NATURAL RESOURCES EVALUATION ADDENDUM

Florida Department of Transportation

District One

Harborview Road PD&E Re-evaluation

Limits of Project: From Melbourne Street to I-75

Charlotte County, Florida

Financial Management Number: 434965-2-32-01

ETDM Number: 5351

Date: November 2023

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

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EXECUTIVE SUMMARY

Since the completion of the Harborview Road PD&E Study in 2019, design of the proposed project has proceeded. The proposed design has been changed to include more right-of-way (ROW) throughout the project for mainline improvements and different parcels for stormwater management ponds. These changes are summarized below.

- The typical section was modified from a four-lane divided urban roadway with 11-foot travel lanes, curb and gutter in the inside and outside edges of pavement, seven-foot buffered bicycle lanes bordered by six-foot sidewalks on both sides, and a 30-foot median to a four-lane divided urban roadway with 11-foot travel lanes bordered by Type F curb and gutter, 10-foot shared use paths on both sides of the roadway, and a raised 22-foot median;
- There were seven preferred pond locations in the PD&E Study; one pond site alternative for each of the six drainage basins, as well as one historic drainage basin pond. Following the pond siting analysis in the design-phase, a total of five pond sites have been selected. Two sites are the same as PD&E-identified ponds, while the remaining three sites are new locations identified during the design phase of the project.
- The roadway right-of-way width will expand by approximately 53 feet instead of 34 feet;
- Approximately 16.40 acres of ROW acquisition is needed for the mainline instead of 11.0 acres;
- Approximately 5.35 acres of ROW acquisition is needed for stormwater management instead of 9.5 acres.

These changes and current design-level analysis have resulted in the following updates to wetlands and protected species:

- The Florida bonneted bat acoustic survey was conducted in April 2023. The Florida bonneted bat effect determination was updated from may affect, not likely to adversely affect to may affect, not likely to adversely affect – programmatic (MANLAA-P). This programmatic concurrence does not require further consultation with the U.S. Fish and Wildlife Service (USFWS); however, Best Management Practices (BMPs) will be incorporated, which are listed below:
    - In accordance with the Florida bonneted bat consultation key, FDOT will implement Best Management Practice #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;
    - In accordance with the Florida bonneted bat consultation key, FDOT will implement Best Management Practice #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;

    - In accordance with the Florida bonneted bat consultation key, FDOT will implement Best Management Practice #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;
    - In accordance with the Florida bonneted bat consultation key, FDOT will implement Best Management Practice #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;
- The construction methods for the box culvert replacements have been more refined and the potential impacts to smalltooth sawfish and sea turtles have been considered, minimized, and avoided to the greatest extent practicable. As a result, the smalltooth sawfish effect determination was updated from may affect, likely to adversely affect to may affect, not likely to adversely affect;
- Impacts to smalltooth sawfish Critical Habitat (CH) were revised from 0.38-acre to 0.03-acre and the effect determination remains as no adverse modification or destruction of Critical Habitat;
- A new commitment was added to protect the smalltooth sawfish by coordinating with FWC prior to closing the cross drain #4 (CD-4) opening and to avoid closure during March 1 – July 31;
- Additional commitments were added:
    - No blasting will occur during the construction of the proposed culverts;
    - The FDOT will only conduct in-water work during daytime hours;
    - The FDOT will require contractors to install sheet pile walls using vibratory hammers and not impact hammers;
    - The FDOT will contact the FWC prior to the temporary culvert closure (CD-4) should the agency wish to sweep the creek upstream of the culvert with nets to capture sawfish prior to the temporary culvert closure. Culvert closure will avoid the smalltooth sawfish pupping season which is March 1 – July 31;
    - Impacts to suitable foraging habitat for the federally-protected wood stork will be mitigated through the purchase of credits from a U.S. Fish and Wildlife Service-approved mitigation bank pursuant to Section 373.4137, F.S. or as otherwise agreed to by the FDOT and the appropriate regulatory agencies;
- Impacts to West Indian manatee CH were reduced from 0.14-acre to 0.03-acre and the effect determination remains as no adverse modification or destruction of Critical Habitat;
- The *Protected Species Construction Conditions (NOAA Fisheries Southeast Regional Office)* has replaced the *NMFS Sea Turtle and Smalltooth Sawfish Construction Conditions* and will be followed;
- The snail kite effect determination was updated from may affect, not likely to adversely affect to no effect given lack of suitable habitat in the project area;
- Wetland impacts were reduced from 0.80-acre to 0.46-acre;
- Surface water impacts were reduced from 2.70 acres to 1.99 acres;
- Essential Fish Habitat (EFH) impacts were reduced from 0.38-acre to 0.30-acre;

- The FDOT will perform additional wildlife surveys for Florida sandhill crane, bald eagle, osprey, gopher tortoise, and other wildlife species during the project design phase. If these species are found to be present in the project area, then the appropriate measures discussed in this report will be followed; and
- The FDOT will require contractors to use a ramp-up procedure if sawcuts or jack hammers are used in the removal of the existing box culverts. This gradual increase in noise level gives species time to leave the impact area prior to initiation of full noise levels.

1.0 PROJECT OVERVIEW

The Florida Department of Transportation (FDOT), District One, is proposing to widen Harborview Road from two to four lanes between Melbourne Street and I-75 to address capacity needs based on projected travel demand generated by future population and economic growth. The total project length is approximately 2.3 miles. The project is located just northeast of Charlotte Harbor, Florida and falls within Sections 20, 21, 29 and 30, Township 40 South, Range 23 East, and Section 25, Township 40 South, Range 22 East. The proposed roadwork consists of widening, drainage improvements including replacement of box culverts, and safety-related improvements. The PD&E Study (FPID 434965-1-22-01) was approved by the Office of Environmental Management as a Type 2 Categorical Exclusion (CE) on October 14, 2019.

The current design has been revised from the concept plans prepared during the PD&E Study which has resulted in the following changes shown in **Figure 1** and discussed in detail below:

The PD&E Preferred Alternative included an urban typical section of a four-lane divided roadway with 11-foot travel lanes, curb and gutter along the inside and outside edges of pavement, a 30-foot grassed median, six-foot sidewalks and seven-foot buffered bicycle lanes (see **Appendix A** for typical sections). This alternative recommended shifting to both the north and south of the existing roadway to minimize residential relocations. The proposed posted speed limit is 45 mph. The proposed improvements require 114-feet of right-of-way (ROW), resulting in the need of approximately 34 additional feet of mainline ROW. Acquisition of 11.0 acres for roadway and 9.5 acres for stormwater management for a total of 20.5 acres was deemed necessary.

Since approval of the PD&E Study, the typical section was modified and approved and now consists of a four-lane divided urban roadway with 11-foot travel lanes bordered by Type F curb and gutter, 10-foot shared use paths on both sides of the roadway, and a raised 22-foot median (see **Appendix A** for typical sections). The reduced median width did not affect the posted speed limit and did not require a design variation. The shared-use paths were agreed upon by Charlotte County and offer a safer travel environment for bicyclists.

The primary design change in the horizontal alignment occurs at the first road curve near Laverne Street. The curve is being flattened from the PD&E recommended alignment to enhance safety for motorists. It will also improve access to the parcels on the south side of the roadway. Additionally, an existing conservation easement associated with the Rolls Landing Condominium property was avoided by limiting ROW acquisition to the north side of Harborview Road in this location. Additional ROW is required throughout the corridor to raise the road profile due to the high-water table and to account for sea-level rise in the design. The ROW need varies along the corridor but on average, is approximately 133 feet, which requires approximately 53 feet of additional ROW. This results in acquisition need of 16.40 acres for roadway improvements, as compared to the PD&E estimate of 11.0 acres for roadway improvements.

The proposed stormwater management pond site locations also changed. There were seven preferred pond locations in the PD&E Study; one pond site alternative for each of the six drainage basins, as well as one historic drainage basin pond to address floodplain storage. The ponds were sized to meet the requirements

FIGURE 1: PROJECT LOCATION MAP WITH DESIGN CHANGES

Figure 1. Project Location Map with Design Change
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Harborview Road from Melbourne Street to I-75
Charlotte County

Figure 1. Project Location Map with Design Change
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Harborview Road from Melbourne Street to I-75
Charlotte County

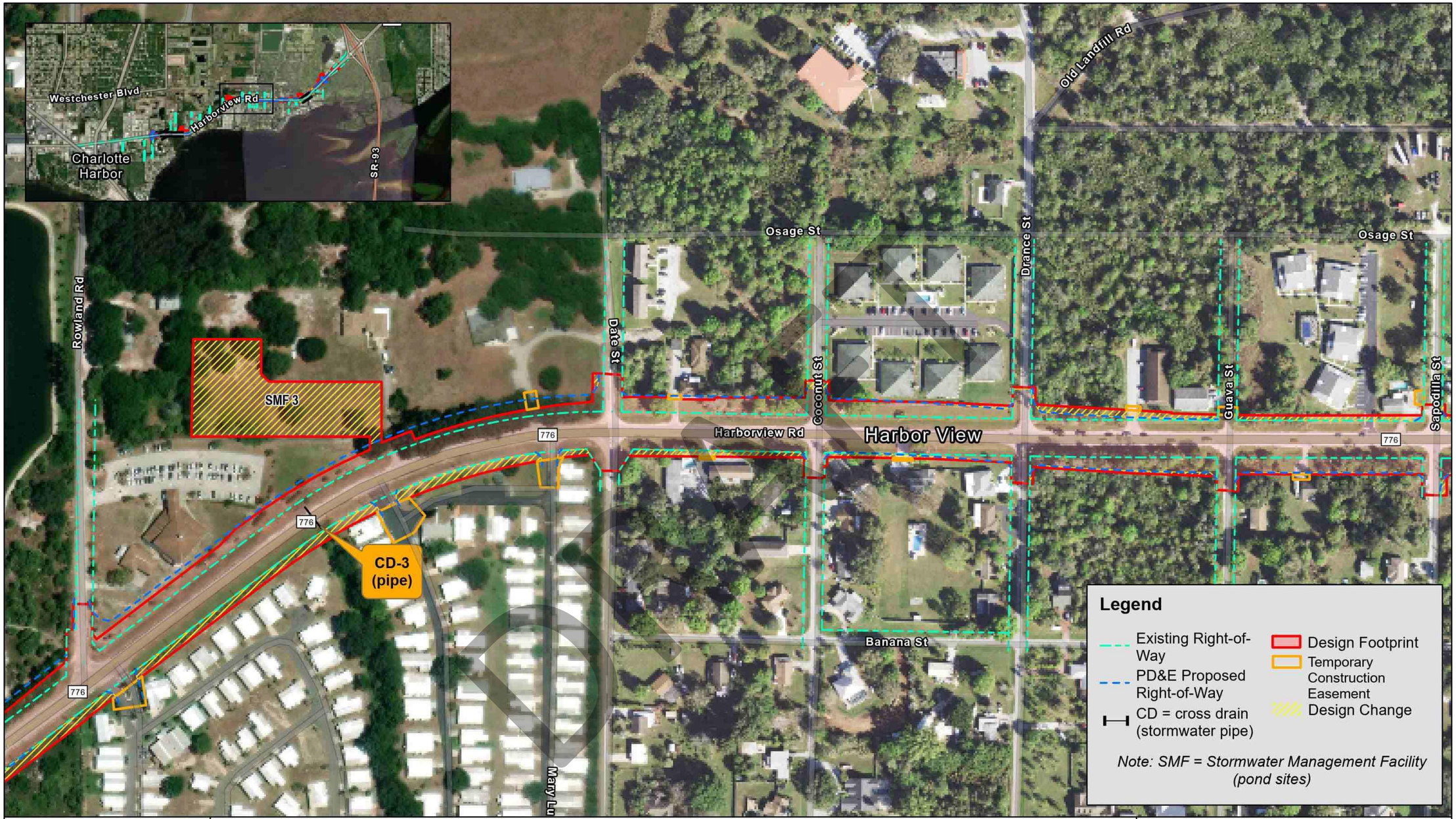

Figure 1. Project Location Map with Design Change
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Harborview Road from Melbourne Street to I-75
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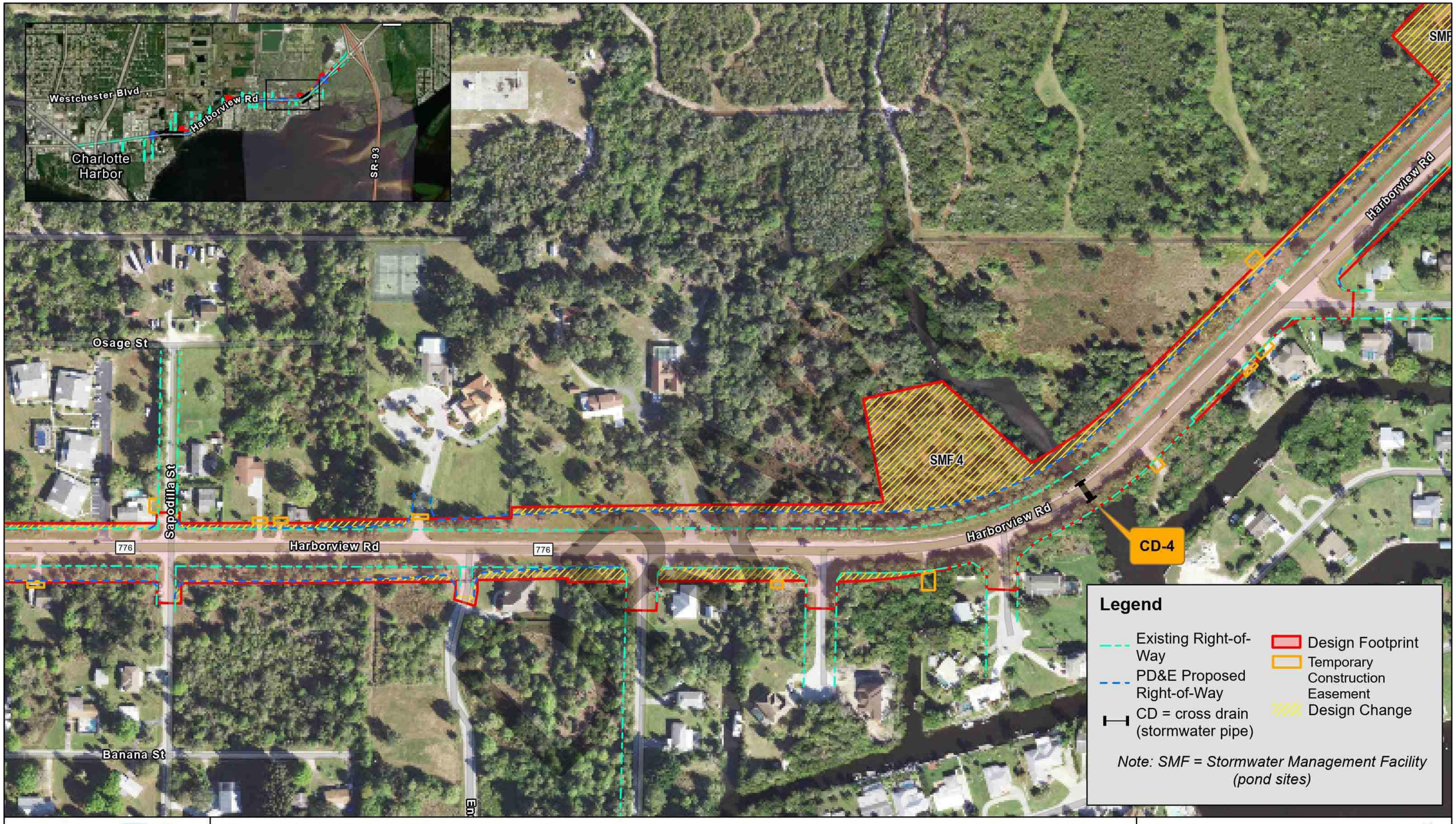

Figure 1. Project Location Map with Design Change
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Harborview Road from Melbourne Street to I-75
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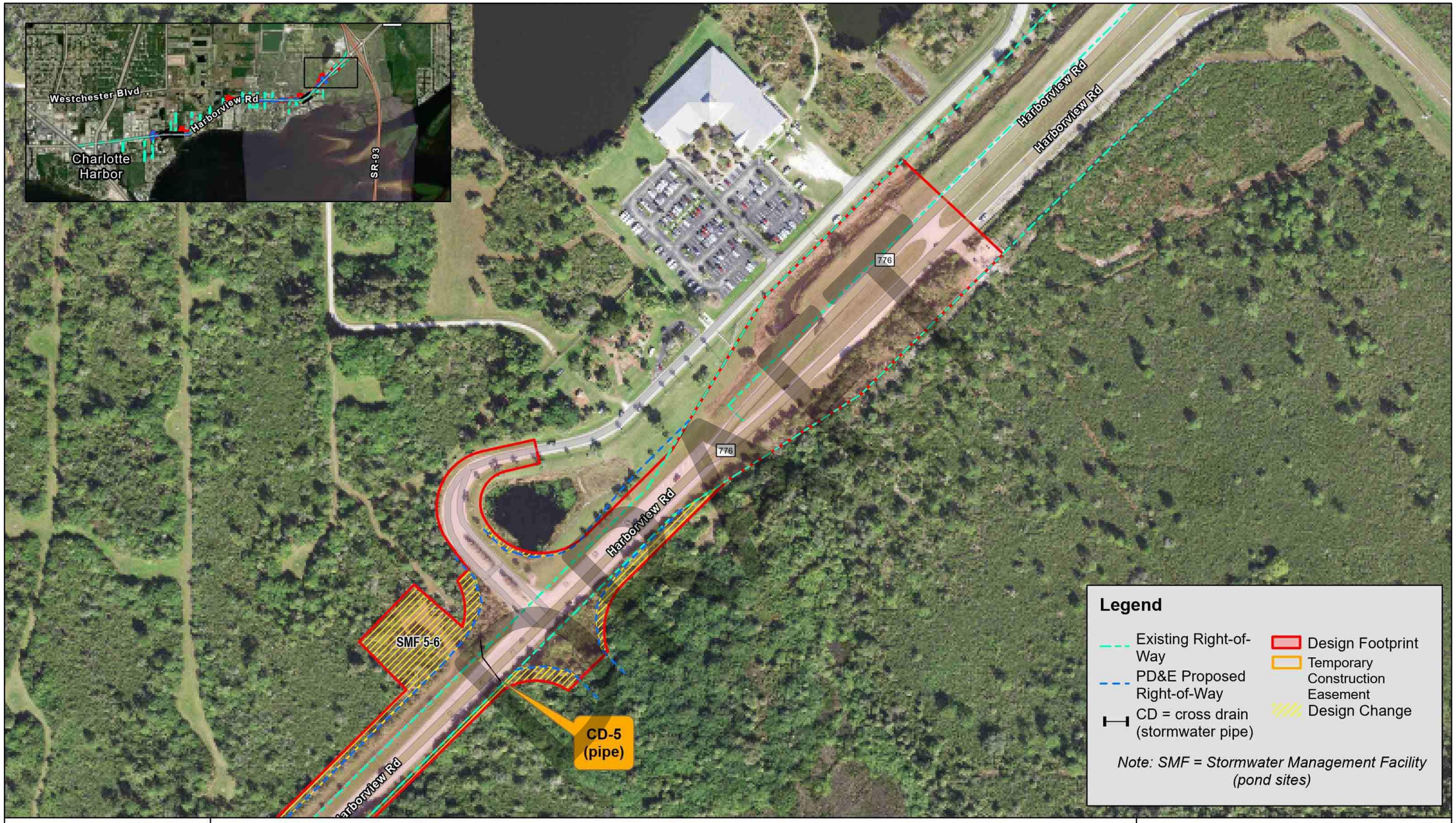

Figure 1. Project Location Map with Design Change
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of FDOT and Southwest Florida Water Management District (SWFWMD) for treatment of stormwater to provide a conservative estimate of ROW need (9.5 acres) for stormwater management. The PD&E-identified pond locations, as well as additional pond locations within each basin, were more fully evaluated during the design phase, including examining options to combine basins to reduce the total number of ponds and using remnant parcels resulting from mainline widening impacts. Evaluation factors included engineering considerations, environmental data, social impacts such as relocations, and cost. Following the pond siting analysis, a total of five pond sites have been selected. Two sites are the same as PD&E-identified ponds (Pond 5-6C; now simply named SMF 5-6 and Pond 1-2D), while the remaining three sites are new locations identified during the design phase of the project. Of these sites, Pond 1-2B uses remainders of parcels proposed for impact by mainline widening. As a result of the refinement of the stormwater ponds, 5.35 acres are needed for stormwater ponds in comparison to the PD&E estimate of 9.50 acres.

The FDOT is preparing a Design Change and Right-of-Way Authorization Re-evaluation for this project. As previously described, a total of 21.75 acres of new ROW is needed for the roadway and stormwater management pond sites as compared to a total of 20.50 acres as estimated during the PD&E Study. This is a net increase of 1.25 acres. This NRE addendum is being prepared to document changes and provide updated information since the January 2019 NRE was completed for the PD&E Study.

1.1 AGENCY COORDINATION

The January 2019 NRE was provided to the Florida Fish and Wildlife Commission (FWC), U.S. Fish and Wildlife Services (USFWS), and National Marine Fisheries Service (NMFS). Consultation with FWC was initiated, and the agency concurred with the species determinations and project commitments on March 6, 2019. During correspondence with USFWS, it was determined that consultation would be deferred to the design phase since information (e.g. project acoustic survey) was not yet available for the Florida bonneted bat (*Eumops floridanus*). During the correspondence with NMFS, additional information was requested regarding box culvert demolition methods, sheet pile installation, changes in water depths at culverts, and mangrove impacts. It was concluded that NMFS requires specific design and engineering data for the culvert replacement that was not available at the time of the PD&E Study to determine the proposed project's impact on the smalltooth sawfish, and swimming sea turtles.

2.0 WETLAND EVALUATION

During the PD&E Study, the wetlands and surface waters were aerially delineated; therefore, the boundaries shown in the January 2019 NRE were approximate. As the project has progressed to the final design phase, the wetland and surface water boundaries were field-delineated and surveyed-in, thus providing more accuracy than the PD&E estimate. The changes in the quantity of delineated wetlands and surface waters as it relates to both the design changes and the system delineations are discussed below.

Direct impacts to jurisdictional wetlands and surface waters were quantified and evaluated for the design change. Approximately 0.46-acre of direct impacts are proposed to jurisdictional wetlands and 1.99 acres of direct impacts are proposed to surface waters for a total of 2.45 acres of impact.

In the January 2019 NRE, wetland and surface water impacts resulting from the preferred alternative totaled 3.50 acres which included 0.80 acres of wetlands and 2.70 acres of surface waters.

