



FPID #430029-2-21-01

ETDM No. 14413



**Atlantic Isle at West of SR A1A  
Bridge No. 874218  
Project Development and Environment Study**

# Draft Natural Resources Evaluation

**FDOT District Six**  
1000 NW 111th Avenue  
Miami, Florida 33172

Atlantic Isle Bridge (Bridge No. 874218)  
Atlantic Avenue, Sunny Isles Beach, FL  
Miami-Dade County, FL

January 2024



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

DRAFT NATURAL RESOURCES EVALUATION

Florida Department of Transportation

District 6

Atlantic Isle at West of SR A1A (Bridge #874218) Natural Resources Evaluation

Limits of Project: Bridge #874218

Miami-Dade County, Florida

Financial Management Number: 430029-2-22-01

ETDM Number: #14413

Date: January 2024

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

## EXECUTIVE SUMMARY

The Florida Department of Transportation (FDOT), District 6, is planning a bridge replacement project at Atlantic Isle Bridge (Bridge No. 874218). The Atlantic Isle Bridge is a historic bridge located on Atlantic Island just west of State Road (SR) A1A (Collins Avenue), within the City of Sunny Isles Beach in Miami-Dade County, Florida. The replacement of the bridge involves six drilled shafts and temporary sheet piles that will be installed within the water column, and all other work such as removal of the existing bridge will occur from the upland. As part of the planning process, a Natural Resources Evaluation (NRE) was completed.

This NRE contains detailed information pertaining to protected species, critical habitat and wetland impacts within the project limits as well as avoidance and minimization measures for potential impacts associated with this project. A Protected Species and Habitat Evaluation was conducted to document potential project involvement with federal and state protected species that may occur as part of the proposed project. This evaluation was conducted in accordance with Section 7 of the Endangered Species Act (ESA) of 1973 as amended (16 United States Code [U.S.C.] 1531 et seq) and the Protected Species and Habitat chapter of the FDOT PD&E Manual. In addition, this NRE includes a Wetland and Essential Fish Habitat (EFH) Evaluation conducted in accordance with the Wetlands and Other Surface Waters chapter and the Essential Fish Habitat chapter of the FDOT PD&E Manual and the Magnuson-Stevens Fishery Conservation and Management Act as amended, 1996.

A total of 32 species (five plants, nine birds, two mammals, seven reptiles, two fish, and seven corals) that are federally and/or state listed as threatened or endangered (T&E) were determined to occur or potentially occur within the project area. Critical habitat for the West Indian manatee occurs within the project area, however no destruction or adverse modification of the critical habitat is anticipated for this project. Based on the review of these species, including database searches, Geographic Information Systems (GIS) resource analysis, field surveys, and the use of United States Fish and Wildlife Service's (USFWS) most current guidance for Standard Protection measures during construction, the following effect determinations were made: *"May Affect, Not Likely to Adversely Affect"* for the West Indian manatee, wood stork, eastern indigo snake, Florida bonneted bat, smalltooth sawfish, giant manta ray, American crocodile, Kemp's ridley sea turtle, leatherback sea turtle, hawksbill sea turtle, loggerhead sea turtle, and green sea turtle; and, *"No Effect"*, *"No effect anticipated"*, or *"No adverse effect anticipated"* for the remainder of the species covered in this NRE.

This project will result in the removal of three trees and impacts to 0.005 acres of wetlands. These impacts will be indirect impacts to an existing seagrass bed due to the wider footprint of the replacement bridge structure. Additionally, 0.01 acres of direct and indirect impacts to other surface waters (OSWs) including potential seagrass habitat within the lagoon will occur from permanent additional shading (0.008 acres) and temporary installation of sheet piles (0.002 acres). The impacted seagrass bed is also EFH and a Habitat Area of Particular Concern (HAPC) for federally managed fisheries. The footprint of the bridge replacement was designed to minimize these impacts, but to adequately protect the bridge infrastructure, complete avoidance of seagrass is not possible.

## Contents

EXECUTIVE SUMMARY .....	i
INTRODUCTION .....	6
Purpose and Need.....	7
Bridge Deficiencies.....	7
Modal Interrelationships .....	7
Emergency Evacuation.....	8
Project Description.....	8
Project Background.....	9
No-Action Alternative .....	10
Preferred Alternative .....	11
EXISTING CONDITIONS.....	14
Land Use.....	14
Soils .....	16
Aerial Photographs.....	16
PROTECTED SPECIES AND HABITAT .....	18
Prior Coordination and Methodology.....	18
Listed Species and Designated Critical Habitat.....	19
Federally Listed Species and Habitat .....	21
State Listed Species and Habitat.....	27
WETLAND EVALUATION.....	33
Methodology.....	33
Wetland Identification, Delineation, and Classification .....	35
Wetland Impact Assessment .....	36
Other Surface Water Impact Assessment.....	36
Cumulative Impacts .....	37
Avoidance and Minimization .....	39
Mitigation.....	39
Wetlands Finding .....	39
ESSENTIAL FISH HABITAT .....	40
Direct, Indirect, and Cumulative Impacts .....	41
ANTICIPATED PERMITS.....	42
COMMITMENTS .....	43

CONCLUSIONS.....	44
REFERENCES.....	46
Appendix A – Preferred Alternative Concept Plans.....	47
Appendix B – Land Use Descriptions.....	48
Appendix C – IPaC Resource List.....	49
Appendix D – Survey Reports.....	50
Appendix E – Consultation Keys.....	51
Appendix F – Standard Protection Measures.....	52
Appendix G – Uniform Mitigation Assessment Method.....	53

## List of Figures

Figure 1. Project Location Map.....	6
Figure 2. Project Study Area.....	9
Figure 3. Preferred Alternative Elevation View.....	12
Figure 4. Preferred Alternative Typical Section.....	13
Figure 5. Land Use Map.....	15
Figure 6. Natural Resources Conservation Service (NRCS) Soils Map.....	17
Figure 7: Benthic Survey Results and Wetland ID Map from July 8, 2020.....	34
Figure 8. Wetland Impact Map.....	38

## List of Tables

Table 1. Listed Species Potentially Occurring in the Project Area.....	20
Table 2. Summary of Effect Determinations.....	30
Table 3. Wetland Characteristics.....	35
Table 4. Summary of Wetland and Other Surface Water Impacts.....	37
Table 5. EFH and HAPC within the Study Area.....	40
Table 6. Summary of EFH Impacts.....	41

## Appendices

Appendix A – Preferred Alternative Concept Plans
Appendix B – Land Use Descriptions
Appendix C – IpaC Resource List
Appendix D – Survey Reports
Appendix E – Consultation Keys
Appendix F – Standard Protection Measures
Appendix G – Uniform Mitigation Assessment Method

## ACRONYMS AND ABBREVIATIONS

CIP	Cast-in-place
CFA	Core Foraging Area
EFH	Essential fish habitat
EPA	United States Environmental Protection Agency
ERP	Environmental Resource Permit
ESA	Endangered Species Act
EST	Environmental Screening Tool
ETDM	Efficient Transportation Decision Making
F.S.	Florida Statutes
FDEP	Florida Department of Environmental Protection
FDHR	Florida Division of Historical Resources
FDOT	Florida Department of Transportation
FE	Federally Endangered
FGDL	Florida Geographic Data Library
FHWA	Federal Highway Administration
FLUCCS	Florida Land Use Cover and Forms Classification System
FMP	Fisheries Management Plan
FMSF	Florida Master Site File
FNAI	Florida Natural Area Inventory
FT	Federally Threatened
FWC	Florida Fish and Wildlife Conservation Commission
GIS	Geographic Information Systems
GPS	Global Positioning System
HAPC	Habitat Area of Particular Concern
IPaC	Information for Planning and Consultation

NAVD88	North American Vertical Datum of 1988
NMFS	National Marine Fisheries Service
NRCS	Natural Resources Conservation Service
NRE	Natural Resource Evaluation
NRHP	National Register of Historic Places
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
OFW	Outstanding Florida Water
PD&E	Project Development and Environment
ROW	Right-of-way
SAFMC	South Atlantic Fisheries Management Council
SAV	Submerged Aquatic Vegetation
SE	State Endangered
SFWMD	South Florida Water Management District
SR	State Road
SSL	Sovereign Submerged Lands
ST	State Threatened
SU	Single unit
T&E	Threatened or Endangered
U.S.C.	United States Code
USACE	United States Army Corps of Engineers
USDOT	United States Department of Transportation

## INTRODUCTION

The Florida Department of Transportation (FDOT), District Six, is conducting a Project Development and Environment (PD&E) Study to address the deficiencies of the existing Atlantic Isle Bridge (Bridge No. 874218). The Atlantic Isle Bridge is a historic bridge located on Atlantic Island just west of State Road (SR) A1A (Collins Avenue), within the City of Sunny Isles Beach in Miami-Dade County, Florida. The limits of the proposed project encompass the bridge (along Atlantic Avenue) and approaches for a distance of approximately 0.009 mile. **Figure 1** presents the Project Location Map.

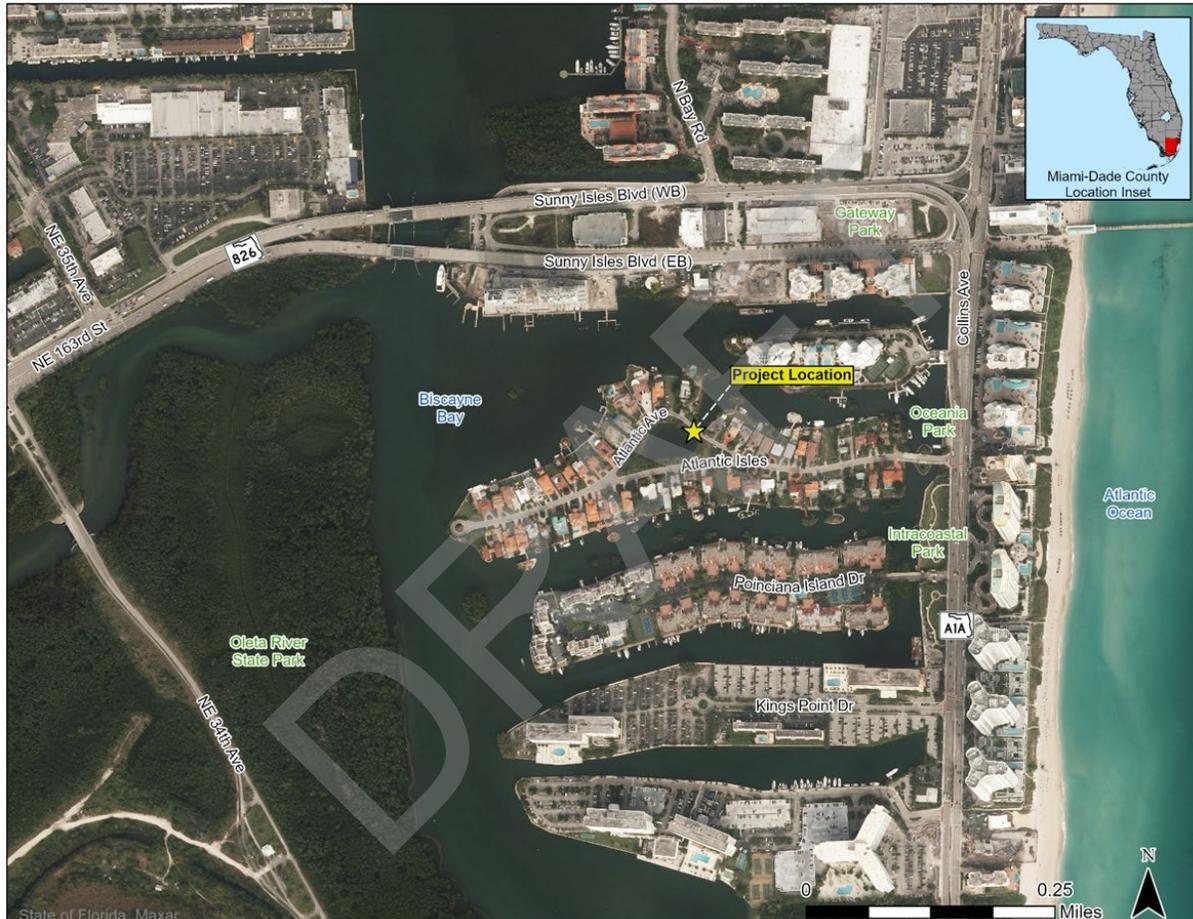


Figure 1. Project Location Map

This Natural Resources Evaluation (NRE) was prepared to document the natural resources analysis performed to support decisions related to the evaluation of the preferred alternative and to summarize potential impacts to wetlands, federal and state protected species and protected habitats. Measures considered to avoid, minimize, and mitigate for potential impacts are also discussed. This report provides documentation of these processes to supplement the Environmental Document.

This NRE will be submitted to each regulatory resource agency with involvement in the project for review and comment (and/or concurrence) regarding the findings. Comments and concurrences received from

the resource agencies will be incorporated into the environmental document. Additional coordination may be necessary to confirm that all agency comments are sufficiently addressed and included.

### Purpose and Need

The purpose of the project is to address the structural and functional deficiencies of the existing bridge in order to provide a safe and functional route for the surrounding community/traveling public. According to a bridge inspection conducted on September 26, 2022, the Atlantic Isle Bridge [Bridge Identification Number 874218] has been determined to be 'Functionally Obsolete', with a Sufficiency Rating of 40.9 and a Health Index of 60.39. The Sufficiency Rating and Health Index values vary from 0 [worst] to 100 [best].

The bridge also has weight restrictions and limitations with an existing Bridge Load Posting Sign for single unit (SU) and Class 1 Trucks at 12 Tons and 21 Tons, respectively. The load posting on the bridge poses a significant issue for the residents of Atlantic Isle since garbage trucks, as well as trucks transporting concrete, building materials/demolition debris, and other urban goods, may not be within an adequate weight range to cross the bridge. As trucks are restricted to smaller loads when crossing the bridge and are forced to make several circuitous trips to transport freight, unnecessary truck traffic is being added to the surrounding roadway network. In some cases, fire trucks, emergency vehicles, delivery or moving vans, and construction vehicles also exceed the posted bridge load limit. Overweight vehicles accessing neighboring properties must complete a crossover requiring special procedures such as the use of flagmen in order to proceed. Given these conditions, the bridge does not meet the current transportation needs of the community.

### Bridge Deficiencies

As previously noted, the bridge has a sufficiency rating of 40.9 and a health index of 60.39. Sufficiency rating and health index values vary from 0 (worst) to 100 (best). Existing functional deficiencies observed during the bridge inspection in September 2022 include substandard traffic barriers, multi-directional cracks in the asphalt overlay, and missing oolitic limestone on some areas of the north face of the arch. The southwest corner along the underside edge and the south side of the arch have spalls and delamination with exposed steel and areas of corrosion stains throughout the length of the arch along the fallen coral rock. In addition, the arch underside has a core hole at the center of the mid-span and exhibits delamination at random locations.

### Modal Interrelationships

The project's surrounding land use is residential. The two bridges at the entrance of Atlantic Island (reconstructed in 1993) are approximately 0.14 mile from the intersection at Atlantic Avenue and include a barrier-separated pedestrian pathway on the south side of the bridges that connects to the existing sidewalk along SR A1A. There are no existing pedestrian or bicycle facilities along Atlantic Avenue or Atlantic Isles on the island, but field reviews confirmed that pedestrians on Atlantic Avenue use the roadway pavement and bridge. No bus service is available on Atlantic Island, but the Sunny Isles Beach Shuttle includes three routes (Orange Line #1, Orange Line #2, and Blue Line #3) that operate along SR A1A, and a bus stop (Bus Stop #40) is located just outside the community on the west side of SR A1A just south of Atlantic Avenue. The Miami-Dade County Transit service also has Limited-Stop Service and North-South Local Stop Service along SR A1A, but there are no stops that serve Atlantic Island.

## Emergency Evacuation

Atlantic Isles and Atlantic Avenue are not identified as designated evacuation routes. However, they are the only existing roadways and are needed to effectively evacuate Atlantic Island. Residents along Atlantic Avenue could exit Atlantic Island in an emergency without using Atlantic Isle Bridge by driving the opposite direction of travel along the one-way road. However, it would be difficult for large emergency vehicles to make turnaround movements on Atlantic Avenue. The bridge provides evacuation function based on the existing roadway network.

## Project Description

The Atlantic Isle Bridge was constructed in c. 1925 and is located on Atlantic Avenue which is approximately 0.25 miles in length and is a one-way eastbound, undivided roadway that serves residential traffic and service vehicles. Atlantic Isle is a two-way, east-west residential roadway that intersects with Atlantic Avenue and is located on the south side of the Atlantic Isle Lagoon. There are approximately 14 residential properties along Atlantic Avenue that use the bridge to access their properties on the one-way roadway. The functional classification for both facilities is local road. The roadways on Atlantic Island are owned, operated, and maintained by the City of Sunny Isles Beach including the Atlantic Isle Bridge.

The Atlantic Isle Bridge spans approximately 60 feet over a narrow channel between the Lake of the Isles (Atlantic Isle Lagoon) and Biscayne Bay. The west and east bridge approaches are approximately 16 feet wide. The bridge typical section is approximately 20 feet wide with one 10-foot-wide travel lane in the center, and includes a planter easement, curbs, and barrier walls on both sides. Bicyclists and pedestrians must share the 10-foot-wide travel lane to cross the bridge as no sidewalks are provided on the existing facility.

The bridge is open to vehicular traffic that meets posted weight restrictions and is used for access to the residential properties on Atlantic Avenue. The Atlantic Avenue roadway typical section east and west of the bridge consists of 16 feet of pavement utilized by one-way traffic with curb and gutter on the outside. The posted speed limit along Atlantic Isle and Atlantic Avenue is 20 miles per hour. **Figure 2** shows the current traffic pattern at the project location, as well as the project study area. The project study area is within the historic triangular landscape of the Atlantic Island Park [Florida Master Site File (FMSF) No. 8DA6433], which is both privately and publicly owned.



Figure 2. Project Study Area

## Project Background

In 2016, FDOT conducted a feasibility study to identify bridge rehabilitation alternatives to better serve the needs of the community and to preserve the service life of the Atlantic Isle Bridge. The results of the feasibility study are documented in the *Atlantic Isle Lagoon Bridge Proof of Concept Report* finalized in September 2016. The 2016 *Proof of Concept Report* evaluated several alternatives to rehabilitate the bridge which included reusing the existing concrete arch, replacing the existing arch with a new cast-in-place (CIP) reinforced concrete arch, reconstructing the existing bridge with a new precast concrete structure, and preserving the existing bridge with minor repairs but without any bridge rehabilitation. The study resulted in the identification of a preferred alternative to reuse the existing concrete arch.

Based on the feasibility study, FDOT prepared rehabilitation design plans based on the preferred alternative. The location of foundations was coordinated with the FDOT District Six geotechnical and maintenance staff. Results from borings and excavations were not conclusive at the bridge approaches, and excavation of both approaches were required to complete the rehabilitation design plans. However, since excavation of the bridge approaches had the potential to have an adverse effect on the bridge, FDOT discontinued the bridge rehabilitation design until further study of a range of alternatives could be analyzed for environmental effects. In 2016, a CRAS was conducted for the rehabilitation of the bridge.

The CRAS resulted in the determination that the Atlantic Island Bridge (8DA6433) was National Register-eligible under Criteria A and C in the areas of Community Planning and Development and Architecture for its association with the development of the Atlantic Island subdivision and Sunny Isles Beach, as well as its unique design. The SHPO concurred on the determination of eligibility on August 23, 2016. However, the project was placed on hold due to the complexities of testing the bridge approaches.

Subsequently, FDOT initiated the current PD&E Study in September 2020 to fully evaluate all potential alternatives including a replacement alternative. Prior to the initiation of the PD&E Study, an Efficient Transportation Decision Making (ETDM) Programming Screen was completed in February 2020. An updated CRAS was conducted in 2022 to incorporate all potential alternatives during the current PD&E Study. The 2022 CRAS resulted in the confirmation that the Atlantic Island Bridge (8DA6433) remained National Register-eligible and resulted in the documentation and identification of three additional National Register properties (the Atlantic Island Resource Group (8DA19241), with two contributing resources, the Lake of the Isles (8DA15824) and Atlantic Island Park (8DA15825).

Alternatives evaluated for the current PD&E study, included the No Action and Build Alternatives. Potential build alternatives include the Rehabilitation Alternative (Build Alternative #1) or the Replacement Alternative (Build Alternative #2) of the bridge. The Preferred Alternative is the Replacement Alternative (Build Alternative #2). The following provides an assessment of the No-Action and Preferred Alternative. **Appendix A** presents the project concept plans.

#### No-Action Alternative

The No-Action Alternative maintains the existing bridge and roadway approaches in their existing condition and includes no rehabilitation of the existing bridge superstructure or substructure. The No-Action Alternative involves minor maintenance repairs in an attempt to extend the functional use of the bridge as recommended by routine bridge inspections until future inspections require reduced loading capacity or bridge closure. In the existing condition, the bridge is functionally obsolete. The bridge rating is below a sufficiency rating of 50 and is eligible for replacement per FHWA (Federal Highway Administration) policy. The bridge is nearing the end of its service life and displays exposed rebar and multiple instances of cracking, delamination, and spalls, which vary in size and severity on the soffit and sides of the bridge. The exterior oolitic limestone-covered walls also show cracks up to 1 inch wide. The posted weight restrictions would be maintained in the No-Action Alternative and increased as needed based on future maintenance inspections. In the No-Action Alternative, emergency vehicles, larger delivery and moving vans, and heavy vehicles will continue to be prohibited to cross the bridge. Additionally, overweight vehicles will be required to continue use of flagging staff and special crossover procedures. A geotechnical investigation performed in March 2021 was initiated to determine the size and type of the existing foundations; however, the investigation was inconclusive, and the bridge was classified as having “unknown foundations.” The remaining service life of the bridge is unknown because of the age of the structure (approximately 95 years) and the bridge will continue to deteriorate even with routine maintenance. Similarly, the aesthetic appearance (oolitic limestone) will continue to deteriorate. The No-Action Alternative would not preserve the aesthetic façade or the historic integrity of the bridge.

## Preferred Alternative

After the Alternatives Public Meeting held on June 23, 2022, and follow-up meetings/presentations with the City of Sunny Isles Beach, and City of Sunny Isles Beach Historic Preservation Board, FDOT has selected Build Alternative 2 as the Preferred Alternative. The Preferred Alternative was selected because of public input, lower risks and cost, and improved bridge functionality and safety. The No-Action Alternative remains an alternative throughout the PD&E Study and forms a basis for comparison to the Build Alternatives.

This alternative will not require any right-of-way (ROW), however 0.03 acres of temporary ROW from one privately owned parcel and one City owned parcel is needed. No residences or businesses will be displaced as a result of the Preferred Alternative.

The Preferred alternative involves replacing the entire bridge to address the structural and functional deficiencies of the existing superstructure and substructure to enhance operations and remove load restrictions. This would require demolition of the existing bridge and replacement of the bridge at the same location to minimize overall environmental impacts. The proposed bridge typical section would be approximately 27 feet wide to accommodate one 10-foot-wide travel lane, one 8-foot-wide shared use path, 3-foot-wide shoulders, and concrete traffic railings on both sides. A raised sidewalk would separate pedestrians from vehicular traffic.

New approach retaining walls would replace the existing retaining walls. A new, non-structural oolitic limestone façade would be placed along the exterior faces of the traffic railings and retaining walls to provide aesthetics similar to the existing bridge. A slightly longer bridge span may be required to span over portions of the existing unknown foundations which may not be able to be removed, in order to eliminate potential conflicts and enhance constructability.

Limestone rock fill with roadway pavement will be placed on the new arch structure. New approach retaining walls will replace the existing retaining walls. In addition, a new rubble oolitic limestone façade would be placed along the exterior faces of the vertical shape barriers and retaining walls to mimic the existing structure. The limestone could be obtained from the original source used to construct the original bridge, or the limestone from the existing bridge could be reused and incorporated into the new bridge. New bridge approach slabs are anticipated and would be the standard length of 20 feet each.

The Preferred Alternative requires temporary roadway widening and a turnout along Atlantic Avenue to maintain two-way access during construction. The turnout would be temporary and removed after rehabilitation of the bridge is complete. The temporary roadway turnout is proposed west of the bridge to accommodate maintenance of traffic. The temporary turnout would require temporary walls (either gravity or sheet pile wall-types). All wall options would require excavation of the soil or installation via driving or vibratory methods near the waterline of the Lake of the Isles (Atlantic Isle Lagoon). The wall is considered temporary and could be removed following completion of the bridge construction work and elimination of the temporary turnouts.

**Figure 3** presents the proposed Preferred Alternative Typical Elevation and **Figure 4** presents the Preferred Alternative Typical Section.

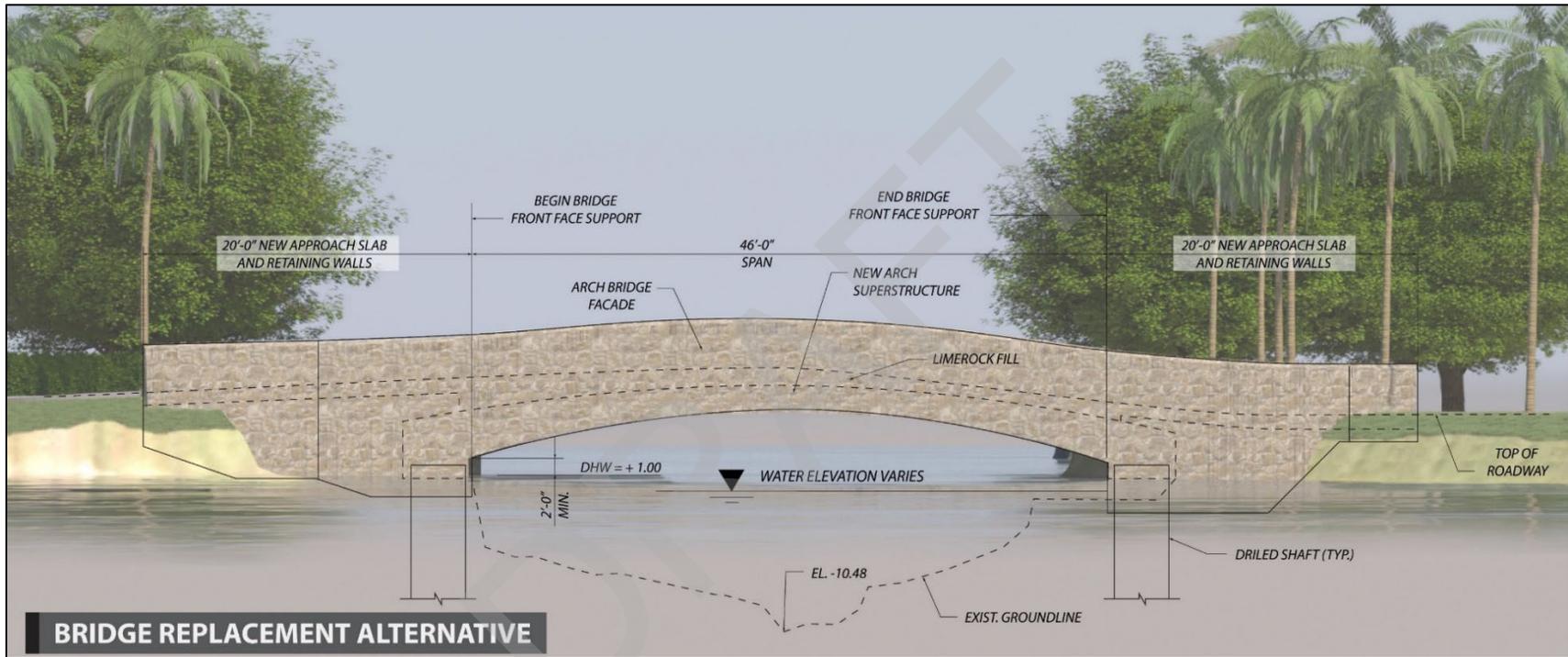


Figure 3. Preferred Alternative Elevation View

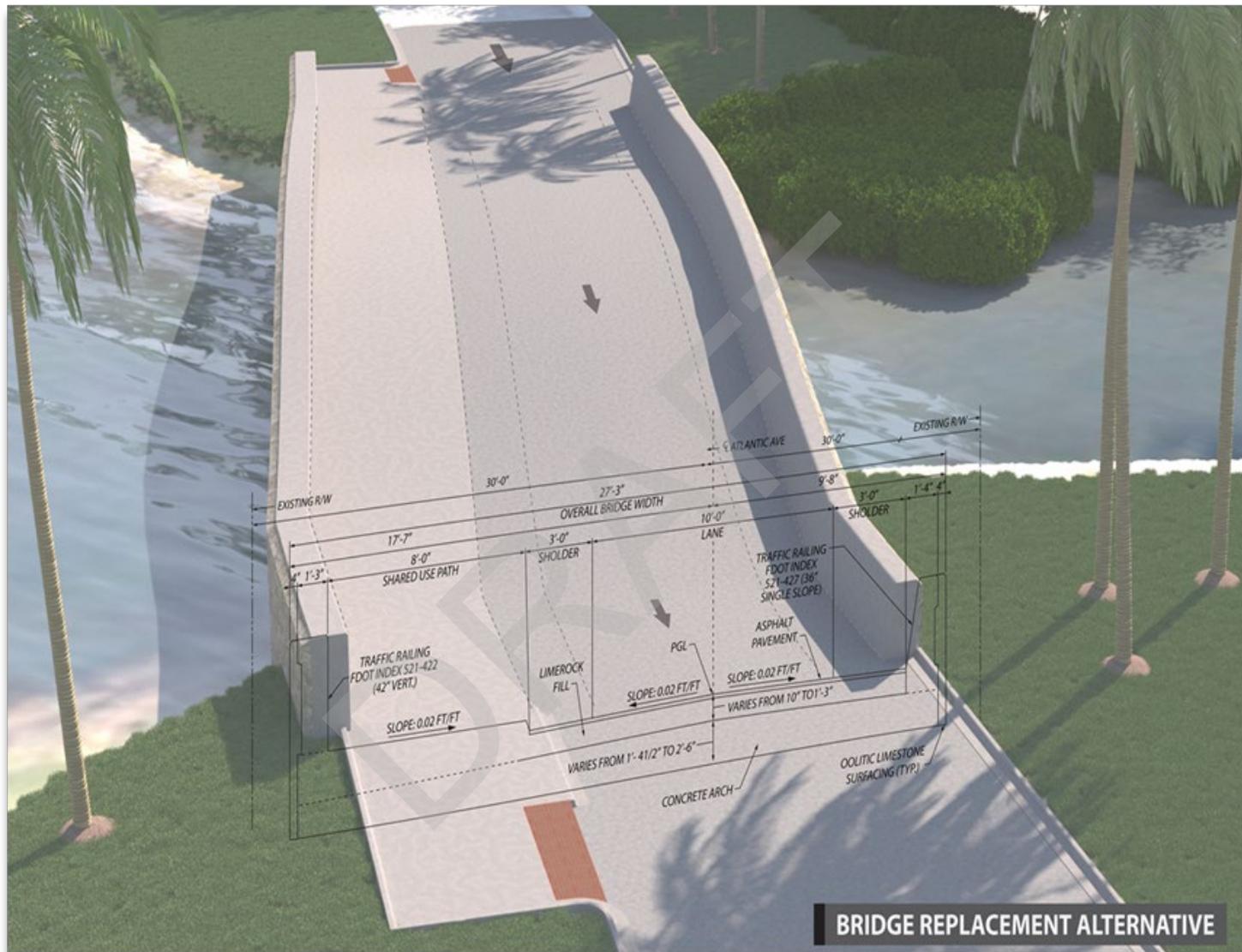


Figure 4. Preferred Alternative Typical Section

## EXISTING CONDITIONS

### Land Use

The existing land use within the project area was identified through the review and interpretation of the most recent version (updated 8-24-2020) of the South Florida Water Management District's (SFWMD) Land Cover Land Use 2008 Geographic Information Systems (GIS) layer. The existing land use is categorized in this report using the Florida Land Use, Cover, and Forms Classification (FLUCCS) codes.

The Atlantic Island project study area, between the western and eastern intersections of Atlantic Avenue and Atlantic Isle roadways, is designated as developed and urbanized residential land use. The project area is mainly residential and consists of single-family residential homes with limited public/semi-private open space. There is an existing tidally influenced lagoon in the middle of Atlantic Isle that connects to Biscayne Bay through a small canal located on the northeast point of the island. No other natural wetland habitat exists within the project area. Existing land use along the project area is depicted in **Figure 5**. Additionally, no other natural land areas exist within the project area, and the surrounding waters consist of canal, bay, and estuary habitat. The existing land uses are identified and briefly described in **Appendix B – Land Use Descriptions**.

DRAFT

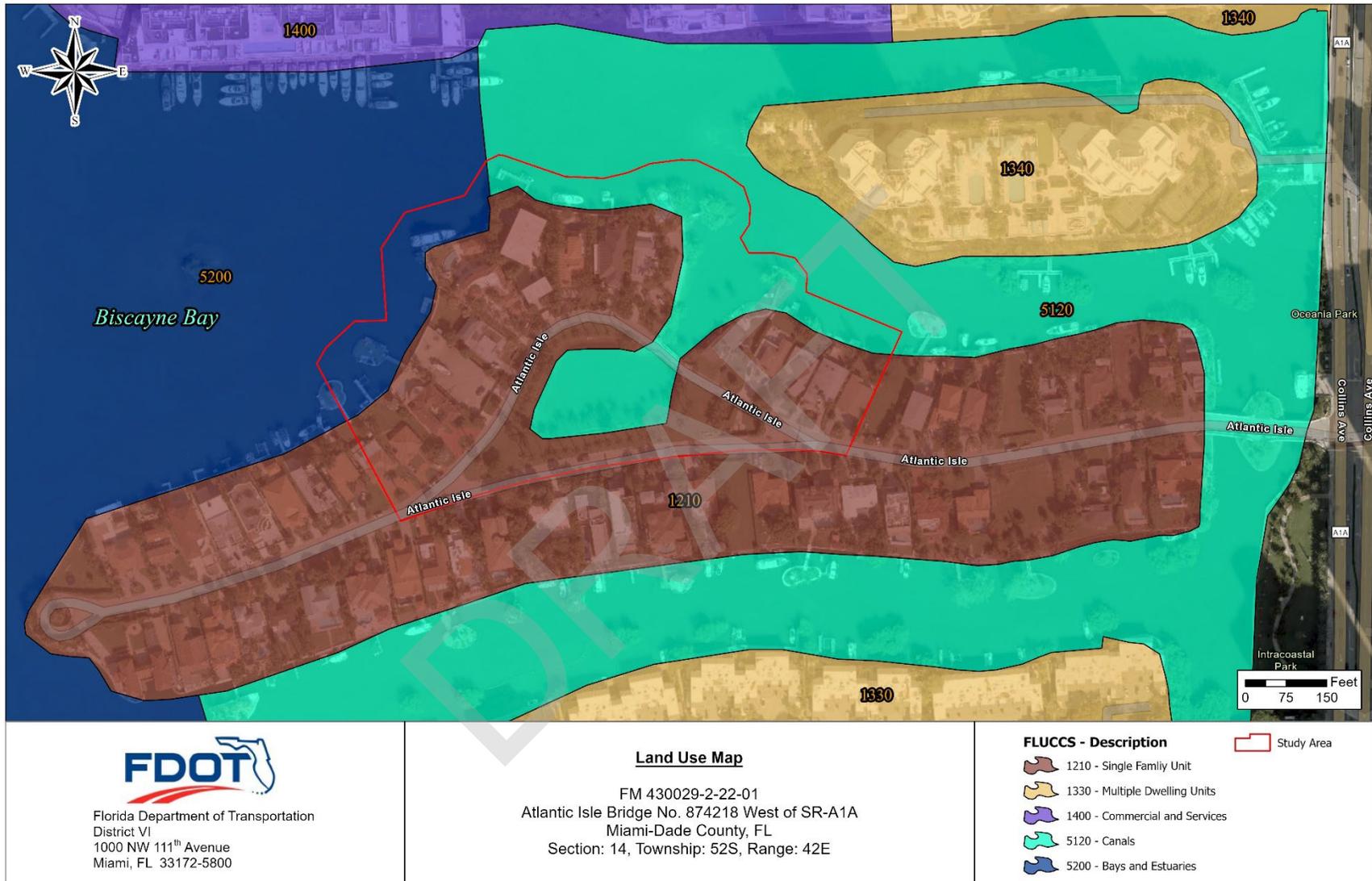


Figure 5. Land Use Map

## Soils

The existing soil types within the project area were identified through the review and interpretation of the most recent version (Tabular: Version 13, Sep 1, 2022; Spatial: Version 4, Aug 25, 2021) of the Natural Resources Conservation Service (NRCS) Soils GIS layer. The existing soils were categorized from the GIS layer and are shown in **Figure 6**.

The Atlantic Isle project study area is designated as urban land and water. There is an existing tidally influenced lagoon in the middle of Atlantic Isle that connects to Biscayne Bay through a small canal located on the northeast point of the island. No other soil types exist within the project area.

## Aerial Photographs

Aerial photographs of the project area were examined using Google Earth satellite images from the years 1985-2022. Review of these photographs in chronological order shows the area and land use has remained unchanged for the past 37 years.

DRAFT

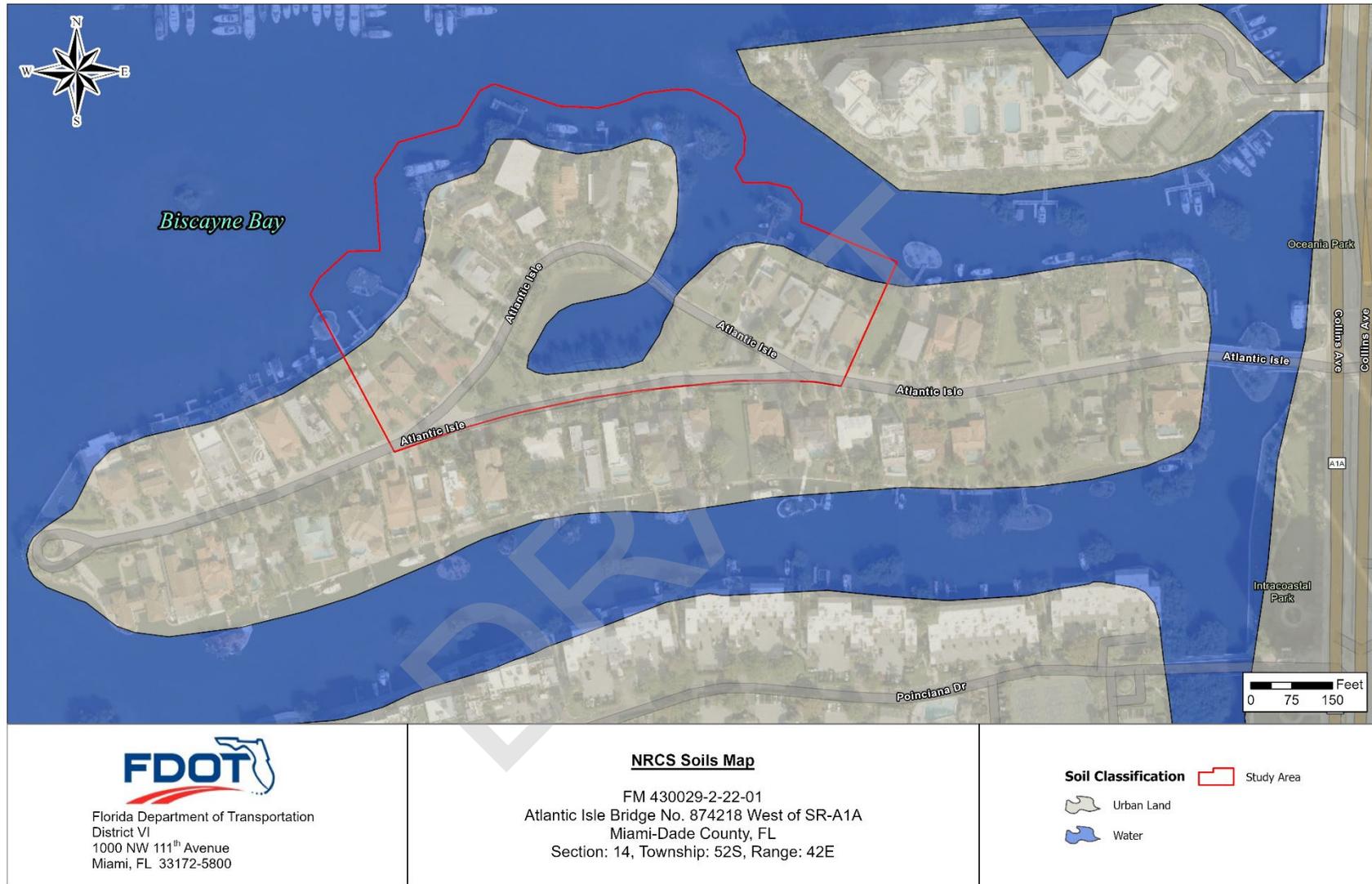


Figure 6. Natural Resources Conservation Service (NRCS) Soils Map

## PROTECTED SPECIES AND HABITAT

The project area surrounds a developed shallow lagoon, which is accessed via land as the canal under the bridge is only navigable by small, shallow draft watercraft such as canoes and kayaks. The lagoon and unnavigable canal leading to the lagoon are categorized as a tidal estuary. The shallow lagoon within the project area contains submerged aquatic vegetation (SAV) and is connected to Biscayne Bay. Biscayne Bay is a designated Aquatic Preserve and an Outstanding Florida Water (OFW) that provides habitat for many protected species; therefore, potential project related impacts to this lagoon and canal were reviewed to determine effects to protected species and habitat.

