

MEMO

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To
Jonathon A. Bennett,
Environmental Project Manager –
FDOT District One

Copies:
Douglas Schallmoser – FDOT Project Manager

From
Sierra Lauck, Environmental Scientist - HNTB

Subject
Listed/Protected Species Assessment Technical Memorandum
Highlands County Substructure Repairs at Various Locations
Bridges 090026, 090032, 090016
FPID: 437962-1-52-01
Highlands County, Florida

Date
April 15, 2019

Introduction

The Florida Department of Transportation (FDOT) is proposing bridge repairs and rehabilitation to three bridges (Bridge 090026, 090032, 090016) along US 98 (SR 700) in Highlands County Florida. Bridge 090026 is located on US 98 (SR 700) over Lorida Creek; Bridge 090032 is located on US 98 (SR 700) over the Istokpoga Canal; and Bridge 090016 is located on US 98 (SR 700) over the Kissimmee River. The proposed improvements will vary by bridge, but generally include substructure repairs, crutch bent and pile jacket installation and repair, spalled areas restoration, pavement markings, debris removal, and timber fender pile strengthening. Please refer to **Attachment A** for a project location map.

A desktop review and field analysis of the project area was conducted for the presence and potential occurrence of federal and state-listed species and their habitat. The purpose of this review was to identify protected species which have the potential to be present and to identify potential impacts to these species that could occur as a result of the construction of the proposed project.

Wetlands and surface water systems are located at each of the bridge locations. Due to the nature of the proposed improvements, no permits will be required. Please see **Attachment B** for a copy of the no permits memo.

Methodology

A desktop analysis and detailed field review were completed using available online GIS data, the Efficient Transportation Decision Making (ETDM) Environmental Screening Tool (EST), Florida Natural Areas

Inventory (FNAI) Rare Animals and Rare Plants field guides, United States Fish and Wildlife Service (USFWS) South Florida Ecological Services website, USFWS wood stork nesting colony database, Florida Fish and Wildlife Conservation Commission (FWC) December 2018 Florida's Endangered and Threatened Species List, FWC bald eagle nest locator database, FDOT Bats in Bridges Maintenance Reports, FWC "Status and Management of Bats Roosting in Bridges in Florida" (2005), Draft November 2017 Florida Bonneted Bat Consultation Guidelines, and FDOT Florida Land Use, Cover and Forms Classification System were reviewed for protected species, and their habitat, that have been documented or have a potential to occur within or adjacent to the project limits.

Results

A desktop analysis using the aforementioned data was conducted for the project area in an effort to identify the presence of federal or state protected species, and their habitat within and adjacent to the proposed project limits. The project is mapped within the USFWS consultation area for the snail kite (*Rostrhamus sociabilis*), Audubon's crested caracara (*Caracara cheriway audubonii*), Florida scrub-jay (*Aphelocoma coerulescens*) Florida grasshopper sparrow (*Ammodramus savannarum floridanus*), sand (*Neoseps reynoldsi*) and bluetail mole skinks (*Eumeces egregious lividus*), Florida bonneted bat (*Eumops floridanus*), and the Lake Wales ridge plants. Additionally, Bridges 090032 and 090016 are located within the consultation area for the Florida panther (*Puma concolor coryi*). The project is also located within the abundant and common ranges for the Florida black bear (*Ursus americanus floridanus*) and one bald eagle nest is located adjacent to Bridge 090026. There are no wood stork nesting colonies within 18.6 miles of the project. Additionally, from FDOT maintenance records, Bridge 090016 was documented to have bats in or near the bridge structure.

An initial field survey of the project and immediate adjacent areas was conducted on December 20, 2018, by qualified biologists to identify the presence and potential occurrence of federal and state-listed species and their habitat. The purpose of this review was to identify protected species which have the potential to be present and to identify potential impacts to these species that could occur as a result of the construction of the proposed project. Additionally, detailed bat surveys were conducted for Bridge 090016. These surveys included acoustic surveys from February 21st – March 1st, 2019, and a detailed bat presence/absence survey on March 29th, 2019. Please see **Attachment C** for a map showing the survey areas for the visual inspections. Please see **Attachment D** for a photo representation of the bridges.

See below for a more detailed analysis for the Florida bonneted bat, bats, crested caracara, and bald eagle.

Bats, which are protected under the Florida Administrative Code (F.A.C.) 68A, have begun to utilize artificial structures in lieu of natural sites for roosting locations from the effects of urbanization, and from a bat's perspective, bridges share many similar characteristics with cliffs and caves. Old, prestressed concrete beams are favored as roosting sites because they are long-lasting structures with an abundance of crevices providing optimal temperature ranges and protection from diurnal predators. At least five species of bats found in Florida have been documented to use bridges crossing highways and in bridges crossing over water as roosting sites. Additionally, **Florida bonneted bats** are listed as endangered by the USFWS. This species is the largest bat known to occur in Florida. They are an exceedingly rare bat that can sometimes be found

in urban, suburban, and rural areas of southeastern Florida. Little is known about the roosting behavior of Florida bonneted bats; however, they are thought to roost in buildings, artificial bat houses, and sometimes in previous woodpecker cavities or the foliage of palm fronds. They are primarily insectivorous and forage on beetles, flies, and true bugs in semitropical forests with tropical hardwood, pineland, and mangrove habitats, as well as golf courses and neighborhoods. They were listed as a federally endangered species by the USFWS in 2013 and receives protection from the Federal Endangered Species Act 16 U.S.C. §1531-1544 and Florida's Endangered and Threatened Species Rule 68A-27 F.A.C. Natural areas adjacent to the bridges consisting of pastures, freshwater marshes, and mixed hardwood forests may provide potential foraging for the species. According to FDOT maintenance records, Bridge 090016 has previously recorded presence of bats. During the December 2018 field review, all three bridges were reviewed for the presence of bats. A visual survey for bat activity was conducted from land, underneath the bridges using binoculars and a spotting scope. No suitable roosting habitat is available for bats on Bridge 090026 and 090032. No observations were noted on Bridge 090016; however, the expansion joints underneath the bridge can provide suitable roosting habitat for bat species, and due to the size of the bridge and its location over the Kissimmee River, access was limited.

Acoustic surveys were conducted from February 21st – March 1st, 2019, by Johnson Engineering at Bridge 090016 to determine which bat species may be utilizing the bridge structure and specifically if any of the bat species present are the endangered Florida bonneted bat. The acoustic surveys were conducted following the November 2017 draft acoustic survey protocol for the Florida bonneted bat. Five species of bats were documented during the surveys:

- Northern yellow bat (*Lasiurus intermedius*)
- Brazilian free-tailed bat (*Tadarida brasiliensis*)
- Tricolored bat (*Perimyotis subflavus*)
- Big brown bat (*Eptesicus fuscus*)
- Evening bat (*Nycticeius humeralis*)

Based on the results of the acoustic surveys and the November 2017 draft Consultation Key the project is expected to have *no effect* on the Florida bonneted bat. Please see **Attachment E** for a copy of the Florida Bonneted Bat Acoustic Survey memorandum.

A detailed presence/absence bat survey for Bridge 090016 was conducted on March 29th, 2019, by HNTB biologists to determine where, if at all, bats may be roosting within the bridge to accurately determine the need for exclusionary devices. No bats or evidence of bats were documented utilizing any of the bridge bents or crevices, additionally, no evidence of bats was documented on any part of the bridge structure. It was determined that no exclusionary devices will be required.

The **crested caracara** is listed as a threatened species by the USFWS. Caracaras are resident, non-migratory raptor species in Florida. This species is typically found nesting in cabbage palms surrounded by open habitats of low density groundcover but may also be found in sparsely wooded areas. The project study area is within the USFWS consultation area for the Audubon's crested caracara and suitable nesting and foraging

habitat are present adjacent to the project. Nests and observations have been documented adjacent to the project by the USFWS. Please see **Attachment F** for protected species maps for each of the three bridge locations that show all documented nests and observations within the past 20 years (1999-2019). Based on previous coordination with the Service, any proposed improvements occurring on existing pavement would not constitute a disturbance to nesting caracaras. All of the proposed bridge work will occur on existing pavement/ structures; therefore, the project is anticipated to have *no effect* on the caracara.

The **bald eagle** (*Haliaeetus leucocephalus*) was removed from the U.S. Endangered Species Act in 2007; however, this species is still protected under the Bald and Golden Eagle Protection Act of 1940, as amended and the Migratory Bird Treaty Act of 1918, as amended. Protection measures under the USFWS and FWC are found in the National Bald Eagle Management Guidelines published by the USFWS in May 2007 and the Species Action Plan for the Bald Eagle adopted by the FWC in November 2017. The Species Action Plan for the Bald Eagle is a non-regulatory conservation plan that outlines steps to protect the species in an effort to maintain stable or increasing populations. Bald eagles prefer riparian habitat associated with coastal areas, lakes and rivers. They nest in living and dead trees near bodies of water to provide optimal foraging resources. The FWC maintains a database of bald eagle nests located throughout the state of Florida that is updated annually. According to the FWC's eagle nest locator database, there is one eagle nest located within the general project study area approximately 1700 feet southeast of Bridge 090026 that has been documented as active within the last five years. Please see the protected species map for Bridge 090026 in **Attachment F** showing the nest location. No work is proposed within the 660-foot primary buffer zone of the nest; therefore no impacts are anticipated. If an active nest is located within 660-feet of the proposed work, the FWC 2017 Species Action Plan for the Bald Eagle shall be followed.

