NATURAL RESOURCES EVALUATION

Florida Department of Transportation

District 6

SR 994/SW 200th Street/Quail Roost Drive PD&E Study

From West of SW 137th Avenue to East of SW 127th Avenue

Miami-Dade County, Florida

Financial Management Number: 445804-1-22-01

ETDM Number: 14429

September 5, 2023

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

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Financial Management Number: 445804-1-22-01
FAP Project Number: Not Assigned
Efficient Transportation Decision-Making Number: 14429

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EXECUTIVE SUMMARY

The State Road (SR) 994/SW 200th Street/Quail Roost Drive Project Development and Environment (PD&E) Study was initiated to evaluate the potential of improving the safety and capacity of the existing SR 994/SW 200th Street/Quail Roost Drive from west of SW 137th Avenue to east of SW 127th Avenue, in Miami Dade County, Florida. The proposed Preferred Alternative would address traffic operations and capacity constraints on SR 994/SW 200th Street/Quail Roost Drive, improve safety conditions along the corridor, including emergency evacuation and response times, and enhance mobility options and multimodal access. This roadway project involves the potential widening of Quail Roost Drive from two lanes up to four lanes from west of SW 137th Avenue to east of SW 127th Avenue. In addition to the potential widening, the proposed roadway improvements may include operational enhancements at the existing intersections, removal and replacement of the bridge structure (#870633) over Black Creek Canal (C-1W), access management measures, and stormwater management facilities.

The NRE is prepared in accordance with Wetlands and Other Surface Waters, Protected Species and Habitat, and Essential Fish Habitat chapters of the FDOT PD&E Manual and the FDOT 2022 Natural Resources Evaluation Outline and Guidance.

This NRE was prepared to document the natural resources analysis performed to support decisions related to the evaluation of the project alternatives and to summarize potential impacts to federal and state protected species, wetlands/surface waters, critical habitats, and Essential Fish Habitat (EFH). This report provides documentation of these processes to supplement the Environmental Document (Type II Categorical Exclusion).

Protected Species

The Preferred Alternative was evaluated for potential occurrences of federally listed and state-listed animal and plant species in accordance with Section 7 of the Endangered Species Act (ESA) of 1973, as amended; the Fish and Wildlife Conservation Act; the Migratory Bird Treaty Act (MBTA); Protected Species and Habitat chapter of the FDOT PD&E Manual; the Florida Endangered and Threatened Species Act, Section 379.2291, Florida Statutes (FS); and Chapters 5B-40 and 68A-27 of the Florida Administrative Code (FAC). Based on this evaluation, a total of seven (7) federally listed animal species, six (6) state listed animal species seven (7) federally listed plant species, and one (1) state listed plant species, were identified as potentially occurring within the project study area. Additionally, while not state or federally listed under the ESA, the bald eagle (*Haliaeetus leucocephalus*), the Florida black bear (*Ursus americanus floridanus*) and the Osprey (*Pandion haliaetus*) were included in the protected species analysis due to the regulatory protections associated with these species. Though not listed under the ESA, the Tricolored bat (*Perimyotis subflavus*) and the Monarch butterfly (*Danaus plexippus*) are currently proposed for ESA listing and included in this evaluation (refer to Section 4.3.3). **Table ES-1** provides a summary of the federally and state-listed species with the potential to occur within the limits of the Preferred Alternative project study area, along with their corresponding effect determinations.

The project study area was also evaluated for the presence of federally-designated Critical Habitat as defined by Congress in 50 Code of Federal Regulations (CFR) Part 17. Based on this evaluation, no federally designated Critical Habitat exists within the project study area.

Table ES - 1: Federally & State Listed Species with Potential to Occur within the Project Study Area and their associated Effect Determinations

Protected Species		Jurisdictional Agency		Potential of Occurrence	Effect Determination
Common Name	Scientific Name	USFWS/ NMFS	FWC/ FDACS		
MAMMALS					
Florida bonneted bat	*Eumops floridanus*	E	E	Low	*No Effect*
West Indian manatee	*Trichechus manatus latirostris*	T	T	Low	*May Affect, Not Likely to Adversely Affect*
Tricolored bat***	*Perimyotis subflavus*	C	NL	Low	*Candidate Species*
Florida black bear**	*Ursus americanus floridanus*	NL	68A-4.009 FAC	Low	*N/A*
REPTILES					
American crocodile	*Crocodylus acutus*	T	T	Low	*No Effect*
Eastern indigo snake	*Drymarchon couperi*	T	T	Low	*May Affect, Not Likely to Adversely Affect*
Florida pine snake	*Pituophis melanoleucus mugitus*	NL	T	Low	*No effect anticipated*
Gopher tortoise	*Gopherus polyphemus*	NL	T	Low	*No effect anticipated*
BIRDS					
Bald eagle*	*Haliateetus leucocephalus*	BGEPA/ MBTA	68A-16.002 FAC	Low	*N/A*
Osprey*	*Pandion haliaetus*	MBTA	NA	Low	*N/A*
Wood stork	*Mycteria americana*	T	T	Low	*No Effect*
Little blue heron	*Egretta caerulea*	NL	T	Low	*No effect anticipated*
Reddish egret	*Egretta rufescens*	NL	T	Low	*No effect anticipated*
Tricolored Heron	*Egretta tricolor*	NL	T	Low	*No effect anticipated*
Florida burrowing owl	*Athene cunicularia floridana*	NL	T	Low	*No effect anticipated*
INSECTS					
Bartram's Hairstreak Butterfly	*Strymon acis bartrami*	E	E	Moderate	*No Effect*
Monarch Butterfly	*Danaus plexippus*	C	NL	Moderate	*Candidate Species*
PLANTS					
Blodgett's Silverbush	*Argythamnia blodgettii*	T	T	Low	*No Effect*
Florida Brickell-bush	*Brickellia mosieri*	E	E	Low	*No Effect*
Florida Prairie-clover	*Dalea carthagenensis floridana*	E	E	Low	*No Effect*
Garber's Spurge	*Chamaesyce garberi*	E	E	Low	*No Effect*
Sand Flax	*Linum arenicola*	E	E	Low	*No Effect*
Small's Milkpea	*Galactia smallii*	E	E	Low	*No Effect*
Tiny Polygala	*Polygala smallii*	E	E	Low	*No Effect*
Florida royal palm	*Roystonea elata*	NL	E	High	*Potential for Adverse Effect*

Definitions:

E = Endangered, **T** = Threatened, , **C**= Candidate Species, **NL**= Not Listed
Low = Minimal suitable habitat present and no documented occurrences within or near the project study area.
Moderate = Potentially suitable habitat present and/or documented occurrences near the project study area.

Protected Species		Jurisdictional Agency		Potential of Occurrence	Effect Determination
Common Name	Scientific Name	USFWS/ NMFS	FWC/ FDACS		

High = Suitable habitat present and documented occurrences within the project study area.
** Removed from Florida's Endangered and Threatened Species List in 2008 but is still protected under the Bald and Golden Eagle Protection Act (BGEPA), Migratory Bird Treaty Act (MBTA), and Florida Administrative Code (FAC).*
*** Removed from Florida's Endangered and Threatened Species List in 2012, but is still protected under the Florida Black Bear Conservation FAC.*
**** USFWS has proposed to list the tricolored bat as an endangered species under the ESA.*

Wetlands and Other Surface Waters

In accordance with Presidential Executive Order (EO) 11990 entitled "Protection of Wetlands", United States Department of Transportation Order 5660.1A, "Preservation of the Nation's Wetlands" and Wetlands and Other Surface Waters chapter of the FDOT PD&E Manual, the Preferred Alternative was assessed for the presence of wetlands that may be impacted by proposed project activities. There are no jurisdictional wetlands in the project area. Surface water features that occur within the proposed Preferred Alternative consists of one man-made canal. Desktop reviews and field investigations identified one South Florida Water Management District (SFWMD) owned canal, the Black Creek Canal (C-1W). **Table ES-2** lists the individual surface water present within the project study area, with the Florida Land Cover Classification System (FLUCFCS) code, USFWS Wetlands and Deepwater Habitats classification system, and acreage.

Table ES - 2: Summary of Individual Water Features

ID	Type	FLUCFCS Description	FLUCFCS Code	USFWS Classification*	Acres in Project Study Area
Black Creek Canal (C-1W)	Surface Water Feature	Canal	816	R2UBHx	0.13

***USFWS Wetland Description:**
R2UBHx: Riverine, Lower Perennial, Unconsolidated Bottom, Permanently Flooded, Excavated

Impacts to this other surface water feature does not require mitigation. However, a Section 408 review and authorization will be necessary for any proposed improvements in or over this federal Central and Southern Florida (C&SF) Federal Flood Control Project canal. Future phases of the project will require coordination with the US Army Corps of Engineers (USACE) and the SFWMD during the Environmental Resource Permitting (ERP) process.

Essential Fish Habitat

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

1.0 PROJECT OVERVIEW

1.1 Project Description and Location

A Project Development and Environment (PD&E) Study is being conducted by the Florida Department of Transportation to evaluate potential impacts of widening State Road (SR) 994/SW 200th Street/Quail Roost Drive from west of SW 137th Avenue to east of SW 127th Avenue from two lanes to four lanes. The project is located in southwest Miami-Dade County at SR 994/SW 200th Street/Quail Roost Drive, from west of SW 137th Avenue to east of SW 127th Avenue (see **Figure 1-1**) The project corridor is approximately 1.67 miles in length. Within the project limits, the roadway is locally known as Quail Roost Drive. This roadway project involves the potential widening of Quail Roost Drive from two lanes up to four lanes from west of SW 137th Avenue to east of SW 127th Avenue.

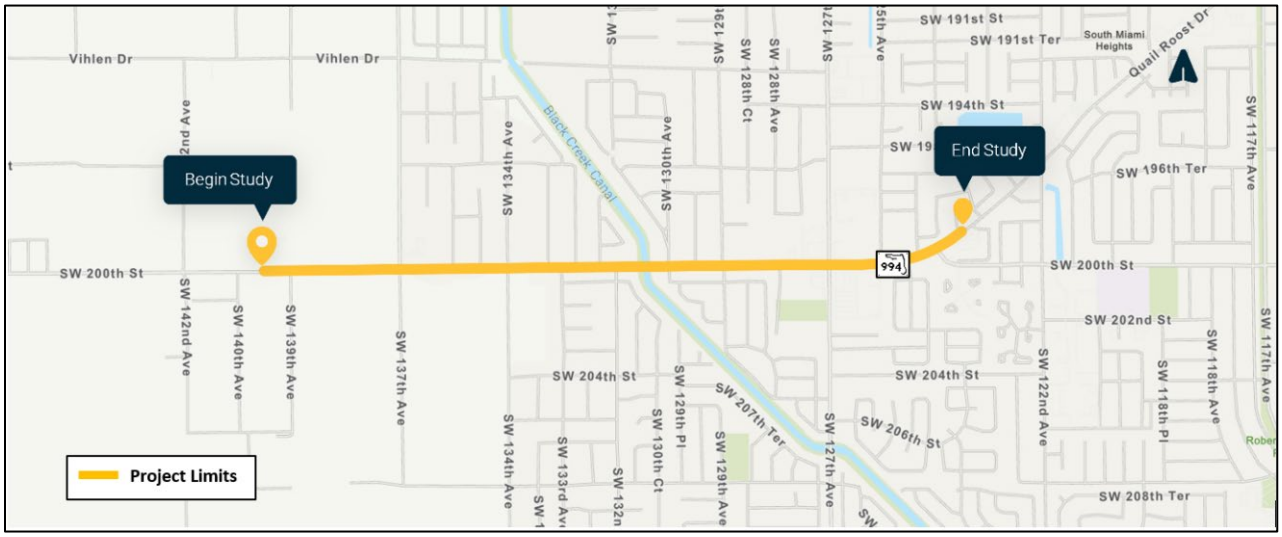


Figure 1-1: Project Location Map

In addition to the potential widening, the proposed roadway improvements may include operational enhancements at the existing intersections, removal and replacement of the bridge structure (#870633) over Black Creek Canal (C-1W), access management measures, and stormwater management facilities. The PD&E Study will evaluate typical section alternatives based on design criteria, safety and operational needs, and the minimization of environmental effects and right-of-way (ROW) needs. The PD&E Study will evaluate the provision of ADA compliant facilities as well as new/enhanced pedestrian and bicycle infrastructure, including paved shoulders/designated bicycle lanes, sidewalks, and/or a shared-use path connection to the existing Black Creek Trail. Improvements at four intersections/cross streets are also proposed as part of this project:

- SR 994 and SW 137th Avenue
- SR 994 and SW 134th Avenue
- SR 994 and SW 132nd Avenue
- SR 994 and SW 127th Avenue

Refer to **Section 6.1.8 Intersection Concepts** in the **Preliminary Engineering Report (PER)** for detailed information regarding these improvements.

Black Creek Trail- Segment of Route 7 is owned by the Miami-Dade County, Parks, Recreation and Open Spaces (MDPROS) and is located along the Black Creek Canal (C-1W). Black Creek Trail- Segment of Route 7 is an 8.7-mile-long greenway corridor that begins at Black Point Park and Marina and ends near Larry and Penny Thompson Park. The preferred alternative includes relocating the trail under the proposed new bridge over Black Creek Canal (C-1W). The advantages of this option include improved safety and traffic operations due to the elimination of conflicts between motor vehicles and bicyclists/pedestrians. In addition, this option provides improved overall bridge vertical clearance.

The project is located in southwest unincorporated Miami-Dade County and occurs within the Miami Urbanized Area (as defined by the Miami-Dade County 2015 Urban Development Boundary). The project corridor primarily serves existing and future residential land uses and provides local east-west access and connectivity. Outside of the project limits, SR 994 connects directly to two Strategic Intermodal System (SIS) Highway Corridors at SR 997/Krome Avenue (west of study limits) and SR 821/HEFT (east of study limits).

Within the project limits, SR 994 is classified as a rural major collector to the west of SW 137th Avenue and an urban minor arterial to the east of SW 137th Avenue. The corridor primarily has a C3R Suburban Residential Context Classification and a posted speed of 40 miles per hour. Four major intersections are located along the project corridor, including two signalized intersections (SW 137th Avenue and SW 127th Avenue) and two unsignalized intersections (SW 134th Avenue and SW 132nd Avenue). Eight other minor (unsignalized) intersections are located within the study corridor. The project location map is shown in **Figure 1-1.**

Currently, SR 994 is a two-lane roadway (one lane in each direction) from west of 137th Avenue to west of 127th Avenue. From west of SW 127th Avenue to SR 821/HEFT, SR 994 is a four-lane roadway. The existing SR 994 typical section consists of two undivided 11.5-foot travel lanes with unpaved shoulders and open drainage. Curb and gutter exist at the SR 994/SW 134th Avenue intersection and east of SW 127th Avenue within the study limits. Sidewalks, varying in width, are noncontinuous and generally located at residential subdivisions along the study corridor. There are no existing designated bicycle lanes on SR 994 within the study limits. There is one unrecorded historic bridge within the study limits that spans over the Black Creek Canal (C-1W). There is a pedestrian crossing just east of the bridge for access to the Black Creek Trail, which intersects SR 994.

1.1.1 Description of Preferred Alternative

The Preferred Alternative (**Figure 1-2)** proposes one additional travel lane in each direction, for a total of two 11-ft lanes in each direction, and a 16.5-ft raised median with exclusive left turn lanes along SR 994. Curb and Gutter Type F is proposed on the outside of the travel lanes while Type E curb is the typical condition along the median. This alternative also proposes 10-ft Shared Use Paths (SUP) along both sides of the corridor, that are intended to be utilized by pedestrians as

well as bicyclists. A minimum 4.5-ft buffer is proposed from the back of curb to the front of the SUP. A 2-ft buffer is proposed behind the SUPs to accommodate signing and lighting features. The signalized intersections at SW 137th Avenue and SW 127th Avenue will be widened to accommodate auxiliary turn lanes to meet future travel demand. A new traffic signal is proposed at the intersection of SR 994 and SW 134th Avenue. Refer to **Section 6.1.8 Intersection Concepts** in the **PER** for detailed information regarding these improvements.

Figure 1-2 : Preferred Alternative

The Preferred Alternative includes the removal and replacement of the bridge structure (bridge #870633) over the Black Creek Canal (C-1W) as well as new/enhanced pedestrian and bicycle infrastructure, including paved shoulders/designated bicycle lanes, sidewalks, and/or a shared-use path connection to the existing Black Creek Trail. Refer to **Appendix Q- Preferred Alternative Preliminary Conceptual Design Plans** in the **PER** for more details.

The project study area consists of the existing and proposed ROW limits for the Preferred Alternative for SR 994 from west of SW 137th Avenue to east of SW 127th Avenue. These areas will be evaluated for potential direct and indirect effects of the Preferred Alternative on habitats and wildlife species that may occur within the project study area. Refer to **Appendix J- Preliminary Concept Design Plans** and **Appendix K- Right of Way Impacts** in the **PER** for more details.

1.2 Purpose and Need

The purpose of this project is to address traffic operations and capacity constraints on SR 994 from west of SW 137th Avenue to east of SW 127th Avenue, in unincorporated Miami-Dade County (see **Figure 1-1**) in order to accommodate future travel demand projected as a result of population and employment growth along the corridor. Other goals of the project are to improve safety conditions along the corridor, including emergency evacuation and response times, and enhance mobility options and multimodal access.

1.2.1 Capacity/Transportation Demand

This project is anticipated to improve traffic operations along SR 994 by increasing the capacity to meet projected travel demand as a result of Miami-Dade County population and employment growth. Miami-Dade County is the most populous county in Florida with almost 2.6 million residents in 2015. By 2045, the county's population is expected to grow by over 33% to over 3.5 million residents. Employment growth in the county is expected to increase from 1.4 million workers in 2015 to more than 1.7 million workers by 2045.

Between SW 137th Avenue and SW 127th Avenue, the corridor has experienced a 7% increase in Annual Average Daily Traffic (AADT) from 2015 to 2019 with traffic volumes growing from 17,900 to 19,200 vehicles per day. Traffic is anticipated to continue to increase due to population growth and residential development in the area.

A traffic level of service analysis was conducted for the Future Year (FY) 2045. The analysis determined that some intersections along the corridor and several intersecting roads are expected to operate at LOS F during the AM and PM Peak periods if no improvements are implemented.

1.2.2 Safety

A crash analysis was conducted from west of SW 137th Avenue to east of SW 127th Avenue. The crash data for the latest five-year period (January 2014 to December 2018) was downloaded from the FDOT's Crash Analysis Reporting System (CARS) and summarized for the project segment. A total of 390 crashes were documented for the five-year period within the project limits. The leading types of crashes along the corridor were rear-end (with 187 crashes), angle (with 77 crashes), and sideswipe (with 43 crashes). Based on crash severity, 65% (254 crashes) were property-damage-only crashes, 35% (135 crashes) were injury crashes, and <1% (1 crash) was a fatal crash. Based on FDOT's 2014–2018 High Crash Lists, the following locations were considered high-crash spots/segments:

<u>Spots</u>
- SR 994 at SW 137th Avenue
- SR 994 at SW 134th Avenue
- SR 994 at SW 132nd Avenue

<u>Segment</u>
- SR 994 from SW 137th Avenue to west of SW 127th Avenue

According to the safety review, congestion/lack of capacity and lack of left-turn lanes serve as the probable causes of the safety issues within the corridor. Providing additional multimodal capacity and improving intersections along the corridor are anticipated to result in reduced crashes and safety benefits. Improved traffic operations due to increased capacity are also anticipated to decrease emergency response times for emergency response vehicles.

1.2.3 Modal Interrelationships

There are no existing designated bicycle lanes within the project limits. Sidewalks are noncontinuous and generally located at residential subdivisions along the project corridor. The Black Creek Trail intersects the project corridor just east of the Black Creek Canal (C-1W). The trail is a 17-mile-long greenway corridor that connects the Everglades Levee (L-31N Canal) with Black Point Park and Marina in Homestead. There is a pedestrian crossing equipped with Rectangular Rapid Flashing Beacons (RRFBs) and pavement markings to facilitate pedestrian/bicycle crossing and alert drivers of the pedestrian traffic, just east of the bridge for access to the Black Creek Trail.

Based on the 2010 United States Census Data, approximately 4% of the housing units (192 housing units) within the project study area are transit-dependent (no vehicle available); in addition, approximately 392 housing units within the project study area use public transportation for work. This noted transit-dependent population has a higher propensity to walk, bike, or take transit to access essential services. The project is anticipated to improve multi-modal connectivity and mobility options for the transit-dependent population and the overall residential population within the project area by providing continuous bicycle and pedestrian facilities along the entire corridor and improving access to the Black Creek Trail.

1.3 Existing Environmental Conditions

Prior to field reviews, literature and database searches were conducted to assess existing land uses/vegetative cover, and soils within the project study area. This area was also evaluated for the presence of existing conservation lands. The following data sources were reviewed as part of this evaluation:

- Miami-Dade County GIS Maps and Apps Gallery; Aerial photographs (high-resolution, 1 inch = 500 feet) (2023) https://mdc.maps.arcgis.com/apps/webappviewer/index;
- Google Earth;
- Florida Natural Areas Inventory (FNAI) database;
- FDOT Florida Land Cover Classification System (FLUCFCS), 3rd ed. (FDOT 1999);
- U.S. Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS) Web Soil Survey. http://websoilsurvey.sc.egov.usda.gov/. ;
- Hydric Soils of Florida Handbook, 4th ed. (FAESS/UF 2007)
- US Fish and Wildlife Service (USFWS), National Wetlands Inventory (NWI), Wetlands Online Mapper; and
- USFWS's Classification of Wetlands and Deepwater Habitats of the United States.

Upland habitats were classified using Florida Land Use, Cover and Forms Classification System (FLUCFCS) while wetland and surface water habitats were classified using both FLUCFCS and the USFWS's Classification of Wetlands and Deepwater Habitats of the United States.

1.4 Existing Land Use

The existing land use in the surrounding area is primarily residential and agricultural with some commercial and industrial uses. The agricultural use in proximity of the western project limit consists of some row crops and landscaping plant nurseries. Within the project study area, the

Black Creek Canal (C-1W) is a non-tidally influenced freshwater body with low-quality vegetation. The shrub and brushland area is located on the west bank of Black Creek Canal (C-1W), just north of SR 994. This area is now a single-family residential housing development recently constructed and comprises of an area of approximately 420,000 square feet. The development added 24 single-family homes along the corridor.

A total of 11 land use classifications comprised of 10 upland and one (1) surface water community type, were identified within the project study area. **Table 1-1** lists the acreage and percentage of each land use type. Aerial maps depicting the NRE project study area boundaries of existing land uses and vegetative cover within the limits of the project alternatives and descriptions of each land use category are provided in **Appendices A-1** and **A-2**.

Table 1-1: Land Use Types within the NRE Project study area

FLUCFCS Classification[1]	FLUCFCS Description	Acres	Percentage
110	Residential, Low Density	18.02	10.14%
120	Residential, Medium Density	77.41	43.57%
130	Residential, High Density	2.31	1.3%
140	Commercial and Services	10.90	6.13%
170	Institutional	21.65	12.18%
190	Urban and Built-Up	19.56	11.01%
214	Agriculture/Row Crops	7.77	4.38%
221	Agriculture/Citrus Groves	9.44	5.31%
243	Agriculture/Ornamentals	0.92	0.52%
320	Rangeland/Shrub and Brushland	7.36	4.14%
816	Waterbodies/Canal	2.32	1.31%
Total Land Use/Vegetative Cover		**177.66**	**100%**

[1]FDOT, FLUCFCS (Third edition), 1999.

1.5 Soils

Based on the soil data obtained from the United States Department of Agriculture, Natural Resources Conservation Service for Miami-Dade County, the project study area is comprised of one (1) coverage type and six (6) mapped soil units (soil maps and descriptions are provided in **Appendices B-1 and B-2**). According to the Hydric Soils of Florida Handbook three (3) of the six (6) soil types are classified as hydric; the remaining three (3) types are not classified as hydric. **Table 1-2** lists the acreage and percentage of each mapped soil type within the NRE project study area.

Table 1-2: Soil Types and Coverage within the NRE Project Study Area

Unit Symbol	Mapped Soil Type	Hydric Y/N	Acres	Percentage
4	Pennsuco marly silt loam, drained, 0 to 1 percent slopes	Y	0.0	0.0%
7	Krome very gravelly marly loam, 0 to 2 percent slopes	N	0.6	1.6%
15	Urban land, 0 to 2 percent slopes	N	5.3	15.0%
53	Biscayne marly silt loam, drained-Urban land complex, 0 to 1 percent slopes	Y	1.8	5.1%
61	Krome very gravelly marly loam-Urban land complex, 0 to 2 percent slopes	N	23.5	66.1%
69	Perrine marly silt loam, drained Urban land complex, 0 to 1 percent slopes	Y	4.0	11.2%
99	Water	N/A	0.4	1.1%
		Total	***35.5***	***100%***

1.6 Drainage

The project is located in within the jurisdictional boundary of the SFWMD and Miami-Dade Regulatory and Economic Resources (DRER).

The SR 994 corridor presents favorable field conditions for drainage. The corridor is located within high terrain, with a relatively low groundwater table and excellent limestone percolation. Given these conditions, a self-contained French drain system is found to be typically the most effective and economic stormwater management system for the project. The approach will include maintaining existing corridor drainage flow patterns which does not include existing outfall connections to the Black Creek Canal (C-1W). The proposed system will not be provided with outfall connections.

The project includes a bridge crossing over the Black Creek Canal (C-1W) approximately at the mid-section of the project. The Black Creek Canal (C-1W) is a primary canal owned, operated, and maintained by the SFWMD. However, the project does not have any existing outfall connections into this canal. The project's existing drainage infrastructure is self-contained and consists mainly of roadside swales with inlets connected to isolated short segments for French drains providing runoff disposal. The project's proposed stormwater management systems will be also designed as self-contained French drain systems.

Based on the conceptual drainage design evaluation for the proposed improvements, the stormwater management facilities will meet FDOT drainage criteria as well as SFWMD permit criteria. The improvements will have no negative drainage impacts to the surrounding areas and the proposed stormwater management facilities will have the capacity to adequately treat and attenuate roadway runoff within the project limits.

The project lies within FEMA 100-year floodplain, within Zone X with base flood elevations. There is no anticipated adverse floodplain impacts associated with this project. The modifications to the drainage systems due to this project are not anticipated to result in a significant change in capacity to carry floodwater, with minimal to no increase in flood heights and flood limits. Floodplain analysis will be documented in **Section 6.0 Design Features of the Preferred Alternative** in the **PER**.

2.0 PROTECTED SPECIES AND HABITAT

2.1 Introduction

The project area was evaluated for potential occurrences of federally listed and state listed plant and animal species that are protected by law, regulation, or rule. The protected species and habitat discussed in this document include those listed under Section 7 of the Endangered Species Act of 1973 (ESA); Chapter 68A-27, Florida Administrative Code (FAC), the Fish and Wildlife Conservation Act; the Migratory Bird Treaty Act (MBTA); Florida Endangered and Threatened Species List; and Chapter 5B-40, FAC, Regulated Plant Index. The project study area was also evaluated for the occurrence of federally designated Critical Habitat as defined by Congress in 50 Code of Federal Regulations (CFR) Part 17.

In addition, the project was screened through the ETDM Process (ETDM Project #14429) in 2020. Agencies that provided comments during the ETDM process included the US Fish and Wildlife Service (USFWS), Florida Department of Agriculture and Consumer Services (FDACS), Florida Fish and Wildlife Conservation Commission (FWC), SFWMD, and the NMFS/NOAA. During ETDM coordination, the SFWMD stated that the Black Creek Canal (C-1W) is located within the project area and may be accessible to the West Indian manatee (*Trichechus manatus latirostris*). The USFWS stated that the project may contain suitable wood stork foraging habitat and further indicates that the project is located within the geographic range and the Service's consultation area for the Florida bonneted bat. The USFWS also noted that federally listed plant species may potentially occur in or near the project site.

The analysis conducted and documented within this report is consistent with the Natural Resources Evaluation Outline and Guidance, 2022, along with the Protected Species and Habitat chapter found in the PD&E Manual.

2.2 Data Collection and Field Review

Prior to a field review, biologists performed a GIS database and literature review to identify protected species or critical habitat documented within and adjacent to the project study area. The project area was evaluated for the potential occurrence of federal and state listed protected plant and animal species. Habitat field reviews (performed on November 17, 2021, March 2, 2022, December 30, 2022, and March 28, 2023) were conducted to identify protected species and suitable habitat that might occur within the project study area. Referenced materials included, but were not limited to, the following data sources:

- Current and historical aerial photography;
- FDOT EST GIS;
- FDACS database;
- FWC, Eagle Nest Locator website;
- FWC, Florida's Endangered and Threatened Species;
- Florida Natural Areas Inventory (FNAI) database;
- USFWS, Consultation Keys for Protected Species;
- USFWS, Endangered Species Database;

- USFWS, Florida Nest Colonies and Core Foraging Areas 2006-2019 Map;
- USFWS, National Wetlands Inventory (NWI), Wetlands Online Mapper;
- USFWS, Threatened and Endangered Species' Critical Habitat Online Mapping Application;
- USFWS Information for Planning and Consultation (IPaC) website;
- USFWS and NOAA critical habitat maps and GIS layers; and
- ETDM Summary Report #14429.

2.3 Species Occurrence and Effect Determinations

The state and federally listed wildlife species that have the potential to occur within the region of the project study area are listed in **Table 2-1.** It's important to note that federally listed species are also state listed species. Each species listed in the table below was assigned a potential for occurrence within the project study area based on data reviews, field observations, presence and quality of suitable habitat, and the species' known ranges. Each species was assigned a low, moderate, or high likelihood for occurrence within the project study area based on the following:

- **Low** – The project is within the species' range, and minimal or marginal quality habitat exists within or adjacent to the project study area; however, there are no documented occurrences of the species in the vicinity of the project, and it was not observed during the field reviews.

- **Moderate** – The project is within the species' range, and suitable habitat exists within or adjacent to the project study area; however, there are no documented occurrences of the species, and it was not observed during the field reviews.

- **High** – The project is within the species' range, suitable habitat exists within or adjacent to the project buffer, there is at least one (1) documented occurrence of the species within the project study area, and/or the species was observed during the field reviews.