This section describes the likelihood of occurrence and potential for impact to each federally and/or state listed species and/or their critical habitats. This Protected Species and Habitat Evaluation was conducted in accordance with Section 7 of the Endangered Species Act (ESA) of 1973 as amended (16 U.S.C. 1531 et seq) and the Protected Species and Habitat chapter of the FDOT PD&E Manual, as well as the FHWA *Management of the Endangered Species Act Environmental Analysis and Consultation Process*. Federally listed species fall under the jurisdiction of United States Fish and Wildlife Service (USFWS) and the National Oceanic and Atmospheric Administration's (NOAA) National Marine Fisheries Service (NMFS). It should be noted that federally listed species are also considered state listed, but species only listed at the state level are not considered federally listed and fall under the jurisdiction of Florida Fish and Wildlife Conservation Commission (FWC) or the Florida Department of Agriculture and Consumer Services (FDACS). Any involvement with federally listed species or their designated critical habitat will require consultation under Section 7 of the ESA and the Magnuson-Stevens Fishery Conservation and Management Act. In addition, any project involvement with state listed species will be coordinated with the FWC and/or FDACS as appropriate.

### Prior Coordination and Methodology

A detailed desktop analysis was performed to gather baseline information about potentially present species utilizing the following resources prior to field assessments: FDOT's Environmental Screening Tool (EST); FDOT Efficient Transportation Decision Making (ETDM) Programming Screen Summary Report #4413; USFWS' Information for Planning and Consultation (IPaC) (see **Appendix C – IPaC Resource List**); Florida Natural Areas Inventory (FNAI) and FNAI's Biodiversity Matrix; Audubon's EagleWatch bald eagle nest locator; FWC's bird rookery database; FWC'S Rare Snake Sighting database, Chapter 5B-40, FAC, Regulated Plant Index and the USFWS Wood Stork Core Foraging Area (CFA) GIS (Florida Geographic Data Library [FGDL]) database.

A benthic survey was conducted on 7/8/2020 to characterize the benthic habitats and presence of Federal and State listed species in the marine environment (see Wetland Evaluation and Essential Fish Habitat (EFH) sections and **Appendix D – Survey Reports** for additional details). Wetland habitat assessments such as mangrove areas were also documented at the time of this survey. The survey consisted of three (3) biologists using free-diving (snorkeling) equipment to survey the area by performing reconnaissance via swimming meandering transects. The lagoon on the west side of the Atlantic Isle bridge and both sides of the bridge were inspected for the presence of Federal and State listed plant and wildlife species and their habitats within the proposed project limits.

A terrestrial survey was also conducted on 3/12/2021 to characterize the presence of potential habitat for the Florida bonneted bat (see **Appendix D – Survey Reports** for additional details).

**Table 1** was compiled listing federal and state listed plant and wildlife species with the potential to occur within the project area. These species are listed by the USFWS, NOAA NMFS, FDACS or FWC as Federally endangered [FE], Federally threatened [FT], State threatened [ST], or State endangered [SE]. The potential of occurrence for each species was assigned based on above mentioned data set and the field reviews. Low occurrence potential is assigned to species who have low quality habitat present and/or suitable habitat adjacent to the project area. Moderate occurrence potential is assigned to species that have preferred habitat present and/or suitable habitat that will be impacted by the project. High occurrence potential indicates that there is suitable habitat for the species within the project area, and individuals were observed during field investigations.

### Listed Species and Designated Critical Habitat

A total of 32 species (five plants, nine birds, two mammals, seven reptiles, two fish, and seven corals) that are federally and/or state listed as threatened or endangered (T&E) were determined to occur or potentially occur within the project area (see **Table 1**). This list has been compiled based on the above methodology and field surveys coupled with the availability of potential suitable habitat and confirmed sightings or documented home ranges.

The project is within the USFWS designated consultation areas for the Florida bonneted bat (*Eumops floridanus*), piping plover (*Charadrius melodus*), the West Indian manatee (*Trichechus manatus*) and Atlantic Coast Plants. The project is also within the CFA for two known wood stork (*Mycteria americana*) colonies. In addition, the project falls within the South Florida range for the eastern indigo snake (*Drymarchon corais couperi*).

Table 1. Listed Species Potentially Occurring in the Project Area

Species Name	Listing Status	Occurrence Potential
Plants		
Florida prairie-clover ( <i>Dalea carthagenensis</i> var. <i>floridana</i> )	FE	Low
Carter's flax ( <i>Linum carteri</i> )	FE	Low
Tiny polygala ( <i>Polygala smallii</i> )	FE	Low
Skyblue clustervine ( <i>Jacquemontia pentantha</i> )	SE	Low
Longlip Ladies-tresses ( <i>Spiranthes longilabris</i> )	ST	Low
Birds		
Wood stork ( <i>Mycteria americana</i> )	FT	Low
Piping plover ( <i>Charadrius melodus</i> )	FT	Low
Tricolored heron ( <i>Egretta tricolor</i> )	ST	Moderate
Little blue heron ( <i>Egretta caerulea</i> )	ST	Moderate
Roseate spoonbill ( <i>Platalea ajaja</i> )	ST	Moderate
Reddish egret ( <i>Egretta rufescens</i> )	ST	Moderate
Black skimmer ( <i>Rynchops niger</i> )	ST	Low
Least tern ( <i>Sterna antillarum</i> )	ST	Low
Burrowing Owl ( <i>Athene cunicularia</i> )	ST	Low
Mammals		
West Indian manatee ( <i>Trichechus manatus</i> )	FT	Moderate
Florida bonneted bat ( <i>Eumops floridanus</i> )	FE	Low
Reptiles		
American crocodile ( <i>Crocodylus acutus</i> )	FT	Low
Eastern indigo snake ( <i>Drymarchon corais couperi</i> )	FT	Low
Kemp's ridley sea turtle ( <i>Lepidochelys kempii</i> )	FE	Low
Leatherback sea turtle ( <i>Dermochelys coriacea</i> )	FE	Low
Hawksbill sea turtle ( <i>Eretmochelys imbricata</i> )	FE	Low
Loggerhead sea turtle ( <i>Caretta caretta</i> )	FT	Moderate
Green sea turtle ( <i>Chelonia mydas</i> )	FT	Moderate
Fish		
Smalltooth sawfish ( <i>Pristis pectinata</i> )	FE	Moderate
Giant Manta Ray ( <i>Manta birostris</i> )	FT	Moderate
Corals		
Staghorn coral ( <i>Acropora cervicornis</i> )	FT	Low
Elkhorn coral ( <i>Acropora palmata</i> )	FT	Low
Pillar coral ( <i>Dendrogyra cylindrus</i> )	FT	Low
Rough cactus coral ( <i>Mycetophyllia ferox</i> )	FT	Low
Lobed star coral ( <i>Orbicella annularis</i> )	FT	Low
Mountainous star coral ( <i>Orbicella faveolata</i> )	FT	Low
Boulder star coral ( <i>Orbicella franksi</i> )	FT	Low

\***Note:** FE: Federally Endangered; FT: Federally Threatened; SE: State Endangered; ST: State Threatened; Low = low quality habitat present and/or suitable habitat adjacent; Medium/Moderate = preferred habitat present and/or suitable habitat impacted; **High** = Suitable habitat present and documented occurrences within the project study area.

## Federally Listed Species and Habitat

### Plants

#### Florida prairie-clover (*Dalea carthagenensis*) – Federally Endangered (USFWS Jurisdiction)

This plant is part of the legume family and grows in pine rocklands, edges of rockland hammocks, coastal uplands, and marl prairie. The Florida prairie-clover is a shrub that grows 6 feet tall and has bipinnate leaves with 11-23 oval leaflets. The leaflets have dotted glands on the underside. This plant flowers in small heads of loose glandular stalks with 9 to 10 stamens. The base and branches of the Florida prairie-clover are non-woody, red velvety stems. No pine rockland, coastal upland, or marl prairie habitat exists within or adjacent to the project area. Therefore, a determination of “No Effect” has been made for the Florida prairie-clover.

#### Carter’s flax (*Linum carteri*) – Federally Endangered (USFWS Jurisdiction)

Carter’s flax is an annual herb growing up to 24 inches tall. The plant has small yellow flowers that are about 0.5 inches in diameter with 5 petals. The smooth stems hold long and narrow leaves, alternately arranged with red glands often found at the base. Carter’s flax grows in pine rocklands, pine flatwoods, and adjacent to disturbed uplands. There is a low probability of occurrence for this species as the project includes disturbed uplands. However, the landscaped project area is regularly mowed and maintained, and no individuals were observed during the field surveys. Therefore, a determination of “No Effect” was made for the Carter’s flax.

#### Tiny polygala (*Polygala smallii*) – Federally Endangered (USFWS Jurisdiction)

The tiny polygala plant is a small perennial herb with 1-4 unbranched stems that only grows 4 inches tall. Branches may be buried in the sand it grows in if present. This plant is endemic to the southeast Florida Atlantic Coast Ridge in pine rocklands, scrub habitat, sandhills, and open coastal spoil piles. The plant flowers year-round with a short yellow-green inflorescence. The plant is only known in eight sites of Miami-Dade County, none of which occur in conjunction or adjacent to the project area. Therefore, a determination of “No Effect” has been made for the tiny polygala.

### Birds

#### Wood stork (*Mycteria americana*) – Federally Threatened (USFWS Jurisdiction)

The wood stork is a large wading bird that utilizes wetlands within south Florida. This species is highly colonial and will nest in large rookeries. USFWS recognize the 18.6-mile radius around all known wood stork colonies as designated CFA. Wood storks will forage for small fish within suitable foraging habitat which includes shallow water areas of freshwater marshes, swamps, lagoons, ponds, tidal creeks and flooded pastures and ditches that are relatively calm and have water depths (seasonal or permanent) between 2 to 15 inches. Nests for this species are typically located within large cypress trees.

This project occurs within the USFWS CFA for one known wood stork colony. The closest colony is located approximately 17.6 miles northwest of the project area. The project area contains a littoral zone of 2-15 inches within the estuarine marsh that is the Atlantic Isle Lagoon. Temporary impacts to this suitable foraging habitat, less than one-half acre, will occur as a result of the construction of a temporary turnaround for MOT. Based on the scope of work and area of suitable habitat within the project area, an effect determination of “May Affect, Not Likely to Adversely Affect” was made for the wood stork. This

determination is supported by the USFWS consultation key for the wood stork (2010) following path (A>B>NLAA) (see **Appendix E – Consultation Keys**).

#### Piping plover (*Charadrius melodus*) – Federally Threatened (USFWS Jurisdiction)

The project is within the USFWS consultation area for the piping plover. These small, stocky shorebirds have a sand-colored upper body, a white underside, and orange legs. During the breeding season, adults have a black forehead, a black breast band, and an orange bill. The piping plover does not breed in Florida but is known to winter in Florida. Piping plovers will forage within intertidal zones of beaches, mudflats, sand floats and shoals, and flat, open, sandy beaches with very little grass or other vegetation along the coastline. Their diet consists of small crustaceans and other marine invertebrates, marine worms, and insects. Nesting and roosting occur within open sandy shorelines along the coast. This species will use dry sand or organic material deposited by the tide for nesting. There are no open sandy beach habitats present within or adjacent to the project area that this species could potentially utilize. Therefore, an effect determination of “*No Effect*” has been made for the piping plover.

#### *Mammals*

#### West Indian manatee (*Trichechus manatus*) – Federally Threatened (USFWS Jurisdiction)

Manatees are herbivorous marine mammals found in marine, estuarine, and freshwater environments. Manatees have large bodies with paired flippers and a round, paddle-shaped tail. They are typically grey in color and occasionally spotted with barnacles or colored by patches of green or red algae. The muzzle is heavily whiskered and coarse, single hairs are sparsely distributed throughout the body. The manatee typically inhabits coastal waters, bays, and rivers. They require warm water refugia during cold weather and can frequently be observed in large groups gathered in the effluent of cooling facilities at such times. The manatee is wide-ranging during warmer months and restricted to springs and other warm water areas during the winter. They can be found in any coastal or estuarine waters but are most common in peninsular Florida. This project occurs within an area where manatees are frequently observed traveling to and from warm water aggregation areas and foraging areas.

This species is Federally protected, and the project lies within Federally Designated Critical Habitat for this species. The area of Biscayne Bay which includes the Haulover Inlet near where the project will occur is a known corridor for manatees traveling to foraging habitat and warm water aggregation areas. The proposed construction will be phased to ensure manatees have unobstructed access between the lagoon and the bay to prevent a stranding within the lagoon. During construction, *Standard Manatee Conditions for In-Water Work* will be implemented (See **Appendix F – Standard Protection Measures**). In addition, no blasting or explosives will be used during demolition or removal of the existing bridge. Permanent impacts to 0.005 acres of seagrass habitat will occur due to this project. There are no known primary manatee feeding areas or aggregation areas in the vicinity of the project. (See **Appendix D – Survey Reports** for a copy of the benthic report). Based on this information and the United States Army Corps of Engineers (USACE) Manatee Effect Determination Key April 2013, (path followed: A>B>C>G>N>O>P), a determination of “*May Affect, Not Likely to Adversely Affect*” is anticipated for the West Indian manatee (see **Appendix E – Consultation Keys**).

Critical habitat for the West Indian manatee exists within the project area. The manatee critical habitat is defined by specific waterways that were known to be important concentration areas for manatees at the time of designation. Biscayne Bay, and therefore the canal leading into the lagoon within the project area, is listed as manatee critical habitat. The project does not include the construction of marinas or additional

docks and will not result in an increase in boater traffic. Additionally, the project will not restrict access to the lagoon or movement throughout Biscayne Bay. Therefore, no destruction or adverse modification to Critical Habitat for this species is anticipated.

#### Florida bonneted bat (*Eumops floridanus*) – Federally Endangered (USFWS Jurisdiction)

The project is within the USFWS consultation area as well as the Urban Bat Boundary for the Florida bonneted bat. The bonneted bat will forage over freshwater, freshwater wetlands (permanent or seasonal), wetland and upland forests, wetland and upland shrub and agricultural land as well as small patches of natural habitat and open areas in urban settings (i.e., golf courses or parking lots). While no freshwater wetlands exist within the project area, there is an area of freshwater ponds and freshwater forested wetlands in Oleta State Park, approximately 0.6 miles southwest of the project area. No impacts to either of these freshwater waterbodies is anticipated. Therefore, no impacts to potential foraging habitat are anticipated.

Suitable roosting habitat is critical for the survival and fecundity of this species. Roosting habitat includes artificial structures (i.e., buildings and utility poles) in urban areas, natural crevices (i.e., limestone crevices) and tall mature trees with structural features for breeding and sheltering such as cavities, hollows, crevices, loose bark, tree snags, deformities, and palm fronds. Based on USFWS guidance, criteria for trees to be considered suitable roosting habitat include diameter at breast height (DBH) over eight inches, height over thirty-three feet or crevices, hollows, and cavities sixteen feet above ground level or greater. Due to proposed impacts to landscaped trees along the edges of the project area, a Florida bonneted bat survey was completed on 3/12/2021. Survey methodology followed the USFWS limited roost survey protocol and consisted of visually inspecting the impacted trees for crevices, measuring height with a clinometer, and measuring DBH with a flexible transect tape. Based on the scope of work, there will be impacts to two royal palms (*Roystonea regia*) and one sabal palm (*Sabal palmetto*) that may be potential suitable roosting habitat. Although there will be tree removals, there is no freshwater present in the project area which would be used for foraging habitat. No crevices, snags or cavities were observed at a height of 16 feet or higher. Therefore, due to the low number of tree removals, the lack of freshwater within the project area, and lack of suitable roosting features such as tree cavities, FDOT has made an effect determination of “*May Affect, Not Likely to Adversely Affect*”. Please see **Appendix D – Survey Reports** for more information.

#### *Reptiles*

#### American crocodile (*Crocodylus acutus*) – Federally Threatened (USFWS Jurisdiction)

The project is within the USFWS consultation area for the American crocodile. The American crocodile is a large, brownish-gray crocodylian with black or dark green mottling. The American crocodile is found primarily in mangrove swamps and along low-energy mangrove-lined bays, creeks, and inland swamps. Crocodiles forage opportunistically, eating whatever animals they can catch. Juveniles typically eat fish, crabs, snakes, and other small invertebrates, whereas adults are known to eat fish, crabs, snakes, turtles, birds, and small mammals. There is limited foraging and basking habitat and no nesting habitat within the lagoon or project area. Although no American crocodiles were observed during field surveys, there is potential for this species to traverse the proposed project area during construction. Due to this potential, the use of turbidity barriers will be implemented to prevent impacts to water quality. Based on the scope of the work, the limited foraging and basking area is not anticipated to be affected during or after construction. Therefore, no adverse impacts to this species are anticipated as a result of this proposed

project and a determination of “*May Affect, Not Likely to Adversely Affect*” is anticipated for the American crocodile.

Eastern indigo snake (*Drymarchon corais couperi*) – Federally Threatened (USFWS Jurisdiction)

The project area is within the known range of the eastern indigo snake. This species is widely distributed throughout the state and is known to utilize a variety of habitat types. Preferred habitat for this species includes upland such as pine flatwoods and tropical hardwood hammocks but is also known to utilize edges of freshwater marshes, agricultural fields, and mangrove swamps. While it is highly unlikely that this species will be encountered due to the developed nature of the project area, the eastern indigo snake is known to occur in disturbed habitats. Although most commonly associated with gopher tortoise burrows, the eastern indigo snake will use burrows of other species and other underground refugia to seek shelter from thermal stress. No areas of underground refugia were observed during field reviews, and the nearest eastern indigo snake sighting has been more than 30 miles away (in Homestead, FL). Therefore, using the approved USFWS Programmatic Consultation Key (2017) for the eastern indigo snake (path followed: A>B>C>D) a determination of “*May Affect, Not Likely to Adversely Affect*” was made for the eastern indigo snake. The USFWS *Standard Protection Measures for the Eastern Indigo Snake* will be implemented during construction. See **Appendix E – Consultation Keys** for the USFWS consultation key and **Appendix F – Standard Protection Measures** for the standard construction protection measures.

Kemp’s ridley sea turtle (*Lepidochelys kempi*) – Federally Endangered (NMFS Jurisdiction – Swimming Turtles, USFWS Jurisdiction – Nesting Sea Turtles)

The Kemp’s ridley sea turtle is the rarest sea turtle species and only has one major nesting beach which is found in Mexico’s Gulf coast. Females can be found on Florida and south Texas beaches occasionally. It is unlikely this species would occur within the project area but has the potential to occur within the waters surrounding the project area. Furthermore, the project area lacks suitable nesting habitat such as sandy coastal shoreline. Therefore, based on the rarity of this species, the nature of the populated area, and no known sightings of the species nearby, a determination of “*May Affect, Not Likely to Adversely Affect*” is anticipated for the Kemp’s ridley sea turtle.

Leatherback sea turtle (*Dermochelys coriacea*) – Federally Endangered (NMFS Jurisdiction – Swimming Turtles, USFWS Jurisdiction – Nesting Sea Turtles)

The largest sea turtle, leatherbacks are found in Florida’s coastal waters, with a small number nesting on the Atlantic coast. They eat soft-bodied animals such as jellyfish. This pelagic species is unlikely to occur within the project area as it primarily inhabits the open ocean, and the project area lacks suitable nesting habitat such as sandy coastal shoreline but has the potential to occur within the waters surrounding the project area. The species has been documented within one mile of the project location according to FNAI’s Biodiversity Matrix. Therefore, based on the shallow lagoon with lack of foraging and nesting habitat, the determination of “*May Affect, Not Likely to Adversely Affect*” is anticipated for the leatherback sea turtle.

Hawksbill sea turtle (*Eretmochelys imbricata*) – Federally Endangered (NMFS Jurisdiction – Swimming Turtles, USFWS Jurisdiction – Nesting Sea Turtles)

Hawksbill sea turtles are critically endangered and are rare in Florida. Hawksbills inhabit reefs in the Florida Keys and along the southeastern Atlantic coast. It is unlikely this species would be present in the bay as potential foraging habitat, such as coral reefs, are not present within the bay. Furthermore, the project area lacks suitable nesting habitat such as sandy coastal shoreline. However, the species has the potential to occur within the waters surrounding the project area and has been documented within 0.5 of

a mile to the project area. Therefore, based on the lack of foraging habitat (coral reefs) and lack of nesting habitat, the determination of “*May Affect, Not Likely to Adversely Affect*” is anticipated for the hawksbill sea turtle.

Loggerhead sea turtle (*Caretta caretta*) – Federally Threatened (NMFS Jurisdiction – Swimming Turtles, USFWS Jurisdiction – Nesting Sea Turtles)

The loggerhead turtle is found in marine coastal and oceanic waters. They nest on coastal sand beaches often near the dune line where it is sufficiently high enough to avoid inundation. Hatchlings often use offshore floating sargassum mats, and juvenile’s frequent coastal bays, inlets, and lagoons. Due to the oceanic inlet south of the project area, Haulover Inlet, the area experiences thorough flushing and acts as a large corridor to allow pelagic species to enter the Intracoastal Waterway. There is not sandy coastal shoreline suitable for nesting within the project area. However, it is likely this species would be present in the bay as forage habitat is available and nesting beaches are nearby. The species is commonly documented on nesting beaches within 0.5 miles of the project area. An effect determination of “*May Affect, Not Likely to Adversely Affect*” is anticipated for the loggerhead sea turtle.

Green sea turtle (*Chelonia mydas*) – Federally Threatened (NMFS Jurisdiction – Swimming Turtles, USFWS Jurisdiction – Nesting Sea Turtles)

Atlantic populations of green turtles are typically found in estuarine, marine coastal and oceanic waters. This species nests on coastal Atlantic sand beaches between Volusia and Miami-Dade counties. Juveniles are frequently found in coastal bays, inlets, lagoons, and offshore reefs. Due to the oceanic inlet south of the project area, Haulover Inlet, the area experiences thorough flushing and acts as a large corridor to allow pelagic species to enter the Intracoastal Waterway. Large juveniles and adults feed on seagrasses and algae. There is not sandy coastal shoreline suitable for nesting within the project area. However, it is likely this species would be present in the bay as forage habitat is available and nesting beaches are nearby. The species is commonly documented on nesting beaches within 0.5 miles of the project area. An effect determination of “*May Affect, Not Likely to Adversely Affect*” is anticipated for the green sea turtle.

Protection of all sea turtle species during all phases of bridge construction will be accomplished through the implementation of the NMFS Southeast Regional Office (SERO) Vessel Strike Avoidance Measures and compliance with the NMFS SERO Protected Species Construction Conditions (found within **Appendix F – Standard Protection Measures**). In addition, due to noise concerns for these species associated with pile driving, all piles for this project are to be constructed using drill shafts and no blasting or use of explosives will be used to demolish existing bridge structures. If any of these species are found within the project area during construction, all active work would cease to give the individual the space and time required to leave the project area per State and Federal regulations.

### *Fish*

Smalltooth sawfish (*Pristis pectinata*) – Federally Threatened (NMFS Jurisdiction)

The smalltooth sawfish is listed as a federally endangered species and is listed as imperiled by the FWC. The smalltooth sawfish is one of two species of sawfish that inhabit coastal US waters. Sawfish are year-round residents of peninsular Florida, with most encounters occurring in southwest Florida from Charlotte Harbor to the Florida Keys. According to the FWC, smaller individuals from 3 to 6 feet (1 to 1.8 meters) total length typically live in estuarine systems close to shore near river mouths or tidal creeks, while larger smalltooth sawfish up to 18 feet (5.5 meters) typically inhabit deeper offshore waters. Juvenile smalltooth

sawfish most often inhabit brackish water within a mile of land. They can be found in a wide range of habitats, including mud bottoms, sand bottoms, oyster bars, red mangrove shorelines, docks, seawall-lined canals, and piers. The smalltooth sawfish is ovoviviparous meaning the mother carries the eggs inside her until they hatch, and the young are born alive, usually in litters of 15 to 20 pups. Juveniles can travel many miles up rivers if freshwater inflow is reduced. Large smalltooth sawfish, longer than 10 feet (3 meters), are occasionally found nearshore in the spring when most sawfish are born, and mating is thought to occur, but most are reported in deeper offshore waters with muddy bottoms. The substrate around the project area consists of seagrass bottom, grassy shoreline, and mangrove habitat (no seawalls present). Since there will not be mangrove impacts along the northeastern side of the bridge, FDOT has made a determination of “*May Affect, Not Likely to Adversely Affect*” for the smalltooth sawfish.

Protection of smalltooth sawfish during all phases of bridge construction will be accomplished through the implementation of the NMFS SERO Vessel Strike Avoidance Measures and compliance with the NMFS SERO Protected Species Construction Conditions (**Appendix F – Standard Protection Measures**). In addition, due to noise concerns associated with pile driving, all piles for this project are to be constructed using drill shafts and no blasting or use of explosives will be used to demolish existing bridge structures. If the species is found within the project area during construction, all active work would cease to give the individual the space and time required to leave the project area per State and Federal regulations.

#### Giant manta ray (*Manta birostris*) – Federally Threatened (NMFS Jurisdiction)

The giant manta ray is a large filter feeding elasmobranch with a wingspan that can reach up to 29 feet. This species is typically found in productive nearshore coastal waters and in deeper waters offshore but is also known to migrate through the Intracoastal Waterway. Due to the oceanic inlet south of the project area, Haulover Inlet, the area experiences thorough flushing and acts as a large corridor to allow pelagic species to enter the project area via the Intracoastal Waterway. Due to the in-water work associated with this project, potential impacts to this species include injury from construction materials and vessel strikes from in-water equipment. Due to noise concerns for these species associated with pile driving, all piles for this project are to be constructed using drill shafts and no blasting or use of explosives will be used to demolish existing bridge structures. Giant manta rays are highly mobile and will likely avoid the construction area and any slow-moving vessels used for dredging. However, to minimize the risk of vessel strikes and disturbances from in-water work, this project will implement the NMFS SERO Vessel Strike Avoidance Measures and comply with the NMFS SERO Protected Species Construction Conditions. Based on the required in-water work, implementation of avoidance measures and compliance with required construction conditions, a determination of “*May Affect, Not Likely to Adversely Affect*” has been made for the giant manta ray.

## Corals

Staghorn coral (*Acropora cervicornis*); Elkhorn coral (*Acropora palmata*); Pillar coral (*Dendrogyra cylindrus*); Rough cactus coral (*Mycetophyllia ferox*); Lobed star coral (*Orbicella annularis*); Mountainous star coral (*Orbicella faveolata*); Boulder star coral (*Orbicella franksi*) – Federally Threatened (NMFS Jurisdiction)

The project area is within the range for seven federally listed stony corals: pillar coral, lobed star coral, mountainous star coral, boulder star coral, rough cactus coral, elkhorn coral and staghorn coral. The benthic substrate is sandy and dominated by shoal and paddle grass (*Halodule wrightii* and *Halophila decipiens*, respectively). The project area lacks significant structure, outside the bridge piles, for these corals to grow. Furthermore, no corals, including any of the above listed species, were observed during any of the benthic surveys. Therefore, FDOT has made a determination of “No Effect” for these federally listed coral species.

## State Listed Species and Habitat

There are no state threatened or endangered mammal, reptile, fish, or coral species with the potential to occur within the project area.

## Plants

Skyblue clustervine (*Jacquemontia pentantha*) – State Endangered (FDACS Jurisdiction)

The skyblue clustervine is an annual sprawling plant with a woody base and non-woody, hairy stems that grow up to 3 feet long. Leaves are approximately 3 inches long with lance shaped rounded bases and pointed tips. The leaves are hairy and are arranged alternately. This species is named for its distinct blue flowers, which can show as white or pale pink, and grow in clusters on long stalks along the stems. Habitat for this species includes pine rockland, coastal rock barren, and hammocks including rockland hammock or disturbed openings in hammocks. No rockland, coastal rock barren, or hammock habitat exists along the project area. Therefore, a determination of “No effect anticipated” has been made for the skyblue clustervine.

Longlip ladies-tresses (*Spiranthes longilabris*) – State Threatened (FDACS Jurisdiction)

This perennial herb with an erect stem is 6-20 inches tall with 2–6-inch thin lanceolate leaves. The flowers are 0.5 inches long with lateral sepals widely spreading. The inflorescence spirals and includes pale white to yellow flowers. This plant grows in pine flatwoods, wet savannas, and saw palmetto hammocks. There are no known pine flatwoods, wet savannas, or saw palmetto hammock habitat within or adjacent to the project area. Therefore, a determination of “No effect anticipated” has been made for the longlip ladies-tresses.

## Birds

Tricolored heron (*Egretta tricolor*) – State Threatened (FWC Jurisdiction)

The tricolored heron prefers coastal environments. Nesting for this species occurs mostly on mangrove islands or in freshwater willow thickets on islands or over standing water. Foraging areas consist of permanently and seasonally flooded wetlands, mangrove swamps, tidal creeks, ditches and the edges of lakes and ponds. The project area includes areas of suitable foraging, nesting, and roosting habitat for this

state listed species that will be impacted by the proposed improvements. However, due to the small scale of this project (less than two acres) in relation to abundant foraging and roosting habitat in the vicinity of the project, a determination of “*No adverse effect anticipated*” has been made for the tricolored heron.

Little Blue Heron (*Egretta caerulea*) – State Threatened (FWC Jurisdiction)

The little blue heron forages in shallow freshwater, brackish and saltwater habitats, and nests in woody vegetation such as cypress, willow, maple, black mangrove, and cabbage palm. The project area includes areas of suitable foraging, nesting, and roosting habitat for this state listed species that will be impacted by the proposed improvements. However, due to the small scale of this project (less than two acres) in relation to abundant foraging and roosting habitat in the vicinity of the project, a determination of “*No adverse effect anticipated*” has been made for the little blue heron.

Roseate spoonbill (*Platalea ajaja*) – State Threatened (FWC Jurisdiction)

The roseate spoonbill forages in shallow water for crayfish, shrimp, crabs, and small fish. This species nests in mixed colonies of other wading bird species in mangroves or trees along coastlines and are sometimes found nesting inland. Mangrove islands are the preferred nesting sites for the roseate spoonbill. Main threats to this species in Florida are increased freshwater flow that affects prey availability, habitat loss, and pesticide use. While potential foraging and nesting habitat within the project area will be impacted, the habitat does not provide preferred conditions due to the urbanization of the area. Therefore, an effect determination of “*No adverse effect anticipated*” has been made for the roseate spoonbill.

Reddish egret (*Egretta rufescens*) – State Threatened (FWC Jurisdiction)

Preferred habitat for this species is almost exclusively coastal areas with nesting occurring on coastal mangrove islands or in Brazilian pepper located on dredge spoil islands. Foraging habitat includes shallow water areas (typically less than six inches deep) of variable salinity. This species will also utilize broad, open marine tidal flats and shorelines with little vegetation. The surrounding urban areas are not coastal and do not include any suitable foraging or nesting habitats for this species. Furthermore, no individuals were observed during any field reviews. Therefore, while this species may migrate through the project area, anticipated habitat impacts are limited and a determination of “*No adverse effect anticipated*” has been made for the reddish egret.

Black skimmer (*Rynchops niger*) – State Threatened (FWC Jurisdiction)

The black skimmer is a seabird that uses their bill to skim the surface of water in flight to catch prey. These birds inhabit all of Florida’s coastline. Black skimmers nest between May and September along sand beaches, sandbars, or dredge islands. Habitat loss is the largest threat to this species. Due to the lack of sandy coastline in the area and the small lagoon not providing enough flight surface for the bird to forage, a determination of “*No effect anticipated*” has been made for the black skimmer.

Least tern (*Sterna antillarum*) – State Threatened (FWC Jurisdiction)

The least tern is a colony nesting shorebird that is highly susceptible to nest disturbance. This species nests on wide sandy beaches but has been found to nest on roofs in recent years as the species suffers from habitat loss and beach disturbance. The species feeds on small fish and invertebrates. Due to the lack of sandy area for nesting in the project area and no impacts to flat areas such as roofs that could otherwise be used for nesting, a determination of “*No effect anticipated*” has been made for the least tern.

Burrowing owl (*Athene cunicularia*) – State Threatened (FWC Jurisdiction)

The burrowing owl is a small owl that nests in burrows dug in the ground. Burrowing owls inhabit open prairies with very little understory vegetation. These areas can typically include agricultural fields, vacant lots, and airports. There are no open areas adjacent to the project corridor that may be considered burrowing owl habitat. Due to the lack of suitable habitat adjacent to the project corridor an effect determination of “*No effect anticipated*” has been made for the burrowing owl.

**Table 2** provides a summary of the study area’s potential listed species and their effect determinations.

DRAFT

Table 2. Summary of Effect Determinations

Species Name and Jurisdiction	Listing Status	Effect Determination
<b>Plants</b>		
Florida prairie-clover (USFWS)	FE	No Effect
Carter's flax (USFWS)	FE	No Effect
Tiny polygala (USFWS)	FE	No Effect
Skyblue clustervine (FDACS)	SE	No effect anticipated
Longlip Ladies-tresses (FDACS)	ST	No effect anticipated
<b>Birds</b>		
Wood stork (USFWS)	FT	May Affect, Not Likely to Adversely Affect
Piping plover (USFWS)	FT	No adverse effect anticipated
Tricolored heron (FWC)	ST	No adverse effect anticipated
Little blue heron (FWC)	ST	No adverse effect anticipated
Roseate spoonbill (FWC)	ST	No adverse effect anticipated
Reddish egret (FWC)	ST	No adverse effect anticipated
Black skimmer (FWC)	ST	No effect anticipated
Least tern (FWC)	ST	No effect anticipated
Burrowing owl (FWC)	ST	No effect anticipated
<b>Mammals</b>		
West Indian manatee (USFWS)	FT	May Affect, Not Likely to Adversely Affect
Florida bonneted bat (USFWS)	FE	May Affect, Not Likely to Adversely Affect
<b>Reptiles</b>		
American crocodile (USFWS)	FT	May Affect, Not Likely to Adversely Affect
Eastern indigo snake (USFWS)	FT	May Affect, Not Likely to Adversely Affect
Kemp's ridley sea turtle (USFWS/NMFS)	FE	May Affect, Not Likely to Adversely Affect
Leatherback sea turtle (USFWS/NMFS)	FE	May Affect, Not Likely to Adversely Affect
Hawksbill sea turtle (USFWS/NMFS)	FE	May Affect, Not Likely to Adversely Affect
Loggerhead sea turtle (USFWS/NMFS)	FT	May Affect, Not Likely to Adversely Affect
Green sea turtle (USFWS/NMFS)	FT	May Affect, Not Likely to Adversely Affect
<b>Fish</b>		
Smalltooth sawfish (NMFS)	FE	May Affect, Not Likely to Adversely Affect
Giant Manta Ray (NMFS)	FT	May Affect, Not Likely to Adversely Affect
<b>Corals</b>		
Staghorn coral (NMFS)	FT	No Effect
Elkhorn coral (NMFS)	FT	No Effect
Pillar coral (NMFS)	FT	No Effect
Rough cactus coral (NMFS)	FT	No Effect
Lobed star coral (NMFS)	FT	No Effect
Mountainous star coral (NMFS)	FT	No Effect
Boulder star coral (NMFS)	FT	No Effect

### *Other Protected Species*

#### Black bear (*Ursus americana floridanus*) – State Protected (FWC Jurisdiction)

The Florida black bear is a recovered species but is still protected by the Bear Conservation Rule. Black bears can use almost every habitat type found in Florida but prefer flatwoods, swamps, scrub oak, and hammocks. The project location is in a suburban area with limited access to the developed area of A1A Sunny Isles. Although the project location has the rare potential for the Florida black bear to occupy or traverse through the area, no suitable habitat for the bear is present within the project area and no road kills or nuisance bear reports have been documented within one mile of the project area. Therefore, no impacts to the Florida black bear are anticipated as a result of this project.

#### Bald eagle (*Haliaeetus leucocephalus*) – Federally Protected (Bald and Golden Eagle Protection Act)

Florida has one of the densest concentrations of nesting bald eagles in the lower 48 states. The bald eagle is protected under The Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act. To reduce the potential for human activity to adversely affect bald eagles, USFWS and FWC Management Guidelines suggest the protection of a 660-ft habitat buffer around each active bald eagle nest. According to Audubon's EagleWatch nest locator, the nearest bald eagle nest is more than five miles away from the project location in Ives Estates. The project is not anticipated to affect the bald eagle or its habitat. Therefore, no impacts to the bald eagle are anticipated as a result of this project.

#### Tricolored bat (*Perimyotis subflavus*) – Proposed Federally Endangered by USFWS

On September 14, 2022, this species was proposed by USFWS for listing as endangered under the ESA and is considered a 'Species of Greatest Conservation Need' in Florida. Florida's smallest bat, it generally weighs between 4 and 8 grams. The tricolored bat, formerly the Eastern pipistrelle (*Pipistrellus subflavus*), can be identified from other bats in Florida by its pink forearms that strongly contrast their black wings.

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

As stated previously in the FBB description, multiple landscaped trees are found within the project study area, some of which may be impacted due to this project. The surrounding project area may contain culverts suitable for hibernation. However, during the field reviews, no signs of bats were discovered. As this species is not listed at the time of this NRE submittal, no effect determination was made. If the listing status of the tricolored bat is elevated by USFWS to Threatened or Endangered and the Preferred Alternative is located within the consultation area, during the design and permitting phase of the proposed project, FDOT commits to re-initiating consultation with the USFWS to determine the

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

Though no signs of bats were seen during the field reviews, it is worth mentioning, that all bats are protected in the state of Florida under Florida Administrative Code rule 68A-4.001 General Prohibitions; and rule 68A-9.010 Taking Nuisance Wildlife. If any species of bat is encountered in the future prior to the removal and construction of bridge No. 874218, bat exclusion will be completed to comply with Florida Administrative Code rule 68A-4.001 General Prohibitions; and rule 68A-9.010 Taking Nuisance Wildlife. Per the regulations, exclusion is not permitted during bat maternity season April 15 through August 15. Exclusion devices must be left up for a minimum of four nights and the low temperature must be forecasted to remain above 50 degrees Fahrenheit during that time period.

