

NATURAL RESOURCES EVALUATION REPORT

Florida Department of Transportation

District 4

SR 5/US 1 at Aviation Boulevard Project Development and Environment Study

Limits of Project: SR 5/US 1 at Aviation Boulevard

Indian River County, Florida

Financial Management Number: 441693-1-22-02

ETDM Number: 14475

Date: April 24, 2024

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

Project Development & Environment (PD&E) Study

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Draft

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Florida Department of Transportation

District Four

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&

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TABLE OF CONTENTS

EXECUTIVE SUMMARY	ES-1
1.0 INTRODUCTION	1-1
1.1 PROJECT DESCRIPTION	1-1
1.2 PURPOSE & NEED	1-2
1.3 ALTERNATIVES ANALYSIS	1-5
1.4 ROADWAY TYPICAL SECTIONS	1-8
1.5 PREFERRED ALTERNATIVE.....	1-10
1.6 NATURAL RESOURCES EVALUATION	1-11
1.7 EXISTING ENVIRONMENTAL CONDITIONS.....	1-11
1.7.1 Methodology	1-11
1.7.2 Soils.....	1-12
1.7.3 Land Use and Cover Types	1-14
2.0 PROTECTED SPECIES AND HABITAT	2-1
2.1 AGENCY COORDINATION.....	2-1
2.2 METHODOLOGY.....	2-1
2.3 PROTECTED SPECIES EVALUATION	2-4
2.3.1 Federally Listed Species and Designated Critical Habitat	2-5
2.3.2 State Listed Species	2-11
2.3.3 Other Protected Species	2-13
2.4 EVALUATION OF ALTERNATIVES.....	2-15
2.4.1 Direct Impacts.....	2-15
2.4.2 Indirect, Secondary, and Cumulative Impacts	2-17
2.5 SPECIAL DESIGNATIONS AND CONSERVATION LANDS	2-18
3.0 WETLANDS AND SURFACE WATERS.....	3-1
3.1 AGENCY COORDINATION.....	3-1
3.2 METHODOLOGY.....	3-1
3.3 AVOIDANCE AND MINIMIZATION	3-2
3.4 RESULTS	3-2
3.5 EVALUATION OF ALTERNATIVES.....	3-2
3.5.1 Direct Impacts.....	3-2
3.5.2 Indirect, Secondary, and Cumulative Impacts	3-5
3.6 WETLAND IMPACT MITIGATION	3-5

4.0	ANTICIPATED PERMITS	4-1
4.1	SECTION 404 DREDGE AND FILL PERMIT	4-1
4.2	ERP.....	4-1
4.3	NPDES.....	4-2
5.0	CONCLUSIONS.....	5-1
5.1	PROTECTED SPECIES AND CRITICAL HABITAT	5-1
5.2	WETLANDS AND SURFACE WATERS.....	5-3
5.3	IMPLEMENTATION MEASURES.....	5-3
5.4	COMMITMENTS.....	5-4
5.5	AGENCY COORDINATION.....	5-4
6.0	REFERENCES.....	6-1

LIST OF FIGURES

Figure 1-1	Project Location Map	1-2
Figure 1-2	Existing Typical Section 1 – SR 5/US 1	1-8
Figure 1-3	Existing Typical Section 2 – SR 5/US 1	1-9
Figure 1-4	Existing Typical Section – Aviation Boulevard	1-9
Figure 1-5	NRCS Soils	1-13
Figure 1-6	Land Use Map	1-15
Figure 2-1	Species Occurrence Map.....	2-3
Figure 3-1	Surface Waters (Preferred Alternative).....	3-4

LIST OF TABLES

Table ES-1	Effect Determination for Federally Listed Plant and Wildlife Species...	ES-2
Table ES-2	Effect Determination for State Listed Wildlife Species	ES-3
Table ES-3	Potential Surface Water Impacts Associated with Preferred Alternative	ES-4
Table 1-1	Existing NRCS Soil Types within the Project Study Area.....	1-12
Table 1-2	Existing Land Use/Land Cover (FLUCFCS) within the Project Study Area	1-14
Table 2-1	Potentially Occurring and Observed Listed Species	2-6
Table 2-2	Potential Land Use/Land Cover Impacts Associated with Alternatives	2-16
Table 3-1	Potential Surface Water Impacts Associated with the Build Alternatives	3-3
Table 3-2	Potential Surface Water Impacts Associated with Preferred Alternative.....	3-5

APPENDICES

Appendix A	NRCS Soils Descriptions
Appendix B	FLUCFCS Descriptions
Appendix C	USFWS Standard Protection Measures for the Eastern Indigo Snake
Appendix D	USFWS Programmatic Effect Determination Key for the Eastern Indigo Snake (South Florida)
Appendix E	USFWS Effect Determination Key for the Wood Stork in South Peninsular Florida
Appendix F	Standard Manatee Conditions for In-Water Work
Appendix G	USACE Effect Determination Key for the Manatee in Florida
Appendix H	Representative Photographs
Appendix I	UMAM Datasheets

ACRONYMS AND ABBREVIATIONS

AADT – Annual Average Daily Traffic
BGEPA – Bald and Golden Eagle Protection Act
BMP – Best Management Practices
CA – Consultation Area
CFA – Core Foraging Area
CFR – Code of Federal Registration
CH – Critical Habitat
ECOS – Environmental Conservation Online System
EFH – Essential Fish Habitat
EPA – U.S. Environmental Protection Agency
ERP – Environmental Resource Permit
ESA – Endangered Species Act
ESRI – Environmental Systems Research Institute, Inc.
EST – Environmental Screening Tool
ETAT – Environmental Technical Advisory Team
ETDM – Efficient Transportation Decision Making
FAA – Federal Aviation Administration
FAC – Florida Administrative Code
FDACS – Florida Department of Agricultural and Consumer Services
FDEP – Florida Department of Environmental Protection
FDOT – Florida Department of Transportation
FEC – Florida East Coast
FHWA – Federal Highway Administration
FLUCFCS – Florida Land Use, Cover and Forms Classification System
FNAI – Florida Natural Areas Inventory
FNPS – Florida Native Plant Society
FS – Florida Statute
FSHSP – Florida Strategic Highway Safety Plan
FWC – Florida Fish and Wildlife Conservation Commission
FWF – Florida Wildflower Foundation
GIS – Geographic Information Systems

ICE – Intersection Control Evaluation
IPaC – Information for Planning and Consultation
IRFWCD – Indian River Farms Water Control District
LOS – Level of Service
LRTP – Long Range Transportation Plan
MBTA – Migratory Bird Treaty Act
MPO – Metropolitan Planning Organization
MUID – Map Unit Identified
NMFS – National Marine Fisheries Service
NOAA – National Oceanic and Atmospheric Administration
NPDES – National Pollutant Discharge Elimination System
NRCS – Natural Resources Conservation Service
NRE – Natural Resources Evaluation
NWI – National Wetlands Inventory
NWP – Nationwide Permit
OEM – Office of Environment Management
OSW – Other Surface Water
PD&E – Project Development and Environment
PE – Preliminary Engineering
RPZ – Runway Protection Zone
SFH – Suitable Foraging Habitat
SHCA – Strategic Habitat Conservation Areas
SIS – Strategic Intermodal System
SJRWMD – Saint Johns Water Management District
SR – State Road
SSC – Species of Special Concern
STIP – State Transportation Improvement Program
SW – Surface Water
TCRPM – Treasure Coast Regional Planning Model
TDP – Transit Development Plan
TIP – Transportation Improvement Program
UMAM – Uniform Mitigation Assessment Methodology
USACE – U.S. Army Corps of Engineers

USC – U.S. Code

USDA – U.S. Department of Agricultural

USFWS – U.S. Fish and Wildlife Service

EXECUTIVE SUMMARY

The FDOT, District Four, is conducting a PD&E Study for SR 5/US 1 and Aviation Boulevard in Vero Beach, Indian River County, Florida.

The primary purpose of the project is to evaluate intersection improvement solutions to address existing and projected traffic demands, improve safety, support economic growth, and enhance modal interrelationships with rail, bicycle, and pedestrian modes.

The project proposes operational and capacity improvements to the intersection of SR 5/US 1 and Aviation Boulevard/32nd Street. Various alternatives were considered during the PD&E study, which include grade-separated crossings over the FEC Railroad. Additional features were considered such as multi-modal improvements. To account for potential grade separation and other solutions that address the purpose and need, the north-south limits of the PD&E study extend beyond the intersection along US 1 between 21st Street and 41st Street (approximately 2 miles). The west limits extend along Aviation Boulevard between 27th Avenue and SR 5/US 1 (approximately 1 mile). The east limits include the area east of SR 5/US 1 to 13th Avenue.

This NRE has been prepared as part of this PD&E Study. The NRE evaluates the Preferred Alternative's involvement with wetlands, surface waters, protected species, and their habitats, in addition to EFH.

The project study area was evaluated for CH as defined by Congress 50 CFR Chapter IV, Subchapter A, Part 424. The project area falls within USFWS-designated CH for the West Indian manatee (*Trichechus manatus latirostris*). The proposed project will not result in the destruction or adverse modification of CH, and appropriate compensatory mitigation will be provided to offset impacts to wetlands and surface waters within the CH.

Based on literature and field reviews, thirty-two (32) species of protected plants and animals are known to occur in Indian River County. Twenty-one (21) of the species are federally listed as endangered or threatened. Eleven (11) species are state listed as endangered or threatened. One (1) species is not listed as endangered or threatened but is still managed and protected, which includes the bald eagle (*Haliaeetus leucocephalus*). Additionally, multiple species of state protected bats are known to occur within the project study area. Effect determinations were made for each wildlife and plant species after evaluating the habitat requirements for each species, the types of habitats present within the project study area, and habitats that would be impacted by the Build Alternatives.

Effect determinations for federally listed plant and wildlife species are presented in **Table ES-1**.

Table ES-1 Effect Determination for Federally Listed Plant and Wildlife Species

Scientific Name	Common Name	USFWS Designation	Effect Determination
Plants			
<i>Harrisia fragrans</i>	Fragrant prickly-apple	E	No Effect
<i>Dicerandra immaculata</i>	Lakela's mint	E	No Effect
Insects			
<i>Cyclargus thomasi bethunebakeri</i>	Miami blue butterfly	E	No Effect
Reptiles			
<i>Caretta caretta</i>	Loggerhead sea turtle	T	No Effect
<i>Chelonia mydas</i>	Green sea turtle	T	No Effect
<i>Dermochelys coriacea</i>	Leatherback sea turtle	E	No Effect
<i>Drymarchon couperi</i>	Eastern indigo snake	T	MANLAA
<i>Eretmochelys imbricata</i>	Hawksbill sea turtle	E	No Effect
<i>Nerodia clarkia taeniata</i>	Atlantic salt marsh snake	T	No Effect
Birds			
<i>Aphelocoma coerulescens</i>	Florida scrub-jay	T	No Effect
<i>Calidris canutus rufa</i>	Red knot	T	No Effect
<i>Caracara plancus audubonii</i>	Audubon's crested caracara	T	No Effect
<i>Charadrius melodus</i>	Piping plover	T	No Effect
<i>Laterallus jamaicensis ssp. jamaicensis</i>	Eastern black rail	T	No Effect
<i>Mycteria americana</i>	Wood stork	T	MANLAA
<i>Sterna dougallii</i>	Roseate tern	T	No Effect
Mammals			
<i>Eumops floridanus</i>	Florida bonneted bat	E	No Effect
<i>Peromyscus polionotus niveiventris</i>	Southern beach mouse	T	No Effect
<i>Puma concolor coryi</i>	Florida panther	E	No Effect
<i>Trichechus manatus latirostris</i>	West Indian manatee	T	MANLAA

Key:

T = Threatened

E = Endangered

MANLAA = May affect, not likely to adversely affect

EXECUTIVE SUMMARY

Effect determinations for state listed plant and wildlife species are presented in **Table ES-2**.

Table ES-2 Effect Determination for State Listed Wildlife Species

Scientific Name	Common Name	FWC Designation	Effect Determination
Reptiles			
<i>Gopherus polyphemus</i>	Gopher tortoise	T	No Adverse Effect Anticipated
Birds			
<i>Antigone canadensis pratensis</i>	Florida sandhill crane	T	No Adverse Effect Anticipated
<i>Athene cunicularia floridana</i>	Florida burrowing owl	T	No Adverse Effect Anticipated
<i>Charadrius nivosus</i>	Snowy plover	T	No Effect Anticipated
<i>Egretta caerulea</i>	Little blue heron	T	No Adverse Effect Anticipated
<i>Egretta rufescens</i>	Reddish egret	T	No Adverse Effect Anticipated
<i>Egretta tricolor</i>	Tricolored heron	T	No Adverse Effect Anticipated
<i>Falco sparverius paulus</i>	Southeastern American kestrel	T	No Adverse Effect Anticipated
<i>Platalea ajaja</i>	Roseate spoonbill	T	No Adverse Effect Anticipated
<i>Rynchops niger</i>	Black skimmer	T	No Effect Anticipated
<i>Sternula antillarum</i>	Least tern	T	No Effect Anticipated

Key:

T = Threatened

Five SW and OSW features, identified as SW-1 (Main Canal), OSW-1, OSW-2, OSW-3, and OSW-4, are present within the project study area. The SW is classified as FLUCFCS 5100: streams and waterways (USFWS: PEM1Hx [Palustrine, Emergent, Persistent, Permanently Flooded, Excavated]) and the OSWs are classified as FLUCFCS 5300: reservoirs (USFWS: PSS1Cx [Palustrine, Scrub-Shrub, Broad-Leaved Deciduous, Excavated]).

Impacts are only anticipated for SW-1 and OSW-1 for all the Build Alternatives.

Build Alternative 1 will result in direct impacts to 0.11 acres of SW-1 (Main Canal) and 0.11 acres of OSW-1 totaling 0.22 acres of fill/shade impacts. Build Alternative 2 will result

in direct impacts to 0.08 acres of SW-1 and 0.05 acres to OSW-1 totaling 0.13 acres of permanent fill. Build Alternative 7 will result in direct impacts to 0.10 acres of SW-1 and 0.03 acres to OSW-1 totaling 0.13 acres of permanent fill. Build Alternative 8 will result in direct impacts to 0.11 acres of SW-1 and 0.05 acres to OSW-1 totaling 0.16 acres of permanent fill.

Build Alternative 1 was determined to be the Preferred Alternative. Surface water impacts (SW-1) for the Preferred Alternative total 0.11 acres of streams and waterways, which equates to a total functional loss of 0.06 palustrine herbaceous units. Shade impacts are not considered since this area for surface waters consists of non-vegetated bottom. Other surface water (OSW-1) impacts for the Preferred Alternative total 0.11 acres. Mitigation is not required for impacts to OSW since these areas were permitted as part of the stormwater management plan for the area and are thus non-jurisdictional. Functional loss for project impacts was calculated using the Uniform Mitigation Assessment Methodology (UMAM). A summary of impacts requiring mitigation for the Preferred Alternative is provided in **Table ES-3**.

Table ES-3 Potential Surface Water Impacts Associated with Preferred Alternative

FLUCFCS / ID	USFWS Classification	Preferred Alternative			
		Impact Type	Impact Acreage	UMAM Score	Functional Loss
Surface Waters					
5100 / SW-1	PEM1Hx	Fill	0.11	0.50	0.06
Other Surface Waters					
5300 / OSW-1	PSS1Cx	Fill	0.11	-	-
Total			0.22		0.06

Wetland impacts which will result from the construction of this project will be mitigated pursuant to Section 373.4137, Florida Statutes (FS), to satisfy all mitigation requirements of Part IV of Chapter 373, FS and 33 U.S. Code (USC) 1344. The use of a mitigation bank to offset adverse impacts resulting from a project is the preferred mitigation option. The project must fall within the service area of an approved mitigation bank. The project study area is located within the service areas of CGW Mitigation Bank and Basin 22 Mitigation Bank (FKA Corrigan Ranch). The project is located within the Central Indian River Lagoon basin. It is anticipated that mitigation may be required by the agencies. Mitigation credits could be purchased from one of the aforementioned permitted wetland mitigation banks. Following desktop research, Basin 22 Mitigation Bank has a sufficient number of palustrine credits to mitigate the proposed impacts appropriately. CGW Mitigation Bank has only estuarine credits available.

EXECUTIVE SUMMARY

In accordance with the Magnuson-Stevens Fishery Conservation and Management Act of 1996 (50 CFR Section 600.920), as amended through January 12, 2007, and as administered by the NOAA NMFS, federal agencies must consult with NMFS regarding any of their actions authorized, funded, or undertaken, or proposed to be authorized, funded, or undertaken that may adversely affect EFH. As stated in the PD&E Manual, NMFS has designated FDOT to conduct EFH consultations in Florida pursuant to 50 CFR § 600.920(c) and outlined in a July 19, 2000, letter to FHWA and FDOT. No EFH exists within the project study area, therefore the proposed project will have **no involvement** with EFH, and an EFH analysis was not required.

1.0 INTRODUCTION

1.1 Project Description

The project intersection of SR 5/US 1 and Aviation Boulevard is located within the urbanized area of the City of Vero Beach in Indian River County, Florida. This is a 4-legged, signalized intersection that accommodates the FEC Railroad crossing on the eastbound approach. The FEC Railroad, which is part of the SIS Railroad Corridor, includes double-tracks running north-south parallel to SR 5/US 1 on the west side. Pedestrian crosswalks are provided on the northbound and westbound approaches of the intersection. There are no dedicated bicycle facilities. Nearby landmarks include Vero Beach Regional Airport, Cleveland Clinic Indian River Hospital and Indian River Medical Center, and downtown Vero Beach. The intersection is near an RPZ of the Vero Beach Regional Airport.

The project proposes operational and capacity improvements to the intersection of SR 5/US 1 and Aviation Boulevard/32nd Street. Various alternatives were considered during the PD&E study, which include grade-separated crossings over the FEC Railroad. Additional features were considered such as multi-modal improvements. To account for potential grade separation and other solutions that address the purpose and need, the north-south limits of the PD&E study extend beyond the intersection along US 1 between 21st Street and 41st Street (approximately 2 miles). The west limits extend along Aviation Boulevard between 27th Avenue and SR 5/US 1 (approximately 1 mile). The east limits include the area east of SR 5/US 1 to 13th Avenue. The project limits are shown in **Figure 1-1**.

SR 5/US 1 constitutes the north and south approaches of the intersection, as a four-lane divided facility with a painted center turn-lane, curb and gutter on both sides, and a sidewalk on the east side. SR 5/US 1 has a functional classification of Urban Principal Arterial Other and a context classification of C4 Urban General since there are mostly non-residential land uses along the corridor with residential neighborhood connections. Indian River County has designated SR 5/US 1 corridor as a hurricane evacuation route.

At the eastbound approach of the intersection, Aviation Boulevard crosses the FEC Railroad. This is a 2-lane undivided roadway with no pedestrian facilities. Aviation Boulevard has a functional classification of Urban Minor Arterial and a context classification of C3 Commercial due to the non-residential land uses. The westbound approach is served by 32nd Street as a local 2-lane undivided street serving limited commercial and residential properties.

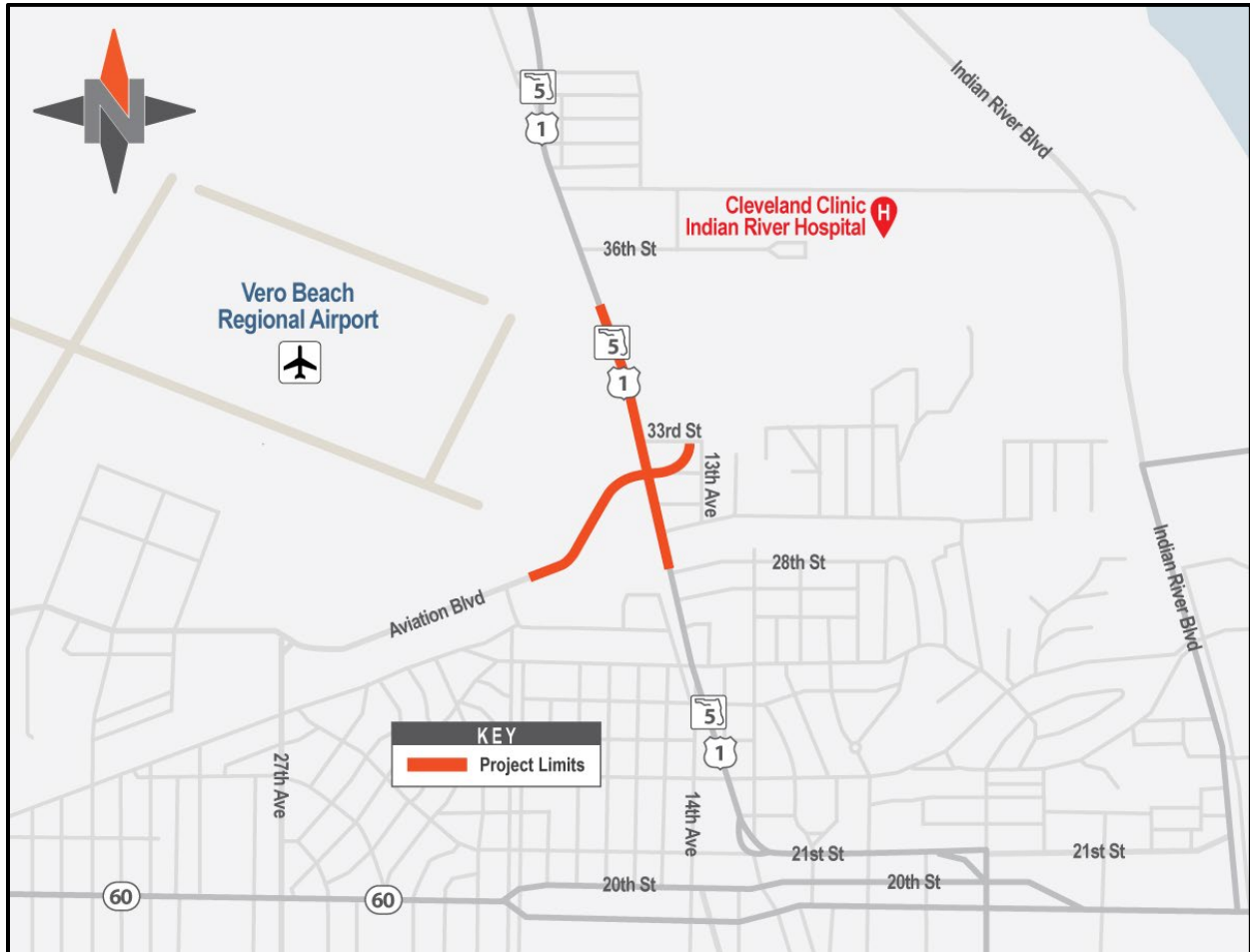


Figure 1-1 Project Location Map

1.2 Purpose & Need

Purpose

The primary purpose of the project is to evaluate intersection improvement solutions to address existing and projected traffic demands, improve safety, support economic growth, and enhance modal interrelationships with rail, bicycle, and pedestrian modes.