Total direct impacts have decreased from 3.50 acres to 2.45 acres due to the more refined wetland and surface water boundaries and the new design. There are fewer surface waters delineated as part of the design-phase because several of the roadside areas conservatively coded as surface waters in the January 2019 NRE document were determined to be swales. These are linear systems between culverted driveways that were measured to have side slopes more gradual than 1:4, which is the side slope that the SWFWMD uses to distinguish between a swale and a surface water/ditch. These linear, man-made systems typically only hold shallow standing water for short durations after heavy rain events. The design-phase wetland jurisdictional delineations also identified three additional wetlands as compared to the January 2019 NRE. Some of these systems are wetland edges of surface waters that warranted designation as wetlands due to presence of mangroves. **Table 1** shows the updates in wetland and surface water impacts. **Figure 2** provides an updated wetland and surface water impact map.

TABLE 1: PROPOSED WETLAND AND SURFACE WATER IMPACTS

Impact Type	**Preferred Alternative from January 2019 NRE (acres)**	**Design Change Re-Evaluation (acres)**
Wetlands	0.80	**0.46**
Surface Waters	2.70	**1.99**
Total impacts	**3.50**	**2.45**

FIGURE 2: WETLAND AND SURFACE WATER IMPACTS MAP

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Harborview Road from Melbourne Street to I-75
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Figure 2. Wetland and Surface Water Impacts Map
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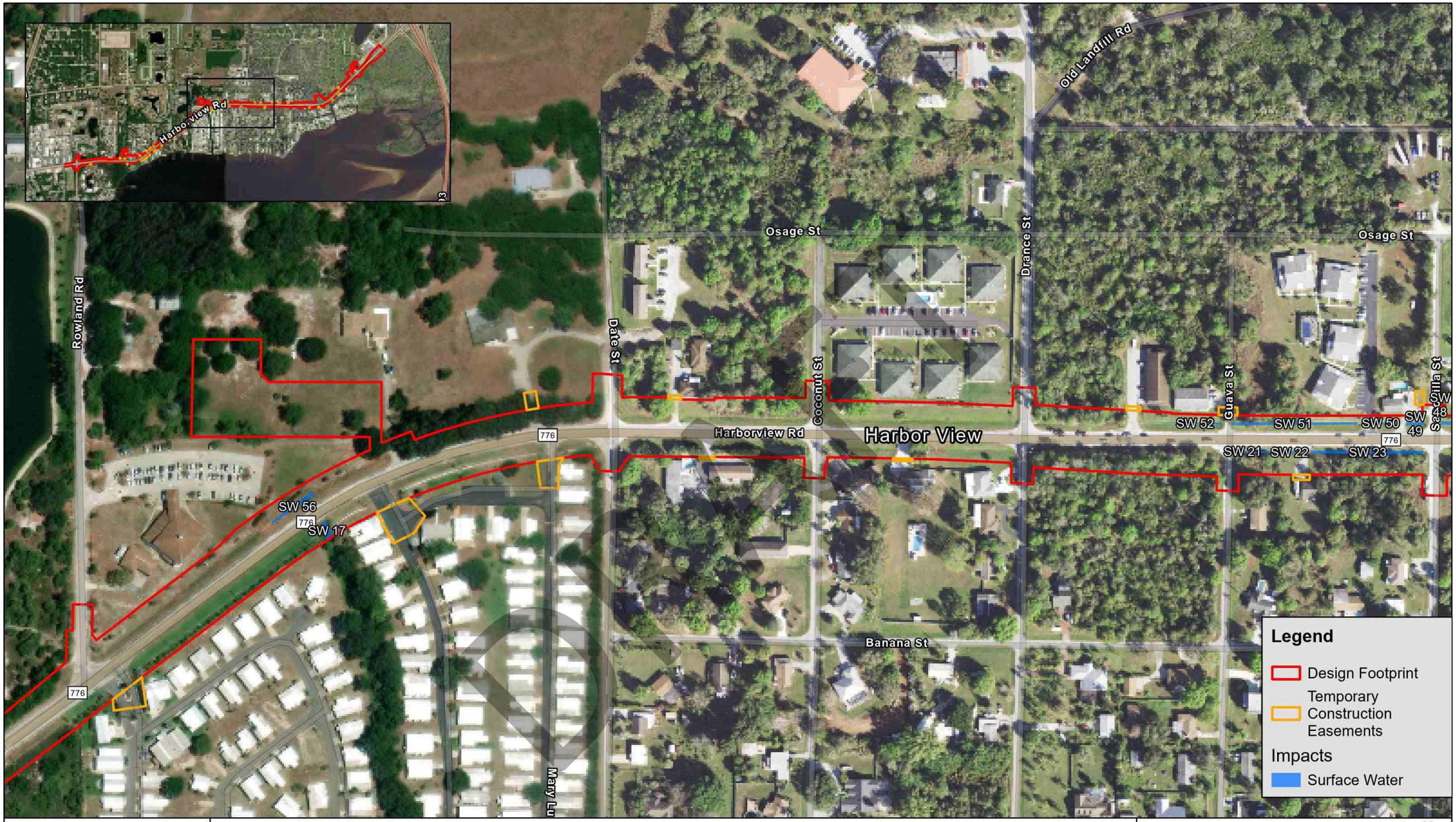

Figure 2. Wetland and Surface Water Impacts Map
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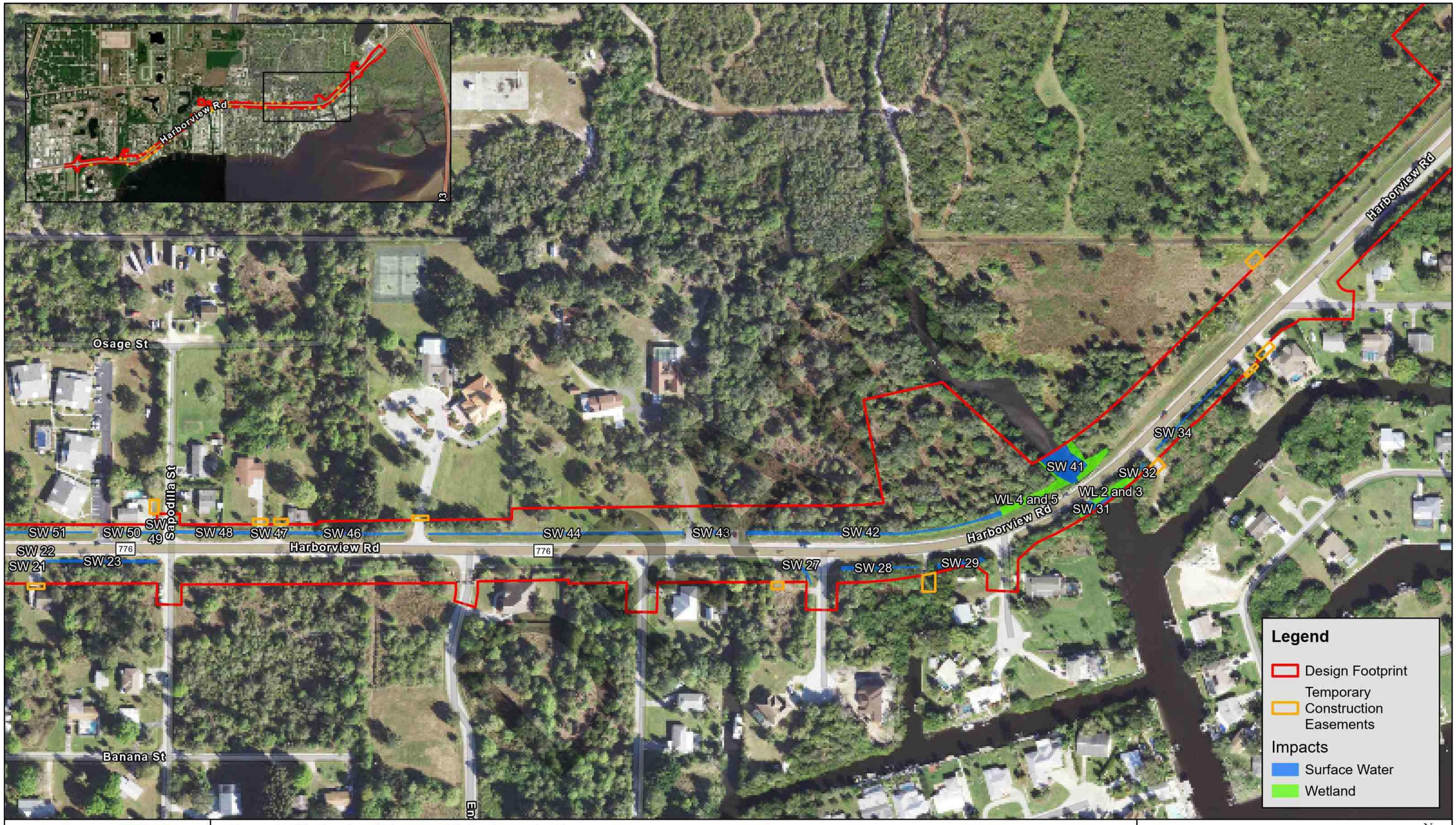

Figure 2. Wetland and Surface Water Impacts Map
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Table 2 shows the Uniform Mitigation Assessment Method (UMAM) delta scores and functional loss by habitat type. UMAM scores and preliminary wetland and surface water boundaries discussed are subject to revisions and approval by regulatory agencies during the permitting process. During the PD&E, the January 2019 NRE proposed to obtain mitigation credits from Little Pine Island Mitigation Bank (LPIMB) which offered appropriate credits. However, during the design phase it was determined that credits will likely come from multiple sources, such as LPIMB to mitigate for estuarine and mangrove impacts and from Boran Ranch Mitigation Bank (BRMB) to mitigate for freshwater wetland impacts.

TABLE 2: ESTIMATED UMAM FUNCTIONAL LOSS BY WETLAND TYPE

National Wetland Inventory (NWI) Classification	UMAM Delta	Impacts (Acres)	Functional Loss (UMAM)	Jurisdiction
*PEM1x	0.33	0.50	0.16	State
	0.43	1.03	0.44	State
*PSS1x, PSS3x/EM1x	0.27	0.21	0.06	State and Federal
**E1UB3 (surface waters)	0.50	0.25	0.13	State and Federal
E2SS3, E2FO3	0.53	0.19	0.10	State and Federal
E2SS3 - WL 2 and 3	0.70	0.04	0.03	State and Federal
E2SS3 - WL 4 and 5	0.70	0.11	0.08	State and Federal
E2SS3 - WL 6	0.53	0.11	0.06	State and Federal
Estuarine Total	--	0.70	0.39	--
Freshwater Total	--	1.74	0.66	--
GRAND TOTAL	--	2.45	1.05	--

*These systems are linear cut roadside ditches that normally do not warrant wetland mitigation for impacts; however, they were included in the functional loss calculations as a worst-case scenario, similar to the 2019 NRE document.

**These are open water surface waters with no vegetation therefore do not warrant wetland mitigation for impacts; however, they were included in the functional loss calculations as a worst-case scenario, similar to the 2019 NRE document.

E1UB3: Estuarine, Subtidal, Unconsolidated Bottom, Mud
E2FO3: Estuarine, Intertidal, Forested, Broad-Leaved Evergreen
E2SS3: Estuarine, Intertidal, Scrub-Shrub, Broad-Leaved Evergreen
PEM1x: Palustrine, Emergent, Persistent, Excavated
PSS1x: Palustrine, Scrub-Shrub, Broad-Leaved Deciduous, Excavated
PSS3x/EM1x: Palustrine, Scrub-Shrub, Broad-Leaved Evergreen, Excavated / Emergent, Persistent, Excavated

The exact type of mitigation to offset impacts will be coordinated with the U.S. Army Corps of Engineers (USACE) and the SWFWMD during the permitting phase of this project. Mitigation will be addressed pursuant to Chapter 373.4137, Florida Statutes (F.S.) in order to satisfy all mitigation requirements of Part IV, Chapter 373, F.S. and 33 U.S.C. §1344.

On Dec. 22, 2020, the U.S. Environmental Protection Agency (EPA) published their approval of Florida's State 404 Program in the Federal Register, and the Florida Department of Environmental Protection (FDEP) began administering the State 404 Program on that date. The project is located in USACE Retained Waters. As a result the project is expected to receive a Section 404 permit from the USACE.

3.0 ESSENTIAL FISH HABITAT

The Southeast Region Habitat Conservation Division, Gulf of Mexico Fishery Management Council (GMFMC) established that mangrove swamps and other tidally influenced wetlands are EFH with the 1998 Fisheries Management Plans (FMP) Amendment (GMFMC 1998). Therefore, EFH was redefined to include the wetlands surrounding SW 31, SW 41, and SW 65, essentially the mangrove fringes. Total impacts to EFH habitat changed from 0.38-acre to 0.30-acre and the effect determination for these impacts will remain minimal on EFH. Impacts which will result from the construction of this project will be mitigated pursuant to Section 373.4137, F.S., to satisfy all mitigation requirements of Part IV of Chapter 373, F.S., and 22 U.S.C. §1344. Compensatory mitigation for this project will be completed through the use of mitigation banks and any other mitigation options that satisfy state and federal requirements. It is anticipated that the wetland mitigation credits to be purchased to offset estuarine forested systems (mangroves) will also serve to offset the project EFH impacts.

4.0 LISTED/PROTECTED SPECIES

All state and federally listed species impacted by the project were designated an anticipated effect determination during the PD&E Study. However, six federally listed species required initiation of consultation with USFWS and NMFS during the design phase; therefore, the federal agencies have not yet concurred with these effect determinations. The January 2019 NRE made a may affect, not likely to adversely affect determination for the Florida bonneted bat, leatherback sea turtle (*Dermochelys coriacea*), green sea turtle (*Chelonia mydas*), loggerhead sea turtle (*Caretta caretta*), and Kemp's Ridley sea turtle (*Lepidochelys kempii*). The January 2019 NRE also determined a may affect, likely to adversely affect determination for the smalltooth sawfish (*Pristis pectinata*).

4.1 FEDERALLY LISTED SPECIES

The following species information has been updated from the January 2019 NRE.

4.1.1 FLORIDA BONNETED BAT

The Florida bonneted bat is a large, free-tailed bat with joined ears that varies in color from dark gray to brownish gray or cinnamon brown. It is listed as endangered by the USFWS. Precise roosting and foraging habitat requirements are unknown; however, the species forages in open areas and is closely associated with forested communities due to their roosting habits. They are thought to nest in tree cavities or building crevices. The project is within the Consultation Area (CA) for the species.

According to Florida Natural Areas Inventory (FNAI) data, the Florida bonneted bat has the potential to occur in Charlotte County; however, minimal roosting habitat exists within the preferred alternative and no occurrences have been documented within one mile of the project study area. As part of the PD&E Study, tree cavities and man-made structures were examined during species-specific surveys for the Florida bonneted bat in May 2018. Several cavities were located and inspected; however, no signs of the Florida bonneted bat were observed in these cavities. Additionally, no visual observations of individuals were made during field reviews or species-specific surveys. While an acoustic survey was deemed needed based on USFWS guidance at the time, this survey was delayed to the design phase due to the pending 2019 Florida bonneted bat survey protocol update and anticipated expiration of an acoustic survey by the time the project would be permitted.

The PD&E determination of may affect, not likely to adversely affect was made prior to the finalization of the October 2019 Consultation Key for the Florida bonneted bat. Using the current, October 2019 consultation key, the project follows 1a>2a>3a Conduct Full Acoustic/Roost Surveys then go to 6 (see **Appendix B**). Therefore, an acoustic survey for this species was conducted in April 2023 to assess the involvement of this species. Based on the results of the survey (**Appendix C**) use of the species consultation key results in an effect determination of "may

affect, not likely to adversely affect –Programmatic (MANLAA-P)" for the Florida bonneted bat. This programmatic concurrence does not require further consultation with USFWS; however, Best Management Practices (BMPs) will be incorporated. The BMPs required to reach a MANLAA determination are based on couplet 12b. The requirements for couplet 12b include BMPs number 1 and any 3 BMPs out of BMPs 3 through 13. FDOT commits to using the following BMPs listed below.

- BMP 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.
- BMP 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.
- BMP 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.
- BMP 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.

4.1.2 SMALLTOOTH SAWFISH AND CRITICAL HABITAT

The smalltooth sawfish is federally listed as endangered. Habitat includes shallow estuarine and coastal habitats including bays, lagoons, rivers, and muddy or sandy bottom shorelines. Although this species prefers euryhaline conditions, characterized as fluctuating salinity, it can tolerate freshwater. Juveniles use shallow vegetated habitats, such as mangrove forests, particularly red mangrove (*Rhizophora mangle*), as nursery grounds. Portions of the study area contain suitable habitat and are within the USFWS smalltooth sawfish critical habitat (CH). Previously, 0.38-acre of impact to CH were estimated. While no individuals were observed during project surveys, NMFS has indicated that the species may use open water habitats at the eastern end of the project.

The extent of impacts to CH have changed given the design change and detailed field surveys (see **Figure 3**). According to 50 CFR 226.218, smalltooth sawfish CH is defined as red mangroves and shallow euryhaline habitats characterized by water depths between the Mean High Water (MHW) and 3 feet (0.9 meters) measured at Mean Lower Low Water (MLLW) within specified areas which includes the Charlotte Harbor Estuary Unit. A northern boundary of this unit is Harborview Road. Potential habitats that are not physically accessible to sawfish can be excluded. MHW data was obtained from the FDEP Land Boundary Information Systems (LABINS) and is recorded between 0.11 feet and 0.15 feet for the estuarine systems within the project footprint. A 0.5-foot contour

FIGURE 3: SMALLTOOTH SAWFISH CRITICAL HABITAT IMPACTS MAP

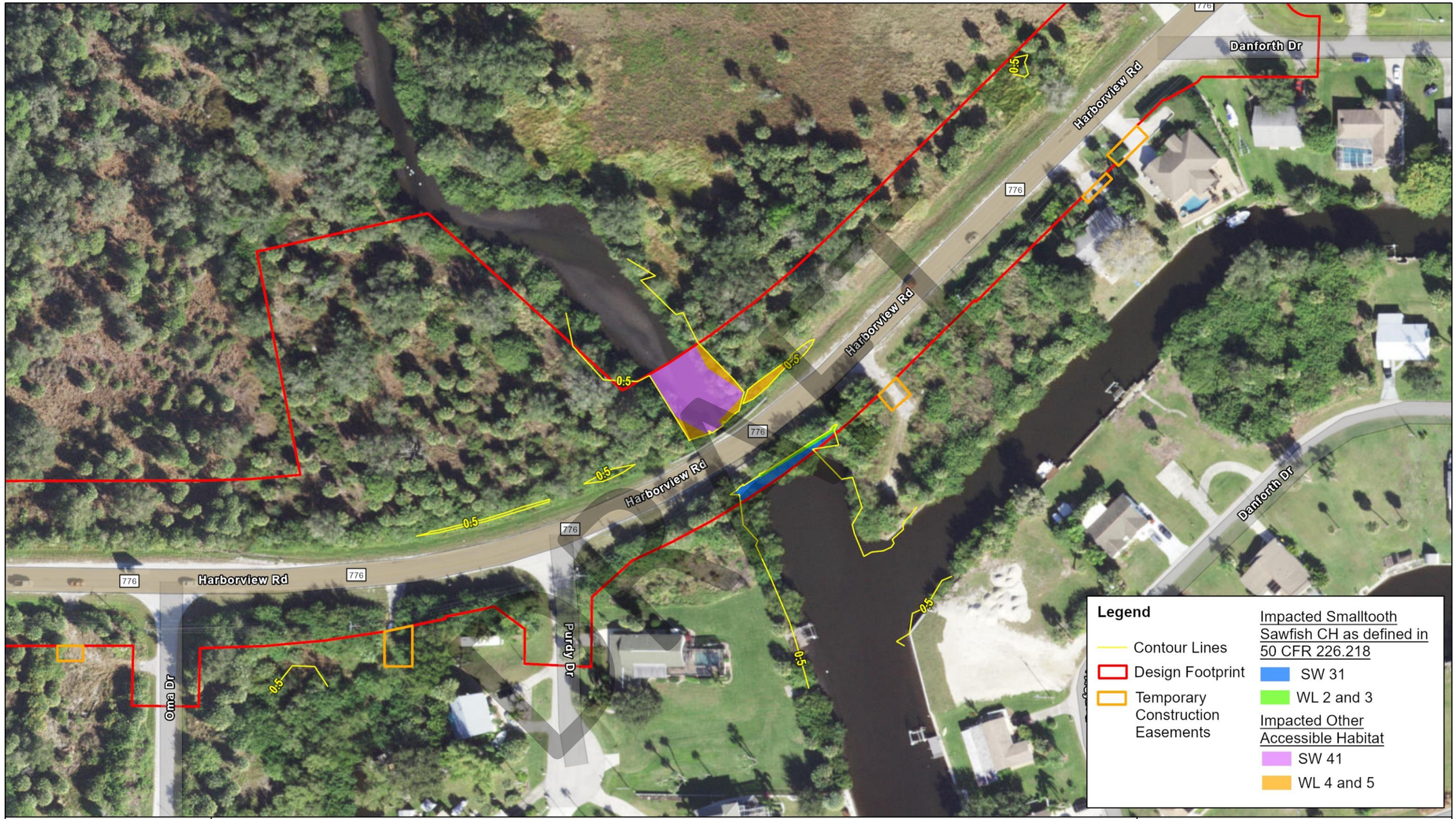

Figure 3. Smalltooth Sawfish Potential Habitat Impacts Map
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Harborview Road from Melbourne Street to I-75
Charlotte County

line, obtained from project survey data, was used to calculate the worse-case impacts to smalltooth sawfish CH. Several estuarine wetlands and surface waters on the south side of Harborview Road were deemed to not meet the definition of CH based on the MLLW water regimes or inaccessibility to smalltooth sawfish due to undulating topography and thick vegetation. These systems include WL 1, SW 17, SW 37, and SW 69. However, additional habitats located north of Harborview Road were identified as being potentially accessible to smalltooth sawfish, and, while they do not meet the definition of CH, are deemed to be suitable habitat. These systems include WL 4, WL 5, and SW 41 (**Table 3**).

Based on the new design and examination of survey data and site conditions, 0.03-acre of CH and 0.13-acre of presumed accessible habitat are anticipated to be impacted (**Table 3**). In addition to acreage impact calculations, the NMFS requires the linear footage of shoreline mangroves accessible to smalltooth sawfish proposed for impacted, which totals 783 linear feet.

