FLORIDA DEPARTMENT OF TRANSPORTATION

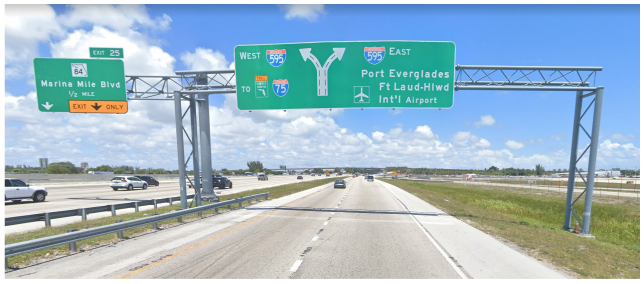
PROJECT DEVELOPMENT & ENVIRONMENT (PD&E) STUDY

Interstate 95 (I-95/SR 9) • From South of Hallandale Beach Boulevard (SR 858)
to North of Hollywood Boulevard (SR 820)
Broward County, FL • FPID No.: 436903-1-22-02 • ETDM No.: 14254

NATURAL RESOURCES EVALUATION

DRAFT

JULY 2021



NATURAL RESOURCES EVALUATION

Interstate 95 (I-95) / State Road 9
Project Development and Environment Study

Project Study Limits:
From South of Hallandale Beach Boulevard (SR 858) to
North of Hollywood Boulevard (SR 820), Broward County
Mileposts 0.0 – 3.1
ETDM Number 14254

Broward County
FPID Number 436903-1-22-02

Prepared for:
Florida Department of Transportation – District 4
3400 West Commercial Boulevard
Fort Lauderdale, FL 33309

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

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JULY 2021

DRAFT

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Quality Process Log		
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1.0 EXECUTIVE SUMMARY

The Florida Department of Transportation (FDOT) District 4 is conducting a Project Development and Environment (PD&E) Study to evaluate alternatives for the ultimate improvements of the State Road (SR 9/Interstate 95 (I-95) interchanges at Hallandale Beach Boulevard, Pembroke Road, and Hollywood Boulevard. The project is located in Broward County, Florida and is contained within the municipalities of Hallandale Beach, Pembroke Park, and Hollywood. The project is approximately three miles long and extends from south of Hallandale Beach Boulevard to north of Hollywood Boulevard (Mileposts 0.0-3.1).

This *Natural Resources Evaluation (NRE) Report* is prepared in accordance with the FDOT *PD&E Manual, Part 2, Chapters 9 (Wetlands and Other Surface Waters), 16 (Protected Species and Habitat), and 17 (Essential Fish Habitat), all dated July 1, 2020*, and other state and federal laws and requirements. The purpose of this report is to document the threatened and endangered species and wetland analyses in support of the environmental study consistent with federal, state, and local objectives for the preferred alternative.

The analysis results determined that this project ***May Affect, Not Likely to Adversely Affect*** the federally-listed eastern indigo snake, and wood stork, and will have a ***May Affect, Not Likely to Adversely Affect with Best Management Practices*** to the Florida bonneted bat, and ***No Effect*** on the Everglade snail kite, American crocodile, West Indian manatee, and Johnson's seagrass.

The project will also have ***No Adverse Effect*** to the state-listed Florida burrowing owl, little blue heron, tricolored heron, and gopher tortoise (which is a candidate species for federal listing).

One mangrove wetland, four wet stormwater swales with hydrophytic vegetation, and 12 retention ponds are present within 500 feet of the project corridor. No natural wetland systems will be impacted by the project. Direct impacts to SFWMD permitted stormwater swales within the existing I-95 right-of-way (ROW) are anticipated due to construction activities. It should be noted that the C-10 Canal is also referred to as the Hollywood Canal in the vicinity of Hollywood Boulevard. For this report, this canal will be referenced as the C-10 Canal.

Mangrove habitats, that are Essential Fish Habitat (EFH) and Habitat Area of Particular Concern (HAPC), were observed along the C-10 Canal on the north side of the bridge only. Two benthic surveys were conducted and no benthic resources (i.e., submerged aquatic vegetation) were identified and no in-water work is proposed. Therefore, impacts to EFH are not anticipated.

2.0 Project Overview

2.1 Project Description and Location

The Florida Department of Transportation (FDOT) District 4 is conducting a Project Development and Environment (PD&E) Study for Interstate 95 (I-95) from south of Hallandale Beach Boulevard (SR 858) to north of Hollywood Boulevard (SR 820), a distance of approximately three miles (see ***Figure 2.1***). The PD&E Study is proposing improvements to the Hallandale Beach Boulevard, Pembroke Road, and Hollywood Boulevard interchanges. The project is located in Broward County, Florida and is contained within the municipalities of Hallandale Beach, Pembroke Park, and Hollywood.

I-95 is the primary north-south interstate facility that links all major cities along the Atlantic Seaboard and is one of the most important transportation systems in southeast Florida. I-95 is one of the two major expressways, Florida's Turnpike being the other that connects major employment centers and residential areas within the South Florida tri-county area. I-95 is part of the State's Strategic Intermodal System (SIS) and the National Highway System. In addition, I-95 is designated as an evacuation route along the east coast of Florida.

I-95, within the project limits, currently consists of eight general use lanes (four in each direction) and four dynamically tolled express lanes (two in each direction). This segment of I-95 is functionally classified as a Divided Urban Principal Arterial Interstate and has a posted speed limit of 65 miles per hour. The access management classification for this corridor is Class 1.2, Freeway in an existing urbanized area with limited access.

There are three existing full interchanges within the project limits located at Hallandale Beach Boulevard, Pembroke Road, and Hollywood Boulevard. All

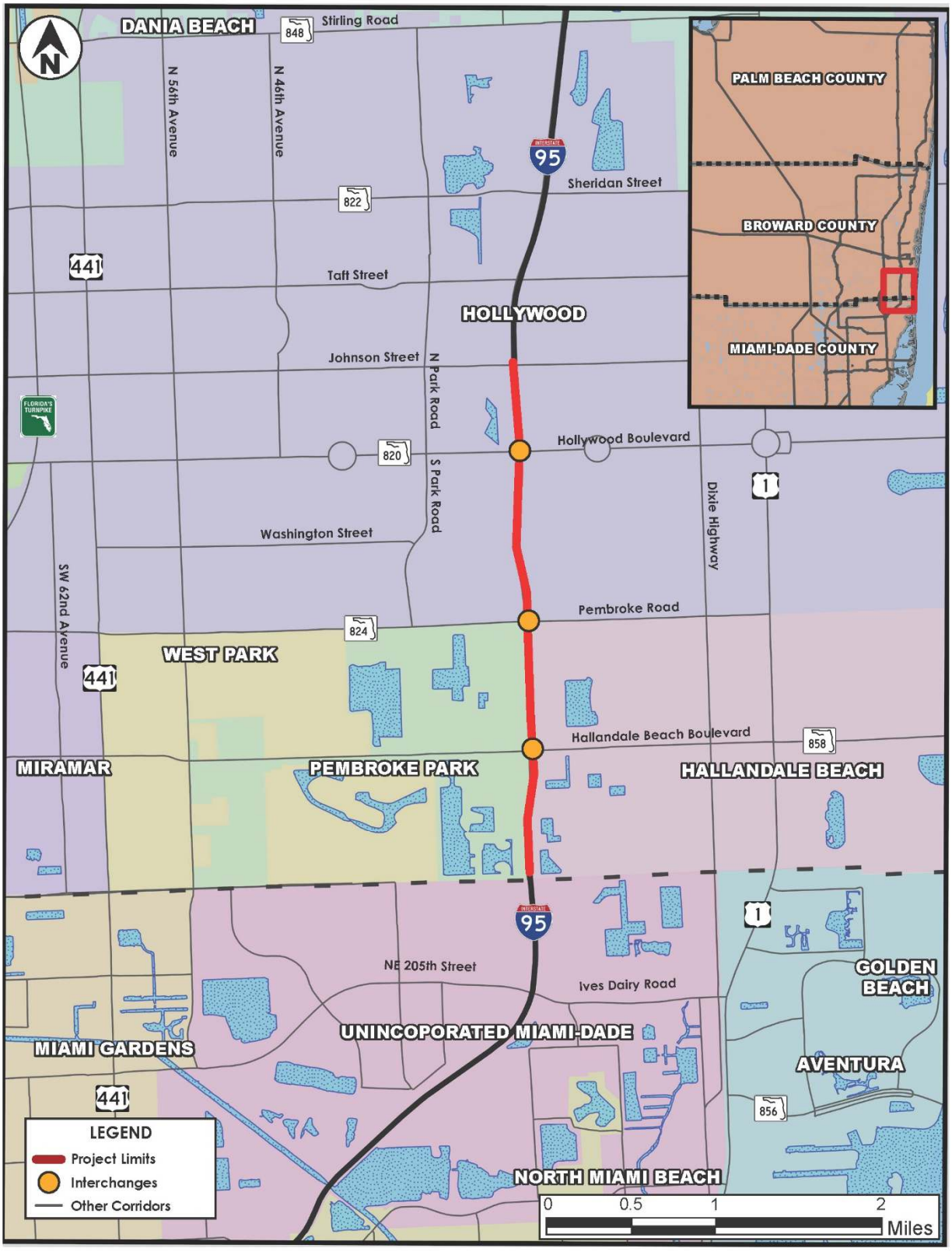


Figure 2.1 – Project Location Map

three roadways are classified as Divided Urban Principal Arterials. Hallandale Beach Boulevard consists of four lanes west of I-95 and six lanes east of I-95. Pembroke Road and Hollywood Boulevard each have six lanes west of I-95 and four lanes east of I-95.

This PD&E Study is evaluating the potential modification of existing entrance and exit ramps serving the three interchanges within the project limits. Widening and turn lane modifications at the ramp terminals were evaluated to facilitate the ramp modifications and improve the access and operation of the interchanges.

2.2 Purpose and Need of the Project

The overall goals and objectives of this PD&E Study are described below:

- Evaluate the implementation of potential interchange and intersection improvements that will improve capacity, operations, safety, mobility, and emergency evacuation.
- Identify the appropriate interstate/interchange access improvements that, combined with Transportation Systems Management and Operations (TSM&O) improvements, will service the users of the area, and achieve the Purpose and Need.
- Provide relief from existing and projected traffic congestion.
- Improve the safety of the I-95 mainline corridor by addressing speed differentials and lane weaving deficiencies between interchanges.
- Support the optimal operations of the existing roadway network.
- Maintain consistency with the current I-95 Express Lanes and local projects.
- Prioritize the proposed improvements based on the area needs (short-term vs. long-term), logical segmentation and funding.

The need for this project is to increase interchange and ramp terminals intersection capacity at Hallandale Beach Boulevard, Pembroke Road and Hollywood Boulevard. Other considerations for the purpose and need of this project include safety, system linkage, modal interrelationships, transportation demand, social demands, economic development, and emergency evacuation. The primary and secondary needs for the project are discussed in further detail below:

Capacity – The I-95 ramps at Hallandale Beach Boulevard, Pembroke Road, and Hollywood Boulevard are currently congested and affecting traffic operations along I-95 between the interchange ramps and at the arterial intersections near I-95.

Without future improvements, the driving conditions will continue to deteriorate well below acceptable Level of Service (LOS) standards. The following I-95 freeway segments will operate below LOS D within at least one peak-hour period before the year 2045:

- Ives Dairy Road northbound on-ramp to Hallandale Beach Boulevard northbound off-ramp
- Hallandale Beach Boulevard northbound on-ramp to Pembroke Road northbound off-ramp
- Pembroke Road northbound on-ramp to Hollywood Boulevard northbound off-ramp
- Hollywood Boulevard northbound on-ramp to Sheridan Street northbound off-ramp
- Sheridan Street southbound on-ramp to Hollywood Boulevard southbound off-ramp
- Pembroke Road southbound on-ramp to Hallandale Beach Boulevard southbound off-ramp
- Hallandale Beach Boulevard southbound on-ramp to Ives Dairy Road southbound off-ramp

Additionally, the following intersections will fall below LOS D during at least one peak-hour period before the year 2045:

- Hallandale Beach Boulevard northbound ramp terminal
- Hallandale Beach Boulevard southbound ramp terminal
- Hollywood Boulevard southbound ramp terminal
- Hollywood Boulevard/28th Avenue

The improvements proposed as part of this project will increase the capacity of the interchanges and the ramp terminal intersections.

Safety – The crash safety analysis indicates that the I-95 study area segments have experienced greater overall number of crashes for the years 2012 through 2014 than what would typically be anticipated on similar facilities. A review of the crash data

indicates that traffic operational improvements could address some of the safety issues.

Additional I-95 entry and exit ramp capacity at these interchanges will improve the safety and overall flow of traffic within the project corridor and adjacent intersections.

System Linkage – I-95 is part of the State's SIS and the National Highway System. I-95 provides limited access connectivity to other major arterials such as I-595 and Florida's Turnpike. The project is not proposing to change system linkage. However, potential interchange modifications would improve movements within the existing network systems.

Modal Interrelationships – There are sidewalks in both directions and public transit routes along Hallandale Beach Boulevard, Pembroke Road, and Hollywood Boulevard. Additionally, there is a Tri-Rail Station in the northwest quadrant of the I-95/Hollywood Boulevard Interchange.

Capacity improvements within the study area will enhance the mobility of people and goods by alleviating current and future congestion at the interchanges and on the surrounding freight and transit networks. Reduced congestion will serve to maintain and improve viable access to the major transportation facilities and businesses in the area.

Transportation Demand – The I-95 PD&E Study phase from south of Hallandale Beach Boulevard to north of Hollywood Boulevard is included in the Broward Metropolitan Planning Organization (MPO) 2045 Long Range Transportation Plan (LRTP), Transportation Improvement Program (TIP), FDOT Work Program, FDOT State TIP, and FDOT SIS Five Year Plan.

Social Demands and Economic Development – Social and economic demands on the I-95 corridor will continue to increase as population and employment increase. The Broward County MPO LRTP predicted that the population would grow from 1.9 million in 2018 to 2.2 million by 2045, an increase of 16 percent. Jobs were predicted to increase from 0.9 to 1.2 million during the same period, an increase of 25 percent. The project intersects the cities of Hallandale Beach, Pembroke Park, and Hollywood, the third largest city in Broward County.

Emergency Evacuation – The project is anticipated to improve emergency evacuation capabilities by enhancing connectivity and accessibility to major arterials designated on the state evacuation route. I-95, Hallandale Beach Boulevard, Pembroke Road, and Hollywood Boulevard serve as part of the emergency evacuation route network designated by the Florida Division of Emergency Management and by Broward County. Hallandale Beach Boulevard, Pembroke Road, and Hollywood Boulevard move traffic from the east to I-95. I-95 is critical in facilitating traffic during emergency evacuation periods as it connects to other major arterials and highways in the state evacuation route network (i.e., I-595 and the Florida's Turnpike).

2.3 Existing Conditions

I-95, within the study limits, consists of eight 11 to 12-foot wide general use lanes (four lanes in each direction), four 11-foot wide dynamically tolled express lanes (two in each direction), 12-foot wide auxiliary lanes at selected locations, 12-foot wide paved outside shoulders, 6 to 11-foot wide paved inside shoulders, a 2-foot wide median barrier wall, and outside roadway guardrails. The express lanes are buffer-separated from the general use lanes with express lane markers and a 3-foot wide buffer. ***Figure 2.2*** shows the roadway section north of Hallandale Beach Boulevard and ***Figure 2.3*** shows the roadway section north of Pembroke Road. ***Figure 2.4*** depicts the existing conditions schematic line diagram.

The existing limited access right of way varies slightly within the study limits. The right of way is generally consistent throughout the corridor except at the interchanges, where it varies to accommodate entrance and exit ramps. ***Table 2.1*** summarizes the available right of way along the corridor.

Table 2.1 – Summary of Existing Limited Access Right of Way

I-95 Roadway Section	Right of Way Width (feet)
Miami-Dade/Broward County Line – Hallandale Beach Boulevard	303
Hallandale Beach Boulevard – Pembroke Road	300
Pembroke Road – Hollywood Boulevard	315
Hollywood Boulevard – Johnson Street	343

Source: FDOT ROW Survey

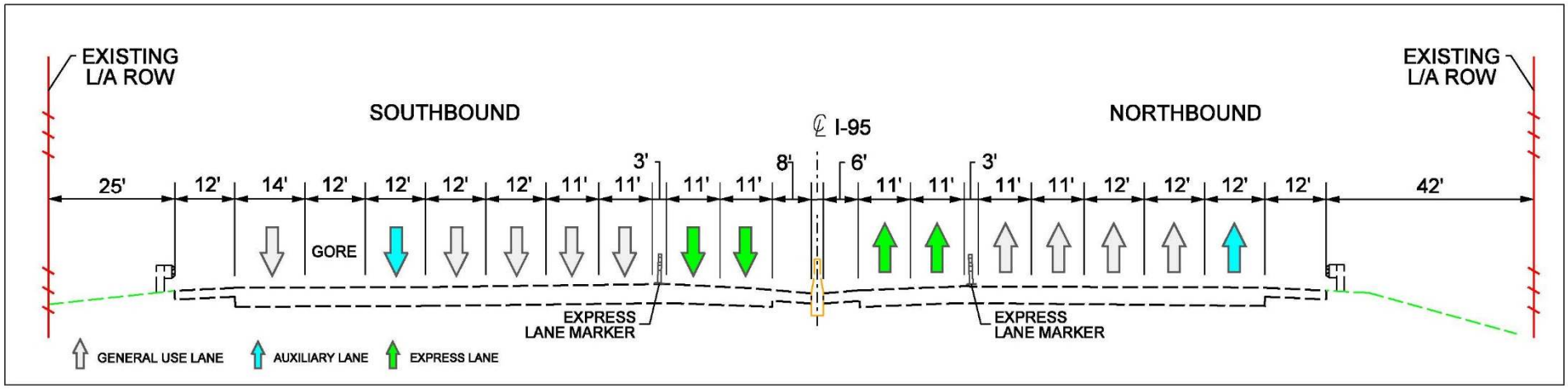


Figure 2.2 – I-95 Existing Roadway Section North of Hallandale Beach Boulevard

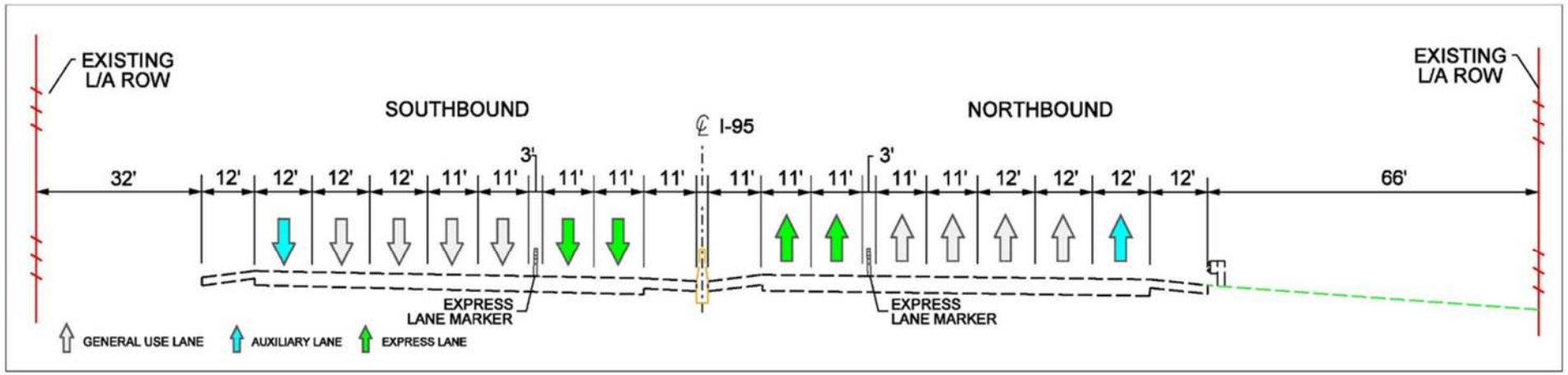
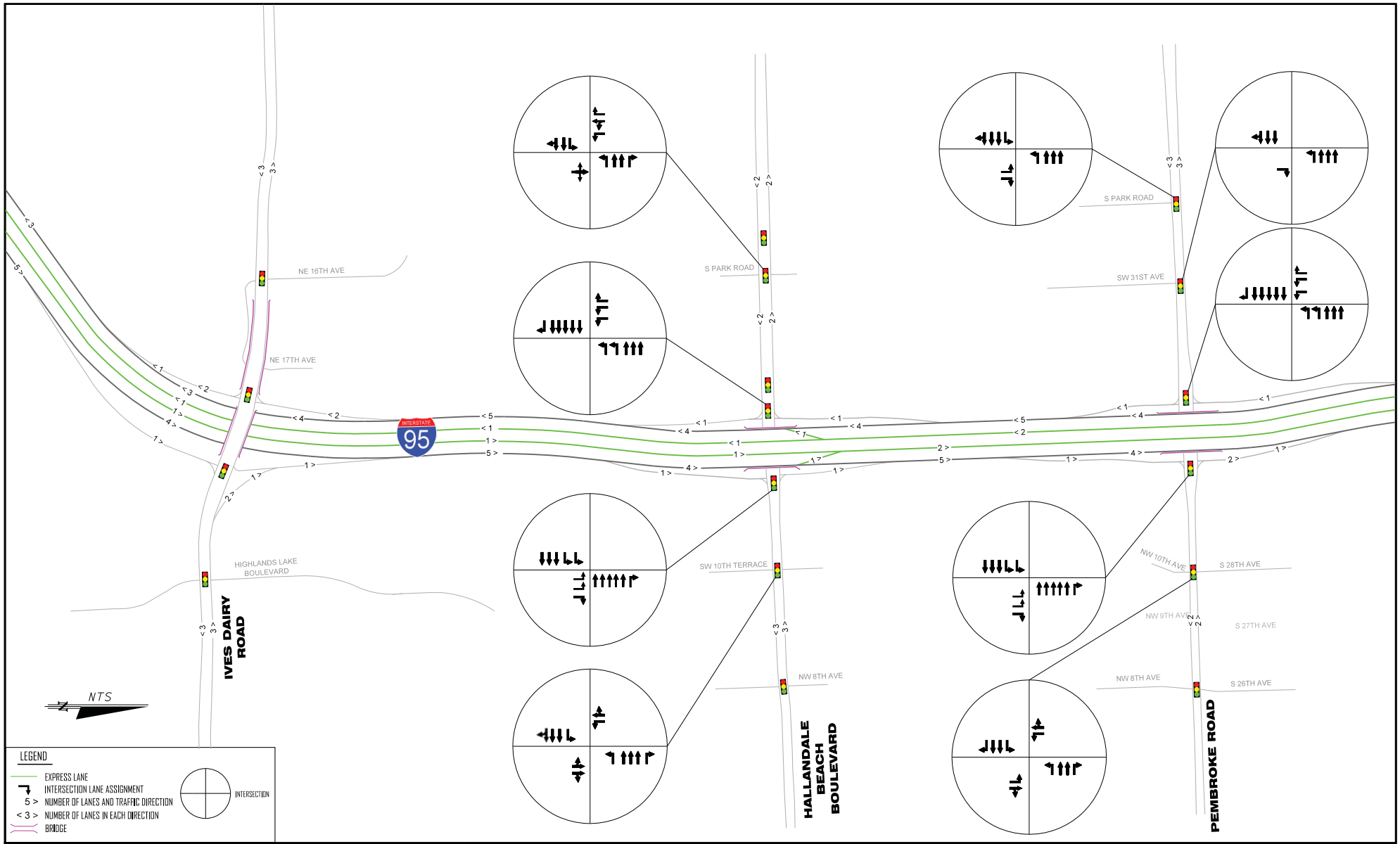


Figure 2.3 – I-95 Existing Roadway Section North of Pembroke Road



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DISTRICT FOUR
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OCTOBER 2020

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from South of Hallandale Beach Boulevard (SR 858) to North of Hollywood Boulevard (SR 820)
FPID No.: 436903-1-22-02
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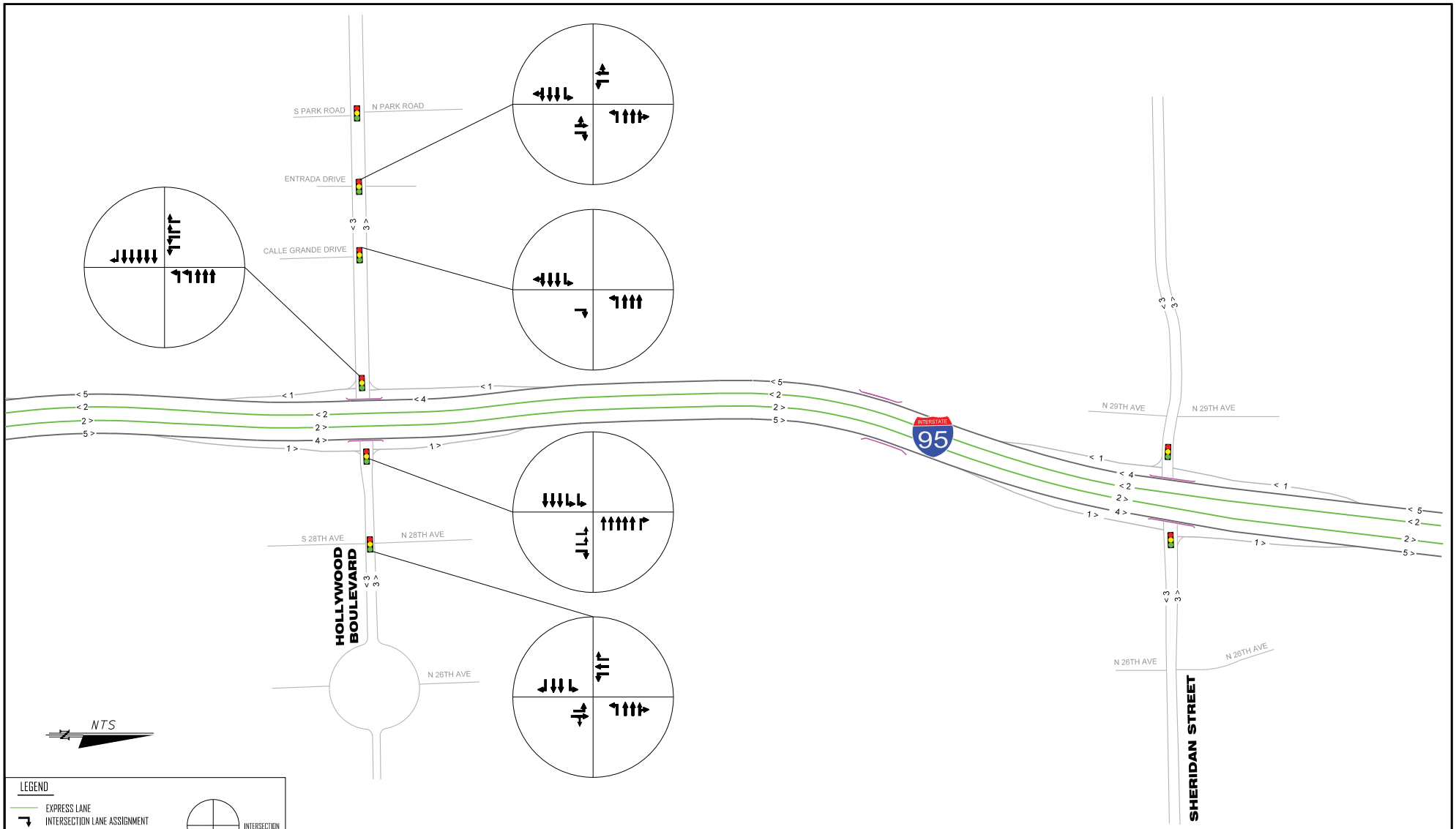
SR 9 (INTERSTATE 95)
LANE GEOMETRY AND CONFIGURATIONS
EXISTING LINE DIAGRAM

FIGURE 2.4a



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SR 9 (INTERSTATE 95) LANE GEOMETRY AND CONFIGURATIONS EXISTING LINE DIAGRAM

FIGURE 2.4b

3.0 PROJECT ALTERNATIVES

Alternatives evaluated during the PD&E Study include the No-Build Alternative and two Build Alternatives. Alternatives were developed and evaluated based on the ability to meet the project purpose and need.

3.1 NO-BUILD ALTERNATIVE/NO-ACTION ALTERNATIVE

The No-Build Alternative (also referred to as "No-Action") includes the existing transportation network and any funded, planned or programmed improvements open to traffic by the design year. The No-Build Alternative includes only those improvements that are elements of the MPO's Transportation Improvement Program, the 2045 Cost Feasible LRTP, the FDOT's Adopted Five Year Work Program, any local government comprehensive plans and/or any development mitigation improvement projects that are elements of approved development orders.

The No-Build Alternative includes currently planned and programmed improvements. One of the programmed improvements are the safety short-term interim improvements at the Hallandale Beach Boulevard, Pembroke Road and Hollywood Boulevard interchanges. The No-Build Alternative includes the ongoing District 4 I-95 Express Phase 3C Construction Project between south of Hollywood Boulevard and north of I-595. This construction project will add additional express lane access points (northbound egress and southbound ingress) within the Hollywood Boulevard Interchange. The No-Build Alternative also includes the District 6 I-95 Planning Study between US 1 (Downtown Miami) and the Miami-Dade/Broward County Line. This planning study is proposing to add mainline capacity and interchange improvements by the design year of this project.

This alternative is considered to be a viable alternative to serve as a comparison to the study's proposed build alternatives.

The No-Build Alternative roadway sections are the same as the existing sections plus any future planned improvements. I-95, within the study limits, consists of eight 11 to 12-foot wide general use lanes (four lanes in each direction), four 11-foot wide dynamically tolled express lanes (two in each direction), 12-foot wide auxiliary lanes at selected locations, 12-foot wide paved outside shoulders, 6 to

11-foot wide paved inside shoulders, a 2-foot wide median barrier wall, and outside roadway guardrails. The express lanes are buffer-separated from the general use lanes with express lane markers and a 3-foot wide buffer. ***Figure 3.1*** shows the roadway section north of Hallandale Beach Boulevard and ***Figure 3.2*** shows the roadway section north of Pembroke Road. ***Figure 3.3*** depicts the No-Build Alternative schematic line diagram.

3.2 Build Alternative

Two build alternatives were evaluated to improve traffic operations within the study area for the I-95 mainline and interchanges. Build alternatives were developed with the goal of reducing congestion and delay while also maximizing the efficiency of the transportation system.

Alternative 1 – This alternative proposes braided ramps between interchanges to improve substandard weaving movements along I-95. In this alternative, the on-ramps from each interchange will remain unchanged. However, the off-ramps to Pembroke Road and Hollywood Boulevard in the northbound direction and to Pembroke Road and Hallandale Beach Boulevard in the southbound direction will be located one interchange prior to the destination interchange. For example, travelers destined northbound to Pembroke Road would use an exit ramp located just south of the Hallandale Beach Boulevard corridor right after the Hallandale Beach Boulevard off-ramp. The new exit ramp will continue separated from the I-95 mainline braiding over the Hallandale Beach Boulevard on-ramp and continuing along the right of way line until reaching the cross-street ramp terminal. This new exit ramp bypasses and avoids conflicts with the Hallandale Beach Boulevard on-ramp. The same design continues northbound to Hollywood Boulevard and southbound to Pembroke Road and Hallandale Beach Boulevard. ***Figure 3.4*** shows the roadway section north of Hallandale Beach Boulevard and ***Figure 3.5*** shows the roadway section north of Pembroke Road. ***Figure 3.6*** shows the schematic geometric layout of Alternative 1

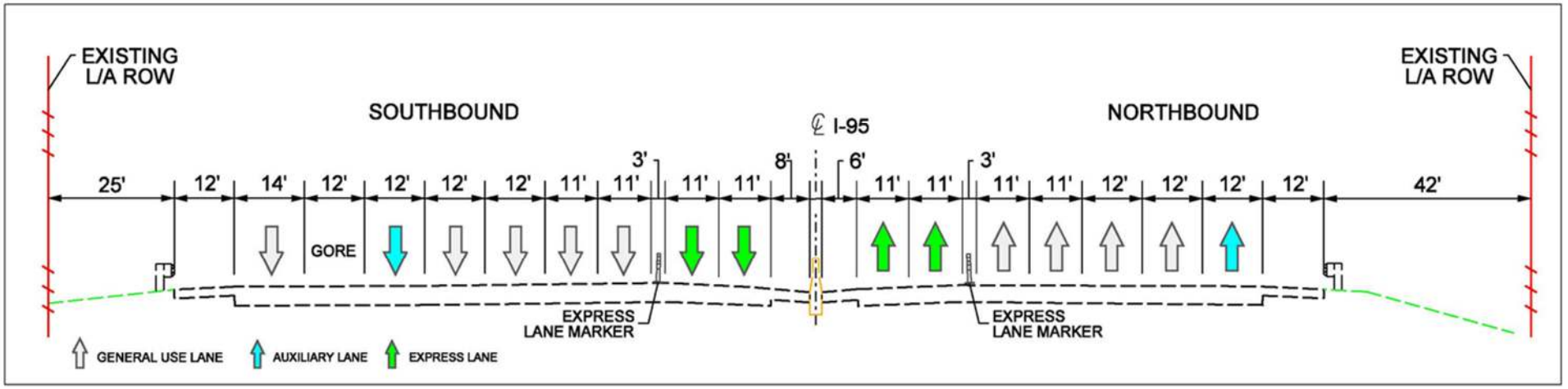


Figure 3.1 – I-95 No-Build Alternative Roadway Section North of Hallandale Beach Boulevard

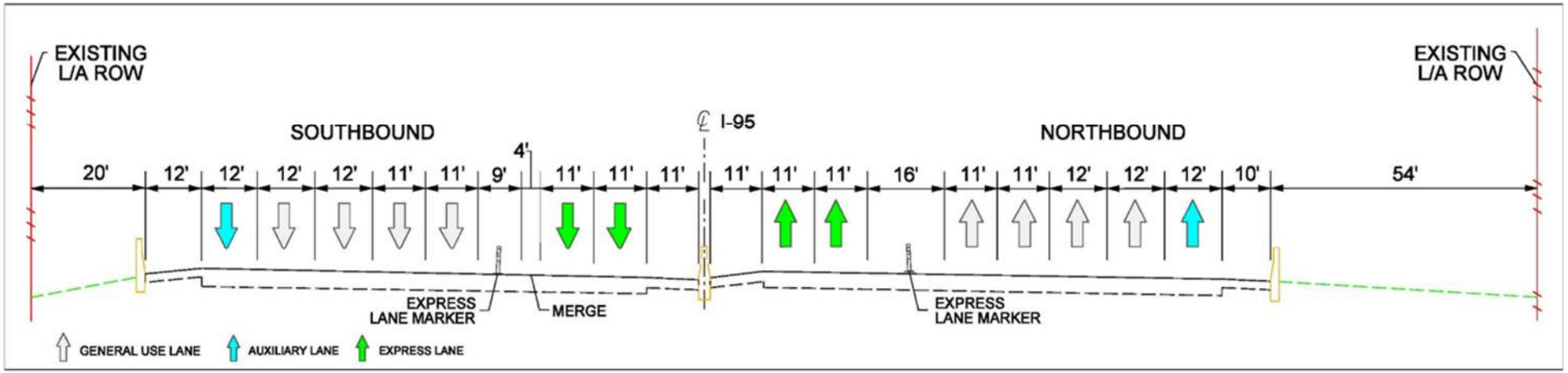
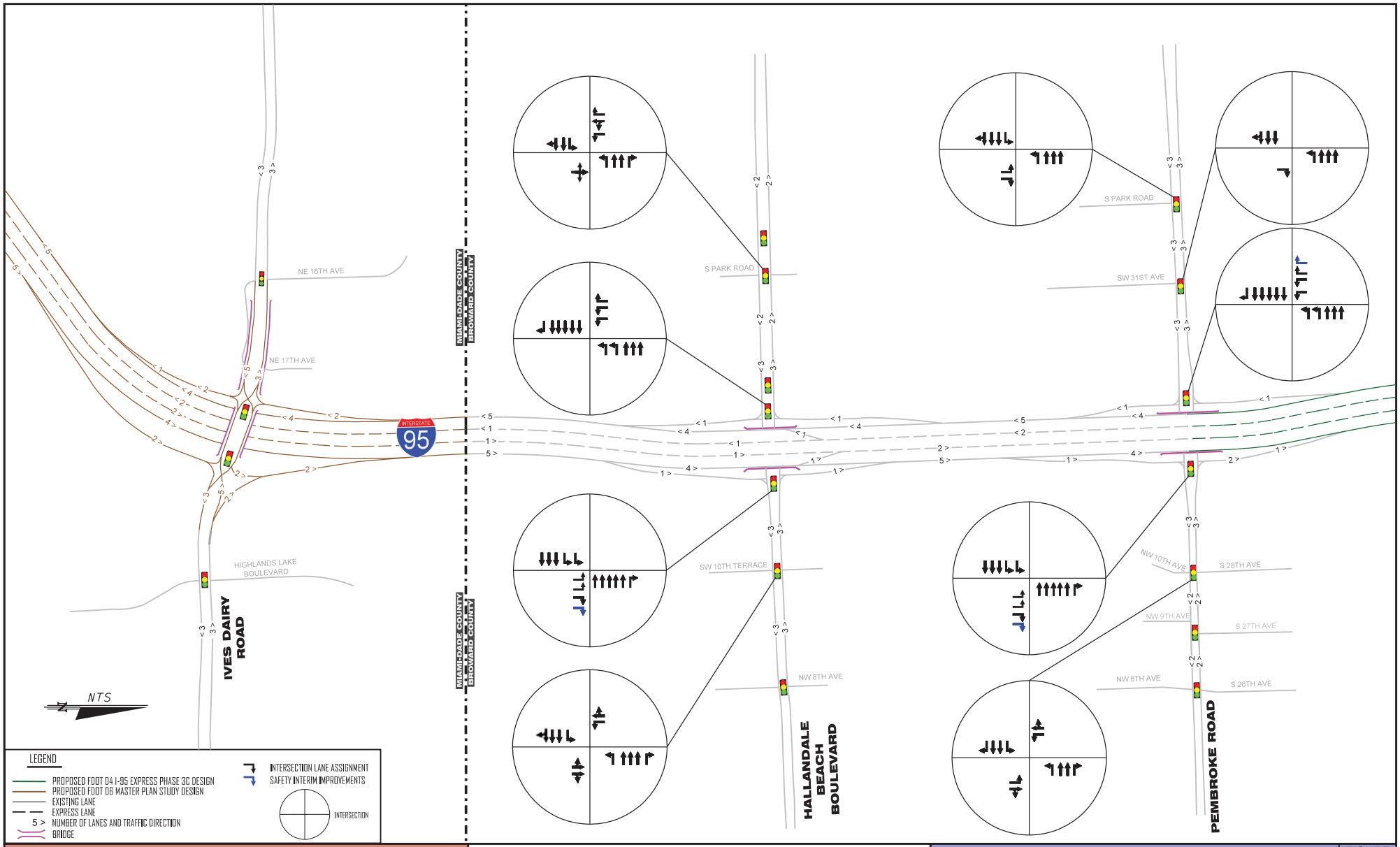