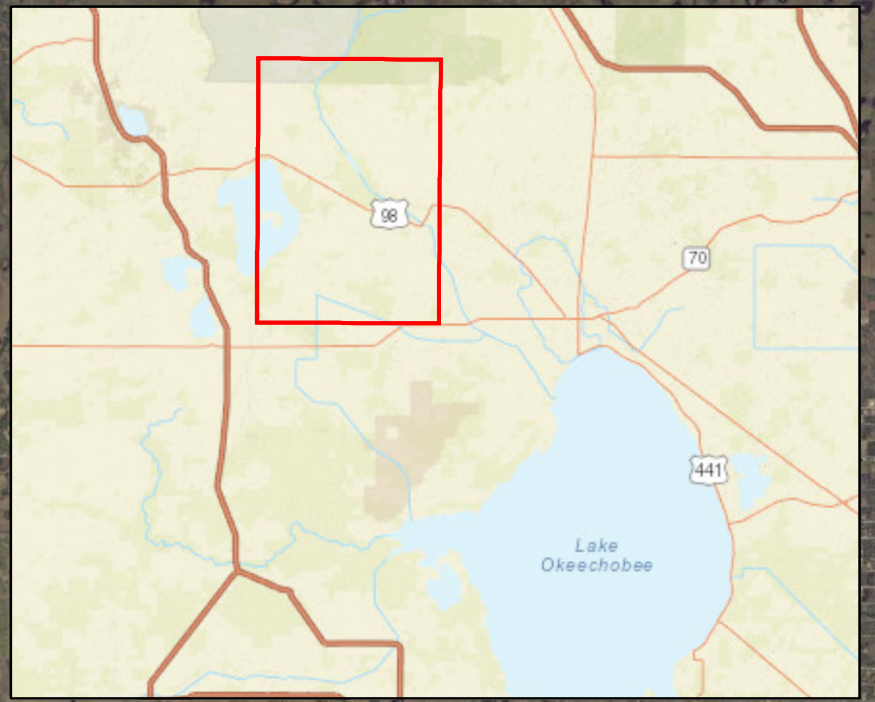
Conclusion

Due to the limited, maintenance type of work being proposed at the bridges and the results of the desktop analysis and field reviews, it is unlikely that any federal and state-listed species or their habitat will be adversely affected by the proposed project. No suitable habitat is proposed to be impacted by the project for any of the above species. Therefore, it was determined that the project would have *no effect* on the snail kite, Audubon's crested caracara, Florida scrub-jay, Florida grasshopper sparrow, sand and blue-tailed mole skinks, Florida bonneted bat, Florida panther, and Lake Wales ridge plants. Additionally, the project will have no impact on active bald eagle nests or any bat species.


Section 7-1.4: Compliance with Federal Endangered Species Act and other Wildlife Regulations of the *Standard Specifications for Road and Bridge Construction* manual should be adhered to for wildlife involvement during construction. If you have any questions, or if you would like any additional information, please contact me at (813) 498-5104 or via e-mail at slauck@hntb.com.

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.

Attachment A: Project Location Map

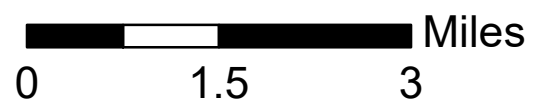


Legend

 Bridge Locations



Highlands County Substructure
Repairs at Various Locations
(Bridge 090026, 090032, & 090016)
FPID: 437962-1-52-01
Location Map



Attachment B: No Permits Required Memo

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
PERMIT TRANSMITTAL MEMORANDUM

650-040-01
ENVIRONMENTAL MANAGEMENT
02/12

DATE: 01/07/2019

TO: DISTRICT CONSTRUCTION ENGINEER

FROM: M. Nicole Monies *MMM*
District Permit Coordinator

PERMITS ATTACHED FOR: _____ THE FOLLOWING PERMITS ARE REQUIRED FOR THIS PROJECT:
Financial Project No.: 437962-1-52-01 FDEP ; USACE ; USCG ; WMD ;
Federal Aid No.: _____ LOCAL ; _____ ;
County: Highlands _____ ; _____ .
Description: US 98 Bridge 090026 over Lorida Creek - Substructure Repairs

The valid permits are attached. Please note the "particular and specific conditions" and the expiration dates. Construction Engineer: Please comply with all permit conditions. Please provide me with copies of all permitted work started and permitted work completed notices you send to regulatory agencies. Please notify me six (6) months before the permit expiration date if it will occur prior to completion of the permitted work.

TOTAL STATUS OF PERMITS: CLEAR PENDING MODIFIED EXTENDED

Remarks: _____

For each permit, indicate below AGENCY and permit TYPE (NW, GP, IND, etc.):

SFWMD Permit No. 28-100832-P ; Type: GP ; Expiration Date: 01/04/2024

Permit Pending Permit in hand

Remarks: _____

ACOE Permit No. _____ ; Type: _____ ; Expiration Date: _____

Permit Pending Permit in hand

Remarks: _____

_____ Permit No. _____ ; Type: _____ ; Expiration Date: _____

Permit Pending Permit in hand

Remarks: _____

_____ Permit No. _____ ; Type: _____ ; Expiration Date: _____

Permit Pending Permit in hand

Remarks: _____

_____ Permit No. _____ ; Type: _____ ; Expiration Date: _____

Permit Pending Permit in hand

Remarks: _____

CC: DISTRICT OFFICE NO. 1

- District Drainage Engineer
- District Central File
- District Design Engineer
- District Project Manager
(Legible permit in contract file)
- District Maintenance Engineer
- District Production Mgmt (copy this memo only)
- District ROW - State Lands Acq.
- District Specifications Engineer
- Other S. Stevenson via e-mail
- Other D. Schallmoser via e-mail

CENTRAL OFFICE

- FHWA (by separate letter)
- Other _____

Attachment C: Visual Bat Survey Map



BRIDGE
090026




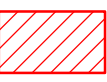
BRIDGE
090016



BRIDGE
090032

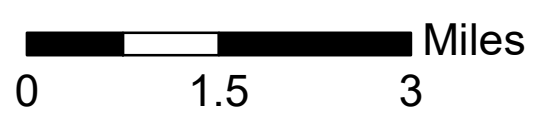


Legend

-  Bridge Locations
-  Survey Locations



Highlands County Substructure
Repairs at Various Locations
(Bridge 090026, 090032, & 090016)
FPID: 437962-1-52-01
Bat Survey Map



Attachment E: Florida Bonneted Bat Acoustic Survey Memorandum

Florida Bonneted Bat Acoustic Survey

**Highland County Bridge Repairs –
US 98 Bridge 090016 over Kissimmee River
FPID 437962-1**

March 2019

Prepared for:

**FDOT, District One
801 North Broadway
Bartow, FL 33830**

Prepared by:

**Johnson Engineering, Inc.
2122 Johnson Street
Fort Myers, Florida 33901
(239) 334-0046**

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

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1.0 **INTRODUCTION / PROJECT BACKGROUND**

1.1 **Project Information**

Florida Department of Transportation (FDOT) intends to make improvements to the US 98 bridge (Bridge Number 090016) crossing the Kissimmee River. Proposed improvements include: cleaning and sealing of concrete deck and expansion joints; pile jacket installation; cathodic protection at crust bents; repairs to concrete deficiencies; anchor bolt replacement; and timber fender pile strengthening. The project is located along US 98, approximately 0.25 miles northeast of the intersection of US 98 and County Road 721. The right of way in the vicinity of the bridge, which serves as the approximate survey area, totals approximately 2.85 acres. The project is located in Section 5, Township 36, Range 33 in Highlands County, Florida.




The U.S. Fish and Wildlife Service (FWS) has established a Consultation Area for the federally endangered Florida bonneted bat (*Eumops floridanus*; FBB). Based on the project site's location within the FBB Consultation Area and crevices beneath the bridge structure providing potential suitable roosting habitat, FDOT, District One staff requested acoustic surveys be conducted to assess whether FBBs may be utilizing the project area. A project location map is provided as **Figure 1**.

1.2 **Florida Bonneted Bat**

Effective November 2, 2013, the FWS listed the FBB as endangered under the Endangered Species Act (ESA) (FWS, 2013). Increased acoustic and roost surveys and independent research using radio telemetry, GPS technology and tracking have led to discoveries of new natural roosts. While most of the natural roosts discovered are on public lands, several occur in urban areas on private lands (Halupa, pers. com.). The Florida bonneted bat was previously known as the Florida mastiff bat, Wagner's mastiff bat, and mastiff bat (*Eumops glaucinus floridanus*). Recent genetic research confirmed that *E. floridanus* is a distinct species (FWS, 2013). The FBB is a member of the Molossidæ (free-tailed bats) family within the Order Chiroptera.