TABLE 3: PROPOSED IMPACTS TO SMALLTOOTH SAWFISH HABITAT

*CH Impacts (acres)	0.03 acre (WL 2, WL 3, SW 31)
**Additional Accessible Sawfish Habitat (acres)	0.13 acre (WL 4, WL 5, SW 41)
Mangrove Impacts (linear feet)	783 lf (WL 2, WL 3, WL 4, WL 5)

**CH impacts were calculated according to 50 CFR 226.218 (a) and (b)(1); therefore, only impacts to red mangroves and euryhaline habitats that occur south of Harborview Road, meet the required water regime, and are unobstructed by thick vegetation and undulating topography are considered as CH.*
***This includes habitat north of Harborview Road that is hydrologically connected to smalltooth sawfish CH south of Harborview Road which can potentially be used by smalltooth sawfish.*

No new bridges are proposed as part of this project that could entail underwater noise or vibration from bridge pile installation. Instead, three concrete box culvert replacements will be required. These are located west of Cortez Drive (9 foot x 4 foot box culvert at STA 164+60 - CD-1), east of DeLeon Drive (2- 6 foot x 5 foot box culvert at STA 171+90 - CD-2), and east of Purdy Drive (10 foot x 7 foot box culvert at STA 253+03 - CD-4). CD-4 is accessible by sawfish. CD-1 and CD-2 are considered as not accessible, given the MLLW water regimes, set-back of these box culverts from open water, and the dense vegetation which consist of soft rush (*Juncus effusus*), Carolina willow (*Salix caroliniana*), primrose willow (*Ludwigia peruviana*), Brazilian pepper (*Schinus terebinthifolia*), and mangroves between the open waters of Charlotte Harbor and the culvert headwalls (see **Appendix D**). CD-3 and CD-5 are small piped cross drains that were deemed to be dry for the majority of the year and hold water only during times of high flood conditions or heavy rains. There is also one new box culvert proposed just west of CD-1. This new

structure, CD-1A, will be similar to CD-1 and is located at STA 165+06. The cross drain locations are depicted in **Figure 1**.

Construction Information

During construction for the replacement of the box culverts specifically CD-1, CD-1A, CD-2, and CD-4, temporary cofferdams will be used to close-off the box culvert structures from the tidal waterbodies/wetlands, creating a discrete and dry construction zone. A pump with grates over the intake will be installed at the box culvert construction areas to allow for the continued tidal flow and flushing of the upstream system.

However, given the understanding that CD-4 is located at a tributary which has a permanent, open water connection to Charlotte Harbor, and since this tributary may be used by smalltooth sawfish, alternate construction methods are being considered that would allow for the existing box culvert CD-4 to be left open for wildlife passage during the majority of construction. It has been deemed hydraulically feasible and constructable to first construct the new, northern extended portion of the culvert while leaving the current culvert open, then install a temporary connection between the new and existing culvert pieces, then construct the new southern culvert replacement immediately adjacent to the current location. The culvert connection would only require temporary closing for an estimated 2-week timeframe while a permanent connection is constructed between the north and south pieces. During this short period, a pump with grates as previously described would be installed to maintain tidal flows and flushing. Since sawfish pupping season occurs from March 1 to July 31, the period that the culvert connection must be closed will occur outside this season.

Table 4 provides a summary of estimated temporary cofferdam sheet pile installation in the water. Note that some of these locations may involve sheet pile installation in upland areas; these are not tallied below. In total, 78 panels of sheet pile are anticipated to be required for these locations that are in water and accessible to smalltooth sawfish (CD-4). CD-1 and CD-2 are not accessible to sawfish given water regimes and dense vegetation; CD-1A is not currently an existing box culvert and therefore is not considered to have potential involvement with the species. The anticipated installation rate is 10-15 sheet pile panels per construction day.

TABLE 4: BOX CULVERT CONSTRUCTION AND COFFERDAM ESTIMATES

Culvert ID	STA	# cells	Width (ft)	Height (ft)	Coffer cell 1 (ft)	Coffer cell 2 (ft)	Total length (ft)	# panels
CD-1	164+60	1	9	4	90	90	180	90
CD-1A	165+06	1	7	4	90	90	180	90
CD-2	171+90	2	6	5	90	90	180	90
CD-4	253+03	1	10	7	110	45	155	78

Note: rows with grey fill are not currently accessible to smalltooth sawfish.

No blasting or in-water night work will occur during the culvert construction. If sawcuts or jack hammers are used in the removal of the existing box culverts, a noise method ramp-up will be used. Sheet pile walls will be vibrated in as opposed to impact driven to avoid under-water noise. Sediment and erosion control screens and curtains will be strategically placed to avoid and minimize potential wildlife entrapment. Water depths immediately adjacent to the culvert sites will not be altered (e.g. no change in channel elevations beyond the construction footprint). It is anticipated that construction activities will take six to eight months per culvert; the contractor will determine means and methods and may overlap culvert constructions. To minimize potential adverse impacts to the smalltooth sawfish, the FDOT will implement the *Protected Species Construction Conditions (NOAA Fisheries Southeast Regional Office)*, which replaced the *Sea Turtle and Smalltooth Sawfish Construction Condition*s (see **Appendix E**). In addition to the measures listed above, FDOT will contact the FWC prior to the temporary culvert closure (CD-4) should the agency wish to sweep the creek upstream of the culvert with nets to capture sawfish prior to the temporary culvert closure. The temporary (2 week) culvert closure will occur outside of the pupping season for this species (March 1 through July 31).

Based on the above information, proposed construction methods to eliminate or reduce under-water noise and to reduce to the greatest extent practical the duration that upstream habitat supporting the smalltooth sawfish will be closed-off to wildlife movement, the anticipated effect determination has been updated from may affect, likely to adversely affect to may affect, not likely to adversely affect for this species. The effect determination for CH remains as no adverse modification or destruction of Critical Habitat. **Table 5** includes additional construction details needed for consultation.

TABLE 5: ADDITIONAL INFORMATION REQUIRED FOR NMFS CONSULTATION

Turbidity/silt curtains AND cofferdams will be used	
	installation method – vibratory hammer
	size of area within the curtain or cofferdam – approximately 0.30-acre for CD-1 and CD-2 and approximately 0.20-acre for CD-4
	in-water duration of installed curtain or cofferdam – 6-8 months per culvert (3 in total – CD-1, CD-2, and CD-4)
No dredging is anticipated	
No vessels are anticipated	
In-water structure will be used	
	size of the structure and how it will be constructed, installed, or removed - A temporary cofferdam will be used to close-off the structures from the tidal waterbody, creating a discrete and dry construction zone (see **Table 2** below for details). This will be installed by a vibratory hammer outside of sawfish pupping season during daylight hours. A pump with grates over the intake would be installed at the box culvert construction area to allow for the continued tidal flow and flushing of the upstream system. This temporary cofferdam will be removed after the proposed box culvert construction is completed.
	whether any listed or non-listed special resources (i.e., seagrass, mangroves, or corals) are in the footprint of the structure – no seagrass or corals present in water column; however, mangroves (black, red, and white) are located along the shoreline.
This project is not proposing an aquaculture	
This project is not proposing an artificial reef	
There is potential for riprap to be placed at the mouth of the culverts or culvert wingwalls but details are not known at this time	
	type of material – rock riprap
	dimensions (water depth, linear feet, and area covered by riprap) – less than 400 sf and 60 lf in each location. Water depths at MHW approx. 1 foot in most locations except CD-4 where MLLW conditions hold approx. 4 feet of water.
	placement method (e.g., small rocks by hand) – mechanical placement (e.g. backhoe)
	material source location – as per FDOT standard specifications, material will be clean fill, free of debris and toxic or deleterious substances
	whether material will be placed below and/or above the waterline – below water line
	volume of material to be placed – pending more detailed design information
	characteristics of substrate that will be covered or removed – unconsolidated bottom/sand

4.1.3 WEST INDIAN MANATEE AND CRITICAL HABITAT

The West Indian manatee (*Trichechus manatus*) is a federally listed threatened species. The species is also federally protected under the Marine Mammal Protection Act. The project is within the CA, the CH, and the protection zone of this species. Manatees may inhabit marine and

freshwater habitats and seek warm-water sites during the winter season. The nearest documented species observation occurred in 1999, 0.80-mile southeast of the project. Although no visual observations were made during field reviews, there are 12 documented historical mortalities within one mile of the project limits.

During the PD&E, 0.14 acres of impact to CH were estimated. Due to the proposed design change, the impacts to CH have been reduced from 0.14-acre to 0.03-acre and includes 0.01-acre impact to WL 2 and WL 3 and 0.02-acre impact to SW 31, located at CD-4. To minimize potential adverse impacts to the West Indian manatee, the FDOT will implement the *Standard Manatee Conditions for In-Water Work* during the proposed roadway improvements (see **Appendix F**). According to FWC guidance, the recommended three feet minimum depth from culvert bottom at low tide will also be met. In preliminary communication with the USFWS, it was confirmed that a manatee grate would not be warranted or desired at CD-4 given the proposed replacement size (10 x 7 feet), minimum water elevation, and potential for smalltooth sawfish use of upstream habitat. For these reasons the determination of effect for this species will remain as may affect, not likely to adversely affect and the species determination of effect key is provided in **Appendix G**. The effect determination for CH remains as no adverse modification or destruction of Critical Habitat.

4.1.4 WOOD STORK

The wood stork (*Mycteria americana*) is listed as threatened by the USFWS. For south Florida, the USFWS has defined the core foraging area (CFA) for a wood stork colony as the area within an 18.6-mile radius from the colony location. The project corridor is located within, completely or in part, the CFA of five south Florida wood stork nesting colonies: Morganton Central, Morganton North, Morganton South, North Port Charlotte South, and North Port Charlotte North. As defined by the USFWS, wood stork suitable foraging habitat (SFH) includes wetlands and surface waters that have areas of water that are relatively calm, uncluttered by dense thickets of aquatic vegetation, and have permanent or seasonal water depth between two and 15 inches.

The wetlands and other surface waters within the project footprint generally provide such habitat. During the PD&E, a wood stork foraging analysis was conducted to determine the amount of biomass loss from wetlands and surface waters impacts. However, based on the *South Florida Wood Stork Key*, a foraging analysis only needs to be conducted for projects impacting greater than five acres of wetlands. The design change is anticipated to impact 0.46-acre of wetlands and 1.99 acres of surface water which falls under the threshold needed for the wood stork forging analysis. However, suitable foraging habitat impacts will be mitigated through credit purchase from federally-permitted wetland mitigation banks. As per the USFWS South Florida Programmatic Concurrence for the wood stork (2010) (**Appendix H**), the determination of may affect, but is not likely to adversely affect for this species remains valid.

4.1.5 SNAIL KITE

The snail kite (*Rostrhamus sociabilis*) is designated by the USFWS as endangered. The project is located approximately 29 miles outside of the CA for the species. There have been no documented occurrences within a mile of the project. The snail kite's diet consists almost exclusively of apple snails (*Pomacea paludosa*) and they require habitat consisting of freshwater marshes and shallow vegetated marsh or lake edges where these snails are found. The project area does not provide suitable foraging or nesting habitat because the freshwater habitats consist of roadside ditches only. While the PD&E indicated a may affect, not likely to adversely affect determination for this species, based on design-phase field reviews, there is no suitable habitat for this species. Based on this information, it has been determined that the project will have no effect on the snail kite.

4.1.6 OTHER FEDERALLY-LISTED SPECIES

The design-phase changes have not resulted in changes to effect determinations made for other federally-listed species with potential to occur in the project area. In summary, these are:

No effect

- Beautiful pawpaw (*Deeringothamnus pulchellus*)
- Aboriginal prickly apple (*Harrisia aboriginum*)
- Gulf sturgeon (*Acipenser oxyrinchus desotoi*)
- Red-cockaded woodpecker (*Picoides borealis*)
- Florida scrub-jay (*Aphelocoma coerulescens*)
- Crested caracara (*Caracara cheriway*)
- American crocodile (*Crocodylus acustus*)

May affect, not likely to adversely affect

- Eastern indigo snake (*Drymarchon couperi*) with use of species key (**Appendix I**)
- Piping plover (*Charadrius melodus*)
- Leatherback sea turtle
- Green sea turtle
- Loggerhead sea turtle
- Kemp's Ridley sea

The American alligator (*Alligator mississippiensis*) was listed as an anticipated may affect, not likely to adversely affect determination in the January 2019 NRE. Since that time, the USFWS has indicated that they will not consult on this species given that it is listed only by similarity of appearance to the American crocodile. As a result, no further evaluation or agency coordination will occur for the alligator.

4.2 STATE LISTED SPECIES

The design-phase changes have not resulted in changes to effect determinations made for other state-listed species with potential to occur in the project area. In summary, these are:

No effect anticipated

- Many-flowered grass-pink (*Calopogon multiflorus*)
- Iguana hackberry (*Celtis iguanaea*)
- Florida Beargrass (*Nolina atopocarpa*)
- Sleeping beauty waterlily (*Nymphaea jamesoniana*)
- Hand fern (*Ophioglossum palmatum*)
- Giant orchid (*Pteroglossaspis ecristata*)
- Florida burrowing owl (*Athene cunicularia floridana*)

No adverse effect anticipated

- Golden leather fern (*Acrostichum aureum*)
- Gopher tortoise (*Gopherus polyphemus)*
- Pine snake *(Pituophis melanoleucus)*
- American oystercatcher (*Haematopus palliatus*)
- Black skimmer (*Rynchops niger*)
- Florida sandhill crane (*Grus canadensis pratensis*)
- Least tern (*Sternula antillarum*)
- Little blue heron (*Egretta caerulea*)
- Tricolored heron (*Egretta tricolor*)
- Roseate spoonbill *(Platalea ajaja)*
- Southeastern American kestrel *(Falco sparverius paulus)*
- Snowy plover *(Charadrius nivosus)*

5.0 CONCLUSIONS

5.1 COMMITMENTS

Based on literature reviews, field surveys, data collection, and coordination with the agencies throughout the extent of the PD&E Study, federal and state listed species have the potential to occur within the project area. To minimize project impacts on protected species to the greatest extent practicable, the following project commitments have been made:

1. The USFWS Standard Protection Measures for the Eastern Indigo Snake will be implemented to ensure that the Eastern indigo snake will not be adversely impacted by the project.
   No update, this remains a valid commitment.

2. ESA Section 7 consultation for the Florida bonneted bat will be initiated with USFWS during the design phase of the project.
   With use of the USFWS Florida bonneted bat (FBB) consultation key and completion of the acoustic survey for the Florida bonneted bat, which was required for USFWS to conduct a concurrence of all federally listed species under the Service's purview at one time, this NRE Addendum is now requesting initiation of Section 7 consultation with the USFWS for the project.

3. In accordance with the Florida bonneted bat consultation key, FDOT will implement Best Management Practice #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.

4. In accordance with the Florida bonneted bat consultation key, FDOT will implement Best Management Practice #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.

5. In accordance with the Florida bonneted bat consultation key, FDOT will implement Best Management Practice #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.

6. In accordance with the Florida bonneted bat consultation key, FDOT will implement Best Management Practice #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.

7. ESA Section 7 consultation for sea turtles will be initiated with NMFS during the design phase of the project.
   This NRE Addendum is requesting initiation of Section 7 consultation with NMFS.

8. ESA Section 7 formal consultation for the small tooth sawfish will be initiated with NMFS during the design phase of the project.
   This NRE Addendum is requesting initiation of Section 7 consultation with NMFS.

9. No blasting will occur during the construction of the proposed culverts.
   This is a new commitment.

10. The FDOT will only conduct in-water work during daytime hours.
    This is a new commitment.

11. The FDOT will require contractors to install sheet pile walls using vibratory hammers and not impact hammers.
    This is a new commitment.

12. The FDOT will contact the FWC prior to the temporary culvert closure (CD-4) should the agency wish to sweep the creek upstream of the culvert with nets to capture sawfish prior to the temporary culvert closure. Culvert closure will avoid the smalltooth sawfish pupping season which is March 1 – July 31.
    This is a new commitment.

In addition, the following Implementation Measures were listed in the January 2019 NRE document which are currently classified as commitments:

13. Impacts to suitable foraging habitat for the federally-protected wood stork will be mitigated through the purchase of credits from a U.S. Fish and Wildlife Service-approved mitigation bank pursuant to Section 373.4137, F.S. or as otherwise agreed to by the FDOT and the appropriate regulatory agencies.
    No update, this remains a valid commitment.

14. The most current version of the FWC Standard Manatee Conditions for In-Water Work will be implemented to ensure that manatees will not be adversely impacted by the project.
    No update, this remains a valid commitment.

15. The *NMFS Sea Turtle and Smalltooth Sawfish Construction Conditions* will be implemented to ensure that sea turtles and small tooth sawfish will not be adversely impacted by the project.
    This document has since been replaced with the *Protected Species Construction Conditions (NOAA Fisheries Southeast Regional Office).*

Remaining Implementation Measures include:

16. The FDOT will perform additional wildlife surveys for Florida sandhill crane, Southern fox squirrel, bald eagle, osprey, gopher tortoise, and other wildlife species during the project design phase. If these species are found to be present in the project area, then the appropriate measures discussed in this report will be followed.
    The Southern fox squirrel is no longer a state listed species and will not be targeted with additional wildlife surveys. The remainder of this implementation remains valid.

One new Implementation Measure has been added:

17. The FDOT will require contractors to use a ramp-up procedure if sawcuts or jack hammers are used in the removal of the existing box culverts. This gradual increase in noise level gives species time to leave the impact area prior to initiation of full noise levels.

6.0 SUMMARY OF SPECIES UPDATES

Table 6 provides a summary of the federally listed species and CH effect determinations as per the 2019 NRE and this document, noting any changes.

TABLE 6: SUMMARY OF FEDERALLY LISTED SPECIES AND CH EFFECT DETERMINATIONS

Species	PD&E Effect Determination	Design Effect Determination
Florida bonneted bat	MANLAA	MANLAA-P with key
West Indian Manatee	MANLAA with key	No change
West Indian Manatee CH	no adverse modification or destruction of Critical Habitat	No change
Smalltooth sawfish	MALAA	MANLAA
Smalltooth sawfish CH	no adverse modification or destruction of Critical Habitat	No change
Gulf sturgeon	NE	No change
Leatherback sea turtle	MANLAA	No change
Green sea turtle	MANLAA	No change
Loggerhead sea turtle	MANLAA	No change
Kemp's Ridley sea turtle	MANLAA	No change
Eastern indigo snake	MANLAA with key	No change
American crocodile	NE	No change
American alligator	MANLAA	No concurrence needed
Snail kite	MANLAA	NE
Wood stork	MANLAA	MANLAA with key
Piping plover	MANLAA	No change
Red-cockaded woodpecker	NE	No change
Florida scrub-jay	NE	No change
Crested caracara	NE	No change
Aboriginal prickly apple	NE	No change
Beautiful pawpaw	NE	No change

MALAA- may affect, likely to adversely affect; MANLAA- may affect, not likely to adversely affect; NE- no effect; P- programmatic

7.0 REFERENCES

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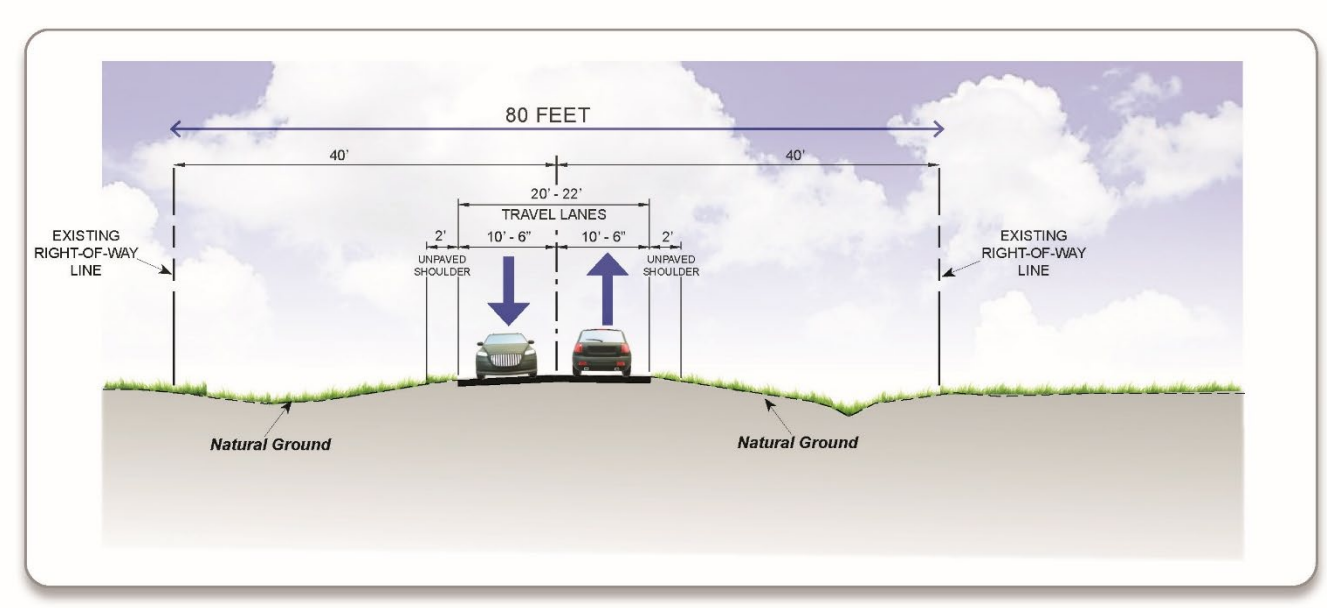
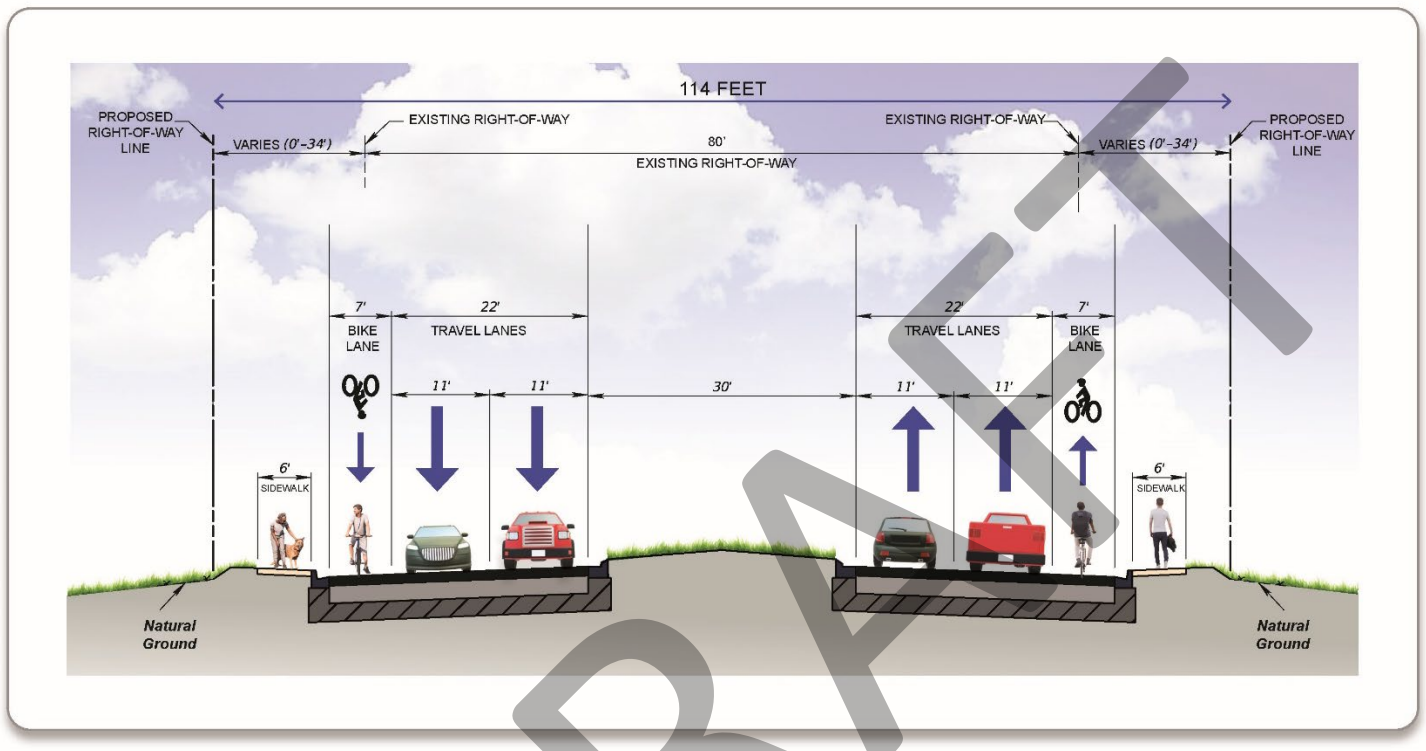
Appendix A