Figure 3.2 – I-95 No-Build Alternative Roadway Section North of Pembroke Road



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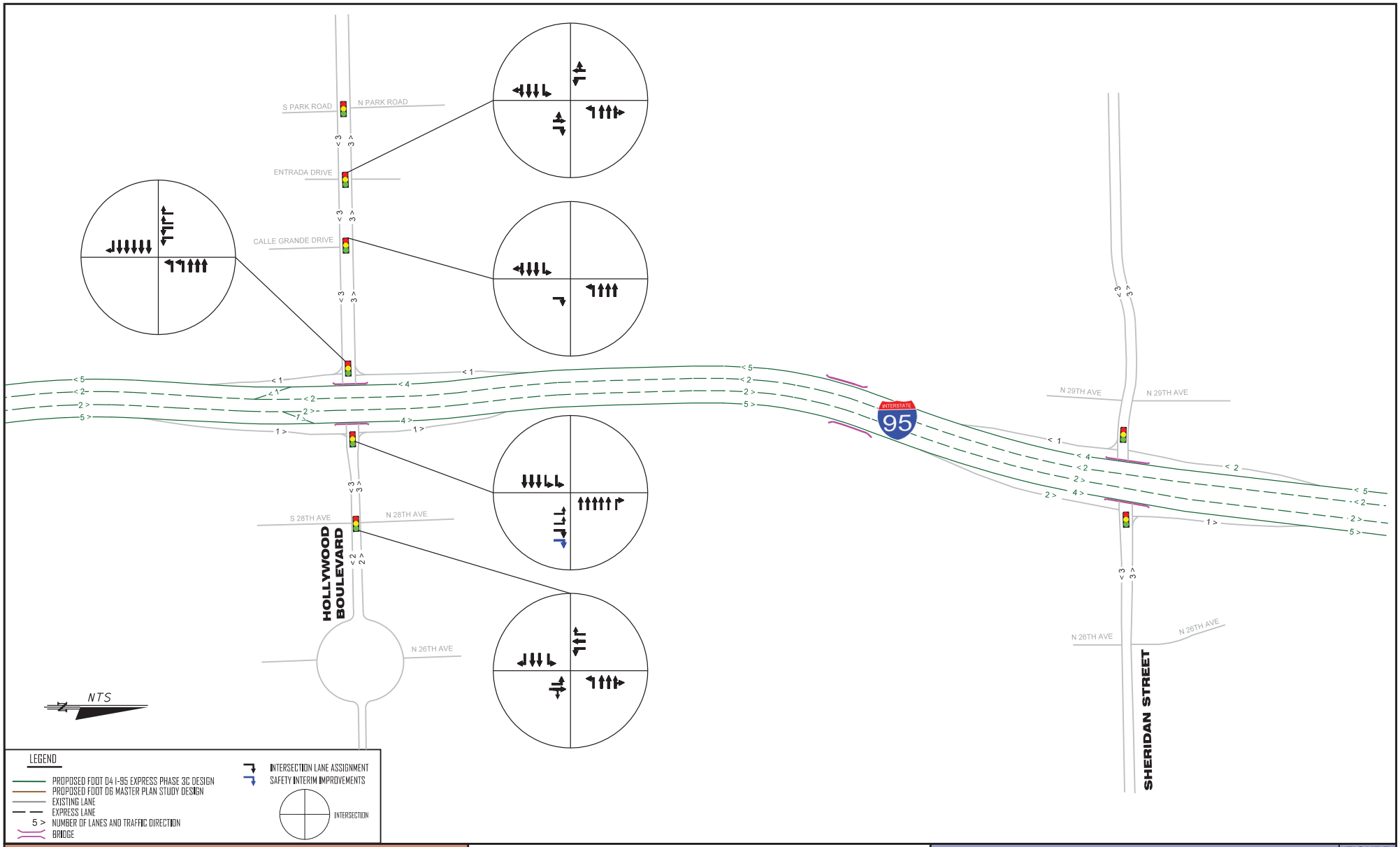
SR 9 (INTERSTATE 95)
LANE GEOMETRY AND CONFIGURATIONS
2045 NO-BUILD LINE DIAGRAM

FIGURE 3.3a



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LANE GEOMETRY AND CONFIGURATIONS
2045 NO-BUILD LINE DIAGRAM

FIGURE 3.3b

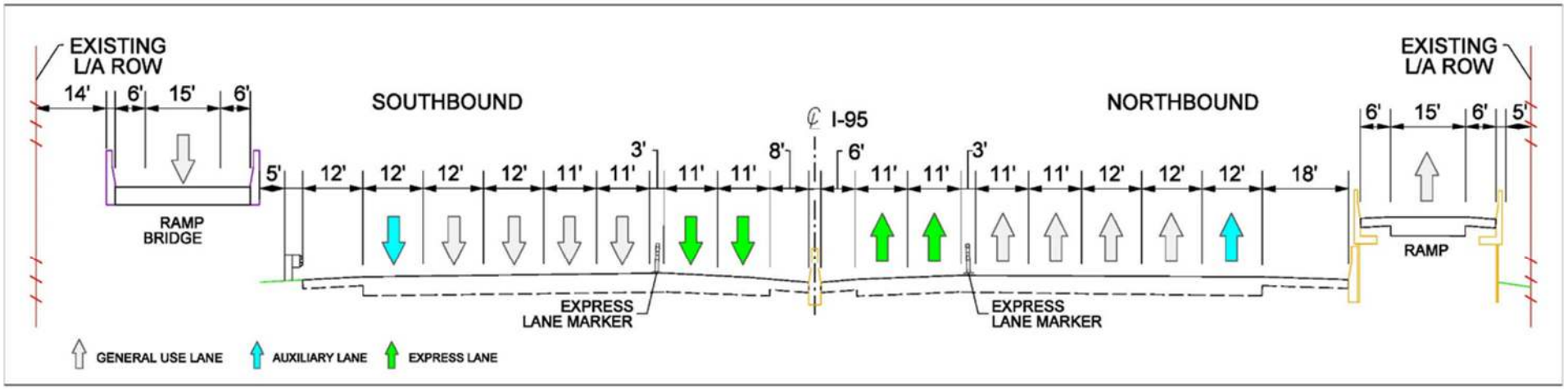


Figure 3.4 – I-95 Alternative 1 Roadway Section North of Hallandale Beach Boulevard

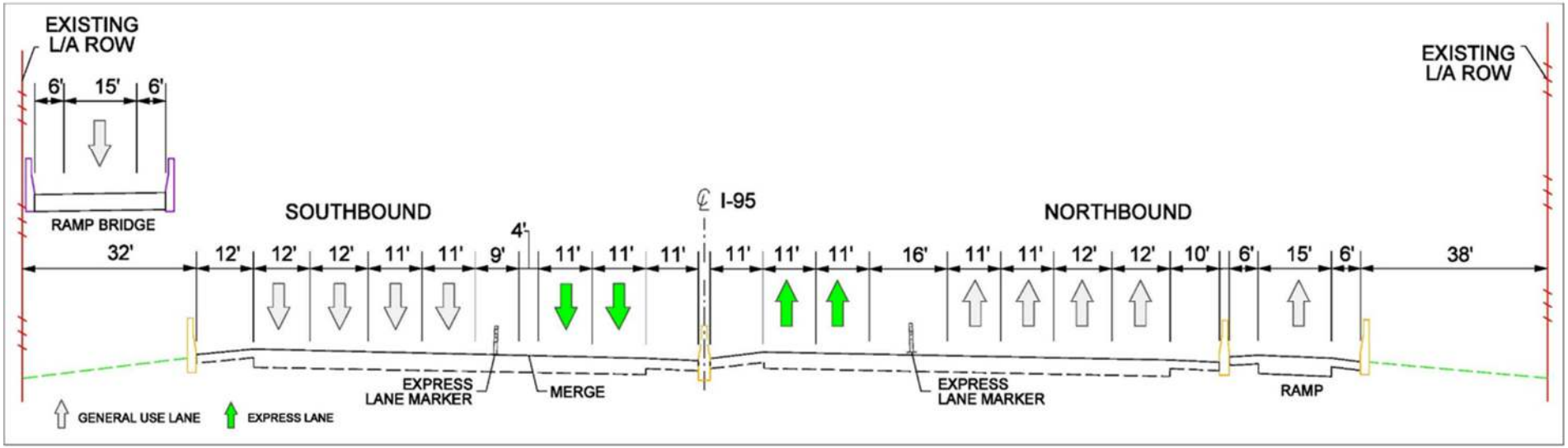
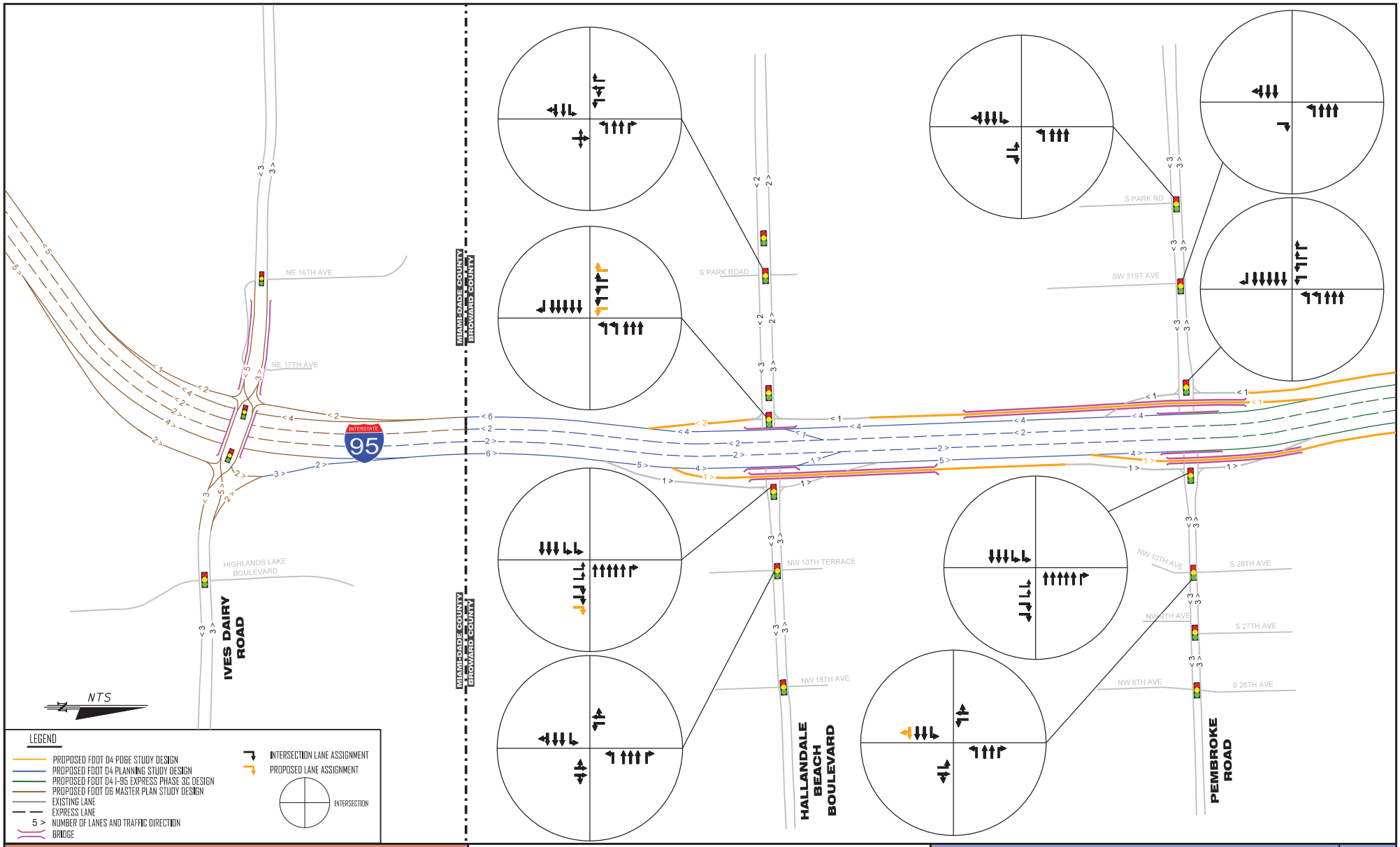


Figure 3.5 - I-95 Alternative 1 Roadway Section North of Pembroke Road



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DISTRICT FOUR
3400 WEST COMMERCIAL BOULEVARD
FORT LAUDERDALE, FL 33309

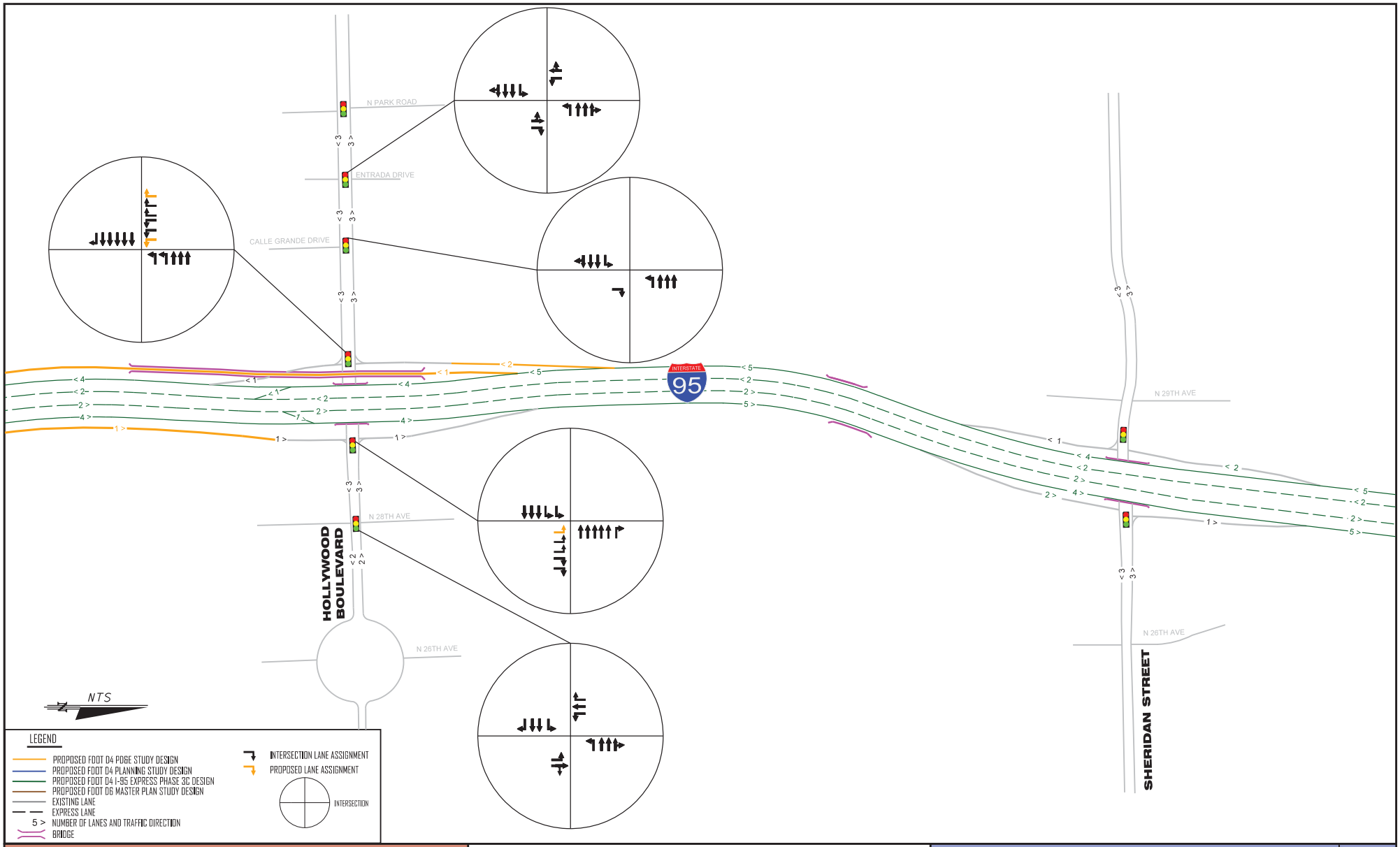
OCTOBER 2020

I-95 (SR 9) PROJECT DEVELOPMENT & ENVIRONMENT STUDY

from South of Hallandale Beach Boulevard (SR 858) to North of Hollywood Boulevard (SR 820)
FPID No.: 436903-1-22-02
ETDM No.: 14254

SR 9 (INTERSTATE 95)
LANE GEOMETRY AND CONFIGURATIONS
ALTERNATIVE 1 LINE DIAGRAM

FIGURE 3.6a



FDOT
FLORIDA DEPARTMENT OF TRANSPORTATION
DISTRICT FOUR
3400 WEST COMMERCIAL BOULEVARD
FORT LAUDERDALE, FL 33309
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SR 9 (INTERSTATE 95)
LANE GEOMETRY AND CONFIGURATIONS
ALTERNATIVE 1 LINE DIAGRAM

FIGURE 3.6b

Alternative 2 – This alternative proposes a collector distributor roadway system within the I-95 mainline project area. The collector distributor roadway system will remove the Pembroke Road Interchange from directly interacting with the I-95 mainline. In the northbound direction, all exiting traffic to Pembroke Road and Hollywood Boulevard will utilize a new collector distributor off-ramp just south of Hallandale Beach Boulevard. The collector distributor roadway system will extend to just north of Hollywood Boulevard serving the exit traffic to Pembroke Road, entry traffic from Pembroke Road and entry traffic from Hollywood Boulevard. In the southbound direction, the new collector distributor roadway system will not be continuous, it will end and begin at Pembroke Road. The first section combines the off-ramps to Hollywood Boulevard and Pembroke Road and the second section moves the Pembroke Road on-ramp to enter I-95 south of the Hallandale Beach Boulevard on-ramp. ***Figure 3.7*** shows the roadway section north of Hallandale Beach Boulevard and ***Figure 3.8*** shows the roadway section north of Pembroke Road. ***Figure 3.9*** shows the schematic geometric layout of Alternative 2.

Widening and turn lane modifications at the ramp terminals were evaluated to facilitate the ramp modifications and improve the access and operation of the interchanges. These improvements are the same in both alternatives.

3.3 Preferred Alternative

The preferred alternative for the I-95 corridor is Alternative 2. Alternative 2 was selected based on the alternative alignment analysis and the evaluation results summarized as part of the PD&E Study. Alternative 2 will add the capacity improvements necessary to improve traffic operations, safety, transit, system linkage, modal interrelationships, transportation demand, social demand, economic development, interchange access and emergency evacuation. Alternative 2 is the most prudent when compared with Alternative 1 for the following reasons:

- Removing the Pembroke Road interchange from directly interacting with I-95 improves the mobility and access in and out of Pembroke Road and adjacent roadways.
- Reduces the number of entrances and exits to and from I-95, which improves the overall operations of the I-95 mainline, ramps, and interchanges.

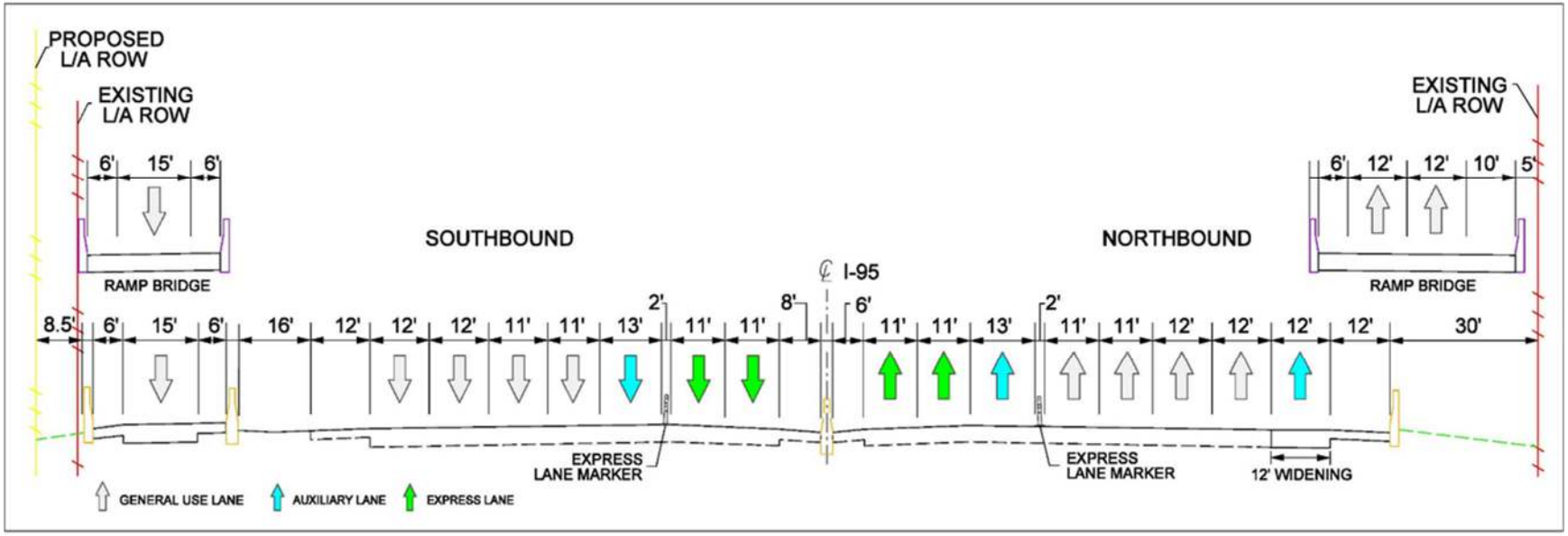


Figure 3.7 – I-95 Alternative 2 Roadway Section North of Hallandale Beach Boulevard

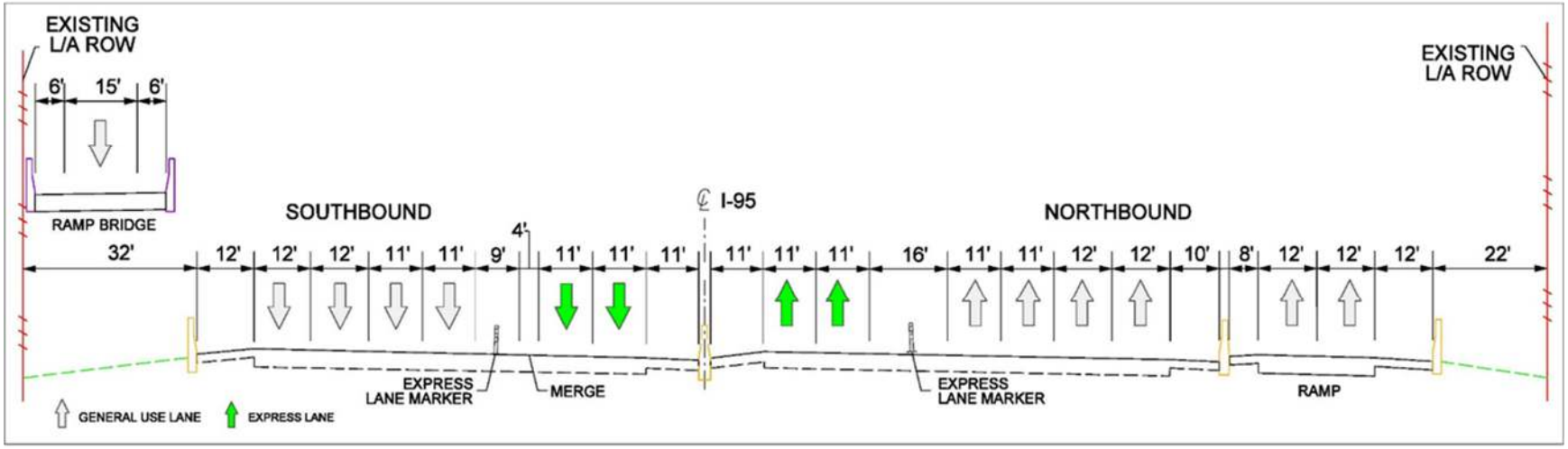
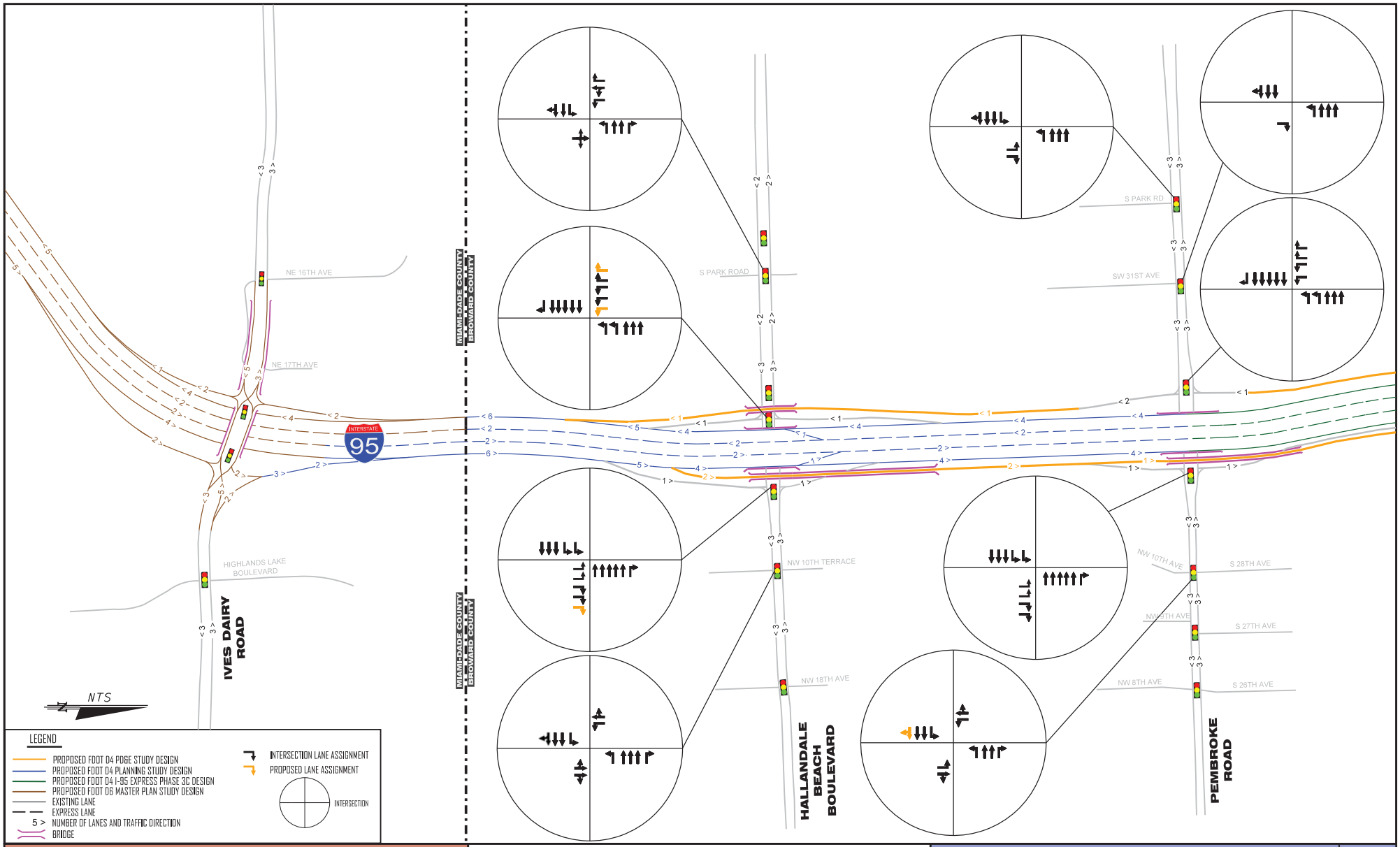


Figure 3.8 – I-95 Alternative 2 Roadway Section North of Pembroke Road



FLORIDA DEPARTMENT OF TRANSPORTATION
DISTRICT FOUR
3400 WEST COMMERCIAL BOULEVARD
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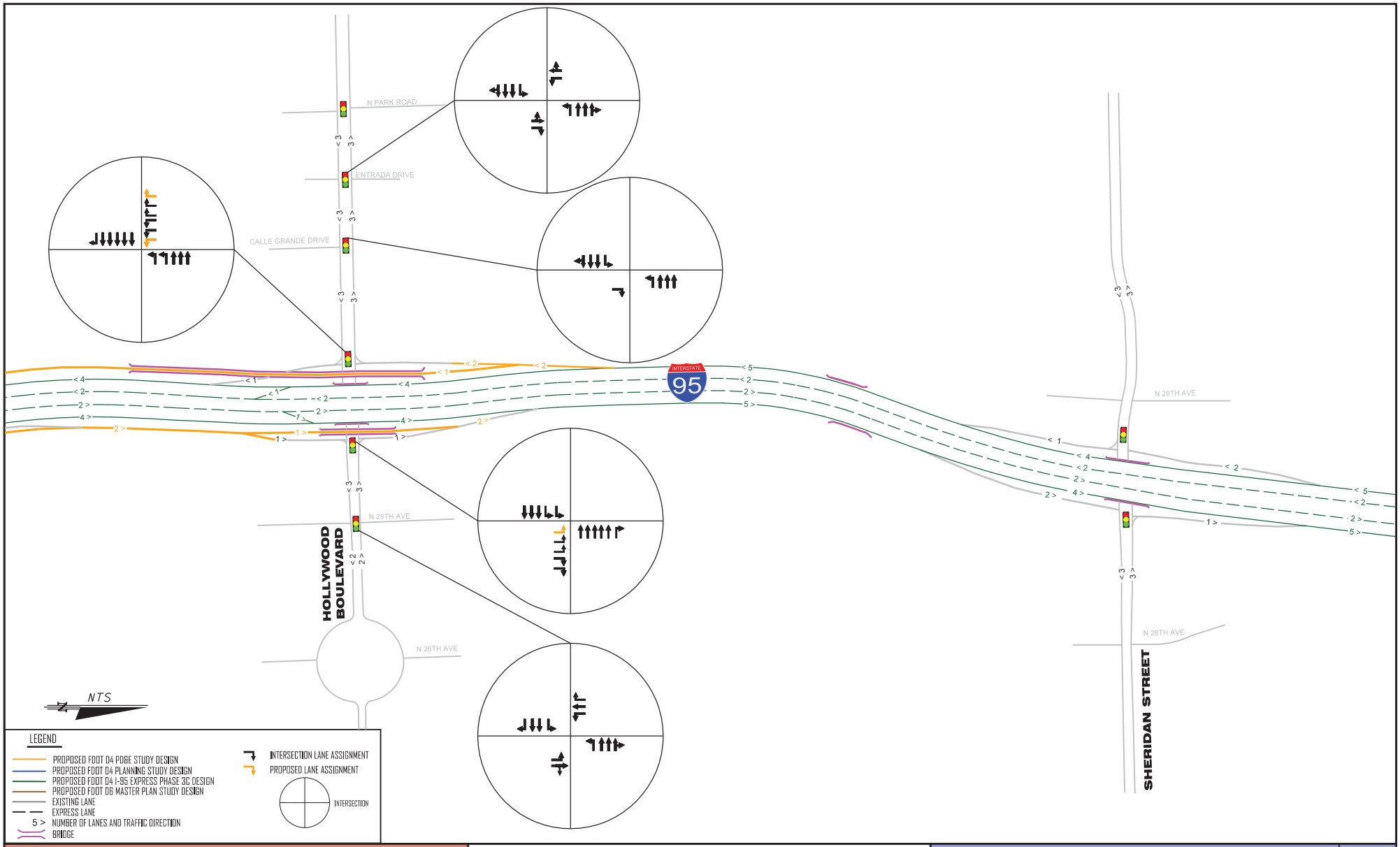
OCTOBER 2020

I-95 (SR 9) PROJECT DEVELOPMENT & ENVIRONMENT STUDY

from South of Hallandale Beach Boulevard (SR 858) to North of Hollywood Boulevard (SR 820)
FPID No.: 436903-1-22-02
ETDM No.: 14254

SR 9 (INTERSTATE 95)
LANE GEOMETRY AND CONFIGURATIONS
ALTERNATIVE 2 LINE DIAGRAM

FIGURE 3.9a



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DISTRICT FOUR
3400 WEST COMMERCIAL BOULEVARD
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OCTOBER 2020

I-95 (SR 9) PROJECT DEVELOPMENT & ENVIRONMENT STUDY
from South of Hallandale Beach Boulevard (SR 858) to North of Hollywood Boulevard (SR 820)
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ETDM No.: 14254

SR 9 (INTERSTATE 95)
LANE GEOMETRY AND CONFIGURATIONS
ALTERNATIVE 2 LINE DIAGRAM

FIGURE 3.9b

- Reduces long-term crashes related to heavy congestion, mainline weaving maneuvers, mainline and ramp speed differentials, and interstate access.
- The collector distributor roadway system removes I-95 mainline traffic, which provides more capacity to several mainline segments of I-95.
- Provides the ability to enhance/improve bus service, which offers an alternative to auto travel and addresses needs of low-income users and disadvantaged groups.
- Provides more off-ramp storage and requires less signage on the mainline due to less access points.
- Lower construction cost.

4.0 EXISTING CONDITIONS

This project is located in southern Broward County within the incorporated City of Hallandale Beach, Town of Pembroke Park, and City of Hollywood. The corridor begins at the Broward/Miami-Dade County Line and continues north along I-95 to Johnson Street. At the three interchanges, the approximate street improvement limits are: east of South Park Road/1st Street to west of NW 10th Terrace (Hallandale Beach Boulevard), east of South Park Road to east of NW 9th Avenue (Pembroke Road), and Calle Largo Drive to North 29th Avenue (Hollywood Boulevard).

This corridor consists of a completely developed urban environment, with minimal to moderate habitat for listed species within and immediately adjacent to the ROW. Dry stormwater swales and four wet swales containing hydrophytic vegetation are located within or adjacent to the I-95 ROW; all are permitted as part of the existing surface water management system. One canal (C-10 Canal), is located adjacent to the proposed improvements on Hollywood Boulevard, west of I-95. A fringe mangrove wetland is also found on the north side of Hollywood Boulevard adjacent to the C-10 Canal, and within the Stan Goldman Memorial Park. It should be noted that the C-10 Canal is also referred to as the Hollywood Canal in the vicinity of Hollywood Boulevard. For this report, this canal will be referenced as the C-10 Canal.

Twelve man-made retention ponds are also within 500 feet of the project area. These areas include drainage ponds along the I-95 corridor and within the three

project interchanges. These other surface waters (OSW's) are primarily associated with commercial, residential, and golf course developments.

4.1 Existing and Future Land Use

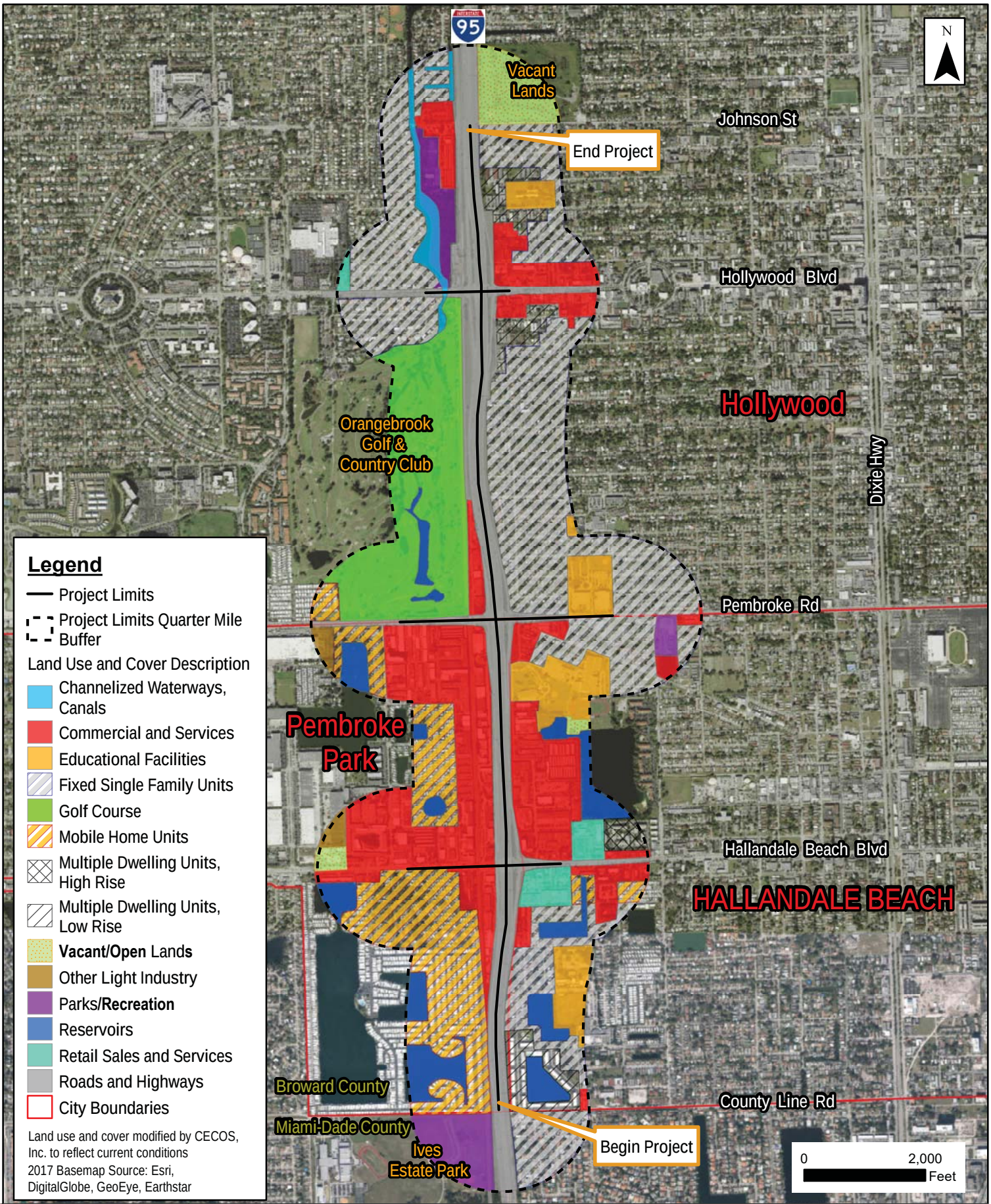
Existing land use within, and adjacent to, the project was mapped using the *Land Use Layer* from the *South Florida Water Management District (GIS) Data Catalog*. Land use within the ROW is transportation (road and highway) with supporting features such as drainage swales and ponds. The primary land uses adjacent to the project corridor comprise developed properties, such as commercial, light industrial, residential, institutional facilities, and recreation/open space (e.g., golf course). ***Figure 4.1*** depicts the existing land use and cover within 500 feet of the project corridor.