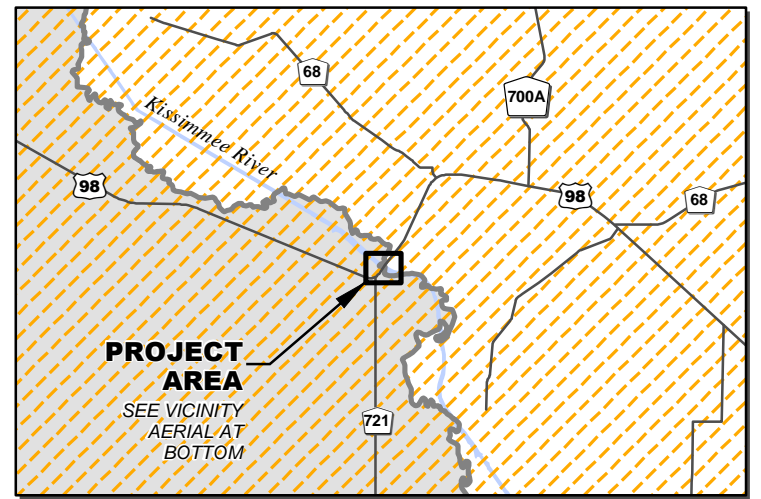
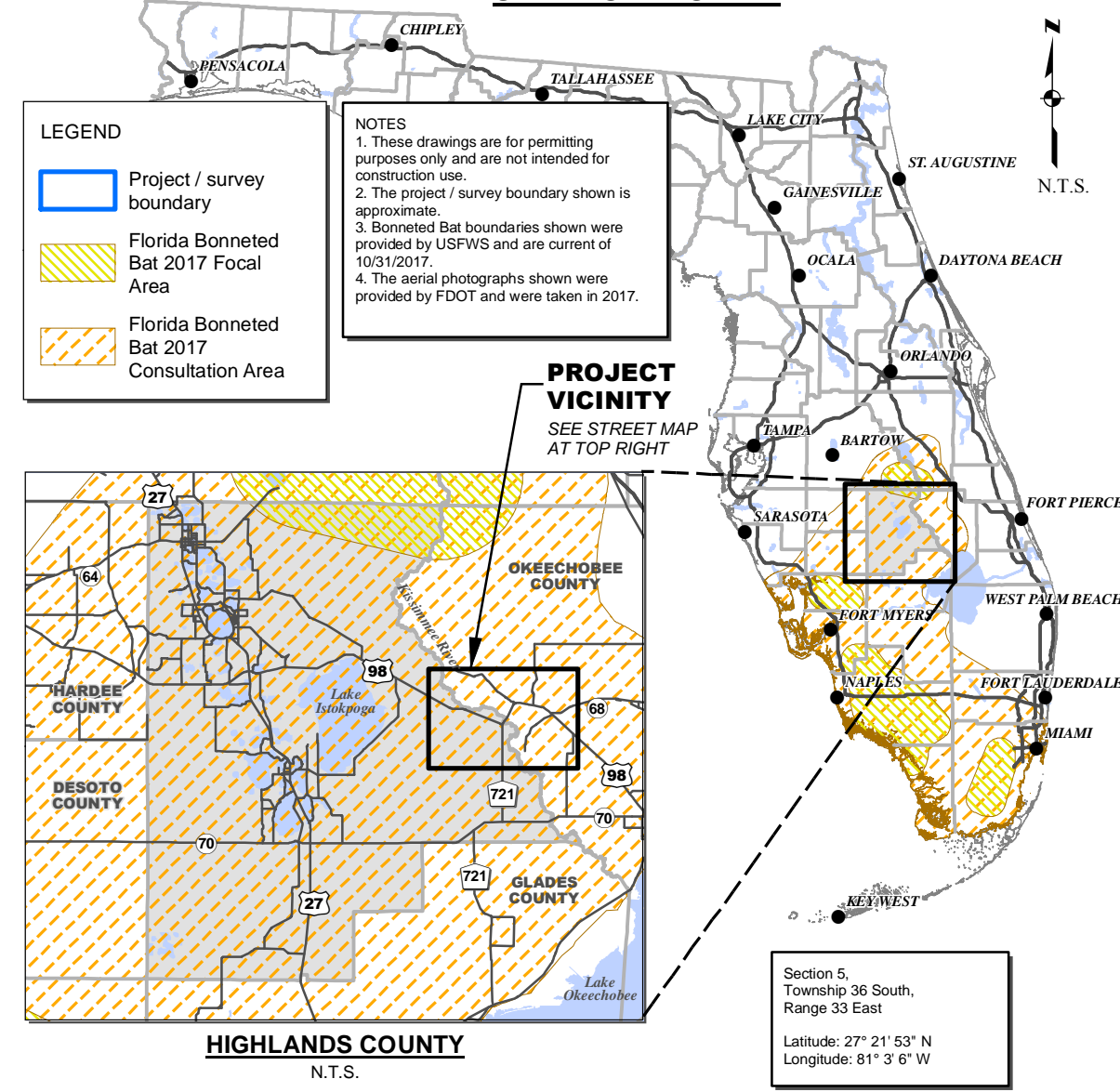
STATE OF FLORIDA

LEGEND

-  Project / survey boundary
-  Florida Bonneted Bat 2017 Focal Area
-  Florida Bonneted Bat 2017 Consultation Area

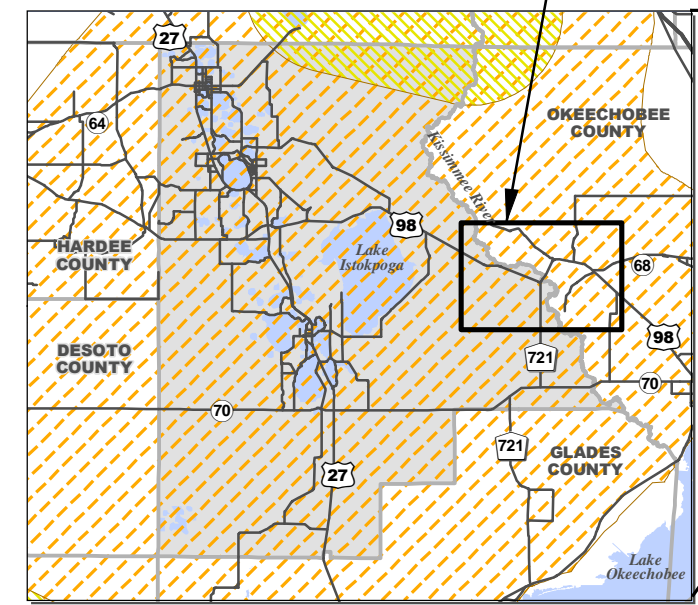
NOTES

1. These drawings are for permitting purposes only and are not intended for construction use.
2. The project / survey boundary shown is approximate.
3. Bonneted Bat boundaries shown were provided by USFWS and are current of 10/31/2017.
4. The aerial photographs shown were provided by FDOT and were taken in 2017.

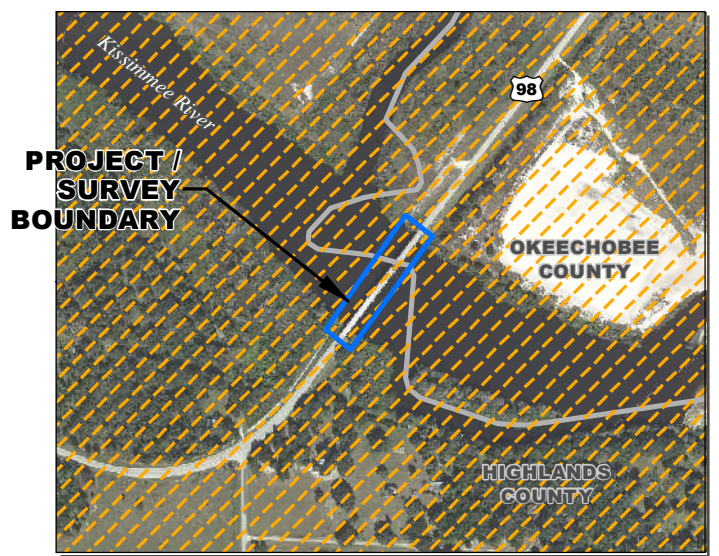


STREET MAP
N.T.S.

PROJECT VICINITY
SEE STREET MAP AT TOP RIGHT



HIGHLANDS COUNTY
N.T.S.



VICINITY AERIAL
N.T.S.

