NATURAL RESOURCES EVALUATION

Florida Department of Transportation

District One

State Road 865

(San Carlos Blvd.)

Limits of Project: From North of Cresent Street to North of Hurricane Bay Bridge

Lee, Florida

Financial Management Number: 433726-1-22-01

ETDM Number: 14124

Date: December 2020

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.

NATURAL RESOURCE EVALUATION REPORT

Prepared For:

Florida Department of Transportation

District One

State Road 865 (San Carlos Boulevard)
From North of Crescent Street to North of Hurricane Bay Bridge
Project Development and Environment (PD&E) Study
Lee County, Florida

FPID No. 433726-1-22-01
ETDM No. 14124

December 2020

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EXECUTIVE SUMMARY

The Florida Department of Transportation (FDOT) is conducting a Project Development and Environment (PD&E) study of the operational improvement project along State Road (SR) 865 (San Carlos Boulevard) from North of Crescent Street to North of the Hurricane Bay Bridge, in Lee County, Florida.

The purpose of the project is to increase accessibility and enhancement of mobility and safety for vehicle and non-vehicular transportation. The proposed improvements include widening the Matanzas Pass Bridge to accommodate a new shared-use path along the west side of the bridge, milling and resurfacing, new and modification to existing traffic signals and crosswalks, and the Hurricane Bay Bridge will be modified to accommodate bicycle lanes in each direction of travel and a barrier-protected sidewalk along the west side of the bridge. The project was evaluated through FDOT's Efficient Transportation Decision Making (ETDM) process as project #14124. In partnership with Lee County, LeeTran, and Town of Fort Myers Beach, this project will incorporate Lee County's Seafarers Alternative at the intersection of Estero Boulevard and Fifth Street. Lee County presented Seafarers Alternative to Fort Myers Beach Town Council on March 2, 2020. Town Council consensus was to move forward with Lee County's intersection concept. New traffic signals will be constructed at Fifth Street to replace the existing pedestrian crosswalk signals. The posted speed limit will remain 25 mph. The reconstructed intersection will enhance public transit mobility, pedestrian safety, and provide opportunity areas for landscaping and other aesthetic features.

In accordance with Presidential Executive Order 11990, Federal Highway Administration (FHWA) Technical Advisory T6640.8A, Section 7(c) of the Endangered Species Act (ESA) of 1973 (ESA, P.L. 93-205), and the FDOT PD&E Manual, Part 2, Chapters 9 and 16 (July 7, 2020), assessment of protected species and their habitat and an evaluation of the potential impact to wetlands were conducted for the proposed improvements along SR 865. Essential Fish Habitat (EFH) consultation takes place with the National Oceanic and Atmospheric Administration's (NOAA's) National Marine Fisheries (NMFS). According to the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA), areas designated as EFH are "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." A review per the FDOT's PD&E Manual Part 2, Chapter 17 (2020) was conducted, and essential fish habitat is documented within and adjacent to the project limits. The shading impacts for minor widening of the Matanzas Pass Bridge will be negligible, as the existing habitat is comprised of a sandy bottom with no submerged aquatic vegetation (i.e., seagrass); thus, no mitigation is required.

This Natural Resource Evaluation (NRE) is prepared as part of the PD&E study, and in accordance with the Office of Environmental Management NRE Outline and Guidance, effective July 1, 2020. This report reviews the potential impacts to federal and state protected species and wetland systems, summarizes the results of these assessments, and identifies measures to avoid, minimize and mitigate for any potential impacts. A summary of the analysis of potential project impacts for the proposed operational improvements to San Carlos Boulevard is presented below.

PROTECTED SPECIES

The project study area was evaluated for potential occurrences of federal and state listed protected plant and animal species in accordance with Section 7 of the Endangered Species Act of 1973, as amended, and Chapters 5B-40 and 68A-27 of the Florida Administrative Code (F.A.C.). The evaluation included a literature review of the Florida Natural Areas Inventory (FNAI) elemental occurrence database, GIS maps, and field review of the project area to identify the potential for occurrence of protected species. Field evaluations of the project area and adjacent habitats and general wildlife surveys were conducted by qualified scientists in September 2019, February 2020, and November 2020.

A total of 17 federally listed species and ten (10) state listed species have been reviewed for the potential to occur within the SR 865 project study area. There will be no adverse impacts to listed species from this project. The project is within U.S. Fish and Wildlife Service (USFWS) designated Critical Habitat for two species. The project area is located

within and/or near coastal habitats. Therefore, during construction, netting shall be installed beneath the bridge span and all debris shall be collected on small floating barges located outside the navigational channel.

No impacts to Essential Fish Habitat resources are anticipated. An effect determination was made for each of these federal and state listed species based on an analysis of the potential impacts of the proposed project on each species. Based on evaluation of collected data and field reviews, the federal and state listed species listed below have been reviewed for the potential to occur within or adjacent to the project area.

Federal Species:

"No effect"

- Florida scrub-jay
- Red knot
- Piping plover
- Wood stork
- Eastern Black Rail
- Aboriginal prickly-apple
- Beautiful pawpaw

"May affect, not likely to adversely affect"

- Smalltooth sawfish
- Loggerhead sea turtle
- Kemp's ridley sea turtle
- Green sea turtle
- Eastern indigo snake
- American alligator
- American crocodile
- Florida bonneted bat
- West Indian manatee

State species:

"No effect anticipated"

- Gopher tortoise
- Florida sandhill crane
- Florida burrowing owl
- Snowy plover
- Little blue heron
- Reddish egret
- Roseate spoonbill
- Tricolored heron
- Southeastern American kestrel
- American oystercatcher
- Black skimmer

Other Protected Species

- Bald eagle
- Common bottlenose dolphin
- Roosting bats

WETLANDS AND OTHER SURFACE WATERS

For the purposes of this document, wetlands are defined as per 62.340, F.A.C. and Section 373.019 (27), Florida Statutes. Surface waters are defined as open water bodies or streams/waterways.

In accordance with EO 11990, the FDOT has undertaken all actions to minimize the destruction, loss or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands in carrying out the agency's responsibilities. The proposed improvements to SR 865 and the anticipated construction method are not anticipated to result in direct or secondary impacts to wetlands or other surface waters. Mangroves are in close proximity to the Hurricane Bay Bridge; however, all road improvements along the bridge will be completed within the footprint of the existing bridge. Therefore, a mangrove trimming permit from the Florida Department of Environmental Protection will

not be required. No impacts from shading are anticipated to EFH within the Hurricane Bay Bridge project area as improvements will occur within the existing footprint, thus, no mitigation will be required. Shading impacts from the proposed minor widening of Matanzas Pass Bridge will be di minimis, as the existing habitat is comprised of a sandy bottom with no submerged aquatic vegetation (i.e., seagrass); thus, no mitigation is required.

The results of this PD&E study indicate there are no impacts due to the roadway improvements and safety considerations proposed by this project. Furthermore, impacts to project area wetlands have been avoided as a result of selection of the proposed alignment and design consideration.

1.0 PROJECT OVERVIEW

The Florida Department of Transportation (FDOT), District One, is conducting a Project Development and Environment (PD&E) Study for improvements to State Road (SR) 865 / San Carlos Boulevard from North of Crescent Street to North of Hurricane Bay Bridge in Lee County, Florida (**Figure 1**).

The project includes improving San Carlos Boulevard (SR 865) from North of Crescent Street to north of Hurricane Bay Bridge, in Lee County, to better serve the diverse transportation needs of the corridor. From Estero Boulevard to Main Street, San Carlos Boulevard is primarily an elevated two-lane undivided urban minor arterial roadway with a dedicated southbound Bus/Bicycle-Only lane and a barrier-protected sidewalk on the east side of the bridge. The posted speed limit is 35 mph. From Main Street to north of Hurricane Bay Bridge, the roadway transitions to a four-lane divided minor arterial roadway with a two-way left turn lane median and sidewalks on both sides of the roadway. The posted speed limit is 45 mph. San Carlos Boulevard serves as the primary route to Fort Myers Beach. The total project length is approximately 1.2 miles.

In partnership with Lee County, LeeTran, and Town of Fort Myers Beach, this project will incorporate Lee County's Seafarers Alternative at the intersection of Estero Boulevard and Fifth Street. Lee County presented Seafarers Alternative to Fort Myers Beach Town Council on March 2, 2020. Town Council consensus was to move forward with Lee County's intersection concept. New traffic signals will be constructed at Fifth Street to replace the existing pedestrian crosswalk signals. The posted speed limit will remain 25 mph. The reconstructed intersection will enhance public transit mobility, pedestrian safety, and provide opportunity areas for landscaping and other aesthetic features.

FDOT is coordinating with the Town of Fort Myers Beach, Lee County, and Lee Tran on improvements throughout the project limits. Two projects will be implemented via the FDOT Local Agency Project (LAP) process. Lee County is developing plans for a new traffic signal at the intersection of Estero Boulevard and Crescent Street. The Town of Fort Myers Beach is developing plans for a new traffic signal at the intersection of Estero Boulevard and Old San Carlos Boulevard. The Matanzas Pass Bridge will be widened to accommodate a new shared-use path along the west side of the bridge. The existing southbound Bus/Bicycle-Only lane will be converted to a general use travel lane. San Carlos Boulevard from Main Street to Hurricane Bay Bridge will be restriped to accommodate bicycle lanes in each direction of travel. The existing southbound Right-Turn-Only lane approaching Main Street will be converted to a general use travel lane that will continue across the Matanzas Pass Bridge. A new traffic signal will be constructed at Main Street. The alternating signal at Prescott Street/ Buttonwood Drive will be adjusted to operate as a conventional signal. The Hurricane Bay Bridge will be modified to accommodate bicycle lanes in each direction of travel and a barrier-protected sidewalk along the west side of the bridge.

Figure 1. *Project location map*

1.1 PURPOSE AND NEED

The primary purpose of the SR 865 (San Carlos Boulevard) mobility improvement project is to provide additional travel options on a congested corridor, especially during the peak tourist season (January - April). The proposed project is also intended to promote emphasis for alternative transportation use and increase public transit ridership. The project will also enhance mobility and safety for vehicular and non-vehicular transportation and increase accessibility and connections between community points of interest. The need for the project is based on the following criteria:

1.1.1 Capacity/Transportation Demand: Improve Operational Performance

The project is expected to help relieve congestion caused by high traffic volumes accessing Fort Myers Beach and other community destinations, especially during peak season timeframes, by improving mobility and enhancing alternative modes of transportation. In 2013, the peak season weekday average daily traffic (PSWADT) for the project corridor was 25,397, and the corridor had a Level of Service (LOS) of "D". By year 2035, the project corridor is anticipated to reach a PSWADT of 31,011, surpassing the 29,000 AADT maximum level of capacity. It should be noted that the 2035 volume was anticipated with a mere 1% growth rate. Should that rate increase in the future, the traffic volume of the corridor would certainly exceed capacity.

While the posted speed limit on SR 865 (San Carlos Boulevard) within the proposed project limits ranges from 35 mph to 45 mph, the average speed within the corridor is around 12.9 mph. Existing average travel time comparisons in the corridor:

- Automobile (northbound) - 6.3 minutes
- Automobile (southbound) - 18.3 minutes
- Trolley (northbound) - 12.4 minutes
- Trolley (southbound) - 23.3 minutes

Additionally, an average of three to four public transit vehicles travel the corridor an hour with average midday headway times around 16.7 minutes. Each public transit vehicle can accommodate 32 seated and 23 standees (total 55 riders.) With the additional mobility improvements in the corridor, public transit could run more frequently per hour with reduced wait times.

1.1.2 Social and Economic Demand: Improve Access to Community Features

The mobility improvement project will enhance economic viability in the area by moving people more quickly and conveniently and with additional transportation options from the mainland to businesses and recreation opportunities around Fort Myers Beach. Community facilities in Fort Myers Beach include the American Legion - Post 274, Loyal Order of Moose Lodges, Compass Rose Boat Club, Estero Island Beach Accesses, and Fort Myers Beach Chamber of Commerce.

1.1.3 Modal Interrelationships: Enhance Mobility Options and Multi-Modal Access

SR 865 (San Carlos Boulevard) is identified as a primary pedestrian/bicycle corridor in the Lee County Bicycle Pedestrian Master Plan. The project will identify opportunities for new and improved bicycle and pedestrian facilities. There are no existing dedicated bike lanes along SR 865, except on the Matanzas Bridge in the shared bus lane. Sidewalks are currently present on both sides of SR 865 (San Carlos Boulevard) from CR 869 (Summerlin Road) to Main Street. From Main Street to Estero Boulevard, sidewalks are limited to a pathway on the east side of the roadway

separated from vehicular traffic by a low barrier wall. The proposed project will allow for better overall multi-modal access to retail, employment, and residences in the area.

1.1.4 Safety: Enhance Safety for Vehicular and Non-Vehicular Transportation

The SR 865 (San Carlos Boulevard) mobility improvements project will enhance safety for both vehicular and non-vehicular modes of transportation by identifying potential improvements at key intersections along the corridor with features such as roundabouts, improved signalization, and operational improvements. In 2010, there was one fatal crash within the 200' buffer of the project corridor and 36 nonfatal crashes. The corridor has a safety ratio of 1.36 (meaning that there are on average more crashes on this corridor than the State average for a similar facility type.) Additionally, the project intends to address any structural capacity issues of the Matanzas bridge and Hurricane Bay bridge.

The SR 869 (San Carlos Blvd) bridge (Structure No. 120089) over Hurricane Bay was originally constructed in 1980 with a total bridge length of 350’ comprised of 10 – 35’-0” simple spans. The original structure had a navigable clear width of 32’-0”, a minimum vertical clearance of 6.02’ and an overall bridge width of 49’-4”. The original superstructure consists of 1’-6” deep voided concrete precast panels topped with a 2” minimum wearing surface. The original cast-in-place substructure consists of two end bents and 9 intermediate bents. All substructures are supported by a combination of plumb and battered 18” prestressed concrete piles.

In 1990 the bridge was widened to the west 15’-9.5” and to the east 22’-0” to reach the current overall bridge width of 83’- 0.5”. All portions of the widened superstructure consist of 1’-6” cast-in-place concrete slabs, doweled into the original voided concrete precast panels. An excerpt from the existing plans showing the current typical section is provided below.

1.2 PROJECT ALTERNATIVES

An Operational Analysis Report (OAR) was prepared to document and summarize the analysis of the traffic operations and develop feasible improvements for San Carlos Boulevard (FDOT 2018). Within this study, six build alternatives were evaluated. Of these, four Beach Alternatives were evaluated that included work within the Town of Fort Myers on Estero Island and the Matanzas Pass Bridge. Two Island Alternatives were evaluated which included work on San Carlos Island and improvements to Hurricane Pass Bridge. These build alternatives were presented at a public workshop in February 2018 and as a result, Beach Alternative 1 and Island Alternative 2 were recommended for design along the San Carlos Boulevard corridor from Estero Boulevard to north of Hurricane Bay Bridge. The alternative descriptions below were extracted from the December 2018 Operational Analysis Report (FDOT 2018):

1.2.1 Beach Alternative 1

Beach Alternative 1 would add three signals and remove the right turn from Northbound SR 865 to Eastbound Fifth Street. This alternative includes milling and resurfacing SR 865 from the existing pedestrian crossing to Matanzas Pass Bridge; milling and resurfacing Estero Boulevard from SR 865 to Old San Carlos Boulevard; new sidewalk on the west side of SR 865 from Fifth Street to the Matanzas Pass Bridge; removal of the existing pedestrian signal and crosswalk between Crescent Street and Fifth Street; and a total of three new traffic signals at Estero Boulevard/SR 865/Fifth Street, Old San Carlos Boulevard/Estero Boulevard, and Estero Boulevard/Crescent Street. Following the February 2018 public workshop, the alternative was revised to remove the right turn from NB SR 865 to EB Fifth Street to address existing safety and operational issues. The existing pedestrian island would be expanded/connected to the

existing sidewalk along Fifth Street to accomplish this lane closure. This expanded pedestrian island provides a landscape opportunity area for a gateway feature for Fort Myers Beach.

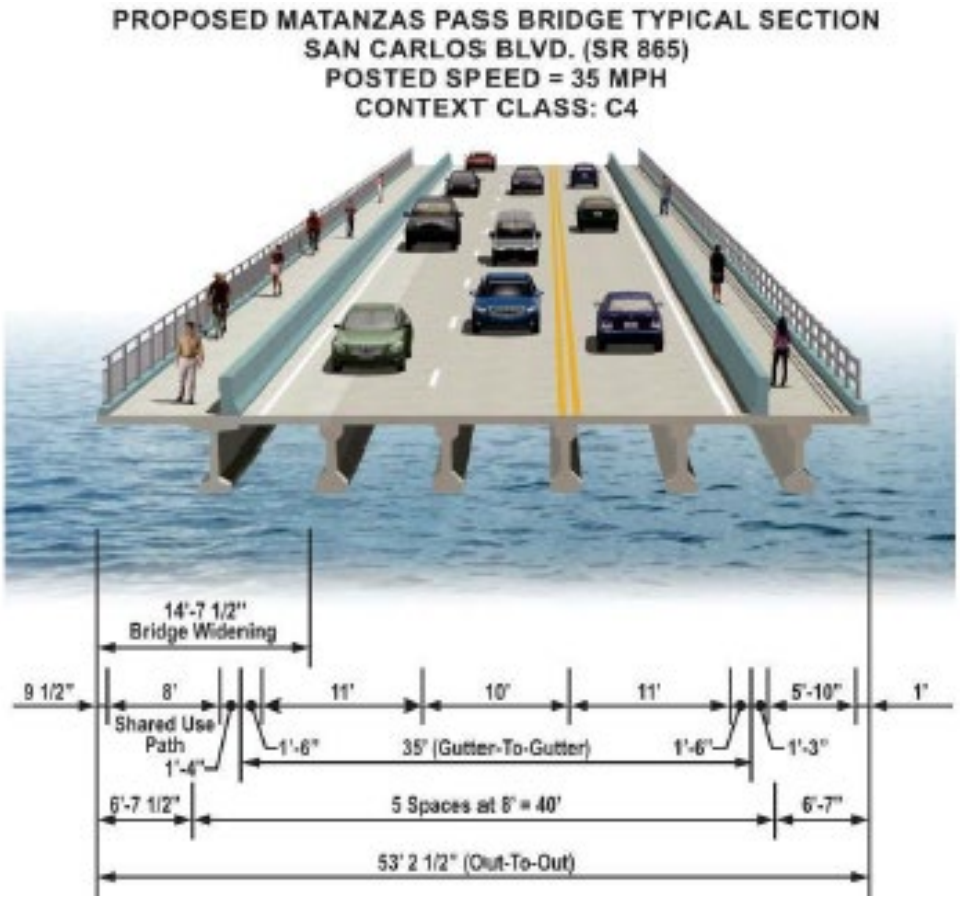

Figure 2. *Typical Section of the Matanzas Pass Bridge improvements*

The typical section for Beach Alternative 1 includes milling and resurfacing of SR 865 from the intersection at Fifth Street to Matanzas Pass Bridge. The existing roadway will be re-striped to accommodate one northbound travel lane and two southbound travel lanes. The southbound outside travel lane will become right turn only at Estero Boulevard. New sidewalk or shared-use path will be added on the west side of SR 865 from Fifth Street across Matanzas Pass Bridge (Figure 2). Except for the milling and resurfacing along Estero Boulevard (FMB) and the proposed signals at Old San Carlos Boulevard/Estero Boulevard (FMB) and Estero Boulevard /Crescent Street (Lee County), all work is within the FDOT right-of-way (ROW) and no additional ROW is required.

To meet the proposed bridge typical section, the west overhang for the existing bridge over Matanzas Pass will be widened from 2'-10.5" to 6'-10". By limiting the bridge work to an overhang replacement, in lieu of a traditional bridge widening, the existing bridge will not require new beams or new foundation work. A feasible method of construction during deck removal is to provide a lightweight excavator equipped with a Slab Crab attachment to remove rectangular sections of concrete deck (Figure 2a). A Slab Crab system will allow for large debris to be collected from the deck surface, while minimizing impacts to the water channel below. Small debris will be collected via a netting system that

is installed beneath each bridge span, funneled down the existing bridge piers and stored on the top of the existing pier footings. The accumulated debris on each pier footing will be contained by temporary barriers/fencing and regularly collected to avoid impacts to Matanzas Pass. During collection, unanchored floating barges (approx. 10' wide x 20' long) will travel within the existing waterway. Barges will not be allowed in environmentally sensitive areas and will be limited to regions of Matanzas Pass where recreational boats currently have permitted access. During construction of the overhang system, concrete/reinforcing steel can be delivered to the jobsite by bridge with all formwork being installed from the existing bridge deck. As a precaution, the netting/small debris system will remain in place during all phases of demolition and overhang reconstruction. Nighttime lane closures along SR 865 (San Carlos Blvd) are anticipated during construction.

Figure 2a. *Slab Crab System*

1.2.2 Island Alternative 2

Island Alternative 2 includes milling and resurfacing SR 865 between Main St and Prescott Street/Buttonwood Drive to add bike lanes and a new signal at Main Street. SR 865 would be widened to the west to accommodate two Southbound (SB) lanes and a sidewalk onto the Matanzas Pass Bridge south of Main Street. Southbound Fisherman's Wharf frontage road will have to be shifted to accommodate the SR 865 widening. The existing metered signal at Prescott Street/Buttonwood Drive would be modified to an actuated metered signal that would only run as metered (one lane at a time) when SB traffic backs up across the Matanzas Pass Bridge. Landscape opportunity areas would be provided on both sides of SR 865 south of Main Street between SR 865 and the Fisherman's Wharf frontage roads.

The typical section for Island Alternative 2 includes milling and resurfacing of SR 865 from Main Street to north of Hurricane Bay Bridge. The existing roadway will be re-striped to accommodate two northbound travel lanes, two southbound travel lanes, a two-way left-turn lane median, and bicycle lanes in each direction of travel (Figure 3). Existing sidewalks will remain. Hurricane Bay Bridge will be modified to accommodate two northbound travel lanes, two southbound travel lanes, a median left-turn lane, bicycle lanes in each direction of travel, and barrier-protected sidewalk in each direction of travel (Figure 4). South of Main Street, SR 865 will be widened to accommodate two southbound travel lanes across Matanzas Pass Bridge and new sidewalk or shared-use path on the west side of SR

865. Southbound Fisherman's Wharf frontage road will be shifted to accommodate the SR 865 widening. All work is within the existing FDOT ROW and no additional ROW is required.

Bridge improvements for the SR 856 (San Carlos Blvd) over Hurricane Bay include: installing a permanent rigid concrete barrier, replacing existing expansion joints and milling/resurfacing the roadway to meet the proposed typical section. All bridge construction activities will occur within the footprint of the existing bridge, therefore no additional slab construction, or foundation installation will be required at Hurricane Bay. The proposed rigid concrete barrier will be constructed by drilling ¾" diameter x 9" deep dowel holes into the existing 18" thick cast-in-place flat slab structure. All holes will be cleaned, and #5 dowels will be epoxied into each hole to anchor the barrier system. The excess deck thickness will block any epoxy from spilling into the waterway below and all excess epoxy will be removed after dowel placement. All existing bridge expansion joints will be placed with a poured joint with backer rod system and all milling/resurfacing operations will replace the existing 2" thick bridge surface.

Figure 3. *Typical Section of the SR 865 (San Carlos Blvd.) improvements from Main Street north to Hurricane Pass Bridge*

Figure 4. *Typical Section of the proposed Hurricane Pass Bridge improvements*

1.2.3 Seafarers Alternative

In partnership with Lee County, LeeTran, and Town of Fort Myers Beach, this project will incorporate Lee County's Seafarers Alternative at the intersection of Estero Boulevard and Fifth Street. Lee County presented Seafarers Alternative to Fort Myers Beach Town Council on March 2, 2020. Town Council consensus was to move forward with Lee County's intersection concept. New traffic signals will be constructed at Fifth Street to replace the existing pedestrian crosswalk signals. The posted speed limit will remain 25 mph. The reconstructed intersection will enhance public transit mobility, pedestrian safety, and provide opportunity areas for landscaping and other aesthetic features. A concept layout of the Seafarers Alternative is provided as Figure 5.

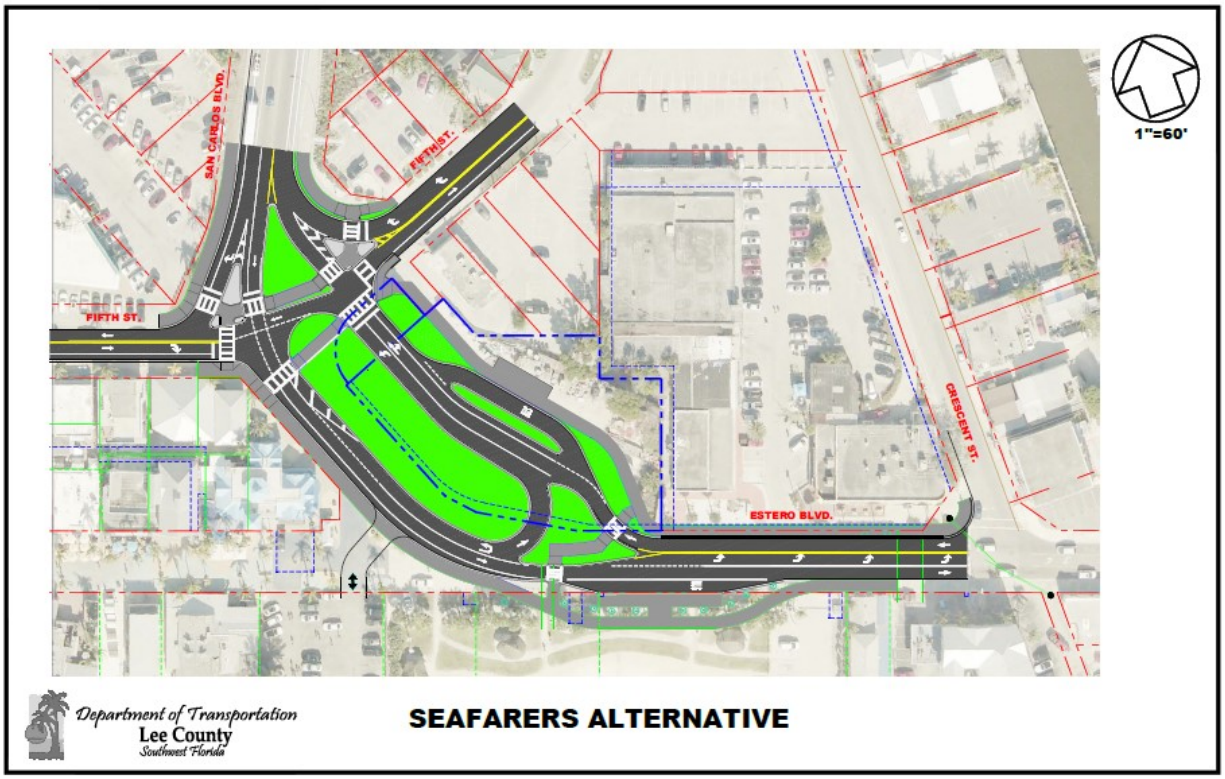

Figure 5. *Seafarers Alternative Intersection Concept at Estero Boulevard and Fifth Street*

2.0 EXISTING CONDITIONS

2.1 METHODOLOGY

Pursuant to Presidential Executive Order (EO) 11990 entitled "Protection of Wetlands," the United States Department of Transportation has developed a policy, (USDOT Order 5660.1A), Preservation of the Nation's Wetlands, dated August 24, 1978, which requires all federally funded highway projects to protect wetlands to the fullest extent possible. In accordance with this policy, the project study area was evaluated to assess the potential occurrence of wetlands with and adjacent to the project limits.

The study area is defined as the 500-foot corridor (250 feet east and west of the SR 865 centerline). This section presents a description of existing conditions within the project study area, including soils and land use/vegetative cover types within both wetlands and uplands. **Section 3.0** presents a description of the potential impacts to federal and state listed species and proposed conservation measures to off-set these impacts. **Section 4.0** presents a description of wetland and surface water impacts that would result from construction of the proposed project and a discussion of the mitigation options to offset these impacts. **Section 5.0** presents a description of the potential impacts to Essential Fish Habitat (EFH).

Environmental scientists familiar with Florida natural communities conducted field reviews of the study area in September 2019, February 2020 and November 2020. Field reviews consisted of pedestrian transects throughout all-natural habitat types found within the study area. The purpose of the reviews was to verify and/or refine preliminary

habitat boundaries and classification codes established through in-office literature reviews and aerial photo interpretation. During field investigations, each wetland and surface water habitat within the study area was visually inspected and photographed. Plant species were identified to species level and listed by dominance for each community. Nuisance/exotic plant species were estimated by percent cover. Attention was also given to identifying wildlife and signs of wildlife usage in each wetland and adjacent upland habitats within the study area.

2.1.1 Land Use, Land Cover

The following land uses were identified within the SR 865 Study Area (see also **Figure 6**). Each land use type within the Study Area was mapped from geospatial data generated by the SFWMD using the Florida Land Use, Cover Classification System (FLUCCS; FDOT, 1999). Mapped land use features were further cross-referenced by habitat type using the Classification of Wetlands and Deepwater Habitats of the United States (Cowardin, *et. al.*, 1979), as adopted by the United States Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) and the Florida Natural Areas Inventory's (FNAI) Guide to the Natural Communities of Florida (FNAI, 2010). The USFWS NWI fields are restricted to wetland categories only, and therefore do not have an equivalent field shared with upland FLUCCS land cover classes or upland FNAI habitat communities. A summary of the relationship between the three cover types and relative areas is provided in **Table 1** below. Representative photographs by land cover class are included in **Appendix A.**

Table 1. *Existing Land Uses within the SR 865 (San Carlos Blvd.) Study Area*

FLUCCS Code	Land Use Type	Area w/in Project Study (acres)	Ratio w/in Project Study (%)	NWI Classification	FNAI Classification
1210	Fixed Single Family Units	11.80	8.11	--	Developed
1320	Mobile Home Units	15.74	10.81	--	Developed
1340	Multiple Dwelling Units, High Rise	3.66	2.51	--	Developed
1400	Commercial and Services	50.47	34.7	--	Developed
1810	Swimming Beach	2.09	1.43	--	Beach Dune
1840	Marinas and Fish Camps	10.74	7.38	--	Developed
5120	Channelized Waterways, Canals	2.04	1.42	E1UBLx	Canal/ditch
5300	Reservoirs	0.13	0.09	PUBHx	Artificial pond

FLUCCS Code	Land Use Type	Area w/in Project Study (acres)	Ratio w/in Project Study (%)	NWI Classification	FNAI Classification
5410	Embayments Opening Directly to Gulf or Ocean	38.69	26.6	E1UBL, E2US2M	Unconsolidated Substrate
5720	Gulf of Mexico	1.90	1.33	M1UBL	Unconsolidated Bottom
6120	Mangrove Swamp	5.96	4.09	E2FO3N, E2SS3N	Mangrove Swamp
8140	Roads and Highways	2.24	1.53	--	Road

Fixed Single Family Units
Land use classification: FLUCCS 1210
FNAI Habitat type: Developed

This classification is used to describe properties with two to five single-family structures per acre within urban or suburban areas anywhere that sub-division or urban street patterns occur. Included are gardens, lawns, fields, pools, stables, garages, out buildings, and other outdoor structures. They may surround golf courses and include other recreational amenities. Very few non-residential uses occur in medium-density fixed-unit single family housing areas. This land use is distributed throughout the project corridor, with concentrations on San Carlos and Estero Islands. Fixed Single Family Units comprise 11.80 acres, or 8.11 percent, of the total Study Area. Wildlife utilization is typically low in developed areas.