#### Osprey (*Pandion haliaetus*) – Migratory Bird Treaty Act

The osprey is protected by the U.S. Migratory Bird Treaty Act. The osprey is a species of raptor that is sometimes mistaken for the bald eagle. Osprey habitat includes the coast, lakes, rivers, and swamps in Florida. In Florida, non-migratory, resident osprey have been well-documented and extensively studied in Florida Bay, the southern Everglades, and the Florida Keys. The osprey's diet primarily consists of fish. Feeding areas include most open-water habitats along the coast and freshwater lakes and rivers. Nests are found in large trees, utility poles, channel markers, and in urbanized areas where ospreys readily utilize manmade nesting platforms. Pesticides, shoreline development and declining water quality continue to threaten the abundance and availability of food and nest sites for ospreys. The project area includes osprey habitat as the lagoon and surrounding waters have the potential to be fishing grounds for the bird. The project area is also within a possible non-migratory distribution, meaning if ospreys are present, they may stay within the area all year round. No ospreys or active nests were observed during the field review and no impacts are anticipated to occur as a result of this project. If active nests are to be impacted by the project, a permit must be obtained before removal or relocation.

#### Monarch butterfly (*Danaus plexippus*) – Candidate Species (USFWS)

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

The South Florida region potentially serves as a “stopping point” on the species’ seasonal migration to Mexico and as a year-round habitat for the Monarchs. Urban and suburban development is eliminating monarch habitat by supplanting agricultural landscapes where an estimated 90% of milkweeds, the Monarch’s host plant, occur. Monarchs have the potential to occur wherever their host plant is found; this includes roadside, fields, and urbanized and suburbanized areas. The project area has the potential to sustain milkweed; therefore, the monarch butterfly may potentially occur within the project area. However, no milkweed was observed during any of the field reviews conducted for this project.

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

## WETLAND EVALUATION

Pursuant to Executive Order 11990 (EO 11990) entitled "Protection of Wetlands and Other Surface Waters," (May 1977) the United States Department of Transportation (USDOT) developed a policy, Preservation of the Nation's Wetlands (USDOT Order 5660.1A), dated August 24, 1978, which requires all federally funded highway studies to protect wetlands to the fullest extent possible. Jurisdictional wetlands and other surface waters (OSWs) within the project area were surveyed and delineated in compliance with the criteria specified in the 2010 USACE Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plan Region, along with the Wetlands and Other Surface Waters chapter of the PD&E Manual, the Florida Department of Environmental Protection (FDEP) Florida Wetlands Delineation Manual (1995), and Chapter 62-340 Florida Administrative Code – Delineation of the Landward Extent of Wetlands and Surface Waters. The project area was reviewed, including a field survey, to identify, delineate, and evaluate wetlands and surface waters located within or adjacent to the Atlantic Isle Bridge No. 874218 West of SR-A1A PD&E study area. The intent of the field survey was to document any wetland and surface water features in order to avoid and/or minimize impacts to these resources.

Agency coordination to obtain wetland information for this project occurred through the ETDM Programming Screening (ETDM #14413), where members of the ETAT provided comments. In summary, the US Environmental Protection Agency (EPA), USACE, NMFS, and USFWS stated that the project will have a "Moderate" degree of effect on wetlands. In addition, the FDEP and SFWMD stated that the project will have a "Minimal" degree of effect on wetlands. The study area contains jurisdictional wetlands throughout the project area. Following this determination, a benthic survey was conducted to document the wetland resources.

### Methodology

A desktop review of existing information, including aerial photographs, GIS databases and previous permit documentation, was performed prior to the field assessments. This information was used as a basis for this benthic field assessment.

A benthic and shoreline characterization survey was conducted on July 8, 2020, by field biologists experienced in south Florida flora and fauna. The objective of the field survey was to document existing conditions and identify the presence or absence of natural resources and EFH, as well as any habitat for/presence of any threatened or endangered species. During the benthic survey, observations and data including depth, benthic substrate, and observed natural resources were recorded on underwater datasheets and photographs were taken to document all identified resources and shoreline vegetation. The locations of any observed resources were recorded using a sub-meter accurate Trimble R1 GNSS Receiver (a Global Positioning System (GPS) device) and were mapped and overlaid onto recent aerial imagery of the study area using ESRI ArcGIS (See Figure 7).



Figure 7: Benthic Survey Results and Wetland ID Map from July 8, 2020

## Wetland Identification, Delineation, and Classification

The Wetland and Surface Water evaluation identified an existing tidally influenced lagoon and canal within the project area. The existing tidally influenced lagoon is connected to Biscayne Bay by a small canal on the northeast point of the island. These tidal waters have the potential to contain protected marine resources such as seagrasses and corals, as well as other EFH. Several mangroves have established along the western shoreline of the canal and red mangrove saplings were documented colonizing the shallow banks along portions of the lagoon (**See Figure 7**). No other natural features exist within the project area as the remainder of the island consists of private residential properties.

The survey identified mangrove resources along the western and southern shorelines of the lagoon as well as along the western bank of the canal adjacent to the bridge. The mangroves in the lagoon include red mangrove (*Rhizophora mangle*) saplings and buttonwood (*Conocarpus erectus*) saplings growing along the shoreline in areas inundated during high tide. Along the western bank of the canal, mature trees of both red and white mangrove (*Laguncularia racemosa*) species were identified. Sparse and discontinuous occurrences of paddle grass (*Halophila decipiens*) were documented within the middle area of the lagoon. Shoal grass (*Halodule wrightii*) was found along some of the shallower shoreline areas of the lagoon where coverage ranged from sparse to dense. Other marine resources included green macroalgae (*Halimeda*), barnacles, and fish species (**See Table 3**). A total of 0.70 acres of seagrass and mangrove wetlands were identified.

Table 3. Wetland Characteristics

Wetland ID	FLUCCS	Habitat Value	Hydrologic Function	Size (Acres)
W1	911 Seagrass	Foraging and nursery habitat and refuge for invertebrates, wading birds, and marine species.	Limited water quality enhancement, sediment stabilization, wave attenuation, nutrient cycling due to size and coverage of seagrass beds.	0.10
W2	612 Mangroves	Foraging and nursery habitat and refuge for fish, invertebrates, and wading birds.	Limited shoreline stabilization, wave attenuation, nutrient cycling provided by mangrove fringe.	0.02
W3	612 Mangroves	Foraging and nursery habitat and refuge for fish, invertebrates, and wading birds.	Limited shoreline stabilization, wave attenuation, nutrient cycling provided by mangrove fringe.	0.02
W4	911 Seagrass	Foraging and nursery habitat and refuge for invertebrates, wading birds, and marine species.	Limited water quality enhancement, sediment stabilization, wave attenuation, nutrient cycling due to size and coverage of seagrass beds.	0.48
W5	612 Mangroves	Foraging and nursery habitat and refuge for fish, invertebrates, and wading birds.	Limited shoreline stabilization, wave attenuation, nutrient cycling provided by mangrove fringe.	0.03
W6	911 Seagrass	Foraging and nursery habitat and refuge for invertebrates, wading birds, and marine species.	Limited water quality enhancement, sediment stabilization, wave attenuation, nutrient cycling due to size and coverage of seagrass beds.	0.05

\*This table corresponds to Figure 7. Benthic Survey Results and Wetland ID Map.

## Wetland Impact Assessment

Jurisdictional wetlands (estuarine and marine deepwater) identified through the Environmental Screening Tool (EST) are present within and adjacent to the project area. Based on the proposed construction, 0.005 acres of wetland impacts are anticipated to occur as a result of the bridge replacement (see **Table 4** and **Figure 8**).

### Indirect, Permanent – Existing Seagrass Bed (W4 – FLUCCS 911)

The preferred alternative (bridge replacement) will result in minimal indirect, permanent impacts to 0.005 acres of Wetland 4 (W4), an existing seagrass bed (isolated blades of *H. decipiens*). (See **Table 4**). The bridge will be widened by 9.6 feet on the southside of the bridge. The larger bridge footprint will create additional shading that will permanently prevent sunlight from reaching the benthic habitat and existing seagrass bed and prohibit future growth of the existing seagrass bed.

## Other Surface Water Impact Assessment

All areas of the lagoon and the canal from the lagoon leading into Biscayne Bay are considered Other Surface Waters (OSWs). In addition to the existing drainage system, seven new drainage structures are proposed. The structures are proposed to have connected pipes to convey runoff into the existing pollution control box located west of the Atlantic Isle Lagoon. The preferred alternative would create a temporary increase of 0.088 acres of impervious surface area due to temporary pavement for MOT and a permanent increase of 0.02 acres of impervious surface area due to the construction of the 8-foot-wide shared use path on the south side of the bridge. This added impervious surface can contribute to additional runoff of hydrocarbons and other roadway pollutants into the Atlantic Isle Lagoon and Biscayne Bay, an Aquatic Preserve and OFW. This additional impervious surface area would be analyzed for water quality and attenuation. The proposed stormwater management system for the project will be developed to meet the design and performance criteria established in the SFWMD Environmental Resource Permit Applicants Handbook Volumes I and II for the treatment and attenuation of discharges to nearby waterbodies (ETDM Report # 14413-1). Direct and indirect impacts to the potential seagrass habitat within the lagoon (OSW 1), totaling 0.01 acres, will occur from the replacement of the existing bridge.

### Direct, Temporary

Water quality within and adjacent to the construction area may be temporarily impacted by construction activities such as demolition or the removal of existing structures. The pilings of the existing bridge are currently covered in oysters, which play an important role in filtering water. Although it is likely these oysters would recolonize after construction, temporary impacts to water quality would be exacerbated by the removal or disturbance of existing oysters within the project area. Therefore, oysters from the pilings will be removed and relocated to an undisturbed area near the project area prior to construction. Additionally, sheet piles used in the construction of the bridge will create 0.002 temporary direct impacts to potential seagrass habitat (See **Table 4**).

### Indirect, Permanent – Potential Seagrass Habitat (OSW1 – Lagoon)

Construction of a stormwater management system in accordance with current regulations will eliminate most indirect impacts, such as impacts to water quality or alteration to vegetative communities in wetlands and surface waters outside the project limits. However, the newly shaded areas from bridge widening, will cause permanent indirect effects to potential seagrass habitat. The additional shading will

permanently prevent existing seagrass beds from expanding, or for new seagrass beds to establish within, this potential habitat as sunlight from the water column is necessary for seagrass growth. Therefore, 0.008 acres of indirect permanent impacts will occur to the potential seagrass habitat directly shaded by the bridge widening. (See **Table 4**).

*Table 4. Summary of Wetland and Other Surface Water Impacts*

	Permanent	Temporary	Total Permanent and Temporary Impacts
<b>Indirect Impacts (W4 - Existing Seagrass Bed)</b>	0.005 acres	-	0.015 acres
<b>Direct Impacts (OSW1 – Potential Seagrass Habitat)</b>	-	0.002 acres	
<b>Indirect Impacts (OSW1 – Potential Seagrass Habitat)</b>	0.008 acres	-	
<b>Total</b>	0.013 acres	0.002 acres	

### Cumulative Impacts

Cumulative wetland impacts include the combined direct and indirect wetland impacts of the proposed action and other reasonably foreseeable actions in the general area that are not dependent on the proposed action. As minimal to moderate direct or indirect impacts to wetlands are anticipated, cumulative impacts are also anticipated.

The anticipated cumulative impacts are a seagrass reduction in suitable seagrass habitat in the area from additional shading and/or sedimentation, in addition to a permanent impact to the existing seagrass bed due to widening of the bridge footprint. Less coverage of seagrass can lead to less sediment control and cause carbon dioxide to be released in the water column. These two additional factors can reduce water quality for all organisms within the lagoon that require high oxygen content and clear waters for photosynthesis.



Figure 8. Wetland Impact Map

## Avoidance and Minimization

The project limits include Atlantic Isle Bridge No. 874218 along Atlantic Avenue. The preferred alternative is expected to require in-water work within the lagoon located underneath the bridge connected to Biscayne Bay. Biscayne Bay has many protected resources and working over Biscayne Bay would pose risk to water quality and marine resources. However, to minimize potential impacts, minimization measures should follow FDOT Standard Specifications for Road and Bridge Construction (i.e., stormwater management plan, temporary turf, rolled erosion control products, sediment containment systems, runoff control structures, sediment barriers, inlet protection systems, silt fences, and turbidity barriers). Alterations to the design plan have been made to further minimize impacts such as determining that only two of the six drill shafts will be waterward of the existing bridge, and mangroves will be tied back out of the way from construction rather than trimmed or removed. Additionally, no rip-rap placement along the shorelines will be required for this project.

## Mitigation

This project will result in 0.005 acres of unavoidable impacts to an existing seagrass bed within the project area. These impacts will be mitigated pursuant to Section 373.4137, Florida Statutes (F.S.), to satisfy all mitigation requirements of Part IV of Chapter 373, F.S., and 33 U.S.C. § 1344. Based on the Uniform Mitigation Assessment Method (UMAM) (see **Appendix G**), the unavoidable impacts will result in a functional loss of 0.002 units. Mitigation options for this project include Biscayne Bay Environmental Enhancement Trust Fund, permittee responsible mitigation or out of basin mitigation which would require a cumulative impact analysis. A conceptual mitigation plan will be developed through continued coordination with permitting agencies and recommendations from NMFS during the design/permitting phase of the project.

## Wetlands Finding

In accordance with EO 11990, the proposed project will have no significant short-term or long-term adverse impacts to wetlands, there is no practicable alternative to construction in wetlands, and measures have been taken to minimize harm to wetlands.

## ESSENTIAL FISH HABITAT

The 1996 amendments to the Magnuson-Stevens Fishery Conservation and Management Act established a new requirement to identify and describe EFH in order to protect, conserve and enhance EFH for the benefit of the federally managed fisheries. As in-water work will occur, the project has the potential to impact EFH and species within the associated Fisheries Management Plans (FMPs) which have been developed by the South Atlantic Fisheries Management Council (SAFMC). Agency coordination to obtain EFH information for this project occurred through the ETDM Programming Screening (ETDM #14413), where members of the ETAT provided comments concerning EFH. In summary, the EPA, USACE, NMFS, and USFWS stated that the project will have a “Moderate” degree of effect on EFH. In addition, the FDEP and SFWMD stated that the project will have a “Minimal” degree of effect on EFH. All agencies agree that avoidance and mitigation should be implemented to compensate for potential impact and loss. Per the Essential Fish Habitat chapter of the PD&E Manual, an EFH assessment, which included a desktop review and an in-water benthic survey (conducted on 6/24/2020 and included in **Appendix D – Survey Reports**) was performed for this project.

Based on the results of the desktop review, three (3) EFH types and four (4) Habitat Areas of Particular Concern (HAPCs) were identified within the project area. The EFH and HAPCs found within the project area via the desktop review are listed below in Table 5 with their associated FMPs. The benthic survey performed on July 8, 2020, identified an additional three (3) EFH types and two (2) HAPCs: mangrove wetland EFH, SAV EFH, oyster EFH and HAPC, and seagrass HAPC. This survey focused on benthic and shoreline characterization of protected marine resources, including seagrasses, corals, mangroves, and other submerged aquatic vegetation (SAV) within 100-feet from the existing bridge including underneath the bridge and the adjacent lagoon.

Table 5. EFH and HAPC within the Study Area

Fisheries Management Plan	EFH Type	HAPC	Life Stages
Shrimp (Various species: white, pink, brown, rock)	Estuarine & Marine SAV	Coastal Inlets	Juvenile, Adult, Larvae (Depending on Species)
	Estuarine Scrub/Shrub (mangroves)		
	Unconsolidated Bottom		
Snapper/Grouper Complex	Estuarine & Marine SAV	Continuous and Discontinuous Seagrass; Mangroves; Oysters	Juvenile, Adult, All (Depending on species)
	Estuarine Scrub/Shrub (mangroves)		
	Unconsolidated Bottom		
	Oysters		
Spiny Lobster ( <i>Panulirus argus</i> )	Estuarine & Marine SAV	Biscayne Bay	All
	Estuarine Scrub/Shrub (mangroves)		
	Algal Communities		
	Shallow Subtidal Bottom		
	Unconsolidated Bottom		
Coral (Various species)	Unconsolidated Bottom	<i>Phragmatopoma</i> (worm reefs) – Not observed	N/A

The Northeast canal approaching the Atlantic Isle Lagoon consisted of mature red (*Rhizophora mangle*) and white (*Laguncularia racemosa*) mangroves. No seagrasses, corals, or other protected benthic resources were found within the canal. The fish species that were observed at this location included: checkered pufferfish (*Sphoeroides testudineus*), mullet (*Mugil cephalus*), barracuda (*Sphyraena barracuda*) and juvenile snapper (*Lutjanidae spp.*). The lagoon banks were mowed and maintained with the exception of a small area along the western and southern banks that contained red and white mangrove saplings. Within the lagoon, paddle grass (*H. decipiens*) and shoal grass (*H. wrightii*) were observed. No threatened or endangered species were documented within the lagoon or canal. The lagoon is linked to Biscayne Bay, which contains EFH and HAPCs for an array of species associated with several FMPs.

Based on the EFH types within the project area, this area has the potential to provide habitat for juvenile and adult assemblages of species from the snapper-grouper complex, penaeid shrimp and spiny lobster FMPs. Based on the HAPC types, this area also has the potential to provide habitat for corals and associated shallow water reef species. Therefore, various species of the federally managed penaeid shrimp, spiny lobster, fish (snapper, grouper, grunts) and coral fisheries have the potential to occur within the study area.

Table 6. Summary of EFH Impacts

EFH Type	Impacted Acres
Estuarine & Marine SAV	0.005 (Permanent)
Estuarine Scrub/Shrub (mangroves)	No mangrove impacts
Oysters	To Be Determined
Algal Communities	Acreage Not Calculated
Shallow Subtidal Bottom	0.002
Unconsolidated Bottom	0.002

\*Please note that EFH impact acres are not mutually exclusive.

### Direct, Indirect, and Cumulative Impacts

The in-water work for the bridge replacement will consist of installing sheet piles for dewatering. Only after the area has been dewatered will drill shafts be installed. This will reduce the amount of in-water work needed and any turbidity issues typically associated with in-water work. There will be 88 sheet piles used for dewatering which will be driven with a vibratory hammer. Temporary sheet pile driving will take a total of four days, with each sheet pile taking approximately 5 minutes to reach their depth and top grade. The final leveling of the temporary sheet pile driving will occur within one day for each bridge end. The construction methods call for drilled shafts to be drilled to -15 feet and drilled shaft casings to be inserted up to -41 feet North American Vertical Datum (NAVD88). The vibratory installation methodology of these shaft casings will be advantageous to other methods, as vibration is expected to be minimal due to oscillating/rotator casing installation. The total duration of the drilled shaft activities will be 18 days. Upon removal of temporary sheet piles, each sheet will be vibrated out at approximately 1 minute per sheet. Additionally, no rip-rap placement along the project shorelines will be required as a part of this project. The design plans are included in **Appendix A – Preferred Alternative Concept Plans** which show the locations of proposed in-water structures.

The proposed work is anticipated to result in 0.005 acres of permanent, indirect shading impacts to Estuarine and Marine SAV EFH (seagrass) and 0.008 acres of permanent, indirect shading impacts to

potential seagrass habitat (shallow subtidal/unconsolidated) due to the widening of the bridge during replacement. Installation of sheet piles during construction will cause 0.002 acres of direct impacts to potential seagrass habitat (shallow subtidal/unconsolidated bottom). The sheet pile impacts will be temporary in nature as they will be removed after construction. Additional temporary direct impacts to the following EFH types are anticipated during construction: oysters and algal communities. Impacts to these EFH types may potentially affect species within the following FMPs: shrimp, coral, snapper-grouper, and spiny lobster. No listed coral species were observed in the survey area. Temporary displacements of individuals of the species included in the shrimp, snapper-grouper and spiny lobster FMPs may occur during project construction; however, these species are all anticipated to return to the project area post-construction as these EFH types that currently exist within the construction limits will not be permanently displaced and should naturally return to similar conditions post-construction. Therefore, no permanent impacts to species within the snapper-grouper, spiny lobster and coral FMPs are anticipated from this project. Oysters observed within the project area provide EFH and HAPC habitat for the snapper-grouper complex fishery. Oysters within the lagoon may experience temporary impacts from water quality changes during construction. Oysters from the pilings will be removed and relocated to an undisturbed area near the project area prior to construction. The use of BMPs and compliance with the most recent edition of the FDOT's *Standard Specifications for Road and Bridge Construction* will further ensure that no unavoidable impacts occur to EFH from project construction.

Adverse impacts to EFH are anticipated to be **Moderate** as there are permanent, indirect impacts to seagrass EFH and potential seagrass habitat, and temporary, direct impacts to potential seagrass habitat, algal communities, and oysters. Due to the small size of the project and the moderate and localized nature of the anticipated EFH impacts, it is anticipated that cumulative impacts to EFH from the proposed project, when combined with other past, present, and future projects, will not adversely impact any FMPs regulated by the SAFMC. Based on impacts to EFH, further NMFS coordination will be required for this project.

## ANTICIPATED PERMITS

Anticipated permits for the project include:

- SFWMD Environmental Resource Permit (ERP)
- FDEP National Pollutant Discharge Elimination System (NPDES) Permit
- USACE Section 404 and Section 10 Permit
- Miami-Dade County Department of Regulatory and Economic Resources Class I and Class II Permits
- Sovereign Submerged Lands (SSL) Easement

The project does not require a U.S. Coast Guard (USCG) permit due to the bridge's clearance deeming the canal into the lagoon an unnavigable waterway.

## COMMITMENTS

FDOT will adhere to the following commitments during the construction phase to minimize and avoid environmental protected resources:

- The USFWS and FWC *Standard Manatee Conditions for In-Water Work* will be utilized during construction.
- The NMFS *Protected Species Construction Conditions*, NOAA Fisheries Southeast Regional Office will be utilized during construction.
- The NMFS *Vessel Strike Avoidance Measures*, NOAA Fisheries Southeast Regional Office will be utilized during construction.
- The most recent version of the USFWS Standard Protection Measures for the Eastern Indigo Snake will be utilized during construction.
- If required, barge spudding and staging will be limited to areas outside of seagrass habitat and/or within the areas permitted for impacts.
- No blasting or use of explosives will be used to demolish existing bridge structures. Noise and vibration work, such as pile driving, should be conducted in as few consecutive days as possible.
- Mangrove impacts will be avoided via the use of tie-back methods.
- Oysters from the pilings will be removed and relocated to an undisturbed area near the project area prior to construction.
- A survey will be conducted for the Florida bonneted bat within the limits of construction activities. If any signs of the Florida bonneted bat are observed (e.g., tree cavities, new potential man-made roosting habitat), the FDOT is committed to coordinating with USFWS regarding the most updated protocols for the Florida bonneted bat.
- If the listing status of the tricolored bat is elevated by USFWS to Threatened or Endangered and the Preferred Alternative is located within the consultation area during the design and permitting phase of the proposed project, FDOT commits to re-initiating consultation with the USFWS to determine the appropriate survey methodology and to address USFWS regulations regarding the protection of the tricolored bat.
- If the listing status of the monarch butterfly is elevated by USFWS to Threatened or Endangered and the Preferred Alternative is located within the consultation area, FDOT commits to re-initiating consultation with the USFWS during the design and permitting phase to determine the appropriate survey methodology and to address USFWS regulations regarding the protection of the monarch butterfly.

## CONCLUSIONS

The Proposed project consists of improvements along Atlantic Isle Bridge No. 874218 West of SRA1A, in Miami-Dade County. Based on a review of the FLUCCS codes, the existing conditions consist of urbanized residential land use, canals and bays and estuaries. Furthermore, the soil type is classified as urban soils that lack definable horizons due to the extensive development within the corridor. The existing conditions create limited potential for native species to inhabit, however, some threatened or endangered species have the potential to occur within the project area.

There are 32 federally listed and/or state-listed species of concern with the potential to occur within the project area (see **Table 1**. Listed Species Potentially Occurring in the Project Area). Fifteen federally threatened species, (West Indian manatee, piping plover, wood stork, American crocodile, eastern indigo snake, loggerhead sea turtle, giant manta ray, green sea turtle, and seven coral species), eight federally endangered species (Florida prairie-clover, Carter’s flax, tiny polygala, Florida bonneted bat, hawksbill sea turtle, leatherback sea turtle, Kemp’s Ridley sea turtle, and smalltooth sawfish), one state endangered plants (skyblue clustervine), and eight state threatened species (longlip ladies-tresses plant, tricolored heron, little blue heron, roseate spoonbill, reddish egret, black skimmer, least tern, burrowing owl) have the potential to occur within the project area. Through the use of Federal keys, field work and desktop analysis, FDOT has reached an effect determination of “*May Affect, Not Likely to Adversely Affect*” for the West Indian manatee, Florida bonneted bat, eastern indigo snake, smalltooth sawfish, giant manta ray, hawksbill sea turtle, loggerhead sea turtle, Kemp’s ridley sea turtle, and green sea turtle. The remainder of the species are determined to have “*No Effect*”, “*No effect anticipated*”, or “*No adverse effect anticipated*” from the project. Applicable FDOT Environmental Special Provisions regarding compliance with Federal Endangered Species Act and Other Wildlife Regulations (**Appendix F**) including: SP0070104-4 (manatee), SP0070104-5 (smalltooth sawfish), SP0070104-6 (sea turtle), SP0070104-7 (eastern indigo snake SP0070104-9 (Seagrass Beds), and SP0080303-Barge Use (Barge Use), will be added to the specifications package for the project.

The proposed project will have minimal impacts on wetlands as limited in-water work is anticipated for this Bridge project. This low-level bridge crosses over a tidally influenced canal that leads into the adjacent Atlantic Isle Lagoon. A total of 0.70 acres of mangrove and seagrass wetlands were identified in the project area. A total of 0.005 acres of wetlands (seagrass habitat) are anticipated to be impacted. No impacts to mangrove habitat are anticipated as the mangroves along the lagoon shorelines are located outside the proposed improvements, and mangroves along the bank of the canal will be avoided via the use of tie-back methods. Indirect impacts include 0.005 acres of permanent shading from bridge widening to an existing seagrass bed and 0.008 acres of permanent shading to potential seagrass habitat adjacent to existing seagrass bed that would prevent the growth of seagrass in the future. Direct impacts include 0.002 acres of temporary impacts to potential seagrass habitat from the temporary installation of sheet piles for construction. Additional indirect impacts to surrounding habitat and existing seagrass beds, from turbidity or sedimentation during construction, will be minimized/avoided by the use of turbidity barriers and minimal impact construction methods.

The tidal waters of the project area contain EFH for the following managed fisheries; shrimp, snapper/grouper complex, spiny lobster, and coral. EFH types within the project area for these fisheries include marine and estuarine SAV (seagrass), estuarine scrub/shrub (mangroves), unconsolidated bottom, oysters, shallow subtidal bottom, and algal communities. The project area also includes HAPCs such as seagrass, coastal inlets, oysters, and mangroves. The impact to EFH and HAPCs are determined to be moderate, as limited in-water work is proposed but direct impacts to existing seagrass habitat are limited

to 0.005 acres. Lastly, proper drainage to manage future runoff into the lagoon canal (and associated habitat) will be included in the project plans.

The next steps of the project will include agency coordination throughout the design phase and associated permitting efforts. The following permits are anticipated to be required prior to construction:

- SFWMD ERP
- FDEP NPDES Permit
- USACE Section 404 and Section 10 Permits
- Miami-Dade County Department of Regulatory and Economic Resources Class I and Class II Permits
- SSL Easement

DRAFT

## REFERENCES

Florida Department of Transportation (FDOT). June 2020. *Project Development and Environment Manual, Part 2, Chapter 9; Part 2, Chapter 16; Part 2, Chapter 17.*

Florida Department of Transportation (FDOT). *Efficient Transportation Decision Making Environmental Screening Tool*, ETDM Summary No. 14413, Published February 4, 2020.

Florida Fish and Wildlife Conservation Commission (FWC). N.d. Profiles and Databases. <https://myfwc.com/wildlifehabitats/profiles/> Accessed January 25, 2023.

South Atlantic Fishery Management Council (SAFMC). 1998. *Comprehensive Amendment Addressing Fish Habitat In Fishery Management Plans of the South Atlantic Region, Section 4. Environmental Consequences*. South Atlantic Fishery Management Council, 1 Southpark Cir., Ste 306, Charleston, S.C. 29407-4699.

United States Fish and Wildlife Service (USFWS). 1973. *Endangered Species Act, Section 7*. Department of the Interior, U.S. Fish and Wildlife Service, Washington D.C. 20240

United States Fish and Wildlife Service (USFWS). N.d. IPaC Information for Planning and Consultation. <https://ipac.ecosphere.fws.gov/> Accessed January 25, 2023

Appendix A – Preferred Alternative Concept Plans

DRAFT

CONTRACT PLANS COMPONENTS  
STRUCTURES

STATE OF FLORIDA  
DEPARTMENT OF TRANSPORTATION

CONTRACT PLANS

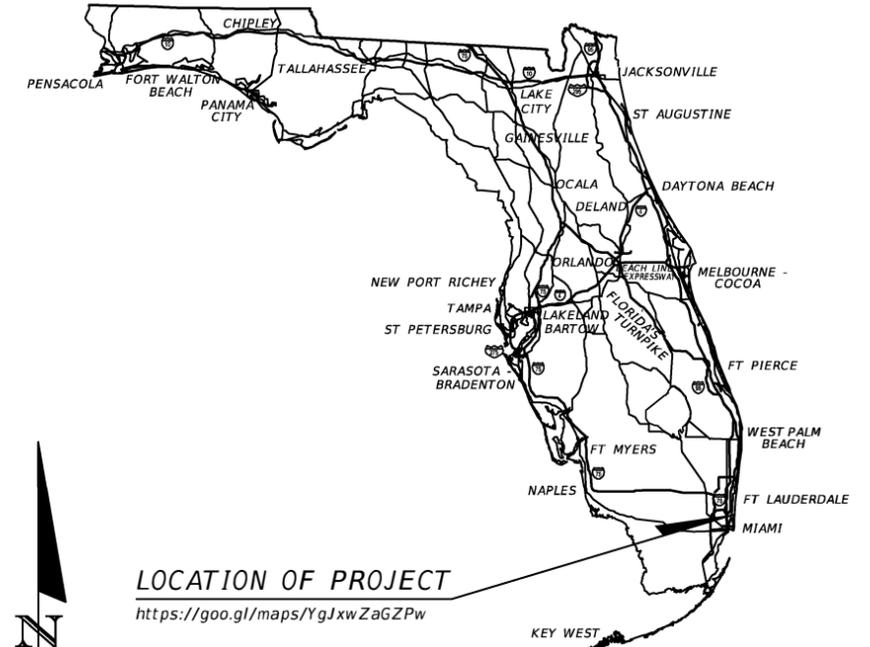
FINANCIAL PROJECT ID 430029-2-22-01

MIAMI-DADE COUNTY (87674)

ATLANTIC AVENUE BRIDGE REPLACEMENT

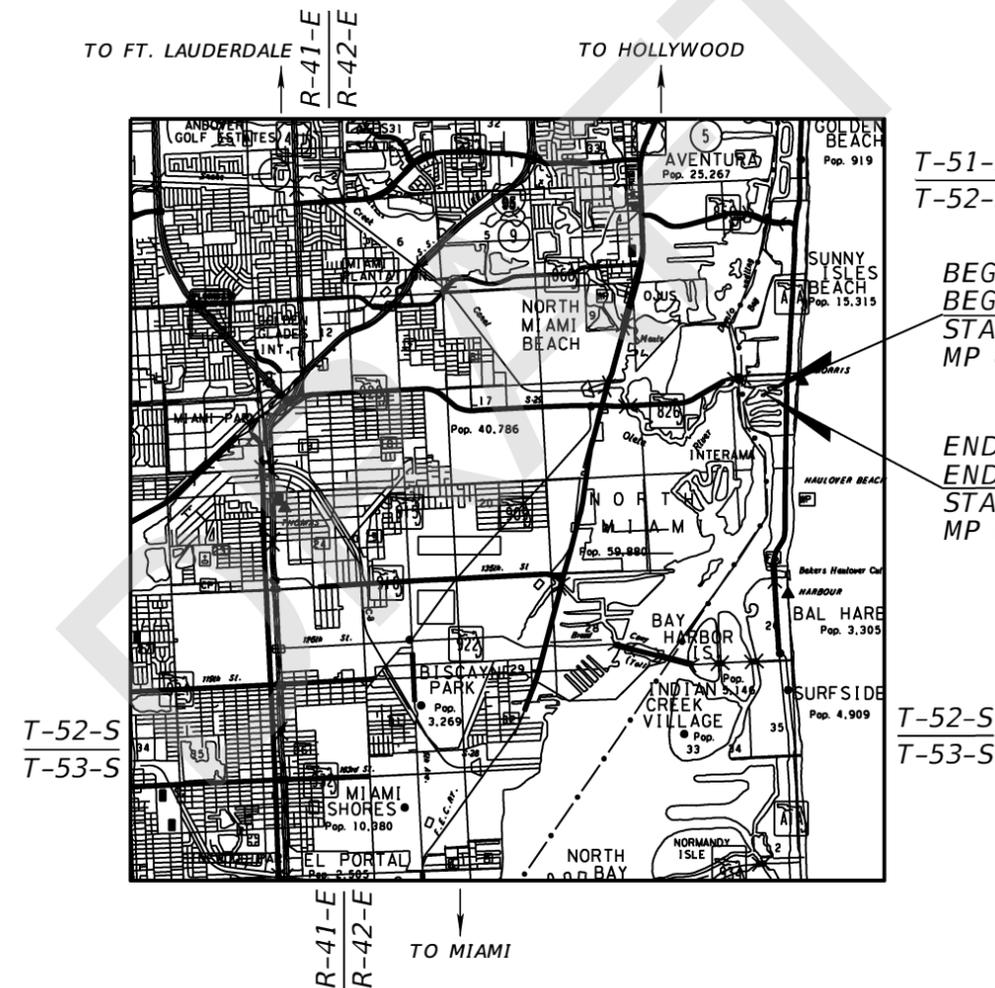
INDEX OF ROADWAY PLANS

SHEET NO.	SHEET DESCRIPTION
1	KEY SHEET
2	TYPICAL SECTION
3	PROJECT LAYOUT
4	PLAN SHEET
5	PROFILE
6	TTCP TYPICAL SECTION
7	TRAFFIC CONTROL PLAN
8	TTCP CROSS SECTIONS
9	ADVANCE WARNING DETAIL



LOCATION OF PROJECT

<https://goo.gl/maps/YgJxwZaGZPw>



T-51-S  
T-52-S

BEGIN PROJECT  
BEGIN BRIDGE  
STA. 113+43.93  
MP 0.255

END PROJECT  
END BRIDGE  
STA. 113+89.93  
MP 0.264

T-52-S  
T-53-S

GOVERNING STANDARD PLANS:

Florida Department of Transportation, FY 22/23 Standard Plans for Road and Bridge Construction and applicable Interim Revisions (IRs).