Table 2-1: Federally & State Listed Species with Potential to Occur within the Project Area and their associated Effect Determinations

Protected Species		Jurisdictional Agency		Potential of Occurrence	Effect Determination
Common Name	Scientific Name	USFWS/ NMFS	FWC/ FDACS		
MAMMALS					
Florida bonneted bat	*Eumops floridanus*	E	E	Low	*No Effect*
West Indian manatee	*Trichechus manatus latirostris*	T	T	Low	*May Affect, Not Likely to Adversely Affect*
Tricolored bat***	*Perimyotis subflavus*	C	NL	Low	*Candidate Species*
Florida black bear**	*Ursus americanus floridanus*	NL	68A-4.009 FAC	Low	*N/A*
REPTILES					
American crocodile	*Crocodylus acutus*	T	T	Low	*No Effect*
Eastern indigo snake	*Drymarchon couperi*	T	T	Low	*May Affect, Not Likely to Adversely Affect*
Florida pine snake	*Pituophis melanoleucus mugitus*	NL	T	Low	*No effect anticipated*
Gopher tortoise	*Gopherus polyphemus*	NL	T	Low	*No effect anticipated*
BIRDS					
Bald eagle*	*Haliateetus leucocephalus*	BGEPA/ MBTA	68A-16.002 FAC	Low	*N/A*
Osprey*	*Pandion haliaetus*	MBTA	NA	Low	*N/A*
Wood stork	*Mycteria americana*	T	T	Low	*No Effect*
Little blue heron	*Egretta caerulea*	NL	T	Low	*No effect anticipated*
Reddish egret	*Egretta rufescens*	NL	T	Low	*No effect anticipated*
Tricolored Heron	*Egretta tricolor*	NL	T	Low	*No effect anticipated*
Florida burrowing owl	*Athene cunicularia floridana*	NL	T	Low	*No effect anticipated*
INSECTS					
Bartram's Hairstreak Butterfly	*Strymon acis bartrami*	E	E	Moderate	*No Effect*
Monarch Butterfly	*Danaus plexippus*	C	NL	Moderate	*Candidate Species*
PLANTS					
Blodgett's Silverbush	*Argythamnia blodgettii*	T	T	Low	*No Effect*
Florida Brickell-bush	*Brickellia mosieri*	E	E	Low	*No Effect*
Florida Prairie-clover	*Dalea carthagenensis floridana*	E	E	Low	*No Effect*
Garber's Spurge	*Chamaesyce garberi*	E	E	Low	*No Effect*
Sand Flax	*Linum arenicola*	E	E	Low	*No Effect*
Small's Milkpea	*Galactia smallii*	E	E	Low	*No Effect*
Tiny Polygala	*Polygala smallii*	E	E	Low	*No Effect*
Florida royal palm	*Roystonea elata*	NL	E	High	*Potential for Adverse Effect*

Definitions:

E = Endangered, **T** = Threatened, , **C**= Candidate Species, **NL**= Not Listed
Low = Minimal suitable habitat present and no documented occurrences within or near the project study area.
Moderate = Potentially suitable habitat present and/or documented occurrences near the project study area.
High = Suitable habitat present and documented occurrences within the project study area.
** Removed from Florida's Endangered and Threatened Species List in 2008 but is still protected under the Bald and Golden Eagle Protection Act (BGEPA), Migratory Bird Treaty Act (MBTA), and Florida Administrative Code (FAC).*
*** Removed from Florida's Endangered and Threatened Species List in 2012, but is still protected under the Florida Black Bear Conservation FAC.*
**** USFWS has proposed to list the tricolored bat as an endangered species under the ESA.*

2.3.1 Federally Listed Protected Wildlife Species

Mammals

Florida bonneted bat (*Eumops floridanus*)

The Florida bonneted bat (FBB) is federally listed as endangered due to human activities and habitat loss. This species is found in central and south Florida, including Monroe and Miami-Dade counties. The FBB is known to roost in hollow trees, royal palms, rock crevices, buildings, and other infrastructure. FBB roosts will be situated in areas with sufficient open space for these bats to fly (e.g., open, or semi-open canopy, canopy gaps, above the canopy, and edges which provide relatively uncluttered conditions [i.e., reduced numbers of obstacles, such as fewer tree branches and leaves, in the flight environment]). The FBB forages from high in the air over natural as well as human-altered landscapes. This species flies and primarily forages at heights of 30 feet or more above treetops; over non-forested wetlands and freshwater features such as canals, streams, and ponds; and over golf courses. The project study area is located within the limits of the USFWS-designated 2019 FBB Consultation Area and within the South Florida Urban Bat Area. Refer to **Appendix C-1** for the FBB range and project location map.

The project study area was surveyed on November 17, 2021, March 2, 2022, December 30, 2022, and March 28, 2023, to identify any potential roosting habitat features that may be utilized by the FBB. Per the USFWS 2019 Florida bonneted bat consultation guidelines, these features consist of:

- Trees greater than 33 feet in height, greater than 8 inches in diameter at breast height (DBH), with cavity elevations higher than 16 feet aboveground level;
- Areas with a high incidence of large or mature live trees with various deformities (e.g., large cavities, hollows, broken tops, loose bark, and other evidence of decay);
- Rock crevices (e.g., limestone in Miami-Dade County); and/or
- Artificial structures, mimicking natural roosting conditions (e.g., bat houses, utility poles, buildings), situated in natural or semi-natural habitats.

Landscaped trees, such as Cabbage palms (Sabal), Southern live oaks (*Quercus virginiana*), Royal poincianas (*Delonix regia*), Florida strangler figs (*Ficus aurea*) as well as multiple invasive trees, including Australian pines (*Casuarina equisetifolia*) and Brazilian peppertree (*Schinus terebinthifolia*) exist throughout the project study area. These tree resources were inspected for signs of bat use per the USFWS 2019 Guidance for FBB surveys. Of the landscaped trees, palms, and snags identified, none met all three USFWS 2019 criteria including 33-foot tree height, 8-inch DBH, and cavities/crevices above 16-feet. Although no trees met all three criteria, two (2) Florida strangler fig trees were identified to contain cavities and/or crevices. Representative photos can be found in **Appendix C-2**. Each of these cavities/crevices were inspected using a high intensity light, however, no evidence (staining and/or guano) of bats was observed.

The Preferred Alternative includes the replacement of one (1) bridge the SR 994 Bridge (#870633) over the Black Creek Canal (C-1W). The bridge was also inspected for individuals and signs of bats (staining and/or guano). No signs of bats were found during the field reviews and no individuals have been documented within the immediate vicinity of the project study area. The

vertical clearance for the bridge is also too low to be considered a suitable roosting habitat for the bat; the bridge measures 4.2' from the mean high-water line. Refer to **Appendix H** for photos of the canal and bridge.

In summary, the FBB was not observed during the roosting habitat survey and the probability of occurrence is determined to be 'low' as no evidence of bat roosting activities were observed within the project area. No adverse impacts to the FBB are anticipated as a result of the proposed project since no suitable roosting habitat will be adversely impacted from the proposed construction activities. Therefore, the proposed project will have "***No Effect***" on the FBB.

Prior to commencing construction activities, the FDOT is committed to resurveying the project study area for features that could serve as potential roosting habitat and signs of the FBB. If any signs of the FBB are observed, the FDOT is committed to reinitiating consultation with the USFWS to determine the appropriate course of action.

Tricolored Bat (*Perimyotis subflavus*)
The USFWS is proposing to list the tricolored bat as endangered under the ESA and is considered a 'Species of Greatest Conservation Need' in Florida. Florida's smallest bat, it generally weighs between 4 and 8 grams. The tricolored bat, formerly the Eastern pipistrelle (*Pipistrellus subflavus*), can be identified from other bats in Florida by its pink forearms that strongly contrast their black wings.

During the spring, summer, and fall, known as the non-hibernating seasons, tricolored bats are found in forested habitats where they roost in trees, primarily among leaves. Tricolored bats will roost singly or in small groups, within caves, tree foliage, tree cavities, and have been known to use bat houses, buildings, and other man-made structures. Tricolored bats exhibit high site fidelity with many individuals returning year after year to the same hibernaculum. These bats are insectivorous and feed on smaller insects such as mosquitoes, flying ants, leafhoppers, and small beetles. During the winter, tricolored bats hibernate in caves and mines; although, in the southern United States, where caves are sparse, tricolored bats often hibernate in culverts, as well as sometimes in tree cavities and abandoned water wells. Tricolored bats emerge early in the evening and forage at treetop level or above but may forage closer to ground later in the evening. This species of bat exhibits slow, erratic, fluttery flight, while foraging and are known to forage most commonly over waterways and forest edges.

As stated within the FBB description above, multiple landscaped trees are found within the project study area, some of which may be impacted due to this project. However, during the field reviews, no signs of bats were discovered. The project area does not contain any culverts and/or water wells. Due to the lack of suitable habitat within the project study area, the probability of occurrence is low.

If the listing status of the tricolored bat is elevated by USFWS to Threatened or Endangered and the Preferred Alternative is located within the consultation area during the design and permitting phase of the proposed project, FDOT commits to re-initiating consultation with the USFWS to

determine the appropriate survey methodology and to address USFWS regulations regarding the protection of the tricolored bat.

West Indian manatee (*Trichechus manatus latirostris*)
The West Indian manatee is federally listed as threatened due to human activities and habitat loss. The West Indian manatee inhabits marine, brackish, and freshwater coastal and riverine areas. During the ETDM coordination, SFWMD made a comment stating the Black Creek Canal (C-1W) contains potential suitable habitat for this species, however this project exists about six (6) miles upstream of one salinity control structure and manatees were not observed during field visits.

The Preferred Alternative includes the removal and replacement of the existing bridge over the Black Creek Canal (C-1W). All parts of the existing bridge will be removed in its entirety, including the existing end bents, intermediate piers, existing fender system, and bascule piers. Piles will be removed 2' below the mudline. Because this canal may be accessible to manatees, the USACE 2013 Manatee Consultation Key (**Appendix D-1**), was used to make an effect determination. The following pathway: *A2, B2, C2, G2, N1, O1, P5*, concluded that the proposed project will have a "***May Affect Not Likely to Adversely Affect***" on the West Indian manatee. Due to use of the key to reach a MANLAA determination, no further consultation is required.

To increase the protection of this species during construction, the FDOT will adhere to the most current version of the Standard Manatee Conditions for In-Water Work (**Appendix D-2**) and the latest edition of FDOT Standard Specifications for Road and Bridge Construction.

Reptiles
American crocodile (*Crocodylus acutus*)
The American crocodile is federally listed as threatened due to human activities and coastal development. American crocodiles inhabit brackish or saltwater, and can be found in ponds, coves, canals, and creeks in mangrove swamps in southern Florida. The project area does not contain suitable nesting habitat for this species, no nests have been documented within one (1) mile of the project study area, and no individuals were observed during the field reviews. The project area is also highly urbanized and far from known crocodile habitat making it unlikely that the project will affect crocodile nesting areas. In addition, the project area is not within the American crocodile consultation area. Therefore, this species was assigned a 'low' probability of occurrence within the project study area. Therefore, the proposed project will have "***No Effect***" on the American crocodile.

Eastern indigo snake (*Drymarchon corais couperi*)
The eastern indigo snake is listed by the USFWS as threatened. This species uses a wide variety of habitats including pine flatwoods, scrubby flatwoods, high pine, dry prairie, tropical hardwood hammocks, edges of freshwater marshes, agricultural fields, coastal dunes, and human-altered habitats. They are known to winter in gopher tortoise burrows. Suitable habitat is not present within the project area, however the USFWS stated in the ETDM Summary Report that an occurrence of the Eastern indigo snake has been documented within a quarter mile of the project.

No eastern indigo snakes were observed during the field reviews. For these reasons, this species was assigned a 'low' probability of occurrence within the project study area. The USFWS Eastern Indigo Snake Programmatic Effect Determination Key – Revised July 2017 (**Appendix E-1**), was used to make an effect determination. The following pathway: *A1, B1, C1, D1,* concluded that the proposed project will have a "***May Affect, Not Likely to Adversely Affect***" on the eastern indigo snake. Due to use of the key to reach a MANLAA determination, no further consultation is required.

To increase protection of this species during construction, the FDOT will adhere to the most current version of the Standard Protection Measures for the Eastern Indigo Snake (**Appendix E-2**).

Birds

Wood stork (*Mycteria americana*)

The wood stork is federally listed as threatened by the USFWS. This opportunistic wading bird utilizes various open hydric pine-cypress habitats, herbaceous marshes, and artificial wetlands and canals. Nests for this species are typically located within large cypress trees. The USFWS has defined an area with a radius of 18.6 miles (30 kilometers) from nesting wood stork colonies as the Core Foraging Area (CFA) for those colonies. The nearest wood stork colony (Grossman Ridge West located in Everglades National Park) is located approximately 16.1 miles northwest of the project study area.

While there is a canal within the project limits, there are no jurisdictional wetlands, and this area does not contain any suitable foraging habitat (SFH) for the wood stork. SFH includes wetlands that are usually shallow-open water areas with a water depth of 2″ to 15″. The Black Creek Canal (C-1W) was box-cut into the coral rock substrate and due to this design, the walls of the canal are steep and nearly vertical and water depth is between 6′ to 12′ deep. Furthermore, the project study area does not contain any other surface water features, wetland habitat or cypress trees. No individuals were observed during the field reviews and no permanent adverse impacts are anticipated to occur to foraging habitat as a result of this project. The USFWS Wood Stork South Florida Programmatic Concurrence and Key (**Appendix F-1**), was used to make an effect determination. The following pathway: *A3,* concluded that the proposed project will have a "***No Effect***" on the wood stork. Due to use of the key to reach a No Effect determination, further consultation is not required.

Insects

Bartram's Hairstreak Butterfly (*Strymon acis bartrami*)

The Bartram's hairstreak butterfly is federally listed as an endangered species due to human activities such as development, nonnative species, and mosquito control. The Hairstreak Butterfly exclusively inhabits the pine Rocklands of Florida, where its only host plant, pineland croton, is found. The project does not contain suitable habitat to sustain this species, and its closest documented critical habitat is located in Everglades National Park. Additionally, the project study area is heavily urbanized, and no specimens were observed during a field review of the project's corridor. Therefore, the proposed project will have ***"No Effect"*** on Bartram's hairstreak butterfly.

Monarch Butterfly (*Danaus plexippus*)
The Monarch butterfly is currently included in the 2022-2027 USFWS National Listing Workplan for FY24 as a candidate species for the ESA. Inclusion within the Workplan does not automatically list a species as endangered or threatened under the ESA. The species is not currently protected by federal law under this act; however, federal agencies may voluntarily add conservation actions to their projects.

The South Florida region potentially serves as a "stopping point" on the species' seasonal migration to Mexico and as a year-round habitat for the Monarchs. Urban and suburban development is eliminating monarch habitat by supplanting agricultural landscapes where an estimated 90% of milkweeds, the Monarch's host plant, occur. Monarchs have the potential to occur wherever their host plant is found; this includes roadside, fields, and urbanized and suburbanized areas. The project area has the potential to sustain milkweed; therefore, the monarch butterfly may potentially occur within the project area.

If the listing status of the monarch butterfly is elevated by USFWS to Threatened or Endangered and the Preferred Alternative is located within the consultation area, during the design and permitting phase of the proposed project, FDOT commits to re-initiating consultation with the USFWS to determine the appropriate survey methodology and to address USFWS regulations regarding the protection of the monarch butterfly.

2.3.2 State Listed Protected Wildlife Species

Birds
Little blue heron (*Egretta caerulea*)
The little blue heron is state-designated threatened due to coastal development, disturbance at foraging and breeding sites, environmental issues, degradation of feeding habitat, reduced prey availability, and predators. Little blue herons inhabit fresh, salt, and brackish water environments in Florida including swamps, estuaries, ponds, lakes, and rivers. Their diet primarily consists of fish, insects, shrimp, and amphibians and they feed alone, usually along freshwater systems and on floating vegetation. The only water body found within the project area is the Black Creek Canal (C-1W), which has near vertical walls and a water depth between 6′-12′, making it very difficult for a wading bird to forage. No individuals were observed during the field reviews and no permanent adverse impacts are anticipated to occur to foraging habitat as a result of this project. The project is anticipated to have "***No Effect Anticipated***" on the little blue heron.

Reddish egret (*Egretta rufescens*)
The reddish egret is state-designated threatened due to coastal development, recreational disturbance at foraging and breeding sites, habitat degradation, loss of genetic diversity, and increased pressure from predators. Reddish egrets inhabit coastal areas, mainly on estuaries near mangroves, and lagoons, but they can also be found on dredge spoil islands. The diet of the reddish egret primarily consists of small fish. The only water body found within the project area is the Black Creek Canal (C-1W), which has near vertical walls and a water depth between 6′-12′,

making it very difficult for a wading bird to forage. No individuals were observed during the field reviews and no permanent adverse impacts are anticipated to occur to foraging habitat as a result of this project. The project is anticipated to have ***"No Effect Anticipated"*** on the reddish egret.

Tricolored heron (*Egretta tricolor*)

The tricolored heron is state-designated threatened. This bird is a medium-size heron with a long slender neck, two-toned body coloration on the head, neck, and body along with a white underside. Nesting mostly occurs on mangrove islands or in freshwater willow thickets on islands or over standing water. This heron prefers coastal environments. Feeding areas consist of permanently, or seasonally, flooded wetlands, mangrove swamps, tidal creeks, ditches, and the edges of lakes and ponds. The only water body found within the project area is the Black Creek Canal (C-1W), which has near vertical walls and a water depth between 6′-12′, making it very difficult for a wading bird to forage. No individuals were observed during the field reviews and no permanent adverse impacts are anticipated to occur to foraging habitat as a result of this project. The project is anticipated to have "***No Effect Anticipated"*** on the tricolored heron.

Florida burrowing owl (*Athene cunicularia floridana*)

The Florida burrowing owl is state-designated threatened. This owl is a small, ground-dwelling bird with long legs, white chin stripe, round head, and stubby tail. Adults are noticeably spotted and barred with brown and white. Juveniles exhibit less spotting with little or no brown barring. Habitat requirements include high, sparsely vegetated sandy ground (e.g., dry prairies and sandhills), and ruderal areas such as pastures, airports, ball fields, parks, school and university grounds, road ROW areas, and vacant parcels in residential areas. This species utilizes burrows year-round for nesting and roosting in winter. The burrows are either self-dug or dug by another species, such as Gopher Tortoises.

No suitable habitat exists within the project study area and no individuals or burrows were observed during the field review. The project is anticipated to have "***No Effect Anticipated"*** on the Florida burrowing owl.

Reptiles

Florida pine snake (*Pituophis melanoleucus mugitus)*

The Florida pine snake is state-designated threatened and one of the largest snakes in eastern North America. The Florida pine snake lives in pine flatwoods, sandy pine-oak woodlands, prairies, cultivated fields, open brushland, and chaparral. Within these habitats, pine snakes require well-drained, sandy soils with little vegetation for use as nesting and hibernation sites. Per FWC, the Florida pine snake is uncommon or absent from the southern Florida peninsula because of unsuitable habitat. Therefore, the project is anticipated to have "***No Effect Anticipated"*** on the Florida pine snake.

Gopher tortoise (*Gopherus polyphemus)*

The gopher tortoise is a state-designated threatened species in Florida. This tortoise is typically found in dry upland habitats including sandhills, scrub, xeric oak hammock, and dry pine flatwoods as well as disturbed habitats such as pastures, old fields, and road shoulders. Gopher tortoises'

nest in open, sunny locations, frequently within the soft mound of sand at the entrance of their burrow, called the burrow apron. Due to its warm climate, tortoises are essentially active year-round in Florida, though peak activity outside burrows occurs from May through August. Gopher tortoises are herbivorous; they feed on low-growing plants like wiregrass, broadleaf grasses, gopher apple, and legumes.

No suitable habitat exists within the project study area and no individuals or burrows of this species were observed during the field review. The project is anticipated to have "***No Effect Anticipated"*** on the gopher tortoise.

2.3.3 Federal and State Listed Plant Species

No federally listed plant species were identified during the field reviews (refer to **Table 2-2**). Since there is very limited habitat for these plant species and the area within the project study area is regularly mowed and maintained, it is unlikely that occurrences of these federally protected plant species will be observed within the project study area. Therefore, the project is expected to have "***No Effect***" on the federally protected plant species listed in Table 2-2.

Table 2-2: Federally Listed Plant Species

Federally Listed Plant Species		Listing Status	Effect Determination
Common Name	Scientific Name		
Blodgett's Silverbush	*Argythamnia blodgettii*	Threatened	***No Effect***
Florida Brickell-bush	*Brickellia mosieri*	Endangered	***No Effect***
Florida Prairie-clover	*Dalea carthagenensis floridana*	Endangered	***No Effect***
Garber's Spurge	*Chamaesyce garberi*	Endangered	***No Effect***
Sand Flax	*Linum arenicola*	Endangered	***No Effect***
Small's Milkpea	*Galactia smallii*	Endangered	***No Effect***
Tiny Polygala	*Polygala smallii*	Endangered	***No Effect***

SR 994 and the surrounding project study area has been significantly altered by man. During field reviews, the state-designated as endangered species, Florida royal palm (*Roystonea regia*) were observed throughout the corridor as part of the planted landscaping. Some individual palms may be impacted and/or possibly relocated due to their current location. At the time of this NRE, the exact palms that may be impacted are unknown. Due to the Florida royal palm being a state listed endangered species, coordination with FDACS will be required.

An effect determination of '***Potential for Adverse Effect***' on the royal palm is anticipated as a result of this project.

2.3.4 Other Protected Species

Bald Eagle *(Haliaeetus leucocephalus)*
The bald eagle was removed from the protection of the ESA in September 2007; however, it is still protected under the Migratory Bird Treaty Act (MBTA), the Bald and Golden Eagle Protection Act (BGEPA), the Lacey Act 16 U.S.C. §§ 3371-3378 and by 68A-16.002, FAC (Florida Administrative Code). To reduce the potential for human activity to adversely affect bald eagles, USFWS and FWC Management Guidelines suggest the protection of a 660-ft habitat buffer around each active bald eagle nest. According to the FWC, Eagle Nest Locator website, six (6) bald eagle nests occur in Miami-Dade County and one (1) bald eagle nest occurs in southern Broward County; however, none are reported within one (1) mile of the project study area. No eagles or their nests were observed during the field review and the closest documented eagle nest is well beyond the 660-ft protection buffer requirement. This species has been assigned a probability occurrence of 'low'. Therefore, no impacts to the bald eagle are anticipated.

Osprey (*Pandion haliaetus*)
The osprey is protected by the U.S. Migratory Bird Treaty Act. Although it is no longer listed as a Species of Special Concern, it is still included in the Imperiled Species Management Plan. The osprey is a species of raptor that is sometimes mistaken for the bald eagle. Osprey habitat includes the coast, lakes, rivers, and swamps in Florida. In Florida, non-migratory, resident osprey have been well-documented and extensively studied only in Florida Bay, the southern Everglades, and the Florida Keys. The osprey's diet primarily consists of fish. Feeding areas include most open-water habitats along the coast and freshwater lakes and rivers. Nests are found in large trees, utility poles, channel markers, and in urbanized areas where ospreys readily utilize man-made nesting platforms. Pesticides, shoreline development and declining water quality continue to threaten the abundance and availability of food and nest sites for ospreys. No ospreys or active nests were observed during the field review and no impacts are anticipated to occur as a result of this project.

Two (2) additional species were commented on through the ETDM Summary Report by the FWC and FDOT. These species include the Florida black bear (*Ursus americanus floridanus*), and the mangrove rivulus (*Kryptolebias marmoratus*). The Florida black bear is rare in this area of South Florida and no road kills or nuisance bear reports have been documented within one mile of the project area. The mangrove rivulus is a species of killifish in the family Rivulidae. It lives in brackish and marine waters along the coasts of Florida, therefore impacts to this species are unlikely. No impacts to the Florida black bear or the mangrove rivulus are anticipated as a result of the proposed project.

2.4 Notable Habitats

2.4.1 Critical Habitats
Critical Habitat is a specific, federally designated, geographic area that is essential for the conservation of a threatened or endangered species that may require special management and protection. Critical Habitat may include an area that is not currently occupied by the species, but that will be needed for its recovery. Based on the review of USFWS and NMFS GIS data and

literature, there are no designated critical habitats documented within the project study area. Therefore, no adverse impacts to federally designated critical habitats are expected to occur as a result of the proposed project.

3.0 WETLANDS AND SURFACE WATERS

3.1 Introduction

In accordance with Presidential Executive Order (EO) 11990 entitled "Protection of Wetlands" and United States Department of Transportation Order 5660.1A, “Preservation of the Nation's Wetlands” and Wetlands and Other Surface Waters chapter of the FDOT PD&E Manual, the project study area was reviewed to identify, quantify, and map wetland communities that are located within the proposed project boundaries. In order to protect, preserve, and fully enhance wetlands, the FDOT has assessed wetlands that may be affected by proposed roadway improvements.

The project was screened through the ETDM Process (ETDM Project #14429) in 2020. Project Effects Overviews were reviewed in July 2020. Agencies that provided comments during the ETDM process included the Florida Department of Environmental Protection (FDEP), US Environmental Protection Agency (EPA), USACE, SFWMD, NMFS, and the USFWS.

The EPA commented that the proposed project corridor lies within the Biscayne Sole Source Aquifer and recharge zone. The EPA supports a qualitative analysis of potential wetland and surface water impacts conducted under the Uniform Mitigation Assessment Methodology (UMAM) during the PD&E study. The wetlands assessment will determine classification of filled wetlands, mitigation, economic importance of aquatic resources, and the importance of the aquatic resources to the protection, maintenance, or enhancement of water quality. There are no jurisdictional wetlands located in the project study area.

SFWMD commented that while no state jurisdictional wetlands exist within the project area, state jurisdictional surface waters for the Black Creek Canal (C-1W) are present; however, there are no protection or mitigation requirements for work in/on/over this water body. Impacts to the canal will be coordinated with the SFWMD during the Environmental Resource Permitting process conducted in future phases of the project.

USACE stated that, the Black Creek Canal (C-1W) should be determined if it is a part of the Federal Flood Control Project as it would require a Section 408 review and authorization for the proposed work over the canal. The waters of the U.S. (wetlands and surface waters) included in this project consist of 0.33 acre of riverine wetlands exist within a 100-foot buffer. These areas are associated with the man-made Black Creek Canal (C-1W) and are a surface water feature that does not possess wetland characteristics and is not considered a jurisdictional wetland.

FDEP and EPA recommended avoidance, minimization, and mitigation measures or opportunities to protect wetlands and other surface waters. USFWS specifically stated that if wetland impacts are unavoidable, mitigation that fully compensates for the loss of wetlands is recommended. The proposed improvements do not include impacts to jurisdictional wetlands. Best management practices will be utilized during construction and compensatory mitigation will be considered in the unlikely event that wetland impacts are identified during the design and construction phases of the project. Additionally, every effort will be made to maximize the treatment of stormwater

runoff from the proposed project.

3.2 Assessment Methodology

In order to determine preliminary locations and boundaries of the existing wetlands, surface water communities and stormwater retention/conveyance features within and adjacent to the project area, available site-specific data was collected and reviewed. Published site-specific data reviewed included the following:

- Aerial photographs (high-resolution, 1 inch = 500 feet) (2023);
- FDOT, Florida Land Use, Cover and Forms Classification System (FLUCFCS), (2011-2017);
- Miami-Dade County GIS data (2023);
- US Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS), (2023);
- USFWS, Classification of Wetlands and Deepwater Habitats of the United States (Cowardin, et al., 1979); and
- USFWS National Wetlands Inventory (NWI), Wetlands Online Mapper, reviewed January 2023 (http://www.fws.gov/wetlands/Data/Mapper.html)
- Using the above-referenced information, the approximate boundaries of existing wetlands, surface water communities, and stormwater retention/conveyance features were mapped in GIS on aerial photography.

On November 17, 2021 and March 2, 2022, field reviews were conducted for the project study area to verify preliminary wetland, surface water community, stormwater retention/conveyance feature boundaries, and land use classifications. During field investigations, each wetland/surface water habitat within the project study area was visually inspected, assessed, and photographed (*see **Appendix H***). Attention was given to identifying plant species composition for each community type. Wildlife observations and signs of wildlife usage within each surface water habitat within the project study area were also documented. Mapped habitat boundaries and field observations were compared with the State of Florida Wetlands Delineation Manual (Chapter 62-340, FAC) and the guidelines found within the Regional Supplement to the USACE Wetlands Delineation Manual: Atlantic and Gulf Coastal Plain Region. It was determined there are no jurisdictional wetlands located within the project study area.

3.3 Individual Water Features

The project crosses one SFWMD maintained canal, the Black Creek Canal (C-1W). The project lies within two drainage basins: C-1 (Black Creek Canal/WBID 3297) and C-102 (WBID 3300), neither of which will be affected by this proposed project. Aerial maps depicting the Black Creek Canal (C-1W) within the project study area can be found in **Appendix G. Table 3-1** lists the individual surface water present within the project study area, with the FLUCFCS code, USFWS Wetlands and Deepwater Habitats classification system, and acreage. A description of the Black Creek Canal (C-1W) within the project study area is provided below.

Table 3-1: Summary of Individual Water Features

ID	Type	FLUCFCS Description	FLUCFCS Code	USFWS Classification*	Acres in Project Study Area
Black Creek Canal (C-1W)	Surface Water Feature	Waterbodies/ Canal	816	R2UBHx	0.13

*USFWS Wetland Description - R2UBHx: Riverine, Lower Perennial, Unconsolidated Bottom, Permanently Flooded, Excavated

Black Creek Canal (C-1W)

FLUCFCS – 816 (Waterbodies/Canal)

USFWS – R2UBHx (Riverine, Lower Perennial, Unconsolidated Bottom, Permanently Flooded, Excavated)

The Black Creek Canal (C-1W) is located in southeastern Miami-Dade County and has two main branches (C-1N and C-1W). The main canal flows southeasterly from three flood control structures (S-148, S-149, and S-122) to the salinity control structure at SW 87th Avenue. The S-122 structure at Franjo Road separates Black Creek from the Cutler Drain Canal (C-100B). The 9.3 miles of navigable Black Creek canals were constructed in the mid-1900s as part of a large flood control project. These canals were box-cut into the coral rock substrate and have near vertical walls. The main canal ranges from 40 to over 150 feet wide, and averages about 12 feet deep. The lateral canals are from 35 to 55 feet wide and 6 to 12 feet deep. No emergent wetland vegetation was observed along the bank, but submerged vegetation, Bladderwort (*Utricularia*) was observed. The Black Creek Canal (C-1W) primarily functions as a stormwater conveyance canal. The overall wildlife habitat quality of this canal is low due to lack of vegetation and proximity to major roadways. Wildlife species observed during the field review included the green iguana (*Iguana iguana*) and one large sized goldfish (*Carassius auratus*). No threatened or endangered species were observed.

3.4 Wetland and Surface Water Impacts

No vegetated wetland resources exist within the project study area. The existing surface water feature within the project study area provides low quality habitat due to the location within a densely developed urban area and the proximity to the existing roadway corridor. The Preferred Alternative will result in impacts to the existing surface water feature, due to the proposed bridge replacement over the Black Creek Canal (C-1W). The approach will include maintaining existing corridor drainage flow patterns which does not include existing outfall connections to the Black Creek Canal (C-1W). The proposed system does not include any new outfall connections. Refer to **Table 3-2** for a summary of surface water impacts for the preferred alternative.

Table 3-2: Drainage/Surface Water Feature Impacts

Drainage/Surface Water Feature	Preferred Alternative	
	Sq.Ft.	Acres
Black Creek Canal (C-1W)	24339.94	0.559
Total Impacts	**24339.94**	**0.559**

3.5 Avoidance and Minimization

From desktop review and field observations, it was determined that jurisdictional wetlands will not be impacted by the proposed improvements. A minor amount of impacts to other surface waters is anticipated from the Black Creek (C-1W) Canal bridge replacement.

All necessary measures will be taken to avoid and/or minimize impacts to surface water features during project design. While mitigation is not required, best management practices will be utilized during construction. In addition, all applicable permits will be obtained or modified in accordance with federal, state, and local laws and regulations. Further, the proposed stormwater management system does not include discharges into the canal and the design will make every effort to maximize the treatment of stormwater runoff from the proposed project.