Section 5,
Township 36 South,
Range 33 East

Latitude: 27° 21' 53" N
Longitude: 81° 3' 6" W

\\frms01\drawings\2016\20160001-000\Environmental\arcgis\US 98 bridge\bat maps\bat locmap.mxd

US 98 Bridge at
Kissimmee River
FDOT District 1
Highlands & Okeechobee
Counties, Florida



JOHNSON ENGINEERING, INC.
251 WEST HICKPOCHEE AVENUE
FORT MYERS, FLORIDA 33935-4757
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FAX (239) 334-3661
E.B. #642 & L.B. #642

Location Map
Florida Bonneted Bat Survey

DATE	PROJECT NO.	FILE NO.	SCALE	SHEET
March 2019	20160001-000	--	N/A	Figure 1

The FBB is the largest bat in Florida and is distinguished from the Brazilian free-tailed bat (*Tadarida brasiliensis*) by its larger size and the ears being joined at the midline of the head (FWS, 2013). The FBB's fur is short, glossy, and sharply bi-colored with a white lower portion of its hair shaft and variable coloration on the upper portion from black to brown to brownish-gray to cinnamon (FWS, 2013).

Understanding of the long-term habitat requirements of the FBB are limited. Foraging areas for the FBB are thought to be diverse and include fields, ball parks, golf courses, lakes, canals, streams, and wetlands. Analysis of fecal samples indicates that beetles (Coleoptera), flies (Diptera), and true bugs (Hemiptera) appear to be important prey items (FWS, 2013). Echolocation is used to detect prey 10 to 16 feet away (Belwood, 1992). Foraging flights can last hours and may occur at long distances from established roosts (FWS, 2013). The FBB produces loud calls easily recognizable by humans as they fly (Belwood, 1992). Free-tailed (Molossid) bats are known to be high fliers when foraging and acoustic surveys for FBBs should take this into consideration when positioning microphones for recording.

2.0 METHODOLOGY

2.1 Acoustic Survey Methodology

To date, the FWS has not formalized a standard FBB survey protocol for determining presence/absence, roost identification, or foraging activity. However, the July 2017 draft acoustic survey protocol for the FBB (Protocol) and Consultation Key ("Key") were utilized during the survey (FWS, 2017). Ecologists at Johnson Engineering, Inc. (JEI) have attended multiple acoustic bat surveying seminars and training courses by the Florida Bat Conservancy (FBC), Wildlife Acoustics, Inc., Dr. Bruce Miller and others to obtain training on equipment and methodologies that can be used to collect and analyze acoustic call data during FBB acoustic surveys. JEI ecologists have conducted numerous acoustic bat surveys since the FBB's listing using Wildlife Acoustics, SM3BAT and SM4BAT Full Spectrum (FS) ultrasonic bat detectors and stay abreast of the latest survey guidelines and advances in acoustic survey equipment and techniques by regularly participating in the Florida Fish and Wildlife Conservation Commission (FWC) FBB Working Group meetings and attending bat survey training courses.

The acoustic survey was conducted using two full spectrum SM4BAT acoustic detectors. All microphones were mounted on metal conduit to be above the shrub level. As shown in **Table 2-1**, each microphone was calibrated prior to deployment in accordance with manufacturer guidelines to ensure proper microphone sensitivity.

The FBB acoustic survey was conducted by JEI ecologists in one deployment at two different survey sites. **Figure 2** provides an aerial photograph and depicts the deployment location for each acoustic recorder. The location of the recorders and ultrasonic microphones was established to survey the entire project area (i.e., the right of way along the entire US 98 bridge) where bat foraging would be expected to be detected. Photo documentation of the detector deployments at the project is provided in **Appendix A**.

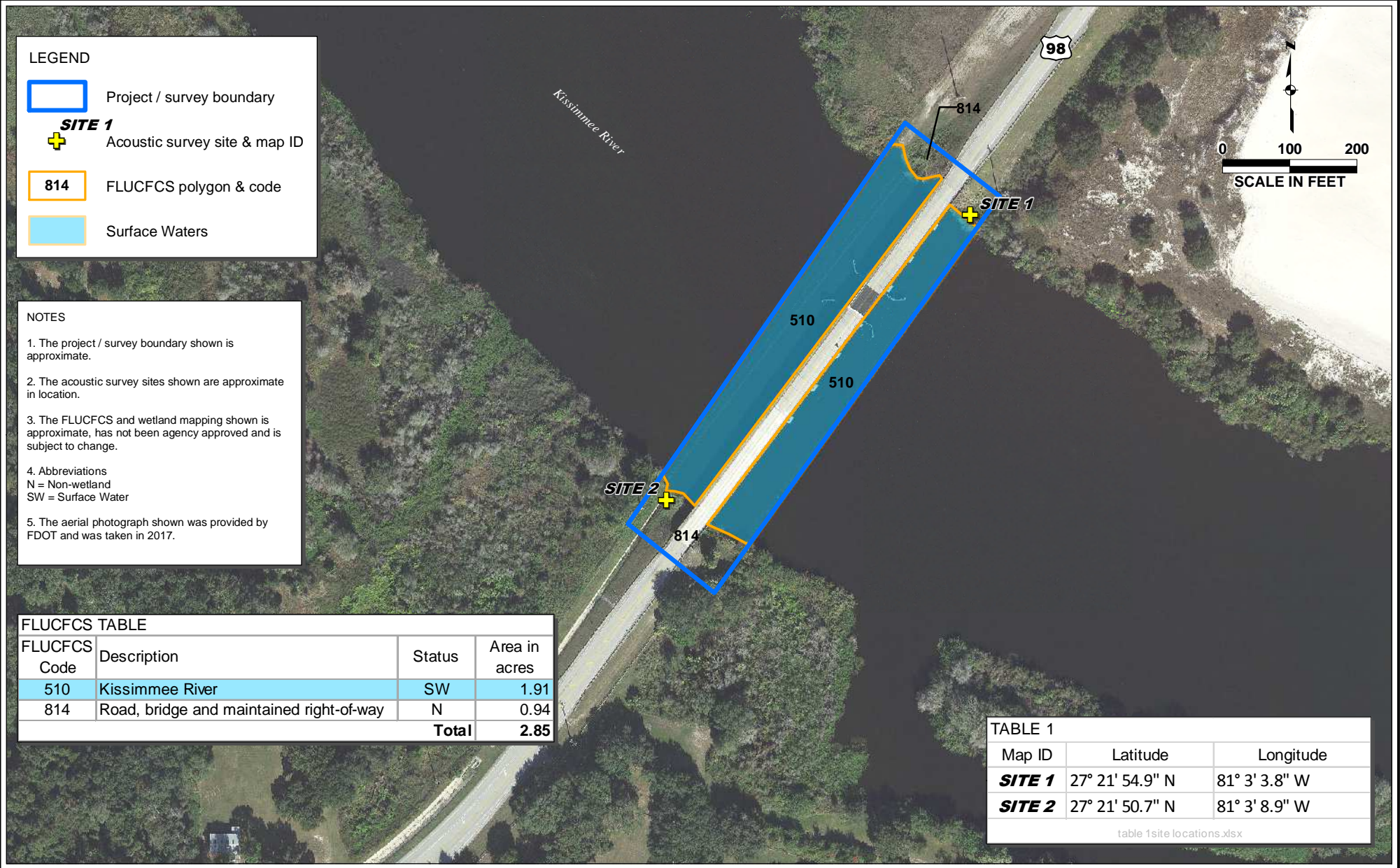
Passive sampling was conducted from approximately 35 minutes before sunset (19:45 hours) to at least 40 minutes after sunrise (07:15 hours) at the two selected survey sites. Each of the two survey sites was passively sampled for eight consecutive nights. Acoustic data collection commenced prior to sunset on February 21, 2019 and was terminated after sunrise on March 1, 2019.

Table 2-1. Ultrasonic Microphone Calibration

<u>Date</u>	<u>Detector</u>	<u>Microphone ID</u>	<u>Standard (dB)</u>	<u>Actual (dB)</u>	<u>Pass / Fail</u>
20-February-2019	6	MU104523	-38	-29.99	Pass
20-February-2019	7	MU106508	-38	-29.58	Pass

Following data collection, all call sequences were manually identified through visual comparison with a known library of bat calls. Calls were recorded using the full spectrum WAV file format in accordance with recommendations by the equipment manufacturer. The bottom call frequency range of the FBB is unique to this species and lies between 10-17 kilohertz (kHz). This unique frequency range is a valuable aid in identifying the presence of FBBs.

\\firms01\drawings\2016\20160001-000\Environmental\arcgis\US 98 bridge\bat maps\acoustic survey sites.mxd



LEGEND

- Project / survey boundary
- SITE 1**
+ Acoustic survey site & map ID
- 814 FLUCFCS polygon & code
- Surface Waters

NOTES

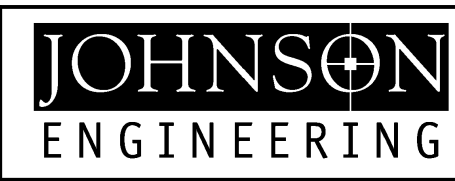
1. The project / survey boundary shown is approximate.
2. The acoustic survey sites shown are approximate in location.
3. The FLUCFCS and wetland mapping shown is approximate, has not been agency approved and is subject to change.
4. Abbreviations
N = Non-wetland
SW = Surface Water
5. The aerial photograph shown was provided by FDOT and was taken in 2017.