Mobile Home Units
Land use classification: FLUCCS 1320
FNAI Habitat type: Developed

Mobile homes are rectangular and light-toned, from 8 to 12 feet wide and 30 to 50 feet long. In most instances, mobile home areas have clear boundaries which abut other residential areas, open areas, agricultural areas, limited-access highways, and large water bodies. Mobile home areas mapped within the Study Area are located on the mainland and San Carlos Island and comprise 15.74 acres, or 10.81 percent of total area. Wildlife utilization is typically low in developed areas.

Multiple Dwelling Units, High Rise
Land use classification: FLUCCS 1340
FNAI Habitat type: Developed

This high density, residential land use includes town houses, apartments, and condominiums of three stories or more. It also includes subsidiary parking, recreational, and open landscaped areas. Land use of this type within the project Study Area are found adjacent to Hurricane Pass and comprise 3.66 acres (2.51 percent of total). Wildlife utilization is typically low in developed areas.

Commercial and Services
Land use classification: FLUCCS 1400
FNAI Habitat type: Developed

This class includes a broad range of uses, including subclasses such as retail and wholesale, professional, cultural and entertainment, and tourist services. Most vegetation is not natural, but a result of landscaping. This land use is evenly distributed throughout the project corridor, with areas of this land use on both sides of San Carlos Boulevard. This land use makes up the majority of the land uses within the project Study Area at 50.46 acres, or 34.70 percent of the total. Wildlife utilization is typically low in developed areas.

Swimming Beach
Land use classification: FLUCCS 1810
FNAI Habitat type: Beach Dune

This class includes saltwater and freshwater beach areas, both public and private, that are accessible from land and available for recreational purposes. This class generally refers to sandy, non-vegetated, strip of land between the water line and residential or commercial uses. Recreational structures, such as picnic areas, service stands, piers and boardwalks, fenced areas, protected swimming areas, and ball courts may be present. The areas mapped under this land use are associated with Fort Myers Beach near the project beginning, totaling 2.04 acres (or 1.42 percent of the total). Wildlife utilization is typically low in developed areas.

Marinas and Fish Camps
Land use classification: FLUCCS 1840
FNAI Habitat type: Developed

Marinas include fresh water and marine harbors, yacht clubs, and boat launching sites that are primarily used for recreational marine craft. Fish camps include boat launching sites, docking facilities, fishing piers, bait houses and store facilities, and any lodging or camping facilities. Marinas and fish camps are shoreline uses that tend to occur in areas protected from storms by natural coves or bays, breakwaters, or inland areas connected by canals to an open water body. Land uses of this type are associated with the Matanzas Pass Bridge within the Study Area, totaling 10.74 acres (or 7.38 percent of the total). Wildlife utilization is typically low in developed areas.

Channelized Waterway, Canals
Land use classification: FLUCCS 5120
NWI classification: Estuarine, Subtidal, Unconsolidated Bottom, Subtidal, Excavated (E1UBLx)
FNAI Habitat type: Canal/ditch

This class includes artificially improved rivers, creeks, canals, and other linear water bodies flowing across the landscape with man-made (or substantially man-made or altered) channels. Channelized waterways and canals are often used for recreation, travel, irrigation, and shipping. Canals in the project Study Area are associated with residential boat docks and marinas. Canals within the Study Area total 2.04 acres (or 1.42 percent of the total) and are located on Estero Island near the project beginning.

Reservoirs
Land use classification: FLUCCS 5300
NWI classification: Palustrine, Unconsolidated Bottom, Permanently Flooded, Excavated (PUBHx)
FNAI Habitat type: Artificial Pond

Reservoirs are artificial impoundments of water or water bodies that have been significantly modified from their natural state. They are used for irrigation, flood control, municipal and rural water supplies, stormwater treatment, recreation, and hydro-electric power generation. Often the presence of dams, levees, and other water control structures or evidence of excavation are indicative of this land use type. A single reservoir, approximately 0.13 acres or 0.09 percent of the total area, was identified in the Study Area towards the middle of the project. Reservoirs can provide limited freshwater habitats in coastal environments.

Embayment Opening Directly to Gulf or Ocean
Land use classification: FLUCCS 5410
NWI classification: Estuarine, Subtidal, Unconsolidated Bottom (E1UBL) and Estuarine, Intertidal, Unconsolidated Shore, Sand, Irregularly Exposed (E2US2M)
FNAI Habitat type: Unconsolidated Substrate

Embayments are inlets or arms of the sea that extend into the land. Waterbodies in this class are those which have a direct connection to the open Gulf of Mexico or Atlantic Ocean and do not meander great distances up or down the interior of the coast. Although mostly open water, this classification may include vegetation characteristic of saltwater marshes. Within the project Study Area, this land use includes waterways under both bridge crossings, totaling 38.90 acres (26.6 percent of total). Continuous, open water habitats such as these are frequented by many coastal marine species.

Gulf of Mexico
Land use classification: FLUCCS 5720
NWI classification: Marine, Subtidal, Unconsolidated Bottom (M1UBL)
FNAI Habitat type: Unconsolidated Substrate

The Gulf of Mexico consists of open ocean with a high-energy coastline. Marine habitats are exposed to the waves and currents. Tidal salt water continuously covered with tidal water. Continuous, open water habitats such as these are frequented by many coastal marine species. The Gulf of Mexico is 3500 feet from the proposed project area, totaling 1.90 acres or 1.33% of the study area.

Mangrove Swamp
Land use classification: FLUCCS 6120
NWI classification: Estuarine, Intertidal, Forested, Broad-leaved Evergreen, Regularly Flooded (E2FO3N) and Estuarine, Intertidal, Scrub-shrub, Broad-leaved Evergreen, Regularly Flooded (E2SS3N)
FNAI Habitat type: Mangrove Swamp

This class is used for communities in which mangrove species are pure or predominant. Mangroves appear as a medium height (10 to 20 feet) thicket of fleshy leaved woody plants in coastal areas subject to periodic or continual inundation by salt of brackish water. In many sites, mangroves are prevented from reaching mature stature (20+ feet) by natural processes, including climate, nutrients, and wave action or through mechanical trimming. Mangroves are present in numbers in areas without armored shorelines at the end of the project, totaling 5.96 acres or 4.09 percent of the total area. Mangroves provide nesting and foraging habitat for many protected species.

Roads and Highways
Land use classification: FLUCCS 8140
FNAI Habitat type: Road

This class includes those highways exceeding 100 feet in width, with four or more lanes and median strips. Also included are interchanges, rights-of-way, highway patrol facilities, maintenance and service facilities, and associated parking areas. San Carlos Boulevard north of the Hurricane Pass Bridge accounts for this mapped land use within the project Study Area, approximately 2.24 acres (or 1.54 percent of total). Wildlife utilization is typically low in developed areas.

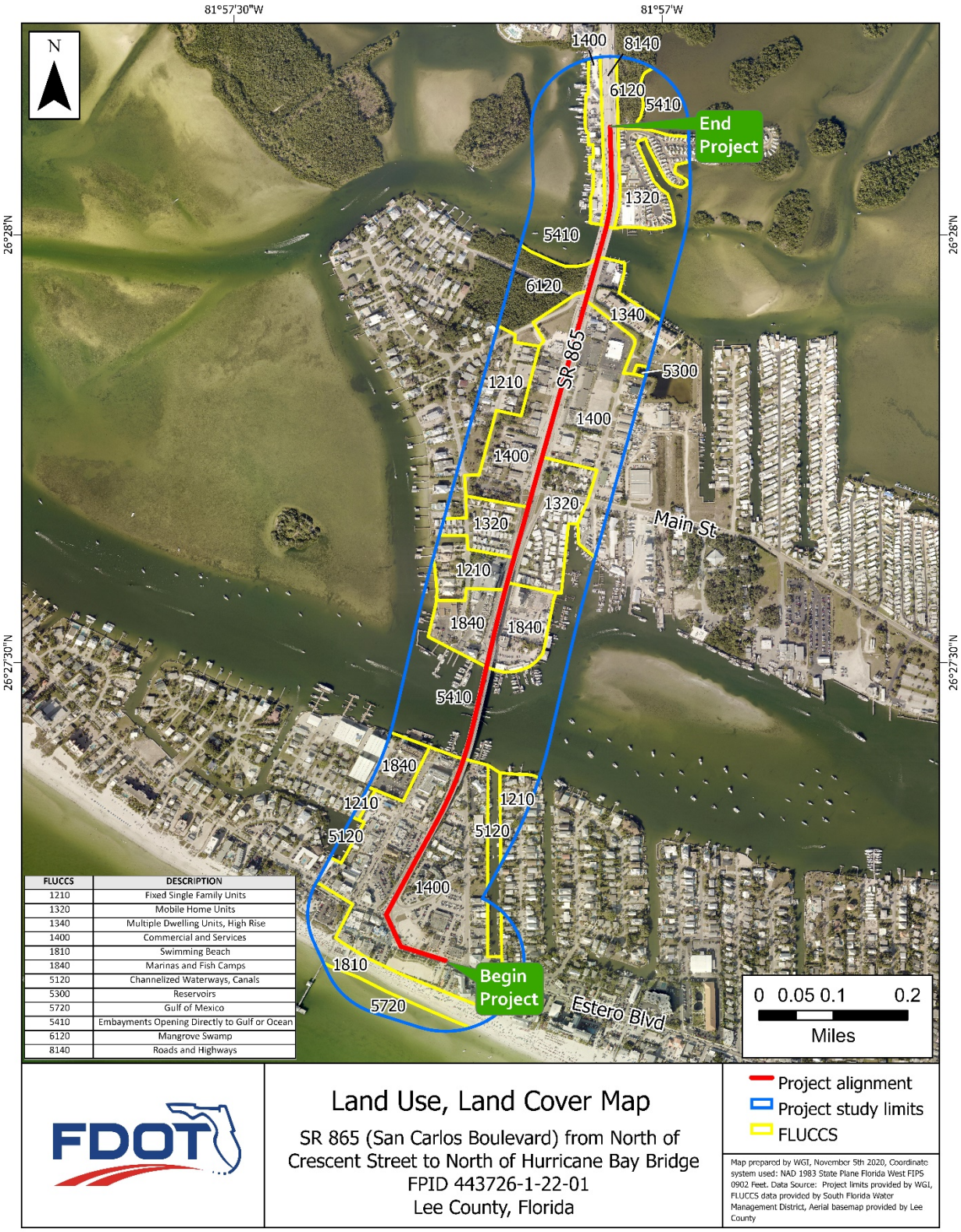

***Figure 6**. Land Use, Land Cover (FLUCCS) map of SR 865 (San Carlos Blvd.) Study Area*

2.1.2 Soils

The project Study Area comprises seven mapped soil types totaling 143.73 acres. Four of the mapped soil types are characterized as hydric, two of which are technically open water rather than a soil type. Mapped hydric soils total 49.32 acres (34.31 percent) of the Study Area. Mapped soils found within the SR 865 (San Carlos Blvd.) Study Area, including relative areas, according to the Natural Resources Conservation Service (NRCS) *Soil Survey of Lee County, Florida* (NRCS, 1984) are shown in **Table 2** (see also **Figure 7**). The hydric status and depth to water table are also listed by soil type. A brief description of each soil type is provided below.

***Table 2**. Soil types and coverage within the SR 865 (San Carlos Blvd.) Study Area*

Map Unit Symbol	Map Unit Name	Area w/in Project Study (acres)	Ratio w/in Project Study (%)	Hydric (Yes / No)	Depth to Water Table (inches)
7	Matlacha-Urban Land Complex	8.94	6.22	No	24 to 36
22	Beaches	0.93	0.65	Yes *	0 [1]
23	Wulfert Muck	1.54	1.07	Yes	0 to 6 [1]
24	Kesson Fine Sand	6.37	4.43	Yes	0 to 6 [1]
28	Immokalee Sand, 0 to 2 Percent Slopes	0.20	0.07	No	10 to > 40
59	Urban Land	85.28	59.33	No	varies
69	Matlacha Gravelly, 0 to 2 Percent Slopes	0.20	0.07	No	24 to 36
100	Waters of the Gulf of Mexico	40.47	28.16	Yes *	0 [2]

* Open water; [1] Fluctuates with tide; [2] Open water

Matlacha-Urban land complex is a complex consisting of nearly level Matlacha gravelly fine sand and areas of Urban land. Most of the natural vegetation has been removed, however remaining vegetation generally consist of slash pine (*Pinus elliottii*) and ruderal herbaceous groundcovers.

Beaches consist of narrow strips of nearly level, mixed sand and shell fragments along the Gulf of Mexico. These areas are covered with saltwater at daily high tides. The areas are subject to movement by the wind and tide and are bare of vegetation in most places. The only vegetation is salt-tolerant plants.

Wulfert muck is a nearly level, very poorly drained soil on broad tidal swamps. The water table fluctuates with the tide. Areas are subject to tidal flooding. Natural vegetation consists of mangrove species and needle rush (*Juncus roemerianus*).

Kesson fine sand is a nearly level, very poorly drained soil in broad tidal swamps. Areas are subject to tidal flooding. The water table fluctuates with the tide. Natural vegetation consists of black mangrove (*Avicennia germinans*), saltwort (*Batis maritima*), bushy seaside oxeye (*Borrichia frutescens*), and white mangrove (*Laguncularia racemosa*).

Immokalee sand, 0 to 2 percent slopes is a nearly level, poorly drained soil in flatwood areas. Available water capacity is medium in the subsoil and very low in the surface and subsurface layers. Natural vegetation consists of palmetto (*Serenoa repens*), fetterbush (*Lyonia lucida*), wiregrass (*Aristida stricta*), and slash pine.

Urban land consists of areas that are more than 85 percent covered with parking lots, airports, shopping centers, large buildings, streets, and sidewalks. Unoccupied areas are mostly lawns, vacant lots, and recreational fields.

Matlacha gravelly, 0 to 2 percent slopes is a nearly level somewhat poorly drained soil formed by filling and earthmoving. Most of the natural vegetation has been removed, or the existing vegetation consists of various scattered weeds.

Waters of the Gulf of Mexico is a moderately well drained sandy soil found on rises, knolls, and ridges of mesic uplands. Associated vegetation cover types include longleaf pine-turkey oak communities.

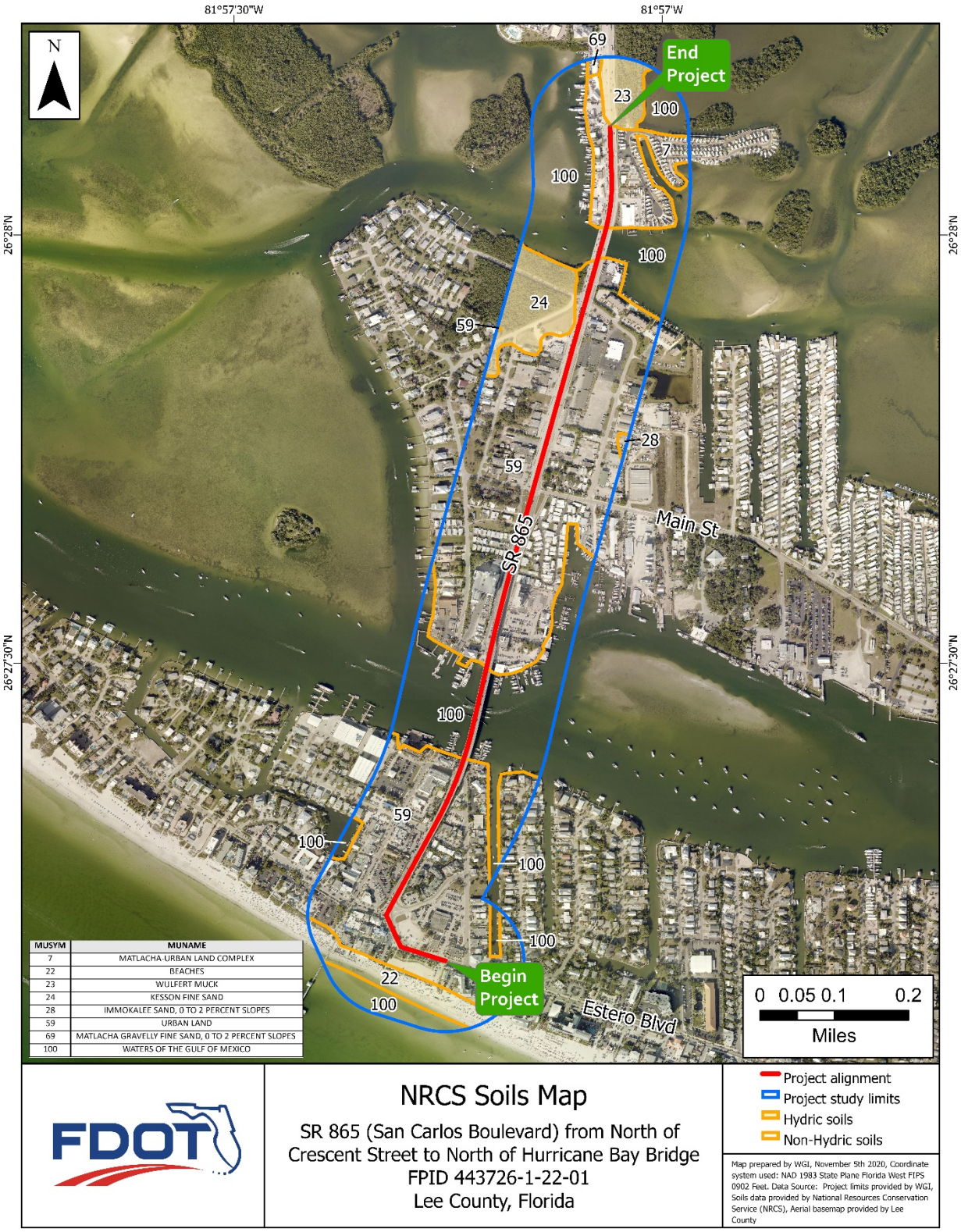

***Figure 7**. NRCS Soils map of SR 865 (San Carlos Blvd.) Study Area*

3.0 PROTECTED SPECIES AND HABITAT

The USFWS, through the Endangered Species Act (ESA) and other regulatory instruments, and the Florida Fish and Wildlife Conservation Commission (FWC), through Rule 68 A-27.0031, F.A.C., regulate activities that may affect protected species. Information regarding the occurrence, or likelihood of occurrence, for any protected species was gathered for the project corridor in order to comply with agency regulations. The analysis is consistent with Part 2, Chapter 16, Protected Species and Habitat of the PD&E Manual

A literature review was conducted to identify those species listed by the USFWS and FWC as being Endangered, Threatened, Species of Special Concern, or otherwise regulated through statute, rule, or treaty (collectively described as "protected species") that may have the potential to occur within the project corridor. Regulatory areas, including USFWS Critical Habitat and Consultation Areas, were also overlain with the project boundary to determine potential involvement of protected species. Protected species lists were also obtained from the USFWS and FWC via the FDOT Efficient Transportation Decision Making (ETDM) and Information for Planning and Consultation (IPaC) web sites. The FNAI was contacted for documented occurrences of listed species within one mile of the project alignment (see **Appendix B**).

Field visits to assess the potential occurrence of protected species within the study corridor were conducted in September 2019, February 2020, and November 2020. Wildlife observations were performed by qualified environmental scientists through direct observation or recognition of tracts, scat, calls, or other visual cues. Observations were performed utilizing haphazard pedestrian transects within the project boundary. Observational data were recorded using the ArcGIS Collector™ application on a mobile tablet device.

The potential for occurrence for each species was designated as *None*, *Low*, *Moderate*, or *High* based on the type of habitat present within the Study Area, its relative condition, and if the species has been previously documented or was observed in the Study Area. A *None* rating indicates that no habitat for that species was found within the study area. A *Low* rating indicates that minimal/suboptimal habitat for that species was found within the study area, but the species has not been documented within the study area. A *Moderate* rating indicates that suitable habitat exists, and the species has been documented within one mile of the study area. A *High* rating indicates that suitable habitat exists, and the species was observed during field reviews.

While the proposed project has taken all practicable measures to avoid and minimize impacts to potentially occurring protected species and their habitats, unavoidable impacts may occur because of roadway improvements. A determination of the anticipated project "effect" on protected species was made based on their probability of occurrence within the project study area, the proposed changes to their habitat quality, quantity and availability as a result of project construction, and how each species is expected to respond to anticipated habitat changes. An "effect determination" is provided for each species below.

A summary of all protected species with either verified occurrence records in the project corridor, observations during field visits, or regulatory areas that overlap the project boundary can be found within **Table 3** below and are individually described below.

Table 3. Protected species with the potential to occur within the SR 865 (San Carlos Blvd.) Study Area

Taxon	Scientific Name	Common Name	Protection Status*	Habitat	Potential for Occurrence
Mollusks	None				
Crustaceans	None				
Insects	None				
Fishes	*Pristis pectinata*	Smalltooth sawfish	E	Coastal areas such as estuaries, river mouths, and bays (juveniles); open water and deep-water reefs (adults)	Moderate
Amphibians	None				
Reptiles	*Alligator mississippiensis*	American alligator	T (S/A)	Freshwater lakes and slow-moving rivers and associated wetlands, occasional in brackish water habitats	Low
	Caretta caretta	Loggerhead Sea Turtle	T	Subtropical and temperate oceans of the world; sandy beaches (nesting)	Moderate
	Crocodylus acutus	American crocodile	T	Brackish and saltwater areas, mangrove swamps	Low
	Drymarchon couperi	Eastern indigo snake	T	Pine flatwoods, hardwood forests, mesic hammocks, and cypress swamps	Low

* Protection Status abbreviations in order of appearance: FAC = Florida Administrative Code; ST = State-designated Threatened; T = Federally Threatened; E = Federally Endangered; BGEPA = Bald and Golden Eagle Protection Act; MMPA = Marine Mammal Protection Act; T(S/A) = Federally Threatened due to Similarity of Appearance; C = Federal Candidate Species

Taxon	Scientific Name	Common Name	Protection Status*	Habitat	Potential for Occurrence
Reptiles	*Gopherus polyphemus*	Gopher tortoise	C; ST	Well-drained, sandy soils found in Longleaf pine sandhills, xeric oak hammocks, scrub, pine flatwoods, dry prairies, and coastal dunes, also disturbed habitats including pastures and urban areas	Low
	Lepidochelys kempii	Kemp's Ridley Sea Turtle	E	Marine waters of the Gulf of Mexico and western North Atlantic Ocean; sandy beaches (nesting)	Moderate
	Chelonia mydas	Green Sea Turtle	E	Marine waters of the Gulf of Mexico and western North Atlantic Ocean; sandy beaches (nesting)	Moderate
Birds	*Antigone canadensis pratensis*	Florida sandhill crane	ST	Freshwater marshes, prairies, and pastures	Low
	Aphelocoma coerulescens	Florida scrub-jay	T	Sand pine and xeric oak scrub and scrubby flatwoods	None
	Athene cunicularia floridana	Florida burrowing owl	ST	Open prairies and disturbed areas with minimal vegetation	Low
	Calidris canutus rufa	Red knot	T	Coastal habitats	Low
	Charadrius melodus	Piping plover	T	Sandy beaches, sand flats, and mudflats (coastal)	Low
	Charadrius nivosus	Snowy plover	ST	Sandy beaches (coastal)	Low

* Protection Status abbreviations in order of appearance: FAC = Florida Administrative Code; ST = State-designated Threatened; T = Federally Threatened; E = Federally Endangered; BGEPA = Bald and Golden Eagle Protection Act; MMPA = Marine Mammal Protection Act; T(S/A) = Federally Threatened due to Similarity of Appearance; C = Federal Candidate Species

Taxon	Scientific Name	Common Name	Protection Status*	Habitat	Potential for Occurrence
	Egretta caerulea	Little Blue Heron	ST	Fresh, salt, and brackish water environments, including swamps, estuaries, ponds, lakes, and rivers	Low
	Egretta rufescens	Reddish egret	ST	Coastal areas, mainly estuaries near mangroves, lagoons, and spoil islands	Low
	Egretta tricolor	Tricolored heron	ST	Fresh, salt, and brackish water environments, including swamps, estuaries, ponds, lakes, and rivers	Low
	Falco sparverius paulus	Southeastern American kestrel	ST	Open woodlands, sandhill, fire maintained savannah pine habitats, pastures, and open fields	Low
	Haematopus palliates	American oystercatcher	ST	Beaches, sandbars, spoil islands, shell rakes, salt marsh, and oyster reefs (coastal)	Low
	Haliaeetus leucocephalus	Bald eagle	BGEPA	Mature forests (nesting); shallow fresh or salt water (foraging)	Low
	Mycteria americana	Wood stork	T	Mixed hardwood swamps, sloughs, mangroves, and cypress domes/strands (nesting); freshwater and estuarine marshes (forage)	Low
	Laterallus jamaicensis	Eastern Black Rail	T	Marshes, salt, brackish, and freshwater wetlands	Low

* Protection Status abbreviations in order of appearance: FAC = Florida Administrative Code; ST = State-designated Threatened; T = Federally Threatened; E = Federally Endangered; BGEPA = Bald and Golden Eagle Protection Act; MMPA = Marine Mammal Protection Act; T(S/A) = Federally Threatened due to Similarity of Appearance; C = Federal Candidate Species

Taxon	Scientific Name	Common Name	Protection Status*	Habitat	Potential for Occurrence
	Platalea ajaja	Roseate spoonbill	ST	Marshes, lagoons, mudflats, and mangrove forests (coastal and inland)	Low
	Rynchops niger	Black skimmer	ST	Estuaries, beaches, and sandbars (coastal and inland)	Low
	Sternula antillarum	Least tern	ST	Sandy beaches (coastal and inland) and man-made structures	Low
Mammals	*Eumops floridanus*	Florida bonneted bat	E	Semitropical forests with tropical hardwood, pineland, and mangrove habitats and disturbed habitats including golf courses and suburban neighborhoods	High
	Trichechus manatus	West Indian manatee	T	Rivers, bays, canals, estuaries, and coastal areas	High
	Tursiops truncatus	Common bottlenose dolphin	MMPA	Temperate and tropical oceans of the world	High
	Chiroptera	Roosting bats	FAC	Caves, crevices of trees and palms, and manmade structures (roosting)	Moderate
Plants	*Harrisia aboriginum (syn = Cereus gracilis)*	Aboriginal prickly-apple	E	Maritime hammocks	Low
	Asimina pulchella (syn = *Deeringothamnus pulchellus*)	Beautiful pawpaw	E	Mesic pine flatwoods	None

* Protection Status abbreviations in order of appearance: FAC = Florida Administrative Code; ST = State-designated Threatened; T = Federally Threatened; E = Federally Endangered; BGEPA = Bald and Golden Eagle Protection Act; MMPA = Marine Mammal Protection Act; T(S/A) = Federally Threatened due to Similarity of Appearance; C = Federal Candidate Species

3.1 FEDERALLY LISTED SPECIES

The **smalltooth sawfish** is a large, cartilaginous fish belonging to the group including rays, skates, and sharks. Sawfish get their name from their distinct rostrum – a long, flat snout edged in teeth-like scales – that looks like a saw. Smalltooth sawfish live in tropical seas and estuaries of the Atlantic Ocean. This species is listed federally as endangered and regulated by the NOAA Fisheries. While the study area lies within the federal designated Smalltooth Sawfish Critical Habitat (see **Figure 9**), the proposed action will not result in destruction or adverse modification of critical habitat. Additionally, this species was not observed during the field reviews of the study area. To minimize potential adverse impacts to the smalltooth sawfish, the FDOT will implement the NOAA-approved *Sea Turtle and Smalltooth Sawfish Construction Conditions* (revised March 2006) during the proposed roadway improvements (**Appendix C**). Based on this information, the project determination is **may affect, not likely to adversely affect** the smalltooth sawfish.

The **Loggerhead sea turtle** is the most abundant sea turtle found in the U.S. Atlantic and Gulf of Mexico waters. Named for its relatively large head, the loggerhead sea turtle feeds on hard-shelled prey, such as whelks and conch. The shell is heart-shaped and reddish-brown in adults. Adults and juveniles use coastal areas for foraging habitat, inter-nesting habitat, and migratory habitat. Florida's sandy Atlantic and Gulf of Mexico beaches comprise one of the largest nesting aggregations of loggerhead sea turtles in the world. The loggerhead sea turtle is listed as threatened by the USFWS. Adult **Kemp's ridley sea turtle** are the smallest sea turtle in the world. Recognized by their size and olive-gray circular shaped shell, Kemp's ridley sea turtles are primarily found in nearshore coastal habitats with mud or sand bottoms where their preferred prey (crabs) are more abundant. Although rare, occasional nesting has been documented along Florida's southwestern coastline. Kemp's ridley sea turtle is listed as endangered by the USFWS. **Green sea turtle** is among the largest of turtles and is a circum-global species found in coastal and estuarine areas where water temperatures exceed 20 degrees Celsius. They are known to nest near the dune on coastal sandy beaches. Green sea turtles will return to the same beaches for every nesting event. Adult green sea turtles feed primarily on submerged aquatic vegetation (SAV), while young hatchlings tend to eat invertebrates, fish eggs, and macroalgae. The Green sea turtle is listed as endangered by the USFWS.

The USFWS and NOAA Fisheries share Federal jurisdiction for sea turtles with the USFWS having lead responsibility on the nesting beaches and NOAA Fisheries, the marine environment. The project study area lies within the USFWS Consultation Area for the loggerhead sea turtle and Kemp's ridley sea turtle. None of the alternatives considered will result in loss of habitats used by sea turtles. Additionally, neither species was observed during the field reviews of the study area. To minimize potential adverse impacts to sea turtles during construction activities, the FDOT will implement the NOAA-approved *Sea Turtle and Smalltooth Sawfish Construction Conditions* (revised March 2006; **Appendix C**). Based on this information, the project determination is **may affect, not likely to adversely affect** the sea turtles.

The **eastern indigo snake** is listed under both federal and state law as threatened. This large, stout-bodied, shiny black snake can reach 8 feet in length and will utilize a wide range of habitats from scrub and sandhills to wetlands throughout Florida. They are known to winter in gopher tortoise burrows. Eastern indigo snakes require large tracts of natural land to survive, typically foraging in more hydric habitats. No eastern indigo snakes were observed during the field review of the corridor. Less than 25 acres of xeric habitat will be impacted by the construction of the roadway and associated pond sites. Although no gopher tortoise burrows or other underground refugia were identified during field reviews, the *Standard Protection Measures for the Eastern Indigo Snake* found in **Appendix D** will be implemented prior to construction, including inspection prior to site manipulation. Therefore, based on the USFWS' Determination Key (A > B > C > D > NLAA), a **may affect, but not likely to adversely affect** determination has been made for this species.

The **American alligator** is classified by the USFWS as similarity of appearance to a threatened species due to its resemblance to other protected crocodilian species. They prefer freshwater lakes and slow-moving rivers and their associated wetlands, but they can also be found in brackish water habitats. No individuals were noted during field visits. However, due to the sizable population on Sanibel Island, and the potential for use of the project area waterways, this project **may affect, but not likely to adversely affect** the American alligator.

The **American crocodile** is a large, greenish-gray crocodilian with black mottling. It can be distinguished from the American alligator by the former having a narrower, longer snout and an exposed fourth tooth on the lower jaw. American crocodiles inhabit coastal areas throughout the Caribbean and occur at the northern limits of their range in south Florida. American crocodiles are found in brackish or saltwater areas including ponds, coves, creeks, and mangrove swamps. They can also occasionally be found in freshwater systems, especially associated with man-made canals and ditches. The American crocodile is listed as threatened by the USFWS. While marginally suitable habitat is present in the project area in the bay and mangrove areas, the project area is located at the northern limits of the American crocodile's range. There were no observations of American crocodiles during field reviews. Due to the sizable population on Sanibel Island, and the potential for use of the project area waterways, this project **may affect, but not likely to adversely affect** the.