3.6 Agency Coordination

While mitigation is not anticipated for this project, the FDOT will coordinate with the USACE and SFWMD to ensure that any unanticipated mitigation requirements are fully satisfied. The specific type and extent of any required mitigation will be finalized during permitting.

An interagency meeting with the SFWMD ROW department was conducted on June 16, 2022, to discuss the proposed improvements within the ROW of the Black Creek Canal (C-1W). A summary of the topics discussed is included in **Appendix I.**

4.0 ESSENTIAL FISH HABITAT

The NMFS is the regulatory agency responsible for the nation's living marine resources and their habitats, including EFH. This authority is designated by the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA), as amended. The MSFCMA defines EFH as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity". Based on the ETDM coordination, the NMFS concluded that the project study area will not directly or indirectly impact EFH and provided a no involvement determination. Based on the Essential Fish Habitat chapter of the PD&E Manual, location of the project, comments received from NMFS and field reviews, the project will have no involvement with EFH. Further coordination or consultation with NMFS is not necessary unless future modifications on the project are proposed that may result in adverse impacts to EFH.

4.1 Strategic Habitat Conservation Areas

Strategic Habitat Conservation Areas (SHCA) are defined as regions not in public ownership, which are recommended for protection in order to maintain biological diversity. These SHCA designations are intended to indicate that the existing land use should be maintained in order to conserve state-wide biodiversity. There are no Strategic Habitat Conservation Areas within proximity to the project study area. As such, no impacts are anticipated as a result of the proposed project.

5.0 ANTICIPATED PERMITS

Both the USACE and SFWMD regulate impacts on wetlands and surface waters. However, there are no jurisdictional wetlands located within the project study area. The FDEP regulates stormwater discharges from construction sites. The following permits are anticipated to be required for this project:

Permit	Issuing Agency
Section 408 Approval	USACE
Environmental Resource Permit (ERP)	SFWMD
Right-of-Way Occupancy Permit	SFWMD
Water Use Permits (for construction dewatering)	SFWMD
National Pollutant Discharge Elimination System (NPDES)	FDEP

Section 408 approval is anticipated from the USACE for modifications to the Black Creek Canal (C-1W) once determined that the canal is part of the Federal Flood Control Project.

The SFWMD requires an ERP when construction of any project results in the modification or creation of a water management system or results in impacts to wetlands or waters of the state. Although ERPs exist for portions of the corridor, it is anticipated that a new Individual ERP will be required for this entire project. It is also anticipated that a Right-of-Way Occupancy Permit for work within the SFWMD's ROW of the Black Creek Canal (C-1W) will be required per coordination with the district's ROW department. A SFWMD Water Use Permit for construction dewatering associated with the bridge replacement is also anticipated to be required from the SFWMD. The need for this permit will be confirmed during the final design phase of the project.

Under the FDEP'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 or an individual permit for point source discharges of stormwater to waters of the United States. A major component of the NPDES permit is the development of a Stormwater Pollution Prevention Plan (SWPPP). The SWPPP identifies potential sources of pollution that may reasonably be expected to affect the quality of stormwater discharges from the site and discusses good engineering practices (i.e., BMPs) that will be used to reduce the pollutants.

6.0 CONCLUSIONS

6.1 Protected Species and Habitats

The project study area was evaluated for the presence of federal and state protected species and their suitable habitats in accordance with Section 7 of the ESA and the FDOT PD&E Manual. **Table 6-1** below presents the respective effect determinations assigned to each federally and state listed species based on their potential of occurrence. It was determined that Black Creek Canal (C-1W) contains potential suitable habitat for the West Indian manatee (*Trichechus manatus latirostris*), however no manatees were observed during field visits. The Preferred Alternative will not result in destruction or adverse modification of federally-designated Critical Habitat.

Table 6-1: Summary of Listed Species and Effect Determinations

Protected Species		Jurisdictional Agency		Potential of Occurrence	Effect Determination
Common Name	Scientific Name	USFWS/ NMFS	FWC/ FDACS		
MAMMALS					
Florida bonneted bat	*Eumops floridanus*	E	E	Low	*No Effect*
West Indian manatee	*Trichechus manatus latirostris*	T	T	Low	*May Affect, Not Likely to Adversely Affect*
Tricolored bat***	*Perimyotis subflavus*	C	NL	Low	*Candidate Species*
Florida black bear**	*Ursus americanus floridanus*	NL	68A-4.009 FAC	Low	*N/A*
REPTILES					
American crocodile	*Crocodylus acutus*	T	T	Low	*No Effect*
Eastern indigo snake	*Drymarchon couperi*	T	T	Low	*May Affect, Not Likely to Adversely Affect*
Florida pine snake	*Pituophis melanoleucus mugitus*	NL	T	Low	*No effect anticipated*
Gopher tortoise	*Gopherus polyphemus*	NL	T	Low	*No effect anticipated*
BIRDS					
Bald eagle*	*Haliateetus leucocephalus*	BGEPA/ MBTA	68A-16.002 FAC	Low	*N/A*
Osprey*	*Pandion haliaetus*	MBTA	NA	Low	*N/A*
Wood stork	*Mycteria americana*	T	T	Low	*No Effect*
Little blue heron	*Egretta caerulea*	NL	T	Low	*No effect anticipated*
Reddish egret	*Egretta rufescens*	NL	T	Low	*No effect anticipated*
Tricolored Heron	*Egretta tricolor*	NL	T	Low	*No effect anticipated*
Florida burrowing owl	*Athene cunicularia floridana*	NL	T	Low	*No effect anticipated*
INSECTS					
Bartram's Hairstreak Butterfly	*Strymon acis bartrami*	E	E	Moderate	*No Effect*
Monarch Butterfly	*Danaus plexippus*	C	NL	Moderate	*Candidate Species*
PLANTS					
Blodgett's Silverbush	*Argythamnia blodgettii*	T	T	Low	*No Effect*
Florida Brickell-bush	*Brickellia mosieri*	E	E	Low	*No Effect*
Florida Prairie-clover	*Dalea carthagenensis floridana*	E	E	Low	*No Effect*
Garber's Spurge	*Chamaesyce garberi*	E	E	Low	*No Effect*
Sand Flax	*Linum arenicola*	E	E	Low	*No Effect*

Protected Species		Jurisdictional Agency		Potential of Occurrence	Effect Determination
Common Name	Scientific Name	USFWS/ NMFS	FWC/ FDACS		
Small's Milkpea	*Galactia smallii*	E	E	Low	*No Effect*
Tiny Polygala	*Polygala smallii*	E	E	Low	*No Effect*
Florida royal palm	*Roystonea elata*	NL	E	High	*Potential for Adverse Effect*

Definitions:

E = Endangered, **T** = Threatened, , **C**= Candidate Species, **NL**= Not Listed
Low = Minimal suitable habitat present and no documented occurrences within or near the project study area.
Moderate = Potentially suitable habitat present and/or documented occurrences near the project study area.
High = Suitable habitat present and documented occurrences within the project study area.
** Removed from Florida's Endangered and Threatened Species List in 2008 but is still protected under the Bald and Golden Eagle Protection Act (BGEPA), Migratory Bird Treaty Act (MBTA), and Florida Administrative Code (FAC).*
*** Removed from Florida's Endangered and Threatened Species List in 2012, but is still protected under the Florida Black Bear Conservation FAC.*
**** USFWS has proposed to list the tricolored bat as an endangered species under the ESA.*

6.2 Wetlands Finding

The proposed Preferred Alternative was evaluated for impacts to wetlands and surface waters in accordance with EO 11990. No impacts to vegetated wetland resources will occur as a result of the proposed Preferred Alternative. However, based on the location of the existing roadway network and the need for the proposed bridge replacement, the FDOT has determined that there is no practicable alternative to completely avoid impacts to the surface water feature identified. The proposed project will have no significant short-term or long-term adverse impacts to wetlands or surface waters. In accordance with EO 11990, the FDOT has undertaken all actions to avoid and minimize the destruction, loss or degradation of wetlands and surface waters, and to preserve and enhance the natural and beneficial values of wetlands/surface waters in carrying out the agency's responsibilities. Refer to **Table 6-2** for a summary of surface water impacts proposed for the preferred alternative.

Table 6-2: Surface Water Feature Impacts

Drainage/Surface Water Feature	Preferred Alternative	
	Sq.Ft.	Acres
Black Creek Canal (C-1W)	24339.94	0.559
Total Impacts	**24339.94**	**0.559**

6.3 Essential Fish Habitat

An EFH Assessment is not required for this project as the affected surface waters are not tidally influenced and do not contain EFH. The ETDM Programming Screen Summary Report includes a statement from the NMFS that impacts to EFH are not anticipated to occur as a result of this project.

6.4 Implementation Measures

Based on the field and literature reviews outlined in this report, federally and state listed protected species have the potential to occur within the project study area. In order to ensure

that the proposed project will not adversely impact these species, the FDOT will adhere to the following measures:

- The Florida royal palm is state-designated Endangered and is found within the project impact area. Coordination with FDACS will be initiated to allow for relocation to adjacent habitat or other suitable protected lands prior to construction.

- Best Management Practices will be incorporated during construction to minimize wetland impacts and provide sediment and erosion control.

6.5 Commitments

Based on the field and literature reviews outlined in this report, some federally listed or protected species have the potential to occur within the project study area. In order to assure that the proposed project will not adversely impact these species, the FDOT will adhere to the following commitments:

- A survey will be conducted for the Florida bonneted bat within the limits of construction activities. If any signs of the Florida bonneted bat are observed (e.g., tree cavities, new potential man-made roosting habitat), the FDOT is committed to coordinating with USFWS regarding the most updated relocation protocols for the Florida bonneted bat.

- The USFWS and FWC Standard Manatee Construction Conditions for In-Water Work will be utilized during construction.

- The most recent version of the USFWS Standard Protection Measures for the Eastern Indigo Snake will be utilized during construction.

- If the listing status of the tricolored bat is elevated by USFWS to Threatened or Endangered and the Preferred Alternative is located within the consultation area during the design and permitting phase of the proposed project, FDOT commits to re-initiating consultation with the USFWS to determine the appropriate survey methodology and to address USFWS regulations regarding the protection of the tricolored bat.

- If the listing status of the monarch butterfly is elevated by USFWS to Threatened or Endangered and the Preferred Alternative is located within the consultation area, during the design and permitting phase of the proposed project, FDOT commits to re-initiating consultation with the USFWS to determine the appropriate survey methodology and to address USFWS regulations regarding the protection of the monarch butterfly.

7.0 REFERENCES

Audubon Center for Birds of Prey, Eagle Nest Locator website

Audubon Center for Birds of Prey, Project study area (2023)

ESRI aerial photographs (2023)

Florida Administrative Code, Chapter 62-340, Delineation of the Landward Extent of Wetlands and Surface Waters.

Florida Association of Environmental Soil Scientists, Hydric Soils of Florida Handbook (Hurt 2007).

Florida Department of Transportation, Florida Land Use, Cover and Forms Classification System Manual, 3rd edition (1999).

Florida Department of Transportation, Project Development and Environment Manual, Part 2, Chapter 9 – Wetlands and Other Surface Waters (July 1,2023).

Florida Department of Transportation, Project Development and Environment Manual, Part 2, Chapter 11 – Water Resources (July 1, 2023).

Florida Department of Transportation, Project Development and Environment Manual, Part 2, Chapter 13 – Floodplains (July 1, 2023).

Florida Department of Transportation, Project Development and Environment Manual, Part 2, Chapter 16 – Protected Species and Habitat (July 1, 2023).

Florida Fish and Wildlife Conservation Commission (FWC), Florida's Endangered and Threatened Species (updated December 2021).

Florida Fish and Wildlife Service (USFWS), Endangered Species Database

Florida Fish and Wildlife Service (USFWS), National Wetlands Inventory, Wetlands Online Mapper, reviewed January 2023

Florida Fish and Wildlife Service (USFWS), Threatened and Endangered Species 'Critical Habitat Online Mapping Application

Florida Natural Areas Inventory (FNAI) database, reviewed January 2023

Florida Natural Areas Inventory (FNAI) Tracking List, Miami-Dade County (2023)

FNAI Field Guide to the Rare Plants and Animals of Florida Online (2023)

FWC Florida's Endangered and Threatened Species (2023)

FWC Online Imperiled Species List (2023)

FWC Waterbird Colony Locator Database, Project study area (2023)

Interactive Web Soil Survey of the project area (2023).

Miami-Dade County GIS data (2023).

South Florida Water Management District, Geographic Information System (GIS) Land Use Database (2023).

U.S. Army Corps of Engineers Atlantic and Gulf Coast Regional Supplement to the Wetlands Delineation Manual (2010).

U.S. Department of Agriculture, Natural Resources Conservation Service,

U.S. Department of Transportation Order 5660.1A, Preservation of the Nation's Wetlands (August 24, 1978).

U.S. Fish and Wildlife Service Classification of Wetlands and Deepwater Habitats of the United States (1979).

USFWS Critical Habitat Portal, Project study area (2023)

USFWS Environmental Conservation Online System, Miami-Dade County (2023)

USFWS IPaC Resource List (2023)

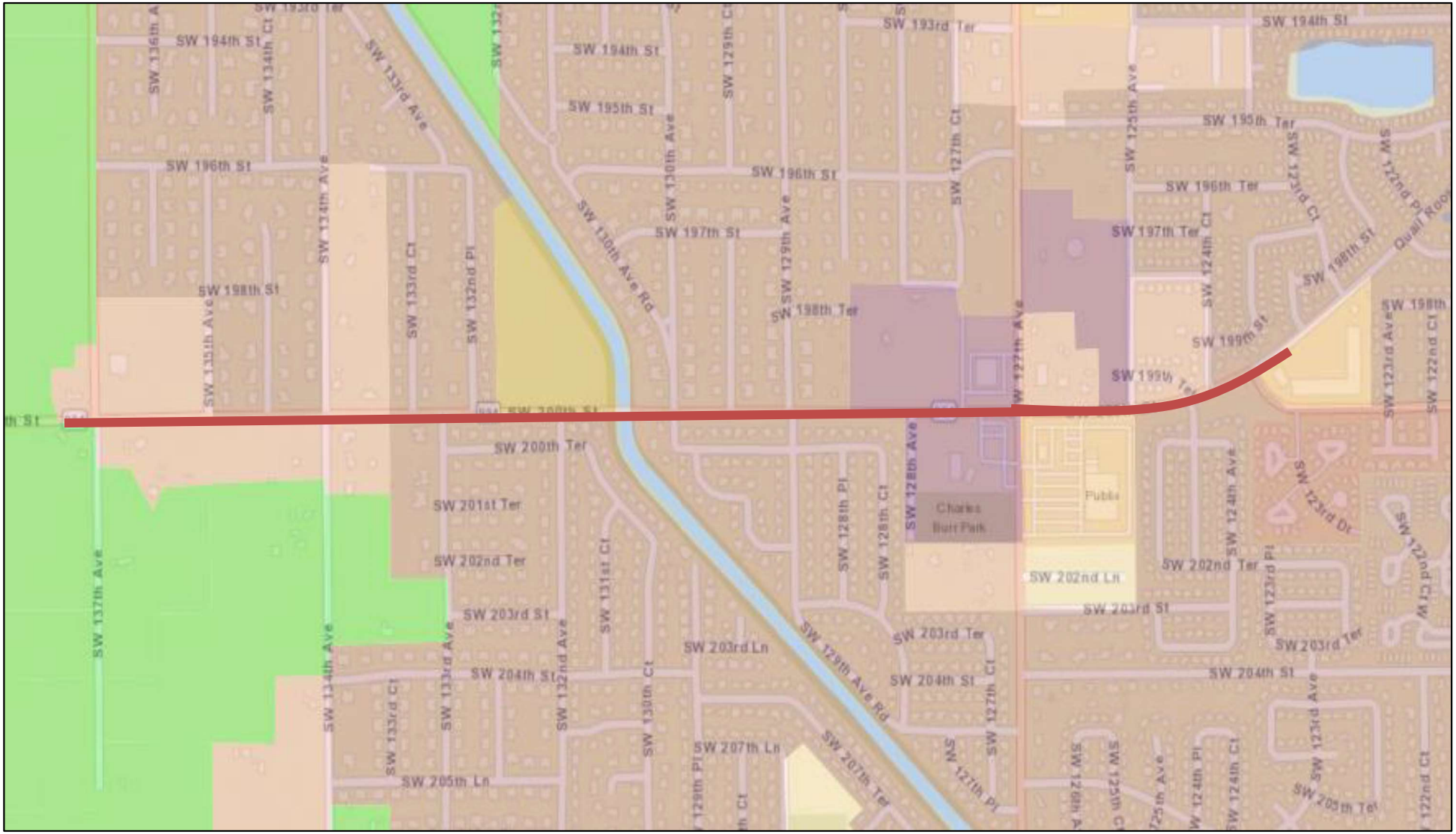
APPENDIX

Appendix A-1: Land Use/Vegetative Cover Maps
Appendix A-2: Land use Descriptions
Appendix B-1: Soils Maps
Appendix B-2: Soils Descriptions
Appendix C-1: FBB Range and Project Location Map
Appendix C-2: Environmental Sites and Tree Survey Photographs
Appendix D-1: USACE 2013 Manatee Consultation Key
Appendix D-2: Standard Manatee Conditions for In-Water Work
Appendix E-1: USFWS Eastern Indigo Snake Key
Appendix E-2: Standard Protection Measures for the Eastern Indigo Snake
Appendix F-1: USFWS Wood Stork Consultation Key
Appendix F-2: Active Wood Stork Colonies
Appendix G: Summary of Individual Water Features (NWI Map)
Appendix H: Surface Waters and Bridge Photos
Appendix I: SFWMD Interagency Meeting Minutes
Appendix J: USFWS IPaC Resource List

Appendix A-1

Land Use and Vegetative Cover Map

Land Use/Vegetative Cover Map



LEGEND

- 110 Residential, Low Density
- 120 Residential, Medium Density
- 130 Residential, High Density
- 140 Commercial and Services
- 170 Institutional
- 190 Urban and Built-Up
- 214 Agricultural/Row Crops
- 243 Agricultural/Ornamentals
- 221 Agricultural/Citrus Groves
- 320 Rangeland/Shrub and Brushland
- 816 Waterbodies/Canals
- Project Limits

1:9,028

N

0 0.05 0.1 0.2 mi

0 0.1 0.2 0.4 km

Miami-Dade County, Esri, HERE, Garmin, INCREMENT P, NGA, USGS

Florida Department of Transportation

Appendix A-2

Land Use Descriptions

Land Use Descriptions

FLUCCS Code	Class Name	Description
110	Residential, Low Density	The land use designation is for fixed homes with less than two dwellings per acre. These areas are located along all segments throughout the study area.
120	Residential, Medium Density	The land use designation is for fixed homes found with two to five dwellings per acre. These areas are located along all segments throughout the study area.
130	Residential, High Density	The land use designation is for fixed homes with six or more dwellings per acre. These areas are located along all segments throughout the study area
140	Commercial and Services	The land use designation is for secondary structures associated with an enterprise in addition to the main building and integral areas assigned to support the base unit. These areas are located between SW 137th Avenue and SW 133rd Avenue.
170	Institutional	This land use designation is for schools, religious buildings, and government buildings. This area is located on the NE corner of SW 200th Street and SW 137th Avenue.
190	Urban and Built-Up	This land use designation is for undeveloped land within urban areas and inactive land with street patterns without structures.
214	Agriculture/Row Crops	This land use designation is for rows of well-defined crops.
221	Agriculture/Citrus Groves	This class is for active tree cropping operations that produce fruit, nuts, or other resources not including wood products.

Land Use Descriptions

243	Agriculture/Ornamentals	Facilities that raise ornamental plants for off-site use.
320	Rangeland/Shrub and Brushland	This land use category includes upland grasses that occur in upland soils.
816	Waterbodies/Canal	Aquatic community of an artificial waterway or modified stream channel constructed for inland navigation, drainage or irrigation of adjacent lands. There is one canal (C1-W) that flows under SR 994/Quail Roost Drive.

Appendix B-1

Soils Map

Soils Map

Map Scale: 1:12,000 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 150 300 600 900

Feet: 0 500 1000 2000 3000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 17N WGS84

Soil Map—Miami-Dade County Area, Florida

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Miami-Dade County Area, Florida
Survey Area Data: Version 14, Sep 1, 2022

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jan 21, 2021—Apr 2, 2021

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
4	Pennsuco marly silt loam, drained, 0 to 1 percent slopes	0.0	0.0%
7	Krome very gravelly marly loam, 0 to 2 percent slopes	0.6	1.6%
15	Urban land, 0 to 2 percent slopes	5.3	15.0%
53	Biscayne marly silt loam, drained-Urban land complexx, 0 to 1 percent slopes	1.8	5.1%
61	Krome very gravelly marly loam-Urban land complex, 0 to 2 percent slopes	23.5	66.1%
69	Perrine marly silt loam, drained-Urban land complex, 0 to 1 percent slopes	4.0	11.2%
99	Water	0.4	1.1%
Totals for Area of Interest		**35.5**	**100.0%**

Appendix B-2

Soil Type Descriptions

Miami-Dade County Area, Florida

4—Pennsuco marly silt loam, drained, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2z9ss
Elevation: 0 to 10 feet
Mean annual precipitation: 55 to 70 inches
Mean annual air temperature: 77 to 81 degrees F
Frost-free period: 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Pennsuco, drained, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pennsuco, Drained

Setting

Landform: Marshes on marine terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Silty marl over oolitic limestone

Typical profile

Lma1 - 0 to 8 inches: marly silt loam
Lma2 - 8 to 44 inches: marly silt loam
2R - 44 to 54 inches: bedrock

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: 40 to 60 inches to lithic bedrock
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 95 percent
Maximum salinity: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum: 5.0
Available water supply, 0 to 60 inches: Moderate (about 7.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7w

Hydrologic Soil Group: B/D
Forage suitability group: Loamy and clayey soils on flats of hydric or mesic lowlands (G156AC341FL)
Other vegetative classification: Loamy and clayey soils on flats of hydric or mesic lowlands (G156AC341FL)
Hydric soil rating: Yes

Minor Components

Biscayne, drained
Percent of map unit: 4 percent
Landform: Marshes on marine terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear
Across-slope shape: Concave
Other vegetative classification: Forage suitability group not assigned (G156AC999FL)
Hydric soil rating: Yes

Pennsuco, ponded
Percent of map unit: 4 percent
Landform: Marshes on marine terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear
Across-slope shape: Concave
Other vegetative classification: Loamy and clayey soils on flats of hydric or mesic lowlands (G156AC341FL)
Hydric soil rating: Yes

Udorthents, marl substratum
Percent of map unit: 3 percent
Landform: Marine terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Forage suitability group not assigned (G156AC999FL)
Hydric soil rating: No

Biscayne, ponded
Percent of map unit: 2 percent
Landform: Marshes on marine terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear
Across-slope shape: Concave
Other vegetative classification: Forage suitability group not assigned (G156AC999FL)
Hydric soil rating: Yes

Shark valley
Percent of map unit: 2 percent
Landform: Depressions on marine terraces
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Talf, dip

Down-slope shape: Linear, concave
Across-slope shape: Convex, concave
Other vegetative classification: Organic soils in depressions and on flood plains (G156AC645FL)
Hydric soil rating: Yes

Data Source Information

Soil Survey Area: Miami-Dade County Area, Florida
Survey Area Data: Version 14, Sep 1, 2022

Miami-Dade County Area, Florida

7—Krome very gravelly marly loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2z9sp
Elevation: 0 to 10 feet
Mean annual precipitation: 55 to 70 inches
Mean annual air temperature: 77 to 81 degrees F
Frost-free period: 365 days
Farmland classification: Farmland of unique importance

Map Unit Composition

Krome and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Krome

Setting

Landform: Rises on marine terraces
Landform position (three-dimensional): Tread, rise
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Marly loamy residuum weathered from limestone over oolitic limestone

Typical profile

Lmap - 0 to 7 inches: very gravelly marly loam
R - 7 to 17 inches: bedrock

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 2 to 10 inches to lithic bedrock
Drainage class: Moderately well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 42 to 60 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 80 percent
Maximum salinity: Slightly saline to strongly saline (4.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum: 15.0
Available water supply, 0 to 60 inches: Very low (about 1.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5s
Hydrologic Soil Group: D

Forage suitability group: Shallow or moderately deep, sandy or loamy soils on rises and ridges of mesic uplands (G156AC521FL)
Other vegetative classification: Shallow or moderately deep, sandy or loamy soils on rises and ridges of mesic uplands (G156AC521FL)
Hydric soil rating: No

Minor Components

Chekika
Percent of map unit: 4 percent
Landform: Rises on marine terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear
Across-slope shape: Convex
Other vegetative classification: Shallow or moderately deep, sandy or loamy soils on rises and ridges of mesic uplands (G156AC521FL)
Hydric soil rating: No

Biscayne
Percent of map unit: 4 percent
Landform: Marshes on marine terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear
Across-slope shape: Concave
Other vegetative classification: Forage suitability group not assigned (G156AC999FL)
Hydric soil rating: Yes

Rock outcrop
Percent of map unit: 3 percent
Hydric soil rating: No

Cardsound
Percent of map unit: 3 percent
Landform: Rises on marine terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear
Across-slope shape: Convex
Other vegetative classification: Forage suitability group not assigned (G156AC999FL)
Hydric soil rating: No

Gator lake
Percent of map unit: 1 percent
Landform: Marshes on marine terraces
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Other vegetative classification: Organic soils in depressions and on flood plains (G156AC645FL)

Hydric soil rating: Yes

Data Source Information

Soil Survey Area: Miami-Dade County Area, Florida
Survey Area Data: Version 14, Sep 1, 2022

Miami-Dade County Area, Florida

15—Urban land, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2z9t5
Elevation: 0 to 30 feet
Mean annual precipitation: 55 to 70 inches
Mean annual air temperature: 68 to 81 degrees F
Frost-free period: 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Urban land: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Urban Land

Setting

Landform: Flatwoods on marine terraces, rises on marine terraces, knolls on marine terraces, ridges on marine terraces, hills on marine terraces
Landform position (two-dimensional): Summit, backslope
Landform position (three-dimensional): Interfluve, side slope, riser, talf, rise
Down-slope shape: Linear, convex
Across-slope shape: Linear
Parent material: No parent material

Interpretive groups

Land capability classification (irrigated): None specified
Forage suitability group: Forage suitability group not assigned (G155XB999FL)
Other vegetative classification: Forage suitability group not assigned (G155XB999FL)
Hydric soil rating: Unranked

Minor Components

Naranja

Percent of map unit: 3 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Forage suitability group not assigned (G156AC999FL)
Hydric soil rating: No

Sunny isles

Percent of map unit: 3 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Riser, talf
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: South Florida Flatwoods (R155XY003FL), Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Hydric soil rating: No

Margate

Percent of map unit: 3 percent
Landform: Flats on marine terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear
Across-slope shape: Concave
Other vegetative classification: Sandy soils on stream terraces, flood plains, or in depressions (G156AC145FL)
Hydric soil rating: Yes

Hallandale

Percent of map unit: 3 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: South Florida Flatwoods (R155XY003FL), Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Hydric soil rating: Yes

Dade

Percent of map unit: 3 percent
Landform: Ridges on marine terraces
Landform position (three-dimensional): Interfluve, tread, rise
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Shallow or moderately deep, sandy or loamy soils on rises and ridges of mesic uplands (G156AC521FL)
Hydric soil rating: No

Data Source Information

Soil Survey Area: Miami-Dade County Area, Florida
Survey Area Data: Version 14, Sep 1, 2022

Miami-Dade County Area, Florida

53—Biscayne marly silt loam, drained-Urban land complexx, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2z9vc
Elevation: 0 to 10 feet
Mean annual precipitation: 42 to 70 inches
Mean annual air temperature: 77 to 81 degrees F
Frost-free period: 365 days
Farmland classification: Farmland of unique importance

Map Unit Composition

Biscayne and similar soils: 50 percent
Urban land: 40 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Biscayne

Setting

Landform: Marshes on marine terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Silty marl over limestone

Typical profile

Lma1 - 0 to 5 inches: marly silt loam
Lma2 - 5 to 15 inches: marly silt loam
2R - 15 to 25 inches: bedrock

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: 3 to 20 inches to lithic bedrock
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 100 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Very low (about 2.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7w
Hydrologic Soil Group: C/D
Forage suitability group: Forage suitability group not assigned (G156AC999FL)
Other vegetative classification: Forage suitability group not assigned (G156AC999FL)
Hydric soil rating: Yes

Description of Urban Land

Setting

Landform: Flats on islands
Landform position (three-dimensional): Riser, talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: No parent material

Interpretive groups

Land capability classification (irrigated): None specified
Forage suitability group: Forage suitability group not assigned (G155XB999FL)
Other vegetative classification: Forage suitability group not assigned (G155XB999FL)
Hydric soil rating: Unranked

Minor Components

Shark valley

Percent of map unit: 2 percent
Landform: Depressions on marine terraces
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Talf, dip
Down-slope shape: Linear, concave
Across-slope shape: Convex, concave
Other vegetative classification: Organic soils in depressions and on flood plains (G156AC645FL)
Hydric soil rating: Yes

Chekika

Percent of map unit: 2 percent
Landform: Rises on marine terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear
Across-slope shape: Convex
Other vegetative classification: Shallow or moderately deep, sandy or loamy soils on rises and ridges of mesic uplands (G156AC521FL)
Hydric soil rating: No

Cooper town

Percent of map unit: 2 percent
Landform: Marshes on marine terraces
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Talf, dip

Down-slope shape: Linear, concave
Across-slope shape: Convex, concave
Other vegetative classification: Organic soils in depressions and on flood plains (G156AC645FL)
Hydric soil rating: Yes

Pennsuco, drained

Percent of map unit: 2 percent
Landform: Marshes on marine terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear
Across-slope shape: Concave
Other vegetative classification: Loamy and clayey soils on flats of hydric or mesic lowlands (G156AC341FL)
Hydric soil rating: Yes

Rock outcrop, misc

Percent of map unit: 2 percent
Landform: Marshes on marine terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: No

Data Source Information

Soil Survey Area: Miami-Dade County Area, Florida
Survey Area Data: Version 14, Sep 1, 2022

Miami-Dade County Area, Florida

61—Krome very gravelly marly loam-Urban land complex, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2z9vl
Elevation: 0 to 10 feet
Mean annual precipitation: 55 to 70 inches
Mean annual air temperature: 77 to 81 degrees F
Frost-free period: 365 days

Map Unit Composition

Krome and similar soils: 45 percent
Urban land: 40 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Krome

Setting

Landform: Rises on marine terraces
Landform position (three-dimensional): Tread, rise
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Marly loamy residuum weathered from limestone over oolitic limestone

Typical profile

Lmap - 0 to 7 inches: very gravelly marly loam
R - 7 to 17 inches: bedrock

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 2 to 10 inches to lithic bedrock
Drainage class: Moderately well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 42 to 60 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 80 percent
Maximum salinity: Slightly saline to strongly saline (4.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum: 15.0
Available water supply, 0 to 60 inches: Very low (about 1.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5s

Hydrologic Soil Group: D
Forage suitability group: Shallow or moderately deep, sandy or loamy soils on rises and ridges of mesic uplands (G156AC521FL)
Other vegetative classification: Shallow or moderately deep, sandy or loamy soils on rises and ridges of mesic uplands (G156AC521FL)
Hydric soil rating: No