FLUCFCS Code	Description	Status	Area in acres
510	Kissimmee River	SW	1.91
814	Road, bridge and maintained right-of-way	N	0.94
Total			2.85

Map ID	Latitude	Longitude
SITE 1	27° 21' 54.9" N	81° 3' 3.8" W
SITE 2	27° 21' 50.7" N	81° 3' 8.9" W

table 1site locations.xlsx

US 98 Bridge at
Kissimmee River
FDOT District 1
Highlands & Okeechobee
Counties, Florida



JOHNSON ENGINEERING, INC.
251 WEST HICKPOCHEE AVENUE
FORT MYERS, FLORIDA 33935-4757
PHONE (863) 612-0594
FAX (239) 334-3661
E.B. #642 & L.B. #642

Acoustic Survey Sites Map

DATE	PROJECT NO.	FILE NO.	SCALE	SHEET
March 2019	20160001-000	--	As Shown	Figure 2

2.2 Acoustic Data Analysis

Full spectrum data was recorded on 32 and 64 gigabyte (GB) SD memory cards, downloaded and retained on an external hard drive. Data files were then converted to Zero Crossing (ZC) format using Kaleidoscope™ software provided by Wildlife Acoustics. Using the ZC file format, each data file was visually reviewed using Anlook software (Anabat™Systems). The program settings resulted in 6,916 recordings of 0.1 to 15 seconds in length that were reviewed for detection and subsequent identification of bat species recorded. A summary table was then created to list the number of total calls recorded, total number of FBB calls, percentage of FBB calls, survey begin and end dates, sampling start and end times, number of monitoring days per station, and sunset and sunrise time for the first sampling period at each survey site.

3.0 **RESULTS AND DISCUSSION**

3.1 **Summary of Results**

Tables 3-1 provides a summary of the acoustic survey results. Representative bat call sequences from each of the species recorded are provided in **Appendix B**. Nightly weather conditions during the survey are provided in **Appendix C**. A total of 6,916 call sequences from five (5) different bat species were recorded during 16 detector nights at the two acoustic survey sites. Based on call frequency and other characteristics, bat species identified during data analysis include the following:

- Northern yellow bat (*Lasiurus intermedius*) – **common**
- Brazilian free-tailed bat (*Tadarida brasiliensis*) – **common**
- Tricolored bat (*Perimyotis subflavus*) – **common**
- Big brown bat (*Eptesicus fuscus*) - **rare**
- Evening bat (*Nycticeius humeralis*) – **rare**

None of the 6,916 recordings were manually identified as potential FBB calls.

Table 3-1: Acoustic Survey Summary

Location	Latitude	Longitude	Total Recordings	Noise	Calls	FBB	% FBB
Site 1	27°21'54.9" N	81°3'3.8" W	6,301	2,227	4,084	0	0
Site 2	27°21'50.7" N	81°3'8.9" W	5,158	2,326	2,832	0	0
TOTALS:			11,459	4,543	6,916	0	0

Of greatest interest to FWS in searching for a roost site is the time of emergence from the roost shortly after sunset and returning to the same roost before sunrise. Based on communication with FWS South Florida Ecological Services Office staff, timing of acoustic survey calls is one parameter to identify potential roosting in an area (Halupa, pers. com.). Calls recorded within 1.5 hours after sunset or 1.5 hours before sunrise may suggest possible FBB roosting in an area, according to draft FWS guidelines. However, some experts disagree with this assertion based on the high speeds at which FBBs are known to fly and additional survey methods are typically required before an FBB roost identification can be verified.

Thus, an FBB may have a roost site several miles away even if recorded close to sunset or sunrise (Marks, pers. comm.).

Based on the absence of potential FBB call recordings over the 16 detector-night survey period, no evidence of FBB roosting or foraging usage was detected. If the bridge was actively used as an FBB roost site or a roost site was present in close proximity to the survey area, it would be expected that FBB calls would have been detected during the survey.

3.2 Conclusions and Effect Determination

The acoustic survey recorded a total of 6,916 bat call sequences with zero (0) identified as FBB calls. Based on the project size being less than 5 acres, absence of FBB call recordings during the 16 detector-night acoustic survey period, absence of “high FBB activity” or “high likelihood of FBB roosting” as defined in the FWS July 2017 draft survey protocol and Consultation Key, the project is expected to have “No Effect” on the FBB.

4.0 REFERENCES

- Belwood, J.J. 1992. Florida mastiff bat *Eumops glaucinus floridanus*. Pages 216-223 in S.R. Humphrey (ed.), Rare and endangered biota of Florida. Vol. I. Mammals. University Press of Florida. Gainesville, Florida.
- U.S. Fish and Wildlife Service. 2013. Endangered and Threatened Wildlife and Plants; Endangered Species Status for the Florida Bonneted Bat; Final Rule. 78 Fed. Reg. § 61004 (final rule October 2, 2013) (to be codified at 50 C.F.R. part 17).
- U.S. Fish and Wildlife Service. 2017. Florida Bonneted Bat Consultation Guidelines and Draft Survey Protocol. South Florida Ecological Service Office.

Appendix A
Photo Documentation



Photo 1 – Typical U1 ultrasonic microphone placement above the shrub zone using bracketed mount on cabbage palm at survey Site 1. Microphone is approximately 15 feet above ground and facing the US 98 bridge to reduce interference from vegetation and maximize potential number of recordings.



Photo 2 – Photo of acoustic survey Site 1, representative of the acoustic survey deployment location near the northeast portion of the US 98 bridge.

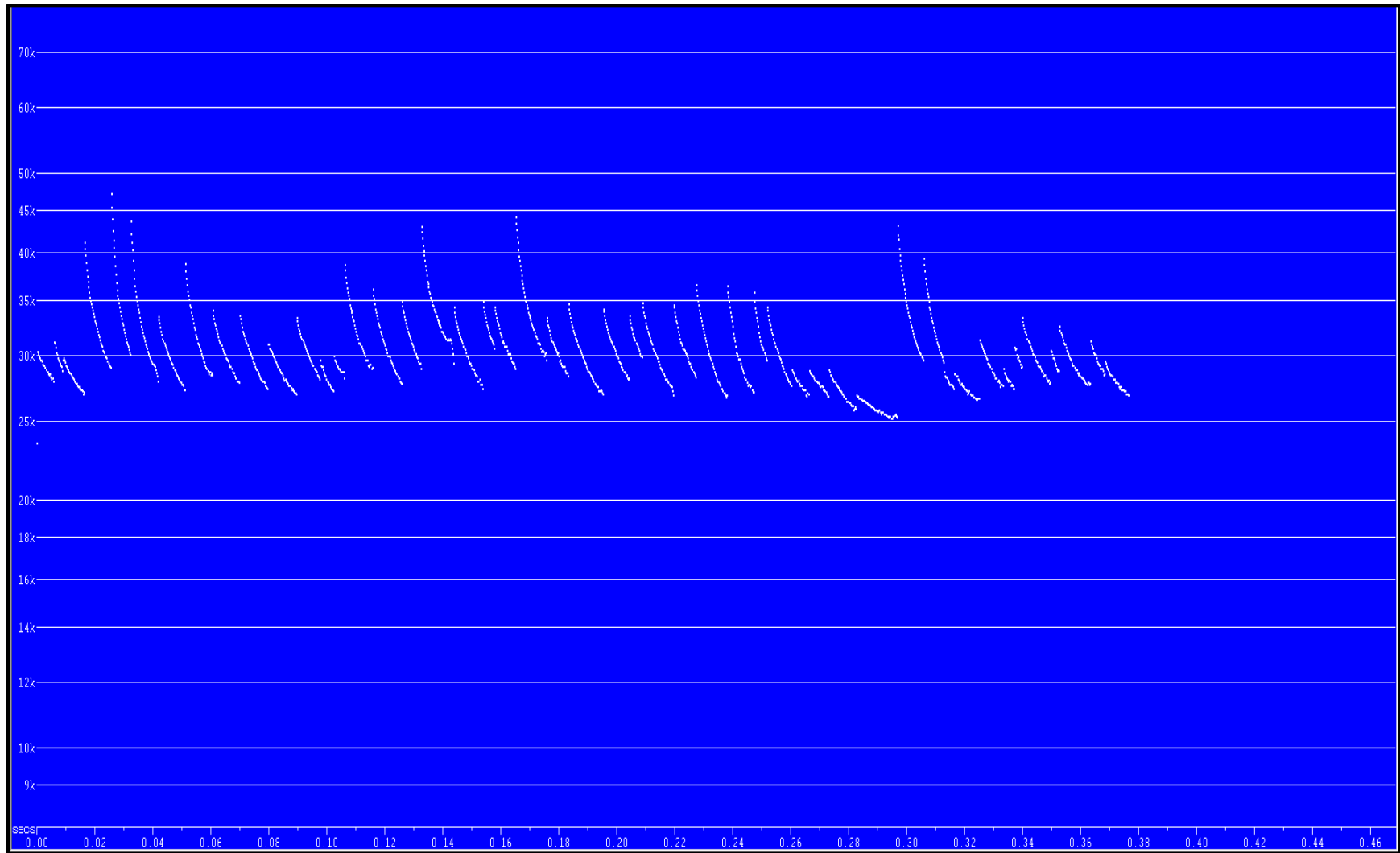


Photo 3 – U1 ultrasonic microphone placement above the shrub zone using bracketed mount on a fence pole at survey Site 2. Microphone is approximately 5 feet above ground (to minimize potential for equipment theft/vandalism) and facing open areas to reduce interference from vegetation and maximize potential number of recordings.