Need

Project Status

The project is listed in the Indian River MPOs 2045 LRTP Cost Feasible Plan Projects as project ID 2 with as a “New Interchange” with an implementation timeframe between 2036 to 2045. This project is also listed as Priority Project #6 in the MPOs 2021/2022 Priority Projects Report. The project is programmed for funding for PE phase in the TIP and the

STIP. The project is planned for funding for the right-of-way and construction phases according to the 2045 LRTP.

Traffic Demand and Capacity

According to the Indian River County MPO 2021 Priority Projects Report, the intersection is currently failing or nearly failing during peak periods and in peak directions.

As part of this PD&E study, FDOT District 4 developed, under a separate study, the Traffic Forecasting Memorandum - SR 5/US 1 at Aviation Boulevard PD&E Support, dated November 2, 2021. The ETDM traffic forecasting section is updated as follows.

The SR 5/US 1 at Aviation Boulevard intersection operates in the year 2021 at LOS C/D in the AM/PM peak periods. With the eastbound and westbound approaches operating at LOS E or F for both periods, with the eastbound queue length exceeding the available storage.

The future No-Build (without improvements) condition shows the 2045 traffic demand increasing due to population and employment growth as well as planned capacity improvements in the immediate network; therefore, conditions are expected to degrade at this intersection without improvements.

According to the analysis forecast developed from the TCRPM, the AADT is projected to increase 61% between the years 2021 and 2045. Along SR 5/US 1 south of Aviation Boulevard, No-Build traffic volumes are projected to increase from 26,500 to 42,600 AADT for the analysis years 2021 and 2045, respectively. To the north of Aviation Boulevard, SR 5/US 1 traffic volumes will increase from 34,200 to 55,000 AADT. Along Aviation Boulevard, the increase is from 12,000 to 19,300 AADT.

The SR 5/US 1 at Aviation Boulevard intersection operation will degrade to LOS F in the year 2045 for the No-Build condition with delay reaching 135/156 seconds per vehicle for the AM/PM peak periods. With the eastbound and westbound approach LOS F reaching delays ranging from 206/135 seconds of delay per vehicle, with the eastbound queue length exceeding the available storage by 169%.

The Aviation Boulevard extension project, which is a separate nearby project, has construction funds committed in the Fiscal Year 2023/2024 according to the Indian River County Capital Improvement Element adopted in December 2020. The project will replace the westbound approach of the intersection with a new road that extends Aviation Boulevard to the east from US 1 to 41st Street. According to the Indian River County MPO 2045 LRTP, other planned nearby capacity improvements include widening of Aviation

Boulevard from 2 to 4 lanes, from 27th Avenue to the subject intersection with SR 5/US1. These projects will increase the traffic demand at the subject intersection.

Safety

The 2021 FSHSP has identified intersections as an emphasis area while rail crossings are an evolving emphasis area. A historical crash evaluation of the intersection of SR 5/US 1 and Aviation Boulevard revealed a total of 54 crashes observed over a five-year period between 2016 and 2020. Approximately 23% of these crashes resulted in injuries. The majority of these crashes were rear end at approximately 42% followed by sideswipe at 26% and left turn crashes at 15%. These types of crashes may be correlated to congested conditions at the intersection. One crash involved an FEC Railroad train which was struck by a vehicle and resulted in injury. Two crashes involved the FEC Railroad crossing gate. The existing facility's safety performance crash rate was calculated at 0.92 which is significantly higher than the Statewide crash rate of 0.53 and the Districtwide crash rate of 0.34. This indicates a potential safety concern. The SR 5/US 1 corridor has been designated by Indian River County as an evacuation route.

Social Demands or Economic Development

According to the Indian River County MPO 2045 LRTP, the County's population is projected to grow 41% between the year 2015 to 2045 (143,326 population in 2015 to 201,839 in 2045). Similarly, the employment is projected to grow 24% (76,386 employed during 2015 to 94,626 in 2045).

The City of Vero Beach Comprehensive Plan (April 2018) shows existing undeveloped lands along SR 5/US 1 in the vicinity of the intersection with Aviation Boulevard. The Future Land Use map presents a transformation of this area with mixed-use development, commercial, mixed residential, and residential medium. This indicates potential land development growth in the immediate area of the project.

Based on the Indian River County Comprehensive Plan, the Indian River County/City of Vero Beach Enterprise Area includes an area from SR 5/US 1 as the eastern boundary, 43rd Avenue as the western boundary, 53rd Street as the northern boundary, and Atlantic Boulevard as the southern boundary. The Enterprise Area encourages economic growth and investment through tax incentives which may increase traffic demand in the area.

The Vero Beach Regional Airport Master Plan includes an Airport Commercial Village and proposes to increase daily passenger traffic and identifies aircraft storage. Moreover, the master plan forecasts an annual average growth rate for aircraft operations at 1.5% indicating an increase in air traffic to/from the airport.

Modal Interrelationships

The intersection of SR 5/US 1 and Aviation Boulevard currently serves numerous modes of transportation, including: vehicles, pedestrians (sidewalks and crosswalks), transit, and the FEC Railroad crossing at the eastbound approach of the intersection. Indian River County's transit system, GoLine, includes three bus routes along SR 5/US 1 and one route along Aviation Boulevard based on the 2021 transit system map. In addition, the Vero Beach Regional Airport is located directly northwest of the intersection with direct access along Aviation Boulevard.

The existing bicycle and pedestrian network are limited in the vicinity of the project. There are no bicycle lanes, and sidewalks are only present on the east side of SR 5/US 1. Guided by the 2015 Bicycle and Pedestrian Plan, the Indian River MPO 2045 LRTP proposes new sidewalks and bicycle facilities in conjunction with roadway improvement projects along Aviation Boulevard between SR 5/US 1 and 43rd Avenue which is the entire southern boundary of the Vero Beach Regional Airport. The plan also proposes a new bicycle facility along SR 5/US 1 north of Aviation Boulevard which supports a vision to have a bicycle facility along most SR 5/US 1 within the County.

The Indian River MPO 2045 LRTP, which is based on the Indian River County TDP, presents several transit needs in the immediate area of the intersection of SR 5/US 1 including a potential bus shelter at the intersection, new/modified route service along SR 5/US 1, and improved route operations along Aviation Boulevard.

The FEC Railroad, which is parallel and abutting west of SR 5/US 1, is part of the FDOT SIS. According to the Indian River MPO 2045 LRTP, a performance evaluation goal is to enhance the FDOT SIS by constructing a flyover at the FEC Railroad at the intersection of SR 5/US 1 and Aviation Boulevard (Objective 1.04, Policy 1.04.1, and Performance Indicator 1.041.1).

In 2016, the Vero Beach Regional Airport released their master plan that identified numerous needs such as an "Airport Commercial Village" along Aviation Boulevard which would function as a key commercial district. In addition, the plan describes improvements to Aviation Boulevard which is the gateway and primary access to the Airport.

1.3 Alternatives Analysis

Alternatives analysis is the process of developing, evaluating, and eliminating potential project alternatives based on the purpose and need of the project. The analysis focused on the intersection and approaches at SR 5/US 1 and Aviation Boulevard/32nd Street. The Indian River County MPO LRTP included a feasibility study into the PD&E study to consider grade separating the intersection over the railroad. The process also included a

separate RPZ alternatives analysis requested by the FAA to evaluate effects to Runway 30L operations and safety.

The alternatives analysis process included a screening of eight alternatives, elimination of four alternatives, and four alternatives considered for additional study. The ‘No-Build’ Alternative is defined as the alternative in which the proposed project improvements would not take place and is used as the baseline against which ‘Build’ Alternatives are evaluated. Local coordination with the public, Vero Beach Regional Airport, City of Vero Beach, Indian River County Public Works, and MPO occurred throughout the alternatives analysis process.

Alternatives Considered

No Build Alternative: This alternative does not implement improvements and maintains the existing conditions through the project with only periodic maintenance improvements.

Alternatives 1 through 6 represent the at-grade and grade separated alternatives. Alternatives 7 and 8 resulted from the ICE process.

Alternative 1 Conventional Intersection: This alternative reconstructs the intersection and adds turn lanes to all approaches and adds one westbound through lane on Aviation Boulevard to accept the dual left and right turns. The Main Canal bridge is replaced. The at-grade railroad crossing is improved.

Alternative 2 One-way Pair: This alternative splits SR 5/US 1 into a pair of roadways. The existing SR 5 serves southbound traffic, and a new two-lane roadway is located 600 feet to the east. The Main Canal bridge is replaced. The at-grade railroad crossing is improved.

Alternative 3 US-1 Overpass Alternative: This alternative elevates the four through lanes of SR 5/US 1 over Aviation Boulevard with ramps to provide for turning movements and local access. The Main Canal bridge is replaced. The at-grade railroad crossing is improved. The SR 5/US 1 overpass is outside of the RPZ and below the 40:1 flight surface.

Alternative 4 Aviation Boulevard Overpass (without railroad grade crossing): This alternative elevates Aviation Boulevard over SR 5/US 1 and eliminates the at-grade FEC railroad crossing and signalized intersection on SR 5/US 1. A new four-lane quadrant street connection provides for turning movements to/from the overpass. The overpass and approaches are within the RPZ and below the 40:1 flight surface. The Main Canal bridge is replaced.

Alternative 5 Aviation Boulevard Underpass (without railroad grade crossing): This alternative depresses Aviation Boulevard and eliminates the at-grade FEC railroad crossing and signalized intersection on SR 5/US 1. A new four-lane quadrant street connection provides for turning movements to/from the underpass. Two new bridge structures would

be required to carry the FEC railroad and SR 5/US 1 roadway over the underpass. This depressed, open-cut type roadway is within the RPZ. The Main Canal bridge is replaced.

Alternative 6 Aviation Boulevard Overpass (with railroad grade crossing): This alternative elevates Aviation Boulevard through lanes over the FEC railroad and SR 5/US 1 and retains an at grade railroad crossing for turning movements and the signalized intersection at SR 5/US 1. The Aviation Boulevard overpass embankment is within the RPZ and below the 40:1 flight surface with 17.8 ft of clearance between the bridge profile and flight surface. The Main Canal bridge is replaced.

Alternative 7 Displaced Left Turn (DLT): This alternative is at-grade with the northbound SR 5/US 1 left turn displaced or deflected to the west side of the SR 5/US 1 right of way via a signalized directional median and a two-lane, two-way parallel roadway located between southbound lanes of SR 5/US 1 and the FEC right of way. The Main Canal bridge is replaced.

Alternative 8 Median U-Turn with Roundabout: This alternative eliminates three of the four left turns and incorporates a roundabout and quadrant road to provide for the left turns on the northbound, westbound, and southbound approaches. The eastbound left turn remains in place. The Main Canal bridge is replaced. The at-grade railroad crossing is improved.

Alternatives Considered and Eliminated

The alternatives analysis process included several coordination meetings with the city, county, airport, FAA, FEC RR, and MPO. The FAA required a RPZ alternatives analysis that evaluated the PD&E alternatives and alternatives that modified the runway. The RPZ analysis concluded that at-grade PD&E alternatives were the best solution for aviation safety and operations. The FAA, airport, and city officials concurred with the findings of the RPZ alternatives analysis and supported only at-grade alternatives. A screening matrix compared the eight alternatives' operations, impacts and cost. The four at-grade alternatives scored best. Alternatives 3, 4, 5, and 6 were eliminated from further study.

Alternatives Considered for Further Evaluation

Alternatives 1, 2, 7, and 8, which are the at-grade alternatives were advanced into detailed PD&E analysis. A public alternatives workshop was held and further coordination with the city, county, airport, FAA, FEC RR, and MPO occurred. Alternative 1 scored the best, was supported by the city, county and public and became the Preferred Alternative.

1.4 Roadway Typical Sections

The SR 5/US 1 at Aviation Boulevard PD&E Study area includes SR 5/US 1 from 21st Street to 41st Street, and Aviation Boulevard from 27th Avenue to SR 5/US 1 and 32nd Street from SR 5/US 1 to 13th Avenue. The SR 5/US 1 existing typical section contains two (2) travel lanes in each direction with a center flush paved median for left turns and a concrete sidewalk along the east side. FEC railroad tracks run parallel to SR 5/US 1 along the west side. SR 5/US 1 Bridge #880085 over the Main Canal follows the same typical section as the roadway and includes two-foot shoulders on either side of the bridge. Most of the SR 5/US 1 corridor is flanked by curb and gutter and has a normal crown. The existing typical section (with normal crown) for SR 5/US 1 can be seen in **Figure 1-2**.

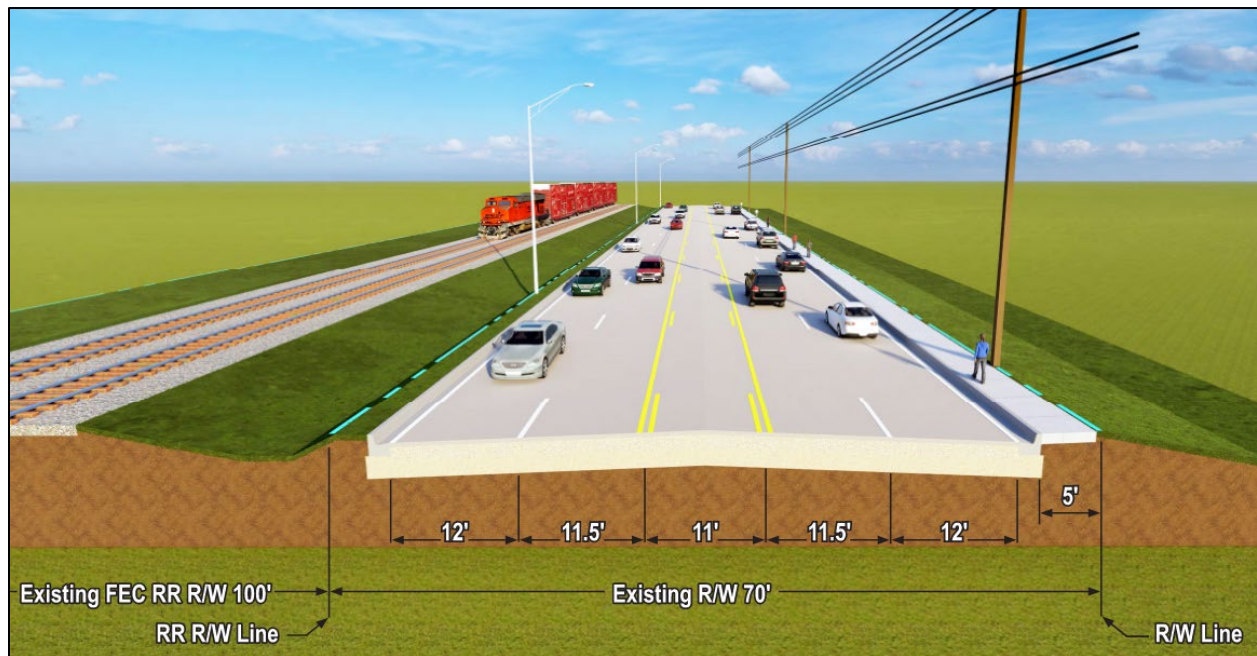


Figure 1-2 Existing Typical Section 1 – SR 5/US 1

Within the study limits, there is approximately 750 feet of SR 5/US 1 that doesn't have normal crown and is comprised of a cross slope that is sloped down towards the east curb and gutter. This mono-pitched section of SR 5/US 1 occurs at the intersection with Aviation Boulevard. The second existing typical section (with mono-pitch cross slope) for SR 5/US 1 can be seen in **Figure 1-3**.

SECTION 1 – INTRODUCTION

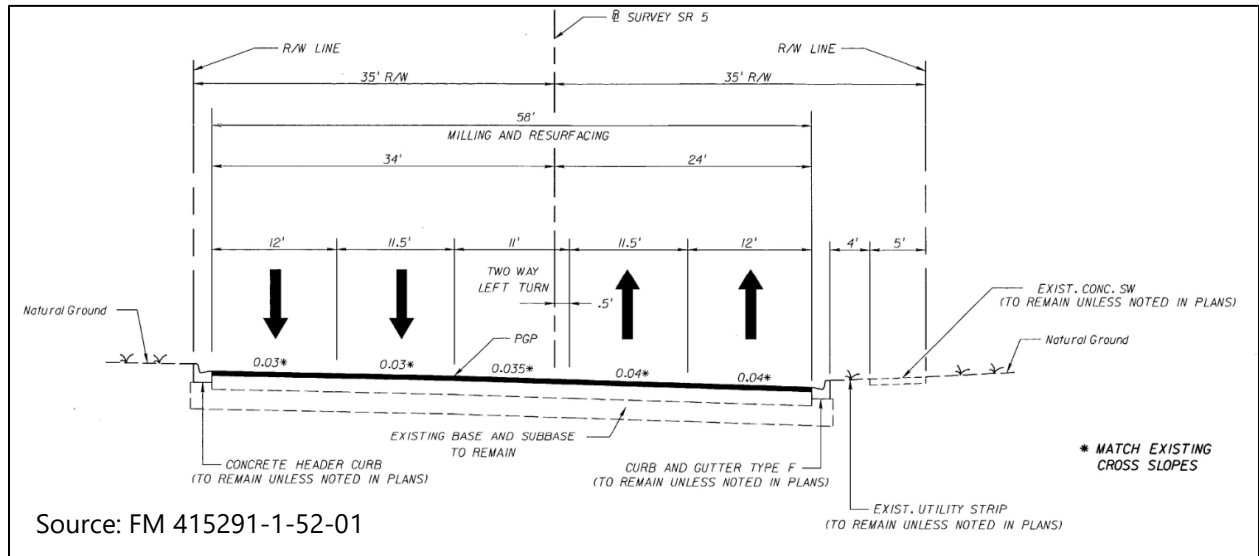


Figure 1-3 Existing Typical Section 2 – SR 5/US 1

Aviation Boulevard is an Indian River County maintained roadway with one (1) travel lane in each direction with curb and gutter from 27th Avenue to 27th Street and grass shoulders from 27th Street to SR 5/US 1. The county is currently evaluating extending Aviation Boulevard east from SR 5/US 1 to the Cleveland Clinic Hospital, which would reconstruct the existing 32nd Street. The proposed extension would connect the intersection of SR 5/US 1 at Aviation Boulevard directly to 37th Street, go along the west perimeter of the hospital campus and extend north of 37th Street to 41st Street. The existing typical section for Aviation Boulevard can be seen in **Figure 1-4**.

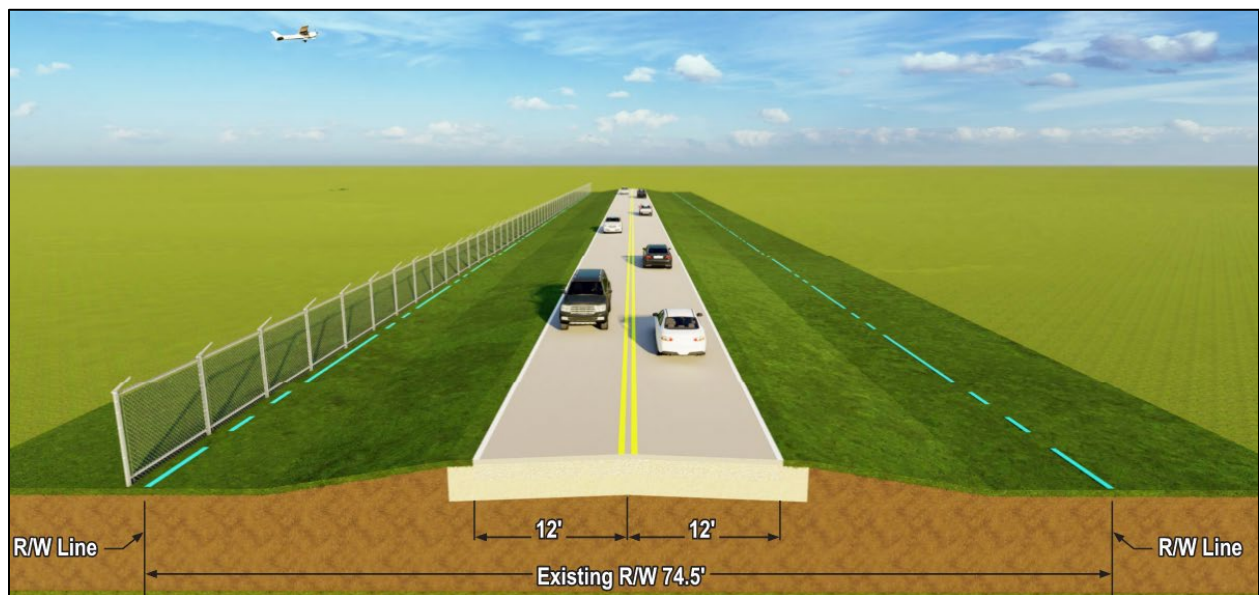


Figure 1-4 Existing Typical Section – Aviation Boulevard

1.5 Preferred Alternative

The Preferred Alternative was identified based on the results of the alternatives evaluation, public involvement, and coordination with local officials. No design exceptions or variations are anticipated with the Preferred Alternative.

The Preferred Alternative reconstructs SR 5/US 1 and Aviation Boulevard:

- Limits of Construction:
 - SR 5/US 1 limits begin at 28th Street and end 1300 feet north of Aviation Boulevard, for a total length of 2700 feet.
 - Aviation Blvd limits begin 430 feet west of Airport N. Drive and end 670 feet east of SR 5/US 1, for a total length of 1900 feet.
- The existing SR 5/US 1 bridge (Bridge No. 880085) over the IRFWCD Main Canal will be replaced and includes a 12-foot shared use path on the east side.
- A 1.61-acre dry retention pond is proposed and located adjacent to the project between 30th Street and 31st Street.
- SR 5/US 1 at Aviation Boulevard intersection configuration:
 - Northbound approach: two left turns, two travel lanes, and one right turn lane,
 - Southbound approach: one left turn, two travel lanes, and two right turn lanes,
 - Westbound approach: two left turn lanes, one travel lane, one right turn lane,
 - Eastbound approach: one left turn lane, one travel lane, one right turn lane,
 - Bicycle lanes are provided on SR 5/US 1 from 29th Street to approximately 350 ft north of 33rd Street.
 - Bicycle lanes are provided on Aviation Boulevard from SR 5/US 1 to 33rd Street in the eastbound and westbound direction; and from SR 5/US 1 to Airport N. Drive in the westbound direction only. The bicyclist will use the shared use path in the eastbound direction within the airport property.
- The alignment east of SR 5/US 1 curves to the north and connects with 33rd Street to be compatible with the proposed alignment of the Aviation Boulevard Extension project being conducted by Indian River County.
- At the Main Canal Bridge, SR 5/US 1 is shifted 15 feet to the east for additional maintenance access between the bridge and FEC Railroad right of way.
- Bus bays are provided on SR 5/US 1, north and south of the intersection.
- A 12-foot shared use path is provided along the east side of SR 5/US 1 and a 12-foot shared use path is provided on the south side of Aviation Boulevard.
- High emphasis crosswalks are provided on the south and east approach of the intersection.
- Access to Airport N. Drive is provided at-grade north of the intersection with two westbound travel lanes, one westbound right turn lane, one eastbound left lane and two eastbound travel lanes.