Description of Urban Land

Setting

Landform: Flats on islands
Landform position (three-dimensional): Riser, talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: No parent material

Interpretive groups

Land capability classification (irrigated): None specified
Forage suitability group: Forage suitability group not assigned (G155XB999FL)
Other vegetative classification: Forage suitability group not assigned (G155XB999FL)
Hydric soil rating: Unranked

Minor Components

Chekika

Percent of map unit: 4 percent
Landform: Rises on marine terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear
Across-slope shape: Convex
Other vegetative classification: Shallow or moderately deep, sandy or loamy soils on rises and ridges of mesic uplands (G156AC521FL)
Hydric soil rating: No

Biscayne

Percent of map unit: 4 percent
Landform: Marshes on marine terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear
Across-slope shape: Concave
Other vegetative classification: Forage suitability group not assigned (G156AC999FL)
Hydric soil rating: Yes

Cardsound

Percent of map unit: 3 percent
Landform: Rises on marine terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear

Across-slope shape: Convex
Other vegetative classification: Forage suitability group not assigned (G156AC999FL)
Hydric soil rating: No

Rock outcrop

Percent of map unit: 3 percent
Hydric soil rating: No

Gator lake

Percent of map unit: 1 percent
Landform: Marshes on marine terraces
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Other vegetative classification: Organic soils in depressions and on flood plains (G156AC645FL)
Hydric soil rating: Yes

Data Source Information

Soil Survey Area: Miami-Dade County Area, Florida
Survey Area Data: Version 14, Sep 1, 2022

Miami-Dade County Area, Florida

69—Perrine marly silt loam, drained-Urban land complex, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2z9vw
Elevation: 0 to 10 feet
Mean annual precipitation: 55 to 70 inches
Mean annual air temperature: 77 to 81 degrees F
Frost-free period: 365 days

Map Unit Composition

Perrine, drained, and similar soils: 45 percent
Urban land: 40 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Perrine, Drained

Setting

Landform: Marshes on marine terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Silty marl over oolitic limestone

Typical profile

Lma1 - 0 to 11 inches: marly silt loam
Lma2 - 11 to 26 inches: marly silt
2R - 26 to 36 inches: bedrock

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: 14 to 40 inches to lithic bedrock
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 90 percent
Maximum salinity: Nonsaline to moderately saline (0.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum: 10.0
Available water supply, 0 to 60 inches: Low (about 4.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w

Hydrologic Soil Group: C/D
Forage suitability group: Forage suitability group not assigned (G156AC999FL)
Other vegetative classification: Forage suitability group not assigned (G156AC999FL)
Hydric soil rating: Yes

Description of Urban Land

Setting

Landform: Flats on islands
Landform position (three-dimensional): Riser, talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: No parent material

Interpretive groups

Land capability classification (irrigated): None specified
Forage suitability group: Forage suitability group not assigned (G155XB999FL)
Other vegetative classification: Forage suitability group not assigned (G155XB999FL)
Hydric soil rating: Unranked

Minor Components

Pennsuco, ponded

Percent of map unit: 4 percent
Landform: Marshes on marine terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear
Across-slope shape: Concave
Other vegetative classification: Loamy and clayey soils on flats of hydric or mesic lowlands (G156AC341FL)
Hydric soil rating: Yes

Biscayne, drained

Percent of map unit: 4 percent
Landform: Marshes on marine terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear
Across-slope shape: Concave
Other vegetative classification: Forage suitability group not assigned (G156AC999FL)
Hydric soil rating: Yes

Udorthents, marl substratum

Percent of map unit: 3 percent
Landform: Marine terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Forage suitability group not assigned (G156AC999FL)

Hydric soil rating: No

Shark valley

Percent of map unit: 2 percent
Landform: Depressions on marine terraces
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Talf, dip
Down-slope shape: Linear, concave
Across-slope shape: Convex, concave
Other vegetative classification: Organic soils in depressions and on flood plains (G156AC645FL)
Hydric soil rating: Yes

Biscayne, pondede

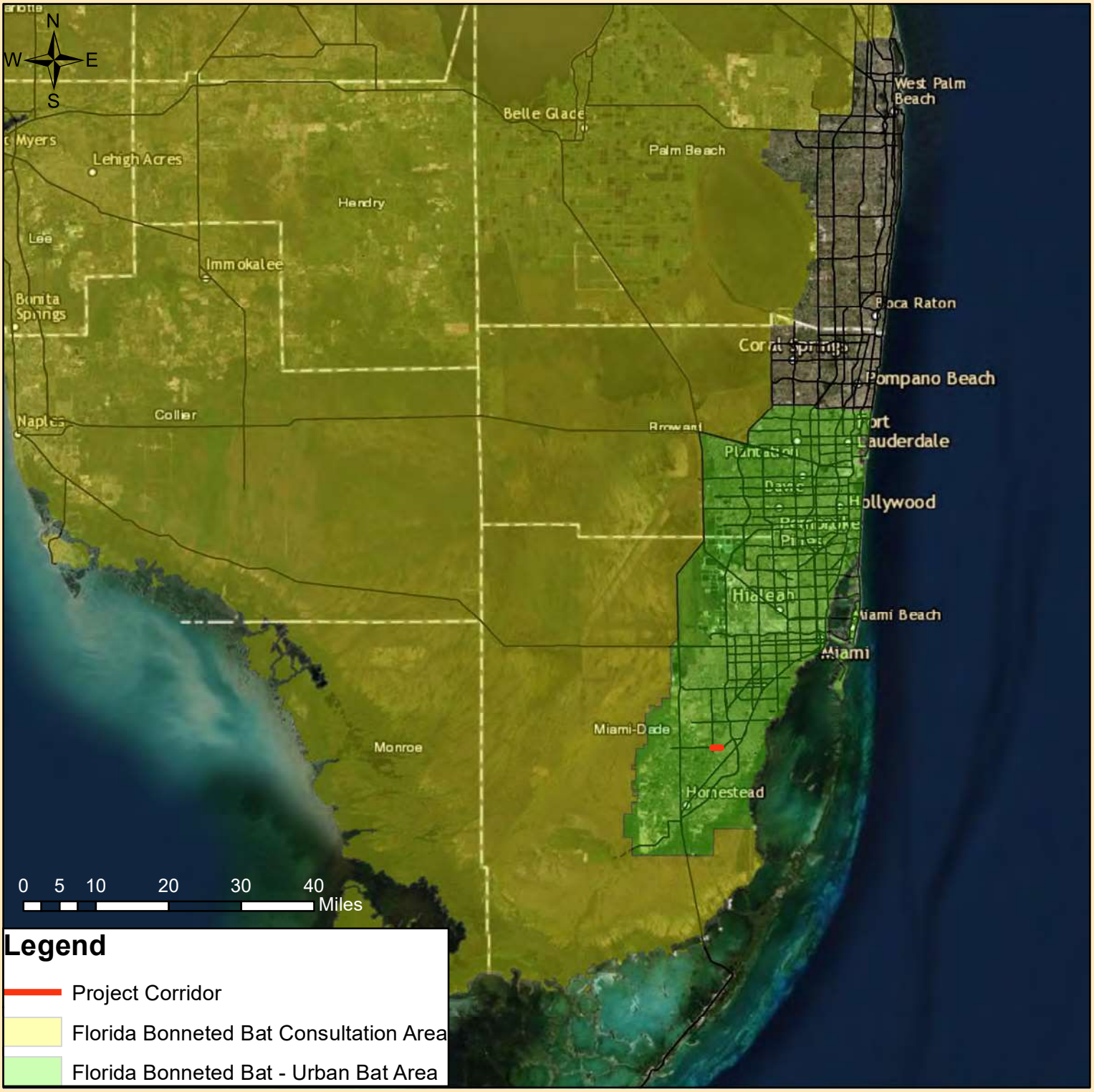
Percent of map unit: 2 percent
Landform: Marshes on marine terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear
Across-slope shape: Concave
Other vegetative classification: Forage suitability group not assigned (G156AC999FL)
Hydric soil rating: Yes

Data Source Information

Soil Survey Area: Miami-Dade County Area, Florida
Survey Area Data: Version 14, Sep 1, 2022

Appendix C-1

FBB Range and Project Location Map



Florida Bonneted Bat Consultation Areas	SR 994/Quail Roost Drive PD&E Study from SW137th Ave to SW 127th Ave Miami-Dade County, FL FM# 445804-1-22-01 ETDM# 14429

Appendix C-2

Environmental Sites
and
Tree Survey Photographs

Environmental Site Photos

The southern side of SR 994 west of SW 139th Ave is lined with multiple Florida strangler figs (*Ficus aurea*). One(1) tree contained a cavity and was surveyed for signs of bats. No signs of bats were present.

A large portion of the southern side of SR 994 between SW 139th Ave and SW 137th Ave is a dedicated mango tree (*Mangifera indica*) farm. The trees located along the fence did not meet the USFWS guidelines for the FBB, however they were still inspected for signs of bat usage. The surrounding area was also surveyed for any signs of burrowing owl and gopher tortoise. There were no signs of either the bat, gopher tortoise and/or burrowing owls.

Environmental Site Photos

The area along the north side of SR 994 between SW 139th Ave and SW 137th Ave is densely vegetated with the invasive species, Burma reed (*Neyraudia reynaudiana*). No suitable habitat present for any of the listed species found in the project study area.

The corner of SR 994 and SW 137th Ave was mainly void of vegetation except for the private property on the southwest corner of the intersection. The trees along the private property fence are densely packed with Florida strangler figs (*Ficus aurea)* and mango trees (*Mangifera indica*). One(1) Florida strangler fig (*Ficus aurea)* tree contained a cavity and was surveyed for signs of bats. No signs of bats were present.

Appendix D-1

USFWS West Indian Manatee Key

United States Department of the Interior

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

April 25, 2013

Donald W. Kinard
Chief, Regulatory Division
U.S. Army Corps of Engineers
701 San Marco Boulevard, Room 372
Jacksonville, Florida 32207-8175

Dear Mr. Kinard:

This letter acknowledges the U.S. Fish and Wildlife Service's (Service) receipt of your April 12, 2013, letter requesting concurrence on the U.S. Army Corps of Engineers' (Corps) implementation of the revised Manatee Key and its enclosures dated April 2013. This letter represents the Service's views on the potential effects of the proposed action in accordance with section 7 of the Endangered Species Act of 1973, as amended (Act) (16 U.S.C. 1531 *et seq.*) and the Marine Mammal Protection Act of 1972, as amended (MMPA) (16 U.S.C. 1361 *et seq.*). For future reference, we have assigned this concurrence letter to Service Consultation Code 2013-I-0151.

The Manatee Key is a tool that has been used by the Corps' Regulatory Division since 1992 to assist in making its effect determinations, as required under 50 CFR 402.14(a), on permit applications for in-water activities such as, but not limited to, maintenance dredging, the placement of fill material for shoreline stabilization, the construction or placement of other in-water structures, as well as the construction of docks, marinas, boat ramps, boat slips, dry storage or any other watercraft access structures or facilities. Your agency has determined utilization of the 2013 Manatee Key, and its enclosures, to review projects in waters accessible to the endangered West Indian manatee (*Trichechus manatus*) may affect, but is not likely to adversely affect the manatee or its designated critical habitat.

Since July 2011, the Service has worked closely with the Corps and the Florida Fish and Wildlife Conservation Commission (FWC) on revising the March 2011 version of the Manatee Key and its associated maps. Minor changes to the March 2011 Manatee Key were made to ensure consistency with the manatee programmatic consultation co-developed by the Corps and the Service in cooperation with the FWC.

For all new or expanding multi-slip facilities located in a county with a State-approved MPP in place that reach a "may affect, not likely to adversely affect" determination using the 2013 Manatee Key, the Service concurs with these determinations and no further consultation with the Service is necessary.

For all applications to construct residential dock facilities that reach a "may affect, not likely to adversely affect" determination using the 2013 Manatee Key, the Service concurs with these determinations and no further consultation with the Service is necessary. As such, the Service will not receive permit applications from the Corps for these types of facilities.

For those counties with a watercraft-related mortality rate that averages less than one dead manatee a year, we conclude take is not reasonably certain to occur as a result of new or expanding watercraft access facilities in these counties. Therefore, for multi-slip facilities proposed to be built or expanded in those counties that reach a "may affect, not likely to adversely affect" determination using the 2013 Manatee Key, the Service concurs with these effect determinations and no further consultation with the Service is necessary.

For all applications to repair or replace existing multi-slip facilities that do not provide new watercraft access and reach a "may affect, not likely to adversely affect" determination using the 2013 Manatee Key, the Service concurs with these determinations. As such, the Service will not receive permit applications from the Corps for these types of existing facilities since they were covered by the Service's March 17, 2011, consultation on the 2011 Manatee Key.

All other future applications for multi-slip facilities reaching a "may affect, not likely to adversely affect" determination using the 2013 Manatee Key will be forwarded to the Service for concurrence. The Corps agreed to forward to the Service those applications that are consistent with the Manatee Key.

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. 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 appropriate and no further consultation with the Service is necessary.

We have examined the April 2013 version of the Manatee Key and its enclosures and agree with its structure and content. Currently, the FWC does not require implementation of the signage component of the standard construction conditions for in-water work for the State's review of the permit application. However, the Corps and the Service will require applicants to implement the signage component of the standard construction conditions for any in-water work authorized by a Department of the Army permit. Therefore, except as noted above, for all future applications reviewed with the April 2013 version of the Manatee Key in which the Corps reaches a "may affect, not likely to adversely affect" determination with respect to the manatee and/or its designated critical habitat, the Service hereby concurs with those determinations in accordance with 50 CFR 402.14(b)1. As such, the March 2011 version of the Manatee Key and its associated maps, as well as other earlier versions of the Manatee Key, are no longer applicable.

The Service does not anticipate the proposed action will result in the incidental take of manatees. Furthermore, the Service is not including an incidental take authorization for marine mammals at this time because the incidental take of marine mammals is not expected to occur and has not been authorized under section 101(a)(5) of the MMPA and/or its 1994 Amendments. Following issuance of such regulations or authorizations, the Service may reinitiate consultation to include an incidental take statement for marine mammals, if deemed appropriate.

This concurrence letter fulfills the requirements of section 7 of the Act and no further action is required. If modifications are made to the Manatee Key, if additional information involving potential effects to listed species becomes available, or if a new species is listed or new critical habitat is designated that may be affected by the project, then reinitiation of consultation may be necessary.

This concurrence letter represents the collective assessment of the April 2013 version of the Manatee Key and its enclosures from the Service's three field offices in Florida: Panama City, North Florida, and South Florida. If you have any questions or concerns about this consultation, please feel free to contact Kalani Cairns at 772-469-4240.

Sincerely yours,

Larry Williams
State Supervisor

cc: electronic copy only
Corps, Jacksonville, Florida (Stuart Santos)
Service, Atlanta, Georgia (Jack Arnold)
Service, Jacksonville, Florida (Dawn Jennings)
Service, Panama City, Florida (Don Imm)

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
Florida[1]
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 structure[3] 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 Maps[4]); [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, DESOTO[7], FLAGLER, GLADES, HENDRY, HILLSBOROUGH, LEVY, MANATEE, MONROE[7], PASCO[7], 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 vegetation[8], emergent vegetation or mangrove will have beneficial, insignificant, discountable[9] or no effects on the manatee[10] ..... O

Project impacts to submerged aquatic vegetation[8], emergent vegetation or mangrove may adversely affect the manatee[10] ..... *May affect*

O. Project proponent **elects** to follow standard manatee conditions for in-water work[11] and requirements, as appropriate for the proposed activity, prescribed on the maps[4] ..... P

Project proponent **does not elect** to follow standard manatee conditions for in-water work[11] and appropriate requirements prescribed on the maps[4] ..... *May affect*

P. If project is for a new or expanding[5] 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 appropriate[12] and no further consultation with the Service is necessary.

If project is for a new or expanding[5] 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 appropriate[12] 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 appropriate[12] 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 new[5] multi-slip facility, residential dock facility, shoreline stabilization, or dredging, and does not provide new[5] access for watercraft or

improve an existing access to allow increased watercraft usage, the determination of "*May affect, not likely to adversely affect*" is appropriate[12] 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 appropriate[11] 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 (J*uncus 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 <u>any</u> 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.

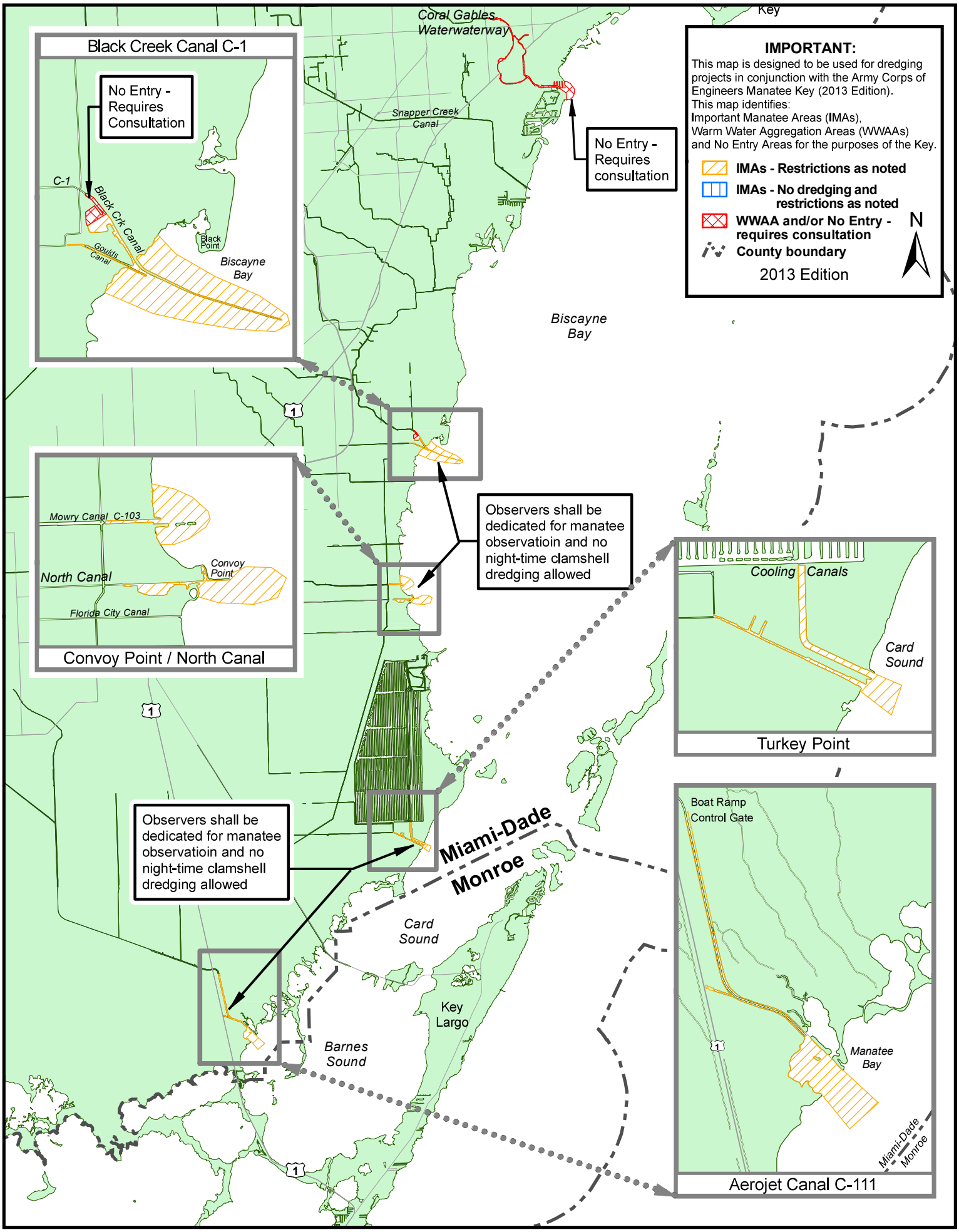
Submerged aquatic vegetation (SAV) – Rooted, submerged, aquatic plants such as, but not limited to, shoal grass (*Halodule wrightii*), paddle grass (*Halophila decipiens*), star grass (*Halophila engelmanni*), Johnson's seagrass (*Halophila johnsonii*), sago pondweed (*Potamogeton pectinatus*), clasping-leaved 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.

Miami-Dade County - South



Appendix D-2

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 in Vero Beach (1-772-562-3909) for south Florida, and emailed 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 8½ " 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 http://www.myfwc.com/WILDLIFEHABITATS/manatee_sign_vendors.htm. Questions concerning these signs can be forwarded 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 E-1

USFWS Eastern Indigo Snake Key

United States Department of the Interior

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

August 1, 2017

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

Subject: Consultation Key for the Eastern Indigo Snake – Revised

Dear Mr. Kinard:

This letter revises and replaces the January 25, 2010, and August 13, 2013, letters to the U.S. Army Corps of Engineers (Corps) regarding the use of the eastern indigo snake programmatic effect determination key (Key) for projects occurring within the South Florida Ecological Service's Office (SFESO) jurisdiction. This revision supersedes all prior versions of the Key in the SFESO area. The purpose of this revision is to clarify portions of the previous keys based on questions we have been asked, specifically related to habitat and refugia used by eastern indigo snakes (*Drymarchon corais couperi*), in the southern portion of their range and within the jurisdiction of the SFESO. This Key is provided pursuant to the Service's authorities under the Endangered Species Act of 1973, as amended (Act) (87 Stat. 884; 16 U.S.C.1531 *et seq.*). This Key revision has been assigned Service Consultation Code: 41420-2009-I-0467-R001.

The purpose of this Key is to assist the Corps (or other Federal action agency) in making appropriate effects determinations for the eastern indigo snake under section 7 of the Act, and streamline informal consultation with the SFESO for the eastern indigo snake when the proposed action can be walked through the Key. The Key is a tool available to the Corps (or other Federal action agency) for the purposes of expediting section 7 consultations. There is no requirement to use the Key. There will be cases when the use of the Key is not appropriate. These include, but are not limited to: where project specific information is outside of the scope of the Key or instances where there is new biological information about the species. In these cases, we recommend the Corps (or other Federal action agency) initiates traditional consultation pursuant to section 7 of the Act, and identify that consultation is being requested outside of the Key.

This Key uses project size and home ranges of eastern indigo snakes as the basis for making determinations of "may affect, but is not likely to adversely affect" (NLAA) and "may affect, and is likely to adversely affect" (may affect). Suitable habitat for the eastern indigo snake consists of a mosaic of habitats types, most of which occur throughout South Florida. Information on home ranges for individuals is not available in specific habitats in South Florida. Therefore, the SFESO uses the information from a 26-year study conducted by Layne and Steiner (1996) at Archbold Biological Station, Lake Placid, Florida, as the best available

information. Layne and Steiner (1996) determined the average home range size for a female eastern indigo snake was 46 acres and 184 acres for a male.

Projects that would remove/destroy less than 25 acres of eastern indigo snake habitat are expected to result in the loss of a portion of an eastern indigo snakes home range that would not impair the ability of the individual to feed, breed, and shelter. Therefore, the Service finds that take would not be reasonably certain to occur due to habitat loss. However, these projects have the potential to injure or kill an eastern indigo snake if the individual is crushed by equipment during site preparation or other project aspects. The Service's *Standard Protection Measures for the Eastern Indigo Snake* (Service 2013 or most current version) and the excavation of underground refugia (where a snake could be buried, trapped and/or injured), when implemented, are designed to avoid these forms of take. Consequently, projects less than 25 acres that include the Service's *Standard Protection Measures for the Eastern Indigo Snake* (Service 2013 or most current version) and a commitment to excavate underground refugia as part of the proposed action would be expected to avoid take and thus, may affect, but are not likely to adversely affect the species.

If a proposed project would impact less than 25 acres of vegetated eastern indigo snake habitat (not urban/ human-altered) completely surrounded by urban development, and an eastern indigo snake has been observed on site, the Key should not be used. The Service recommends formal consultation for this situation because of the expected increased value of the vegetated habitat within the individual's home range.

Projects that would remove 25 acres or more of eastern indigo snake habitat could remove more than half of a female eastern indigo snakes home range. This loss of habitat within a home range would be expected to significantly impair the ability of that individual to feed, breed, and shelter. Therefore, the Service finds take through habitat loss would be reasonably certain to occur and formal consultation is appropriate. Furthermore, these projects have the potential to injure or kill an eastern indigo snake if the individual is crushed by equipment during site preparation or other project aspects. The Service's *Standard Protection Measures* for the *Eastern Indigo Snake* (Service 2013 or most current version) and the excavation of underground refugia (where a snake could be buried, trapped and/or injured), when implemented, are designed to avoid these forms of take.

Eastern indigo snakes use a variety of habitat and are difficult to detect. Therefore, site specific information on the land use, observations of eastern indigo snakes within the vicinity, as well as other factors, as appropriate, will all be considered by the Service when making a final recommendation on the appropriate effects determination and whether it is appropriate to conclude consultation with the Corps (or other Federal action agency) formally or informally for projects that will impact 25 acres or more of habitat. Accordingly, when the use of the Key results in a determination of "may affect," the Corps (or other Federal action agency) is advised that consultation may be concluded informally or formally, depending on the project specific effects to eastern indigo snakes. Technical assistance from the Service can assist you in making a determination prior to submitting a request for consultation. In circumstances where the Corps (or other Federal action agency) desires to proceed with a consultation request prior to receiving

additional technical assistance from the Service, we recommend the agency documents the biological rationale for their determination and proceed with a request accordingly.

If the use of the Key results in a determination of "no effect," no further consultation is necessary with the SFESO. If the use of the Key results in a determination of "NLAA," the SFESO concurs with this determination based on the rationale provide above, and no further consultation is necessary for the effects of the proposed action on the eastern indigo snake. For "no effect" or "NLAA" determinations, the Service recommends that the Corps (or other Federal action agency) documents the pathway used to reach your no effect or NLAA determination in the project record and proceed with other species analysis as warranted.

Eastern Indigo Snake Programmatic Effect Determination Key
Revised July 2017
South Florida Ecological Service Office

Scope of the Key

This Key should be used only in the review of permit applications for effects determinations for the eastern indigo snake (*Drymarchon corais couperi*) within the South Florida Ecological Service's Office (SFESO) area (Broward, Charlotte, Collier, De Soto, Glades, Hardee, Hendry, Highlands, Lee, Indian River, Martin, Miami-Dade, Monroe, Okeechobee, Osceola, Palm Beach, Polk, Sarasota, and St. Lucie Counties). There is no designated critical habitat for the eastern indigo snake.

This Key is subject to revision as the Corps (or other Federal action agency) and Service deem necessary and in particular whenever there is new information on eastern indigo snake biology and effects of proposed projects.

The Key is a tool available to the Corps (or other Federal action agency) for the purposes of expediting section 7 consultations. There is no requirement to use the Key. There will be cases when the use of the Key is not appropriate. These include, but are not limited to: where project specific information is outside of the scope of the Key or instances where there is new biological information about the species. In these cases, we recommend the Corps (or other Federal action agency) initiates traditional consultation pursuant to section 7 of the Act, and identify that consultation is being requested outside of the Key.

Habitat

Habitat use varies seasonally between upland and wetland areas, especially in the more northern parts of the species' range. In southern parts of their range eastern indigo snakes are habitat generalists which use most available habitat types. Movements between habitat types in northern areas of their range may relate to the need for thermal refugia (protection from cold and/or heat).

In northern areas of their range eastern indigo snakes prefer an interspersion of tortoise-inhabited sandhills and wetlands (Landers and Speake 1980). In these northern regions eastern indigo

snakes most often use forested areas rich with gopher tortoise burrows, hollowed root channels, hollow logs, or the burrows of rodents, armadillos, or land crabs as thermal refugia during cooler seasons (Lawler 1977; Moler 1985a; Layne and Steiner 1996). The eastern indigo snake in the northern region is typically classified as a longleaf pine savanna specialist because here, in the northern four-fifths of its range, the eastern indigo snake is typically only found in vicinity of xeric longleaf pine–turkey oak sandhills inhabited by the gopher tortoise (Means 2006).

In the milder climates of central and southern Florida, comprising the remaining one fifth of its range, thermal refugia such as those provided by gopher tortoise burrows may not be as critical to survival of indigo snakes. Consequently, eastern indigo snakes in these regions use a more diverse assemblage of habitats such as pine flatwoods, scrubby flatwoods, floodplain edges, sand ridges, dry glades, tropical hammocks, edges of freshwater marshes, muckland fields, coastal dunes, and xeric sandhill communities; with highest population concentrations of eastern indigo snakes occurring in the sandhill and pineland regions of northern and central Florida (Service 1999). Eastern indigo snakes have also been found on agricultural lands with close proximity to wetlands (Zeigler 2006).

In south Florida, agricultural sites (*e.g.*, sugar cane fields and citrus groves) are occupied by eastern indigo snakes. The use of sugarcane fields by eastern indigo snakes was first documented by Layne and Steiner in 1996. In these areas there is typically an abundance of wetland and upland ecotones (due to the presence of many ditches and canals), which support a diverse prey base for foraging. In fact, some speculate agricultural areas may actually have a higher density of eastern indigo snakes than natural communities due to the increased availability of prey. Gopher tortoise burrows are absent at these locations but there is an abundance of both natural and artificial refugia. Enge and Endries (2009) reporting on the status of the eastern indigo snake included sugarcane fields and citrus groves in a Global Information Systems (GIS)-base map of potential eastern indigo snake habitat. Numerous sightings of eastern indigo snakes within sugarcane fields have been reported within south Florida (Florida Fish and Wildlife Conservation Commission Indigo Snake Database [Enge 2017]). A recent study associated with the Comprehensive Everglades Restoration Plan (CERP) (A-1 FEB Project formerly A-1 Reservoir; Service code: 41420-2006-F-0477) documented eastern indigo snakes within sugarcane fields. The snakes used artificial habitats such as piles of limerock, construction debris, and pump stations. Recent studies also associated with the CERP at the C-44 Project (Service code: 41420-2009-FA-0314), and C-43 Project (Service code: 41420-2007-F-0589) documented eastern indigo snakes within citrus groves. The snakes used artificial habitats such as boards, sheets of tin, construction debris, pipes, drain pipes in abandoned buildings and septic tanks.

In extreme south Florida (*i.e.*, the Everglades and Florida Keys), eastern indigo snakes also utilize tropical hardwood hammocks, pine rocklands, freshwater marshes, abandoned agricultural land, coastal prairie, mangrove swamps, and human-altered habitats. Though eastern indigo snakes have been found in all available habitats of south Florida it is thought they prefer hammocks and pine forests since most observations occur there and use of these areas is disproportionate compared to the relatively small total area of these habitats (Steiner *et al.* 1983).

Even though thermal stress may not be a limiting factor throughout the year in south Florida, eastern indigo snakes still seek and use underground refugia. On the sandy central ridge of central Florida, eastern indigo snakes use gopher tortoise burrows more (62 percent) than other underground refugia (Layne and Steiner 1996). Other underground refugia used include armadillo (*Dasypus novemcinctus*) burrows near citrus groves, cotton rat (*Sigmodon hispidus*) burrows, and land crab (*Cardisoma guanhumi*) burrows in coastal areas (Layne and Steiner 1996; Wilson and Porras 1983). Natural ground holes, hollows at the base of trees or shrubs, ground litter, trash piles, and crevices of rock-lined ditch walls are also used (Layne and Steiner 1996). These refugia are used most frequently where tortoise burrows are not available, principally in low-lying areas off the central and coastal ridges.

