in the legal statutes that afford protection for Florida's crested caracaras should review the federal Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.); the federal Migratory Bird Treaty Act (16 U.S.C. 703-711); and Rules 68A-4.001 and 68A-27.011 of the state of Florida Wildlife Code.

LITERATURE CITED

- American Ornithologists' Union. 1983. Check-list of birds of North America. Sixth edition. American Ornithologists' Union, Washington, D.C., USA.
- Bailey, H. H. 1925. The birds of Florida. Williams and Wilkins, Baltimore, Maryland, USA.
- Bent, A. C. 1938. Life histories of North American birds of prey. Part 2. U.S. National Museum Bulletin No. 167.
- Brown, L. H., and D. Amadon. 1968. Eagles, hawks, and falcons of the world. McGraw-Hill, New York, New York, USA.
- Bryant, H. 1859. Birds observed in east Florida south of St. Augustine. Proceedings of the Boston Society of Natural History 7:5–21.
- Howell, A. 1932. Florida birdlife. J. J. Little and Ives, New York, New York, USA.
- Layne, J. N. 1996. Crested caracara. Pages 197–210 in J. Rogers Jr., H. W. Kale II, and H. Smith, editors. Rare and endangered biota of Florida. Volume 5: Birds. University Press of Florida, Gainesville, Florida, USA.
- Logan, T. 1997. Florida's endangered species, threatened species, and species of special concern. Florida Game and Fresh Water Fish Commission. Tallahassee, Florida, USA.
- Morrison, J. L. 1995. Habitat associations, reproduction, and foraging ecology of Audubon's crested caracara. Quarterly Report. Florida Game and Fresh Water Fish Commission, Tallahassee, Florida, USA.
- _____. 1996. Crested caracara (*Caracara plancus*). In A. Poole and F. Gill, editors. The birds of North America, No. 249. Academy of Natural Sciences, Philadelphia, Pennsylvania, and American Ornithologists' Union, Washington, D.C., USA.
- _____. 1997a. Reproductive ecology and habitat associations of Florida's crested caracaras (*Caracara plancus audubonii*). Dissertation, University of Florida, Gainesville, Florida, USA.

- _____. 1997*b*. Habitat associations, reproduction, and foraging ecology of Audubon's crested caracara. Final Report. Florida Game and Fresh Water Fish Commission, Tallahassee, Florida, USA.
- _____. 1998. Effects of double brooding on productivity in crested caracaras. *Auk* 115:979–987.
- _____. 1999. Breeding biology of the crested caracara in Florida. *Condor* 101:505–517.
- _____, and S. R. Humphrey. 2001. Conservation value of private lands for crested caracaras in Florida. *Conservation Biology* 15:675–684.
- _____, and M. Maltbie. 1999. Methods for gender identification in crested caracaras. *Journal of Raptor Research* 33:128–133.
- Nicholson, D. J. 1929. The Audubon caracara, a little known bird in Florida. *Florida Naturalist* 2:67–69.
- Phelps, F. M. 1912. A March list from the Caloosahatchee River and Lake Okeechobee. *Wilson Bulletin* 24:117–125.
- Scott, W. E. 1892. Notes on the birds of the Caloosahatchee region of Florida. *Auk* 9:209–218.
- Shaffer, M. L. 1981. Minimum population sizes for species conservation. *BioScience* 31:131–134.
- Sprunt, A., Jr. 1954. Audubon's caracara. *Florida Naturalist* 27:99–101, 119.
- Stevenson, H. M., and B. H. Anderson. 1994. *The birdlife of Florida*. University Press of Florida, Gainesville, Florida, USA.
- U.S. Fish and Wildlife Service. 1987. Endangered and threatened wildlife and plants; threatened status for the Florida population of the Audubon's crested caracara. Final Rule. *Fed. Reg.* 52:25229–25231.
- Wheeler, B. K., and W. S. Clark. 1995. *A photographic guide to North American raptors*. Academic Press, San Diego, California, USA.

South Florida Ecological Services
DRAFT
April 20, 2004

APPENDIX B

Survey Protocol for Finding Caracara Nests

SURVEY PROTOCOL FOR FINDING CARACARA NESTS

This supplemental information is provided for further guidance on surveying for caracara nest based on the protocol in Morrison (2001). There is the highest probability of success in finding caracara nests during the period January to April. This period covers the time when most birds are feeding the nestlings and become more visible to observers. Surveys should start in January and continue through April to provide adequate data to conclude that a caracara nest does not occur on site. Once all nests on the site are found the survey can be terminated. Surveys should be conducted by a biologist with caracara experience as the birds can be hard to find and identify at long distances. The protective area for the caracara is 1,500 m (4,920 ft) around the nest. The area surveyed should include the project area and a 1,500-m buffer to account for off-site territories that might overlap onto the project area. All areas of suitable habitat within the project area and buffer should be initially surveyed for 1 day. If the area is large or the view obstructed more than 1 day or multiple observers may be needed to completely survey the area.

The observer should position themselves in a location where the largest open area (unobstructed by trees) can be viewed. The survey area should be no more than about 500 ha, which is the largest area easily observable from one point. An aerial photograph of the property and buffer zone can be used to identify areas of suitable habitat and map observation blocks to facilitate surveying the whole area. Use the map and a site visit to select strategic points where caracaras are more likely to be seen going to and from potential nesting sites. From a stationary position search for caracara activity, especially birds moving to the nest tree carrying sticks or food. Watch for other birds, such as American crows (*Corvus brachyrhynchos*), red-tailed hawks (*Buteo jamaicensis*), and turkey vultures (*Cathartes aura*), that might elicit an aggressive response from caracaras present. Nesting caracaras will often chase potential predators away from the nest; thus, revealing their presence. Also circling vultures can indicate the presence of naturally occurring carrion that may attract caracaras. If a potential nesting tree is detected then the observer can reposition to improve observing the bird's behavior. Weather condition should

South Florida Ecological Services
DRAFT
April 20, 2004

be adequate to clearly view the whole area. The area should be viewed from sunrise to 11AM and again 3 hours before sunset. During midday potential nest trees can be examined close up for evidence of nests (Morrison 2001). The area viewed during each survey should be marked on a site map. All caracara activity observed should be recorded by time of day and distinguished between juvenile and adult birds. Record flight direction to identify foraging areas and the nesting tree. Mark any nesting tree locations on a map and obtain GPS coordinates. Weather conditions including temperature, wind speed and direction, cloud cover, visibility, and precipitation, should be recorded at the start and end of each survey period.

If no nests are found during the initial survey then return and repeat the survey in 2 weeks. Continue to repeat the survey at a 2-week interval through the end of April or until a nest is found. If the survey starts after January and no nests are found the earlier part of the survey should be completed during the next nesting season to insure that early nesting birds are not missed.

The opportunity for caracara observation can be enhanced by placing fresh meat (or road kills) along the property border overnight and observing the bait site during the morning survey. These birds can be followed back to their nest trees. For more details on caracara activities and habits see Morrison (2001).

Literature Cited

Morrison, J.L. 2001. Recommended management practices and survey protocols for Audubon's crested caracaras (*Caracara cheriway audubonii*) in Florida. Technical Report No. 18. Florida Fish and Wildlife Conservation Commission, Tallahassee, Florida.

Crested Caracara

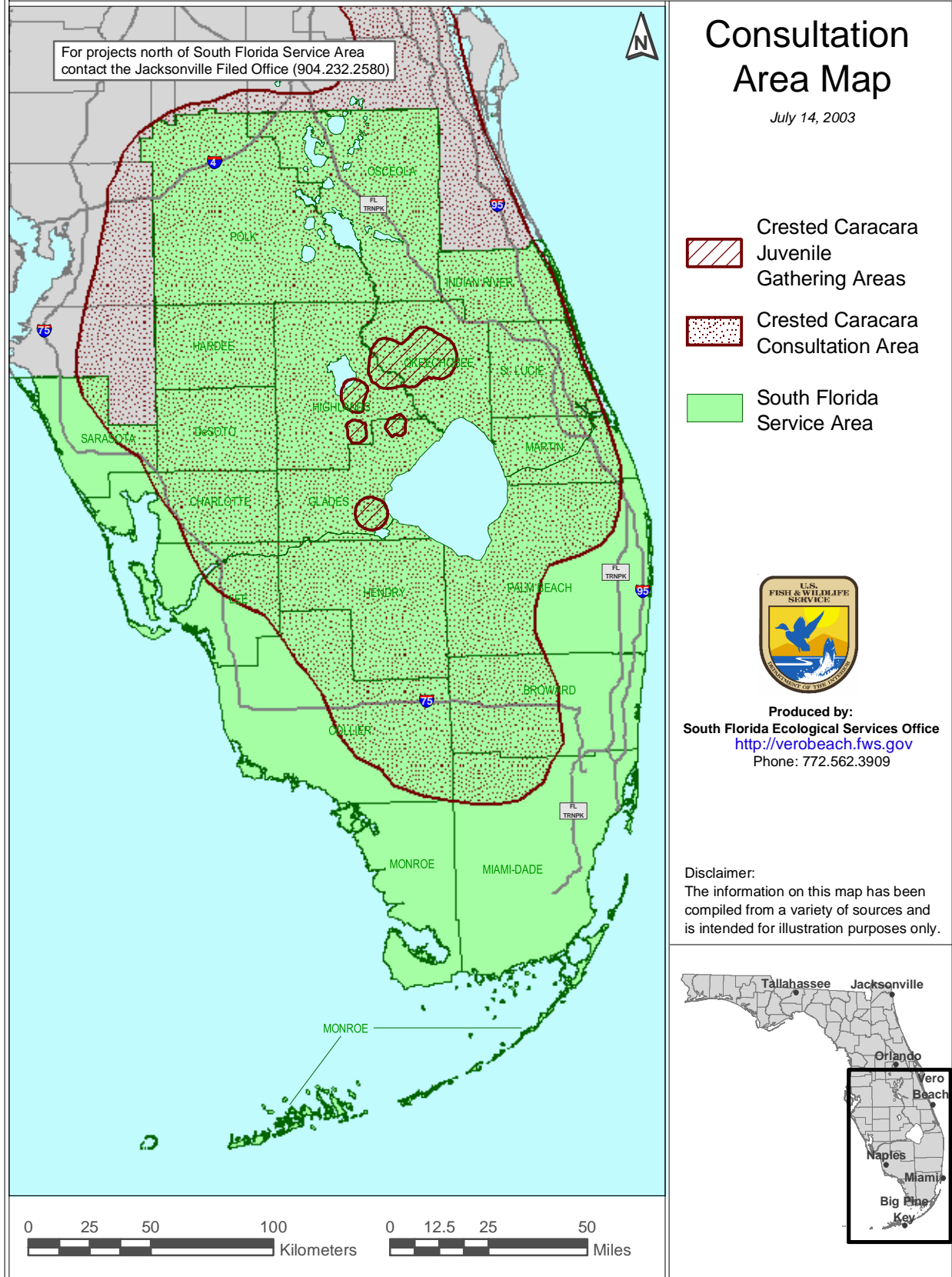


Figure 1.

Crested Caracara Monitoring Field Data Form

Date: _____ Start Time _____ Stop Time _____ Monitor _____

Site Name and Location: **Include latitude and longitude**, section, township, and range, and county.

Weather Data

Time	Temp	Wind Speed/Direction	% Cloud Cover	Cloud Type	Rain
Start					
Finish					

Flight Data

#	Age A/Im	Time	Description

Nesting Data: Observed Activity

(perching, preening, courtship, feeding, nest building, incubation, head color change, head throwback, diving)

#	Age A/Im	Time	Description

General Observations

(crested caracara reaction to passing planes, trains, trucks, pedestrians, other birds, etc.)

#	Age A/Im	Time	Description

**Standard Local Operating Procedures for Endangered Species
Audubon's Crested Caracara**



Start Here

STEP 1

- Project Description
- Habitat Description
- Checked County List?

STEP 2

- ✓ Check Consultation Area Map
- ✓ Check Suitable Habitat

STEP 4

No Effect

Inside Consultation Area

STEP 3

Suitable Habitat

Nest within 1,500 m / 4,920 ft or Aggregation Present

Survey Habitat For Nests and aggregations.

Recommended Management Practices for Caracaras (Morrison 2001)

Can not avoid or implement Conservation Measures

Likely to Adversely Affect

Formal Consultation

Conservation Measures

- Conservation measures implemented.
- Actions proposed outside nesting season.