1.6 Natural Resources Evaluation

This NRE was prepared to document the natural resources analysis performed to support decisions related to the evaluation of project alternatives and to summarize potential impacts to wetlands, federal and state protected species, protected habitats, and EFH. Measures considered to avoid, minimize, and mitigate potential impacts are also discussed. This report provides documentation of these processes to support the Environmental Document.

1.7 Existing Environmental Conditions

1.7.1 Methodology

The project proposes operational and capacity improvements to the intersection of SR 5/US 1 and Aviation Boulevard/32nd Street. Various alternatives were considered during the PD&E study, which include grade-separated crossings over the FEC Railroad. Additional features were considered such as multi-modal improvements. To account for potential grade separation and other solutions that address the purpose and need, the north-south limits of the PD&E study extend beyond the intersection along US 1 between 21st Street and 41st Street (approximately 2 miles). The west limits extend along Aviation Boulevard between 27th Avenue and SR 5/US 1 (approximately 1 mile). The east limits include the area east of SR 5/US 1 to 13th Avenue. The project limits are shown in **Figure 1-1**.

In order to determine the approximate locations and boundaries of existing upland and wetland communities within the project study area, available site-specific data was collected and reviewed. The project boundary includes all of the limits of the intersection of SR 5/US 1 and Aviation Boulevard/32nd Street. The north-south limits extend beyond the intersection along US 1 between 21st Street and 41st Street (approximately 2 miles). The west limits extend along Aviation Boulevard between 27th Avenue and SR 5/US 1 (approximately 1 mile). The east limits include the area east of SR 5/US 1 to 13th Avenue. The project study area encompasses the project boundary plus an approximate 300-foot buffer. The following information was collected and analyzed:

- USDA, NRCS, Web Soil Survey (<http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx>);
- NRCS Soil Survey of Indian River County (2023);
- USFWS, NWI Wetlands Mapper (<https://www.fws.gov/wetlands/data/mapper.html>);
- SJRWMD FLUCFCS (2014);
- FDOT, FLUCFCS, 3rd edition, 1999;

SECTION 1 – INTRODUCTION

- USFWS, *Classification of Wetlands and Deepwater Habitats of the United States*, (Cowardin, et. al. 1979);
- FNAI 2010. *Guide to the Natural Communities of Florida: 2010 edition*. Florida Natural Areas Inventory, Tallahassee, Florida; and
- 2019 aerial photographs of the project study area.

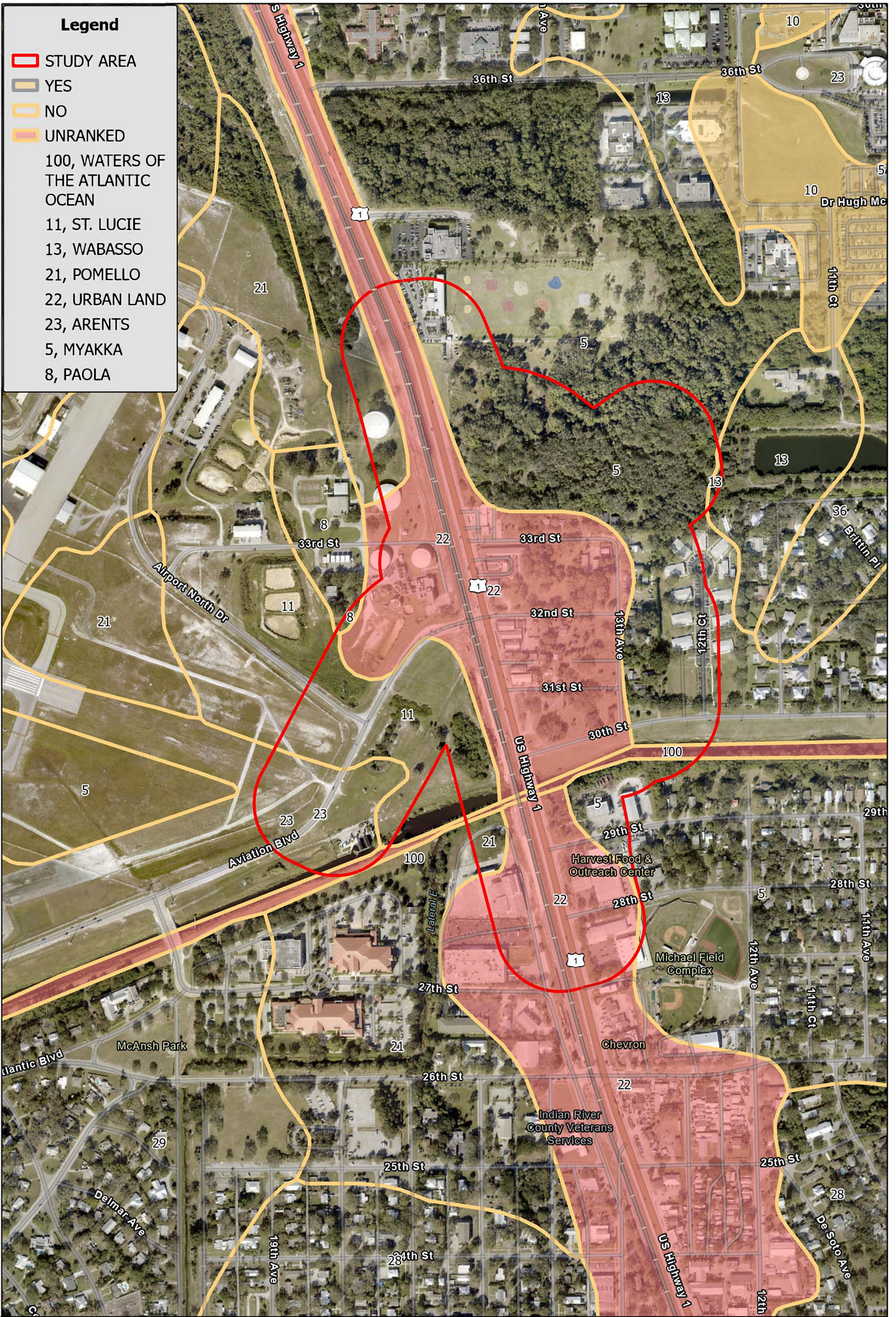
Using the above referenced information, the approximate boundaries of upland and wetland communities within the project study area were mapped on color aerial photographs. Each community type was then classified using the *FDOT, Florida Land Use, Cover and Forms Classification System* (FDOT 1999). Wetlands were also classified using the *USFWS Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin, et. al. 1979).

1.7.2 Soils

According to the *Florida Association of Environmental Soil Scientists’ Hydric Soils of Florida Handbook*, there are no hydric soils within any of the alternative footprints. The *Soil Survey of Indian River County, Florida*, indicates that the most prevalent soils in the project footprint are Myakka fine sand (5); St. Lucie Sand (11), Urban Land (22); Arents (23); and Waters of the Atlantic (100). Detailed descriptions of soils are provided and a list of acres and percentages within the project study area are listed in **Table 1-1**. Project study area soil types are depicted in **Figure 1-5** and are described in more detail **Appendix A**.

Table 1-1 Existing NRCS Soil Types within the Project Study Area

NRCS Code	NRCS Soil Description	Hydric Status	Acres	Percent of Total
5	Myakka-Myakka, Wet, Fine Sands, 0 to 2 Percent Slopes	No	36.53	35.58
8	Paola Sand, 0 to 5 Percent Slopes	No	0.16	0.15
11	St. Lucie Sand, 0 to 8 Percent Slopes	No	11.57	11.27
13	Wabasso Wabasso-Wabasso, Wet, Fine Sand, 0 to 2 Percent Slopes	No	0.18	0.18
21	Pomello Sand, 0 to 5 Percent Slopes	No	0.97	0.94
22	Urban Land, 0 to 2 Percent Slopes	No	45.28	44.10
23	Arents, 0 to 5 Percent Slopes	No	6.57	6.40
100	Waters of the Atlantic Ocean	No	1.42	1.38
Total			102.68	100.0



Legend

- STUDY AREA
- YES
- NO
- UNRANKED
- 100, WATERS OF THE ATLANTIC OCEAN
- 11, ST. LUCIE
- 13, WABASSO
- 21, POMELLO
- 22, URBAN LAND
- 23, ARENTS
- 5, MYAKKA
- 8, PAOLA

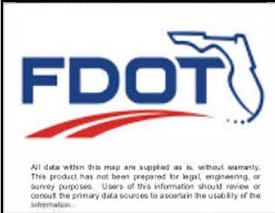


Figure 1-5 - NRCS Soils

FPID #: 441693-1-22-02
 State Road (SR) 5/US-1 at Aviation Boulevard
 Indian River County, Florida

0 500 1,000 Feet

Data Source: ESA, ESRI, WGI
 NRCS Soils 2020

1.7.3 Land Use and Cover Types

Land use was reviewed within the study area using the 2014 data layers from the SJWRMD FLUCFCS data and current aeriels. Habitats were subsequently field verified on June 22, 2023, and a project-specific FLUCFCS map was prepared with a 300-foot buffer around proposed project alternatives. All land use and cover types documented within the project study area (includes a 300-foot buffer) and their relative acreages are in **Table 1-2**. Project study area land use and cover types are depicted in **Figure 1-6** and are described in more detail in **Appendix B**.

The major land use categories in the four alternatives are, upland mixed coniferous/ hardwood (16.30%), airports (14.56%), commercial and services (14.24%), residential, medium density (12.80%), roads and highways (divided-4 lane w/ medians) (11.68%). These land use categories account for 69.58% of the land use within the study area. No natural wetlands occur within the proposed project footprint; however, Main Canal traverses SR 5/US 1, south of Aviation Boulevard.

Table 1-2 Existing Land Use/Land Cover (FLUCFCS) within the Project Study Area

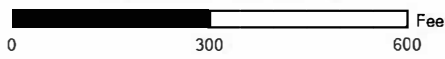
FLUCFCS Code	FLUCFCS Description	Project Study Area (Acres)	Percent of Total
1200	Residential, Medium Density - 2-5 Dwelling Units/Acre	13.14	12.80
1300	Residential, High Density - 6 or More Dwelling Units/Acre	5.81	5.66
1400	Commercial and Services	14.63	14.24
1510	Food Processing	3.43	3.34
1860	Community Recreational Facilities	0.05	0.05
3100	Herbaceous Upland Non-forested	1.79	1.74
3200	Shrub And Brushland (Wax Myrtle or Saw Palmetto, Occasionally Scrub Oak)	0.65	0.64
3300	Mixed Upland Non-forested	3.60	3.51
4340	Upland Mixed Coniferous/Hardwood	16.74	16.30
5100	Streams and Waterways	1.39	1.35
5300	Reservoirs	1.69	1.64
6460	Mixed Scrub-Shrub Wetland	1.04	1.01
8110	Airports	14.95	14.56
8140	Roads and Highways (Divided 4-Lanes with Medians)	11.99	11.68
8160	Locks and Dams	1.20	1.17
8340	Wastewater Treatment	10.58	10.31
Total		102.68	100.0

- ▭ STUDY AREA
- ▭ FLUCFCS
- 1200: RESIDENTIAL, MEDIUM DENSITY - 2-5 DWELLING UNITS/ACRE
- 1300: RESIDENTIAL, HIGH DENSITY - 6 OR MORE DWELLING UNITS/ACRE
- 1400: COMMERCIAL AND SERVICES
- 1510: FOOD PROCESSING
- 1860: COMMUNITY RECREATIONAL FACILITIES
- 3100: HERBACEOUS UPLAND NONFORESTED
- 3200: SHRUB AND BRUSHLAND (WAX MYRTLE OR SAW PALMETTO, OCCASIONALLY SCRUB OAK)
- 3300: MIXED UPLAND NONFORESTED
- 4340: UPLAND MIXED CONIFEROUS/HARDWOOD
- 5100: STREAMS AND WATERWAYS
- 5300: RESERVOIRS
- 6460: MIXED SCRUB-SHRUB WETLAND
- 8110: AIRPORTS
- 8140: ROADS AND HIGHWAYS (DIVIDED 4-LANES WITH MEDIANS)
- 8160: LOCKS AND DAMS
- 8340: WASTEWATER TREATMENT



Figure 1-6 - Land Use Map

FPID #: 441693-1-22-02
 State Road (SR) 5/US-1 at Aviation Boulevard
 Indian River County, Florida



Data Source: ESA, ESRI, WGI, SJWRMD 2014



All data within this map are supplied as is, without warranty. This product has not been prepared to a specific engineering or survey purpose. Users of this information should verify or accept the given data sources to determine the quality of the information.



2.0 PROTECTED SPECIES AND HABITAT

This project was evaluated for impacts to wildlife and habitat resources, including protected species, in accordance with 50 CFR Part 402 of the ESA of 1973, as amended, the Florida Endangered and Threatened Species Act, Section 379.2291, FS, and the FDOT PD&E Manual chapter titled Protected Species and Habitat.

The project area falls within USFWS-designated CH for West Indian manatee (*Trichechus manatus*). The project falls entirely within the USFWS CAs of the Florida scrub-jay (*Aphelocoma coerulescens*), piping plover (*Charadrius melodus*), Audubon's crested caracara (*Caracara plancus audubonii*), and Atlantic salt marsh snake (*Nerodia clarkii taeniata*). The project falls within the Core Foraging Area (CFA) of one wood stork colony, Pelican Island, located approximately nine miles north of the project limits.

2.1 Agency Coordination

This project was evaluated through the FDOT's ETDM process (ETDM Project No. 14475). The purpose of the ETDM process is to incorporate environmental considerations into transportation planning to inform project delivery. An ETDM Programming Screen Summary Report was published on January 21, 2022, containing comments from the ETAT on the project's effects on various natural, physical, and social resources. The USFWS, FHWA, and FWC were commenting agencies for Wildlife and Habitat.

Wildlife and Habitat were assigned a degree of effect of 3 – Moderate. As part of the PD&E Study there will be coordination with appropriate regulatory agencies regarding the West Indian manatee critical habitat and other protected species. Wildlife agencies with jurisdiction in the project area include the USFWS, FWC, and NMFS. The FDACS has jurisdiction over state protected plant species.

2.2 Methodology

Literature reviews, agency database searches, and field reviews of potential habitat areas were conducted to identify state and federally protected species occurring or potentially occurring within the project area. The Indian River County Soil Survey, recent aerial imagery (2019), and SJRWMD land use/land cover mapping were reviewed to determine habitat types occurring within and adjacent to the project corridor. Land use/land cover mapping was updated to reflect the current field conditions.

Information sources and databases reviewed for the project include the following:

- ESRI and Google Earth aerial imagery (2019)
- FNAI Biodiversity Matrix

- NRCS Soil Survey of Indian River County (2023)
- FWC – Bald Eagle (*Haliaeetus leucocephalus*) Nest Locator for Indian River County (2021-2022 nesting season data) and Audubon EagleWatch
- FWC – Waterbird colony locator (1999)
- FWC's SHCA
- USFWS ECOS
- USFWS IPaC
- USFWS – South Florida wood stork CFA (18.6-mile radius)
- USFWS Listed Species GIS databases
- NMFS EFH Mapper, v3.0
- FDOT's ETDM EST
- FDOT's ETDM Summary Report 2022 (ETDM Project No. 14475).

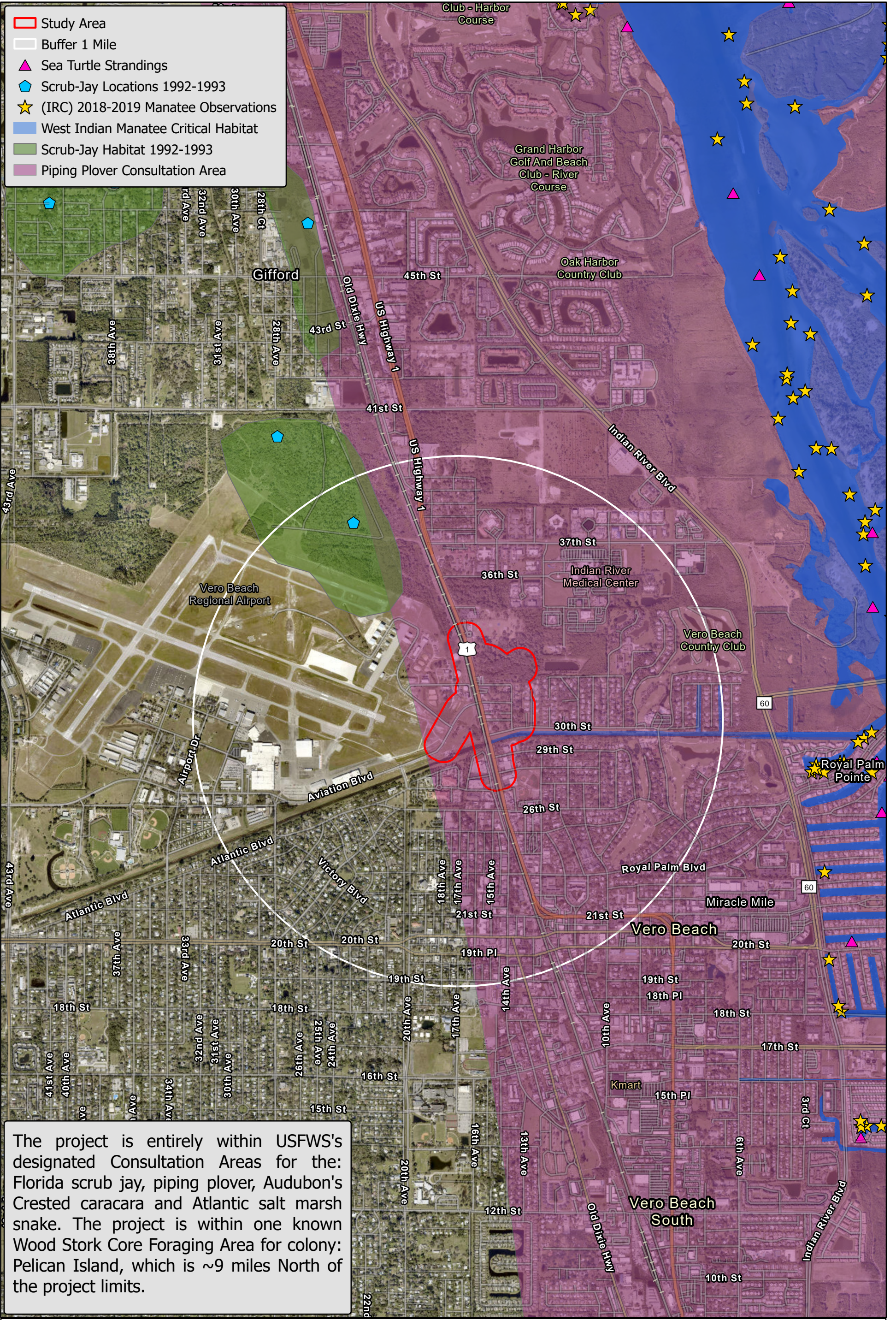
Based on the results of database searches, preliminary field reviews, and review of aerial photographs and soil surveys, field survey methods for specific habitat types and tables of potentially occurring protected fauna and flora were developed.

Project scientists conducted initial general surveys on June 22, 2023; the field team consisted of ecologists with bachelor's degrees in a biological science, and several years of field experience in Florida ecosystems.

Field reviews consisted of vehicular surveys and pedestrian surveys, through natural areas and altered habitats with the potential to support protected species. In the absence of physical evidence of a protected species, evaluation of the appropriate habitat was conducted to determine the likelihood of a species being present.

Using vehicular and pedestrian survey methods during daylight hours, appropriate habitat within the study area was visually scanned for evidence of listed species as well as general wildlife. All natural areas within the project study area provide some level of potential suitable habitat for protected species. All observations of wildlife in the study area were recorded and occurrence locations were depicted on project aerials. These occurrence records could include observations of the actual species, or signs of their presence including tracks, burrows, dens, scat, nests, or calls. Special attention was given to identifying signs of listed species.

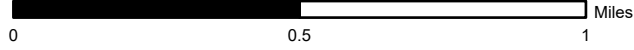
Figure 2-1 depicts field observations as well as historic species occurrences from database searches.



The project is entirely within USFWS's designated Consultation Areas for the: Florida scrub jay, piping plover, Audubon's Crested caracara and Atlantic salt marsh snake. The project is within one known Wood Stork Core Foraging Area for colony: Pelican Island, which is ~9 miles North of the project limits.

Figure 2-1 - Species Occurrence Map

FPID #: 441693-1-22-02
 State Road (SR) 5/US-1 at Aviation Boulevard
 Indian River County, Florida



Data Source: ESA, ESRI, WGI
 USFWS
 FWC
 FNAI
 Indian River County



All data within this map are supplied as is, without warranty. This product has not been prepared for legal, engineering, or survey purposes. Users of this information should review or consult the primary data sources to ascertain the usability of the information.

2.3 Protected Species Evaluation

A review of USFWS, FWC, FDACS, and FNAI data indicates thirty-two (32) protected plant and wildlife species known to occur in Indian River County. Twenty-one (21) of the species are federally listed endangered or threatened. Eleven (11) listed species are state listed endangered or threatened. The bald eagle (*Haliaeetus leucocephalus*) was delisted from protection under the Endangered Species Act in 2007. However, the bald eagle is still protected under the BGEPA, MBTA, and State law (FAC 68A-16.002). Multiple species of bats are state protected by FAC 68A-4.001 General Prohibitions and 68A-9.010 Taking Nuisance Wildlife.

To further summarize the results of desktop and field data collection efforts, each potential occurring species was assigned a likelihood for occurrence of “none”, “low”, “moderate”, or “high” within habitats found on the project corridor and an indicator of suitable habitat proximity to the project area of “distant”, “near”, or “contiguous”. Definitions of probability of species presence/habitat proximity are provided below.

Likelihood of Species Presence

None – Species has been documented in Indian River County, but due to complete absence of suitable habitat, could not be naturally present within the project corridor.

Low – Species with a low likelihood of occurrence within the project area are defined as those species that are known to occur in Indian River County or the bio-region, but preferred habitat is limited in the project area, or the species is rare.