Minimization Measures

The Service developed protection measures for the eastern indigo snake "Standard Protection Measures for the Eastern Indigo Snake" (Service 2013) located at: https://www.fws.gov/verobeach/ReptilesPDFs/20130812_EIS%20Standard%20Protection%20Measures_final.pdf. These protections measures (or the most updated version) are considered a minimization measure for projects proposed within eastern indigo snake habitat.

Determinations

If the use of this Key results in a determination of "**no effect**," no further consultation is necessary with the SFESO.

If the use of this Key results in a determination of "**NLAA**," the SFESO concurs with this determination and no further consultation is necessary for the effects of the proposed action on the eastern indigo snake.

For no effect or NLAA determinations, the Corps (or other Federal action agency) should make a note in the project file indicating the pathway used to reach your no effect or NLAA determination.

If a proposed project would impact less than 25 acres of vegetated eastern indigo snake habitat (not urban/ human-altered) completely surrounded by urban development, and an eastern indigo snake has been observed on site, the subsequent Key should not be used. The Service recommends formal consultation for this situation because of the expected increased value of the vegetated habitat within the individual's home range.

If the use of this Key results in a determination of "**may affect**," consultation may be concluded informally or formally depending on project effects to eastern indigo snakes. Technical assistance from the Service can assist you in making a determination prior to submitting a request for consultation. In circumstances where the Corps desires to proceed with a consultation request prior to receiving additional technical assistance from the Service, we recommend the Corps document the biological rationale for their determination and proceed with a request accordingly.

A. Project is not located in open water or salt marsh.....go to B

Project is located solely in open water or salt marsh.....**no effect**

B. Permit will be conditioned for use of the Service's most current guidance for Standard Protection Measures For The Eastern Indigo Snake (currently 2013) during site preparation and project construction.....go to C

Permit will not be conditioned as above for the eastern indigo snake, or it is not known whether an applicant intends to use these measures and consultation with the Service is requested.....**may affect**

C. The project will impact less than 25 acres of eastern indigo snake habitat (*e.g.*, sandhill, scrub, pine flatwoods, pine rocklands, scrubby flatwoods, high pine, dry prairie, coastal prairie, mangrove swamps, tropical hardwood hammocks, hydric hammocks, edges of freshwater marshes, agricultural fields [including sugar cane fields and active, inactive, or abandoned citrus groves], and coastal dunes).....go to D

The project will impact 25 acres or more of eastern indigo snake habitat (*e.g.*, sandhill, scrub, pine flatwoods, pine rocklands, scrubby flatwoods, high pine, dry prairie, coastal prairie, mangrove swamps, tropical hardwood hammocks, hydric hammocks, edges of freshwater marshes, agricultural fields [including sugar cane fields and active, inactive, or abandoned citrus groves], and coastal dunes).....**may affect**

D. The project has no known holes, cavities, active or inactive gopher tortoise burrows, or other underground refugia where a snake could be buried, trapped and/or injured during project activities.....**NLAA**

The project has known holes, cavities, active or inactive gopher tortoise burrows, or other underground refugia where a snake could be buried, trapped and /or injured.....go to E

E. Any permit will be conditioned such that all gopher tortoise burrows, active or inactive, will be excavated prior to site manipulation in the vicinity of the burrow[1]. If an eastern indigo snake is encountered, the snake must be allowed to vacate the area prior to additional site manipulation in the vicinity. Any permit will also be conditioned such that holes, cavities, and snake refugia other than gopher tortoise burrows will be inspected each morning before planned site manipulation of a particular area, and, if occupied by an eastern indigo snake, no work will commence until the snake has vacated the vicinity of proposed work.....**NLAA**[2]

Permit will not be conditioned as outlined above.....**may affect**

End Key

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[1] If excavating potentially occupied burrows, active or inactive, individuals must first obtain state authorization via a Florida Fish and Wildlife Conservation Commission Authorized Gopher Tortoise Agent permit. The excavation method selected should also minimize the potential for injury of an indigo snake. Applicants should follow the excavation guidance provided within the most current Gopher Tortoise Permitting Guidelines found at http://myfwc.com/gophertortoise.

[2] Please note, if the proposed project will impact less than 25 acres of vegetated eastern indigo snake habitat (not urban/ human-altered) completely surrounded by urban development, and an eastern indigo snake has been observed on site, NLAA is not the appropriate conclusion. The Service recommends formal consultation for this situation because of the expected increased value of the vegetated habitat within the individual's home range

Working with the Fish and Wildlife Foundation of Florida, the Service has established a fund to support conservation and recovery for the eastern indigo snake. Any project that has the potential to affect the eastern indigo snake and/or its habitat is encouraged to make a voluntary contribution to this fund. If you would like additional information about how to make a contribution and how these monies are used to support eastern indigo snake recovery please contact Ashleigh Blackford, Connie Cassler, or José Rivera at 772-562-3559.

This revised Key is effective immediately upon receipt by the Corps. Should circumstances change or new information become available regarding the eastern indigo snake and/or implementation of the Key, the determinations herein may be reconsidered and this Key further revised or amended.

Thank you for your continued cooperation in the effort to conserve fish and wildlife resources. If you have any questions or comments regarding this Key, please contact the SFESO at 772-562-3909.

Sincerely,

Roxanna Hinzman
Field Supervisor
South Florida Ecological Services

Cc:
Corps, Jacksonville, Florida (Dale Beter, Muriel Blaisdell, Ingrid Gilbert, Angela Ryan, Irene Sadowski, Victoria White, Alisa Zarbo)
Service, Athens, Georgia (Michelle Elmore)
Service, Jacksonville, Florida (Annie Dziergowski)
Service, Panama City, Florida (Sean Blomquist)

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STANDARD PROTECTION MEASURES FOR THE EASTERN INDIGO SNAKE
U.S. Fish and Wildlife Service

March 23, 2021

The eastern indigo snake protection/education plan (Plan) below has been developed by the U.S. Fish and Wildlife Service (USFWS) in Florida and Georgia for use by applicants and their construction personnel. At least **30 days prior** to any clearing/land alteration activities, the applicant shall notify the appropriate USFWS Field Office via e-mail that the Plan will be implemented as described below (North Florida Field Office: jaxregs@fws.gov; South Florida Field Office: verobeach@fws.gov; Panama City Field Office: panamacity@fws.gov; Georgia Field Office: gaes_assistance@fws.gov). As long as the signatory of the e-mail certifies compliance with the below Plan (including use of the attached poster and brochure), no further written confirmation or approval from the USFWS is needed and the applicant may move forward with the project.

If the applicant decides to use an eastern indigo snake protection/education plan other than the approved Plan below, written confirmation or approval from the USFWS that the plan is adequate must be obtained. At least 30 days prior to any clearing/land alteration activities, the applicant shall submit their unique plan for review and approval. The USFWS will respond via e-mail, typically within 30 days of receiving the plan, either concurring that the plan is adequate or requesting additional information. A concurrence e-mail from the appropriate USFWS Field Office will fulfill approval requirements.

The Plan materials should consist of: 1) a combination of posters and pamphlets (see **Poster Information** section below); and 2) verbal educational instructions to construction personnel by supervisory or management personnel before any clearing/land alteration activities are initiated (see **Pre-Construction Activities** and **During Construction Activities** sections below).

POSTER INFORMATION

Posters with the following information shall be placed at strategic locations on the construction site and along any proposed access roads (a final poster for Plan compliance, to be printed on 11 x 17in or larger paper and laminated, is attached):

DESCRIPTION: The eastern indigo snake is one of the largest non-venomous snakes in North America, with individuals often reaching up to 8 feet in length. They derive their name from the glossy, blue-black color of their scales above and uniformly slate blue below. Frequently, they have orange to coral reddish coloration in the throat area, yet some specimens have been reported to only have cream coloration on the throat.

These snakes are not typically aggressive and will attempt to crawl away when disturbed. Though indigo snakes rarely bite, they should NOT be handled.

SIMILAR SNAKES: The black racer is the only other solid black snake resembling the eastern indigo snake. However, black racers have a white or cream chin, thinner bodies, and WILL BITE if handled.

LIFE HISTORY: The eastern indigo snake occurs in a wide variety of terrestrial habitat types throughout Florida and Georgia. Although they have a preference for uplands, they also utilize some wetlands and agricultural areas and often move seasonally between upland and lowland habitats, particularly in the northern portions of its range (North Florida and Georgia). Eastern indigo snakes will often seek shelter inside gopher tortoise burrows and other below- and above-ground refugia, such as other animal burrows, stumps, roots, and debris piles. Reliance on xeric sandhill habitats throughout the northern portion of the range in northern Florida and Georgia is due to the dependence on gopher tortoise burrows for shelter during winter. Breeding occurs during October through February. Females may lay from 4 - 12 white eggs as early as April through June, with young hatching in late July through October.

PROTECTION UNDER FEDERAL AND STATE LAW: The eastern indigo snake is classified as a Threatened species by both the USFWS and the Florida Fish and Wildlife Conservation Commission. Taking of eastern indigo snakes is prohibited by the Endangered Species Act without a permit is defined by the USFWS as an attempt to kill, harm, harass, pursue, hunt, shoot, wound, trap, capture, collect, or engage in any such conduct. Penalties include a maximum fine of $25,000 for civil violations and up to $50,000 and/or imprisonment for criminal offenses, if convicted.

Only individuals currently authorized through an issued Incidental Take Statement in association with a USFWS Biological Opinion, or by a Section 10(a)(1)(A) permit issued by the USFWS, to handle an eastern indigo snake are allowed to do so.

IF YOU SEE A <u>LIVE</u> EASTERN INDIGO SNAKE ON THE SITE:

- Cease clearing activities and allow the live eastern indigo snake sufficient time to move away from the site without interference;
- Personnel must NOT attempt to touch or handle snake due to protected status.
- Take photographs of the snake, if possible, for identification and documentation purposes. Â
- Immediately notify supervisor or the applicants designated agent, **and** the appropriate USFWS office, with the location information and condition of the snake.
- If the snake is located in a vicinity where continuation of the clearing or construction activities will cause harm to the snake, the activities must halt until such time that a representative of the USFWS returns the call (within one day) with further guidance as to when activities may resume.

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

- Cease clearing activities and immediately notify supervisor or the applicants designated agent, **and** the appropriate USFWS office, with the location information and condition of the snake.
- Take photographs of the snake, if possible, for identification and documentation purposes.
- Thoroughly soak the dead snake in water and then freeze the specimen. The appropriate wildlife agency will retrieve the dead snake.

Telephone numbers of USFWS Florida Field Offices to be contacted if a live or dead eastern indigo snake is encountered:

North Florida Field Office: (904) 731-3336
Panama City Field Office: (850) 769-0552
South Florida Field Office: (772) 562-3909
Georgia Field Office: (706) 613-9493

PRE-CONSTRUCTION ACTIVITIES

1. The applicant or designated agent will post educational posters in the construction office and throughout the construction site, including any access roads. The posters must be clearly visible to all construction staff. A sample poster is attached.

2. Prior to the onset of construction activities, the applicant/designated agent will conduct a meeting with all construction staff (annually for multi-year projects) to discuss identification of the snake, its protected status, what to do if a snake is observed within the project area, and applicable penalties that may be imposed if state and/or federal regulations are violated. An educational brochure including color photographs of the snake will be given to each staff member in attendance and additional copies will be provided to the construction superintendent to make available in the onsite construction office (a final brochure for Plan compliance, to be printed double-sided on 8.5 x 11in paper and then properly folded, is attached). Â Photos of eastern indigo snakes may be accessed on USFWS and/or FWC or GADNR websites.

3. Construction staff will be informed that in the event that an eastern indigo snake (live or dead) is observed on the project site during construction activities, all such activities are to cease until the established procedures are implemented according to the Plan, which includes notification of the appropriate USFWS Field Office. The contact information for the USFWS is provided on the referenced posters and brochures.

DURING CONSTRUCTION ACTIVITIES

1. During initial site clearing activities, an onsite observer may be utilized to determine whether habitat conditions suggest a reasonable probability of an eastern indigo snake sighting (example: discovery of snake sheds, tracks, lots of refugia and cavities present in the area of clearing activities, and presence of gopher tortoises and burrows).

2. If an eastern indigo snake is discovered during gopher tortoise relocation activities (i.e. burrow excavation), the USFWS shall be contacted within one business day to obtain further guidance which may result in further project consultation.

3. Periodically during construction activities, the applicants designated agent should visit the project area to observe the condition of the posters and Plan materials, and replace them as needed. Construction personnel should be reminded of the instructions (above) as to what is expected if any eastern indigo snakes are seen.

POST CONSTRUCTION ACTIVITIES

Whether or not eastern indigo snakes are observed during construction activities, a monitoring report should be submitted to the appropriate USFWS Field Office within 60 days of project completion. The report can be sent electronically to the appropriate USFWS e-mail address listed on page one of this Plan.

Appendix E-2

Standard Protection Measures for the Eastern Indigo Snake

STANDARD PROTECTION MEASURES FOR THE EASTERN INDIGO SNAKE
U.S. Fish and Wildlife Service

March 23, 2021

The eastern indigo snake protection/education plan (Plan) below has been developed by the U.S. Fish and Wildlife Service (USFWS) in Florida and Georgia for use by applicants and their construction personnel. At least **30 days prior** to any clearing/land alteration activities, the applicant shall notify the appropriate USFWS Field Office via e-mail that the Plan will be implemented as described below (North Florida Field Office: jaxregs@fws.gov; South Florida Field Office: verobeach@fws.gov; Panama City Field Office: panamacity@fws.gov; Georgia Field Office: gaes_assistance@fws.gov). As long as the signatory of the e-mail certifies compliance with the below Plan (including use of the attached poster and brochure), no further written confirmation or approval from the USFWS is needed and the applicant may move forward with the project.

If the applicant decides to use an eastern indigo snake protection/education plan other than the approved Plan below, written confirmation or approval from the USFWS that the plan is adequate must be obtained. At least 30 days prior to any clearing/land alteration activities, the applicant shall submit their unique plan for review and approval. The USFWS will respond via e-mail, typically within 30 days of receiving the plan, either concurring that the plan is adequate or requesting additional information. A concurrence e-mail from the appropriate USFWS Field Office will fulfill approval requirements.

The Plan materials should consist of: 1) a combination of posters and pamphlets (see **Poster Information** section below); and 2) verbal educational instructions to construction personnel by supervisory or management personnel before any clearing/land alteration activities are initiated (see **Pre-Construction Activities** and **During Construction Activities** sections below).

POSTER INFORMATION

Posters with the following information shall be placed at strategic locations on the construction site and along any proposed access roads (a final poster for Plan compliance, to be printed on 11 x 17in or larger paper and laminated, is attached):

DESCRIPTION: The eastern indigo snake is one of the largest non-venomous snakes in North America, with individuals often reaching up to 8 feet in length. They derive their name from the glossy, blue-black color of their scales above and uniformly slate blue below. Frequently, they have orange to coral reddish coloration in the throat area, yet some specimens have been reported to only have cream coloration on the throat.

These snakes are not typically aggressive and will attempt to crawl away when disturbed. Though indigo snakes rarely bite, they should NOT be handled.

SIMILAR SNAKES: The black racer is the only other solid black snake resembling the eastern indigo snake. However, black racers have a white or cream chin, thinner bodies, and WILL BITE if handled.

LIFE HISTORY: The eastern indigo snake occurs in a wide variety of terrestrial habitat types throughout Florida and Georgia. Although they have a preference for uplands, they also utilize some wetlands and agricultural areas and often move seasonally between upland and lowland habitats, particularly in the northern portions of its range (North Florida and Georgia). Eastern indigo snakes will often seek shelter inside gopher tortoise burrows and other below- and above-ground refugia, such as other animal burrows, stumps, roots, and debris piles. Reliance on xeric sandhill habitats throughout the northern portion of the range in northern Florida and Georgia is due to the dependence on gopher tortoise burrows for shelter during winter. Breeding occurs during October through February. Females may lay from 4 - 12 white eggs as early as April through June, with young hatching in late July through October.

PROTECTION UNDER FEDERAL AND STATE LAW: The eastern indigo snake is classified as a Threatened species by both the USFWS and the Florida Fish and Wildlife Conservation Commission. Taking of eastern indigo snakes is prohibited by the Endangered Species Act without a permit is defined by the USFWS as an attempt to kill, harm, harass, pursue, hunt, shoot, wound, trap, capture, collect, or engage in any such conduct. Penalties include a maximum fine of $25,000 for civil violations and up to $50,000 and/or imprisonment for criminal offenses, if convicted.

Only individuals currently authorized through an issued Incidental Take Statement in association with a USFWS Biological Opinion, or by a Section 10(a)(1)(A) permit issued by the USFWS, to handle an eastern indigo snake are allowed to do so.

IF YOU SEE A <u>LIVE</u> EASTERN INDIGO SNAKE ON THE SITE:

- Cease clearing activities and allow the live eastern indigo snake sufficient time to move away from the site without interference;
- Personnel must NOT attempt to touch or handle snake due to protected status.
- Take photographs of the snake, if possible, for identification and documentation purposes. Â
- Immediately notify supervisor or the applicants designated agent, **and** the appropriate USFWS office, with the location information and condition of the snake.
- If the snake is located in a vicinity where continuation of the clearing or construction activities will cause harm to the snake, the activities must halt until such time that a representative of the USFWS returns the call (within one day) with further guidance as to when activities may resume.

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

- Cease clearing activities and immediately notify supervisor or the applicants designated agent, **and** the appropriate USFWS office, with the location information and condition of the snake.
- Take photographs of the snake, if possible, for identification and documentation purposes.
- Thoroughly soak the dead snake in water and then freeze the specimen. The appropriate wildlife agency will retrieve the dead snake.

Telephone numbers of USFWS Florida Field Offices to be contacted if a live or dead eastern indigo snake is encountered:

North Florida Field Office: (904) 731-3336
Panama City Field Office: (850) 769-0552
South Florida Field Office: (772) 562-3909
Georgia Field Office: (706) 613-9493

PRE-CONSTRUCTION ACTIVITIES

1. The applicant or designated agent will post educational posters in the construction office and throughout the construction site, including any access roads. The posters must be clearly visible to all construction staff. A sample poster is attached.

2. Prior to the onset of construction activities, the applicant/designated agent will conduct a meeting with all construction staff (annually for multi-year projects) to discuss identification of the snake, its protected status, what to do if a snake is observed within the project area, and applicable penalties that may be imposed if state and/or federal regulations are violated. An educational brochure including color photographs of the snake will be given to each staff member in attendance and additional copies will be provided to the construction superintendent to make available in the onsite construction office (a final brochure for Plan compliance, to be printed double-sided on 8.5 x 11in paper and then properly folded, is attached). Â Photos of eastern indigo snakes may be accessed on USFWS and/or FWC or GADNR websites.

3. Construction staff will be informed that in the event that an eastern indigo snake (live or dead) is observed on the project site during construction activities, all such activities are to cease until the established procedures are implemented according to the Plan, which includes notification of the appropriate USFWS Field Office. The contact information for the USFWS is provided on the referenced posters and brochures.

DURING CONSTRUCTION ACTIVITIES

1. During initial site clearing activities, an onsite observer may be utilized to determine whether habitat conditions suggest a reasonable probability of an eastern indigo snake sighting (example: discovery of snake sheds, tracks, lots of refugia and cavities present in the area of clearing activities, and presence of gopher tortoises and burrows).

2. If an eastern indigo snake is discovered during gopher tortoise relocation activities (i.e. burrow excavation), the USFWS shall be contacted within one business day to obtain further guidance which may result in further project consultation.

3. Periodically during construction activities, the applicants designated agent should visit the project area to observe the condition of the posters and Plan materials, and replace them as needed. Construction personnel should be reminded of the instructions (above) as to what is expected if any eastern indigo snakes are seen.

POST CONSTRUCTION ACTIVITIES

Whether or not eastern indigo snakes are observed during construction activities, a monitoring report should be submitted to the appropriate USFWS Field Office within 60 days of project completion. The report can be sent electronically to the appropriate USFWS e-mail address listed on page one of this Plan.

Appendix F-1

USFWS Wood stork Key

United States Department of the Interior

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

May 18, 2010

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

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

Dear Mr. Kinard:

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

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

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

Wood stork

Habitat

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

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

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

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

Conservation Measures

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

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

In an effort to reduce correspondence in effect determinations and responses, the Service is providing the Wood Stork Effect Determination Key below. If the use of this key results in a Corps determination of "no effect" for a particular project, the Service supports this determination. If the use of this Key results in a determination of NLAA, the Service concurs with this determination[1]. This Key is subject to revisitation as the Corps and Service deem necessary.

The Key is as follows:

A. Project within 0.76 km (0.47 mile)[2] of an active colony site[3] ..... "*may affect*[4]"

Project impacts Suitable Foraging Habitat (SFH)[5] at a location greater than 0.76 km (0.47 mile) from a colony site..... ....."*go to* B"

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

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

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

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

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

Project does not affect SFH……..….. *"no effect*[1]*"*.

B. Project impact to SFH is less than 0.20 hectare (one-half acre)[6]……..……*NLAA*[1]"

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

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

Project impacts to SFH within the CFA of a colony site …….…..…...…….*go to* E

D. Project impacts to SFH have been avoided and minimized to the extent practicable; compensation (Service approved mitigation bank or as provided in accordance with Mitigation Rule 33 CFR Part 332) for unavoidable impacts is proposed in accordance with the CWA section 404(b)(1) guidelines; and habitat compensation replaces the foraging value matching the hydroperiod[7] of the wetlands affected and provides foraging value similar to, or higher than, that of impacted wetlands. See Enclosure 3 for a detailed discussion of the hydroperiod foraging values, an example, and further guidance[8]…….. *NLAA*[1]"

Project not as above..……... "*may affect*[4]*"*

E. Project provides SFH compensation in accordance with the CWA section 404(b)(1) guidelines and is not contrary to the HMG; habitat compensation is within the appropriate CFA or within the service area of a Service-approved mitigation bank; and habitat compensation replaces foraging value, consisting of wetland enhancement or restoration matching the hydroperiod[7] of the wetlands affected, and provides foraging value similar

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

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

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

to, or higher than, that of impacted wetlands. See Enclosure 3 for a detailed discussion of the hydroperiod foraging values, an example, and further guidance[8]..... *"NLAA[1]"*

Project does not satisfy these elements ..... *"may affect[4]"*

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

Monitoring and Reporting Effects

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

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

Sincerely yours,

Paul Souza
Field Supervisor
South Florida Ecological Services Office

Enclosures

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

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HABITAT MANAGEMENT GUIDELINES FOR THE WOOD STORK IN THE SOUTHEAST REGION

HABITAT MANAGEMENT GUIDELINES FOR THE WOOD STORK IN THE SOUTHEAST REGION

Prepared by

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Wildlife Research
Everglades National Park

for the

Southeast Region
U.S. Fish and Wildlife Service

Cover design by
Florida Power & Light Company
Miami, Florida

HABITAT MANAGEMENT GUIDELINES FOR THE WOOD STORK IN THE SOUTHEAST REGION

Introduction

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

General

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

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

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

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

I. Feeding habitat.

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

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

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

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

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

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

II. Nesting habitat.

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

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

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

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

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

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

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

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

III. Roosting habitat.

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

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

IV. Management zones and guidelines for feeding sites.

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

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

B. Feeding sites should not be subjected to water management practices that alter traditional water levels or the seasonally normal drying patterns and rates. Sharp rises in water levels are especially disruptive to feeding storks.

C. The introduction of contaminants, fertilizers, or herbicides into wetlands that contain stork feeding sites should be avoided, especially those compounds that could adversely alter the diversity and numbers of native fishes, or that could substantially change the characteristics of aquatic vegetation. Increase in the density and height of emergent vegetation can degrade or destroy sites as feeding habitat.

D. Construction of tall towers (especially with guy wires) within three miles, or high power lines (especially across long stretches of open country) within one mile of major feeding sites should be avoided.

V. Management zones and guidelines for nesting colonies.

A. Primary zone: This is the most critical area, and must be managed according to recommended guidelines to insure that a colony site survives.

1. Size: The primary zone must extend between 1000 and 1500 feet in all directions from the actual colony boundaries when there are no visual or broad aquatic barriers, and never less than 500 feet even when there are strong visual or aquatic barriers. The exact width of the primary zone in each direction from the colony can vary within this range, depending on the amount of visual screen (tall trees) surrounding the colony, the amount of relatively deep, open water between the colony and the nearest human activity, and the nature of the nearest human activity. In general, storks forming new colonies are more tolerant of existing human activity, than they will be of new human activity that begins after the colony has formed.

2. Recommended Restrictions:

a. Any of the following activities within the primary zone, at any time of the year, are likely to be detrimental to the colony:

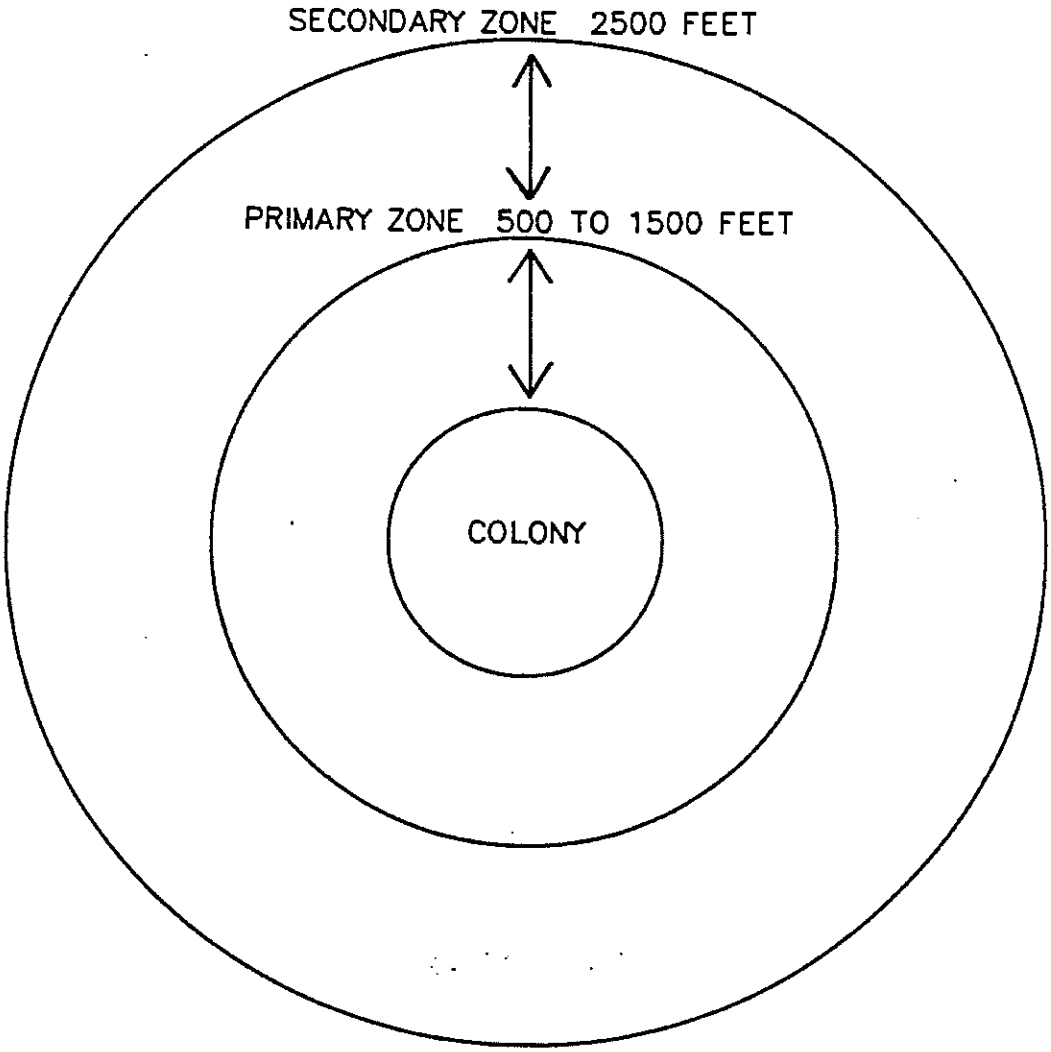
(1) Any lumbering or other removal of vegetation, and

(2) Any activity that reduces the area, depth, or length of flooding in wetlands under and surrounding the colony, except where periodic (less than annual) water control may be required to maintain the health of the aquatic, woody vegetation, and

(3) The construction of any building, roadway, tower, power line, canal, etc.

b. The following activities within the primary zone are likely to be detrimental to a colony if they occur when the colony is active:

(1) Any unauthorized human entry closer than 300 feet of the colony, and


SECONDARY ZONE 2500 FEET
PRIMARY ZONE 500 TO 1500 FEET
COLONY

(2) Any increase or irregular pattern in human activity anywhere in the primary zone, and

(3) Any increase or irregular pattern in activity by animals, including livestock or pets, in the colony, and

(4) Any aircraft operation closer than 500 feet of the colony.

B. Secondary Zone: Restrictions in this zone are needed to minimize disturbances that might impact the primary zone, and to protect essential areas outside of the primary zone. The secondary zone may be used by storks for collecting nesting material, for roosting, loafing, and feeding (especially important to newly fledged young), and may be important as a screen between the colony and areas of relatively intense human activities.

1. Size: The secondary zone should range outward from the primary zone 1000-2000 feet, or to a radius of 2500 feet of the outer edge of the colony.

2. Recommended Restrictions:

a. Activities in the secondary zone which may be detrimental to nesting wood storks include:

(1) Any increase in human activities above the level that existed in the year when the colony first formed, especially when visual screens are lacking, and

(2) Any alteration in the area's hydrology that might cause changes in the primary zone, and

(3) Any substantial (>20 percent) decrease in the area of wetlands and woods of potential value to storks for roosting and feeding.

b. In addition, the probability that low flying storks, or inexperienced, newly-fledged young will strike tall obstructions, requires that high-tension power lines be no closer than one mile (especially across open country or in wetlands) and tall trans-mission towers no closer than 3 miles from active colonies. Other activities, including busy highways and commercial and residential buildings may be present in limited portions of the secondary zone at the time that a new colony first forms. Although storks may tolerate existing levels of human activities, it is important that these human activities not expand substantially.