Typical Sections

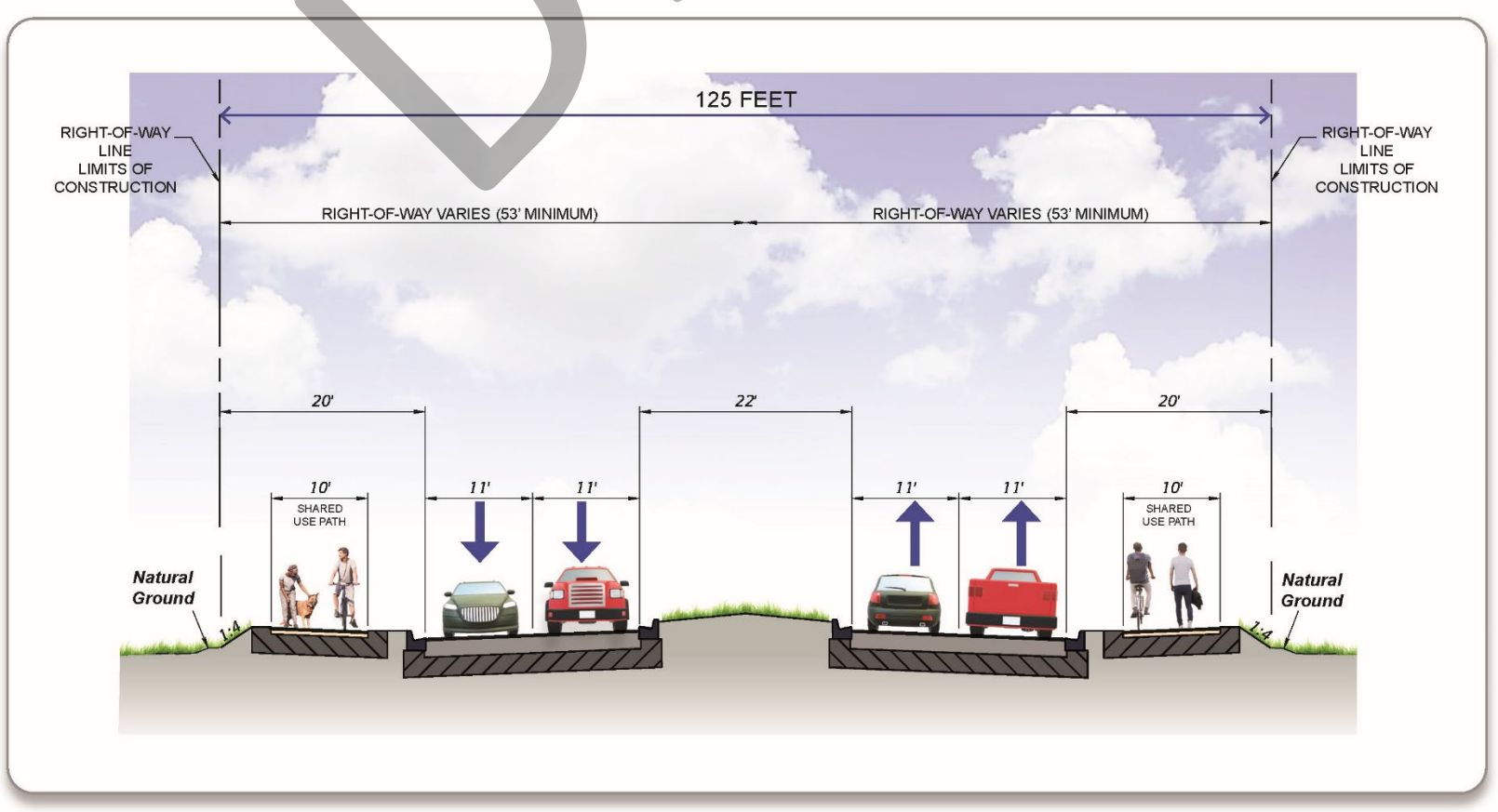
Existing typical section



PD&E typical section



Design typical section



Appendix B

Consultation Key for Florida Bonneted Bat (FBB)

United States Department of the Interior

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

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

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

Dear Mr. Zinszer:

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

The purpose of the guidelines and Key is to aid the Corps (or other Federal action agency) in making appropriate effect determinations for the Florida bonneted bat under section 7 of the Act, and streamline informal consultation with the Service for the Florida bonneted bat when the proposed action is consistent with the Key. There is no requirement to use the Key. There will be cases when the use of the Key is not appropriate. These include, but are not limited to: where project specific information is outside of the scope of the Key, applicants do not wish to implement the identified survey or best management practices, or if there is new biological information about the species. In these cases, we recommend the Corps (or other Federal action agency) initiate traditional consultation pursuant to section 7 of the Act, and identify that consultation is being requested outside of the Key.

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

Roosting habitat

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

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

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

Foraging habitat

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

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

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

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

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

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

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

Determinations

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

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

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

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

> **MANLAA-P**: If the use of the Key results in a determination of "MANLAA- P," the Service concurs with this determination based on the rationale provide above, and no further consultation is necessary for the effects of the proposed action on the Florida bonneted bat. The Service recommends that the Corps (or other Federal action agency) documents the pathway used to reach the determination in the project record and proceeds with other species analyses as warranted.
>
> **MANLAA-C**: If the use of the Key results in a determination of MANLAA-C, further consultation with the Service is required to confirm that the Key has been used properly, and the Service concurs with the evaluation of the survey results. Survey results should be submitted with the consultation request.

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

Working with the Fish and Wildlife Foundation of Florida, the Service has established a fund to support conservation and recovery for the Florida bonneted bat. Any project that has the potential to affect the Florida bonneted bat and/or its habitat is encouraged to make a voluntary contribution to this fund. If you would like additional information about how to make a contribution and how these monies are used to support Florida bonneted bat recovery please contact Ashleigh Blackford, Connie Cassler, or José Rivera at 772-562-3909.

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

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

Sincerely,

Roxanna Hinzman
Field Supervisor
South Florida Ecological Services

Enclosure

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

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

FLORIDA BONNETED BAT CONSULTATION GUIDELINES

October - 2019

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

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

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

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

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

Use of Consultation Area, Flowchart, and Key

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

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

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

Using the Key and Consultation Flowchart

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

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

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

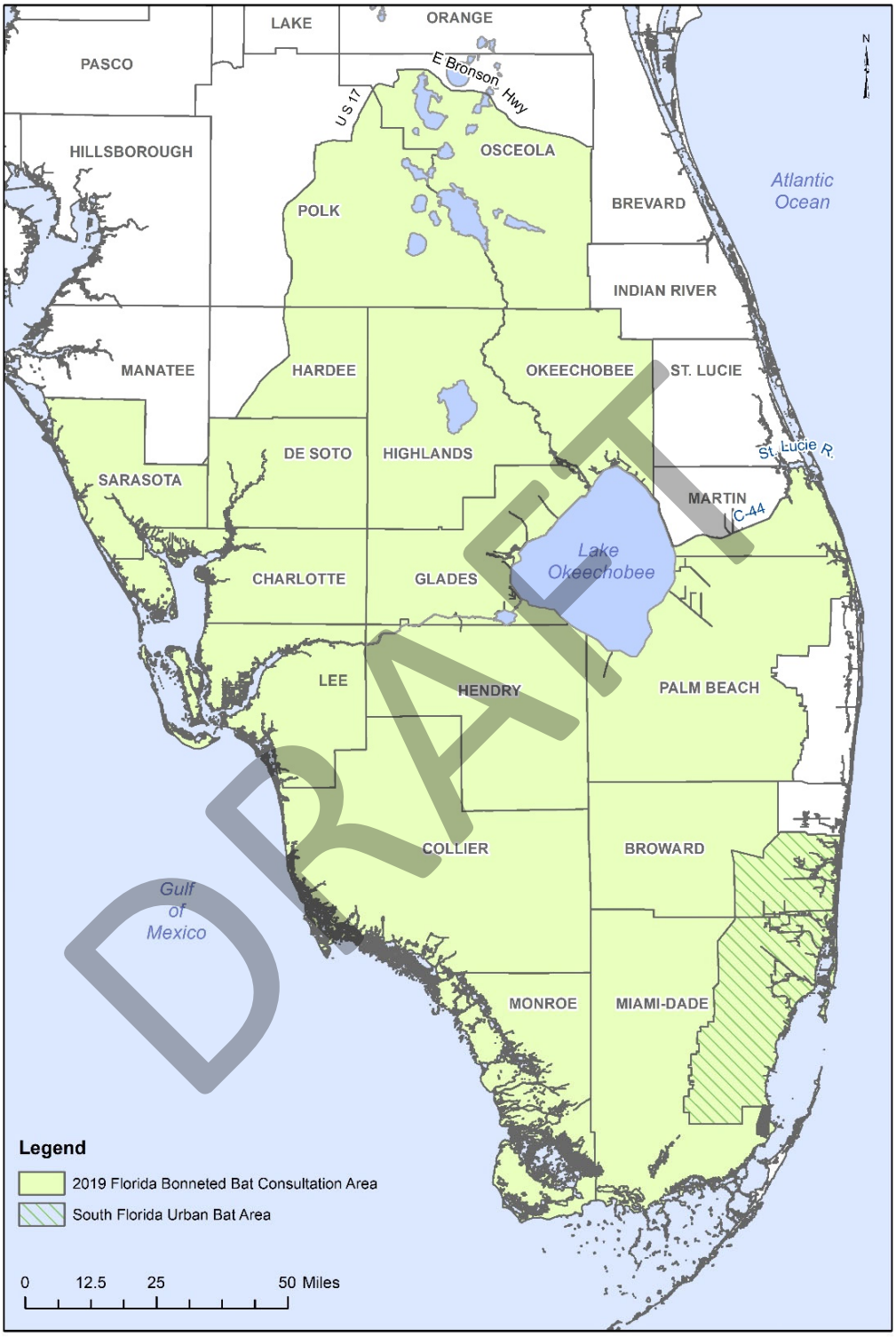

Figure 1. Florida Bonneted Bat Consultation Area. Hatched area (Figure 2) identifies the urban development boundary in Miami-Dade and Broward County. Applicants with projects in this area should contact the Service for specific guidance addressing this area and individual consultation. The Consultation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

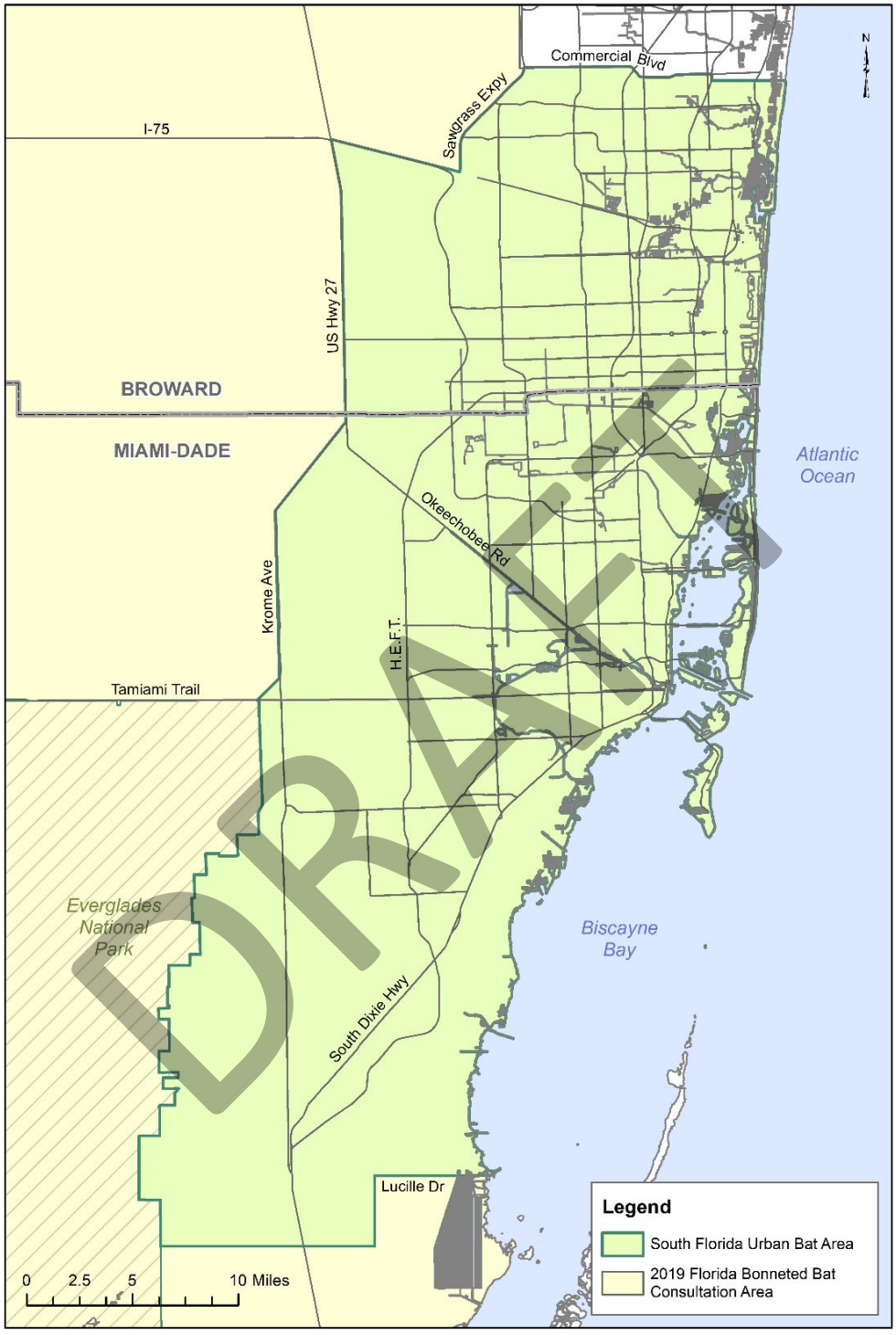

Figure 2. Urban development boundary in Miami-Dade and Broward County. The Consultation Key should not be used for projects in this area. Applicants with projects in this South Florida Urban Bat Area should contact the Service for specific guidance addressing this area and individual consultation.

Florida Bonneted Bat Consultation Key[#]

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

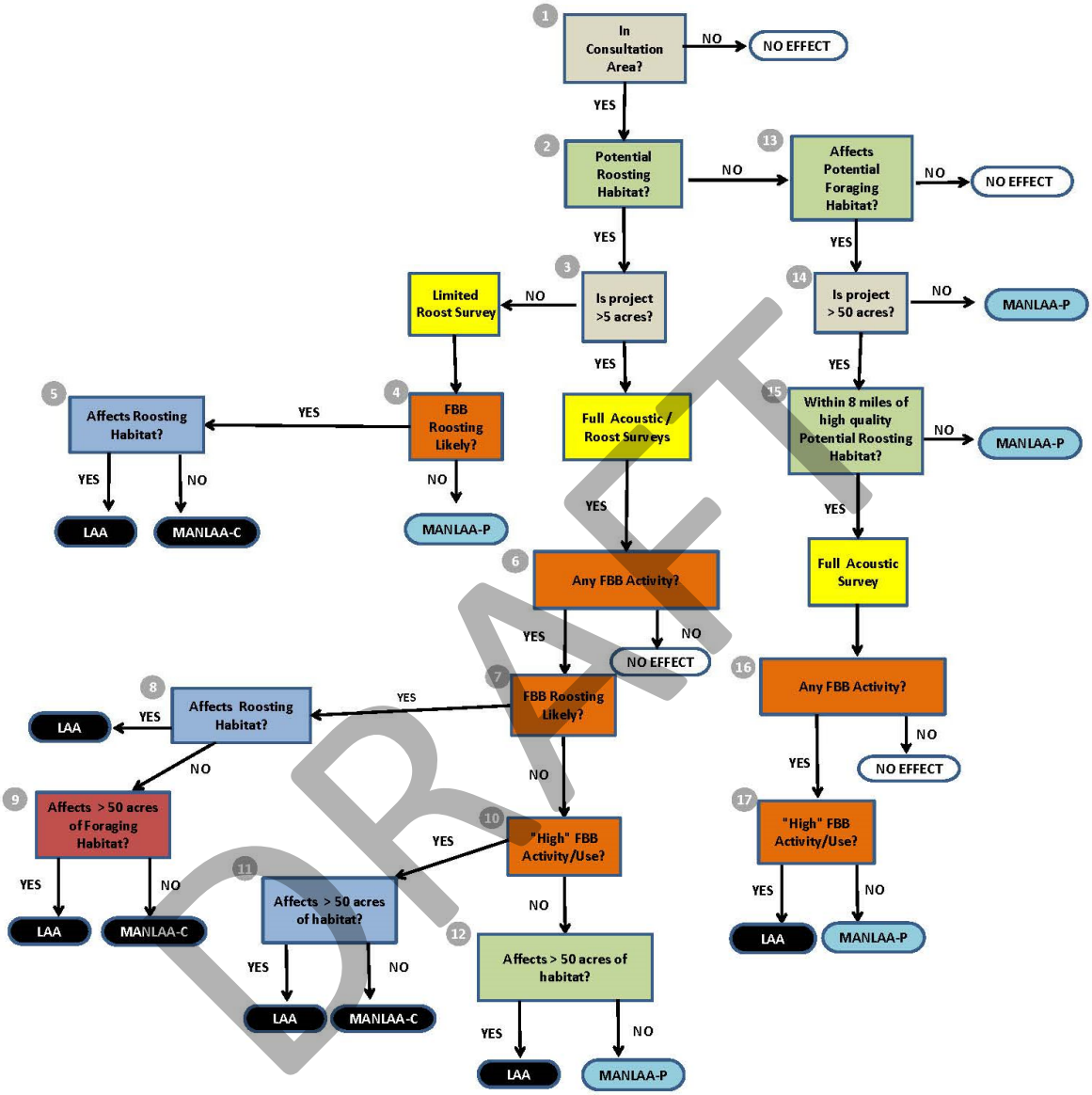

Figure 3. Florida bonneted bat Consultation Flowchart. "**No effect**" determinations do not need Service concurrence. "May affect, but not likely to adversely affect", **MANLAA-P,** in blue have programmatic concurrence through the transmittal letter of these Guidelines, and therefore no further consultation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

GLOSSARY

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

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

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

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

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

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

LAA - May Affect, and is Likely to Adversely Affect. The appropriate conclusion if any adverse effect to listed species may occur as a direct or indirect result of the proposed action or its interrelated or interdependent actions, and the effect is not: discountable, insignificant, or

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

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

MANLAA - May Affect, but is Not Likely to Adversely Affect. The appropriate conclusion when effects on listed species are expected to be discountable, insignificant, or completely beneficial. Beneficial effects are contemporaneous positive effects without any adverse effects to the species. Insignificant effects relate to the size of the impact and should never reach the scale where take occurs. Discountable effects are those extremely unlikely to occur. Based on best judgment, a person would not: (1) be able to meaningfully measure, detect, or evaluate insignificant effects; or (2) expect discountable effects to occur. To use these Guidelines and Consultation Key applicants must incorporate the appropriate **BMPs** (Appendix D) to reach a **MANLAA** determination.

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

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

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

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

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

- trees greater than 33 feet (10 meters) in height, greater than 8 inches (20 centimeters) in diameter at breast height (DBH), with cavity elevations higher than 16 feet (5 meters) above ground level (Braun de Torrez 2019);
- areas with a high incidence of large or mature live trees with various deformities (*e.g.,* large cavities, hollows, broken tops, loose bark, and other evidence of decay) (*e.g.,* pine flatwoods);
- rock crevices (*e.g.,* limestone in Miami-Dade County); and/or
- artificial structures, mimicking natural roosting conditions (*e.g.,* bat houses, utility poles, buildings), situated in natural or semi-natural habitats.

In order for a building to be considered a roosting structure, it should be a minimum of 15 feet high and contain one or more of the following features: chimneys, gaps in soffits, gaps along gutters, or other structural gaps or crevices (outward entrance approximately 1 inch (2.5 centimeters) in size or greater. Structures similar to the above (*e.g.,* bridges, culverts, minimum of 15 feet high) are expected to also provide roosting habitat, based upon the species' morphology and behavior (Keeley and Tuttle 1999). Florida bonneted bat roosts will be situated in areas with sufficient open space for these bats to fly (*e.g.,* open or semi-open canopy, canopy gaps, above the canopy, and edges which provide relatively uncluttered conditions [*i.e.,* reduced numbers of obstacles, such as fewer tree branches and leaves, in the flight environment]).

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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Appendix B: Full Acoustic / Roost Survey Framework

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

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

General Survey Protocol:

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

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

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

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

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

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

Literature Cited – Appendix B

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

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Appendix C: Limited Roost Survey Framework

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

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

General Survey Protocol:

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

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

Identification of potential roost structures

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

Visual Inspection of trees and snags with tree-top cameras

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

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

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

Emergence Surveys

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

Acoustic surveys

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

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

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

Reporting

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

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

Literature Cited – Appendix C

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

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

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

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

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

BMPs for development, construction, and other general activities:

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

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

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

Ecological Land Management

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

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

Ecological Land Management BMPs:

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

Literature Cited – Appendix E

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

Appendix C

FBB Acoustic Survey Tech Memo

Florida Bonneted Bat Acoustic Survey Technical Report

Harborview Road Design from Melbourne Street to I-75

Florida Department of Transportation

District One

Financial Project Identification No.: 434965-2-52-01

Charlotte County, Florida

September 2023

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

HARBORVIEW ROAD DESIGN FROM MELBOURNE STREET TO I-75
FPID 434965-2-52-01
Florida Bonneted Bat Acoustic Survey Technical Report

Prepared for
Scalar Consulting Group, Inc.
and
FDOT, District One

September 2023

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HARBORVIEW ROAD DESIGN FROM MELBOURNE STREET TO I-75

Florida Bonneted Bat Acoustic Survey Technical Report

Introduction

The Florida Department of Transportation (FDOT), District One, is conducting a roadway widening project of Harborview Road from Melbourne Street to I-75, a distance of approximately 2.20 miles. The design proposes widening of the existing two-lane undivided roadway and adding roundabouts at the intersections at Melbourne Street and Eastport Road (easternmost limits of the project). The proposed project includes the addition of traffic medians, paved shoulders/marked bicycle lanes, sidewalks, and/or a shared-use path, and resurfaced driveways. The project is in Charlotte County, Florida in Section 25 Township 40 South, Range 22 East and Sections 20, 29, and 30 of Township 40 South, Range 23 East. Reference attached **Figure 1: Project Location Map** showing the location of the proposed project.