- Conservation measures implemented.
- During nesting season.
- Site monitor.

- Conservation measures modified with supporting data

- Minimal habitat modification in primary or secondary zones.
- On-site enhancement and restoration.

Not Likely to Adversely Affect
Request Concurrence

Service Response

Likely to Adversely Affect

Formal Consultation

No Effect

Proceed with Action

Proceed with Action

Figure 2.



United States Department of the Interior



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

August 1, 2017

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

Subject: Consultation Key for the Eastern Indigo Snake – Revised

Dear Mr. Kinard:

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

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

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

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

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

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

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

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

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

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

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

Scope of the Key

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

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

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

Habitat

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

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

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

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

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

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

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

Minimization Measures

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

Determinations

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

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

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

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

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

- A. Project is not located in open water or salt marsh.....go to B
 Project is located solely in open water or salt marsh.....**no effect**

- B. Permit will be conditioned for use of the Service's most current guidance for Standard Protection Measures For The Eastern Indigo Snake (currently 2013) during site preparation and project construction.....go to C
 Permit will not be conditioned as above for the eastern indigo snake, or it is not known whether an applicant intends to use these measures and consultation with the Service is requested.....**may affect**

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

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

- E. Any permit will be conditioned such that all gopher tortoise burrows, active or inactive, will be excavated prior to site manipulation in the vicinity of the burrow¹. If an eastern indigo snake is encountered, the snake must be allowed to vacate the area prior to additional site manipulation in the vicinity. Any permit will also be conditioned such that holes, cavities, and snake refugia other than gopher tortoise burrows will be inspected each morning before planned site manipulation of a particular area, and, if occupied by an eastern indigo snake, no work will commence until the snake has vacated the vicinity of proposed work.....NLAA²
 Permit will not be conditioned as outlined above.....**may affect**

End Key

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

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

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

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

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

Sincerely,



Roxanna Hinzman
Field Supervisor
South Florida Ecological Services

Cc:

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

LITERATURE CITED

- Enge K. M. 2017. Personal communication. Email from Kevin Enge, Florida Fish and Wildlife Conservation Commission, Gainesville, Florida to Steve Mortellaro, U.S. Fish and Wildlife Service, Vero Beach, Florida, July 5, 2017. Locations of Eastern Indigo Snake (*Drymarchon couperi*).
- Enge K. M. and M. J. Endries. 2009. Status of the Eastern Indigo Snake (*Drymarchon couperi*) in Florida. Southeast Partners in Amphibian and Reptile Conservation Meeting.
- Landers, J. L. and D.W. Speake. 1980. Management Needs of Sandhill Reptiles in Southern Georgia. Proceedings Annual Conference of Southeastern Association of Fish and Wildlife Agencies. 34: 515-529.
- Layne, J.N., and T.M. Steiner. 1996. Eastern indigo snake (*Drymarchon corais couperi*): summary of research conducted on Archbold Biological Station. Report prepared under Order 43910-6-0134 to the U.S. Fish and Wildlife Service; Jackson, Mississippi.
- Lawler, H.E. 1977. The status of *Drymarchon corais couperi* (Holbrook), the eastern indigo snake, in the southeastern U.S.A. *Herpetological Review* 8(3):76-79.
- Means, D. B. 2006. Vertebrate faunal diversity of longleaf pine ecosystems. In *The Longleaf Pine Ecosystem* pp. 157-213. Springer New York.
- Molar, P.E. 1985a. Distribution of the eastern indigo snake, *Drymarchon corais couperi*, in Florida. *Herpetological Review* 16(2):37-38.
- Moler, P.E. 1985b. Home range and seasonal activity of the eastern indigo snake, *Drymarchon corais couperi*, in northern Florida. Final performance report, Study E-1-06, III-A-5. Florida Game and Fresh Water Fish Commission; Tallahassee, Florida.
- Steiner, T.M., O.L. Bass, Jr., and J.A. Kushlan. 1983. Status of the eastern indigo snake in Southern Florida National Parks and vicinity. South Florida Research Center Report SFRC-83-01, Everglades National Park; Homestead, Florida.
- U.S. Fish and Wildlife Service (Service). 1999. South Florida multi-species recovery plan. 23 pp.
- U.S. Fish and Wildlife Service (Service). 2013. Standard Protection Measures for the Eastern Indigo Snake. August 12, 2013. U.S. Fish and Wildlife Service, South Florida Ecological Services Office; Vero Beach, Florida.
- Wilson, L.D. and L. Porras. 1983. The ecological impact of man on the south Florida herpetofauna. *University of Kansas Museum of Natural History Special Publication* 9:1-89.
- Zeigler, M. 2006. Personal communication. Citrus grove operations manager. Meeting with the U.S. Fish and Wildlife Service on August 1, 2006. Agricultural Resource Management; Vero Beach, Florida.

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

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

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

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

POSTER INFORMATION

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

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

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

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

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

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

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

IF YOU SEE A LIVE EASTERN INDIGO SNAKE ON THE SITE:

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

IF YOU SEE A DEAD EASTERN INDIGO SNAKE ON THE SITE:

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

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

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

PRE-CONSTRUCTION ACTIVITIES

1. The applicant or designated agent will post educational posters in the construction office and throughout the construction site, including any access roads. The posters must be clearly visible to all construction staff. A sample poster is attached.
2. Prior to the onset of construction activities, the applicant/designated agent will conduct a meeting with all construction staff (annually for multi-year projects) to discuss identification of the snake, its protected status, what to do if a snake is observed within the project area, and applicable penalties that may be imposed if state and/or federal regulations are violated. An educational brochure including color photographs of the snake will be given to each staff member in attendance and additional copies will be provided to the construction superintendent to make available in the onsite construction office (a final brochure for Plan compliance, to be printed double-sided on 8.5" x 11" paper and then properly folded, is attached). Photos of eastern indigo snakes may be accessed on USFWS and/or FWC websites.
3. Construction staff will be informed that in the event that an eastern indigo snake (live or dead) is observed on the project site during construction activities, all such activities are to cease until the established procedures are implemented according to the Plan, which includes notification of the appropriate USFWS Field Office. The contact information for the USFWS is provided on the referenced posters and brochures.

DURING CONSTRUCTION ACTIVITIES

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

POST CONSTRUCTION ACTIVITIES

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

Red-cockaded Woodpecker

South Florida

Survey Protocol

(Adapted from Service 2003)

Nesting and Foraging Habitat

Surveys are used to determine whether the nesting and/or foraging habitat of a red-cockaded woodpecker group will be adversely impacted by a proposed project. This is an important part of the conservation and management of this endangered species, and therefore the Fish and Wildlife Service has developed standard survey and analysis procedures for such determinations. These determinations must be undertaken prior to the initiation of any project within the southeastern United States that calls for removal of pine trees 60 years or older; typically such trees will be at least 25.4 cm (10 in) dbh (diameter at breast height) or larger. In south Florida slash pines as small as 15.2 cm (6 in) dbh can be this old. The procedure is also used following new land acquisition by state and federal agencies in the southeast or any other circumstance in which the presence or absence of red-cockaded woodpeckers is to be assessed.

The first step in the survey procedure is to determine if suitable nesting or foraging habitat exists within the area to be impacted by the project. If no suitable nesting or foraging habitat is present within the project impact area, further assessment is unnecessary and no effect to the red-cockaded woodpecker is anticipated. If no suitable nesting habitat is present within the project impact area, but suitable foraging habitat is present and will be impacted, potential use of this foraging habitat by groups outside the project boundaries must be determined. This is accomplished by identifying any potential nesting habitat within 0.8 km (0.5 mi) of the suitable foraging habitat that would be impacted by the project. Any potential nesting habitat is then surveyed for cavity trees. This procedure is described in greater detail below. If no active clusters are found, then no effect to the red-cockaded woodpecker is anticipated. If one or more active clusters are found, a foraging habitat analysis is conducted (see below) to determine whether sufficient amounts of foraging habitat will remain for each group post-project.

For nesting and foraging habitat surveys within project impact areas and within 0.8 km (0.5 mi) of the project site, potential habitat is assessed at the level of the stand. A stand is a term used to refer to a wooded area receiving past or current silvicultural treatment as a single management unit. Here we expand the term to include any subset of a tract of wooded land, divided by biological community type, management history, or any other reasonable approach. A small tract of land may be considered a single stand or part of a large stand.

Identification of Suitable Foraging Habitat

For the purpose of surveying, suitable foraging habitat consists of a pine or pine/hardwood stand of forest, woodland, or savannah in which 50 percent or more of the dominant trees are pines and the dominant pine trees are generally 60 years in age or older. These characteristics do not necessarily describe good quality foraging habitat; rather, this is a conservative description of potentially suitable habitat. Identification of pine and pine/hardwood stands can be made using cover maps that identify pine and pine/hardwood stands, aerial photographs interpreted by standard techniques, or a field survey conducted by an experienced forester or biologist. Age of stands can be determined by aging representative dominant pines in the stands using an increment-borer and counting annual growth rings. Stand data describing size classes may be substituted for age if the average size of 60 year-old pines is known for the local area and habitat type.

If no suitable foraging habitat is present within the project area (that is, no pines 60 years or older will be impacted), then further evaluation is unnecessary and red-cockaded woodpeckers can be presumed absent. If the project area contains any suitable foraging habitat that will be impacted by the project, that habitat, if it contains any 60 year old trees or older, and all other suitable nesting habitat within 0.8 km (0.5 mi) of the project site, regardless of ownership, must be surveyed for the presence of red-cockaded woodpeckers.

Identification of Suitable Nesting Habitat

For the purpose of surveying, suitable nesting habitat consists of pine, pine/hardwood, and hardwood/pine stands that contain pines 60 years in age or older and that are within 0.8 km (0.5 mi) of the suitable foraging habitat to be impacted at the project site (see above). Additionally, pines 60 years in age or older may be scattered or clumped within younger stands; these older trees within younger stands must also be examined for the presence of red-cockaded woodpecker cavities. These characteristics do not necessarily describe good quality nesting habitat; rather, this is a conservative description of potential nesting habitat.

Determination of suitable nesting habitat may be based on existing stand data, aerial photo interpretation, or field reconnaissance. Trees should either be aged or assumed suitable if greater than 15.2 cm (6 in) dbh. All stands meeting the above description, regardless of ownership, should be surveyed for cavity trees.

Cavity Tree Survey

Once suitable nesting habitat is identified (above), it must be surveyed for cavity trees of red-cockaded woodpeckers by personnel experienced in management and monitoring of the species. Potential nesting habitat is surveyed by running line transects through stands and visually inspecting all medium-sized and large pines for evidence of cavity excavation by red-cockaded woodpeckers. Transects must be spaced so that all trees are

inspected. Necessary spacing will vary with habitat structure and season from a maximum of 91 m (300 ft) between transects in very open pine stands to 46 m (150 ft) or less in areas with dense midstory. Transects are run north-south, because many cavity entrances are oriented in a westerly direction, and can be set using a hand compass. While surveying for cavities look and listen for red-cockaded woodpeckers. If any are observed record their location and behavior.

When cavity trees are found, their location is recorded in the field using a Global Positioning System (GPS) unit, aerial photograph, or field map. Activity status, cavity stage (start, advanced start, or complete cavity), and any entrance enlargement are assessed and recorded at this time. A cavity can only be considered abandoned if inactive for five consecutive years. Again, it is extremely important to have all surveys and cavity tree assessments performed by experienced personnel. If cavity trees are found, more intense surveying within 457 m (1,500 ft) of each cavity tree is conducted to locate all cavity trees in the area. Cavity trees are later assigned into clusters based on observations of red-cockaded woodpeckers as described in Service (2003, section 3A).

Foraging Area Survey

When a known red-cockaded woodpecker cluster is located on site or within off site, but within 0.8 km (0.5 mi) of the project site a forage area survey is needed to determine if birds are foraging on site. If the off-site buffer can not be surveyed then the nearest known active cluster should be determined. If an active cluster occurs within 5 km (3.1 mi) of the site then a forage survey should be conducted.

Surveys for foraging area boundaries require both breeding season surveys (April 15 through June 15) and non-nesting season (fall) surveys (October 15 through December 15). Surveys should be conducted during the morning hours, from 1 hour prior to sunrise to four hours past sunrise. Surveys outside of these time frames can be inconclusive. Only calm, clear days should be surveyed as red-cockaded woodpecker activity is limited on windy and rainy days. The foraging area surveys require 14 days of survey over the season. Two methods of identifying foraging area boundaries are provided depending on the circumstances.