VI. Roosting site guidelines.

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

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

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

VII. Legal Considerations.

A. Federal Statutes

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

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

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

B. State Statutes

1. State of Alabama

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

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

2. State of Florida

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

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

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

3. State of Georgia

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

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

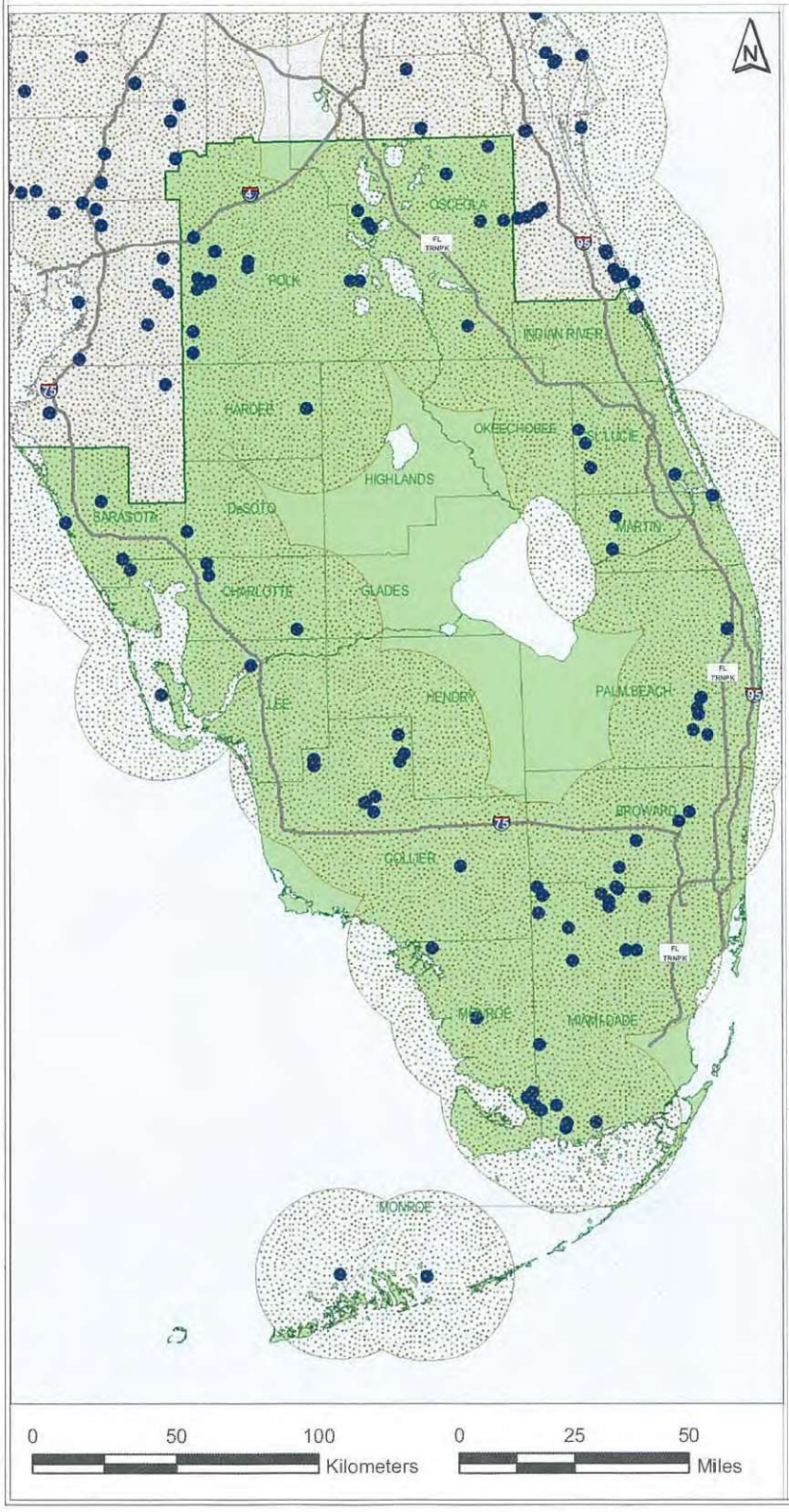
Section 27-3-22 states, in part, "It shall be unlawful for any person to hunt, trap, take, possess, sell, purchase, ship, or transport any hawk, eagle, owl, or any other bird or any part, nest, or egg thereof...".

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

4. State of South Carolina

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

Wood Stock



Nesting Colonies
Core Foraging Areas

1999 to 2005

- Colony Location
- Core Foraging Area
- South Florida Service Area

U.S. FISH & WILDLIFE SERVICE
DEPARTMENT OF THE INTERIOR

Produced by:
South Florida Ecological Services Office
http://verobeach.fws.gov
Phone: 772.562.3909

Enclosure 3

Wood Stork Foraging Analysis: Excerpts of concepts and procedure as presented by the Service in this appendix may be viewed in detail in any one of our recent Biological Opinions for project related impacts to the wood stork. These documents can be found at the internet website address http://www.fws.gov/filedownloads/ftp%5verobeach.

Foraging Habitat

Researchers have shown that wood storks forage most efficiently and effectively in habitats where prey densities are high and the water shallow and canopy open enough to hunt successfully (Ogden et al. 1978, Browder 1984, Coulter 1987). Prey availability to wood storks is dependent on a composite variable consisting of density (number or biomass/m^2) and the vulnerability of the prey items to capture (Gawlik 2002). For wood storks, prey vulnerability appears to be largely controlled by physical access to the foraging site, water depth, the density of submerged vegetation, and the species-specific characteristics of the prey. For example, fish populations may be very dense, but not available (vulnerable) because the water depth is too deep (greater than 30 cm) for storks or the tree canopy at the site is too dense for storks to land. Calm water, about 5-40 cm (2-16 in) in depth, and free of dense aquatic vegetation is ideal (Coulter and Bryan 1993).

Coulter and Bryan's (1993) study suggested that wood storks preferred ponds and marshes, and visited areas with little or no canopy more frequently. Even in foraging sites in swamps, the canopy tended to be sparse. They suggested that open canopies may have contributed to detection of the sites and more importantly may have allowed the storks to negotiate landing more easily than at closed-canopy sites. In their study, the median amount of canopy cover where wood stork foraging was observed was 32 percent. Other researchers (P.C. Frederick, University of Florida, personal communication 2006; J.A. Rodgers, FWC, personal communication 2006) also confirm that wood storks will forage in woodlands, though the woodlands have to be fairly open and vegetation not very dense. Furthermore, the canopies must be open enough for wood storks to take flight quickly to avoid predators.

Melaleuca-infested Wetlands: As discussed previously, wetland suitability for wood stork foraging is partially dependent on vegetation density. Melaleuca is a dense-stand growth plant species, effectively producing a closed canopy and dense understory growth pattern that generally limits a site's accessibility to foraging by wading birds. However, O'Hare and Dalrymple (1997) suggest moderate infestations of melaleuca may have little effect on some species' productivity (*i.e.*, amphibians and reptiles) as long as critical abiotic factors such as hydrology remain. They also note as the levels of infestation increase, usage by wetland dependent species decreases. Their studies also showed that the number of fish species present in a wetland system remain stable at certain levels of melaleuca. However, the availability of the prey base for wood storks and other foraging wading birds is reduced by the restriction of access caused from dense and thick exotic vegetation. Wood storks and other wading birds can forage in these systems in open area pockets (*e.g.*, wind blow-downs), provided multiple conditions are optimal (*e.g.*, water depth, prey density). In O'Hare and Dalrmyple's study (1997), they identify five cover types (Table 1) and

provide information on the number of wetland dependent bird species and the number of individuals observed within each of these vegetation classes (Table 2).

Table 1: Vegetation classes

DMM	75-100 percent mature dense melaleuca coverage
DMS or (SDM)	75-100 percent sapling dense melaleuca coverage
P75	50-75 percent melaleuca coverage
P50	0-50 percent melaleuca coverage
MAR (Marsh)	0-10 percent melaleuca coverage

The number of wetland-dependent species and individuals observed per cover type is shown below in columns 1, 2, and 3 (Table 2). To develop an estimate of the importance a particular wetland type may have (based on density and aerial coverage by exotic species) to wetland dependent species, we developed a foraging suitability value using observational data from O'Hare and Dalrymple (1997). The Foraging Suitability Value as shown in column 5 (Table 2) is calculated by multiplying the number of species by the number of individuals and dividing this value by the maximum number of species and individuals combined (12*132=1584). The results are shown below for each of the cover types in O'Hare and Dalrymple (1997) study (Table 1). As an example, for the P50 cover type, the foraging suitability is calculated by multiplying 11 species times 92 individuals for a total of 1,012. Divide this value by 1,584, which is the maximum number of species times the maximum number of individuals (12*132 = 1,584). The resultant is 0.6389 or 64 percent 11*92=1012/1584*100=63.89).

Table 2: Habitat Foraging Suitability

Cover Type	# of Species (S)	# of Individuals (I)	S*I	Foraging Suitability
DMM	1	2	2	0.001
DMS	4	10	40	0.025
P75	10	59	590	0.372
P50	11	92	1,012	0.639
MAR	12	132	1,584	1.000

This approach was developed to provide us with a method of assessing wetland acreages and their relationship to prey densities and prey availability. We consider wetland dependent bird use to be a general index of food availability. Based on this assessment we developed an exotic foraging suitability index (Table 3):

Table 3. Foraging Suitability Percentages

Exotic Percentage	Foraging Suitability (percent)
Between 0 and 25 percent exotics	100
Between 25 and 50 percent exotics	64
Between 50 and 75 percent exotics	37
Between 75 and 90 percent exotics	3
Between 90 and 100 percent exotics	0

In our assessment however, we consider DMM to represent all exotic species densities between 90 and 100 percent and DMS to represent all exotic species densities between 75 and 90 percent. In our evaluation of a habitat's suitability, the field distinction between an exotic coverage of

90 percent and 100 percent in many situations is not definable, therefore unless otherwise noted in the field reports and in our analysis; we consider a suitability value of 3 percent to represent both densities.

Hydroperiod: The hydroperiod of a wetland can affect the prey densities in a wetland. For instance, research on Everglades fish populations using a variety of quantitative sampling techniques (pull traps, throw traps, block nets) have shown that the density of small forage fish increases with hydroperiod. Marshes inundated for less than120 days of the year average ± 4 fish/m^2; whereas, those flooded for more than 340 days of the year average ± 25 fish/m^2 (Loftus and Eklund 1994, Trexler et al. 2002).

The Service (1999) described a short hydroperiod wetland as wetlands with between 0 and 180-day inundation, and long hydroperiod wetlands as those with greater than 180-day inundation. However, Trexler et al. (2002) defined short hydroperiod wetlands as systems with less than 300 days per year inundation. In our discussion of hydroperiods, we are considering short hydroperiod wetlands to be those that have an inundation of 180 days or fewer.

The most current information on hydroperiods in south Florida was developed by the SFWMD for evaluation of various restoration projects throughout the Everglades Protection Area. In their modeling efforts, they identified the following seven hydroperiods:

Table 4. SFWMD Hydroperiod Classes – Everglades Protection Area

Hydroperiod Class	Days Inundated
Class 1	0-60
Class 2	60-120
Class 3	120-180
Class 4	180-240
Class 5	240-300
Class 6	300-330
Class 7	330-365

Fish Density per Hydroperiod: In the Service's assessment of project related impacts to wood storks, the importance of fish data specific to individual hydroperiods is the principle basis of our assessment. In order to determine the fish density per individual hydroperiod, the Service relied on the number of fish per hydroperiod developed from throw-trap data in Trexler et al.'s (2002) study and did not use the electrofishing data also presented in Trexler et al.'s study that defined fish densities in catch per unit effort, which is not hydroperiod specific. Although the throw-trap sampling generally only samples fish 8 cm or less, the Service believes the data can be used as a surrogate representation of all fish, including those larger than 8 cm, which are typically sampled by either electrofishing or block net sampling.

We base this evaluation on the following assessment. Trexler et al.'s (2002) study included electrofishing data targeting fish greater than 8 cm, the data is recorded in catch per unit effort and in general is not hydroperiod specific. However, Trexler et al. (2002) notes in their assessment of the electrofishing data that in general there is a correlation with the number of fish per unit effort per changes in water depth. In literature reviews of electrofishing data by Chick et

al. (1999 and 2004), they note that electrofishing data provides a useful index of the abundance of larger fish in shallow, vegetated habitat, but length, frequency, and species compositional data should be interpreted with caution. Chick et al. (2004) also noted that electrofishing data for large fish (> 8cm) provided a positive correlation of the number of fish per unit effort (abundance) per changes in hydropeiod. The data in general show that as the hydroperiod decreases, the abundance of larger fishes also decreases.

Studies by Turner et al. (1999), Turner and Trexler (1997), and Carlson and Duever (1979) also noted this abundance trend for fish species sampled. We also noted in our assessment of prey consumption by wood storks in the Ogden et al. (1976) study (Figure 4) (discussed below), that the wood stork's general preference is for fish measuring 1.5 cm to 9 cm, although we also acknowledged that wood storks consume fish larger than the limits discussed in the Ogden et al. (1976) study. A similar assessment is reference by Trexler and Goss (2009) noting a diversity of size ranges of prey available for wading birds to consume, with fish ranging from 6 to 8 cm being the preferred prey for larger species of wading birds, particularly wood storks (Kushlan et al. 1975).

Therefore, since data were not available to quantify densities (biomass) of fish larger than 8 cm to a specific hydroperiod, and Ogden et al.'s (1976) study notes that the wood stork's general preference is for fish measuring 1.5 cm to 9 cm, and that empirical data on fish densities per unit effort correlated positively with changes in water depth, we believe that the Trexler et al. (2002) throw-trap data represents a surrogate assessment tool to predict the changes in total fish density and the corresponding biomass per hydroperiod for our wood stork assessment.

In consideration of this assessment, the Service used the data presented in Trexler et al.'s (2002) study on the number of fish per square-meter per hydroperiod for fish 8 cm or less to be applicable for estimating the total biomass per square-meter per hydroperiod for all fish. In determining the biomass of fish per square-meter per hydroperiod, the Service relied on the summary data provided by Turner et al. (1999), which provides an estimated fish biomass of 6.5 g/m^2 for a Class 7 hydroperiod for all fish and used the number of fish per square-meter per hydroperiod from Trexler et al.'s data to extrapolate biomass values per individual hydroperiods.

Trexler et al.'s (2002) studies in the Everglades provided densities, calculated as the square-root of the number of fish per square meter, for only six hydroperiods; although these cover the same range of hydroperiods developed by the SFWMD. Based on the throw-trap data and Trexler et al.'s (2002) hydroperiods, the square-root fish densities are:

Table 5. Fish Densities per Hydroperiod from Trexler et al. (2002)

Hydroperiod Class	Days Inundated	Fish Density
Class 1	0-120	2.0
Class 2	120-180	3.0
Class 3	180-240	4.0
Class 4	240-300	4.5
Class 5	300-330	4.8
Class 6	330-365	5.0

Trexler et al.'s (2002) fish densities are provided as the square root of the number of fish per square meter. For our assessment, we squared these numbers to provide fish per square meter, a simpler calculation when other prey density factors are included in our evaluation of adverse effects to listed species from the proposed action. We also extrapolated the densities over seven hydroperiods, which is the same number of hydroperiods characterized by the SFWMD. For example, Trexler et al.'s (2002) square-root density of a Class 2 wetland with three fish would equate to a SFWMD Model Class 3 wetland with nine fish. Based on the above discussion, the following mean annual fish densities were extrapolated to the seven SFWMD Model hydroperiods:

Table 6. Extrapolated Fish Densities for SFWMD Hydroperiods

Hydroperiod Class	Days Inundated	Extrapolated Fish Density
Class 1	0-60	2 fish/m^2
Class 2	60-120	4 fish/m^2
Class 3	120-180	9 fish/m^2
Class 4	180-240	16 fish/m^2
Class 5	240-300	20 fish/m^2
Class 6	300-330	23 fish/m^2
Class 7	330-365	25 fish/m^2

Fish Biomass per Hydroperiod: A more important parameter than fish per square-meter in defining fish densities is the biomass these fish provide. In the ENP and WCA-3, based on studies by Turner et al. (1999), Turner and Trexler (1997), and Carlson and Duever (1979), the standing stock (biomass) of large and small fishes combined in unenriched Class 5 and 6 hydroperiod wetlands averaged between 5.5 to 6.5 grams-wet-mass/m^2. In these studies, the data was provided in g/m^2 dry-weight and was converted to g/m^2 wet-weight following the procedures referenced in Kushlan et al. (1986) and also referenced in Turner et al. (1999). The fish density data provided in Turner et al. (1999) included both data from samples representing fish 8 cm or smaller and fish larger than 8 cm and included summaries of Turner and Trexler (1997) data, Carlson and Duever (1979) data, and Loftus and Eklund (1994) data. These data sets also reflected a 0.6 g/m^2 dry-weight correction estimate for fish greater than 8 cm based on Turner et al.'s (1999) block-net rotenone samples.

Relating this information to the hydroperiod classes developed by the SFWMD, we estimated the mean annual biomass densities per hydroperiod. For our assessment, we considered Class 7 hydroperiod wetlands based on Turner et al. (1999) and Trexler et al. (2002) studies to have a mean annual biomass of 6.5 grams-wet-mass/m^2 and to be composed of 25 fish/m^2. The remaining biomass weights per hydroperiod were determined as a direct proportion of the number of fish per total weight of fish for a Class 7 hydroperiod (6.5 grams divided by 25 fish equals 0.26 grams per fish).

For example, given that a Class 3 hydroperiod has a mean annual fish density of 9 fish/m^2, with an average weight of 0.26 grams per fish, the biomass of a Class 3 hydroperiod would be 2.3 grams/m^2 (9*0.26 = 2.3). Based on the above discussion, the biomass per hydroperiod class is:

Table 7. Extrapolated Mean Annual Fish Biomass for SFWMD Hydroperiods

Hydroperiod Class	Days Inundated	Extrapolated Fish Biomass
Class 1	0-60	0.5 gram/m^2
Class 2	60-120	1.0 gram/m^2
Class 3	120-180	2.3 grams/m^2
Class 4	180-240	4.2 grams/m^2
Class 5	240-300	5.2 grams/m^2
Class 6	300-330	6.0 grams/m^2
Class 7	330-365	6.5 grams/m^2

Wood stork suitable prey size: Wood storks are highly selective in their feeding habits and in studies on fish consumed by wood storks, five species of fish comprised over 85 percent of the number and 84 percent of the biomass of over 3,000 prey items collected from adult and nestling wood storks (Ogden et al. 1976). Table 8 lists the fish species consumed by wood storks in Ogden et al. (1976).

Table 8. Primary Fish Species consumed by Wood Storks from Ogden et al. (1976)

Common name	Scientific name	Percent Individuals	Percent Biomass
Sunfishes	*Centrarchidae*	14	44
Yellow bullhead	*Italurus natalis*	2	12
Marsh killifish	*Fundulus confluentus*	18	11
Flagfish	*Jordenella floridae*	32	7
Sailfin molly	*Poecilia latipinna*	20	11

These species were also observed to be consumed in much greater proportions than they occur at feeding sites, and abundant smaller species [*e.g.*, mosquitofish (*Gambusia affinis*), least killifish (*Heterandria formosa*), bluefin killifish (*Lucania goodei*)] are under-represented, which the researchers believed was probably because their small size did not elicit a bill-snapping reflex in these tactile feeders (Coulter et al. 1999). Their studies also showed that, in addition to selecting larger species of fish, wood storks consumed individuals that are significantly larger (>3.5 cm) than the mean size available (2.5 cm), and many were greater than 1-year old (Ogden et al. 1976, Coulter et al. 1999). However, Ogden et al. (1976) also found that wood storks most likely consumed fish that were between 1.5 and 9.0 cm in length (Figure 4 in Ogden et al. 1976).

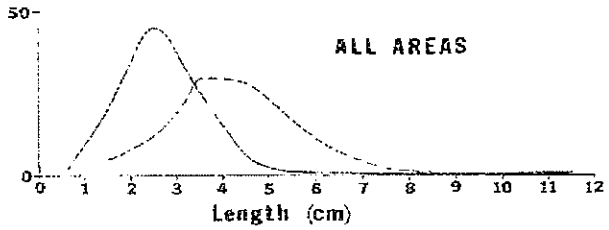


FIGURE 4. Length frequency distribution of fish available to and consumed by Wood Storks in different habitats.

In Ogden et al.'s (1976) Figure 4, the dotted line is the distribution of fish consumed and the solid line is the available fish. Straight interpretation of the area under the dotted line curve

represents the size classes of fish most likely consumed by wood storks and is the basis of our determination of the amount of biomass that is within the size range of fish most likely consumed by wood storks, which in this example is a range size of 1.5 to 9.0 cm in length.

Wood stork suitable prey base (biomass per hydroperiod): To estimate that fraction of the available fish biomass that might be consumed by wood storks, the following analysis was conducted. Trexler et al.'s (2002) 2-year throw trap data of absolute and relative fish abundance per hydroperiod distributed across 20 study sites in the ENP and the WCAs was considered to be representative of the Everglades fish assemblage available to wood storks (n = 37,718 specimens of 33 species). Although Trexler et al.'s (2002) data was based on throw-trap data and representative of fish 8 cm or smaller, the Service believes the data set can be used to predict the biomass/m^2 for total fish (those both smaller and larger than 8 cm). This approach is also supported, based on our assessment of prey consumption by wood storks in Ogden et al.'s (1976) study (Figure 4), that the wood storks general preference is for fish measuring 1.5 cm to 9 cm and is generally inclusive of Trexler et al.'s (2002) throw-trap data of fish 8 cm or smaller.

To estimate the fraction of the fish biomass that might be consumed by wood storks, the Service, using Trexler et al.'s (2002) throw-trap data set, determined the mean biomass of each fish species that fell within the wood stork prey size limits of 1.5 to 9.0 cm. The mean biomass of each fish species was estimated from the length and wet mass relationships for Everglades' icthyofauna developed by Kushlan et al. (1986). The proportion of each species that was outside of this prey length and biomass range was estimated using the species mean and variance provided in Table 1 in Kushlan et al. (1986). These biomass estimates assumed the length and mass distributions of each species was normally distributed and the fish biomass could be estimated by eliminating that portion of each species outside of this size range. These biomass estimates of available fish prey were then standardized to a sum of 6.5 g/m^2 for Class 7 hydroperiod wetlands (Service 2009).

For example, Kushlan et al. (1986) lists the warmouth (*Lepomis gulosus*) with a mean average biomass of 36.76 g. In fish samples collected by Trexler et al. (2002), this species accounted for 0.048 percent (18/37,715=0.000477) of the Everglades freshwater ichthyofauna. Based on an average biomass of 36.76 g (Kushlan et al. 1986), the 0.048 percent representation from Trexler et al. (2002) is equivalent to an average biomass of 1.75 g (36.76*0.048) or 6.57 percent (1.75/26.715) of the estimated average biomass (26.715 g) of Trexler et al.'s (2002) samples (Service 2009).

Standardizing these data to a sample size of 6.5 g/m^2, the warmouth biomass for long hydroperiod wetlands would be about 0.427 g (Service 2009). However, the size frequency distribution (assumed normal) for warmouth (Kushlan et al. 1986) indicate 48 percent are too large for wood storks and 0.6 percent are too small (outside the 1.5 cm to 9 cm size range most likely consumed), so the warmouth biomass within the wood stork's most likely consumed size range is only 0.208 g (0.427*(0.48+0.006)=0.2075) in a 6.5 g/m^2 sample. Using this approach summed over all species in long hydroperiod wetlands, only 3.685 g/m^2 of the 6.5 g/m^2 sample consists of fish within the size range likely consumed by wood storks or about 57 percent (3.685/6.5*100=56.7) of the total biomass available.

An alternative approach to estimate the available biomass is based on Ogden et al. (1976). In their study (Table 8), the sunfishes and four other species that accounted for 84 percent of the biomass eaten by wood storks totaled 2.522 g of the 6.5 g/m^2 sample (Service 2009). Adding the remaining 16 percent from other species in the sample, the total biomass would suggest that 2.97 g of a 6.5 g/m^2 sample are most likely to be consumed by wood storks or about 45.7 percent (2.97/6.5=0.4569)

The mean of these two estimates is 3.33g/m^2 for long hydroperiod wetlands (3.685 + 2.97 = 6.655/ 2 = 3.33). This proportion of available fish prey of a suitable size (3.33 g/m^2 / 6.5 g/m^2 = 0.51 or 51 percent) was then multiplied by the total fish biomass in each hydroperiod class to provide an estimate of the total biomass of a hydroperiod that is the appropriate size and species composition most likely consumed by wood storks.

As an example, a Class 3 SFWMD model hydroperiod wetland with a biomass of 2.3 grams/m^2, adjusted by 51 percent for appropriate size and species composition, provides an available biomass of 1.196 grams/m^2. Following this approach, the biomass per hydroperiod potentially available to predation by wood storks based on size and species composition is:

Table 9. Wood Stork Suitable Prey Base (fish biomass per hydroperiod)

Hydroperiod Class	Days Inundated	Fish Biomass
Class 1	0-60	0.26 gram/m^2
Class 2	60-120	0.52 gram/m^2
Class 3	120-180	1.196 grams/m^2
Class 4	180-240	2.184 grams/m^2
Class 5	240-300	2.704 grams/m^2
Class 6	300-330	3.12 grams/m^2
Class 7	330-365	3.38 grams/m^2

Wood Stork-Wading Bird Prey Consumption Competition: In 2006, (Service 2006), the Service developed an assessment approach that provided a foraging efficiency estimate that 55 percent of the available biomass was actually consumed by wood storks. Since the implementation of this assessment approach, the Service has received comments from various sources concerning the Service's understanding of Fleming et al.'s (1994) assessment of prey base consumed by wood storks versus prey base assumed available to wood stork and the factors included in the 90 percent prey reduction value.

In our original assessment, we noted that, "*Fleming et al. (1994) provided an estimate of 10 percent of the total biomass in their studies of wood stork foraging as the amount that is actually consumed by the storks. However, the Fleming et al. (1994) estimate also includes a second factor, the suitability of the foraging site for wood storks, a factor that we have calculated separately. In their assessment, these two factors accounted for a 90 percent reduction in the biomass actually consumed by the storks. We consider these two factors as equally important and are treated as equal components in the 90 percent reduction; therefore, we consider each factor to represent 45 percent of the reduction. In consideration of this approach, Fleming et al.'s (1994) estimate that 10 percent of the biomass would actually be consumed by the storks would be added to the 45 percent value for an estimate that 55 percent (10 percent plus the remaining 45 percent) of the available biomass would actually be consumed by the storks and is the factor we believe represents the amount of the prey base that is actually consumed by the stork.*"

In a follow-up review of Fleming et al.'s (1994) report, we noted that the 10 percent reference is to prey available to wood storks, not prey consumed by wood storks. We also noted the 90 percent reduction also includes an assessment of prey size, an assessment of prey available by water level (hydroperiod), an assessment of suitability of habitat for foraging (openness), and an assessment for competition with other species, not just the two factors considered originally by the Service (suitability and competition). Therefore, in re-evaluating of our approach, we identified four factors in the 90 percent biomass reduction and not two as we previously considered. We believe these four factors are represented as equal proportions of the 90 percent reduction, which corresponds to an equal split of 22.5 percent for each factor. Since we have accounted previously for three of these factors in our approach (prey size, habitat suitability, and hydroperiod) and they are treated separately in our assessment, we consider a more appropriate foraging efficiency to represent the original 10 percent and the remaining 22.5 percent from the 90 percent reduction discussed above. Following this revised assessment, our competition factor would be 32.5 percent, not the initial estimate of 55 percent.

Other comments reference the methodology's lack of sensitivity to limiting factors, i.e., is there sufficient habitat available across all hydroperiods during critical life stages of wood stork nesting and does this approach over emphasize the foraging biomass of long hydroperiod wetlands with a corresponding under valuation of short hydroperid wetlands. The Service is aware of these questions and is examining alternative ways to assess these concerns. However, until futher research is generated to refine our approach, we continue to support the assessment tool as outlined.

Following this approach, Table 10 has been adjusted to reflect the competition factor and represents the amount of biomass consumed by wood storks and is the basis of our effects assessments (Class 1 hydroperiod with a biomass 0.26 g, multiplied by 0.325, results in a value of 0.08 g [0.25*.325=0.08]) (Table 10).

Table 10 Actual Biomass Consumed by Wood Storks

Hydroperiod Class	Days Inundated	Fish Biomass
Class 1	0-60	0.08 gram/m^2
Class 2	60-120	0.17 gram/m^2
Class 3	120-180	0.39 grams/m^2
Class 4	180-240	0.71 grams/m^2
Class 5	240-300	0.88 grams/m^2
Class 6	300-330	1.01 grams/m^2
Class 7	330-365	1.10 grams/m^2

Sample Project of Biomass Calculations and Corresponding Concurrence Determination

Example 1:

An applicant is proposing to construct a residential development with unavoidable impacts to 5 acres of wetlands and is proposing to restore and preserve 3 acres of wetlands onsite. Data on the onsite wetlands classified these systems as exotic impacted wetlands with greater than 50

percent but less than 75 percent exotics (Table 3) with an average hydroperiod of 120-180 days of inundation.

The equation to calculate the biomass lost is: The number of acres, converted to square-meters, times the amount of actual biomass consumed by the wood stork (Table 10), times the exotic foraging suitability index (Table 3), equals the amount of grams lost, which is converted to kg.

Biomass lost (5*4,047*0.39 (Table 10)*0.37 (Table 3)=2,919.9 grams or 2.92 kg)

In the example provided, the 5 acres of wetlands, converted to square-meters (1 acre= 4,047 m^2) would provide 2.9 kg of biomass (5*4,047*0.39 (Table 10)*0.37 (Table 3)= 2,919.9 grams or 2.9 kg), which would be lost from development.

The equation to calculate the biomass from the preserve is the same, except two calculations are needed, one for the existing biomass available and one for the biomass available after restoration.

Biomass Pre: (3*4,047*0.39(Table 10)*0.37 (Table 3)=1,751.95grams or 1.75 kg)

Biomass Post: (3*4,047*0.39 (Table 10)*1(Table 3)=4,734.99 grams or 4.74 kg)

Net increase: 4.74 kg-1.75 kg = 2.98 kg Compensation Site

Project Site Balance 2.98 kg- 2.92 kg = 0.07kg

The compensation proposed is 3 acres, which is within the same hydroperiod and has the same level of exotics. Following the calculations for the 5 acres, the 3 acres in its current habitat state, provides 1.75 kg (3*4,047*0.39 (Table 10)*0.37 (Table 3)=1,751.95grams or 1.75 kg) and following restoration provides 4.74 kg (3*4,047*0.39 (Table 10)*1(Table 3)=4,734.99 grams or 4.74 kg), a net increase in biomass of 2.98 kg (4.74-1.75=2.98).

Example 1: 5 acre wetland loss, 3 acre wetland enhanced – same hydroperiod - NLAA

Hydroperiod	Existing Footprint		On-site Preserve Area				Net Change*	
			Pre Enhancement		Post Enhancement			
	Acres	Kgrams	Acres	Kgrams	Acres	Kgrams	Acres	Kgrams
Class 1 - 0 to 60 Days								
Class 2 - 60 to 120 Days								
Class 3 - 120 to 180 Days	5	2.92	3	1.75	3	4.74	(5)	0.07
Class 4 - 180 to 240 Days								
Class 5 - 240 to 300 Days								
Class 6 - 300 to 330 Days								
Class 7 - 330 to 365 days								
TOTAL	**5**	**2.92**	**3**	**1.75**	**3**	**4.74**	**(5)**	**0.07**

*Since the net increase in biomass from the restoration provides 2.98 kg and the loss is 2.92 kg, there is a positive outcome (4.74-1.75-2.92=0.07) in the same hydroperiod and Service concurrence with a NLAA is appropriate.

Example 2:

In the above example, if the onsite preserve wetlands were a class 4 hydroperiod, which has a value of 0.71. grams/m^2 instead of a class 3 hydroperiod with a 0.39 grams/m^2 [Table 10]), there would be a loss of 2.92 kg of short hydroperiod wetlands (as above) and a net gain of 8.62 kg of long-hydroperiod wetlands.