The City of Hallandale Beach, Town of Pembroke Park, and City of Hollywood adopted comprehensive plans to establish goals, objectives and policies for future growth pursuant to *Chapter 163, Florida Statutes*. These plans include Future Land Use Elements as well as Transportation Elements. Each of the municipalities' future land use maps are shown in ***Appendix A***.

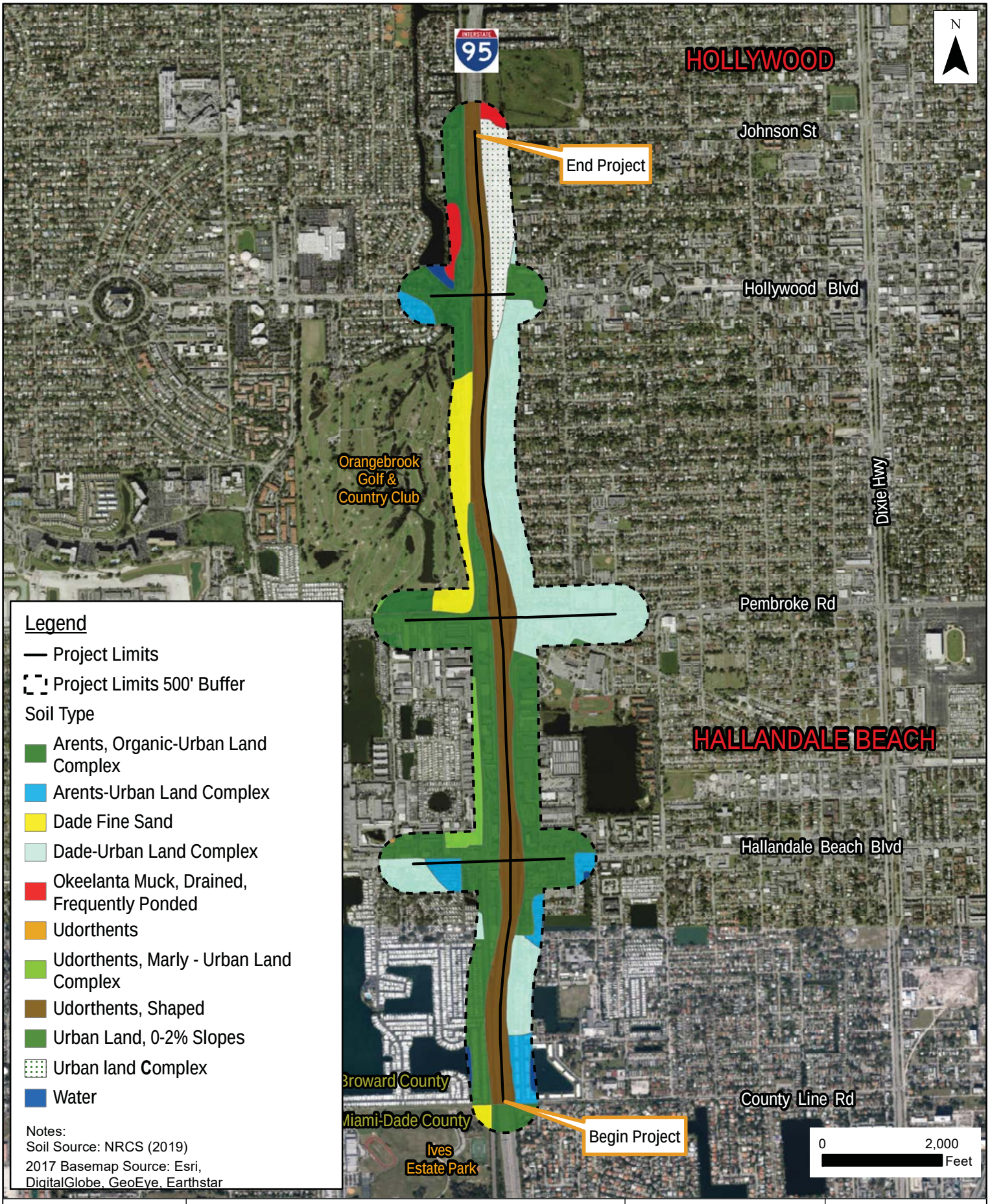
4.2 Soils

Based on the *Natural Resources Conservation Service (NRCS) Soil Survey*, mapped soil types within close proximity to the proposed improvements are classified in ***Table 4.1***, and shown in ***Figure 4.2***.

Four of the ten soils listed above in ***Table 4.1*** are classified as hydric. These soils are mainly characterized as poorly to very poorly drained muck or sandy soils. The majority of the areas within and adjacent to the project corridor have been disturbed by residential and infrastructure development, and may not currently exhibit historic soil conditions.



FDOT	SR9/I-95 from South of SR858/Hallandale Beach Blvd. to North of SR820/Hollywood Blvd. PD&E Study Broward County	**Existing** Land Use and Cover Map Source: SFWMD & FDOT (2015)	Figure **4.1** Date Prepared: 05/24/2021



FDOT	SR9/I-95 from South of SR858/Hallandale Beach Blvd. to North of SR820/Hollywood Blvd. PD&E Study Broward County	Soils Map	**Figure 4.2** Date Prepared: 05/20/2021

Table 4.1 - Mapped Soils within 500 Feet of the Project Corridor

Soil Name	Hydric Rating
Arents, organic substratum-Urban land complex	No
Arents-Urban land complex	No
Dade fine sand	Yes
Dade-Urban land complex	Yes
Okeelanta muck, drained, frequently ponded, 0 to 1 percent slopes	Yes
Udorthents	No
Udorthents, marly -Urban land complex	No
Udorthents, shaped	No
Urban land complex	No
Urban land, 0 to 2 percent slopes	No
Water	Yes

4.3 Conservation Lands

Existing conservation lands within, and adjacent to, the project corridor were mapped using the *Florida Natural Areas Inventory (FNAI) Conservation Lands GIS Data Catalog*, and the *Comprehensive Everglades Restoration Plan (CERP) GIS Data Catalog*. There are two conservation areas owned and managed by public entities within a quarter-mile of the project corridor. These areas are managed for public recreation, education, and Everglades Restoration. The two sites are briefly discussed below, and shown in ***Figure 4.3***.

CERP Broward County Secondary Canal System Project – This project will reduce water shortages in local wellfields and stabilize saltwater interface. This will be accomplished by pumping excess water from C-9, C-12 and C-13 Canal Basins into the coastal canal systems in order to maintain canal stages at optimum levels. This project includes a series of water control structures, pumps and canal improvements in C-9, C-12 and C-13 Canal Basins and the east basin of the North New River Canal in central and southern Broward County.

Miami Dade County's Ives Estate Park – This park is located adjacent to the southern project limit on the west side of I-95. This is an approximately 94-acre recreational park with a 10.8 acre County-designated Natural Forest Community. Amenities include a baseball field, fitness zones, football field, playground, recreation center, soccer field, and softball field.

FDOT	SR9/I-95 from South of SR858/Hallandale Beach Blvd. to North of SR820/Hollywood Blvd. PD&E Study Broward County	Conservation Lands Map	Figure **4.3** Date Prepared: 05/20/2021

5.0 Protected Species and Habitat

This project was evaluated for impacts to wildlife and habitat resources, including protected species in accordance with *50 Code of Federal Regulations (CFR) Part 402 of the Endangered Species Act (ESA) of 1973, as amended*, and *Part 2, Chapter 16 (July, 1, 2020) of the FDOT PD&E Manual*. Wildlife species are protected under the *ESA*, the *Migratory Bird Treaty Act (MBTA)*, and the State of Florida, pursuant to *Florida Statute 379.411*.

Both wetland and upland habitats, as well as surface waters, exist within the project corridor, providing potential nesting and foraging habitat for federal and state-listed species. The C-10 Canal is accessible to the West Indian manatee and American crocodile, and brackish mangrove wetlands in this canal provide suitable foraging habitat for listed wading birds. Other surface waters are adjacent to the project area, including retention ponds that also contain some foraging habitat for wading birds. Upland drainage swales, four wet swales, and other maintained grassed areas are located within the project's ROW. These areas provide marginal habitat for the eastern indigo snake, burrowing owl, gopher tortoise, and associated commensal species.

5.1 Assessment Methodology

Road improvements associated with the preferred alternative are primarily contained within the existing ROW's of I-95, Hollywood Boulevard, Pembroke Road, and Hallandale Beach Boulevard. Additional ROW is being acquired primarily for drainage purposes/ponds. Throughout the urban, developed corridor, a combination of windshield surveys and pedestrian transects were used to conduct the field reviews. Existing conditions field reviews were initially conducted on February 24 and 27, 2017 during daylight hours, within 500 feet from both sides of the road centerlines within the proposed study area. Additional field reviews were conducted to update previously identified resources. These field verification reviews were conducted on September 22, 2020 and November 18, 2020 during daylight hours between 9:00 am and 5:00 pm, within 500 feet from both sides of the road centerlines. The September 22, 2020 field review weather conditions were windy, partly cloudy and approximately 84°F and the November 18, 2020 field review weather conditions were windy, partly cloudy, with light rain towards end of the day and temperatures ranging from 72°F-77°F. All previously

identified features existed within project buffer. Photographs from the field surveys are included in ***Appendix B***. Benthic surveys were conducted in the C-10 Canal on August 23, 2017 and September 16, 2020, during daylight hours. The benthic surveys involved transects within the canal, extending 100 feet from the northern and southern end of the Hollywood Boulevard Bridge. Additional field reviews of the corridor occurred on April 6, 2021 and June 17, 2021 during daylight hours. The purpose of these reviews was to identify locations of trees and/or palms adjacent to the corridor that may be potential roosting habitat for the Florida bonneted bat (FBB).

Pursuant to coordination with the US Fish and Wildlife Service (USFWS) during a video conference on July 14, 2021, a tree/palm roost inventory/survey will be performed for trees a minimum of 15 feet in height and eight inches or greater Diameter Breast Height (DBH). See **Appendix C** for a copy of that meeting summary. For trees to qualify as potential roosting habitat, the 15 foot minimum height must be roostable (i.e., display sufficient trunk width to support a bat cavity). Similarly, qualifying palm trees must exhibit a minimum height of 20 foot clear trunk with that trunk wide enough to support a FBB cavity. This survey is ongoing and the results will be provided to USFWS and incorporated in the NRE. The purpose of this survey is to specifically quantify whether qualifying trees/palms contain potential roosts at the time of this survey.

5.2 Data Collection

A preliminary desktop review was conducted prior to performing field assessments to establish baseline information. Data collection through literature review, ETAT comments, agency database searches, agency coordination, and GIS analyses were performed to identify federal and state protected species occurring or potentially occurring within the project area that may be impacted by the construction of the I-95 proposed improvements. Information sources and databases used for the wildlife analyses include the following:

- *ESRI and Google Earth aerial imagery*
- *FDOT's Efficient Transportation Decision Making (ETDM) Screening Summary Report Number 14254 (incorporated by reference)*
- *FDOT's ETDM Environmental Screening Tool (EST)*
- *Florida Natural Areas Inventory (FNAI) Biodiversity Matrix*

- *Florida Fish and Wildlife Conservation Commission (FWC) databases*
- *FWC Bald Eagle Nesting database*
- *FWC Waterbird Colony Locator*
- *FWC's Strategic Habitat Conservation Areas (SHCA)*
- *NMFS EFH Mapper, v3.0*
- *USFWS Environmental Conservation Online System (ECOS)*
- *USFWS Information for Planning and Consultation (IPaC)*
- *USFWS Listed Species GIS databases*
- *USFWS CERP Manatee Accessibility Map*
- *USFWS South Florida Multi-Species Recovery Plan (1999)*

5.2.1 Listed Species Occurrence

The *FDOT ETDM Screening Summary Report*, *FDOT Environmental Screening Tool (EST)*, *USFWS' listed species database for Broward County*, and *FNAI* were reviewed to develop a project-specific, protected species list. This list was then compared to field conditions during the field reviews to correlate the habitat of each listed species with habitat present on the corridor. Per the USFWS IPaC database, no critical habitats are present in this area.

5.2.2 Federally Listed Species

Based on the results of the combined desktop (literature) and on-site reviews, the federally-listed species with potential to exist within or adjacent to the project corridor are presented in ***Table 5.1.*** Each species was assigned as no, low, moderate, or high likelihood of occurrence within the study area based on the following definitions:

- **No** – The corridor is outside the species' known range or the corridor is within the species' range but no suitable habitat for, or previous documentation of this species occurs, within the corridor, and it was not observed during field reviews.
- **Low** – The corridor is located within the species' known range and minimal or marginal quality habitat is present within or adjacent to the corridor. However, there are no documented occurrences of the species in the vicinity and it was not observed during field reviews.

- **Moderate** – The corridor is within the species' range and suitable habitat exists; but there are no known occurrences of the species and it was not observed during field reviews.
- **High** – The project is within the species' known range, suitable habitat exists within the corridor, there is a minimum of one documented occurrence of the species within the corridor and/or the species was observed during field reviews.

Note that species listed as federally endangered or threatened are also listed by the State of Florida as endangered or threatened.

Table 5.1 - Federally Listed Species with the Potential to Occur in the Project Area

Scientific Name	Common Name	Listing Status	Probability of Occurrence
REPTILES			
Drymarchon corais couperi	Eastern Indigo Snake	FT	Low
Crocodylus acutus	American Crocodile	FT	Low
BIRDS			
Mycteria americana	Wood Stork	FT	Moderate
Rostrhamus sociabilis plumbeus	Everglade Snail Kite	FE	Low
MAMMALS			
Trichechus manatus latirostris	West Indian (Florida) Manatee	FT	Moderate
Eumops floridanus	Florida Bonneted Bat	FE	Moderate
PLANTS			
Halophila johnsonii	Johnson's Seagrass	FT	No

Note: FT = Federally-designated Threatened; FE = Federally-designated Endangered

Sources: *FWC. May 2017. Florida's Endangered Species, Threatened Species and Species of Special Concern. Official Lists; FNAI. 2017. Biodiversity Matrix; USFWS. 2017. ECOS; USFWS. September 2006. Central and Southern Florida Project Manatee Accessibility. SFWMD Fort Lauderdale Field Station. 2019 Florida Bonneted Bat Consultation Key.*

Each species and their habitat requirements are briefly discussed in the following sections.

5.2.2.1 Eastern Indigo Snake – Federal/State Threatened

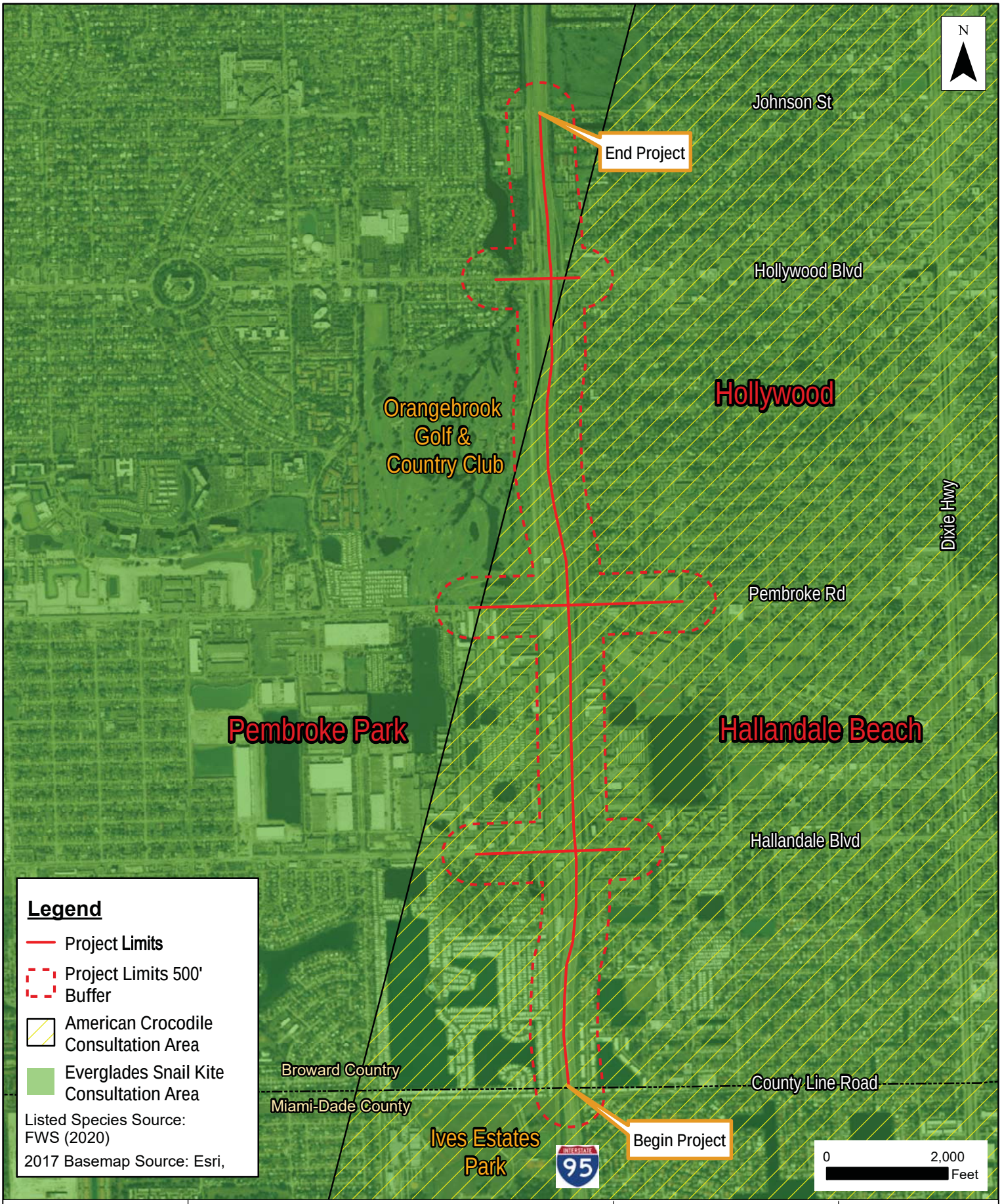
Habitat requirements for this snake are broad, ranging from scrub and sandhills to wet prairies and disturbed uplands. Low quality habitat is present in areas of open, undeveloped land along the corridor (e.g. canal banks, vacant lots). These snakes often inhabit gopher tortoise burrows, although no burrows were observed within the corridor and only minimal habitat for the gopher tortoise was present in the study area. Individuals of this species were not observed during field reviews and assigned a *Low* probability of occurrence.

5.2.2.2 American Crocodile – Federal/State Threatened

The project corridor is within USFWS consultation area for the American crocodile (see ***Figure 5.1***). During the non-nesting season, the American crocodile is found primarily in fresh and brackish water inland swamps, creeks, and bays. Nesting habitat includes sites with well drained sandy shorelines or marl creek banks adjacent to deep water. Crocodiles also nest on elevated man-made structures such as canal berms. This species may forage within the C-10 Canal. A crocodile warning sign was observed on the north side of Hollywood Boulevard adjacent to Stan Goldman Memorial Park. Recent coordination with the FWC revealed that crocodile sightings in this area have not occurred within the past year. The agency coordination, including coordination with FWC, is included in ***Appendix C***. The closest crocodile sighting, reported in 2020, was in West Lake Park in the vicinity of Sheridan Street, approximately three miles to the northeast. Individuals, or nests, of this species were not observed during field reviews and a *Low* probability of occurrence was assigned.

5.2.2.3 Everglade Snail Kite – Federal/State Endangered

Everglade snail kites are medium-sized hawks, with deep red eyes and a white rump patch. The project corridor is within USFWS consultation area for this species (see ***Figure 5.1***). They regularly occur in lake shallows along the shores and islands of many major lakes, such as Lake Okeechobee, as well as expansive marshes of southern Florida such as Everglades National Park. Kites nest primarily from January through July, though they can nest nearly year-round. This species relies almost entirely on apple snails for food. Foraging habitat consists of relatively



FDOT	SR9/I-95 from South of SR858/Hallandale Beach Blvd. to North of SR820/Hollywood Blvd. PD&E Study Broward County	Other Listed Species Consultation Areas Map	Figure **5.1** Date Prepared: 05/20/2021

shallow emergent wetland vegetation, either within extensive marsh systems, or in lake littoral zones. Kites nest in a variety of vegetation types, including both woody vegetation such as willows (*Salix sp.*), cypress (*Taxodium sp.),* pond apple (*Anona glabra*), as well as invasive, exotic species such as melaleuca (*Melaleuca quinquenervia*). The height of a nest is usually about three to ten feet above the water. This species almost always nests in areas with good foraging habitat nearby. Minimal suitable nesting and foraging habitat for this species exists within the project corridor, and individuals or nests of this species or apple snails (the kite's primary food source) were not observed during field reviews and a *Low* probability of occurrence is assigned to the snail kite.

5.2.2.4 Wood Stork – Federal/State Threatened

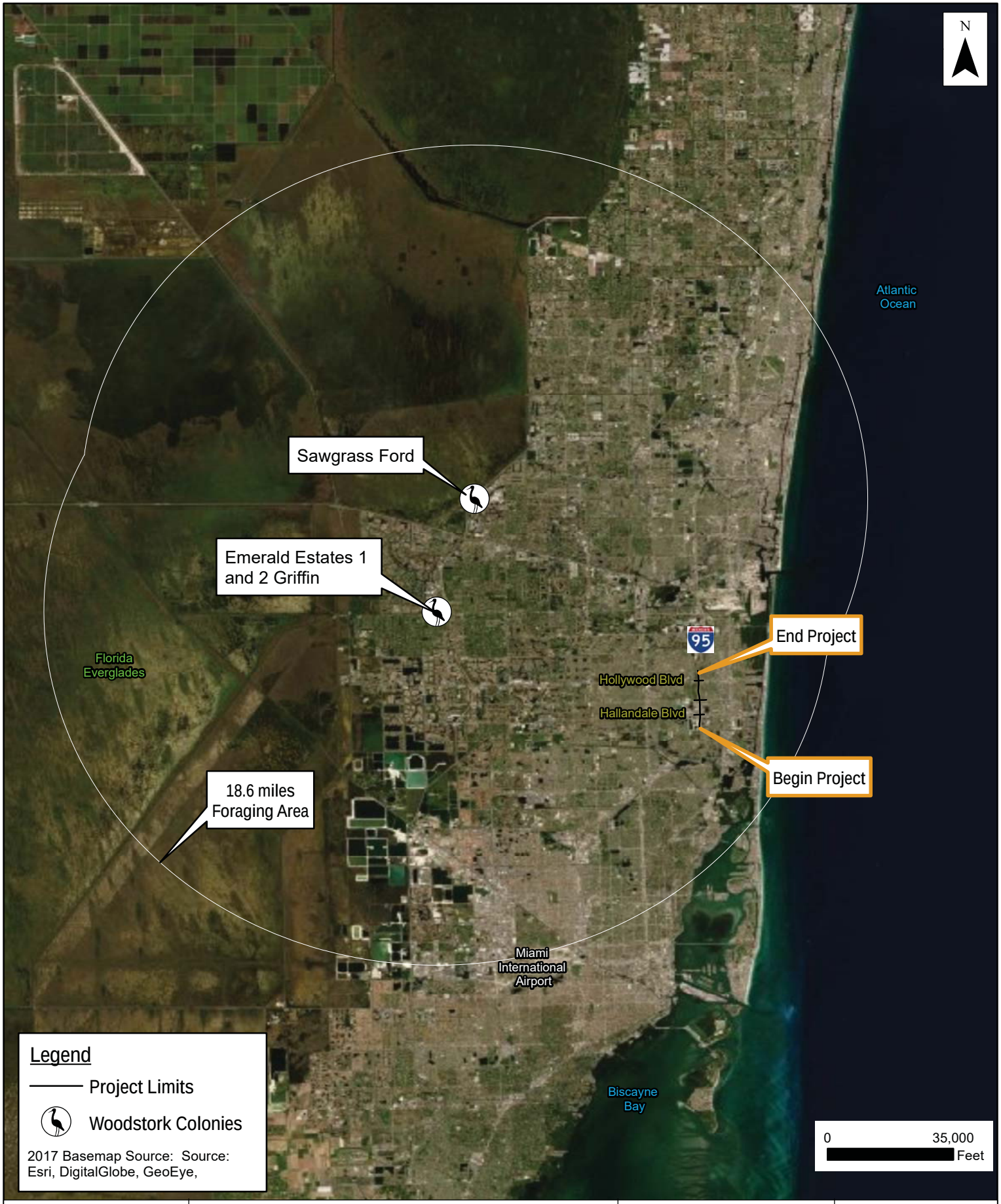
The wood stork is a large wading bird that nests in inundated wetland forests, and forages in water depths ranging from two to 15 inches. The project corridor falls within the Core Foraging Area (CFA), 18.6 miles, of two nesting wood stork colonies, Sawgrass Ford and Emerald Estates (see ***Figure 5.2***). Wetlands and portions of some retention ponds and canals contain suitable foraging habitat (SFH) for this species. Individuals of this species were not observed during field reviews and it was assigned a *Moderate* probability of occurrence.

5.2.2.5 West Indian (Florida) Manatee – Federal/State Threatened

The West Indian manatee is a large, aquatic mammal that inhabits marine, brackish, and freshwater systems in coastal and riverine areas, and forages on seagrasses and other aquatic vegetation. According to the USFWS Manatee Fort Lauderdale Field Station Accessibility Map, the C-10 Canal is accessible to manatees. A control structure, however, is present in the canal approximately 167 feet south of Hollywood Boulevard, prohibiting further manatee access south into the Orangebrook Golf Course. Individuals of this species were not observed during field reviews and a *Moderate* probability of occurrence was assigned.

5.2.2.6 Florida Bonneted Bat – Federal/State Endangered

The Florida bonneted bat (FBB), also known as the Florida mastiff bat, is the largest bat species in Florida. This species is non-migratory and inhabits a variety of natural



FDOT	SR9/I-95 from South of SR858/Hallandale Beach Blvd. to North of SR820/Hollywood Blvd. PD&E Study Broward County	Wood Stork Core Foraging Area Map Source: FWS (2019)	Figure **5.2** Date Prepared: 05/20/2021

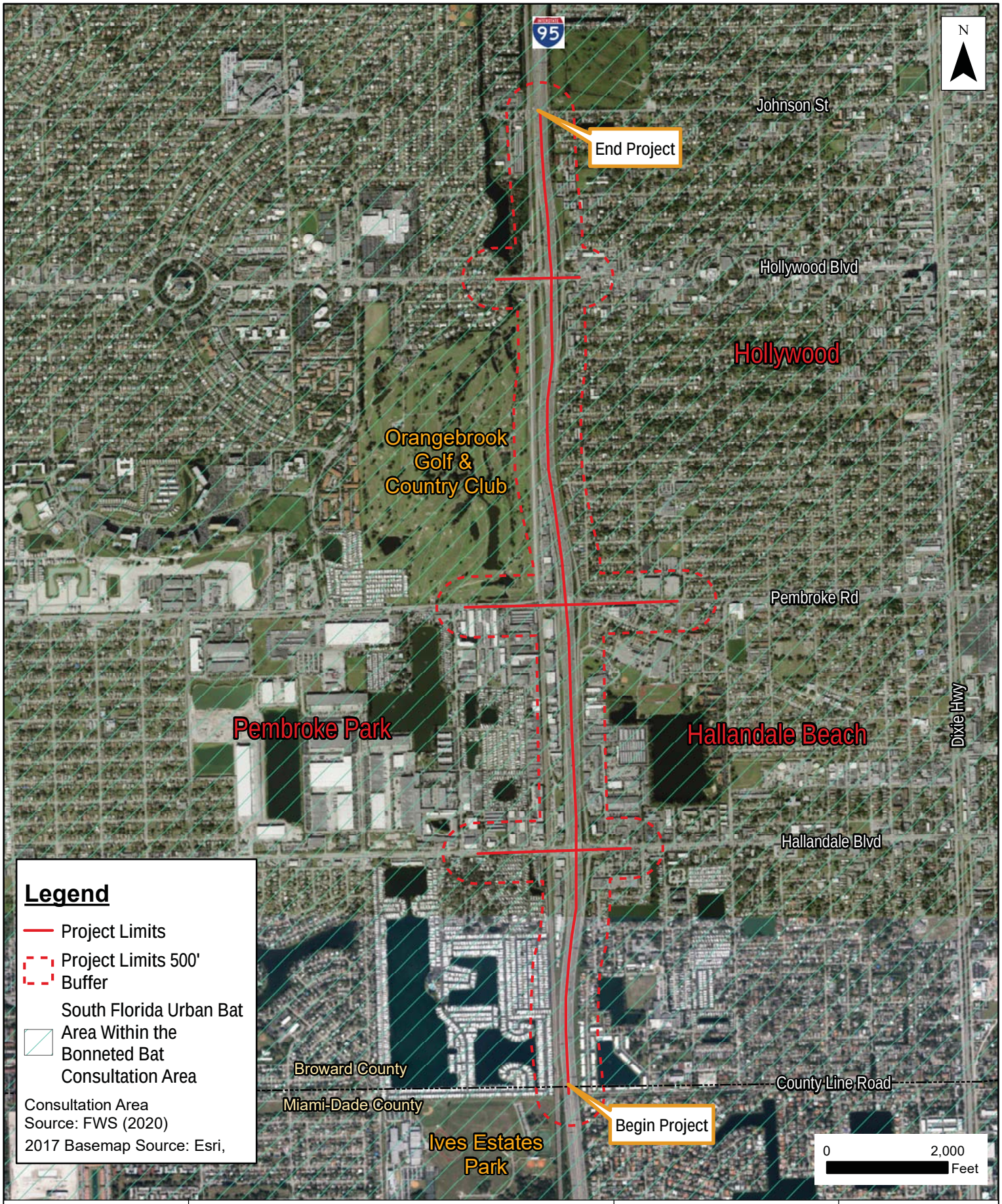
habitats including tropical hardwoods, pineland, and mangrove habitats, as well as man-made areas such as golf courses, bridges, buildings, and neighborhoods. The project corridor is within *USFWS 2019 Florida Bonneted Bat Consultation Area*, as well as the more restrictive *South Florida Urban Bat Area*, which is shown in ***Figure 5.3***. According to GPS and radio-telemetry data collected on Florida bonneted bats, they may travel large distances while foraging, travelling an average distance of one to 9.5 miles from the roost. Most observed though are within 1 mile of their roost. The FBB prefers open spaces for foraging and trees for nesting, although artificial structures can also be used. Within the project corridor there is little open space except for the Orangebrook Golf Course and the City's vacant parcel previously associated with the former privately owned Sunset Golf Course. Individuals were not observed during field reviews but potential roosting habitat (i.e. landscape trees and bridges) are present. Based on information provided by the USFWS, the FBB has been documented within six miles of the project. Therefore, this species was assigned a *Moderate* probability of occurrence.

5.2.2.7 Johnson's Seagrass – Federal Threatened

The ETDM Summary Report #14254 does not reference the potential for seagrass within the project area. However, it does reference the occurrence of moderate quality estuarine (mangrove) wetlands along the C-10 Canal where it runs adjacent to I-95 and Hollywood Boulevard crosses the C-10 Canal. This seagrass prefers to grow in coastal lagoons in the intertidal zone, or deeper than many other seagrasses, and has been found in both coarse sand and muddy substrates, and in areas of turbid waters and high tidal currents. Benthic surveys were conducted on August 23, 2017 and September 16, 2020 in the C-10 Canal within 100-feet north and south of the Hollywood Boulevard Bridge. The results of both surveys did not reveal the presence of any seagrass or other benthic resource. This species was assigned a *No* probability of occurrence.

5.2.3 State Listed Species

The *ETDM Summary Report #14254* indicated minimal involvement with state-listed species. Based on our field reviews, some state–listed species could be present within the study area. These species are listed in ***Table 5.2.***



FDOT	SR9/I-95 from South of SR858/Hallandale Beach Blvd. to North of SR820/Hollywood Blvd. PD&E Study Broward County	South Florida Urban Bat Area and Bonneted Bat Consultation Area	Figure **5.3** Date Prepared: 05/20/2021

Table 5.2 - State-Listed Species with the Potential to Occur in the Project Area

Scientific Name	Common Name	Listing Status	Probability of Occurrence
REPTILES			
Gopherus polyphemus	Gopher Tortoise	ST	Low
BIRDS			
Athene cunicularia floridana	Florida Burrowing Owl	ST	Moderate
Egretta caerulea	Little Blue Heron	ST	High
Egretta tricolor	Tricolored Heron	ST	High

Note: ST = State-designated Threatened

Sources: FWC. January 2017. Florida's Endangered Species, Threatened Species and Species of Special Concern. Official Lists; FNAI. 2017. Biodiversity Matrix

Each species and their habitat requirements are briefly discussed in the following sections.

5.2.3.1 Gopher Tortoise – Federal Candidate for Listing/State Threatened

Gopher tortoises live in well-drained sandy soils, typically with a sparse tree canopy and abundant herbaceous vegetation, such as pine flatwoods, scrub, dry prairies, coastal dunes, and disturbed uplands. Minimal habitat is present in adjacent canal banks along the corridor. No burrows or individuals of this species were observed during field reviews. The tortoise was assigned a *Low* probability of occurrence. Note the tortoise is a candidate species for federal listing.

5.2.3.2 Florida Burrowing Owl – State Threatened

This owl prefers sparsely vegetated, high, sandy ground to create nesting burrows in the ground. Habitats may include ruderal areas such as pastures, airports, golf courses, parks, school grounds, road ROW, and vacant parcels in residential areas. Marginal habitat is present within and outside the study area. Individuals, or burrows, of this species were not observed during field reviews and it was assigned a *Moderate* probability of occurrence.

5.2.3.3 Little Blue Heron – State Threatened

This heron is a medium-sized wading bird that nests in woody vegetation and forages in shallow freshwater, saltwater or brackish habitats. Moderate foraging habitat is present within the project corridor's wetland, stormwater swales and littoral areas of retention ponds, as well as the C-10 Canal. One individual was observed foraging in a stormwater pond within Orangebrook Golf and Country Club, outside the study area. No nests, of this species were observed during the field reviews. This species was assigned a *High* probability of occurrence.

5.2.3.4 Tricolored Heron – State Threatened

This heron is also a medium-sized wading bird that typically nests on densely vegetated sites over water, such as mangrove islands or freshwater thickets, and forages in a variety of wetlands, including tidal marshes, creeks, ditches, swamps, and edges of lakes and ponds. Moderate nesting and foraging habitat is present within the study area's wetland, stormwater swales and littoral areas of retention ponds as well as the C-10 Canal. No individuals, or nests, of this species were observed during the field reviews. This species was assigned a *High* probability of occurrence.

The project corridor falls within the CFA of two wood stork colonies, and the consultation areas of the American crocodile, Everglade snail kite and Florida bonneted bat. One little blue heron was observed foraging in a stormwater pond within the Orangebrook Golf Course, outside the project corridor. However, no other listed species were observed within or directly adjacent to the study area.

5.2.3.5 Incidental Species

Incidental, species observed throughout the project corridor during field reviews are listed in ***Table 5.3*** along with the locations observed.

5.3 Listed Species Effect Determination

Potential habitat within the corridor is moderate for the American crocodile and West Indian manatee, and high for the wood stork, little blue heron, and tricolored heron. Impacts to listed species are not anticipated with the preferred alternative.

Table 5.3 - Incidental Species Observed within the Project Area

Scientific Name	Common Name	Location	Listing Status
REPTILES			
Iguana iguana	Green Iguana	C-10 Canal	Exotic, Not Listed
BIRDS			
Alopochen aegyptiaca	Egyptian Goose	Orangebrook Golf Course	Exotic, Not Listed
Anhinga anhinga	Anhinga	OSW 8	***MBTA***
Eudocimus albus	White Ibis	Orangebrook Golf Course	***MBTA***
Ardea alba	Great white heron	Swale 2	***MBTA***

Note: MBTA = Migratory Bird Treaty Act

5.3.1 Effect Determinations

Direct impacts are caused by an action/project and occur at the same time and place as that action/project. Fill placement in wading bird nesting or foraging habitat is one example of a direct impact. The potential effect of the preferred alternative on each federally-listed and state-listed species is summarized in ***Table 5.4*** and ***Table 5.5***, respectively, in the following discussion.

5.3.1.1 Federally Listed Species

5.3.1.1.1 Eastern Indigo Snake – Federal/State Threatened

While disturbed, upland habitat (i.e., dry, open lots) are present adjacent to the project ROW, no active or inactive gopher tortoise burrows were observed and no potential eastern indigo snake habitat will be impacted. To minimize potential, adverse effects to the Eastern indigo snake during construction, the FDOT will adhere to the *Standard Protection Measures for the Eastern Indigo Snake (USFWS*

Table 5.4 - Federally Listed Species Determination of Effect

Scientific Name	Common Name	Listing Status	Determination of Effect - Preferred Alternative**
REPTILES			
Drymarchon corais couperi	Eastern Indigo Snake	FT	MANLAA
Crocodylus acutus	American Crocodile	FT	NE
BIRDS			
Mycteria americana	Wood Stork	FT	MANLAA
Rostrhamus sociabilis plumbeus	Everglade Snail Kite	FE	NE
MAMMALS			
Trichechus manatus	West Indian Manatee	FT	NE
Eumops floridanus	Florida Bonneted Bat	FE	MANLAA with BMPs***
PLANTS			
Halophila johnsonii	Johnson's Seagrass	FT	NE

Note: FT = Federally-designated Threatened; FE = Federally-designated Endangered
** NE = No Effect; MANLAA = May Affect, Not Likely to Adversely Affect, TBD = To Be Determined
***BMPs = Best Management Practices

.