The **West Indian manatee** is a gray, nearly hairless, aquatic mammal that is listed as threatened by the USFWS. This large herbivore is typically found in coastal tidal rivers and streams, mangrove swamps, salt marshes, freshwater springs, and vegetated bottoms of the Gulf of Mexico and the Atlantic Ocean. The manatee feeds on a wide range of aquatic vegetation but prefers shallow grass beds in coastal and riverine habitats. Hurricane Bay and Matanzas Pass are included in a larger area designated as critical habitat by the USFWS and manatees have been documented in the vicinity of the project area. However, minimal suitable foraging habitat is present within the project study area for this species and no individuals were observed during field reviews. The proposed project activities will not result in adverse modification or significant destruction of critical habitat, as Lee County (per 68C-22.005 F.A.C.) has established Manatee Slow Speed Zones All Year and 25 MPH zones in areas adjacent to and surrounding the project area. In addition, with the implementation of the USFWS *Standard Manatee Conditions for In-water Work* (2011) (**Appendix E**) and the limited in-water activities proposed, it has been determined that the project **may affect, but is not likely to adversely affect** the West Indian manatee.

The largest bat in Florida, the **Florida bonneted bat** can be distinguished from other bats within its range by its size and anatomy of the ears (joined at the midline of the head). Roosting occurs in palms and hollow trees as well as man-made structures. Florida bonneted bats have been detecting foraging in a variety of habitats including semitropical hardwood forests, pineland, and mangrove forests in addition to suburban areas such as golf courses and neighborhoods. The Florida bonneted bat is listed as endangered by the USFWS, which also recently proposed Critical Habitat for the Florida bonneted bat in the Federal Register (June 2020). The project is located within the USFWS Florida Bonneted Bat Consultation Area. Based on the USFWS' Consultation Key for the Florida bonneted bat (1a > 2a > 3b), a full acoustic / roost survey is necessary. Per the USFWS Consultation Key, a formal bat acoustic and roost survey was completed in November 2020, and the presence of the Florida bonneted bat was confirmed (**Appendix F**). The FDOT will commit to initiating ESA Section 7 informal consultation with USFWS for the Florida bonneted bat following the submittal of the NRE. However, no potential roost trees were identified during the roost survey. Bridges were assessed, although expansion joints observed appeared filled and did not exhibit adequate space required for roosting bats. No signs of roosting, such as guano or staining, were observed on any other areas of the bridges. Considering only one diagnostic call of the Florida bonneted bat was confirmed and no potential roosting features/signs were observed, the Project is not expected to adversely affect the species.

Following the Florida Bonneted Bat Consultation Key in the 2019 Guidelines, (3b. Project size/footprint >5 acres (go to 6) > (6a. Results show some FBB activity (go to 7) > 7b. Results do not show FBB roosting is likely (go to 10) > 10b. Results do not show high FBB activity/use (go to 12) > 12b. Project will affect ≤50 acres of FBB habitat (roosting and/or foraging), and providing the Best Management Practices to help conserve Florida bonneted bats that may be foraging or roosting in an area, It has been determined that the proposed project **may affect, but is not likely to adversely affect** the Florida bonneted bat.

The **Florida scrub-jay** is listed by both the USFWS and FWC as threatened. This small, blue and gray bird is very gregarious in nature. They can be found in low-growing, oak scrub habitat with well drained soils as well as fallow orange groves. They are year-round residents in Florida but are most likely to be spotted between March and October. No appropriate habitat occurs within the project area and no individuals were noted during field visits. Therefore, this project has been determined to have **no effect** on the species.

The **red knot** is a large, stocky sandpiper with a medium straight bill and dark legs. Nesting occurs in High Arctic tundra habitats. Wintering birds along the Atlantic and Gulf Coasts are found almost exclusively in marine habitats – sandy beaches, salt marshes, mudflats, and mangrove forests. The diet consists of mollusks, arthropods, and other invertebrates; however, they are particularly reliant on the eggs of horseshoe crab (*Limulus polyphemus*) during spawning. The eastern subspecies of red knot is listed as threatened by the USFWS and no Critical Habitat has been designated. None of the alternatives considered will result in loss of habitats used by the red knot. Therefore, this project has been determined to have **no effect** on the species.

The **piping plover** is a species of small shorebird distinguished from other North American belted plovers by the presence of a short, stout black bill, yellow to greenish-olive legs, and a white band across upper tail feathers. Migrant piping plovers are generally more lightly colored with many of the dark breeding markings faded. No breeding populations occur in Florida. In Florida, piping plovers are found in southern peninsular Gulf and Atlantic coast habitats including beaches, mudflats, and sandflats, as well as barrier islands and spoil islands from mid-July through mid-May. The piping plover is listed as threatened by the USFWS. The project is not located within the USFWS designated Critical Wintering Habitat for the piping plover. None of the alternatives considered will result in loss of habitats used by the piping plover. Therefore, this project has been determined to have **no effect** on the species.

The **wood stork** is a long-legged, large-bodied white bird with black in the wings and tail. Wood storks nest in colonies in a variety of inundated forested wetlands such as cypress swamps, sloughs or mangroves. Foraging habitat includes shallow freshwater marshes, ponds, ditches or pastures. The USFWS and the FWC both list the wood stork as threatened. No wood storks were observed during field visits within the project boundary or within the shallow marshes and adjacent to the project area and no suitable nesting or foraging habitat exists within the project boundary. Based on the USFWS' Determination Key (A > "no effect"), a **no effect** determination is anticipated for this species, as the project is located greater than 0.76 km (0.47 miles) from an active colony site and does not affect Suitable Foraging Habitat (SFH).

The **Eastern black rail** is the smallest rail species in North America. Adult black rails are pale to blackish gray, with a small black bill and bright red eyes. The secretive marsh bird inhabits saltwater, brackish, and freshwater marshes across the eastern U.S., while the majority of the population inhabit the Atlantic Coast. The black rail is a wetland dependent bird requiring dense overhead cover, soils that are saturated and interspersed with or adjacent to very shallow waters. In Florida Gulf Coast marshes, habitat occupied by the eastern black rail is comprised of black needlerush with bands of coastal saltgrass. The black rail is listed as threatened by the USFWS. None of the alternatives considered will result in loss of habitats used by the black rail. Therefore, this project has been determined to have **no effect** on the species.

The project area was evaluated for the presence or absence of federally listed plant species. Listed plant species with the potential to occur in the project study area include the **aboriginal prickly-apple** and **beautiful pawpaw**. Land uses within the project corridor consist of previously disturbed areas, commercial and residential, stormwater management facilities, and utility corridors on either side of the existing roadway. Due to the historic use of the project area as developed land and frequent disturbance due to vehicle traffic and vegetation control, no habitat exists that would support the protected plant species identified above. During field reviews, no protected plant species were observed within the project corridor. Therefore, the project has been determined to have **no effect** on listed plant species.

3.2 STATE LISTED SPECIES

The **gopher tortoise** is a medium sized turtle fully adapted for life on land. The forelimbs are greatly expanded for excavating deep burrows to escape predators, weather, and fire. Gopher tortoises are found in dry habitats such as sandhills, xeric oak habitats, and dry pine flatwoods. More than 300 "commensal" species of animals have been recorded sharing gopher tortoise burrows. Gopher tortoises are listed by the FWC as State designated Threatened. The project area includes poor quality habitat, as the highwater table from adjacent marine/estuarine environments preclude burrowing; and no gopher tortoise or their burrows were identified during field reviews. This project has been determined to have no effect on the species.

Florida sandhill cranes are tall, long-necked, long-legged birds ranging throughout the Florida peninsula from Okefenokee Swamp to the Everglades. These birds spend much of the year foraging within a variety of habitats including improved pasture, open pine forests, agricultural cropland, and freshwater marshes. In South Florida, the Florida sandhill crane typically nests in shallow freshwater marshes and forages on agricultural lands. They are listed as State Threatened by FWC. No sandhill cranes were observed during field reviews and no nesting habitat exists within the project Study Area, therefore, no effect is anticipated for this species.

The **Florida burrowing owl** is a small raptor that resides in open, treeless areas where it spends most of its time on the ground. Its sandy brown plumage provides camouflage from predators from its ground-level perch. Throughout the state its distribution is considered localized and spotty. They often inhabit native prairies, golf courses, airports, and vacant lots. Burrows are used year-round and are dug on their own, however, they can also utilize gopher tortoise or armadillo burrows opportunistically. They are listed as State Threatened by the FWC. The project corridor includes suboptimal habitat, as the highwater table from adjacent marine/estuarine environments preclude burrowing; and no burrowing owls or their burrows were observed during the field review. Therefore, no effect is anticipated for this species.

The **snowy plover, American oystercatcher,** and **black skimmer** are shorebirds associated with the sandy beaches along the Gulf Coast. Nesting occurs on sandy, shelly, or stony ground with sparse to no vegetation present. The diet consists of shellfish, marine worms, and other small invertebrates and small fish of the intertidal zone. The species included here are listed as State Threatened by the FWC. No wetlands, surface waters, or beach habitats will be impacted as a result of this project. Therefore, no effects to these beach nesting shorebirds are anticipated.

The **little blue heron**, **reddish egret**, **roseate spoonbill**, and **tricolored heron**, collectively belong to the group termed "wading birds" and are common to wetlands where they forage for small fish and invertebrates. The species included here are listed as State Threatened per the FWC. Review of the FWC Historical Waterbird Colony Locator identified one known rookery in the project area. The Matanzas Pass Island is uninhabited mangrove island approximately 0.3 miles northwest of the Matanzas Pass Bridge. The island is designated as a Critical Wildlife Area by the FWC, which carries restrictions on access during seasonal nesting periods (Chapter 68A-19.005, F.A.C.). The restrictions include year-round closure with a 100-foot perimeter buffer; the project area is located ~1,500 feet from the

buffer area. No wetlands or surface waters will be impacted as a result of this project. Therefore, no adverse effects to wading birds are anticipated.

The **Southeastern American kestrel** is a small falcon that is a full time Florida resident. This sub-species is similar in appearance to the American kestrel, which is a migratory species that winters in Florida. The Southeastern American kestrel utilizes cavities within older longleaf pine and live and turkey oak trees, many of which have been abandoned by woodpeckers. These small predators can be seen at the edge of longleaf pine, turkey oak and live oak woodlands, in open land/pastures and along power lines and fence lines hunting for insects, reptiles, and small mammals. The FWC lists this species as State Threatened. No nesting habitat for kestrels is present along the project corridor and no kestrels were sighted during field reviews. The project alignment will not result in removal of potential nest trees; therefore, no effect is anticipated for this species.

3.3 NON-LISTED PROTECTED SPECIES

The **bald eagle** was delisted by the USFWS and FWC because the population has recovered in the lower 48 states, threats to the species have been reduced or eliminated, and reproductive success has significantly increased. The bald eagle continues to be managed and protected by the Bald and Golden Eagle Protection Act (BGEPA) and the Migratory Bird Treaty Act (MBTA). In addition, the bald eagle is protected in Florida under 68A-16.002, F.A.C. The FWC bald eagle nest locator database does not indicate any active or inactive bald eagle nests within 660 feet of the project limits. The nearest active nest, LE084, occurs approximately 1.3 mile to the northeast of the project limits. Given that there are no documented nests within 660-feet of the project boundary and no bald eagles were observed during field visits, no adverse impacts are anticipated.

The **common bottlenose dolphin** is the most frequently observed dolphin species in Florida's coastal waters. Bottlenose dolphins have robust, powerful bodies that are blue-gray on top with lighter coloration on the lateral and ventral sides. The common bottlenose dolphin is protected under the Marine Mammal Protection Act (MMPA), implemented by NOAA Fisheries. A specimen was observed in the water outside the project study limits, but continuous with the waters found in the project study limits. Observers following the criteria in the USFWS *Standard Manatee Conditions for In-water Work* (2011) and *Sea Turtle and Smalltooth Sawfish Construction Conditions* (revised March 2006) may also report observations of the common bottlenose dolphin and other mammal species protected under the MMPA. With the limited in-water activities proposed and implementation of construction conditions for similar protected species, no adverse impacts are anticipated.

Roosting bat species are protected from take in Florida under rule 68A-4.001 and 68A-9.010, F.A.C. Bats are particularly vulnerable to disturbance and harm at roosting sites as these sites are often limited and therefore bats will congregate in large numbers. Bats also rear their young at roost sites and show a strong fidelity to these sites over multiple maternity seasons. A visual inspection was conducted in February 2020 of the Hurricane Pass Bridge and Matanzas Pass Bridge deck and superstructures and resulted in no observations or evidence of roosting bats. With the absence of current and previous observations in the project area, no impacts are anticipated.

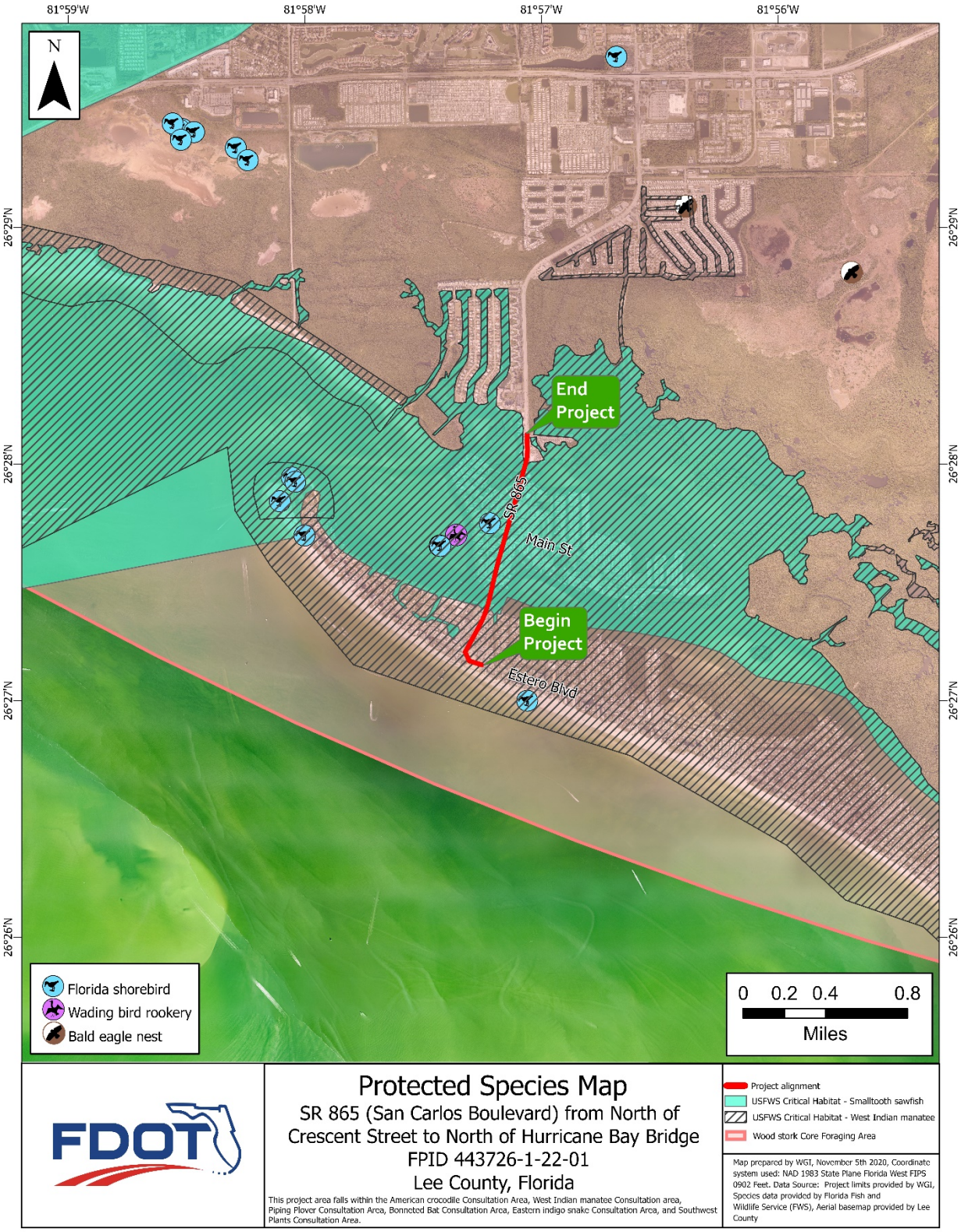

Figure 8. *Protected Species map of SR 865 (San Carlos Blvd.) Study Area*

4.0 WETLANDS AND OTHER SURFACE WATERS

The jurisdictional extent of wetlands and other surface water systems within the study area was approximated through the review of aerial imagery, NWI databases, United States Geological Survey topographic maps, NRCS soil survey maps, FLUCCS maps, and field verification. Wetland limits were identified in general accordance with the United States Army Corps of Engineers' (USACE) Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region (November 2010) and the state of Florida's Delineation of the Landward Extent of Wetlands and Surface Waters (Chapter 62-340, Florida Administrative Code). A formal determination of wetland limits will be initiated during design with the SFWMD and U.S. Army Corps of Engineers.

Mapped wetland areas were derived from SFWMD GIS shapefiles using FLUCCS classification (FDOT, 1999) and further categorized using the Classification of Wetlands and Deepwater Habitats of the United States, (Cowardin, *et. Al.*, 1979) as adopted by the USFWS and the NWI (**Figure 9**) and FNAI Guide to the Natural Communities of Florida (FNAI, 2010).

Wetland dependent wildlife species observed during field visits include bottlenose dolphin (*Tursiops truncatus*), osprey (*Pandion haliaetus*), American white pelican (*Pelecanus erythrorhynchos*), brown pelican (*Pelecanus occidentalis*), great blue heron (*Ardea herodias*), double-crested cormorant (*Phalacrocorax auritus*), blue crab (*Callinectes sapidus*), eastern oyster (*Crassostrea virginica*).

Jurisdictional wetlands and surface waters identified within the project study area consist of estuarine habitats common to Hurricane Bay and Matanzas Pass waterbodies. These habitats include open water and mangrove forests; none of which will be impacted as a result of project activities. The Estero Bay Aquatic Preserve is located directly adjacent to the Hurricane Pass Bridge. The aquatic preserve was dedicated in December 1966 as the state's first aquatic preserve. The preserve is state-owned sovereign submerged lands which have been designated as having exceptional biological, aesthetic and scientific value, as described in Chapter 258.39, F.S. The aquatic preserve is designated as an Outstanding Florida Water (Ch. 62-302.700, F.A.C.), which is given the state's highest level of water quality protection. No in-water work will be conducted; thus, no adverse direct or indirect impacts are anticipated. Representative photographs of project habitat types, including adjacent wetlands, can be found in **Appendix A**.

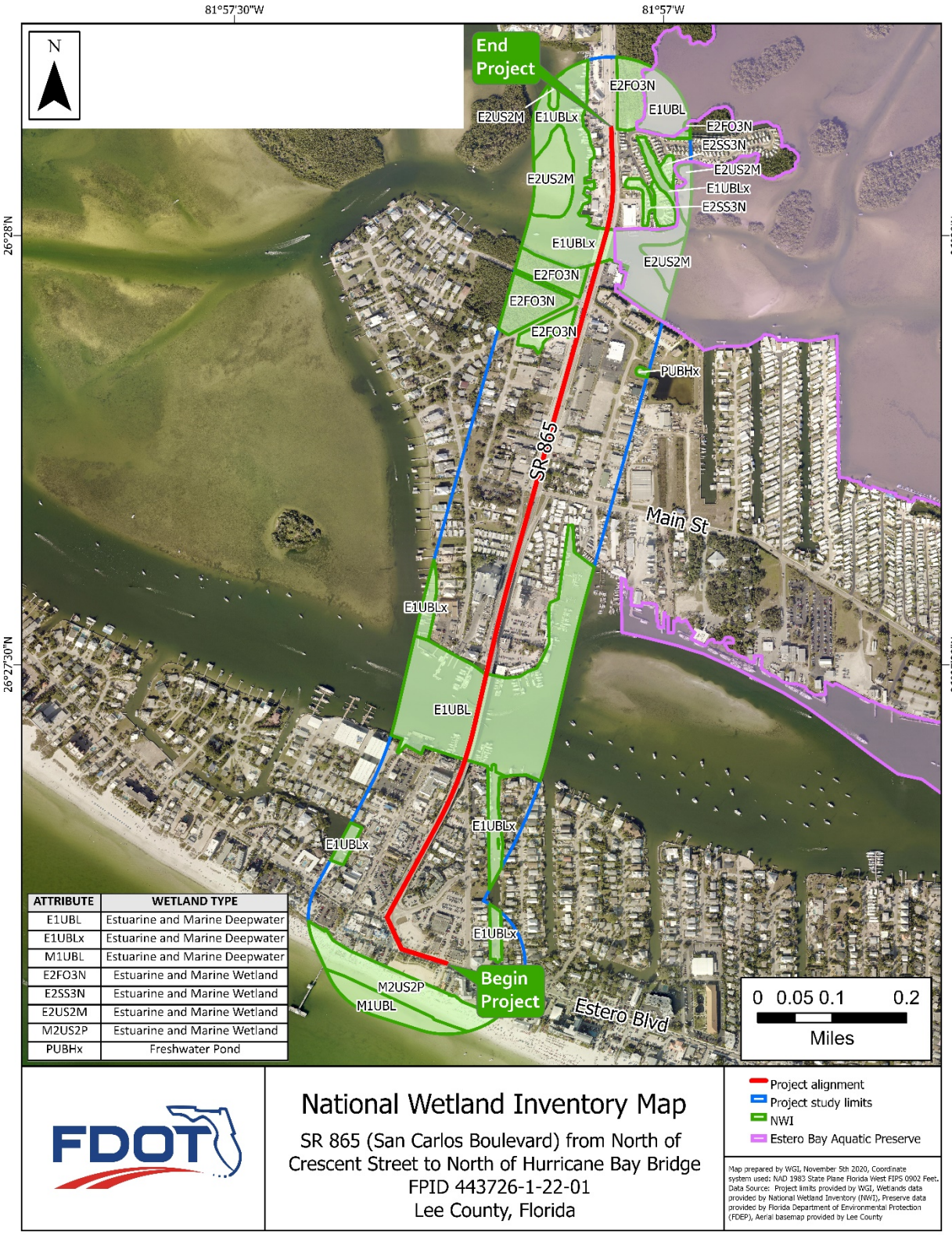

Figure 9. *USFWS National Wetland Inventory (NWI) map of SR 865 (San Carlos Blvd.) Study Area*

5.0 ESSENTIAL FISH HABITAT

The Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act), as amended by the Sustainable Fisheries Act of 1996, requires that fishery management plans describe and identify EFH; minimize to the extent practicable adverse effects on such habitat caused by fishing; and identify other actions to encourage the conservation and enhancement of such habitat. EFH is defined as those waters and substrate necessary to fish for the spawning, breeding, feeding, or growth to maturity. The designation of EFH permits regional fishery management councils and the National Oceanic and Atmospheric Administration (NOAA) Fisheries to intervene in decisions on non-fishing activities by highlighting essential habitat and requires other federal agencies with responsibility for proposed non-fishing actions to consult with NOAA Fisheries on projects with potential adverse impacts to EFH. As a subset of the areas identified as EFH, the regional management councils can identify Habitat Areas of Particular Concern (HAPC). HAPCs are those areas within EFH that are of ecological importance to the long-term sustainability of managed species or are rare or susceptible to degradation or development.

The proposed project is within the Gulf of Mexico Fishery Management Council (GMFMC) area of jurisdiction, which extends from the Texas/Mexico border to the Florida Keys and seaward to the limit of the United States' exclusive economic zone (200 nautical miles from the baseline of the territorial sea). Due to their pan-regional distribution, coastal pelagic migratory fisheries (e.g., mackerels) and highly migratory species (e.g., tunas, swordfish, sharks, and billfish) are managed jointly by the GMFMC and South Atlantic Fishery Management Council and NOAA Fisheries, respectively.

A description of project elements and activities that have the potential to require consultation with NMFS under jurisdiction of the Magnuson-Stevens Act are individually described below.

Matanzas Pass Bridge

The existing SR 865 bridge over Matanzas Pass (structure ID 120088) begins at mile post 0.138. The bridge structure measures 2,103 feet long and the deck is 49.2 feet five wide at the channel crossing (64.9 feet vertical clearance); in addition to spanning over Matanzas Pass, this bridge is elevated over multiple local streets, fishing piers, and several City of Fort Myers Beach parking areas. The current configuration consists of two travel lanes (one northbound and one southbound), with a dedicated southbound bus lane, and one pedestrian path.

The proposed operational improvements to SR 865 include widening the Matanzas Pass Bridge to accommodate an additional southbound lane and shared-use path to the outside (west). Widening will be accomplished by the partial demolition and reconstruction of the existing bridge deck and the addition of a concrete deck overhang attached to the existing deck structure – requiring no additional beams or new substructures. Construction barges will only be needed for debris collection and minor construction activities, avoiding the need for larger crane vessels. Widening will not result in any change to the structures existing vertical clearance. Therefore, no direct or secondary impacts to EFH should occur, as shading from the minor widening will be negligible and no boat/barge anchoring will take place. The existing piers, foundations, and fender structures associated with the federal channel will remain. All work is proposed within the existing FDOT ROW and no additional ROW is required.

Hurricane Bay Bridge

The Hurricane Bay Bridge (structure ID 120089) is a flat slab bridge beginning at mile post 0.947. The bridge structure measures 350 feet long and the deck width is 83.5 feet; the minimum vertical clearance is approximately 6 feet above mean high water elevation at mid-bent. The north abutment incorporates a concrete bulkhead at the water interface while the south abutment is located above the mean highwater elevation. Scour countermeasures (articulated concrete block) were installed in 2016 at the channel bottom. The current traffic configuration consists of two southbound lanes,

a dedicated southbound left turn lane, two northbound lanes, and a barrier separated sidewalk on the east side of the bridge.

The proposed operational improvements to SR 865 include milling, resurfacing, and restriping the lanes on Hurricane Pass Bridge to provide bike lanes in both directions and constructing additional barrier wall to provide a sidewalk on the west side of the bridge, to supplement the existing sidewalk on the east side of the bridge. All proposed improvements are to the existing bridge surface. No widening or construction in-water is anticipated. All work is proposed within the FDOT ROW and no additional ROW is required. Therefore, no direct or secondary impacts to EFH should occur within the Hurricane Bay Bridge project area as improvements will occur within the existing footprint.

5.1 EXISTING ESSENTIAL FISH HABITAT

EFH is defined as all marine and estuarine waters and substrates (mud, sand, shell, rock, hardbottom, and associated biological communities) including sub-tidal vegetation (seagrasses and algae) and adjacent inter-tidal vegetation (marshes and mangroves) from the shoreline to the seaward limit of the exclusive economic zone. The project study area includes portions of both Hurricane Bay and Matanzas Pass. EFH within the project study area consists of tidally influenced open-water channels with infrequent seagrass coverage and a littoral fringe of red and black mangroves, oyster reefs, or bare sand. The areas directly affected by the proposed roadway improvements are either located behind concrete bulkheads or above the waterline. No HAPCs were identified in the project study area.

The proposed project is located within an area designated as EFH for three Fishery Management Plans (FMP): Gulf of Mexico, Coastal Migratory Pelagic, and Highly Migratory Species management plans. NOAA Fisheries has identified and described EFH for 60 managed species within the project study area. These include the red drum, 43 managed reef species, 4 managed shrimp species, 3 managed coastal migratory pelagic species, and 9 managed highly migratory species. Of the sixty managed fisheries species identified, many are likely to occur nearshore at only one life stage (typically early development stages). A description of the life stage and associated habitat where the species commonly occur are included for each EFH.

A summary of all managed fisheries species recorded by the NOAA Fisheries mapping tool can be found within **Table 4** below. The potential for occurrence in the project area is listed for each individual species based on suitable habitat present for at least one life history stage, verified occurrence record in the project corridor, or direct observation during field visits.

Table 4. Managed species under EFH with the potential to occur within the SR 865 (San Carlos Blvd.) Study Area

Fishery Management Unit	Common Name	Scientific Name	Life stage(s) Found at Location	Habitat Association	Potential for Occurrence in Project Area
Red Drum[1]	Red Drum	*Sciaenops ocellatus*	All	Offshore to very shallow estuarine waters	Moderate
Reef Fish[1]	Gray triggerfish	*Balistes capriscus*	All	Juvenile: shallow, inshore areas (grass beds, mangroves, and inshore reefs); Adult: Coral reef, limestone, hard bottom, and artificial reef substrates	Low
	Greater amberjack	*Seriola dumerili*	All		Low
	Lesser amberjack	*Seriola fasciata*	All		Low
	Almaco jack	*Seriola rivoliana*	All		Low
	Banded rudderfish	*Seriola zonata*	All		Low
	Hogfish	*Lachnolaimus maximus*	All		Moderate
	Queen snapper	*Etelis oculatus*	All		Low
	Mutton snapper	*Lutjanus analis*	All		Moderate
	Schoolmaster	*Lutjanus apodus*	All		Moderate
	Blackfin snapper	*Lutjanus buccanella*	All		Low
	Red snapper	*Lutjanus campechanus*	All		Low
	Cubera snapper	*Lutjanus cyanopterus*	All		Low
	Gray (mangrove) snapper	*Lutjanus griseus*	All		Moderate

[1] Gulf of Mexico Fishery Management Plan and Amendments
[2] Gulf of Mexico and South Atlantic Coastal Migratory Pelagic Fishery Management Plan and Amendments
[3] Consolidated Atlantic HMS Fishery Management Plan and Amendments

Potential for Occurrence ratings based on presence of suitable habitat and observational data as follows:
None – suitable habitat does not occur within the Project Area.
Low – suitable habitat present in Project Area at one or more life history stages.
Moderate – suitable habitat present in Project Area and species documented in waterbody.
High – suitable habitat present in Project Area and EFH for managed species present, direct observation of species in Project Area.

Fishery Management Unit	Common Name	Scientific Name	Life stage(s) Found at Location	Habitat Association	Potential for Occurrence in Project Area
Reef Fish[1]	Dog snapper	*Lutjanus jocu*	All	Juvenile: shallow, inshore areas (grass beds, mangroves, and inshore reefs); Adult: Coral reef, limestone, hard bottom, and artificial reef substrates	Low
	Mahogany snapper	*Lutjanus mahogoni*	All		Low
	Lane snapper	*Lutjanus synagris*	All		Moderate
	Silk snapper	*Lutjanus vivanus*	All		Low
	Yellowtail snapper	*Ocyurus chrysurus*	All		Low
	Wenchman	*Pristipomoides aquilonaris*	All		Low
	Vermillion snapper	*Rhomboplites aurorubens*	All		Low
	Goldface tilefish	*Caulolatilus chrysops*	All		Low
	Blackline tilefish	*Caulolatilus cyanops*	All		Low
	Anchor tilefish	*Caulolatilus intermedius*	All		Low
	Blueline tilefish	*Caulolatilus microps*	All		Low
	Golden tilefish	*Lopholatilus chamaeleonticeps*	All		Low
	Dwarf sand perch	*Diplectrum bivittatum*	All		Low
	Sand perch	*Diplectrum formosum*	All		Moderate
	Rock hind	*Epinephelus adscensionis*	All		Low
	Speckled hind	*Epinephelus drummondhayi*	All		Low

[1] Gulf of Mexico Fishery Management Plan and Amendments
[2] Gulf of Mexico and South Atlantic Coastal Migratory Pelagic Fishery Management Plan and Amendments
[3] Consolidated Atlantic HMS Fishery Management Plan and Amendments

Potential for Occurrence ratings based on presence of suitable habitat and observational data as follows:

None – suitable habitat does not occur within the Project Area.
Low – suitable habitat present in Project Area at one or more life history stages.
Moderate – suitable habitat present in Project Area and species documented in waterbody.
High – suitable habitat present in Project Area and EFH for managed species present, direct observation of species in Project Area.