Biomass lost: (5*4,047*0.39 (Table 10)*0.37 (Table 3)=2,919.9 grams or 2.92 kg)

The current habitat state of the preserve provides 3.19 kg (3*4,047*0.71 (Table 10)*0.37 (Table 3)=3,189.44 grams or 3.19 kg) and following restoration the preserve provides 8.62 kg (3*4,047*0.71 (Table 10)*1(Table 3)= 8,620.11 grams or 8.62 kg, thus providing a net increase in class 4 hydroperiod biomass of 5.43 kg (8.62-3.19=5.43).

Biomass Pre: (3*4,047*0.71(Table 10)*0.37 (Table 3) = 3,189.44 grams or 3.19 kg)

Biomass Post: (3*4,047*0.71 (Table 10)*1(Table 3)=8,620.11 grams or 8.62 kg)

Net increase: 8.62 kg-3.19 kg = 5.43 kg

Project Site Balance 5.43 kg- 2.92 kg = 2.51 kg

Example 2: 5 acre wetland loss, 3 acre wetland enhanced – different hydroperiod – May Affect

Hydroperiod	Existing Footprint		On-site Preserve Area				Net Change*	
			Pre Enhancement		Post Enhancement			
	Acres	Kgrams	Acres	Kgrams	Acres	Kgrams	Acres	Kgrams
Class 1 - 0 to 60 Days								
Class 2 - 60 to 120 Days								
Class 3 - 120 to 180 Days	5	2.92					(5)	-2.92
Class 4 - 180 to 240 Days			3	3.19	3	8.62	0	5.43
Class 5 - 240 to 300 Days								
Class 6 - 300 to 330 Days								
Class 7 - 330 to 365 days								
TOTAL	**5**	**2.92**	**3**	**3.19**	**3**	**8.62**	**(5)**	**2.51**

In this second example, even though there is an overall increase in biomass, the biomass loss is a different hydroperiod than the biomass gain from restoration, therefore, the Service could not concur with a NLAA and further coordination with the Service is appropriate.

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Appendix F-2

Active Wood stork Colonies Map

Active Wood Stork Colonies
with Corresponding
Core Foraging Areas (18.6 Miles)

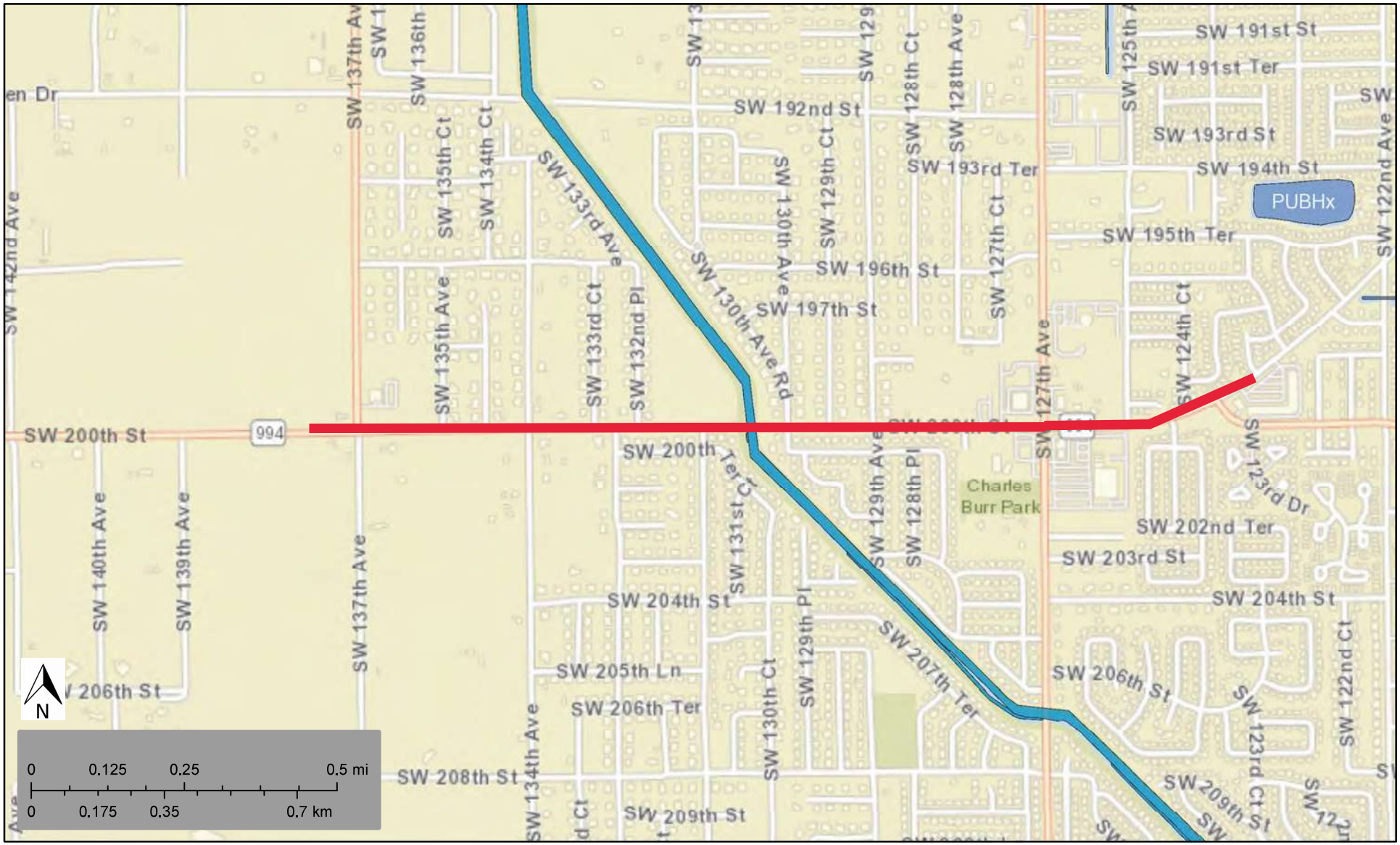
SR 994/Quail Roost Drive PD&E Study
from SW137th Ave to SW 127th Ave
Miami-Dade County, FL
FM# 445804-1-22-01
ETDM# 14429

Appendix G

Summary of Individual Water Features

U.S. Fish and Wildlife Service
National Wetlands Inventory

Individual Water Features



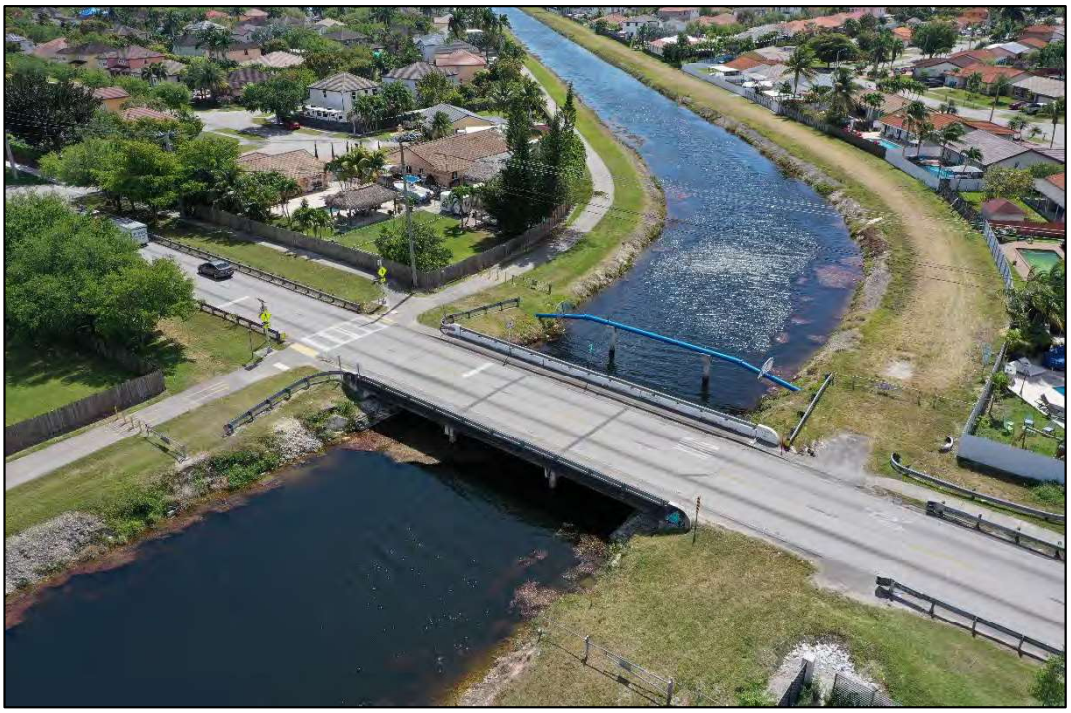
Legend

- Project Limits
- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

Appendix H

Surface Waters and Bridge Photographs

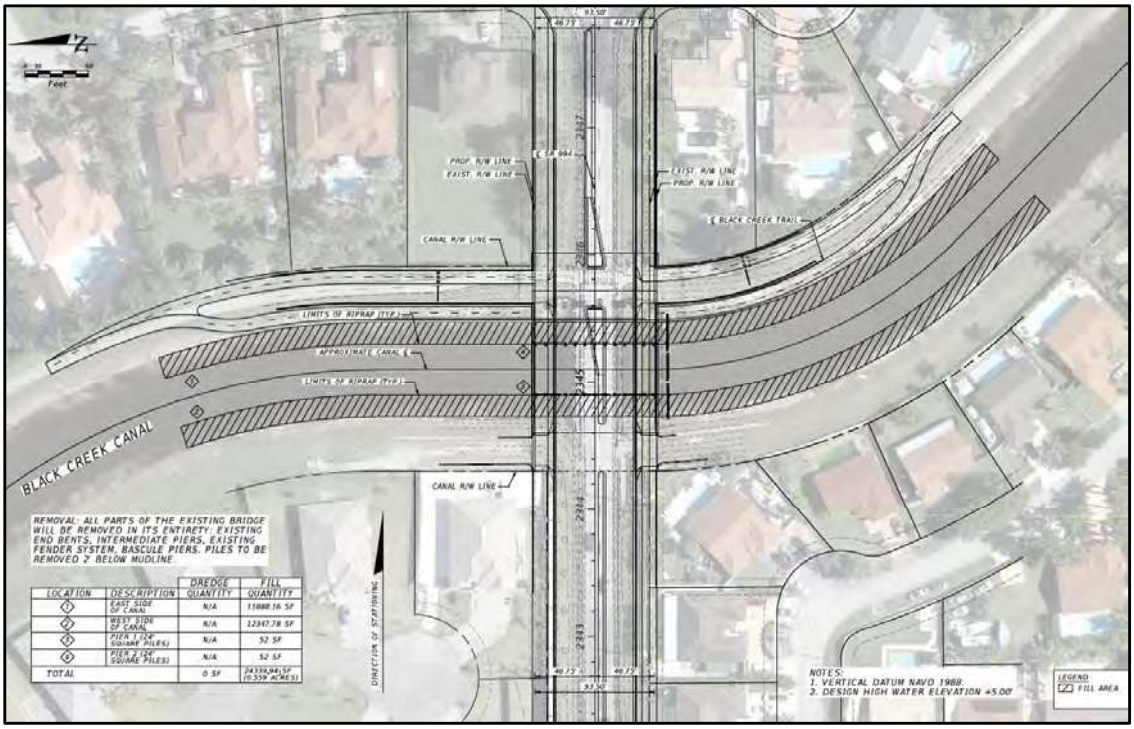
Aerial Photograph of the Black Creek Canal



Photograph of Bridge Facing North

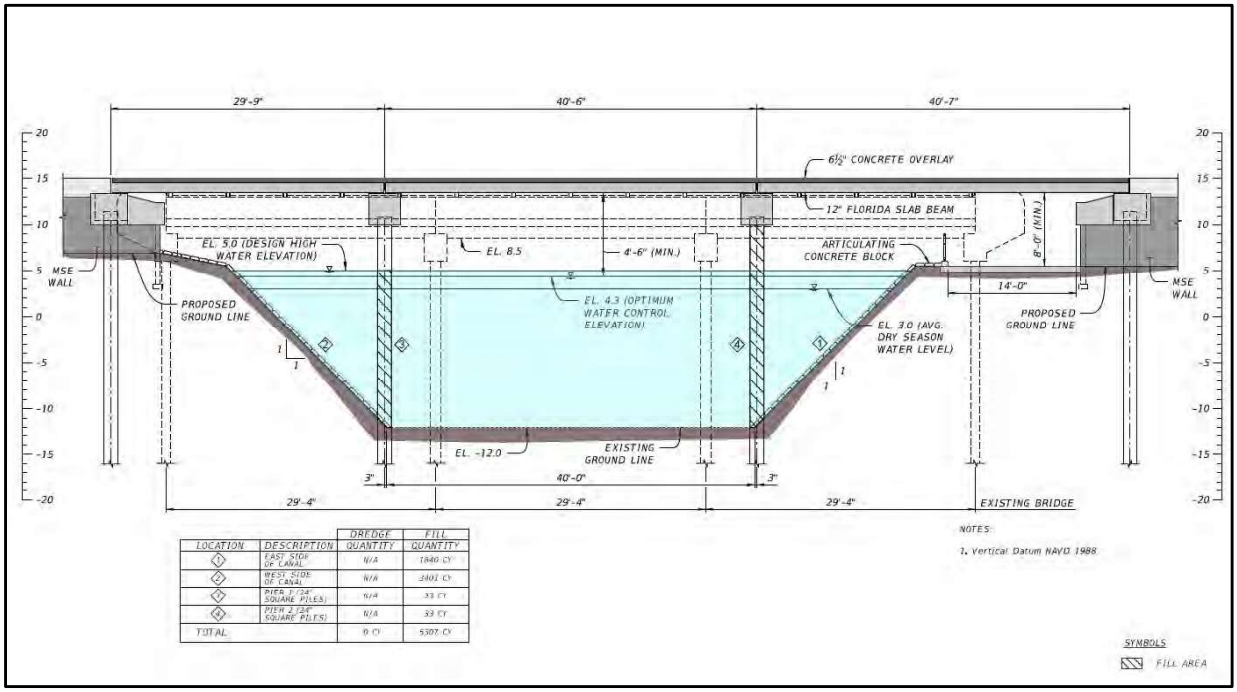
Photograph of Bridge Facing South

Surface Water Impacts Dredge & Fill Bridge Plan



LOCATION	DESCRIPTION	DREDGE QUANTITY	FILL QUANTITY
1	EAST SIDE OF CANAL	N/A	11888.16 SF
2	WEST SIDE OF CANAL	N/A	12347.78 SF
3	PIER 1 (24" SQUARE PILES)	N/A	52 SF
4	PIER 2 (24" SQUARE PILES)	N/A	52 SF
TOTAL		0 SF	24339.94 SF (0.559 ACRES)

Surface Water Impacts Bridge Elevation Plan



LOCATION	DESCRIPTION	DREDGE QUANTITY	FILL QUANTITY
1	EAST SIDE OF CANAL	N/A	1840 CY
2	WEST SIDE OF CANAL	N/A	3401 CY
3	PIER 1 (24" SQUARE PILES)	N/A	33 CY
4	PIER 2 (24" SQUARE PILES)	N/A	33 CY
TOTAL		0 CY	5307 CY

Appendix I

SFWMD Meeting Minutes

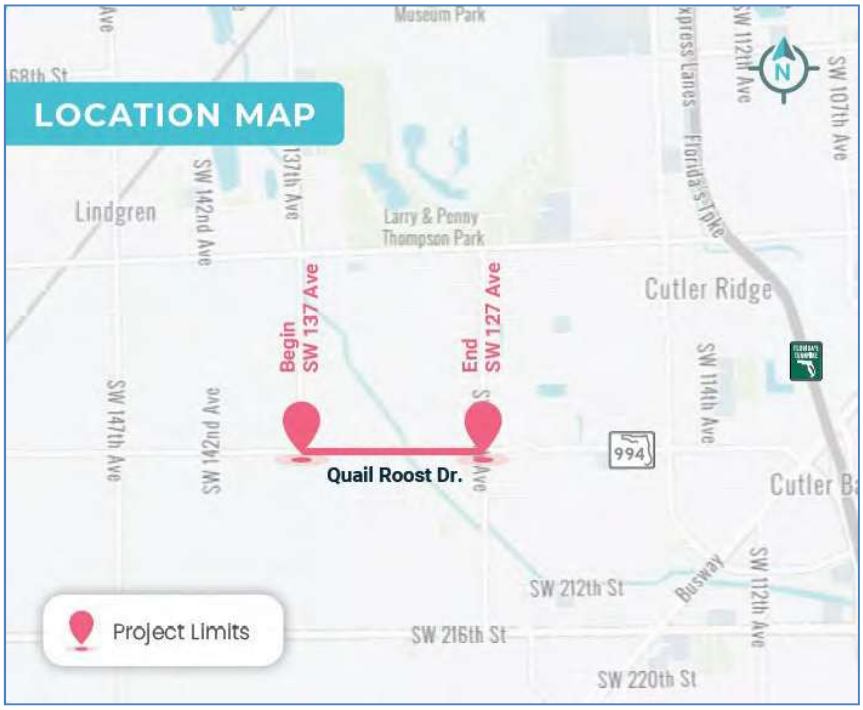
FLORIDA DEPARTMENT OF TRANSPORTATION
INTERAGENCY MEETING MINUTES

9:00 – 9:30 am: (D6) SW 200th Street/Quail Roost Dr from W of SW 137th Ave to E of SW 127th Ave

AGENDA SUMMARY:

PROJECT INFO

1. FPID/FM Number: 445804-1-22-01
2. FDOT Project Name: SR 994/SW 200th Street/Quail Roost Drive from W of SW 137th Ave to E of SW 127th Ave
3. FDOT Project Manager: Elsa Riverol
   FDOT Drainage Liaison: Nathan Pulido
   FDOT PLEMO Liaison: Steven Craig James, Robert McMullen
4. Consultant/Company Name and Contact information: Gannett Fleming; Project Manager: Alina Fernandez, afernandez@gfnet.com, 305.519.2987; Courtney Arena, carena@gfnet.com, 954.649.9450.
5. SR/Local Name: SR 994/SW 200th Street/Quail Roost Drive
6. County: Miami-Dade
7. Project Limits (provide location map and figures): SR 994/SW 200th Street/Quail Roost Drive from W of SW 137th Ave to E of SW 127th Ave



8. General Project Scope (include stage of project - PD&E, Design, Design/Build, Construction, etc.): Current Stage: PD&E
   General Scope: The proposed roadway widening is intended to improve Safety, Operational Conditions, Enhance Mobility Options. The project also replaces the existing bridge over Black Creek Canal (C-1W), and relocates the Black Creek Trail crossing under the new bridge.

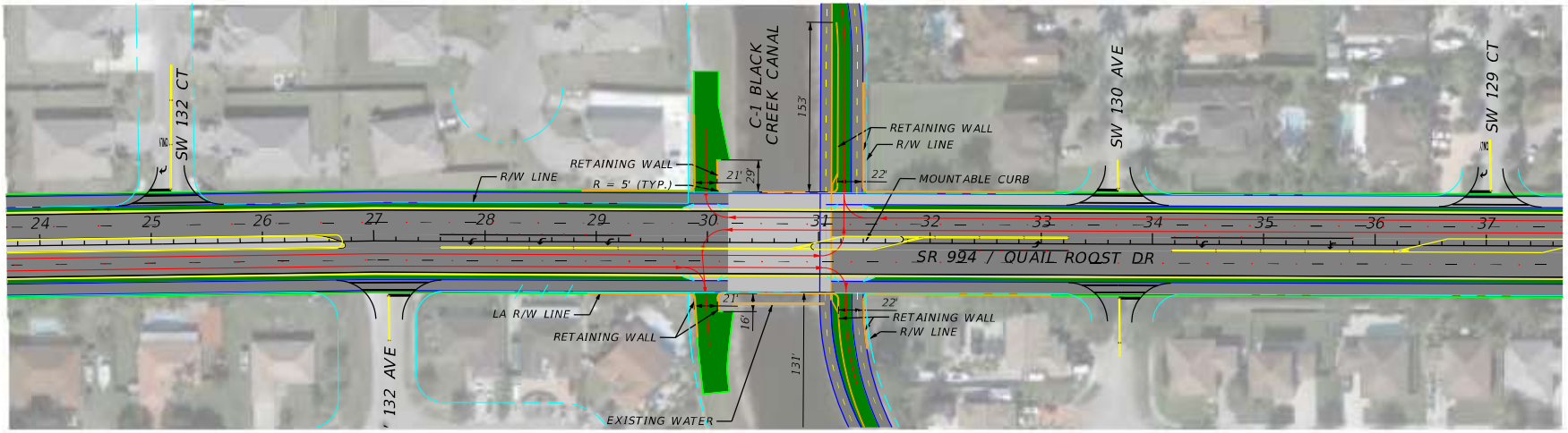
   The purpose of this project is to address traffic operations and capacity constraints on SR 994 from west of SW 137th Street to east of SW 127th Avenue in unincorporated Miami-Dade County in order to accommodate future travel demand projected as a result of population and employment growth along the corridor. Other goals of the project are to 1) improve safety conditions along the corridor, including emergency evacuation and response times, and 2) enhance mobility options and multimodal access.
9. Anticipated Permits: The project is currently in the PD&E Phase. Section 408 Review (USACE) - *Black Creek Canal (C-1W) is part of a federal flood control project, and a 408 review may be required for proposed bridge improvements*. SFWMD Environmental Resource Permit, Right-of-Way Occupancy Permit (SFWMD); Water Use Permit (obtained by construction contractor), National Pollutant Discharge Eliminated System (FDEP, obtained by construction contractor).
10. Provide specific agenda discussion topics (i.e., goal of meeting): Discuss bridge replacement and Black Creek Trail relocation passing under the bridge versus the existing at grade crossing. Refer to PowerPoint presentation.
11. Requested Attendees (SFWMD - Environmental Resources, Surface Water Management, Water Use, ROW; USACE; USFWS; NMFS, etc.): SFWMD- Environmental Resources including roadway drainage treatment; ROW for the Black Creek Trail (Section 4f) crossing along the C-1W Canal.
12. Does your project include impacts to any environmental resources? If yes, please answer Questions a- d:
    a. Have wetland and/or protected species impacts been identified? If so define the impact amount and type: No wetland impacts are anticipated. A minor amount of surface water impacts may occur as a result of the proposed bridge replacement.

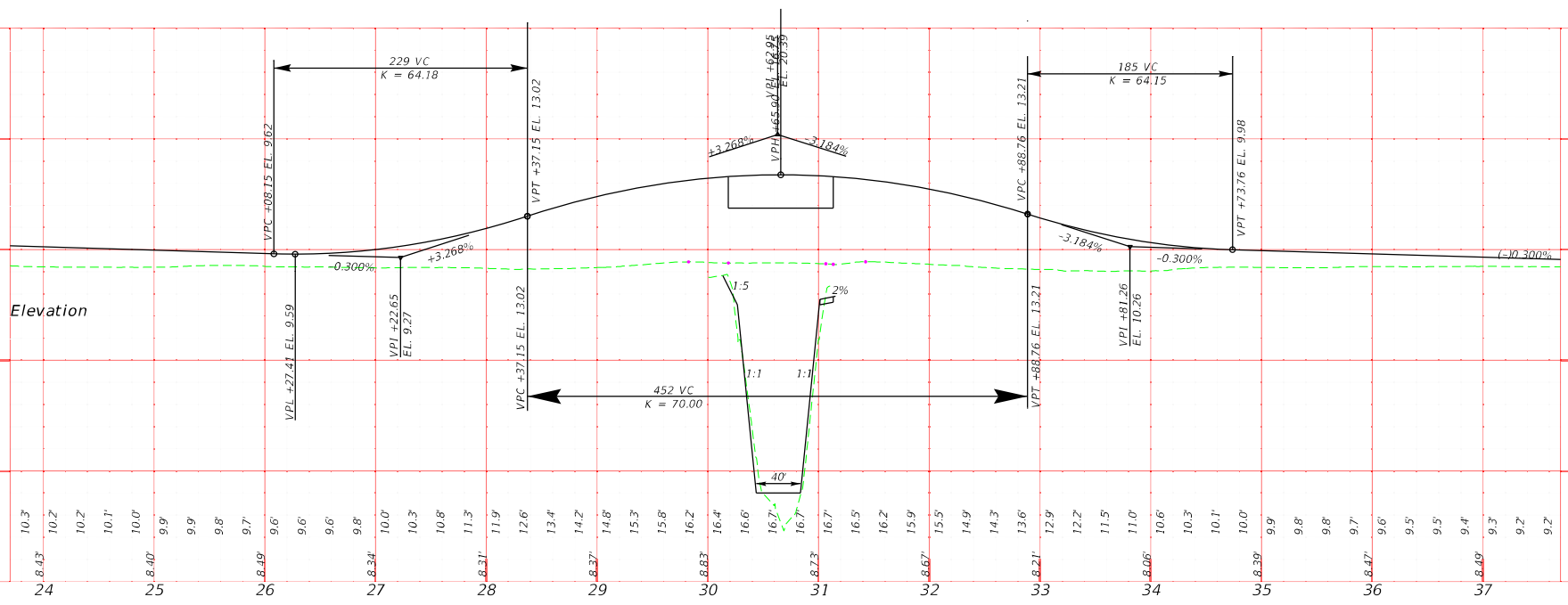
       Based on range and preferred habitat type the following species listed by the Federal Endangered Species Act and the State of Florida as Federally Endangered (FE), Federally Threatened (FT), or State-Threatened (ST) have the potential to occur in the project area: American alligator (FT based on similarity of appearance to American crocodile), eastern indigo snake (FT), Florida bonneted bat (FE), wood stork (FT), little blue heron (ST), roseate spoonbill (ST), and tricolored heron (ST). All the aquatic and wetland species either likely or potentially utilize appropriate habitats in the vicinity of the bridge. Given that the area surrounding the project corridor is predominantly urban in nature, field reviews did not identify any suitable habitat for these species.

b. Have the project representatives discussed the wetland and/or protected species impacts with PL&EM? (List the PL&EM person who you discussed with and the date of the meeting/discussion): In Progress with FDOT District 6 PL&EM, Robert McMullen.
c. During the meeting/discussion with PL&EM did project representatives discuss avoidance and minimization criteria? Has PL&EM concurred these criteria were applied? (For District IV projects, participation in this interagency meeting is not permitted if elimination and reduction has not been explored with PL&EM): N/A
d. Have mitigation options for unavoidable impacts been discussed with PL&EM, and concurrence on the amount and type been achieved? (For District IV projects, participation in this interagency meeting is not permitted if options for unavoidable impacts been discussed with PL&EM): N/A

PRIOR COORDINATION

13. Has the project approach been discussed with:
    a. FDOT Drainage Liaison? Yes
    b. PLEMO Liaison? Yes
14. Have you coordinated with Cultural Resource Manager to determine if a SHPO concurrence letter has been received and can be included in the application? The project is in the PD&E phase and coordination with SHPO is on-going. We do not anticipate submitting a permit application at this time.
15. Have you coordinated with the Contamination Coordinator to determine if there are contamination concerns in the event a dewatering permit is required? A Contamination Screening is in progress.
16. Have you coordinated with Natural Resource Manager to determine if a USFWS concurrence letter has been received and can be included in the application? Coordination with USFWS is anticipated to occur later on in the PD&E phase.
17. For projects going into the permitting phase: Has a pre-application meeting been held or any preliminary correspondence been made by FDOT PM or Consultant with the regulatory agencies/reviewers? Specify the agencies and dates when meetings were held: N/A
18. For project in the permitting phase, please provide any application numbers and the reviewer's name: N/A
19. Anticipated Permits (or, if you already applied for or received any permits, please include the application/permit numbers): N/A





REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
994	MIAMI-DADE	445804122O1

PLAN-PROFILE

SHEET NO. 01

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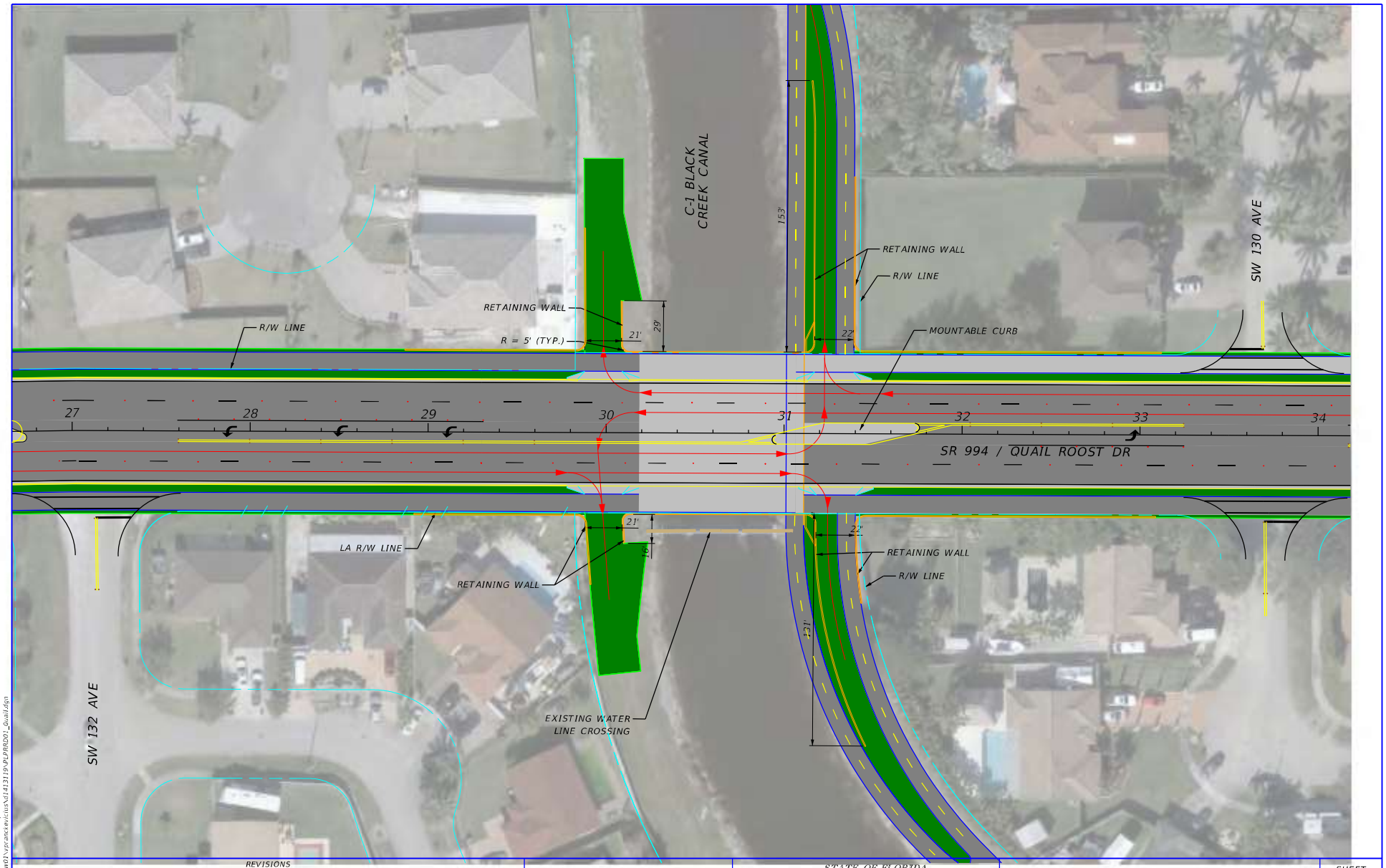