Table 5.5 - State Listed Species Determination of Effect

Scientific Name	Common Name	Listing Status	Determination of Effect - Preferred Alternative
REPTILES			
Gopherus polyphemus	Gopher Tortoise	ST	No Adverse Effect
BIRDS			
Athene cunicularia floridana	Florida Burrowing Owl	ST	No Adverse Effect
Egretta caerulea	Little Blue Heron	ST	No Adverse Effect
Egretta tricolor	Tricolored Heron	ST	No Adverse Effect

Note: ST = State Threatened

2013, see ***Appendix D***). These measures will be incorporated into the final project construction documents and FDOT will require the Contractor to abide by these guidelines. Additionally, the *Programmatic Indigo Snake Key (USFWS, July 2017)* was also reviewed (see ***Appendix D***). Based on this key, site conditions, and incorporation of standard protection measures, the FDOT determined the project ***May Affect, Not Likely to Adversely Affect*** the eastern indigo snake.

5.3.1.1.2 American Crocodile – Federal/State Threatened

While the project corridor is located within the USFWS Consultation Area for the American crocodile (see ***Figure 5.1***), and foraging habitats (canal, berms and wetlands) are adjacent to the corridor (C-10 Canal), no individuals were observed during the field review and no nests have been recorded in the project area. Coordination with the FWC regarding the presence of the crocodile revealed no sightings within the previous year and coordination with FWC approximately two years ago indicated crocodiles were not observed in this canal within the prior three (3) years (see ***Appendix C*** for FWC coordination). In-water work is not proposed at the C-10 Canal. Based on the project location, minimal suitable habitat, FWC coordination, field review results and no in-water work proposed at the C-10 Canal, the FDOT determined the project will have ***No Effect*** to the American crocodile.

5.3.1.1.3 Wood Stork – Federal/State Threatened

The project corridor falls within the CFA of two wood stork colonies (see ***Figure 5.2***). There are wetlands and portions of retention ponds and canals adjacent to the project corridor with hydrophytic vegetation that can provide potential wood stork SFH. The *Wood Stork Effect Determination Key (USFWS, May 18, 2010)*, and *Habitat Management Guidelines for the Wood Stork in the Southeast Region (HMG) (USFWS, 1990)*, both incorporated by reference, were reviewed for this project. The project is anticipated to impact 1.35-acre of drainage swales. Per response to the EDTM coordination, the USFWS stated the project is not likely to adversely affect the wood stork. As there are only minor impacts to SFH associated with the preferred alternative, new swales proposed as part of the proposed drainage system and/or credits purchased from a USFWS-approved mitigation bank, the FDOT determined the project ***May Affect, Not Likely to Adversely Affect*** the wood stork.

5.3.1.1.4 Everglade Snail Kite – Federal/State Endangered

The project is located within the USFWS Consultation Area for the Everglade snail kite (see ***Figure 5.1***), and minimal foraging habitat (lakes and wetlands with relatively shallow emergent vegetation) for this species exist within the project corridor. In addition, individuals or nests of this species were not observed during field reviews and none recorded in close proximity to the project. Since the project incurs minor impact to minimal foraging habitat and no individuals or nests were observed or recorded, the FDOT has determined the project will have ***No Effect*** on the Everglade snail kite.

5.3.1.1.5 West Indian (Florida) Manatee – Federal/State Threatened

According to the USFWS Manatee Fort Lauderdale Field Station Accessibility Map, the C-10 Canal is accessible to manatees. That portion of the C-10 Canal between Johnson Street and Hollywood Boulevard is also accessible to manatees but a control structure is present in the canal approximately 167 feet south of Hollywood Boulevard, prohibiting further manatee access into Orangebrook Golf Course. No in-water work is proposed at the C-10 Canal. No manatees were observed during field reviews. Based on the project location, the field review results and no in-water work proposed at the C-10 Canal, the FDOT determined the project will have ***No Effect*** to the West Indian (Florida) manatee.

5.3.1.1.6 Florida Bonneted Bat – Federal/State Endangered

This project is located within the consultation area of the FBB, as well as the South Florida Urban Bat Area. The project corridor is contained within an urban landscape with little open space, except for the Orangebrook Golf Course and the City of Hollywood's vacant land formerly associated with the privately-owned Sunset Golf Course. As stated in the Methodology Section, visual surveys of the project area were conducted to determine if potential bat roosting and foraging habitat was present. Potential roosting habitat may be found in the landscape trees present within the drainage swales, along cross-streets and within interchange areas as well as the existing bridges, but open bat foraging areas are not present, except for the aforementioned golf course and vacant land. The project will impact some landscape trees including black olives, mahogany, royal and cabbage palms, and new bridges will be constructed and overland bridge

widenings will occur, but no existing bridges removed. Field reviews of the corridor and bridges were performed and bats were not observed, however numerous tall trees and palms were observed. An acoustic survey was not performed during this PD&E Study because construction is not scheduled to begin for a minimum of five years; making any results from a current study obsolete. Based on the above, the FDOT coordinated with the USFWS to discuss this species and the project's potential determination of effect. A summary of those coordination efforts are shown in the bullet list below; with the corresponding documentation included in **Appendix C**.

- FDOT submitted an initial consultation letter to USFWS for the FBB on April 6, 2021. This correspondence described the project and requested further discussion on a determination of effect for the FBB.

- USFWS responded to the April 6, 2021 inquiry on April 14, 2021. USFWS stated that due to the number of tall trees/palms associated with the corridor, an acoustic survey is required. USFWS also provided, in this response, preliminary guidance regarding tree size and diameter at breast height (DBH) for potential roosting trees (25 foot tall, 8 inch DBH).

- FDOT/USFWS participated in a video conference on July 14, 2021. The purpose of this video conference was to further discuss the site conditions, requirement for an acoustic survey, and the construction schedule. In summary, construction is not scheduled for five years, making the results of a PD&E acoustic survey obsolete by that time. FDOT committed to conduct a tree/palm roosting survey during the PD&E Study, then consult with USFWS on the results of that survey, and incorporate the survey results into the NRE. During this video conference the tree/palm roosting criteria was revised to trees at 15 foot tall or higher with 8 inch DBH and palms 20 foot tall clear trunk. Both trees and palms have to be "roostable" (i.e., sufficiently wide enough at that height, or higher, to support a bat cavity).

- FDOT committed to perform another roost survey and/or acoustical survey during design, as coordinated with USFWS.

- The FDOT is aware that they must continue to coordinate with USFWS regarding future survey methodologies and Best Management Practices

(BMPs). FDOT is aware that pending the results of the PD&E roost survey, additional BMPs may be required.

This roosting survey is on-going and the results will be provided to USFWS, when available. USFWS confirmation that FBBs have been documented within six miles of the project. Based on FDOTs commitment to perform another roost survey during design, and to continue coordination with USFWS regarding survey methods and additional BMPs, there are reasonable assurances that the requirements of the Endangered Species Act (ESA) will be met prior to construction. Therefore, the FDOT's determination of effect for the FBB is ***May Affect, but Not Likely to Adversely Affect* with BMPs**.

5.3.1.1.7 Johnson's Seagrass – Federal Threatened

There is low potential for Johnson's seagrass to occur in the C-10 Canal. Two benthic surveys were conducted within 100 feet of the Hollywood Boulevard Bridge over the C 10 Canal. In both surveys, benthic resources, including seagrasses, were not observed. In water work is not proposed as part of this project. Based on the current project location and previous survey results and no in-water work proposed, the FDOT determined the project will have ***No Effect*** on Johnson's seagrass.

5.3.1.2 State Listed Species

The potential effect of the preferred alternative on each state-listed species is summarized in ***Table 5.5***.

5.3.1.2.1 Gopher Tortoise – Federal Candidate for Listing/State Threatened

A ***No Adverse Effect*** determination for the gopher tortoise is based on the lack of available, suitable burrowing habitat and minimal foraging habitat within, and adjacent to, the ROW.

5.3.1.2.2 State-Listed Birds

The ***No Adverse Effect*** determination for the burrowing owl is based on the low potential of burrowing and foraging habitat within the heavily developed

corridor. Nesting habitat for the little blue heron and tricolored heron was not observed in the project corridor during the field reviews and foraging, if present, is anticipated to be transient. Therefore, the FDOT determined the project will have ***No Adverse Effect*** to the little blue heron or tricolored heron.

5.3.2 Avoidance and Minimization

Avoidance, minimization, and conservation measures are intended to minimize or avoid environmental impacts to listed species or critical habitat. The project is located within urban Broward County, so minimal, appropriate habitats are available for protected species within or adjacent to the ROW. Naturally-occurring uplands and wetlands are located outside the ROW will not be impacted. Permitted stormwater swales and surface waters (i.e., retention ponds) within the ROW provide marginal habitat for wading birds, including the wood stork, and impacts to these areas will be avoided and/or minimized to the greatest extent practical throughout the project's design. While protected avian species were observed foraging in stormwater ponds during this study's field reviews, nesting within these areas or any area within the ROW is not anticipated. During the design phase, the proposed project will avoid and minimize impacts to listed species, including impacts to trees/palms meeting the FBB criteria described in Section 5.3.1.1.6, to the maximum extent practical while still accomplishing the objectives of the project.

5.3.3 Cumulative Impacts

This project is not anticipated to contribute adversely to protected species or offsite habitats. The entire corridor is surrounded by development, and located within urban Broward County. The intent of the project is to increase capacity at the interchanges of I-95 and Hallandale Beach Boulevard, Pembroke Road, and Hollywood Boulevard. FDOT will comply with the requirements of National Pollutant Discharge Elimination System (NPDES), and implement Best Management Practices (BMPs) during construction as well as the eastern indigo snake provisions during construction. Based on the proposed scope of work, urban setting, surrounding development and proposed mitigation measures, no cumulative impacts to protected species or offsite habitats are anticipated for this project.

6.0 Wetlands and Other Surface Waters

In accordance with the FDOT PD&E Manual, *Chapter 9 (July 1, 2020), Executive Order 11990, Protection of Wetlands* as well as applicable federal and state regulatory requirements (*Section 404 of the Clean Water Act* and *Chapter 373, Florida Statute*, respectively) a wetland and other surface waters (OSW) evaluation was conducted for the project. The objectives of this evaluation were to identify existing wetlands and OSW's, evaluate potential impacts to them, and to assess the function and value of wetlands potentially impacted by the project.

6.1 Assessment Methodology

As previously stated, road improvements associated with the preferred alternative are primarily contained within the existing ROW's of I-95, Hollywood Boulevard, Pembroke Road, and Hallandale Beach Boulevard. Additional ROW is being acquired primarily for drainage purposes/ponds. Existing conditions field reviews were conducted on February 24 and 27, 2017 during daylight hours between 9:00 am and 5:00 pm, within 500 feet from both sides of the road centerlines. Weather conditions were sunny and warm (75-80°F). A field conditions verification survey was conducted to confirm previously identified wetlands, swales or OSW's conditions. These field verifications were conducted on September 22, 2020 and November 18, 2020 during daylight hours between 9:00 am and 5:00 pm, within 500 feet from both sides of the road centerlines. The September 22, 2020 field review weather conditions were windy, partly cloudy and about 84°F and the November 18, 2020 field review weather conditions were windy, partly cloudy, with light rain towards end of the day and temperatures ranging from 72°F-77°F. All previously identified features were still existing within study area.

6.2 Data Collection

A desktop review was performed prior to performing the field assessments to establish baseline wetland and OSW information. The following resources were reviewed for the presence of wetlands and OSW's:

- *ESRI and Google Earth aerial imagery*
- *FDOT's Efficient Transportation Decision Making (ETDM) Screening Summary Report Number 14254 (Incorporated by Reference)*

- *FDOT's ETDM Environmental Screening Tool*
- *Florida Natural Areas Inventory (FNAI) Cooperative Land Cover Map*
- *NRCS Soil Survey for Broward County*
- *NRCS Web Soil Survey*
- *USFWS National Wetlands Inventory (NWI) Maps*

Pedestrian transect surveys and windshield reviews were used to conduct the field reviews and confirm identified wetland and/or OSW areas. Wetland and surface water boundaries were determined through field surveys and reviews of aerial photography, hydrologic connectivity, and historical boundaries of existing wetland systems. Wetlands were delineated in overall conformance with the criteria specified in the *US Army Corps of Engineers (USACE) Wetland Delineation Manual, 1987: Regional Supplement to Atlantic and Gulf Coast Plain Region (Version 2.0) (USACE, 2010)*, and the *Florida Department of Environmental Protection (FDEP) Florida Wetlands Delineation Manual (FDEP, 1995)* which is based on *Chapter 62-340, F.A.C.* Each area was classified using the *Florida Land Use, Cover and Forms Classification System (FLUCCS, FDOT, 1999)*. *Arc GIS, Version 10.3.1*, was then used to create the wetland and surface water shapefiles from field, delineation, and aerial imagery data. Representative ground level photographs are included in ***Appendix B***.

6.3 Existing Wetlands and Other Surface Waters

One mangrove wetland adjacent to the C-10 Canal is present with hydrophytic vegetation, hydric soils, and hydrology. This wetland is considered jurisdictional to regulatory agencies and the hydrology of this area is dependent upon the C-10 Canal. In addition, four man-made wet stormwater swales with hydrophytic vegetation were also observed within the study area. Hydric soils are not present and their hydrology appeared dependent on rainfall, stormwater runoff, and groundwater. These swales were considered jurisdictional surface waters as they are part of an existing SFWMD permitted, stormwater drainage system. Other man-made surface waters were observed within the project area, including retention ponds associated with developments. The majority of these retention ponds do not contain littoral vegetation although some contained tapegrass (*Vallasnaria americana*), duck potato (*Sagittaria latifolia*), spike rush (*Eleocharis spp.*), water hyssop (*Bacopa spp.*) and bald cypress (*Taxodium distichum*) at the time of the field reviews.

Figure 6.1 illustrates the location of wetlands, stormwater swales and OSW sites and ***Table 6.1*** summarizes those areas found within 500 feet of the project corridor. The size, hydrologic contiguity and vegetative structural diversity are described in this table. Photographs of wetlands and surface waters are provided in ***Appendix B***.

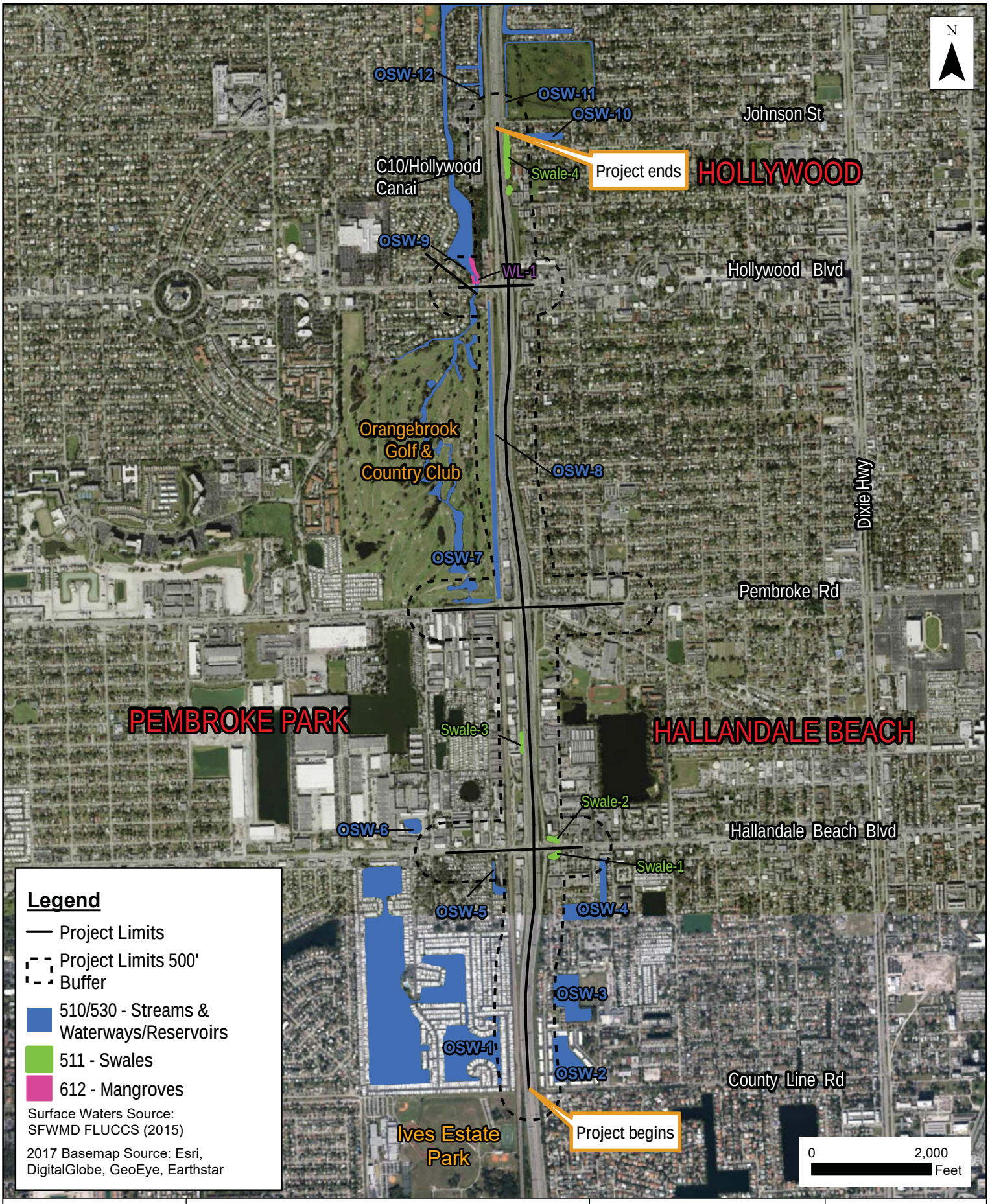
6.3.1 Wetlands

One natural mangrove wetland (FLUCCS 612) is present within the project area. Approximate acreage of the wetland is provided in ***Table 6.1***. The mangrove system is jurisdictional to SFWMD. The mangrove system is jurisdictional to the USACE and the swales may be jurisdictional to the USACE.

WL-1 (FLUCCS 612) - Within the project study area, WL-1 is comprised of approximately 0.43 acre mangrove fringe bordering brackish C-10 Canal, west of I-95. The wetland is within the canal adjacent to Stan Goldman Park and Lions Park, just north of Hollywood Boulevard. The dominant wetland vegetation is white mangrove, with patches of pond apple, melaleuca, bald cypress, coco plum, and leather fern. Upland vegetation consists of ficus (*Ficus* sp.), Australian pine (*Casuarina equisetifolia*), Brazilian pepper (*Schinus terebinthifolius*), seagrape (*Coccoloba uvifera*), umbrella tree (*Schefflera actinophylla*), Cuban royal palm (*Roystonea regia*), and coconut palm (*Cocos nucifera*). This wetland may provide foraging habitat for fish, birds, reptiles, and mammals. During the field visit on November 18, 2020, Muscovy ducks (*Cairina moschata*) were observed in this area.

6.3.2 Other Surface Waters

Twelve man-made retention ponds (OSW-1 through OSW-12) and four man-made wet swales, are within 500 feet of the project corridor. Approximate acreages of each surface water and swales, within the project limits, are provided in ***Table 6.1***. The surface waters were classified with a FLUCCS code of 510 for canals, and 530 for stormwater retention areas. OSW-7 and OSW-9 contain littoral vegetation (e.g. torpedo grass and a white mangrove fringe. Because drainage swales were created and not natural landforms, a FLUCCS code of 511 (Wet Swale) was



FDOT	SR9/I-95 from South of SR858/Hallandale Beach Blvd. to North of SR820/Hollywood Blvd. PD&E Study Broward County	Wetland and Other Surface Water Location Map	Figure 6.1 Date Prepared: 5/20/2021

Table 6.1 – Wetlands, Wet Swales and Surface Waters within 500 Feet of the Corridor

ID	FLUCC Code	NWI Code	Approx. Area Within 500' Buffer (AC)	Description	Dominant Wetland Vegetation	Hydric Soils (Historic)	Hydrologic Connection to Waters of the US
WL-1	612	E1UBLx	0.43	Mangrove fringe west of I-95 bordering brackish C-10 Canal. The wetland is within the canal adjacent to Stan Goldman Park and Lions Park, just north of Hollywood Boulevard.	White mangrove (*Laguncularia racemose*) fringe, co-mingled with melaleuca, bald cypress, leather fern (*Acrostichum danaefolium*), and pond apple	Yes (Ok)	Yes
Swale-1	511	PEM1Cx	0.17	Wet drainage swale located to the east of I-95 just south of Hallandale Beach Boulevard.	Water hyssop (*Bacopa monieri*) and primrose willow *(Ludwigia spp.)*	No (Ur)	No
Swale-2	511	PEM1Cx	0.27	Wet drainage swale located to the east of I-95 just north of Hallandale Beach Boulevard.	Water hyssop, bald cypress Pennywort (*Hydrocotyle spp.),* and primrose willow	No (Ur)	No
Swale-3	511	PEM1Cx	0.04	Wet stormwater swale located on the west side of I-95 between Pembroke Road and Hallandale Beach Boulevard.	Duck potato, spike rush, and primrose willow	No (US)	Yes
Swale-4	511	PFOCx	0.87	Wet stormwater swale located at the northern project limits, on the east side of I-95.	Bald cypress appears as part of existing landscaping within FDOT ROW between I-95 and adjacent residences	No (US)	Yes
OSW-1	530	L1UBHx	1.15	Large stormwater retention pond located within Park Lake Estates residential community, west of I-95, south of Hallandale Beach Boulevard. Between Marine Drive and Lake Shore Drive.	Not present	No (Ur)	No

ID	FLUCC Code	NWI Code	Approx. Area Within 500' Buffer (AC)	Description	Dominant Wetland Vegetation	Hydric Soils (Historic)	Hydrologic Connection to Waters of the US
OSW-2	530	PUBHx	1.14	Stormwater retention pond within Ro-Len Lakes Gardens residential community, east of I-95 between SW 10th Avenue and 11th Avenue.	Not present	No (AU)	No
OSW-3	530	PUBHx	0.42	Stormwater retention pond within residential community and Hallandale Elementary School, east of I-95 and just north of SW 8th Street.	Not present	Yes (DU)	No
OSW-4	530	PUBHx	0.62	Stormwater retention pond within single-family residential community and commercial facilities east of I-95, between Hallandale Beach Boulevard and SW 3rd Street.	SAV: Tapegrass	No (AU)	No
OSW-5	530	PUBHx	0.39	Stormwater retention pond within Green Acres Village residential community and commercial facilities. The pond is located west of I-95 between Green Acres Road and Country Club Lane.	Bald cypress and marsh fern (*Thelypteris palustris*)	No (Ur)	No
OSW-6	530	PUBHx	0.01	Stormwater retention pond located within Lakeside Business Park, west of I-95 and north of Hallandale Beach Boulevard.	Water hyssop and melaleuca	No (Ud)	No
OSW-7	530	PUBHx/ PEM1Fx	1.49	Stormwater retention pond within the Orangebrook Golf and Country Club. Multiple culverts surround and discharge to this drainage feature, which flows connects to other ponds within the country club.	Torpedo grass (*Panicum repens)*, water hyssop , spike rush, and primrose willow	No (Ar); Yes (Da)	Yes

ID	FLUCC Code	NWI Code	Approx. Area Within 500' Buffer (AC)	Description	Dominant Wetland Vegetation	Hydric Soils (Historic)	Hydrologic Connection to Waters of the US
OSW-8	530	PUBHx	7.60	Large stormwater retention ditch, concrete-lined that temporarily stores water to the west of I-95, in between Orangebrook golf and country club and railroad tracks. No vegetation observed	Not present	Yes (Du)	Yes
OSW-9	510	E1UBLx/ R5UBH	2.61	This waterbody is part of the C-10 Canal. Multiple culverts surround and discharge to this drainage feature, which flows under Hollywood Boulevard and connects to the Orangebrook Golf & Country Club.	Not Present, No SAV Associated with WL-1	No (Ar); Yes (Ok)	Yes
OSW-10	530	PUBHx	0.05	Stormwater retention area within single-family residential homes, located east of I-95 between Johnson and Lincoln Streets. Multiple culverts surround and discharge to this drainage feature.	Not present	No (Ar)	Yes
OSW-11	530	R5UBH	0.19	Stormwater retention area within Sunset Golf Club. Dominated by open water; multiple culverts surround and discharge to this drainage feature.	Australian pine, Brazilian pepper, swamp fern (*Blechnum serrulatum*)	Yes (Ok)	Yes
OSW-12	510	E1UBLx	<0.01	This waterbody is part of the C-10 Canal.	Cocoplum (*Chrysobalanus icaco) and* pond apple on bank	No (Ar)	Yes

FLUCCS: 510 – Streams and Waterways; 511/600 – Swale/Wetland; 530 – Reservoirs/Retention Ponds; 612 – Mangroves
NWI: L1UBHx = Lacustrine, limnetic, unconsolidated bottom, excavated; PUBHx = Palustrine, unconsolidated bottom, excavated; PEM1Fx = Palustrine, emergent, persistent, semipermanently flooded, excavated; E1UBLx = Estuarine, subtidal, unconsolidated bottom, subtidal, excavated; R5UBH = Riverine, unknown perennial, unconsolidated bottom, permanently flooded; PEM1Cx = Palustrine, eme2rgent, persistent, seasonally flooded, excavated; PFOCx = Palustrine, forested, seasonally flooded, excavated.
Soils: Ar = Arents, organic substratum-Urban land complex; Ok = Okeelanta muck, drained, 0 to 1 percent slopes; Da = Dade fine sand; Ud = Udorthents; AU = Arents-Urban land complex; DU = Dade-Urban land complex; US = Udorthents, shaped; Ur = Urban land; W = Water

assigned to classify them. These swales are part of an existing, permitted, stormwater management system, and therefore exempt from state wetland regulations.

Swale-1 (FLUCCS 511) – Swale-1 is an approximately 0.17 acre wet stormwater swale, located on the southeast corner of I-95 and Hallandale Beach Boulevard. This stormwater swale had standing water at the time of the field visit, November 18, 2020, and appeared to be a wet drainage feature. This swale is dominated by herbaceous wetland vegetation such as water hyssop and primrose willow. This area appeared to be regularly maintained at the time of the field visit, with few landscape trees on the edge of the swale. This swale may provide limited foraging habitat for birds, reptiles and small mammals. None were observed during field visits.

Swale-2 (FLUCCS 511) – Swale-2 is an approximately 0.27 acre wet stormwater swale, located on the northeast side of I-95 and Hallandale Beach Boulevard. At the time of field visit on November 18, 2020, there was standing water (6-10 inches deep), as well as dominant wetland plants consisting of water hyssop, primrose willow, bald cypress, pennywort (*Hydrocotyle spp.*), and leather fern. Along the edge of swale were landscape trees and shrubs. This swale may provide limited foraging habitat for birds, reptiles and small mammals.

Swale-3 (FLUCCS 511) - Swale-3 is an approximately 0.04 acre drainage swale, located on the west side of I-95 between Pembroke Road and Hallandale Beach Boulevard. The swale is dominated by upland bahia grass (*Paspalum notatum)* along the edges of the swale, with dense wetland vegetation in the center of the swale consisting of duck potato, spike rush, and primrose willow. Multiple culverts surround and discharge to this drainage feature. No standing water was observed during field reviews. This swale may provide limited foraging habitat for birds, reptiles, and small mammals.

Swale-4 (FLUCCS 511) - Swale-4 is an approximately 0.87 acre drainage swale, located at the northern project limits, on the east side of I-95. The swale is dominated by bald cypress (landscape trees), with herbaceous vegetation. A review of historical aerials showed the area grassed but without trees circa 1967, with development occurring to the east of I-95 in 1969. Landscaping becomes evident circa 1971. A I-95 drainage culvert discharges to this swale. No standing water was observed during the original field review, but surface water was

observed during the field verification on November 18, 2020. This swale may provide limited foraging habitat for birds, reptiles, and small mammals.

OSW-1 (FLUCCS 530) - OSW-1 is a large, stormwater retention pond located within Park Lake Estates residential community, west of I-95, south of Hallandale Beach Boulevard between Marine Drive and Lake Shore Drive. Multiple culverts surround and discharge to this drainage feature. The system comprises of approximately 1.15 acres within the 500 foot project buffer, and is dominated by open water with no littoral vegetation. This surface water may provide limited foraging habitat for birds, reptiles, and small mammals.

OSW-2 (FLUCCS 530) - OSW-2 is a stormwater retention pond within Ro-Len Lakes Gardens residential community, east of I-95 between SW 10th Avenue and 11th Avenue. Multiple culverts surround and discharge to this drainage feature. The system comprises of approximately 1.14 acres within the 500 foot project buffer, and is dominated by open water with no littoral vegetation. This surface water may provide limited foraging habitat for birds, reptiles, and small mammals.

OSW-3 (FLUCCS 530) - OSW-3 is a stormwater retention pond within residential community and Hallandale Elementary School, east of I-95 and just north of SW 8th Street. Multiple culverts surround and discharge to this drainage feature. The system comprises approximately 0.42 acres within the 500 foot project buffer, and is dominated by open water with no littoral vegetation. This surface water may provide limited foraging habitat for birds, reptiles, and small mammals.

OSW-4 (FLUCCS 530) - OSW-4 is a stormwater retention pond within a single-family residential community and commercial facilities east of I-95, between Hallandale Beach Boulevard and SW 3rd Street. Multiple culverts surround and discharge to this drainage feature. The system comprises of approximately 0.62 acres within the 500 foot project buffer, and is dominated by open water. No littoral vegetation was observed, however submerged aquatic vegetation (e.g. tapegrass) was observed. This surface water may provide limited foraging habitat for birds, reptiles, and small mammals.

OSW-5 (FLUCCS 530) - OSW-5 is a stormwater retention pond within Green Acres Village residential community and commercial facilities, west of I-95 between Green Acres Road and Country Club Lane. Multiple culverts surround and discharge to this drainage feature. The system comprises of approximately 0.39

acres within the 500 foot project buffer, and is dominated by open water with marsh fern and bald cypress around the pond edge. This surface water may provide limited foraging habitat for birds, reptiles, and small mammals.

OSW-6 (FLUCCS 530) - OSW-6 is a stormwater retention pond located within Lakeside Business Park, west of I-95 and north of Hallandale Beach Boulevard. Multiple culverts surround and discharge to this drainage feature. The system comprises of approximately 0.01 acres within the 500 foot project buffer, and is dominated by open water with wetland vegetation such as water hyssop and melaleuca. Areca palms (*Dypsis lutescens*) were observed along the pond edge. This surface water may provide limited foraging habitat for birds, reptiles, and small mammals.

OSW-7 (FLUCCS 530) - OSW-7 is a stormwater retention area within the Orangebrook Golf and Country Club, comprising of approximately 1.49 acres within the 500 foot project buffer. Multiple culverts surround and discharge to this drainage feature, which connects to other ponds within the country club. Littoral vegetation is dominated by torpedo grass with other wetland vegetation consisting of spike rush, primrose willow, and water hyssop. This surface water may provide foraging habitat for birds, reptiles, and small mammals.

OSW-8 (FLUCCS 530) - OSW-8 is a linear, stormwater drainage pond that is concrete-lined and runs between Orangebrook Golf and Country Club and the railroad tracks, west of I-95. OSW-8 is approximately 7.60 acres within the 500 foot project buffer, and is dominated by open water with no littoral vegetation and a fence around its perimeter.

OSW-9 (FLUCCS 510) - OSW-9 is part of the C-10 Canal, and comprises of approximately 2.61 acres within the 500 foot project buffer. Several culverts are present and discharge to the canal. This canal runs under Hollywood Boulevard and connects to the Orangebrook Golf & Country Club to the south. The system is dominated by open water, approximately 3-6 feet in depth; white mangrove, Australian pine, Brazilian pepper, bald cypress, leather fern, pond apple and other native and exotic vegetation border the canal. This surface water provides foraging habitat for birds, reptiles, and small mammals.

OSW-10 (FLUCCS 530) - OSW-10 stormwater pond is located within single-family residential homes, east of I-95 between Johnson and Lincoln Streets. This system

comprises of approximately 0.05 acres within the 500 foot project buffer, and is dominated by open water. Multiple culverts surround and discharge to this drainage feature. No littoral vegetation was observed. This surface water may provide foraging habitat for birds, reptiles, and small mammals.

OSW-11 (FLUCCS 510) - OSW-11 drainage ditch is located within the City-owned vacant parcel formerly the privately-owned Sunset Golf Course, and comprises of approximately 0.19 acres within the 500 foot project buffer. This system is dominated by open water, less than one foot in depth. A dense growth of Australian pine, Brazilian pepper, and swamp fern borders the ditch. Multiple culverts surround and discharge to this drainage feature. This surface water may provide foraging habitat for birds, reptiles, and small mammals.

OSW-12 (FLUCCS 510) - OSW-12 is a residential canal that connects to the C-10 Canal. The system comprises of less than 0.01 acres within the 500 foot project buffer. The canal is dominated by open water, with vegetation along the banks consisting of coco plum, pond apple, areca palms, and Brazilian pepper. Multiple culverts surround and discharge to this drainage feature. This surface water may provide foraging habitat for birds, reptiles, and small to large mammals (e.g. West Indian manatee).

6.4 Wetland and Other Surface Water Impacts

Potential impacts associated with the project were evaluated. A discussion of direct, indirect and cumulative impacts associated with the project is summarized in the sections below. In general, no wetland impacts will occur and surface water impacts are limited to existing drainage features/surface waters.

6.4.1 Direct Impacts

Direct impacts include placement of fill for roadway construction and fill/excavation of stormwater swales. For the purposes of this wetland impact assessment, impacts to wet swales and other surface waters were calculated based on the preferred alternative. No natural wetland systems will be impacted by the project. Direct impacts to permitted, stormwater swales within the existing I-95 ROW are anticipated due to construction activities. It is estimated that a total of 1.35 acres of other surface waters (stormwater features) will be impacted. ***Table***

6.2 summarizes the direct impacts to stormwater swales (acreage) for the preferred alternative.

6.4.2 Secondary Impacts

In accordance with State criteria, water quality will be treated prior to discharge to receiving waters. Therefore, secondary impacts are not anticipated as a result of this project.

Table 6.2 – Preferred Alternative Summary of Potential Direct Wetland and Surface Water Impacts (Acres)

ID	FLUCCS Code	Size (Ac)	Direct Impact	
			Wetlands	Other Surface Waters
WL-1	612	0.43	0.00	0.00
Swale-1	511	0.17	0.00	0.17
Swale-2	511	0.27	0.00	0.27
Swale-3	511	0.044	0.00	0.04
Swale-4	511	0.87	0.00	0.87
OSW-1	530	1.15	0.00	0.00
OSW-2	530	1.14	0.00	0.00
OSW-3	530	0.42	0.00	0.00
OSW-4	530	0.62	0.00	0.00
OSW-5	530	0.39	0.00	0.00
OSW-6	530	0.01	0.00	0.00
OSW-7	530	1.49	0.00	0.00
OSW-8	530	7.60	0.00	0.00
OSW-9	510	2.61	0.00	0.00
OSW-10	530	0.05	0.00	0.00
OSW-11	530	0.19	0.00	0.00
OSW-12	510	0.002	0.00	0.00
Total Direct Impacts			**0.00**	**1.35**

6.4.3 Avoidance and Minimization

One mangrove wetland is located within the C-10 Canal, just north of Hollywood Boulevard and west of I-95. Man-made stormwater swales and surface water littoral shelves are located immediately adjacent to the existing roadway. Therefore, complete avoidance and minimization of impacts to these swales and surface waters is not possible nor practicable and still meet the purpose and need of the project. However, impacts to Wetland 1(mangrove wetland) have been avoided. Avoidance and minimization will continue to be incorporated as practical throughout the PD&E and Design processes.

The proposed roadway improvements' stormwater management facilities for the preferred alternative will meet FDOT drainage criteria, SFWMD permit criteria, and use best management practices (BMPs) in accordance with the current *FDOT's Standard Specifications for Road and Bridge Construction*.

6.5 Wetland Functional Assessment and Mitigation

Impacts to Wetland 1 are not anticipated. Therefore, a UMAM evaluation was not prepared. Impacts to surface waters do not require a functional assessment as mitigation for these impacts is typically not required.

6.6 Cumulative Impacts

Cumulative impact is the impact on the environment which results from the action's incremental impact when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such actions. I-95, Hallandale Beach Boulevard, Pembroke Road, and Hollywood Boulevard are existing roadways, and the proposed drainage improvements will provide an anticipated incremental improvement to cumulative water quality over current conditions. These roadways are not likely to promote additional development, although improved access may encourage expansion of already developed properties and/or redevelopment of existing, developed, land; thereby increasing the amount of impervious area. However, cumulative impacts associated with any future development must comply with environmental regulations and standards of water quality, as well as consider habitat requirements for applicable listed species. Therefore, I-95 from south of Hallandale Beach Boulevard to north of Hollywood Boulevard Project is not

expected to contribute to additional impacts beyond the direct impacts described in ***Section 6.4.1.***

7.0 ESSENTIAL FISH HABITAT

This project was evaluated for impacts to EFH in accordance with *16 U.S.C 1801 of January 12, 2007, as amended, Magnuson-Stevens Fishery Conservation and Management Act,* and *Part 2, Chapter 17 (July 1, 2020) of the FDOT PD&E Manual*. EFH describes all waters and substrate necessary for fish to spawn, breed, feed, or grow to maturity. The National Marine Fisheries Service (NMFS) is the agency with jurisdiction and although the *NMFS EFH Mapper* does not indicate EFH in the project area, the *ETDM Summary Report #14254* references the occurrence of moderate quality estuarine (mangrove) wetlands along the C-10 Canal where it runs adjacent to I-95 and where Hollywood Boulevard crosses the C-10 Canal. Mangrove habitat is designated EFH by the South Atlantic Fishery Management Council (SAFMC), as well as a Habitat Areas of Particular Concern (HAPC). The HAPC's are subsets of EFH that are rare, ecologically important, susceptible to human-induced degradation, or located in an environmentally stressed area. Mangroves provide nursery, foraging, and refuge habitat for federally managed fishery species (e.g. snapper/grouper species), as well as for other commercially and recreationally important fish. Additionally, mangroves control runoff and turbidity by stabilizing sediment, indirectly supporting fishery habitat.