Moderate – Species with a moderate likelihood for occurrence are those species known to occur in Indian River or nearby counties, and for which suitable habitat is well represented in the project area, but no observations or positive indications exist to verify presence.

High – Species with a high likelihood for occurrence are suspected within the project area based on known ranges and existence of sufficient preferred habitat in the area; are known to occur adjacent to the project; or have been previously observed or documented in the vicinity.

Habitat Proximity

Distant – Appropriate habitat is distant from the project footprint when accounting for the species’ home range size and level of mobility.

Near – Appropriate habitat is near the project footprint when accounting for the species’ home range size and level of mobility.

Contiguous – Appropriate habitat occurs within or immediately adjacent to the project footprint.

Table 2-1 lists the federally and state listed wildlife species known to occur within Indian River County that could potentially occur near the project area based on availability of suitable habitat and known ranges.

2.3.1 Federally Listed Species and Designated Critical Habitat

Twenty-one (21) species are listed by the USFWS as endangered or threatened. Federally listed species are also considered state listed species. Online research and field reviews were conducted evaluating habitat requirements for each species and habitat types present within the project study area.

Seventeen (17) of the 21 species, including the listed plant and insects, marine sea turtles (hawksbill [*Eretmochelys imbricata*], leatherback [*Dermochelys coriacea*], loggerhead [*Caretta caretta*], and green [*Chelonia mydas*]), Atlantic marsh snake (*Nerodia clarkii taeniata*), Florida scrub-jay (*Aphelocoma coerulescens*), rufa red knot (*Calidris canutus rufa*), Audubon's crested caracara (*Caracara plancus audubonii*), piping plover (*Charadrius melodus*), eastern black rail (*Laterallus jamaicensis ssp. jamaicensis*), roseate tern (*Sterna dougallii*), southern beach mouse (*Peromyscus polionotus niveiventris*), Florida panther (*Puma concolor coryi*), and Florida bonneted bat (*Eumops floridanus*) were determined to have no probability of occurrence due to a lack of suitable habitat within the project study area. The proposed project will have **no effect** on these species. Though the effect determination for the Atlantic salt marsh snake, piping plover, Florida scrub-jay, and Audubon's crested caracara was deemed **no effect**, a description will be provided since the proposed project falls within the CA for the species. Additionally, a description of the four (4) remaining species is provided below.

Table 2-1 Potentially Occurring and Observed Listed Species

Scientific Name	Common Name	State	Federal	Habitat	Habitat Occurrence in Relation to Project Footprint	Probability of Species Presence or Occurrence
Plants						
<i>Harrisia fragrans</i>	Fragrant prickly-apple	FE	E	Scrubby flatwoods and xeric hammocks on the Atlantic Coastal Ridge	Distant	None
<i>Dicerandra immaculata</i>	Lakela's mint	FE	E	Coastal sand-pine scrub vegetation on dunes	Distant	None
Insects						
<i>Cyclargus thomasi bethunebakeri</i>	Miami blue butterfly	FE	E	Tropical hardwood hammocks, tropical pine rocklands, and beachside scrub	Distant	None
Reptiles						
<i>Drymarchon couperi</i>	Eastern indigo snake	FT	T	Hydric hammock, palustrine, sandhill scrub, upland pine forest, mangrove swamp	Contiguous	Low
<i>Eretmochelys imbricata</i>	Hawksbill sea turtle	FE	E	Oceans, Bays, Inlets and beaches	Distant	None
<i>Dermochelys coriacea</i>	Leatherback sea turtle	FE	E	Oceans, Bays, Inlets and beaches	Distant	None
<i>Caretta caretta</i>	Loggerhead sea turtle	FT	T	Oceans, Bays, Inlets and beaches	Distant	None
<i>Chelonia mydas</i>	Green sea turtle	FT	T	Oceans, Bays, Inlets and beaches	Distant	None
<i>Nerodia clarkii taeniata</i>	Atlantic salt marsh snake	FT	T	Salt marsh tidal flats that contain grasses	Distant	None
<i>Gopherus polyphemus</i>	Gopher tortoise	T	NL	Old fields, sandhill, scrub, xeric hammock, ruderal, dry prairie, pine flatwood	Contiguous	Moderate
Birds						
<i>Antigone canadensis pratensis</i>	Florida sandhill crane	T	NL	Basin marsh, depression marsh, dry prairies, marl prairie, pastures, human-altered suburban landscapes	Contiguous	Low
<i>Aphelocoma coerulescens</i>	Florida scrub-jay	FT	T	Relict dune ecosystems or scrub on well drained to excessively well drained sandy soils	Distant	Low
<i>Athene cunicularia floridana</i>	Florida burrowing owl	T	NL	Native prairies and cleared areas with short groundcover	Near	Low
<i>Calidris canatus rufa</i>	Rufa red knot	FT	T	Coastal marine and estuarine habitats with large areas of exposed intertidal sediments.	Distant	None
<i>Caracara plancus audubonii</i>	Audubon's crested caracara	FT	T	Improved pastures and prairie with cabbage palm	Distant	Low
<i>Charadrius melodus</i>	Piping plover	FT	T	Sandy upper beaches, sparsely vegetated shores of shallow lakes, ponds, rivers, and impoundments	Distant	None
<i>Charadrius nivosus</i>	Snowy plover	T	NL	Beaches, dry mud or salt flats, sandy shores of rivers, lakes, and ponds	Distant	None
<i>Egretta caerulea</i>	Little blue heron	T	NL	Estuarine, lacustrine, riverine, tidal marsh, tidal swamp	Contiguous	Moderate
<i>Egretta rufescens</i>	Reddish egret	T	NL	Estuarine, lacustrine, riverine, tidal marsh, tidal swamp	Contiguous	Moderate
<i>Egretta tricolor</i>	Tricolored heron	T	NL	Estuarine, lacustrine, riverine, tidal marsh, tidal swamp	Contiguous	Moderate
<i>Falco sparverius paulus</i>	Southeastern American kestrel	T	NL	Sandhill, mesic flatwoods, ruderal, dry prairie	Near	Low
<i>Haliaeetus leucocephalus</i>	Bald eagle	BGEPA ¹	BGEPA ¹	Forests, estuarine, lacustrine, riverine, tidal marsh, tidal swamp	Contiguous	Moderate
<i>Laterallus jamaicensis ssp.</i>	Eastern black rail	FT	T	Tidal marshes, coastal marsh and wet meadows	Distant	None

SECTION 2 – PROTECTED SPECIES AND HABITAT

Scientific Name	Common Name	State	Federal	Habitat	Habitat Occurrence in Relation to Project Footprint	Probability of Species Presence or Occurrence
<i>Jamaicensis</i>						
<i>Mycteria americana</i>	Wood stork	FT	T	Estuarine tidal swamps/marshes, lacustrine, seepage stream, ditches	Contiguous	Moderate
<i>Platalea ajaja</i>	Roseate spoonbill	T	NL	Estuarine, lacustrine, riverine, tidal marsh, tidal swamp	Contiguous	Moderate
<i>Rynchops niger</i>	Black skimmer	T	NL	Open sand on beaches, sandbars, and dredge material islands	Distant	None
<i>Sterna dougallii</i>	Roseate tern	FT	T	Nest sites include bare limestone, shell-sand beaches, newly deposited rock and marl fill, dredge material, rooftops. Forages in open water over sandbars, reefs, tidal channels.	Distant	None
<i>Sternula antillarum</i>	Least tern	T	NL	Coastal areas throughout Florida, including beaches, lagoons, bays, and estuaries. Increasingly use artificial nesting sites, including gravel rooftops, dredge spoil islands or other dredged material deposits, construction sites, causeways, and mining lands. Nesting areas have a substrate of well-drained sand or gravel and usually have little vegetation.	Distant	None
Mammals						
<i>Peromyscus polionotus niveiventris</i>	Southeastern beach mouse	FT	T	Coastal dunes with sea oats	Distant	None
<i>Puma concolor coryi</i>	Florida panther	FE	E	Extensive blocks of forests, large wetlands, can use human-altered landscapes	Distant	None
<i>Trichechus manatus</i>	West Indian manatee	FT	T	Coastal waters, bays, rivers, estuaries, sometimes lakes and canals	Contiguous	Low
<i>Eumops floridanus</i>	Florida bonneted bat	FE	E	Roosting habitat: Forest and other areas with tall, mature trees or other areas with suitable roost structures. Artificial roosting structure includes buildings, bridges, and bat houses. Foraging habitat: open fresh water, permanent or seasonal freshwater wetlands, wetland and upland forests, and wetland and upland shrub.	Near	Low
	Bats (multiple species)	-	*	Forested areas, manmade structures	Near	Moderate

Key:

FE = Federally Listed Endangered

FT = Federally Listed Threatened

E = Endangered

T = Threatened

NL = Not Listed

¹The bald eagle was delisted from protection under the Endangered Species Act in 2007. However, the bald eagle is still protected under the BGEPA, the MBTA, and State law (FAC 68A-16.002).

*Bats are protected by FAC 68A-4.001 General Prohibitions and 68A-9.010 Taking Nuisance Wildlife

Sources:

USFWS - U.S. Fish and Wildlife Service status, Official lists of Threatened and Endangered species, 50 CFR 17.11

Florida Fish and Wildlife Conservation Commission. 2016. Florida's Imperiled Species Management Plan Amended January 2017. Tallahassee, Florida

FWC - Florida's Endangered and Threatened Species, Updated December 2022

2.3.1.1 Reptiles

Eastern Indigo Snake (*Drymarchon couperi*)

The eastern indigo snake is federally listed as threatened. No individuals were observed during the field review, but because of the wide diversity of habitats utilized by this species, it is assumed that suitable habitat for this species may be within the project limits. Coordination with the agencies is ongoing and to assure the protection of this species during construction, the FDOT will implement the *USFWS Standard Protection Measures for the Eastern Indigo Snake (Appendix C)*. If an eastern indigo snake is encountered in the construction limits, work will stop immediately to allow the snake to vacate the area. The *Eastern Indigo Snake Programmatic Effect Determination Key (South Florida)* was used for this project (**Appendix D**). The path followed through the key was A > B > C > D > E = NLAA. Any permits required for the proposed project will be conditioned for the use of *FWC's Gopher Tortoise Permitting Guidelines*. Given implementation of standard protection measures and limited impacts to low quality habitat it is anticipated. Therefore, the effect determination of **may affect, not likely to adversely affect** is appropriate for the eastern indigo snake.

Atlantic Salt Marsh Snake (*Nerodia clarkii taeniata*)

The Atlantic salt marsh snake is federally listed as threatened. The project limits are located within the USFWS CA for the Atlantic salt marsh snake. The species prefers salt marsh tidal flats that contain grasses for foraging and sheltering. The study area does not contain appropriate foraging or nesting habitat, no individuals were observed during the field review, and no individuals have been previously documented in the study area. Therefore, the project is anticipated to have **no effect** on the Atlantic salt marsh snake.

2.3.1.2 Birds

Florida Scrub-Jay (*Aphelocoma coerulescens*)

The Florida scrub-jay is a federally threatened species adapted to a very specific habitat known as the Florida scrub. Florida scrub consists of sandy, well-drained soils, and is dominated by shrubs and low-growing trees. This habitat is characterized by an open canopy, with patches of bare sand and scattered shrubs. The project study area is located within the USFWS CA for the Florida scrub-jay. During the 1992-1993 state-wide Florida scrub-jay survey, scrub-jays were documented within one mile of the project study area, in natural areas north of the Vero Beach Regional Airport and two other areas north of the airport and west of US 1 (**Figure 2-1**). Scientists investigated the natural area by the airport that once supported scrub-jays. These areas are currently overgrown with Brazilian pepper (*Schinus terebinthifolia*), tall tree canopy, and various species of vines

creating mats over the ground and shrub canopy. These conditions have become less than ideal habitat for scrub-jays. The other areas that were once deemed scrub-jay habitat have been developed into residential areas. Based on observations within the project study area and immediate vicinity (~one mile buffer), no scrub habitat suitable to support Florida scrub-jays and no individuals scrub-jays were observed. Therefore, the project will have **no effect** on the Florida scrub-jay.

Audubon's Crested Caracara (*Caracara plancus audubonii*)

The Audubon's crested caracara is federally listed as threatened. The project limits are located within the USFWS CA for Audubon's crested caracara. The Audubon's crested caracara prefer large dry or wet prairie areas with scattered cabbage palm. They utilize improved pasturelands and lightly wooded areas for foraging habitat. Audubon's crested caracaras prefer to nest in cabbage palm trees surrounded by open habitat with low groundcover and low density of tall or shrubby vegetation. The closest species observation is 6.57 miles in west-southwest direction. The study area does not contain appropriate foraging or nesting habitat, no individuals were observed during the field review, and no individuals have been previously documented in the study area. Therefore, the project is anticipated to have **no effect** on the Audubon's crested caracara.

Piping Plover (*Charadrius melodus*)

The piping plover is federally listed as threatened and the project limits are located within the USFWS CA for this species. The piping plover is a small shorebird with a white belly, pale grayish upperparts, bright yellow-orange legs, and a small bill. Piping plovers can be found along Florida's coasts and generally inhabit sandy beaches, sand flats, and mudflats along coastal areas. They primarily prey on insects, crustaceans, and marine worms. There have been no documented occurrences of this species within the project study area, no foraging habitat in the project limits and none were observed during the field reviews for this project. No project involvement is anticipated for this species; therefore, the project will have **no effect** on the piping plover.

Wood Stork (*Mycteria americana*)

The wood stork is listed as threatened by the USFWS. Wood storks are known to use freshwater marshes, swamps, lagoons, ponds, flooded fields, depressions in marshes and brackish wetlands, open pine-cypress wetlands, and manmade wetlands (i.e., ditches, canals, and stormwater retention ponds). Wood storks are typically colonial nesters and construct their nests in medium to tall trees located within wetlands or on islands. Wood storks are known to forage within a large area, up to 40 miles, from the colony.

For south Florida, the USFWS has defined the CFA for a wood stork colony as the area within an 18.6-mile radius from the colony location. The project corridor is located within the CFA of one wood stork colony, Pelican Island, located nine miles north of the project. As defined by the USFWS, wood stork suitable foraging habitat (SFH) includes wetlands and surface waters that have areas of water that are relatively calm, uncluttered by dense thickets of aquatic vegetation, and have permanent or seasonal water depth between two and fifteen inches.

Surface waters within the study area provide limited low quality SFH for the wood stork. The *USFWS Effect Determination Key for the Wood Stork in South Peninsular Florida* was utilized for this project (**Appendix E**). The path followed through the key for all build alternatives was A > B = NLAA. Because impacts to surface waters are less than 0.5 acres and will be mitigated for as appropriate, an effect determination of **may affect, not likely to adversely affect** is anticipated for the wood stork.

2.3.1.3 Mammals

West Indian Manatee (*Trichechus manatus*)

The West Indian manatee is listed as federally threatened and is also protected by the Marine Mammal Protection Act. The study area falls within the West Indian manatee CA and CH. Manatees live in marine, brackish, and freshwater systems in coastal and riverine areas throughout their range. Preferred habitats include areas near the shore featuring underwater vegetation like seagrass. No manatees have been identified within the study area and no manatees were observed during the field review. In addition, Main Canal has a dam and lock system to the west and a salinity control structure to the east. To protect manatees during construction, the *Standard Manatee Conditions for In-Water Work (2011)* (**Appendix F**) will be followed. Based on the *USACE, Jacksonville District, and the State of Florida Effect Determination Key For The Manatee In Florida* (pathway used: A > B > C > G > N > O > P; **Appendix G**), with implementation of these identified best management practices, a species determination of **may Affect, Not Likely to Adversely** was made for the West Indian manatee.

2.3.1.4 Critical Habitat

The study area occurs within areas of CH for the West Indian manatee, which includes the surface waters of the Main Canal. The proposed project will include the replacement of the existing SR 5/US 1 bridge over the Main Canal. The proposed construction efforts include a new shared use path on the east side, and SR 5/US 1 to be shifted fifteen feet to the east for additional maintenance access between the bridge and FEC Railroad right of way.

The SR 5/US 1 bridge replacement will require new bridge pilings within the Main Canal, resulting in direct fill impacts to the surface water. The Main Canal may be utilized by manatees, since it is hydrologically connected to the Indian River. During desktop reviews, no manatee observations were recorded within the Main Canal near the SR 5/US 1 overpass (**Figure 2-1**) and there is a structure in Main Canal east of the project and west of the Indian River. Following field reviews, scientists concluded that the Main Canal provides low quality habitat and limited foraging opportunities for manatees, as it has a sandy bottom, with no observations of submerged aquatic vegetation (SAV). Additionally, the banks of the canal are overgrown with non-native vegetation such as Brazilian pepper, primrosewillow (*Ludwigia peruviana*), wild taro (*Colocasia esculenta*), and castorbean (*Ricinus communis*). Therefore, it would be unlikely to see a manatee within the surface waters near the SR 5/US 1 bridge. It was determined that the proposed project will **not result in the destruction or adverse modification of critical habitat** for the West Indian manatee.

2.3.2 State Listed Species

Thirty-one (31) species are listed by FWC as endangered or threatened. Twenty (20) of the species are also federally listed and discussed in Section 2.3.1. In-house research and field reviews were conducted evaluating the habitat requirements for each species and the types of habitats present within the project study area.

Three (3) of the eleven (11) state listed species, including snowy plover (*Charadrius nivosus*), black skimmer (*Rynchops niger*), and least tern (*Sternula antillarum*), were determined to have no probability of occurrence due to a lack of suitable habitat within the project study area. The proposed project will have **no effect anticipated** on these species. The remaining eight (8) state listed species were determined to potentially have a probability of occurrence within the project area. A description of the species is provided below.

2.3.2.1 Reptiles

Gopher Tortoise (*Gopherus polyphemus*)

The gopher tortoise is listed by the FWC as threatened. Gopher tortoise burrows provide habitat for many commensal species. Ideal habitats include xeric areas with sandy soils and open canopy with low groundcover. No gopher tortoises or burrows were observed during field reviews. Surveys for gopher tortoise burrows, as well as commensal species, will be conducted during the design phase and permits to relocate tortoises and commensals as appropriate will be obtained from the FWC. Gopher tortoises will be addressed in accordance with FWC Gopher Tortoise Permitting Guidelines. The gopher

tortoise has been assigned a **no adverse effect anticipated** determination for this project.

2.3.2.2 Birds

Florida Sandhill Crane (*Antigone canadensis pratensis*)

The Florida sandhill crane is listed as threatened by the FWC. No nesting habitat exists in the study area; however, foraging habitat is present. Surveys for Florida sandhill crane nest sites will be conducted during the design phase. If it is determined nest areas are found and could be impacted by the project, FDOT will coordinate with FWC to determine appropriate avoidance and minimization measures to apply during construction. Therefore, a **no adverse effect anticipated** determination for Florida sandhill cranes is appropriate.

Florida Burrowing Owl (*Athene cunicularia floridana*)

The Florida burrowing owl is designated by the FWC as threatened. The species creates subterranean burrows in native prairies and cleared pastures. Small tracts of suitable habitat are present within the study area, and suboptimal habitat is available in the surrounding area. However, no burrows were observed during field reviews and habitat is fragmented. Therefore, **no adverse effect anticipated** on the Florida burrowing owl.

Shorebirds

The snowy plover (*Charadrius nivosus*), black skimmer (*Rhynchops niger*), and least tern (*Sternula antillarum*) are state protected species of shorebirds which are known to occur within Indian River County. These are coastal species that occasionally inhabit inland sandy areas. Black skimmers and least terns have been documented to roost on certain suitable flat/gravel roofs of buildings. Because the project footprint and surrounding area do not provide this natural habitat, and no impacts are proposed to buildings that may provide nesting for these species, there is **no effect anticipated** on these shorebird species.

Wading Birds

Wading birds such as the little blue heron (*Egretta caerulea*), reddish egret (*Egretta rufescens*), tricolored heron (*Egretta tricolor*), and roseate spoonbill (*Platalea ajaja*) are listed by the FWC as threatened and are afforded some levels of federal protection by the MBTA (16 U.S.C. 703-712). Though no state listed wading birds were observed in the study area during field surveys, it is very likely these species use the Main Canal and surface waters for foraging. Nesting habitat for these wading birds consists of relatively isolated islands of shrubs and trees out of the reach of predators. Therefore, it is likely

that the canal would not provide suitable nesting habitat. Any permanent impacts to surface waters would be mitigated as appropriate. These species are highly mobile and would not likely nest within the project footprint during construction. For these reasons, a **no adverse effect anticipated** determination is appropriate for state protected wading birds.

Southeastern American Kestrel (*Falco sparverius paulus*)

The southeastern American kestrel is listed by the FWC as threatened. The species inhabits sandhills, mesic flatwoods, and open pastures. The species is commonly observed perched on power lines in rural to suburban areas. Mesic flatwoods and suitable shrubby habitats do occur within and are adjacent to the proposed project. These habitats may support foraging for the southeastern American kestrel; however, optimal nesting habitat is absent from the project footprint. For these reasons, there is **no adverse effect anticipated** on the southeastern American kestrel.

2.3.3 Other Protected Species

Non-Listed Rare Plants

Non-listed native plant species are generally not afforded the type of protection that state or federally protected listed plant or wildlife species are. The FDOT OEM partnered with the FWF and the FNPS to form the Native Florida Plants FDOT Working Group. Through the working group, the FWF and FNPS can engage and review projects early in the process so that their comments regarding potential plants of concern can be considered by FDOT. The working group also includes representatives from FDACS to ensure the procedures under 581.185 Florida Statutes and Chapter 5B-40, Florida Administrative Code are followed. Even though FDOT is not obligated to protect non-listed species of interest/concern, stakeholders are often interested in performing plant relocations or seed and/or cuttings collection to maintain species or population viability if avoidance is not feasible.

Included in the ETDM Summary Report No. 14475, published on January 21, 2022, FDACS recommended surveys for rare and listed plants be conducted, and if present, plants should be protected or translocated to a suitable alternative site by a qualified organization such as the FDOT working group. The Peninsular Florida Genera of Concern List (2021) provided by FNPS was reviewed and plants that were identified with the potential to occur within the study area were not documented during field reviews.

Bald Eagle

The bald eagle (*Haliaeetus leucocephalus*) was delisted from protection under the Endangered Species Act in 2007. However, the bald eagle is still protected under the BGEPA, the MBTA, and State law. It is a large bird with dark plumage, white head (in adults), white tail, and large yellow bill. Bald eagles are commonly observed near large open water habitats such as rivers, lakes, and the coast. Bald eagles generally nest in large pine trees near water bodies that provide dependable food sources.

The location and activity of bald eagle nest sites throughout the state are closely monitored by the Audubon Society and FWC. A desktop review of Audubon EagleWatch mapping indicates that there are no bald eagle nests within one mile of the project study area. The proposed project will have no impact on the species.