Standard Plans for Road Construction and associated IRs are available at the following website: <http://www.fdot.gov/design/standardplans>

APPLICABLE IRs: IR\_\_\_\_

Standard Plans for Bridge Construction are included in the Structures Plans Component

GOVERNING STANDARD SPECIFICATIONS:

Florida Department of Transportation, July 2022 Standard Specifications for Road and Bridge Construction at the following website: <http://www.fdot.gov/programmanagement/Implemented/SpecBooks>

DRAFT CONCEPT  
NOT FOR CONSTRUCTION  
NOVEMBER 2023

ROADWAY PLANS

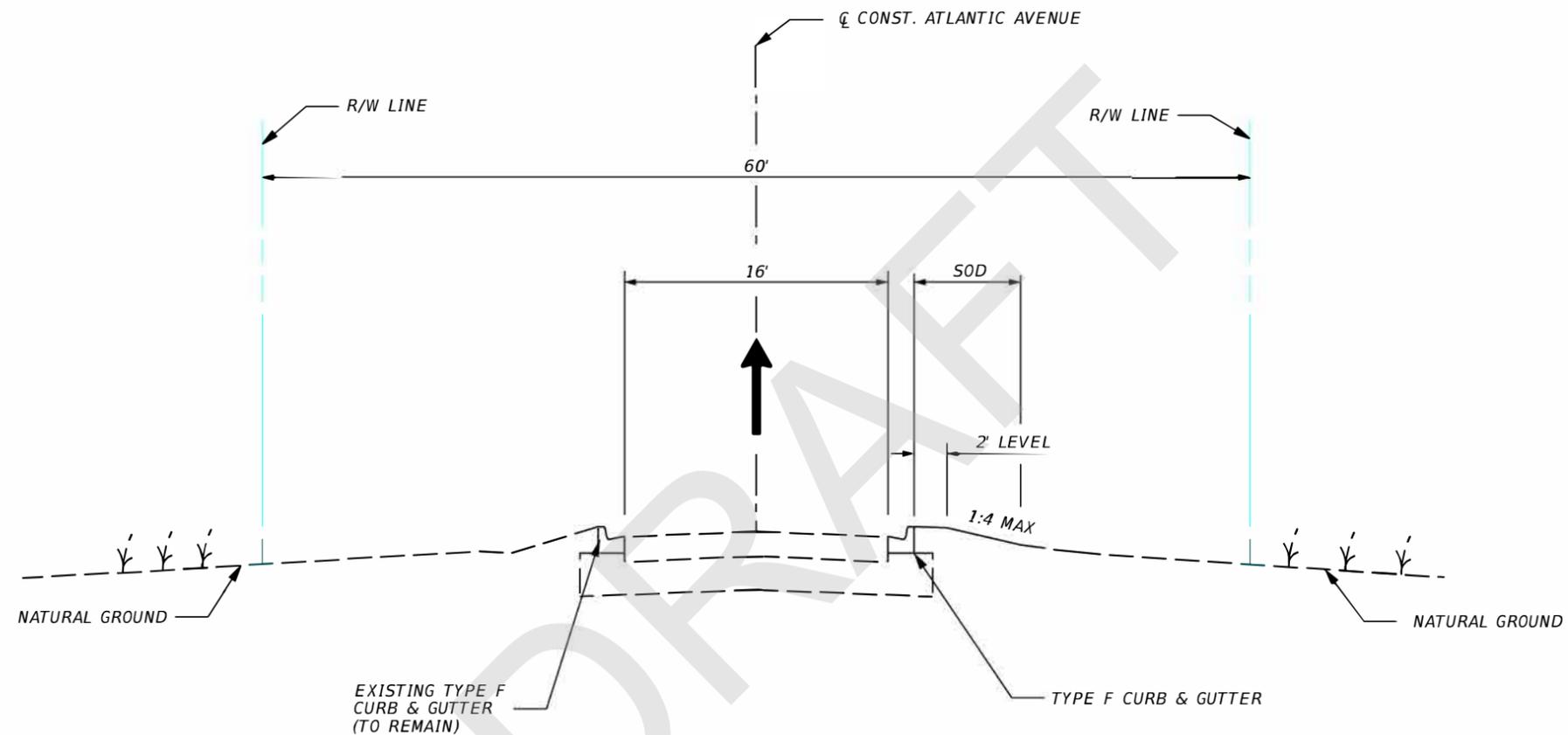
ENGINEER OF RECORD:

ALEJANDRO M. MEITIN, P.E.  
P.E. NO.: 44744  
JACOBS ENGINEERING GROUP, INC.  
3150 SW 38TH AVE, SUITE 700  
MIAMI, FL 33146  
CONTRACT NO.: C9U43  
VENDOR NO.: F 954081636

FDOT PROJECT MANAGER:

VICTORIA VOGT

CONSTRUCTION CONTRACT NO.	FISCAL YEAR	SHEET NO.
		1



ROADWAY TYPICAL SECTION  
ATLANTIC AVENUE  
STA. 108+00 TO STA. 113+13.93  
STA. 114+19.93 TO 115+80.00

**TRAFFIC DATA**

CURRENT YEAR = 2019 AADT = 605  
 K = 8.18% D = 51.1% T = 5.18% (24 HOUR)  
 DESIGN SPEED = 25 MPH  
 POSTED SPEED = 20 MPH

REVISIONS				STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION	SR NO.	COUNTY	FINANCIAL PROJECT ID	
					MIAMI-DADE	430029-2-22-01	2

ALEJANDRO G. MEITIN, P.E.  
 P.E. LICENSE NUMBER 44744  
 JACOBS ENGINEERING GROUP, INC.  
 3150 SW 38TH AVE, SUITE 700  
 MIAMI, FL 33146

**TYPICAL SECTION**

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

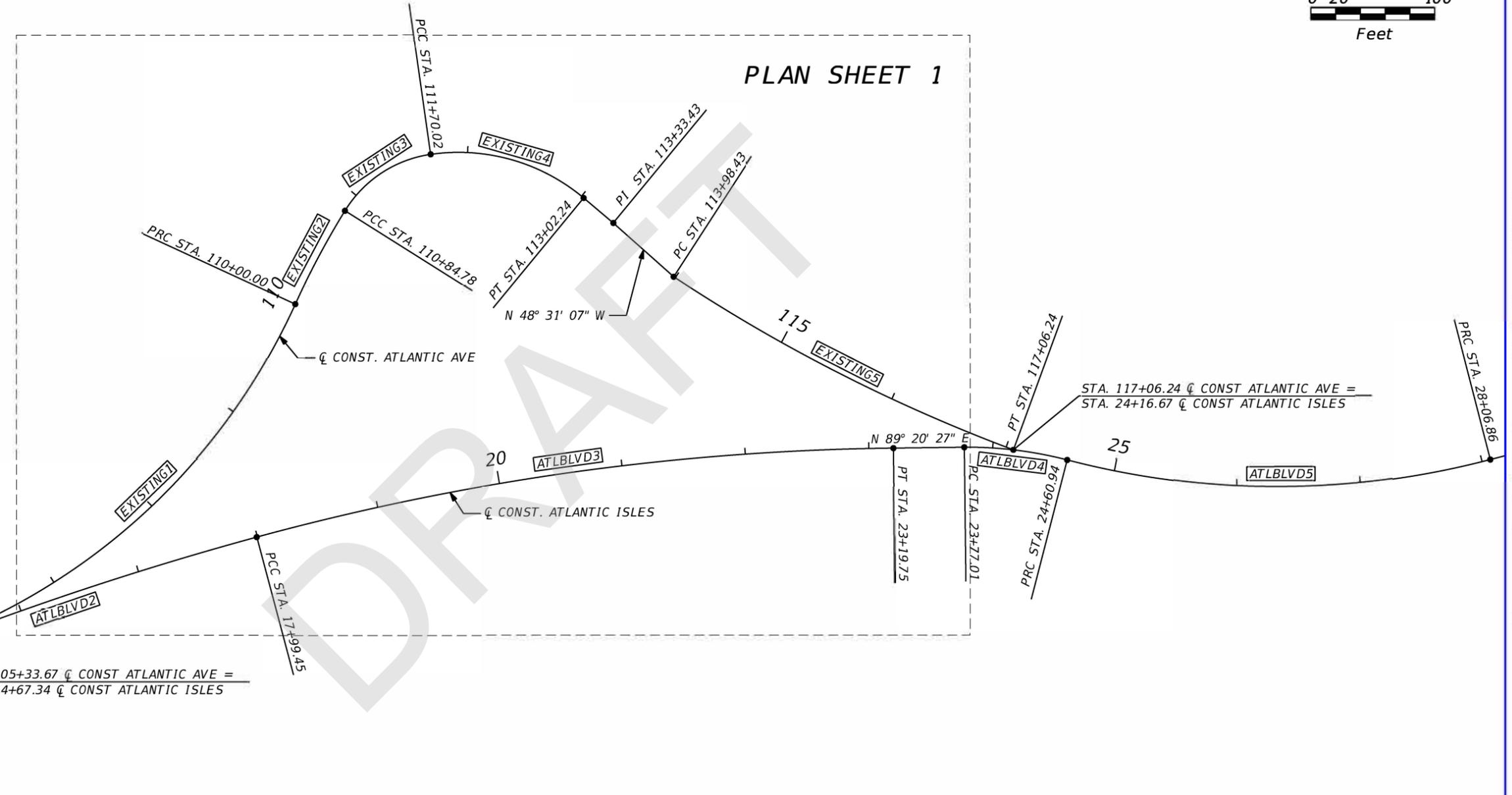
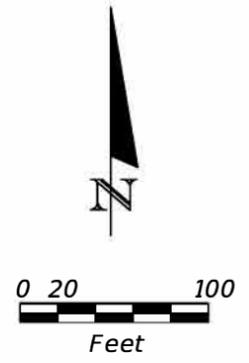
CURVE DATA EXISTING1  
 PI STA. = 108+14.96  
 $\Delta$  = 43° 18' 26" (LT)  
 D = 11° 06' 39"  
 T = 204.73  
 L = 389.77  
 R = 515.67  
 PC STA. = 106+10.23  
 PT STA. = 110+00.00

CURVE DATA EXISTING2  
 PI STA. = 110+42.45  
 $\Delta$  = 7° 24' 30" (RT)  
 D = 8° 44' 20"  
 T = 42.45  
 L = 84.77  
 R = 655.64  
 PC STA. = 110+00.00  
 PT STA. = 110+84.78

CURVE DATA EXISTING3  
 PI STA. = 111+30.30  
 $\Delta$  = 49° 50' 05" (RT)  
 D = 58° 27' 54"  
 T = 45.53  
 L = 85.24  
 R = 98.00  
 PC STA. = 110+84.78  
 PT STA. = 111+70.02

CURVE DATA EXISTING4  
 PI STA. = 112+40.28  
 $\Delta$  = 47° 56' 54" (RT)  
 D = 36° 15' 47"  
 T = 70.26  
 L = 132.22  
 R = 158.00  
 PC STA. = 111+70.02  
 PT STA. = 113+02.24

CURVE DATA EXISTING5  
 PI STA. = 115+52.99  
 $\Delta$  = 12° 52' 22" (LT)  
 D = 4° 10' 56"  
 T = 154.55  
 L = 307.80  
 R = 1,370.00  
 PC STA. = 113+98.43  
 PT STA. = 117+06.24



CURVE DATA ATLBLVD1  
 PI STA. = 12+03.11  
 $\Delta$  = 13° 42' 48" (LT)  
 D = 3° 23' 32"  
 T = 203.11  
 L = 404.27  
 R = 1,689.10  
 PC STA. = 10+00.00  
 PT STA. = 14+04.27

CURVE DATA ATLBLVD2  
 PI STA. = 16+33.61  
 $\Delta$  = 7° 02' 19" (RT)  
 D = 2° 07' 10"  
 T = 166.26  
 L = 332.11  
 R = 2,703.38  
 PC STA. = 14+67.34  
 PT STA. = 17+99.45

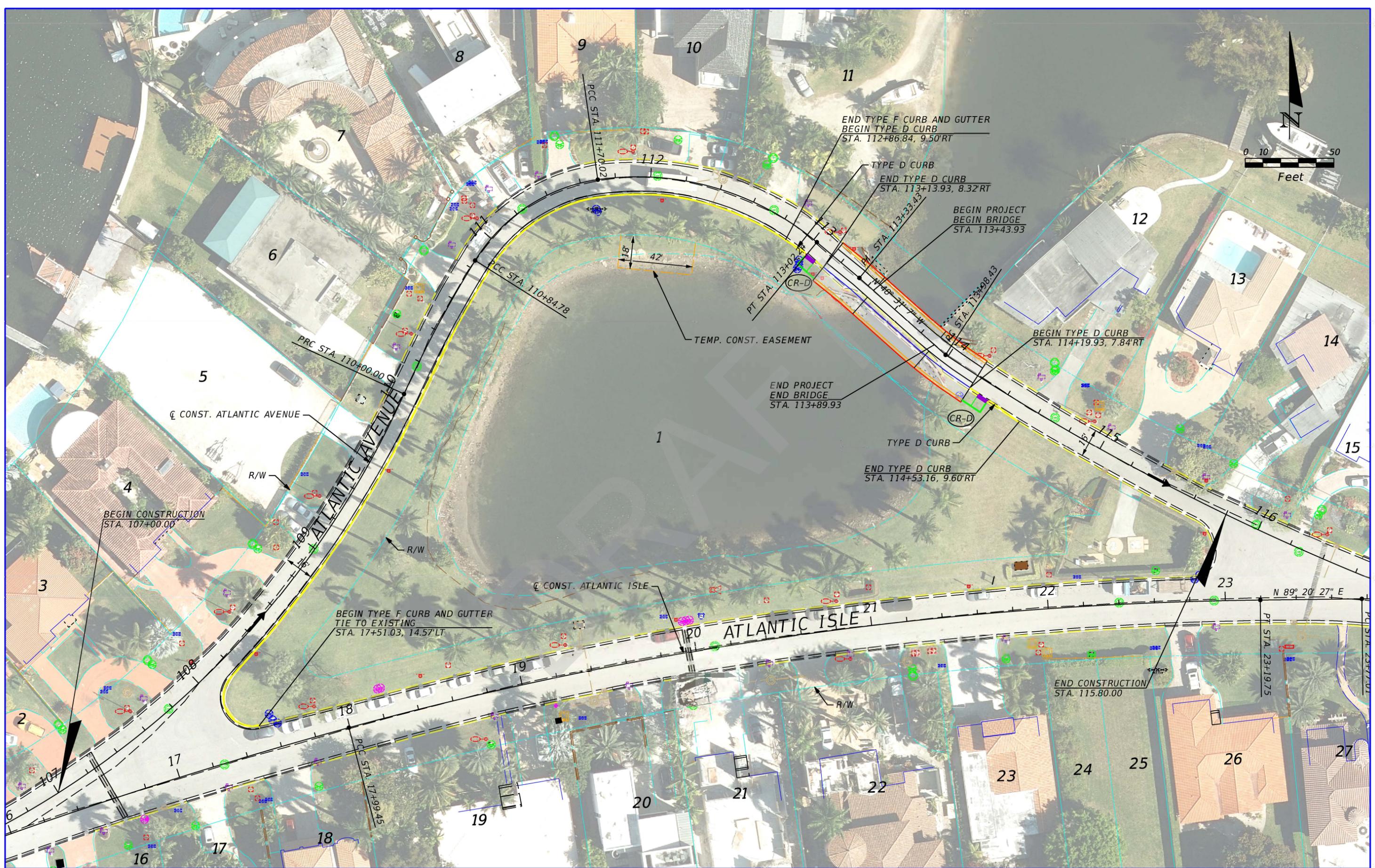
CURVE DATA ATLBLVD3  
 PI STA. = 20+60.99  
 $\Delta$  = 14° 26' 28" (RT)  
 D = 2° 46' 32"  
 T = 261.53  
 L = 520.30  
 R = 2,064.31  
 PC STA. = 17+99.45  
 PT STA. = 23+19.75

CURVE DATA ATLBLVD4  
 PI STA. = 24+19.23  
 $\Delta$  = 15° 14' 20" (RT)  
 D = 18° 09' 21"  
 T = 42.22  
 L = 83.93  
 R = 315.58  
 PC STA. = 23+77.01  
 PT STA. = 24+60.94

CURVE DATA ATLBLVD5  
 PI STA. = 26+37.72  
 $\Delta$  = 29° 05' 57" (LT)  
 D = 8° 24' 44"  
 T = 176.77  
 L = 345.91  
 R = 681.10  
 PC STA. = 24+60.94  
 PT STA. = 28+06.86

REVISIONS				ALEX MEITIN, P.E. P.E. LICENSE NUMBER 44744 JACOBS ENGINEERING GROUP, INC. 3150 SW 38TH AVE, SUITE 700 MIAMI, FL 33146	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			PROJECT LAYOUT	SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID		3
					MIAMI-DADE	430029-2-22-01			

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.



THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

REVISIONS	
DATE	DESCRIPTION

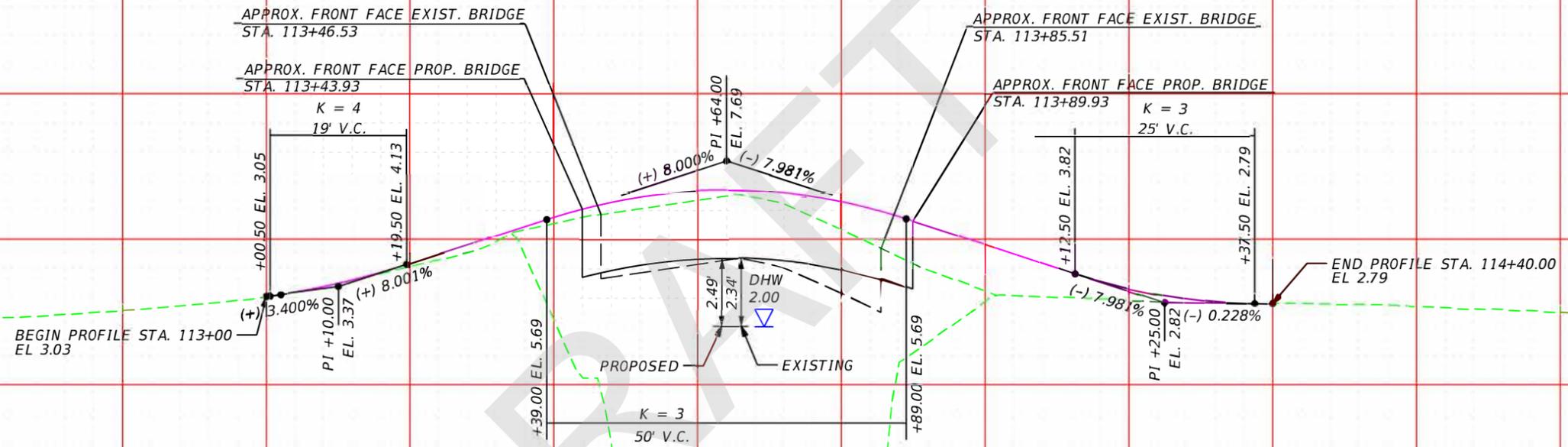
ALEJANDRO G. MEITIN, P.E.  
P.E. LICENSE NUMBER 44744  
JACOBS ENGINEERING GROUP, INC.  
3150 SW 38TH AVE, SUITE 700  
MIAMI, FL 33146

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
SR NO.	COUNTY	FINANCIAL PROJECT ID
	MIAMI-DADE	430029-2-22-01

**PLAN SHEET**  
**BRIDGE REPLACEMENT (ALT 2)**

SHEET NO.  
4

BEGIN/END BRIDGE STATIONS SUBJECT TO CHANGE  
 BRIDGE SHOWN IS ONLY TO DETERMINE VERTICAL CLEARANCE AND DOES NOT REPRESENT THE ACTUAL BRIDGE APPEARANCE



SCALE:  
 1" = 20' HORIZONTAL  
 1" = 5' VERTICAL

113+00

114+00

115+00

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

ALEX MEITIN, P.E.  
 P.E. LICENSE NUMBER 44744  
 JACOBS ENGINEERING GROUP, INC.  
 3150 SW 38TH AVE, SUITE 700  
 MIAMI, FL 33146

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
NONE	MIAMI-DADE	430029-2-22-01

**PROFILE SHEET**  
**BRIDGE REPLACEMENT (ALT 2)**

SHEET NO.  
 5

GENERAL NOTES

- ALL WORK SHALL BE PERFORMED DURING DAYTIME ONLY FROM 8:00 AM TO 8:00 PM.
- PCMS MESSAGES SHALL BE PLACED ACCORDING TO THE PLANS AND SHALL DISPLAY THE FOLLOWING MESSAGES:
 

MESSAGE 1	MESSAGE 2
CONST STARTS MM/DD	BRIDGE CLOSED
- REGULATORY SPEED SHALL BE 20 MPH FOR ALL PHASES OF TEMPORARY TRAFFIC CONTROL PLANS.

**PHASE 1**  
THE INTENT OF THIS PHASE IS TO CONSTRUCT TEMPORARY WIDENING.

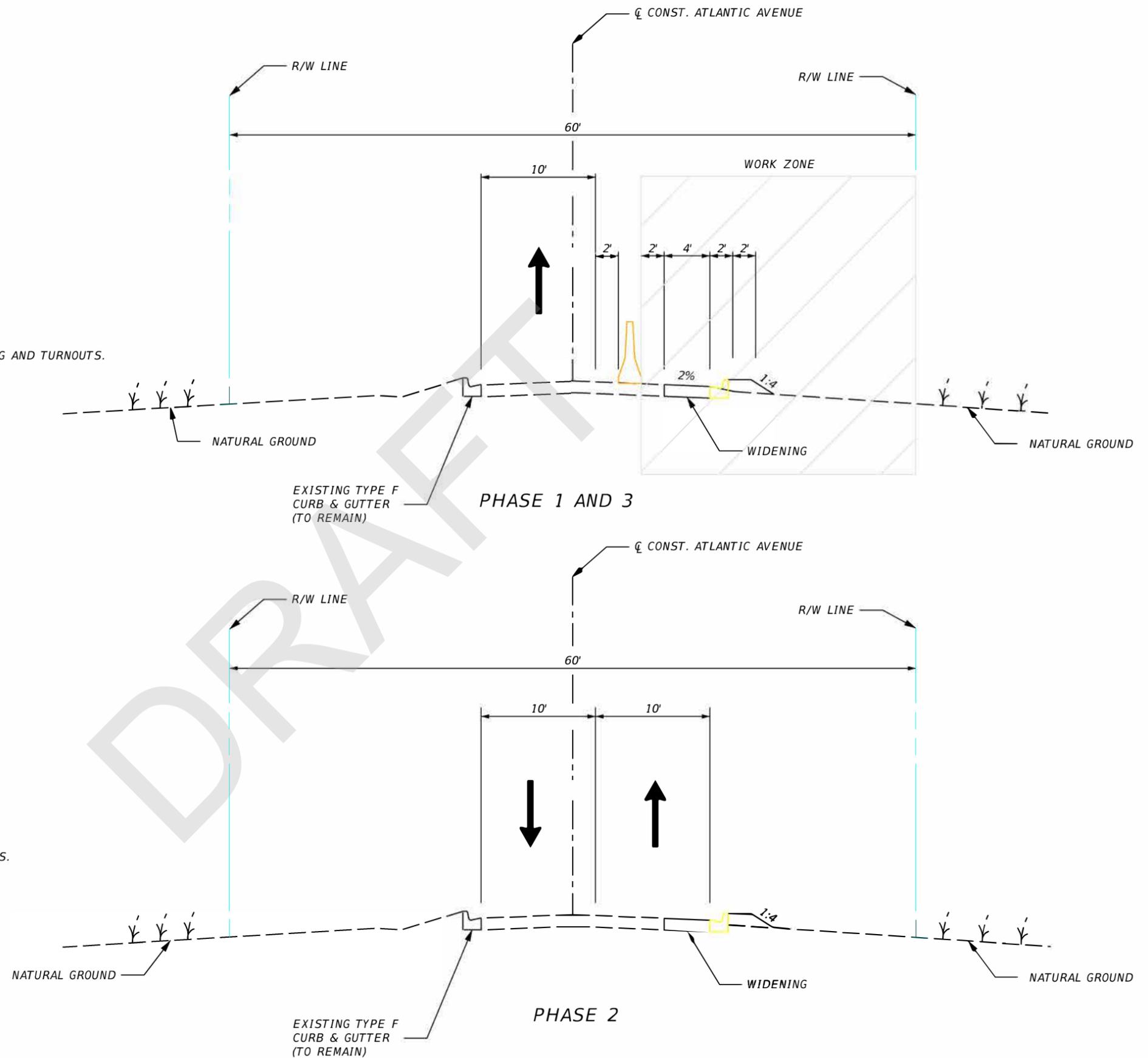
- INSTALL TEMPORARY CONCRETE BARRIER WALL.
- SHIFT TRAFFIC TO THE LEFT SIDE OF THE ROADWAY.
- CONSTRUCT TEMPORARY DRAINAGE, TEMPORARY CURB & GUTTER, WIDENING AND TURNOUTS.
- REMOVE TEMPORARY CONCRETE BARRIER WALL.
- ALLOW FOR TWO-WAY TRAFFIC.

**PHASE 2**  
THE INTENT OF THIS PHASE IS TO DEMO AND CONSTRUCT THE NEW BRIDGE.

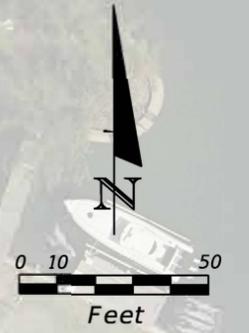
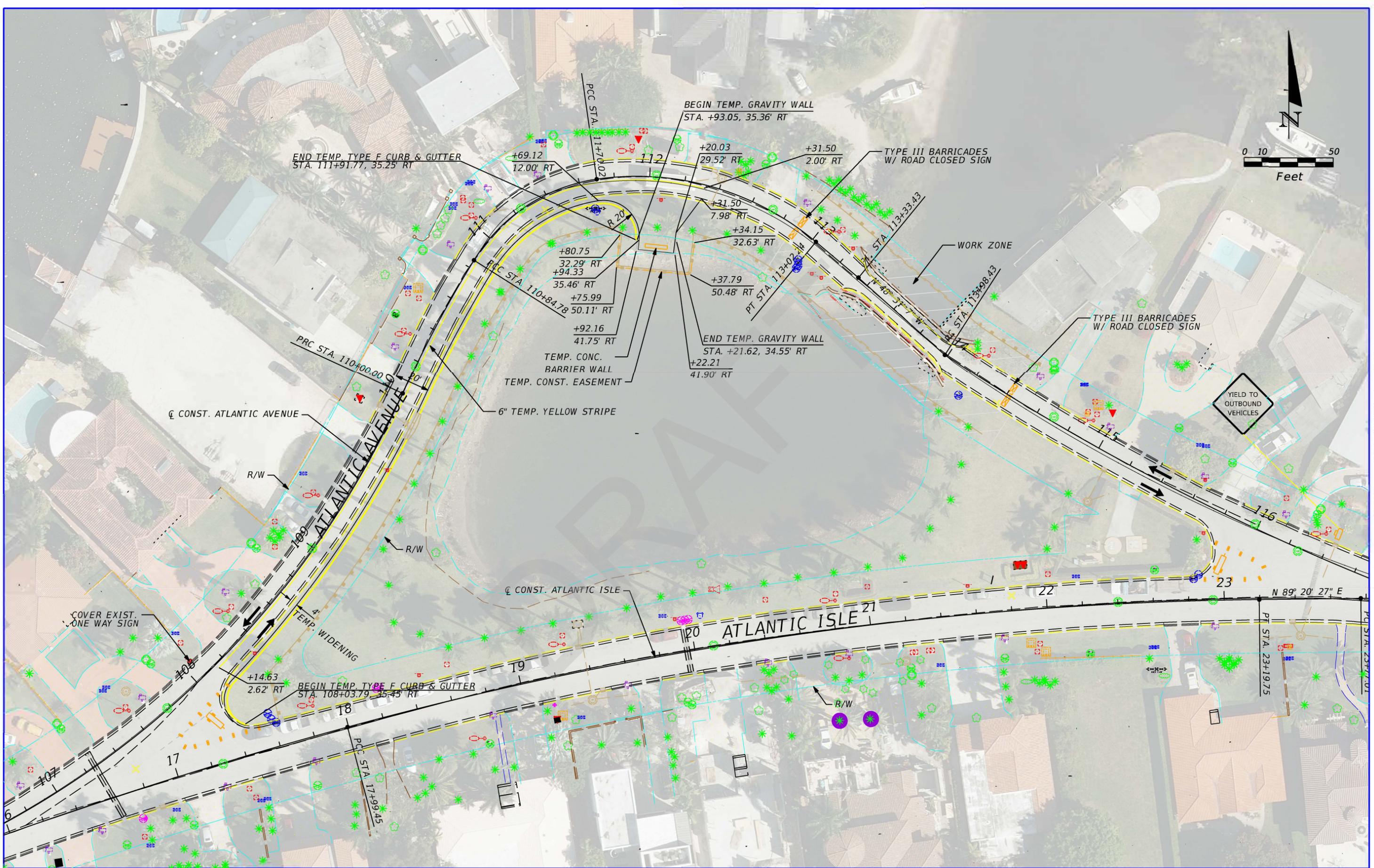
- CLOSE THE BRIDGE TO TRAFFIC.
- DEMOLISH EXISTING BRIDGE.
- CONSTRUCT NEW BRIDGE.

**PHASE 3**  
THE INTENT OF THIS PHASE IS TO REMOVE THE TEMPORARY WIDENING.

- INSTALL TEMPORARY CONCRETE BARRIER WALL.
- SHIFT TRAFFIC TO THE LEFT SIDE OF THE ROADWAY.
- REMOVE TEMPORARY CURB & GUTTER, DRAINAGE, WIDENING AND TURNOUTS.
- CONSTRUCT NEW CURB AND GUTTER.
- REMOVE TEMPORARY CONCRETE BARRIER WALL.
- ALLOW FOR TWO-WAY TRAFFIC.



REVISIONS				ALEJANDRO G. MEITIN, P.E. P.E. LICENSE NUMBER 44744 JACOBS ENGINEERING GROUP, INC. 3150 SW 38TH AVE, SUITE 700 MIAMI, FL 33146	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			<b>TTCP TYPICAL SECTION ALT 1 AND ALT 2</b>	SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION		SR NO.	COUNTY	FINANCIAL PROJECT ID		6
					MIAMI-DADE	430029-2-22-01			



REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

ALEX MEITIN, P.E.  
P.E. LICENSE NUMBER 44744  
JACOBS ENGINEERING GROUP, INC.  
3150 SW 38TH AVE, SUITE 700  
MIAMI, FL 33146

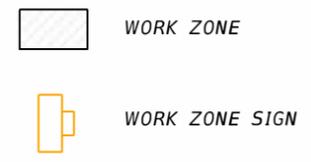
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	MIAMI-DADE	430029-2-22-01

**TRAFFIC CONTROL PLAN**  
**BRIDGE REPLACEMENT (ALT 2)**

SHEET NO.  
7

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.





REVISIONS				ALEJANDRO G. MEITIN, P.E. P.E. LICENSE NUMBER 44744 JACOBS ENGINEERING GROUP, INC. 3150 SW 38TH AVE, SUITE 700 MIAMI, FL 33146	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			ADVANCE WARNING DETAIL BRIDGE REPLACEMENT (ALT 2)	SHEET NO. 9
DATE	DESCRIPTION	DATE	DESCRIPTION		SR NO.	COUNTY	FINANCIAL PROJECT ID		
					MIAMI-DADE	430029-2-22-01			

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

*STATE OF FLORIDA*  
*DEPARTMENT OF TRANSPORTATION*

INDEX OF STRUCTURE PLANS

<u>SHEET NO.</u>	<u>SHEET DESCRIPTION</u>
B1	KEY SHEET
B1-1	ALTERNATIVE 2 - BRIDGE REPLACEMENT PLAN & ELEVATION
B1-2	ALTERNATIVE 2 - BRIDGE REPLACEMENT TYPICAL SECTION
B1-3	ALTERNATIVE 2 - BRIDGE REPLACEMENT CONSTRUCTABILITY CONCEPT
B1-4	EXISTING BRIDGE PLAN AND ELEVATION

CONTRACT PLANS

FINANCIAL PROJECT ID 430029-2-21-01  
(FEDERAL FUNDS)  
MIAMI-DADE COUNTY (87674)

STRUCTURE PLANS

DRAFT

GOVERNING STANDARDS & SPECIFICATIONS:  
FLORIDA DEPARTMENT OF TRANSPORTATION,  
DESIGN STANDARDS DATED FY 2023-24,  
AND STANDARD SPECIFICATIONS FOR ROAD AND  
BRIDGE CONSTRUCTION DATED FY 2023-24,  
AS AMENDED BY CONTRACT DOCUMENTS.

APPLICABLE DESIGN STANDARDS MODIFICATIONS: MM-DD-YY  
For Design Standards Modifications click on "Design Standards"  
at the following Web site: <http://www.dot.state.fl.us/rddesign/>

STRUCTURE SHOP DRAWINGS  
TO BE SUBMITTED TO:  
HNTB CORPORATION  
161 N.W. 6TH STREET, SUITE 1000  
MIAMI, FL. 33136  
P: (305) 551-8100 F: (305) 551-2800

PLANS PREPARED BY:  
HNTB CORPORATION  
161 N.W. 6TH STREET, SUITE 1000  
MIAMI, FL. 33136  
P: (305) 551-8100 F: (305) 551-2800

NOTE: THE SCALE OF THESE PLANS MAY  
HAVE CHANGED DUE TO REPRODUCTION.

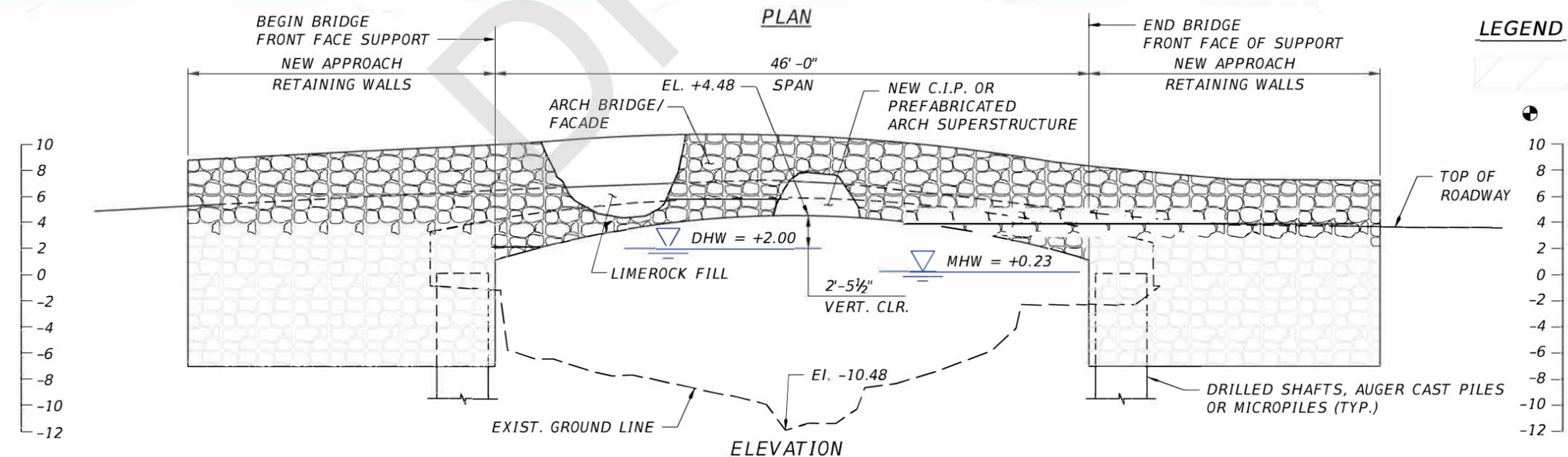
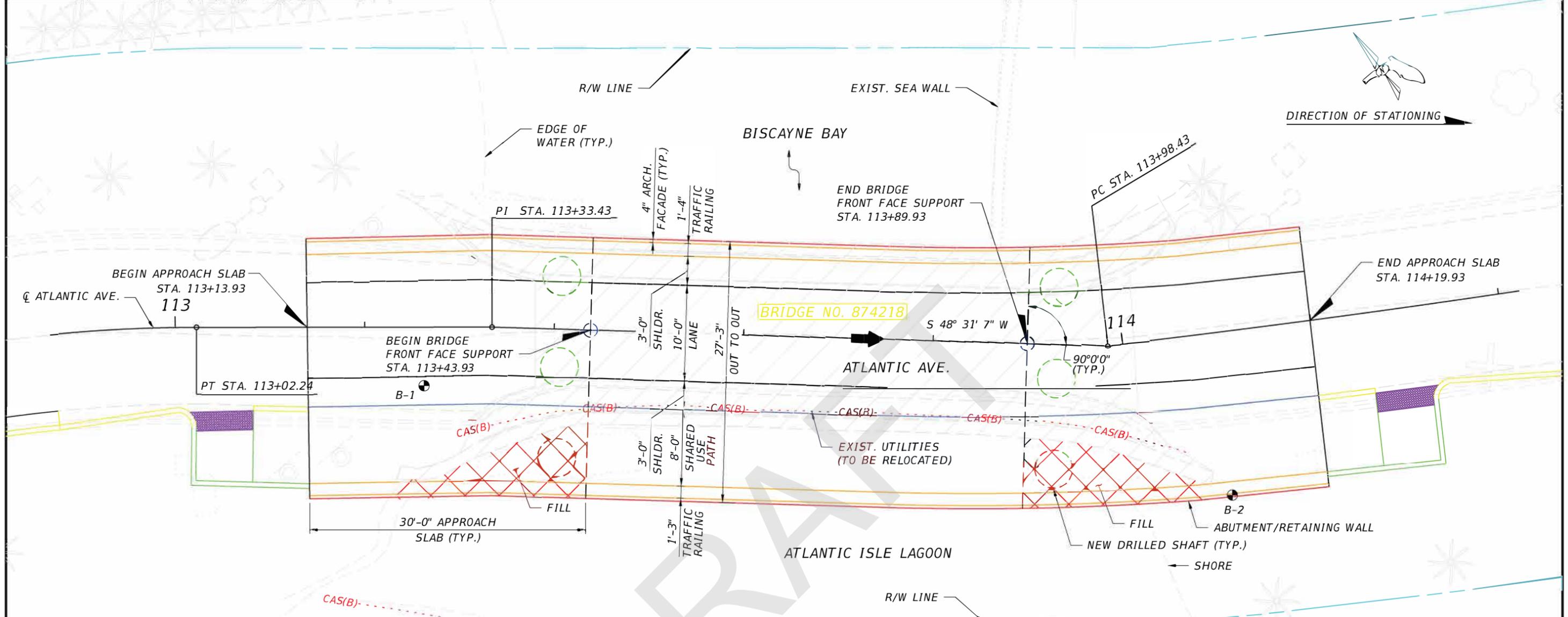
STRUCTURE PLANS  
ENGINEER OF RECORD: FENG LIU

P.E. NO.: 65738

FDOT PROJECT MANAGER : VICTORIA VOGT

FISCAL YEAR	SHEET NO.
	B1

NOT FOR CONSTRUCTION PRELIMINARY AND SUBJECT TO CHANGE



**LEGEND**

	EXISTING STRUCTURE TO BE REMOVED
	APPROXIMATE LOCATION OF SOIL BORINGS

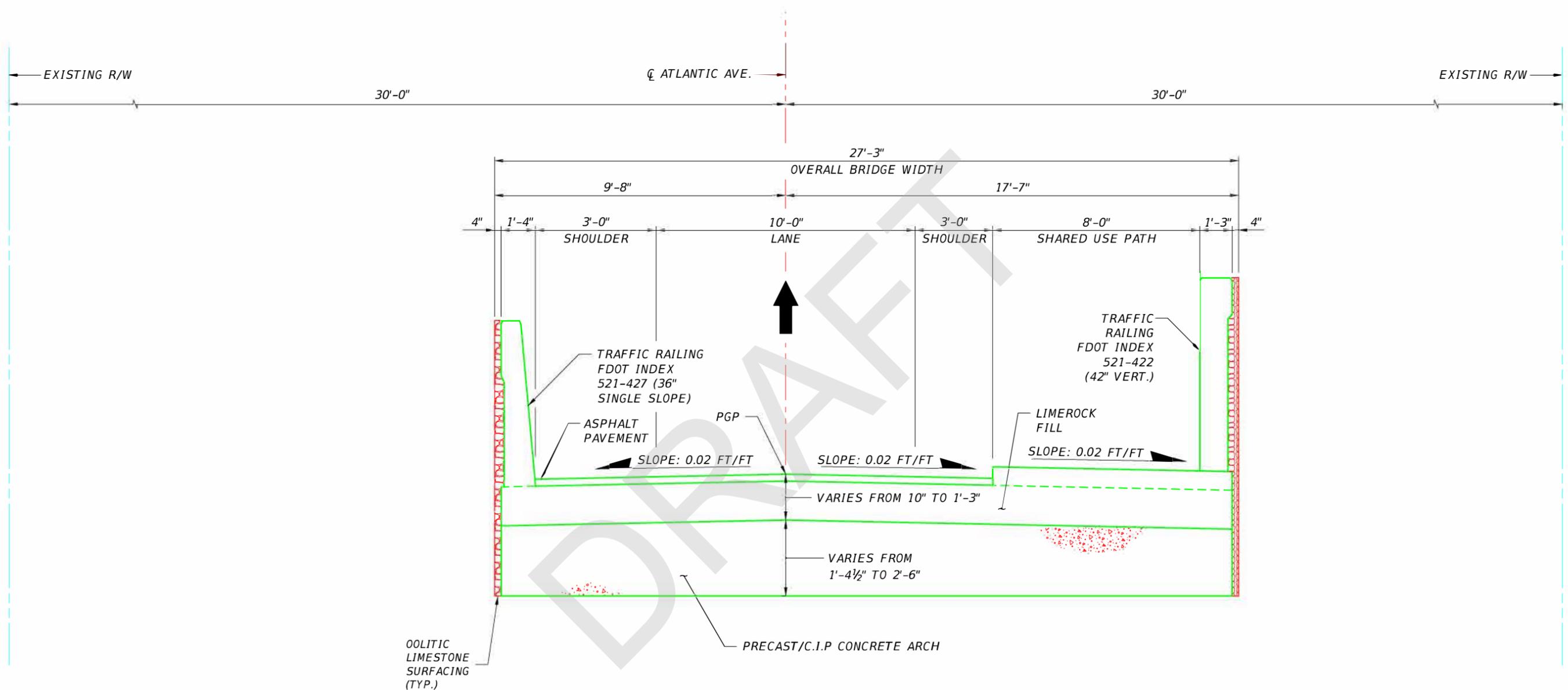
BRIDGE NO. XXXXX

REVISIONS						DRAWN BY: XSD	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			SHEET TITLE: ALTERNATIVE 2 - BRIDGE REPLACEMENT PLAN AND ELEVATION	REF. DWG. NO.
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID		
						CHECKED BY: JGL	N/A	MIAMI-DADE	430029-2-21-02	ATLANTIC AVE. OVER OCEAN CANAL	B1-1
						DESIGNED BY: CAM					
						CHECKED BY: FL					