This report summarizes the methods and results of a species-specific survey for the Florida bonneted bat (*Eumops floridanus*). The project limits overlap the U.S. Fish and Wildlife Service (USFWS) Florida bonneted bat consultation area (CA). This survey was conducted in accordance with the 2019 USFWS Florida Bonneted Bat Consultation Guidelines.

Species Information

Species and Habitat Description

The Florida bonneted bat has a body length of 84 to 108 millimeters (mm) (approximately 3.75 inches) with a wingspan of 490 to 530 mm (approximately 20 inches), making it the largest species of bat in Florida. Its fur color can range from a dark grey to reddish brown. A distinguishing characteristic of the Florida bonneted bat is its large, rounded ears that are joined at the midline of the forehead. There is no significant difference in size or appearance between males and females. Florida bonneted bat echolocations have a minimum frequency of 10-18 kilohertz (kHz) and a maximum frequency of 16-22 kHz.

Very little is known about the life history and ecology of the Florida bonneted bat. Natural roosting habitat for this species includes forested areas containing tall mature trees such as pine flatwoods, mixed or hardwood hammocks, wetland forested systems, and sand pine scrub. In these natural

habitats, Florida bonneted bats may roost in tree snags, tree cavities, tree crevices, under loose bark, or other deformities of mature trees. Documented roosts have occurred in trees greater than six (6) meters (20 feet) tall, with a diameter-at-breast height (DBH) of 20.3 centimeters (cm) (8 inches), and having cavities higher than 4.6 meters (15 feet) above ground. Florida bonneted bats have also been documented roosting in urban/suburban areas. Roosting habitat in these areas includes the shafts of royal palm (*Roystonea regia*) leaves, underneath tiles in Spanish tile roofs, attics, rock or brick chimneys of buildings, utility poles, and manmade bat houses.

This species can cover large areas when foraging. Studies at the Babcock-Webb Wildlife Management Area (WMA) conducted with Florida bonneted bats fitted with Global Positioning System (GPS) satellite tags documented the maximum distance detected from a capture site was 24.2 miles and the longest path traveled in a single night was 56.3 miles. In a sample size of eight (8) individuals, Florida bonneted bats were documented traveling a mean maximum distance of 9.5 miles from the roost.

Status

The Florida bonneted bat is listed as a federally designated endangered species by the USFWS and is protected by the Endangered Species Act, as amended (16 U.S. Code (U.S.C.) 1531-1544, 87 Stat. 884). No critical habitat (CH) has been designated for this species; however, in June 2020 the USFWS proposed draft language for designation of CH. Following a public comment and in response to new information, the USFWS revised the proposed rule designating CH in November 2022 and made the rule available for public comment through January 23, 2023. The revised rule includes nine (9) CH units (Kissimmee, Peace River, Babcock, Fisheating Creek, Corkscrew, Big Cypress, Everglades Tree Islands, Long Pine Key, and Miami Rocklands) covering portions of 13 counties. CH is not proposed to be designated in Charlotte County, so this project does not fall within the proposed CH. If a project is located in the proposed CH, the consultation key does not apply and specific guidance from USFWS and individual consultation to address this area is required.

Florida bonneted bats are unique from other bat species in Florida because they are reproductively active through most of the year, and their large size makes them capable of foraging long distances from their roost. Consequently, this species is vulnerable to disturbances around the roost during the greater portion of the year and considerations about foraging habitat extend further than the localized roost. Furthermore, impacts to their foraging habitat can also have adverse effects, even if the impacts are located a significant distance from their roosts.

Methodology

Desktop Data Collection

A comprehensive literature and geospatial database search were conducted for the project area to determine if the Florida bonneted bat has been previously documented within the project limits and if suitable roosting or foraging habitat is available. The literature and geospatial database search included standard references such as the Rare and Endangered Biota of Florida Series, as well as

resources from the Florida Fish and Wildlife Conservation Commission (FWC) and USFWS databases such as National Wetlands Inventory (NWI) mapping, CA limits, proposed CH limits, and the 2019 USFWS Consultation Key for the Florida Bonneted Bat. Additional reviewed sources included the 2020 Southwest Florida Water Management District (SWFWMD) Florida Land Use, Cover and Forms Classification System (FLUCFCS), current information from the Federal Register for Endangered and Threatened Wildlife and Plants, and current aerial imagery.

Based on this preliminary data collection effort, findings related to the Florida bonneted bat and this project include the following:

- The project falls entirely within the USFWS Florida bonneted bat CA;
- The project does not fall within the USFWS designated South Florida Urban Bat Area located in Miami-Dade and Broward County;
- The project mainline is not within the proposed CH;
- Potentially suitable foraging and roosting habitat was identified within the project boundary; and
- The project is in close proximity to conservation lands including the Peace River Preserve (approximately 5 miles east of I-75).

Field Surveys

The Florida bonneted bat acoustic surveys followed the protocol documented in the October 2019 U.S. Fish and Wildlife Service (USFWS) South Florida Ecological Services Office - Florida Bonneted Bat Consultation Guidelines (USFWS 2019) for linear projects that contain potential bonneted bat roosting and foraging habitat and that are also greater than five (5) acres in size. Per the Guidelines, the following weather conditions are required to be met for the first five (5) hours of each survey night:

- Temperature at or above 65 degrees Fahrenheit;
- Precipitation events, including rain and/or fog cannot exceed 30 minutes in length; and
- Sustained wind speeds cannot be greater than nine (9) miles per hour.

For the Harborview Road from Melbourne Street to I-75 project, five (5) acoustic survey stations were established based on the minimum requirements of five (5) detector nights per 0.60 miles for linear projects. The acoustic survey station locations are depicted in **Figure 2: Acoustic Survey Station Location Map**. Representative photos of the acoustic survey stations are provided in **Appendix A** and the survey locations and dates for each survey station are provided in **Table 1** below.

TABLE 1
EQUIPMENT DEPLOYMENT DETAILS

Station	Latitude	Longitude	Deployment Dates (2023)	Notes
1	26.96627	-82.055961	4/6/2023 through 4/20/2023	April 6, 9, 10, 11, 12, 13, 15, 16, 17, and 19 were excluded due to inclement weather.
2	26.970513	-82.047556	4/6/2023 through 4/20/2023	April 6, 9, 10, 11, 12, 13, 15, 16, 17, and 19 were excluded due to inclement weather.
3	26.971803	-82.038668	4/6/2023 through 4/20/2023	April 6, 9, 10, 11, 12, 13, 15, 16, 17, and 19 were excluded due to inclement weather.
4	26.972005	-82.032727	4/6/2023 through 4/20/2023	April 6, 9, 10, 11, 12, 13, 15, 16, 17, and 19 were excluded due to inclement weather.
5	26.975794	-82.028924	4/6/2023 through 4/20/2023	April 6, 9, 10, 11, 12, 13, 15, 16, 17, and 19 were excluded due to inclement weather.

Each acoustic survey station was placed in an area deemed to be a potentially suitable flight path for the Florida bonneted bat and where nearby habitat contained mature forested areas and an open water source to maximize chances of detecting foraging bats and potential roosting areas. At each survey station, a Wildlife Acoustics Song Meter SM4BAT Full Spectrum (FS) detector, set to automatically begin collecting data continuously from 30 minutes before sunset to 30 minutes after sunrise, was deployed and programmed to record 15-second file lengths with a two-second trigger window. Each detector was fitted with an omnidirectional Wildlife Acoustics SMM-U2 External Ultrasonic Microphone placed atop an adjustable pole. The microphones were not placed beneath tree canopies and were situated away from echo-producing surfaces including open water.

Data Analysis

The Wildlife Acoustics Song Meter SM4BAT Full Spectrum detector records bat echolocations as Waveform Audio (WAV) files. A single WAV file is made up of a series of pulses that are considered a single bat pass. The WAV files recorded at each survey station were analyzed using Wildlife Acoustics Kaleidoscope Pro version 5.5.0. The auto-identification parameters used by Kaleidoscope Pro were from Bats of North America (Version 5.4.0), region Florida, and the sensitivity setting was set to zero balanced (neutral). The species to be selected in the auto identification classifier included: big brown bat (*Eptesicus fuscus*), Florida bonneted bat (*Eumops floridanus*), eastern red bat (*Lasiurus borealis*), hoary bat (*Lasiurus cinereus*), northern yellow bat (*Lasiurus intermedius*), Seminole bat (*Lasiurus seminolus*), southeastern myotis (*Myotis austroriparius*), northern long-eared bat (*Myotis septentrionalis*), evening bat (*Nycticeius humeralis*), tri-colored bat (*Perimyotis subflavus*), and Brazilian free-tailed bat (*Tadarida brasiliensis*).

The bat acoustic data was retrieved, saved, analyzed, and interpreted by experienced biologists who have taken one or more bat acoustic courses/workshops and who have also previously reviewed Florida bonneted bat echolocations using Kaleidoscope Pro. All echolocations auto identified by Kaleidoscope Pro as being created by a Florida bonneted bat were visually reviewed and manually

verified by experienced biologists. The following parameters were considered in manual verification of Florida bonneted bat echolocations:

- Whether the characteristic frequency of echolocations fall within the documented range for the Florida bonneted bat;
- Whether there are three or more echolocations where the time between echolocations remained consistent across the sequence of echolocations;
- Whether the minimum frequency remained consistent across the sequence of echolocations;
- Whether the slope and bandwidth remained consistent from echolocation to echolocation; and
- Whether there was good signal to noise ratio as evidenced by a crisp, clean oscillogram.

All WAV files with characteristic frequencies below 25 kHz not assigned an auto identification and classified by Kaleidoscope Pro as "No ID" were manually reviewed to determine if they could contain Florida bonneted bat echolocations i.e., pulses.

Results

Weather data was collected from the National Oceanic and Atmospheric Administration (NOAA) National Weather Service (NWS) from 30 minutes prior to sunset to 30 minutes after sunrise and is provided in **Appendix B** and start and end times for the five (5) hour surveys for each day is included in **Table 2** below. The Punta Gorda Airport (KPGD station is approximately 7 miles north of the project site and close to the Peace River. Weather data was used from this station for the dates April 6, 2023, to April 20, 2023.

TABLE 2
SURVEY START AND END TIMES

Date	Sunset	Sunrise	Survey Start	Survey End
4/6/2023 – 4/7/2023	7:48:00 PM	7:14:00 AM	7:18:00 PM	7:44:00 AM
4/7/2023 – 4/8/2023	7:49:00 PM	7:12:00 AM	7:19:00 PM	7:42:00 AM
4/8/2023 – 4/9/2023	7:49:00 PM	7:11:00 AM	7:19:00 PM	7:41:00 AM
4/9/2023 – 4/10/2023	7:50:00 PM	7:10:00 AM	7:20:00 PM	7:40:00 AM
4/10/2023 – 4/11/2023	7:50:00 PM	7:09:00 AM	7:20:00 PM	7:39:00 AM
4/11/2023 – 4/12/2023	7:51:00 PM	7:08:00 AM	7:21:00 PM	7:38:00 AM
4/12/2023 – 4/13/2023	7:51:00 PM	7:07:00 AM	7:21:00 PM	7:37:00 AM
4/13/2023 – 4/14/2023	7:52:00 PM	7:06:00 AM	7:22:00 PM	7:36:00 AM
4/14/2023 – 4/15/2023	7:52:00 PM	7:05:00 AM	7:22:00 PM	7:35:00 AM
4/15/2023 – 4/16/2023	7:53:00 PM	7:04:00 AM	7:23:00 PM	7:34:00 AM
4/16/2023 – 4/17/2023	7:53:00 PM	7:03:00 AM	7:23:00 PM	7:33:00 AM
4/17/2023 – 4/18/2023	7:54:00 PM	7:02:00 AM	7:24:00 PM	7:32:00 AM
4/18/2023 – 4/19/2023	7:54:00 PM	7:01:00 AM	7:24:00 PM	7:31:00 AM
4/19/2023 – 4/20/2023	7:55:00 PM	7:00:00 AM	7:25:00 PM	7:30:00 AM

A summary of the acoustic data collected at each survey station is listed in **Appendix C** and is detailed in the following sections. This summary includes the total number of nights the detectors were deployed and the nights during which the weather conditions met the requirements in the Guidelines. The results of the Florida bonneted bat call analysis were packaged as required and uploaded into the NABat database on June 22, 2023. All WAV files were matched to the metadata files for each station and no errors were reported.

Acoustic Survey Station 1

Station 1 was surveyed from April 6 to April 20, 2023. The nights with acceptable weather conditions were April 7, 8, 13, 14, and 18, 2023. A total of 5,955 WAV files were recorded and, of these, 1,594 WAV files were auto-identified to the species level, 447 WAV files were not assigned an auto-identification, and 3,914 WAV files were classified as noise. Seven (7) WAV files were auto-identified as containing Florida bonneted bat echolocations. These WAV files were manually inspected and none were confirmed as Florida bonneted bat echolocations. None of the calls were recorded within 30 minutes before sunset to 1½ hours following sunset or within 1½ hours before sunrise and no emergence calls were recorded. The following is a summary of the auto-identification data:

- Big brown bat (64 WAV files)
- Eastern red bat (29 WAV files)
- Hoary bat (198 WAV files)
- Northern yellow bat (124 WAV files)
- Seminole bat (19 WAV files)
- Evening bat (19 WAV files)
- Tricolored bat (10 WAV files)
- Brazilian free-tailed bat (1,124 WAV files)
- **Florida bonneted bat (7 WAV files with 0 confirmed WAV files)**

Acoustic Survey Station 2

Station 2 was surveyed from April 6 to April 20, 2023. The nights with acceptable weather conditions were April 7, 8, 13, 14, and 18, 2023. A total of 3,109 WAV files were recorded and, of these, 2,103 WAV files were auto-identified to the species level, 489 WAV files were not assigned an auto-identification, and 517 WAV files were classified as noise. Fifteen (15) WAV files were auto-identified as containing Florida bonneted bat echolocations. These WAV files were manually inspected and none were confirmed as Florida bonneted bat echolocations. None of the calls were recorded within 30 minutes before sunset to 1½ hours following sunset or within 1½ hours before sunrise and no emergence calls were recorded. The following is a summary of the auto-identification data:

- Big brown bat (60 WAV files)
- Eastern red bat (9 WAV files)
- Hoary bat (313 WAV files)

- Northern yellow bat (170 WAV files)
- Seminole bat (21 WAV files)
- Evening bat (9 WAV files)
- Tricolored bat (2 WAV files)
- Brazilian free-tailed bat (1,504 WAV files)
- **Florida bonneted bat (15 WAV files with 0 confirmed WAV files)**

Acoustic Survey Station 3

Station 3 was surveyed from April 6 to April 20, 2023. The nights with acceptable weather conditions were April 7, 8, 13, 14, and 18, 2023. A total of 3,544 WAV files were recorded and, of these, 2,425 WAV files were auto-identified to the species level, 596 WAV files were not assigned an auto-identification, and 523 WAV files were classified as noise. Nineteen (19) WAV files were auto-identified as containing Florida bonneted bat echolocations. These WAV files were manually inspected and none were confirmed as Florida bonneted bat echolocations. None of the calls were recorded within 30 minutes before sunset to 1½ hours following sunset or within 1½ hours before sunrise and no emergence calls were recorded. The following is a summary of the auto-identification data:

- Big brown bat (84 WAV files)
- Eastern red bat (17 WAV files)
- Hoary bat (449 WAV files)
- Northern yellow bat (129 WAV files)
- Seminole bat (13 WAV files)
- Evening bat (6 WAV files)
- Tricolored bat (1 WAV file)
- Brazilian free-tailed bat (1,707 WAV files)
- **Florida bonneted bat (19 WAV files with 0 confirmed WAV files)**

Acoustic Survey Station 4

Station 4 was surveyed from April 6 to April 20, 2023. The nights with acceptable weather conditions were April 7, 8, 13, 14, and 18, 2023. A total of 9,439 WAV files were recorded and, of these, 6,063 WAV files were auto-identified to the species level, 2,141 WAV files were not assigned an auto-identification, and 1,235 WAV files were classified as noise. Ten (10) WAV files were auto-identified as containing Florida bonneted bat echolocations. These WAV files were manually inspected and one (1) was confirmed as Florida bonneted bat echolocations. However, this call was not recorded within 30 minutes before sunset to 1½ hours following sunset or within 1½ hours before sunrise and no emergence calls were recorded. The following is a summary of the auto-identification data:

- Big brown bat (525 WAV files)
- Eastern red bat (232 WAV files)
- Hoary bat (618 WAV files)

- Northern yellow bat (603 WAV files)
- Seminole bat (148 WAV files)
- Evening bat (232 WAV files)
- Tricolored bat (10 WAV files)
- Brazilian free-tailed bat (3,685 WAV files)
- **Florida bonneted bat (10 WAV files with 1 confirmed WAV file)**

Acoustic Survey Station 5

Station 5 was surveyed from April 6 to April 20, 2023. The nights with acceptable weather conditions were April 7, 8, 13, 14, and 18, 2023. A total of 9,231 WAV files were recorded and, of these, 6,930 WAV files were auto-identified to the species level, 1,611 WAV files were not assigned an auto-identification, and 690 WAV files were classified as noise. Six (6) WAV files were auto-identified as containing Florida bonneted bat echolocations. These WAV files were manually inspected and none were confirmed as Florida bonneted bat echolocations. None of the calls were recorded within 30 minutes before sunset to 1½ hours following sunset or within 1½ hours before sunrise and no emergence calls were recorded. The following is a summary of the auto-identification data:

- Big brown bat (174 WAV files)
- Eastern red bat (37 WAV files)
- Hoary bat (718 WAV files)
- Northern yellow bat (566 WAV files)
- Seminole bat (28 WAV files)
- Southeastern myotis (1 WAV file)
- Evening bat (19 WAV files)
- Tricolored bat (7 WAV files)
- Brazilian free-tailed bat (5,374 WAV files)
- **Florida bonneted bat (6 WAV files with 0 confirmed WAV files)**

Conclusion

A total of 31,278 WAV files were recorded at the five (5) survey stations during Florida bonneted bat acoustic surveys for this proposed Harborview Road widening project. Of these, 57 WAV files were auto identified by Kaleidoscope Pro as containing Florida bonneted bat echolocations. Biologists manually verified each of the auto identified Florida bonneted bat WAV files and all files with frequencies between 8 kHz and 25 kHz classified by Kaleidoscope Pro as "No ID". As a result, it was found that one (1) of the files contain echolocations from the Florida bonneted bat. As described above, Station 4 had one (1) confirmed Florida bonneted bat echolocations. However, this call was not recorded within 30 minutes before sunset to 1½ hours following sunset or within 1½ hours before sunrise and no emergence calls were recorded. Many of the files were identified as noise (potentially from vehicular traffic, insects, or birds). **Figure 3** is an example of a call that was misclassified as Florida bonneted bat.

The Florida Bonneted Bat Consultation Key, included in the USFWS 2019 Florida Bonneted Bat Consultation Guidelines, was used to identify the effect determination for the proposed I-75 widening project. The progression through the key was 1a → 2a → 3b → 6a→7b→10b→12b, resulting in an effect determination of "May Affect, Not Likely to Adversely Affect – Programmatic (MANLAA-P)" for the Florida bonneted bat. This programmatic concurrence does not require further consultation with USFWS; however, Best Management Practices (BMPs) should be incorporated. The BMPs required to reach a MANLAA determination are based on couplet 12b. The requirements for couplet 12b include BMPs number 1 and any 3 BMPs out of BMPs 3 through 13.