Bats (Multiple species)

Bats in the state of Florida are protected via FAC 68A-4.001 General Prohibitions, FAC 68A-9.010 Taking Nuisance Wildlife, and FAC 68A-29.002 Regulations Relating to the Taking of Mammals. There is one species of bat, the Florida bonneted bat (*Eumops floridanus*) which receives additional protection as it is listed as endangered by the USFWS. The project is not within the designated CA for the Florida bonneted bat documented in the *October 2019 USFWS Florida Bonneted Bat Consultation Guidelines*. The proposed project will have **no effect** on the species.

The tricolored bat (*Perimyotis subflavus*) is a candidate for listing under the jurisdiction of the USFWS. As of September 14, 2022, the USFWS proposed to list the tricolored bat as an endangered species under the ESA. Designated CH is not proposed for the tricolored bat at this time. Tricolored bats are found throughout Florida; however, they are more common in the northern half of the state. The tricolored bat populations have been drastically impacted by a fungal infection, white nose syndrome, that affects hibernating bat colonies. The small, insect-eating bats prefer to roost in mature hardwood forests, caves, and less commonly manmade structures. Tricolored bats forage in waterways, forests, and agricultural areas where small insects can be found. The study area contains limited roosting habitat for the tri-colored bat. FDOT will continue coordination with USFWS to determine the potential effect to the tricolored bat once a final listing decision has been made.

Other solitary bat species may roost in small tree cavities or palm fronds while larger colonies of bats may roost in manmade structures. Within the study area are structures which could provide roosting habitat for state protected bats. During field reviews, no evidence of bat utilization was noted. A bat exclusion would be unlikely to be needed for the proposed project.

2.4 Evaluation of Alternatives

2.4.1 Direct Impacts

Table 2-2 shows the expected direct impacts for the Build Alternatives and the No-Build Alternative by FLUCFCS code indicating project impacts to potential habitat utilized by listed species. This analysis was conducted based on land uses within the Build Alternatives combined footprint with no buffer area; this is unlike the project study area which includes a 300-ft buffer of the Build Alternatives combined footprint. The impacts for the Build Alternatives were calculated by summing the FLUCFCS categories that could potentially be used by a state or federally listed or otherwise protected species.

Table 2-2 Potential Land Use/Land Cover Impacts Associated with Alternatives

FLUCFCS Code	FLUCFCS Description	Alternative 1	Alternative 2	Alternative 7	Alternative 8
		(acres)	(acres)	(acres)	(acres)
1200	Residential, Medium Density - 2-5 Dwelling Units/Acre	1.43	7.27	3.11	4.94
1300	Residential, High Density - 6 or More Dwelling Units/Acre	0.00	0.08	0.00	0.00
1400	Commercial and Services	3.48	1.57	4.44	4.64
3100	Herbaceous Upland Non-forested	0.17	0.11	0.14	0.16
3300	Mixed Upland Non-forested	0.35	0.38	0.42	0.32
4340	Upland Mixed Coniferous/Hardwood	0.60	1.22	1.42	3.67
5100	Streams and Waterways	0.11	0.08	0.10	0.11
5300	Reservoirs	0.00	0.04	0.02	0.04
8110	Airports*	2.96	1.60	1.77	2.22
8140	Roads and Highways (Divided 4-Lanes w/ Medians)	4.64	4.43	4.71	3.73
8340	Wastewater Treatment	0.28	0.22	0.32	0.22
Alternative Total		14.13	17.00	16.45	20.05

Note:

FLUCFCS = Florida Land Use, Cover and Forms. Classification System

*Airports have large areas of open grass and forested natural areas that may provide habitat for protected species.

2.4.1.1 Build Alternative 1

Build Alternative 1 totals 14.13 acres. Of this amount, non-natural habitats account for 69.5% of the total land uses. Of the 30.5% of the natural habitats, Airports (FLUCFCS 8110) makes up 21.0%, Upland Mixed Coniferous/Hardwood (FLUCFCS 4340) makes up 4.3%, Mixed Upland Non-forested (FLUCFCS 3300) comprises 2.5%, Herbaceous Upland Non-forested (FLUCFCS 3100) comprises 1.2%, and Streams and Waterways (FLUCFCS 5100) and Reservoirs (5300) each account for less than 1% of the total natural habitat land uses.

2.4.1.2 Build Alternative 2

Build Alternative 2 totals 17.00 acres. Of this amount, non-natural habitats account for 79.8% of the total land uses. Of the 20.2% of the natural habitats, Airports (FLUCFCS 8110) makes up 9.4%, Upland Mixed Coniferous/Hardwood (FLUCFCS 4340) makes up

7.2%, Mixed Upland Non-forested (FLUCFCS 3300) comprises 2.2%, and Herbaceous Upland Non-forested (FLUCFCS 3100), Streams and Waterways (FLUCFCS 5100) and Reservoirs (5300) each account for less than 1% of the total natural habitat land uses.

2.4.1.3 Build Alternative 7

Build Alternative 7 totals 16.45 acres. Of this amount, non-natural habitats account for 76.5% of the total land uses. Of the 23.5% of the natural habitats, Airports (FLUCFCS 8110) makes up 10.8%, Upland Mixed Coniferous/Hardwood (FLUCFCS 4340) makes up 8.6%, Mixed Upland Non-forested (FLUCFCS 3300) comprises 2.6%, and Herbaceous Upland Non-forested (FLUCFCS 3100), Streams and Waterways (FLUCFCS 5100), and Reservoirs (5300) each account for less than 1% of the total natural habitat land uses.

2.4.1.4 Build Alternative 8

Build Alternative 8 totals 20.05 acres. Of this amount, non-natural habitats account for 67.5% of the total land uses. Of the 32.5% of the natural habitats, Upland Mixed Coniferous/Hardwood (FLUCFCS 4340) makes up 18.3%, Airports (FLUCFCS 8110) makes up 11.1%, Mixed Upland Non-forested (FLUCFCS 3300) comprises 1.6%, and Herbaceous Upland Non-forested (FLUCFCS 3100), Streams and Waterways (FLUCFCS 5100), and Reservoirs (FLUCFCS 5300) each account for less than 1% of the total natural habitat land uses.

2.4.1.5 No-Build Alternative

There are no direct impacts to wildlife and/or habitats associated with the No-Build Alternative.

2.4.2 Indirect, Secondary, and Cumulative Impacts

Indirect and secondary effects are those impacts that are reasonably certain to occur later in time as a result of the proposed project. They may occur outside of the area directly affected by the proposed project. Potential secondary effects include increased noise, traffic, and development, which could impact wildlife or result in a change in wildlife migration patterns. Cumulative effects include the effects of future state, local, or private actions that are reasonably certain to occur in the project area. Future federal actions that are unrelated to the proposed project are not considered in the determination of cumulative effects because they require a separate consultation in accordance with Section 7 of the ESA.

2.4.2.1 Build Alternatives 1, 2, 7, and 8

For the project area near SR 5/US 1 and Aviation Boulevard roadways, indirect, secondary, and cumulative impacts associated with the proposed project would be minor since both roadways have proposed improvements. For natural areas farther from the roadway, specifically to the east side of the existing SR 5/US 1, natural areas that already have nuisance/exotic vegetation are anticipated to possibly have an increase of certain species. These species include but are not limited to Brazilian pepper and cogon grass (*Imperata cylindrica*) that are particularly aggressive and successful colonizers in disturbed areas; therefore, it is likely that the disturbance of construction may allow them to colonize and crowd out native vegetation. Nuisance/exotic vegetation has negative impacts to native wildlife as they take over the natural habitats upon which the species rely. The commercial properties on the east side of the project could experience increased noise and some interruptions to service caused by construction activities.

2.4.2.2 No-Build Alternative

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

2.5 Special Designations and Conservation Lands

No designated Outstanding Florida Waters, Aquatic Preserves, Sole Source Aquifers, Scenic Highways, or Wild and Scenic Rivers are reported within the project study area. The project is not located within a special regulatory basin of the SJRWMD. There are no upland state-owned conservation lands or other conservation lands within the project study area.

3.0 WETLANDS AND SURFACE WATERS

3.1 Agency Coordination

Agency coordination has been initiated through the ETDM process and both the SJRWMD and USACE were commenting agencies. An ETDM Programming Screen Summary Report was published on January 21, 2022, containing comments from the ETAT on the project's effects on various natural, physical, and social resources. The NMFS, SJRWMD, FDEP, USFWS, and EPA and were commenting agencies for Wetlands.

Wetlands were assigned a degree of effect of 3 – Moderate. As part of the PD&E Study there will be continued coordination with appropriate regulatory agencies.

3.2 Methodology

The extent and types of wetlands in the project study limits were documented in accordance with Executive Order 11990, Protection of Wetlands, and the FDOT PD&E Manual. Surface waters were identified through the review of available literature, GIS data, and field verification. The following sources were reviewed prior to conducting the field review:

- USFWS NWI Maps;
- Land use and land cover maps (SJRWMD 2014);
- NRCS Soil Survey of Indian River County, Florida (2023);
- FDOT's ETDM Environmental Screening Tool;
- FNAI Cooperative Land Cover Map;
- ETDM Summary Report (2022); and
- True color aerial photography (2021).

Following the review of all available materials, field assessments were conducted on June 22, 2023, to identify the presence of wetland vegetation, evidence of hydrology, and hydric soil indicators. The jurisdictional limits of the surface waters were estimated using the criteria stated in the *USACE Final Regional Supplement to the Corps of Engineers Wetland Delineations Manual: Atlantic and Gulf Coastal Plain Region* (October 2010), and Florida statewide unified wetland delineation methodology as adopted by the FDEP and the Water Management Districts per Chapter 62-340 of the FAC and described in *The Florida Wetlands Delineation Manual*. Project scientists evaluated wetland and surface water systems using the UMAM. The results presented in this report are a

compilation of information collected from field assessment performed by project scientists and from the data sources described above.

3.3 Avoidance and Minimization

The proposed project will result in unavoidable impacts to surface waters (SW) and other surface waters (OSW). No wetlands were identified within the project study area, so no impacts to wetlands are proposed. Given that the project involves improvements to an existing roadway, replacement of a bridge over the Main Canal, and a section of new alignment, opportunities to completely avoid SW and OSW impacts were not available. Impacts have been avoided and minimized to the greatest extent possible. Transportation safety and design standards, side slopes, turn radius, lane number, and widths necessitate the impacts. Furthermore, the impacts are unavoidable due to the location of the SW and OSW within the study area. Water quality, quantity, hydroperiod, and habitat will be maintained in all systems that will remain undisturbed.

Best Management Practices (BMPs) will be utilized during construction to minimize erosion and sediment transport. Erosion control measures are to be installed and maintained in accordance with standard FDOT specifications during the design phase of the project.

3.4 Results

The project area contains one SW (SW-1 [Main Canal]) and four OSWs (OSW-1, OSW-2, OSW-3, and OSW-4). The SW is classified as FLUCFCS 5100: streams and waterways (USFWS: PEM1Hx [Palustrine, Emergent, Persistent, Permanently Flooded, Excavated]) and is a man-made canal which drains to the Indian River Lagoon. The OSWs are classified as FLUCFCS 5300: reservoirs (USFWS: PSS1Cx [Palustrine, Scrub-Shrub, Broad-Leaved Deciduous, Excavated]), which are man-made, open water ponds with mowed edges. A surface water map is included as **Figure 3-1**. Representative photographs of surface water systems within the project study area are included in **Appendix H**.

3.5 Evaluation of Alternatives

3.5.1 *Direct Impacts*

For the purposes of this report, the worst-case scenario of permanent fill impacts to surface waters systems within the footprint is assumed.

3.5.1.1 Build Alternatives

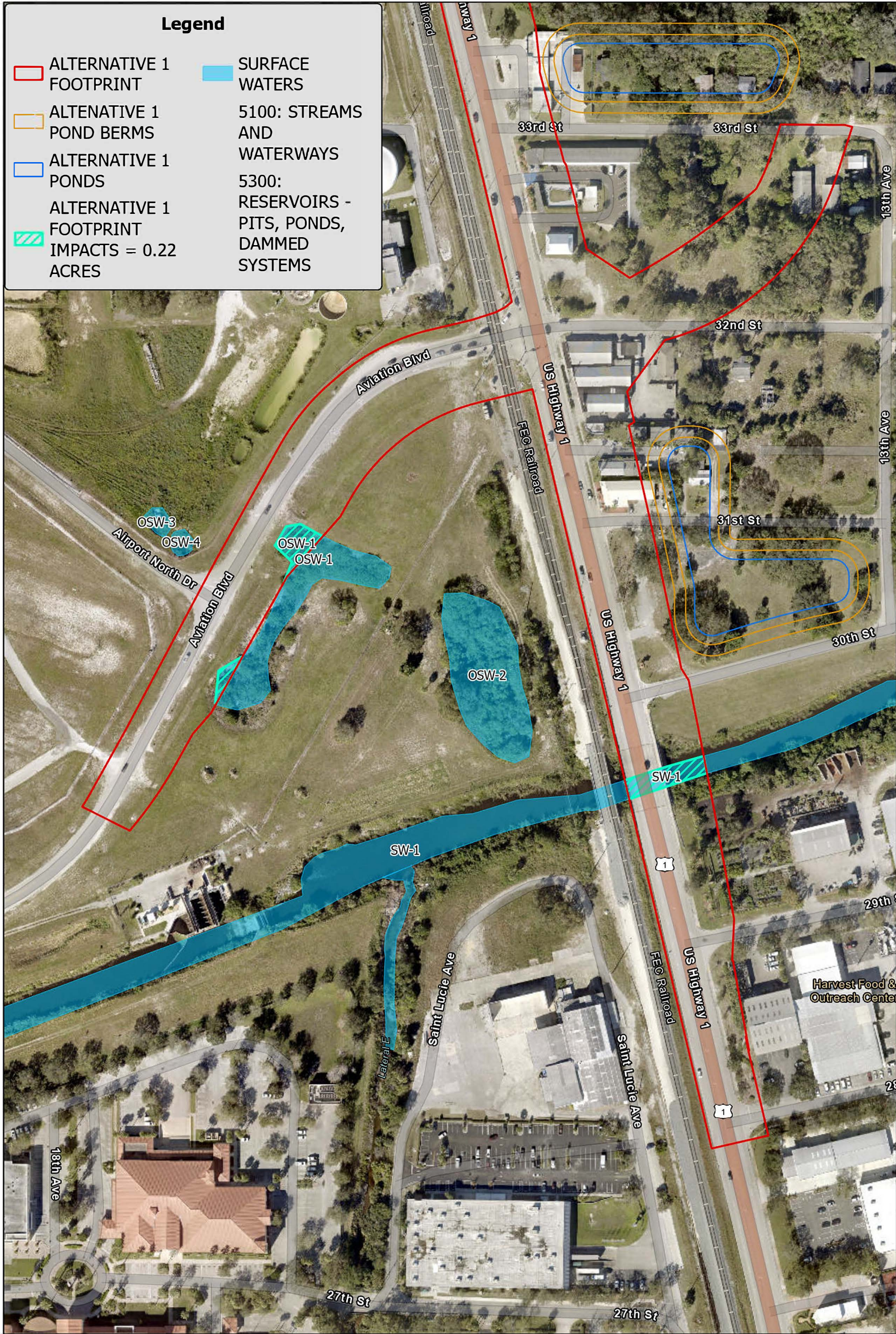
Build Alternative 1 will result in direct impacts to 0.11 acres of SW-1 (Main Canal) and 0.11 acres of OSW-1 totaling 0.22 acres of permanent fill. Build Alternative 2 will result in direct impacts to 0.08 acres of SW-1 and 0.05 acres to OSW-1 totaling 0.13 acres of permanent fill. Build Alternative 7 will result in direct impacts to 0.10 acres of SW-1 and 0.03 acres to OSW-1 totaling 0.13 acres of permanent fill. Build Alternative 8 will result in direct impacts to 0.11 acres of SW-1 and 0.05 acres to OSW-1 totaling 0.16 acres of permanent fill. Impact totals associated with the Build Alternatives are presented in **Table 3-1**.

Table 3-1 Potential Surface Water Impacts Associated with the Build Alternatives

FLUCFCS / ID	USFWS Classification	Impact Type	Impact Acres			
			Alternative 1	Alternative 2	Alternative 7	Alternative 8
Surface Waters						
5100 / SW-1	PEM1Hx	Fill	0.11	0.08	0.10	0.11
Other Surface Waters						
5300 / OSW-1	PSS1Cx	Fill	0.11	0.05	0.03	0.05
5300 / OSW-2	PSS1Cx	No Impact	-	-	-	-
5300 / OSW-3	PSS1Cx	No Impact	-	-	-	-
5300 / OSW-4	PSS1Cx	No Impact	-	-	-	-
Build Alternative Total			0.22	0.13	0.13	0.16

Build Alternative 1 was determined to be the Preferred Alternative. Surface water impacts (SW-1) for the Preferred Alternative total 0.11 acres, which equates to a total functional loss of 0.06 palustrine herbaceous units. Direct fill impacts to SW-1 result from construction of bridge pilings and widening activities. Shade impacts are not considered since this area for surface waters consists of non-vegetated bottom. Other surface water (OSW-1) impacts for the Preferred Alternative total 0.06 acres. Mitigation is not required for impacts to OSW since These reservoirs have been permitted through an existing permitted stormwater system and are thus non-jurisdictional.

Impacts to SW and OSW within the Preferred Alternative are summarized in **Table 3-2**. UMAM scores and functional loss analysis for surface waters for the Preferred Alternative are summarized in **Table 3-2**. UMAM datasheets for SW-1 are provided in **Appendix I**. Wetland impact maps for the Preferred Alternative are included as **Figure 3-1**.



Legend

- ▭ ALTERNATIVE 1 FOOTPRINT
- ▭ ALTERNATIVE 1 POND BERMS
- ▭ ALTERNATIVE 1 PONDS
- ▭ ALTERNATIVE 1 FOOTPRINT IMPACTS = 0.22 ACRES
- ▭ SURFACE WATERS
- 5100: STREAMS AND WATERWAYS
- 5300: RESERVOIRS - PITS, PONDS, DAMMED SYSTEMS

Figure 3-1 - Surface Waters (Preferred Alternative)

FPID #: 441693-1-22-02
 State Road (SR) 5/US-1 at Aviation Boulevard
 Indian River County, Florida



Data Source: ESA, ESRI
 WGI, NWI, SJRWMD Land Use



All data within this map are supplied as is without warranty. This product has not been prepared to be printed, reproduced, or used for any other purpose. Users of this information should verify or accept the primary data sources to determine the quality of the information.

Table 3-2 Potential Surface Water Impacts Associated with Preferred Alternative

FLUCFCS / ID	USFWS Classification	Preferred Alternative			
		Impact Type	Impact Acreage	UMAM Score	Functional Loss
Surface Waters					
5100 / SW-1	PEM1Hx	Fill	0.11	0.50	0.06
Other Surface Waters					
5300 / OSW-1	PSS1Cx	Fill	0.11	-	-
Preferred Alternative Total			0.22		0.06

3.5.1.2 No Build Alternative

There are no direct impacts to wetlands associated with the no-build alternative.

3.5.2 Indirect, Secondary, and Cumulative Impacts

Indirect and secondary effects are those impacts that are reasonably certain to occur later in time as a result of the proposed project. They may occur outside of the area directly affected by the proposed project. Cumulative effects include the effects of future state, local, or private actions that are reasonably certain to occur in the project area.

3.5.2.1 Build Alternatives

Due to the minor direct surface water impacts, minimal indirect and secondary impacts are anticipated. Due to the developed nature of the surrounding area and the project’s minor surface water impacts, no cumulative impacts are anticipated to occur.

3.5.2.2 No-Build Alternative

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

3.6 Wetland Impact Mitigation

The project study area is located within the service areas of CGW Mitigation Bank and Basin 22 Mitigation Bank (FKA Corrigan Ranch). The project is located within the Central Indian River Lagoon basin. It is anticipated that mitigation may be required by the agencies. Mitigation credits could be purchased from one of the aforementioned permitted wetland mitigation banks. Following desktop research, Basin 22 Mitigation Bank has a

SECTION 3 – WETLANDS AND SURFACE WATERS

sufficient number of palustrine credits to mitigate the proposed impacts appropriately. CGW Mitigation Bank has only estuarine credits available.

All UMAM scores, UMAM calculations, preliminary surface water boundaries and determinations discussed are subject to revisions and approval by regulatory agencies during the permitting process. The exact type of mitigation to offset impacts will be coordinated with the SJRWMD during the permitting phase of this project. Mitigation will be addressed pursuant to Chapter 373.4137, FS in order to satisfy all mitigation requirements of Part IV, Chapter 373, FS and 33 U.S.C. 1344.

This project is in conformance with Executive Order 11990, Protection of Wetlands; consideration was given to avoiding and/or minimizing wetland impacts. The proposed project will have no significant short-term or long-term adverse impacts to wetlands, there is no practicable alternative to construction in wetlands, and measures have been taken to minimize harm to wetlands.

For impacts to surface waters, it is anticipated that mitigation would be required by both the SJRWMD and USACE. Permanent impacts to surface waters associated with pilings and bridge widening activities resulted in 0.06 units of functional loss. Shade impacts are not considered since this area for surface waters consists of non-vegetated bottom. No impacts to OSWs are proposed to be mitigated. UMAM scores for SW-1 are provided in **Table 3-1**. UMAM datasheets are included in **Appendix I**.

4.0 ANTICIPATED PERMITS

The USACE and SJRWMD regulate impacts to wetlands within the project area. Other agencies, including the USFWS, EPA, and the FWC, review and comment on wetland permit applications. The FWC issues permits for gopher tortoise relocation activities and protected bird nest take. No gopher tortoise burrows or nests were recorded within the project study area. Additional surveys and coordination may be required during the permitting phase. In addition, the FDEP regulates stormwater discharges from construction sites. The complexity of the permitting process will depend on the impact to jurisdictional wetlands and surface waters, EFH, CH, and listed species areas. It is anticipated that the following permits will be required for this project:

Because the project is adding a travel lane, it is currently anticipated that the project will qualify for a SJRWMD Individual Permit under FAC Chapter 62-330.054. Due to the section of new alignment, it is anticipated that the project will qualify for a USACE Nationwide Permit #14 for Linear Transportation Projects. This permit allows for the construction of transportation facilities; however, impacts cannot exceed 0.5 acre for non-tidal systems.

<u>Permit</u>	<u>Issuing Agency</u>
Section 404 Dredge and Fill NWP 14	USACE
ERP	SJRWMD
NPDES Permit	FDEP

4.1 Section 404 Dredge and Fill Permit

It is anticipated that a permit be required from the USACE. Surface water impacts are related to proposed modifications to abutments and bridge approaches and pilings. Due to the section of new alignment, it is anticipated that the project will qualify for a USACE NWP 14 - Linear Transportation Projects. This permit allows for the construction of transportation facilities; however, impacts cannot exceed 0.5 acre for non-tidal systems.