Fishery Management Unit	Common Name	Scientific Name	Life stage(s) Found at Location	Habitat Association	Potential for Occurrence in Project Area
Reef Fish[1]	Yellowedge grouper	*Epinephelus flavolimbatus*	All	Juvenile: shallow, inshore areas (grass beds, mangroves, and inshore reefs); Adult: Coral reef, limestone, hard bottom, and artificial reef substrates	Low
	Red hind	*Epinephelus guttatus*	All		Low
	Goliath grouper	*Epinephelus itajara*	All		Moderate
	Red grouper	*Epinephelus morio*	All		Moderate
	Misty grouper	*Epinephelus mystacinus*	All		Low
	Warsaw grouper	*Epinephelus nigritus*	All		Low
	Snowy grouper	*Epinephelus niveatus*	All		Low
	Nassau grouper	*Epinephelus striatus*	All		Low
	Marbled grouper	*Epinephelus inermis*	All		Low
	Black grouper	*Mycteroperca bonaci*	All		Moderate
	Yellowmouth grouper	*Mycteroperca interstitialis*	All		Low
Shrimp [1]	Gag	*Mycteroperca microlepis*	All	Juvenile: shallow, vegetated, estuarine habitats; Adult: silt, muddy sand, and sandy substrates	Moderate
	Scamp	*Mycteroperca phenax*	All		Low
	Yellowfin grouper	*Mycteroperca venenosa*	All		Low

[1] Gulf of Mexico Fishery Management Plan and Amendments
[2] Gulf of Mexico and South Atlantic Coastal Migratory Pelagic Fishery Management Plan and Amendments
[3] Consolidated Atlantic HMS Fishery Management Plan and Amendments

Potential for Occurrence ratings based on presence of suitable habitat and observational data as follows:
None – suitable habitat does not occur within the Project Area.
Low – suitable habitat present in Project Area at one or more life history stages.
Moderate – suitable habitat present in Project Area and species documented in waterbody.
High – suitable habitat present in Project Area and EFH for managed species present, direct observation of species in Project Area.

Fishery Management Unit	Common Name	Scientific Name	Life stage(s) Found at Location	Habitat Association	Potential for Occurrence in Project Area
Shrimp	Brown shrimp	*Penaeus aztecus*	All	Juvenile: shallow, vegetated, estuarine habitats; Adult: silt, muddy sand, and sandy substrates	Low
	White shrimp	*Penaeus setiferus*	All	Juvenile: vegetated, estuarine habitats, rivers, and tributaries; Adult: nearshore sandy substrates	Low
	Pink shrimp	*Penaeus duorarum*	All	Juvenile: vegetated, estuarine habitats; Adult: offshore marine waters	Moderate
	Royal red shrimp	*Pleoticus robustus*	All	Deep water habitats along the continental shelf	None
Coastal Migratory Pelagics [2]	King mackerel	*Scomberomorus cavalla*	All	Open water, areas of bottom relief – holes or reefs (schools) and around structures – wrecks and oil rigs (individuals)	Moderate

[1] Gulf of Mexico Fishery Management Plan and Amendments
[2] Gulf of Mexico and South Atlantic Coastal Migratory Pelagic Fishery Management Plan and Amendments
[3] Consolidated Atlantic HMS Fishery Management Plan and Amendments

Potential for Occurrence ratings based on presence of suitable habitat and observational data as follows:

None – suitable habitat does not occur within the Project Area.
Low – suitable habitat present in Project Area at one or more life history stages.
Moderate – suitable habitat present in Project Area and species documented in waterbody.
High – suitable habitat present in Project Area and EFH for managed species present, direct observation of species in Project Area.

Fishery Management Unit	Common Name	Scientific Name	Life stage(s) Found at Location	Habitat Association	Potential for Occurrence in Project Area
Coastal Migratory Pelagics [2]	Spanish mackerel	*Scomberomorus maculatus*	All	Open water, tidal estuaries, bays, and lagoons	Moderate
	Cobia	*Rachycentron canadum*	All	Open water, inlets, bays, and mangroves	Low
Highly Migratory Species [3]	Bull shark	*Carcharhinus leucas*	Juvenile / Adult Neonate	Estuaries, nearshore habitats, and waters of the continental shelf	Moderate
	Nurse shark	*Ginglymostoma cirratum*	Juvenile / Adult	Estuaries, nearshore habitats, and waters of the continental shelf	Moderate
	Lemon shark	*Negaprion brevirostris*	Adult	Estuaries, nearshore habitats, and waters of the continental shelf	Moderate
	Scalloped hammerhead shark	*Sphyrna lewini*	Neonate	Estuaries, nearshore habitats, and waters of the continental shelf	Low
	Tiger shark	*Galeocerdo cuvieri*	Juvenile / Adult	Estuaries, nearshore habitats, and waters of the continental shelf	Low

[1] Gulf of Mexico Fishery Management Plan and Amendments
[2] Gulf of Mexico and South Atlantic Coastal Migratory Pelagic Fishery Management Plan and Amendments
[3] Consolidated Atlantic HMS Fishery Management Plan and Amendments

Potential for Occurrence ratings based on presence of suitable habitat and observational data as follows:

None – suitable habitat does not occur within the Project Area.
Low – suitable habitat present in Project Area at one or more life history stages.
Moderate – suitable habitat present in Project Area and species documented in waterbody.
High – suitable habitat present in Project Area and EFH for managed species present, direct observation of species in Project Area.

Fishery Management Unit	Common Name	Scientific Name	Life stage(s) Found at Location	Habitat Association	Potential for Occurrence in Project Area
Highly Migratory Species [3]	Blacktip shark	*Carcharhinus limbatus*	Neonate	Estuaries, nearshore habitats, and waters of the continental shelf	Moderate

[1] Gulf of Mexico Fishery Management Plan and Amendments
[2] Gulf of Mexico and South Atlantic Coastal Migratory Pelagic Fishery Management Plan and Amendments
[3] Consolidated Atlantic HMS Fishery Management Plan and Amendments

Potential for Occurrence ratings based on presence of suitable habitat and observational data as follows:

None – suitable habitat does not occur within the Project Area.
Low – suitable habitat present in Project Area at one or more life history stages.
Moderate – suitable habitat present in Project Area and species documented in waterbody.
High – suitable habitat present in Project Area and EFH for managed species present, direct observation of species in Project Area.

5.2 SUMMARY

A review of designated EFH identified a single species, the royal red shrimp, as having a potential for occurrence in the project study are of "none" because of the lack of suitable habitat at any life stage.

Thirty-one managed reef species, two managed shrimp species, one managed coastal migratory pelagic species, and four managed highly migratory species were determined to have a "low" potential for occurrence in the project study area. This determination was made based on the presence of suitable habitat within the project study area at one or more life stages.

One red drum species, ten managed reef species, one managed shrimp species, two managed coastal migratory pelagic species, and five managed highly migratory species were determined to have a "moderate" potential for occurrence in the project study area. This determination was made based on the presence of suitable habitat within the project study area at one or more life stages and the species previously documented nearby (FDEP 2014).

No managed species were determined to have a "high" potential for occurrence in the project study area. This determination was made based on the presence of suitable habitat within the project study area at one or more life stages and direct observation during field visits.

Impacts to EFH are not anticipated as a result of this project. All construction will take place above the waterline. There will be minimal use of barges during the limited demolition of the Matanzas Pass Bridge. All vessels will follow marked channels and follow standard BMPs. In addition, the project will adhere to the *Sea Turtle and Smalltooth Sawfish Construction Conditions* (revised March 2006) and the *Standard Manatee Conditions for In-Water Work* (2011) published by NOAA and USFWS, respectively. The use of standard BMPs and adherence to programmatic conditions for protected species will minimize the potential disturbance to all aquatic resources and EFH.

6.0 ANTICIPATED PERMITS AND COORDINATION

Both the Water Management District (WMD) and U.S. Army Corp of Engineers (USACE) regulate impacts to wetlands. Activities required for impacts to Waters of the U.S. (WOTUS) associated with construction, modification, or improvement of the road project would require a NW 14 or SAJ 92 permit from the USACE. However, no impacts to federal WOTUS are proposed from the bridge improvement projects. Under state permitting rules, an Environmental Resource Permit (ERP) would govern the stormwater drainage and any wetland impacts; however, none are proposed.

If a Florida Department of Transportation (FDOT) project has a federal nexus (a project receives federal funding, a federal permit, or occurs on federal land), work must comply with Section 7 of the Endangered Species Act (ESA) and the Magnuson-Stevens Fishery and Conservation Act (EFH). Due to the presence of the Florida Bonneted bat, FDOT will conduct an informal consultation with the USFWS to ensure that the continued existence of the federally endangered species is not jeopardized.

7.0 CONCLUSION

Adverse impacts to individual species or regional populations of federal or state protected species or their habitat are not anticipated as a result of the construction of this project. An effect determination of "may affect, not likely to adversely affect" ("MANLAA") was made for the eastern indigo snake, Florida bonneted bat, West Indian manatee, smalltooth sawfish, loggerhead sea turtle, Kemp's ridley sea turtle, green sea turtle, American alligator, and American crocodile. An effect determination of "no effect" was made for the gopher tortoise, Florida scrub-jay, red knot, piping plover, wood stork, Eastern black rail, aboriginal prickly-apple, and beautiful pawpaw. Determinations for the wood stork and eastern indigo snake were based on results of the USFWS' determination key and literature review, GIS maps, and field data collection for other listed species. Determination, in part, for the Florida bonneted bat was based on the USFWS programmatic consultation key. Per USFWS guidance, an informal consultation will be required due to the presence of the Florida bonneted bat and a concurrence letter shall be sought for the "MANLAA" determinations resulting from the use of the effect determination keys. No adverse effects are anticipated for any other protected species.

No wetland impacts will result from the construction of this project. The project alignment and construction limits have been located to avoid any direct or indirect impacts to area wetlands. In accordance with EO 11990, the FDOT has undertaken all actions to minimize the destruction, loss or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands in carrying out the agency's responsibilities.

Commitments

The applicant makes the following commitments to minimize impacts to wetlands and protected wildlife species:

- Adhere to the most recent version of the *Sea Turtle and Smalltooth Sawfish Construction Conditions* during construction.
- Adhere to the most recent version of the *Standard Protection Measures for the Eastern Indigo Snake* during construction.
- Commit to initiating an ESA Section 7 informal consultation with USFWS for the Florida bonneted bat following submittal of the NRE.
- Adhere to the most recent version of the *Standard Manatee Conditions for In-water Work* during construction.

8.0 REFERENCES

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Florida Department of Environmental Protection's (FDEP) Florida Coastal Office (FCO). 2014. Estero Bay Aquatic Preserve Management Plan. Estero Bay Aquatic Preserve, Fort Myers Beach, FL.

Appendix A

REPRESENTATIVE PHOTOGRAPHS

Photo 1. Hurricane Bay Bridge

Photo 2. Bulkhead, Hurricane Bay Bridge

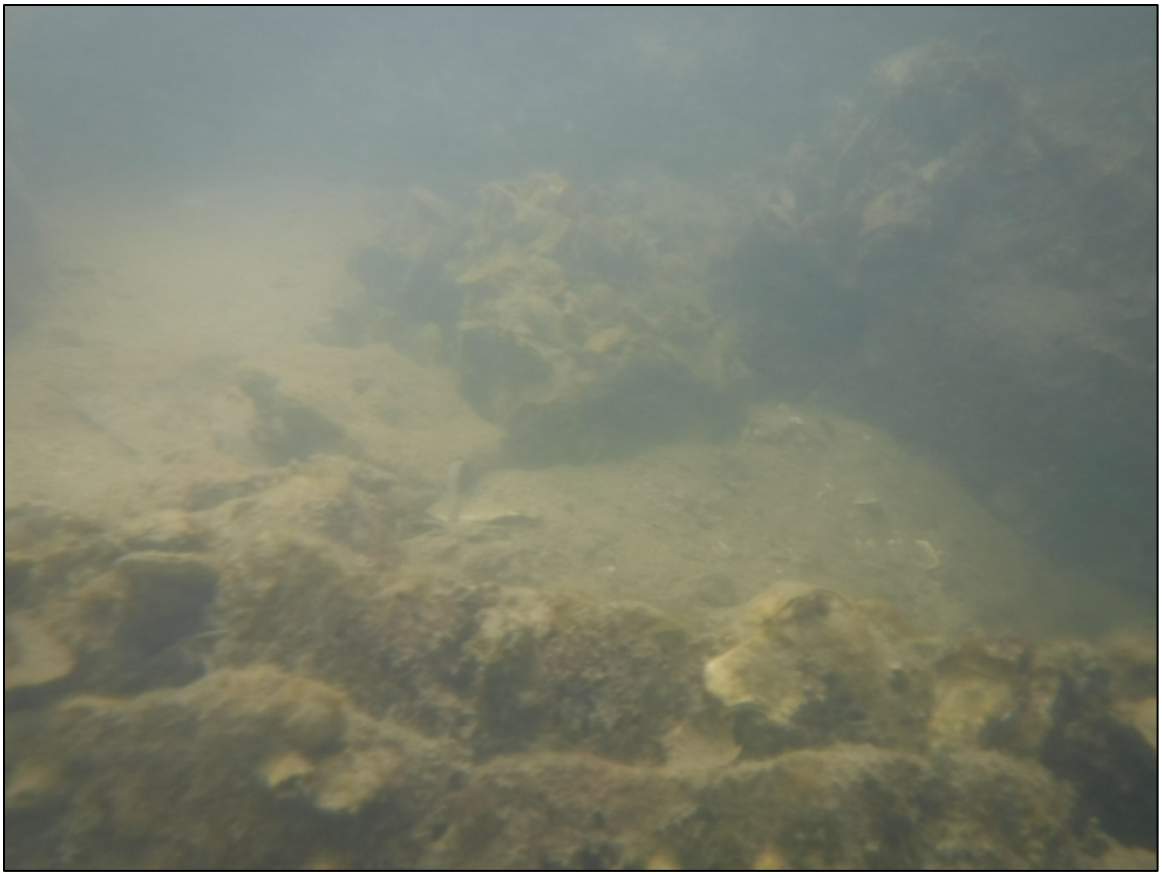

Photo 3. Submerged substrate under Hurricane Bay Bridge

Photo 4. American white pelican, brown pelican, and double-crested cormorant

Photo 5. Blue crab and eastern oyster

Photo 6. Mangrove Swamp (FLUCCS 6120)

Photo 7. Embayments Opening Directly to Gulf or Ocean (FLUCCS 5410)

Photo 8. Matanzas Pass Island (Critical Wildlife Area)

Photo 9. Matanzas Pass Bridge

Photo 10. Commercial and Services (FLUCCS 1400)

Appendix B

FNAI STANDARD DATA REPORT FOR STATE ROAD 865 PD&E STUDY

FLORIDA
Natural Areas
INVENTORY

1018 Thomasville Road
Suite 200-C
Tallahassee, FL 32303
850-224-8207
fax 850-681-9364
www.fnai.org

March 16, 2020

Joel Johnson
Wantman Group, Inc
3111 W. Dr Martin Luther King Jr. Boulevard, Suite 375
Tampa, FL 33607

Dear Mr. Johnson,

Thank you for requesting information from the Florida Natural Areas Inventory (FNAI). At your request we have produced the following report for your project area.

The purpose of this Standard Data Report is to provide objective scientific information on natural resources located in the vicinity of a site of interest, in order to inform those involved in project planning and evaluation. This Report makes no determination of the suitability of a proposed project for this location, or the potential impacts of the project on natural resources in the area.

Project: State Road 865 PD&E Study

Date Received: 3/11/2020

Location: Lee County

Element Occurrences

A search of our maps and database indicates that we currently have several element occurrences mapped in the vicinity of the study area (see enclosed map and element occurrence table). Please be advised that a lack of element occurrences in the FNAI database is not a sufficient indication of the absence of rare or endangered species on a site.

The element occurrences data layer includes occurrences of rare species and natural communities. The map legend indicates that some element occurrences occur in the general vicinity of the label point. This may be due to lack of precision of the source data, or an element that occurs over an extended area (such as a wide ranging species or large natural community). For animals and plants, element occurrences generally refer to more than a casual sighting; they usually indicate a viable population of the species. Note that some element occurrences represent historically documented observations which may no longer be extant. Extirpated element occurrences will be marked with an 'X' following the occurrence label on the enclosed map.

Likely and Potential Rare Species

In addition to documented occurrences, other rare species and natural communities may be identified on or near the site based on habitat models and species range models (see enclosed Biodiversity Matrix Report). These species should be taken into consideration in field surveys, land management, and impact avoidance and mitigation.

FNAI habitat models indicate areas, which based on land cover type, offer suitable habitat for one or more rare species that is known to occur in the vicinity. Habitat models have been developed for approximately 300 of the rarest species tracked by the Inventory, including all federally listed species.

Florida Resources
and Environmental
Analysis Center

Institute of Science
and Public Affairs

The Florida State University

FNAI species range models indicate areas that are within the known or predicted range of a species, based on climate variables, soils, vegetation, and/or slope. Species range models have been developed for approximately 340 species, including all federally listed species.

The FNAI Biodiversity Matrix Geodatabase compiles Documented, Likely, and Potential species and natural communities for each square mile Matrix Unit statewide.

CLIP

The enclosed map shows natural resource conservation priorities based on the Critical Lands and Waters Identification Project. CLIP is based on many of the same natural resource data developed for the Florida Forever Conservation Needs Assessment, but provides an overall picture of conservation priorities across different resource categories, including biodiversity, landscapes, surface waters, and aggregated CLIP priorities (that combine the individual resource categories). CLIP is also based primarily on remote sensed data and is not intended to be the definitive authority on natural resources on a site.

For more information on CLIP, visit http://www.fnai.org/clip.cfm .

The Inventory always recommends that professionals familiar with Florida's flora and fauna conduct a site-specific survey to determine the current presence or absence of rare, threatened, or endangered species.

Please visit www.fnai.org/trackinglist.cfm for county or statewide element occurrence distributions and links to more element information.

The database maintained by the Florida Natural Areas Inventory is the single most comprehensive source of information available on the locations of rare species and other significant ecological resources. However, the data are not always based on comprehensive or site-specific field surveys. Therefore this information should not be regarded as a final statement on the biological resources of the site being considered, nor should it be substituted for on-site surveys. Inventory data are designed for the purposes of conservation planning and scientific research, and are not intended for use as the primary criteria for regulatory decisions.

Information provided by this database may not be published without prior written notification to the Florida Natural Areas Inventory, and the Inventory must be credited as an information source in these publications. **The maps contain sensitive environmental information, please do not distribute or publish without prior consent from FNAI.** FNAI data may not be resold for profit.

Thank you for your use of FNAI services. An invoice will be mailed separately. If I can be of further assistance, please contact me at (850) 224-8207 or at kbrinegar@fnai.fsu.edu.

Sincerely,

Kerri Brinegar

Kerri Brinegar
GIS / Data Services

Encl

State Road 865 PD&E Study

Site boundaries are approximate.

Lee County

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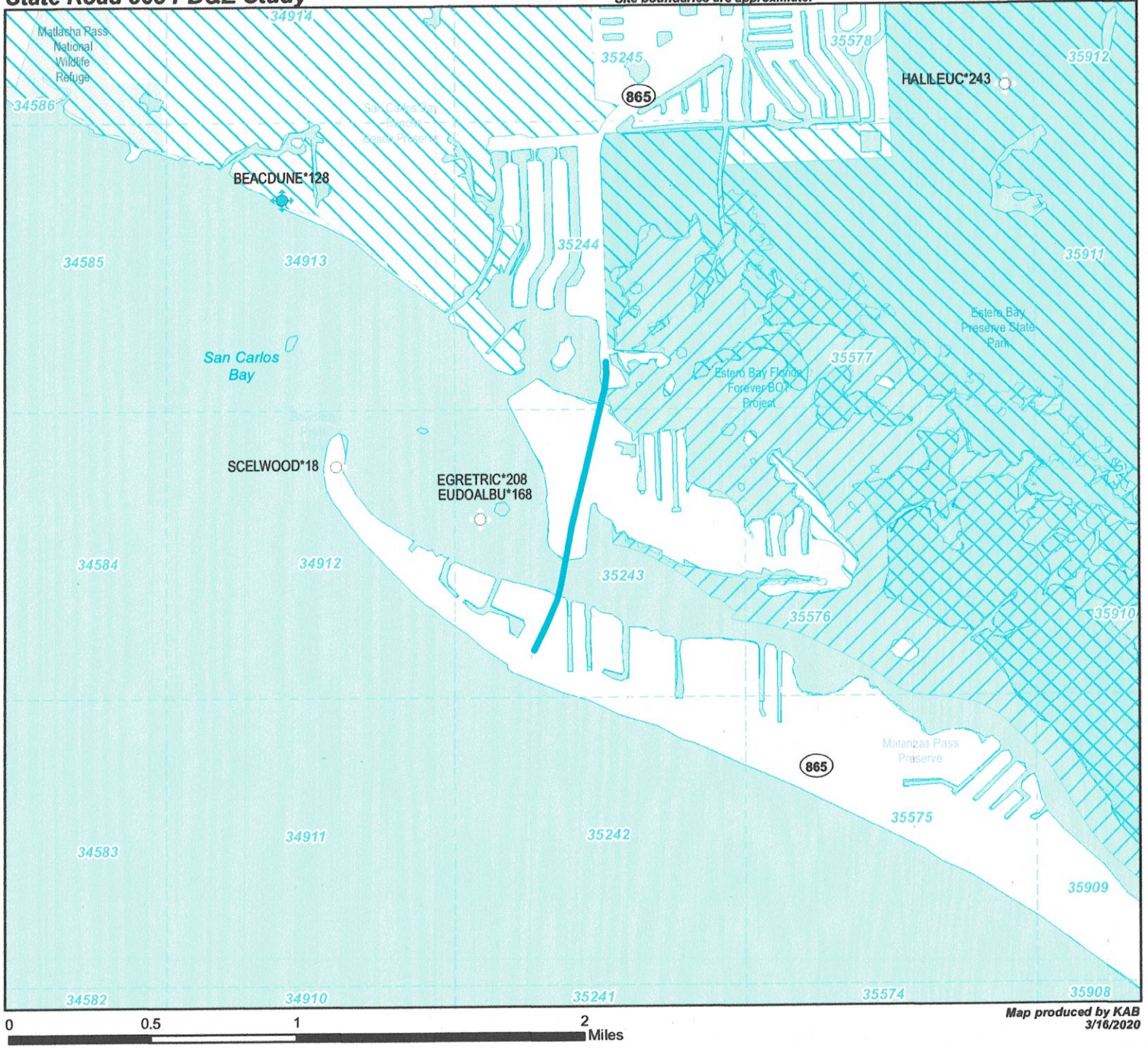
FLORIDA Natural Areas INVENTORY



Element Occurrences

- Animals
- Plants
- Communities
- Other
- Data Sensitive

Point Indicates General Vicinity of Element

U.S. Fish & Wildlife Service Scrub Jay Survey 1992-96

Conservation Lands

- Federal
- State
- Local
- Private
- State Aquatic Preserves

N

Land Acquisition Projects

- Florida Forever Board of Trustees Projects

- FNAI Rare Species Habitat
- FNAI Biodiversity Matrix Square Mile Units

- County Boundary
- Roads
- Water

NOTE

This map contains environmentally sensitive information. Please do not distribute or publish without prior consent from FNAI. Map should not be interpreted without accompanying documents.

Map produced by KAB 3/16/2020

State Road 865 PD&E Study

Site boundaries are approximate.

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FLORIDA Natural Areas INVENTORY

CLIP v4.0 Resource Priorities

Biodiversity Resource Category
- Priority 1 - highest
- Priority 2
- Priority 3
- Priority 4
- Priority 5

Landscape Resource Category
- Priority 1 - highest
- Priority 2
- Priority 3
- Priority 4
- Priority 5

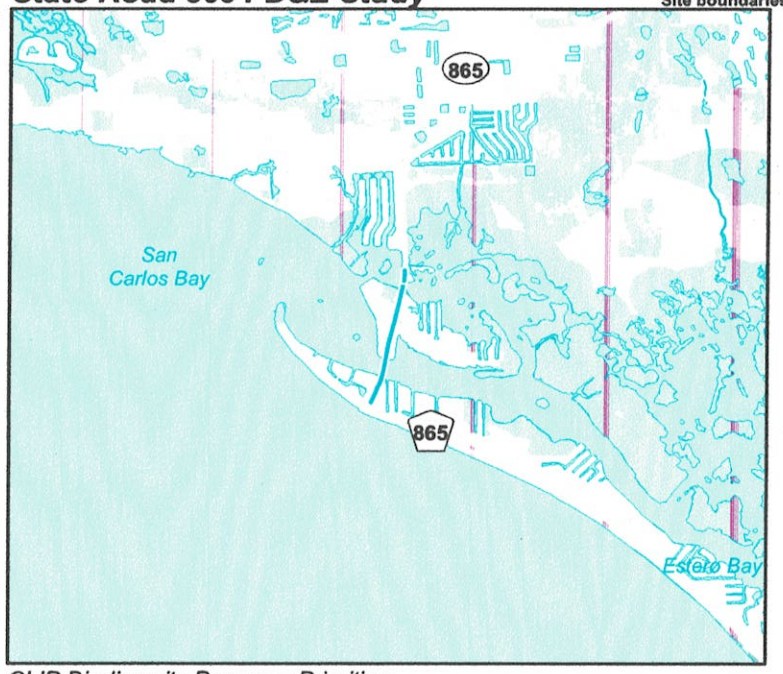
Surface Water Resource Category
- Priority 1 - highest
- Priority 2
- Priority 3
- Priority 4
- Priority 5

Aggregated CLIP Priorities
- Priority 1 - highest
- Priority 2
- Priority 3
- Priority 4
- Priority 5

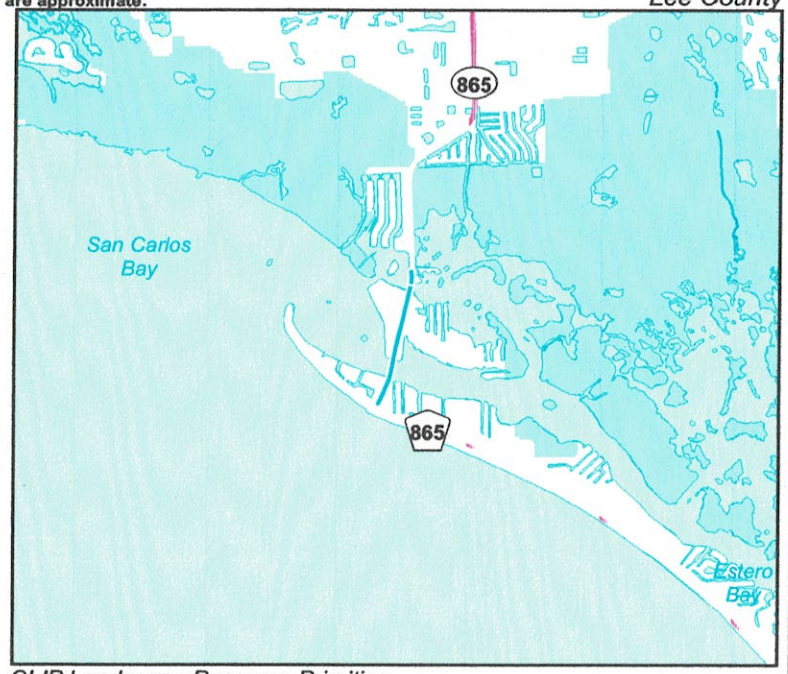
Site Boundary

Map should not be interpreted without accompanying documents.

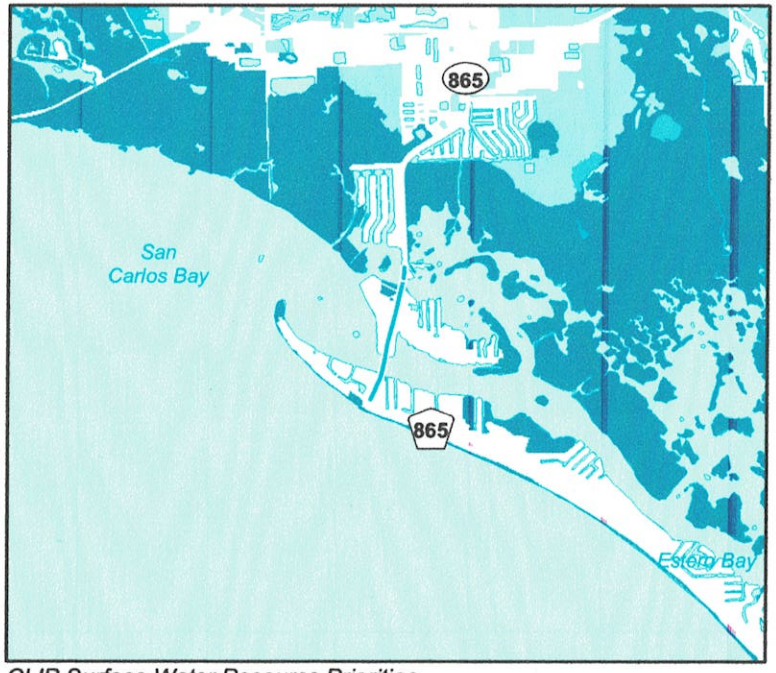
Critical Lands and Waters Identification Project (CLIP) is a cooperative effort between the FSU Florida Natural Areas Inventory, UF Center for Landscape Conservation Planning, and FL Fish & Wildlife Conservation Commission, with additional funding from FL Dept of Environmental Protection and US Fish & Wildlife Service.