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
994	MIAMI-DADE	44580412201

PLAN-PROFILE

SHEET NO. 02

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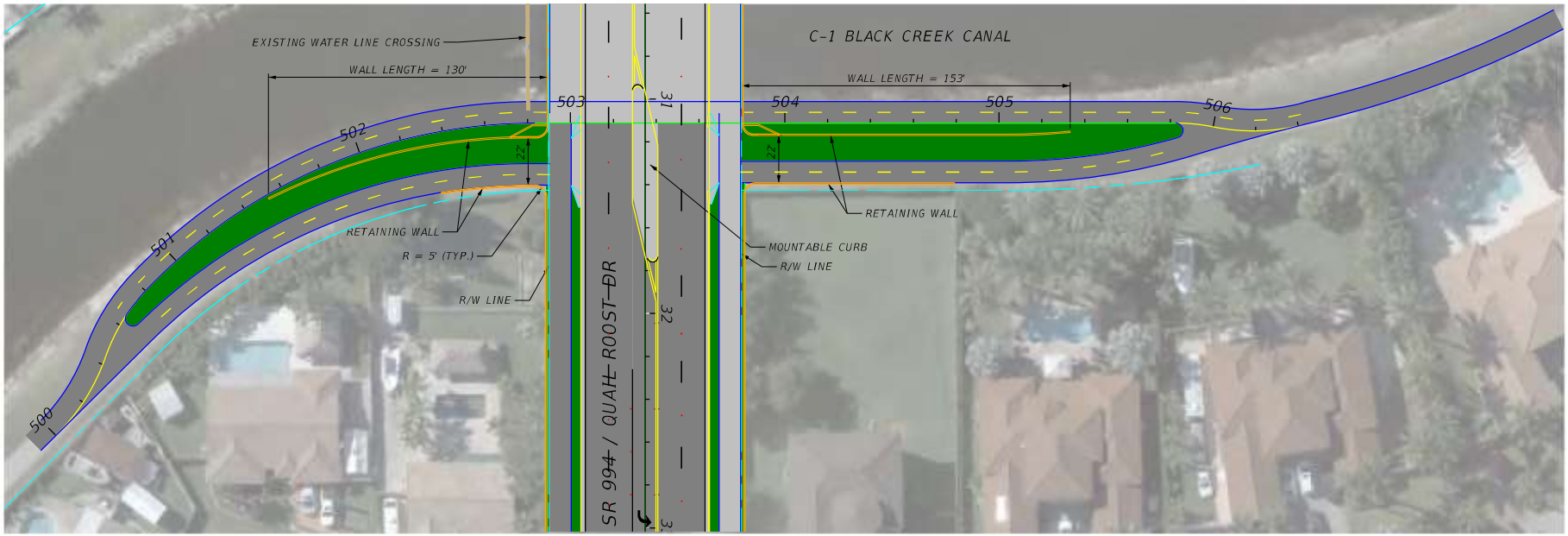

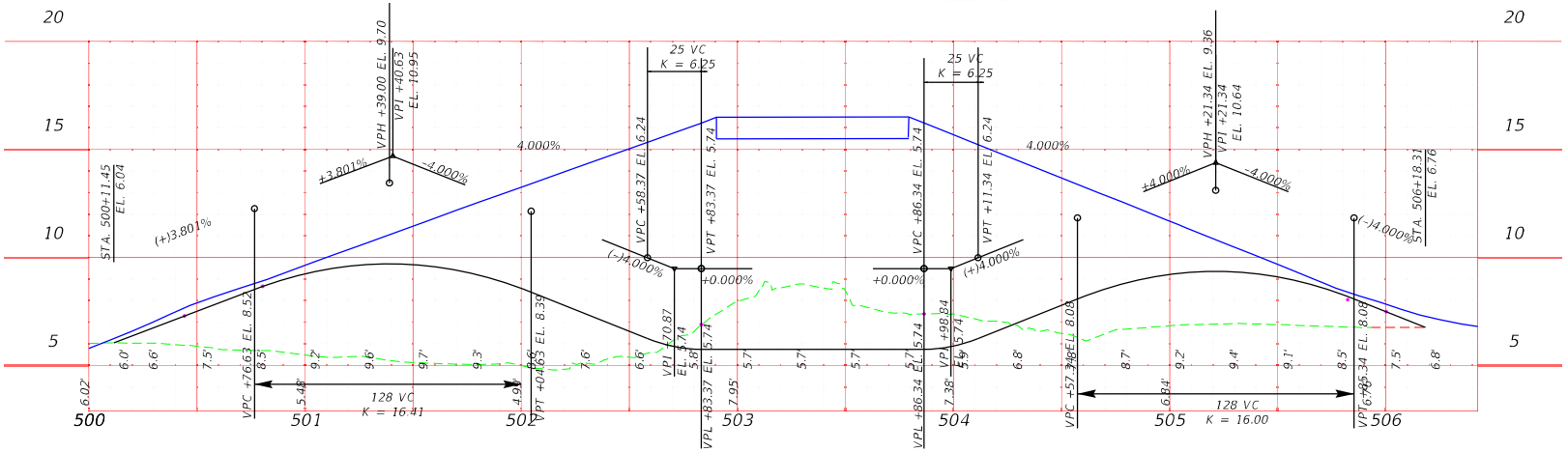

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
994	MIAMI-DADE	44580412201

PLAN-PROFILE

SHEET NO.
PLAN 1

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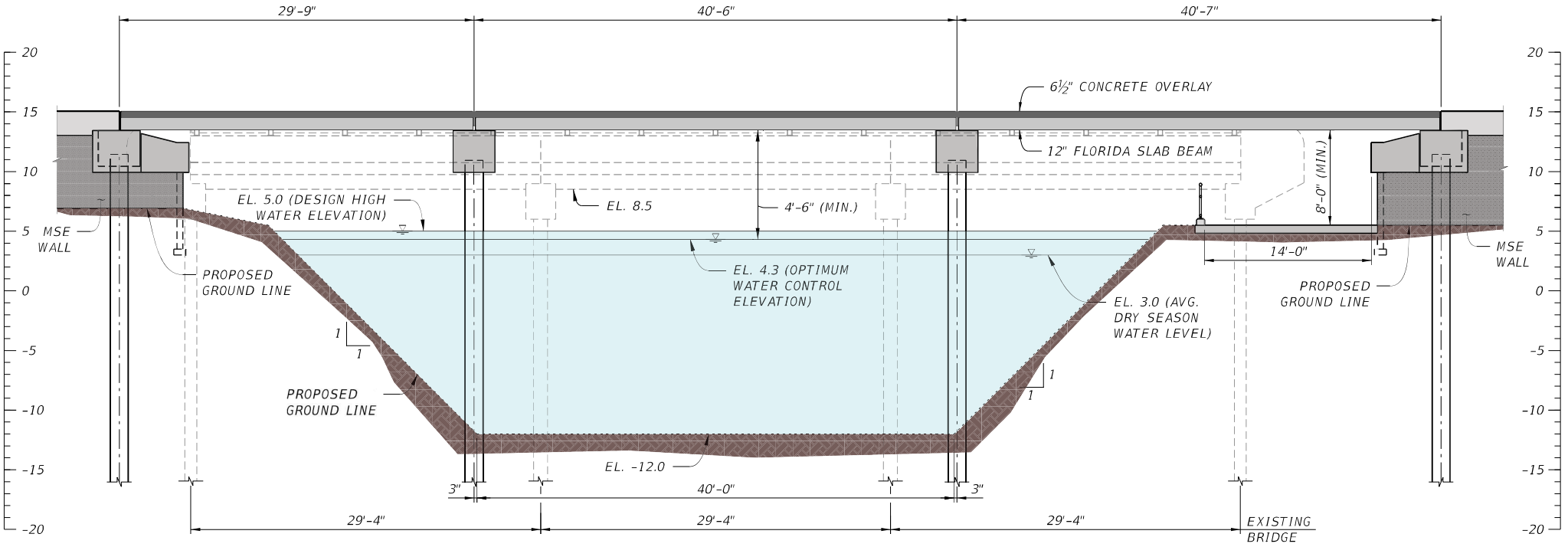
29'-9"
40'-6"
40'-7"
20
15
10
5
0
-5
-10
-15
-20
6½" CONCRETE OVERLAY
12" FLORIDA SLAB BEAM
8'-0" (MIN.)
EL. 5.0 (DESIGN HIGH WATER ELEVATION)
EL. 8.5
4'-6" (MIN.)
MSE WALL
PROPOSED GROUND LINE
EL. 4.3 (OPTIMUM WATER CONTROL ELEVATION)
14'-0"
EL. 3.0 (AVG. DRY SEASON WATER LEVEL)
PROPOSED GROUND LINE
MSE WALL
1
1
1
1
PROPOSED GROUND LINE
EL. -12.0
3"
40'-0"
3"
29'-4"
29'-4"
29'-4"
EXISTING BRIDGE

PROJECT MEETING SUMMARY:

ATTENDEES:

Name	Organization	Email Address
Dustin Wood	SFWMD	duwood@sfwmd.gov
Barb Conmy	SFWMD - ERP	bconmy@sfwmd.gov
Caitlin Westerfield	SFWMD - ERP	cwesterf@sfwmd.gov
John Hixenbaugh	SFWMD - ROW	jhixenba@sfwmd.gov
Teri Swartz	SFWMD - 408	tswartz@sfwmd.gov
Michelle Gilbert	USACE	michelle.l.gilbert@usace.army.mil
Elsa Riverol	FDOT - PM	elsa.riverol@dot.state.fl.us
Daniel ChominVirden	FDOT	daniel.chomin-virden@dot.state.fl.us
Alina Ferndandez	Gannett Fleming	afernandez@gfnet.com
Carlos Cejas	Gannett Fleming	ccejas@gfnet.com
Courtney Arena	Gannett Fleming	carena@gfnet.com
Alejandro Uribe	Gannett Fleming	auribe@gfnet.com
Amanda De Cun	Gannett Fleming	adecun@gfnet.com
Vinicius Pranckevicius	Gannett Fleming	vpranckevicius@gfnet.com
Carlos Ribbeck	Ribbeck Engineering	cribbeck@gmail.com
Francis Mitchell	Ribbeck Engineering	f-mitchell@att.net

The Project meeting started around 9:00 am and was completed by 9:40 am. After roll call of attendees, the overall project scope, limits, and approach were reviewed and presented by representatives of Gannett Fleming. The Project was described as a PD&E project for a 1.5-mile-long roadway improvement with bridge replacement including pedestrian mobility improvements. It is currently a two-lane undivided roadway and bridge that has substandard vertical clearance. There are two options being proposed: Option 1) Keep it as a two-lane bridge but add a turning lane and shared use path with lighting. This would increase the bridge footprint. Option 2) add two lanes to be a 4-lane roadway/bridge with median and shared use path. In either Option, the bridge would be replaced. It is a SFWMD canal and the shared use path and work is within the SFWMD ROW. The purpose of this meeting is to confirm the design considerations for the bridge and shared use path which is being proposed under the east side of the bridge. Proposed would be adding two piles at 40' separation at bottom of canal with 1:1 slope up to grade. North would accommodate a 14' wide paved shared use path under the bridge with 8' clearance. West top of bank would be like existing with no path/access. At grade SFWMD access at top of bridge/roadway would be maintained.

Agency Discussion:

ROW:

- John of SFWMD confirmed maintenance access will need to be maintained at all four corners to accommodate drive and turning lane for trailers and cranes. Consultant indicated at grade access will remain as existing.

- Consultant inquired how much of "underpass" of shared use path will need to be paved. Proposing 10' paved with 22' of clear width (grass is drivable).
    - SFWMD indicated 14' wide paved driveway at the quadrant and aprons need to accommodate a vehicle 75 feet in length. A minimum 15' width and 75' length is provided - see pg 1 of Exhibits.pdf
- SFWMD indicated they will need more detailed cross-sections to share with the maintenance team to confirm if proposed widths, lengths, gates, and guard rails are appropriate. Can e-mail him (John) the plans to coordinate with his team. Two (2) Cross-sections will be needed.
    - One cross-section to show the overall proposed profile of the driveways, underpass, guardrail locations, gates pave widths etc which will be shared with the maintenance group. Refer to pg. 1 for location of guardrail, retaining walls, gates, paved widths. Refer to pg 2 for cross slope and longitudinal slope of west access road. See pg 3 for profile of east access road. Cross section on Pages 5 and 6 show guardrail and retaining walls.
    - The second cross-section is set of cross-sectional surveys of the existing canal and right-of-way profiles to determine if dredging will be required. At a minimum, this set consists of five (5) surveys: one at the centerline, one at each proposed bridge face, one 25-feet upstream and one 25-feet downstream of the proposed bridge. (See SFWMD Bridge Application Checklist). Please see pg. 4 to 6
- SFMWD indicated more info on the slopes will be required for mowing considerations etc. If it is greater than 3:1, will need to be stabilized. A hardened slope will be required with 1:1 slope as follows: These requirements will be included in the PD&E Project Engineering Report (PER) and will be reflected in the construction cost estimate for the selected alternative. We will adhere to this criteria during the design phase.
    - 1:1 Articulated Block (Not riprap) from top of bank to toe of slope. Top of bank landward can be riprap (stabilization needs to be 25' from bridge face in each direction and can be articulated block)
    - 1.5:1 and shallower – riprap is allowed
    - 1.5:1 and steeper – a slope stability analysis would be required by USACE (per Teri)
- Consultant briefly shared a letter they received from Beverly Miller in 2021 with canal design requirements.
    - John indicated they looked to be current, so should still apply.
- Consultant inquired on canal depth. Proposing -12.0. Where it is greater depth than that, do they need to fill?
- SFWMD indicated it is what ever you need to fulfill the hydraulic needs, but no, they don't required to fill to be all uniform if existing is greater depth.

ERP

- Consultant indicated they do not anticipate any impacts to wetlands and drainage is anticipated to be self-contained with no new outfalls or modifications to existing systems.
- SFWMD stormwater indicated an ERP would be required for the work activity and would be a new permit.
- SFWMD environmental group would expect the following to be shown/discussed in permit application: acres of wetlands or other surface waters as their jurisdiction is to top of bank, riprap and any other dredge or fill required as part of the project. Plans need to show erosion control. A manatee protection plan during work activities would be required if appropriate for the location. If dewatering will be necessary this needs to be indicated in the application.

USACE

- Michelle confirmed a 408 authorization will be required for this project

Appendix J

USFWS IPaC Resource List

IPaC **U.S. Fish & Wildlife Service**

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Miami-Dade County, Florida

Local office

Florida Ecological Services Field Office

fw4flesregs@fws.gov

https://www.fws.gov/office/florida-ecological-services

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

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1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see

FAQ).

2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS
Florida Bonneted Bat *Eumops floridanus* Wherever found There is **proposed** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/8630	Endangered
Florida Panther *Puma (=Felis) concolor coryi* Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/1763	Endangered
Puma (=mountain Lion) *Puma (=Felis) concolor (all subsp. except coryi)* No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/6049	SAT
West Indian Manatee *Trichechus manatus* Wherever found There is **final** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/4469	Threatened Marine mammal

Birds

NAME	STATUS
Bachman's Warbler (=wood) *Vermivora bachmanii* Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/3232	Endangered

Eastern Black Rail Laterallus jamaicensis ssp. jamaicensis — Threatened
Wherever found
No critical habitat has been designated for this species.
https://ecos.fws.gov/ecp/species/10477

Wood Stork Mycteria americana — Threatened
No critical habitat has been designated for this species.
https://ecos.fws.gov/ecp/species/8477

Reptiles

NAME	STATUS

American Alligator Alligator mississippiensis — SAT
Wherever found
No critical habitat has been designated for this species.
https://ecos.fws.gov/ecp/species/776

American Crocodile Crocodylus acutus — Threatened
There is **final** critical habitat for this species. Your location does not overlap the critical habitat.
https://ecos.fws.gov/ecp/species/6604

Eastern Indigo Snake Drymarchon couperi — Threatened
Wherever found
No critical habitat has been designated for this species.
https://ecos.fws.gov/ecp/species/646

Green Sea Turtle Chelonia mydas — Threatened
There is **final** critical habitat for this species. Your location does not overlap the critical habitat.
https://ecos.fws.gov/ecp/species/6199

Hawksbill Sea Turtle Eretmochelys imbricata — Endangered
Wherever found
There is **final** critical habitat for this species. Your location does not overlap the critical habitat.
https://ecos.fws.gov/ecp/species/3656

Leatherback Sea Turtle Dermochelys coriacea — Endangered
Wherever found
There is **final** critical habitat for this species. Your location does not overlap the critical habitat.
https://ecos.fws.gov/ecp/species/1493

Loggerhead Sea Turtle Caretta caretta — Threatened
There is **final** critical habitat for this species. Your location does not overlap the critical habitat.
https://ecos.fws.gov/ecp/species/1110

Fishes

NAME	STATUS

Gulf Sturgeon Acipenser oxyrinchus (=oxyrhynchus) desotoi — Threatened
Wherever found
There is **final** critical habitat for this species. Your location does not overlap the critical habitat.
https://ecos.fws.gov/ecp/species/651

Insects

NAME	STATUS

Bartram's Hairstreak Butterfly Strymon acis bartrami — Endangered
Wherever found
There is **final** critical habitat for this species. Your location does not overlap the critical habitat.
https://ecos.fws.gov/ecp/species/4837

Florida Leafwing Butterfly Anaea troglodyta floridalis — Endangered
Wherever found
There is **final** critical habitat for this species. Your location does not overlap the critical habitat.
https://ecos.fws.gov/ecp/species/6652

Miami Blue Butterfly Cyclargus (=Hemiargus) thomasi bethunebakeri — Endangered
Wherever found
No critical habitat has been designated for this species.
https://ecos.fws.gov/ecp/species/3797

NAME	STATUS
Monarch Butterfly Danaus plexippus Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9743	Candidate

Flowering Plants

NAME	STATUS
Beach Jacquemontia Jacquemontia reclinata No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/1277	Endangered
Blodgett's Silverbush Argythamnia blodgettii There is **proposed** critical habitat for this species. https://ecos.fws.gov/ecp/species/6823	Threatened
Cape Sable Thoroughwort Chromolaena frustrata There is **final** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/4733	Endangered
Carter's Mustard Warea carteri No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/5583	Endangered
Carter's Small-flowered Flax Linum carteri carteri There is **final** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/7208	Endangered
Crenulate Lead-plant Amorpha crenulata No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/6470	Endangered
Deltoid Spurge Chamaesyce deltoidea ssp. deltoidea No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/199	Endangered

Everglades Bully Sideroxylon reclinatum ssp. austrofloridense — Threatened
There is **proposed** critical habitat for this species.
https://ecos.fws.gov/ecp/species/4735

Florida Brickell-bush Brickellia mosieri — Endangered
There is **final** critical habitat for this species. Your location does not overlap the critical habitat.
https://ecos.fws.gov/ecp/species/956

Florida Pineland Crabgrass Digitaria pauciflora — Threatened
There is **proposed** critical habitat for this species.
https://ecos.fws.gov/ecp/species/3728

Florida Prairie-clover Dalea carthagenensis floridana — Endangered
There is **proposed** critical habitat for this species.
https://ecos.fws.gov/ecp/species/2300

Florida Semaphore Cactus Consolea corallicola — Endangered
There is **final** critical habitat for this species. Your location does not overlap the critical habitat.
https://ecos.fws.gov/ecp/species/4356

Pineland Sandmat Chamaesyce deltoidea pinetorum — Threatened
There is **proposed** critical habitat for this species.
https://ecos.fws.gov/ecp/species/1914

Sand Flax Linum arenicola — Endangered
There is **proposed** critical habitat for this species.
https://ecos.fws.gov/ecp/species/4313

Small's Milkpea Galactia smallii — Endangered
No critical habitat has been designated for this species.
https://ecos.fws.gov/ecp/species/3360

Tiny Polygala Polygala smallii — Endangered
No critical habitat has been designated for this species.
https://ecos.fws.gov/ecp/species/996

Ferns and Allies

NAME STATUS

Florida Bristle Fern Trichomanes punctatum ssp. floridanum — Endangered

There is **proposed** critical habitat for this species.
https://ecos.fws.gov/ecp/species/8739

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

There are no critical habitats at this location.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern https://www.fws.gov/program/migratory-birds/species
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and

around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
American Kestrel Falco sparverius paulus This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9587	Breeds Apr 1 to Aug 31
Bald Eagle Haliaeetus leucocephalus This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds Sep 1 to Jul 31
Black Skimmer Rynchops niger This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/5234	Breeds May 20 to Sep 15
Chimney Swift Chaetura pelagica This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Mar 15 to Aug 25
Great Blue Heron Ardea herodias occidentalis This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds Jan 1 to Dec 31
Gull-billed Tern Gelochelidon nilotica This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9501	Breeds May 1 to Jul 31

King Rail Rallus elegans — Breeds May 1 to Sep 5
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/8936

Lesser Yellowlegs Tringa flavipes — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9679

Magnificent Frigatebird Fregata magnificens — Breeds Oct 1 to Apr 30
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Mangrove Cuckoo Coccyzus minor — Breeds Apr 20 to Aug 20
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Painted Bunting Passerina ciris — Breeds Apr 25 to Aug 15
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Prairie Warbler Dendroica discolor — Breeds May 1 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Reddish Egret Egretta rufescens — Breeds Mar 1 to Sep 15
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/7617

Ruddy Turnstone Arenaria interpres morinella — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Short-billed Dowitcher Limnodromus griseus — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9480

Swallow-tailed Kite Elanoides forficatus — Breeds Mar 10 to Jun 30
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/8938

White-crowned Pigeon Patagioenas leucocephala — Breeds May 1 to Sep 30
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/4047

Willet Tringa semipalmata — Breeds Apr 20 to Aug 5
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Wilson's Plover Charadrius wilsonia — Breeds Apr 1 to Aug 20
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence ( )

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum

probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.

3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

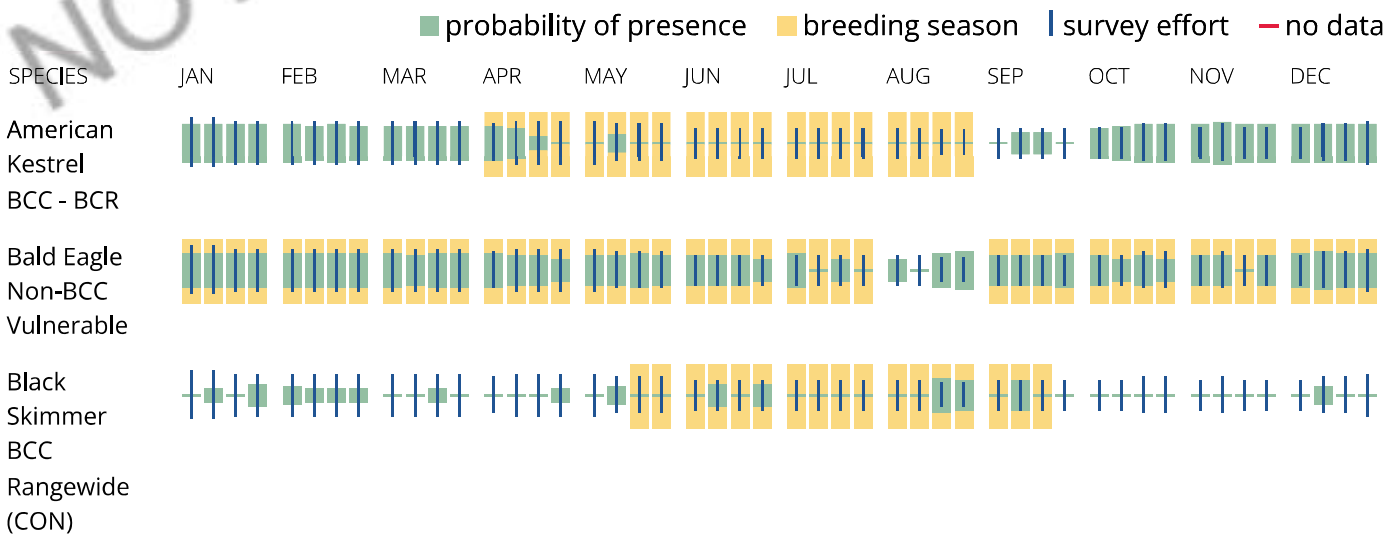
Breeding Season (▪)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

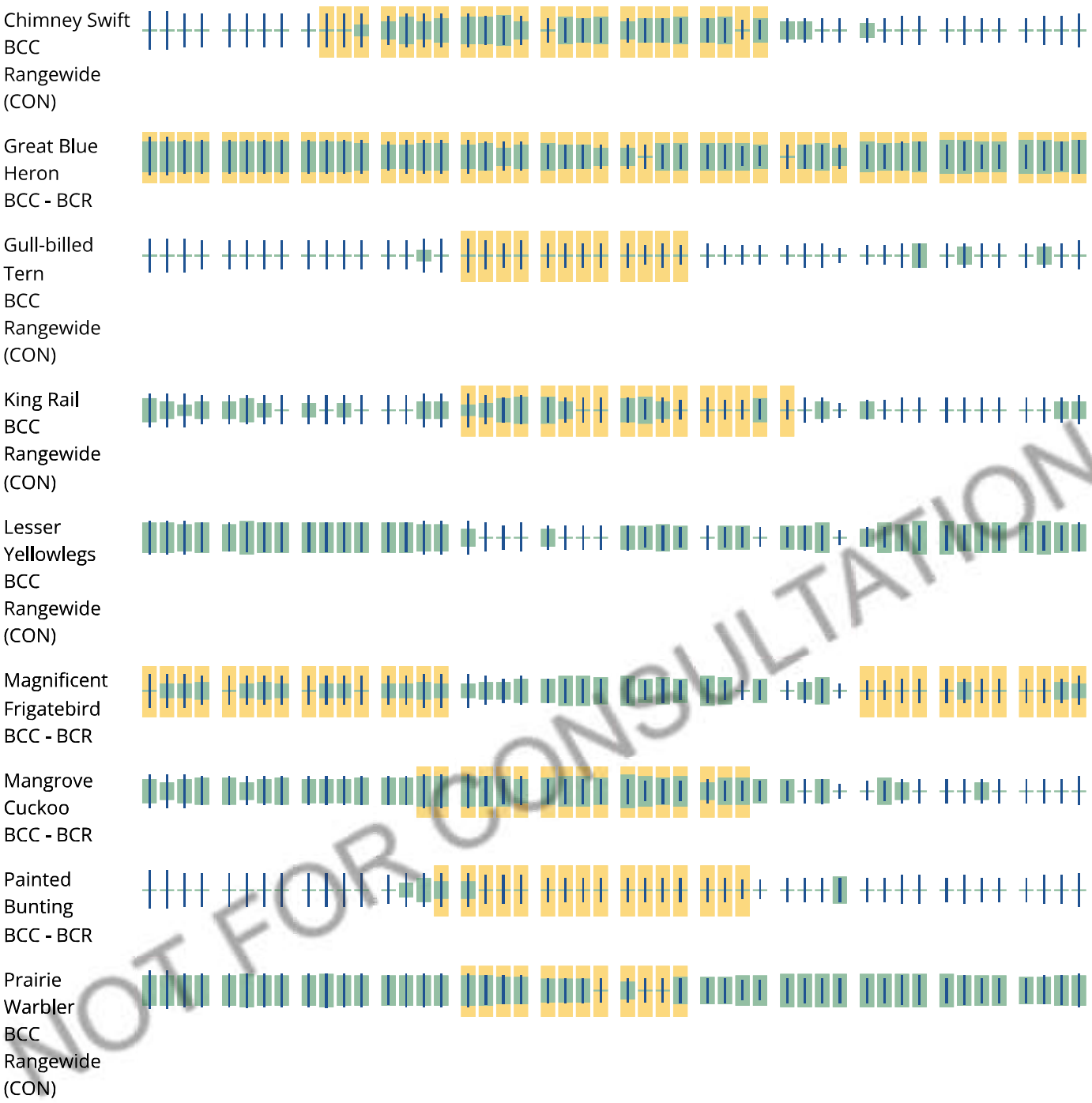
Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.





Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the list of migratory birds that potentially occur in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets.

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering or migrating in my area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may query your location using the RAIL Tool and look at the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Marine mammals

Marine mammals are protected under the Marine Mammal Protection Act. Some are also protected under the Endangered Species Act[1] and the Convention on International Trade in Endangered Species of Wild Fauna and Flora[2].

The responsibilities for the protection, conservation, and management of marine mammals are shared by the U.S. Fish and Wildlife Service [responsible for otters, walruses, polar bears, manatees, and dugongs] and NOAA Fisheries[3] [responsible for seals, sea lions, whales, dolphins, and porpoises]. Marine mammals under the responsibility of NOAA Fisheries are **not** shown on this list; for additional information on those species please visit the Marine Mammals page of the NOAA Fisheries website.

The Marine Mammal Protection Act prohibits the take (to harass, hunt, capture, kill, or attempt to harass, hunt, capture or kill) of marine mammals and further coordination may be necessary for project evaluation. Please contact the U.S. Fish and Wildlife Service Field Office shown.

1. The Endangered Species Act (ESA) of 1973.
2. The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) is a treaty to ensure that international trade in plants and animals does not threaten their survival in the wild.
3. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following marine mammals under the responsibility of the U.S. Fish and Wildlife Service are potentially affected by activities in this location:

NAME

West Indian Manatee *Trichechus manatus*
https://ecos.fws.gov/ecp/species/4469

Coastal Barrier Resources System

Projects within the John H. Chafee Coastal Barrier Resources System (CBRS) may be subject to the restrictions on Federal expenditures and financial assistance and the consultation requirements of the Coastal Barrier Resources Act (CBRA) (16 U.S.C. 3501 et seq.). For more information, please contact the local Ecological Services Field Office or visit the CBRA

Consultations website. The CBRA website provides tools such as a flow chart to help determine whether consultation is required and a template to facilitate the consultation process.

There are no known coastal barriers at this location.

Data limitations

The CBRS boundaries used in IPaC are representations of the controlling boundaries, which are depicted on the official CBRS maps. The boundaries depicted in this layer are not to be considered authoritative for in/out determinations close to a CBRS boundary (i.e., within the "CBRS Buffer Zone" that appears as a hatched area on either side of the boundary). For projects that are very close to a CBRS boundary but do not clearly intersect a unit, you may contact the Service for an official determination by following the instructions here: https://www.fws.gov/service/coastal-barrier-resources-system-property-documentation

Data exclusions

CBRS units extend seaward out to either the 20- or 30-foot bathymetric contour (depending on the location of the unit). The true seaward extent of the units is not shown in the CBRS data, therefore projects in the offshore areas of units (e.g., dredging, breakwaters, offshore wind energy or oil and gas projects) may be subject to CBRA even if they do not intersect the CBRS data. For additional information, please contact CBRA@fws.gov.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

There are no refuge lands at this location.

Fish hatcheries

There are no fish hatcheries at this location.

Wetlands in the National Wetlands Inventory (NWI)

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Wetland information is not available at this time

This can happen when the National Wetlands Inventory (NWI) map service is unavailable, or for very large projects that intersect many wetland areas. Try again, or visit the NWI map to view wetlands at this location.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design

or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate Federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.