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FIGURES

Project Footprint

Sarasota
N River Rd
North Port
E Price Blvd
Warm Mineral Springs
Big Slough
Veterans Blvd
Peachland Blvd
Harbor Blvd
Beacon Dr
Port Charlotte
Myakka State Forest
Winchester Blvd
Gillot Blvd
Charlotte Harbor
Harbour Heights
Platt
Fort Ogden
Southfort
Cleveland
SR-93
Bermont Rd
Bermont
Punta Gorda
Taylor Rd
Grove City
Rotonda West
Gasparilla Rd
Placida
Charlotte Harbor Preserve State Park
South Punta Gorda Heights
Charlotte
Tuckers Corner
Orlando
Tampa
Lakeland
St Petersburg
Project Location
Cape Coral
75
45
769
776
764
768
765
31

DRAFT

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

Figure 1 - Project Location

FPID #: 434965-2-52-01
Harborview Road Design from Melbourne Street to I-75
Florida Bonneted Bat Acoustic Survey Technical Report
Charlotte County, Florida

0 700 1,400 Feet

Data Source: ESA, ESRI

N

Project Footprint
Acoustic Survey Station

Old Landfill Rd
Park Place Dr N
Wickens Ave
Branch Ave
Cedarton Ave
Patera Ave
Corinne Ave
Buckner Ave
Elmira Blvd
Gemstone Ave
Westchester Blvd
Swanee Rd
Dunkirk St
Tiffany St
Loveland Blvd
Oakview Dr
Osage St
Harbor View
Date St
Coconut St
Guava St
Sapodilla St
Citron St
Harborview Rd
SR 93
I-75
776
Cortez Dr
Mills St
Melbourne St
Harper Ave
1
2
3
4
5

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

Figure 2 - Florida Bonneted Bat Acoustic Survey Station Locations

FPID #: 434965-2-52-01
Harborview Road Design from Melbourne Street to I-75
Florida Bonneted Bat Acoustic Survey Technical Report
Charlotte County, Florida

Feet
0 700 1,400

Data Source: ESA, ESRI
FDOT 2020 Imagery

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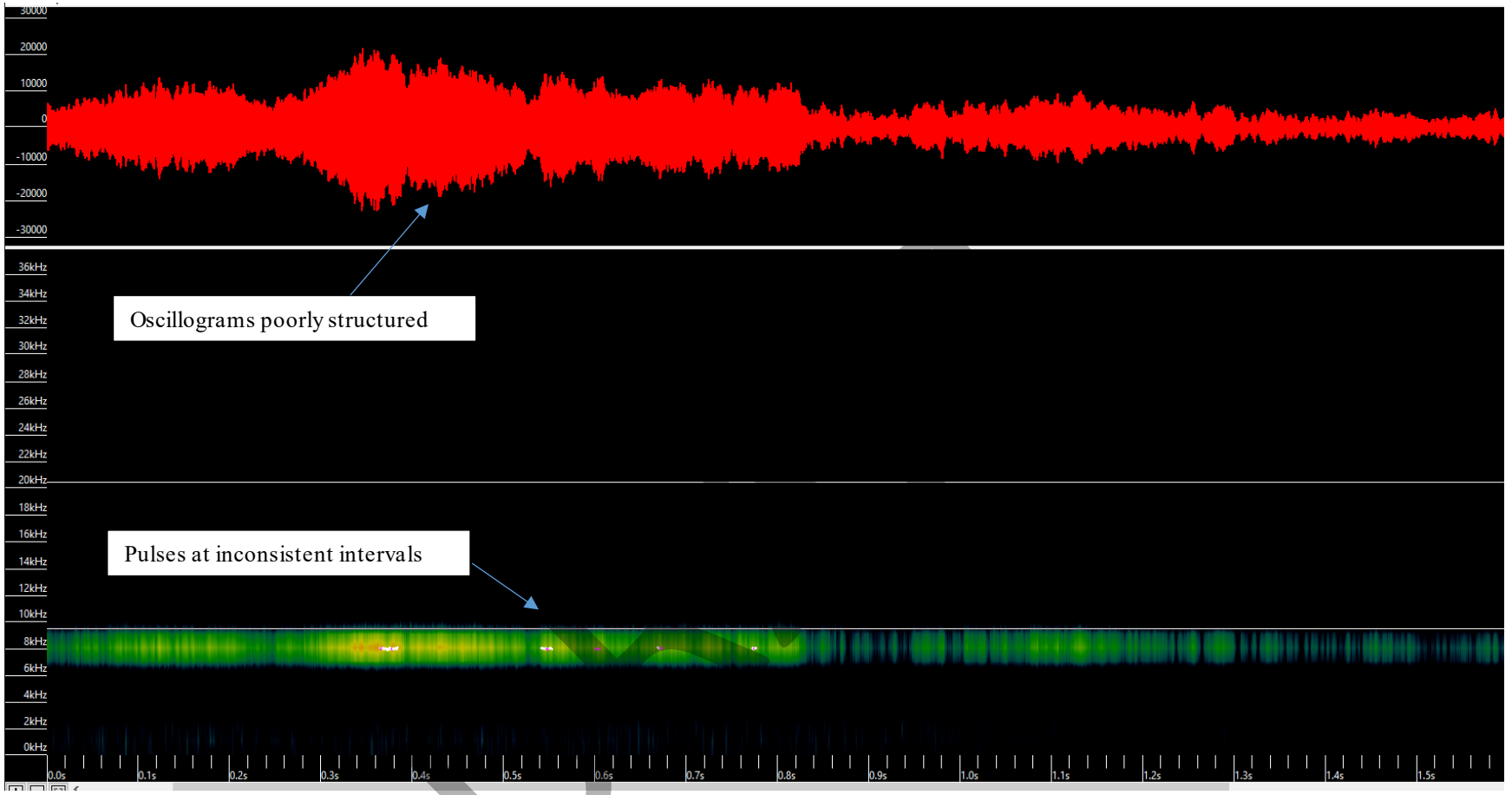


Figure 3. Examples of Calls Misclassified as Florida Bonneted Bat

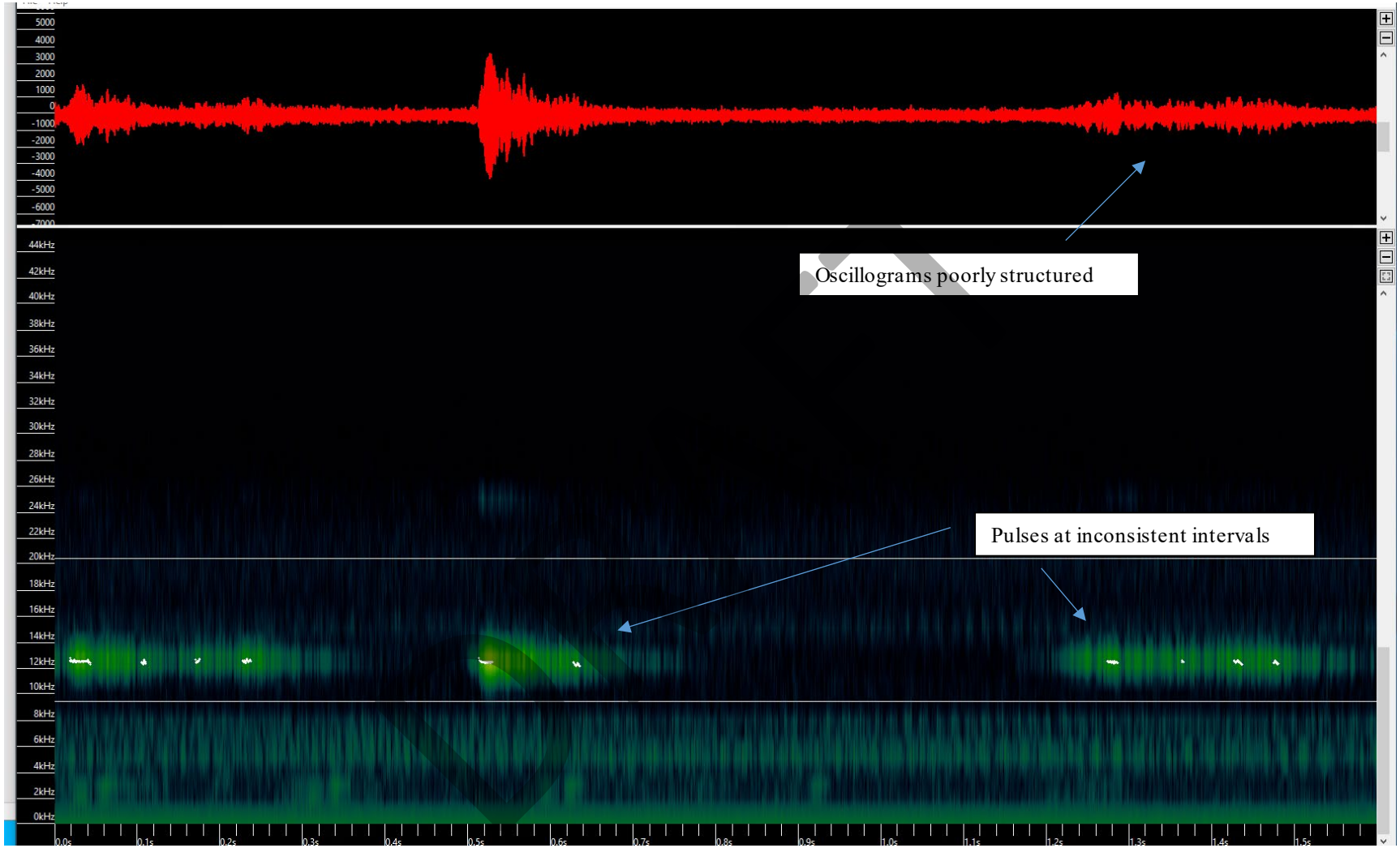


Figure 3. Examples of Calls Misclassified as Florida Bonneted Bat

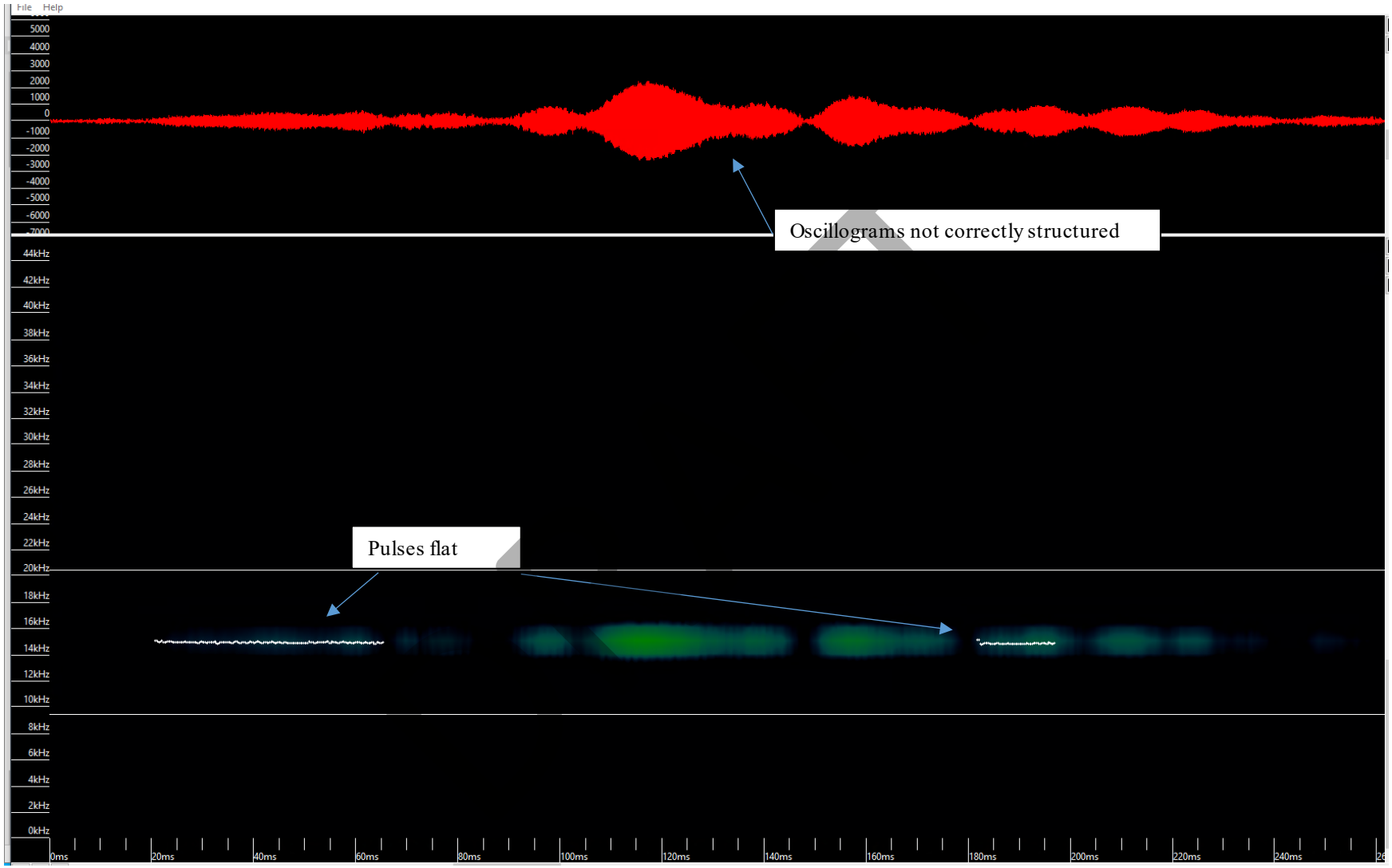


Figure 3. Examples of Calls Misclassified as Florida Bonneted Bat

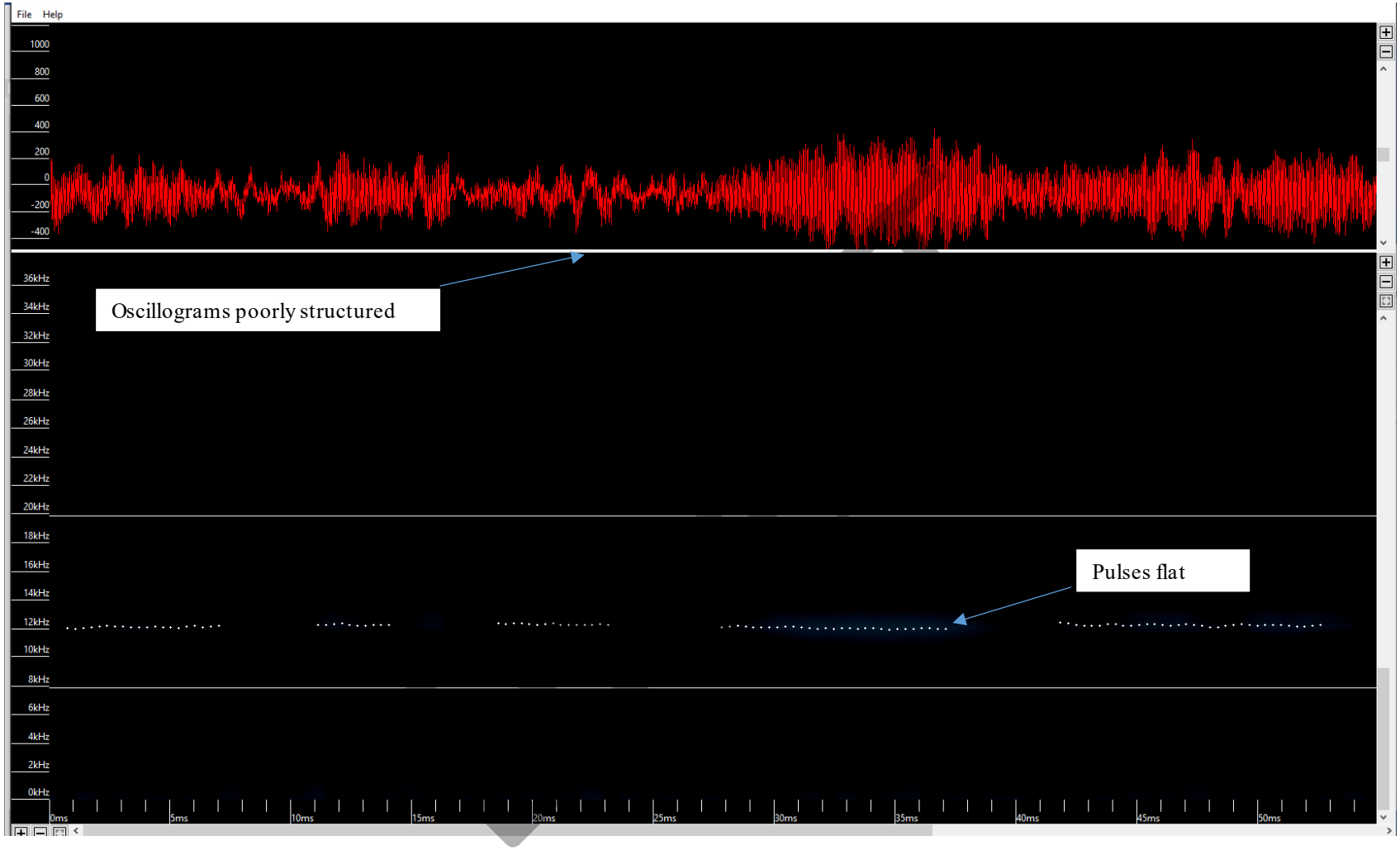


Figure 3. Examples of Calls Misclassified as Florida Bonneted Bat

Appendix A

REPRESENTATIVE PHOTOGRAPHS OF SURVEY STATIONS

Survey Station No. 1

Survey Station No. 2

Survey Station No. 3

Survey Station No. 4

Survey Station No. 5

Harborview Road Design from Melbourne Street to I-75 FPID No. 434965-2-52-01	**Appendix A** Representative Photographs of Acoustic Survey Stations

Appendix B

NOAA National Weather Service Data

Survey Day	Date	Time	Temperature (°F)	Dew Point (°F)	Humidity (%)	Wind Direction	Wind Speed (mph)	Wind Gust (mph)	Pressure (in.)	Precipitation (in.)	Conditions
1	4/6/2023 – 4/7/2023	6:53 PM	86 °F	64 °F	48 %	W	10 mph	0 mph	30.08 in	0.0 in	Cloudy
		7:53 PM	81 °F	68 °F	65 %	W	6 mph	0 mph	30.09 in	0.0 in	Mostly Cloudy
		8:53 PM	82 °F	66 °F	58 %	WSW	5 mph	0 mph	30.11 in	0.0 in	Mostly Cloudy
		9:53 PM	80 °F	68 °F	67 %	CALM	0 mph	0 mph	30.13 in	0.0 in	Cloudy
		10:53 PM	74 °F	71 °F	91 %	S	17 mph	0 mph	30.15 in	0.0 in	Light Rain
		11:53 PM	74 °F	71 °F	91 %	S	3 mph	0 mph	30.15 in	0.0 in	Cloudy
		12:53 AM	72 °F	70 °F	93 %	CALM	0 mph	0 mph	30.15 in	0.0 in	Fair
		2:53 AM	69 °F	68 °F	96 %	E	5 mph	0 mph	30.11 in	0.0 in	Fair
		3:53 AM	68 °F	67 °F	96 %	E	5 mph	0 mph	30.09 in	0.0 in	Fair
		4:53 AM	68 °F	67 °F	96 %	E	5 mph	0 mph	30.08 in	0.0 in	Cloudy
		6:53 AM	66 °F	65 °F	96 %	NE	3 mph	0 mph	30.10 in	0.0 in	Mostly Cloudy
		7:53 AM	68 °F	67 °F	96 %	ENE	6 mph	0 mph	30.12 in	0.0 in	Partly Cloudy
2	4/7/2023 – 4/8/2023	6:53 PM	84 °F	65 °F	53 %	W	8 mph	0 mph	30.01 in	0.0 in	Cloudy
		9:53 PM	75 °F	67 °F	76 %	ENE	8 mph	0 mph	30.06 in	0.0 in	Mostly Cloudy
		10:53 PM	75 °F	68 °F	79 %	SE	3 mph	0 mph	30.07 in	0.0 in	Cloudy
		11:53 PM	76 °F	63 °F	64 %	SE	7 mph	0 mph	30.06 in	0.0 in	Mostly Cloudy
		12:53 AM	73 °F	59 °F	61 %	ESE	7 mph	0 mph	30.06 in	0.0 in	Fair
		1:53 AM	70 °F	60 °F	71 %	SE	7 mph	0 mph	30.05 in	0.0 in	Fair
		2:53 AM	69 °F	61 °F	75 %	ESE	7 mph	0 mph	30.04 in	0.0 in	Fair
		3:53 AM	67 °F	61 °F	81 %	SE	6 mph	0 mph	30.04 in	0.0 in	Fair
		4:53 AM	64 °F	60 °F	87 %	ESE	3 mph	0 mph	30.03 in	0.0 in	Fair
		5:53 AM	65 °F	61 °F	87 %	NNE	5 mph	0 mph	30.04 in	0.0 in	Fair
		6:53 AM	64 °F	61 °F	90 %	CALM	0 mph	0 mph	30.05 in	0.0 in	Fair
		7:53 AM	65 °F	62 °F	90 %	E	5 mph	0 mph	30.06 in	0.0 in	Fair
3	4/8/2023 – 4/9/2023	6:53 PM	85 °F	59 °F	41 %	W	9 mph	0 mph	29.95 in	0.0 in	Fair
		7:53 PM	81 °F	59 °F	47 %	W	8 mph	0 mph	29.96 in	0.0 in	Fair
		8:53 PM	79 °F	62 °F	56 %	W	9 mph	0 mph	29.97 in	0.0 in	Fair
		9:53 PM	77 °F	66 °F	69 %	WNW	8 mph	0 mph	29.99 in	0.0 in	Mostly Cloudy
		10:53 PM	76 °F	68 °F	76 %	NW	7 mph	0 mph	30.00 in	0.0 in	Fair
		11:53 PM	76 °F	69 °F	79 %	NNW	9 mph	0 mph	30.01 in	0.0 in	Mostly Cloudy
		12:53 AM	74 °F	69 °F	85 %	NW	5 mph	0 mph	29.99 in	0.0 in	Fair
		1:53 AM	75 °F	70 °F	84 %	WNW	6 mph	0 mph	29.98 in	0.0 in	Fair
		2:29 AM	75 °F	70 °F	84 %	NW	6 mph	0 mph	29.97 in	0.0 in	Mostly Cloudy
		2:53 AM	74 °F	70 °F	87 %	WNW	5 mph	0 mph	29.96 in	0.0 in	Fair
		3:53 AM	74 °F	70 °F	87 %	NW	5 mph	0 mph	29.96 in	0.0 in	Fair
		4:53 AM	73 °F	70 °F	90 %	CALM	0 mph	0 mph	29.94 in	0.0 in	Fair
		5:53 AM	73 °F	70 °F	90 %	NW	3 mph	0 mph	29.95 in	0.0 in	Fair
		6:53 AM	72 °F	70 °F	93 %	CALM	0 mph	0 mph	29.96 in	0.0 in	Fair
		7:53 AM	72 °F	70 °F	93 %	CALM	0 mph	0 mph	29.98 in	0.0 in	Mostly Cloudy
4	4/9/2023 - 4/10/2023	6:53 PM	78 °F	67 °F	68 %	E	8 mph	0 mph	29.96 in	0.0 in	Cloudy
		7:49 PM	75 °F	68 °F	78 %	E	6 mph	0 mph	29.98 in	0.0 in	Cloudy
		7:53 PM	75 °F	67 °F	76 %	E	8 mph	0 mph	29.98 in	0.0 in	Cloudy
		8:53 PM	73 °F	63 °F	71 %	NE	13 mph	0 mph	29.99 in	0.0 in	Cloudy
		9:53 PM	71 °F	63 °F	75 %	NE	13 mph	0 mph	30.03 in	0.0 in	Fair
		10:53 PM	69 °F	63 °F	81 %	NE	10 mph	0 mph	30.04 in	0.0 in	Fair
		11:53 PM	67 °F	63 °F	87 %	NNE	6 mph	0 mph	30.05 in	0.0 in	Fair
		12:53 AM	67 °F	63 °F	87 %	NNE	10 mph	0 mph	30.04 in	0.0 in	Fair
		1:28 AM	67 °F	63 °F	87 %	NNE	8 mph	0 mph	30.03 in	0.0 in	Mostly Cloudy
		1:53 AM	67 °F	64 °F	90 %	NNE	9 mph	0 mph	30.02 in	0.0 in	Cloudy
		2:53 AM	67 °F	64 °F	90 %	NNE	10 mph	0 mph	30.01 in	0.0 in	Mostly Cloudy
		3:11 AM	67 °F	64 °F	90 %	N	9 mph	0 mph	30.01 in	0.0 in	Partly Cloudy
		3:53 AM	67 °F	64 °F	90 %	NNE	10 mph	0 mph	30.00 in	0.0 in	Mostly Cloudy
		4:53 AM	68 °F	65 °F	90 %	NNE	9 mph	0 mph	30.00 in	0.0 in	Cloudy
		5:53 AM	68 °F	65 °F	90 %	NNE	9 mph	0 mph	30.01 in	0.0 in	Cloudy
		6:53 AM	67 °F	65 °F	93 %	NNE	8 mph	0 mph	30.02 in	0.0 in	Partly Cloudy
		7:53 AM	68 °F	65 °F	90 %	NE	7 mph	0 mph	30.03 in	0.0 in	Fair
5	4/10/2023 – 4/11/2023	6:53 PM	74 °F	63 °F	68 %	ENE	21 mph	30 mph	30.03 in	0.0 in	Fair / Windy
		7:53 PM	72 °F	63 °F	73 %	E	14 mph	0 mph	30.04 in	0.0 in	Mostly Cloudy
		8:53 PM	72 °F	60 °F	66 %	E	14 mph	25 mph	30.05 in	0.0 in	Cloudy
		9:53 PM	71 °F	60 °F	68 %	E	13 mph	0 mph	30.08 in	0.0 in	Mostly Cloudy
		10:53 PM	68 °F	63 °F	84 %	E	7 mph	0 mph	30.10 in	0.0 in	Fair
		11:53 PM	67 °F	61 °F	81 %	NE	8 mph	0 mph	30.08 in	0.0 in	Fair
		12:53 AM	67 °F	60 °F	79 %	NE	10 mph	0 mph	30.08 in	0.0 in	Fair
		1:53 AM	66 °F	60 °F	81 %	NE	13 mph	0 mph	30.05 in	0.0 in	Fair
		2:53 AM	65 °F	59 °F	81 %	NE	12 mph	0 mph	30.05 in	0.0 in	Fair
		3:53 AM	65 °F	59 °F	81 %	NE	10 mph	0 mph	30.04 in	0.0 in	Fair
		4:53 AM	64 °F	58 °F	80 %	NE	13 mph	0 mph	30.03 in	0.0 in	Fair
		5:53 AM	63 °F	58 °F	84 %	NE	12 mph	0 mph	30.03 in	0.0 in	Fair
		6:53 AM	63 °F	58 °F	84 %	NE	13 mph	0 mph	30.04 in	0.0 in	Fair
		7:53 AM	66 °F	59 °F	78 %	NE	13 mph	0 mph	30.05 in	0.0 in	Fair
6	4/11/2023 – 4/12/2023	6:53 PM	75 °F	59 °F	57 %	E	20 mph	32 mph	30.00 in	0.0 in	Fair
		7:53 PM	73 °F	58 °F	59 %	E	18 mph	29 mph	30.02 in	0.0 in	Fair
		8:53 PM	72 °F	57 °F	59 %	ENE	18 mph	35 mph	30.03 in	0.0 in	Fair
		9:53 PM	71 °F	58 °F	63 %	ENE	18 mph	25 mph	30.05 in	0.0 in	Mostly Cloudy
		10:53 PM	70 °F	58 °F	65 %	ENE	15 mph	0 mph	30.05 in	0.0 in	Fair
		11:53 PM	70 °F	59 °F	68 %	ENE	13 mph	0 mph	30.05 in	0.0 in	Partly Cloudy
		12:53 AM	69 °F	59 °F	70 %	ENE	14 mph	0 mph	30.04 in	0.0 in	Fair
		1:53 AM	68 °F	60 °F	76 %	NE	10 mph	0 mph	30.02 in	0.0 in	Partly Cloudy
		2:53 AM	68 °F	60 °F	76 %	ENE	12 mph	0 mph	30.00 in	0.0 in	Cloudy
		3:53 AM	69 °F	60 °F	73 %	ENE	10 mph	0 mph	29.98 in	0.0 in	Cloudy
		4:53 AM	69 °F	59 °F	70 %	ENE	14 mph	0 mph	29.96 in	0.0 in	Cloudy
		5:53 AM	70 °F	59 °F	68 %	ENE	15 mph	0 mph	29.96 in	0.0 in	Cloudy
		6:53 AM	69 °F	60 °F	73 %	E	17 mph	0 mph	29.97 in	0.0 in	Mostly Cloudy
		8:53 AM	67 °F	65 °F	93 %	ENE	17 mph	0 mph	29.99 in	0.0 in	Rain