JACOBS ENGINEERING GROUP  
200 W. FORSYTH STREET, SUITE 1520  
JACKSONVILLE, FL 32202

egunders 1/17/2024 2:23:09 PM ...\B1PlanElev-Replacement-01.dgn

NOT FOR CONSTRUCTION PRELIMINARY AND SUBJECT TO CHANGE



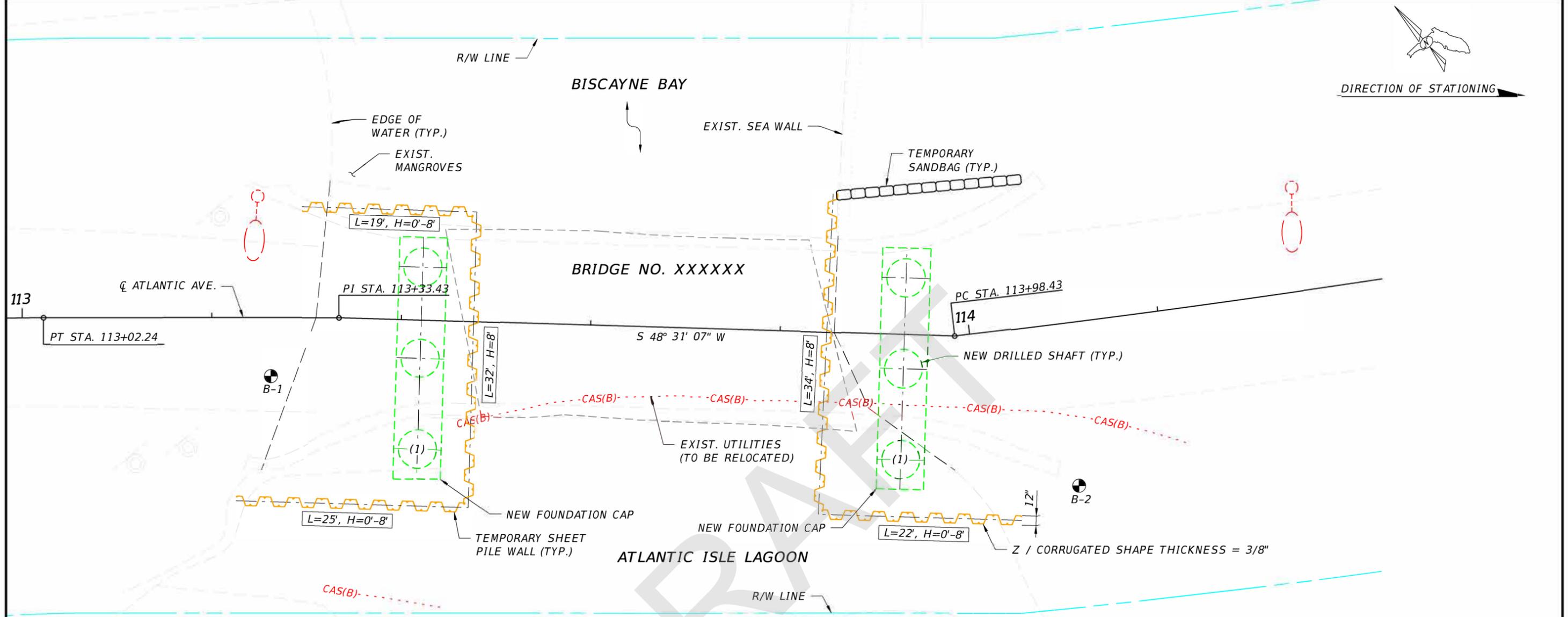
**TYPICAL SECTION**

BRIDGE NO. XXXXX

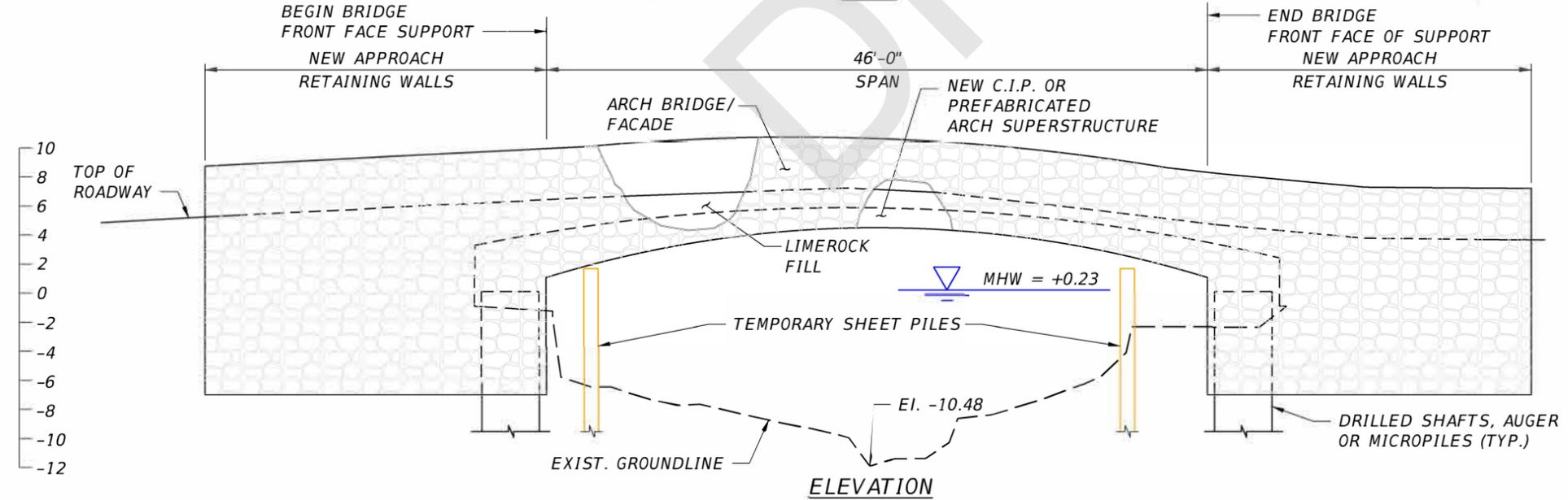
REVISIONS						DRAWN BY: GNJ CHECKED BY: XSD DESIGNED BY: CAM CHECKED BY: FL	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			SHEET TITLE:		REF. DWG. NO.
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID	BRIDGE REPLACEMENT (ALT 2) TYPICAL SECTION		
							N/A	MIAMI-DADE	430029-2-22-02	ATLANTIC AVE. OVER OCEAN CANAL		
						PROJECT NAME: ATLANTIC AVE. OVER OCEAN CANAL			SHEET NO. B1-2			



DIRECTION OF STATIONING



PLAN



ELEVATION

LEGEND

⊙ = APPROXIMATE LOCATION OF SOIL BORINGS

- NOTE:
- EXISTING BRIDGE 874218 TO BE COMPLETELY REMOVED INCLUDING FOUNDATIONS.
  - TEMPORARY SHEET PILING SHOWN WILL BE REMOVED PRIOR TO CONSTRUCTION OF THE ARCH AND SUPERSTRUCTURE.

<b>TEMPORARY SHEET PILE:</b>	
LENGTH: AT BEGIN BRIDGE	= 76 LF 51 SHEETS
AT END BRIDGE	= 56 LF 37 SHEETS
<b>TOTAL</b>	<b>= 132 LF 88 SHEETS</b>

H= HEIGHT ABOVE CANAL BOTTOM.

(1) DRILLED SHAFT WATERWARD OF EXISTING BRIDGE.

BRIDGE NO. 874218

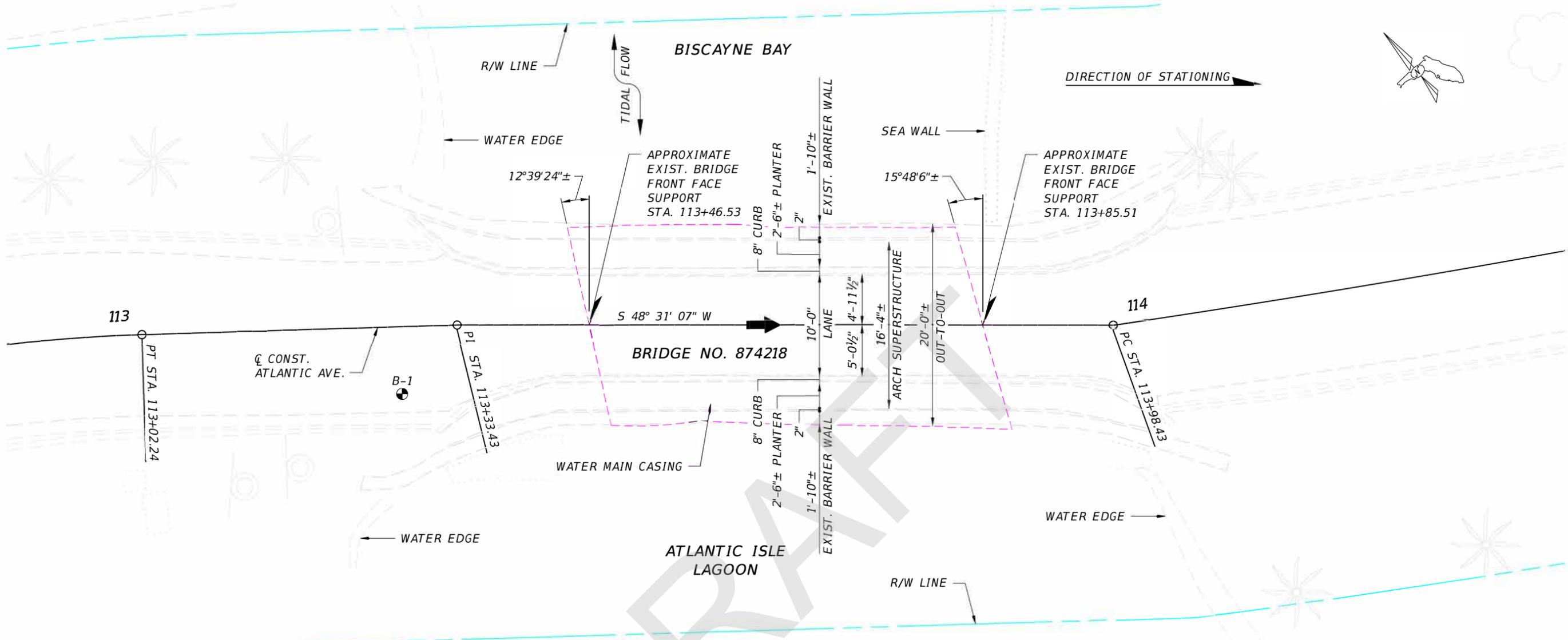
REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

JACOBS ENGINEERING GROUP  
 200 W. FORSYTH STREET, SUITE 1520  
 JACKSONVILLE, FL 32202

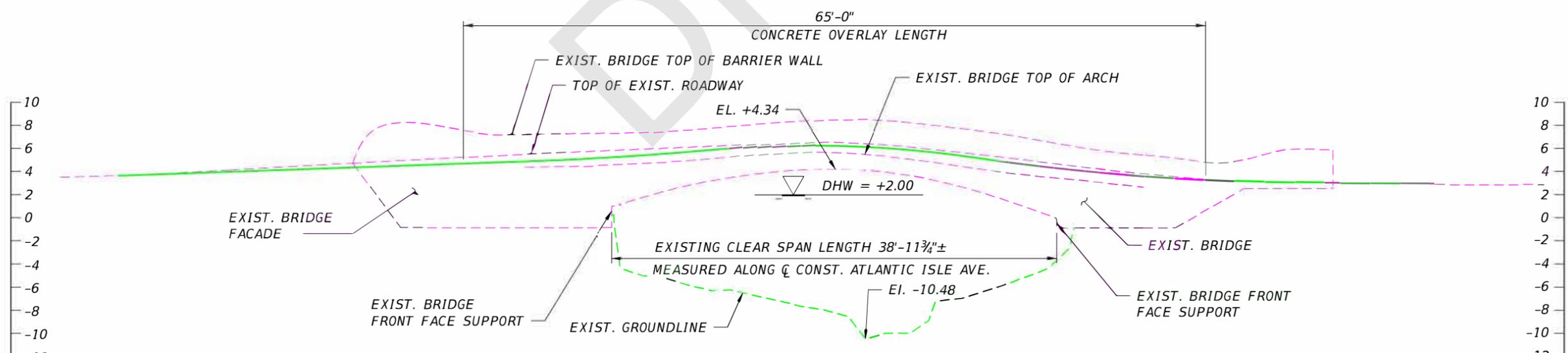
DRAWN BY: EAG	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
CHECKED BY: RLM	ROAD NO.	COUNTY	FINANCIAL PROJECT ID
DESIGNED BY: BAG	N/A	MIAMI-DADE	430029-2-21-02
CHECKED BY: RLM			

SHEET TITLE: ALTERNATIVE 2 - BRIDGE REPLACEMENT CONSTRUCTABILITY CONCEPT	REF. DWG. NO.
PROJECT NAME: ATLANTIC AVE. OVER OCEAN CANAL	SHEET NO. B1-3

NOT FOR CONSTRUCTION PRELIMINARY AND SUBJECT TO CHANGE



**PLAN**



**ELEVATION**

REVISIONS						DRAWN BY: EAG CHECKED BY: RLM DESIGNED BY: BAG CHECKED BY: RLM	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			SHEET TITLE: EXISTING BRIDGE PLAN AND ELEVATION		REF. DWG. NO.
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID	PROJECT NAME:		SHEET NO.
							N/A	MIAMI-DADE	430029-2-21-02	ATLANTIC AVE. OVER OCEAN CANAL		B1-4

NOT FOR CONSTRUCTION PRELIMINARY AND SUBJECT TO CHANGE

Appendix B – Land Use Descriptions

DRAFT

## Land Use Descriptions / FLUCCS Codes

1210 - Fixed Single Family, High Density. This category includes fixed single-family homes with six or more dwelling units per acre.

1330 - Multiple Dwellings, Low Rise. This category includes multi-family housing units of two stories or less.

1400 - Commercial and Services. This category includes buildings that support a mixture of commercial and retail services.

5120 - Channelized Waterways, Canals. This category describes man-made and maintained waterways.

5200 - Bays and Estuaries. This category describes inlets or arms of the sea that extend into the land.

DRAFT

Appendix C – IPaC Resource List

DRAFT

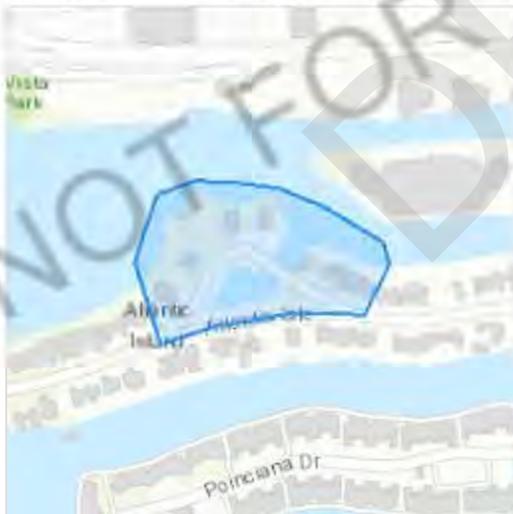
# IPaC resource list

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

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

## Location

Miami-Dade County, Florida



## Local office

Florida Ecological Services Field Office

☎ (772) 562-3909

📠 (772) 562-4288

✉ [fw4flesregs@fws.gov](mailto:fw4flesregs@fws.gov)

1339 20th Street  
Vero Beach, FL 32960-3559

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

NOT FOR CONSULTATION  
DRAFT

# Endangered species

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

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

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

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

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

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

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

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

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

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

## Mammals

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

## Birds

NAME	STATUS
<p><b>Bachman's Warbler (=wood)</b> <i>Vermivora bachmanii</i>            Wherever found            No critical habitat has been designated for this species.  <a href="https://ecos.fws.gov/ecp/species/3232">https://ecos.fws.gov/ecp/species/3232</a></p>	Endangered
<p><b>Eastern Black Rail</b> <i>Laterallus jamaicensis ssp. jamaicensis</i>            Wherever found            No critical habitat has been designated for this species.  <a href="https://ecos.fws.gov/ecp/species/10477">https://ecos.fws.gov/ecp/species/10477</a></p>	Threatened

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

## Reptiles

NAME	STATUS
American Alligator <i>Alligator mississippiensis</i> Wherever found No critical habitat has been designated for this species. <a href="https://ecos.fws.gov/ecp/species/776">https://ecos.fws.gov/ecp/species/776</a>	SAT
American Crocodile <i>Crocodylus acutus</i> There is <b>final</b> critical habitat for this species. Your location does not overlap the critical habitat. <a href="https://ecos.fws.gov/ecp/species/6604">https://ecos.fws.gov/ecp/species/6604</a>	Threatened
Eastern Indigo Snake <i>Drymarchon couperi</i> Wherever found No critical habitat has been designated for this species. <a href="https://ecos.fws.gov/ecp/species/646">https://ecos.fws.gov/ecp/species/646</a>	Threatened
Green Sea Turtle <i>Chelonia mydas</i> There is <b>final</b> critical habitat for this species. Your location does not overlap the critical habitat. <a href="https://ecos.fws.gov/ecp/species/6199">https://ecos.fws.gov/ecp/species/6199</a>	Threatened
Hawksbill Sea Turtle <i>Eretmochelys imbricata</i> Wherever found There is <b>final</b> critical habitat for this species. Your location does not overlap the critical habitat. <a href="https://ecos.fws.gov/ecp/species/3656">https://ecos.fws.gov/ecp/species/3656</a>	Endangered
Leatherback Sea Turtle <i>Dermochelys coriacea</i> Wherever found There is <b>final</b> critical habitat for this species. Your location does not overlap the critical habitat. <a href="https://ecos.fws.gov/ecp/species/1493">https://ecos.fws.gov/ecp/species/1493</a>	Endangered

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

## Fishes

NAME	STATUS
Gulf Sturgeon <i>Acipenser oxyrinchus (=oxyrhynchus) desotoi</i> Wherever found There is <b>final</b> critical habitat for this species. Your location does not overlap the critical habitat. <a href="https://ecos.fws.gov/ecp/species/651">https://ecos.fws.gov/ecp/species/651</a>	Threatened

## Insects

NAME	STATUS
Bartram's Hairstreak Butterfly <i>Strymon acis bartrami</i> Wherever found There is <b>final</b> critical habitat for this species. Your location does not overlap the critical habitat. <a href="https://ecos.fws.gov/ecp/species/4837">https://ecos.fws.gov/ecp/species/4837</a>	Endangered
Florida Leafwing Butterfly <i>Anaea troglodyta floridalis</i> Wherever found There is <b>final</b> critical habitat for this species. Your location does not overlap the critical habitat. <a href="https://ecos.fws.gov/ecp/species/6652">https://ecos.fws.gov/ecp/species/6652</a>	Endangered
Miami Blue Butterfly <i>Cyclargus (=Hemiargus) thomasi bethunebakeri</i> Wherever found No critical habitat has been designated for this species. <a href="https://ecos.fws.gov/ecp/species/3797">https://ecos.fws.gov/ecp/species/3797</a>	Endangered

## Flowering Plants

NAME	STATUS
Beach Jacquemontia <i>Jacquemontia reclinata</i> No critical habitat has been designated for this species. <a href="https://ecos.fws.gov/ecp/species/1277">https://ecos.fws.gov/ecp/species/1277</a>	Endangered

Blodgett's Silverbush <i>Argythamnia blodgettii</i>	Threatened
There is <b>proposed</b> critical habitat for this species. <a href="https://ecos.fws.gov/ecp/species/6823">https://ecos.fws.gov/ecp/species/6823</a>	
Cape Sable Thoroughwort <i>Chromolaena frustrata</i>	Endangered
There is <b>final</b> critical habitat for this species. Your location does not overlap the critical habitat. <a href="https://ecos.fws.gov/ecp/species/4733">https://ecos.fws.gov/ecp/species/4733</a>	
Carter's Mustard <i>Warea carteri</i>	Endangered
No critical habitat has been designated for this species. <a href="https://ecos.fws.gov/ecp/species/5583">https://ecos.fws.gov/ecp/species/5583</a>	
Carter's Small-flowered Flax <i>Linum carteri carteri</i>	Endangered
There is <b>final</b> critical habitat for this species. Your location does not overlap the critical habitat. <a href="https://ecos.fws.gov/ecp/species/7208">https://ecos.fws.gov/ecp/species/7208</a>	
Crenulate Lead-plant <i>Amorpha crenulata</i>	Endangered
No critical habitat has been designated for this species. <a href="https://ecos.fws.gov/ecp/species/6470">https://ecos.fws.gov/ecp/species/6470</a>	
Deltoid Spurge <i>Chamaesyce deltoidea</i> ssp. <i>deltoidea</i>	Endangered
No critical habitat has been designated for this species. <a href="https://ecos.fws.gov/ecp/species/199">https://ecos.fws.gov/ecp/species/199</a>	
Everglades Bully <i>Sideroxylon reclinatum</i> ssp. <i>austrofloridense</i>	Threatened
There is <b>proposed</b> critical habitat for this species. <a href="https://ecos.fws.gov/ecp/species/4735">https://ecos.fws.gov/ecp/species/4735</a>	
Florida Brickell-bush <i>Brickellia mosieri</i>	Endangered
There is <b>final</b> critical habitat for this species. Your location does not overlap the critical habitat. <a href="https://ecos.fws.gov/ecp/species/956">https://ecos.fws.gov/ecp/species/956</a>	
Florida Pineland Crabgrass <i>Digitaria pauciflora</i>	Threatened
There is <b>proposed</b> critical habitat for this species. <a href="https://ecos.fws.gov/ecp/species/3728">https://ecos.fws.gov/ecp/species/3728</a>	

Florida Prairie-clover *Dalea carthagenensis floridana* Endangered

There is **proposed** critical habitat for this species.

<https://ecos.fws.gov/ecp/species/2300>

Florida Semaphore Cactus *Consolea corallicola* Endangered

There is **final** critical habitat for this species. Your location does not overlap the critical habitat.

<https://ecos.fws.gov/ecp/species/4356>

Pineland Sandmat *Chamaesyce deltoidea pinetorum* Threatened

There is **proposed** critical habitat for this species.

<https://ecos.fws.gov/ecp/species/1914>

Sand Flax *Linum arenicola* Endangered

There is **proposed** critical habitat for this species.

<https://ecos.fws.gov/ecp/species/4313>

Small's Milkpea *Galactia smallii* Endangered

No critical habitat has been designated for this species.

<https://ecos.fws.gov/ecp/species/3360>

Tiny Polygala *Polygala smallii* Endangered

No critical habitat has been designated for this species.

<https://ecos.fws.gov/ecp/species/996>

## Critical habitats

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

This location overlaps the critical habitat for the following species:

NAME	TYPE
West Indian Manatee <i>Trichechus manatus</i> <a href="https://ecos.fws.gov/ecp/species/4469#crithab">https://ecos.fws.gov/ecp/species/4469#crithab</a>	Final

## Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act<sup>1</sup> and the Bald and Golden Eagle Protection Act<sup>2</sup>.

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

1. The [Migratory Birds Treaty Act](#) of 1918.
2. The [Bald and Golden Eagle Protection Act](#) of 1940.

Additional information can be found using the following links:

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

The birds listed below are birds of particular concern either because they occur on the [USFWS Birds of Conservation Concern](#) (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ [below](#). This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the [E-bird data mapping tool](#) (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found [below](#).

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

NAME

BREEDING SEASON

Black Scoter *Melanitta nigra*

Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.

**Brown Pelican** *Pelecanus occidentalis*

Breeds Jan 15 to Sep 30

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.

**Common Loon** *Gavia immer*

Breeds Apr 15 to Oct 31

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.

<https://ecos.fws.gov/ecp/species/4464>

**Great Shearwater** *Puffinus gravis*

Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.

**Manx Shearwater** *Puffinus puffinus*

Breeds Apr 15 to Oct 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

**Pomarine Jaeger** *Stercorarius pomarinus*

Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.

**Red-breasted Merganser** *Mergus serrator*

Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.

**Ring-billed Gull** *Larus delawarensis*

Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.

Royal Tern *Thalasseus maximus*

Breeds Apr 15 to Aug 31

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.

Surf Scoter *Melanitta perspicillata*

Breeds elsewhere

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.

## Probability of Presence Summary

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

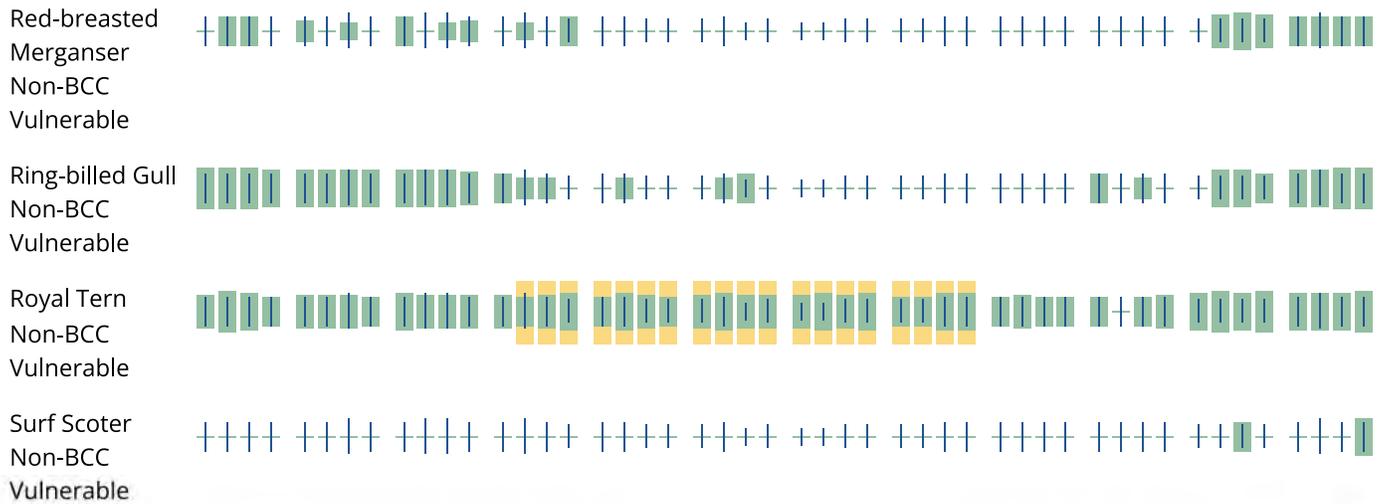
### Probability of Presence (■)

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

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

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is  $0.25/0.25 = 1$ ; at week 20 it is  $0.05/0.25 = 0.2$ .
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.





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

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

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

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

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

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

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

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

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

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

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

### **What are the levels of concern for migratory birds?**

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

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

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

### **Details about birds that are potentially affected by offshore projects**

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

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

### **What if I have eagles on my list?**

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

## Proper Interpretation and Use of Your Migratory Bird Report

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

NOT FOR DRAFT CONSULTATION

# Marine mammals

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

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

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

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

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

NAME

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

# Facilities

## National Wildlife Refuge lands

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

There are no refuge lands at this location.

## Fish hatcheries

There are no fish hatcheries at this location.

## Wetlands in the National Wetlands Inventory (NWI)

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

For more information please contact the Regulatory Program of the local [U.S. Army Corps of Engineers District](#).

Wetland information is not available at this time

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

### Data limitations

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

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

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

### **Data exclusions**

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

### **Data precautions**

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate Federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

Appendix D – Survey Reports

DRAFT

# JULY 2020 BENTHIC SURVEY TECHNICAL MEMORANDUM

Florida Department of Transportation

District 6

Project Title: Atlantic Isle Bridge No. 874218 West of SR-A1A

Limits of Project: Atlantic Isle Bridge No. 874218

Miami-Dade County, Florida

Financial Management Number: 430029-2-22-02

ETDM Number: 14413

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.

DRAFT



## Florida Department of Transportation

RON DESANTIS  
GOVERNOR

1000 NW 111th Avenue  
Miami, FL 33172-5800

KEVIN J. THIBAUT, P.E.  
SECRETARY

### **BENTHIC SURVEY TECHNICAL MEMORANDUM**

**DATE:** July 9, 2020  
**TO:** Florida Department of Transportation District VI  
**FROM:** George Burke, Environmental Scientist  
Stantec Consulting Services Inc.  
**SUBJECT:** Benthic Survey and Shoreline Characterization  
FM No. 430029-2-22-02  
Atlantic Isle Bridge No. 874218 West of SR-A1A  
Miami-Dade County, FL  
**Attachments:** Figure 1: Project Location Map  
Figure 2: Benthic Survey Results Map  
Representative Photographs  
Protected Species Construction Conditions

---

### **Background**

The Florida Department of Transportation (FDOT) District VI is approaching the Project Development and Environmental (PD&E) Study phase that will evaluate long-term transportation improvements for the proposed study area around the Atlantic Isle Bridge No. 874218 West of SR-A1A, in Miami-Dade County (See **Figure 1: Project Location Map**). In order to document existing conditions that may influence project design, the FDOT tasked Stantec to perform a benthic survey and shoreline characterization of the study area to locate and identify any natural resources. The results detailed in this technical memorandum will be used to develop avoidance and minimization measures associated with the project design and for the development of a Natural Resource Evaluation (NRE). The NRE will be the basis of coordination/consultation with Federal, State and/or local resource agencies. The purpose of this memorandum is to provide the results of the benthic survey and shoreline characterization performed on June 24, 2020, which sought to identify the presence/absence, and general limits of existing natural resources located in the vicinity of the study area.

The existing Atlantic Isle Bridge No. 874218 is an historic, low-level bridge that crosses over a tidally influenced canal that leads into the adjacent Atlantic Isles Lagoon. These tidal waters have the potential to contain protected marine resources such as seagrasses and corals, as well as Essential Fish Habitat (EFH). In addition, the lagoon and canal areas within the project study area are located within the National Marine Fisheries Service's (NMFS) designated Critical Habitat for the federally threatened Johnson's seagrass (*Halophila johnsonii*). Other federally listed species including the

West Indian manatee (*Trichechus manatus*), smalltooth sawfish (*Pristis pectinata*), and green (*Chelonia mydas*), hawksbill (*Eretmochelys imbricata*), loggerhead (*Caretta caretta*), Kemps ridley (*Lepidochelys kempii*), and leatherback (*Dermochelys coriacea*) sea turtles have the potential to occur within the study area. The survey limits and identified natural resources are presented in **Figure 2: Benthic Survey Results Map.**

### **Methodology**

The benthic and shoreline characterization survey covered the areas underneath and adjacent to the existing bridge, the adjacent lagoon, as well as the area within 100-ft to the northeast of the bridge within the adjacent channel. Prior to this field survey, a desktop review of the study area was performed using both the Efficient Transportation Decision Making (ETDM) Environmental Screening Tool (EST) and the National Oceanographic and Atmospheric Administration (NOAA) NMFS's EFH Mapper to determine which protected species have the potential to occur in the area and which Federally managed fisheries may have EFH in the study area. Coral habitat, mangroves, and seagrass are also considered Habitat Areas of Particular Concern (HAPC). In addition, Biscayne Bay is geographically designated as an HAPC for Caribbean spiny lobster (*Panulirus argus*), coral, coral reefs and live/hardbottom. HAPC's are subsets of EFH that are rare, particularly susceptible to human-induced degradation, especially ecologically important, or located in an environmentally stressed area. Biscayne Bay is also considered an Outstanding Florida Water (OFW) and state designated nursery area. The project's study area has the potential to contain EFH for species within the following fisheries managed by the South Atlantic Fisheries Management Council (SAFMC):

- Snapper-Grouper Complex
- Spiny Lobster
- Corals
- Red Drum
- Live/Hardbottom
- Shrimp

The benthic survey and shoreline characterization was conducted on June 24, 2020 during an incoming tide within the science-based seagrass survey window (between June 1 and September 30) to accommodate the Johnson's Seagrass growing season and period of maximum abundance (NOAA NMFS, 2010). The survey area and data recordings were divided into two (2) areas corresponding to the bridge channel (from southern bridge edge to the adjacent intercoastal waterway) and the lagoon area. The survey was performed by three (3) biologists using snorkeling equipment. The survey began with the three (3) biologists performing reconnaissance by swimming meandering transects throughout these two (2) defined areas. The shallow depths (less than 10-ft) and relatively small size of the survey area allowed the surveyors to observe and document conditions within the entire survey area. Observations and data including depth, benthic substrate, and observed natural

resources were recorded on underwater datasheets and photographs were taken to document all identified resources and shoreline vegetation. The locations of any observed resources were recorded using a sub-meter accurate, Trimble RNSS 1 Receiver (a Global Positioning System (GPS) device) and were mapped and overlaid onto recent aerial imagery of the study area using ESRI ArcGIS (See **Figure 2: Benthic Survey Results Map**).

## Survey Results

### Northeast Channel approaching the Atlantic Isles Lagoon

This survey area extended 100 ft from the bridge edge into the northeast channel and included the area underneath the existing bridge. The channel is shallow with depths ranging from 3-7 ft and underwater visibility during the survey was approximately 5-10 ft. The channel experiences a gentle tidal flow which provides flushing to/from the lagoon. The eastern bank of the channel is lined with a seawall from the underside of the bridge and along a private property which extends to the channel boundary. The western bank of this channel consists of mangroves growing on top of rip-rap boulders which transition to a more natural and crumbling shoreline heading away from the bridge to the northeast. These mangroves extend approximately 80-ft along this western bank from the northwest bridge approach heading to the northeast and consist of mature red (*Rhizophora mangle*) and white (*Laguncularia racemosa*) mangroves. The benthic substrate within this channel consisted of fine, silty sediment with scattered rocks and detritus. The survey did not identify any seagrasses, corals, or other protected benthic resources within the channel. Along the seawall, both underneath the bridge and along the eastern channel, barnacles and algal growth was observed. The eastern seawall was in a state of disrepair and tidal waters overtopped this wall allowing saltwater intrusion into the adjacent private property (see the attached **Representative Photographs** for further details). Several fish species were observed in this area and included checkered pufferfish (*Sphoeroides testudineus*), mullet (*Mugil cephalus*), barracuda (*Sphyraena barracuda*) and juvenile snapper (*Lutjanidae spp.*). No boat traffic was observed in the area due to the low clearance of the bridge (approximately 5 ft).

### Atlantic Isles Lagoon

The lagoon survey area encompassed the entire lagoon (which is less than one acre in size) as well as the shorelines. A small area containing red mangrove saplings (less than 2 ft in height) was identified along the western banks of the lagoon. The remainder of the lagoon bank appears to be mowed and maintained. The benthic substrate within the lagoon was consistent with those of the channel, with fine, silty sediment with scattered rocks and detritus. Depths within the lagoon ranged from 1 to 8 ft and visibility was around 5-10 ft which improved to 10-15 ft with the incoming tide. Two species of seagrasses were identified within the lagoon, paddle grass (*Halophila decipiens*) and shoal grass (*Halodule wrightii*). The paddle grass was observed in mainly sparse densities within the middle area of the lagoon at depths between 5-8 ft. The shoal grass was observed with

coverages ranging from sparse to dense along the shallower shorelines and margins of the lagoon (see **Figure 2: Benthic Survey Results Map**). Macroalgae, primarily *Halimeda spp.*, barnacles and oysters were observed within the lagoon area. No corals were observed within the lagoon area and no Johnson's seagrass was documented within the entire survey area. Similar wildlife observations were observed as were within the bridge channel and included checkered pufferfish, mullet (*Mugil cephalus*), barracuda, juvenile snapper, bar jack (*Caranx ruber*), and jack creviale (*Caranx hippos*).

## Summary

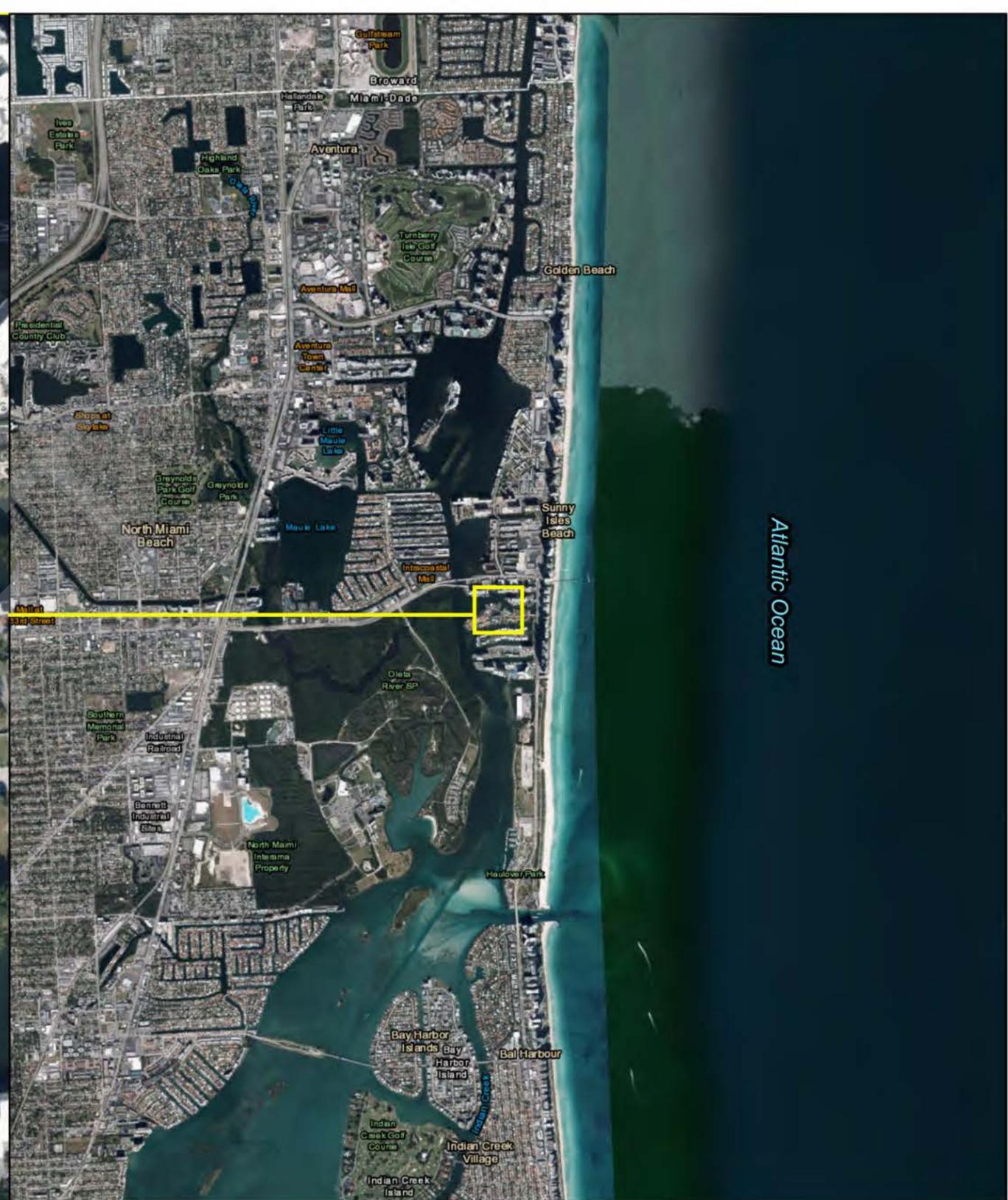
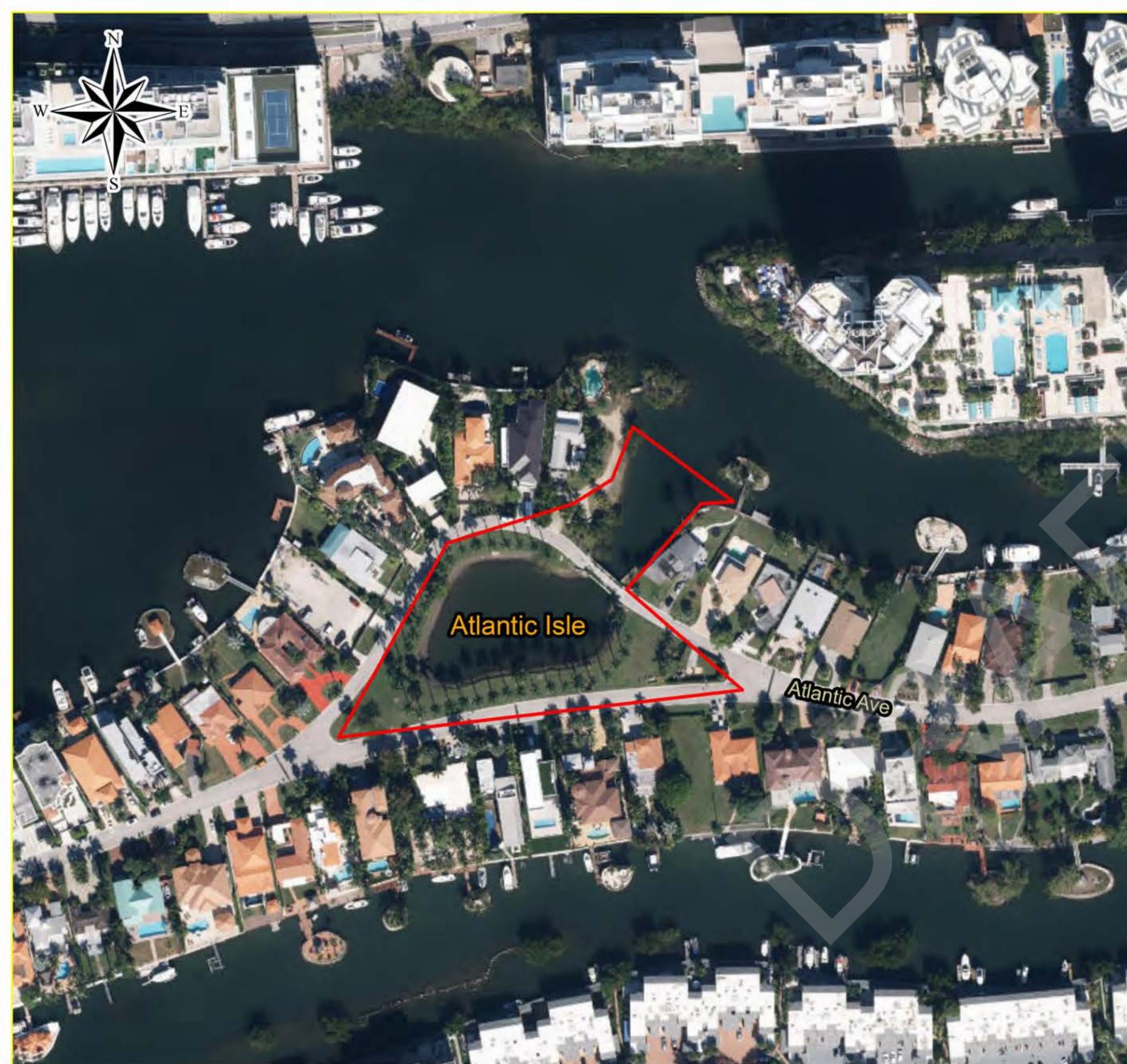
The benthic survey and shoreline characterization were conducted to document existing conditions and identify the presence or absence of protected marine resources, EFH, as well as Federally threatened/endangered species. All existing natural resources were mapped to document their location for consideration during the PD&E study for this project.