If there are active red-cockaded woodpecker cavities on the property the territory is considered a 0.8-km (0.5 mi) radius area surrounding the cluster. This can be modified if a foraging area survey is conducted to determine the area boundaries. A foraging area survey commences with observations of the red-cockaded woodpeckers when they leave their roosts. The surveyor documents the number of birds and tracks the birds as they forage through the adjacent habitats. Data should be collected at half hour intervals, recorded on maps, or documented with GPS coordinates for later mapping. If the red-cockaded woodpecker moves to a new location while being observed, the flight direction and the location where the red-cockaded woodpecker lands should be noted. Behavior and vocalizations should be noted, especially behavior that would indicate courtship or nesting.

If there are no active red-cockaded woodpecker cavities on the property a meandering pedestrian transect should be conducted through all suitable habitat. The observer should stop every 3 to 5 minutes, look, and listen for red-cockaded woodpecker activity. Since these birds are territorial and will defend their territory from intrusion by other individuals, the use of red-cockaded woodpecker vocal recordings can facilitate observation. Therefore, at each of the stops, play 30 seconds of continuous red-cockaded woodpecker vocal calls. Tapes of red-cockaded woodpecker vocalizations are available from Audubon and Peterson field guide series.

Report

A final survey report should include the following, as applicable:

A. Field data sheets that include:

1. dates and starting and ending times of all surveys conducted;
2. weather conditions during all surveys, including temperature, wind speed and direction, visibility, and precipitation; and
3. the total number of red-cockaded woodpeckers observed and number of red-cockaded woodpecker clusters.

Red-cockaded woodpecker activity and cavity tree information should be submitted in a survey report to the South Florida Ecological Services Office, 1339 20th Str., Vero Beach, FL 32960.



- [Welcome](#)
- [Our Strategic Plan](#)
- [Area of Responsibility](#)
- [Our Office Location](#)
- [Contact Us](#)
- [Current News Releases](#)
- [News Archives](#)
- [Landowner Tools](#)
- [Programs and Resources](#)
- [Partners for Fish and Wildlife](#)
- [Coastal Program](#)
- [Habitat Conservation Plans](#)
- [Federally-listed Species in Florida](#)
- [Students & Teachers](#)
- [Related Sites of Interest](#)
- **Key North Florida Species**
- [Bald Eagle](#)
- [Florida Manatee](#)
- [Eastern Indigo Snake](#)
- [Florida Scrub-Jay](#)
- [Sand Skinks](#)
- [Sea Turtles](#)
- [Whooping Crane](#)
- [Wood Stork](#)
- **General Information**
- [Hunting-Fishing Licenses & Permits](#)
- [Injured/Nuisance Wildlife](#)
- [Wildlife Law Violations](#)
- **Other USFWS Resources**
- [Service Office Finder](#)
- [Office Directory](#)
- [Southeast Region Contacts](#)
- [Federal Register Notices](#)
- [Regional Five-Year Reviews](#)

Media contacts:

Florida: [Chuck Underwood](#), 904-731-3332
Alabama: [Denise Rowell](#), 251-441-6630
Georgia/Louisiana: [Tom Mackenzie](#), 404-679-7291
South Carolina: [Jennifer Koches](#), 843-727-4707 ext. 214
Mississippi: [Connie Dickard](#), 601-321-1121

Protection of Gopher Tortoise in the Eastern Portion of Its Range Warranted but Precluded Under the Endangered Species Act

Gopher tortoises east of Mobile Bay will be added to the list of candidate species eligible for [Endangered Species Act](#) (ESA) protection. While candidate species receive no statutory protection under the ESA, inclusion on the candidate list promotes cooperative conservation efforts for these species.

“After careful review, we have determined the gopher tortoise east of Mobile Bay is facing many of the same problems and challenges as the western population, which is already listed as threatened,” said Cynthia Dohner, Southeast Regional Director for the U.S. Fish and Wildlife Service. “We hope increased protection and conservation efforts in the next few years by private landowners and state and federal agencies in Alabama, Georgia, Louisiana, Mississippi and South Carolina can reduce those threats.”

In making this determination, the Service completed a comprehensive review “known as a 12-month finding” and found sufficient scientific and commercial data to propose listing the species as threatened or endangered throughout its range. However, the Service is precluded from beginning work immediately on a listing proposal because its limited resources must be devoted to other, higher priority actions.

The Service can provide technical assistance and competitive matching grants to private landowners, states and territories undertaking conservation efforts on behalf of candidate species. The Service also can work with interested landowners to develop Candidate Conservation Agreements. These voluntary agreements allow citizens to manage their property in ways that benefit candidate species. These agreements also can be developed to provide regulatory certainty for landowners should the species become listed under the ESA.

The Service made the determination in response to a petition filed on January 25, 2006, to list the gopher tortoise in the eastern portion of its range as threatened under the ESA. The petition was submitted by Mr. Brett Paben, of Wildlaw, on behalf of Save Our Big Scrub, Inc. and Wild South, and included supporting information regarding the potential causes of decline for the gopher tortoise in the eastern United States.

The Service completed an initial review on September 9, 2009, and concluded that the petition contained substantial information supporting a full study of the gopher tortoise’s status.

The eastern portion of the gopher tortoise’s range includes Alabama (east of the Tombigbee and Mobile Rivers), Florida, Georgia, and southern South Carolina. In these areas, the gopher tortoise will become a candidate species for listing under the ESA. In the western range states, west of the Tombigbee River in Alabama, Mississippi, and Louisiana, it will continue to be listed as threatened under the ESA.

Threats to the gopher tortoise include habitat loss, fragmentation and degradation, predation, inadequacy of regulatory mechanisms, and incompatible use of herbicides in forest management.

Gopher tortoises need relatively deep, sandy, soils in which to burrow, open sunny sites for nesting and abundant non-woody food plants. Favored foods are beans, broadleaf grasses, and selected plants in the sunflower family. Gopher tortoises also eat blackberries, blueberries, gopher apples, and other low-growing fruits. They thrive in longleaf pine forests, and enjoy the same type of habitat as the endangered red-cockaded woodpecker.

The gopher tortoise typically inhabits relatively well-drained, sandy soils and is generally associated with longleaf pine-dry oak sandhills, but also occurs in scrub, dry hammock, pine flatwoods, dry prairie, coastal grasslands and dunes, mixed hardwood-pine communities, and a variety of disturbed habitats. Gopher tortoises excavate burrows averaging up to 52 feet long and nine to 23 feet deep. These burrows, which provide protection from temperature extremes and predators, also provide refuge for about 360 other species throughout its range. Some of those species include indigo snakes, gopher frogs, Florida mice, skunks, opossums, rabbits, quail, armadillos, burrowing owls, snakes, lizards, frogs, toads, and many invertebrates.

“The real challenge now is to fine tune on-the-ground management and reach out to more private landowners, who can have a profound impact on recovery for all species in this ecosystem,” Dohner said.

Gopher tortoises can live to be over 50 years old, but do not reach reproductive age until they are 13 to 21 years old. Although it may seem that there are still a number of gopher tortoises out there, the current generation is

aging and suffering lower reproductive success due to degraded habitat conditions. While still relatively common, as older gopher tortoises die, they are not being replaced by young ones.

To achieve the open habitat conditions tortoises prefer, prescribed burns are generally needed every three to five years. In palmetto flatwoods habitat, more frequent burns may be necessary. If burning is not possible to rejuvenate tortoise habitat, regular mowing and brush removal by mechanical means can get help clear out woody shrubs, and thin trees to maintain the natural landscape here in the Southeast that provides a home for the tortoise.

Any future proposal to place the gopher tortoise in the eastern portion of its range on the federal list of threatened and endangered species will include a formal proposed rulemaking process with ample opportunity for public review and comment.

STATE BY STATE STATUS

Georgia	State listed gopher tortoise as a threatened species.
Florida	State listed as a threatened species.
South Carolina	State listed as an endangered species.
Mississippi	State-and federally-listed as a threatened species.
Alabama	Protected non-game species; Populations west of the Tombigbee and Mobile Rivers are federally listed as a threatened species.
Louisiana	State and federally listed as a threatened species.

The 12-month finding and other information about the gopher tortoise is available on the Internet at <http://www.fws.gov/northflorida/>. The finding may also be requested via e-mail to northflorida@fws.gov (please include "GT 12-month Finding" in subject line) or by mail to: U.S. Fish and Wildlife Service, North Florida Ecological Services Office, Attn: GT 12-month Finding, 7915 Baymeadows Way, Suite 200, Jacksonville, FL 32256.

The mission of the U.S. Fish and Wildlife Service is working with others to conserve, protect, and enhance fish, wildlife, plants, and their habitats for the continuing benefit of the American people. For more information on our work and the people who make it happen, visit www.fws.gov/southeast. Connect with us on Facebook at www.facebook.com/usfwssoutheast, follow our tweets at www.twitter.com/usfwssoutheast, watch our YouTube Channel at <http://www.youtube.com/usfws>, and download photos from our Flickr page at <http://www.flickr.com/photos/usfwssoutheast>.

[Federal Register Notice](#)

[Frequently Asked Questions on the 12-month Finding](#)

[Opening Teleconference Remarks by Cindy Dohner, U.S. Fish and Wildlife Service Southeast Regional Director, July 26, 2011](#) - PDF - 176KB

[Literature Cited in 12-month Finding](#) - PDF - 145KB

[Petition to list](#) - PDF 995KB

[Gopher tortoise Images](#)

[Gopher tortoise Video Clip](#) - Scroll down to "Reptiles"

[Gopher tortoise Species Information](#)

[Gopher Tortoise Fact Sheet](#)

[Information on the federally-listed Gopher tortoise in the western portion of its range](#)



Send comments on our web site or general questions to [North Florida office](#).
If you need special assistance please contact the [Public Affairs Officer](#).

BURROWING OWL NEST PROTECTION GUIDELINES AND PROCEDURES IN URBAN AREAS

The Florida burrowing owl (*Athene cunicularia floridana*) is listed by the State of Florida, Fish and Wildlife Conservation Commission (Commission) as a Species of Special Concern (Florida Administrative Code [F.A.C.] 68A-27.005). This classification means that the burrowing owl has a high vulnerability to factors that may lead to its becoming a threatened species in the absence of appropriate protection or management. As a Species of Special Concern, it is illegal to take (pursue, hunt, capture, molest, or kill) burrowing owls and their nest burrows and eggs without a permit issued by the Executive Director of the Commission (68A-9.002 & 68A-27.005 F.A.C.). Burrowing owls and their nests are also afforded protection under the Federal Migratory Bird Treaty Act. Rules promulgated under this act (Title 50, Code of Federal Regulations, Part 21) prohibit the destruction of active (i.e., nests which contain eggs or flightless young) nests without a federal permit, which is issued by the U.S. Fish and Wildlife Service Regional Office in Atlanta, Georgia.

The Commission's policy is to issue permits to destroy burrowing owl nest burrows only as a last resort, after all reasonable alternatives (such as realigning development to avoid the nest) have been shown to be impractical. When such permits are issued, they apply only to inactive nests (i.e., burrows containing no eggs or flightless young). Burrowing owl nests can generally be considered inactive from 10 July to 15 February, although some nesting occurs as early as October each year. Between 15 February and 10 July, burrows attended by one or more burrowing owls are considered active nests unless information is available to suggest otherwise (i.e., proof that young fledged from the nest prior to 10 July).

Burrowing owls often nest on vacant lots in rapidly developing suburban areas. In these areas, home construction is a major cause of burrow destruction. However, Commission studies in Cape Coral, Lee County, have shown that if development is conducted in such a way that the area within 50 ft of the burrow is protected from disturbance, nesting is seldom interrupted. No Commission permit is needed to build a home on a lot when at least a 50-ft radius circle can be provided around the burrow, but cautionary measures must be taken to guard against accidental destruction of the nest. A larger buffer, ideally 150 ft, will decrease chances the nest burrow will be adversely impacted. We recommend that the buffer circle around the burrow entrance be staked and roped-off prior to initiating construction. Sod may be laid within the protected area outside the "active" nesting period, but the burrow entrance must be left open. Plugging the burrow entrance or causing the burrow to collapse would effectively destroy the nest, and as such, require a permit. As a cautionary measure, we recommend that after completion of the home, the homeowners place a T-perch (see enclosed brochure) near the burrow or stake-off the area around the burrow to prevent someone from accidentally stepping into the entrance.