7.1 ASSESSMENT METHODOLOGY

Due to the presence of EFH within the project corridor and the potential for widening of the Hollywood Boulevard Bridge over the C-10 Canal, two benthic resource surveys were conducted by a team of biologists on August 23, 2017 and September 16, 2020, between 10:00 am and 1:30 pm, and 1:00 pm and 3:00 pm, respectively. The survey on September 16, 2020 was conducted during an ebb tide, high tide was approximately at 9:20 am. The purpose of these surveys was to confirm the presence of mangrove habitat, and ascertain the presence of submerged aquatic vegetation (e.g. seagrass), listed fish species, or any other significant benthic resource, in the vicinity where the Hollywood Boulevard Bridge crosses this canal.

The site was accessed north of Hollywood Boulevard, via the Stan Goldman Park's pedestrian trail, which runs along the eastern edge of the C-10 Canal, for both

surveys. During the survey on September 16, 2020, weather conditions were sunny, and the northbound current was minimal. Meandering/switchback surveys were conducted by biologists using SCUBA/snorkel, approximately 100 feet north and south of the Hollywood Boulevard Bridge. Water depth varied from approximately four to ten feet, and visibility was extremely poor (zero-six inches).

7.2 EFH Occurrences

EFH (mangroves) were observed north of the Hollywood Boulevard Bridge and occurs along both the east and west sides of the C-10 Canal and consists of white mangroves . This area may provide foraging, nursery and refuge habitat for the numerous small juvenile fish observed north and south of the Hollywood Boulevard Bridge. No other EFH was observed during the field reviews. Overall, the benthic substrate was sandy/silty with a moderate layer of organic material and shell hash. Leaf litter and trash were present both north and south of the bridge. South of the bridge, rock rubble was dominant along the canal edges, and tree limbs also noted. No seagrass, other submerged aquatic vegetation, or coral were observed within the entire survey area. Green macroalgae was observed both north and south of the bridge. Additionally, other incidental fish and wildlife observations included: common snook (*Centropomus undecimalis*), spotted tilapia (*Pelmatolapia mariae*), blue land crab (*Cardisoma guanhumi*), and iguana (*Iguana iguana*).

7.3 EFH Impacts

No widening of the Hollywood Bridge over the C-10 Canal is proposed and no other in-water work is proposed within the C-10 Canal. Therefore, no impacts to EFH are anticipated by this project and consultation with NMFS is not required.

8.0 Agency Coordination

8.1 ETDM ETAT Review

The project was reviewed through the FDOT's ETDM process where members of the ETDM ETAT provide input and comments; the ETDM Screening Summary Report (No. 14254) is incorporated by reference. The following is a summary of the ETAT reviews and description of the potential effects of on wetlands, and listed species that could potentially inhabit the project area.

The USFWS, FWC and Federal Highway Administration (FHWA) commented the project will have "Minimal" effect on wildlife and habitat, and a "Minimal" effect on wetlands. USFWS provided the following comments, and the corresponding response/action taken by FDOT is included below each comment:

a) Comment: The project corridor is not located in the Core Foraging Areas (CFA) (within 18.6 miles) of any known active nesting colony of the endangered wood stork (*Mycteria americana*). The Service finds it unlikely that the project will result in adverse effects to the wood stork. The USFWS and FHWA assigned an effect of "Minimal" to wildlife during their ETAT reviews.

Response: The corridor is located in the CFA of two active nesting wood stork colonies. Drainage swales will be impacted by the proposed project. Drainage swales will be included, which would offset wood stork SFH.

b) Comment: The Service believes the following federally listed species have the potential to occur in or near the project site: American crocodile (*Crocodylus acutus*), eastern indigo snake (*Drymarchon couperi = Drymarchon corais couperi*), and West Indian manatee (*Trichechus manatus*).

Response: FDOT will adhere to the *Standard Protection Measures for the Eastern Indigo Snake* (see ***Appendix D***) during construction to prevent adverse impacts to this species. In accordance with the coordination with FWC, crocodile sightings adjacent to Hollywood Boulevard have not occurred within the last year. Previous coordination with FWC approximately two years ago indicated crocodiles have not been observed in this canal for the three years prior to that coordination. No in-water work is proposed within the C-10 Canal and therefore, the FDOT determined the project will have ***No Effect*** to the American crocodile and West Indian manatee.

c) Comment: The USFWS recommended that wetland impacts be avoided to the greatest extent practicable, and if impacts are unavoidable, the FDOT should provide compensatory mitigation.

Response: No wetland impacts have been identified. However, if modifications to the preferred alternative occur during the design phase, mitigation for wetland impacts will be identified and could include implementing drainage features to offset wood stork SFH, or by purchasing wetland credits at the Loxahatchee Mitigation Bank or Everglades Mitigation Bank.

d) Comment: The FWC commented the project will have "Minimal" effect on wildlife and habitat. They provided the following comment, and the corresponding response/action taken by FDOT is included below the comment:

1) There are no significant fish, wildlife or habitat resources identified in the project area.

Response: No response required.

Other ETAT comments regarding wetlands, wildlife, water quality/quantity, and coastal/marine resources are provided below, followed by the corresponding response/action taken by FDOT:

a) Comment: The FHWA commented the effect of the project on resources will be "None" and SFWMD commented the project will have "Minimal" effect on wetlands. An ERP and potentially a Water Use Permit will be required. They recommended care must be taken during dewatering and construction activities to prevent contaminated soil/water from migrating into non-contaminated areas.

Response: FDOT will obtain an ERP and a SFWMD Water Use Permit, if needed, during final design. BMPs will be implemented to ensure any contaminated areas will not migrate into non-contaminated areas. If a ROW permit modification is required, it will be obtained. However, preliminary coordination with SFWMD indicated their ROW interest in the C-10 Canal terminates at Johnson Street. Additional coordination during the design phase is required to confirm the applicability of this permit to the Hollywood Boulevard Bridge crossing over the C-10 Canal.

b) Comment: The USACE did not provide ETAT comments regarding wetlands or wildlife. The US Environmental Protection Agency (EPA) commented the project will have "Moderate" effect on wetlands and surface waters. Wetland and surface water impacts should be avoided and minimized, and if unavoidable, fully mitigated. Appropriate stormwater treatment systems and best management practices must be employed to prevent nonpoint source pollution to surface waters and potential impacts to groundwater. The USEPA supports conducting a Water Quality Impact Evaluation and recommends coordinating the assessment with Broward County and the SFWMD.

   Response: FDOT will avoid and minimize wetland and surface water impacts to the greatest extent practicable. Mitigation for unavoidable wetland impacts will be determined during the final design/environmental permitting process by implementing drainage features that offset the functional loss of the existing swales. FDOT will prepare a Water Quality Impact Evaluation as part of this PD&E assessment, and will coordinate with relevant agencies for design of the proposed stormwater system and the requirements for stormwater treatment, evaluating existing stormwater treatment adequacy and details on the future stormwater treatment facilities.

c) Comment: FDEP and EPA commented the project will have "Moderate" effect on water quality/quantity, and SFWMD commented the project will have "Minimal" effect on water quality and quantity. Effort should be made to maximize treatment of stormwater runoff from the proposed interchange improvements to prevent ground and surface water contamination. Net impact on water quality and water flow should be minimized and Best Management Practices used.

   Response: FDOT will design the stormwater treatment system to meet current SFWMD criteria, minimizing impacts to water quality and quantity impacts as a result of this project. Best Management Practices (BMP) will be implemented during design and construction to ensure compliance with the FDEP NPDES permit.

d) Comment: The FDOT, SFWMD and FHWA commented the project will have "Minimal" effect on floodplains. The project needs to be designed to mitigate any changes in flooding areas.

Response: FDOT will modify existing SFWMD ERP's and/or obtain a new ERP and compensate for any floodplain storage impacts per current SFWMD criteria.

e) Comment: The NMFS and SFWMD commented the project will have "Minimal" effect on coastal and marine resources. The project description states that the Hollywood Boulevard Bridge over the C-10 Canal may be replaced. Impacts to mangroves will require avoidance, minimization and mitigation for unavoidable impacts. To the extent practicable, runoff from the new bridge should be treated before discharged into the lagoon. A modification of SFWMD ROW permit #1684 will be necessary to widen or alter the bridge over the C-10 Canal.

Response: FDOT will obtain a SFWMD ERP and ROW permit (if needed) for this project. An EFH assessment has been included in this NRE Report. At this time, the preferred alternative does not propose any in-water work within the C-10 Canal; therefore, impacts to EFH are not anticipated.

8.2 Other Agency Coordination

a) The FDOT submitted a species-specific consultation letter to the USFWS on April 12, 2021 to coordinate on the FBB. The USFWS responded on April 14, 2021. In summary, the USFWS stated that due to the large number of trees within the project area, that are potential roosting habitat an acoustic survey is required. The USFWS stated the survey should only encompass areas where trees 25-feet in height and 8-inch DBH are located. See **Appendix C** for copies of this correspondence.

b) Pursuant to coordination with the USFWS concerning the FBB, the FDOT commits to the following to provide reasonable assurance that the requirements of the ESA will be complied with prior to construction:

- Perform a tree/palm roost survey of qualifying trees/palms during the PD&E Study and provide those results to USFWS and incorporate into the NRE.
- Perform another tree/palm roost survey and/or acoustic survey during final design, as coordinated with USFWS.
- Continue coordination with USFWS regarding appropriate, project-specific, survey methodologies and BMPs.

- FDOT is aware that pending the results of the PD&E roost survey, additional BMPs may be required.

8.3 Concurrence

Concurrence on the determinations of effect is currently pending and will be included in the final NRE. Coordination/concurrence from NMFS is not required as EFH is not impacted.

8.4 Permits Required

The environmental permits anticipated for this project are summarized in ***Table 8.1*** and described below.

Table 8.1 - Anticipated Environmental Permits

Permit Type	Issuing Agency
Environmental Resource Permit	SFWMD
Water Use Permit (for Construction Dewatering)	SFWMD
Section 404 Dredge and Fill Permit	USACE/FDEP
National Pollutant Discharge Elimination Permit (NPDES)	FDEP

The SFWMD requires an Environmental Resource Permit when construction of any project results in the modification or creation of a surface water management system or results in impacts to wetlands or waters of the state. It is anticipated that an Individual Environmental Resource Permit will be required for this project. Widening of the bridge over the C-10 Canal or drainage modifications (outfalls) is not proposed at this time. If those modifications are determined to be required during design, than coordination with the City of Hollywood and/or SFWMD is recommended. Should a SFWMD dewatering permit be required, it will be obtained concurrent with the SFWMD ERP.

For the USACE, a Section 404 Dredge and Fill Permit will be required and compliance with the 404(b)(1) guidelines, including verification that all impacts have first been eliminated to the greatest extent practicable, that unavoidable impacts have been reduced to the greatest extent practicable, and lastly that unavoidable impacts have been mitigated. The USACE recently delegated a portion of its Section 404 permitting program to FDEP. Therefore, it is possible the federal permit may be issued from FDEP if it falls within FDEP's "assumed waters".

Under the FDEP's delegated authority to administer the NPDES program, construction sites that 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 U.S. Development of a Stormwater Pollution Prevention Plan (SWPPP) is required as part of this permit. The SWPPP identifies the type and location of erosion control measures used to contain runoff from construction sites to keep it from entering surface waters.

9.0 CONCLUSIONS

Unavoidable direct impacts to man-made, wet stormwater swales and surface waters will result as part of this project. The FDOT will avoid and minimize impacts to the greatest extent practical and will continue to evaluate avoidance and minimization measures during design and permitting to the greatest extent practical. The FDOT will adhere to the permitting agencies' general and specific conditions regarding turbidity control during construction to ensure that waters remain in compliance with water quality parameters.

The preferred alternative will incur a total of 1.35 acres of impacts to stormwater swales, supporting hydrophytic vegetation, and OSWs. Compensation for unavoidable drainage swale impacts will occur in coordination with USACE/FDEP and SFWMD. Mitigation may be accomplished onsite through the creation of vegetated drainage swales.

It was determined the preferred alternative ***May Affect, Not Likely Adversely Affect*** the federally-listed Eastern indigo snake, FBB, and wood stork. The preferred alternative will have ***No Effect*** on the Everglade snail kite, American crocodile, West Indian manatee, and Johnson's seagrass. USFWS concurrence on these determinations is pending and will be included in the final NRE. Coordination with

the NMFS is not required, as no impacts to EFH are anticipated. The project corridor currently falls within the CFA of two wood stork colonies. The FDOT will continue to coordinate with the USFWS regarding wood storks, and any required suitable foraging habitat compensation will be accomplished through new drainage features or through the purchase of credits at a USFWS-approved mitigation bank.

It was determined that this project will have ***No Adverse Effect*** to the state-listed Florida burrowing owl, little blue heron, tricolored heron, and gopher tortoise. However, if a gopher tortoise or burrowing owl is encountered within or adjacent to the ROW, a state relocation permit will be required, and coordination with FWC will be initiated.

The FDOT will continue to coordinate with the regulatory and commenting agencies, and local governments including USACE, SFWMD, FDEP, USFWS, EPA, FWC, and Broward County during final design, construction and permitting to seek avoidance, minimization and mitigation measures for wetlands, and protected species.

9.1 COMMITMENTS

The FDOT made the following natural resource commitments as part of this PD&E Study:

- FDOT agrees to follow the USFWS Standard Protection Measures for the Eastern Indigo Snake during the implementation of this project.

- Impacted wet swales will be replaced within the core foraging area of the active wood stork breeding colony. If the replacement of these swales within the core foraging area is not practicable, the FDOT will coordinate with the USFWS to identify acceptable compensation outside the core foraging area, such as purchasing wetland credits from a "FWS Approved" mitigation bank.

- If impacts to wet swales are unavoidable, FDOT will provide swale replacement to compensate for this loss.

- FDOT commits to perform a FBB roost and/or acoustic survey during design and prior to the start of construction. Should the FBB be present, FDOT

commits to coordinate further with USFWS regarding the appropriate course of action.

- FDOT commits to avoid impacts to trees 15-feet in height and 8-inch DBH and palms 20-feet in height (clear trunk) to the greatest extent practical while still meeting the project's purpose and need.

- FDOT commits to perform a tree/palm roost survey of qualifying trees/palms during the PD&E Study and provide those results to USFWS and incorporate into the NRE.

- FDOT commits to perform another tree/palm roost survey and/or acoustic survey during final design, as coordinated with USFWS.

- Continue coordination with USFWS regarding appropriate, project-specific, survey methodologies and BMPs.
- FDOT is aware that pending the results of the PD&E roost survey, additional BMPs may be required.

9.2 Next Steps

The FDOT will continue to coordinate with the regulatory and commenting agencies, and local governments including USACE, SFWMD, FDEP, USFWS, EPA, WMD, and FWC during final design, construction and permitting to seek avoidance, minimization and mitigation measures for wetlands, protected species, and managed species.

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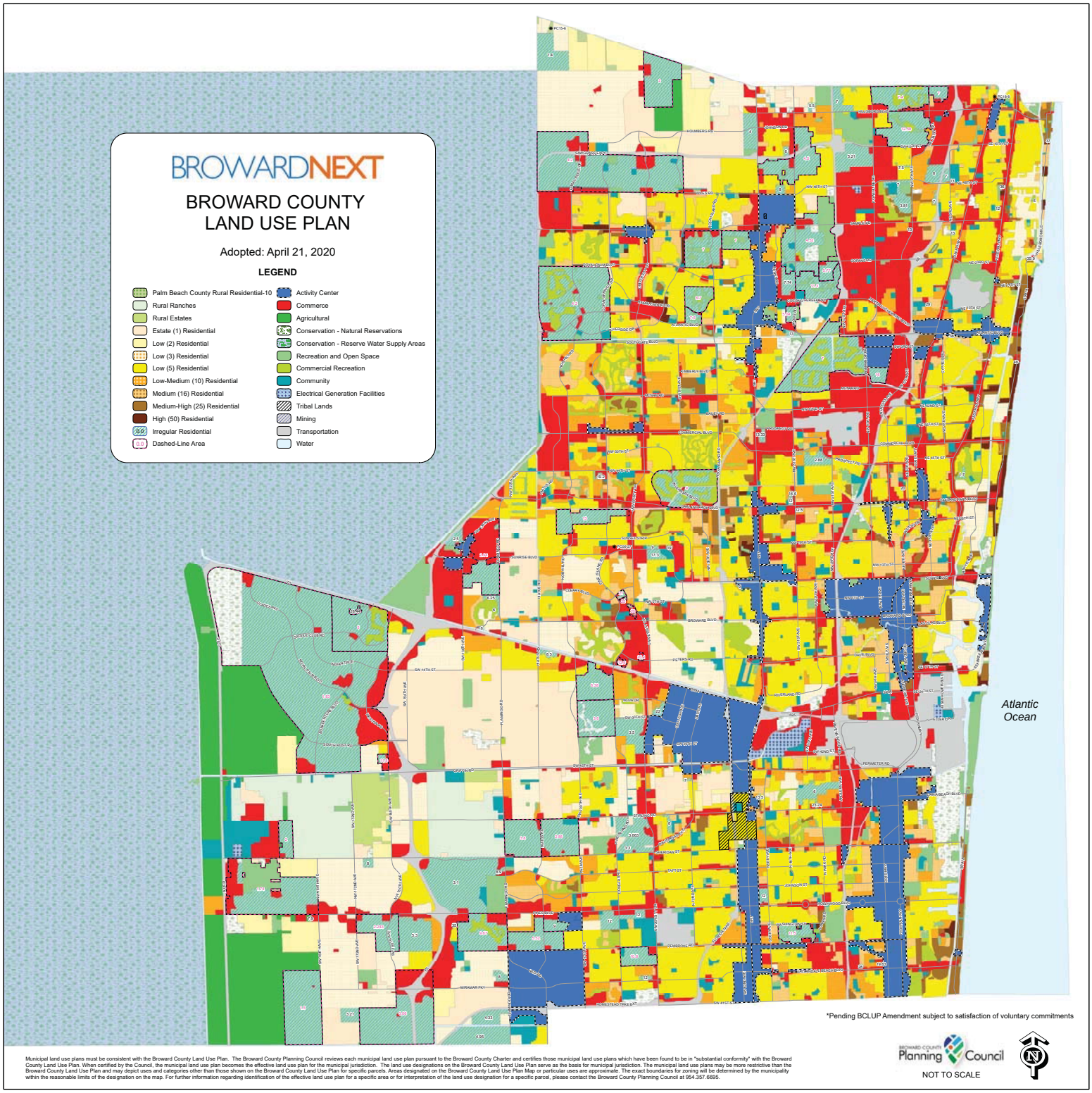
APPENDIX A

Future Land Use Maps



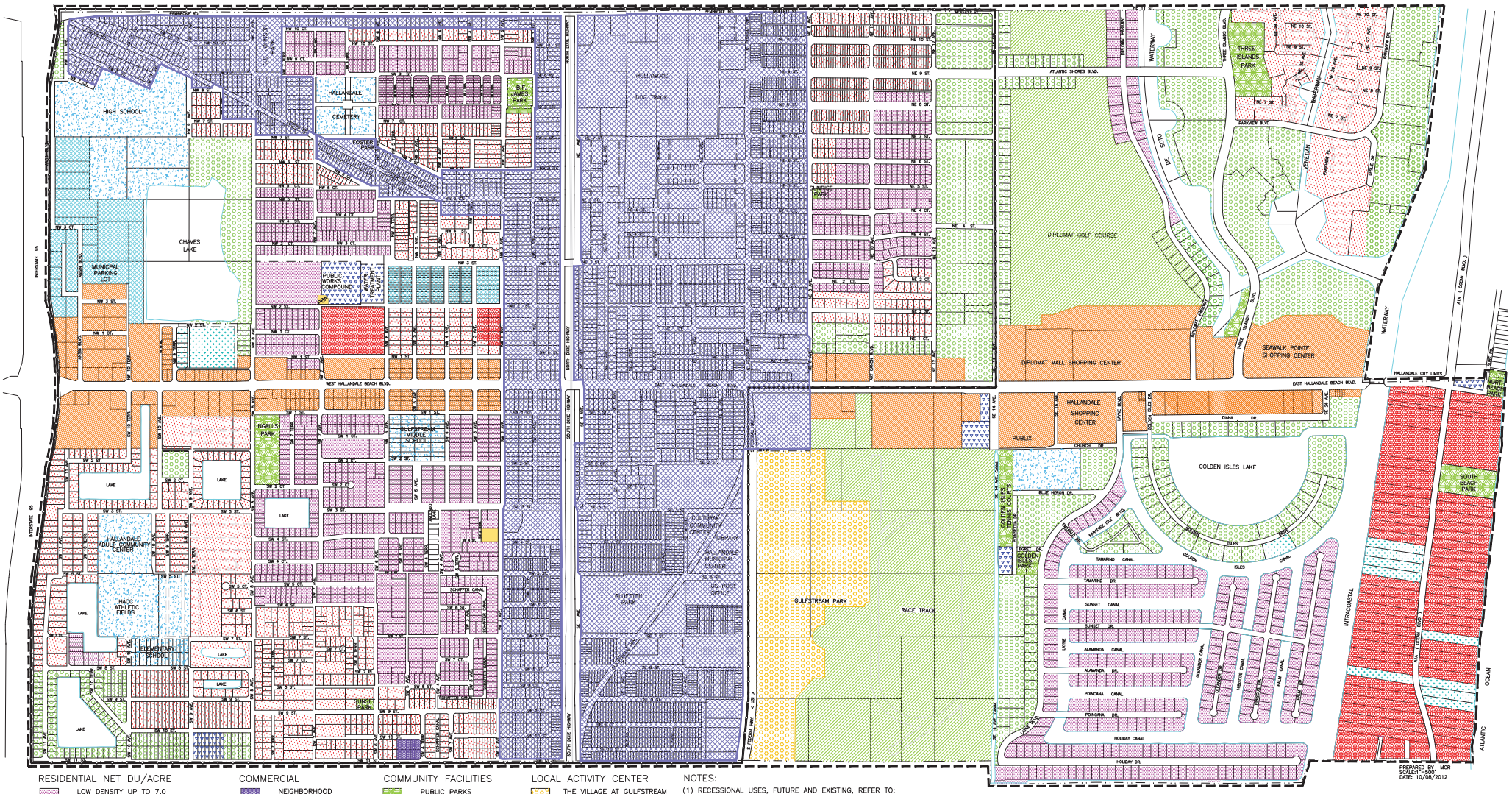
*Pending BCLUP Amendment subject to satisfaction of voluntary commitments

Municipal land use plans must be consistent with the Broward County Land Use Plan. The Broward County Planning Council reviews each municipal land use plan pursuant to the Broward County Charter and certifies those municipal land use plans which have been found to be in "substantial conformity" with the Broward County Land Use Plan. When certified by the Council, the municipal land use plan becomes the effective land use plan for the municipal jurisdiction. The land use designations on the Broward County Land Use Plan serve as the basis for municipal jurisdiction. The municipal land use plans may be more restrictive than the Broward County Land Use Plan and may depict uses and categories other than those shown on the Broward County Land Use Plan for specific parcels. Areas designated on the Broward County Land Use Plan Map or particular uses are approximate. The exact boundaries for zoning will be determined by the municipality within the reasonable limits of the designation on the map. For further information regarding identification of the effective land use plan for a specific area or for interpretation of the land use designation for a specific parcel, please contact the Broward County Planning Council at 954.357.6695.

Broward County Planning Council

NOT TO SCALE

CITY OF HALLANDALE BEACH
FUTURE LAND USE MAP



RESIDENTIAL NET DU/ACRE

- LOW DENSITY UP TO 7.0
- LOW-MEDIUM DENSITY UP TO 14.0
- MEDIUM DENSITY UP TO 18.0
- HIGH DENSITY UP TO 25.0
- HIGH DENSITY-2 UP TO 50.0

COMMERCIAL

- NEIGHBORHOOD
- GENERAL
- RECREATION
- LIGHT INDUSTRIAL
- EMPLOYMENT CENTER

COMMUNITY FACILITIES

- PUBLIC PARKS
- INSTITUTIONAL
- UTILITIES
- HISTORIC

LOCAL ACTIVITY CENTER

- THE VILLAGE AT GULFSTREAM PARK LAC

REGIONAL ACTIVITY CENTER

NOTES:

(1) RECESSIONAL USES, FUTURE AND EXISTING, REFER TO: FIGURE 8-2, VOLUME II, COMPREHENSIVE PLAN.

(2) WATER WELLS AND CONES OF INFLUENCE, REFER TO: FIGURE 7-6, VOLUME II, COMPREHENSIVE PLAN.

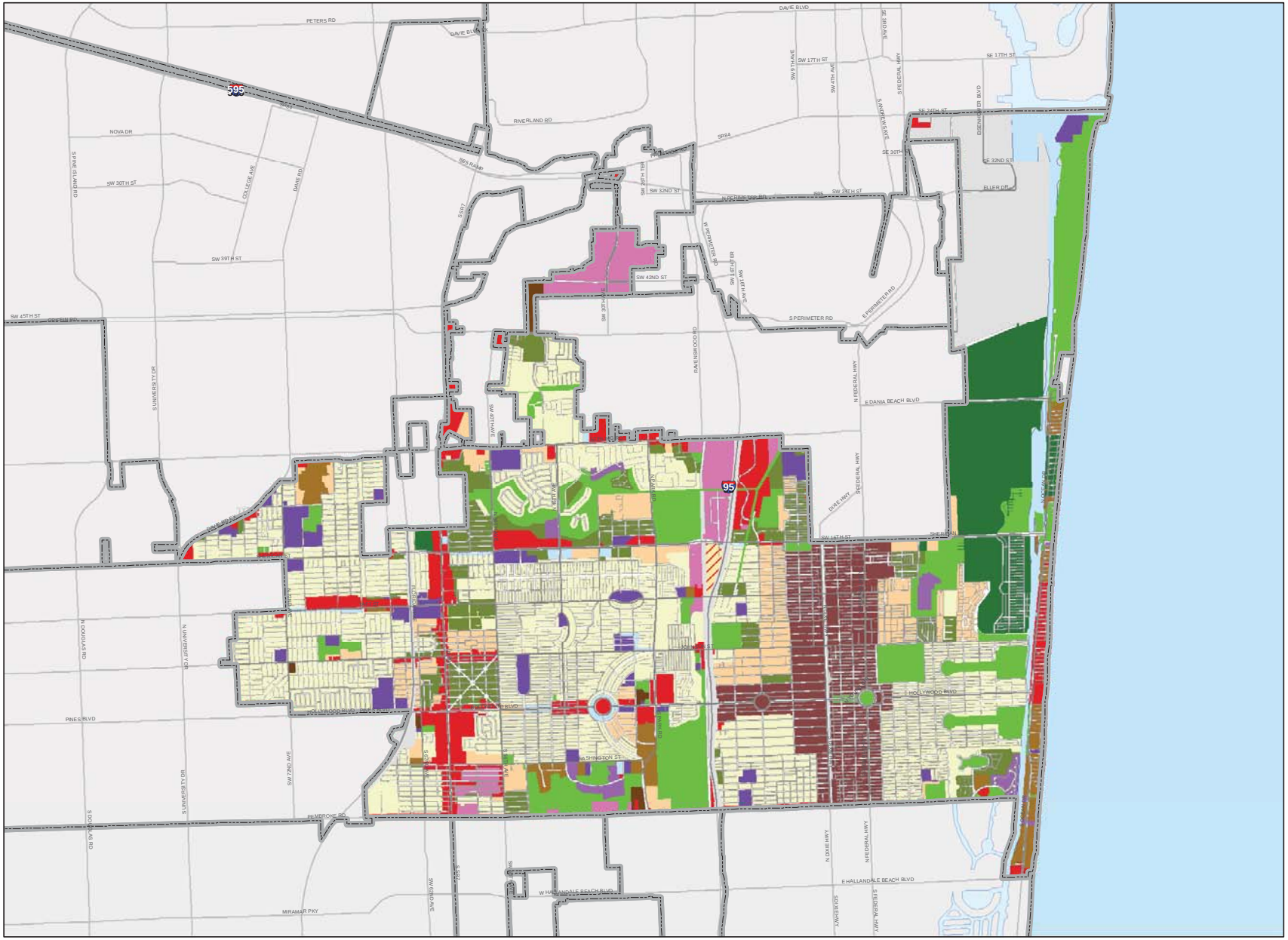
(3) HISTORICAL DISTRICTS AND STRUCTURES, REFER TO: FIGURE 4-19, VOLUME II, COMPREHENSIVE PLAN.

(4) HALLANDALE FUTURE LAND USE PLAN COMPLIES WITH BROWARD COUNTY TRAFFIC WAYS PLAN, REFER TO: FIGURE 3-12, VOLUME II, COMPREHENSIVE PLAN.

(5) CITY OF HALLANDALE BEACH FLEXIBILITY ZONES, REFER TO: FIGURE 2-2, VOLUME II, COMPREHENSIVE PLAN.

TRANSPORTATION CONCURRENCE EXCEPTION AREAS

- URBAN INFILL AREA
- URBAN REDEVELOPMENT AREA
- CITY LIMITS



City of Hollywood
Comprehensive Plan

Map LU-12

Future Land Use

Legend

Hollywood City Boundary

Hollywood Future Land Use

F.L.U. Designations

- LOW RESIDENTIAL
- LOW MEDIUM RESIDENTIAL
- MEDIUM RESIDENTIAL
- MEDIUM HIGH RESIDENTIAL
- HIGH RESIDENTIAL
- COMMUNITY FACILITY
- INDUSTRIAL
- OFFICE
- GENERAL BUSINESS
- RIGHTS OF WAY
- TRANSPORTATION
- UTILITIES
- RAC ZONE
- PARKS AND OPEN SPACE
- CONSERVATION AREA
- TOD
- TOC (NO SITE DESIGNATED)

Printed September 13, 2007

N
W E
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Miles

Calvin, Giordano & Associates, Inc.
EXCEPTIONAL SOLUTIONS

GIS Produced and maintained by the CGA Geographic Information Systems Services

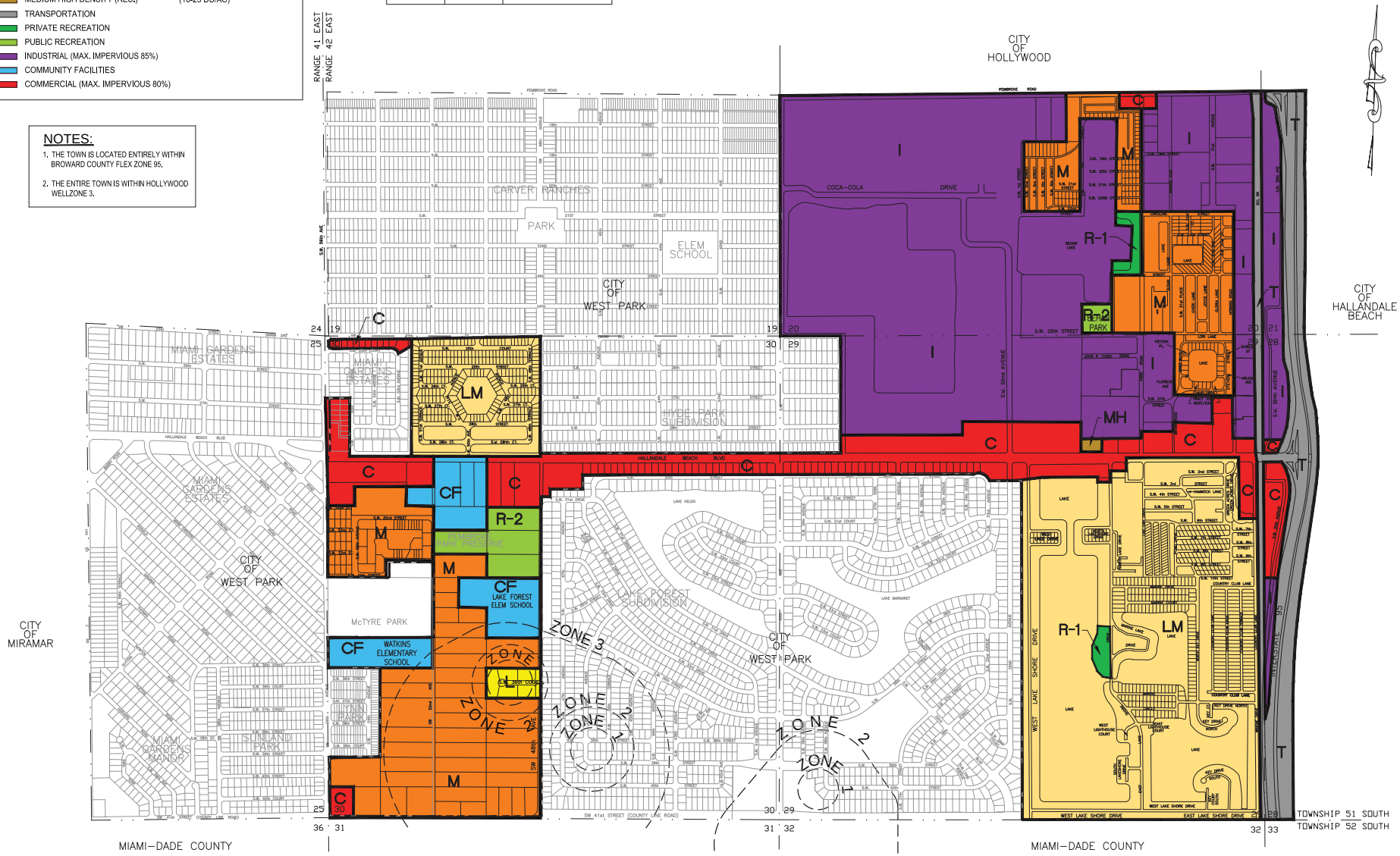
LEGEND

L	LOW DENSITY (RES.)	(0-5 DU/AC)
LM	LOW MEDIUM DENSITY (RES.)	(5-10 DU/AC)
M	MEDIUM DENSITY (RES.)	(10-16 DU/AC)
MH	MEDIUM HIGH DENSITY (RES.)	(16-25 DU/AC)
T	TRANSPORTATION	
R-1	PRIVATE RECREATION	
R-2	PUBLIC RECREATION	
I	INDUSTRIAL (MAX. IMPERVIOUS 85%)	
CF	COMMUNITY FACILITIES	
C	COMMERCIAL (MAX. IMPERVIOUS 80%)	

NOTES:

1. THE TOWN IS LOCATED ENTIRELY WITHIN BROWARD COUNTY FLEX ZONE 95.
2. THE ENTIRE TOWN IS WITHIN HOLLYWOOD WELLZONE 3.

AMENDMENTS SINCE 1989		
DATE	ORD. NO.	PURPOSE
6/20/03	03-06-04	SIP SS FLUM
6/17/04	HB 1491	WEST PARK CREATED – DEANNEXATION
6/16/09	HB 777	MCTYPRE PARK DEANNEXATION
XX/XX/2016	XX/XX/XX	2016 EBA



NO.	DATE	REVISION	BY

Designed: MJM
Drawn: SDM
Checked: MJM

MICHAEL MILLER PLANNING ASSOCIATES, INC.
7522 Wiles Rd. Suite B-203
Coral Springs, Florida 33067
Tel. (954) 757-9909 Fax: (954) 757-7089

PREPARED FOR
TOWN OF PEMBROKE PARK

FUTURE LAND USE MAP 2015-2030

FUTURE LAND USE MAP 09/23/16
SCALE 1" = 500'
PROJECT 2032
SHEET NO. 1 / 1

APPENDIX B

Ground-Level Photographs

Photo 1: WL-1 White mangrove fringe looking north in the Hollywood Canal.

Photo 2: Swale-1 a wet drainage swale located east of I-95 and south of Hallandale Beach Boulevad.

Photo 3: Swale-2 a wet drainage swale with *Bacopa monieri* located to the east of I-95 and north of Hallandale Beach Boulevard.

Photo 4: Swale-3 on the west side of I-95 between Pembroke Road and Hallandale Beach Boulevard.

Photo 5: Swale-4 with bald cypress at the north project limit, east of I-95, south of Johnson Street.

Photo 6: OSW-1 – Porton of the stormwater retention pond within Park Lake Estates within the 500' buffer.

Photo 7: OSW-2 – Stormwater retention pond within Ro-Len Lakes Gardens (typical).

Photo 8: OSW-3 – Stormwater retention pond within residential community and Hallandale Elementary School (typical).

Photo 9: OSW-4 – Portion of the stormwater retention pond within the 500' buffer between Hallandale Beach Blvd. and SW 3rd Street.

Photo 10: OSW-5 – Portion of the stormwater retention pond within the 500' buffer within Green Acres Village.

Photo 11: OSW-6 – Stormwater retention pond within Lakeside Business Park (typical).

Photo 12: OSW-7 – Stormwater retention area within the Orangebrook Golf and Country Club.

Photo 13: OSW-8 – Retention area that is along the east side of Orangebrook Golf and Country Club.

Photo 14: OSW-9 – Portion of the Hollywood Canal south of Hollywood Boulevard.

Photo 15: OSW-10 – Portion of the stormwater retention area within the 500 ft. buffer east of I-95 between Johnson and Lincoln Streets.

Photo 16: OSW-11 – Stormwater retention area within the former Sunset Golf Course (typical).

Photo 17: OSW-12 – Portion of the C-10/Canal towards the north end of the project.

APPENDIX C

Agency Coordination

Lena Åkesson

From: Jenna santangelo <js@cecosenvironmental.com>
Sent: Thursday, August 10, 2017 11:00 AM
To: Mark Clark
Cc: Wendy Cyriacks
Subject: Hollywood Canal Benthic Review

Mark,

This morning I spoke with Amanda West from FWC Alligator & Croc Management Program (863-462-0016). She said a croc was sighted 3 years ago north of the bridge near the skating ramps. She also said if we were conducting daytime diving we should be ok, as long as the animals were 6' or less in size. She also suggested having a spotter, so if we do that we may need to tie a line to someone's hand so we can tug if a gator/croc is spotted. She said they'd usually surface if they heard noise.

Thanks,

JENNA SANTANGELO | Senior Environmental Scientist

Cyriacks Environmental Consulting Services, Inc.
3001 Southwest 15th Street | Suite B | Deerfield Beach, Florida 33442
T: 954.571.0290 | **M:** 561.427.9308

7850 Northwest 146th Street | Suite 510 | Miami Lakes, Florida 33016
T: 305.509.6550

Lena Åkesson

From: Florida Fish and Wildlife Conservation Commission <fwc@mycusthelp.net>
Sent: Tuesday, January 05, 2021 1:56 PM
To: ah@cecosenvironmental.com
Subject: Ask FWC Article Updated:: W130087-010521

--- Please respond above this line ---

Thank you for contacting AskFWC. My name is Ryan Ford and I am the Crocodile Response Coordinator with FWC. There have been a total of 10 crocodile sightings in Broward county in 2020. Of those only 2 sightings were within Hollywood FL.