The survey identified mangrove resources along the western shoreline of the lagoon as well as along the western bank of the channel adjacent to the bridge. The mangroves in the lagoon area were small, immature red mangroves growing around the shorelines and slightly encroaching into the lagoon. Along the western bank of the channel, mature trees of both red and white mangrove species were identified. Sparse and discontinuous occurrences of paddle grass were documented within the middle area of the lagoon. Shoal grass was observed along some of the shallower shoreline areas of the lagoon and coverage ranged from sparse to dense. Other marine resources included macroalgae, barnacles, and fish species. Environmental permits would be required for any unavoidable project related impacts to the documented mangroves and/or seagrasses and would likely require compensatory mitigation for those impacts.

The NOAA NMFS's EFH mapper identified the project area as potentially providing viable spawning, breeding, and feeding areas for certain species within several federally managed fisheries, and several fish species were observed utilizing the area. Due to the presence of these existing seagrasses and mangroves, EFH coordination with the NMFS will be required if the project anticipates work within this lagoon and/or impacts to these existing EFHs. This benthic survey and shoreline characterization report will be used in the preparation of the NRE, which will be the basis of the United States Fish and Wildlife Service (USFWS) and NMFS coordination for the project.

The federally-threatened West Indian manatee, the federally-endangered smalltooth sawfish and the federally listed green, hawksbill, loggerhead, Kemps ridley, and leatherback sea turtles have the potential to occur within the study area. None of these species were observed during the survey. It is anticipated that the *Standard Manatee Conditions for In-water Work* and *Sea Turtle and Smalltooth Sawfish Construction Conditions*, will be commitments included in the PD&E study (see the attached **Protected Species Construction Conditions**) for work proposed in, on or over these waters.

Figure 1. Project Location Map



Florida Department of Transportation  
 District VI  
 1000 NW 111<sup>th</sup> Avenue  
 Miami, FL 33172

**Project Location Map**

FM 430029-2-22-01  
 Atlantic Isle Bridge No. 874218 West of SR-A1A  
 Miami-Dade County, Fl  
 Section: 14, Township: 52S, Range: 42E

**Legend**

 Survey Area

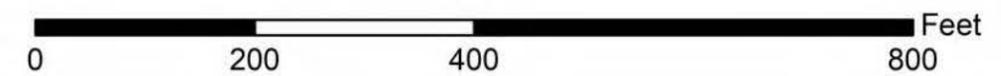
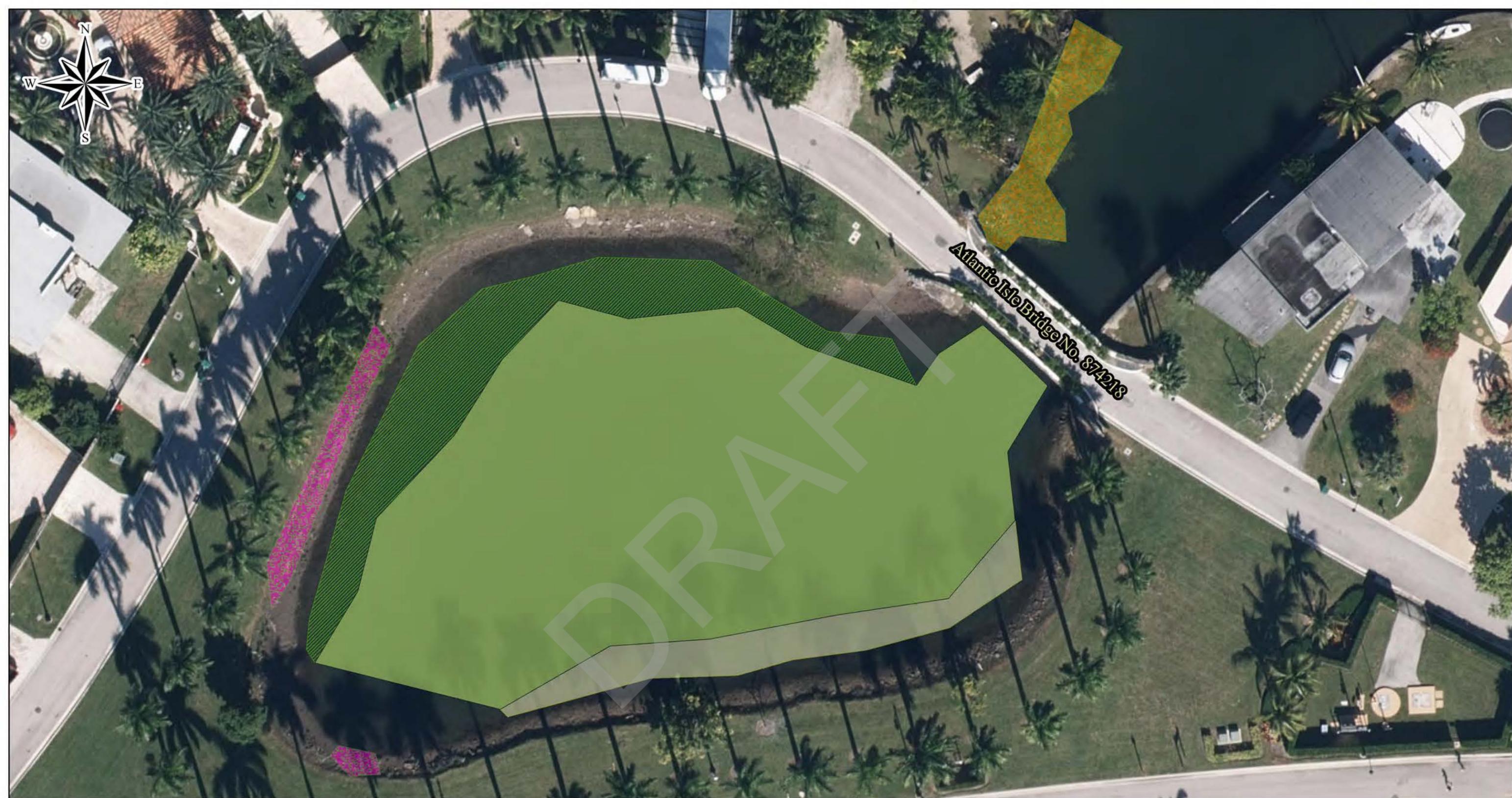


Figure 2. Benthic Survey Results Map



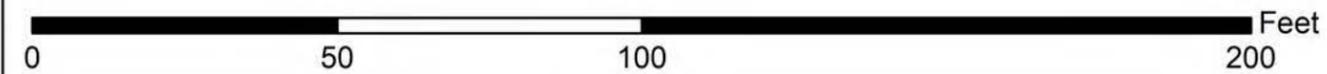
Florida Department of Transportation  
 District VI  
 1000 NW 111<sup>th</sup> Avenue  
 Miami, FL 33172-5800

**Benthic Survey Results Map**

FM 430029-2-22-01  
 Atlantic Isle Bridge No. 874218 West of SR-A1A  
 Miami-Dade County, FL  
 Section: 14, Township: 52S, Range: 42E

**Legend**

-  Shoal Grass (*H. wrightii*) Moderate to Dense
-  Shoal Grass (*H. wrightii*) Sparse to Moderate
-  Isolated Blades of Paddle Grass (*H. decipiens*)
-  Mangrove Saplings
-  Mature Mangroves (White and Red)



Representative Photographs

# Representative Photographs



**Photograph No.:** 1

**Date:** July 8, 2020

**Location:** Atlantic Isle Bridge No. 874218 West of SR-A1A, Miami-Dade County, FL

**Notes:** This photograph shows small mangrove fringe along the northern shoreline located at the western bridge landing. This fringe included mature white and red mangroves.



# Representative Photographs

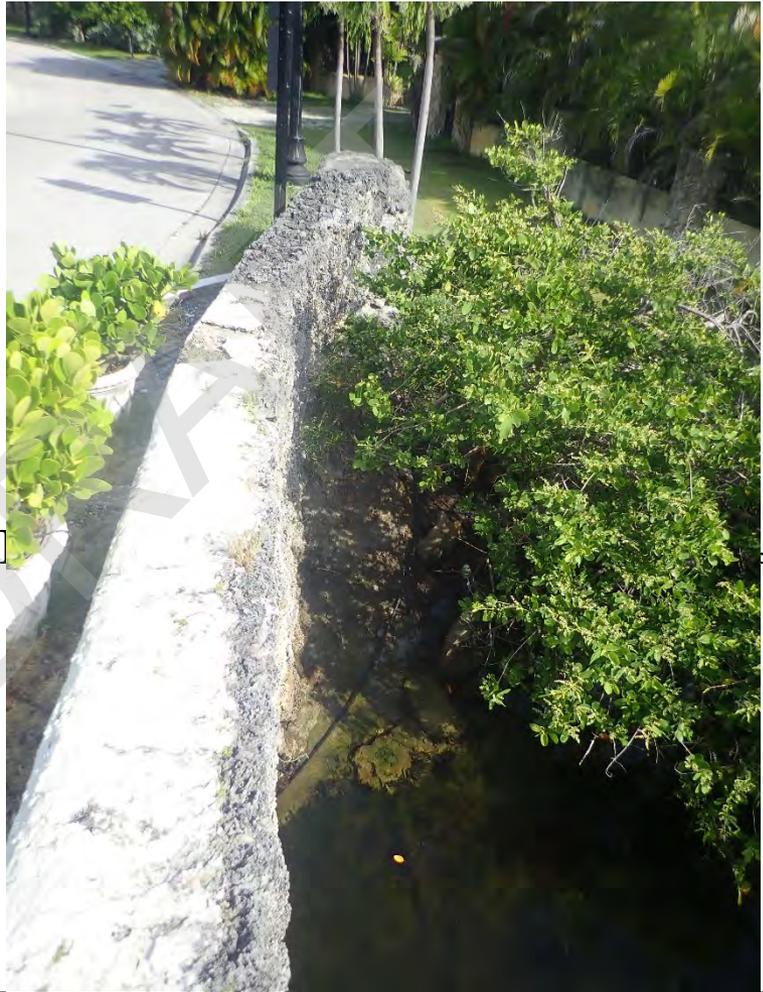


**Photograph No.:** 2

**Date:** July 8, 2020

**Location:** Atlantic Isle Bridge No. 874218 West of SR-A1A, Miami-Dade County, FL

**Notes:** This photograph again shows the small mangrove fringe along the northern shoreline located at the western bridge landing.



# Representative Photographs

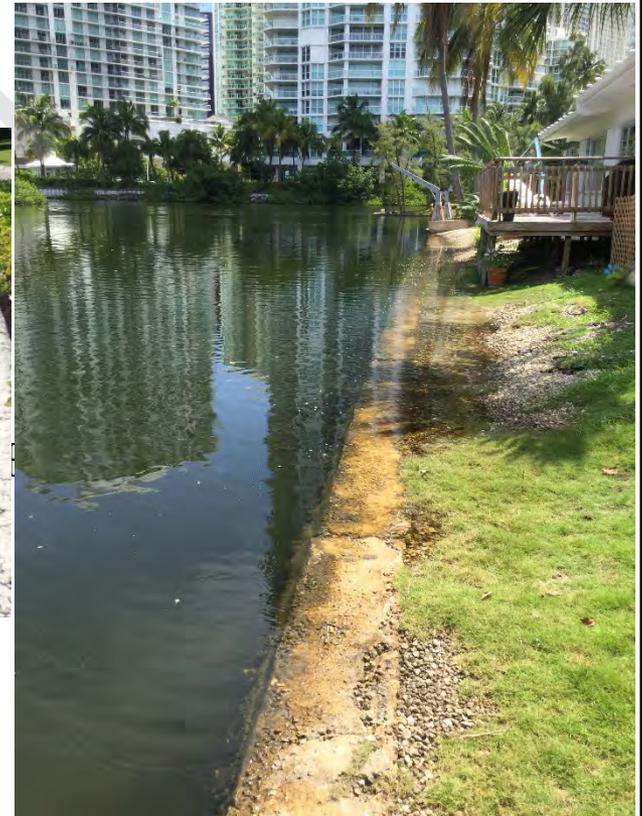


**Photograph No.:** 3

**Date:** July 8, 2020

**Location:** Atlantic Isle Bridge No. 874218 West of SR-A1A, Miami-Dade County, FL

**Notes:** These photographs show the tidal inundation along the northeastern shoreline adjacent to the project bridge. The picture on the left was taken around low tide and the picture on the right was taken during the incoming tide which overtopped the seawall into the private property.



## Representative Photographs



**Photograph No.:** 4

**Date:** July 8, 2020

**Location:** Atlantic Isle Bridge No. 874218 West of SR-A1A, Miami-Dade County, FL

**Notes:** This photograph shows the southern side of the bridge over the lagoon at Atlantic Isle. No mangroves are located adjacent to the south of the bridge; however, isolated blades of paddle grass (*Halophila decipiens*) were documented adjacent to the bridge edge within the lagoon.



# Representative Photographs

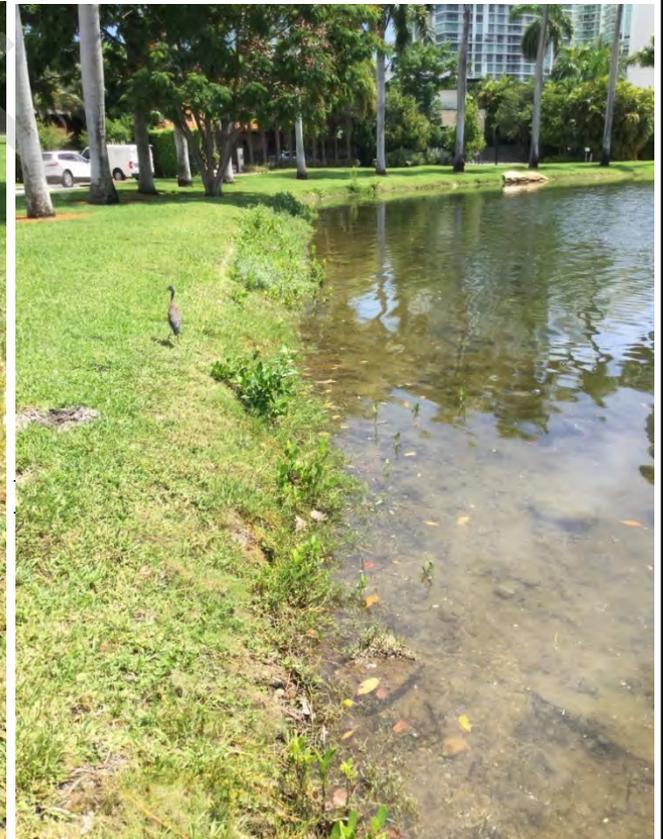


**Photograph No.:** 5

**Date:** July 8, 2020

**Location:** Atlantic Isle Bridge No. 874218 West of SR-A1A, Miami-Dade County, FL

**Notes:** These photographs document the fringe of red mangrove saplings around the western shoreline of the Atlantic Isles Lagoon.



# Representative Photographs



**Photograph No.:** 6

**Date:** July 8, 2020

**Location:** Atlantic Isle Bridge No. 874218 West of SR-A1A, Miami-Dade County, FL

**Notes:** This photograph shows the representative conditions on the bottom in the channel to the northeast of the project bridge which consisted of silty sand and detritus with sporadic coverage of green algae (*Batophora spp.*).



## Representative Photographs



**Photograph No.:** 7

**Date:** July 8, 2020

**Location:** Atlantic Isle  
Bridge No. 874218 West of  
SR-A1A, Miami-Dade  
County, FL

**Notes:** This photograph shows the sparse coverage of paddle grass (*Halophila decipiens*) that was observed within the middle area of the lagoon. The lagoon had gentle sloping shorelines with depths around 1-4 feet deep and the middle of the lagoon had depths around 4-8 feet deep at the time of the survey.



# Representative Photographs



**Photograph No.:** 8

**Date:** July 8, 2020

**Location:** Atlantic Isle Bridge No. 874218 West of SR-A1A, Miami-Dade County, FL

**Notes:** This photograph shows the algal coverage along the sloping shorelines near the bridge approach on the southeast. The sloping shoreline consisted of a rockier shoreline that transitions to a silty-sand substrate in the middle of the lagoon.



## Representative Photographs



**Photograph No.:** 9

**Date:** July 8, 2020

**Location:** Atlantic Isle  
Bridge No. 874218 West of  
SR-A1A, Miami-Dade  
County, FL

**Notes:** This photograph shows the sparse coverage of shoal grass (*Halodule wrightii*) that was documented along the edge of the sloping shorelines along the lagoon boundaries. This seagrass was documented in depths of 2-4-feet deep.



# Representative Photographs



**Photograph No.:** 10

**Date:** July 8, 2020

**Location:** Atlantic Isle  
Bridge No. 874218 West of  
SR-A1A, Miami-Dade  
County, FL

**Notes:** This photograph shows an area with moderate coverage of shoal grass (*H. wrightii*) along the boundary of the lagoon. The coverage of shoal grass varied from sparse to dense along the lagoon edge and this species was not observed within the slightly deeper area within the middle of the lagoon.



## Representative Photographs



**Photograph No.:** 11

**Date:** July 8, 2020

**Location:** Atlantic Isle  
Bridge No. 874218 West of  
SR-A1A, Miami-Dade  
County, FL

**Notes:** This photograph shows the dense coverage of shoal grass (*H. wrightii*) documented along the northwest shoreline of the lagoon. This area of the lagoon had the densest coverage of seagrass within the survey area.



## Representative Photographs



**Photograph No.:** 12

**Date:** July 8, 2020

**Location:** Atlantic Isle  
Bridge No. 874218 West of  
SR-A1A, Miami-Dade  
County, FL

**Notes:** This photograph shows the typical benthic coverage within the middle of the lagoon which consisted of varying coverage of green macroalgae (*Halimeda*). Isolated blades of paddle grass (*H. decipiens*) were documented scattered throughout this middle of the lagoon area. The benthic substrate in this area was generally silty-sand.



# Representative Photographs



**Photograph No.:** 13

**Date:** July 8, 2020

**Location:** Atlantic Isle Bridge No. 874218 West of SR-A1A, Miami-Dade County, FL

**Notes:** This photograph documents the historic nature of Bridge no 874218. This bridge was built in the 1920's and was designated as a historic site in 1994.





## Florida Department of Transportation

RON DESANTIS  
GOVERNOR

1000 NW 111th Avenue  
Miami, FL 33172-5800

JARED W. PERDUE, P.E.  
SECRETARY

### **FLORIDA BONNETED BAT SURVEY TECHNICAL MEMORANDUM**

**DATE:** May 25, 2022

**SUBJECT:** Florida Bonneted Bat Potential Roosting Habitat Survey  
Atlantic Isle Bridge (Bridge No. 874218)  
FM No. 430029-2-21-01  
Miami-Dade County, Florida

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, executed by FHWA and FDOT.

---

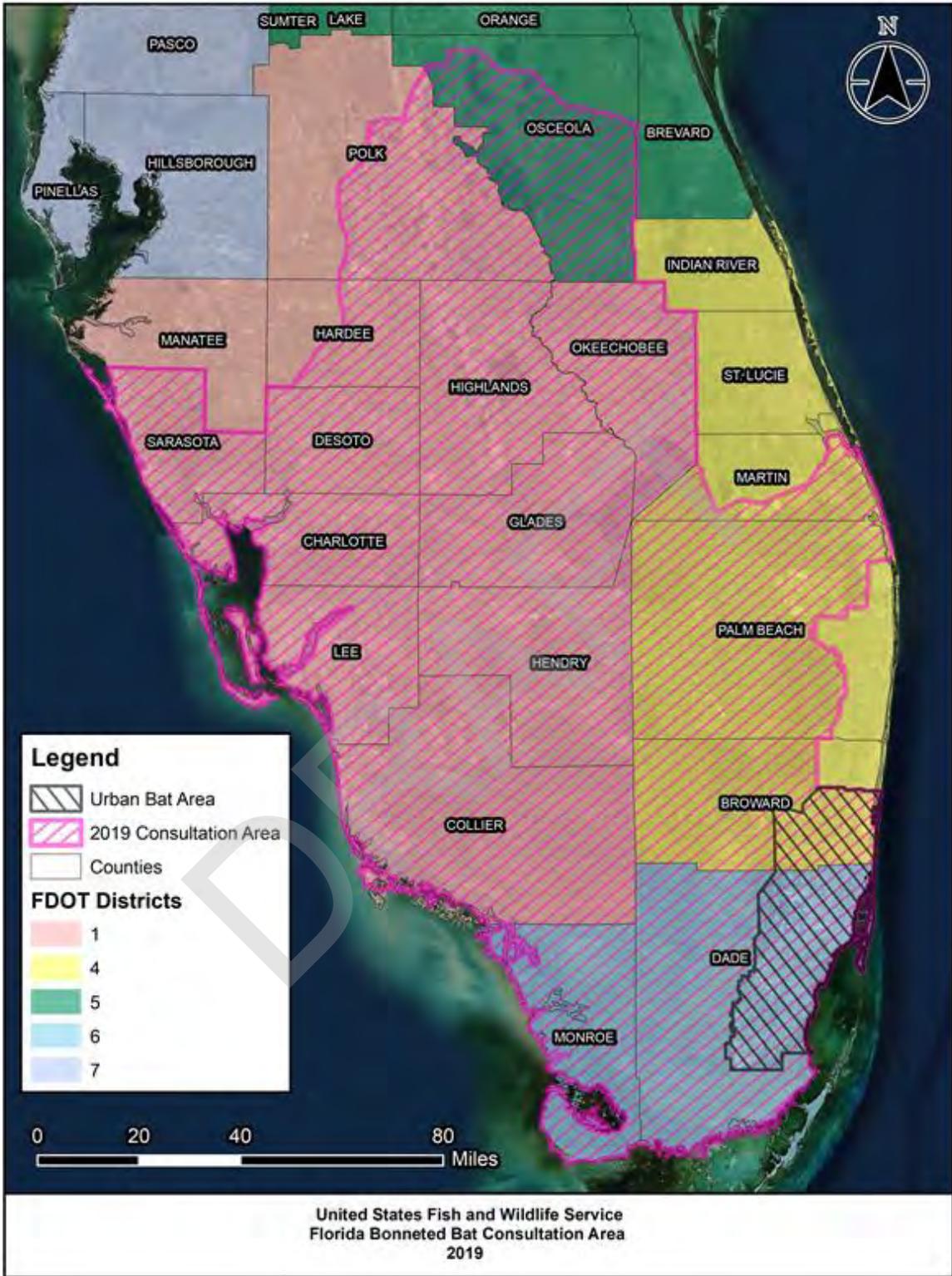
#### **Background**

The Florida bonneted bat (*Eumops floridanus*) is a rare species with a limited range and a low abundance within its range. The Florida bonneted bat is the largest of the bat species inhabiting Florida. The documented range of the bonneted bat includes 17 counties in Florida: Broward, Charlotte, Collier, De Soto, Hardee, Hendry, Highlands, Glades, Lee, Martin, Miami-Dade, Monroe, Okeechobee, Osceola, Palm Beach, Polk, and Sarasota. It was thought to have gone extinct in the late 1980s but remains extant in low abundance throughout its range (Belwood, 1992).

The bat is listed as endangered by the United States Fish and Wildlife Service (USFWS). Due to its reclusive nature and low abundance, there is limited life history information for the Florida bonneted bat. In general, bats will forage over open freshwater, freshwater wetlands (permanent or seasonal), wetland and upland forests, wetland and upland shrub, and agricultural lands as well as golf courses, parking lots, parks, and small patches of natural habitat in urban areas, and drink when flying over open water. During dry seasons, bats become more dependent on perennial ponds, streams, and wetlands for foraging purposes. Florida bonneted bat populations are believed to have declined in south Florida due to urbanization and the loss of suitable roosting habitats. The presence of roosting habitat is critical for day roosts, protection from predators, and the rearing of young. For most bats, the availability of suitable roosts typically limits survival and fecundity. The Florida bonneted bat is known to roost in artificial structures (i.e., buildings, bridges and utility poles in urban areas), natural crevices (i.e., limestone crevices in Miami-Dade County), and tall mature trees (alive or dead) with structural features for breeding and sheltering (i.e., palm fronds, tree snags, tree cavities, hollows, decay, crevices, loose bark, or deformities). The Florida bonneted bat has been known to roost in woodpecker tree cavities; however, only two instances of nesting within Red-Cockaded Woodpecker (*Dryobates (=Picoides) borealis*, endangered) tree cavities

have been recorded (Charlotte County, Polk County). Florida bonneted bats are known to be vulnerable to disturbances around their roosts (see **Appendix A**), and likely prefer areas with limited traffic and light pollution. The USFWS has established a designated consultation area, as well as an Urban Bat Area, for this species (see **Figure 1**). All FDOT roadway projects, that include tree impacts or bridge work, located within the consultation area, are evaluated to reduce potential impacts to the Florida bonneted bat.

DRAFT



**Figure 1** – United States Fish and Wildlife Service (USFWS) 2019 Consultation Area for the Florida Bonneted Bat and Urban Bat Area

## **Project Background and Description**

FDOT is conducting a Project Development and Environment (PD&E) Study for the Atlantic Isle Bridge (Bridge No. 874218). This bridge, constructed in 1925, is a historic bridge along located on Atlantic Island within Sunny Isles Beach, Miami-Dade County. The bridge is a one-way low-level bridge along Atlantic Avenue, located approximately 0.25 miles west of SR A1A. The current bridge is approximately 20 feet wide with one 10-foot travel lane, planters, curbs and barrier walls and pans approximately 43 feet over a channel between the Atlantic Isle Lagoon and Biscayne Bay. Due to the age of the bridge, there are structural deficiencies, substandard traffic barriers and roadway geometry and the bridge is functionally obsolete. This purpose of this project is to address the existing bridge deficiencies. Three alternatives were evaluated, rehabilitation, replacement and no-action (or no-build).

The project area falls within the USFWS designated consultation area and Urban Bat Area for the Florida bonneted bat (see **Figure 2**). Due to the project's location within the USFWS consultation area for the Florida bonneted bat, this species could potentially inhabit the impacted trees, structures and/or the surrounding area. Therefore, Stantec Consulting Services, Inc. was tasked to perform a species-specific survey for the Florida bonneted bat. The purpose of the survey was to determine the presence/absence of suitable roosting habitat or other evidence of site use by this species. The results of the survey performed are provided in this memorandum. At the time of the survey a preferred alternative had not been selected so a worst-case scenario was assumed and all trees around the lagoon were surveyed.

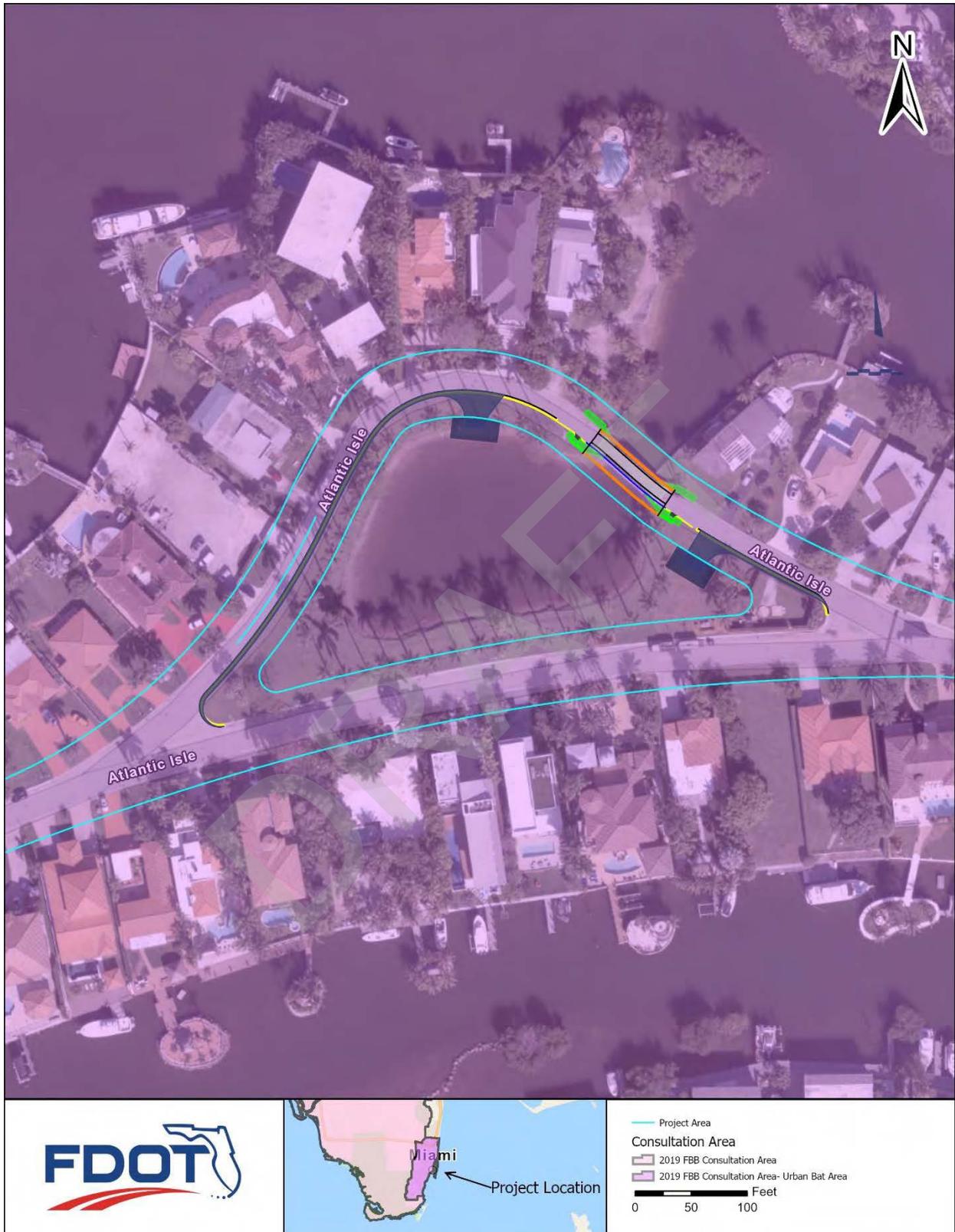


Figure 2 – Atlantic Isle Bridge Project Location Map

## **Methodology**

### Site Description

The project is located within an urban area of Miami-Dade County. This area is also within the USFWS designated consultation area, and the Urban Bat Area for the Florida bonneted bat defined in the USFWS 2019 Florida Bonneted Bat Consultation Key. The project area consists of a lagoon with landscaped shorelines and residential properties.

### Survey Protocols

On March 12, 2021, Stantec biologists surveyed all trees within the landscaped shorelines surrounding the lagoon that may be impacted by the proposed project. The survey followed the 2019 USFWS Survey Protocol for the Florida bonneted bat. A copy of the survey protocol is included in **Appendix A**. The USFWS Draft Protocol requires survey transects for potential tree impacts. However, all trees in the project area were individually surveyed via visual inspection (with and without binoculars) to ensure any potential impacts caused by the final design were captured during the survey. Weather conditions were sunny during the survey. For the purposes of this survey, suitable roosting habitat is defined as any tree greater than 33 feet in height, with diameter at breast height (DBH) greater than eight inches, and cavities or crevices higher than 16 feet above ground level (USFWS 2019) or bridges greater than 15 feet tall. Suitable roosting structures such as cavities, or structural gaps in bridges, must have an entrance of 1 inch or greater, and be in areas with open space, open or semi-open canopies and few obstacles such as branches. In this memo, trees meeting the height and DBH criteria listed above, but lacking suitable roost structure (cavities at least 16 feet off the ground) are considered potential but not suitable roosting habitat. The limited roost survey was performed by visually inspecting each of the trees for suitable roosting habitat and/or evidence of site utilization such as the presence of guano. DBH was measured using a Forestry Supplier's Fabric Diameter Tape (metric), and the measurements were converted from centimeters to inches. The surveyed trees are documented in in the **Representative Photographs** section.

## **Results**

### Potential Roosting Habitat

Trees identified during the survey in the project area included Mexican fan palms (*Washingtonia robusta*), royal palms (*Roystonea regia*), royal poinciana (*Delonix regia*), sabal palm (*Sabal palmetto*) and gumbo limbo (*Bursera simaruba*). Of the trees surveyed only the royal palms, met the potential roosting habitat following USFWS criteria (height >33 feet and DBH >8 inches). However, none of these trees had any observed cavities above the 16-foot criteria for suitable roosting structure. Therefore, no trees surveyed in the project area would be considered suitable habitat for the Florida bonneted bat. Furthermore, no other indicators of bat use (i.e., guano) were observed in or around any of the surveyed trees for this segment. The distance between the bridge

substructure and the water not provide an adequate drop height (15 feet) for this species. Therefore, the bridge was not considered potential roosting habitat and was not surveyed.

*Potential Foraging Habitat*

The surrounding area consists primarily of residential land use surrounding a small lagoon and abutting Biscayne Bay. The open area of the lagoon and the surrounding landscaped shoreline as well as Biscayne Bay provide foraging habitat for this species. The rehabilitation alternative would maintain the existing alignment and bridge footprint, but the replacement alternative would require a wider footprint (20 feet to 27 feet). While the change in bridge dimensions may require fill within and along the shoreline of the lagoon and Biscayne Bay, the overall nature of the project area would remain the same and ample foraging habitat in the area would remain.

DRAFT

### Conclusions

The proposed project will not impact any trees that meet the USFWS criteria for suitable roosting habitat for the Florida bonneted bat as none of the trees contained cavities or other suitable roosting structure. Additionally, no site utilization by this species was observed at any of these surveyed trees. Impacts to potential foraging habitat within the project area would be limited to small amounts of fill within, or along the shoreline of, the lagoon or Biscayne Bay and the surrounding area would still provide foraging habitat for this species once construction is completed. Furthermore, due to the lack of suitable roosting habitat within the project area, it is unlikely that this species is actively utilizing the project area. Therefore, no adverse impacts to the Florida bonneted bat are anticipated and FDOT has made an effect determination of '**No Effect**' for the Florida bonneted bat. Due to this project's location within the USFWS Urban Bat Area FDOT seeks USFWS agreement with this determination.

### **Summary**

The survey completed for the project area did not identify any suitable roosting habitat for the Florida bonneted bat and no site utilization was observed. Although there is the potential the Florida bonneted bat may utilize areas such as the lagoon and landscaped shorelines for foraging, the lack of site utilization evidence the presence of this species is unlikely within the project area

Given the lack of evidence of this species, and the lack of suitable roosting habitat within the project area, adverse impacts to this species are not anticipated as a result of the proposed project. FDOT has made a determination of '**No Effect**' the Florida bonneted bat. For completion of this survey and memorandum, FDOT seeks USFW agreement with this effect determination.

For further details on the Florida bonneted bat survey please see the **Representative Photographs** taken during the survey.

## References

Belwood, J.J. 1992. Florida mastiff bat *Eumops glaucinus floridanus*. Pages 216-223 in S.R. Humphrey (ed.), Rare and endangered biota of Florida. Vol. I. Mammals. University Press of Florida. Gainesville, Florida.

U.S. Fish and Wildlife Service. 2008. U.S. Fish and Wildlife Service Species Assessment and Listing Priority Assignment.

U.S. Fish and Wildlife Service. 2019. U.S. Fish and Wildlife Service Consultation Key for the Florida bonneted bat.

DRAFT

## **Representative Photographs**



**Photo 1** – Photo facing northeast. Royal palms (*Roystonea regia*) located at the western tip of the landscaped shoreline surround the lagoon. No cavities or roosting structure was observed at any of these trees.



**Photo 2** – Photo facing northwest. Royal palms (*Roystonea regia*), along the southern shoreline of the lagoon. No cavities or roosting structure was observed at any of these trees.



**Photo 3** – Photo facing west. Royal poincianas (*Delonix regia*) along the northern shoreline of the lagoon. No cavities or roosting structure was observed at any of these trees.



**Photo 4** – Photo facing east. Mexican fan palms (*Washingtonia robusta*) and royal palms along the eastern shoreline of the lagoon. No cavities or roosting structure was observed at any of these trees.



**Photo 5** – Photo of a royal palm trunk and canopy representative of royal palms in the project area.

# **Appendix A**

**USFWS Florida Bonneted Bat Programmatic Key and Survey Protocol**

**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](mailto:FBBguidelines@fws.gov). These comments will be reviewed and incorporated in an annual review.