At present, the Commission has no guidelines for management of burrowing owls in other than urban/suburban areas. Protection criteria for these situations, or situations where numerous burrows will be impacted, will be developed on a case-by-case basis.

To request a permit to take a burrowing owl nest, submit an application packet to the Protected Species Permit Coordinator, Species Conservation Planning Section, Florida Fish and Wildlife Conservation Commission, 620 South Meridian St., Mail Station 2A, Tallahassee, FL 32399-1600, (850) 921-5990, ext. 17310, Fax (850) 921-1847. The packet must contain: (1) a complete application stating the location of the burrow(s), (2) a statement as to why the burrow(s) must be destroyed (i.e. nest burrow conflicts with proper installation/functioning of a structure or prohibits construction in a certain manner) in detail, (3) a detailed site plan or scaled diagram of the property that clearly indicates the location of the burrow(s) and it's proximity/distance to the proposed structure/construction activity, and (4) a statement of mitigation measures that will be enacted to offset the loss of nesting habitat for this species. Federal permits are required only if the nest is active (i.e., has flightless young or eggs present). Please contact Special Law Enforcement Agent in charge, U.S. Fish and Wildlife Service.



State of Florida Fish and Wildlife Conservation Commission
Division of Habitat and Species Conservation

MIGRATORY BIRD NEST REMOVAL PERMIT APPLICATION

(Please Print or Type)

Applicant Name _____ Date of Application _____

Affiliation _____

Mailing Address _____

Telephone Number(s): _____
Voice line _____ Fax _____ Email address _____

Applicant Signature _____

Certification: I hereby state and confirm by signature that the information submitted in this application and supporting documents is complete and accurate to the best of my knowledge and belief. I understand that any false statement herein may subject me to criminal penalties. I further state that I will abide by all applicable State, Federal, and local laws. Finally, I hereby confirm by signature that representatives of the Florida Fish and Wildlife Conservation Commission (Commission) have my permission as the applicant and that of the landowner(s) to enter on and inspect the property(ies) described in the application for all reasonable purposes pertaining to applicable Commission rules.

Bird species: Burrowing Owl* _____ Osprey _____ Other _____

Did you previously have a state permit for the proposed work at this site? _____ Permit number _____

Nest information:

Number of nests or burrows to be removed _____ Duration of work _____

Location of nest (i.e., what structure [light pole, tree, tower etc.] block, lot, street address, city, county, Township/Range/Section [T,R,S]): _____

Are eggs or flightless young present? Yes/No Are any adult birds present? Yes/No. How many? _ You must also contact Special Agent in Charge, US Fish and Wildlife Service, 1875 Century Boulevard, Atlanta, GA 30345, (404) 679-7049 for a federal permit, if any eggs and/or flightless young are in the nest.

Has an environmental consultant or other trained or experienced person inspected the nest(s) or owl burrow (s)? Yes/No. If yes, please provide written confirmation of the inspection from the environmental consultant or other trained individual (indicating they have inspected the nest(s) or owl burrow(s) and have verified the current status.) _____

Justification for removal of nest(s) or owl burrow(s) (i.e.-location of nest conflicts with proper functioning/installation of a structure or prohibits construction) _____

Describe proposed measures to (i.e., placement of T-perch on-site, starter burrows, erecting replacement nest structure, etc.) mitigate for this loss of nesting habitat for this species (refer to appropriate species policy/guidelines): _____

* - Those applying for a permit to remove a burrowing owl nest burrow must include a site plan or scaled diagram of the property that shows the location of the burrow(s) relative to the proposed construction.

The Florida Statutes require state agencies to approve or deny complete applications within 90-days of receipt. This office operates on a self-imposed policy to make every effort to approve or deny complete applications within 45 days of receipt. Therefore we ask you to submit a complete application and include all relevant information as attachments (i.e. scientific project proposals, site plans etc.). Complete permit applications should be submitted a minimum of 45 days prior to the requested effective date.

Mail to: Protected Species Permit Coordinator, Florida Fish and Wildlife Conservation Commission, Division of Habitat and Species Conservation, 620 South Meridian Street, Mail Station 2A, Tallahassee, Florida 32399-1600, (850) 921-5990, ext. 17310, Fax: (850) 921-1847.

Florida Sandhill Crane

Antigone canadensis pratensis



Photograph by FWC.

Species Overview

Status: Listed as state Threatened on Florida’s Endangered and Threatened Species List.

Current Protections

- 68A-27.003(a), F.A.C., No person shall take, possess, or sell any of the endangered or threatened species included in this subsection, or parts thereof or their nests or eggs except as allowed by specific federal or state permit or authorization.
- 68A-27.001(4), F.A.C., Take – to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in such conduct. The term “harm” in the definition of take means an act which actually kills or injures fish or wildlife. Such act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering. The term “harass” in the definition of take means an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding or sheltering.
- Florida sandhill cranes, active nests, eggs, and young also are protected under the Federal Migratory Bird Treaty Act, state Rule 68A-16.001, F.A.C., and state Rule 68A-4.001, F.A.C.
- Intentional feeding of sandhill cranes is prohibited under Rule 68A-4.001(5) F.A.C.

Biological Background

This section describes the biological background for this species and provides context for the following sections. It focuses on the habitats that support essential behaviors for the Florida sandhill crane, threats faced by the species, and what constitutes significant disruption of essential behavioral patterns. Florida sandhill cranes (*Antigone canadensis pratensis*) occur from southern Georgia, primarily in the Okefenokee Swamp, to the Everglades (Stys 1997). However, most of the population is in peninsular Florida from Alachua County in the north to the northern edge of the Everglades in the south. The migratory greater sandhill crane (*A. c. tabida*) winters in Florida, arriving in October and November and leaving for breeding grounds in northern U.S. and Canada from late January to early March. Although the two sandhill crane subspecies occurring in Florida are difficult to distinguish, those observed in the peninsula from April to September can be assumed to be the resident Florida subspecies. Florida sandhill cranes typically breed from February through April, but the breeding season can extend as early as December and as late as August (Bent 1926, Walkinshaw 1973). The Florida subspecies and *A. c. tabida* are not known to interbreed.

Habitat features that support essential behavioral patterns

Florida sandhill cranes forage in a variety of open habitats, including shallow (0-32 inches deep) herbaceous wetlands, improved pastures, prairies, open pine forests, croplands, golf courses, airports, and sod farms (Stys 1997). Cranes in north Florida spent 86% of their time in 4 habitat types: pasture, freshwater marsh, pasture– marsh transition, and pasture–forest transition (Nesbitt and Williams 1990). Preferred sandhill crane habitat contains short vegetation (e.g., vegetation less than 20 inches high in uplands), and sandhill cranes generally avoid areas with taller vegetation or dense forest canopies (Stys 1997).



Florida sandhill cranes and flightless young. FWC Photograph.

Although Florida sandhill cranes forage in a variety of open habitats, shallow, freshwater marshes are critical for both nesting and roosting (Wood and Nesbitt 2001). Average water depth at the nest ranges from 5 to 13 inches and averages 4 to 12 inches at roosting sites (Walkinshaw 1973, 1976; Bennett 1992). Nesting and roosting locations vary from year to year due to fluctuation in water levels in wetlands across the landscape. Shallow wetlands are particularly important in supporting essential behaviors for this species.

Additionally, uplands directly adjacent to nesting marshes are important for young sandhill cranes for the first several months until they are capable of flying. Young sandhill cranes remain flightless until approximately 70 days after hatching (Nesbitt 1996). Herbaceous wetlands, marsh-pasture transition zones, and adjacent pasture are the most common foraging habitat for young birds during the pre-fledging period (McMillen et al. 1992).

Threats

According to the [Species Action Plan](#) (SAP), habitat loss and degradation are the primary threats for sandhill cranes. Much of the remaining sandhill crane habitat is on private lands, underscoring the need to work with private landowners to reduce habitat loss and habitat degradation at nesting sites. Overgrown habitat makes sandhill cranes more vulnerable to predators, and habitat fragmentation forces sandhill cranes to travel farther between wetland and upland sites, which can lead to higher mortality. Given the importance of wetlands for roosting and nesting, changes in the timing or quantity of water can have significant consequences for sandhill cranes (Nesbitt 1996). For example, low water levels can make nests and young more vulnerable to predators and can deter breeding altogether (Nesbitt 1996). Rapid rises in water levels



Florida Sandhill crane on a nest, FWC Photograph.

from storm events can flood nests or lead to nest failure. Runoff from impermeable surfaces potentially worsens the effects of storm events (Dwyer and Tanner 1992).

Disturbances in and around wetlands with active nests can significantly impact nesting success. Humans approaching a nest location within 250 feet of a nest site can cause a crane to flush (Dwyer and Tanner 1992). Once flushed, parents can remain off of the nest for 15 minutes to over 4 hours, and some nests are abandoned altogether (Dwyer and Tanner 1992; FWC, unpublished data). Disturbances within 400 feet can interrupt nesting activity and even cause abandonment of the area, even if

the birds do not flush (Stys 1997).

Other threats to sandhill cranes include collisions with vehicles, power lines, and fences (Folk et al. 2001). Adults with pre-fledged young often walk across roadways rather than flying, leading to increased mortality from vehicle strikes. Collisions with power lines can lead to broken necks, wings, and legs (Windingstad 1988). Entanglement with fences can occur when cranes are landing or if cranes cannot walk under or pass through the fence (Nesbitt 1996).

Potential to Significantly Impair Essential Behavioral Patterns

Sandhill cranes rely on shallow wetlands for breeding, feeding, and sheltering. Therefore actions that result in loss of suitable natural wetlands where cranes are foraging, roosting, or nesting can cause significant impairment of essential behavioral patterns. Similarly, actions that degrade occupied suitable natural wetlands through changes in timing, quantity, or quality of water can result in significant impairment of essential behavioral patterns. Flushing cranes from their nests can result in loss or abandonment of active nests, regardless of whether nests occur in natural or man-made wetlands, and can significantly impair breeding. Young, flightless sandhill cranes have been observed foraging 1500 feet from the nest site within weeks of hatching (Layne 1981). Actions that impact upland foraging of flightless young (i.e., young within first 70 days after hatching; Nesbitt 1996) could result in the significant impairment and cause take.

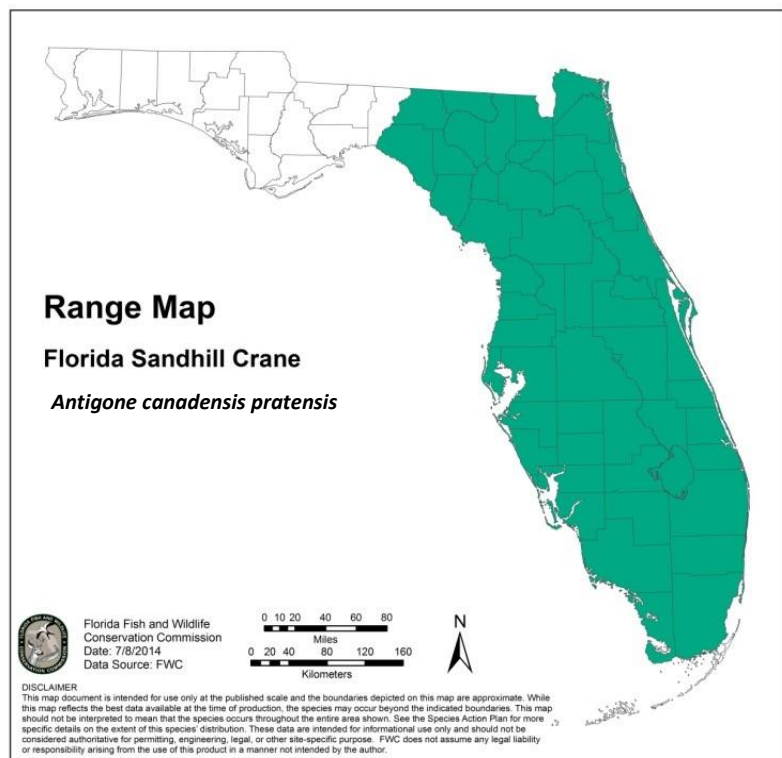
Distribution and Survey Methodology

The map below represents the principle geographic range of the Florida sandhill crane, including intervening areas of unoccupied habitat. This map is for informational purposes only and is not for regulatory purposes.