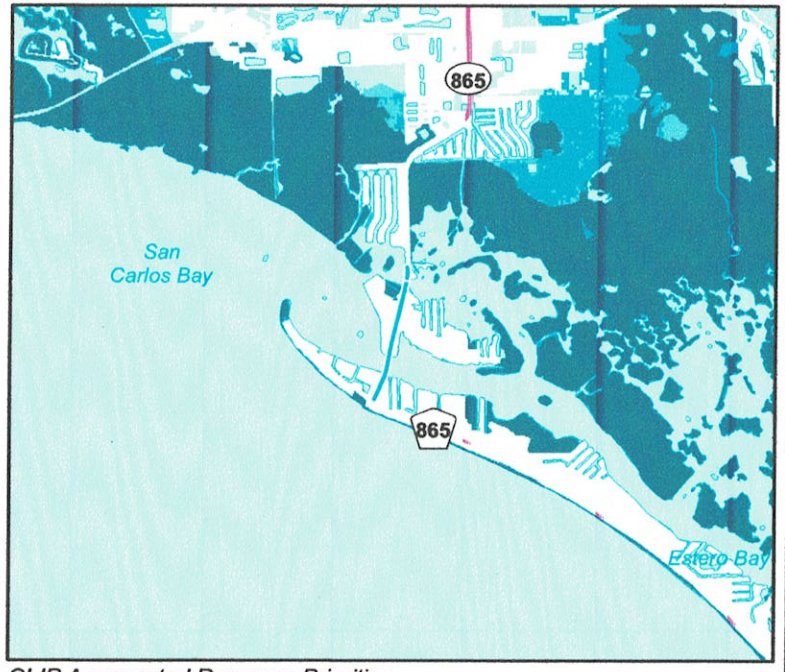
CLIP Biodiversity Resource Priorities



CLIP Landscape Resource Priorities



CLIP Surface Water Resource Priorities



CLIP Aggregated Resource Priorities

0 0.5 1 2 3 4 5 Miles

Map produced by KAB
3/16/2020

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FLORIDA Natural Areas INVENTORY

FNAI ELEMENT OCCURRENCE REPORT on or near

State Road 865 PD&E Study

Map Label	Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Listing	Observation Date	Description	EO Comments
BEACDUNE*128	Beach dune		G3	S2	N	N	1999	LOW DAMP BEACH.	1999: Update to last obs date was based on interpretation of aerial photography (previous value was 1991-02-24) (U05FNA02FLUS). LITTLE DUNE DEVELOPMENT OR SEA OATS. PATCHES OF LOW SALT TOLERANT HERBS AND GRASSES ABOVE BEACH BORDERING MANGROVES INCLUDING: SPOROBOLUS VIRGINICUS, PASPALUM DISTICHUM, SESUVIUM PORTULACASTRUM, PHYSALIS WALTERII, BORRICHIA FRUTESCENS.
EGRETRIC*208	*Egretta tricolor*	Tricolored Heron	G5	S4	N	ST	1989-05-17	Main island has mangrove fringe; second island covered with Australian pine.	1989/05/17: E. Carter, GFC. Main island w/BRPE nests w/young, & DCCO on nest in mangroves. GREG on nests in seagrape. WHIB & TCHE flying nearby. GBHE nests w/large young in Casurina on other island in Pelican bay. Helicopter survey. "Total" = C (6 spp.).
EUDOALBU*168	*Eudocimus albus*	White Ibis	G5	S4	N	N	1989-05-17	One island with mangrove fringe; second with Australian pine.	1989/05/17: E. Carter, GFC. Main island w/BRPE nests w/young, & DCCO on nest in mangroves. GREG on nests in seagrape. WHIB & TCHE flying nearby. GBHE nests w/large young in Casurina on other island in Pelican bay. Helicopter survey. "Total" = C (6 spp.).
SCELWOOD*18	*Sceloporus woodi*	Florida Scrub Lizard	G2G3	S2S3	N	N	1949-02-03	No general description given	STEWART COLLECTED SPECIMEN HERE 1949-02-03.

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FLORIDA Natural Areas INVENTORY

Florida Natural Areas Inventory

Biodiversity Matrix Report

Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Listing
Matrix Unit ID: 35243					
Likely					
Caretta caretta	Loggerhead Sea Turtle	G3	S3	T	FT
Mycteria americana	Wood Stork	G4	S2	T	FT
Trichechus manatus	West Indian Manatee	G2	S2	T	FT
Potential					
Acipenser oxyrinchus desotoi	Gulf Sturgeon	G3T2T3	S2?	T	FT
Ardea herodias occidentalis	Great White Heron	G5T2	S2	N	N
Charadrius melodus	Piping Plover	G3	S2	T	FT
Chelonia mydas	Green Sea Turtle	G3	S2S3	T	FT
Crocodylus acutus	American Crocodile	G2	S2	T	FT
Dermochelys coriacea	Leatherback Sea Turtle	G2	S2	E	FE
Drymarchon couperi	Eastern Indigo Snake	G3	S3	T	FT
Egretta tricolor	Tricolored Heron	G5	S4	N	ST
Eragrostis pectinacea var. tracyi	Sanibel lovegrass	G5T1	S1	N	E
Eretmochelys imbricata	Hawksbill Sea Turtle	G3	S1	E	FE
Eudocimus albus	White Ibis	G5	S4	N	N
Gopherus polyphemus	Gopher Tortoise	G3	S3	C	ST
Gymnopogon chapmanianus	Chapman's skeletongrass	G3	S3	N	N
Harrisia aboriginum	aboriginal prickly apple	G1	S1	E	E
Lechea cernua	nodding pinweed	G3	S3	N	T
Linum carteri var. smallii	Small's flax	G2T2	S2	N	E
Nemastylis floridana	celestial lily	G2	S2	N	E
Nolina atopocarpa	Florida beargrass	G3	S3	N	T
Pteroglossaspis ecristata	giant orchid	G2G3	S2	N	T
Rallus longirostris scottii	Florida Clapper Rail	G5T3?	S3?	N	N
Rivulus marmoratus	Mangrove Rivulus	G4G5	S3	SC	N
Rostrhamus sociabilis	Snail Kite	G4G5	S2	E	FE
Sceloporus woodi	Florida Scrub Lizard	G2G3	S2S3	N	N
Setophaga discolor paludicola	Florida Prairie Warbler	G5T3	S3	N	N
Ursus americanus floridanus	Florida Black Bear	G5T4	S4	N	N
Matrix Unit ID: 35244					
Likely					
Mycteria americana	Wood Stork	G4	S2	T	FT
Trichechus manatus	West Indian Manatee	G2	S2	T	FT
Potential					
Acipenser oxyrinchus desotoi	Gulf Sturgeon	G3T2T3	S2?	T	FT
Ardea herodias occidentalis	Great White Heron	G5T2	S2	N	N
Calopogon multiflorus	many-flowered grass-pink	G2G3	S2S3	N	T
Centrosema arenicola	sand butterfly pea	G2Q	S2	N	E
Charadrius melodus	Piping Plover	G3	S2	T	FT
Crocodylus acutus	American Crocodile	G2	S2	T	FT
Dermochelys coriacea	Leatherback Sea Turtle	G2	S2	E	FE
Drymarchon couperi	Eastern Indigo Snake	G3	S3	T	FT
Egretta tricolor	Tricolored Heron	G5	S4	N	ST

Definitions: *Documented - Rare species and natural communities documented on or near this site.*
Documented-Historic - Rare species and natural communities documented, but not observed/reported within the last twenty years.
Likely - Rare species and natural communities likely to occur on this site based on suitable habitat and/or known occurrences in the vicinity.
Potential - This site lies within the known or predicted range of the species listed.

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FLORIDA Natural Areas INVENTORY

Florida Natural Areas Inventory

Biodiversity Matrix Report

Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Listing
Elytraria caroliniensis var. angustifolia	narrow-leaved Carolina scalystem	G4T2	S2	N	N
Eragrostis pectinacea var. tracyi	Sanibel lovegrass	G5T1	S1	N	E
Eretmochelys imbricata	Hawksbill Sea Turtle	G3	S1	E	FE
Eudocimus albus	White Ibis	G5	S4	N	N
Gymnopogon chapmanianus	Chapman's skeletongrass	G3	S3	N	N
Lechea cernua	nodding pinweed	G3	S3	N	T
Linum carteri var. smallii	Small's flax	G2T2	S2	N	E
Mustela frenata peninsulae	Florida Long-tailed Weasel	G5T3?	S3	N	N
Nemastylis floridana	celestial lily	G2	S2	N	E
Nolina atopocarpa	Florida beargrass	G3	S3	N	T
Platanthera integra	yellow fringeless orchid	G3G4	S3	N	E
Pteroglossaspis ecristata	giant orchid	G2G3	S2	N	T
Rallus longirostris scottii	Florida Clapper Rail	G5T3?	S3?	N	N
Rivulus marmoratus	Mangrove Rivulus	G4G5	S3	SC	N
Rostrhamus sociabilis	Snail Kite	G4G5	S2	E	FE
Sceloporus woodi	Florida Scrub Lizard	G2G3	S2S3	N	N
Setophaga discolor paludicola	Florida Prairie Warbler	G5T3	S3	N	N
Ursus americanus floridanus	Florida Black Bear	G5T4	S4	N	N

Definitions: *Documented - Rare species and natural communities documented on or near this site.*
Documented-Historic - Rare species and natural communities documented, but not observed/reported within the last twenty years.
Likely - Rare species and natural communities likely to occur on this site based on suitable habitat and/or known occurrences in the vicinity.
Potential - This site lies within the known or predicted range of the species listed.

Element Occurrence Ranking

FNAI ranks of quality of the element occurrence in terms of its viability (EORANK). Viability is estimated using a combination of factors that contribute to continued survival of the element at the location. Among these are the size of the EO, general condition of the EO at the site, and the conditions of the landscape surrounding the EO (e.g. an immediate threat to an EO by local development pressure could lower an EO rank).

A = Excellent estimated viability
A? = Possibly excellent estimated viability
AB = Excellent or good estimated viability
AC = Excellent, good, or fair estimated viability
B = Good estimated viability
B? = Possibly good estimated viability
BC = Good or fair estimated viability
BD = Good, fair, or poor estimated viability
C = Fair estimated viability
C? = Possibly fair estimated viability
CD = Fair or poor estimated viability
D = Poor estimated viability
D? = Possibly poor estimated viability
E = Verified extant (viability not assessed)
F = Failed to find
H = Historical
NR = Not ranked, a placeholder when an EO is not (yet) ranked.
U = Unrankable
X = Extirpated

*For additional detail on the above ranks see: http://www.natureserve.org/explorer/eorankguide.htm

FNAI also uses the following EO ranks:

H? = Possibly historical
F? = Possibly failed to find
X? = Possibly extirpated

The following offers further explanation of the H and X ranks as they are used by FNAI:

The rank of H is used when there is a lack of recent field information verifying the continued existence of an EO, such as (a) when an EO is based only on historical collections data; or (b) when an EO was ranked A, B, C, D, or E at one time and is later, without field survey work, considered to be possibly extirpated due to general habitat loss or degradation of the environment in the area. This definition of the H rank is dependent on an interpretation of what constitutes "recent" field information. Generally, if there is no known survey of an EO within the last 20 to 40 years, it should be assigned an H rank. While these time frames represent suggested maximum limits, the actual time period for historical EOs may vary according to the biology of the element and the specific landscape context of each occurrence (including anthropogenic alteration of the environment). Thus, an H rank may be assigned to an EO before the maximum time frames have lapsed. Occurrences that have not been surveyed for periods exceeding these time frames should not be ranked A, B, C, or D. The higher maximum limit for plants and communities (i.e., ranging from 20 to 40 years) is based upon the assumption that occurrences of these elements generally have the potential to persist at a given location for longer periods of time. This greater potential is a reflection of plant biology and community dynamics. However, landscape factors must also be considered. Thus, areas with more anthropogenic impacts on the environment (e.g., development) will be at the lower end of the range, and less-impacted areas will be at the higher end.

The rank of X is assigned to EOs for which there is documented destruction of habitat or environment, or persuasive evidence of eradication based on adequate survey (i.e., thorough or repeated survey efforts by one or more experienced observers at times and under conditions appropriate for the Element at that location).

FEDERAL LEGAL STATUS

Legal status information provided by FNAI for information only. For official definitions and lists of protected species, consult the relevant federal agency.

Definitions derived from U.S. Endangered Species Act of 1973, Sec. 3. Note that the federal status given by FNAI refers only to Florida populations and that federal status may differ elsewhere.

C = Candidate species for which federal listing agencies have sufficient information on biological vulnerability and threats to support proposing to list the species as Endangered or Threatened.
E = Endangered: species in danger of extinction throughout all or a significant portion of its range.
E, T = Species currently listed endangered in a portion of its range but only listed as threatened in other areas
E, PDL = Species currently listed endangered but has been proposed for delisting.
E, PT = Species currently listed endangered but has been proposed for listing as threatened.
E, XN = Species currently listed endangered but tracked population is a non-essential experimental population.
T = Threatened: species likely to become Endangered within the foreseeable future throughout all or a significant portion of its range.
PE = Species proposed for listing as endangered
PS = Partial status: some but not all of the species' infraspecific taxa have federal
PT = Species proposed for listing as threatened
SAT = Treated as threatened due to similarity of appearance to a species which is federally listed such that enforcement personnel have difficulty in attempting to differentiate between the listed and unlisted species.
SC = Not currently listed, but considered a "species of concern" to USFWS.

STATE LEGAL STATUS

Provided by FNAI for information only. For official definitions and lists of protected species, consult the relevant state agency.

Animals: Definitions derived from "Florida's Endangered Species and Species of Special Concern, Official Lists" published by Florida Fish and Wildlife Conservation Commission, 1 August 1997, and subsequent updates.

C = Candidate for listing at the Federal level by the U. S. Fish and Wildlife Service
FE = Listed as Endangered Species at the Federal level by the U. S. Fish and Wildlife Service
FT = Listed as Threatened Species at the Federal level by the U. S. Fish and Wildlife Service
FXN = Federal listed as an experimental population in Florida
FT(S/A) = Federal Threatened due to similarity of appearance
ST = State population listed as Threatened by the FFWCC. Defined as a species, subspecies, or isolated population which is acutely vulnerable to environmental alteration, declining in number at a rapid rate, or whose range or habitat is decreasing in area at a rapid rate and as a consequence is destined or very likely to become an endangered species within the foreseeable future.
SSC = Listed as Species of Special Concern by the FFWCC. Defined as a population which warrants special protection, recognition, or consideration because it has an inherent significant vulnerability to habitat modification, environmental alteration, human disturbance, or substantial human exploitation which, in the foreseeable future, may result in its becoming a threatened species. (SSC* for Pandion haliaetus (Osprey) indicates that this status applies in Monroe county only.)
N = Not currently listed, nor currently being considered for listing.

Plants: Definitions derived from Sections 581.011 and 581.185(2), Florida Statutes, and the Preservation of Native Flora of Florida Act, 5B-40.001. FNAI does not track all state-regulated plant species; for a complete list of state-regulated plant species, call Florida Division of Plant Industry, 352-372-3505 or see: http://www.doacs.state.fl.us/pi/.

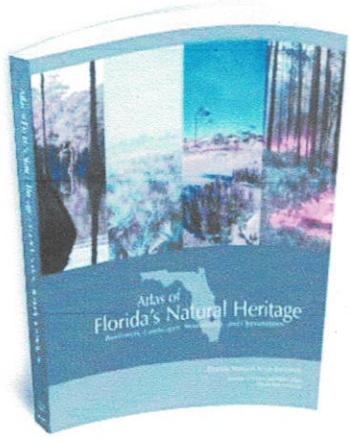
E = Endangered: species of plants native to Florida that are in imminent danger of extinction within the state, the survival of which is unlikely if the causes of a decline in the number of plants continue; includes all species determined to be endangered or threatened pursuant to the U.S. Endangered Species Act.
T = Threatened: species native to the state that are in rapid decline in the number of plants within the state, but which have not so decreased in number as to cause them to be Endangered.
N = Not currently listed, nor currently being considered for listing.

ON SALE NOW

Atlas of Florida's Natural Heritage

Biodiversity, Landscapes, Stewardship, and Opportunities

The Florida Natural Areas Inventory is pleased to announce the publication of the ***Atlas of Florida's Natural Heritage: Biodiversity, Landscapes, Stewardship, and Opportunities***. This high-quality, full-color *Atlas* is sure to become a standard reference for anyone involved in the conservation, management, study, or enjoyment of Florida's rich natural resources. We hope the *Atlas* will inspire, educate, and raise awareness of and interest in biodiversity and conservation issues.



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Appendix C

SEA TURTLE AND SMALLTOOTH SAWFISH CONSTRUCTION CONDITIONS

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southeast Regional Office
263 13th Avenue South
St. Petersburg, FL 33701

SEA TURTLE AND SMALLTOOTH SAWFISH CONSTRUCTION CONDITIONS

The permittee shall comply with the following protected species construction conditions:

a. The permittee shall instruct all personnel associated with the project of the potential presence of these species and the need to avoid collisions with sea turtles and smalltooth sawfish. All construction personnel are responsible for observing water-related activities for the presence of these species.

b. The permittee shall advise all construction personnel that there are civil and criminal penalties for harming, harassing, or killing sea turtles or smalltooth sawfish, which are protected under the Endangered Species Act of 1973.

c. Siltation barriers shall be made of material in which a sea turtle or smalltooth sawfish cannot become entangled, be properly secured, and be regularly monitored to avoid protected species entrapment. Barriers may not block sea turtle or smalltooth sawfish entry to or exit from designated critical habitat without prior agreement from the National Marine Fisheries Service's Protected Resources Division, St. Petersburg, Florida.

d. All vessels associated with the construction project shall operate at "no wake/idle" speeds at all times while in the construction area and while in water depths where the draft of the vessel provides less than a four-foot clearance from the bottom. All vessels will preferentially follow deep-water routes (e.g., marked channels) whenever possible.

e. If a sea turtle or smalltooth sawfish is seen within 100 yards of the active daily construction/dredging operation or vessel movement, all appropriate precautions shall be implemented to ensure its protection. These precautions shall include cessation of operation of any moving equipment closer than 50 feet of a sea turtle or smalltooth sawfish. Operation of any mechanical construction equipment shall cease immediately if a sea turtle or smalltooth sawfish is seen within a 50-ft radius of the equipment. Activities may not resume until the protected species has departed the project area of its own volition.

f. Any collision with and/or injury to a sea turtle or smalltooth sawfish shall be reported immediately to the National Marine Fisheries Service's Protected Resources Division (727-824-5312) and the local authorized sea turtle stranding/rescue organization.

g. Any special construction conditions, required of your specific project, outside these general conditions, if applicable, will be addressed in the primary consultation.

Revised: March 23, 2006
O:\forms\Sea Turtle and Smalltooth Sawfish Construction Conditions.doc

Appendix D

STANDARD PROTECTION MEASURES FOR THE EASTERN INDIGO SNAKE

STANDARD PROTECTION MEASURES FOR THE EASTERN INDIGO SNAKE
U.S. Fish and Wildlife Service
August 12, 2013

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

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

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

POSTER INFORMATION

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

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

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

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

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

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

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

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

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

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

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

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

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

PRE-CONSTRUCTION ACTIVITIES

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

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

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

DURING CONSTRUCTION ACTIVITIES

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

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

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

POST CONSTRUCTION ACTIVITIES

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

Appendix E

STANDARD MANATEE CONDITIONS FOR IN-WATER WORK

STANDARD MANATEE CONDITIONS FOR IN-WATER WORK

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

a. All personnel associated with the project shall be instructed about the presence of manatees and manatee speed zones, and the need to avoid collisions with and injury to manatees. The permittee shall advise all construction personnel that there are civil and criminal penalties for harming, harassing, or killing manatees which are protected under the Marine Mammal Protection Act, the Endangered Species Act, and the Florida Manatee Sanctuary Act.

b. All vessels associated with the construction project shall operate at "Idle Speed/No Wake" at all times while in the immediate area and while in water where the draft of the vessel provides less than a four-foot clearance from the bottom. All vessels will follow routes of deep water whenever possible.

c. Siltation or turbidity barriers shall be made of material in which manatees cannot become entangled, shall be properly secured, and shall be regularly monitored to avoid manatee entanglement or entrapment. Barriers must not impede manatee movement.

d. All on-site project personnel are responsible for observing water-related activities for the presence of manatee(s). All in-water operations, including vessels, must be shutdown if a manatee(s) comes within 50 feet of the operation. Activities will not resume until the manatee(s) has moved beyond the 50-foot radius of the project operation, or until 30 minutes elapses if the manatee(s) has not reappeared within 50 feet of the operation. Animals must not be herded away or harassed into leaving.

e. Any collision with or injury to a manatee shall be reported immediately to the Florida Fish and Wildlife Conservation Commission (FWC) Hotline at 1-888-404-3922. Collision and/or injury should also be reported to the U.S. Fish and Wildlife Service in Jacksonville (1-904-731-3336) for north Florida or in Vero Beach (1-772-562-3909) for south Florida, and emailed to FWC at ImperiledSpecies@myFWC.com.

f. Temporary signs concerning manatees shall be posted prior to and during all in-water project activities. All signs are to be removed by the permittee upon completion of the project. Temporary signs that have already been approved for this use by the FWC must be used. One sign which reads *Caution: Boaters* must be posted. A second sign measuring at least 8½ " by 11" explaining the requirements for "Idle Speed/No Wake" and the shut down of in-water operations must be posted in a location prominently visible to all personnel engaged in water-related activities. These signs can be viewed at http://www.myfwc.com/WILDLIFEHABITATS/manatee_sign_vendors.htm. Questions concerning these signs can be forwarded to the email address listed above.

CAUTION: MANATEE HABITAT

All project vessels

IDLE SPEED / NO WAKE

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

SHUT DOWN

Report any collision with or injury to a manatee:

Wildlife Alert:

1-888-404-FWCC(3922)

cell *FWC or #FWC

Appendix F

FLORIDA BONNETED BAT ACOUSTIC AND ROOST SURVEY & BEST MANAGEMENT PRACTICES

FPID 433726-2-32-01
SR 865 FROM CRESCENT STREET TO NORTH OF HURRICANE BAY BRIDGE

FLORIDA BONNETED BAT (*EUMOPS FLORIDANUS*) ACOUSTIC AND ROOST SURVEY

LEE COUNTY, FLORIDA

19 November 2020

Prepared for:

Florida Department of Transportation – District One
801 North Broadway Avenue
Bartow, FL 33830

LIST OF TABLES

1.0 Introduction

The Florida Department of Transportation (FDOT), District One, is conducting a Project Development and Environment (PD&E) Study to evaluate proposed improvements to SR 865 (San Carlos Boulevard) from north of Crescent Street to north of Hurricane Bay Bridge, in Lee County, Florida (Figure 1). The purpose of the project is to increase accessibility and enhancement of mobility and safety for vehicle and non-vehicular transportation. The proposed improvements include widening the Matanzas Pass Bridge to accommodate a new shared-use path along the west side of the bridge, milling and resurfacing, new and modification to existing traffic signals and crosswalks, and the Hurricane Bay Bridge will be modified to accommodate bicycle lanes in each direction of travel and a barrier-protected sidewalk along the west side of the bridge. The project was evaluated through FDOT's Efficient Transportation Decision Making (ETDM) process as project #14124.

In partnership with Lee County, LeeTran, and Town of Fort Myers Beach, this project will incorporate Lee County's Seafarers Alternative at the intersection of Estero Boulevard and Fifth Street. Lee County presented Seafarers Alternative to Fort Myers Beach Town Council on March 2, 2020. Town Council consensus was to move forward with Lee County's intersection concept. New traffic signals will be constructed at Fifth Street to replace the existing pedestrian crosswalk signals. The posted speed limit will remain 25 mph. The reconstructed intersection will enhance public transit mobility, pedestrian safety, and provide opportunity areas for landscaping and other aesthetic features.

The project is within the U.S. Fish and Wildlife Service's (USFWS) Florida bonneted bat (*Eumops floridanus*) consultation area. Environmental Solutions & Innovations, Inc. (ESI) was retained to conduct an acoustic and roost survey for the species pursuant to the October 2019 *Florida Bonneted Bat Consultation Guidelines* (2019 Guidelines)(USFWS 2019). Project objectives include determining the potential presence or probable absence of the Florida bonneted bat and identifying potential roosts within the Project area.

2.0 Ecological Setting

2.1 Description

The Florida bonneted bat is the largest bat found in Florida. Individuals have short, glossy fur which is darker on the dorsal side and lighter on the ventral side, and hairs are bicolored as the bases are white (Timm and Genoways 2004). The fur may vary in

color from black to brown to brownish gray or cinnamon brown (Timm and Genoways 2004). The forearm length has a range of 60.0 to 69.1 millimeters (2.4 – 2.7 in) (Ober et al. 2017). The head and body length range from 130 to 165 millimeters (5.1 – 6.5 in). Although Timm and Genoways (2004) describe the species without sexual dimorphism, further study indicates males are slightly larger than females and possess gular glands, which are absent in females (Ober et al. 2017).

Federal Register Documents

78 FR 61003 61043: 2 October 2013: Endangered Species Status for the Florida Bonneted Bat; Final Rule

77 FR 60749 60776; 4 October 2012: Proposed Endangered Species Status for the Florida Bonneted Bat: Proposed Rule; request for public comments

76 FR 66370 66439; 26 October 2011: Review of Native Species That Are Candidates for Listing as Endangered or Threatened; Annual Notice of Findings on Resubmitted Petitions; Annual Description of Progress on Listing Actions

75 FR 69222 69294; 10 November 2010: Review of Native Species That Are Candidates for Listing as Endangered or Threatened; Annual Notice of Findings on Resubmitted Petitions; Annual Description of Progress on Listing Actions; Proposed Rule

74 FR 57804 57878; 9 November 2009: Review of Native Species That Are Candidates for Listing as Endangered or Threatened; Annual Notice of Findings on Resubmitted Petitions; Annual Description of Progress on Listing Actions

2.2 Status

The USFWS listed the Florida bonneted bat as endangered on 2 October 2013 (USFWS 2013). The species was considered a subspecies of Wagner's mastiff bat (*Eumops glaucinus*) and was described as a separate species in 2004 (Timm and Genoways 2004). In the U.S., eight species of bats are within the family Molossidae, and the Florida bonneted bat is the only federally listed species among them. Factors affecting the status of this species include threats to roosting and foraging habitat, inadequacy of existing regulatory protections prior to listing, and other natural or manmade factors, especially a small population size, restricted range, low fecundity, and few, isolated colonies (USFWS 2013).

Additionally, the species is protected as a federally-designated endangered species by the Florida Fish and Wildlife Conservation Commission (FWC).

2.3 Species Distribution

The Florida bonneted bat has one of the most restricted distributions of any bat in North America, with records from only twelve counties in southern Florida: Charlotte, Collier, DeSoto, Glades, Hendry, Highlands, Lee, Miami-Dade, Monroe, Okeechobee, Osceola, and Polk (Timm and Genoways 2004, USFWS 2013).

Most known records of Florida bonneted bats are on federal, state, or county managed lands; however, a few are on lands under private ownership. The USFWS defines the Florida bonneted bat's general distributable range, or Consultation Area, using confirmed presence data, key habitat features, reasonable flight distances, and home range sizes. Current Consultation Area requirements extend out 24 kilometers (15 mi) from a known roost as the distance Florida bonneted bats are expected to travel on a given night.

2.4 Ecology

Compared to other listed bat species in the U.S., relatively little is known about the Florida bonneted bat. Recent studies are beginning to provide valuable information critical for the species' future.

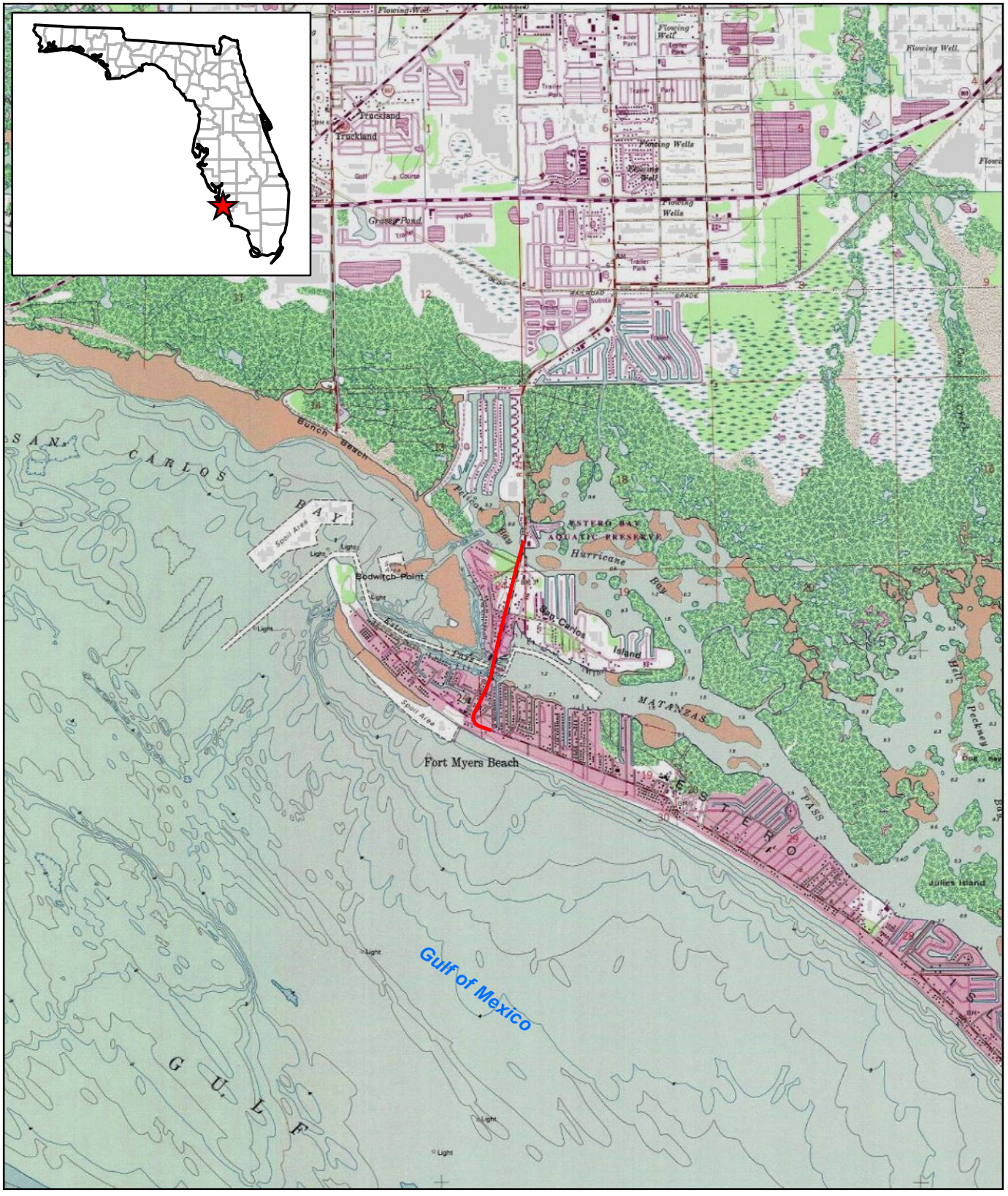

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Figure 1. Location of FPID 433726-2-32-01, SR 865 from Crescent Street to North of Hurricane Bay Bridge.

Project No. 1606

0 0.5 1 Mile

Base Map: US Topographic

2.4.1 Roosting Ecology

The Florida bonneted bat is known to roost in a variety of man-made structures and natural roosts. It has been found under the Spanish tile of buildings, in low shrubbery, and in growths of tropical flowers and shrubs in residential Miami, Coconut Grove, and Coral Gables (Best et al. 1997). Natural roosts include shafts of royal palms (*Roystonea regia*) and cavities excavated by red-cockaded woodpeckers (*Picoides borealis*), and sometimes enlarged by pileated woodpeckers (*Dryocopus pileatus*), in longleaf pines (*Pinus palustris*) (Best et al. 1997). In recent years, individuals were discovered occupying a cavity in a longleaf pine at Avon Park Air Force Range in Polk and Highlands Counties and also a cavity in a slash pine (*Pinus elliottii*) in Florida Panther National Wildlife Refuge in Collier County (Braun de Torrez et al. 2016). The species may also use utility poles or highway structures (i.e., bridges).

Artificial bat boxes also provide potential roosting habitat for the Florida bonneted bat. The species was observed roosting in bat boxes in the Fred C. Babcock/Cecil M. Webb Wildlife Management Area (BWWMA) (Ober et al. 2017). Boxes are primarily found in mesic and hydric pine flatwoods with other habitat types such as basin wetlands in the vicinity (USFWS 2013).

The Florida bonneted bat roosts in small colonies potentially consisting of a male and a harem of females. Roosting in tree cavities likely allows a male to better defend the roost from other males (Belwood 1981).

2.4.2 Maternity Season

Evidence suggests that Florida bonneted bats are polyestrous as pregnant bats have been found in early summer and September in Florida (Belwood 1981, Timm and Genoways 2004). Females give birth to one offspring each maternity season (USFWS 2013). Like other bats, females leave the young in the roost to forage during the lactation period. In the latter portion of the maternity season, the young forage with the females until the young can sufficiently forage alone (USFWS 2013).