4.2 ERP

SJRWMD requires an ERP when construction of any project results in the creation or modification of a surface water management system or results in impacts to jurisdictional wetlands. The ERP permitting process depends on the size of the project and/or the extent of wetland impacts. This project is anticipated to require an individual permit.

4.3 NPDES

40 CFR Part 122 prohibits point source discharges of stormwater to waters of the U.S. without an NPDES permit. Under the State of Florida's delegated authority to administer the NPDES program, construction sites that will result in greater than one acre of disturbance must file for and obtain either coverage under an appropriate generic permit contained in Chapter 62-621, FAC, or an individual permit issued pursuant to Chapter 62-620, FAC.

5.0 CONCLUSIONS

5.1 Protected Species and Critical Habitat

The project may affect but is not likely to adversely affect federally and state listed wildlife species.

The project is anticipated to have **no effect** on the following federally listed species:

- Fragrant prickly-apple
- Lakela's mint
- Miami blue butterfly
- Loggerhead sea turtle
- Green sea turtle
- Leatherback sea turtle
- Hawksbill sea turtle
- Atlantic salt marsh snake
- Florida scrub-jay
- Red knot
- Audubon's crested caracara
- Piping plover
- Eastern black rail
- Roseate tern
- Florida bonneted bat
- Southern beach mouse
- Florida panther

Federally listed species assigned an effect determination of **may affect, not likely to adversely affect** include:

- Eastern indigo snake
- Wood stork
- West Indian manatee

SECTION 5 – CONCLUSIONS

There is **no effect anticipated** on the following state listed species:

- Snowy plover
- Black skimmer
- Least tern

There is **no adverse effect anticipated** on the following state listed species:

- Gopher tortoise
- Florida sandhill crane
- Florida burrowing owl
- Little blue heron
- Reddish egret
- Tricolored heron
- Southeastern American kestrel
- Roseate spoonbill

There are species which may occur in the project vicinity that are not listed as threatened or endangered but receive other legal protection. The project is not expected to negatively impact the bald eagle which is protected under the BGEPA, the MBTA, and State law (FAC 68A-16.002).

No roosting bats were observed within the project study area during field reviews. The tricolored bat is not likely to roost or forage within the project study area. FDOT will continue coordination with USFWS to determine the potential effect to the tricolored bat once a final listing decision has been made. No impacts are anticipated to state or federally protected bats due to the proposed project.

Multiple avenues of protection will be employed to negate and minimize any potential effects to these species. Some of the measures employed may include detailed surveys and agency coordination during the project design phase, including providing appropriate mitigation to offset impacts. During construction, best management practices, adherence to *FDOT's Standard Specification for Road and Bridge Construction* and use of preconstruction surveys are strategies that will be considered, as needed, for protection of listed species.

The study area occurs within areas of CH for the West Indian manatee. No impacts to manatee CH are anticipated as a result of this project. For these reasons, it was

determined that the Build Alternatives will result in **no destruction or adverse modification** of CH for the West Indian manatee.

5.2 Wetlands and Surface Waters

Build Alternative 1 was determined to be the Preferred Alternative. A total of 0.22 acres of SW and OSW are proposed to be impacted by the Preferred Alternative. Surface water impacts (SW-1) for the Preferred Alternative total 0.11 acres, which equates to a total functional loss of 0.06 palustrine herbaceous units. The surface waters of the Main Canal will be impacted temporarily during the bridge widening Build Alternative 1 improvements, but the existing canal surface waters will be maintained in the post-development condition. Shade impacts are not considered since this area for surface waters consists of non-vegetated bottom. This surface water is a canal system which was determined to be SJRWMD and USACE jurisdictional. It is manmade, with slopes steeper than 4 feet to 1 foot (horizontal to vertical) and was excavated in hydric soils to drain the surrounding residential area and existing roadway.

Other surface water (OSW-1) impacts for the Preferred Alternative total 0.11 acres. Mitigation is not required for impacts to OSWs.

The FDOT will address impacts to wetland and/or surface waters and provide appropriate wetland mitigation in future phases of this project.

No wetlands are present within the project study area.

5.3 Implementation Measures

Implementation measures are actions that the FDOT is required to take per procedure, standard specifications, or other agency requirements. These are standard measures which will be implemented at a later project phase. For this project, implementation measures that address protected species and wetlands-related items include:

- Practicable measures to avoid or minimize impacts will be further addressed during final design for the project;
- Best Management Practices (BMPs) will be utilized for erosion control during construction to minimize impacts to any wetlands and surface waters that are affected by the proposed project; and
- Unavoidable impacts to surface waters will be mitigated pursuant to S. 373.4137 FS to satisfy all mitigation requirements of Part IV, Chapter 373 FS and 33 U.S.C.s 1344 should state and/or federal regulations require it.

5.4 Commitments

Based upon findings of the preliminary data collection, general corridor surveys, and ongoing coordination with the USFWS and FWC, the FDOT is considering the following project commitments:

1. The most recent version of *USFWS' Standard Protection Measures for the Eastern Indigo Snake* will be adhered to during construction of the proposed project (**Appendix C**).
2. The most recent version of the *USFWS Standard Manatee Conditions for In-Water Work* will be adhered to during construction of the proposed project (**Appendix F**).
3. A gopher tortoise burrow survey within suitable tortoise habitat will be conducted prior to construction.

5.5 Agency Coordination

This Natural Resources Evaluation will be submitted to the following agencies: USFWS, NMFS, FWC, USACE, and SJRWMD.

6.0 REFERENCES

- Anderson, Patti J. and Richard E. Weaver. 2010. Notes on Florida's Endangered and Threatened Plants. Florida Department of Agriculture and Consumer Services.
- Collier Metropolitan Planning Organization. 2015. Collier 2040 Long Range Transportation Plan Final Report. Figure 4-5 & 4-6. <http://www.colliermplanning.org/modules/showdocument.aspx?documentid=7725> [Accessed December 13, 2018].
- Cowardin, Lewis M., Carter, Virginia, Golet, Francis C., and Edward T. LaRoe. 1979. Classification of Wetlands and Deepwater Habitats of the United States. U.S. Fish and Wildlife Service Publication, Washington D.C.
- Delany, Michael F. 1996. Letter. April 16, 1996. On file at U.S. Fish and Wildlife Service, South Florida Ecosystem Office; Vero Beach, Florida.
- Florida Association of Environmental Soil Scientists. 2007. Hydric Soils of Florida Handbook, 4th Edition, Gainesville, Florida.
- Florida Department of Transportation. 1999. Florida Land Use, Cover and Forms Classification System. Surveying and Mapping Thematic Mapping Section. Tallahassee, Florida.
- Florida Fish and Wildlife Conservation Commission. 2008. Bald Eagle Management Plan. Florida Fish and Wildlife Conservation Commission, Tallahassee, Florida.
- Florida Fish and Wildlife Conservation Commission <https://public.myfwc.com/FWRI/EagleNests/nestlocator.aspx#search> [Accessed January 3, 2019].
- Florida Fish and Wildlife Conservation Commission. 2018. Florida's Official Endangered and Threatened Species List (Updated December 2018).
- Florida Natural Areas Inventory. 2001. Field Guide to the Rare Animals of Florida. http://www.fnai.org/FieldGuide/pdf/Charadrius_melodus.PDF
- South Florida Water Management District. 2014. Environmental Resource Permit Information Manual. Regulation Division South Florida Water Management District; West Palm Beach, Florida.
- U.S. Army Corps of Engineers Environmental Laboratory. 2010. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region (Version 2.0). U.S. Army Engineer Research and Development Center, Vicksburg, Mississippi.

SECTION 6 – REFERENCES

- U.S. Department of Agriculture. 2018. NRCS. Soil Survey of Collier County, Florida. <https://www.nrcs.usda.gov/wps/portal/nrcs/surveylist/soils/survey/state/?stateId=FL> [Accessed December 13, 2018].
- U.S. Fish and Wildlife Service. 2004. DRAFT Snail Kite Survey Protocol. South Florida Ecological Services Office, Vero Beach, Florida. <https://www.fws.gov/verobeach/BirdsPDFs/SnailKiteSurveyProtocol.pdf>
- U.S. Fish and Wildlife Service. 2004. The Species Conservation Guidelines for the Florida Scrub-jay (*Aphelocoma coerulescens*). *South Florida Ecological Services Office, Vero Beach, Florida*. <http://www.fws.gov/verobeach/BirdsPDFs/FSJConservationGuidelinesALLINCLUSIVE1.pdf>

Appendix A
NRCS Soils Descriptions

Appendix A: Project Area NRCS Soils Descriptions

Myakka-Myakka, Wet, Fine Sands, 0 to 2 Percent Slopes (NRCS Code 5)

This soil type comprises 35.58 percent of the study area. This is a nearly level to gently sloping, poorly-drained soil that occurs in citrus groves, improved pastures, and other upland areas. The water table is at a depth of 6-18 inches. The natural vegetation is longleaf pine, slash pine, saw palmetto and native grasses.

Paola Sand, 0 to 5 Percent Slopes (NRCS Code 8)

This soil type comprises 0.15 percent of the study area. This well to excessively drained and very rapid permeability soil occurs in developed urban land. A few small areas are cleared and used for growing citrus. Native vegetation consists of cabbage palm, running oak, saw palmetto, common sea grape, sea oats, bays, and oaks.

St. Lucie Sand, 0 to 8 Percent Slopes (NRCS Code 11)

This soil type comprises 11.27 percent of the study area. This excessively drained soil occurs in sand pine scrub, flatwoods and xeric uplands. The water table is at a depth of more than 80 inches. Natural vegetation is live oak, sand pine, dwarf willow, saw palmetto, rosemary, prickly pear cactus, and lichens.

Wabasso-Wabasso, Wet, Fine Sand, 0 to 2 Percent Slopes (NRCS Code 13)

This soil type comprises 0.18 percent of the study area. This poorly drained soil occurs where natural vegetation consists of longleaf pine, slash pine, cabbage palm, live oak, with an understory of saw palmetto, laurel oak, and wax myrtle.

Pomello Sand, 0 to 5 Percent Slopes (NRCS Code 21)

This soil type comprises 0.94 percent of the study area. This somewhat poorly and moderately well drained occurs in forest and range production, wildlife habitat, and recreation, some areas are used for pasture and urban development. Potential native vegetation consists of scrub oak, dwarf live oak, saw palmetto, longleaf pine, and slash pine.

Urban Land, 0 to 2 Percent Slopes (NRCS Code 22)

This soil type comprises 44.10 percent of the study area.

Arents, 0 to 5 Percent Slopes (NRCS Code 23)

This soil type comprises 6.40 percent of the study area. This nearly level to gently sloping, somewhat poorly drained soil. These soils have been deeply mixed by plowing, and other methods of moving by humans. Arents are used mostly as cropland, urban land, or pasture. Some are used as wildlife habitat.

Waters of the Atlantic (NRCS Code 100)

This soil type comprises 1.38 percent of the study area. This is a canal that headwaters west and discharges east to the Indian River Lagoon.

Appendix B

FLUCFCS Descriptions

Appendix B: Project Study Area Land Use Descriptions

Residential, Medium Density (FLUCFCS 1200)

Residential, medium density contains 2-5 units per acre. Residential uses range from high-density urban housing developments to low-density rural areas characterized by a relatively small number of homes per acre. The variation extends from the multi-family apartment complexes generally located in larger urban centers to those single-family houses sometimes having lot sizes of more than one acre.

Residential, High Density (FLUCFCS 1300)

Residential, high density contains 6 or more dwelling units per acre. Residential land uses range from high-density urban housing developments to low-density rural areas characterized by a relatively small number of homes per acre. The variation extends from the multi-family apartment complexes generally located in larger urban centers to those single-family houses sometimes having lot sizes of more than one acre.

Commercial and Services (FLUCFCS 1400)

Commercial areas are predominantly associated with the distribution of products and services. This category consists of a large number of individual types of commercial land uses which often occur in complex mixtures.

Food Processing (FLUCFCS 1510)

Citrus processing plants, sugar refineries and seafood packaging plants are typical examples of this category.

Community Recreational Facilities (FLUCFCS 1860)

Facilities that host recreational activities for the community at large.

Herbaceous Upland Nonforested (FLUCFCS 3100)

This category includes upland prairie grasses, which occur on non-hydric soils but may be occasionally inundated by water. These grasslands are generally treeless with a variety of vegetation types dominated by grasses, sedges, rushes and other herbs including wire grasses (*Aristida stricta*) with some saw palmetto (*Serenoa repens*) present.

Shrub and Brushland (FLUCFCS 3200)

This category includes saw palmettos, gallberry (*Ilex glabra*), southern wax myrtle (*Morella cerifera*), coastal scrub and other shrubs and brush. Generally, saw palmetto is the most prevalent plant cover intermixed with a wide variety of other woody scrub plant species as well as various types of short herbs and grasses. Vegetation documented includes saw palmetto, southern wax myrtle, railroad vine (*Ipomoea pes-caprae*), bay bean (*Canavalia rosea*) and sea grape (*Coccoloba uvifera*).

Mixed Upland Nonforested (FLUCFCS 3300)

Mixed upland nonforested communities is an intermixture of either grassland or shrub-brushland range species. Vegetation documented includes southern wax myrtle, saw palmetto, wild coffee (*Psychotria nervosa*), and railroad vine.

Upland Mixed Coniferous/Hardwood (FLUCFCS 4340)

Upland mixed coniferous/hardwood includes hardwood communities where no single hardwood species appears to achieve 66% dominance of the canopy vegetation. Vegetation includes southern live oak (*Quercus virginiana*), laurel oak (*Quercus laurifolia*), cabbage palm (*Sabal palmetto*), carrot wood (*Canarium australianum*), Brazillian pepper (*Schinus terebinthifolia*), wild coffee and Virginia creeper vine (*Parthenocissus quinquefolia*).

Streams and Waterways (FLUCFCS 5100)

Streams and waterways within the project boundary include the Main Canal that extends southwest to the west Vero Beach corridor and east to the Indian River Lagoon. The east and west sides of the canal at US 1 are separated by a dam/ lock system. With a greater than 4 to 1 slope not being conducive for wetland vegetation, only mixed grasses and ornamental plants were observed.

Reservoirs (FLUCFCS 5300)

Reservoirs within the project boundary are stormwater detention ponds that were created to help direct stormwater runoff from the adjacent Vero Beach airport and wastewater treatment plant. In reviewing aerial imagery, it appears that construction began on these ponds in 2009 and was completed in 2010. Typical vegetation within the ponds include Carolina willow (*Salix caroliniana*), Peruvian primrose willow (*Ludwigia peruviana*) Brazilian pepper, wax myrtle, and common cattail (*Typha latifolia*).

Mixed Scrub-Shrub Wetland (FLUCFCS 6460)

This community is associated with topographic depressions and poorly drained soil. Associated species include pond cypress, swamp tupelo, willows, and other low scrub with no dominate species.

Airports (FLUCFCS 8110)

Airport facilities include runways, intervening land, terminals, service buildings, navigational aids, fuel storage and parking lots.

Roads and Highways (FLUCFCS 8140)

Divided 4 lane roads with medians

Canals and Locks (FLUCFCS 8160)

Canal and lock system on the west side of the bridge crossing the Main Canal. If closed, this canal and lock system would restrict flow from the west.

Sewage Treatment (FLUCFCS 8340)

Consists of all related facilities such as aeration fields, digesters, etc.

Appendix C

USFWS Standard Protection
Measures for the Eastern Indigo
Snake

STANDARD PROTECTION MEASURES FOR THE EASTERN INDIGO SNAKE

U.S. Fish and Wildlife Service

December 2023

The Standard Protection Measures for the Eastern Indigo Snake (Plan) below has been developed by the U.S. Fish and Wildlife Service (USFWS) in Florida and Georgia for use by project proponents and their construction personnel help minimize adverse impacts to eastern indigo snakes. However, implementation of this Plan does not replace any state or federal consultation or regulatory requirements. At least 30 days prior to any land disturbance activities, the project proponent shall notify the appropriate USFWS Field Office (see Field Office contact information) via e-mail that the Plan will be implemented as described below.

As long as the signatory of the e-mail certifies compliance with the below Plan (including use of the approved poster and pamphlet ([USFWS Eastern Indigo Snake Conservation webpage](#))), no further written confirmation or approval from the USFWS is needed regarding use of this Plan as a component of the project.

If the project proponent 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. The project proponent 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.

STANDARD PROTECTION MEASURES

BEFORE AND DURING CONSTRUCTION ACTIVITIES:

- All Project personnel shall be notified about the potential presence and appearance of the federally protected eastern indigo snake (*Drymarchon couperi*).
- All personnel shall be advised that there are civil and criminal penalties for harassing, harming, pursuing, hunting, shooting, wounding, killing, capturing, or collecting the species, in knowing violation of the Endangered Species Act of 1973.
- The project proponent or designated agent will post educational posters in the construction office and throughout the construction site. The posters must be clearly visible to all construction staff and shall be posted in a conspicuous location in the

Project field office until such time that Project construction has been completed and time charges have stopped.

- Prior to the onset of construction activities, the project proponent or 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 pamphlet 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. Photos of eastern indigo snakes may be accessed on USFWS, Florida Fish and Wildlife Conservation Commission and/or Georgia Department of Natural Resources websites.
- Each day, prior to the commencement of maintenance or construction activities, the Contractor shall perform a thorough inspection for the species of all worksite equipment.
- If an eastern indigo snake (alive, dead or skin shed) 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 Office. The contact information for the USFWS is provided below and on the referenced posters and pamphlets.
- During initial site clearing activities, an onsite observer is recommended 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).
- Periodically during construction activities, the project area should be visited 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.
- For erosion control use biodegradable, 100% natural fiber, net-free rolled erosion control blankets to avoid wildlife entanglement.

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 (See USFWS Field Office Contact Information).

USFWS FIELD OFFICE CONTACT INFORMATION

Georgia Field Office: Phone: (706) 613-9493, email: gaes_assistance@fws.gov
Florida Field Office: Phone: (352) 448-9151, email: fw4flesregs@fws.gov

POSTER & PAMPHLET INFORMATION

Posters with the following information shall be placed at strategic locations on the construction site and along any proposed access roads (final posters for Plan compliance are available on our website in English and Spanish and should be printed on 11 x 17in or larger paper and laminated ([USFWS Eastern Indigo Snake Conservation webpage](#))). Pamphlets are also available on our webpage and should be printed on 8.5 x 11in paper and folded, and available and distributed to staff working on the site.

POSTER CONTENT (ENGLISH):

ATTENTION

Federally-Threatened Eastern Indigo Snakes may be present on this site!

Killing, harming, or harassing eastern indigo snakes is strictly prohibited and punishable under State and Federal Law.

IF YOU SEE A LIVE EASTERN INDIGO SNAKE OR ANY BLACK SNAKE ON THE SITE:

- Stop land disturbing activities and allow the snake time to move away from the site without interference. Do NOT attempt to touch or handle the snake.
- Take photographs of the snake, if possible, for identification and documentation purposes.
- Immediately notify supervisor/agent, and a U.S. Fish and Wildlife Service (USFWS) Ecological Services Field Office, with the location information and condition of the snake.
- If the snake is located near clearing or construction activities that will cause harm to the snake, the activities must pause until a representative of the USFWS returns the call (within one day) with further guidance.

IF YOU SEE A DEAD EASTERN INDIGO SNAKE ON THE SITE:

- Stop land disturbing activities and immediately notify supervisor/applicant, and a USFWS Ecological Services Field 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.

DESCRIPTION: The eastern indigo snake is one of the largest non-venomous snakes in North America, reaching up to 8 ft long. Named for the glossy, blue-black scales above and slate blue below, they often have orange to reddish color (cream color in some cases)

in the throat area. They are not typically aggressive.

SIMILAR SPECIES: The black racer resembles the eastern indigo snake. However, black racers have a white or cream chin, and thinner bodies.

LIFE HISTORY: Eastern indigo snakes live in a variety of terrestrial habitat types. Although they prefer uplands, they also use wetlands and agricultural areas. They will shelter inside gopher tortoise burrows, other animal burrows, stumps, roots, and debris piles. Females may lay from 4 to 12 white eggs as early as April through June, with young hatching in late July through October.

PROTECTED STATUS: The eastern indigo snake is protected by the USFWS, Florida Fish and Wildlife Conservation Commission, and Georgia Department of Natural Resources. Any attempt to kill, harm, harass, pursue, hunt, shoot, wound, trap, capture, collect, or engage eastern indigo snakes is prohibited by the U.S. Endangered Species Act. Penalties include a maximum fine of \$25,000 for civil violations and up to \$50,000 and/or imprisonment for criminal offenses. Only authorized individuals with a permit (or an Incidental Take Statement associated with a USFWS Biological Opinion) may handle an eastern indigo snake.

Please contact your nearest USFWS Ecological Services Field Office if a live or dead eastern indigo snake is encountered:

Florida Office: (352) 448-9151

Georgia Office: (706) 613-9493

POSTER CONTENT (SPANISH):

ATENCIÓN

¡Especie amenazada, la culebra Índigo del Este, puede ocupar el área!

Matar, herir o hostigar culebras Índigo del Este es estrictamente prohibido bajo la Ley Federal.

SI VES UNA CULEBRA ÍNDIGO DEL ESTE O UNA CULEBRA NEGRA VIVA EN EL ÁREA:

- Pare excavación y permite el movimiento de la culebra fuera del área sin interferir. NO atentes tocar o recoger la culebra.
- Fotografié la culebra si es posible para identificación y documentación.
- Notifique supervisor/agente, y la Oficina de Campo de Servicios Ecológicos del Servicio Federal de Pesca y Vida Silvestre (USFWS) apropiada con información acerca del sitio y condición de la culebra.

- Si la culebra está cerca de un área de construcción que le pueda causar daño, las actividades deben parar hasta un representante del USFWS regrese la llamada (dentro de un día) con más orientación.

SI VES UNA CULEBRA ÍNDIGO DEL ESTE MUERTA EN EL ÁREA:

- Pare excavación. Notifique supervisor/aplicante, y la Oficina de Campo de Servicios Ecológicos apropiada con información acerca del sitio y condición de la culebra.
- Fotografié la culebra si es posible para identificación y documentación.
- Emerge completamente la culebra en agua y congele la especie hasta que personal apropiado de la agencia de vida silvestre la recoja.

DESCRIPCIÓN. La culebra Índigo del Este es una de las serpientes sin veneno más grande en Norte América, alcanzando hasta 8 pies de largo. Su nombre proviene del color azul-negro brillante de sus escamas, pero pueden tener un color anaranjado-rojizo (color crema en algunos casos) en su mandíbula inferior. No tienden a ser agresivas.