Counties: Alachua, Baker, Bradford, Brevard, Broward, Citrus, Charlotte, Clay, Collier, Colombia, DeSoto, Dixie, Duval, Flagler, Gilchrist, Glades, Hamilton, Hardee, Hernando, Hendry, Highlands, Hillsborough, Indian River, Lafayette, Lake, Lee, Levy, Madison, Manatee, Marion, Martin, Miami-Dade, Monroe, Nassau, Okeechobee, Orange, Osceola, Palm Beach, Pasco, Pinellas, Polk, Putnam, Sarasota, Seminole, St. Johns, St. Lucie, Sumter, Suwannee, Taylor, Union, Volusia..

Recommended Survey Methodology

Surveys can be used to determine if Florida Sandhill Cranes are nesting in an area or to confirm that the species are present. Surveys are not required but if conducted in accordance with the methodology described below and the species are not detected, no FWC review or coordination is needed.



Surveys of breeding habitat

Surveys during the breeding season (December to August) are useful for identifying active nests. Nesting primarily occurs from February to April. Surveys are recommended 1) during project planning and 2) immediately prior to project activities:

- 1) **Project planning.** Surveys are recommended during the early stages of a project (e.g., as part of the Environmental Resource Permit [ERP] process) to identify areas used for nesting in order to aid in development of appropriate avoidance, minimization, and mitigation.
 - Three surveys should be spaced at least 3 weeks apart during the breeding season.
 - The objective of the surveys is to detect nesting activity; thus, if observers detect nesting sandhill cranes in a wetland on the first survey date, there is no need to conduct the second or third survey in that wetland.
 - Spacing the 3 surveys to occur in early March, early April, and early May is ideal.
 - If active nests or flightless young are found, the applicant should coordinate with the FWC during the ERP process (see page 8) to discuss avoidance, minimization, and mitigation.
 - If no active nests or flightless young cranes are found, no further coordination is needed with the FWC regarding sandhill cranes during the ERP process.
- 2) **Pre-activity (pre-clearing or pre-construction) surveys** are recommended immediately prior to project activities during the breeding season to identify active nests or flightless young in order to avoid, minimize, or mitigate for take of those nests or young.
 - Nesting locations vary from year to year due to fluctuation in water levels in wetlands across the landscape. Therefore, project planning surveys are insufficient to assure that no take of active nests or flightless young will occur.
 - Pre-activity surveys should occur within thirty days of initiation of activities and should include either 1 aerial survey or 2 ground surveys (see methods below).
 - If active nests or flightless young are found and avoidance of take is not feasible, the applicant should contact the FWC to discuss potential minimization and mitigation for take of those nests or young.
 - If active nests or flightless young are not found, no further action is required.
- Aerial transects covering 100% of the suitable nesting habitat are the most effective method for locating nesting sandhill cranes (Stys 1997).
 - Nests typically are easier to detect at higher altitudes (e.g., 500-700 feet).
 - Aerial transects at an altitude above 250 feet are not expected to result in flushing from nests. Note that this minimum altitude is higher than that suggested in the 1997 [FWC Nongame Technical Report No. 15](#).
 - Sandhill cranes may react differently to different types of aircraft, and altitude may need to be adjusted to prevent disturbance.



Florida Sandhill crane and mate on a nest. FWC Photograph.

Surveys from the ground are adequate, provided precautions are taken to avoid flushing nesting cranes. On small sites, one or a few observation points may be sufficient for complete coverage of the area via ground surveys. On larger areas, transects should be spaced to provide approximately 100% coverage of suitable

habitat, taking into account the limits on visibility imposed by the vegetation and terrain.

- Sandhill crane nests can be difficult to detect from the ground, and observers should take care to avoid flushing nesting cranes.
- Patiently scan suitable nesting habitat from as far away as practical. Transects through the marsh can result in disturbance and are not recommended. Slowly scanning from the periphery of the marsh from a high vantage point (e.g., standing on a truck) can increase visibility and decrease the probability of disturbance.
- A lone adult sandhill crane observed foraging during the breeding season is a good indicator that nesting may be occurring nearby. Members of a breeding pair exchange nest duties several times per day, and observing a lone bird from a distance may help locate the mate on the nest, if necessary.
- Ground surveys should be conducted during the cool part of the day (dawn to 10 AM and 4 PM to dusk) to avoid exposure of eggs to heat in the event that adults accidentally flush from nests. Sandhill crane breeding pairs engage in “unison calling” early in the morning or when switching incubation duties, which can help identify marshes used for nesting.
- Because of the state and federal regulations (Federal Electric Reliability Council (FERC) Electric Reliability Standard FAC-003-3, National Electrical Safety Code (NESC) section 218, and Florida Public Service Commission (FPSC) mandates) associated with routine vegetation maintenance in powerline right of ways, sandhill crane nests do not have to be located prior to routine vegetation maintenance activities within existing power line right of ways, nor does the existing power line right of way need to be surveyed for the presence of nests or the animals themselves prior to maintenance. Removal of active nests encountered during vegetation maintenance activities is prohibited without appropriate State and Federal authorizations.

Recommended Conservation Practices

Recommendations are general measures that could benefit the species but are not required. No FWC permit is required to conduct these activities.

- Maintain or restore hydrology in areas suitable for sandhill cranes. For example, incorporate culverts

into road design or road improvements that will allow for maintenance and/or restoration of natural hydrology.

- Avoid placement of impermeable surfaces, such as roads or parking lots, adjacent to wetlands suitable for nesting cranes, as this reduces the chance of nest failure due to flooding.
- Maintain quality sandhill crane breeding habitat when possible by ensuring availability of areas with average water depths between 5 to 13 inches from January through April. Water depths in sandhill crane foraging habitat range from 0-32 inches (Stys 1997).
- Include a shallow end or shelf, vegetated with native herbaceous wetland species such as maidencane (*Panicum hemitomon*), pickerelweed (*Pontederia cordata*), and smartweeds (*Polygonum* spp.) when constructing new ponds, provided the ponds are not in areas potentially hazardous to sandhill cranes (e.g., not immediately adjacent to high-traffic roads or ponds used for stormwater treatment).
- Develop a prescribed fire regime that minimizes woody encroachment into wetlands and uplands.
- Take steps when possible to avoid disturbing active nests and flightless young (e.g., conduct activities outside of the breeding season or outside of a 400 foot buffer around active nests when feasible) when conducting land management activities beneficial to wildlife in accordance with Rule 68A-27.007(2)(c), F.A.C.
- Maintain open areas for foraging through cattle grazing, mowing, or other means.
- Add power line markers during power line installation to increase visibility to flying cranes as described in the SAP.
- Avoid or minimize fertilizer, herbicide, and pesticide runoff into wetlands.
- Have signs posted in areas frequented by cranes to alert motorists where vehicle-caused mortality of sandhill cranes is common.
- Discourage feeding of sandhill cranes by people. If sandhill cranes are attracted to human-provided food sources (e.g., bird feeders), remove the source of food until sandhill cranes stop visiting the site.
- Use fencing that is more permeable (i.e., barbed wire versus woven wire or chain link) and less dangerous to cranes when constructing fences in or around wetlands and associated uplands suitable for sandhill cranes.

Measures to Avoid Take

Avoidance Measures that Eliminate the Need for FWC Take Permitting

The following measures will eliminate the need for an FWC take permit.

- Avoid impacts to suitable natural wetlands used by sandhill cranes for breeding, feeding, or sheltering.
- Avoid activities within 400 feet of an active nest (Stys 1997).
- If flightless young are present in a wetland, avoid land use conversion in suitable upland habitat within 1500 feet of the nest site until after young are capable of sustained flight (i.e., young within first 70 days after hatching; Nesbitt 1996, Walkinshaw 1976, Layne 1981).

Examples of Activities Not Expected to Cause Take

This list is not an exhaustive list of exempt actions. Please contact FWC if you are concerned that you could potentially cause take.

- Take of inactive nests, as described in FWC's policy on Nest Removal for Inactive Single-Use Nests of State-designated Threatened Bird Species.

- [Approved aversive conditioning methods](#) (see page 11) as described in FWC's policy on Aversive Conditioning of State Listed Species.
- Aerial transect surveys in fixed wing aircraft or helicopters above 250 feet have been demonstrated not to result in flushing from nests. However, the reaction of sandhill cranes may vary depending on the type of aerial activity, and activities should cease or move to a higher altitude if flushing occurs.
- Linear utility and highway right-of-way vegetation maintenance activities outside of the breeding season.
- Cranes are not likely to be disturbed by routine use of roads, homes and other infrastructure, routine agricultural operations, or routine management or repair of linear utilities occurring greater than 400 feet of an active sandhill crane nests or outside the breeding season (December to August). Therefore, in most cases, existing activities of the same degree may continue with little risk of disturbing nesting sandhill cranes.

Florida Forestry Wildlife BMP's and Florida Agricultural Wildlife BMP's

- Agriculture, as defined in Section 570.02, F.S., conducted in accordance with Chapter 5I-8, F.A.C., and the wildlife best management practices (BMPs) adopted in Rule 5I-8.001 and 5M-18.001, F.A.C., by the Department of Agriculture and Consumer Service pursuant to Section 570.94, F.S., is authorized and does not require a permit authorizing incidental take despite any other provision of Rule 68A-27.007 or 68A-27.005, F.A.C.
- Participation in the Florida Forestry Wildlife BMP's and Florida Agricultural Wildlife BMP's program and implementation of these BMP's provides a presumption of compliance with regard to incidental take of Florida Sandhill cranes.
- Forestry and Agricultural BMP's state to avoid heavy equipment operation (except prescribed burning and related activities) within 400 feet of active, known, and visibly apparent Florida Sandhill Crane nests from February to May.

Other Authorizations for Take

- Activities within an airport property in accordance with Rule 68A-9.012, F.A.C.
- Participation in the Florida Forestry Wildlife BMP's and Florida Agricultural Wildlife BMP's program and implementation of these BMP's provides a presumption of compliance with regard to incidental take of the Florida Sandhill crane.
- As described in Rule 68A-27.007(2)(c), F.A.C., land management activities (e.g., exotic species removal) that benefit wildlife and are not inconsistent with FWC Management Plans are authorized and do not require a permit authorizing incidental take.
- In accordance with local, state, and federal regulations (including, but not limited to, Federal Electric Reliability Council (FERC) Electric Reliability Standard FAC-003-3, National Electrical Safety Code (NESC) section 218, and Florida Public Service Commission (FPSC) mandates), routine vegetation maintenance activities within existing power line right of ways that avoid heavy equipment operation within 400 feet of active, known and visibly apparent Florida sandhill crane nests do not require a permit authorizing incidental take.
- In cases where there is an immediate danger to the public's health and/or safety, including imminent or existing power outages that threaten public safety, or in direct response to an official declaration of a state of emergency by the Governor of Florida or a local governmental entity, power restoration activities and non-routine removal or trimming of vegetation within linear right of way in accordance with vegetation management plan that meets applicable federal and state standards does not

require an incidental take permit from the state.

Coordination with Other State and Federal Agencies

The FWC participates in other state and federal regulatory programs as a review agency. During review, FWC identifies and recommends measures to address fish and wildlife resources to be incorporated into other agencies' regulatory processes. FWC provides recommendations for addressing potential impacts to state listed species in permits issued by other agencies. If permits issued by other agencies adequately address all of the requirements for issuing a State-Threatened species take permit, the FWC will consider these regulatory processes to fulfill the requirements of Chapter 68A-27, F.A.C., with a minimal application process. This may be accomplished by issuing a concurrent take permit from the FWC, by a memorandum of understanding with the cooperating agency, or by a programmatic permit issued to another agency. These permits would be issued based on the understanding that implementation of project commitments will satisfy the requirements of Rule 68A-27.007, F.A.C.