Terms in <b>bold</b> 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](mailto:FBBsurveyreport@fws.gov), or mail electronic file to U.S. Fish and Wildlife Service, Attention Florida bonneted bat surveys, 1339 20<sup>th</sup> 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.

DRAFT

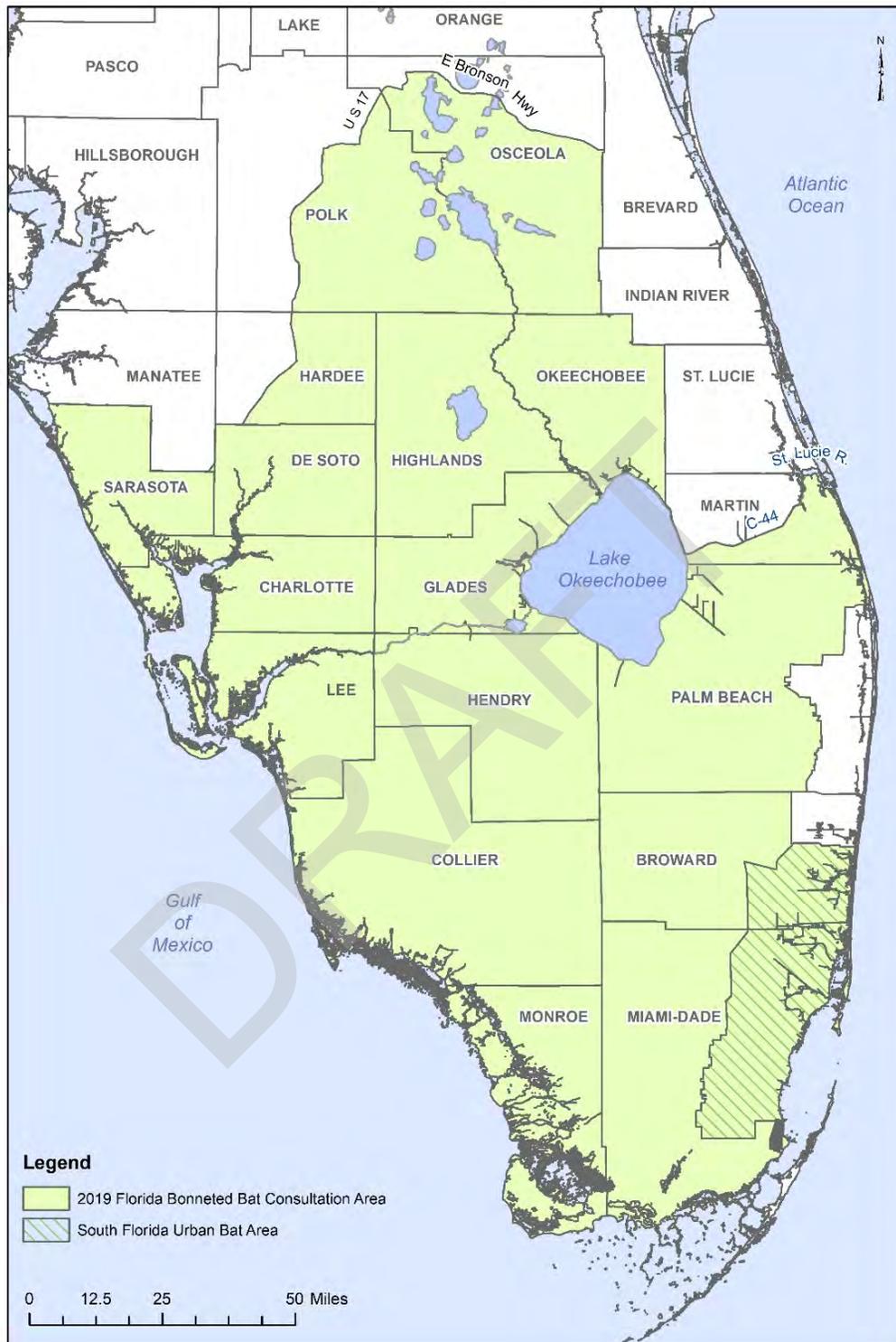


Figure 1. Florida Bonneted Bat Consultation Area. Hatched area (Figure 2) identifies the urban development boundary in Miami-Dade and Broward County. Applicants with projects in this area should contact the Service for specific guidance addressing this area and individual consultation. The Consultation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

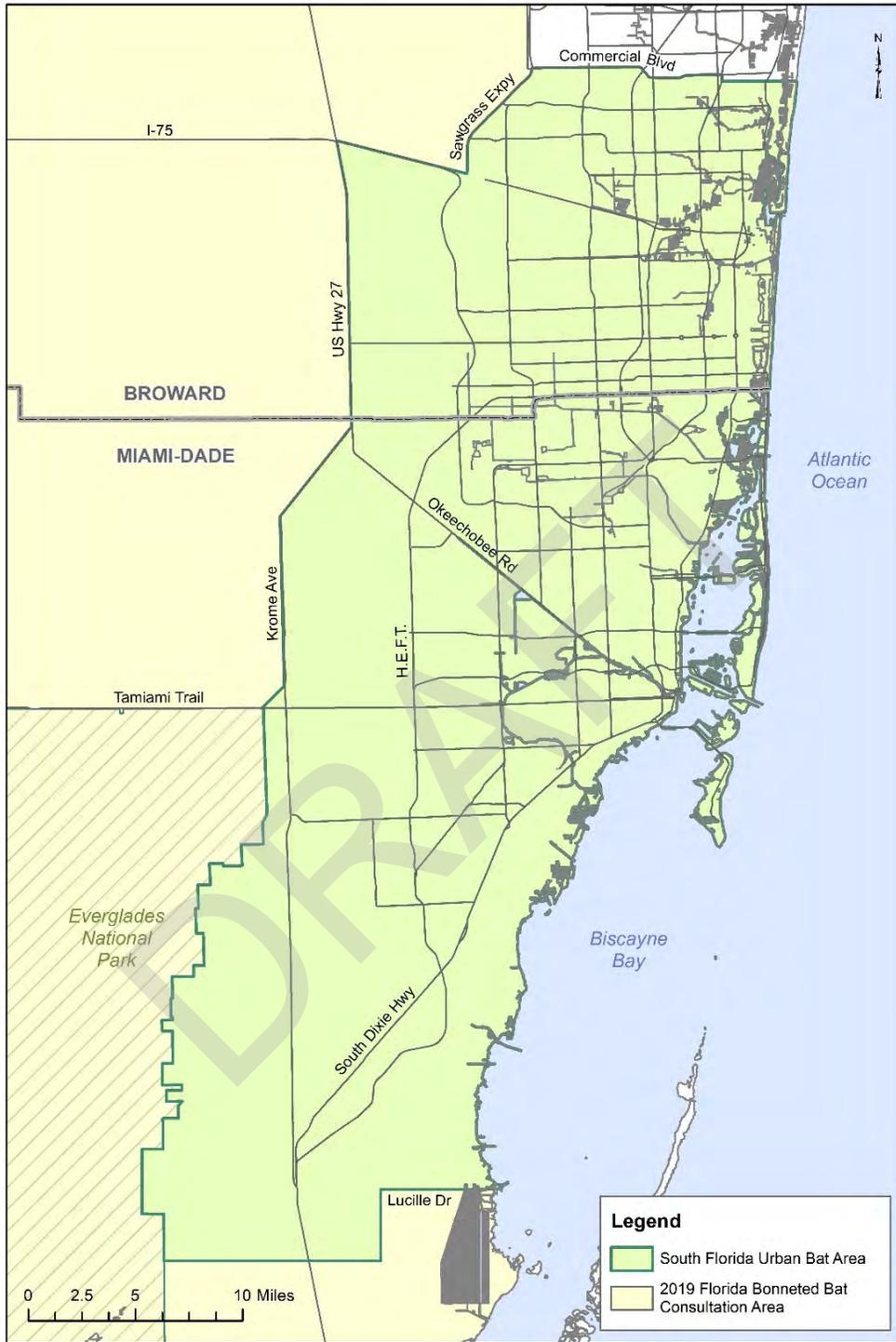


Figure 2. Urban development boundary in Miami-Dade and Broward County. The Consultation Key should not be used for projects in this area. Applicants with projects in this South Florida Urban Bat Area should contact the Service for specific guidance addressing this area and individual consultation.

## Florida Bonneted Bat Consultation Key<sup>#</sup>

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\*  $\leq$  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<sup>+</sup> 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<sup>+</sup> Further consultation with the Service required.**
  
- 9a. Project will affect\*  $>$  50 acres (20 hectares) (wetlands and uplands) of foraging habitat.....**LAA<sup>+</sup> Further consultation with the Service required.**
- 9b. Project will affect\*  $\leq$  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<sup>+</sup> Further consultation with the Service required.**
- 11b. Project will affect\*  $\leq$  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<sup>+</sup> Further consultation with the Service required.**
- 12b. Project will affect\*  $\leq$  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.

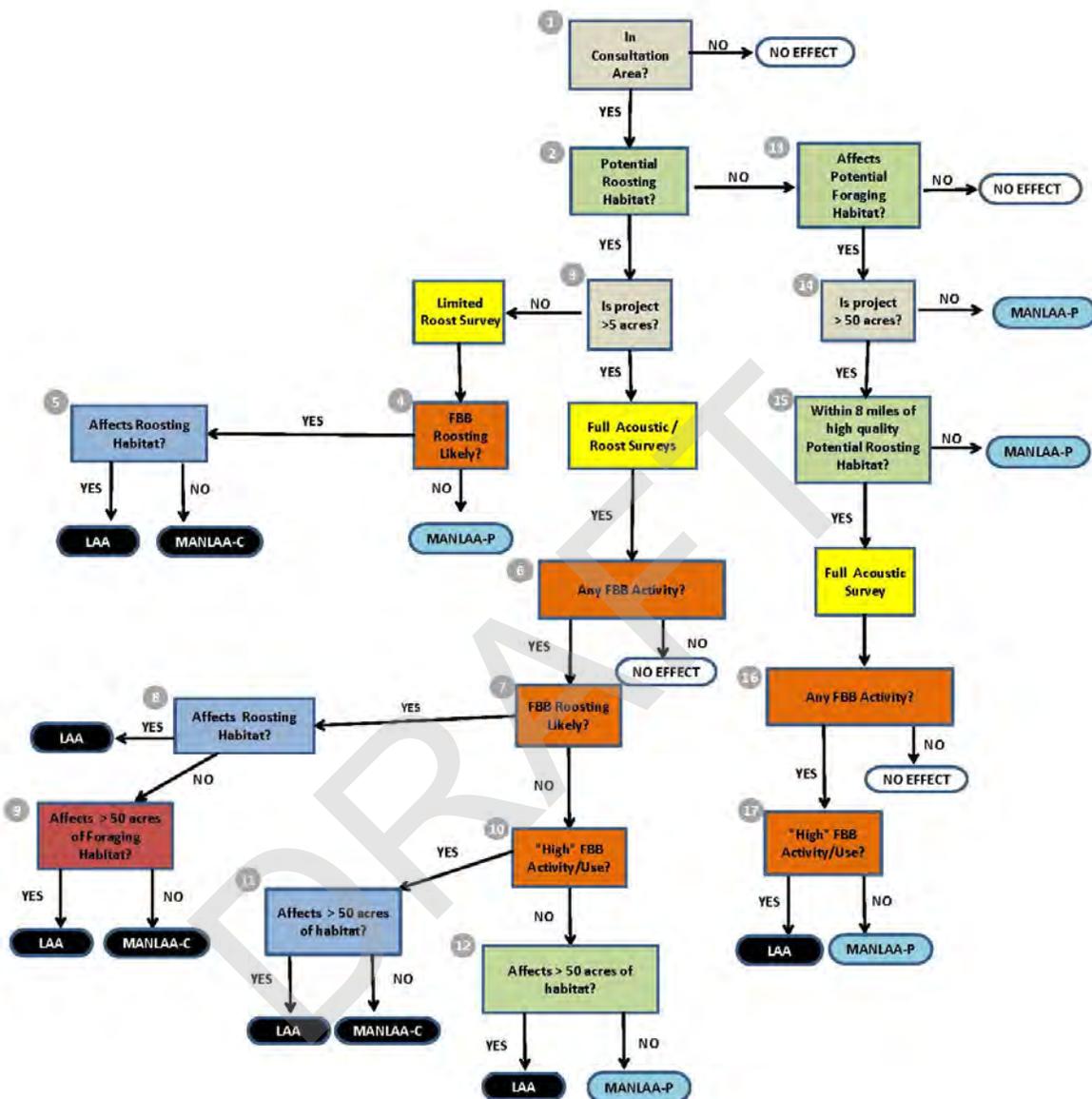


Figure 3. Florida bonneted bat Consultation Flowchart. “No effect” determinations do not need Service concurrence. “May affect, but not likely to adversely affect”, **MANLAA-P**, in blue have programmatic concurrence through the transmittal letter of these Guidelines, and therefore no further consultation 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.*,  $\geq 25$  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  $\geq 20$  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].

DRAFT

## Literature Cited

- 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.
- Braun de Torrez, E. 2019. Email from biologist E. Braun de Torrez, Florida Fish and Wildlife Conservation Commission to biologist, S. Sneckenberger, U.S. Fish and Wildlife Service. July 24, 2019. Gainesville, Florida.
- Keeley, B.W., and M.D. Tuttle. 1999. Bats in American bridges. Bat Conservation International, Inc. Austin, Texas.
- Ober, H.K., E.C. Braun de Torrez, J.A. Gore, A.M. Bailey, J.K. Myers, K.N. Smith, and R.A. McCleery. 2016. Social organization of an endangered subtropical species, *Eumops floridanus*, the Florida bonneted bat. *Mammalia* 2016:1-9.
- U.S. Fish and Wildlife Service. 2013. Endangered and threatened wildlife and plants; endangered species status for the Florida bonneted bat. *Federal Register* 78:61004-61043.

## 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, Vaughn 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 Florida 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.

## Literature Cited -Appendix A

- 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.
- Belwood, J.J. 1992. Florida mastiff bat *Eumops glaucinus floridanus*. Pages 216-223 in S.R. Humphrey (ed.), *Rare and Endangered Biota of Florida*. Vol. I. Mammals. University Press of Florida. Gainesville, Florida.
- Best, T.L., Kiser, W.M., and P.W. Freeman. 1996. *Eumops perotis*. *Mammalogy Papers: University of Nebraska State Museum*. Lincoln.
- Braun de Torrez, E.C. 2018c. Presentation given at Florida bonneted bat working group meeting at The Conservancy of Southwest Florida. Florida Fish and Wildlife Research Institute, Florida Fish and Wildlife Conservation Commission. Gainesville, Florida. May 23, 2016.
- Findley, J.S., E.H. Studier, and D.E. Wilson. 1972. Morphologic properties of bat wings. *Journal of Mammalogy* 53(3): 429-444.
- Norberg, U.M. and J.M.V. Rayner. 1987. Ecological morphology and flight in bats (Mammalia; Chiroptera): wing adaptations, flight performance, foraging strategy and echolocation. *Philosophical Transactions of the Royal Society of London. Series B, Biological Sciences* 316(1179):335-427.
- 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.
- Ober, H.K., R.A. McCleery, and E.C. Braun de Torrez. 2018. Managing with fire to promote the recently listed Florida bonneted bat, *Eumops floridanus*. Final report. JFSP Project ID: 14-1-05-7. University of Florida, Department of Wildlife Ecology and Conservation. Gainesville, Florida.
- Rainho, A., and J.M. Palmeirim. 2011. The importance of distance to resources in the spatial modelling of bat foraging habitat. *PLoS ONE* 6(4): e19227.
- Siders, M. 2005. *Eumops perotis*, Western mastiff bat. Western Bat Working Group. Species Accounts. Updated at the 2005 Portland Biennial Meeting. [http://www.wbwg.org/species\\_accounts](http://www.wbwg.org/species_accounts)
- Siders, M. S., Rabe, M. J., Snow, T. K., and K. Yasuda. 1999. Long foraging distances in two uncommon bat species (*Euderma maculatum* and *Eumops perotis*) in northern Arizona. In *Proceedings of the Fourth Biennial Conference of Research on the Colorado Plateau*. US Geological Survey, Flagstaff, AZ, Vol. 4.
- Tibbitts, T., A. Pate, Y. Petryszyn, and B. Barns. 2002. Determining foraging and roosting areas

for Underwood's mastiff bat (*Eumops underwoodi*) using radiotelemetry, at Organ Pipe Cactus National Monument, Arizona. Final summary report, year two – December 2002. Organ Pipe Cactus National Monument. Ajo, Arizona.

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.

DRAFT

## 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 rationale 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. Secondly, 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](mailto: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](mailto:verobeach@fws.gov) or via mail to U.S. Fish and Wildlife Service, Attn: Florida bonneted bat data manager, 1339 20<sup>th</sup> 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](mailto: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.
- Braun de Torrez, E.C., H.K. Ober, and R.A. McCleery. 2016. Use of a multi-tactic approach to locate and endangered Florida bonneted bat roost. *Southeastern Naturalist* 15(2):235-242.
- Loeb, S.C., T.J. Rodhouse, L.E. Ellison, C.L. Lausen, J.D. Reichard, K.M. Irvine, T.E. Ingersoll, J.T.H. Coleman, W.E. Thogmartin, J.R. Sauer, C.M. Francis, M.L. Bayless, T.R. Stanley, and D.H. Johnson. 2015. A plan for the North American bat monitoring program (NABat). United States Department of Agriculture. Forest Service. Research & Development, Southern Research Station. General Technical Report SRS-208.
- Ober, H.K., E.C. Braun de Torrez, J.A. Gore, A.M. Bailey, J.K. Myers, K.N. Smith, and R.A. McCleery. 2016. Social organization of an endangered subtropical species, *Eumops floridanus*, the Florida bonneted bat. *Mammalia* 2016:1-9.
- 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  $\leq 5$  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 20<sup>th</sup> 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](mailto: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.
- Braun de Torrez, E.C., H.K. Ober, and R.A. McCleery. 2016. Use of a multi-tactic approach to locate and endangered Florida bonneted bat roost. *Southeastern Naturalist* 15(2):235-242.
- Loeb, S.C., T.J. Rodhouse, L.E. Ellison, C.L. Lausen, J.D. Reichard, K.M. Irvine, T.E. Ingersoll, J.T.H. Coleman, W.E. Thogmartin, J.R. Sauer, C.M. Francis, M.L. Bayless, T.R. Stanley, and D.H. Johnson. 2015. A plan for the North American bat monitoring program (NABat). United States Department of Agriculture. Forest Service. Research & Development, Southern Research Station. General Technical Report SRS-208.
- Ober, H.K., E.C. Braun de Torrez, J.A. Gore, A.M. Bailey, J.K. Myers, K.N. Smith, and R.A. McCleery. 2016. Social organization of an endangered subtropical species, *Eumops floridanus*, the Florida bonneted bat. *Mammalia* 2016:1-9.
- U.S. Fish and Wildlife Service. 2004. South Florida Ecological Services Office DRAFT July 12, 2004 Species Conservation Guidelines South Florida Red-cockaded Woodpecker. Appendix A. Red-cockaded Woodpecker South Florida Survey Protocol. July 12, 2004. South Florida Ecological Service Office, Vero Beach Florida. <https://www.fws.gov/verobeach/BirdsPDFs/200407SlopesCompleteRedCockadedWoodpecker.pdf>
- 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*.

Appendix E – Consultation Keys

DRAFT



## United States Department of the Interior



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

August 1, 2017

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

Subject: Consultation Key for the Eastern Indigo Snake – Revised

Dear Mr. Kinard:

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

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

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

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

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

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

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

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

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

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

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

**Scope of the Key**

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

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

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

**Habitat**

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

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

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

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

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

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

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

### **Minimization Measures**

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

### **Determinations**

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

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

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

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

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

- A. **Project is not located in open water or salt marsh.....go to B**  
 Project is located solely in open water or salt marsh.....**no effect**
- B. **Permit will be conditioned for use of the Service's most current guidance for Standard Protection Measures For The Eastern Indigo Snake (currently 2013) during site preparation and project construction.....go to C**  
 Permit will not be conditioned as above for the eastern indigo snake, or it is not known whether an applicant intends to use these measures and consultation with the Service is requested.....**may affect**
- C. **The project will impact less than 25 acres of eastern indigo snake habitat (e.g., sandhill, scrub, pine flatwoods, pine rocklands, scrubby flatwoods, high pine, dry prairie, coastal prairie, mangrove swamps, tropical hardwood hammocks, hydric hammocks, edges of freshwater marshes, agricultural fields [including sugar cane fields and active, inactive, or abandoned citrus groves], and coastal dunes).....go to D**  
 The project will impact 25 acres or more of eastern indigo snake habitat (e.g., sandhill, scrub, pine flatwoods, pine rocklands, scrubby flatwoods, high pine, dry prairie, coastal prairie, mangrove swamps, tropical hardwood hammocks, hydric hammocks, edges of freshwater marshes, agricultural fields [including sugar cane fields and active, inactive, or abandoned citrus groves], and coastal dunes).....**may affect**
- D. **The project has no known holes, cavities, active or inactive gopher tortoise burrows, or other underground refugia where a snake could be buried, trapped and/or injured during project activities.....NLAA**  
 The project has known holes, cavities, active or inactive gopher tortoise burrows, or other underground refugia where a snake could be buried, trapped and /or injured.....go to E
- E. Any permit will be conditioned such that all gopher tortoise burrows, active or inactive, will be excavated prior to site manipulation in the vicinity of the burrow<sup>1</sup>. 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<sup>2</sup>**  
 Permit will not be conditioned as outlined above.....**may affect**

**End Key**

<sup>1</sup> 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>.

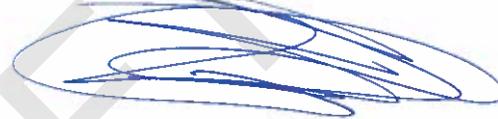
<sup>2</sup> Please note, if the proposed project will impact less than 25 acres of vegetated eastern indigo snake habitat (not urban/ human-altered) completely surrounded by urban development, and an eastern indigo snake has been observed on site. NLAA is not the appropriate conclusion. The Service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

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

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

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

Sincerely,



Roxanna Hinzman  
Field Supervisor  
South Florida Ecological Services

Cc:

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

**LITERATURE CITED**

- Enge K. M. 2017. Personal communication. Email from Kevin Enge, Florida Fish and Wildlife Conservation Commission, Gainesville, Florida to Steve Mortellaro, U.S. Fish and Wildlife Service, Vero Beach, Florida, July 5, 2017. Locations of Eastern Indigo Snake (*Drymarchon couperi*).
- Enge K. M. and M. J. Endries. 2009. Status of the Eastern Indigo Snake (*Drymarchon couperi*) in Florida. Southeast Partners in Amphibian and Reptile Conservation Meeting.
- Landers, J. L. and D.W. Speake. 1980. Management Needs of Sandhill Reptiles in Southern Georgia. Proceedings Annual Conference of Southeastern Association of Fish and Wildlife Agencies. 34: 515-529.
- Layne, J.N., and T.M. Steiner. 1996. Eastern indigo snake (*Drymarchon corais couperi*): summary of research conducted on Archbold Biological Station. Report prepared under Order 43910-6-0134 to the U.S. Fish and Wildlife Service; Jackson, Mississippi.
- Lawler, H.E. 1977. The status of *Drymarchon corais couperi* (Holbrook), the eastern indigo snake, in the southeastern U.S.A. *Herpetological Review* 8(3):76-79.
- Means, D. B. 2006. Vertebrate faunal diversity of longleaf pine ecosystems. In *The Longleaf Pine Ecosystem* pp. 157-213. Springer New York.
- Molar, P.E. 1985a. Distribution of the eastern indigo snake, *Drymarchon corais couperi*, in Florida. *Herpetological Review* 16(2):37-38.
- Moler, P.E. 1985b. Home range and seasonal activity of the eastern indigo snake, *Drymarchon corais couperi*, in northern Florida. Final performance report, Study E-1-06, III-A-5. Florida Game and Fresh Water Fish Commission; Tallahassee, Florida.
- Steiner, T.M., O.L. Bass, Jr., and J.A. Kushlan. 1983. Status of the eastern indigo snake in Southern Florida National Parks and vicinity. South Florida Research Center Report SFRC-83-01, Everglades National Park; Homestead, Florida.
- U.S. Fish and Wildlife Service (Service). 1999. South Florida multi-species recovery plan. 23 pp.
- U.S. Fish and Wildlife Service (Service). 2013. Standard Protection Measures for the Eastern Indigo Snake. August 12, 2013. U.S. Fish and Wildlife Service, South Florida Ecological Services Office; Vero Beach, Florida.
- Wilson, L.D. and L. Porras. 1983. The ecological impact of man on the south Florida herpetofauna. *University of Kansas Museum of Natural History Special Publication* 9:1-89.
- Zeigler, M. 2006. Personal communication. Citrus grove operations manager. Meeting with the U.S. Fish and Wildlife Service on August 1, 2006. Agricultural Resource Management; Vero Beach, Florida.



## United States Department of the Interior



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

April 25, 2013

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

Dear Mr. Kinard:

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

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

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

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

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

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

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

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

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

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

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

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

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

Sincerely yours,



Larry Williams  
State Supervisor

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

---

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

**Purpose and background of the key**

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

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

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

**Scope of the key**

This key should only be used in the review of permit applications for effect determinations on manatees and should not be used for other listed species or for other aquatic resources such as Essential Fish Habitat (EFH). Corps Project Managers should ensure that consideration of the project's effects on any other listed species and/or on EFH is performed independently. This key may be used to evaluate applications for all types of State of Florida (State Programmatic General Permits, noticed general permits, standard general permits, submerged lands leases, conceptual and individual permits) and Department of the Army (standard permits, letters of permission, nationwide permits, and regional general permits) permits and authorizations. The final effect determination will be based on the project location and description; the potential effects to manatees, manatee habitat, and/or manatee critical habitat; and any measures (such as project components, standard construction precautions, or special conditions included in the authorization) to avoid or minimize effects to manatees or manatee critical habitat. Projects that key to a "may affect" determination equate to "likely to adversely affect" situations, and those projects should not be processed under the SPGP or any other programmatic general permit. For

all “may affect” determinations, Corps Project Managers shall refer to the Manatee Programmatic Biological Opinion, dated March 21, 2011, for guidance on eliminating or minimizing potential adverse effects resulting from the proposed project. If unable to resolve the adverse effects, the Corps may refer the applicant to the U.S. Fish and Wildlife Service (Service) for further assistance in attempting to revise the proposed project to a “may affect, not likely to adversely affect” level. The Service will coordinate with the Florida Fish and Wildlife Conservation Commission (FWC) and the counties, as appropriate. Projects that provide new access for watercraft and key to “may affect, not likely to adversely affect” may or may not need to be reviewed individually by the Service.

DRAFT

**MANATEE KEY**  
**Florida<sup>1</sup>**  
**April 2013**

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

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

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

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

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

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

Project is other than the activities listed above..... C

- C. Project is located in an Important Manatee Area (IMA) (see Glossary and accompanying Maps<sup>4</sup>) ..... D

Project is not located in an Important Manatee Area (IMA) (see Glossary and accompanying Maps<sup>4</sup>) ..... G

- D. Project includes dredging of less than 50,000 cubic yards ..... E

Project does not include dredging ..... G

- E. Project is for dredging a residential dock facility or is a land-based dredging operation..... N

Project not as above..... F

- F. Project proponent **does not elect** to follow all dredging protocols described on the maps for the respective IMA in which the project is proposed ..... *May affect*

Project proponent **elects** to follow all dredging protocols described on the maps for the respective IMA in which the project is proposed..... G

- G. Project provides new<sup>5</sup> access for watercraft, *e.g.*, docks or piers, marinas, boat ramps and associated trailer parking spaces, new dredging, boat lifts, pilings, floats, floating docks, floating vessel platforms, boat slips, dry storage, mooring buoys, or other watercraft access (residential boat lifts, pilings, floating docks, and floating vessel platforms installed in existing slips are not considered new access) or improvements allowing increased watercraft usage..... H

Project does not provide new<sup>5</sup> access for watercraft, *e.g.*, bulkheads, seawalls, riprap, maintenance dredging, boardwalks and/or the maintenance (repair or rehabilitation) of currently serviceable watercraft access structures provided all of the following are met: (1) the number of slips is not increased; (2) the number of existing slips is not in question; and (3) the improvements do not allow increased watercraft usage..... N

- H. Project is located in the Braden River Area of Inadequate Protection (Manatee County) (see Glossary and accompanying AIP Map<sup>4</sup>) ..... *May affect*

Project is not located in the Braden River Area of Inadequate Protection (Manatee County) (see Glossary and accompanying AIP Map<sup>4</sup>)..... I

- I. Project is for a multi-slip facility (see Glossary) ..... J

Project is for a residential dock facility or is for dredging (see Glossary)..... N

- J. Project is located in a county that currently has a State-approved MPP in place (BREVARD, BROWARD, CITRUS, CLAY, COLLIER, DUVAL, INDIAN RIVER, LEE, MARTIN, MIAMI-DADE, PALM BEACH, ST. LUCIE, SARASOTA, VOLUSIA) or shares contiguous waters with a county having a State-approved MPP in place (LAKE, MARION, SEMINOLE)<sup>6</sup> ..... K

Project is located in a county not required to have a State-approved MPP ..... L

- K. Project has been developed or modified to be consistent with the county’s State-approved MPP **and** has been verified by a FWC review (or FWS review if project is exempt from State permitting) **or** the number of slips is below the MPP threshold ..... N
- Project has not been reviewed by the FWC or FWS **or** has been reviewed by the FWC or FWS **and** determined that the project is not consistent with the county’s State-approved MPP ..... *May affect*
- L. Project is located in one of the following counties: CHARLOTTE, DESOTO<sup>7</sup>, FLAGLER, GLADES, HENDRY, HILLSBOROUGH, LEVY, MANATEE, MONROE<sup>7</sup>, PASCO<sup>7</sup>, PINELLAS ..... M
- Project is located in one of the following counties: BAY, DIXIE, ESCAMBIA, FRANKLIN, GILCHRIST, GULF, HERNANDO, JEFFERSON, LAFAYETTE, MONROE (south of Craig Key), NASSAU, OKALOOSA, OKEECHOBEE, PUTNAM, SANTA ROSA, ST. JOHNS, SUWANNEE, TAYLOR, WAKULLA, WALTON ..... N
- M. The number of slips does not exceed the residential dock density threshold (see Glossary) ..... N
- The number of slips exceeds the residential dock density threshold (see Glossary) ..... *May affect*
- N. Project impacts to submerged aquatic vegetation<sup>8</sup>, emergent vegetation or mangrove will have beneficial, insignificant, discountable<sup>9</sup> or no effects on the manatee<sup>10</sup> ..... O
- Project impacts to submerged aquatic vegetation<sup>8</sup>, emergent vegetation or mangrove may adversely affect the manatee<sup>10</sup> ..... *May affect*
- O. Project proponent **elects** to follow standard manatee conditions for in-water work<sup>11</sup> and requirements, as appropriate for the proposed activity, prescribed on the maps<sup>4</sup> ..... P
- Project proponent **does not elect** to follow standard manatee conditions for in-water work<sup>11</sup> and appropriate requirements prescribed on the maps<sup>4</sup> ..... *May affect*
- P. If project is for a new or expanding<sup>5</sup> multi-slip facility and is located in a county with a State-approved MPP in place **or** in Bay, Dixie, Escambia, Franklin, Gilchrist, Gulf, Hernando, Jefferson, Lafayette, Monroe (south of Craig Key), Nassau, Okaloosa, Okeechobee, Putnam, St. Johns, Santa Rosa, Suwannee, Taylor, Wakulla or Walton County, the determination of “*May affect, not likely to adversely affect*” is appropriate<sup>12</sup> and no further consultation with the Service is necessary.
- If project is for a new or expanding<sup>5</sup> multi-slip facility and is located in Charlotte, Desoto, Flagler, Glades, Hendry, Hillsborough, Levy, Manatee, Monroe (north of Craig Key), Pasco, or Pinellas County, further consultation with the Service is necessary for “*May affect, not likely to adversely affect*” determinations.
- If project is for repair or rehabilitation of a multi-slip facility and is located in an Important Manatee Area, further consultation with the Service is necessary for “*May affect, not likely to adversely affect*” determinations. If project is for repair or rehabilitation of a multi-slip facility and: (1) is not located in an Important Manatee Area; (2) the number of slips is not increased; (3) the number of existing slips is not in question; and (4) the improvements to the existing watercraft access structures do not allow increased watercraft usage, the determination of “*May affect, not likely to adversely affect*” is appropriate<sup>12</sup> and no further consultation with the Service is necessary.
- If project is a residential dock facility, shoreline stabilization, or dredging, the determination of “*May affect, not likely to adversely affect*” is appropriate<sup>12</sup> and no further consultation with the Service is necessary. **Note:** For residential dock facilities located in a Warm Water Aggregation Area or in a No Entry area, seasonal restrictions may apply. See footnote 4 below for maps showing restrictions.
- If project is other than repair or rehabilitation of a multi-slip facility, a new<sup>5</sup> multi-slip facility, residential dock facility, shoreline stabilization, or dredging, and does not provide new<sup>5</sup> access for watercraft or

improve an existing access to allow increased watercraft usage, the determination of “*May affect, not likely to adversely affect*” is appropriate<sup>12</sup> and no further consultation with the Service is necessary.

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

<sup>2</sup> All culverts 8 inches to 8 feet in diameter must be grated to prevent manatee entrapment. To effectively prevent manatee access, grates must be permanently fixed, spaced a maximum of 8 inches apart (may be less for culverts smaller than 16 inches in diameter) and may be installed diagonally, horizontally or vertically. For new culverts, grates must be attached prior to installation of the culverts. Culverts less than 8 inches or greater than 8 feet in diameter are exempt from this requirement. If new culverts and/or the maintenance or modification of existing culverts are grated as described above, the determination of “*May affect, not likely to adversely affect*” is appropriate<sup>11</sup> and no further consultation with the Service is necessary.

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

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

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

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

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

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

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

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

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

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

<sup>9</sup> See Glossary, under “is not likely to adversely affect.”

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

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

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

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

## GLOSSARY

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

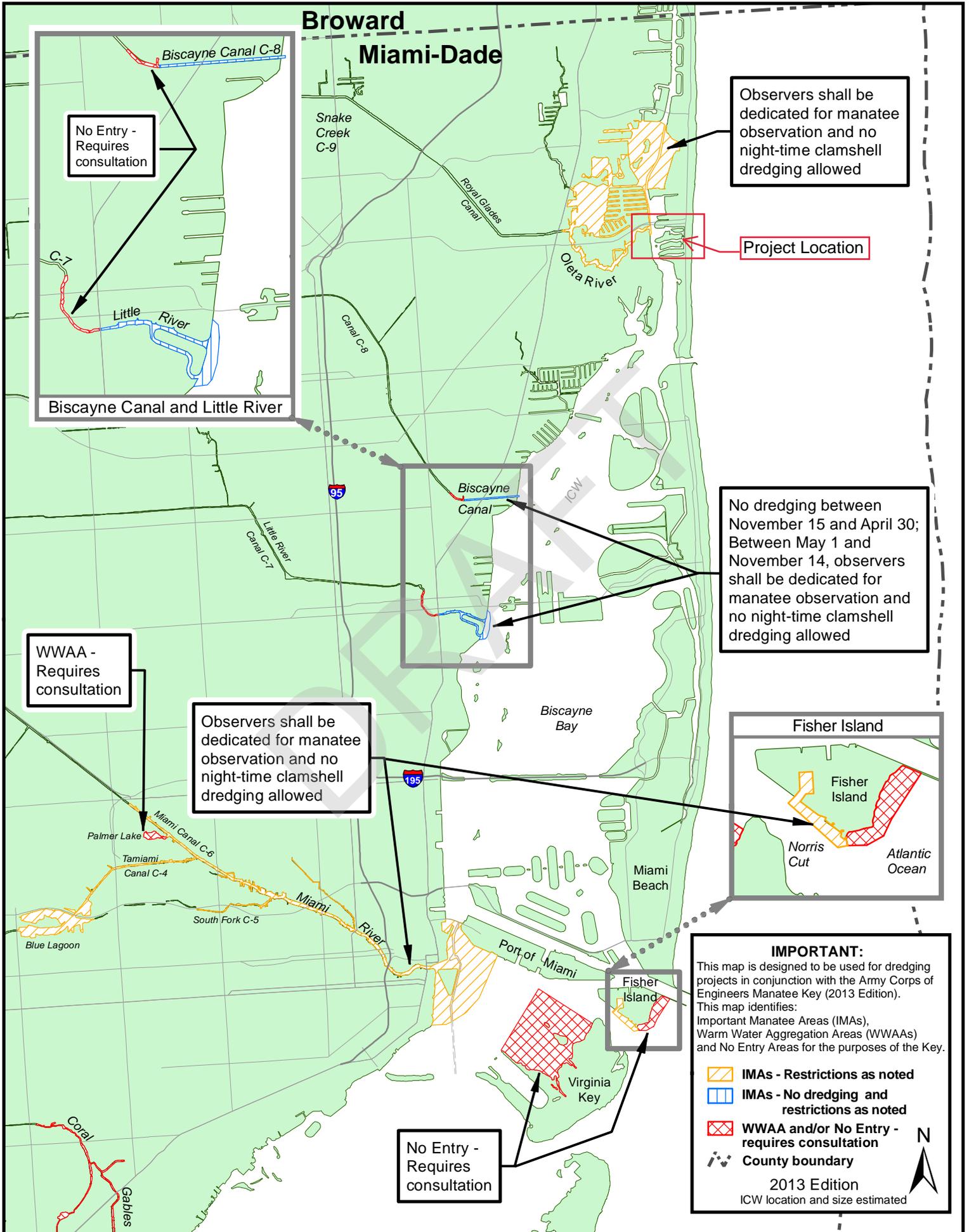
**Warm Water Aggregation Areas (WWAAs) and No Entry Areas** – Areas within certain counties where increased densities of manatees occur due to the proximity of artificial or natural warm water discharges or springs and are considered necessary for survival. Some of these areas may be federally-designated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

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

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

DRAFT

# Miami-Dade County - North





# United States Department of the Interior



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

May 18, 2010

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

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

Dear Mr. Kinard:

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

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

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

Wood stork

## Habitat

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



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

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

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

### Conservation Measures

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

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

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

The Key is as follows:

- A. Project within 0.76 km (0.47 mile)<sup>2</sup> of an active colony site<sup>3</sup> ..... "may affect"<sup>4</sup>
- Project impacts Suitable Foraging Habitat (SFH)<sup>5</sup> at a location greater than 0.76 km (0.47 mile) from a colony site..... "go to B"

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

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

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

<sup>4</sup> Consultation may be concluded informally or formally depending on project impacts.

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

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

B. Project impact to SFH is less than 0.20 hectare (one-half acre)<sup>6</sup>.....*NLAA<sup>1</sup>*”

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

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

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

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

Project not as above..... “*may affect<sup>4</sup>*”

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

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

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

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

to, or higher than, that of impacted wetlands. See Enclosure 3 for a detailed discussion of the hydroperiod foraging values, an example, and further guidance<sup>8</sup> ..... “NLAA<sup>1</sup>”

Project does not satisfy these elements ..... “may affect<sup>4</sup>”

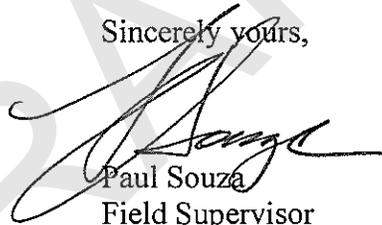
This Key does not apply to Comprehensive Everglades Restoration Plan projects, as they will require project-specific consultations with the Service.