7	4/12/2023 – 4/13/2023	6:53 PM	73 °F	67 °F	81 %	E	14 mph	24 mph	29.90 in	0.0 in	Cloudy
		7:53 PM	72 °F	67 °F	84 %	E	14 mph	22 mph	29.90 in	0.0 in	Cloudy
		9:09 PM	72 °F	68 °F	87 %	ESE	14 mph	24 mph	29.90 in	0.0 in	Cloudy
		9:53 PM	72 °F	68 °F	87 %	E	9 mph	0 mph	29.90 in	0.0 in	Cloudy
		10:53 PM	72 °F	68 °F	87 %	ESE	13 mph	0 mph	29.92 in	0.0 in	Cloudy
		11:34 PM	72 °F	68 °F	87 %	SE	13 mph	20 mph	29.92 in	0.0 in	Cloudy
		11:53 PM	72 °F	68 °F	87 %	SE	14 mph	0 mph	29.92 in	0.0 in	Cloudy
		12:33 AM	71 °F	68 °F	90 %	ESE	9 mph	0 mph	29.91 in	0.0 in	Partly Cloudy
		12:40 AM	71 °F	68 °F	90 %	SE	9 mph	0 mph	29.92 in	0.0 in	Mostly Cloudy
		12:53 AM	71 °F	68 °F	90 %	ESE	9 mph	0 mph	29.91 in	0.0 in	Mostly Cloudy
		1:00 AM	71 °F	68 °F	90 %	ESE	8 mph	0 mph	29.91 in	0.0 in	Mostly Cloudy
		1:53 AM	71 °F	68 °F	90 %	SE	12 mph	0 mph	29.89 in	0.0 in	Cloudy
		2:34 AM	71 °F	68 °F	90 %	SE	12 mph	0 mph	29.88 in	0.0 in	Cloudy
		2:53 AM	70 °F	68 °F	93 %	SE	8 mph	0 mph	29.87 in	0.0 in	Cloudy
		3:53 AM	69 °F	67 °F	93 %	SE	6 mph	0 mph	29.86 in	0.0 in	Fair
		4:23 AM	69 °F	67 °F	93 %	SE	5 mph	0 mph	29.86 in	0.0 in	Mostly Cloudy
		4:33 AM	68 °F	67 °F	96 %	ESE	5 mph	0 mph	29.86 in	0.0 in	Mostly Cloudy
		4:53 AM	68 °F	67 °F	96 %	ESE	6 mph	0 mph	29.85 in	0.0 in	Mostly Cloudy
		5:26 AM	68 °F	67 °F	96 %	ESE	5 mph	0 mph	29.86 in	0.0 in	Cloudy
		5:51 AM	68 °F	66 °F	94 %	SE	5 mph	0 mph	29.86 in	0.0 in	Fog
		5:53 AM	68 °F	67 °F	96 %	SE	5 mph	0 mph	29.86 in	0.0 in	Fog
		6:36 AM	68 °F	67 °F	96 %	SE	6 mph	0 mph	29.87 in	0.0 in	Fog
		6:53 AM	68 °F	67 °F	96 %	SE	5 mph	0 mph	29.87 in	0.0 in	Fair
		7:53 AM	68 °F	67 °F	96 %	SE	5 mph	0 mph	29.89 in	0.0 in	Fair
8*	4/13/2023 – 4/14/2023	6:53 PM	80 °F	70 °F	71 %	SW	13 mph	0 mph	29.87 in	0.0 in	Partly Cloudy
		7:53 PM	78 °F	71 °F	79 %	WSW	9 mph	0 mph	29.88 in	0.0 in	Fair
		8:53 PM	77 °F	71 °F	82 %	SW	5 mph	0 mph	29.90 in	0.0 in	Fair
		9:53 PM	76 °F	72 °F	87 %	SW	5 mph	0 mph	29.92 in	0.0 in	Fair
		10:53 PM	73 °F	71 °F	93 %	S	3 mph	0 mph	29.93 in	0.0 in	Fair
		11:53 PM	72 °F	70 °F	93 %	S	3 mph	0 mph	29.93 in	0.0 in	Fair
		1:53 AM	73 °F	70 °F	90 %	S	3 mph	0 mph	29.93 in	0.0 in	Cloudy
		2:53 AM	72 °F	70 °F	93 %	CALM	0 mph	0 mph	29.92 in	0.0 in	Partly Cloudy
		3:53 AM	70 °F	69 °F	97 %	SSE	6 mph	0 mph	29.90 in	0.0 in	Cloudy
		4:53 AM	70 °F	68 °F	93 %	SSE	3 mph	0 mph	29.91 in	0.0 in	Fair
		5:53 AM	70 °F	69 °F	97 %	SSE	3 mph	0 mph	29.92 in	0.0 in	Partly Cloudy
		6:42 AM	69 °F	68 °F	96 %	SE	3 mph	0 mph	29.93 in	0.0 in	Fair
		6:51 AM	68 °F	68 °F	100 %	ESE	3 mph	0 mph	29.93 in	0.0 in	Fair
		6:53 AM	68 °F	68 °F	100 %	SE	3 mph	0 mph	29.93 in	0.0 in	Fair
		7:00 AM	69 °F	68 °F	96 %	SE	3 mph	0 mph	29.93 in	0.0 in	Fair
		7:53 AM	71 °F	70 °F	96 %	SSE	3 mph	0 mph	29.94 in	0.0 in	Fair
9	4/14/2023 – 4/15/2023	6:53 PM	82 °F	69 °F	65 %	W	9 mph	0 mph	29.92 in	0.0 in	Fair
		7:53 PM	79 °F	70 °F	74 %	W	7 mph	0 mph	29.92 in	0.0 in	Fair
		8:53 PM	78 °F	73 °F	84 %	W	5 mph	0 mph	29.94 in	0.0 in	Fair
		9:53 PM	77 °F	73 °F	88 %	W	6 mph	0 mph	29.96 in	0.0 in	Fair
		10:53 PM	76 °F	73 °F	91 %	CALM	0 mph	0 mph	29.98 in	0.0 in	Fair
		11:53 PM	74 °F	72 °F	93 %	CALM	0 mph	0 mph	29.97 in	0.0 in	Fair
		1:17 AM	72 °F	71 °F	97 %	CALM	0 mph	0 mph	29.97 in	0.0 in	Fog
		1:20 AM	72 °F	71 °F	97 %	CALM	0 mph	0 mph	29.97 in	0.0 in	Fog
		1:40 AM	71 °F	70 °F	96 %	CALM	0 mph	0 mph	29.96 in	0.0 in	Fog
		1:53 AM	71 °F	70 °F	96 %	CALM	0 mph	0 mph	29.96 in	0.0 in	Fog
		2:31 AM	70 °F	69 °F	97 %	ESE	5 mph	0 mph	29.95 in	0.0 in	Fog
		2:40 AM	71 °F	70 °F	96 %	ESE	5 mph	0 mph	29.95 in	0.0 in	Fog
		2:53 AM	71 °F	71 °F	100 %	ESE	5 mph	0 mph	29.95 in	0.0 in	Fog
		3:53 AM	70 °F	70 °F	100 %	CALM	0 mph	0 mph	29.95 in	0.0 in	Fog
		4:20 AM	70 °F	70 °F	100 %	CALM	0 mph	0 mph	29.95 in	0.0 in	Fog
		4:29 AM	70 °F	70 °F	100 %	ESE	3 mph	0 mph	29.95 in	0.0 in	Fog
		4:53 AM	70 °F	69 °F	97 %	CALM	0 mph	0 mph	29.96 in	0.0 in	Fog
		5:34 AM	70 °F	70 °F	100 %	ESE	3 mph	0 mph	29.97 in	0.0 in	Fog
		5:44 AM	70 °F	70 °F	100 %	SE	5 mph	0 mph	29.97 in	0.0 in	Fog
		5:53 AM	71 °F	70 °F	96 %	SSE	3 mph	0 mph	29.97 in	0.0 in	Fog
		6:14 AM	71 °F	71 °F	100 %	SE	3 mph	0 mph	29.98 in	0.0 in	Fog
		6:53 AM	71 °F	71 °F	100 %	CALM	0 mph	0 mph	29.99 in	0.0 in	Fog
		7:24 AM	71 °F	71 °F	100 %	SE	5 mph	0 mph	30.01 in	0.0 in	Fog
		7:39 AM	72 °F	71 °F	97 %	SE	3 mph	0 mph	30.01 in	0.0 in	Fog
10	4/15/2023 – 4/16/2023	6:53 PM	84 °F	70 °F	63 %	WSW	14 mph	0 mph	29.94 in	0.0 in	Fair
		8:53 PM	80 °F	73 °F	79 %	W	8 mph	0 mph	29.98 in	0.0 in	Fair
		9:53 PM	79 °F	73 °F	82 %	WNW	10 mph	0 mph	30.04 in	0.0 in	Mostly Cloudy
		10:53 PM	78 °F	74 °F	87 %	WNW	8 mph	0 mph	30.05 in	0.0 in	Mostly Cloudy
		11:53 PM	77 °F	73 °F	88 %	NNE	3 mph	0 mph	30.05 in	0.0 in	Fair
		12:53 AM	75 °F	72 °F	90 %	E	6 mph	0 mph	30.05 in	0.0 in	Mostly Cloudy
		1:07 AM	75 °F	73 °F	94 %	ENE	3 mph	0 mph	30.06 in	0.0 in	Mostly Cloudy
		1:17 AM	75 °F	73 °F	94 %	E	6 mph	0 mph	30.06 in	0.0 in	Mostly Cloudy
		1:53 AM	75 °F	73 °F	94 %	CALM	0 mph	0 mph	30.05 in	0.0 in	Cloudy
		2:08 AM	75 °F	72 °F	90 %	CALM	0 mph	0 mph	30.05 in	0.0 in	Mostly Cloudy
		2:26 AM	75 °F	72 °F	90 %	NNE	3 mph	0 mph	30.03 in	0.0 in	Mostly Cloudy
		2:53 AM	74 °F	72 °F	93 %	CALM	0 mph	0 mph	30.02 in	0.0 in	Mostly Cloudy
		3:53 AM	74 °F	72 °F	93 %	CALM	0 mph	0 mph	30.00 in	0.0 in	Fair
		4:53 AM	72 °F	70 °F	93 %	CALM	0 mph	0 mph	29.99 in	0.0 in	Fair
		5:53 AM	72 °F	71 °F	97 %	SE	6 mph	0 mph	29.97 in	0.0 in	Fair
		6:53 AM	71 °F	70 °F	96 %	SE	7 mph	0 mph	29.99 in	0.0 in	Fair
		7:53 AM	73 °F	70 °F	90 %	SSE	6 mph	0 mph	30.00 in	0.0 in	Fair

11	4/16/2023 – 4/17/2023	5:53 PM	85 °F	72 °F	65 %	WSW	16 mph	0 mph	29.92 in	0.0 in	Fair
		7:29 PM	81 °F	73 °F	77 %	W	10 mph	0 mph	29.93 in	0.0 in	Mostly Cloudy
		7:53 PM	81 °F	73 °F	77 %	W	7 mph	0 mph	29.94 in	0.0 in	Mostly Cloudy
		8:53 PM	78 °F	74 °F	87 %	CALM	0 mph	0 mph	29.93 in	0.0 in	Partly Cloudy
		9:49 PM	77 °F	75 °F	94 %	NE	3 mph	0 mph	29.94 in	0.0 in	Mostly Cloudy
		9:53 PM	77 °F	75 °F	94 %	ENE	3 mph	0 mph	29.94 in	0.0 in	Mostly Cloudy
		10:39 PM	74 °F	71 °F	91 %	E	5 mph	0 mph	29.93 in	0.0 in	Thunder in the Vicinity
		10:53 PM	73 °F	70 °F	90 %	E	14 mph	21 mph	29.93 in	0.0 in	Thunder in the Vicinity
		11:01 PM	72 °F	71 °F	97 %	E	16 mph	0 mph	29.94 in	0.0 in	Thunder
		11:11 PM	71 °F	69 °F	93 %	ESE	12 mph	30 mph	29.96 in	0.0 in	T-Storm
		11:17 PM	71 °F	69 °F	93 %	E	17 mph	30 mph	30.00 in	0.2 in	Heavy T-Storm
		11:27 PM	69 °F	67 °F	93 %	SSE	17 mph	29 mph	29.99 in	0.9 in	Heavy T-Storm
		11:31 PM	69 °F	67 °F	93 %	SSE	18 mph	0 mph	29.97 in	1.1 in	Heavy T-Storm
		11:46 PM	68 °F	67 °F	96 %	ESE	6 mph	0 mph	29.96 in	1.3 in	T-Storm
		11:53 PM	69 °F	68 °F	96 %	E	10 mph	0 mph	29.95 in	1.3 in	Light Rain with Thunder
		11:59 PM	68 °F	67 °F	96 %	E	9 mph	0 mph	29.94 in	0.0 in	Thunder in the Vicinity
		12:11 AM	69 °F	68 °F	96 %	E	9 mph	0 mph	29.94 in	0.0 in	Mostly Cloudy
		1:09 AM	71 °F	69 °F	93 %	ESE	9 mph	0 mph	29.95 in	0.0 in	Cloudy
		1:53 AM	70 °F	68 °F	93 %	E	10 mph	0 mph	29.90 in	0.0 in	Fair
		2:53 AM	70 °F	68 °F	93 %	E	6 mph	0 mph	29.87 in	0.0 in	Fair
		3:53 AM	70 °F	68 °F	93 %	ESE	7 mph	0 mph	29.84 in	0.0 in	Cloudy
		4:53 AM	70 °F	68 °F	93 %	S	6 mph	0 mph	29.85 in	0.0 in	Mostly Cloudy
		5:53 AM	71 °F	69 °F	93 %	S	5 mph	0 mph	29.86 in	0.0 in	Rain
		6:53 AM	70 °F	68 °F	93 %	SSW	7 mph	0 mph	29.87 in	0.1 in	Light Rain
		7:24 AM	70 °F	68 °F	93 %	SSW	8 mph	0 mph	29.88 in	0.1 in	Heavy Rain
		7:33 AM	70 °F	68 °F	93 %	SSW	6 mph	0 mph	29.89 in	0.2 in	Rain
12	4/17/2023 – 4/18/2023	6:53 PM	80 °F	61 °F	52 %	N	14 mph	0 mph	29.85 in	0.0 in	Fair
		7:53 PM	74 °F	58 °F	57 %	NW	13 mph	0 mph	29.87 in	0.0 in	Fair
		8:53 PM	71 °F	57 °F	61 %	NW	13 mph	0 mph	29.89 in	0.0 in	Fair
		9:53 PM	68 °F	53 °F	59 %	NNW	13 mph	0 mph	29.92 in	0.0 in	Fair
		10:53 PM	66 °F	51 °F	59 %	NNW	9 mph	0 mph	29.94 in	0.0 in	Fair
		11:53 PM	64 °F	51 °F	63 %	N	7 mph	0 mph	29.95 in	0.0 in	Fair
		1:53 AM	62 °F	53 °F	72 %	NNE	3 mph	0 mph	29.94 in	0.0 in	Fair
		2:53 AM	63 °F	52 °F	67 %	N	7 mph	0 mph	29.93 in	0.0 in	Fair
		3:53 AM	61 °F	53 °F	75 %	N	7 mph	0 mph	29.92 in	0.0 in	Fair
		4:53 AM	60 °F	52 °F	75 %	N	8 mph	0 mph	29.93 in	0.0 in	Fair
		5:53 AM	58 °F	54 °F	87 %	NNE	5 mph	0 mph	29.94 in	0.0 in	Fair
		6:53 AM	56 °F	54 °F	93 %	NNE	5 mph	0 mph	29.96 in	0.0 in	Fair
		7:53 AM	61 °F	57 °F	87 %	NNE	8 mph	0 mph	29.98 in	0.0 in	Fair
13	4/18/2023 – 4/19/2023	6:53 PM	81 °F	51 °F	35 %	ENE	9 mph	0 mph	29.94 in	0.0 in	Fair
		7:53 PM	73 °F	55 °F	53 %	NE	7 mph	0 mph	29.95 in	0.0 in	Fair
		8:53 PM	70 °F	54 °F	57 %	E	8 mph	0 mph	29.98 in	0.0 in	Fair
		9:53 PM	70 °F	56 °F	61 %	E	8 mph	0 mph	30.00 in	0.0 in	Fair
		10:53 PM	68 °F	56 °F	65 %	E	9 mph	0 mph	30.02 in	0.0 in	Fair
		11:53 PM	66 °F	56 °F	70 %	ENE	8 mph	0 mph	30.01 in	0.0 in	Fair
		12:53 AM	64 °F	57 °F	78 %	ENE	9 mph	0 mph	30.01 in	0.0 in	Fair
		1:53 AM	64 °F	57 °F	78 %	E	7 mph	0 mph	30.01 in	0.0 in	Fair
		3:53 AM	62 °F	57 °F	84 %	E	6 mph	0 mph	29.99 in	0.0 in	Fair
		4:53 AM	60 °F	57 °F	90 %	ENE	6 mph	0 mph	30.00 in	0.0 in	Fair
		5:53 AM	61 °F	58 °F	90 %	E	6 mph	0 mph	30.01 in	0.0 in	Fair
		6:53 AM	60 °F	57 °F	90 %	ENE	5 mph	0 mph	30.04 in	0.0 in	Fair
		7:53 AM	62 °F	58 °F	86 %	ENE	6 mph	0 mph	30.05 in	0.0 in	Fair
14	4/19/2023 – 4/20/2023	6:53 PM	80 °F	54 °F	40 %	ESE	14 mph	0 mph	30.02 in	0.0 in	Fair
		7:53 PM	76 °F	56 °F	50 %	E	12 mph	0 mph	30.04 in	0.0 in	Fair
		8:53 PM	73 °F	57 °F	57 %	E	9 mph	0 mph	30.05 in	0.0 in	Fair
		9:53 PM	71 °F	58 °F	63 %	E	7 mph	0 mph	30.07 in	0.0 in	Fair
		10:53 PM	68 °F	59 °F	73 %	E	5 mph	0 mph	30.09 in	0.0 in	Fair
		11:53 PM	63 °F	58 °F	84 %	ENE	7 mph	0 mph	30.10 in	0.0 in	Fair
		12:53 AM	63 °F	58 °F	84 %	E	6 mph	0 mph	30.09 in	0.0 in	Fair
		1:53 AM	61 °F	57 °F	87 %	ENE	7 mph	0 mph	30.08 in	0.0 in	Fair
		2:53 AM	60 °F	57 °F	90 %	NE	6 mph	0 mph	30.06 in	0.0 in	Fair
		3:53 AM	60 °F	58 °F	93 %	ENE	6 mph	0 mph	30.05 in	0.0 in	Fair
		4:53 AM	60 °F	57 °F	90 %	NE	6 mph	0 mph	30.06 in	0.0 in	Fair
		5:53 AM	60 °F	58 °F	93 %	ENE	7 mph	0 mph	30.06 in	0.0 in	Fair
		6:53 AM	60 °F	57 °F	90 %	ENE	6 mph	0 mph	30.08 in	0.0 in	Fair
		7:53 AM	64 °F	59 °F	84 %	ENE	6 mph	0 mph	30.10 in	0.0 in	Fair

Note: 8* - Official survey start time for Day 8 was 7:22 PM. Though the wind exceeded 9 mph at 6:53 PM, it met survey conditions by 7:53 PM. For the purposes of this report, this is a night with acceptable weather conditions.

Survey days shaded gray indicate unacceptable weather conditions.