Review of Land and Water Conversion Projects with State-Listed Species Conditions for Avoidance, Minimization and Mitigation of Take

- FWC staff, in coordination with other state agencies, provide comments to Federal agencies (e.g., the Army Corps of Engineers) on federal actions, such as projects initiated by a federal agency or permits being approved by a federal agency.
- FWC staff works with landowners, local jurisdictions, and state agencies such as the Department of Economic Opportunity on large-scale land use decisions, including long-term planning projects like sector plans, projects in Areas of Critical State Concern, and large-scale comprehensive plan amendments.
- FWC staff coordinates with state agencies such as the Department of Environmental Protection (DEP) and the five Water Management Districts on the environmental resource permitting (ERP) program, which regulates activities such as dredging and filling in wetlands, flood protection, stormwater management, site grading, building dams and reservoirs, waste facilities, power plant development, power and natural gas transmission projects, oil and natural gas drilling projects, port facility expansion projects, some navigational dredging projects, some docking facilities, and single-family developments such as for homes, boat ramps, and artificial reefs.
- During the ERP process, the FWC will provide guidance on avoidance, minimization, and mitigation measures for sandhill cranes.
- FWC staff will also work with DEP, WMDs, and the applicants during the pre-application and ERP process so that ERP mitigation will satisfy the applicants' responsibilities under Rule 68A-27 F.A.C. and associated rule enforcement policies (see [FWC Incidental take Permitting Process](#) below).
- Conservation benefit as defined under Rule 68A-27 F.A.C. may be accomplished through avoidance, minimization, and mitigation measures outlined in the ERP permit. The existing ERP requirements for wetland mitigation include replacement of functional loss from impacts to wetlands. The mitigation includes provisions for perpetual conservation and management. Mitigation achieved through the ERP process could be considered in FWC determinations when mitigation sites include shallow herbaceous wetlands with short vegetation and directly adjacent uplands maintained in an open condition suitable for foraging.

FWC Permitting: Incidental Take

According to Rule 68A-27.001, incidental take is take that is incidental to, and not the purpose of, carrying out an otherwise lawful activity. Activities that result in impacts to sandhill cranes can require an Incidental

Take Permit from the FWC (see [above](#) for actions that do not require a permit). Permits may be issued when there is a scientific or conservation benefit to the species and only upon showing by the applicant that that the permitted activity will not have a negative impact on the survival potential of the species. Scientific benefit, conservation benefit, and negative impacts are evaluated by considering the factors listed in Rule 68A-27.007(2)(b), F.A.C. These conditions are usually accomplished through a combination of avoiding take when practicable, minimizing take that will occur, and mitigating for the permitted take. This section describes the minimization measures and mitigation options available as part of the Incidental Take Permit process for take of sandhill cranes. This list is not an exhaustive list of options.

Minimization Options

The suite of options below can help to reduce or minimize take of the species, and lessen the mitigation necessary to counterbalance take. All of the options below assume that adhering to avoidance measures that eliminate the need for FWC permitting described [above](#) is not possible, and that some level of take may occur.

Seasonal, Temporal, and Buffer Measures

- Reducing activities from December to August minimizes take of breeding sandhill cranes. Nesting typically occurs from February to April. However, nesting may occur as early as December and as late as August, and the nesting marsh is important for flightless young for approximately 70 days after hatching.
- Minimize to the extent practicable, activities within 400 feet of active nests to minimize disturbance to nests, eggs, and young (Stys 1997).
- If flightless young are present in a wetland, minimize land use conversion within 1500 feet of the nest site until after young are capable of sustained flight (Walkinshaw 1976, Layne 1981).

Design Modification

- Minimize amount of suitable foraging habitat converted to other land uses.
- Design projects to minimize changes in timing, quantity, or quality of water that could degrade suitable sandhill crane nesting habitat.
- Design projects to avoid or minimize fertilizer, herbicide, and pesticide runoff into wetlands.
- Design new ponds with shallow shelves vegetated with native herbaceous wetland species such as maidencane (*Panicum hemitomon*), pickerelweed (*Pontederia cordata*), and smartweeds (*Polygonum* sp.) to provide breeding, roosting, and foraging opportunities (e.g., not immediately adjacent to high-traffic roads or ponds used for stormwater treatment).
- Avoid placement of impermeable surfaces, such as roads and parking lots, adjacent to wetlands used by nesting cranes. This reduces the chance of nest failure due to flooding and minimizes impacts to foraging habitat needed by flightless young.
- Incorporate culverts into new road designs that will allow for maintenance and/or restoration of natural hydrology.
- Design roads away from suitable wetlands to minimize road mortality.

Method Modification

- Use silt fencing and other methods to minimize impacts to water quality (e.g., turbidity) in shallow wetlands.
- When activities must occur within habitat occupied by nesting cranes, refer to the [Seasonal or Temporal Restrictions](#) above to minimize take.
- During power line installation, add power line markers to increase visibility to flying cranes.

- Where vehicle-caused mortality is likely to occur, post signs in areas frequented by cranes to alert motorists.
- Use fencing that is more permeable (i.e., barbed wire versus woven wire or chain link) and less dangerous to cranes when constructing fences in or around nesting wetlands and associated uplands.
 - Barbed wire fencing with 3 strands is better than 4-strand or 5-strand fencing, especially if the bottom strand is 18 inches above the ground (Nesbitt 1996).
 - Woven or welded wire fence, also called hog or animal wire, is more of an impediment to the subspecies.
 - A framed “walk-through” (18 inches high x 24 inches wide) placed periodically (every 0.3 miles) in a woven wire fence would allow cranes to walk through the fence while still restraining livestock (Nesbitt 1996).

Mitigation Options

Mitigation is scalable depending on the impact, with mitigation options for take that significantly impairs or disrupts essential behavioral patterns (e.g., disturbance to nesting cranes). The DEP’s [ERP process](#) forms a basis of mitigation for loss or degradation of sandhill crane nesting and roosting habitat. Following the ERP process, the FWC will review the resulting wetland mitigation to assess whether the mitigation meets the definition of conservation benefit for sandhill cranes. In most cases, wetland mitigation through the ERP process will satisfy the applicants’ responsibilities under Chapter 68A-27 and associated rule enforcement policies. However, under certain circumstances, the FWC may require mitigation specific for take of sandhill cranes to ensure a conservation benefit. Potential options for mitigation are described below. This list is not an exhaustive list of options.

Scientific Benefit

This section describes research and monitoring activities that provide scientific benefit, per Rule 68A-27.007, F.A.C. Conducting or funding these activities can be the sole form of mitigation for a project with FWC approval of methodologies.

- Funding for multi-year implementation of FWC’s statewide monitoring protocol for sandhill cranes.
- A study using radio or satellite telemetry to examine movements, home range size, productivity, and survival in urban and suburban areas.

Habitat

Habitat Protection/Acquisition or Management:

- The acquisition option includes wetland mitigation through the ERP program. The management option includes wetland restoration or creation through the ERP program. In either case, the FWC will review the ERP mitigation to evaluate whether it meets the definition of conservation benefit for sandhill cranes. Suitable mitigation sites include shallow herbaceous wetlands with short vegetation and adjacent, open uplands suitable for foraging. Water depth in sandhill crane foraging habitat varies from 0-32 inches, with average water depth in nesting habitat ranging from 5-13 inches from January-April (Stys 1997).
- With few exceptions (e.g., take of an active nest or land use conversion during the time period that they are being used for foraging by flightless young), ERP mitigation is expected to satisfy the applicants’ responsibilities under Rule 68A-27 and associated rule enforcement policies, and an FWC permit may be subsequently issued based on the understanding that

implementation of project commitments will satisfy the requirements of 68A-27.005 and 68A-27.007, F.A.C.

Funding

No funding option has been identified at this time. However, funding options as part of mitigation will be considered on a case by case basis.

Information

- Mitigation can be used to support research projects consistent with actions in the SAP.
- Monitoring options can include multi-year monitoring that contributes to a portion of a statewide survey.
- The information option is appropriate in circumstances where ERP mitigation does not satisfy the FWC's definition of conservation benefit for sandhill cranes. For example, additional mitigation may be required if land use conversion in suitable upland habitat within 1500 feet of a nest site cannot take place outside of the timeframe when young are capable of sustained flight.

Programmatic Options

No programmatic option available.

Multispecies Options

- The ERP process can serve as a multi-species option for sandhill cranes and other species that use shallow herbaceous wetlands. In many circumstances, mitigation provided through the ERP process may be sufficient to cover take of sandhill cranes and other state-Threatened wetland dependent species.

FWC Permitting: Intentional Take

Intentional take is not incidental to otherwise lawful activities. Per Chapter 68A-27, F.A.C., intentional take is prohibited and requires a permit. For state-Threatened species, intentional take permits may only be considered for scientific or conservation purposes (defined as activities that further the conservation or survival of the species taken). Permits are issued for state-Threatened species following guidance in Rule 68A-27.007(2)(a), F.A.C.

Risks to Property or People**Intentional take for Human Safety**

- Rule 68A-9.012, F.A.C., describes circumstances under which sandhill cranes may be taken on airport property without further state authorization for an imminent threat to aircraft or human safety.
- Permits will be issued only under limited and specific circumstances, in cases where there is an immediate danger to the public's health and/or safety, including imminent or existing power outages that threaten public safety, or in direct response to an official declaration of a state of emergency by the Governor of Florida or a local governmental entity. Applications submitted for this permit must include all information that is required from any other applicant seeking a permit, along with a copy of the official declaration of a state of emergency, if any. This permit process may be handled after the fact or at least after construction activities have already started. An intentional take permit may be issued for such purposes.

Aversive Conditioning

Prior to using approved aversive conditioning methods, landowners should make all practicable attempts to resolve the issue without aversive conditioning, including:

- Removing, to the extent practicable, any attractants (e.g., food sources) contributing to the behavior. It is important to note that intentional feeding of sandhill cranes is prohibited under Rule 68A-4.001 F.A.C. and should be reported to the FWC’s Wildlife Alert Hotline (888-404-3922).
- Where feasible, covering or moving automobiles so that cranes cannot see their reflections in the shiny surfaces.
- Temporarily covering reflective surfaces like windows or glass doors with material, where feasible, so that the birds do not see their reflections. For example, surfaces can be made less reflective by rubbing a bar of soap on the surface.
- Temporarily protecting windows or screens by erecting an exclusion “fence,” where feasible. For example, such a fence may consist of a string or heavy monofilament line mounted on stakes about 2.5-3 feet off the ground and 3 feet from the parts of homes (window or pool screens) that are being damaged by cranes.
- Protecting windows and screens by planting shrubs or bushes that make the area inaccessible to cranes.
- Placing passive, visual scaring devices (e.g., streamers, Mylar ribbons) on houses or other structures.
- Contacting the FWC’s Wildlife Assistance Biologists at [regional offices](#) for additional guidance.

In accordance with the FWC’s policy on Aversive Conditioning of State Listed Species, no permit is required when using approved aversive conditioning techniques described below. Aversive conditioning may be used to discourage sandhill cranes that exhibit behavior that presents or potentially presents a human safety hazard, causes or is about to cause property damage, or could endanger the life of the crane. **Please note that no aversive conditioning methods are approved within 400 feet of an active nest** without a permit. Approved aversive conditioning methods for sandhill cranes include:

- Spraying with water in a manner unlikely to cause harm.
- Motion-activated sprinklers.
- Use of loud noises, such as air horns, vehicle horns, or propane cannons. Please note that this method is only approved **outside of the breeding season** and is **not** approved for adults accompanied by young that are incapable of sustained flight.
- Chasing cranes from the property by foot or by vehicle in a manner that does not result in physical contact with the birds and does not involve entering suitable nesting habitat. Please note that this method is **not** approved if adults are accompanied by young that are incapable of sustained flight.

As noted in the FWC’s policy for aversive conditioning of state-listed species, landowners are encouraged to provide an “after action” report to the Regional Wildlife Assistance Biologist at the appropriate [regional office](#) so the FWC can track the frequency of use and effectiveness of aversive conditioning methods. The report should include a description of the conflict, the frequency of aversive conditioning, the methods used, and the response of the sandhill cranes. Any injury and/or

mortality of sandhill cranes resulting from aversive conditioning must be reported immediately to the FWC's Regional Wildlife Assistance Biologist.

Permits Issued for Harassment

In areas not covered by Rule 68A-9.012 F.A.C., any attempt to discourage sandhill cranes that does not comply with the approved aversive conditioning methods specified above is considered harassment and is prohibited without a permit. Examples include, but are not limited to, use of pyrotechnics, non-toxic chemical treatments, aversive conditioning within 400 feet of an active nest, or loud noises or chasing of adult cranes accompanied by flightless young.