SERPIENTES PARECIDAS. La corredora negra, que es de color negro sólido, es la única otra serpiente que se asemeja a la Índigo del Este. La corredora negra se diferencia por una mandíbula inferior color blanca o crema y un cuerpo más delgado.

HÁBITATS Y ECOLOGÍA. La culebra Índigo del Este vive en una variedad de hábitats, incluyendo tierras secas, humedales, y áreas de agricultura. Ellas buscan refugio en agujeros o huecos de tierra, en especial madrigueras de tortugas de tierra. Las hembras ponen 4 hasta 12 huevos blancos entre abril y junio, y la cría emergen entre julio y octubre.

PROTECCIÓN LEGAL. La culebra Índigo del Este es clasificada como especie amenazada por el USFWS, la Comisión de Conservación de Pesca y Vida Silvestre de Florida y el Departamento de Recursos Naturales de Georgia. Intento de matar, hostigar, herir, lastimar, perseguir, cazar, disparar, capturar, coleccionar o conducta parecida hacia las culebras Índigo del Este es prohibido por la Ley Federal de Especies en Peligro de Extinción. Penalidades incluyen un máximo de \$25,000 por violaciones civiles y \$50,000 y/o encarcelamiento por actos criminales. Solos individuales autorizados con un permiso o Determinación de toma incidental (Incidental Take Statement) asociado con una Opinión Biológico del USFWS pueden recoger una Índigo del Este.

Por favor de contactar tu Oficina de Campo de Servicios Ecológicos más cercana si encuentras una culebra Índigo del Este viva o muerta:

Oficina de Florida: (352) 448-9151

Oficina de Georgia: (706) 613-9493

Appendix D

USFWS Programmatic Effect Determination Key for the Eastern Indigo Snake (South Florida)



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.

Appendix E

USFWS Effect Determination Key for the Wood Stork in South Peninsular Florida



United States Department of the Interior



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

May 18, 2010

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

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

Dear Mr. Kinard:

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

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

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

Wood stork

Habitat

The wood stork is primarily associated with freshwater and estuarine habitats that are used for nesting, roosting, and foraging. Wood storks typically construct their nests in medium to tall



trees that occur in stands located either in swamps or on islands surrounded by relatively broad expanses of open water (Ogden 1991, 1996; Rodgers et al. 1996). Successful colonies are those that have limited human disturbance and low exposure to land-based predators. Nesting colonies protected from land-based predators are characterized as those surrounded by large expanses of open water or where the nest trees are inundated at the onset of nesting and remain inundated throughout most of the breeding cycle. These colonies have water depths between 0.9 and 1.5 meters (3 and 5 feet) during the breeding season.

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

Wood storks occur in a wide variety of wetland habitats. Typical foraging sites for the wood stork include freshwater marshes and stock ponds, shallow, seasonally flooded roadside and agricultural ditches, narrow tidal creeks and shallow tidal pools, managed impoundments, and depressions in cypress heads and swamp sloughs. Because of their specialized feeding behavior, wood storks forage most effectively in shallow-water areas with highly concentrated prey. Through tactolocation, or grope feeding, wood storks in south Florida feed almost exclusively on fish between 2 and 25 centimeters [cm] (1 and 10 inches) in length (Ogden et al. 1976). Good foraging conditions are characterized by water that is relatively calm, uncluttered by dense thickets of aquatic vegetation, and having a water depth between 5 and 38 cm (5 and 15 inches) deep, although wood storks may forage in other wetlands. Ideally, preferred foraging wetlands would include a mosaic of emergent and shallow open-water areas. The emergent component provides nursery habitat for small fish, frogs, and other aquatic prey and the shallow, open-water areas provide sites for concentration of the prey during seasonal dry-down of the wetland.

Conservation Measures

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

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

In an effort to reduce correspondence in effect determinations and responses, the Service is providing the Wood Stork Effect Determination Key below. If the use of this key results in a Corps determination of "no effect" for a particular project, the Service supports this determination. If the use of this Key results in a determination of NLAA, the Service concurs with this determination¹. This Key is subject to revisitation as the Corps and Service deem necessary.

The Key is as follows:

- A. Project within 0.76 km (0.47 mile)² of an active colony site³ "may affect"⁴
- Project impacts Suitable Foraging Habitat (SFH)⁵ at a location greater than 0.76 km (0.47 mile) from a colony site..... "go to B"

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

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

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

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

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

Project does not affect SFH..... “no effect”.

B. Project impact to SFH is less than 0.20 hectare (one-half acre)⁶.....NLAA¹”

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

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

Project impacts to SFH within the CFA of a colony sitego to E

D. Project impacts to SFH have been avoided and minimized to the extent practicable; compensation (Service approved mitigation bank or as provided in accordance with Mitigation Rule 33 CFR Part 332) for unavoidable impacts is proposed in accordance with the CWA section 404(b)(1) guidelines; and habitat compensation replaces the foraging value matching the hydroperiod⁷ of the wetlands affected and provides foraging value similar to, or higher than, that of impacted wetlands. See Enclosure 3 for a detailed discussion of the hydroperiod foraging values, an example, and further guidance⁸..... NLAA¹”

Project not as above..... “may affect⁴”

E. Project provides SFH compensation in accordance with the CWA section 404(b)(1) guidelines and is not contrary to the HMG; habitat compensation is within the appropriate CFA or within the service area of a Service-approved mitigation bank; and habitat compensation replaces foraging value, consisting of wetland enhancement or restoration matching the hydroperiod⁷ of the wetlands affected, and provides foraging value similar

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

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

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

to, or higher than, that of impacted wetlands. See Enclosure 3 for a detailed discussion of the hydroperiod foraging values, an example, and further guidance⁸..... "NLAA¹"

Project does not satisfy these elements "may affect⁴"

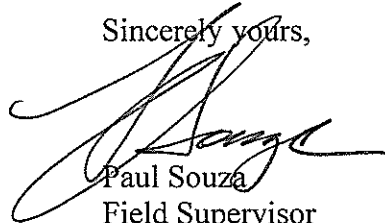
This Key does not apply to Comprehensive Everglades Restoration Plan projects, as they will require project-specific consultations with the Service.

Monitoring and Reporting Effects

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

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

Sincerely yours,



Paul Souza
Field Supervisor
South Florida Ecological Services Office

Enclosures

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

LITERATURE CITED

- Ceilley, D.W. and S.A. Bortone. 2000. A survey of freshwater fishes in the hydric flatwoods of flint pen strand, Lee County, Florida. Proceedings of the 27th Annual Conference on Ecosystems Restoration and Creation, 70-91. Hillsborough Community College; Hillsborough County, Florida.
- Flemming, D.M., W.F. Wolff, and D.L. DeAngelis. 1994. Importance of landscape heterogeneity to wood storks. Florida Everglades Management 18: 743-757.
- 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.
- Ogden, J.C., J.A. Kushlan, and J.T. Tilmant. 1976. Prey selectivity by the wood stork. Condor 78(3):324-330.
- Ogden, J.C. 1996. Wood Stork in J.A. Rodgers, H. Kale II, and H.T. Smith, eds. Rare and endangered biota of Florida. University Press of Florida; Gainesville, Florida.
- 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. 1990. Habitat management guidelines for the wood stork in the southeast region. Prepared by John C. Ogden for the Southeast Region U.S. Fish and Wildlife Service; Atlanta, Georgia.
- 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>.
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Appendix F
Standard Manatee Conditions for In-
Water Work

STANDARD MANATEE CONDITIONS FOR IN-WATER WORK

2011

The permittee shall comply with the following conditions intended to protect manatees from direct project effects:

- a. All personnel associated with the project shall be instructed about the presence of manatees and manatee speed zones, and the need to avoid collisions with and injury to manatees. The permittee shall advise all construction personnel that there are civil and criminal penalties for harming, harassing, or killing manatees which are protected under the Marine Mammal Protection Act, the Endangered Species Act, and the Florida Manatee Sanctuary Act.
- b. All vessels associated with the construction project shall operate at "Idle Speed/No Wake" at all times while in the immediate 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.
- c. Siltation or turbidity barriers shall be made of material in which manatees cannot become entangled, shall be properly secured, and shall be regularly monitored to avoid manatee entanglement or entrapment. Barriers must not impede manatee movement.
- d. All on-site project personnel are responsible for observing water-related activities for the presence of manatee(s). All in-water operations, including vessels, must be shutdown if a manatee(s) comes within 50 feet of the operation. Activities will not resume until the manatee(s) has moved beyond the 50-foot radius of the project operation, or until 30 minutes elapses if the manatee(s) has not reappeared within 50 feet of the operation. Animals must not be herded away or harassed into leaving.
- e. Any collision with or injury to a manatee shall be reported immediately to the Florida Fish and Wildlife Conservation Commission (FWC) Hotline at 1-888-404-3922. Collision and/or injury should also be reported to the U.S. Fish and Wildlife Service in Jacksonville (1-904-731-3336) for north Florida or Vero Beach (1-772-562-3909) for south Florida, and to FWC at ImperiledSpecies@myFWC.com
- f. Temporary signs concerning manatees shall be posted prior to and during all in-water project activities. All signs are to be removed by the permittee upon completion of the project. Temporary signs that have already been approved for this use by the FWC must be used. One sign which reads *Caution: Boaters* must be posted. A second sign measuring at least 8 ½" by 11" explaining the requirements for "Idle Speed/No Wake" and the shut down of in-water operations must be posted in a location prominently visible to all personnel engaged in water-related activities. These signs can be viewed at MyFWC.com/manatee. Questions concerning these signs can be sent to the email address listed above.

CAUTION: MANATEE HABITAT

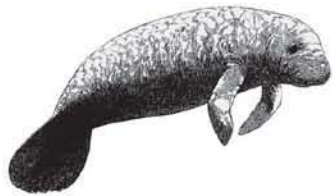
All project vessels

IDLE SPEED / NO WAKE

When a manatee is within 50 feet of work
all in-water activities must

SHUT DOWN

Report any collision with or injury to a manatee:



Wildlife Alert:

1-888-404-FWCC(3922)

cell *FWC or #FWC

Appendix G

USACE Effect Determination Key for the Manatee in Florida

**THE CORPS OF ENGINEERS, JACKSONVILLE DISTRICT, AND THE STATE OF
FLORIDA EFFECT DETERMINATION KEY FOR THE MANATEE IN FLORIDA
April 2013**

Purpose and background of the key

The purpose of this document is to provide guidance to improve the review of permit applications by U.S. Army Corps of Engineers' (Corps) Project Managers in the Regulatory Division regarding the potential effects of proposed projects on the endangered West Indian manatee (*Trichechus manatus*) in Florida, and by the Florida Department of Environmental Protection or its authorized designee or Water Management District, for evaluating projects under the State Programmatic General Permit (SPGP) or any other Programmatic General Permits that the Corps may issue for administration by the above agencies. Such guidance is contained in the following dichotomous key. The key applies to permit applications for in-water activities such as, but not limited to: (1) dredging [new or maintenance dredging of not more than 50,000 cubic yards], placement of fill material for shoreline stabilization, and construction/placement of other in-water structures as well as (2) construction of docks, marinas, boat ramps and associated trailer parking spaces, boat slips, dry storage or any other watercraft access structures or facilities.

At a certain step in the key, the user is referred to graphics depicting important manatee areas or areas with inadequate protection. The maps can be downloaded from the Corps' web page at <http://www.saj.usace.army.mil/Missions/Regulatory/SourceBook.aspx>. We intend to utilize the most recent depiction of these areas, so should these areas be modified by statute, rule, ordinance and/or other legal mandate or authorization, we will modify the graphical depictions accordingly. These areas may be shaded or otherwise differentiated for identification on the maps.

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

Scope of the key

This key should only be used in the review of permit applications for effect determinations on manatees and should not be used for other listed species or for other aquatic resources such as Essential Fish Habitat (EFH). Corps Project Managers should ensure that consideration of the project's effects on any other listed species and/or on EFH is performed independently. This key may be used to evaluate applications for all types of State of Florida (State Programmatic General Permits, noticed general permits, standard general permits, submerged lands leases, conceptual and individual permits) and Department of the Army (standard permits, letters of permission, nationwide permits, and regional general permits) permits and authorizations. The final effect determination will be based on the project location and description; the potential effects to manatees, manatee habitat, and/or manatee critical habitat; and any measures (such as project components, standard construction precautions, or special conditions included in the authorization) to avoid or minimize effects to manatees or manatee critical habitat. 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 shall refer to the Manatee Programmatic Biological Opinion, dated March 21, 2011, for guidance on eliminating or minimizing potential adverse effects resulting from the proposed project. If unable to resolve the adverse effects, the Corps may refer the applicant to the U.S. Fish and Wildlife Service (Service) for further assistance in attempting to revise the proposed project to a “may affect, not likely to adversely affect” level. The Service will coordinate with the Florida Fish and Wildlife Conservation Commission (FWC) and the counties, as appropriate. Projects that provide new access for watercraft and key to “may affect, not likely to adversely affect” may or may not need to be reviewed individually by the Service.

MANATEE KEY
Florida¹
April 2013

The key is not designed to be used by the Corps' Regulatory Division for making their effect determinations for dredging projects greater than 50,000 cubic yards, the Corps' Planning Division in making their effect determinations for civil works projects or by the Corps' Regulatory Division for making their effect determinations for projects of the same relative scope as civil works projects. These types of activities must be evaluated by the Corps independently of the key.

A. Project is not located in waters accessible to manatees and does not directly or indirectly affect manatees (see Glossary).....*No effect*

Project is located in waters accessible to manatees **or** directly or indirectly affects manatees **B**

B. Project consists of one or more of the following activities, all of which are *May affect*:

1. blasting or other detonation activity for channel deepening and/or widening, geotechnical surveys or exploration, bridge removal, movies, military shows, special events, etc.;
2. installation of structures which could restrict or act as a barrier to manatees;
3. new or changes to existing warm or fresh water discharges from industrial sites, power plants, or natural springs or artesian wells (but only if the new or proposed change in discharge requires a Corps permit to accomplish the work);
4. installation of new culverts and/or maintenance or modification of existing culverts (where the culverts are 8 inches to 8 feet in diameter, ungrated and in waters accessible, or potentially accessible, to manatees)²;
5. mechanical dredging from a floating platform, barge or structure³ that restricts manatee access to less than half the width of the waterway;
6. creation of new slips or change in use of existing slips, even those located in a county with a State-approved Manatee Protection Plan (MPP) in place and the number of slips is less than the MPP threshold, to accommodate docking for repeat use vessels, (e.g., water taxis, tour boats, gambling boats, etc; or slips or structures that are not civil works projects, but are frequently used to moor large vessels (>100') for shipping and/or freight purposes; does not include slips used for docking at boat sales or repair facilities or loading/unloading at dry stack storage facilities and boat ramps); [Note: For projects within Bay, Dixie, Escambia, Franklin, Gilchrist, Gulf, Hernando, Jefferson, Lafayette, Monroe (south of Craig Key), Nassau, Okaloosa, Okeechobee, Santa Rosa, Suwannee, Taylor, Wakulla or Walton County, the reviewer should proceed to Couplet C.]
7. any type of in-water activity in a Warm Water Aggregation Area (WWAA) or No Entry Area (see Glossary and accompanying Maps⁴); [Note: For residential docking facilities in a Warm Water Aggregation Area that is not a Federal manatee sanctuary or No Entry Area, the reviewer should proceed to couplet C.]
8. creation or expansion of canals, basins or other artificial shoreline and/or the connection of such features to navigable waters of the U.S.; [Note: For projects proposing a single residential dock, the reviewer should proceed to couplet C; otherwise, project is a *May Affect*.]

9. installation of temporary structures (docks, buoys, etc.) utilized for special events such as boat races, boat shows, military shows, etc., but only when consultation with the U.S. Coast Guard and FWS has not occurred; [Note: See programmatic consultation with the U.S. Coast Guard on manatees dated May 10, 2010.].

	Project is other than the activities listed above.....	C
C.	Project is located in an Important Manatee Area (IMA) (see Glossary and accompanying Maps ⁴)	D
	Project is not located in an Important Manatee Area (IMA) (see Glossary and accompanying Maps ⁴)	G
D.	Project includes dredging of less than 50,000 cubic yards	E
	Project does not include dredging	G
E.	Project is for dredging a residential dock facility or is a land-based dredging operation	N
	Project not as above.....	F
F.	Project proponent does not elect to follow all dredging protocols described on the maps for the respective IMA in which the project is proposed	May affect
	Project proponent elects to follow all dredging protocols described on the maps for the respective IMA in which the project is proposed.....	G
G.	Project provides new ⁵ access for watercraft, e.g., docks or piers, marinas, boat ramps and associated trailer parking spaces, new dredging, boat lifts, pilings, floats, floating docks, floating vessel platforms, boat slips, dry storage, mooring buoys, or other watercraft access (residential boat lifts, pilings, floating docks, and floating vessel platforms installed in existing slips are not considered new access) or improvements allowing increased watercraft usage.....	H
	Project does not provide new ⁵ access for watercraft, e.g., bulkheads, seawalls, riprap, maintenance dredging, boardwalks and/or the maintenance (repair or rehabilitation) of currently serviceable watercraft access structures provided all of the following are met: (1) the number of slips is not increased; (2) the number of existing slips is not in question; and (3) the improvements do not allow increased watercraft usage.....	N
H.	Project is located in the Braden River Area of Inadequate Protection (Manatee County) (see Glossary and accompanying AIP Map ⁴)	May affect
	Project is not located in the Braden River Area of Inadequate Protection (Manatee County) (see Glossary and accompanying AIP Map ⁴).....	I
I.	Project is for a multi-slip facility (see Glossary)	J
	Project is for a residential dock facility or is for dredging (see Glossary).....	N
J.	Project is located in a county that currently has a State-approved MPP in place (BREVARD, BROWARD, CITRUS, CLAY, COLLIER, DUVAL, INDIAN RIVER, LEE, MARTIN, MIAMI-DADE, PALM BEACH, ST. LUCIE, SARASOTA, VOLUSIA) or shares contiguous waters with a county having a State-approved MPP in place (LAKE, MARION, SEMINOLE) ⁶	K
	Project is located in a county not required to have a State-approved MPP	L

- K. Project has been developed or modified to be consistent with the county’s State-approved MPP **and** has been verified by a FWC review (or FWS review if project is exempt from State permitting) **or** the number of slips is below the MPP threshold N
- Project has not been reviewed by the FWC or FWS **or** has been reviewed by the FWC or FWS **and** determined that the project is not consistent with the county’s State-approved MPP *May affect*
- L. Project is located in one of the following counties: CHARLOTTE, DESOTO⁷, FLAGLER, GLADES, HENDRY, HILLSBOROUGH, LEVY, MANATEE, MONROE⁷, PASCO⁷, PINELLAS M
- Project is located in one of the following counties: BAY, DIXIE, ESCAMBIA, FRANKLIN, GILCHRIST, GULF, HERNANDO, JEFFERSON, LAFAYETTE, MONROE (south of Craig Key), NASSAU, OKALOOSA, OKEECHOBEE, PUTNAM, SANTA ROSA, ST. JOHNS, SUWANNEE, TAYLOR, WAKULLA, WALTON N
- M. The number of slips does not exceed the residential dock density threshold (see Glossary) N
- The number of slips exceeds the residential dock density threshold (see Glossary) *May affect*
- N. Project impacts to submerged aquatic vegetation⁸, emergent vegetation or mangrove will have beneficial, insignificant, discountable⁹ or no effects on the manatee¹⁰ O
- Project impacts to submerged aquatic vegetation⁸, emergent vegetation or mangrove may adversely affect the manatee¹⁰ *May affect*
- O. Project proponent **elects** to follow standard manatee conditions for in-water work¹¹ and requirements, as appropriate for the proposed activity, prescribed on the maps⁴ P
- Project proponent **does not elect** to follow standard manatee conditions for in-water work¹¹ and appropriate requirements prescribed on the maps⁴ *May affect*
- P. If project is for a new or expanding⁵ multi-slip facility and is located in a county with a State-approved MPP in place **or** in Bay, Dixie, Escambia, Franklin, Gilchrist, Gulf, Hernando, Jefferson, Lafayette, Monroe (south of Craig Key), Nassau, Okaloosa, Okeechobee, Putnam, St. Johns, Santa Rosa, Suwannee, Taylor, Wakulla or Walton County, the determination of “*May affect, not likely to adversely affect*” is appropriate¹² and no further consultation with the Service is necessary.
- If project is for a new or expanding⁵ multi-slip facility and is located in Charlotte, Desoto, Flagler, Glades, Hendry, Hillsborough, Levy, Manatee, Monroe (north of Craig Key), Pasco, or Pinellas County, further consultation with the Service is necessary for “*May affect, not likely to adversely affect*” determinations.
- If project is for repair or rehabilitation of a multi-slip facility and is located in an Important Manatee Area, further consultation with the Service is necessary for “*May affect, not likely to adversely affect*” determinations. If project is for repair or rehabilitation of a multi-slip facility and: (1) is **not** located in an Important Manatee Area; (2) the number of slips is not increased; (3) the number of existing slips is not in question; and (4) the improvements to the existing watercraft access structures do not allow increased watercraft usage, the determination of “*May affect, not likely to adversely affect*” is appropriate¹² and no further consultation with the Service is necessary.
- If project is a residential dock facility, shoreline stabilization, or dredging, the determination of “*May affect, not likely to adversely affect*” is appropriate¹² and no further consultation with the Service is necessary. **Note:** For residential dock facilities located in a Warm Water Aggregation Area or in a No Entry area, seasonal restrictions may apply. See footnote 4 below for maps showing restrictions.
- If project is other than repair or rehabilitation of a multi-slip facility, a new⁵ multi-slip facility, residential dock facility, shoreline stabilization, or dredging, and does not provide new⁵ access for watercraft or

improve an existing access to allow increased watercraft usage, the determination of “*May affect, not likely to adversely affect*” is appropriate¹² and no further consultation with the Service is necessary.

¹ On the St. Mary’s River, this key is only applicable to those areas that are within the geographical limits of the State of Florida.

² All culverts 8 inches to 8 feet in diameter must be grated to prevent manatee entrapment. To effectively prevent manatee access, grates must be permanently fixed, spaced a maximum of 8 inches apart (may be less for culverts smaller than 16 inches in diameter) and may be installed diagonally, horizontally or vertically. For new culverts, grates must be attached prior to installation of the culverts. Culverts less than 8 inches or greater than 8 feet in diameter are exempt from this requirement. If new culverts and/or the maintenance or modification of existing culverts are grated as described above, the determination of “*May affect, not likely to adversely affect*” is appropriate¹¹ and no further consultation with the Service is necessary.