2.4.3 Food Habits and Foraging Ecology

The species is insectivorous and is known to feed primarily on flying insects such as beetles (Coleoptera), true bugs (Hemiptera), and true flies (Diptera) (Belwood 1981). Florida bonneted bats rely on open spaces for foraging and tend to avoid clutter as they are fast fliers, but not as agile as smaller bats (Best et al. 1997). Recent evidence potentially suggests males and females occupy separate foraging niches, as modest sexual dimorphism in wing morphology exists (Ober et al. 2017). Florida bonneted bats rarely fly below 9 meters (30 ft) (Timm and Genoways 2004). Important foraging areas include wetlands and open, fresh water such as ponds and streams where bats also fly low to drink water (USFWS 2013).

2.5 Survivorship/Population Size

The population size of the Florida bonneted bat is not known; however, it is thought to be less than that needed for optimum viability (Timm and Arroyo-Cabrales 2008). Additional studies will provide more insight; however, initial thoughts range from fewer than a few hundred individuals (Marks and Marks 2008) to a number in the hundreds or lower (FWC 2011).

2.6 Causes of Past/Current Decline

Habitat loss and modification as well as other natural and manmade factors appear to influence the Florida bonneted bat. Management practices such as live or dead tree removal or prescribed burns may potentially destroy roosts. The species' ability to adapt to roost in human structures puts it at risk to purposeful or inadvertent harm from humans. Activities such as utility pole removal or bridge maintenance can disturb maternity roosts or cause mortality in a situation where awareness of the Florida bonneted bat's sensitivity is lacking (USFWS 2013).

Small population size, restricted range, isolated colonies, and low fecundity can allow stochastic or catastrophic events to be severely detrimental to the Florida bonneted bat. Factors also create a bottleneck effect making the species vulnerable to genetic drift. With such a restrictive range and likely small population size, the Florida bonneted bat becomes more vulnerable to demographic, stochastic, and environmental processes (USFWS 2013).

Competition for tree cavities as roosts is high. Florida bonneted bats must compete for roosts with a variety of native and non-native wildlife. Competition increases due to loss of habitat and potential roost trees resulting from development (USFWS 2013).

Several additional factors with potential to adversely affect the Florida bonneted bat are yet to be examined including artificial light pollution, pesticides, disease, predation, and impacts from wind facilities (USFWS 2013).

3.0 Methods

ESI conducted the acoustic and roost survey following the 2019 Guidelines and using methods as outlined in the following subsections.

3.1 Acoustic Survey

3.1.1 Level of Effort

A desktop habitat assessment is conducted to identify the level of effort for the acoustic survey. The assessment is completed using a combination of aerial photographs and

land use data from the Florida Land Use, Cover and Forms Classification System (FLUCCS). No discernable forested habitat is identified within the limits of disturbance (LOD); therefore, acoustic surveys target two bridges within the Project area.

Based on the 2019 Guidelines and given the size and layout of the Project area (<2 kilometers [1.25 mi]), a minimum of 16 detector nights (4 acoustic detectors for 4 calendar nights) are sufficient for the Project.

3.1.2 Detector Deployment

Acoustic detectors (Song Meter Mini Bat Ultrasonic Recorder [Wildlife Acoustics, Inc.]) equipped with omni-directional microphones are deployed. Detectors are mounted approximately 3 to 6 meters (10 to 20 ft) above ground on telescoping poles and/or suspended from bridges and are preset to record 30 minutes before sunset to 30 minutes after sunrise.

Preferred acoustic detector deployment locations have limited acoustic clutter, which reduces the quality of the calls recorded (Britzke 2004, Broders et al. 2004), and regular bat traffic. This includes but is not limited to: forest-canopy openings, forest edges, fencerows adjacent to open habitats or connecting two larger blocks of suitable habitat, utility corridors, water sources (including vegetated wetlands, ponds, and open stretches of streams), and other open linear corridors (including logging and other woodland roads/trails). Priority is placed on areas with potential roosting habitat.

3.1.3 Data Analysis

Data from each detector are downloaded and analyzed using the USFWS approved software identification program Kaleidoscope Pro (Kpro [Wildlife Acoustics, Inc.]). All files are analyzed for the presence of nine species, including the Florida bonneted bat. In addition, recorded call files are visually vetted, including noise files, as low-intensity calls are sometimes classified as noise by Kpro. Calls are vetted for the possibility of Florida bonneted bat presence, and all calls under 22kHz are vetted and marked for later analysis as potentially produced by the target species, or as an animal of another taxa. Call files potentially containing Florida bonneted bat-calls are flagged for vetting in full spectrum using both the Sonobat and Anabat Insight viewers to visually assess the entirety of the call file, as zero-crossing often results in loss of call data.

In some cases, Kpro identifies low-end VHF frequencies from cars, insects, birds, or flying squirrels as Florida bonneted bats due to some repetition in noise or call structure. Extensive experience in acoustic analyses is key to identifying such situations. In addition, Brazilian free-tailed (*Tadarida brasiliensis*) and hoary (*Lasiurus cinereus*) bat calls can overlap Florida bonneted bats in frequency range. Kpro places great emphasis on call frequency as the major indicator, not on call structure or time between calls, to identify species. Low frequency Brazilian free-tailed bat calls are often misidentified as Florida bonneted bats due to characteristic frequencies being below 20 kHz. Experienced acoustic analysts are capable of reviewing all factors to ensure proper identification.

The software also makes use of maximum likelihood estimators (MLE), a multivariate statistical technique used to test the strength of a proposed relationship based on known or assumed error rates. In this case, the proposed relationship is the presence of protected bats identified by analytical software. The MLE considers the number of call sequences identified as a species and compares that to the number of call sequences identified belonging to a similar species based on the assumed error rates. Assumed error rates are obtained by testing the software packages against libraries of known calls. The goal is to provide a mechanism to eliminate errors resulting from misclassification.

3.1.4 Habitat Characterization

Habitat is described for each detector location (**Appendix A**) and representative photographs are taken (**Appendix B**). The emphasis of this description is habitat form: size and relative abundance of large trees, snags, or man-made structures that potentially serve as roosts, canopy closure, understory clutter/openness, water availability, and flight corridors.

3.1.5 Weather and Temperature

To ensure compliance with USFWS guidelines, ESI monitors weather during the acoustic survey. Additional level of effort may be required if the following conditions are encountered during the first 5 hours of the survey period:

- Temperatures <18°C (65°F);
- Precipitation (rain/fog) exceeding 30 minutes or continuing intermittently;
- Sustained wind speeds >9 miles per hour for >30 minutes.

Weather data from the nearest National Oceanic and Atmospheric Administration (NOAA) National Weather Service station is downloaded and reviewed. The closest NOAA weather station to the Project area is the Southwest Florida International Airport (KRSW; approximately 20 kilometers [12.4 mi] northeast).

Supporting weather documents are included in **Appendix C**.

3.2 Roost Survey

Roost surveys are conducted within the Project area. This includes assessing all types and age classes of forest (if present) and artificial structures (such as abandoned buildings, bridges/culverts, and wooden utility poles). Cavities, expansion gaps, and/or other cracks/crevices may provide potential roosting suitability for Florida bonneted bats. Evidence may include bat carcasses, staining at entrance to cavity/crevice, guano, and/or auditory chirping sounds.

4.0 Results

4.1 Acoustic Survey

Based on the layout of the Project area, ESI deployed 4 detectors for 5 calendar nights from 28 October to 1 November 2020 totaling **20 complete detector nights** of effort (**Table 1; Figure 2**). Detector deployment data sheets are provided in **Appendix A**.

Table 1. Detector locations for FPID 433726-2-32-01, SR 865 from Crescent Street to North of Hurricane Bay Bridge.

Detector ID	Completed Survey Dates (2020)	Latitude (DMS)	Longitude (DMS)
D-01	28 October – 1 November	26° 28' 00.32" N	-81° 57' 03.46" W
D-02	28 October – 1 November	26° 27' 59.11" N	-81° 57' 03.70" W
D-03	28 October – 1 November	26° 27' 29.37" N	-81° 57' 12.02" W
D-04	28 October – 1 November	26° 27' 24.08" N	-81° 57' 13.30" W

4.1.1 Analysis of Call Sequences

In total, 2,966 bat calls were identified and analyzed to species by Kpro (Table 2). Six of eight species used in the software analysis were recorded. Florida bonneted bats were detected at three of the four detector locations. Brazilian free-tailed (2,791), big brown (98), and Florida bonneted (71) bats were the most commonly detected species.

An additional 156 calls were recorded by detectors; however, a species classification was not assigned by Kpro.

4.1.2 Maximum Likelihood Estimator

Maximum likelihood analysis in Kpro indicated presence of two of eight species included in the analysis (**Appendix D**). Florida bonneted bat presence was confirmed by the MLE.

4.1.3 Qualitative Vetting

Qualitative vetting, including identification to species via focusing on morphological call characteristics such as frequency, slope, duration, and intensity, was conducted on acoustic calls to confirm Florida bonneted bat presence or probable absence. Kpro classified 71 call files as Florida bonneted bats, with vetted presence at one site, D-03. Automatic identification software frequently creates a suite of false-positive results within certain frequency ranges, such as low frequencies around Florida bonneted bats, spotted bats (*Euderma maculatum*), and mastiff bats (*Eumops perotis*) due to noise, or high frequencies where *Myotis* calls have overlap of multiple species. Automatic identification software programs serve as indicators to guide acoustic-identification specialists' efforts and focus.

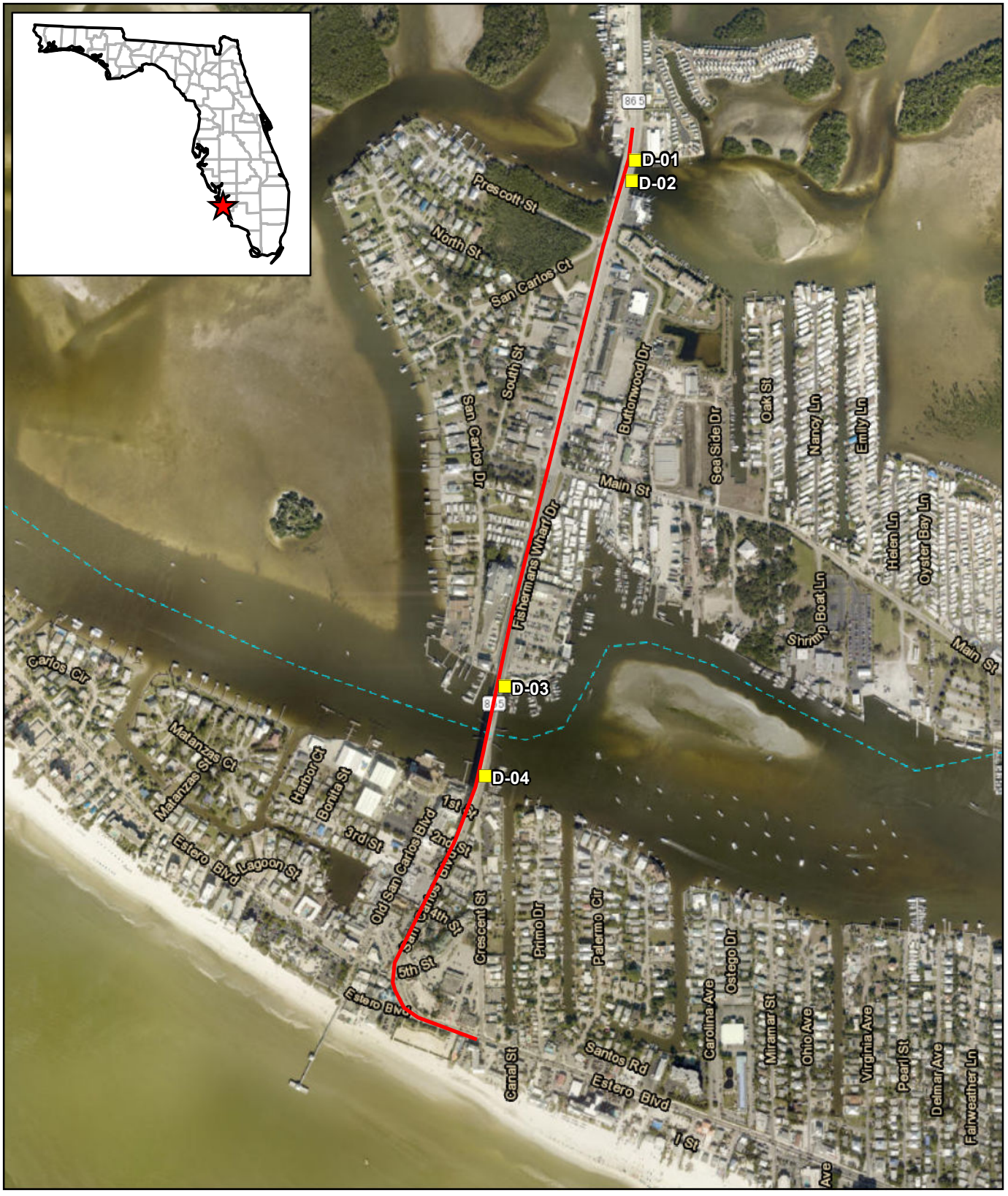

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Figure 2. Detector locations for FPID 433726-2-32-01, SR 865 from Crescent Street to North of Hurricane Bay Bridge.

Project No. 1606

0 0.125 0.25 Mile

Base Map: Esri World Imagery (Clarity)

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Table 2. Bat calls identified by Kaleidoscope Pro automated software for FPID 433726-2-32-01, SR 865 from Crescent Street to North of Hurricane Bay Bridge.

Detector ID	Date (2020)	COTO*	EPFU	EUFL	LABO/ LASE	MYAU	NYHU	PESU	TABR	Total Bat Calls/Day
D-01	28 Oct	0	0	0	1	0	0	0	54	**55**
	29 Oct	0	1	0	0	0	1	0	30	**32**
	30 Oct	0	0	0	0	0	0	0	42	**42**
	31 Oct	0	0	2	0	0	0	0	141	**143**
	1 Nov	0	0	0	0	0	0	0	29	**29**
D-02	28 Oct	0	1	0	0	0	0	0	49	**50**
	29 Oct	0	1	0	0	0	0	1	20	**22**
	30 Oct	0	0	0	0	0	0	0	39	**39**
	31 Oct	0	0	0	0	0	1	0	108	**109**
	1 Nov	0	0	0	0	0	0	0	21	**21**
D-03	28 Oct	0	3	11	0	0	0	0	173	**187**
	29 Oct	0	6	4	0	0	0	0	124	**134**
	30 Oct	0	2	14	0	0	0	0	65	**81**
	31 Oct	0	12	12	1	0	0	0	326	**351**
	1 Nov	0	0	4	0	0	0	0	54	**58**
D-04	28 Oct	0	4	8	0	0	0	0	322	**334**
	29 Oct	0	4	4	0	0	0	0	165	**173**
	30 Oct	0	10	5	0	0	0	0	232	**247**
	31 Oct	0	50	6	1	0	0	0	705	**762**
	1 Nov	0	4	1	0	0	0	0	92	**97**
Total		**0**	**98**	**71**	**3**	**0**	**2**	**1**	**2,791**	**2,966**

COTO=*Corynorhinus townsendii* (Townsend's big-eared bat); **EPFU**=*Eptesicus fuscus* (big brown bat); **EUFL**=*Eumops floridanus* (Florida bonneted bat); **LABO/LASE**=*Lasiurus borealis/Lasiurus seminolus* (eastern red bat/Seminole bat [species grouped together due to overlapping call frequencies]); **MYAU**=*Myotis austroriparius* (southeastern bat); **NYHU**=*Nycticieus humeralis* (evening bat); **PESU**=*Perimyotis subflavus* (tricolored bat); **TABR**=*Tadarida brasiliensis* (Brazilian free-tailed bat).
*Rafinesque's big-eared bat (*Corynorhinus rafinesquii*) was included in the analysis for **COTO**.
An additional 156 calls were recorded by detectors; however, a species classification was not assigned by Kpro.

Calls were vetted, with ESI-specific filters applied to ensure potential files of interest were not overlooked and resulted in identification of **one diagnostic call of Florida bonneted bat within the Project area**. A myriad of low-level triggers was incorrectly classified and included: traffic and low-level noises (**Appendix E**). Dispersed calls recorded during the Project are included in zero cross format as a supplementary electronic submission to this report. Full spectrum calls are available upon request, but file size requires transmission via hard drive.

4.1.4 Habitat Characterization of Detector Locations

Detector deployment consisted of suspending detectors from the edges of bridges over Matanzas Pass and Hurricane Bay. Habitat primarily consisted of urban, developed land with residential and commercial structures in the area. No trees nor any vegetative understory were proximate detector positions. Florida bonneted bat roosting potential was ranked as low at all four detector locations, as no potential roost trees or man-made structures potentially serving as roosts were observed.

4.1.5 Weather

Weather conditions were deemed suitable on all five calendar nights of the survey (28 October to 1 November 2020). No weather issues were recorded (**Appendix C**).

4.2 Roost Survey

No potential roost trees were observed within the Project LOD. Bridges were also assessed for potential roosting locations, but no signs indicative of Florida bonneted bat roosting were observed.

5.0 Discussion

Twenty complete detector nights were completed via deployment of four detectors from 28 October to 1 November 2020. Kpro identified Florida bonneted bats at three of four detector locations (71 call files); however, calls were vetted by a qualified ESI acoustic analyst and **a single diagnostic call of the Florida bonneted bat was identified within the Project area at Detector ID D-03 on 30 October 2020 (See Figure 2).** The single call was not recorded at emergence indicating the bat entered the Project area from adjacent habitat.

No potential roost trees were identified during the roost survey. Bridges were assessed; however, expansion joints observed appeared filled and did not exhibit adequate space required for roosting bats. No signs of roosting, such as guano or staining, were observed on any other areas of the bridges.

Considering only one diagnostic call of the Florida bonneted bat was confirmed and no potential roosting features/signs were observed, the Project is not expected to adversely affect the species. Following the Florida Bonneted Bat Consultation Key in the 2019 Guidelines, the **Project May Affect, Not Likely Adversely Affect** the Florida bonneted bat.

6.0 Literature Cited

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APPENDIX A
DATA SHEETS

2020

Property of: Environmental Solutions & Innovations, Inc.
2250 Lucien Way, Suite 302, Maitland, FL 32751

ESI

HABITAT ASSESSMENT

Project #: 1606 **Date:** 28 October 2020 **State:** FL **County:** Lee

Project Name: WOI-SR865-Bats **Site Name/#:** D-01 - D-04 **USGS Quad:** Fort Myers Beach

Permitted Biologist: Nick Gikas (full name) Other Field Staff: — (full name) State Permit #: — Federal Permit #: —

Net/Trap/ Detector	Net/Trap/ Detector #	Latitude		Longitude		Picture #	Waypoint #
Detector	D-01	26.46675458	"N	-81.950962 24	"W	D-01	D-01
Detector	D-02	26.46641842	"N	-81.951 0 2879	"W	D-02	D-02
Detector	D-03	26.45815789	"N	-81.95333933	"W	D-03	D-03
		° '	"N	° '	"W		

Distance to closest water source (meters): 13 ; 85 Type of water source: Bay

Water source name: _____

ESTIMATED WATER SOURCE CHARACTERISTICS (IF UNDER NETS OR DETECTOR):

Bank Height: 3 meters Channel Width: 70+ meters Stream Width: 70+ meters

Substratum: ___Bedrock ___Boulder ___Cobble ___Gravel ✓Sand ✓Silt/Clay

Still Water Present (Y/N): N Average Water Depth: 5 (m) or cm Clarity (H,M,L): M

VEGETATION:

Dominant Canopy Species (> 40 cm/16" dbh) — Subdominant Canopy Species (< 40 cm/16" dbh)

Estimated dbh range: Lg: — Sm: — Estimated dbh range: Lg: — Sm: —

Relative abundance of dominant vs. subdominant (ratio): —

Estimated canopy closure: ___Closed ___Moderate ✓Open

Roost tree potential consists of: ___Hollow ___Large Trees ___Snags ✓Neither

E. floridanus roost tree potential is: ___High ___Moderate ✓Low

Roost potential comments: No trees present; no potential roosts in man-made structures observed

Subcanopy clutter: ___High ___Moderate ✓Low

Subcanopy consists largely of: __ Low Branches of Canopy Trees __ Saplings __ Shrubs

Common Subcanopy Species: _____ _____ _____

Check all that apply:

__Mature Upland Forest __Recently Logged Forest __Crop/Pasture Land Other Developed/Urban
__Young Upland Forest __Forest Edge __Stream/River
__Mature Lowland Forest __Woodlot __Vernal Pool
__Young Lowland Forest __Old Field ✓Deepwater Lake/Pond

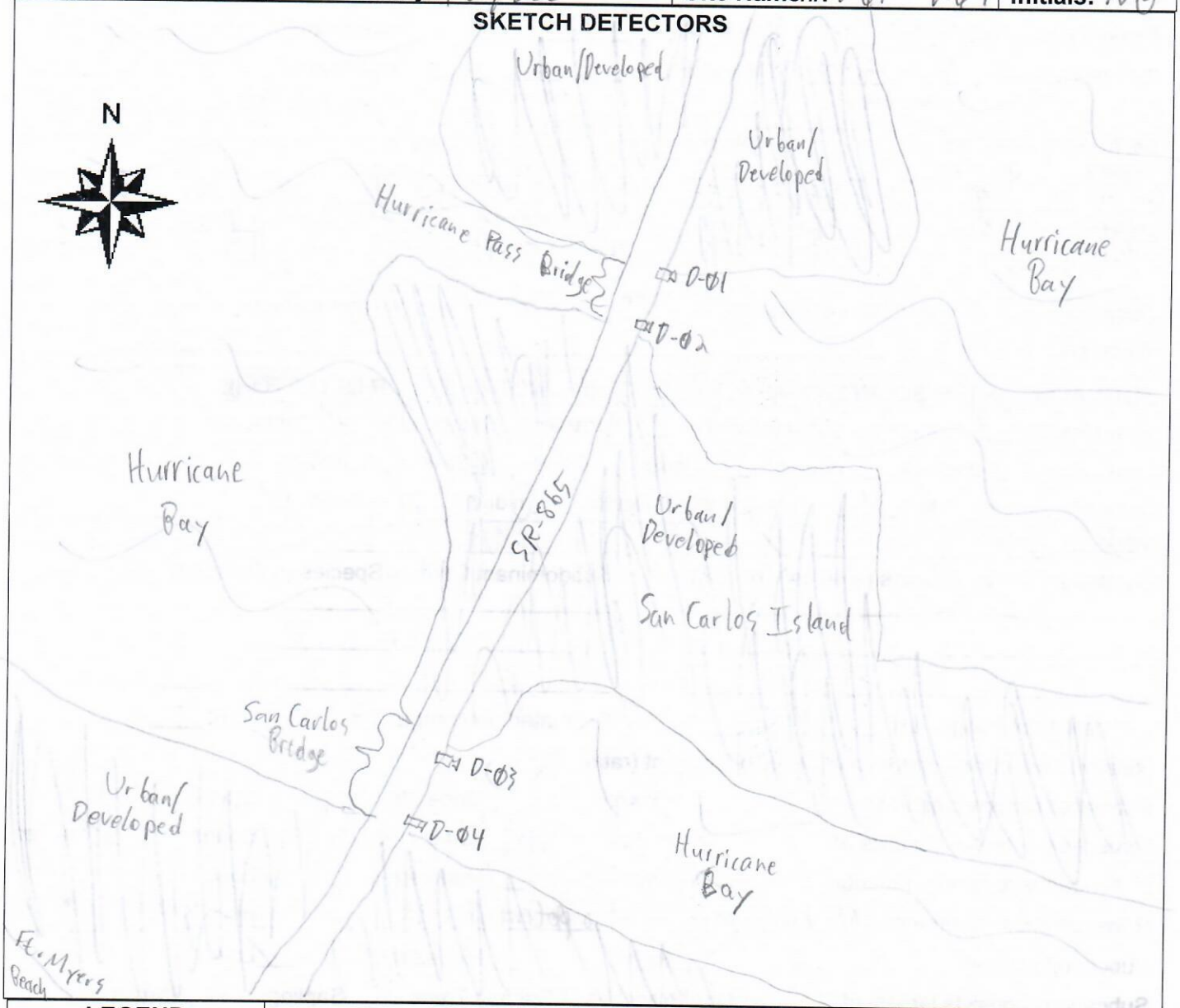
Herbaceous Cover: — Sparse ___Moderate ___Dense

Property of: Environmental Solutions & Innovations, Inc.
2250 Lucien Way, Suite 302, Maitland, FL 32751

HABITAT ASSESSMENT (continued)

Project #: 1606	State/County: FL / Lee	Site Name/#: D-01 - D-04	Initials: NG

SKETCH DETECTORS



LEGEND

Net:

Detector:

DETAILED HABITAT DESCRIPTION & COMMENTS

Detectors suspended from bridges over Hurricane Bay; no nearby trees; mostly open water & urban/ developed land; no potential roosting structures in bridges

2020

Property of: Environmental Solutions & Innovations, Inc.
4525 Este Avenue. Cincinnati, OH 45232 (Phone: 513-451-1777)

ESI

DAILY DETECTOR DEPLOYMENT DATA

Project#: 1606 **Date:** 27 October 2020

Project Name: WGI - SR865 Bats **Site Name#:** D-01 & D-02

State: Florida **County:** Lee

GPS Unit#: iPad 0404 **Camera/IPAD #:** iPad 0404

Biologist (Full name) selected site Nick Gikas

Biologist (Full name) deployed detector Nick Gikas

Wind Speed (mph)	Description	Visible Condition	Wind Speed (mph)	Description	Visible Condition
0	Calm	Smoke rises vertically	19-24	Fresh Breeze	Small trees in leaf begin to sway; crested wavelets on inland water
1-3	Light Air	Direction of wind shown by smoke but not by wind vanes	25-31	Strong Breeze	Large branches in motion; telephone wires whistle; umbrellas used with difficulty
4-7	Light Breeze	Wind felt on face; leaves rustle; ordinary wind vane moved by wind	32-38	Moderate Gale	Whole trees in motion; inconvenience in walking against wind
8-12	Gentle Breeze	Leaves and small twigs in constant motion; wind extends light flag	39-46	Fresh Gale	Breaks twigs off trees; generally impedes progress
13-18	Moderate Breeze	Raises dust and loose paper; small branches are moved			

FILL IN THE FOLLOWING FOR EACH DETECTOR SET

Detector # Red Tag	Latitude	Longitude	Time Up (xxxx h)	Time Down (xxxx h)	Photo #Detector	Photo # Cone	Waypoint #
SMU00573	26.46675452	-81.95096224	1818	0805	D-01		D-01
SMU01837	26.46641842 "N	-81.95102979 "W			D-02		D-02

Provide: Information about the Detector & Microphone

✓ **Wildlife Acoustcs Songmeter (SM):** Please pick and model (microphone)	___ **Titley Electronics Anabat (AB):** ___SD 1, ___SD2, ___ABII and ZCAIM
___SM 3 (___U1 or ___U2 micropone), ___SM 4 (U2) ___✓ Mini (U2)	**Microphone Type**___Standard (Black) ___ High (Green) or ___Stainless steel_

Detector Placement/Site Description: Suspended below bridge over water

DETECTOR CHECKLIST (Initial each blank as you verify each issue)

1. How far (ft) is the detector from vegetative clutter on the ground in all directions? 10 (ft) Compliance = 10 feet minimum

How far (ft) is the detector from another detector? 1320 (ft) Compliance = 656 feet minimum

How far (ft) is the microphone from vegetation in front of it? 50+ (ft) Compliance = 33 feet minimum

What is the angle of the microphone? ____(°) SM should be horizontal, AB ~45°

How far (ft) is the detector from any potential or known roost? 50 (ft) Compliance = 50 feet minimum

Is the detector Parallel to woodland? ☑yes ☐no If not, WHY?

2. Is the Microphone? ☐Directional ☐ Hemispherical ☑Omni Directional

How high (ft) is the microphone above ground level? 10 (ft) Compliance = 10 feet

Are calls recorded in : ☑ Full Spectrum ☐ Zero Crossing

3. Is the gear working? ☑yes ☐no Checked by (name) Nick Gikas at 09:56 (Time)

4. Is detector water-proofed? ☑Yes ☐No NG Initial

5. What is the temperature____ (◦F)? Compliance= >50 degrees F

What is the wind speed (mph)____? Compliance = <9 mph sustained

_____ Precipitation for 30 minutes straight or intermittent the first 5 hours

2020

Property of: Environmental Solutions & Innovations, Inc.
4525 Este Avenue. Cincinnati, OH 45232 (Phone: 513-451-1777)

ESI

DAILY DETECTOR DEPLOYMENT DATA

Project#: 1606 **Date:** 27 October 2020

Project Name: WGI-SR865 Bats **Site Name#:** D-03 & D-04

State: Florida **County:** Lee

GPS Unit#: iPad 0404 **Camera/IPAD #:** iPad 0404

Biologist (Full name) selected site Nick Gikas

Biologist (Full name) deployed detector Nick Gikas

Wind Speed (mph)	Description	Visible Condition	Wind Speed (mph)	Description	Visible Condition
0	Calm	Smoke rises vertically	19-24	Fresh Breeze	Small trees in leaf begin to sway; crested wavelets on inland water
1-3	Light Air	Direction of wind shown by smoke but not by wind vanes	25-31	Strong Breeze	Large branches in motion; telephone wires whistle; umbrellas used with difficulty
4-7	Light Breeze	Wind felt on face; leaves rustle; ordinary wind vane moved by wind	32-38	Moderate Gale	Whole trees in motion; inconvenience in walking against wind
8-12	Gentle Breeze	Leaves and small twigs in constant motion; wind extends light flag	39-46	Fresh Gale	Breaks twigs off trees; generally impedes progress
13-18	Moderate Breeze	Raises dust and loose paper; small branches are moved			

FILL IN THE FOLLOWING FOR EACH DETECTOR SET

Detector # Red Tag	Latitude	Longitude	Time Up (xxxx h)	Time Down (xxxx h)	Photo #Detector	Photo # Cone	Waypoint #
SMU00541	26.45815789	-81.95333933	18:18	08:05	D-03		D-03
SMU00951	26.45668801 "N	-81.95369361 "W			D-04		D-04

Provide: Information about the Detector & Microphone

✓ **Wildlife Acoustcs Songmeter (SM):** Please pick and model (microphone)	___ **Titley Electronics Anabat (AB):** ___SD 1, ___SD2, ___ABII and ZCAIM
___SM 3 (___U1 or ___U2 micropone), ___SM 4 (U2) ✓ Mini (U2)_	**Microphone Type**___Standard (Black) ___ High (Green) or ___Stainless steel_

Detector Placement/Site Description:

DETECTOR CHECKLIST (Initial each blank as you verify each issue)

1. How far (ft) is the detector from vegetative clutter on the ground in all directions? 55 (ft)
Compliance = 10 feet minimum

How far (ft) is the detector from another detector? 545 (ft)
Compliance = 656 feet minimum

How far (ft) is the microphone from vegetation in front of it? 50+ (ft)
Compliance = 33 feet minimum

What is the angle of the microphone? ___(°)
SM should be horizontal, AB ~45°

How far (ft) is the detector from any potential or known roost? 50+ (ft)
Compliance = 50 feet minimum

Is the detector Parallel to woodland? ☑yes ☐no
If not, WHY?