Scientific Collecting and Conservation Permits

Scientific collecting permits may be issued for the sandhill crane using guidance found in Rule 68A-27.007(2)(a), F.A.C. Activities requiring a permit include any research that involves capturing, handling, or marking wildlife; conducting biological sampling; or other research that may cause take.

Considerations for Issuing a Scientific Collecting Permit

- 1) Is the purpose adequate to justify removing the species (if the project requires this)?
 - Permits will be issued if the identified project is consistent with the goal of the SAP (i.e., improvement in status that leads to removal from Florida's Endangered and Threatened Species List), or addresses an identified data gap important for the conservation of the species.
- 2) Are there direct or indirect effects of issuing the permit on the wild population?
- 3) Will the permit conflict with program intended to enhance survival of species?
- 4) Will issuance of the permit reduce the likelihood of extinction?
 - Projects consistent with the goal of the SAP or that fill identified data gaps in species life history or management may reduce the likelihood of extinction. Applications should clearly explain how the proposed research will provide a scientific or conservation purpose for the species.
- 5) Have the opinions or views of other scientists or other persons or organizations having expertise concerning the species been sought?
- 6) Is applicant expertise sufficient?
 - Applicants must have prior documented experience with this or similar species; applicants should have met all conditions of previously issued permits; and applicants should have a letter of reference that supports their ability to handle the species.

Relevant to all Scientific Collecting for Florida Sandhill Cranes

- Applications must include a proposal that clearly states the objectives and scope of work of the project, including a justification of how the project will result in a conservation or scientific purpose that benefits the species. The proposal also must include a thorough description of the project's methods, time frame, and final disposition of all individuals. Permit amendment and renewal applications must be "stand alone" (i.e., include all relevant information on objectives and methods).
- Aerial surveys do not require a permit, provided the surveys do not occur at low enough elevation to flush birds from active nests. Aerial transects above 250 feet are not expected to result in flushing from nests, but activities should cease or move to a higher altitude if flushing occurs.

- Ground surveys do not require a permit, provided surveyors remain outside of a 400 foot buffer around active nests.
- Non-destructive habitat sampling near foraging, roosting, and nesting birds does not need a permit provided observers remain outside the identified buffer distances in active nesting sites and nesting birds do not flush.
- Permits may be issued to display a specimen if the specimen was obtained via a rehabilitation facility or was encountered dead.
- Permits may be issued for captive possession (removal from the wild) if the individual is deemed non-releasable.
- Trapping and handling protocols, and a justification of trapping methods, must be included in the permit application and should identify measures to lessen stress for captured sandhill cranes.
- Methodologies for any collection of tissues such as blood should be clearly spelled out, including measures taken to reduce stress/injury to the birds.
- Disposition involving captive possession for any period of time must include a full explanation of whether the facility has the appropriate resources for accomplishing the objectives and for maintaining the animals in a safe and humane manner.
- Federal permits are required from the USFWS to comply with the Migratory Bird Treaty Act and from the USGS Bird Banding Lab for banding, color-marking, specific capture methods, sampling of blood/tissues, collection of feathers, and attachment of transmitters or other data gathering mechanisms. Federal salvage permits are also required to collect any dead individuals (i.e. mortality not due to research activities or incidental take from research activities) or parts of deceased individuals including feathers and tissues.
- Any mortality should be reported immediately to the FWC at the contact information below. The FWC will provide guidance on proper disposal of specimens.
- Active nest sites should be reported as soon as possible to the FWC at the contact information below.
- A final report should be provided to the FWC in the format specified in the permit conditions.

Additional information

Information on Economic Assessment of this guideline can be found at

<http://myfwc.com/wildlifehabitats/imperiled/management-plans/>

Contact

For permitting questions or to report mortalities, contact the FWC at (850) 921-5990 or

WildlifePermits@myfwc.com. For more species specific information visit <http://myfwc.com/contact/>.

Literature Cited

- Bennett, A. J. 1992. Habitat use by Florida sandhill cranes in the Okefenokee Swamp, Georgia. North American Crane Workshop Proceedings. Paper 293.
- Bent, A. C. 1926. Life histories of North American marsh birds. U.S. Natl. Mus. Bull. 135.
- Dwyer, N.C. and G.W. Tanner. 1992. Nesting Success in Florida Sandhill Cranes. Wilson Bulletin 104:22-31.
- Folk, M. J., S. A. Nesbitt, and M. G. Spalding. 2001. Interactions of sandhill cranes and whooping cranes with foreign objects in Florida. Proceedings of the North American Crane Workshop 8:195-197.
- Layne, J. N. 1981. Nesting, development of young, and parental behavior of a pair of Florida sandhill cranes. Florida Field Naturalist 9:51-59.
- McMillen, J.L., S.A. Nesbitt, M.A. Bishop, A.J. Bennett, and L.A. Bennett. 1992. An evaluation of the three areas of potential populations of whooping cranes. Pages 285-294 in D.A. Wood, editor. Proceedings of the 1988 North American Crane Workshop. Florida Game and Fresh Water Fish Commission and U.S. Fish and Wildlife Service, Lake Wales, Florida.
- Nesbitt, S. A. 1996. Florida sandhill crane. Pages 219-229 in J. A. Rodgers, H. W. Kale and H. T. Smith, editors. Rare and endangered biota of Florida, Volume 5, birds. University Press of Florida, Gainesville.
- Nesbitt, S.A. and K. S. Williams. 1990. Home range and habitat use of Florida sandhill cranes. Journal of Wildlife Management 54:92-96.
- Stys, B. 1997. Ecology of the Florida sandhill crane. Florida Game and Fresh Water Fish Commission. Nongame Wildlife Program Technical Report No. 15. Tallahassee, FL. 20pp.
- Walkinshaw, L.H. 1973. Cranes of the World. Winchester Press, New York, New York, USA.
- Walkinshaw, L. H. 1976. Sandhill crane on and near the Kissimmee Prairie, Florida. Proceedings of the International Crane Workshop 1:1-18.
- Windingstad, R.M. 1988. Nonhunting mortality in sandhill cranes. Journal of Wildlife Management 52:260-263.
- Wood, D. A. and S. A. Nesbitt. 2001. Sandhill crane. Pages 108-123 in D. A. Wood, editor. Florida's fragile wildlife; conservation and management. University Press of Florida, Gainesville.

THE FLORIDA GAME AND FRESH WATER FISH COMMISSION

Funds for the printing of this publication come from the Nongame Wildlife Trust Fund. You can help contribute to this fund when you annually renew your Florida vehicle registration forms. Simply add an extra dollar to the amount of your check. That dollar will be deposited into the Nongame Wildlife Trust Fund to help ensure that future Floridians enjoy the same diversity in wildlife that we enjoy today.

If you would like to learn more about the Florida Game and Fresh Water Fish Commission and projects relating to wildlife, write to the Florida Game and Fresh Water Fish Commission, 620 South Meridian Street, Tallahassee, Florida 32399-1600.



*This agency does not allow
discrimination by race, color, nationality, sex, or handicap. If you
believe you have been discriminated against in any program, activity, or
facility of this agency, write to:*

*Florida Game and Fresh Water Fish Commission
620 South Meridian Street
Tallahassee, Florida 32399-1600*

FDOT Contractor Requirements for Unexpected Interaction with Certain Protected Species During Work Activities

These Requirements are utilized for all FDOT projects and specifically apply when the project has no other identified mitigation measures or permit conditions related to the species encountered.

NOTE: These Requirements represent the species most likely to be unexpectedly encountered on FDOT projects. These Requirements **DO NOT** address all Protected Species that are found in Florida. In the event a species is encountered during project activities and that species' protection status is in question, immediately contact the Engineer.

Bald Eagle

Stop work if live Bald Eagles (*Haliaeetus leucocephalus*) are found in the work area. Work may resume after the bird or birds are allowed to leave the area of their own volition.

Report live sightings of Bald Eagles immediately to the District Environmental Administrator or Construction Environmental Coordinator and the Engineer.

If a Bald Eagle is found nesting within 660 feet of the project limits, cease all work in the area until FDOT (Florida Department of Transportation) has coordinated with USFWS (United States Fish and Wildlife Service).



Crested Caracara

Stop work if live Audubon's Crested Caracara (*Caracara cheriway audubonii*) are found in the work area. Work may resume after the bird or birds are allowed to leave the area of their own volition.

Report live sightings of Audubon's Crested Caracara immediately to the District Environmental Administrator or Construction Environmental Coordinator and the Engineer.

If an Audubon's Crested Caracara is found nesting within 1500 feet of the project limits, cease all work in the area until FDOT has coordinated with USFWS



Florida Burrowing Owl

Stop work if live Florida Burrowing Owls (*Athene cunicularia floridana*) are found in the work area. Work may resume after the bird or birds are allowed to leave the area of their own volition.



Report live sightings of Florida Burrowing Owls immediately to the District Environmental Administrator or Construction Environmental Coordinator and the Engineer.

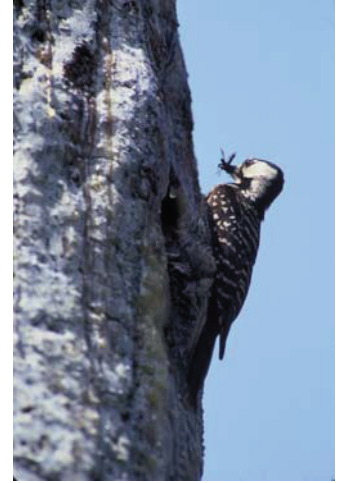
If a Florida Burrowing Owl is found nesting within 1000 feet of the project limits, cease all work in the area until FDOT has coordinated with the Florida Fish and Wildlife Conservation Commission (FWC). Take cautionary measures to guard against accidental destruction of the nest. Do not plug the burrow entrance or cause the burrow to collapse, as this would effectively destroy the nest, and requires a permit.

Red-Cockaded Woodpecker

Stop work if live Red-Cockaded Woodpeckers (*Picoides borealis*) are found in the work area. Work may resume after the bird or birds are allowed to leave the area of their own volition.

Report live sightings of Red-Cockaded Woodpeckers immediately to the District Environmental Administrator or Construction Environmental Coordinator and the Engineer.

If a Red-Cockaded Woodpecker is found nesting within 1000 feet of the project limits, cease all work in the area until FDOT has coordinated with USFWS.

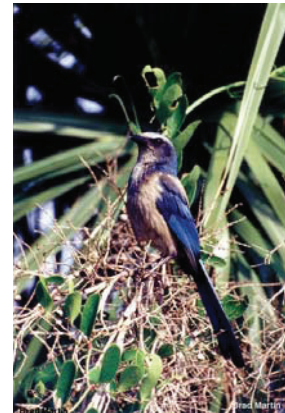


Florida Scrub Jay

Stop work if live Florida Scrub Jays (*Aphelocoma coerulescens*) are found in the work area. Work may resume after the bird or birds are allowed to leave the area of their own volition.

Report live sightings of Florida Scrub Jays immediately to the District Environmental Administrator or Construction Environmental Coordinator and the Engineer .

If a Florida Scrub Jay is found nesting within 1000 feet of the project limits, cease all work in the area until FDOT has coordinated with USFWS.



Everglade Snail Kite

Stop work if live Everglade Snail Kites (*Rostrhamus sociabilis plumbeus*) are found in the work area. Work may resume after the bird or birds are allowed to leave the area of their own volition.

Report live sightings of Everglade Snail Kite immediately to the District Environmental Administrator or Construction Environmental Coordinator and the Engineer.

If an Everglade Snail Kite is found nesting within 1000 feet of the project limits, cease all work in the area until FDOT has coordinated with USFWS.



Woodstork

Stop work if live Woodstorks (*Mycteria americana*) are found in the work area. Work may resume after the bird or birds are allowed to leave the area of their own volition.

Report live sightings of Woodstorks immediately to the District Environmental Administrator or Construction Environmental Coordinator and the Engineer.

If a Woodstork is found nesting within 1000 feet of the project limits, cease all work in the area until FDOT has coordinated with USFWS.



Gopher Tortoise

Stop work if live Gopher Tortoises (*Gopherus polyphemus*) are found in the work area. Work may resume after the Gopher Tortoises are allowed to leave the area of their own volition.

Report live sightings of Gopher Tortoises immediately to the District Environmental Administrator or Construction Environmental Coordinator and the Engineer.