³ If the project proponent agrees to follow the standard manatee conditions for in-water work as well as any special conditions appropriate for the proposed activity, further consultation with the Service is necessary for “*May affect, not likely to adversely affect*” determinations. These special conditions may include, but are not limited to, the use of dedicated observers (see Glossary for definition of dedicated observers), dredging during specific months (warm weather months vs cold weather months), dredging during daylight hours only, adjusting the number of dredging days, does not preclude or discourage manatee egress/ingress with turbidity curtains or other barriers that span the width of the waterway, etc.

⁴ Areas of Inadequate Protection (AIPs), Important Manatee Areas (IMAs), Warm Water Aggregation Areas (WWAAs) and No Entry Areas are identified on these maps and defined in the Glossary for the purposes of this key. These maps can be viewed on the [Corps’ web page](#). If projects are located in a No Entry Area, special permits may be required from FWC in order to access these areas (please refer to Chapter 68C-22 F.A.C. for boundaries; maps are also available at [FWC’s web page](#)).

⁵ New access for watercraft is the addition or improvement of structures such as, but not limited to, docks or piers, marinas, boat ramps and associated trailer parking spaces, boat lifts, pilings, floats, floating docks, floating vessel platforms, (maintenance dredging, residential boat lifts, pilings, floating docks, and floating vessel platforms installed in existing slips are not considered new access), boat slips, dry storage, mooring buoys, new dredging, etc., that facilitates the addition of watercraft to, and/or increases watercraft usage in, waters accessible to manatees. The repair or rehabilitation of any type of currently serviceable watercraft access structure is not considered new access provided all of the following are met: (1) the number of slips is not increased; (2) the number of existing slips is not in question; and (3) the improvements to the existing watercraft access structures do not result in increased watercraft usage.

⁶ Projects proposed within the St. Johns River portion of Lake, Marion, and Seminole counties and contiguous with Volusia County shall be evaluated using the Volusia County MPP.

⁷ For projects proposed within the following areas: the Peace River in DeSoto County; all areas north of Craig Key in Monroe County, and the Anclote and Pithlachascotee Rivers in Pasco County, proceed to Couplet M. For all other locations in DeSoto, Monroe (south of Craig Key) and Pasco Counties, proceed to couplet N.

⁸ Where the presence of the referenced vegetation is confirmed within the area affected by docks and other piling-supported minor structures and the reviewer has concluded that the impacts to SAV, marsh or mangroves would not adversely affect the manatee or its critical habitat, proceed to couplet O.

Where the presence of the referenced vegetation is confirmed within the area affected by docks and other piling-supported minor structures and the reviewer has concluded that the impacts to SAV, marsh or mangroves would adversely affect the manatee or its critical habitat, the applicant can elect to avoid/minimize impacts to that vegetation. In that instance, where impacts are unavoidable and the applicant elects to abide by or employ construction techniques that exceed the criteria in the following documents, the reviewer should conclude that the impacts to SAV, marsh or mangroves would not adversely affect the manatee or its critical habitat and proceed to couplet O.

- “Construction Guidelines in Florida for Minor Piling-Supported Structures Constructed in or over Submerged Aquatic Vegetation (SAV), Marsh or Mangrove Habitat,” prepared jointly by the U.S. Army Corps of Engineers and the National Marine Fisheries Service (August 2001) [refer to the [Corps’ web page](#)], and
- “Key for Construction Conditions for Docks or Other Minor Structures Constructed in or over Johnson’s seagrass (*Halophila johnsonii*),” prepared jointly by the National Marine Fisheries Service and U.S. Army Corps of Engineers (October 2002), for those projects within the known range of Johnson’s seagrass occurrence (Sebastian Inlet to central Biscayne Bay in the lagoon systems on the east coast of Florida) [refer to the [Corps’ web page](#)],

Where the presence of the referenced vegetation is confirmed within the area affected by docks and other piling-supported minor structures and the reviewer has concluded that the impacts to SAV, marsh or mangroves would adversely affect the manatee or its critical habitat, and the applicant does not elect to follow the above Guidelines, the Corps will need to request formal consultation on the manatee with the Service as *May affect*.

For activities other than docks and other piling-supported minor structures proposed in SAV, marsh, or mangroves (*e.g.*, new dredging, placement of riprap, bulkheads, etc.), if the reviewer determines the impacts to the SAV, marsh or mangroves will not adversely affect the manatee or its critical habitat, proceed to couplet O, otherwise the Corps will need to request formal consultation on the manatee with the Service as *May affect*.

⁹ See Glossary, under “is not likely to adversely affect.”

¹⁰ Federal reviewers, when making your effects determination, consider effects to manatee designated critical habitat pursuant to section 7(a)(2) of the Endangered Species Act. State reviewers, when making your effects determination, consider effects to manatee habitat within the entire State of Florida, pursuant to Chapter 370.12(2)(b) Florida Statutes.

¹¹ See the [Corps' web page](#) for manatee construction conditions. At this time, manatee construction precautions c and f are not required in the following Florida counties: Bay, Escambia, Franklin, Gilchrist, Gulf, Jefferson, Lafayette, Okaloosa, Santa Rosa, Suwannee, and Walton.

¹² By letter dated April 25, 2013, the Corps received the Service's concurrence with “*May affect, not likely to adversely affect*” determinations made pursuant to this key for the following activities: (1) selected non-watercraft access projects; (2) watercraft-access projects that are residential dock facilities, excluding those located in the Braden River AIP; (3) launching facilities solely for kayaks and canoes, and (4) new or expanding multi-slip facilities located in Bay, Dixie, Escambia, Franklin, Gilchrist, Gulf, Hernando, Jefferson, Lafayette, Monroe (south of Craig Key), Nassau, Okaloosa, Okeechobee, Santa Rosa, Suwannee, Taylor, Wakulla or Walton County.

Additionally, in the same letter dated April 25, 2013, the Corps received the Service's concurrence for “*May affect, not likely to adversely affect*” determinations specifically made pursuant to Couplet G of the key for the repair or rehabilitation of currently serviceable multi-slip watercraft access structures provided all of the following are met: (1) the project is not located in an IMA, (2) the number of slips is not increased; (3) the number of existing slips is not in question; and (4) the improvements to the existing watercraft access structures do not allow increased watercraft usage. Upon receipt of such a programmatic concurrence, no further consultation with the Service for these projects is required.

GLOSSARY

Areas of inadequate protection (AIP) – Areas within counties as shown on the maps where the Service has determined that measures intended to protect manatees from the reasonable certainty of watercraft-related take are inadequate. Inadequate protection may be the result of the absence of manatee or other watercraft speed zones, insufficiency of existing speed zones, deficient speed zone signage, or the absence or insufficiency of speed zone enforcement.

Boat slip – A space on land or in or over the water, other than on residential land, that is intended and/or actively used to hold a stationary watercraft or its trailer, and for which intention and/or use is confirmed by legal authorization or other documentary evidence. Examples of boat slips include, but are not limited to, docks or piers, marinas, boat ramps and associated trailer parking spaces, boat lifts, floats, floating docks, pilings, boat davits, dry storage, etc.

Critical habitat – For listed species, this consists of: (1) the specific areas within the geographical area occupied by the species, at the time it is listed in accordance with the provisions of section 4 of the Endangered Species Act (ESA), on which are found those physical or biological features (constituent elements) (a) essential to the conservation of the species and (b) which may require special management considerations or protection; and (2) specific areas outside the geographical area occupied by the species at the time it is listed in accordance with the provisions of section 4 of the ESA, upon a determination by the Secretary that such areas are essential for the conservation of the species. Designated critical habitats are described in 50 CFR 17 and 50 CFR 226.

Currently serviceable – Currently, serviceable means usable as is or with some maintenance, but not so degraded as to essentially require reconstruction.

Direct effects – The direct or immediate effects of the project on the species or its habitat.

Dredging – For the purposes of this key, the term dredging refers to all in-water work associated with dredging operations, including mobilization and demobilization activities that occur in water or require vessels.

Emergent vegetation – Rooted emergent vascular macrophytes such as, but not limited to, cordgrass (*Spartina alterniflora* and *S. patens*), needle rush (*Juncus roemerianus*), swamp sawgrass (*Cladium mariscoides*), saltwort (*Batis maritima*), saltgrass (*Distichlis spicata*), and glasswort (*Salicornia virginica*) found in coastal salt marsh-related habitats (tidal marsh, salt marsh, brackish marsh, coastal marsh, coastal wetlands, tidal wetlands).

Formal consultation – A process between the Services and a Federal agency or applicant that: (1) determines whether a proposed Federal action is likely to jeopardize the continued existence of listed species or destroy or adversely modify designated critical habitat; (2) begins with a Federal agency's written request and submittal of a complete initiation package; and (3) concludes with the issuance of a biological opinion and incidental take statement by either of the Services. If a proposed Federal action may affect a listed species or designated critical habitat, formal consultation is required (except when the Services concur, in writing, that a proposed

action “is not likely to adversely affect” listed species or designated critical habitat). [50 CFR 402.02, 50 CFR 402.14]

Important manatee areas (IMA) – Areas within certain counties where increased densities of manatees occur due to the proximity of warm water discharges, freshwater discharges, natural springs and other habitat features that are attractive to manatees. These areas are heavily utilized for feeding, transiting, mating, calving, nursing or resting as indicated by aerial survey data, mortality data and telemetry data. Some of these areas may be federally-designated sanctuaries or state-designated “seasonal no entry” zones. Maps depicting important manatee areas and any accompanying text may contain a reference to these areas and their special requirements. Projects proposed within these areas must address their special requirements.

Indirect effects – Those effects that are caused by or will result from the proposed action and are later in time, but are still reasonably certain to occur. Examples of indirect effects include, but are not limited to, changes in water flow, water temperature, water quality (*e.g.*, salinity, pH, turbidity, nutrients, chemistry), prop dredging of seagrasses, and manatee watercraft injury and mortality. Indirect effects also include watercraft access developments in waters not currently accessible to manatees, but watercraft access can, is, or may be planned to waters accessible to manatees by the addition of a boat lift or the removal of a dike or plug.

Informal consultation – A process that includes all discussions and correspondence between the Services and a Federal agency or designated non-Federal representative, prior to formal consultation, to determine whether a proposed Federal action may affect listed species or critical habitat. This process allows the Federal agency to utilize the Services’ expertise to evaluate the agency’s assessment of potential effects or to suggest possible modifications to the proposed action which could avoid potentially adverse effects. If a proposed Federal action may affect a listed species or designated critical habitat, formal consultation is required (except when the Services concur, in writing, that a proposed action “is not likely to adversely affect” listed species or designated critical habitat). [50 CFR 402.02, 50 CFR 402.13]

In-water activity – Any type of activity used to construct/repair/replace any type of in-water structure or fill; the act of dredging.

In-water structures – watercraft access structures – Docks or piers, marinas, boat ramps, boat slips, boat lifts, floats, floating docks, pilings (depending on use), boat davits, etc.

In-water structures – other than watercraft access structures – Bulkheads, seawalls, riprap, groins, boardwalks, pilings (depending on use), etc.

Is likely to adversely affect – The appropriate finding in a biological assessment (or conclusion during informal consultation) if any adverse effect to listed species may occur as a direct or indirect result of the proposed action or its interrelated or interdependent actions and the effect is not: discountable, insignificant, or beneficial (see definition of “is not likely to adversely affect”). An “is likely to adversely affect” determination requires the initiation of formal consultation under section 7 of the ESA.

Is not likely to adversely affect – The appropriate conclusion when effects on listed species are expected to be discountable, insignificant, or completely beneficial. **Discountable effects** are those extremely unlikely to occur. **Insignificant effects** relate to the size of the impact and should never reach the scale where take occurs. **Beneficial effects** are contemporaneous positive effects without any adverse effects to the species. Based on best judgment, a person would not (1) be able to meaningfully measure, detect, or evaluate insignificant effects or (2) expect discountable effects to occur.

Manatee Protection Plan (MPP) – A manatee protection plan (MPP) is a comprehensive planning document that addresses the long-term protection of the Florida manatee through law enforcement, education, boat facility siting, and habitat protection initiatives. Although MPPs are primarily developed by the counties, the plans are the product of extensive coordination and cooperation between the local governments, the FWC, the Service, and other interested parties.

Manatee Protection Plan thresholds – The smallest size of a multi-slip facility addressed under the purview of a Manatee Protection Plan (MPP). For most MPPs, this threshold is five slips or more. For Brevard, Clay, Citrus, and Volusia County MPPs, this threshold is three slips or more.

Mangroves – Rooted emergent trees along a shoreline that, for the purposes of this key, include red mangrove (*Rhizophora mangle*), black mangrove (*Avicennia germinans*) and white mangrove (*Laguncularia racemosa*).

May affect – The appropriate conclusion when a proposed action may pose any effects on listed species or designated critical habitat. When the Federal agency proposing the action determines that a “may affect” situation exists, then they must either request the Services to initiate formal consultation or seek written concurrence from the Services that the action “is not likely to adversely affect” listed species. For the purpose of this key, all “may affect” determinations equate to “likely to adversely affect” and Corps Project Managers should request the Service to initiate formal consultation on the manatee or designated critical habitat. **No effect** – the appropriate conclusion when the action agency determines its proposed action will not affect a listed species or designated critical habitat.

Multi-slip facility – Multi-slip facilities include commercial marinas, private multi-family docks, boat ramps and associated trailer parking spaces, dry storage facilities and any other similar structures or activities that provide access to the water for multiple (five slips or more, except in Brevard, Clay, Citrus, and Volusia counties where it is three slips or more) watercraft. In some instances, the Corps and the Service may elect to review multiple residential dock facilities as a multi-slip facility.

New access for watercraft – New dredging and the addition, expansion or improvement of structures such as, but not limited to, docks or piers, marinas, boat ramps and associated trailer parking spaces, boat lifts, pilings, floats, floating docks, floating vessel platforms, (residential boat lifts, pilings, floats, and floating vessel platforms installed in existing slips are not considered new access), boat slips, dry storage, mooring buoys, etc., that facilitates the addition of watercraft to, and/or increases watercraft usage in, waters accessible to manatees.

Observers – During dredging and other in-water operations within manatee accessible waters, the standard manatee construction conditions require all on-site project personnel to watch for manatees to ensure that those standard manatee construction conditions are met. Within important manatee areas (IMA) and under special circumstances, heightened observation is needed. **Dedicated Observers** are those having some prior experience in manatee observation, are dedicated only for this task, and must be someone other than the dredge and equipment operators/mechanics. **Approved Observers** are dedicated observers who also must be approved by the Service (if Federal permits are involved) and the FWC (if state permits are involved), prior to work commencement. Approved observers typically have significant and often project-specific observational experience. Documentation on prior experience must be submitted to these agencies for approval and must be submitted a minimum of 30 days prior to work commencement. When dedicated or approved observers are required, observers must be on site during all in-water activities, and be equipped with polarized sunglasses to aid in manatee observation. For prolonged in-water operations, multiple observers may be needed to perform observation in shifts to reduce fatigue (recommended shift length is no longer than six hours). Additional information concerning observer approval can be found at [FWC's web page](#).

Residential boat lift – A boat lift installed on a residential dock facility.

Residential dock density ratio threshold – The residential dock density ratio threshold is used in the evaluation of multi-slip projects in some counties without a State-approved Manatee Protection Plan and is consistent with 1 boat slip per 100 linear feet of shoreline (1:100) owned by the applicant.

Residential dock facility – A residential dock facility means a private residential dock which is used for private, recreational or leisure purposes for single-family or multi-family residences designed to moor no more than four vessels (except in Brevard, Clay, Citrus, and Volusia counties which allow only two vessels). This also includes normal appurtenances such as residential boat lifts, boat shelters with open sides, stairways, walkways, mooring pilings, dolphins, etc. In some instances, the Corps and the Service may elect to review multiple residential dock facilities as a multi-slip facility.

Submerged aquatic vegetation (SAV) – Rooted, submerged, aquatic plants such as, but not limited to, shoal grass (*Halodule wrightii*), paddle grass (*Halophila decipiens*), star grass (*Halophila engelmanni*), Johnson's seagrass (*Halophila johnsonii*), sago pondweed (*Potamogeton pectinatus*), clasping-leaved pondweed (*Potamogeton perfoliatus*), widgeon grass (*Ruppia maritima*), manatee grass (*Syringodium filiforme*), turtle grass (*Thalassia testudinum*), tapegrass (*Vallisneria americana*), and horned pondweed (*Zannichellia palustris*).

Warm Water Aggregation Areas (WWAAs) and No Entry Areas – Areas within certain counties where increased densities of manatees occur due to the proximity of artificial or natural warm water discharges or springs and are considered necessary for survival. Some of these areas may be federally-designated manatee sanctuaries or state-designated seasonal “no entry” manatee protection zones. Projects proposed within these areas may require consultation in order to offset expected adverse impacts. In addition, special permits may be required from the FWC in order to access these areas.

Watercraft access structures – Docks or piers, marinas, boat ramps and associated trailer parking spaces, boat slips, boat lifts, floats, floating docks, pilings, boat davits, dry storage, etc.

Waters accessible to manatees – Although most waters of the State of Florida are accessible to the manatee, there are some areas such as landlocked lakes that are not. There are also some weirs, salinity control structures and locks that may preclude manatees from accessing water bodies. If there is any question about accessibility, contact the Service or the FWC.

Appendix H

Representative Photographs



Representative 4340 - Upland mixed coniferous/hardwood



Representative 4340 - Upland mixed coniferous/hardwood

Appendix H: Representative Photographs

FPID #: 441693-1-22-02

State Road (SR) 5/US-1 at Aviation Boulevard

Indian River County, Florida





Representative 5300 - Reservoirs/stormwater structures filled with
Brazilian pepper (*Schinus terebinthifolia*)



Representative 5100 - Streams and Waterways (Main Canal)

Appendix H: Representative Photographs

FPID #: 441693-1-22-02

State Road (SR) 5/US-1 at Aviation Boulevard

Indian River County, Florida





Representative 8160 - Salinity control structure east of study area



Representative 8340 - Wastewater Treatment Plant

Appendix H: Representative Photographs

FPID #: 441693-1-22-02

State Road (SR) 5/US-1 at Aviation Boulevard

Indian River County, Florida



Appendix I

UMAM Datasheets

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

Site/Project Name SR 5/US 1 at Aviation Boulevard		Application Number		Assessment Area Name or Number Surface Water 1	
FLUCCs code 5100/Channelized Waterways		Further classification (optional) PEM1Hx		Impact or Mitigation Site? Impact	
Assessment Area Size 0.11 acres		Basin/Watershed Name/Number Central Indian River Lagoon		Affected Waterbody (Class) III	
Special Classification (i.e.OFW, AP, other local/state/federal designation of importance) N/A		Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands SW 1 runs perpendicular to SR 5/US 1 and parallel to 30th street to the east. Aviation Blvd to the west.			
Assessment area description This surface waters is a deep ditch with steep slopes and various vegetation that is dominated with Brazilian pepper (<i>Schinus terebinthifolia</i>), ficus (<i>Ficus</i> sp.), Carolina willow (<i>Salix caroliniana</i>), and cabbage palm (<i>Sabal palmetto</i>). Groundcover consisted of swamp ferns (<i>Acrostichum aureum</i>), wild coffee (<i>Psychotria</i> sp.), torpedograss (<i>Panicum repens</i>), saw palmetto (<i>Serenoa repens</i>), American beautyberry (<i>Callicarpa americana</i>), Peruvian primrose-willow (<i>Ludwigia peruviana</i>), and Virginia creeper vine (<i>Parthenocissus quinquefolia</i>).					
Significant nearby features This surface water is bordered by SR 5 / US 1, and Aviation Blvd. Airport to the west			Uniqueness (considering the relative rarity in relation to the regional landscape.) None		
Functions Stormwater runoff storage, flood attenuation.			Mitigation for previous permit/other historic use N/A		
Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found) Variety of birds, mammals of all sizes (squirrels, raccoons, possums, etc.), variety of reptiles (turtles, snakes), insects, small fish, variety of amphibians.			Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area) Wood stork (<i>Mycteria americana</i>) (FT), Florida sandhill crane (<i>Antigone canadensis pratensis</i>) (ST), little blue heron (<i>Egretta caerulea</i>) (ST), reddish egret (<i>Egretta rufescens</i>) (ST), tricolored heron (<i>Egretta tricolor</i>) (ST), roseate spoonbill (<i>Platalea ajaja</i>) (ST)		
Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.): Passerines					
Additional relevant factors: This surface water has a lock and dam system to the west of the project limits and a salinity structure approximately 0.77 miles to the east. The primary use of the canal to provide stormwater storage and flood attenuation for the adjacent roadways and land areas.					
Assessment conducted by: ESA			Assessment date(s): 6/22/2023		

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

Site/Project Name SR 5/US-1 at Aviation Blvd	Application Number	Assessment Area Name or Number Surface Water 1 (Fill)
Impact or Mitigation Impact	Assessment conducted by: ESA	Assessment date: 6/22/2023

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	Within the project study area are surface waters (Surface Water 1 - also known as Main Canal) and other surface waters. The other surface waters in the area appear to be man made, associated with the roadway and/or regional airport, and are used for the conveyance of stormwater. Ultimately, the water from these other surface waters drains into the Main Canal. The Main Canal is hydrologically connected to the Indian River to the east, and beyond to the Atlantic Ocean. Other notable wetland areas in the vicinity of the project study area are to the east, along the Indian River. Wildlife access is predominately to the east. Upland areas adjacent to the Vero Beach Regional Airport may provide shelter and foraging opportunities for a variety of wildlife. However, the project study area is highly urbanized and it may be unlikely for larger terrestrial animals to utilize areas within the project.
w/o pres or current	with
5	0

.500(6)(b)Water Environment (n/a for uplands)	Surface Water 1, also called the Main Canal, is a deep man-made ditch with steep slopes grater than 4 to 1 and water present in areas up to 2 feet or more. The canal is approximately 70 feet across with adequate water movement during the rainy season. Water levels were appropriate for the time of the year, during the field review. The Main Canal is hydrologically connected to the Indian River to the east and ultimately drains to the Atlantic Ocean. Surface Water 1 receives stormwater from receives drainage from the SR 5/US 1 and other surrounding areas, which may contain pollutants and contaminants.
w/o pres or current	with
5	0

.500(6)(c)Community structure	These surface waters are dominated with a subcanopy consisting predominantly of Brazilian pepper, Carolina willow, cabbage palm, torpedograss, saw palmetto, and American beautyberry. Peruvian primrosewillow, wild taro, and Virginia creeper vine were present as well as other nuisance/exotic vegetation with mixed grasses. Coverage of nuisance/exotic species is common since this area appears disturbed by roadway activities.
1. Vegetation and/or	
2. Benthic Community	
w/o pres or current	with
5	0

Score = sum of above scores/30 (if uplands, divide by 20)	
current	
w/o pres	with
0.5	0

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

For impact assessment areas
FL = delta x acres = 0.11 x 0.50= 0.06

Delta = [with-current]
0.5

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

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