Appendix C

ACOUSTIC DATA SUMMARY

Appendix C. Acoustic Data Summary

Station	Number of Kaleidoscope Pro Auto ID'd WAV files															Number of manually verified WAV files
	Total recorded files	**Classifed as noise**	**Not assigned auto ID**	**Total auto ID'd to species level**	**Big brown bat (*Eptesicus fuscus*)**	**Eastern red bat (*Lasiurus borealis*)**	**Hoary bat (*Lasiurus cinereus*)**	**Northern yellow bat (*Lasiurus intermedius*)**	**Seminole bat (*Lasiurus seminolus*)**	**Southeastern myotis (*Myotis austroriparius*)**	**Northern Long-Eared Bat (*Myotis septentrionalis*)**	**Evening bat (*Nycticeius humeralis*)**	**Tricolored bat (*Perimyotis subflavus*)**	**Brazilian free-tailed bat (*Tadarida brasiliensis*)**	**Florida bonneted bat (*Eumops floridanus*)**	**Florida bonneted bat**
1	5,955	3,914	447	1,594	64	29	198	124	19	0	0	19	10	1,124	7	0
2	3,109	517	489	2,103	60	9	313	170	21	0	0	9	2	1,504	15	0
3	3,544	523	596	2,425	84	17	449	129	13	0	0	6	1	1,707	19	0
4	9,439	1,235	2,141	6,063	525	232	618	603	148	0	0	232	10	3,685	10	1
5	9,231	690	1,611	6,930	174	37	718	566	28	1	0	19	7	5,374	6	0
														Total	57	

NOTES:
The following species were not included in Kaleidoscope Pro analysis due to rarity in South Florida: silver haired bat, fringed myotis, Palla's mastiff bat, gray myotis, and little brown myotis.
*Includes one WAV file not assigned an AutoID which contained EUMFLO pulses

Appendix D

Photo Log

Photo 1: shows CD-1 located in Wetland 1 just west of Cortez Dr. and south of Harborview Rd.

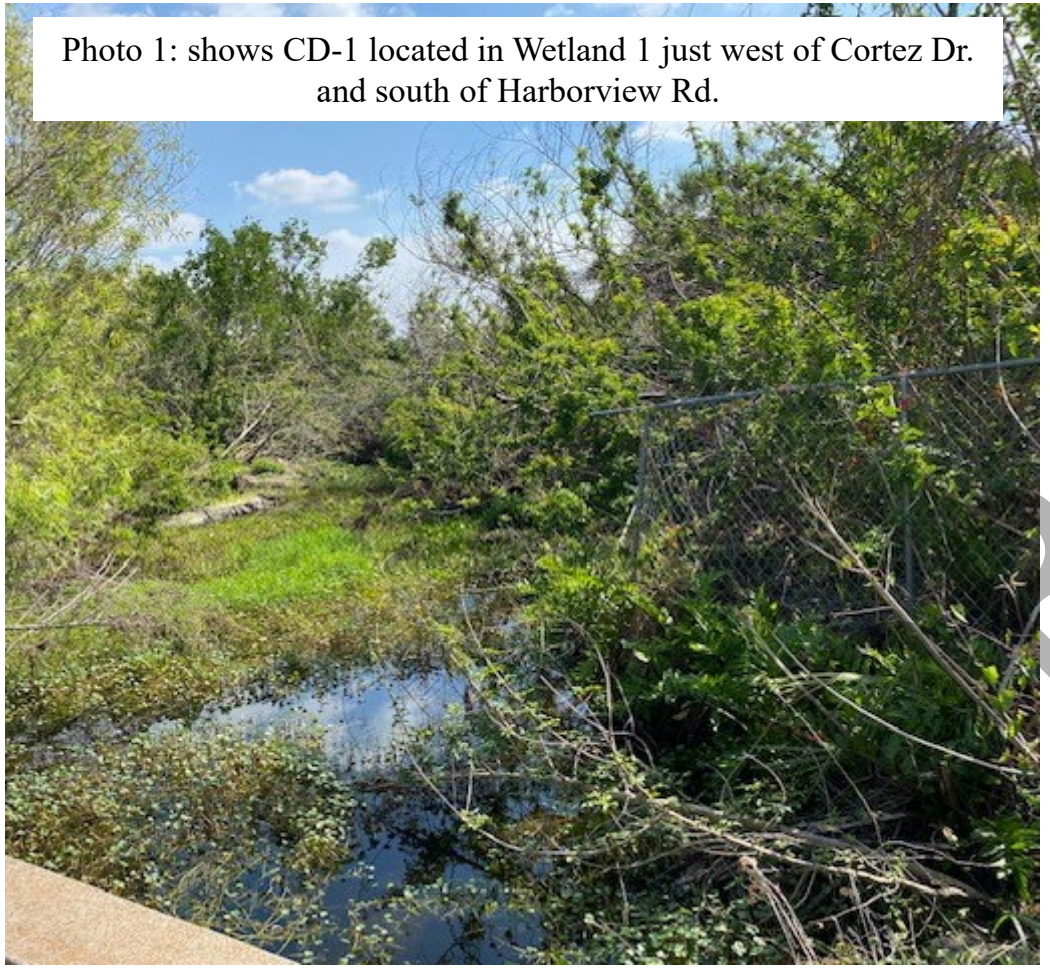
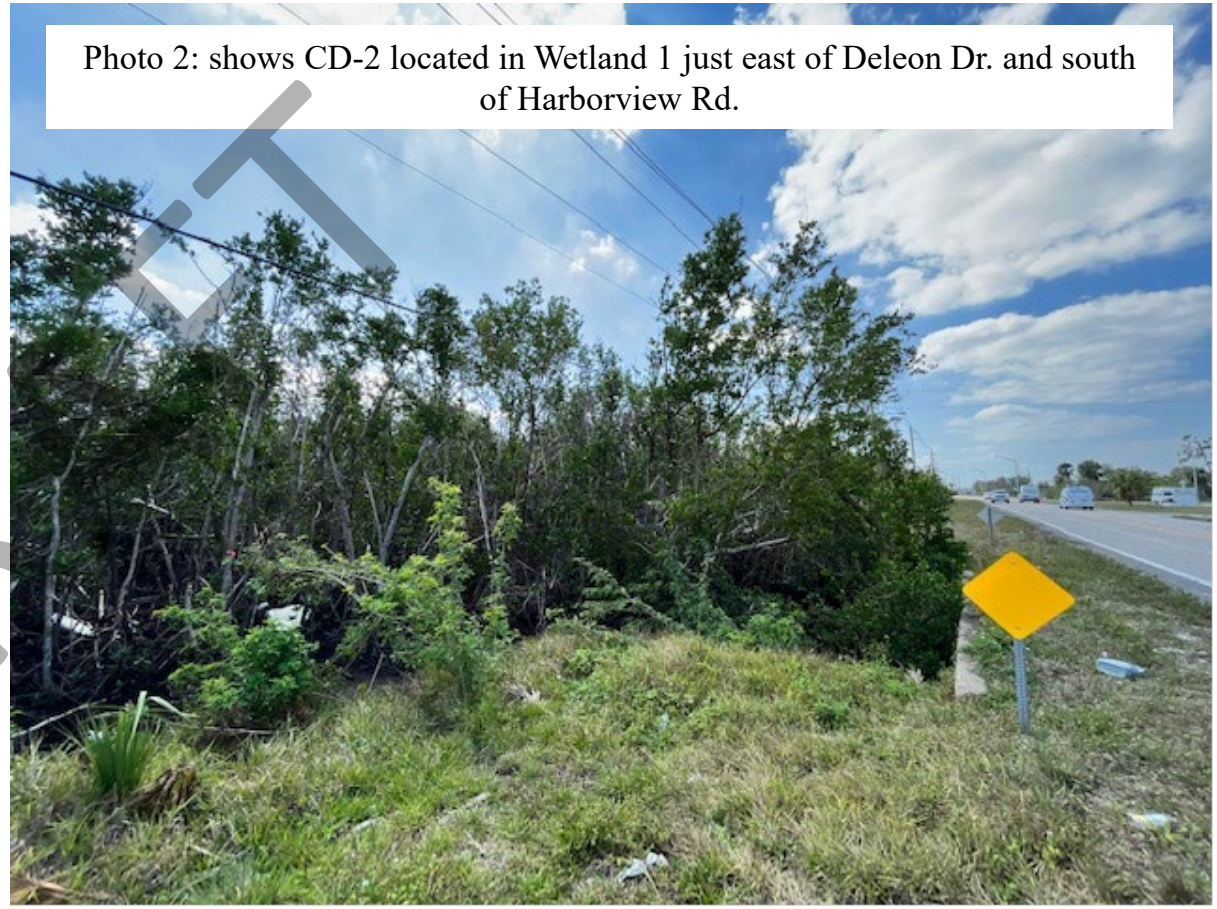


Photo 2: shows CD-2 located in Wetland 1 just east of Deleon Dr. and south of Harborview Rd.





These three photos depict the landscape and vegetation found in Wetland 1.

Appendix E

Protected Species Construction Conditions
(NOAA Fisheries Southeast Regional Office)

PROTECTED SPECIES CONSTRUCTION CONDITIONS, NOAA FISHERIES SOUTHEAST REGIONAL OFFICE

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

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

1. **Equipment**–Turbidity curtains, if used, shall be made of material in which protected species cannot become entangled and be regularly monitored to avoid protected species entrapment. All turbidity curtains and other in-water equipment shall be properly secured with materials that reduce the risk of protected species entanglement and entrapment.

    a. In-water lines (rope, chain, and cable, including the lines to secure turbidity curtains) shall be stiff, taut, and non-looping. Examples of such lines are heavy metal chains or heavy cables that do not readily loop and tangle. Flexible in-water lines, such as nylon rope or any lines that could loop or tangle, shall be enclosed in a plastic or rubber sleeve/tube to add rigidity and prevent the line from looping and tangling. In all instances, no excess line shall be allowed in the water. All anchoring shall be in areas free from hardbottom and seagrass.

    b. Turbidity curtains and other in-water equipment shall be placed in a manner that does not entrap protected species within the project area and minimizes the extent and duration of their exclusion from the project area.

    c. Turbidity barriers shall be positioned in a way that minimizes the extent and duration of protected species exclusion from important habitat (e.g. critical habitat, hardbottom, seagrass) in the project area.

2. **Operations**–For construction work that is generally stationary (e.g., barge-mounted equipment dredging a berth or section of river, or shore-based equipment extending into the water):

    a. Operations of moving equipment shall cease if a protected species is observed within 150 feet of operations.

[1] Manatees are managed under the jurisdiction of the U.S. Fish and Wildlife Service.

b. Activities shall not resume until the protected species has departed the project area of its own volition (e.g., species was observed departing or 20 minutes have passed since the animal was last seen in the area).

3. **Vessels**–For projects requiring vessels, the action agency, and any permittee shall ensure conditions in the Vessel Strike Avoidance Measures are implemented as part of the project/permit issuance (https://www.fisheries.noaa.gov/southeast/consultations/regulations-policies-and-guidance).

4. **Consultation Reporting Requirements–**Any interaction with a protected species shall be reported immediately to NOAA Fisheries SERO PRD and the local authorized stranding/rescue organization.

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

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

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

   NOAA Fisheries Enforcement Hotline (800) 853-1964

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

For additional information, please contact NOAA Fisheries SERO PRD at:
NOAA Fisheries Service
Southeast Regional Office
263 13th Avenue South
St. Petersburg, Florida 33701
Tel: (727) 824-5312
Visit us on the web at Protected Marine Life in the Southeast
(https://www.fisheries.noaa.gov/region/southeast#protected-marine-life)

Revised: May 2021

Appendix F

Standard Manatee Conditions for In-Water Work

STANDARD MANATEE CONDITIONS FOR IN-WATER WORK

2011

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

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

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

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

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

e. Any collision with or injury to a manatee shall be reported immediately to the Florida Fish and Wildlife Conservation Commission (FWC) Hotline at 1-888-404-3922. Collision and/or injury should also be reported to the U.S. Fish and Wildlife Service in Jacksonville (1-904-731-3336) for north Florida or 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 G

Manatee Effect Determination Key

United States Department of the Interior

FISH AND WILDLIFE SERVICE
1339 20th Street
Vero Beach, Florida 32960

May 13, 2019

Andrew D. Kelly, Jr., Colonel
District Commander
U.S. Army Corps of Engineers
P.O. Box 4970
Jacksonville, Florida 32232-0019

Dear Colonel Kelly:

The U.S. Fish and Wildlife Service (Service) and the U.S. Army Corps of Engineers (Corps) currently use a dichotomous key (Key) to assist in making effect determinations pursuant to the Endangered Species Act for in-water activities that may affect manatees. Recently, Corps and Service staff identified the need to make several revisions to the 2013 Key to address new issues and changed circumstances. Although a more complete revision is needed in the future, three issues need to be addressed as soon as possible: 1) requirements associated with clamshell dredge head operation; 2) locations and conditions related to impact hammer driven metal piles and/or sheet piles; and 3) incorporation of the current list of counties that have approved Manatee Protection Plans (MPPs).

For the purpose of continuing to use the Key on projects that involve clamshell dredging or impact driving of metal piles or sheet piles, the Service is issuing this letter as an addendum to the Key. The Service finds work that keys out as "not likely to adversely affect" the manatee or its critical habitat using the 2013 Key is still the appropriate determination provided there is adherence to the following additional conditions:

1) During clamshell dredging operations, the dredge operator shall gravity-release the clamshell bucket only at the water's surface, and only after confirmation that there are no manatees within the safety distance identified in the standard construction conditions (or a 75-foot buffer if dredging is authorized at night);

2) Installation of metal pilings or metal sheet piles by impact hammer – if not within Important Manatee Areas, Warm Water Aggregation Areas, or Federal manatee sanctuaries or state-designated No Entry Areas - may occur under the following conditions: a) Use of at least one dedicated manatee observer, with all work being stopped if a manatee is observed within 1000 feet; b) no work shall occur outside of daylight hours (defined as one-half hour after sunrise to one-half hour before sunset); and, c) no more than 5 piles/day may be installed. If within any of the above-described areas, an informal or formal project-specific consultation with the Service is required.

In addition, the following change will allow projects in Charlotte County and Flagler County to be properly handled using the Key:

3) Charlotte County and Flagler County shall be added to the list of counties that have an approved Manatee Protection Plan (couplet J of the 2013 Key) and removed from the list of counties included in couplet L and the second category of couplet P of the 2013 Key.

With the above-described changes, the Service affirms that such work would not likely adversely affect the West Indian manatee and no further consultation is required provided all other conditions of the 2013 Key are met. The above changes, and possibly others, will ultimately be reflected in an updated version of the Key. We hope this letter provides the Corps with the ability to continue to work with the 2013 Key and in-water construction conditions until a revised and updated Key is approved.

Thank you for your continued support to facilitate recovery of the West Indian manatee and other species protected under the Endangered Species Act. If you have any questions, please contact Mr. Scott Calleson by e-mail at charles_calleson@fws.gov or by phone at (904) 731-3326.

Sincerely,

Larry Williams

Larry Williams
State Supervisor

cc:
Service, Jacksonville, Florida (Jay Herrington)
Service, Vero Beach, Florida (Bob Progulske, Roxanna Hinzman)

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

Purpose and background of the key

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

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

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

Scope of the key

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

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

MANATEE KEY
Florida[1]
April 2013

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

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

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

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

1. blasting or other detonation activity for channel deepening and/or widening, geotechnical surveys or exploration, bridge removal, movies, military shows, special events, etc.;

2. installation of structures which could restrict or act as a barrier to manatees;

3. new or changes to existing warm or fresh water discharges from industrial sites, power plants, or natural springs or artesian wells (but only if the new or proposed change in discharge requires a Corps permit to accomplish the work);

4. installation of new culverts and/or maintenance or modification of existing culverts (where the culverts are 8 inches to 8 feet in diameter, ungrated and in waters accessible, or potentially accessible, to manatees)[2];

5. mechanical dredging from a floating platform, barge or structure[3] that restricts manatee access to less than half the width of the waterway;

6. creation of new slips or change in use of existing slips, even those located in a county with a State-approved Manatee Protection Plan (MPP) in place and the number of slips is less than the MPP threshold, to accommodate docking for repeat use vessels, (*e.g.*, water taxis, tour boats, gambling boats, etc; or slips or structures that are not civil works projects, but are frequently used to moor large vessels (>100') for shipping and/or freight purposes; does not include slips used for docking at boat sales or repair facilities or loading/unloading at dry stack storage facilities and boat ramps); [Note: For projects within Bay, Dixie, Escambia, Franklin, Gilchrist, Gulf, Hernando, Jefferson, Lafayette, Monroe (south of Craig Key), Nassau, Okaloosa, Okeechobee, Santa Rosa, Suwannee, Taylor, Wakulla or Walton County, the reviewer should proceed to Couplet C.]

7. any type of in-water activity in a Warm Water Aggregation Area (WWAA) or No Entry Area (see Glossary and accompanying Maps[4]); [Note: For residential docking facilities in a Warm Water Aggregation Area that is not a Federal manatee sanctuary or No Entry Area, the reviewer should proceed to couplet C.]

8. creation or expansion of canals, basins or other artificial shoreline and/or the connection of such features to navigable waters of the U.S.; [Note: For projects proposing a single residential dock, the reviewer should proceed to couplet C; otherwise, project is a *May Affect*.]

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

Project is other than the activities listed above C

C. Project is located in an Important Manatee Area (IMA) (see Glossary and accompanying Maps[4]) ..... D

Project is not located in an Important Manatee Area (IMA) (see Glossary and accompanying Maps[4]) ..... G

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

Project does not include dredging ..... G

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

Project not as above ..... F

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

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

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

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

H. Project is located in the Braden River Area of Inadequate Protection (Manatee County) (see Glossary and accompanying AIP Map[4]) ..... *May affect*

Project is not located in the Braden River Area of Inadequate Protection (Manatee County) (see Glossary and accompanying AIP Map[4]) I

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

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

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

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

K. Project has been developed or modified to be consistent with the county's State-approved MPP **and** has been verified by a FWC review (or FWS review if project is exempt from State permitting) **or** the number of slips is below the MPP threshold ..... N

Project has not been reviewed by the FWC or FWS **or** has been reviewed by the FWC or FWS **and** determined that the project is not consistent with the county's State-approved MPP ..... *May affect*

L. Project is located in one of the following counties: CHARLOTTE, DESOTO[7], FLAGLER, GLADES, HENDRY, HILLSBOROUGH, LEVY, MANATEE, MONROE[7], PASCO[7], PINELLAS ..... M

Project is located in one of the following counties: BAY, DIXIE, ESCAMBIA, FRANKLIN, GILCHRIST, GULF, HERNANDO, JEFFERSON, LAFAYETTE, MONROE (south of Craig Key), NASSAU, OKALOOSA, OKEECHOBEE, PUTNAM, SANTA ROSA, ST. JOHNS, SUWANNEE, TAYLOR, WAKULLA, WALTON ..... N

M. The number of slips does not exceed the residential dock density threshold (see Glossary) ..... N

The number of slips exceeds the residential dock density threshold (see Glossary) ..... *May affect*

N. Project impacts to submerged aquatic vegetation[8], emergent vegetation or mangrove will have beneficial, insignificant, discountable[9] or no effects on the manatee[10] ..... O

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

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

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

P. If project is for a new or expanding[5] multi-slip facility and is located in a county with a State-approved MPP in place **or** in Bay, Dixie, Escambia, Franklin, Gilchrist, Gulf, Hernando, Jefferson, Lafayette, Monroe (south of Craig Key), Nassau, Okaloosa, Okeechobee, Putnam, St. Johns, Santa Rosa, Suwannee, Taylor, Wakulla or Walton County, the determination of "*May affect, not likely to adversely affect*" is appropriate[12] and no further consultation with the Service is necessary.

If project is for a new or expanding[5] multi-slip facility and is located in Charlotte, Desoto, Flagler, Glades, Hendry, Hillsborough, Levy, Manatee, Monroe (north of Craig Key), Pasco, or Pinellas County, further consultation with the Service is necessary for "*May affect, not likely to adversely affect*" determinations.

If project is for repair or rehabilitation of a multi-slip facility and is located in an Important Manatee Area, further consultation with the Service is necessary for "*May affect, not likely to adversely affect*" determinations. If project is for repair or rehabilitation of a multi-slip facility and: (1) is not located in an Important Manatee Area; (2) the number of slips is not increased; (3) the number of existing slips is not in question; and (4) the improvements to the existing watercraft access structures do not allow increased watercraft usage, the determination of "*May affect, not likely to adversely affect*" is appropriate[12] and no further consultation with the Service is necessary.

If project is a residential dock facility, shoreline stabilization, or dredging, the determination of "*May affect, not likely to adversely affect*" is appropriate[12] and no further consultation with the Service is necessary. Note: For residential dock facilities located in a Warm Water Aggregation Area or in a No Entry area, seasonal restrictions may apply. See footnote 4 below for maps showing restrictions.

If project is other than repair or rehabilitation of a multi-slip facility, a new[5] multi-slip facility, residential dock facility, shoreline stabilization, or dredging, and does not provide new[5] access for watercraft or

improve an existing access to allow increased watercraft usage, the determination of "*May affect, not likely to adversely affect*" is appropriate[12] and no further consultation with the Service is necessary.

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

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

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

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

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

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

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

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

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

- "Construction Guidelines in Florida for Minor Piling-Supported Structures Constructed in or over Submerged Aquatic Vegetation (SAV), Marsh or Mangrove Habitat," prepared jointly by the U.S. Army Corps of Engineers and the National Marine Fisheries Service (August 2001) [refer to the Corps' web page], and

- "Key for Construction Conditions for Docks or Other Minor Structures Constructed in or over Johnson's seagrass (*Halophila johnsonii*)," prepared jointly by the National Marine Fisheries Service and U.S. Army Corps of Engineers (October 2002), for those projects within the known range of Johnson's seagrass occurrence (Sebastian Inlet to central Biscayne Bay in the lagoon systems on the east coast of Florida) [refer to the Corps' web page],

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

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

[9] See Glossary, under "is not likely to adversely affect."

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

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

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

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

GLOSSARY

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Appendix H

Wood Stork Effect Determination Key

United States Department of the Interior

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

May 18, 2010

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

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

Dear Mr. Kinard:

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

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

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

Wood stork

Habitat

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

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

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

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

Conservation Measures

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

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

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

The Key is as follows:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Monitoring and Reporting Effects

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

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

Sincerely yours,

Paul Souza
Field Supervisor
South Florida Ecological Services Office

Enclosures

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

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Appendix I

Consultation Key for the Eastern Indigo Snake

United States Department of the Interior

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

August 1, 2017

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

Subject: Consultation Key for the Eastern Indigo Snake – Revised

Dear Mr. Kinard:

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

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

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

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

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

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

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

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

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

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

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

Scope of the Key

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

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

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

Habitat

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

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

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

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

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

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

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

Minimization Measures

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

Determinations

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

End Key

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

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

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

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

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

Sincerely,

Roxanna Hinzman
Field Supervisor
South Florida Ecological Services

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

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