If a Gopher Tortoise or burrow is found within an area of construction then the area must have staked silt fence partially encircling the burrow. The silt fence must be 25 feet from the apron of the burrow, and the half-radius configuration must prevent the occupant from entering the construction site, yet allow the tortoise to have access to the surrounding natural areas. Do not plug the burrow entrance or cause the burrow to collapse, as this would effectively destroy the burrow, and requires a permit.



Eastern Indigo Snake

If live Eastern Indigo Snakes (*Drymarchon corais couperi*) are found in the work area, stop all work. Work may resume after the snake or snakes are allowed to leave the area of their own volition.

Report live sightings of Eastern Indigo Snakes to the District Environmental Administrator or Construction Environmental Coordinator and the Engineer.

If a dead Eastern Indigo Snake is found on the project site, freeze the dead snake as soon as possible and immediately notify the District Environmental Administrator or Construction Environmental Coordinator and Construction Project Manager.



West Indian Manatee

If a manatee(s) (*Trichechus manatus*) is/are seen within 300 feet of the active daily construction/dredging operation or vessel movement, implement all appropriate precautions to ensure protection of the manatee. These precautions include:

- (a) Do not operate moving equipment closer than 300 feet of a manatee.
- (b) Shutdown the operation of any equipment closer than 300 feet to a manatee.
- (c) Siltation or turbidity barriers shall be made of material in which manatees cannot become entangled, are properly secured, and are regularly monitored to avoid manatee entrapment. Barriers must not block manatee entry to or exit from essential habitat.
- (d) All vehicles associated with the construction project shall operate at “no wake/idle” speeds at all times while in the construction area and while in water where the draft of the vessel provides less than a four foot clearance from the bottom. All vessels will follow routes of deep water whenever possible.
- (e) Do not resume activities until the manatee(s) have departed the project area of its own volition. Reporting of Manatee activity, and injury to listed species is required:
 - (a) Post Manatee Hotline number at on-site telephones to be used for information or help in dealing with manatee problems.
 - (b) Keep a log detailing sightings, collisions or other contact with Manatees as events occur during construction. When work is completed, forward this data to Florida Department of Environmental Protection, Marine Research Institute, Office of Protected Species Research, 100 Eighth Ave., S.E., St. Petersburg, FL 33701-5095.
 - (c) Immediately report any collision with and/or injury to a manatee to the “Manatee Hotline” at 1-888-404-FWCC (1-888-404-3922) and to the U.S. Fish and Wildlife Service Vero Beach office.



Post identification posters for easy recognition of listed species.

- (a) Post, temporary signs concerning manatees prior to and during all construction/dredging activities. Remove the signs upon completion of the project. Post a sign measuring at least 3 feet by 4 feet which reads Caution: Manatee Area in a location prominently visible to water-related construction crews.
- (b) If vessels are associated with the construction, Post a second sign so that it is visible to the vessel operator. The second sign should be at least 8 ½ inches by 11 inches and read: Caution: Manatee Habitat. Idle speed is required if operating a vessel in the construction area. Specific warning sign and design placement is a condition of the Water Management District.

Small Toothed Sawfish

If a small toothed sawfish (*Pristis pectinata*) is seen within 300 feet of the active daily construction/dredging operation or vessel movement, implement all appropriate precautions to ensure protection of the small toothed sawfish.



These precautions include:

- (a) do not operate moving equipment closer than 50 feet of a small toothed sawfish.
- (b) Shutdown the operation of any equipment closer than 50 feet to a small toothed sawfish.
- (c) Siltation or turbidity barriers shall be made of material in which small toothed sawfish cannot become entangled, are properly secured, and are regularly monitored to avoid small toothed sawfish entrapment. Barriers must not block small toothed sawfish entry to or exit from essential habitat.

- (d) All vehicles associated with the construction project shall operate at “no wake/idle” speeds at all times while in the construction area and while in water where the draft of the vessel provides less than a four foot clearance from the bottom. All vessels will follow routes of deep water whenever possible.
- (e) Do not resume activities until the small toothed sawfish have departed the project area of its own volition.

Reporting of small tooth sawfish activity, or injury to listed species is required:

- (a) USFWS (1-561-562-3909), National Marine Fisheries Service at (727) 570-5344 numbers will be available at on-site telephones to be used for information or help in dealing with small tooth sawfish problems.
- (b) Keep a log detailing sightings, collisions or other contact with small tooth sawfish as events occur during construction. Forward this information to the nearest regional U.S. Fish and Wildlife Service.
- (c) Report any collision and/or injury to a small toothed sawfish to the U.S. Fish and Wildlife Service in Vero Beach (1-561-562-3909) in southern Florida, and National Marine Fisheries Service at (727) 570-5344

Post identification posters for easy recognition of listed species.

- (a) Post, temporary signs concerning small tooth sawfish prior to, and during all construction/dredging activities. Remove the signs upon completion of the project.
- (b) If vessels are associated with the construction, post a second sign so that it is visible to the vessel operator. The second sign should be at least 8 ½ inches by 11 inches and read: Caution: small tooth sawfish. Idle speed is required if operating a vessel in the construction area. Specific warning sign and design placement is a condition of the Water Management District.

Sea Turtle Species

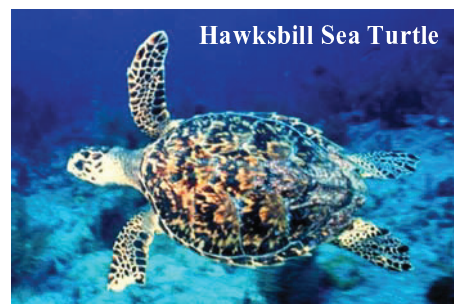
If marine turtles {including Green Sea Turtles (*Chelonia mydas*), Hawksbill Sea Turtles (*Eretmochelys imbricata*), Kemp’s Ridley Sea Turtles (*Lepidochelys kempii*), Leatherback Sea Turtles (*Demochelys coriacea*), and Loggerhead Sea Turtles (*Caretta caretta*)} are seen within 300 feet of the active daily construction/dredging operation or vessel movement, implement all appropriate precautions to ensure protection of the marine turtles.

These precautions include:

- (a) do not operate moving equipment closer than 50 feet of a marine turtle.
- (b) Shutdown the operation of any equipment closer than 50 feet to a marine turtle.
- (c) Siltation or turbidity barriers shall be made of material in which seaturtles cannot become entangled, are properly secured, and are regularly monitored to avoid small toothed sawfish entrapment. Barriers must not block seaturtle entry to or exit from essential habitat.

- (d) All vehicles associated with the construction project shall operate at “no wake/idle” speeds at all times while in the construction area and while in water where the draft of the vessel provides less than a four foot clearance from the bottom. All vessels will follow routes of deep water whenever possible.

- (e) Do not resume activities until the marine turtles have departed the project area of its own volition.

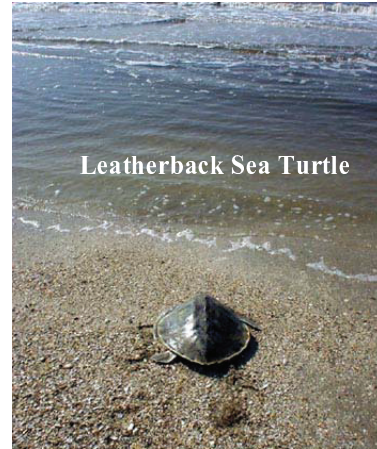


Reporting of marine turtles, and injury to listed species is required:

- (a) Post Hotline number at on-site telephones to be used for information or help in dealing with marine turtle problems.
- (b) Keep a log detailing sightings, collisions or other contact with marine turtles as events occur during construction. When work is completed, forward this data to the nearest U.S. Fish and Wildlife Service regional office.
- (c) Report any collision and/or injury to marine turtles to the U.S. Fish and Wildlife Service in Vero Beach (1-561-562-3909) in southern Florida, and National Marine Fisheries Service at (727) 570-5344

Post identification posters for easy recognition of listed species.

- (a) Post, temporary signs concerning marine turtles prior to and during all construction/dredging activities. Remove the signs upon completion of the project. Post a sign measuring at least 3 feet by 4 feet which reads "Caution: Marine Turtles" in a location prominently visible to water-related construction crews.
- (b) If vessels are associated with the construction, post a second sign so that it is visible to the vessel operator. The second sign should be at least 8 ½ inches by 11 inches and read: "Caution: Marine Turtle Habitat". Idle speed is required if operating a vessel in the construction area. Specific warning sign and design placement is a condition of the Water Management District.



Shortnose and Gulf Sturgeon

If a Shortnose sturgeon (*Acipenser brevirostrum*) or a Gulf sturgeon (*A. oxyrinchus desotoi*) is seen within 300 feet of active construction/dredging operation or vessel movement, implement all appropriate precautions to ensure protection of the sturgeon.



These precautions include:

- (a) Use curtains of appropriate dimension to restrict the animal's access to the work area. Pollution booms or turbidity curtains should use tangle resistant or hemp rope when anchoring, or employ surface anchors to prevent entangling sturgeon.



- (b) Maintain continuous surveillance in order to free animals which may become trapped in silt or turbidity barrier.

- (c) Post signs on site warning of the presence of sturgeon, of their endangered status, and precautions needed.



(d) Take care in lowering equipment or material below the water surface and into the stream bed to ensure no harm occurs to any sturgeon which may have entered the construction area undetected.

(e) Following completion of the project, prepare a report summarizing any involvement with sturgeon for NMFS and/or USFWS.

Florida Panther

Stop work if a live Florida panther (*Puma concolor coryi*) is found in the work area. Work may resume after the panther is allowed to leave the area of their own volition.

Report live sightings of the Florida panther immediately to the District Environmental Administrator or Construction Environmental Coordinator and the Engineer.

If a dead panther is observed within the project site or if any collision with and/or injury to a panther occurs they shall be reported within two hours to the FWC through their wildlife alert line (888-404-3922). Immediately notify the District Environmental Administrator or Construction Environmental Coordinator and the Engineer.



Florida Black Bear

Stop work if a live Florida black bear (*Ursus americanus floridanus*) is found in the work area. Work may resume after the bear (s) are allowed to leave the area of their own volition.

Report live sightings of the Florida black bear to the District Environmental Administrator or Construction Environmental Coordinator and the Engineer.

If a dead black bear is observed within the project site or if any collision with and/or injury to a black bear occurs they shall be reported within two hours to the FWC through their wildlife alert line (888-404-3922). Immediately notify the District Environmental Administrator or Construction Environmental Coordinator and the Engineer.



Florida Sandhill Crane



Stop work if a live Florida sandhill crane (*Grus canadensis pratensis*) is found in the work area. Work may resume after the sandhill crane(s) are allowed to leave the area of their own volition.

Report live sightings of Florida Sandhill Cranes immediately to the District Environmental Administrator or Construction Environmental Coordinator and the Engineer.

If an active nest is found within 400 feet of the project limits, cease all work in the area until FDOT has coordinated with the FWC. Immediately notify the District Environmental Administrator or Construction Environmental Coordinator and the Engineer.

Sherman's Fox Squirrel and Big Cypress Fox Squirrel

Stop work if a live Sherman's Fox Squirrel (*Sciurus niger shermani*) or a Big Cypress Fox Squirrel (*Sciurus niger avicennia*) is found in the work area. Work may resume after the fox squirrel(s) are allowed to leave the area of their own volition.

No trees are to be removed that contain active nest(s) being utilized by fox squirrels. If any nests are found and deemed to be active, a buffer of 125 feet will be established around the nest tree(s) and no clearing shall occur within the buffer until the nest becomes inactive.



Sand Skink and Blue Tailed Mole Skink

Stop work if a live sand skink (*Neoseps reynoldsi*) or a live blue tailed mole skink (*Eumeces egregius lividus*) is found within the work area or adjacent to the work



area. Work may resume after the skink(s) are allowed to leave the area of their own volition.

Report live sightings of skinks immediately to the District Environmental Administrator or Construction Environmental Coordinator and the Engineer.



American Crocodile

Stop work if a live American crocodile (*Crocodylus actus*) is found within the work area or adjacent to the work area. Work may resume after the crocodile(s) are allowed to leave the area of their own volition.

Report live sightings of crocodiles immediately to the District Environmental Administrator or Construction Environmental Coordinator and the Engineer.



All photos not credited to Joanne Williams (www.joannewilliamsphoto.com) are public domain and provided by USFWS or NMFS