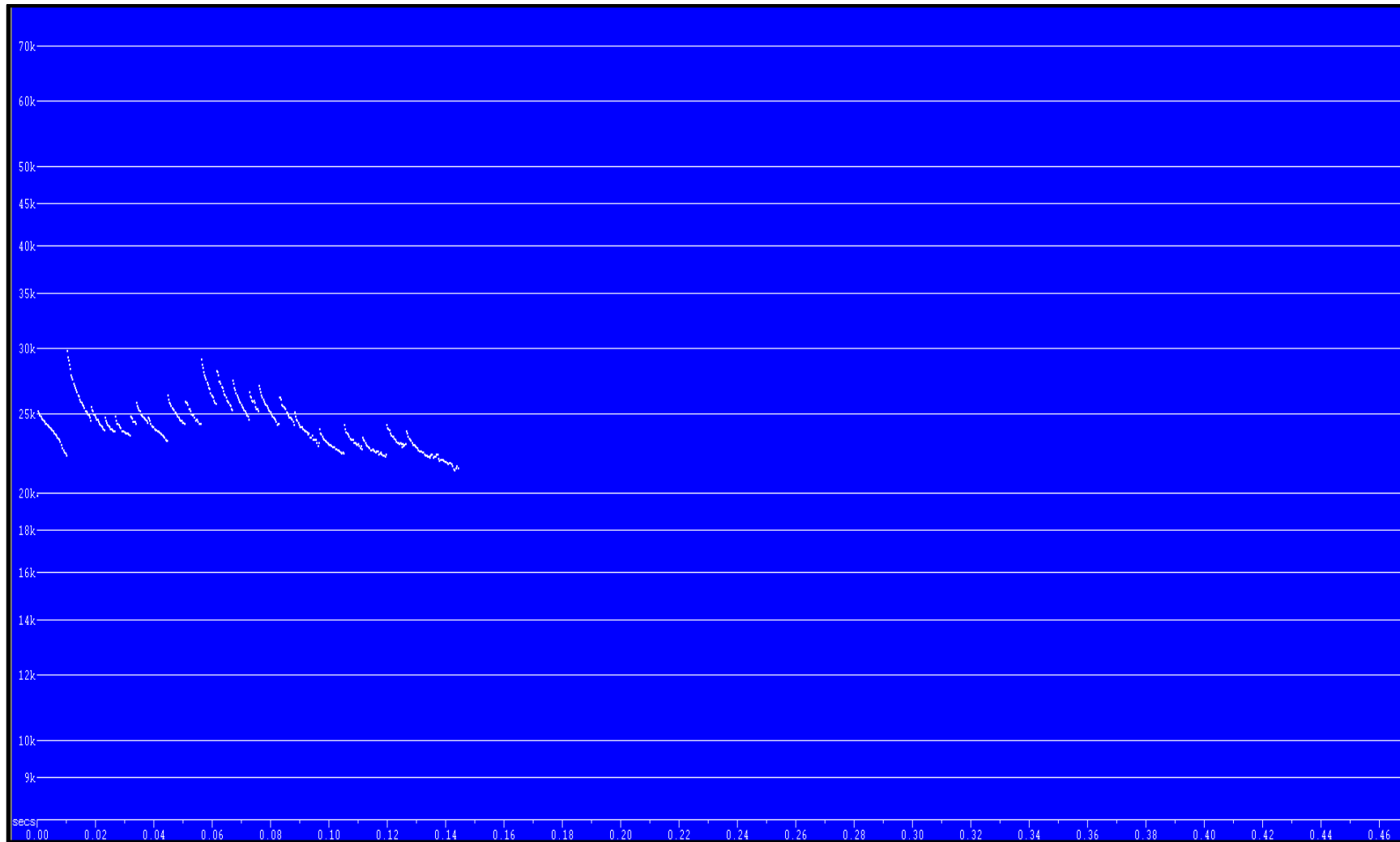


Photo 4 – Photo of acoustic survey Site 2 showing acoustic survey deployment location near the southwest portion of the US 98 bridge.