Please feel free to message me for further inquiries on this.

ryan.ford@myfwc.com

The knowledge base article that you are subscribed to has been modified.

Update Date: 1/5/2021

Summary: [SUMMARY]

Question: [QUESTION]

Click here to view the answer in your browser.

Florida Bonneted Bat Coordination Meeting Minutes

I-95 Project Development and Environment Study
From: South of Hallandale Beach Boulevard
To: North of Hollywood Boulevard
FM: 436903-1-22-02
Broward County

On July 14, 2021 a coordination video conference was held between representatives of the US Fish and Wildlife Service (USFWS), Florida Department of Transportation (FDOT) and Cyriacks Environmental Consulting Services, Inc (CECOS) for the above referenced project. This Project Development and Environment (PD&E) Study is approximately three miles long and its purpose is to evaluate alternatives for the ultimate improvements to the I-95 Interchanges at Hallandale Beach Boulevard, Pembroke Road, and Hollywood Boulevard. The following people attended:

Name	Affiliation	E-Mail	Phone
John Wrublik	USFWS	john_wrublik@fws.gov	772-469-4282
Sandra Sneckenberger	USFWS	sandra_sneckenberger@fws.gov	772-469-4282
Ann Broadwell	FDOT	Ann.Broadwell@dot.state.fl.us	954-777-4325
Molly Winn	FDOT	Molly.Winn@dot.state.fl.us	954-777-4245
Fernando Ascanio	FDOT	Fernando.Ascanio@dot.state.fl.us	954-777-4247
Mark Clark	CECOS	mc@cecosenvironmental.com	954-571-0290

Mark started the meeting by providing a brief overview of the project as described above. In particular, this section of Broward County contains established landscaping along the I-95 mainline as well as the three cross streets (Hallandale Beach Boulevard, Pembroke Road, and Hollywood Boulevard). There are no natural areas within the project limits so existing vegetation is landscape material. Two open areas exist, the Orangebrook Golf Course and the City of Hollywood's vacant parcel (previously the privately-owned Sunset Golf Course). Orangebrook Golf Course will not be impacted by the project and the City's vacant parcel may support a future pond (location to be determined). There are tall trees and palms scattered throughout the corridor; some of which will be impacted by the project. The bullet list below represents a summary of the discussion items.

- Mark stated construction is not scheduled for a minimum of five years. Therefore survey results obtained at this time would be obsolete prior to construction. Therefore, the FDOT committed to perform an acoustic survey during design and requested USFWS concurrence on a *May Affect, Not Likely to Adversely Affect (MANLAA)* determination based on that commitment as well as a commitment to avoid impacts to qualifying landscape trees/palms to the greatest extent practical.
- John stated the USFWS cannot issue a concurrence based on only the above commitments.
- Sandra stated the results of a FBB roost and/or acoustic survey are valid for one year and she confirmed FBBs were documented within six miles of the project.
- Mark stated the FBB key was used to initially screen the project. However, one could not progress in the key beyond the third couplet; which requires a full acoustic/roost survey for projects greater than five acres (which applies to this project). However, if survey results are valid for only one year, then the results of the PD&E survey would be obsolete further into design.
- John and Sandra concurred that concurrence on a *No Effect* determination is not appropriate because the potentially impacted trees will not likely be removed within one year after completion of the roost survey.
- Sandra confirmed that this project can work outside the FBB key because it is located within the South Florida Urban Bat Area.

- Mark confirmed that, at this time, existing bridges will either be widened and/or left in-place, and new bridges added. No existing bridges will be removed. During a review of those bridges, no evidence of bat use (chirping, guano, stained concrete, and odor) were observed/smelled.
- Sandra mentioned that the FBB requires a minimum of 12 feet in height to drop and begin flight.
- The meeting attendees concurred on the dimensions of trees/palms that qualify as potential roosting habitat. Specifically, trees a minimum of 15 feet in height and a minimum of eight inches or greater Diameter Breast Height (DBH) qualify as potential roosting habitat. Note that the 15 foot minimum tree height must be roostable (i.e., display sufficient trunk width to support a bat cavity). Similarly, qualifying palm trees must exhibit a minimum height of 20 foot clear trunk; with that trunk wide enough to support a FBB cavity.
- Ann stated FDOT commits to conduct a roost survey during the current PD&E Study and to report the results of that survey in the Study's Natural Resource Evaluation Report (NRE). The FDOT will then perform a follow-up acoustic/roost survey during design (choice of survey dependent upon the results of the PD&E survey).
- Ann re-stated the purpose of the video conference was to develop a plan to continue with FDOT's PD&E process while concurrently working with USFWS on its concurrence with FDOT's determination of effect; which was proposed to be *MANLAA*. A *MANLAA* determination was selected as the proposed effect because FBB were documented within six miles of the project corridor and the tree/palms will not likely be removed before the PD&E survey results expire
- John and Sandra concurred if the results of the PD&E tree/palm survey indicate that no roosts were found, the USFWS could concur with a *MANLAA with Best Management Practices (BMPs)* determination of effect for this PD&E Study/NRE. The BMP proposed is to perform an acoustic and/or roosting survey during design and/or prior to construction beginning.

Action Items:

- FDOT to perform a tree/palm roosting survey of those qualifying trees/palms per the criteria specified in the meeting summary.
- FDOT will include the tree/palm survey results in the NRE as well as a Determination of Effect. Should no bat roosts be observed, the determination of effect proposed is *MANLAA with BMPs*. The NRE will then be submitted to USFWS for review/concurrence.

Action Items (pursuant to post-meeting coordination with USFWS):

- Review Appendix C of the FBB Consultation Guidelines (Limited Roost Surveys) and Appendix D (BMPs) then discuss appropriate roost survey work following completion of the tree inventory. Coordination is required as modifications to the methodologies may be needed due to this project's size.
- Continue coordination with USFWS regarding BMPs to ensure all stakeholders' understandings are the same.
- Concurrence for a MANLAA determination may require additional BMPs as more project information becomes available.

This document is the writer's understanding of the topics and items discussed during the meeting. Any revisions to the items discussed should be sent to Mark Clark. If no revisions or comments are received by July 28, 2021, the meeting summary will be considered final and accepted as distributed.

Prepared By: *Mark Clark*
Date Prepared: *07/14/2021*

CC: *Attendees (via email)*
Kenzot Jasmin, FDOT
Ryan Solis-Rios, Corradino
Wendy Cyriacks, CECOS

From: Ascanio, Fernando
To: Winn, Molly
Cc: Mark Clark
Subject: FW: [EXTERNAL] Completed: Please DocuSign: FM No. 436903-1 Bonneted Bat Concurrence Request Letters
Date: Monday, April 26, 2021 7:05:09 AM

Molly,

Below please see email from John responding to our request for concurrence.

Thanks,
Fernando

Fernando Ascanio
Senior Environmental Specialist
District Four – PLEMO
3400 West Commercial Blvd
Fort Lauderdale, Florida 33309
Office: (954)777-4664
Mobile: (954) 260-7522

From: Wrublik, John <john_wrublik@fws.gov>
Sent: Wednesday, April 14, 2021 8:53 AM
To: Ascanio, Fernando <Fernando.Ascanio@dot.state.fl.us>
Cc: Sneckenberger, Sandra <sandra_sneckenberger@fws.gov>
Subject: Re: [EXTERNAL] Completed: Please DocuSign: FM No. 436903-1 Bonneted Bat Concurrence Request Letters

Fernando,

I talked to Sandra Sneckenberger (our office lead for the Florida bonneted bat) regarding your project. She indicated that due to the number of trees involved, acoustic surveys should be conducted for your project, but they are only needed for areas of trees that are at least 25 feet in height and have a DBH of 8 inches. She said she would be happy to talk to you or your consultant further to help pinpoint where the acoustic surveys should be conducted.

John

John M. Wrublik
U.S. Fish and Wildlife Service
1339 20th Street
Vero Beach, Florida 32960
Office: (772) 469-4282

Fax: (772) 562-4288
email: John_Wrublik@fws.gov

From: DocuSign System <dse_na2@docusign.net> on behalf of Fernando Ascanio via DocuSign <dse_na2@docusign.net>
Sent: Monday, April 12, 2021 1:47 PM
To: Wrublik, John <john_wrublik@fws.gov>
Subject: [EXTERNAL] Completed: Please DocuSign: FM No. 436903-1 Bonneted Bat Concurrence Request Letters

Your document has been completed

VIEW COMPLETED DOCUMENTS

Fernando Ascanio
Fernando.Ascanio@dot.state.fl.us

All parties have completed their review of the attached document routed through the FDOT DocuSign account. Copies are attached, for those who need to retain copies. Otherwise, please disregard this email. Please DocuSign: FM No. 436903-1 Bonneted Bat Concurrence Request Letters.

Hi John,
For your review and concurrence.
Thank you,

Powered by 

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Florida Department of Transportation

RON DESANTIS
GOVERNOR

3400 West Commercial Boulevard
Fort Lauderdale, Florida 33309

KEVIN J. THIBAULT, P.E.
SECRETARY

April 6, 2021

Mr. John Wrublik
United States Fish and Wildlife Service
South Florida Ecological Services Office
1339 20th Street
Vero Beach, FL 32960

john_wrublik@fws.gov

Subject: Florida Bonneted Bat Coordination
I-95 Project Development and Environment Study
From South of Hallandale Beach Boulevard (SR 858) to
North of Hollywood Boulevard (SR 820)
Broward County, Florida
FPID No. 436903-1-22-02
ETDM No. 14254

Dear Mr. Wrublik:

The Florida bonneted bat (*Eumops floridanus*, FBB) was federally designated as an endangered species by the USFWS and therefore protected by the Endangered Species Act, as amended (*16 U.S. Code (U.S.C.) 1531-1544, 87 Stat. 884*). Based on availability of potential roosting and foraging habitat, and the project's size being greater than five acres, coordination with USFWS regarding this species is requested.

Project Description

The Florida Department of Transportation (FDOT) District Four is conducting a Project Development and Environment (PD&E) Study for Interstate 95 (I-95) from south of Hallandale Beach Boulevard (SR 858) to north of Hollywood Boulevard (SR 820), a distance of approximately three miles (*see* Figure 1.1). The PD&E Study is proposing improvements to the Hallandale Beach Boulevard, Pembroke Road, and Hollywood Boulevard interchanges. The project is located in Broward County, Florida and is contained within the municipalities of Hallandale Beach, Pembroke Park, and Hollywood. The project is located within a completely urban/developed area as shown in the land use map included as Attachment A and aerial photographs of the corridor included as Attachment B.

I-95 is the primary north-south interstate facility that links all major cities along the Atlantic Seaboard and is one of the most important transportation systems in southeast Florida. I-95 is one of the two major expressways, Florida's Turnpike being the other that connects major employment centers and residential areas within the south Florida tri-county area. I-95 is part of the State's Strategic Intermodal System (SIS) and the National Highway System. In addition, I-95 is designated as an evacuation route along the east coast of Florida.

I-95, within the project limits, currently consists of eight general use lanes (four in each direction) and four dynamically tolled express lanes (two in each direction). There are three existing full interchanges within the project limits located at Hallandale Beach Boulevard, Pembroke Road, and Hollywood Boulevard. Hallandale Beach Boulevard consists of four lanes west of I-95 and six lanes east of I-95. Pembroke Road and Hollywood Boulevard each have six lanes west of I-95 and four lanes east of I-95.

The FDOT is evaluating the potential modification of existing entrance and exit ramps serving the three interchanges within the project limits. Widening and turn lane modifications will be evaluated along Hallandale Beach Boulevard, Pembroke Road, and Hollywood Boulevard to facilitate the ramp modifications and improve the access and operation of the corridors upstream and downstream from the interchanges.

Preliminary Data Collection

A comprehensive literature and Geographic Information System (GIS) database search was conducted for the Florida bonneted bat. The literature and database search included current South Florida Water Management Land Use Land Cover spatial data, 2019 US. Fish and Wildlife Service (USFWS) FBB Consultation Area spatial data, 2019 USFWS Consultation Key for the Florida Bonneted Bat, Designated Critical Habitat for the Florida Bonneted Bat, and current aerial imagery. Based on this data collection effort:

- The project falls within the USFWS FBB Consultation Area (CA)
- The project falls within the South Florida Urban Bat Area
- The project does not fall within FBB proposed Critical Habitat (per Federal Register, 50 CFR, Part 17 there is no critical habitat in Broward County) and,
- Potential foraging and roosting habitat was identified within, and adjacent to the corridor; however, the corridor is completely developed with urban infrastructure.

Field Data Collection/Results

Throughout the urban, developed corridor, a combination of aerial interpretation, windshield surveys and pedestrian transects were used to conduct the field review to determine potential roosting habitat. Areas proposed for landscape impacts and those proposed for landscape impacts due to pond installation were reviewed during daylight hours (between 11:00 am to 4:00 pm). Temperature was approximately 80^0 F and weather conditions were partly cloudy/sunny.

There are numerous (100+) tall (20-25 ft. +) trees and palms located within the proposed impact areas. The majority of these tall palms were royal palms, date palms, and cabbage palms and the majority of the tall trees were cypress. These trees and palms were typically located throughout the project corridor directly adjacent to the existing highway (I-95) or urban arterials (Hollywood Boulevard, Pembroke Road, and Hallandale Beach Boulevard) and not consolidated in hammocks or forests. All of the palms/trees within the impact areas appear to be landscape material and not natural areas. Typical photos of these palms/trees are included as Attachment C. Some of these palms/trees were visually scanned and/or scanned using binoculars and cavities were not observed. Note that peep or acoustical surveys were not performed.

The three existing bridges proposed for widening were reviewed for presence of chirping (non-meter) and bat guano. Neither of these indicators was heard/observed. Bats were not observed during the field review.

Discussion

Per the FBB Guidelines, dated October 22, 2019, suitable foraging habitat that provides drinking water and prey base can be found within golf courses, parking lots, and parks; all of which are present within or adjacent to the corridor. Per these guidelines, potential roosting habitat can consist of forests or other tall mature trees or other areas with

suitable roost structures (utility poles, artificial structures, for example). As related to this project, “forest” can be defined as royal palm hammocks and cypress forests.

As previously mentioned, the project location was identified within the FBB consultation area, as well as the more restrictive South Florida Urban Bat Area. Based on the presence of bridges and tall landscape trees within the project corridor, potential FBB roosting habitat could exist. The two largest open areas adjacent to the corridor are the Orangebrook Golf Course and the former Sunset Golf Course. Minor impacts to Orangebrook/City-owned property are proposed, directly adjacent to Hollywood Boulevard and Pembroke Road. While a pond is proposed in the former Sunset Golf Course at this time, it will not encompass the entire parcel. The specific location of the proposed pond will be determined during final design. Individual or communal roosting was not observed during the field review. However, peep or acoustical surveys were not performed. For the Natural Resource Evaluation Report (NRE), a determination of effect could not be made without coordination with USFWS.

As the extent of landscape impacts is not known at this time, it was assumed all trees within proposed impact areas (landscape areas, ponds, and buildings) will be removed. In addition to the landscape impacts, several commercial and some residential buildings will also be removed for pond installation; but the extent of total building loss is not known at this time.

At this time, the FDOT requests to coordinate with your office as to whether roosting habitat is sufficiently available to warrant an acoustical survey, based on current corridor/site conditions, or if a *May Affect, Not Likely to Adversely Affect-P* determination is appropriate for the FBB. The FDOT commits to review the corridor during final design once the landscape, pond, and building impacts are further redefined.

If you have any questions, please do not hesitate to call me at (954) 777-4665 or via email at fernando.ascanio@dot.state.fl.us.

Sincerely,

DocuSigned by:
Fernando Ascanio
3B218C692E7F49A...

Fernando Ascanio
Senior Environmental Specialist
FDOT, District Four

Cc: Kenzot Jasmin, FDOT
Ann Broadwell, FDOT
Molly Winn, FDOT
Ryan Solis-Rios, Corradino

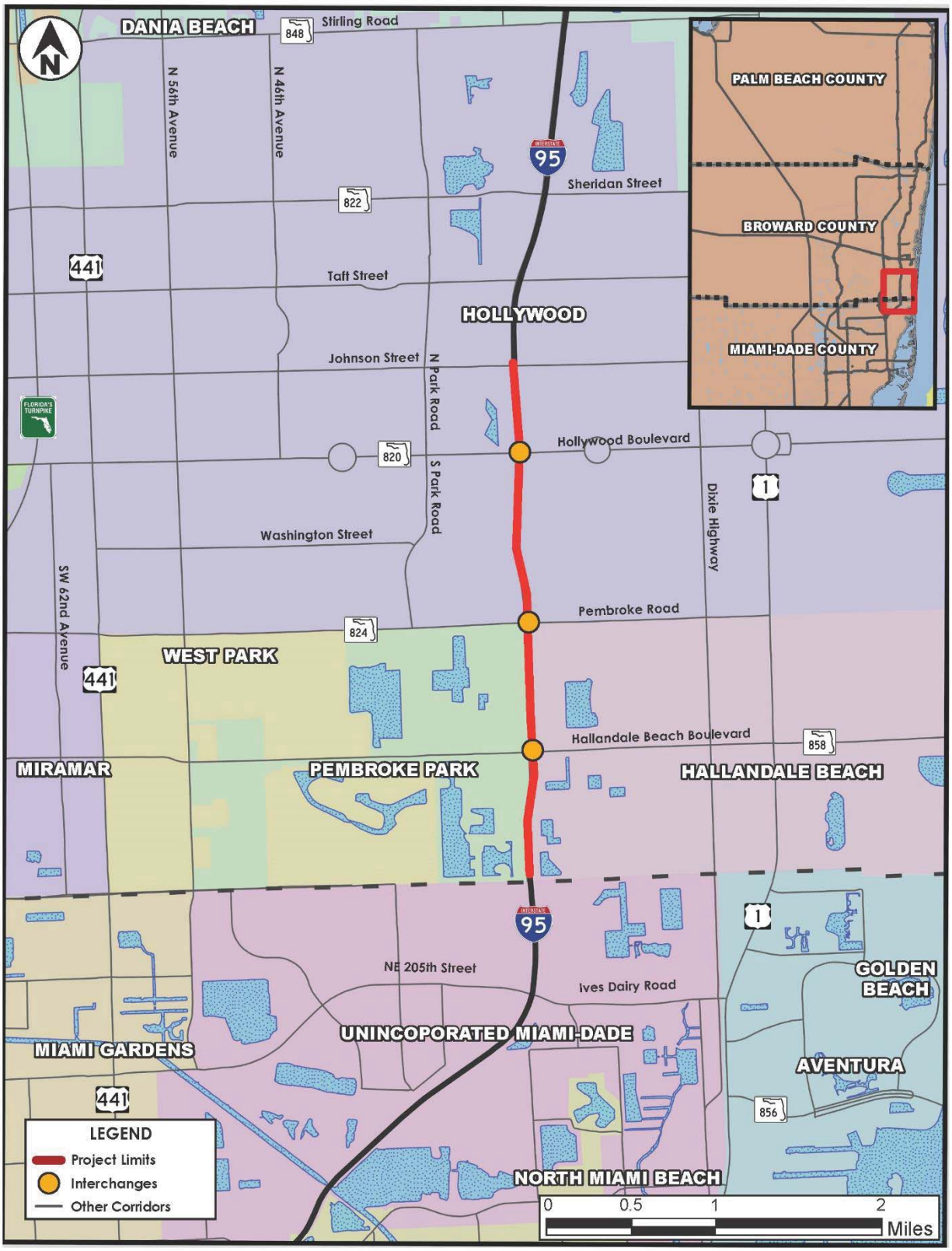
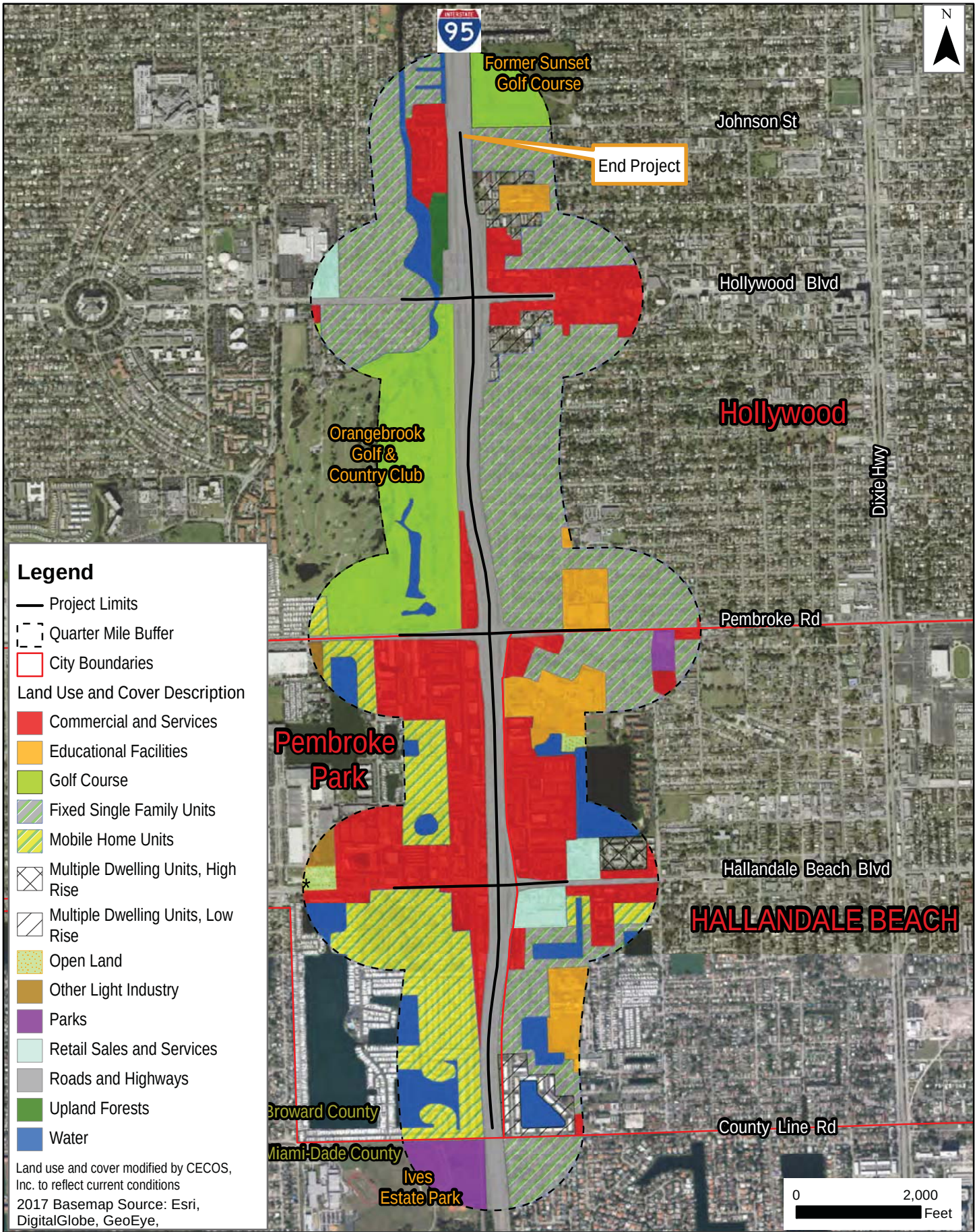


Figure 1.1 - Project Location Map

ATTACHMENT A:

Land Use Map



FDOT

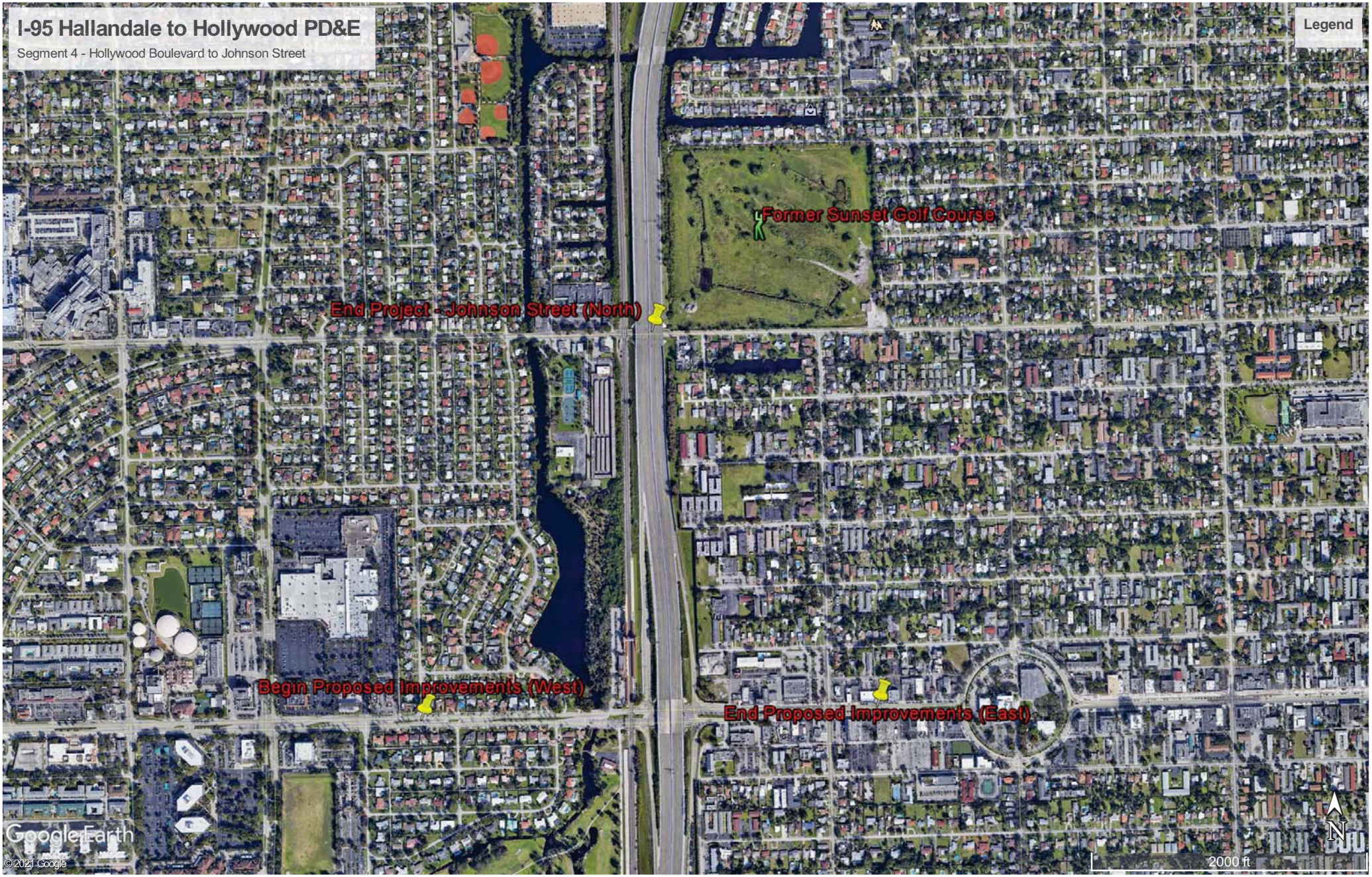
SR9/I-95 from South of SR858/Hallandale Beach Blvd. to North of SR820/Hollywood Blvd. PD&E Study
Broward County

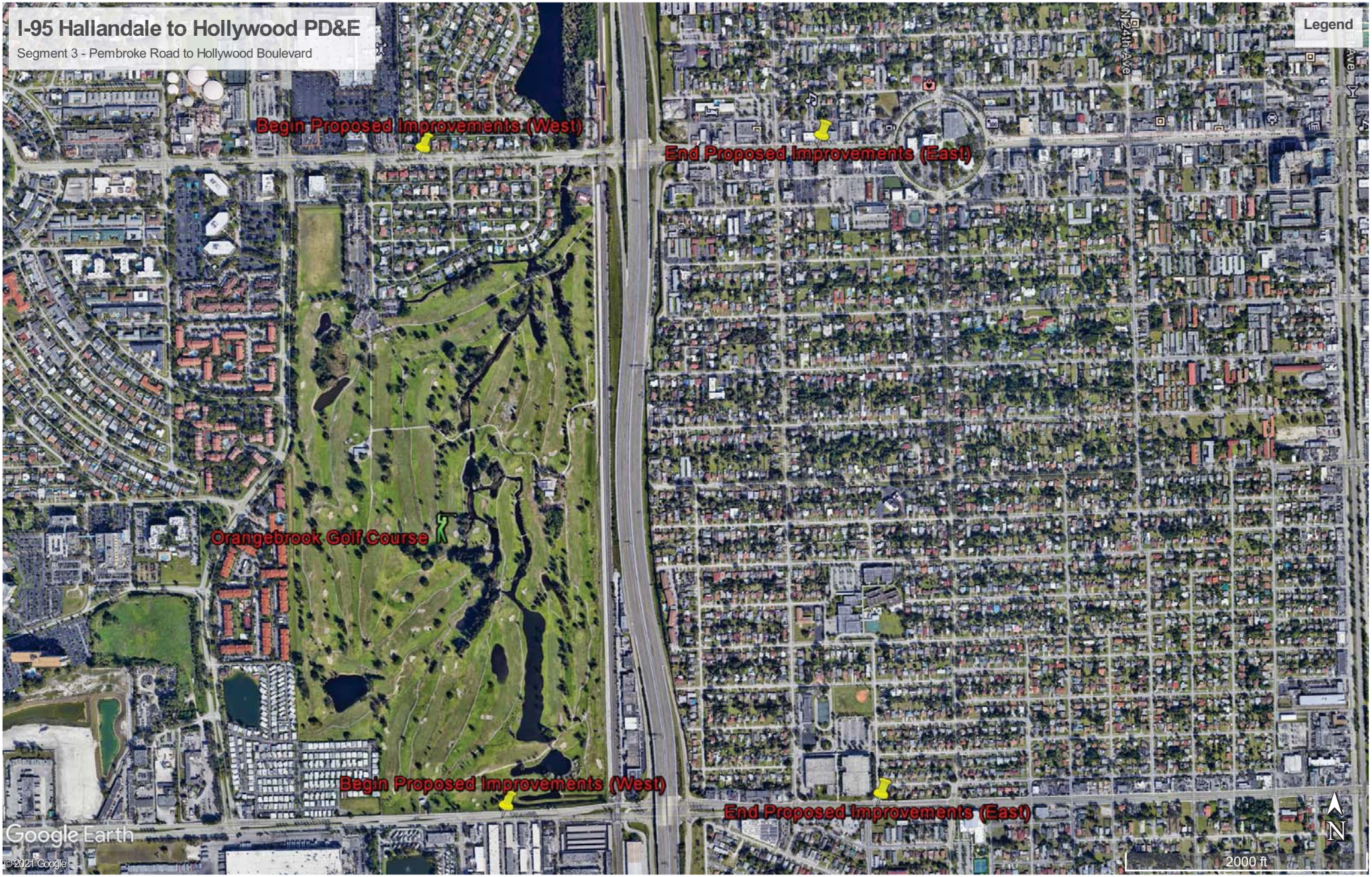
Land Use and Cover Map
Source: SFWMD & FDOT (2015)

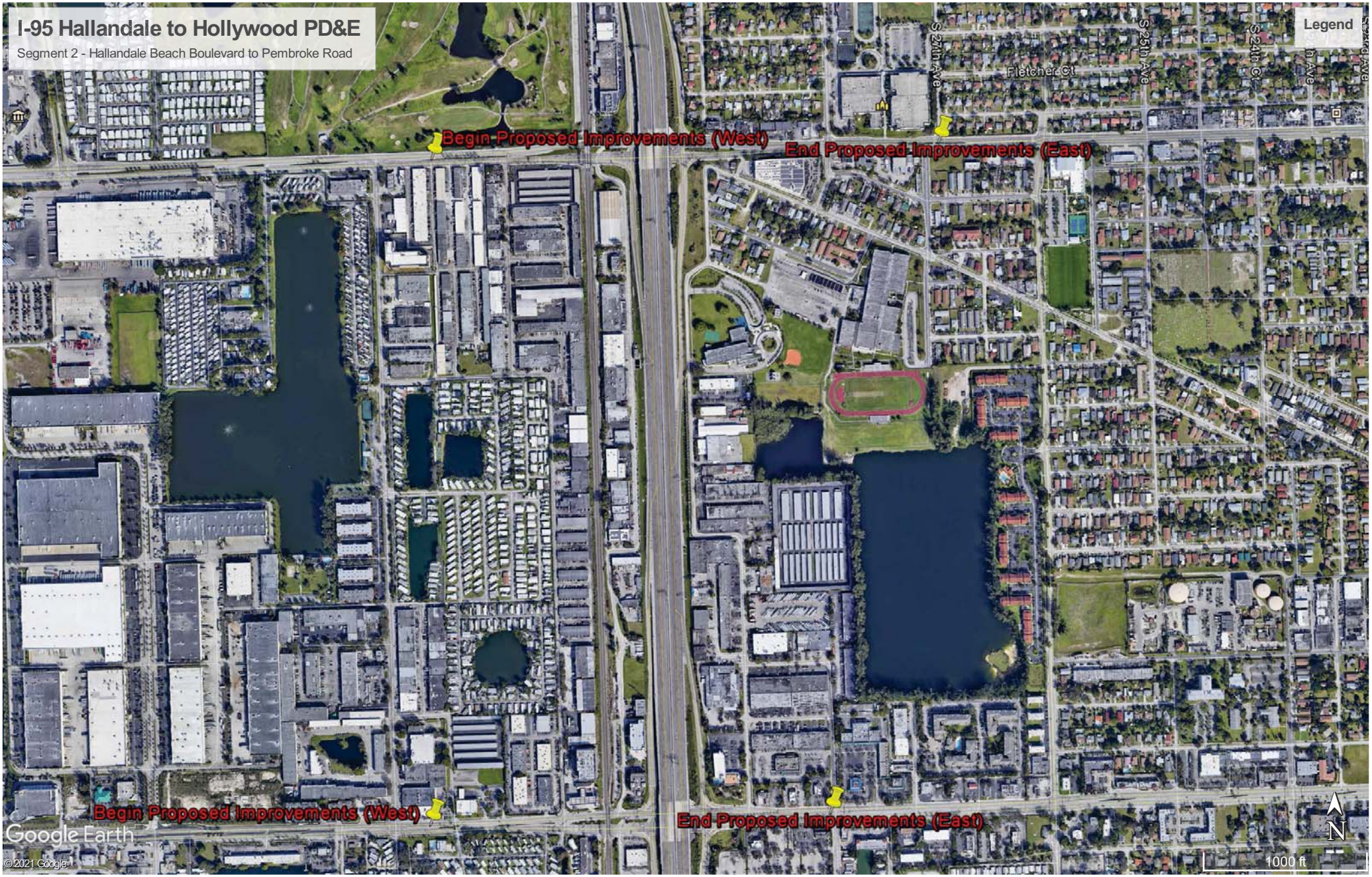
Figure 4.4
Date Prepared: 12/28/2020

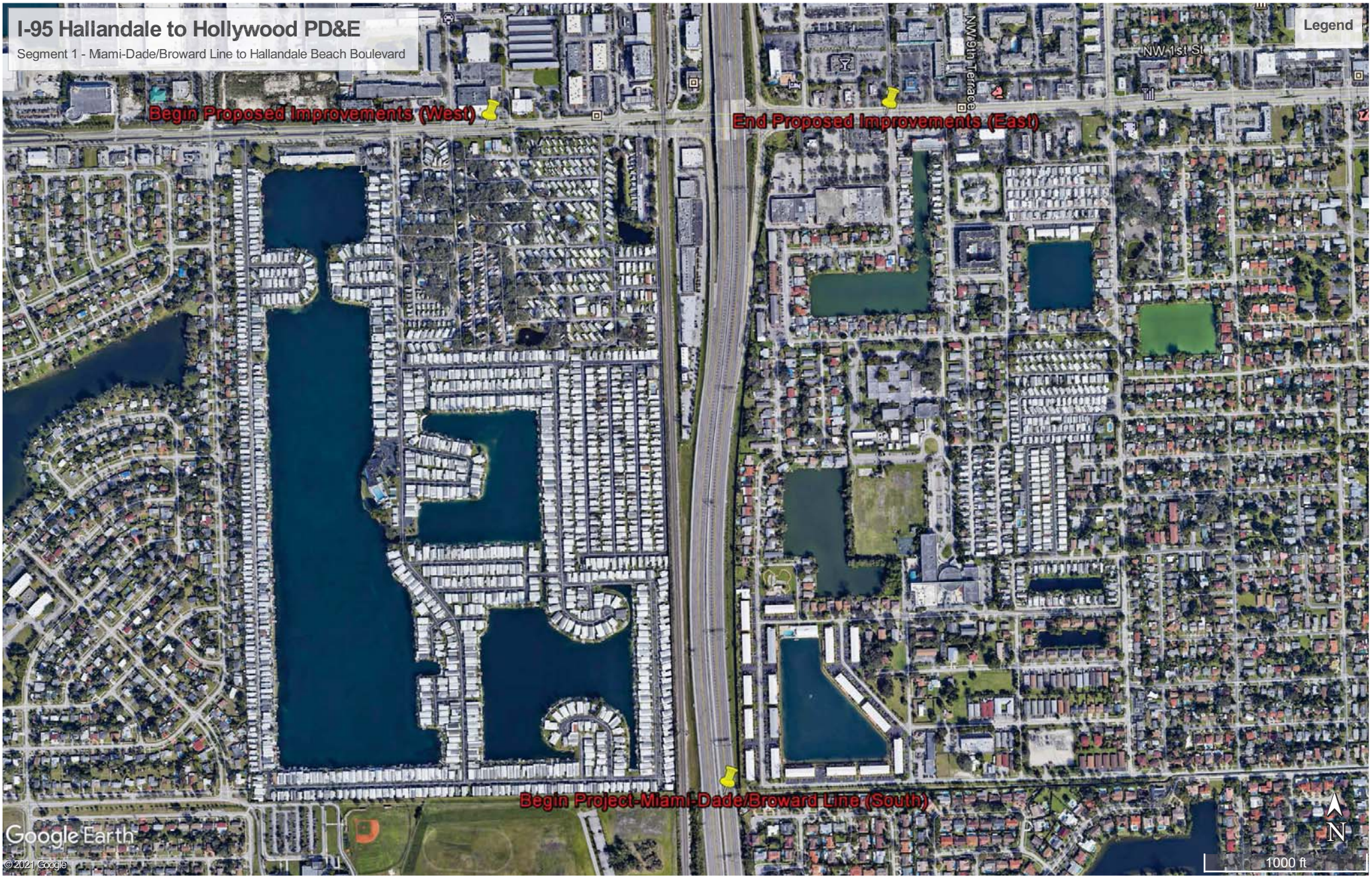
ATTACHMENT B:

Aerials of the Project Corridor


I-95 Hallandale to Hollywood PD&E
Segment 4 - Hollywood Boulevard to Johnson Street
Legend
Former Sunset Golf Course
End Project - Johnson Street (North)
Begin Proposed Improvements (West)
End Proposed Improvements (East)
Google Earth
© 2021 Google
N
2000 ft


I-95 Hallandale to Hollywood PD&E
Segment 3 - Pembroke Road to Hollywood Boulevard
Legend
Begin Proposed Improvements (West)
End Proposed Improvements (East)
Orangebrook Golf Course
Begin Proposed Improvements (West)
End Proposed Improvements (East)
N 24th Ave
Google Earth
©2021 Google
N
2000 ft


I-95 Hallandale to Hollywood PD&E
Segment 2 - Hallandale Beach Boulevard to Pembroke Road
Legend
Begin Proposed Improvements (West)
End Proposed Improvements (East)
S 27th Ave
Fletcher Ct
S 25th Ave
S 24th Ct
Begin Proposed Improvements (West)
End Proposed Improvements (East)
Google Earth
©2021 Google
N
1000 ft


I-95 Hallandale to Hollywood PD&E
Segment 1 - Miami-Dade/Broward Line to Hallandale Beach Boulevard
Legend
Begin Proposed Improvements (West)
End Proposed Improvements (East)
Begin Project-Miami-Dade/Broward Line (South)
NW 9th Terrace
NW 1st St
Google Earth
© 2021 Google
N
1000 ft

ATTACHMENT C:

Typical Photos of Landscape Palms/Trees

Photo 1: Typical royal palms (25 ft. +) adjacent to I-95 off-ramp.