Monitoring and Reporting Effects

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

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

Sincerely yours,



Paul Souza  
Field Supervisor  
South Florida Ecological Services Office

Enclosures

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

**LITERATURE CITED**

- Ceilley, D.W. and S.A. Bortone. 2000. A survey of freshwater fishes in the hydric flatwoods of flint pen strand, Lee County, Florida. Proceedings of the 27th Annual Conference on Ecosystems Restoration and Creation, 70-91. Hillsborough Community College; Hillsborough County, Florida.
- Flemming, D.M., W.F. Wolff, and D.L. DeAngelis. 1994. Importance of landscape heterogeneity to wood storks. Florida Everglades Management 18: 743-757.
- Kahl, M.P., Jr. 1964. Food ecology of the wood stork (*Mycteria americana*) in Florida. Ecological Monographs 34:97-117.
- Ogden, J.C. 1991. Nesting by wood storks in natural, altered, and artificial wetlands in central and northern Florida. Colonial Waterbirds 14:39-45.
- Ogden, J.C., J.A. Kushlan, and J.T. Tilmant. 1976. Prey selectivity by the wood stork. Condor 78(3):324-330.
- Ogden, J.C. 1996. Wood Stork in J.A. Rodgers, H. Kale II, and H.T. Smith, eds. Rare and endangered biota of Florida. University Press of Florida; Gainesville, Florida.
- Rodgers, J.A. Jr., A.S. Wenner, and S.T. Schwikert. 1987. Population dynamics of wood storks in northern and central Florida, USA. Colonial Waterbirds 10:151-156.
- Rodgers, J.A., Jr., S.T. Schwikert, and A. Shapiro-Wenner. 1996. Nesting habitat of wood storks in north and central Florida, USA. Colonial Waterbirds 19:1-21.
- U.S. Fish and Wildlife Service. 1990. Habitat management guidelines for the wood stork in the southeast region. Prepared by John C. Ogden for the Southeast Region U.S. Fish and Wildlife Service; Atlanta, Georgia.
- U.S. Fish and Wildlife Service. 1999. South Florida multi-species recovery plan. Fish and Wildlife Service; Atlanta, Georgia. Available from: <http://verobeach.fws.gov/Programs/Recovery/vbms5.html>.

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



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

Prepared by

John C. Ogden  
Acting Program Manager  
Wildlife Research  
Everglades National Park

for the

Southeast Region  
U.S. Fish and Wildlife Service

Cover design by  
Florida Power & Light Company  
Miami, Florida

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

## Introduction

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

## General

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

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

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

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

#### **I. Feeding habitat.**

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

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

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

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

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

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

## II. Nesting habitat.

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

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

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

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

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

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

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

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

### **III. Roosting habitat.**

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

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

### **IV. Management zones and guidelines for feeding sites.**

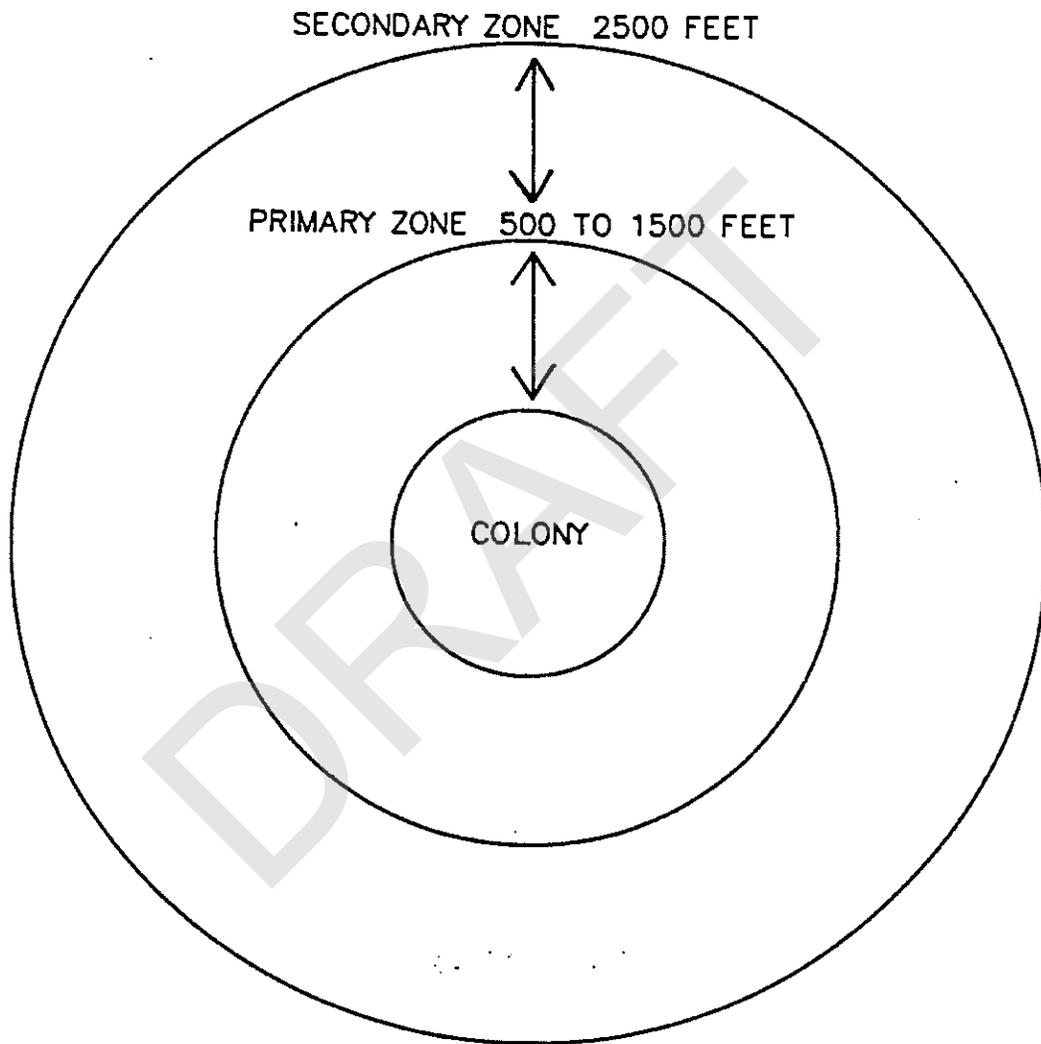
To the maximum extent possible, feeding sites should be protected by adherence to the following protection zones and guidelines:

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

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

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

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



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

## **VI. Roosting site guidelines.**

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

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

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

## VII. Legal Considerations.

### A. Federal Statutes

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

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

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

### B. State Statutes

#### 1. State of Alabama

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

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

#### 2. State of Florida

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

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

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

### 3. State of Georgia

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

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

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

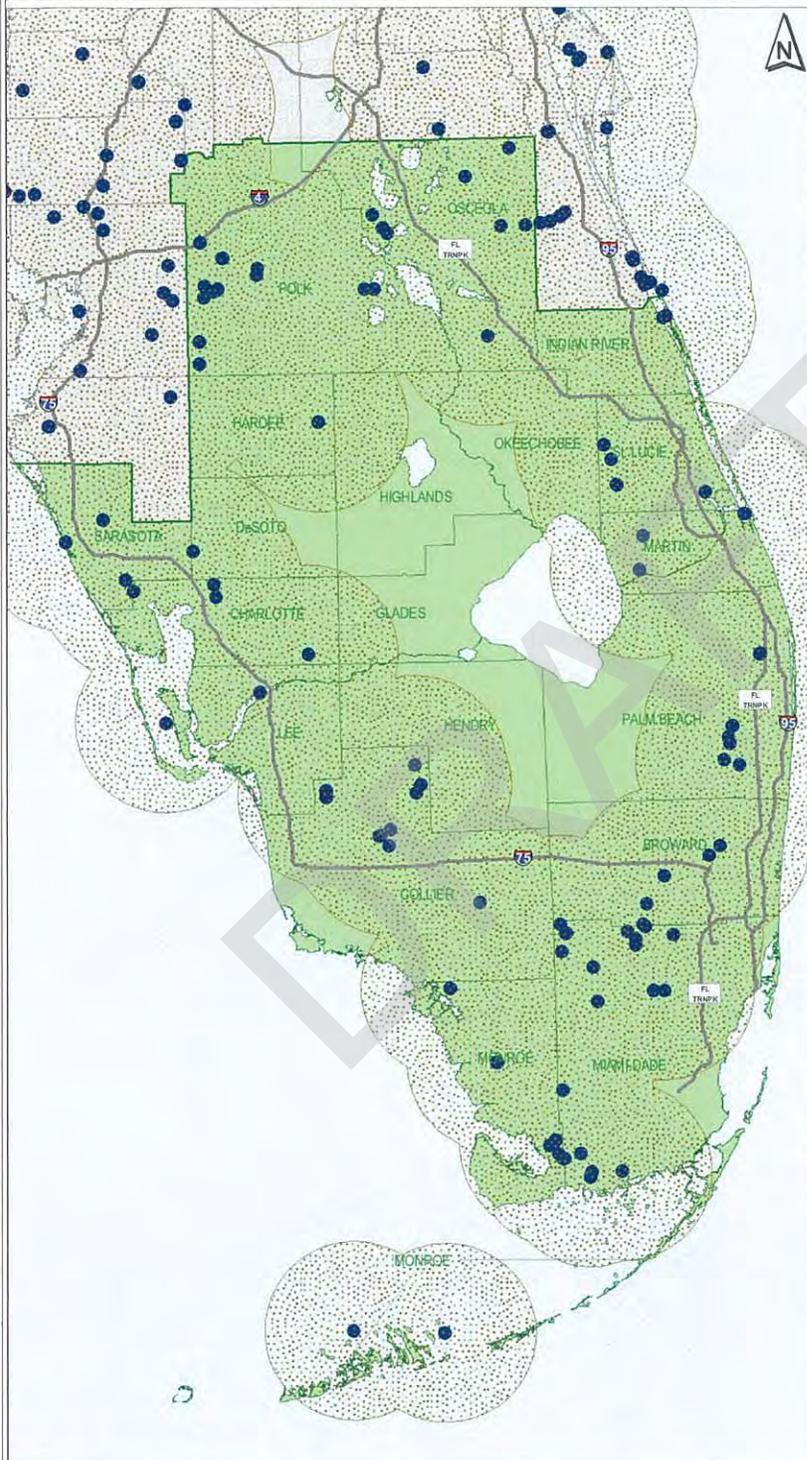
The wood stork is listed as endangered pursuant to the Endangered Wildlife Act of 1973 (Section 27-3-130 of the Code). Section 391-4-13-.06 of the Rules and Regulations of the Georgia Department of Natural Resources prohibits harassment, capture, sale, killing, or other actions which directly cause the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

### 4. State of South Carolina

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

DRAFT

# Wood Stork



## Nesting Colonies Core Foraging Areas

1999 to 2005

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



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



DRAFT

## Enclosure 3

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

### Foraging Habitat

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

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

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

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

**Table 1: Vegetation classes**

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

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

**Table 2: Habitat Foraging Suitability**

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

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

**Table 3. Foraging Suitability Percentages**

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

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

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

**Hydroperiod:** The hydroperiod of a wetland can affect the prey densities in a wetland. For instance, research on Everglades fish populations using a variety of quantitative sampling techniques (pull traps, throw traps, block nets) have shown that the density of small forage fish increases with hydroperiod. Marshes inundated for less than 120 days of the year average  $\pm 4$  fish/m<sup>2</sup>; whereas, those flooded for more than 340 days of the year average  $\pm 25$  fish/m<sup>2</sup> (Loftus and Eklund 1994, Trexler et al. 2002).

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

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

**Table 4. SFWMD Hydroperiod Classes – Everglades Protection Area**

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

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

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

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

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

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

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

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

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

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

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

**Table 6. Extrapolated Fish Densities for SFWMD Hydroperiods**

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

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

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

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

**Table 7. Extrapolated Mean Annual Fish Biomass for SFWMD Hydroperiods**

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

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

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

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

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

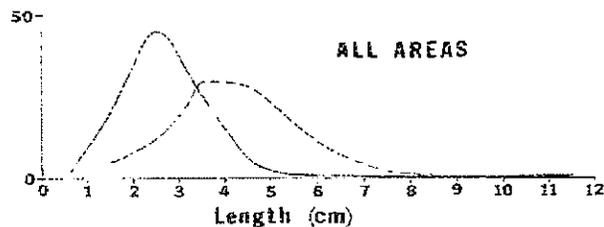


FIGURE 4. Length frequency distribution of fish available to and consumed by Wood Storks in different habitats.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

**Table 10 Actual Biomass Consumed by Wood Storks**

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

**Sample Project of Biomass Calculations and Corresponding Concurrence Determination**

***Example 1:***

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

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

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

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

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

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

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

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

Net increase:  $4.74 \text{ kg} - 1.75 \text{ kg} = 2.98 \text{ kg Compensation Site}$

Project Site Balance  $2.98 \text{ kg} - 2.92 \text{ kg} = 0.07 \text{ kg}$

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

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

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

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

**Example 2:**

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

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

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

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

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

Net increase: 8.62 kg-3.19 kg = 5.43 kg

Project Site Balance 5.43 kg- 2.92 kg = 2.51 kg

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

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

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

## LITERATURE CITED

- Browder, J.S. 1984. Wood stork feeding areas in southwest Florida. *Florida Field Naturalist* 12:81-96.
- Carlson, J.E., and M.J. Duever. 1979. Seasonal fish population fluctuation in south Florida swamps. *Proceedings of Annual Conference of Southeastern Association of Fish and Wildlife Agencies* 31:603-611.
- Chick, J. H., C. R. Ruetz III, and J. C. Trexler. 2004. Spatial Scale and abundance patterns of large fish communities in freshwater marshes of the Florida Everglades. *Wetlands*. 24 (3):652-644. *American Journal of Fisheries Management* 19: 957-967.
- Chick, J. H., S. Coync, and J. C. Trexler. 1999. Effectiveness of airboat electrofishing for sampling fishes in shallow, vegetated habitats. *North American Journal of Fisheries Management* 19: 957-967.
- Coulter, M.C. 1987. Foraging and breeding ecology of wood storks in east-central Georgia. Pages 21-27 in *Proceedings of the Third Southeastern Nongame and Endangered Wildlife Symposium* (R.R. Odom, K.A. Riddleberger, and J.C. Ozier, eds.). Georgia Department of Natural Resources, Atlanta, Georgia.
- Coulter, M.C., and A.L. Bryan, Jr. 1993. Foraging ecology of wood storks (*Mycteria americana*) in east-central Georgia: I. Characteristics of foraging sites. *Colonial Waterbirds* 16(1):59-70.
- Coulter, M.C., J.A. Rodgers, J.C. Ogden, and F.C. Depkin. 1999. Wood stork (*Mycteria americana*). *The Birds of North America*, Issue No. 409 (A. Poole, ed.). Cornell Lab of Ornithology, Ithaca, New York.
- Fleming, D.M., W.F. Wolff, and D.L. DeAngelis. 1994. Importance of landscape heterogeneity to wood storks in Florida Everglades. *Environmental Management* 18(5):743-757.
- Gawlik, D.E. 2002. The effects of prey availability on the numerical response of wading birds. *Ecological Monographs* 72(3):329-346.
- Kushlan, J.A., S.A. Voorhees, W.F. Loftus, and P.C. Frohring. 1986. Length, mass and caloric relationships of Everglades animals. *Florida Scientist* 49(2):65-79.
- Loftus, W.F., and A.M. Eklund. 1994. Long-term dynamics of an Everglades small-fish assemblage. Pages 461-484 in *Everglades: the ecosystem and its restoration* (S.M. Davis and J.C. Ogden, eds.). St. Lucie Press, Delray, Florida.
- O'Hare, N.K., and G.H. Dalrymple. 1997. Wildlife in southern Everglades invaded by melaleuca (*Melaleuca quinquenervia*). *Bulletin of the Florida Museum of Natural History* 41(1):1-68. University of Florida, Gainesville, Florida.

- Ogden, J.C., J.A. Kushlan, and J.T. Tilmant. 1976. Prey selectivity by the wood stork. *The Condor* 78(3):324-330.
- Ogden, J.C., J.A. Kushlan, and J.T. Tilmant. 1978. The food habits and nesting success of wood storks in Everglades National Park in 1974. U.S. Department of the Interior, National Park Service, Natural Resources Report No. 16.
- Trexler, J. C., and C. W. Goss. 2009. Aquatic Fauna as Indicators for Everglades Restoration: Applying Dynamic Targets in Assessments. *Ecological Indicators*. Vol 9: 108-119.
- Trexler, J.C., W.F. Loftus, F. Jordan, J.H. Chick, K.L. Kandl, T.C. McElroy, and O.L. Bass. 2002. Ecological scale and its implications for freshwater fishes in the Florida Everglades. Pages 153-182 in *The Everglades, Florida Bay, and Coral Reefs of the Florida Keys: An ecosystem sourcebook* (J.W. Porter and K.G. Porter, eds.). CRC Press, Boca Raton, Florida.
- Turner, A., and J. C. Trexler. 1997. Sampling invertebrates from the Florida Everglades: a comparison of alternative methods. *Journal of the North American Benthological Society* 16:694-709
- Turner, A.W., J.C. Trexler, C.F. Jordan, S.J. Slack, P. Geddes, J.H. Chick, and W.F. Loftus. 1999. Targeting ecosystem features for conservation: standing crops in the Florida Everglades. *Conservation Biology* 13(4):898-911.
- U.S. Fish and Wildlife Service. 2006. August 31, 2006, Lake Belt Mining Region of Miami-Dade County Biological Opinion. South Florida Ecological Services Office; Vero Beach, Florida
- U.S. Fish and Wildlife Service. 2009. February 12, 2009, Fort Myers Mine No 2 Biological Opinion. South Florida Ecological Services Office, Vero Beach, Florida.  
<http://www.fws.gov/filedownloads/ftp%5verobeach>

## Appendix F – Standard Protection Measures

DRAFT

## 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](mailto: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](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





## **PROTECTED SPECIES CONSTRUCTION CONDITIONS, NOAA FISHERIES SOUTHWEST REGIONAL OFFICE**

The action agency and any permittee shall comply with the following construction conditions for protected species under the jurisdiction of NOAA Fisheries Southwest Regional Office (SERO) Protected Resources Division (PRD):<sup>1</sup>

**Protected Species Sightings**—The action agency and any permittee shall ensure that all personnel associated with the project are instructed about the potential presence of species protected under the Endangered Species Act (ESA) and the Marine Mammal Protection Act (MMPA). All on-site project personnel are responsible for observing water-related activities for the presence of protected species. All personnel shall be advised that there are civil and criminal penalties for harming, harassing, or killing listed species and all marine mammals. To determine which protected species and critical habitat may be found in the transit area, please review the relevant [marine mammal](https://www.fisheries.noaa.gov/find-species) and [ESA-listed species](https://www.fisheries.noaa.gov/find-species) at Find A Species (<https://www.fisheries.noaa.gov/find-species>) and the consultation documents that have been completed for the project.

1. **Equipment**—Turbidity curtains, if used, shall be made of material in which protected species cannot become entangled and be regularly monitored to avoid protected species entrapment. All turbidity curtains and other in-water equipment shall be properly secured with materials that reduce the risk of protected species entanglement and entrapment.
  - a. In-water lines (rope, chain, and cable, including the lines to secure turbidity curtains) shall be stiff, taut, and non-looping. Examples of such lines are heavy metal chains or heavy cables that do not readily loop and tangle. Flexible in-water lines, such as nylon rope or any lines that could loop or tangle, shall be enclosed in a plastic or rubber sleeve/tube to add rigidity and prevent the line from looping and tangling. In all instances, no excess line shall be allowed in the water. All anchoring shall be in areas free from hardbottom and seagrass.
  - b. Turbidity curtains and other in-water equipment shall be placed in a manner that does not entrap protected species within the project area and minimizes the extent and duration of their exclusion from the project area.
  - c. Turbidity barriers shall be positioned in a way that minimizes the extent and duration of protected species exclusion from important habitat (e.g. critical habitat, hardbottom, seagrass) in the project area.
2. **Operations**—For construction work that is generally stationary (e.g., barge-mounted equipment dredging a berth or section of river, or shore-based equipment extending into the water):
  - a. Operations of moving equipment shall cease if a protected species is observed within 150 feet of operations.

---

<sup>1</sup> Manatees are managed under the jurisdiction of the U.S. Fish and Wildlife Service.

- b. Activities shall not resume until the protected species has departed the project area of its own volition (e.g., species was observed departing or 20 minutes have passed since the animal was last seen in the area).
3. **Vessels**—For projects requiring vessels, the action agency, and any permittee shall ensure conditions in the [Vessel Strike Avoidance Measures](#) are implemented as part of the project/permit issuance (<https://www.fisheries.noaa.gov/southeast/consultations/regulations-policies-and-guidance>).
4. **Consultation Reporting Requirements**—Any interaction with a protected species shall be reported immediately to NOAA Fisheries SERO PRD and the local authorized stranding/rescue organization.

To report to NOAA Fisheries SERO PRD, send an email to [takereport.nmfsser@noaa.gov](mailto:takereport.nmfsser@noaa.gov). Please include the species involved, the circumstances of the interaction, the fate and disposition of the species involved, photos (if available), and contact information for the person who can provide additional details if requested. Please include the project's Environmental Consultation Organizer (ECO) number and project title in the subject line of email reports.

To report the interaction to the local stranding/rescue organization, please see the following website for the most up to date information for reporting sick, injured, or dead protected species:

**Reporting Violations**—To report an ESA or MMPA violation, call the NOAA Fisheries Enforcement Hotline. This hotline is available 24 hours a day, 7 days week for anyone in the United States.

NOAA Fisheries Enforcement Hotline (800) 853-1964

5. **Additional Conditions**—Any special construction conditions, required of your specific project, outside these general conditions, if applicable, will be addressed in the project consultation and must also be complied with.

**For additional information, please contact NOAA Fisheries SERO PRD at:**

NOAA Fisheries Service  
Southeast Regional Office  
263 13<sup>th</sup> Avenue South  
St. Petersburg, Florida 33701  
Tel: (727) 824-5312

Visit us on the web at [Protected Marine Life in the Southeast](#)  
(<https://www.fisheries.noaa.gov/region/southeast#protected-marine-life>)

Revised: May 2021



## **VESSEL STRIKE AVOIDANCE MEASURES, NOAA FISHERIES SOUTHWEST REGIONAL OFFICE**

### **Background**

Vessel strikes can injure or kill species protected under the Endangered Species Act (ESA) and the Marine Mammal Protection Act (MMPA). NOAA Fisheries Southwest Regional Office (SERO) Protected Resources Division (PRD) recommends implementing the following identification and avoidance measures to reduce the risk of vessel strikes and disturbance from vessels to protected species under our jurisdiction.<sup>1</sup>

### **Protected Species Sightings**

All vessel operators and crews should be informed about the potential presence of species protected under the ESA and the MMPA and any critical habitat in a vessel transit area. All vessels should have personnel onboard responsible for observing for the presence of protected species. All personnel should be advised that there are civil and criminal penalties for harming, harassing, or killing listed species and all marine mammals. To determine which protected species and critical habitat may be found in the transit area, please review the relevant [marine mammal](#) and [ESA-listed species](#) at Find A Species (<https://www.fisheries.noaa.gov/find-species>) and any ESA Section 7 consultation documents if applicable.

### **Vessel Strike Avoidance**

The following measures should be taken when they are consistent with safe navigation to avoid causing injury or death of a protected species:

1. Operate at the minimum safe speed when transiting and maintain a vigilant watch for protected species to avoid striking them. Even with a vigilant watch, most marine protected species are extremely difficult to see from a boat or ship, and you cannot rely on detecting them visually and then taking evasive action. The most effective way to avoid vessel strikes is to travel at a slow, safe speed. Whenever possible, assign a designated individual to observe for protected species and limit vessel operation to only daylight hours.
2. Follow deep-water routes (e.g., marked channels) whenever possible.
3. Operate at “Idle/No Wake” speeds in the following circumstances:
  - a. while in any project construction areas
  - b. while in water depths where the draft of the vessel provides less than four feet of clearance from the bottom, or
  - c. in all depths after a protected species has been observed in and has recently departed the area.

---

<sup>1</sup> Manatees are managed under the jurisdiction of the U.S. Fish and Wildlife Service.

4. When a protected species is sighted, attempt to maintain a distance of 150 feet or greater between the animal and the vessel. Reduce speed and avoid abrupt changes in direction until the animal(s) has left the area.
5. When dolphins are bow- or wake-riding, maintain course and speed as long as it is safe to do so or until the animal(s) leave the vicinity of the vessel.
6. If a whale is sighted in the vessel's path or within 300 feet from the vessel, reduce speed and shift the engine to neutral. Do not engage the engines until the animals are clear of the area. *Please see below for additional requirements for North Atlantic right whales.*
7. If a whale is sighted farther than 300 feet from the vessel, maintain a distance of 300 feet or greater between the whale and the vessel and reduce speed to 10 knots or less. *Please see below for additional requirements for North Atlantic right whales.*

### **Injured or Dead Protected Species Reporting**

Vessel crews should report sightings of any injured or dead protected species immediately regardless of whether the injury or death is caused by your vessel. Please see [How to Report a Stranded or Injured Marine Animal](https://www.fisheries.noaa.gov/report) (<https://www.fisheries.noaa.gov/report>) for the most up to date information for reporting injured or dead protected species.

If the injury or death is caused by your vessel, also report the interaction to NOAA Fisheries SERO PRD at [takereport.nmfsser@noaa.gov](mailto:takereport.nmfsser@noaa.gov). Please include the species involved, the circumstances of the interaction, the fate and disposition of the animal involved, photos (if available), and contact information for the person who can provide additional details if requested. Please include the project's Environmental Consultation Organizer (ECO) number and project title in the subject line of email reports if a consultation has been completed.

### **Reporting Violations**

To report any suspected ESA or MMPA violation, call the NOAA Fisheries Enforcement Hotline. This hotline is available 24 hours a day, 7 days week for anyone in the United States.

NOAA Fisheries Enforcement Hotline: (800) 853-1964

### **Additional Transit and Reporting Requirements for North Atlantic Right Whales**

1. Federal regulation prohibits approaching or remaining within 500 yards of a North Atlantic right whale (50 CFR 224.103 (c)). All whales sighted within North Atlantic right whale critical habitat should be assumed to be right whales. Please be aware and follow restrictions for all Seasonal Management Areas along the U.S. east coast. These areas have vessel speed restrictions to reduce vessel strikes risks to migrating or feeding whales. More information can be found at [Reducing Vessel Strikes to North Atlantic Right Whales](https://www.fisheries.noaa.gov/national/endangered-species-conservation/reducing-vessel-strikes-north-atlantic-right-whales) (<https://www.fisheries.noaa.gov/national/endangered-species-conservation/reducing-vessel-strikes-north-atlantic-right-whales>).
2. Ships greater than 300 gross tons entering the WHALESOUTH reporting area are required to report to a shore-based station. For more information on reporting procedures consult 33 CFR Part 169, the Coast Pilot, or at [Reducing Vessel Strikes to North Atlantic](https://www.fisheries.noaa.gov/national/endangered-species-conservation/reducing-vessel-strikes-north-atlantic-right-whales)

[Right Whales](https://www.fisheries.noaa.gov/national/endangered-species-conservation/reducing-vessel-strikes-north-atlantic-right-whales) (<https://www.fisheries.noaa.gov/national/endangered-species-conservation/reducing-vessel-strikes-north-atlantic-right-whales>).

3. From November through April, vessels approaching/departing Florida ports of Jacksonville and Fernandina Beach as well as Brunswick Harbor, Georgia are **STRONGLY RECOMMENDED** to use Two-Way Routes displayed on nautical charts. More information on [Compliance with the Right Whale Ship Strike Reduction Rule](#) can be found at ([https://media.fisheries.noaa.gov/2021-06/compliance\\_guide\\_for\\_right\\_whale\\_ship\\_strike\\_reduction.pdf](https://media.fisheries.noaa.gov/2021-06/compliance_guide_for_right_whale_ship_strike_reduction.pdf))
4. Mariners shall check with various communication media for general information regarding avoiding vessel strikes and specific information regarding North Atlantic right whale sighting locations. These include NOAA weather radio, U.S. Coast Guard Broadcast to Mariners, Local Notice to Mariners, and NAVTEX. Commercial mariners calling on United States ports should view the most recent version of the NOAA/USCG produced training CD entitled “A Prudent Mariner’s Guide to Right Whale Protection” (contact the NOAA Fisheries SERO, Protected Resources Division for more information regarding the CD).
5. Injured, dead, or entangled right whales should be immediately reported to the U.S. Coast Guard via VHF Channel 16 and the NOAA Fisheries Southeast Marine Mammal Stranding Hotline at (877) WHALE HELP (877-942-5343).

**For additional information, please contact NOAA Fisheries SERO PRD at:**

NOAA Fisheries Service

Southeast Regional Office

263 13<sup>th</sup> Avenue South

St. Petersburg, Florida 33701

Visit us on the web at [Protected Marine Life in the Southeast](#)

(<https://www.fisheries.noaa.gov/region/southeast#protected-marine-life>)

Revised: May 2021

# STANDARD PROTECTION MEASURES FOR THE EASTERN INDIGO SNAKE

## U.S. Fish and Wildlife Service

March 23, 2021

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

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

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

## POSTER INFORMATION

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

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

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

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

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

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

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

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

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

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

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

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

**North Florida Field Office: (904) 731-3336**

**Panama City Field Office: (850) 769-0552**

**South Florida Field Office: (772) 562-3909**

**Georgia Field Office: (706) 613-9493**

## **PRE-CONSTRUCTION ACTIVITIES**

1. The applicant or designated agent will post educational posters in the construction office and throughout the construction site, including any access roads. The posters must be clearly visible to all construction staff. A sample poster is attached.
2. Prior to the onset of construction activities, the applicant/designated agent will conduct a meeting with all construction staff (annually for multi-year projects) to discuss identification of the snake, its protected status, what to do if a snake is observed within the project area, and applicable penalties that may be imposed if state and/or federal regulations are violated. An educational brochure including color photographs of the snake will be given to each staff member in attendance and additional copies will be provided to the construction superintendent to make available in the onsite construction office (a final brochure for Plan compliance, to be printed double-sided on 8.5 x 11in paper and then properly folded, is attached). Photos of eastern indigo snakes may be accessed on USFWS and/or FWC or GADNR websites.
3. Construction staff will be informed that in the event that an eastern indigo snake (live or dead) is observed on the project site during construction activities, all such activities are to cease until the established procedures are implemented according to the Plan, which includes notification of the appropriate USFWS Field Office. The contact information for the USFWS is provided on the referenced posters and brochures.

## **DURING CONSTRUCTION ACTIVITIES**

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

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

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

## **POST CONSTRUCTION ACTIVITIES**

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

DRAFT

Appendix G – Uniform Mitigation Assessment Method

DRAFT

**UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT**  
**Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)**

Site/Project Name <b>Atlantic Isles Bridge Replacement</b>		Application Number <b>N/A</b>	Assessment Area Name or Number <b>W4 - Indirect/Permanent Seagrass Impacts</b>	
FLUCCs code <b>911</b>	Further classification (optional) <b>Isolated Blades</b>		Impact or Mitigation Site? <b>Impact</b>	Assessment Area Size <b>0.48 Acres</b>
Basin/Watershed Name/Number <b>0309020614 - Southern Florida - North Biscayne Bay</b>	Affected Waterbody (Class) <b>III</b>	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance) <b>OFW, Aquatic Preserve</b>		
Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands  <p>The assessment area consists of a man-made lagoon that connects to Biscayne Bay and the Intracoastal Waterway (ICWW) via a man-made canal. This section of the ICWW connects to the Atlantic Ocean via the Haulover Inlet (approximately 1.9 miles south) and to the Atlantic Ocean via Port Everglades (approximately 11.5 miles north). Tidal mixing of saltwater, via inlet connections to the Atlantic Ocean, and freshwater from sheet flow and upstream canals results in an estuarine system within the assessment area.</p>				
Assessment area description  <p>The assessment area contains sections of seagrass, including paddle grass (<i>Halophila decipiens</i>) and shoal grass (<i>Halodule wrightii</i>). The west side of the lagoon contains a dense bed (~90% coverage) of shoal grass (<i>H. wrightii</i>). The east side of the lagoon contains a bed of shoal grass (<i>H. wrightii</i>) with sparse (&lt;5% coverage) to medium (30-50% coverage) density. The central part of the lagoon consists of sparse isolated blades of paddle grass (<i>H. decipiens</i>). Only the existing bed of paddle grass (0.48 acres) will be impacted by the proposed project.</p>				
Significant nearby features  <b>Biscayne Bay, ICWW</b>		Uniqueness (considering the relative rarity in relation to the regional landscape.)  <b>Presence of seagrass and shoreline mangrove coverage. No impacts to the shoreline mangroves are proposed.</b>		
Functions  <b>Water purification, uptake of nutrients, provide refuge and foraging habitat aquatic wildlife including managed fisheries species.</b>		Mitigation for previous permit/other historic use  <b>N/A</b>		
Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)  <b>Seagrass beds support various life cycle stages and provide habitat for foraging, spawning and refuge for many invertebrate and fish species. (Penaeid shrimp, species in the snapper-grouper complex, tarpon, snook, crustaceans, sharks). Seagrass beds also provide foraging habitat for sea turtles and manatees. The shoreline of the assessment area provides shoreline foraging habitat for a variety of avian species including shorebirds and wading birds.</b>		Anticipated Utilization by Listed Species (List species, their legal classification (FE, FT, FT (S/A), FXN, ST, SSC), type of use, and intensity of use of the assessment area)  <b>Common: West Indian manatee (FT), tricolored heron (ST), little blue heron (ST), reddish egret (ST)</b> <b>Uncommon: sea turtle species (FT and FE), wood stork (FT), piping plover (FT), red knot (FT)</b> <b>Rare: smalltooth sawfish (FE), American crocodile (FT), protected coral species (FT)</b>  <b>EFH for spiny lobster, snapper-grouper complex, coral and penaeid shrimp</b>		
Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):  <b>Juvenile and adult fishes including estuarine predator and prey [e.g. barracuda (<i>Sphyraena barracuda</i>)]; juvenile species from the snapper-grouper complex [e.g. Mangrove snapper (<i>Lutjanus griseus</i>)]; various other fish species [e.g. checkered pufferfish (<i>Sphoeroides testudineus</i>)]</b>				
Additional relevant factors:  <b>The lagoon is bordered by man-made rocky/rip-rap shoreline with mangrove saplings within the lagoon. The canal connecting the lagoon to Biscayne Bay/ICWW consists of a seawall on the eastern side and rocky/rip-rap shoreline with mangroves on the west side.</b>				
Assessment conducted by: <b>David Lestino</b>		Assessment date(s): <b>11/15/23</b>		

**UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT**  
**Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)**

Site/Project Name: <b>Atlantic Isles Bridge Replacement</b>	Application Number: <b>N/A</b>	Assessment Area Name or Number: <b>W4 - Indirect/Permanent Seagrass Impacts</b>
Impact or Mitigation: <b>Impact</b>	Assessment Conducted by: <b>David Lestino</b>	Assessment Date: <b>11/15/23</b>

Scoring Guidance	Optimal (10)	Moderate (7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface water functions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

.500(6)(a) Location and Landscape Support		<p>The assessment area includes mature mangroves [red mangrove (<i>Rhizophora mangle</i>), white mangrove (<i>Laguncularia racemosa</i>) and buttonwood (<i>Conocarpus erectus</i>)] along the western canal shoreline and mangrove saplings along the lagoon shoreline. Terrestrial wildlife access will not be altered by the proposed project. The assessment area is directly accessible to marine species via the ICWW, although the closest inlets are located over 1.9-miles to the south and 11.5-miles to the north. The improvements will not alter the accessibility by marine species as no barriers or obstructions are proposed. The project will not impact or cause land use changes to habitat utilized by wildlife outside the assessment area as all work is limited to the developed area of Atlantic Isle. The assessment area includes seagrass habitat that provides foraging habitat for marine and terrestrial species and provides nursery/refuge habitat for marine species. The seagrass habitat within the project also provides water quality benefits to areas hydrologically connected to the ICWW through sediment trapping and uptake of dissolved nutrients. The terrestrial foraging conditions within the assessment area will remain largely unchanged. Widening of the bridge structure will cause 0.005 acres of permanent shading impacts to an existing 0.48 acre seagrass bed [sparse paddle grass (<i>H. decipiens</i>)] which will diminish foraging and nursery habitat for marine species and water quality benefits for downstream habitats. However, the remaining 0.465 acres will remain unaltered and the overall functions of the seagrass bed will remain.</p>
Current	With Impact	
7	5	

.500(6)(b) Water Environment (n/a for uplands)		<p>The assessment area is located within a man-made lagoon that connects to the Intracoastal Waterway (ICWW) and Biscayne Bay via a man-made canal. The lagoon has very little traffic as it is only accessible by small, shallow draft watercraft. The lagoon experiences water quality degradation from stormwater runoff in the project area. While the assessment area is subject to daily tidal fluctuations, the nearest inlet providing fresh ocean water from the Atlantic is located over 1.9 miles to the south, while the nearest inlet to the north is over 11.5 miles away. Water depth within the assessment area varies from less than 1 foot along the lagoon shorelines to approximately 8 feet in the middle of the lagoon. Light penetration is limited due to sediment suspended within the water column but is adequate to allow seagrass growth throughout the lagoon. Density of seagrass habitat varied by location, with the highest density (~90% coverage) observed along the west side of the lagoon. The east side of the lagoon had sparse (&lt;5%) to moderate (30-50%) coverage and the central part of the lagoon contained isolated blades of seagrass. The observed seagrass habitat included paddle grass (<i>Halophila decipiens</i>) in the central part of the lagoon and shoal grass (<i>Halodule wrightii</i>). Marine dependent species, including fish, mammals and invertebrates may utilize the seagrass habitat for foraging or as nursery habitat. The permanent conversion of this habitat would not alter the water levels or flows within the assessment area or downstream habitats within the ICWW and Biscayne Bay. Water quality in the assessment area could be temporarily impacted from sedimentation during construction. Downstream habitats should not be impacted as turbidity barriers would be implemented during construction to prevent offsite sedimentation. Water quality impacts provided by the existing seagrass bed, would be lost should the seagrass die-off once shaded.</p>
Current	With Impact	
7	5	

.500(6)(c) Community Structure		<p>The assessment area includes shallow unconsolidated bottom and seagrass habitat that provide suitable foraging habit for fish, manatees and sea turtles. This area also provides nursery habitat for fish and invertebrate species. The seagrass community structure is not pristine as degraded water quality allows for siltation, epiphyte growth on seagrass and presence of algal communities that may outcompete seagrass. Once widened, the bridge would shade 0.005 acres of the seagrass bed (acres) and conditions would no longer be adequate for seagrass growth or provide foraging or nursery habitat for fish, invertebrates manatees and sea turtles.</p>
Vegetation _____ Benthic _____ X Both _____		
Current	With Impact	
7	1	

<b>Raw Score</b> = Sum of above scores/30 (if uplands, divide by 20)	
Current	With Impact
0.70	0.37

<b>Impact Delta (ID)</b>	
Current - w/Impact	0.33

<b>Impact Acres =</b>	0.005
-----------------------	-------

<b>Functional Loss (FL)</b> [For Impact Assessment Areas]:	
<b>FL = ID x Impact Acres =</b>	0.002