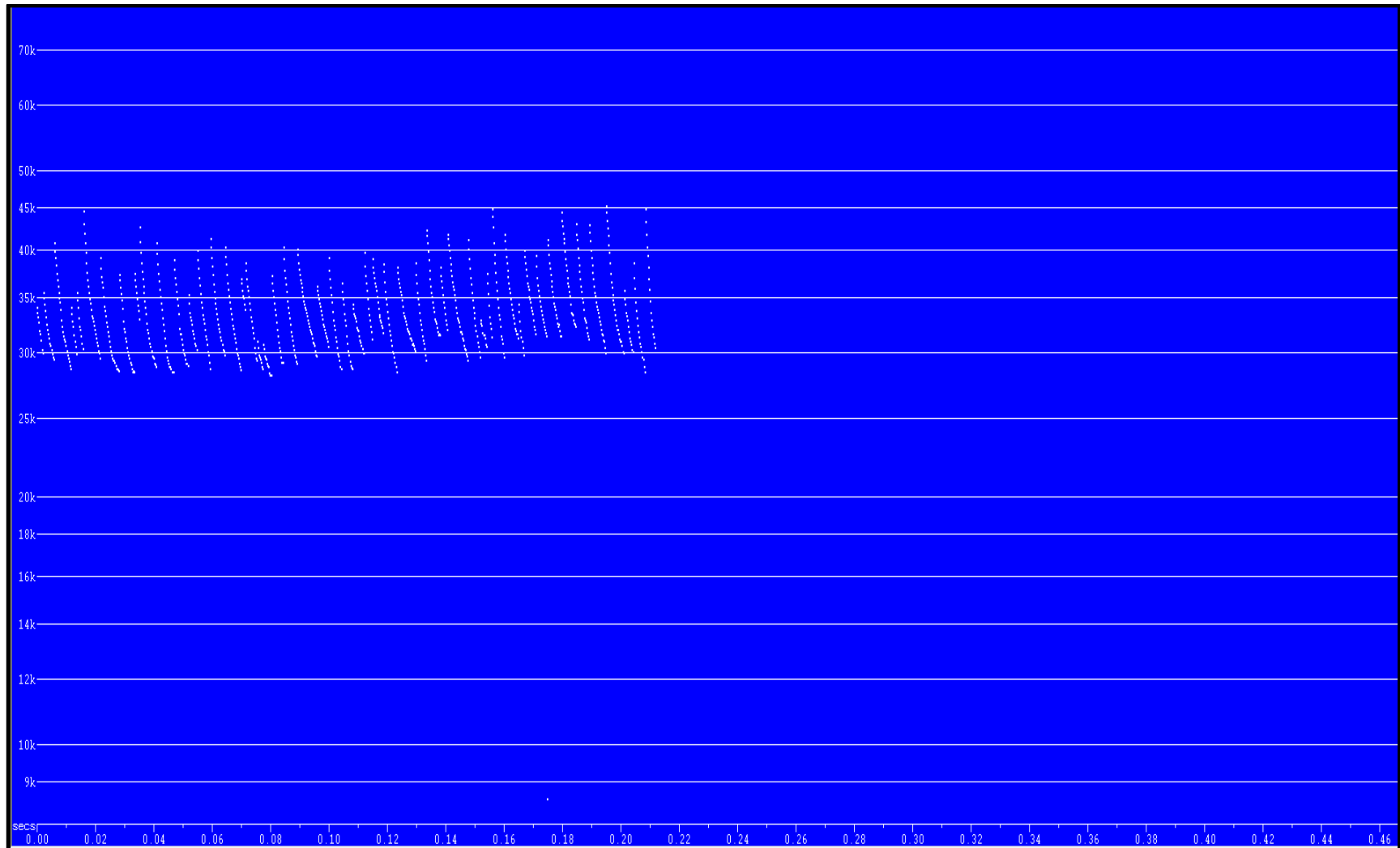
Appendix B
Bat Call Recording Samples



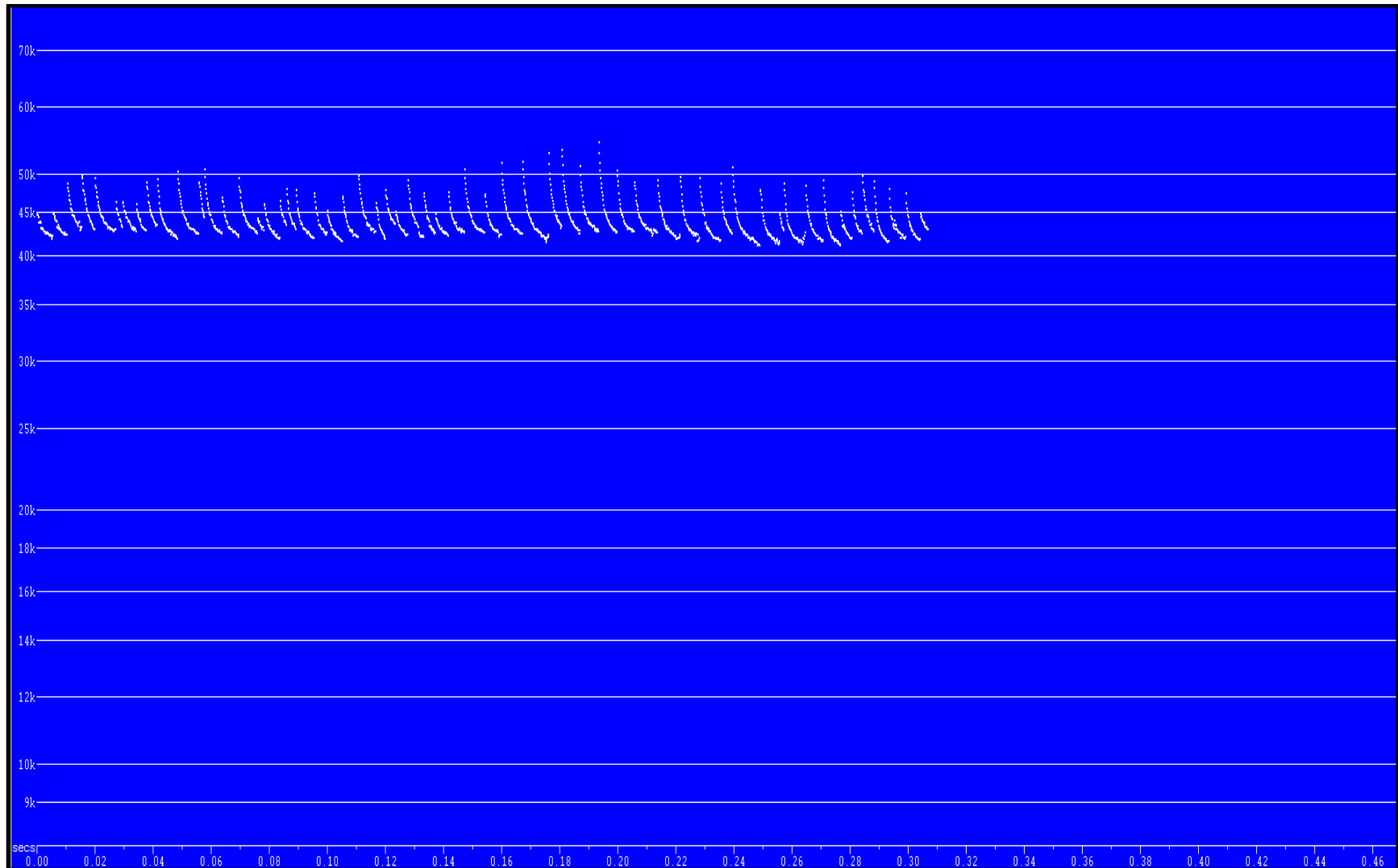
Call 1. Northern yellow bat (*Lasiurus intermedius*) recording (26 - 32 kHz), Site 1, 02/21/2019 at 22:02 hours.



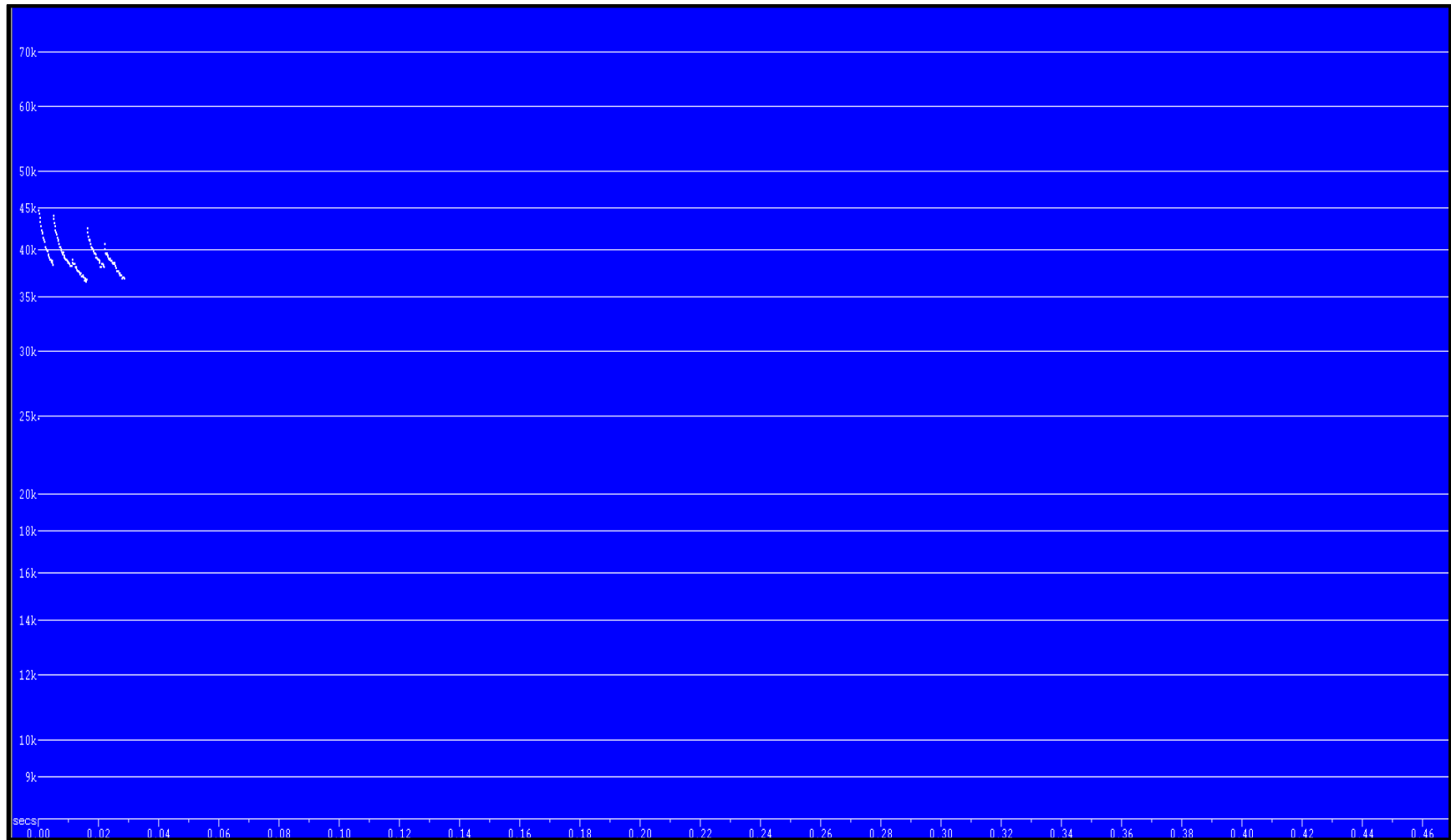
Call 2. Brazilian free-tailed bat (*Tadarida brasiliensis*) recording (22 – 26 kHz), Site 1, 02/21/2019 at 23:59 hours.



Call 3. Big brown bat (*Eptesicus fuscus*) recording (28 – 32 kHz), Site 2, 02/26/2019 at 22:56 hours.



Call 4. Tricolored bat (*Perimyotis subflavus*) recording (42 – 44 kHz), Site 2, 02/24/2019 at 00:56 hours.



Call 5. Evening bat (*Nycticeius humeralis*) recording (36 - 39 kHz), Site 2, 02/28/2019 at 23:34 hours.

Appendix C
Weather Conditions

Appendix C. Weather conditions during the first 5 hours of each survey night

Day	Temperatures <65° F during first 5 hours	Precipitation >30 minutes or continues intermittently	Sustained wind >9 mph for 30 minutes or more	# of potential FBB calls	Notes
21-Feb-19	N	N	N	0	Acceptable conditions
22-Feb-19	N	N	N	0	Acceptable conditions
23-Feb-19	N	N	N	0	Acceptable conditions
24-Feb-19	N	N	N	0	Acceptable conditions
25-Feb-19	N	N	N	0	Acceptable conditions
26-Feb-19	N	Periods of light rain from 1:15am - 4:15am. (Accumulated total of 0.03 inches)	N	0	No precipitation for first 4:35 minutes of survey, then technically exceeds suitable weather conditions per USFWS July 2017 draft survey protocol with trace rainfall beginning at 1:15am.
27-Feb-19	N	N	N	0	Acceptable conditions
28-Feb-19	Y	N	N	0	Temperatures met suitable conditions for first 2.5-hours, and exceeded suitable conditions (below 65° F) beginning 2.5 hours after survey start time.



Notes:

1. Weather conditions from Bassinger Grove West station (KFLOKEEC29).
2. Rows highlighted yellow identify survey nights that exceed suitable weather conditions as per the USFWS draft survey protocol.