Photo 2: Typical tall trees (Black olives, royal palms) adjacent to I-95 on-ramp.

Photo 3: Cypress trees (25 ft. +) adjacent to I-95.

APPENDIX D

Listed Species Information

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

---

[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
August 12, 2013

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

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

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

POSTER INFORMATION

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

DESCRIPTION: The eastern indigo snake is one of the largest non-venomous snakes in North America, with individuals often reaching up to 8 feet in length. They derive their name from the glossy, blue-black color of their scales above and uniformly slate blue below. Frequently, they have orange to coral reddish coloration in the throat area, yet some specimens have been reported to only have cream coloration on the throat. These snakes are not typically aggressive and will attempt to crawl away when disturbed. Though indigo snakes rarely bite, they should NOT be handled.

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

LIFE HISTORY: The eastern indigo snake occurs in a wide variety of terrestrial habitat types throughout Florida. Although they have a preference for uplands, they also utilize some wetlands

and agricultural areas. Eastern indigo snakes will often seek shelter inside gopher tortoise burrows and other below- and above-ground refugia, such as other animal burrows, stumps, roots, and debris piles. Females may lay from 4 - 12 white eggs as early as April through June, with young hatching in late July through October.

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

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

IF YOU SEE A <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.
- Immediately notify supervisor or the applicant's designated agent, **and** the appropriate USFWS office, with the location information and condition of the snake.
- If the snake is located in a vicinity where continuation of the clearing or construction activities will cause harm to the snake, the activities must halt until such time that a representative of the USFWS returns the call (within one day) with further guidance as to when activities may resume.

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

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

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

North Florida Field Office – (904) 731-3336
Panama City Field Office – (850) 769-0552
South Florida Field Office – (772) 562-3909

PRE-CONSTRUCTION ACTIVITIES

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

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

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

DURING CONSTRUCTION ACTIVITIES

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

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

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

POST CONSTRUCTION ACTIVITIES

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

ATTENTION:

THREATENED EASTERN INDIGO SNAKES MAY BE PRESENT ON THIS SITE!!!

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

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

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

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

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

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

DESCRIPTION: The eastern indigo snake is one of the largest non-venomous snakes in North America, with individuals often reaching up to 8 feet in length. They derive their name from the glossy, blue-black color of their scales above and uniformly slate blue below. Frequently, they have orange to coral reddish coloration in the throat area, yet some specimens have been reported to only have cream coloration on the throat. These snakes are not typically aggressive and will attempt to crawl away when disturbed. Though indigo snakes rarely bite, they should NOT be handled.

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

LIFE HISTORY: The eastern indigo snake occurs in a wide variety of terrestrial habitat types throughout Florida. Although they have a preference for uplands, they also utilize some wetlands and agricultural areas. Eastern indigo snakes will often seek shelter inside gopher tortoise burrows and other below- and above-ground refugia, such as other animal burrows, stumps, roots, and debris piles. Females may lay from 4 - 12 white eggs as early as April through June, with young hatching in late July through October.

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

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

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

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

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

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

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

North Florida ES Office – (904) 731-3336
Panama City ES Office – (850) 769-0552
South Florida ES Office – (772) 562-3909

DESCRIPTION: The eastern indigo snake is one of the largest non-venomous snakes in North America, with individuals often reaching up to 8 feet in length. They derive their name from the glossy, blue-black color of their scales above and uniformly slate blue below. Frequently, they have orange to coral reddish coloration in the throat area, yet some specimens have been reported to only have cream coloration on the throat. These snakes are not typically aggressive and will attempt to crawl away when disturbed. Though indigo snakes rarely bite, they should NOT be handled.

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

LIFE HISTORY: The eastern indigo snake occurs in a wide variety of terrestrial habitat types throughout Florida. Although they have a preference for uplands, they also utilize some wetlands and agricultural areas. Eastern indigo snakes will often seek shelter inside gopher tortoise burrows and other below- and above-ground refugia, such as other animal burrows, stumps, roots, and debris piles. Females may lay from 4 - 12 white eggs as early as April through June, with young hatching in late July through October.

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

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.

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

August 12, 2013

ATTENTION:

THREATENED EASTERN INDIGO SNAKES MAY BE PRESENT ON THIS SITE!!!

Please read the following information provided by the U.S. Fish and Wildlife Service to become familiar with standard protection measures for the eastern indigo snake.

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

United States Department of the Interior

FISH AND WILDLIFE SERVICE
South Florida Ecological Services Office
1339 20th Street
Vero Beach, Florida 32960
October 22, 2019

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

Subject: Consultation Key for the Florida bonneted bat; 04EF2000-2014-I-0320-R001

Dear Mr. Zinszer:

This letter replaces the December 2013, Florida bonneted bat guidelines provided to the U.S. Army Corps of Engineers (Corps) to assist your agency with effect determinations within the range of the Florida bonneted bat (*Eumops floridanus*). This October 2019 revision supersedes all prior versions. The enclosed *Florida Bonneted Bat Consultation Guidelines* and incorporated *Florida Bonneted Bat Consultation Key* (Key) are provided pursuant to the U.S. Fish and Wildlife Service's (Service) authorities under the Endangered Species Act of 1973, as amended (Act) (87 Stat. 884; 16 U.S.C.1531 *et seq.*). This letter, guidelines, and Key have been assigned Service Consultation Code: 41420- 04EF2000-2014-I-0320-R001.

The purpose of the guidelines and Key is to aid the Corps (or other Federal action agency) in making appropriate effect determinations for the Florida bonneted bat under section 7 of the Act, and streamline informal consultation with the Service for the Florida bonneted bat when the proposed action is consistent with the Key. 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, applicants do not wish to implement the identified survey or best management practices, or if there is new biological information about the species. In these cases, we recommend the Corps (or other Federal action agency) initiate traditional consultation pursuant to section 7 of the Act, and identify that consultation is being requested outside of the Key.

This Key uses type of habitat (*i.e*, roosting or foraging), survey results, and project size as the basis for making determinations of "may affect, but is not likely to adversely affect" (MANLAA) and "may affect, and is likely to adversely affect" (LAA). The Key is structured to focus on the type(s) of habitat that will be affected by a project. When proposed project areas provide features that could support roosting of Florida bonneted bats, it is considered roosting habitat. If evaluation of roosting habitat determines that roosting is not likely, then the area is subsequently evaluated for its value to the species as foraging habitat.

Roosting habitat

The guidelines describe the features of roosting habitat. When a project is proposed in roosting habitat, the likelihood that roosting is occurring is evaluated through surveys (*i.e.*, full acoustic or limited roost). When a roost is expected and the proposed activity will affect that roost, formal consultation is required. This is because the proposed activity is expected to take individuals through the destruction of the roost and the appropriate determination is that the project may affect, and is likely to adversely affect (LAA) the species. When roosting is expected, but all impacts to the roost can be avoided, and only foraging habitat (without roost structure) will be affected, the Service finds that it is reasonable to conclude that the proposed action is not likely to impair feeding, breeding, or sheltering. Thus, the proposed project may affect, but is not likely to affect the Florida bonneted bat (MANLAA).

The exception to this logic path is if the proposed action will affect more than 50 acres of foraging habitat in proximity to the roost. Under this scenario, we anticipate that the loss of the larger amount of foraging habitat near the roost could significantly impair feeding of young and overall breeding (*i.e.*, LAA). Consequently, these projects would require formal consultation to analyze the effect of the incidental take.

If the roost surveys demonstrate that roosting is not likely, the project is then evaluated for its effects to foraging habitat. Our evaluation of these actions is described below. The exception is for projects less than or equal to 5 acres if a limited roost survey is conducted. Limited roost surveys rely on peeping and visual surveys to determine whether roosting is likely. On these small projects, this survey strategy is believed to be more economical and is considered a reasonable effort to evaluate the potential for roosting. The Service acknowledges that this approach is less reliable in evaluating the likelihood of roosting when it is not combined with acoustic surveys. Therefore, when limited roost surveys are conducted for projects that are less than or equal to 5 acres in size and the determination is that roosting is not likely, we conclude that the proposed project may affect, but is not likely to adversely affect the species (MANLAA).

Foraging habitat

The guidelines describe the features of foraging habitat. Data informing the home range size of the Florida bonneted bats is limited. Global Positioning System (GPS) and radio-telemetry data for Florida bonneted bats documents that they move large distances and likely have large home ranges. Data from recovered GPS satellite tags on Florida bonneted bats tagged at Babcock-Webb Wildlife Management Area (BWWMA) found the maximum distance detected from a capture site was 24.2 mi (38.9 km); the greatest path length travelled in a single night was 56.3 mi (90.6 km) (Ober 2016; Webb 2018a-b). At BWWMA, researchers found that most individual locations were within one mile of the roost (point of capture) (Ober 2015). Additional data collected during the month of December documented the mean maximum distance Florida bonneted bats (n=8) with tags traveled from the roost was 9.5 mi (Webb 2018b).

The Service recognizes that the movement information comes from only one site (BWWMA and vicinity), and data are from small numbers (n=20) of tagged individuals for only short periods of time (Webb 2018a-b). We expect that across the Florida bonneted bat's range differences in

habitat quality, prey availability, and other factors will result in variable habitat use and home range sizes between locations. Foraging distances and home range sizes in high quality habitats are expected to be smaller while foraging distances and home range sizes in low quality habitat would be expected to be larger. Regardless, we use these studies as our best available information to evaluate when changes to foraging habitat may have an effect on the species ability to feed, breed, and shelter and subsequently result in incidental take. When considering where most of the nightly activity was observed, we calculate a foraging area centered on a roost with a 1 mile radius would include approximately 2,000 acres, and a foraging area centered on a 9.5 mile radius would encompass approximately 181,000 acres, on any given night.

Given the Service's limited understanding of how the Florida bonneted bat moves throughout its home range and selects foraging areas, we choose to use 50 acres of habitat as a conservative estimate to when loss of foraging habitat may affect the fitness of an individual to the extent that it would impair feeding and breeding. Projects that would remove, destroy or convert less than 50 acres of Florida bonneted bat foraging habitat are expected to result in a loss of foraging opportunities; however, this decrease is not expected to significantly impair the ability of the individual to feed and breed. Consequently, projects impacting less than 50 acres of foraging habitat that implement the identified best management practices in the Key would be expected to avoid take, and the appropriate determination is that the project may affect, but is not likely to adversely affect the species (MANLAA).

Next, the Service incorporated the level of bat activity into our Key to evaluate when a foraging area may have greater value to the species. When surveys document high bat activity, we deduce that this area has increased value and importance to the species. Thus, when high bat activity is detected in parcels with greater than 50 acres of foraging habitat, we anticipate that the loss, destruction, or conversion of this habitat could significantly impair the ability of an individual to feed and breed (*i.e.*, LAA); thus formal consultation is warranted.

If surveys do not indicate high bat activity, we anticipate that loss of this additional foraging habitat may affect, but is not likely to adversely affect the species (MANLAA). This is because although the acreage is large, the area does not appear to be important at the landscape scale of nightly foraging. Therefore, its loss is not anticipated to significantly impair the ability of an individual to feed or breed.

The exception to this approach is for projects greater than 50 acres when they occur in potential roosting habitat that is not found to support roosting or high bat activity. Under this scenario, the Service concludes that the loss of the large acreage of suitable roosting habitat has the potential to significantly impair the ability of an individual to breed or shelter (*i.e.*, LAA) because the species is cavities for roosting are expected to be limited range wide and the project will impair these limited opportunities for roosting.

Determinations

The Corps (or other Federal action agency) may reach one of several determinations when using this Key. Regardless of the determination, when acoustic bat surveys have been conducted, the Service requests that these survey results are provided to our office to increase our knowledge of

the species and improve our consultation process. Surveys results and reports should be transmitted to the Service at FBBsurveyreport@fws.gov or mail electronic file to U.S. Fish and Wildlife Service, Attention Florida bonneted bat surveys, 1339 20th Street, Vero Beach, Florida 32960. When formal consultation is requested, survey results and reports should be submitted with the consultation request to verobeach@fws.gov.

No effect: If the use of the Key results in a determination of "no effect," no further consultation is necessary with the Service. The Service recommends that the Corps (or other Federal action agency) documents the pathway used to reach the determination in the project record and proceeds with other species analyses as warranted.

May Affect, Not Likely to Adversely Affect (MANLAA): In this Key we have identified two ways that consultation can conclude informally, MANLAA-P and MANLAA-C.

> **MANLAA-P**: If the use of the Key results in a determination of "MANLAA- P," the Service 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 Florida bonneted bat. The Service recommends that the Corps (or other Federal action agency) documents the pathway used to reach the determination in the project record and proceeds with other species analyses as warranted.
>
> **MANLAA-C**: If the use of the Key results in a determination of MANLAA-C, further consultation with the Service is required to confirm that the Key has been used properly, and the Service concurs with the evaluation of the survey results. Survey results should be submitted with the consultation request.

May Affect, Likely to Adversely Affect (LAA) - When the determination in the Key is "LAA" technical assistance with the Service and modifications to the proposed action may enable the project to be reevaluated and conclude with a MANLAA-C determination. Under other circumstance, "LAA" determinations will require formal consultation.

Working with the Fish and Wildlife Foundation of Florida, the Service has established a fund to support conservation and recovery for the Florida bonneted bat. Any project that has the potential to affect the Florida bonneted bat 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 Florida bonneted bat recovery please contact Ashleigh Blackford, Connie Cassler, or José Rivera at 772-562-3909.

This revised Key is effective immediately upon receipt by the Corps. Should circumstances change or new information become available regarding the Florida bonneted bat and/or implementation of the Key, the determinations herein may be reconsidered and this Key further revised or amended. We have established an email address to collect comments on the Key and the survey protocols at: FBBguidelines@fws.gov.

Thank you for your continued cooperation in the effort to conserve fish and wildlife resources. If you have any questions regarding this Key, please contact the South Florida Ecological Services Office at 772-562-3909.

Sincerely,

Roxanna Hinzman
Field Supervisor
South Florida Ecological Services

Enclosure

Cc: electronic only
Corps, Jacksonville, Florida (Dale Beter, Muriel Blaisdell, Ingrid Gilbert, Alisa Zarbo, Melinda Charles-Hogan, Susan Kaynor, Krista Sabin, John Fellows)

LITERATURE CITED

Ober, H. 2015. Annual report to USFWS for calendar year 2015. Permit number TE23583B-1. University of Florida, Department of Wildlife Ecology and Conservation, North Florida Research and Education Center. Quincy, Florida.

Ober, H. 2016. Annual report to USFWS for calendar year 2016. Permit number TE23583B-1. University of Florida, Department of Wildlife Ecology and Conservation, North Florida Research and Education Center. Quincy, Florida.

Webb, E.N. 2018a. Email to Paula Halupa *et al.* University of Florida, Department of Wildlife Ecology and Conservation. Gainesville, Florida. April 1, 2018.

Webb, E.N. 2018b. Presentation given at Florida bonneted bat working group meeting at The Conservancy of Southwest Florida. University of Florida, Department of Wildlife Ecology and Conservation. Gainesville, Florida. May 24, 2016.

U.S. Fish and Wildlife Service
South Florida Ecological Services Office

FLORIDA BONNETED BAT CONSULTATION GUIDELINES

October - 2019

The U.S. Fish and Wildlife Service's South Florida Ecological Services Field Office (Service) developed the Florida Bonneted Bat Consultation Guidelines (Guidelines) to assist in avoiding and minimizing potential negative effects to roosting and foraging habitat, and assessing effects to the Florida bonneted bat (*Eumops floridanus*) from proposed projects. The Consultation Key within the Guidelines assists applicants in evaluating their proposed projects and identifying the appropriate consultation paths under sections 7 and 10 of the Endangered Species Act of 1973 (Act), as amended (87 Stat. 884; 16 U.S.C. 1531 *et seq.*). These Guidelines are primarily for use in evaluating regulatory projects where development and land conversions are anticipated. These Guidelines focus on conserving roosting structures in natural and semi-natural environments. The following Consultation Area map (Figure 1 and Figure 2, Appendix A), Consultation Flowchart (Figure 3), Consultation Key, Survey Framework (Appendices B-C), and **Best Management Practices (BMPs)** (Appendix D) are based upon the best available scientific information. As more information is obtained, these Guidelines will be revised as appropriate. If you have comments, or suggestions on these Guidelines or the Survey Protocols (Appendix B and C), please email your comments to FBBguidelines@fws.gov. These comments will be reviewed and incorporated in an annual review.

Terms in **bold** are further defined in the Glossary.

Wherever possible, proposed development projects within the Consultation Area should be designed to avoid and minimize take of Florida bonneted bats and to retain their habitat. Applicants are encouraged to enter into early technical assistance/consultation with the Service so we may provide recommendations for avoiding and minimizing adverse effects. Although these Guidelines focus on the effects of a proposed action (*e.g.*, development) on natural habitat, (*i.e.*, non-urban), Appendix E also provides Best Management Practices for Land Management Projects.

If you are renovating an existing artificial structure (*e.g.*, building) within the urban environment with or without additional ground disturbing activities, these Guidelines do not apply. The Service is developing separate guidelines for consultation in these situations. Until the urban guidelines are complete, please contact the Service for additional guidance.

The final listing rule for the Florida bonneted bat (Service 2013) describes threats identified for the species. Habitat loss and degradation, as well as habitat modification, have historically affected the species. Florida bonneted bats are different from most other Florida bat species because they are reproductively active through most of the year, and their large size makes them capable of foraging long distances from their roost (Ober *et al.* 2016). Consequently, this species is vulnerable to disturbances around the roost during a greater portion of the year and considerations about foraging habitat extend further than the localized roost.

Use of Consultation Area, Flowchart, and Key

Figure 1 shows the Consultation Area for the Florida bonneted bat where this consultation guidance applies. For information on how the Consultation Area was delineated see Appendix A. The Consultation Flowchart (Figure 3) and Consultation Key direct project proponents through a series of couplets that will provide a conclusion or determination for potential effects to the Florida bonneted bat. *Please Note: If additional listed species, or candidate or proposed species, or designated or proposed critical habitat may be affected, a separate evaluation will be needed for these species/critical habitats.*

Currently, the Consultation Flowchart (Figure 3) and Consultation Key cannot be used for actions proposed within the urban development boundary in Miami-Dade and Broward County. The urban development boundary is part of the Consultation Area, but it is excluded from these Guidelines because Florida bonneted bats use this area differently (roosting largely in artificial structures), and small natural foraging areas are expected to be important. Applicants with projects in this area should contact the Service for further guidance and individual consultation.

Determinations may be either "no effect," "may affect, but is not likely to adversely affect" (**MANLAA**), or "may affect, and is likely to adversely affect" (**LAA**). An applicant's willingness and ability to alter project designs could sufficiently minimize effects to Florida bonneted bats and allow for a **MANLAA** determination for this species (informal consultation). The Service is available for early technical assistance/consultation to offer recommendations to assist in project design that will minimize effects. When take cannot be avoided, applicants and action agencies are encouraged to incorporate compensation to offset adverse effects. The Service can assist with identifying compensation options (*e.g.,* conservation on site, conservation off-site, contributions to the Service's Florida bonneted bat conservation fund, *etc*.).

Using the Key and Consultation Flowchart

- "No effect" determinations do not need Service concurrence.
- "May affect, but is not likely to adversely affect" **MANLAA**. Applicants will be expected to incorporate the appropriate BMPs to reach a **MANLAA** determination.
    - **MANLAA-P** (in blue in Consultation Flowchart) have programmatic concurrence through the transmittal letter of these Guidelines, and therefore no further consultation with the Service is necessary unless assistance is needed in interpreting survey results.
    - **MANLAA-C** (in black in Consultation Flowchart) determinations require further consultation with the Service.
- "May affect, and is likely to adversely affect" (**LAA**) determinations require consultation with the Service. Project modifications could change the **LAA** determinations in numbers 5, 8, 9, 11, 12, and 17 to **MANLAA**. When take cannot be avoided, **LAA** determinations will require a biological opinion.
- The Service requests copies of surveys used to support all determinations. If a survey is required by the Consultation Key and the final determination is "no effect" or "MANLAA-P", send the survey to FBBsurveyreport@fws.gov , or mail electronic file to U.S. Fish and Wildlife Service, Attention Florida bonneted bat surveys, 1339 20th Street, Vero Beach, Florida 32960. If a survey is required by the Consultation Key and the determination is "MANLAA-C" or "LAA", submit the survey in the consultation request.

For the purpose of making a decision at Couplet 2: If any potential roosting structure is present, then the habitat is classified as **potential roosting habitat**, and the left half of the flowchart should be followed (see Figure 3). We recognize that roosting habitat may also be used by Florida bonneted bats for foraging. If the project site only consists of **foraging habitat** (*i.e.*, no suitable roosting structures), then the right side of the flowchart should be followed beginning at step 13.

For couplets 11 and 12: **Potential roosting habitat** is considered **Florida bonneted bat foraging habitat** when a determination is made that roosting is not likely.

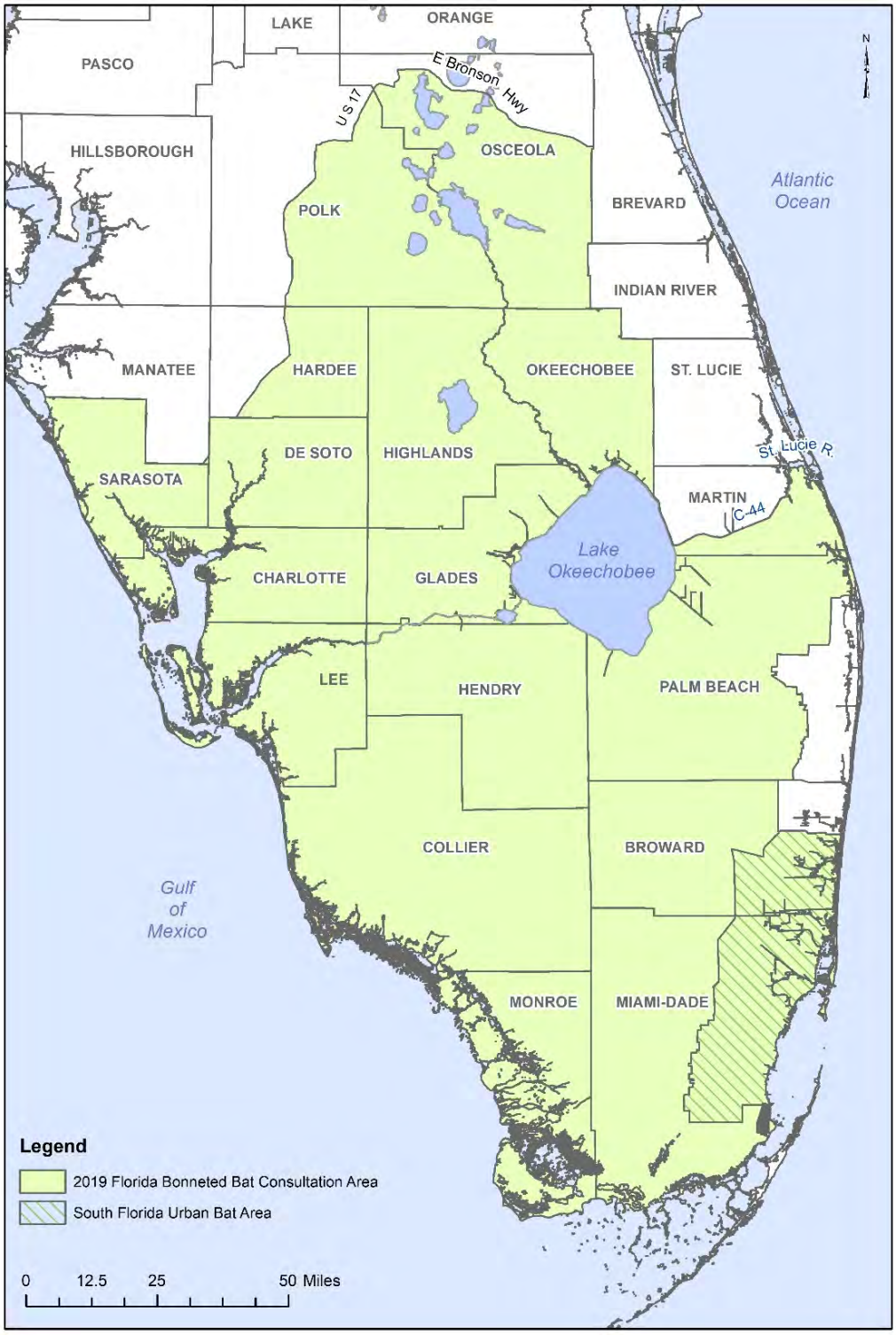

Figure 1. Florida Bonneted Bat Consultation Area. Hatched area (Figure 2) identifies the urban development boundary in Miami-Dade and Broward County. Applicants with projects in this area should contact the Service for specific guidance addressing this area and individual consultation. The Consultation Key should not be used for projects in this area.

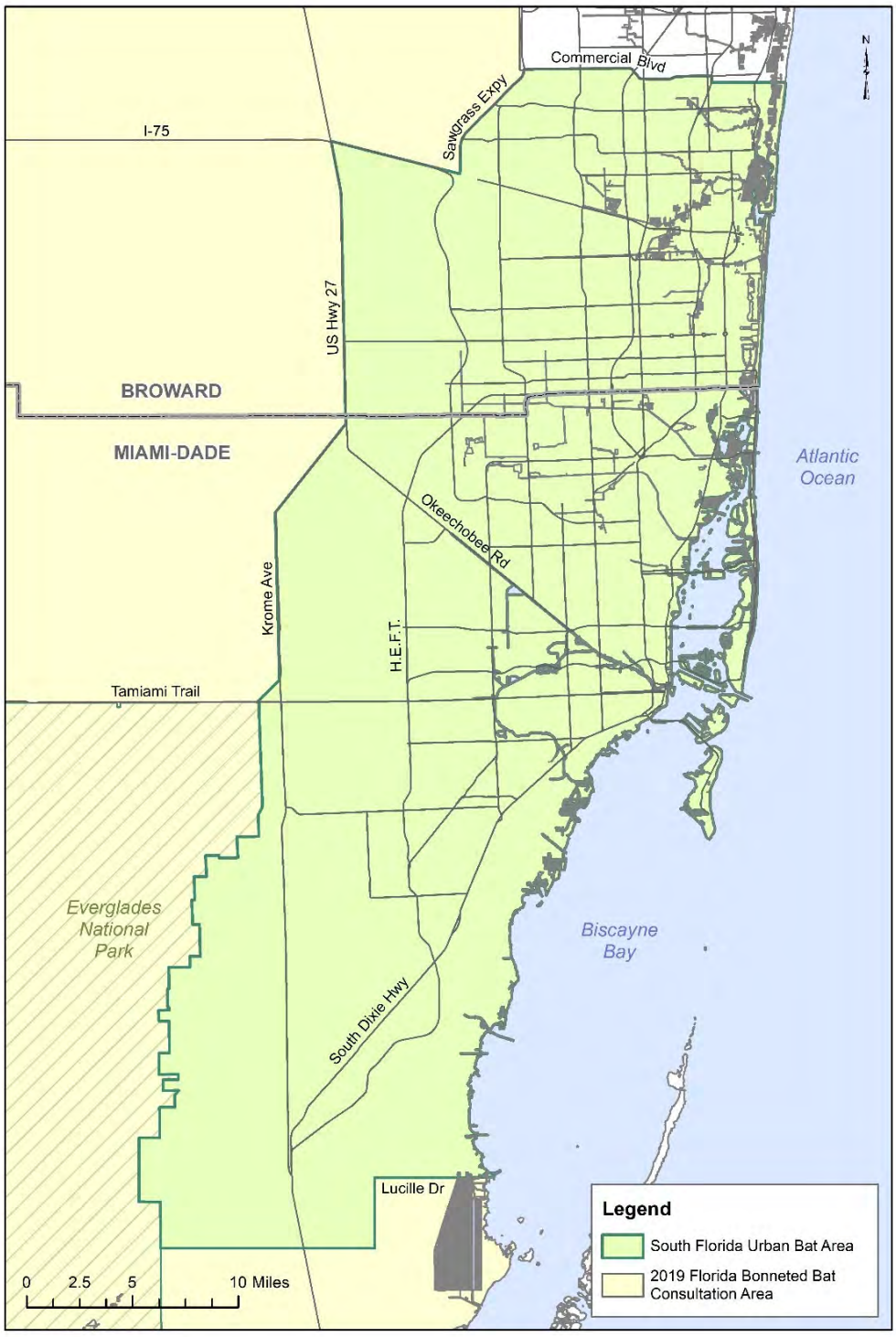

Figure 2. Urban development boundary in Miami-Dade and Broward County. The Consultation Key should not be used for projects in this area. Applicants with projects in this South Florida Urban Bat Area should contact the Service for specific guidance addressing this area and individual consultation.

Florida Bonneted Bat Consultation Key[#]

Use the following key to evaluate potential effects to the Florida bonneted bat (FBB) from the proposed project. Refer to the Glossary as needed.

1a. Proposed project or land use change is partially or wholly within the Consultation Area (Figure 1).....**Go to 2**
1b. Proposed project or land use change is wholly outside of the Consultation Area (Figure 1).....**No Effect**

2a. Potential FBB roosting habitat exists within the project area……**Go to 3**
2b. No potential FBB roosting habitat exists within the project area..……**Go to 13**

3a. Project size/footprint* ≤ 5 acres (2 hectares)…….. **Conduct Limited Roost Survey (Appendix C)** then **Go to 4**
3b. Project size/footprint* > 5 acres (2 hectares)…….....**Conduct Full Acoustic/Roost Surveys (Appendix B)** then **Go to 6**

4a. Results show FBB roosting is likely ……**Go to 5**
4b. Results do not show FBB roosting is likely…….**MANLAA-P if BMPs (Appendix D) used and survey reports are submitted. Programmatic concurrence.**

5a. Project will affect roosting habitat……..**LAA$^+$ Further consultation with the Service required.**
5b. Project will not affect roosting habitat…….. **MANLAA-C with required BMPs (Appendix D). Further consultation with the Service required.**

6a. Results show some FBB activity……**Go to 7**
6b. Results show no FBB activity……**No Effect**

7a. Results show FBB roosting is likely..……**Go to 8**
7b. Results do not show FBB roosting is likely..……**Go to 10**

8a. Project will not affect roosting habitat……**Go to 9**
8b. Project will affect roosting habitat……..……**LAA$^+$ Further consultation with the Service required.**

9a. Project will affect* > 50 acres (20 hectares) (wetlands and uplands) of foraging habitat……..…….**LAA$^+$ Further consultation with the Service required.**
9b. Project will affect* ≤ 50 acres (20 hectares) (wetlands and uplands) of foraging habitat…….. **MANLAA-C with required BMPs (Appendix D). Further consultation with the Service required.**

10a. Results show high FBB activity/use…..…….....**Go to 11**
10b. Results do not show high FBB activity/use…..…….....**Go to 12**

11a. Project will affect* > 50 acres (20 hectares) (wetlands and uplands) of FBB habitat (roosting and/or foraging)…..……..…..... **LAA$^+$ Further consultation with the Service required.**
11b. Project will affect* ≤ 50 acres (20 hectares) (wetlands and uplands) of FBB habitat (roosting and/or foraging)……..... **MANLAA-C with required BMPs (Appendix D). Further consultation with the Service required.**

12a. Project will affect* > 50 acres (20 hectares) (wetlands and uplands) of FBB habitat…..……..…..... **LAA$^+$ Further consultation with the Service required.**
12b. Project will affect* ≤ 50 acres (20 hectares) (wetlands and uplands) of FBB habitat……....…..... **MANLAA-P if BMPs (Appendix D) used and survey reports are submitted. Programmatic concurrence.**

13a. FBB foraging habitat exists within the project area and foraging habitat will be affected…..……..**Go to 14**

13b. FBB foraging habitat exists within the project area and foraging habitat will not be affected **OR** no FBB foraging habitat exists within the project area…..……..**No Effect**

14a. Project size* > 50 acres (20 hectares) (wetlands and uplands) ……..…….**Go to 15**

14b. Project size* ≤ 50 acres (20 hectares) (wetlands and uplands) ……...….. **MANLAA-P if BMPs (Appendix D) used. Programmatic concurrence.**

15a. Project is within 8 miles (12.9 kilometers) of high quality potential roosting areas^……..……**Conduct Full Acoustic Survey (Appendix B) and Go to 16**

15b. Project is not within 8 miles (12.9 kilometers) of high quality potential roosting area^…….....….**MANLAA-P if BMPs (Appendix D) used. Programmatic concurrence.**

16a. Results show some FBB activity……...…….....**Go to 17**

16b. Results show no FBB activity……..…….…....**No Effect**

17a. Results show high FBB activity/use……...…...…....**LAA[+] Further consultation with the Service required.**

17b. Results do not show high FBB activity/use……..……... **MANLAA-P if BMPs (Appendix D) used and survey reports submitted. Programmatic concurrence.**

[#] If you are within the urban environment and you are renovating an existing artificial structure (with or without additional ground disturbing activities), these Guidelines do not apply. The Service is developing separate guidelines for consultation in these situations. Until the urban guidelines are complete, please contact the Service for additional guidance

*****Includes wetlands and uplands that are going to be altered along with a 250- foot (76.2- meter) buffer around these areas if the parcel is larger than the altered area.

[+]Project modifications could change the **LAA** determinations in numbers 5, 8, 9, 11, 12, and 17 to **MANLAA** determinations.

^Determining if **high quality potential roosting areas** are within 8 mi (12.9 km) of a project is intended to be a desk-top exercise looking at most recent aerial imagery, not a field exercise.

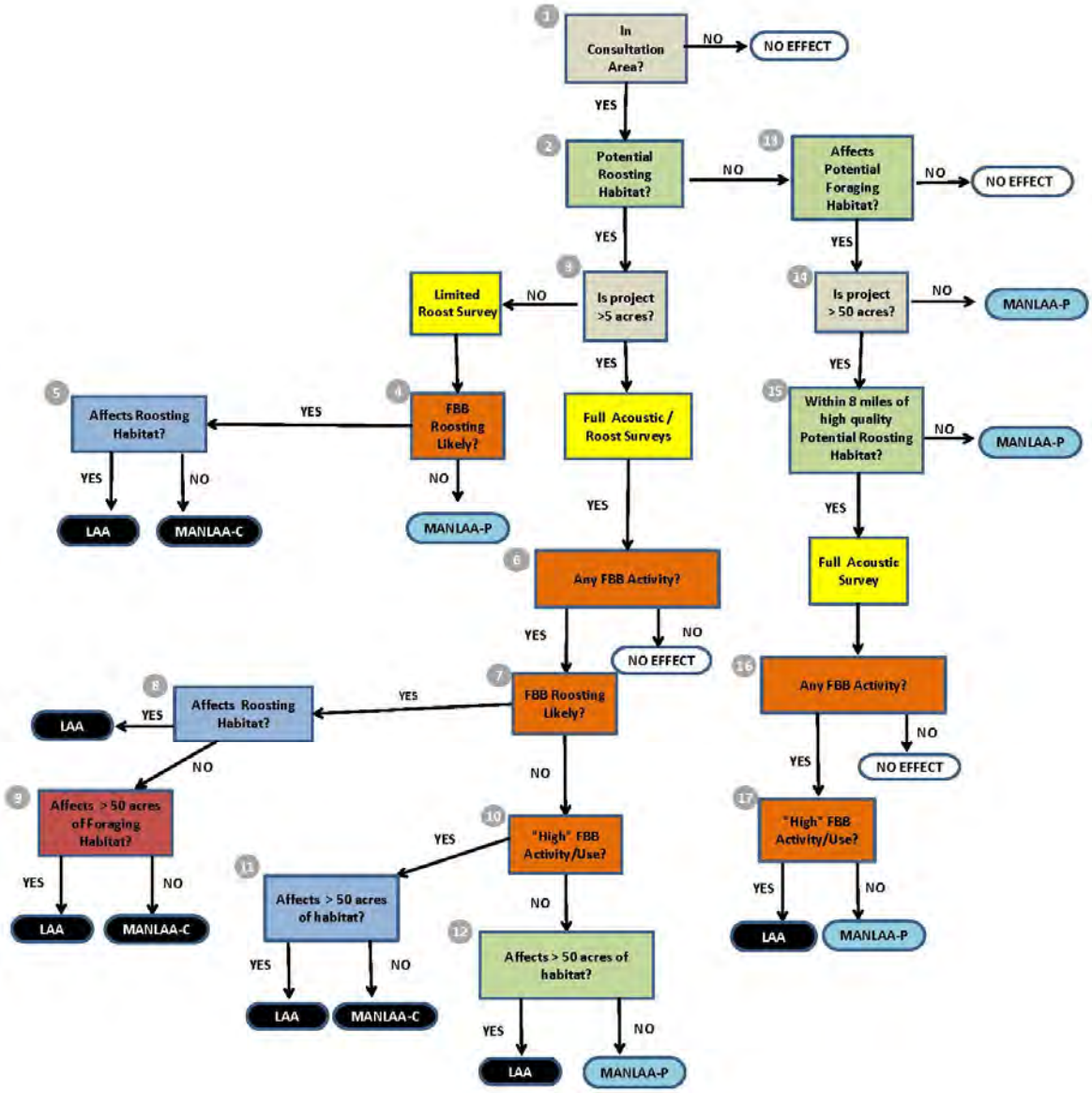

Figure 3. Florida bonneted bat Consultation Flowchart. "**No effect**" determinations do not need Service concurrence. "May affect, but not likely to adversely affect", **MANLAA-P,** in blue have programmatic concurrence through the transmittal letter of these Guidelines, and therefore no further consultation with the Service is necessary unless assistance is needed in interpreting survey results. **MANLAA-C** determinations in black require further consultation with the Service. Applicants are expected to incorporate the appropriate **BMPs** to reach a **MANLAA** determination. "May affect, and is likely to adversely affect", **LAA, (**also in black) determinations require consultation with the Service. Further consultation with the Service may identify project modifications that could change the **LAA** determinations in numbers 5, 8, 9, 11, 12, and 17 to **MANLAA** determinations. The Service requests Florida bonneted bat survey reports for all determinations.