2. Is the Microphone? ☐Directional ☐ Hemispherical ☑Omni Directional

How high (ft) is the microphone above ground level? 85 (ft)
Compliance = 10 feet

Are calls recorded in :
☑ Full Spectrum
☐ Zero Crossing

3. Is the gear working? ☑yes ☐no

Checked by (name) Nick Gikas at 10:52 (Time)

4. Is detector water-proofed? ☑ Yes ☐No NG Initial

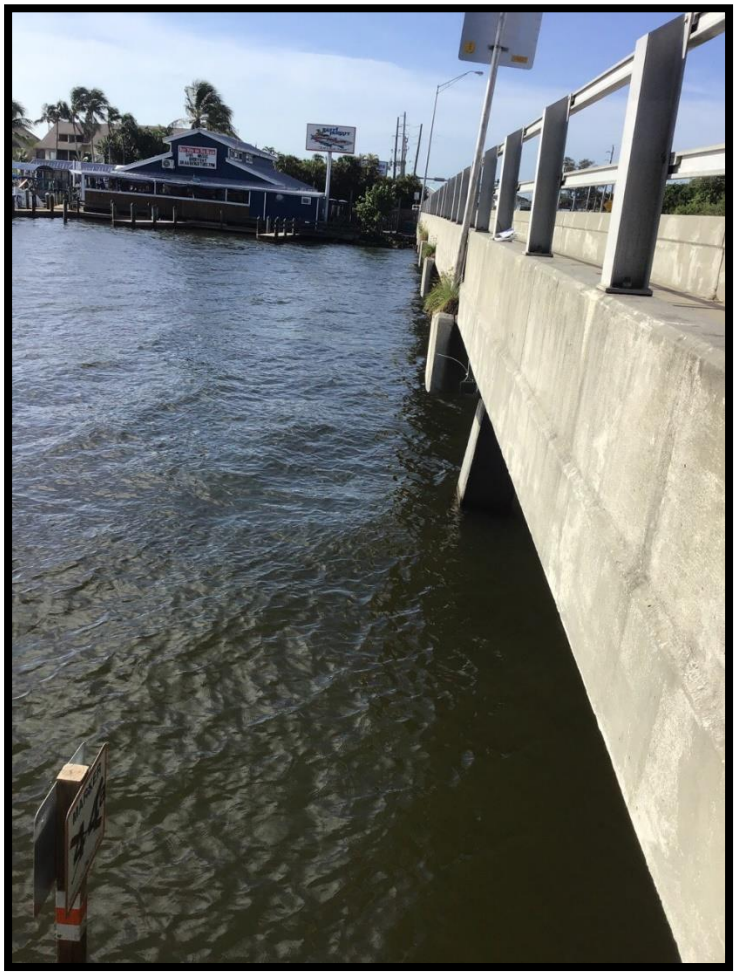
5. What is the temperature____ (°F)?
Compliance= >50 degrees F

What is the wind speed (mph)____?
Compliance = <9 mph sustained

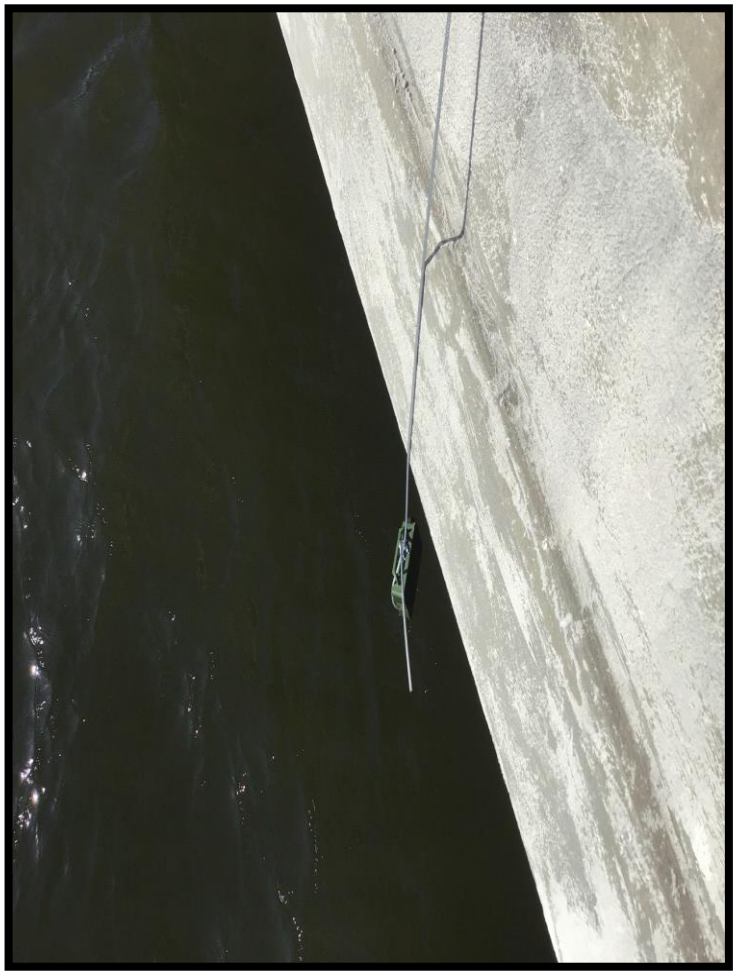
_____ Precipitation for 30 minutes straight or intermittent the first 5 hours

APPENDIX B
PHOTOGRAPHS

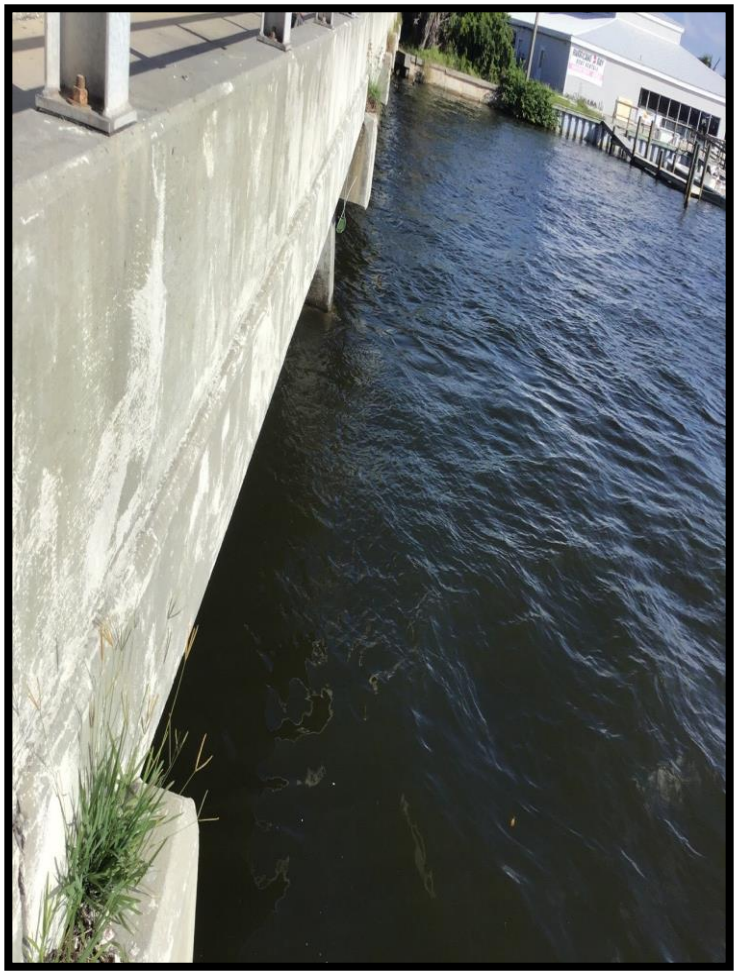
Detector D-01 Photo 1



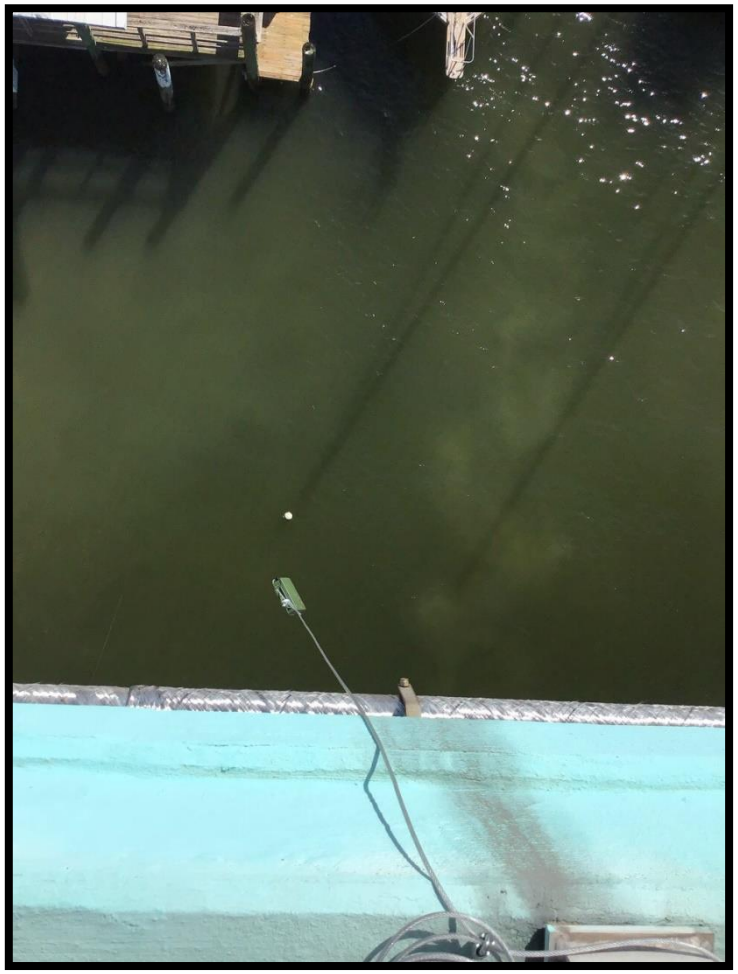
Detector D-01 Photo 2



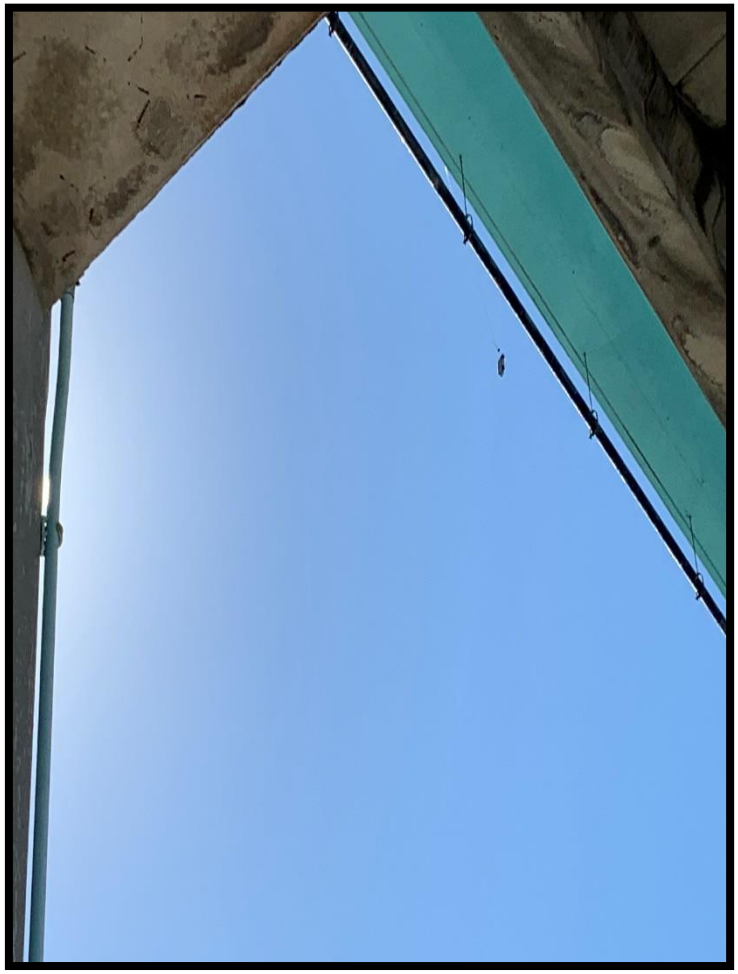
Detector D-02 Photo 1



Detector D-02 Photo 2

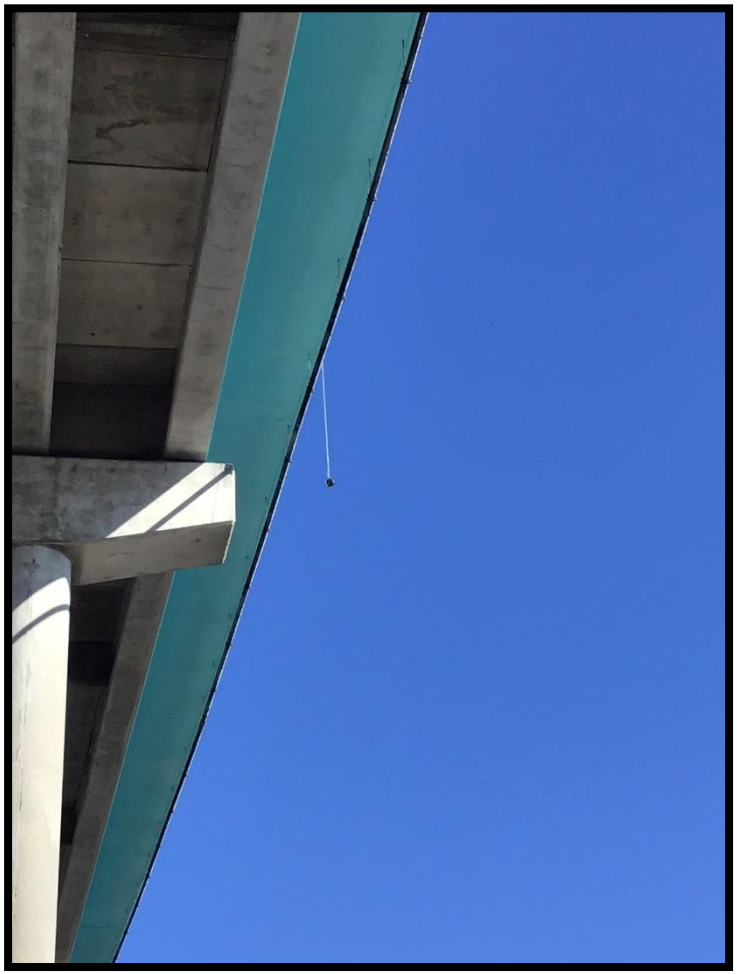


Detector D-03 Photo 1



Detector D-03 Photo 2

Detector D-04 Photo 1



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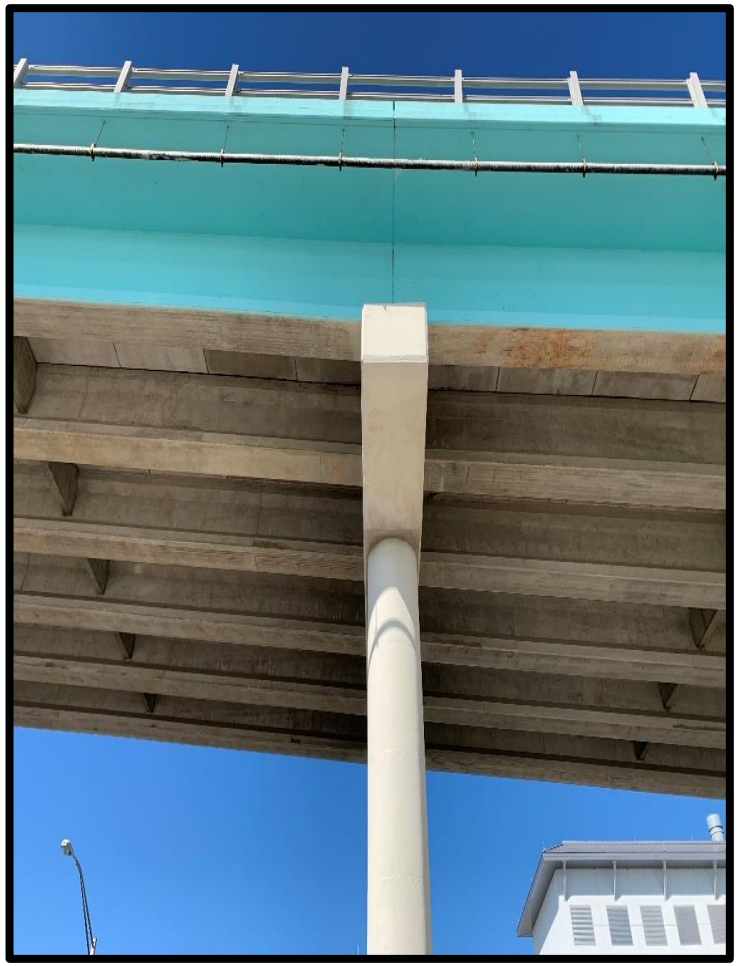


Habitat Photo 1

Habitat Photo 02

APPENDIX C
WEATHER DATA

Search Locations

Log in (Log…

Recent Cities

Fort Myers Beach, FL (weather/us/fl/fort-myers-beach/26.45,-81.95) Sorrento, FL (32776) (weather/us/fl/sorrento/28.79,-81.53) Fort Me

26.53 °N, **81.76** °W

Fort Myers, FL Weather History

79° SOUTHWEST FLORIDA INTERNATIONAL AIRPORT STATION (/WEATHER/US/FL/FORT-MYERS/KRSW?CM_VEN=LOCALWX_PWSDASH) | CHANGE

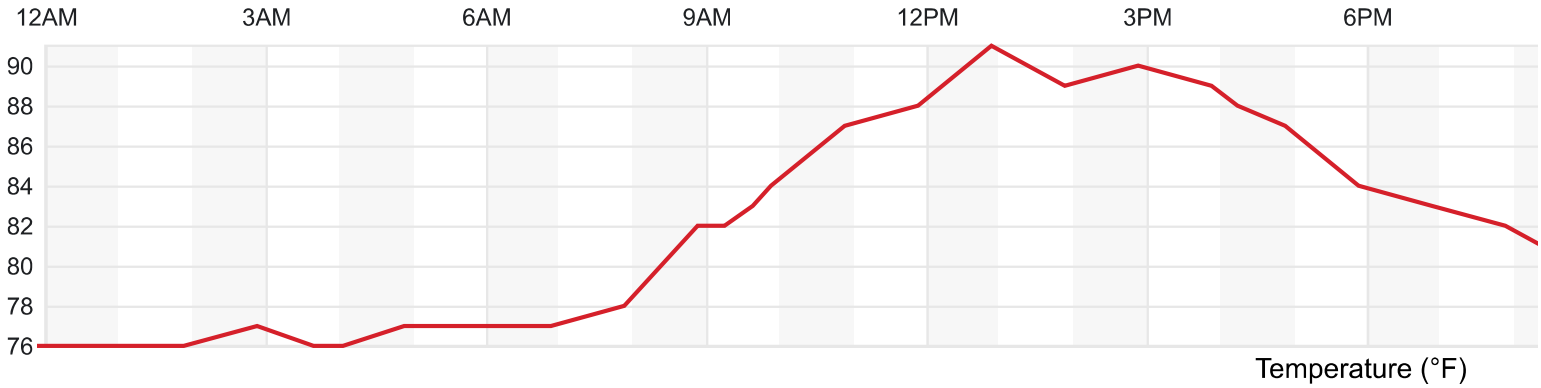
HISTORY (/HISTORY/DAILY/US/FL/FORT-MYERS/KRSW)

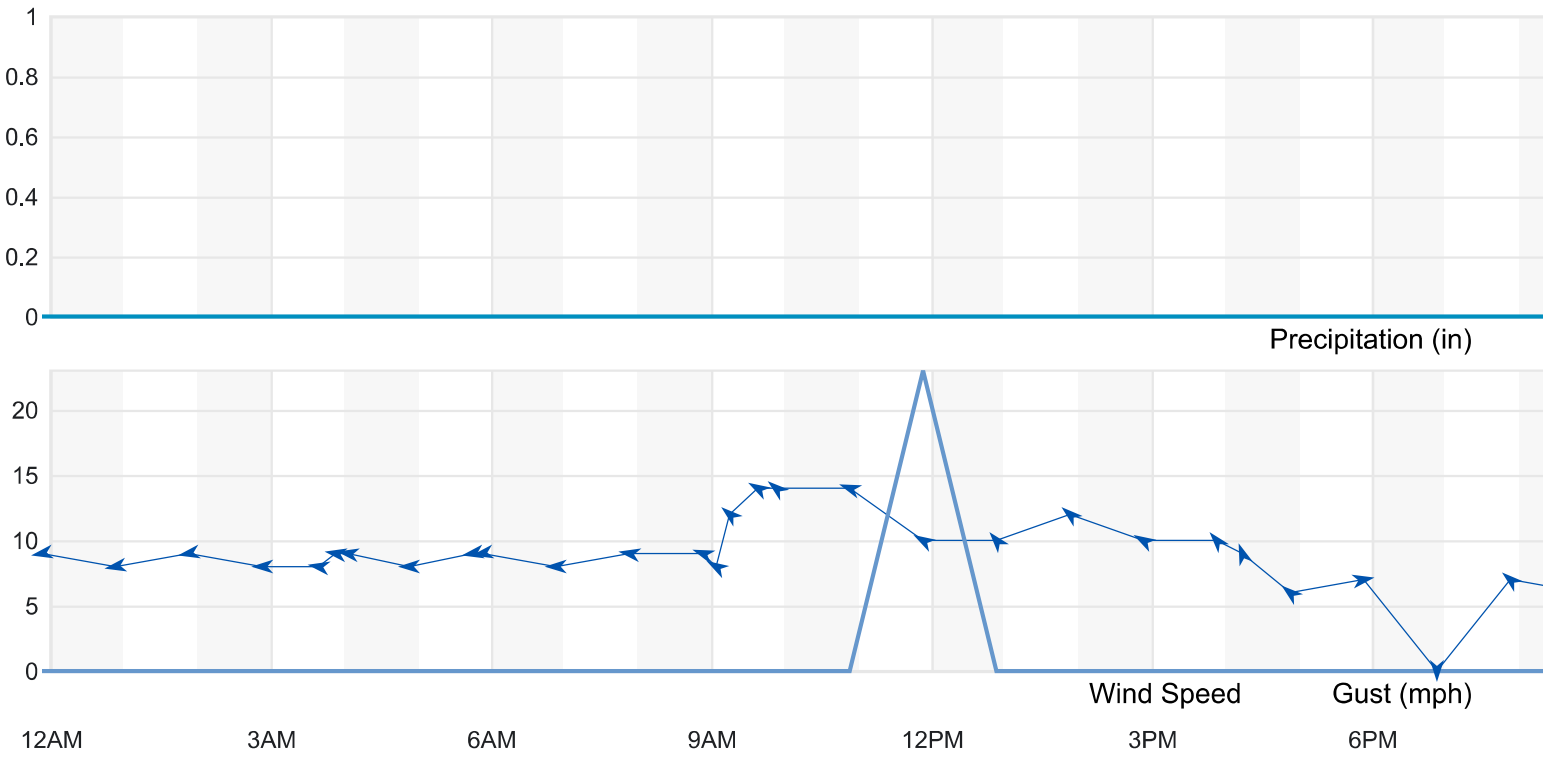
- TODAY (/WEATHER/US/FL/FORT-MYERS/KRSW)
- HOURLY (/HOURLY/US/FL/FORT-MYERS/KRSW)
- 10-DAY (/FORECAST/US/FL/FORT-MYERS/KRSW)
- CALENDAR (/CALENDAR/US/FL/FORT-MYERS/KRSW)
- HISTORY (/HISTORY/DAILY/US/FL/FORT-MYERS/KRSW)
- WUNDERMAP (/WUNDERMAP?LAT=26.53&LON=-81.76)

Daily Weekly Monthly

(/history/daily/us/fl/fort-myers/KRSW/date/2020-10-28) (/history/weekly/us/fl/fort-myers/KRSW/date/2020-10-28) (/history/monthly/us/fl/fort-myers/KRSW/date/2020-10)

October 28 2020 View





Summary

Temperature (° F)	Actual	Historic Avg.	Record
High Temp	91	85	91
Low Temp	76	66	45
Day Average Temp	81.45	75	-
Precipitation (Inches)	Actual	Historic Avg.	Record
Precipitation (past 24 hours from 04:53:00)	0.00	0.07	-
Dew Point (° F)	Actual	Historic Avg.	Record
Dew Point	72.77	-	-
High	75	-	-
Low	69	-	-
Average	72.77	-	-
Wind (MPH)	Actual	Historic Avg.	Record
Max Wind Speed	14	-	-

Temperature (° F)	Actual	Historic Avg.	Record
Visibility	10	-	-

Sea Level Pressure (Hg)	Actual	Historic Avg.	Record
Sea Level Pressure	30.02	-	-

Astronomy	Day Length	Rise	Set
Actual Time	11h 13m	7:35 AM	6:48 PM
Civil Twilight		7:11 AM	7:12 PM
Nautical Twilight		6:44 AM	7:39 PM
Astronomical Twilight		6:17 AM	8:06 PM
Moon: waxing gibbous		4:32 PM	3:57 AM

Daily Observations

Time	Temperature	Dew Point	Humidity	Wind	Wind Speed	Wind Gust	Pressure	Prec
11:53 PM	76 °F	73 °F	91 %	E	9 mph	0 mph	30.01 in	0.0 i
12:53 AM	76 °F	73 °F	91 %	E	8 mph	0 mph	30.00 in	0.0 i
1:53 AM	76 °F	74 °F	94 %	E	9 mph	0 mph	29.98 in	0.0 i
2:53 AM	77 °F	74 °F	90 %	E	8 mph	0 mph	29.98 in	0.0 i
3:39 AM	76 °F	74 °F	94 %	E	8 mph	0 mph	29.97 in	0.0 i
3:53 AM	76 °F	74 °F	94 %	E	9 mph	0 mph	29.97 in	0.0 i
4:03 AM	76 °F	74 °F	94 %	E	9 mph	0 mph	29.97 in	0.0 i
4:53 AM	77 °F	74 °F	90 %	E	8 mph	0 mph	29.97 in	0.0 i
5:45 AM	77 °F	74 °F	90 %	E	9 mph	0 mph	29.98 in	0.0 i
5:53 AM	77 °F	74 °F	90 %	E	9 mph	0 mph	29.98 in	0.0 i
6:53 AM	77 °F	74 °F	90 %	E	8 mph	0 mph	29.99 in	0.0 i
7:53 AM	78 °F	75 °F	90 %	E	9 mph	0 mph	30.00 in	0.0 i
8:53 AM	82 °F	75 °F	79 %	ESE	9 mph	0 mph	30.02 in	0.0 i
9:04 AM	82 °F	75 °F	79 %	ESE	8 mph	0 mph	30.02 in	0.0 i
9:15 AM	82 °F	75 °F	79 %	SE	12 mph	0 mph	30.02 in	0.0 i
9:38 AM	83 °F	74 °F	74 %	ESE	14 mph	0 mph	30.01 in	0.0 i

Time	Temperature	Dew Point	Humidity	Wind	Wind Speed	Wind Gust	Pressure	Prec
9:53 AM	84 °F	74 °F	72 %	SE	14 mph	0 mph	30.01 in	0.0 i
10:53 AM	87 °F	72 °F	61 %	ESE	14 mph	0 mph	30.00 in	0.0 i
11:53 AM	88 °F	71 °F	57 %	ESE	10 mph	23 mph	29.98 in	0.0 i
12:53 PM	91 °F	70 °F	50 %	SE	10 mph	0 mph	29.95 in	0.0 i
1:53 PM	89 °F	69 °F	52 %	SE	12 mph	0 mph	29.93 in	0.0 i
2:53 PM	90 °F	69 °F	50 %	ESE	10 mph	0 mph	29.91 in	0.0 i
3:53 PM	89 °F	70 °F	53 %	SE	10 mph	0 mph	29.91 in	0.0 i
4:14 PM	88 °F	70 °F	55 %	SSE	9 mph	0 mph	29.91 in	0.0 i
4:53 PM	87 °F	71 °F	59 %	SE	6 mph	0 mph	29.91 in	0.0 i
5:53 PM	84 °F	74 °F	72 %	W	7 mph	0 mph	29.93 in	0.0 i
6:53 PM	83 °F	74 °F	74 %	CALM	0 mph	0 mph	29.95 in	0.0 i
7:53 PM	82 °F	72 °F	71 %	SE	7 mph	0 mph	29.95 in	0.0 i
8:53 PM	80 °F	71 °F	74 %	SE	6 mph	0 mph	29.96 in	0.0 i
9:53 PM	78 °F	71 °F	79 %	ESE	7 mph	0 mph	29.96 in	0.0 i
10:53 PM	77 °F	72 °F	84 %	SE	7 mph	0 mph	29.96 in	0.0 i