Attachment F: Protected Species Map

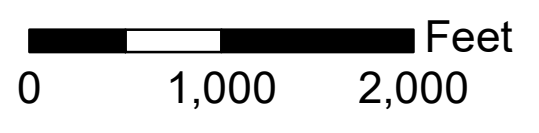


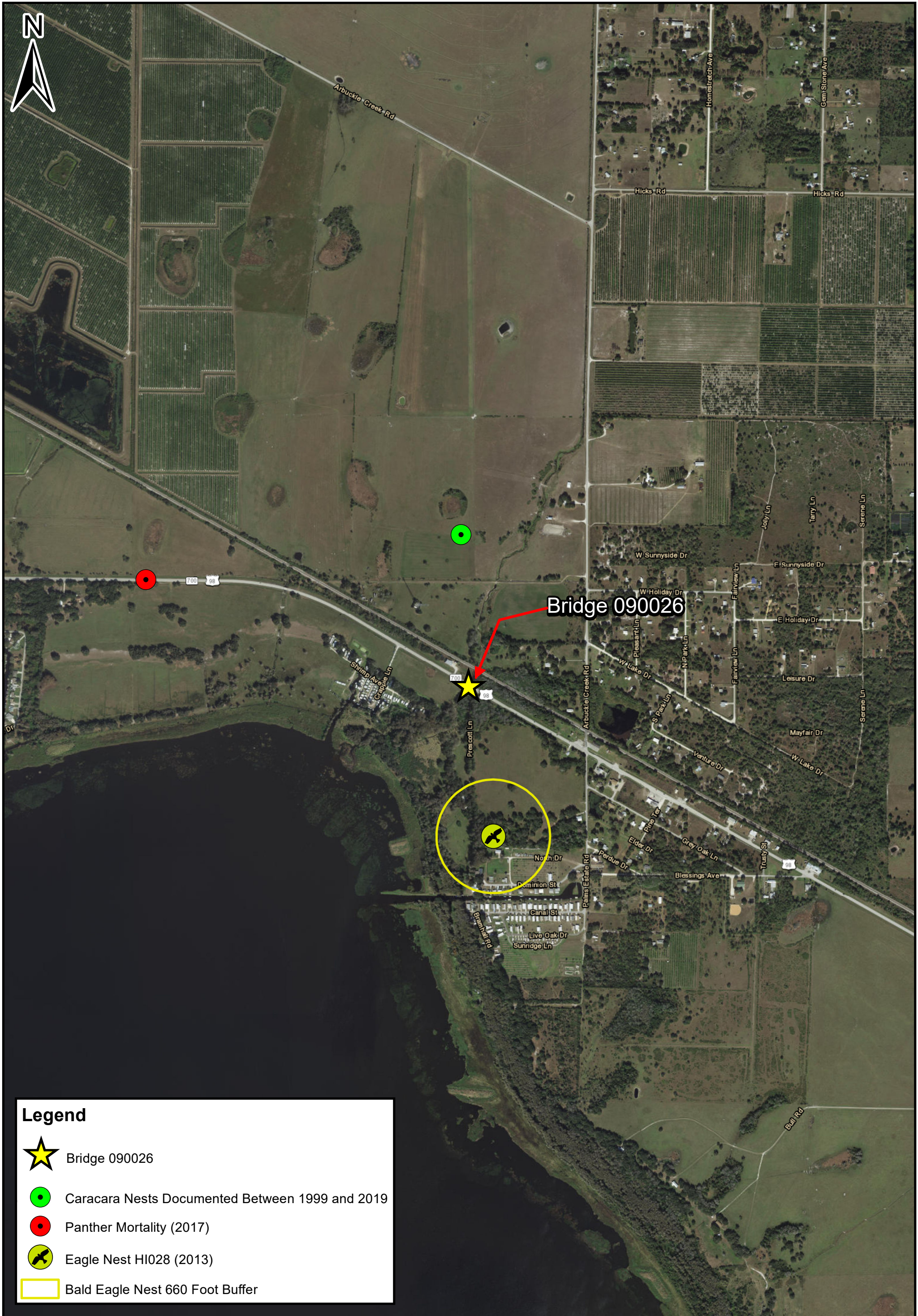
Legend

-  Bridge 090016
-  Caracara Nests Documented Between 1999 and 2019








Highlands County Substructure
Repairs at Various Locations
Bridge 090016
FPID: 437962-1-52-01
Protected Species Map



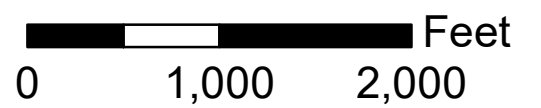


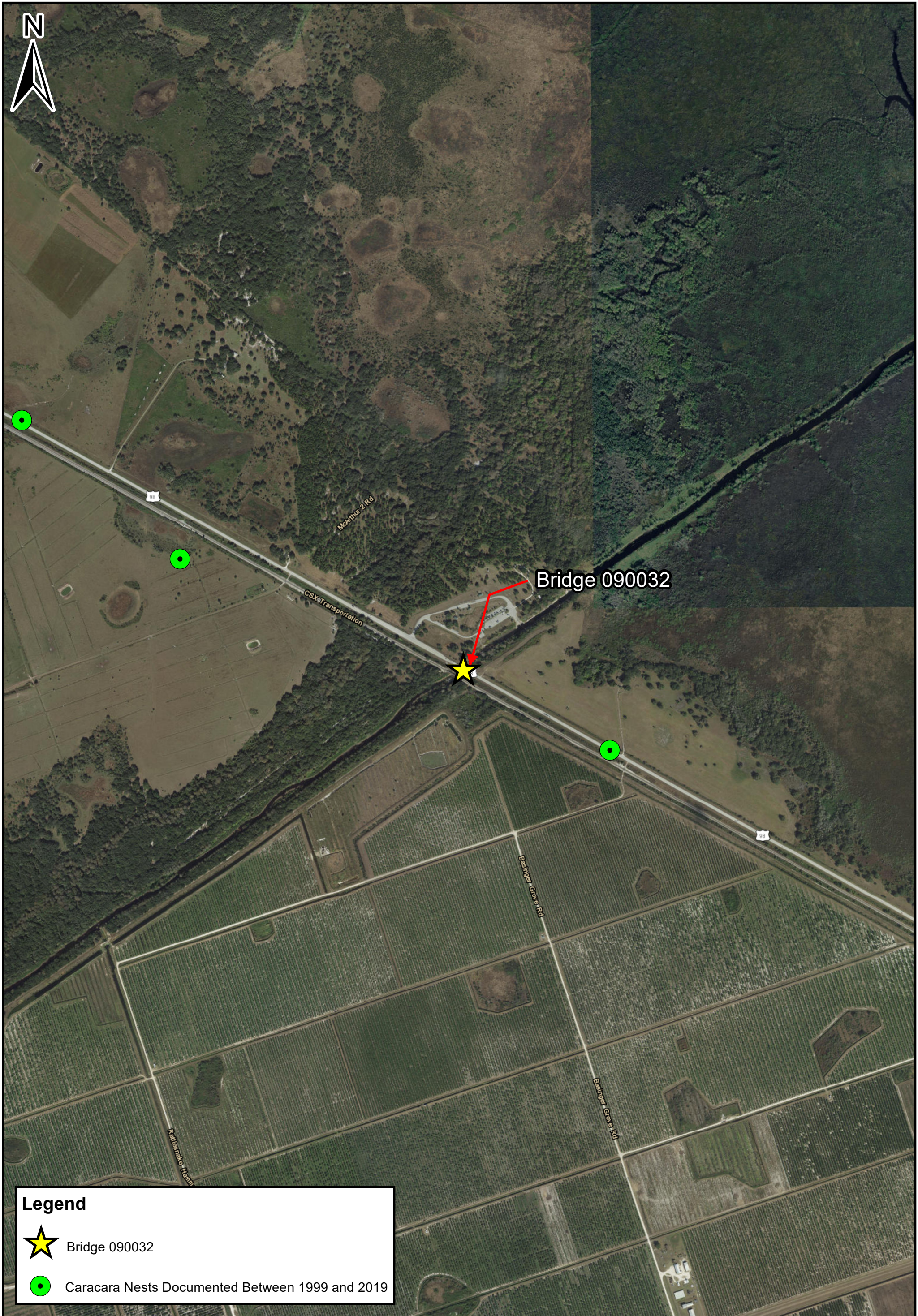
Legend

-  Bridge 090026
-  Caracara Nests Documented Between 1999 and 2019
-  Panther Mortality (2017)
-  Eagle Nest HI028 (2013)
-  Bald Eagle Nest 660 Foot Buffer





Highlands County Substructure
Repairs at Various Locations
Bridge 090026
FPID: 437962-1-52-01
Protected Species Map





Legend

-  Bridge 090032
-  Caracara Nests Documented Between 1999 and 2019



Highlands County Substructure
Repairs at Various Locations
Bridge 090032
FPID: 437962-1-52-01
Protected Species Map