GLOSSARY

BMPs – Best Management Practices. Recommendations for actions to conserve roosting and foraging habitat to be implemented before, during, and after proposed development, land use changes, and land management activities.

FBB Activity – Florida bonneted bat (FBB) activity is when any Florida bonneted bat calls are recorded during an acoustic survey or human observers see or hear Florida bonneted bats on a site.

FORAGING HABITAT - Comprised of relatively open (*i.e.,* uncluttered or reduced numbers of obstacles, such as fewer tree branches and leaves, in the flight environment) areas to find and catch prey, and sources of drinking water. In order to find and catch prey, Florida bonneted bats forage in areas with a reduced number of obstacles. This includes: open fresh water, permanent or seasonal freshwater wetlands, within and above wetland and upland forests, wetland and upland shrub, and agricultural lands (Bailey *et al.* 2017). In urban and residential areas drinking water, prey base, and suitable foraging can be found at golf courses, parking lots, and parks in addition to relatively small patches of natural habitat.

FULL ACOUSTIC/ROOST SURVEY - This is a comprehensive survey that will involve systematic acoustic surveys (*i.e.,* surveys conducted 30 minutes prior to sunset to 30 minutes after sunrise, over multiple consecutive nights). Depending upon acoustic results and habitat type, targeted roost searches through thorough visual inspection using a tree-top camera system or observations at emergence (*e.g.,* looking and listening for bats to come out of tree cavities around sunset) or more acoustic surveys may be necessary. See Appendix B for a full description.

HIGH FBB ACTIVITY/USE - High Florida bonneted bat (FBB) activity/use or importance of an area can be defined using several parameters (*e.g*., types of calls, numbers of calls). An area will be considered to have high FBB activity/use if **ANY** of the following are found: (a) multiple FBB feeding buzzes are detected; (b) FBB social calls are recorded; (c) large numbers of Florida bonneted bat calls (9 or more) are recorded throughout one night. Each of these parameters is considered to indicate that an area is actively used and important to FBBs, however, the Service will further evaluate the activity/use of the area within the context of the site (*i.e.,* spatial distribution of calls, site acreage, habitat on site, as well as adjacent habitat) and provide additional guidance.

HIGH QUALITY POTENTIAL ROOSTING AREAS - Sizable areas (>50 acres) [20 hectares] that contain large amounts of high-quality, natural roosting structure – (*e.g.,* predominantly native, mature trees; especially pine flatwoods or other areas with a large number of cavity trees, tree hollows, or high woodpecker activity).

LAA - May Affect, and is Likely to Adversely Affect. The appropriate conclusion 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 "may affect, but is not likely to adversely affect" (**MANLAA**)]. In the event the overall effect of the proposed action is beneficial to the listed species, but also is likely to cause some adverse effects, then the proposed action is "likely to adversely affect" the listed species. If incidental take is anticipated to occur as a result of the proposed action, an "is likely to adversely affect" (**LAA**) determination should be made. An "is likely to adversely affect" determination requires the initiation of formal section 7 consultation.

LIMITED ROOST SURVEY - This is a reduced survey that may include the following methods: acoustics, observations at emergence (*e.g.,* looking and listening for bats to come out of tree cavities around sunset), and visual inspection of trees with cavities or loose bark using tree-top cameras (or combination of these methods). Methods are fairly flexible and dependent upon composition and configuration of project site and willingness and ability of applicant and partners to conserve roosting structures on site. See also Appendix C for a full description.

MANLAA - May Affect, but is Not Likely to Adversely Affect. The appropriate conclusion when effects on listed species are expected to be discountable, insignificant, or completely beneficial. Beneficial effects are contemporaneous positive effects without any adverse effects to the species. Insignificant effects relate to the size of the impact and should never reach the scale where take occurs. Discountable effects are those extremely unlikely to occur. 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. To use these Guidelines and Consultation Key applicants must incorporate the appropriate **BMPs** (Appendix D) to reach a **MANLAA** determination.

In this Consultation Key we have identified two ways that consultation can conclude informally, **MANLAA-P and MANLAA-C**:

> **MANLAA-P**: programmatic concurrence is provided through the transmittal letter of these Guidelines, no additional consultation is required with the Service for Florida bonneted bats. All survey results must be submitted to Service.
>
> **MANLAA-C**: further consultation with the Service is required to confirm that the Consultation Key has been used properly, and the Service concurs with the evaluation of the survey results. Request for consultation must include survey results.

NO EFFECT - The appropriate conclusion when the action agency determines its proposed action will not affect listed species or designated critical habitat.

POTENTIAL ROOSTING HABITAT - Includes forest and other areas with tall, mature trees or other areas with suitable roost structures (*e.g.,* utility poles, artificial structures). Forest is defined as all types including: pine flatwoods, scrubby flatwoods, pine rocklands, royal palm hammocks, mixed or hardwood hammocks, cypress, sand pine scrub, or other forest types. (Forrest types currently include exotic forests such as melaleuca, please contact the Service for additional guidance as needed). More specifically, this includes habitat in which suitable structural features for breeding and sheltering are present. In general, roosting habitat contains one or more of the following structures: tree snags, and trees with cavities, hollows, deformities, decay, crevices, or loose bark. Structural characteristics are of primary importance.

Florida bonneted bats have been found roosting in habitat with the following structural features, but may also occur outside of these parameters:

- trees greater than 33 feet (10 meters) in height, greater than 8 inches (20 centimeters) in diameter at breast height (DBH), with cavity elevations higher than 16 feet (5 meters) above ground level (Braun de Torrez 2019);
- 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) (*e.g.,* pine flatwoods);
- 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.

In order for a building to be considered a roosting structure, it should be a minimum of 15 feet high and contain one or more of the following features: chimneys, gaps in soffits, gaps along gutters, or other structural gaps or crevices (outward entrance approximately 1 inch (2.5 centimeters) in size or greater. Structures similar to the above (*e.g.,* bridges, culverts, minimum of 15 feet high) are expected to also provide roosting habitat, based upon the species' morphology and behavior (Keeley and Tuttle 1999). Florida bonneted bat 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]).

For the purpose of this Consultation Key*: Roosting habitat refers to habitat with structures that can be used for daytime and maternity roosting. Roosting at night between periods of foraging can occur in a broader range of structure types. For the purposes of this guidance we are focusing on day roosting habitat.*

ROOSTING IS LIKELY– Determining likelihood of roosting is challenging. The Service has provided the following definition for the express purpose of these Guidelines. Researchers use additional cues to assist in locating roosts. As additional indicators are identified and described we expect our Guidelines will be improved.

In this Consultation Key the Service will consider the following evidence indicative that roosting is likely nearby (*i.e.,* reasonably certain to occur) if **ANY** of the following are documented: (a) Florida bonneted bat calls are recorded within 30 minutes before sunset to 1½ hours following sunset or within 1½ hours before sunrise; (b) emergence calls are recorded; (c) human observers see (or hear) Florida bonneted bats flying from or to potential roosts; (d) human observers see and identify Florida bonneted bats within a natural roost or artificial roost; and/or (e) other bat sign (*e.g*., guano, staining, etc.) is found that is identified to be Florida bonneted bat through additional follow-up.

In addition to the aforementioned events, researchers consider roosting likely in an area when (1) large numbers of Florida bonneted bat calls are recorded throughout the night (*e.g.,* ≥ 25 files per night at a single acoustic station when 5 second file lengths are recorded); (2) large numbers of FBB calls are recorded over multiple nights (*e.g.,* an average of ≥ 20 files per night from a single detector when 5 second file lengths are recorded); or (3) social calls are recorded. Because social calls and large numbers of calls recorded over one or more nights can be indicative of high

FBB activity/use or when roosting is likely, the Service is choosing not to use these as indicators to make the determination that roosting is likely. Instead we are relying on the indicators that are only expected to occur at or very close to a roost location [(a)-(e) above].

TAKE - to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in any such conduct. [ESA §3(19)] Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering. Harass is defined by the Service as actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. [50 CFR §17.3].

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Appendix A. **Delineation and Justification for Consultation Area**

The Consultation Area (Figure 1) represents the general range of the species. The Consultation Area represents the area within which consideration should be given to potential effects to Florida bonneted bats from proposed projects or actions. Coordination and consultation with the Service helps to determine whether proposed actions and activities may affect listed species. This Consultation Area defines the area where proposed actions and activities may affect the Florida bonneted bat.

This area was delineated using confirmed presence data, key habitat features, reasonable flight distances and home range sizes. Where data were lacking, we used available occupancy models that predict probability of occurrence (Bailey *et al.* 2017). Below we describe how each one of these data sources was used to determine the overall Consultation Area.

Presence data: Presence data included locations for: (1) confirmed Florida bonneted bat acoustic detections; (2) known roost sites (occupied or formerly occupied; includes natural roosts, bat houses, and utility poles); (3) live Florida bonneted bats observed or found injured; (4) live Florida bonneted bats captured during research activities; and (5) Florida bonneted bats reported as dead. The Geographic Information Systems (GIS) dataset incorporates information from January 2003 to May 2019.

The vast majority of the presence data came from acoustic surveys. The species' audible, low frequency, distinct, echolocation calls are conducive for acoustic surveys. However, there are limitations in the range of detection from ultrasonic devices, and the fast, high-flying habits of this species can confound this. Overall, detection probabilities for Florida bonneted bats are generally considered to be low. For example, in one study designed to investigate the distribution and environmental associations of Florida bonneted bat, Bailey *et al.* 2017 found overall nightly detection probability was 0.29. Based on the estimated detection probabilities in that study, it would take 9 survey nights (1 detector per night) to determine with 95% certainty whether Florida bonneted bat are present at a sampling point. Positive acoustic detection data are extremely valuable. However, it is important to recognize that there are issues with false negatives due to limitations of equipment, low detection probabilities, difference in detection due to prey availability and seasonal movement over the landscape, and in some circumstances improperly conducted surveys (*i.e.,* short duration or in unsuitable weather conditions).

Key habitat features: We considered important physical and biological features with a focus on potential roosting habitat and applied key concepts of bat conservation (*i.e*., need to conserve roosting habitat, foraging habitat, and prey base). To date, all known natural Florida bonneted bat roosts (n=19 have been found in live trees and snags of the following types: slash pine, longleaf pine, royal palm, and cypress (Braun de Torrez 2018). Several of the recent roost discoveries are located in fire-maintained vegetation communities, and it appears that Florida bonneted bats are fire-adapted and can benefit from prescribed burn regimes that closely mimic historical fire patterns (Ober *et al.* 2018).

From a landscape and roosting perspective, we consider key habitat features to include forested areas and other areas with mature trees, wetlands, areas used by red-cockaded woodpeckers

(*Picoides borealis*; RCW), and fire-managed and other conservation areas. However, recent work suggests that Florida bonneted bats do not use pinelands more than other land cover types (Bailey *et al.* 2017). In fact, Bailey *et al.* 2017 detected Florida bonneted bats in all land cover types investigated in their study (e.g., agricultural, developed, upland, and wetland). For the purposes of these consultation guidelines, we are focusing on the conservation of potential roosting habitats across the species' range. However, we also recognize the need for comprehensive consideration of foraging habitats, habitat connectivity, and long-term suitability.

Flight distances and home range sizes: Like most bats, Florida bonneted bats are colonial central-place foragers that exploit distant and scattered resources (Rainho and Palmeirim 2011). Morphological characteristics (narrow wings, high wing-aspect ratio) make *Eumops* spp. well-adapted for efficient, low-cost, swift, and prolonged flight in open areas (Findley *et al*. 1972, Norberg and Rayner 1987). Other Eumops including Underwood's mastiff bat (*Eumops underwoodi*), and Greater mastiff bat or Western mastiff bat (*Eumops perotis*) are known to forage and/or travel distances ranging from 6.2 miles to 62 miles from the roost with multiple studies documenting flight distances approximately 15- 18 miles from the roost (Tibbitts *et al* 2002, Vaugh 1959 as cited in Best *et al*. 1996, Siders *et al.* 1999, Siders 2005, Vaughan 1959 as cited in Siders 2005.)

Like other *Eumops,* Florida bonneted bats are strong fliers, capable of travelling long distances (Belwood 1992). Recent Global Positioning System (GPS) and radio-telemetry data for Florida bonneted bats documents that they also move large distances and likely have large home ranges. Data from recovered GPS satellite tags on Florida bonneted bats tagged at Babcock-Webb Wildlife Management Area (WMA), found the maximum distance detected from a capture site was 24.2 mi (38.9 km); the greatest path length travelled in a single night was 56.3 mi (90.6 km) (Ober 2016; Webb 2018a-b). Additional data collected during the month of December documented the mean maximum distance of Florida bonneted bats (n=8) with tags traveled from the roost was 9.5 mi (Webb 2018b). The Service recognizes that the movement information comes from only one site (Babcock-Webb WMA and vicinity), and data are from small numbers (n=20) of tagged individuals for only short periods of time (Webb 2018a-b). We expect that across the Florida bonneted bat's range differences in habitat quality, prey availability, and other factors will result in variable habitat use and home range sizes between locations. Foraging distances and home range sizes in high quality habitats are expected to be smaller while foraging distances and home range sizes in low quality habitat would be expected to be larger. Consequently, because Babcock-Webb WMA provides high quality roosting habitat, this movement data could represent the low end of individual flight distances from a roost.

Given the species' morphology and habits (*e.g*., central-place forager) and considering available movement data from other *Eumops* and Florida bonneted bats discussed above, we opted to use 15 miles (24 km) as a reasonable estimate of the distance Florida bonneted bats would be expected to travel from a roost on any given night. For the purposes of delineating a majority of the Consultation Area, we used available confirmed presence point location data and extended out 15 miles (24 km), with modifications for habitat features (as described above). As more movement data are obtained and made available, this distance estimate may change in the future.

Occupancy model – Research by Bailey *et al.* (2017) indicates the species' range is larger than previously known. Their model performed well across a large portion of the previously known

range when considering confirmed Florid bonneted bat locations; thus it is anticipated to be useful where limited information is available for the species.

We used the model output from Bailey *et al.* (2017) to more closely examine areas where we are data-deficient (*i.e.,* areas where survey information is particularly lacking). We considered 0.27 probability of occurrence a filter for high likelihood of occurrence because 0.27 was the model output for Babcock-Webb WMA, an area where Florida bonneted bats are known to occupy and heavily use. Large portions of Sarasota, Martin, and Palm Beach counties were identified as having probability of occurrence of 0.27. The consultation area should include areas where the species has a high likelihood of occurring. Based on this reasoned approach, all of Sarasota County, portions of Martin County, and greater parts of Palm Beach County were included in the Consultation Area.

We recognize that there are areas in the northern portion of the range where the model is less successful predicting occurrence based on the known Florida bonneted bat locations (*i.e*., the model predicts low likelihood of occurrence on Avon Park Air Force range, where the species is known to roost). Consequently, the Service is proactively working with partners to conduct surveys in the areas added based on the model to confirm that inclusion of these portions of the aforementioned counties is appropriate. The Consultation Area may be adjusted based on changes in this information.

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Appendix B: Full Acoustic / Roost Survey Framework

Purpose: The purpose of this survey is to: (1) determine if Florida bonneted bats are likely to be actively roosting or using the site; (2) locate active roost(s) and avoid the loss of the structure, if possible; and, (3) avoid or minimize the take of individuals. In some cases, changes in project designs or activities can help avoid and minimize take. For example, project proponents may be able to retain suspected roosts or conserve roosting and foraging habitats. Changing the timing or nature of activities can also help reduce the losses of non-volant young or effects to pregnant or lactating females. If properly conducted, acoustic surveys are the most effective way to determine presence and assess habitat use. If the applicant is unable to follow or does not want to follow the Full Acoustic/Roost Survey framework when recommended according to the Key, the Corps (or other Action Agency) will not be able to use these Guidelines and will need to provide a biologically supported rational using the best available information for their determination in their request for consultation.

General Description: This is a *comprehensive survey effort*, and robust acoustic surveys (*i.e.,* surveys conducted 30 minutes prior to sunset to 30 minutes after sunrise, over multiple nights) are a fundamental component of the approach. Depending upon acoustic results and habitat type, it may also include: observations at emergence (*e.g.,* emergence surveys during which observers look and listen for bats to come out of roost structures around sunset), visual inspection of trees/snags (*i.e.,* those with cavities, hollows, and loose bark) and other roost structures with tree-top cameras, or follow-up targeted acoustic surveys. Methods are dependent upon composition and configuration of project site and willingness and ability of applicant and partners to conserve roosting and foraging habitats on site.

General Survey Protocol:

[Note: The Service will provide more information in separate detailed survey protocols in the near future. This will include specific information on: detector types, placement, orientation, verification of proper functioning, analysis, reporting requirements, etc.]

- Approach is intended for project sites > 5 acres (2 hectares).
- For sites containing roosting habitat, acoustic surveys should primarily focus on assessing roosting habitat within the project site that will be lost or modified (*i.e.,* areas that will not be conserved), and locations on the property within 250 feet (76.2 meters) of areas that will not be conserved. This will help avoid or minimize the loss of an active roost and individuals. Secondarily, since part of the purpose is to determine if Florida bonneted bats are using the site, acoustic devices should also be placed near open water and wetlands to maximize chances of detection and aid in assessing foraging habitat that may be lost.
- For sites that do not contain ANY roosting habitat, but do contain foraging habitat (see Figure 3 - Consultation Flowchart and Key, Step 2 [no], Step 13 [yes]), efforts should focus on assessing foraging habitat within the project site that will be lost or modified (*i.e.,* areas that will not be conserved).
- Acoustic surveys should be performed by those who are trained and experienced in setting up, operating, and maintaining acoustic equipment; and retrieving, saving,

analyzing, and interpreting data. Surveyors should have completed one or more of the available bat acoustic courses/workshops, or be able to show similar on-the-job or academic experience (Service 2018).

- Due to the variation in the quality of recordings, the influence of clutter, the changing performances of software packages over time, and other factors, manual verification is recommended (Loeb *et al.* 2015). Files that are identified to species from auto-ID programs must be visually reviewed and manually verified by experienced personnel.
- Acoustic devices should be set up to record from 30 minutes prior to sunset to 30 minutes after sunrise for multiple nights, under suitable weather conditions.
- Acoustic surveys can be conducted any time of year as long as weather conditions meet the criteria. If any of the following weather conditions exist at a survey site during acoustic sampling, note the time and duration of such conditions, and repeat the acoustic sampling effort for that night: (a) temperatures fall below 65°F (18.3°C) during the first 5 hours of survey period; (b) precipitation, including rain and/or fog, that exceeds 30 minutes or continues intermittently during the first 5 hours of the survey period; and (c) sustained wind speeds greater than 9 miles/hour (4 meters/second; 3 on Beaufort scale) for 30 minutes or more during the first 5 hours of the survey period (Service 2018). At a minimum, nightly weather conditions for survey sites should be checked using the nearest NOAA National Weather Service station and summarized in the survey reports. Although not required at this time, it has been demonstrated that conducting surveys on warm nights late in the spring can help maximize detection probabilities (Ober *et al.* 2016; Bailey *et al.* 2017).
- Acoustic devices should be calibrated and properly placed. Microphones should be directed away from surrounding vegetation, not beneath tree canopy, away from electrical wires and transmission lines, away from echo-producing surfaces, and away from external noises. Directional microphones should be aimed to sample the majority of the flight path/zone. Omnidirectional microphones should be deployed on a pole in the center of the flight path/zone and oriented horizontally. For monitoring possible roost sites, microphones should be directed to maximize likelihood of detection.
- To standardize recordings, acoustic device recordings should have a 2-second trigger window and a maximum file length of 15 seconds.
- The number of acoustic survey sites and nights needed for the assessment is dependent upon the overall acreage of suitable habitat proposed to be impacted by the action.
    - For non-linear projects, a minimum of 16 detector nights per 20 acres of suitable habitat expected to be impacted is recommended.
    - For linear projects (*e.g.,* roadways, transmission lines), a minimum of five detector nights per 0.6 mi (0.97 km) is recommended. Detectors can be moved to multiple locations within each kilometer surveyed, but must remain in a single location throughout any given night.
    - For any site, and in particular for sites > 250 acres, please contact the Service to assist in designing an appropriate approach.
- If results of acoustic surveys show **high Florida bonneted bat activity** or **Florida bonneted bat roosting likely** (*e.g.,* high activity early in the evening) (see definitions in Glossary), follow-up methods such as emergence surveys, visual inspection of the roosting structures, or follow-up acoustic surveys are recommended to locate potential roosts. Using a combination of methods may be helpful.

- For bat emergence surveys, multiple observers should be stationed at potential roosts if weather conditions (as above) are suitable. Surveyors should be quietly stationed 30 minutes before sunset so they are ready to look and listen for emerging FBBs from sunset to 1½ hours after sunset. When conducting emergence surveys it is best to orient observers so that the roost is silhouetted in the remaining daylight; facing west can help maximize the ability to notice movement of animals out of a roost structure.
- Visual inspection of trees with cavities and loose bark during the day may be helpful. Active RCW trees should not be visually inspected during the RCW breeding season (April 15 through June 15).
- Visual inspection alone is not recommended due to the potential for roosts to be too high for cameras to reach, too small for cameras to fit, or shaped in a way that contents are out of view (Braun de Torrez *et al.* 2016).
- If roosting is suspected on site, use tree-top cameras during the day to search those trees/snags or other structures that have potential roost features (*i.e.,* cavities, hollows, crevices, or other structure for permanent shelter). If unsuccessful (*e.g.,* cannot see entire contents within a given cavity, cannot reach cavity, cannot see full extent of cavity) OR occupied roosts are found with the tree-top camera within the area in which high Florida bonneted bat activity/likely Florida bonneted bats roosting were identified, we recommend emergence surveys and/or acoustics to verify occupancy and/or identify bat species.
- Provide report showing effort, methods, weather conditions, findings, and summary of acoustic data relating to Florida bonneted bats (*e.g.,* # of calls, time of calls, and station number) organized by the date on which the data were collected. Sonograms of all calls with signatures at or below 20kHz shall be included in the report. The report shall be provided to the Corps project manager assigned to the project for which the survey was conducted and to the Service via the email address **verobeach@fws.gov. Raw acoustic data should be provided to the Service for all surveys. Raw acoustic data should be provided as "all raw data" and "all raw data with signatures at or below 20kHz". Data can be submitted to the Service via flash drive, memory stick, or hard drive. Data can be submitted digitally to verobeach@fws.gov or via mail to U.S. Fish and Wildlife Service, Attn: Florida bonneted bat data manager, 1339 20th Street, Vero Beach, Florida 32960.**
- Negative surveys are valid for 1 year after completion of the survey.

If you have comments, or suggestions on this survey protocols, please email your comments to FBBguidelines@fws.gov. These comments will be reviewed and incorporated in an annual review.

Literature Cited – Appendix B

Bailey, A.M., H.K. Ober, A.R. Sovie, and R.A. McCleery. 2017. Impact of land use and climate on the distribution of the endangered Florida bonneted bat. Journal of Mammalogy. 98:1586-1593.

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U.S. Fish and Wildlife Service. 2018. Range-wide Indiana bat survey guidelines. https://www.fws.gov/midwest/endangered/mammals/inba/surveys/pdf/2018RangewideIBatSurveyGuidelines.pdf

Appendix C: Limited Roost Survey Framework

Purpose: The purpose of this survey is to: (1) determine if Florida bonneted bats are likely to be actively roosting within suitable structures on-site; (2) locate active roost(s) and avoid the loss of the structure, if possible; and, (3) avoid or minimize the take of individuals. In some cases, changes in project designs or activities can help avoid and minimize take. For example, applicants and partners may be able to retain the suspected roosts or conserve roosting and foraging habitats. Changing the timing of activities can also help reduce the losses of non-volant young or effects to pregnant or lactating females.

General Description: This is a *reduced survey effort* that may include the following methods: visual inspection of trees/snags (*i.e.,* those with cavities, hollows, and loose bark) and other roost structures with tree-top cameras, observations at emergence (*e.g.,* emergence surveys during which observers look and listen for bats to come out of roost structures around sunset), acoustic surveys, or a combination of these methods. Methods are fairly flexible and dependent upon composition and configuration of project site and willingness and ability of applicant and partners to conserve roosting habitat on site.

General Survey Protocol:

[Note: The Service will provide more information in separate, detailed survey protocols in the near future. This will include specific information on: detector types, placement, orientation, verification of proper functioning, analysis, reporting requirements, etc.]

- Approach is **intended only for small project sites** (*i.e.,* sites ≤ 5 acres [2 hectares]).
- Efforts should focus on assessing potential roosting structures within the project site that will be lost or modified (*i.e.,* areas that will not be conserved), or are located on the property within 250 feet (76.2 meters) of areas that will not be conserved.

Identification of potential roost structures

- This step is necessary prior to any of the methods that follow.
- Run line transects through roosting habitat close enough that all trees and snags are easily inspected. Transect spacing will vary with habitat structure and season from a maximum of 91 m (300 ft) between transects in very open pine stands to 46 m (150 ft) or less in areas with dense mid-story. Transects should be oriented north to south, to optimize cavity detectability because many RCW cavity entrances are oriented in a westerly direction (Service 2004).
- Visually inspect all trees and snags or other structures for evidence of cavities, hollows, crevices that can be used for permanent shelter. Using binoculars, examine structures for cavities, loose bark, hollows, or other crevices that are large enough for Florida bonneted bats (diameter of opening > or = to 1 inch (2.5 cm) (Braun de Torrez *et al*. 2016).
- When potential roosting structures are found, record their location in the field using a Global Positioning System (GPS) unit.

Visual Inspection of trees and snags with tree-top cameras

- Visually inspect all cavities using a video probe (peeper) and assess the cavity contents.

Active RCW trees should not be visually inspected during the RCW breeding season (April 15 through June 15).

- Visual inspection alone is valid only when the entire cavity is observed and the contents can be identified. Typically, acoustics at emergence will also be needed to definitively identify bat species, if bats are present or suspected.
- If bats are suspected, or if contents cannot be determined, or if the entire cavity cannot be observed with the video probe; follow methods for an Acoustic Survey or an Emergence Survey (below). If the Corps (or other action agency) or applicant does not wish to conduct acoustic or emergence surveys, the Corps (or other action agency) cannot use the key and must request formal consultation with the Service.
- Record tree species or type of cavity structure, tree diameter and height, cavity height, cavity orientation and cavity contents.

Emergence Surveys

- For bat emergence surveys, multiple observers should be stationed at potential roosts if weather conditions (as described below in Acoustic Surveys) are suitable.
- Surveyors should be quietly stationed 30 minutes prior to sunset so they are ready to look and listen for emerging Florida bonneted bats from sunset to 1½ hours after sunset.
- When conducting emergence surveys it is best to orient observers so that the roost is silhouetted in the remaining daylight; facing west can help maximize the ability to notice movement of animals out of a roost structure.
- Record number of bats that emerged, the time of emergence, and if bat calls were heard.

Acoustic surveys

- Acoustic surveys should be performed by those who are trained and experienced in setting up, operating, and maintaining acoustic equipment; and retrieving, saving, analyzing, and interpreting data. Surveyors should have completed one or more of the available bat acoustic courses/workshops, or be able to show similar on-the-job or academic experience (Service 2018).
- Due to the variation in the quality of recordings, the influence of clutter, and the changing performances of software packages over time, and other factors, manual verification is recommended (Loeb *et al.* 2015). Files that are identified to species from auto-ID programs must be visually reviewed and manually verified by experienced personnel.
- Acoustic devices should be set up to record from 30 minutes prior to sunset to 30 minutes after sunrise for multiple nights, under suitable weather conditions.
- Acoustic surveys can be conducted any time of year as long as weather conditions meet the criteria. If any of the following weather conditions exist at a survey site during acoustic sampling, note the time and duration of such conditions, and repeat the acoustic sampling effort for that night: (a) temperatures fall below 65°F (18.3°C) during the first 5 hours of survey period; (b) precipitation, including rain and/or fog, that exceeds 30 minutes or continues intermittently during the first 5 hours of the survey period; and (c) sustained wind speeds greater than 9 miles/hour (4 meters/second; 3 on Beaufort scale) for 30 minutes or more during the first 5 hours of the survey period (Service 2018). At a minimum, nightly weather conditions for survey sites should be checked using the nearest NOAA National Weather Service station and summarized in the survey reports. Although not required at this time, it has been demonstrated that conducting surveys on

warm nights late in the spring can help maximize detection probabilities (Ober *et al.* 2016; Bailey *et al.* 2017).

- Acoustic devices should be calibrated and properly placed. Microphones should be directed away from surrounding vegetation, not beneath tree canopy, away from electrical wires and transmission lines, away from echo-producing surfaces, and away from external noises. Directional microphones should be aimed to sample the majority of the flight path/zone. Omnidirectional microphones should be deployed on a pole in the center of the flight path/zone and oriented horizontally. For monitoring possible roost sites, microphones should be directed to maximize likelihood of detection.
- To standardize recordings, acoustic device recordings should have a 2-second trigger window and a maximum file length of 15 seconds.
- Acoustic surveys should be conducted over a minimum of four nights.
- If acoustic devices cannot be left in place for the entire night for multiple nights as above, then a combination of short acoustic surveys (from sunset and extending for 1½ hours), stationed observers for emergence surveys or visual inspection of trees/snags with tree-top cameras may be acceptable. Contact the Service for guidance under this circumstance.

Reporting

- Provide report showing effort, methods, weather conditions, findings, and summary of acoustic data relating to Florida bonneted bat by date (*e.g.*, # of calls, time of calls). Sonograms of all calls with signatures at or below 20kHz shall be included in the report. The report shall be provided to the Corps project manager assigned to the project for which the survey was conducted and to the Service via the email address **verobeach@fws.gov. Raw acoustic data should be provided to the Service for all surveys. Raw acoustic data should be provided as "all raw data" and "all raw data with signatures at or below 20kHz". Data can be submitted to the Service via flash drive, memory stick, or hard drive. Data can be submitted digitally to verobeach@fws.gov or via mail to U.S. Fish and Wildlife Service, Attn: Florida bonneted bat data manager, 1339 20th Street, Vero Beach, Florida 32960.**
- Negative surveys are valid for 1 year after completion of the survey

If you have comments, or suggestions on this survey protocols, please email your comments to FBBguidelines@fws.gov. These comments will be reviewed and incorporated in an annual review.

Literature Cited – Appendix C

Bailey, A.M., H.K. Ober, A.R. Sovie, and R.A. McCleery. 2017. Impact of land use and climate on the distribution of the endangered Florida bonneted bat. Journal of Mammalogy. 98:1586-1593.

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U.S. Fish and Wildlife Service. 2018. Range-wide Indiana bat survey guidelines. https://www.fws.gov/midwest/endangered/mammals/inba/surveys/pdf/2018RangewideIBatSurveyGuidelines.pdf

Appendix D: Best Management Practices (BMPs) for Development Projects

Ongoing research and monitoring will continue to increase the understanding of the Florida bonneted bat and its habitat needs and will continue to inform habitat and species management recommendations. These BMPs incorporate what is known about the species and also include recommendations that are beneficial to all bat species in Florida. These BMPs are intended to provide recommendations for improving conditions for use by Florida bonneted bats, and to help conserve Florida bonneted bats that may be foraging or roosting in an area.

The BMPs required to reach a "may affect, but is not likely to adversely affect" (MANLAA) determination vary depending on the couplet from the Consultation Key used to reach that particular MANLAA. The requirements for each couplet are provided below followed by the list of BMPs. If the applicant is unable or does not want to do the required BMPs, then the Corps (or other Action Agency) will not be able to use this Guidance and formal consultation with the Service is required.

Couplet Number for MANLAA from Consultation Key	Required BMPs
4b	BMP number 1 if more than 3 months has occurred between the survey and start of the project, and any 3 BMPs out of BMPs 4 through 13
5b	BMP number 2, and any 3 BMPs out of BMPs 3 through 13
9b	BMPs number 2 and 3, and any 4 BMPs out of BMPs 5 through 13
11b	BMPs number 1 and 4, and any 4 BMPs out of BMPs 5 through 13
12b	BMP number 1, and any 3 BMPs out of BMPs 3 through 13
14b	Any 2 BMPs out of BMPs 3 through 13
15b	Any 3 BMPs out of BMPs 3 through 13
17b	Any 4 BMPs out of BMPs 3 through 13

BMPs for development, construction, and other general activities:

1. If potential roost trees or structures need to be removed, check cavities for bats within 30 days prior to removal of trees, snags, or structures. When possible, remove structure outside of breeding season (*e.g.*, January 1 – April 15). If evidence of use by any bat species is observed, discontinue removal efforts in that area and coordinate with the Service on how to proceed.
2. When using heavy equipment, establish a 250 foot (76 m) buffer around known or suspected roosts to limit disturbance to roosting bats.
3. For every 5 acres of impact, retain a minimum of 1.0 acre of native vegetation. If upland habitat is impacted, then upland habitat with native vegetation should be retained.
4. For every 5 acres of impact, retain a minimum of 0.25 acre of native vegetation. If upland habitat is impacted, then upland habitat with native vegetation should be retained..
5. Conserve open freshwater and wetland habitats to promote foraging opportunities and avoid impacting water quality. Created/restored habitat should be designed to replace the function of native habitat.

6. Conserve and/or enhance riparian habitat. A 50-ft (15.2 m) buffer is recommended around water bodies and stream edges. In cases where artificial water bodies (*i.e.,* stormwater ponds) are created, enhance edges with native plantings especially in cases in which wetland habitat was affected.
7. Avoid or limit widespread application of insecticides (*e.g.,* mosquito control, agricultural pest control) in areas where Florida bonneted bats are known or expected to forage or roost.
8. Conserve natural vegetation to promote insect diversity, availability, and abundance. For example, retain or restore 25% of the parcel in native contiguous vegetation.
9. Retain mature trees and snags that could provide roosting habitat. These may include live trees of various sizes and dead or dying trees with cavities, hollows, crevices, and loose bark. See "Roosting Habitat" in "Background" above.
10. Protect known Florida bonneted bat roost trees, snags or structures and trees or snags that have been historically used by Florida bonneted bats for roosting, even if not currently occupied, by retaining a 250 foot (76 m) disturbance buffer around the roost tree, snag, or structure to ensure that roost sites remain suitable for use in the future.
11. Avoid and minimize the use of artificial lighting, retain natural light conditions, and install wildlife friendly lighting (*i.e*., downward facing and lowest lumens possible). Avoid permanent night-time lighting to the greatest extent practicable.
12. Incorporate engineering designs that discourage bats from using buildings or structures. If Florida bonneted bats take residence within a structure, contact the Service and Florida Fish and Wildlife Conservation Commission prior to attempting removal or when conducting maintenance activities on the structure.
13. Use or allow prescribed fire to promote foraging habitat.

Appendix E: Additional Best Management Practices (BMPs) for Land Management Projects

Ecological Land Management

The Service reviews and develops Ecological Land Management projects that use land management activities to restore and maintain native, natural communities that are beneficial to bats. These activities include prescribed fire, mechanical treatments to reduce vegetation densities, timber thinning to promote forest health, trail maintenance, and the treatment of exotic vegetation. The following BMPs provide recommendations for conserving Florida bonneted bat roosting and foraging habitat during ecological land management activities. The Service recommends incorporating these BMP into ecological land management plans.

If potential roost trees need to be removed, check cavities for bats prior to removal of trees or snags. If evidence of use by any bat species is observed, discontinue removal efforts in that area and coordinate with the Service on how to proceed.

Ecological Land Management BMPs:

- Protect potential roosting habitat during ecological land management activities, if feasible. Avoid removing trees or snags with cavities.
- Rake and/or manually clear vegetation around the base of known or suspected roost trees to remove fuel prior to prescribed burning.
- If possible, use ignition techniques such as spot fires or backing fire to limit the intensity of fire around the base of the tree or snag containing the roost. The purpose of this action is to prevent the known or suspected roost tree or snag from catching fire and also to attempt to limit the exposure of the roosting bats to heat and smoke. A 250-ft (76 m) buffer is recommended.
- If prescribed fire is being implemented to benefit Florida bonneted bats, Braun de Torrez et al. (2018) noted that fire in the dry/spring season could be most beneficial.
- When creating firebreaks or conducting fire-related mechanical treatment, mark and avoid any known or suspected bat roosts.
- When using heavy equipment, establish a buffer of 250 feet (76 m) around known roosts to limit disturbance to roosting bats.
- Establish forest management efforts to maintain tree species and size class diversity to ensure long-term supply of potential roost sites.
- For every 5 acres (2 hectares) of timber that is harvested, retain a clump of trees 1-2 acres (0.4 - 0.8 hectare) in size containing potential roost trees, especially pines and royal palms (live or dead). Additionally, large snags in open canopy should be preserved.

Literature Cited – Appendix E

Braun de Torrez, E.C., H.K. Ober, and R.A. McCleery. 2018. Activity of an Endangered Bat Increases Immediately Following Prescribed Fire. The Journal of Wildlife Management.


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