Search Locations

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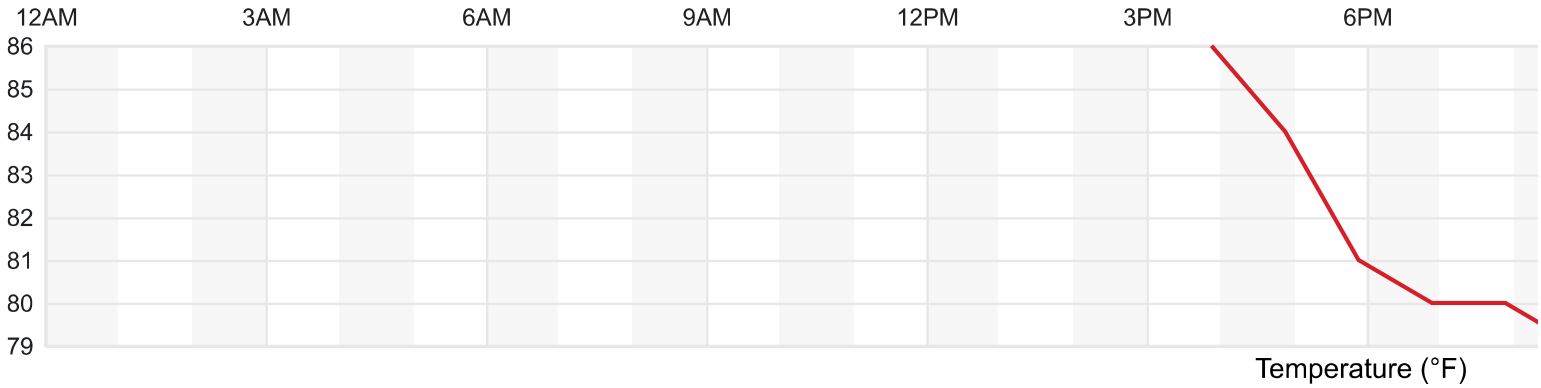
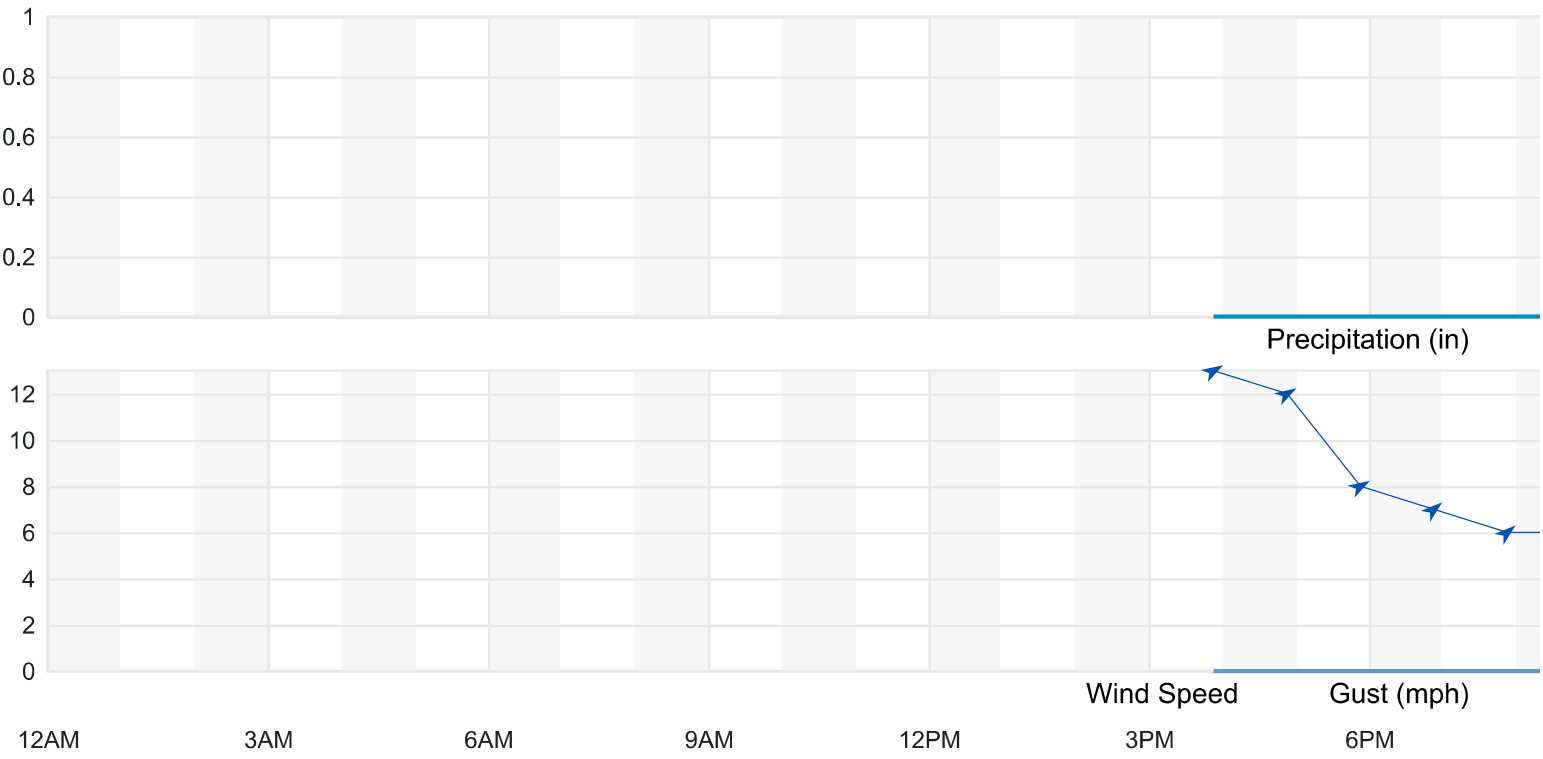
- HOURLY (/HOURLY/US/FL/FORT-MYERS/KRSW)
- 10-DAY (/FORECAST/US/FL/FORT-MYERS/KRSW)
- CALENDAR (/CALENDAR/US/FL/FORT-MYERS/KRSW)
- HISTORY (/HISTORY/DAILY/US/FL/FORT-MYERS/KRSW)
- WUNDERMAP (/WUNDERMAP?LAT=26.53&LON=-81.76)

Daily Weekly Monthly

(/history/daily/us/fl/fort-myers/KRSW/date/2020-10-29) (/history/weekly/us/fl/fort-myers/KRSW/date/2020-10-29) (/history/monthly/us/fl/fort-myers/KRSW/date/2020-10)

October 29 2020 View





Summary

Temperature (° F)	Actual	Historic Avg.	Record
High Temp	86	84	93
Low Temp	79	66	47
Day Average Temp	81.13	75	-

Precipitation (Inches)	Actual	Historic Avg.	Record
Precipitation (past 24 hours from 20:53:00)	0.00	0.07	-

Dew Point (° F)	Actual	Historic Avg.	Record
Dew Point	75.13	-	-
High	76	-	-
Low	73	-	-
Average	75.13	-	-

Wind (MPH)	Actual	Historic Avg.	Record
Max Wind Speed	13	-	-

Temperature (° F)	Actual	Historic Avg.	Record
Visibility	10	-	-

Sea Level Pressure (Hg)	Actual	Historic Avg.	Record
Sea Level Pressure	29.91	-	-

Astronomy	Day Length	Rise	Set
Actual Time	11h 11m	7:35 AM	6:47 PM
Civil Twilight		7:12 AM	7:11 PM
Nautical Twilight		6:44 AM	7:39 PM
Astronomical Twilight		6:17 AM	8:06 PM
Moon: waxing gibbous		5:02 PM	4:48 AM

Daily Observations

Time	Temperature	Dew Point	Humidity	Wind	Wind Speed	Wind Gust	Pressure	Prec
3:53 PM	86 °F	73 °F	65 %	WSW	13 mph	0 mph	29.85 in	0.0 i
4:53 PM	84 °F	74 °F	72 %	WSW	12 mph	0 mph	29.85 in	0.0 i
5:53 PM	81 °F	75 °F	82 %	WSW	8 mph	0 mph	29.86 in	0.0 i
6:53 PM	80 °F	76 °F	87 %	SW	7 mph	0 mph	29.88 in	0.0 i
7:53 PM	80 °F	76 °F	87 %	SW	6 mph	0 mph	29.90 in	0.0 i
8:53 PM	79 °F	75 °F	88 %	SW	6 mph	0 mph	29.90 in	0.0 i
9:53 PM	80 °F	76 °F	87 %	SSW	5 mph	0 mph	29.91 in	0.0 i
10:53 PM	79 °F	76 °F	90 %	S	8 mph	0 mph	29.90 in	0.0 i

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26.53 °N, **81.76** °W

Fort Myers, FL Weather History

79° SOUTHWEST FLORIDA INTERNATIONAL AIRPORT STATION (/WEATHER/US/FL/FORT-MYERS/KRSW?CM_VEN=LOCALWX_PWSDASH) | CHANGE

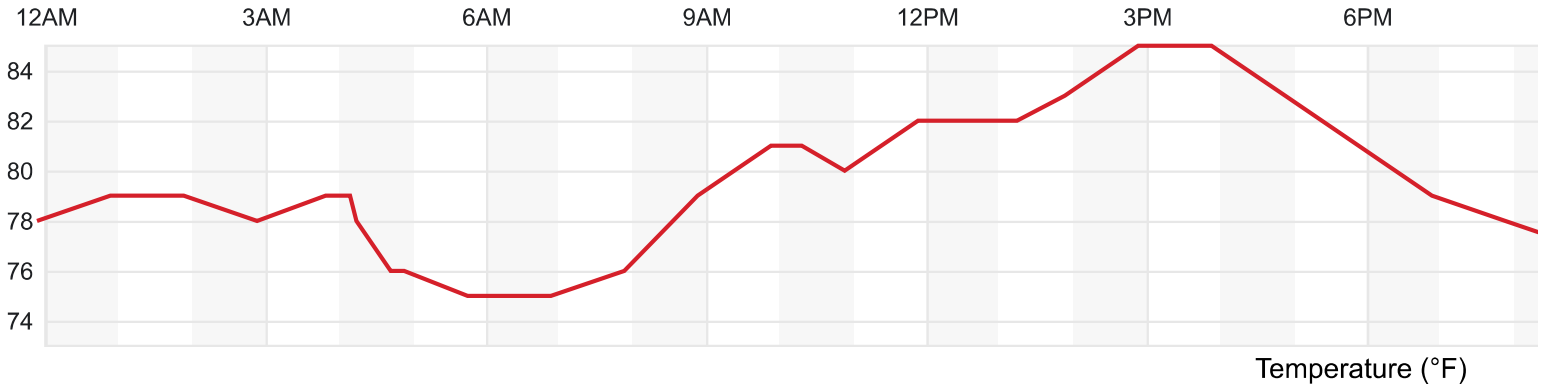
HISTORY (/HISTORY/DAILY/US/FL/FORT-MYERS/KRSW)

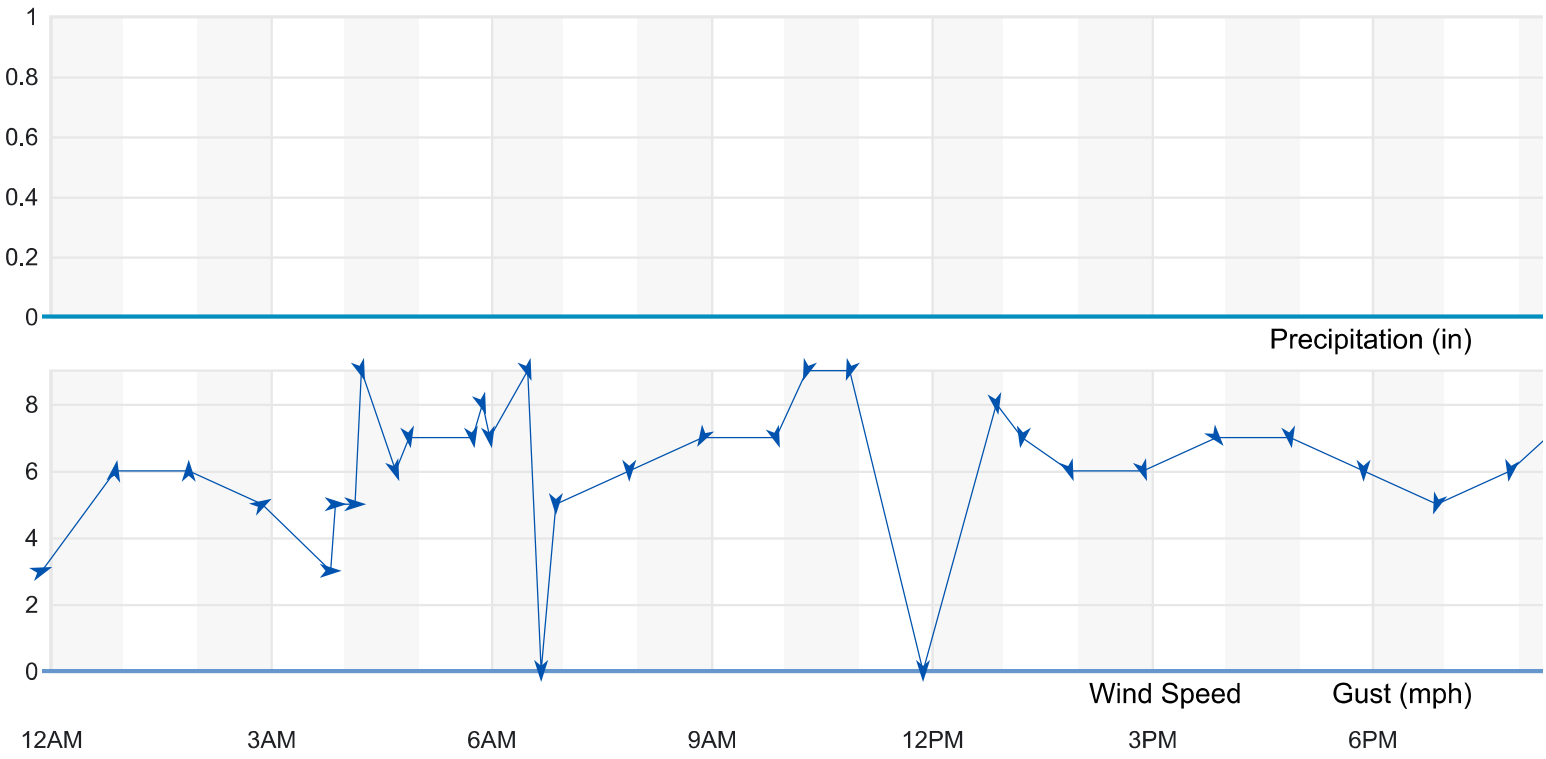
- TODAY (/WEATHER/US/FL/FORT-MYERS/KRSW)
- HOURLY (/HOURLY/US/FL/FORT-MYERS/KRSW)
- 10-DAY (/FORECAST/US/FL/FORT-MYERS/KRSW)
- CALENDAR (/CALENDAR/US/FL/FORT-MYERS/KRSW)
- HISTORY (/HISTORY/DAILY/US/FL/FORT-MYERS/KRSW)
- WUNDERMAP (/WUNDERMAP?LAT=26.53&LON=-81.76)

Daily Weekly Monthly

(/history/daily/us/fl/fort-myers/KRSW/date/2020-10-30) (/history/weekly/us/fl/fort-myers/KRSW/date/2020-10-30) (/history/monthly/us/fl/fort-myers/KRSW/date/2020-10)

October 30 2020 View





Summary

Temperature (° F)	Actual	Historic Avg.	Record
High Temp	85	84	93
Low Temp	73	66	50
Day Average Temp	78.59	75	-
Precipitation (Inches)	Actual	Historic Avg.	Record
Precipitation (past 24 hours from 04:53:00)	0.00	0.07	-
Dew Point (° F)	Actual	Historic Avg.	Record
Dew Point	70.62	-	-
High	76	-	-
Low	63	-	-
Average	70.62	-	-
Wind (MPH)	Actual	Historic Avg.	Record
Max Wind Speed	9	-	-

Temperature (° F)	Actual	Historic Avg.	Record
Visibility	10	-	-

Sea Level Pressure (Hg)	Actual	Historic Avg.	Record
Sea Level Pressure	30.01	-	-

Astronomy	Day Length	Rise	Set
Actual Time	11h 10m	7:36 AM	6:47 PM
Civil Twilight		7:12 AM	7:11 PM
Nautical Twilight		6:45 AM	7:38 PM
Astronomical Twilight		6:18 AM	8:05 PM
Moon: waxing gibbous		5:33 PM	5:39 AM

Daily Observations

Time	Temperature	Dew Point	Humidity	Wind	Wind Speed	Wind Gust	Pressure	Prec
11:53 PM	78 °F	76 °F	93 %	WSW	3 mph	0 mph	29.91 in	0.0 i
12:53 AM	79 °F	76 °F	90 %	S	6 mph	0 mph	29.91 in	0.0 i
1:53 AM	79 °F	76 °F	90 %	S	6 mph	0 mph	29.90 in	0.0 i
2:53 AM	78 °F	76 °F	93 %	WSW	5 mph	0 mph	29.89 in	0.0 i
3:49 AM	79 °F	75 °F	89 %	W	3 mph	0 mph	29.88 in	0.0 i
3:53 AM	79 °F	75 °F	88 %	W	5 mph	0 mph	29.88 in	0.0 i
4:09 AM	79 °F	76 °F	90 %	W	5 mph	0 mph	29.88 in	0.0 i
4:14 AM	78 °F	75 °F	90 %	NNW	9 mph	0 mph	29.89 in	0.0 i
4:42 AM	76 °F	73 °F	91 %	NNW	6 mph	0 mph	29.89 in	0.0 i
4:53 AM	76 °F	73 °F	91 %	N	7 mph	0 mph	29.90 in	0.0 i
5:45 AM	75 °F	72 °F	90 %	N	7 mph	0 mph	29.91 in	0.0 i
5:53 AM	75 °F	71 °F	87 %	NNW	8 mph	0 mph	29.91 in	0.0 i
5:59 AM	75 °F	71 °F	87 %	N	7 mph	0 mph	29.91 in	0.0 i
6:30 AM	75 °F	71 °F	87 %	NNW	9 mph	0 mph	29.91 in	0.0 i
6:41 AM	75 °F	70 °F	84 %		0 mph	0 mph	29.92 in	0.0 i
6:53 AM	75 °F	70 °F	84 %	N	5 mph	0 mph	29.92 in	0.0 i

Time	Temperature	Dew Point	Humidity	Wind	Wind Speed	Wind Gust	Pressure	Prec
7:53 AM	76 °F	70 °F	82 %	N	6 mph	0 mph	29.94 in	0.0 i
8:53 AM	79 °F	69 °F	72 %	NNE	7 mph	0 mph	29.95 in	0.0 i
9:53 AM	81 °F	70 °F	69 %	NNW	7 mph	0 mph	29.95 in	0.0 i
10:18 AM	81 °F	70 °F	69 %	NNE	9 mph	0 mph	29.95 in	0.0 i
10:53 AM	80 °F	70 °F	71 %	NNE	9 mph	0 mph	29.95 in	0.0 i
11:53 AM	82 °F	69 °F	65 %	CALM	0 mph	0 mph	29.94 in	0.0 i
12:53 PM	82 °F	69 °F	65 %	N	8 mph	0 mph	29.93 in	0.0 i
1:14 PM	82 °F	69 °F	65 %	N	7 mph	0 mph	29.93 in	0.0 i
1:53 PM	83 °F	68 °F	60 %	NNW	6 mph	0 mph	29.92 in	0.0 i
2:53 PM	85 °F	69 °F	59 %	NNW	6 mph	0 mph	29.91 in	0.0 i
3:53 PM	85 °F	69 °F	59 %	NW	7 mph	0 mph	29.91 in	0.0 i
4:53 PM	83 °F	69 °F	63 %	N	7 mph	0 mph	29.92 in	0.0 i
5:53 PM	81 °F	68 °F	65 %	N	6 mph	0 mph	29.93 in	0.0 i
6:53 PM	79 °F	67 °F	66 %	NNE	5 mph	0 mph	29.95 in	0.0 i
7:53 PM	78 °F	66 °F	66 %	N	6 mph	0 mph	29.98 in	0.0 i
8:53 PM	77 °F	65 °F	66 %	NNE	8 mph	0 mph	29.99 in	0.0 i
9:53 PM	74 °F	63 °F	68 %	N	6 mph	0 mph	30.00 in	0.0 i
10:53 PM	73 °F	65 °F	76 %	NNE	7 mph	0 mph	30.01 in	0.0 i

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Weather observations for the past three days

Fort Myers, Southwest Florida International Airport

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metric

Date	Time (est)	Wind (mph)	Vis. (mi.)	Weather	Sky Cond.	Temperature (ºF)				Relative Humidity	Wind Chill (°F)	Heat Index (°F)	Pressure		Precipitation (in.)		
						Air	Dwpt	6 hour Max.	6 hour Min.				altimeter (in)	sea level (mb)	1 hr	3 hr	6 hr
02	12:53	NE 15 G 24	10.00	Fair	CLR	79	55	79	69	44%	NA	80	30.07	1017.9			
02	11:53	NE 20 G 26	10.00	Fair	CLR	78	55			45%	NA	79	30.09	1018.7			
02	10:53	NE 16 G 26	10.00	Fair	CLR	76	56			50%	NA	78	30.11	1019.2			
02	09:53	NE 16 G 26	10.00	Fair	CLR	74	56			54%	NA	NA	30.12	1019.6			
02	08:53	NE 13 G 25	10.00	Fair	CLR	71	57			61%	NA	NA	30.11	1019.4			
02	07:53	NE 15 G 24	10.00	Fair	CLR	69	58			68%	NA	NA	30.10	1018.9			
02	06:53	N 14 G 20	10.00	Fair	CLR	69	60	76	69	73%	NA	NA	30.08	1018.2			
02	05:53	N 14 G 22	10.00	Overcast	FEW016 OVC021	71	62			73%	NA	NA	30.06	1017.6			
02	04:53	NE 12 G 22	10.00	Mostly Cloudy	BKN017	72	66			82%	NA	NA	30.03	1016.8			
02	03:53	N 9	10.00	Mostly Cloudy	BKN015	74	68			82%	NA	NA	30.02	1016.3			
02	02:53	N 9	10.00	Mostly Cloudy	FEW008 SCT014 BKN025	75	70			84%	NA	NA	30.01	1016.0			
02	01:53	N 12	10.00	Mostly Cloudy	BKN010 BKN015 BKN022	76	72			88%	NA	76	30.01	1016.1			
02	00:53	N 7	10.00	Partly Cloudy	SCT050	75	72	80	75	90%	NA	NA	30.02	1016.4			
01	23:53	NW 3	10.00	Fair	CLR	75	72			90%	NA	NA	30.02	1016.4			
01	22:53	NW 6	10.00	A Few Clouds	FEW008	76	72			88%	NA	76	30.04	1017.1			
01	21:53	N 5	10.00	Partly Cloudy	SCT050	76	72			88%	NA	76	30.05	1017.4			
01	20:53	N 6	10.00	Fair	CLR	77	71			82%	NA	79	30.04	1016.8			
01	19:53	N 6	10.00	Fair	CLR	79	71			77%	NA	82	30.03	1016.5			
01	18:53	NW 6	10.00	Fair	CLR	80	72	89	80	76%	NA	84	30.01	1016.0			0.02
01	17:53	NW	10.00	Fair	CLR	82	72			72%	NA	87	29.99	1015.4			

		6														
01	16:53	NW 3	10.00	Fair	CLR	85	71			63%	NA	90	29.99	1015.3		
01	15:53	W 3	10.00	Fair	CLR	86	71			61%	NA	91	29.99	1015.1		0.02
01	14:53	E 3	10.00	A Few Clouds	FEW065	87	71			59%	NA	93	29.99	1015.4		
01	13:53	Vrbl 5	7.00	Light Rain	SCT045 OVC070	87	74			65%	NA	95	30.01	1016.1	0.02	
01	12:53	Calm	10.00	Mostly Cloudy	SCT028 BKN075	88	69	88	74	54%	NA	93	30.05	1017.3		
01	11:53	E 6	10.00	Mostly Cloudy	FEW028 BKN075	85	71			63%	NA	90	30.08	1018.2		
01	10:53	E 7	10.00	Mostly Cloudy	BKN013	84	72			67%	NA	90	30.09	1018.6		
01	09:53	E 9	10.00	Mostly Cloudy	BKN013	82	73			74%	NA	87	30.10	1019.1		
01	08:53	NE 6	10.00	Partly Cloudy	SCT007	80	74			82%	NA	85	30.10	1019.0		
01	07:53	NE 5	6.00	Fog/Mist	OVC003	75	73			94%	NA	NA	30.08	1018.4		
01	06:53	NE 3	7.00	Partly Cloudy	SCT003	74	71	75	73	91%	NA	NA	30.08	1018.1		
01	05:53	NE 5	8.00	Fair	CLR	74	71			91%	NA	NA	30.06	1017.8		
01	04:53	E 6	8.00	Fair	CLR	74	72			94%	NA	NA	30.06	1017.5		
01	03:53	NE 5	8.00	A Few Clouds	FEW060	74	72			94%	NA	NA	30.06	1017.6		
01	02:53	NE 6	9.00	Mostly Cloudy	BKN003 BKN024	74	72			94%	NA	NA	30.07	1017.9		
01	01:53	NE 6	9.00	Mostly Cloudy	BKN004	75	72			90%	NA	NA	30.08	1018.2		
01	00:53	NE 5	10.00	Fair	CLR	75	72	77	75	90%	NA	NA	30.08	1018.4		
31	23:53	E 7	10.00	Fair	CLR	75	73			94%	NA	NA	30.09	1018.7		
31	22:53	E 7	10.00	Fair	CLR	76	73			91%	NA	76	30.10	1018.8		
31	21:53	NE 8	10.00	Fair	CLR	76	73			91%	NA	76	30.10	1019.0		
31	20:53	E 7	10.00	Partly Cloudy	SCT110	76	73			91%	NA	76	30.10	1018.9		
31	19:53	E 9	10.00	A Few Clouds	FEW090	77	72			85%	NA	78	30.09	1018.8		
31	18:53	E 9	10.00	Mostly Cloudy	SCT060 BKN090	77	72	86	77	85%	NA	78	30.08	1018.3		
31	17:53	E 12	10.00	Mostly Cloudy	FEW029 FEW042 BKN085	80	72			76%	NA	84	30.06	1017.8		
31	16:53	E 13	10.00	Partly Cloudy	FEW022 FEW029 SCT060	81	73			77%	NA	86	30.06	1017.6		
31	15:53	E 17	10.00	Fair	CLR	83	71			67%	NA	88	30.05	1017.2		
31	14:53	NE 17	10.00	A Few Clouds	FEW025	86	72			63%	NA	92	30.04	1016.9		
31	13:53	E 14	10.00	Overcast	FEW027 BKN046 OVC085	84	72			67%	NA	90	30.05	1017.2		
31	12:53	E 13	10.00	Overcast	SCT026 BKN044 OVC070	85	72	86	71	65%	NA	91	30.06	1017.7		
31	11:53	E 13	10.00	Mostly	BKN026	85	72			65%	NA	91	30.08	1018.3		

				Cloudy	BKN033														
31	10:53	E 12	10.00	Partly Cloudy	SCT023	83	71			67%	NA	88	30.10	1018.9					
31	09:53	NE 14	10.00	A Few Clouds	FEW045	81	70			69%	NA	84	30.10	1019.2					
31	08:53	NE 10	10.00	Overcast	SCT046 OVC070	76	68			77%	NA	77	30.10	1019.0					
31	07:53	NE 9	10.00	Overcast	OVC026	72	65			79%	NA	NA	30.08	1018.3					
31	06:53	NE 9	10.00	Overcast	BKN037 OVC050	71	64	71	70	79%	NA	NA	30.05	1017.4					
31	05:53	NE 8	10.00	Mostly Cloudy	FEW026 SCT033 BKN110	70	63			79%	NA	NA	30.04	1017.0					
31	04:53	NE 8	10.00	Overcast	OVC026	70	63			79%	NA	NA	30.04	1016.9					
31	03:53	NE 8	10.00	Partly Cloudy	SCT110	70	62			76%	NA	NA	30.02	1016.4					
31	02:53	NE 8	10.00	Partly Cloudy	FEW031 SCT110	70	62			76%	NA	NA	30.02	1016.3					
31	01:53	NE 9	10.00	Fair	CLR	71	63			76%	NA	NA	30.03	1016.6					
31	00:53	NE 6	10.00	Fair	CLR	71	63	79	71	76%	NA	NA	30.03	1016.7					
30	23:53	NE 9	10.00	Fair	CLR	72	65			79%	NA	NA	30.04	1017.1					
30	22:53	NE 7	10.00	Fair	CLR	73	65			76%	NA	NA	30.04	1016.8					
30	21:53	N 6	10.00	Partly Cloudy	SCT034	74	63			69%	NA	NA	30.03	1016.7					
30	20:53	N 8	10.00	Overcast	OVC033	77	65			66%	NA	79	30.02	1016.4					
30	19:53	N 6	10.00	A Few Clouds	FEW033	78	66			67%	NA	80	30.01	1015.9					
30	18:53	N 5	10.00	Fair	CLR	79	67	86	79	67%	NA	81	29.98	1014.8					
30	17:53	N 6	10.00	Mostly Cloudy	BKN085	81	68			65%	NA	84	29.96	1014.4					
30	16:53	N 7	10.00	Overcast	OVC080	83	69			63%	NA	87	29.95	1013.9					
30	15:53	NW 7	10.00	Fair	CLR	85	69			59%	NA	89	29.94	1013.6					
30	14:53	N 6	10.00	Fair	CLR	85	69			59%	NA	89	29.94	1013.5					
30	13:53	N 6	10.00	Mostly Cloudy	BKN036	83	68			61%	NA	86	29.95	1013.9					
Date	Time (est)	Wind (mph)	Vis. (mi.)	Weather	Sky Cond.	Air	Dwpt	Max.	Min.	Relative Humidity	Wind Chill (°F)	Heat Index (°F)	altimeter (in.)	sea level (mb)	1 hr	3 hr	6 hr		
						Temperature (ºF)		6 hour					Pressure		Precipitation (in.)				

APPENDIX D
KALEIDOSCOPE PRO MAXIMUM LIKELIHOOD ESTIMATOR

Appendix D. Kaleidoscope Maximum Likelihood Estimator for FPID 433726-2-32-01, SR 865 from Crescent Street to North of Hurricane Bay Bridge.

Detector ID	Date (2020)	COTO	EPFU	EUFL	LABO/ LASE	MYAU	NYHU	PESU	TABR
D-01	28 October	1	1	1	0.404	1	1	1	0
	29 October	1	1	1	1	1	0.617	1	0
	30 October	1	1	1	1	1	1	1	0
	31 October	1	1	0	1	1	1	1	0
	1 November	1	1	1	1	1	1	1	0
D-02	28 October	1	1	1	1	1	1	1	0
	29 October	1	1	1	1	1	1	0.120	0
	30 October	1	1	1	1	1	1	1	0
	31 October	1	1	1	1	1	0.930	1	0
	1 November	1	1	1	1	1	1	1	0
D-03	28 October	1	1	1	0	1	1	1	0
	29 October	1	1	1	0	1	1	1	0
	30 October	1	1	1	0	1	1	1	0
	31 October	1	1	1	0	1	1	1	0
	1 November	1	1	1	0	1	1	1	0
D-04	28 October	1	1	1	0	1	1	1	0
	29 October	1	1	1	0	1	1	1	0
	30 October	1	1	1	0	1	1	1	0
	31 October	1	1	1	0	1	1	1	0
	1 November	1	1	1	0	1	1	1	0

COTO=*Corynorhinus townsendii* (Townsend's big-eared bat)*; **EPFU**=*Eptesicus fuscus* (big brown bat); **EUFL**=*Eumops floridanus* (Florida bonneted bat); **LABO**=*Lasiurus borealis* (eastern red bat); **LASE**=*Lasiurus seminolus* (Seminole bat); **MYAU**=*Myotis austroriparius* (southeastern bat); **NYHU**=*Nycticieus humeralis* (evening bat); **PESU**=*Perimyotis subflavus* (tricolored bat); **TABR**=*Tadarida brasiliensis* (Brazilian free-tailed bat).
*Rafinesque's big-eared bat (*Corynorhinus rafinesquii*) is included in the Kpro analysis for **COTO**.

APPENDIX E
FLORIDA BONNETED BAT CALL VETTING TABLE

Appendix E. Qualitative Acoustic Vetting for FPID 433726-2-32-01, SR 865 from Crescent Street to North of Hurricane Bay Bridge.

FOLDER	OUT FILE ZC	DATE	TIME	AUTO ID*	MANUAL ID
10 Output\D-01_Output\Data	D-01_20201031_235031_000.00#	10/31/2020	23:50:31	EUFL	Noise
10 Output\D-01_Output\Data	D-01_20201101_070458_000.00#	11/1/2020	7:04:58	EUFL	TABR
10 Output\D-03_Output\Data	D-03_20201028_211402_000.00#	10/28/2020	21:14:02	EUFL	Road Noise
10 Output\D-03_Output\Data	D-03_20201029_002151_000.00#	10/29/2020	0:21:51	EUFL	TABR
10 Output\D-03_Output\Data	D-03_20201029_050242_000.00#	10/29/2020	5:02:42	EUFL	TABR
10 Output\D-03_Output\Data	D-03_20201029_055117_000.00#	10/29/2020	5:51:17	EUFL	TABR
10 Output\D-03_Output\Data	D-03_20201029_055856_000.00#	10/29/2020	5:58:56	EUFL	TABR
10 Output\D-03_Output\Data	D-03_20201029_055936_000.00#	10/29/2020	5:59:36	EUFL	TABR
10 Output\D-03_Output\Data	D-03_20201029_060624_000.00#	10/29/2020	6:06:24	EUFL	TABR
10 Output\D-03_Output\Data	D-03_20201029_072306_000.00#	10/29/2020	7:23:06	EUFL	Noise
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EUFL=*Eumops floridanus* (Florida bonneted bat); **TABR**=*Tadarida brasiliensis* (Brazilian free-tailed bat).

Appendix F

FLORIDA BONNETED BAT ACOUSTIC AND ROOST SURVEY & BEST MANAGEMENT PRACTICES

Appendix F: 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.