

# **PROTECTED BAT SPECIES SURVEY REPORT**

**Northern Long-eared Bat  
Research Project  
Eastern North Carolina  
Spring and Summer 2019  
Phase VII**

**TIP No. R-9999  
WBS No. 34634.1.4**

**Prepared for**



The North Carolina Department of Transportation  
Project Development and Environmental Analysis Branch  
Natural Environment Section  
1598 Mail Service Center  
Raleigh, NC 27699-1598  
(919) 707-6000

**December 2019**

**Prepared by**

**VHB Engineering NC, P.C.**



Venture I  
940 Main Campus Drive,  
Suite 500  
Raleigh, NC 27606

Contact:  
Dottie Brown  
dottiebrown@vhb.com  
828-244-1898

## TABLE OF CONTENTS

1.0 PROJECT DESCRIPTION .....	1
2.0 SPECIES INFORMATION.....	1
3.0 QUALIFICATIONS .....	1
4.0 METHODOLOGY .....	2
4.1 Mist-Net Surveys .....	2
4.2 Radio Tracking.....	3
4.3 Roost Inspection/Emergence Surveys .....	3
4.4 Habitat Characterization .....	3
5.0 FINDINGS .....	4
5.1 Mist-Net Sites and Habitat Descriptions.....	4
5.1.1 – Camden County.....	4
5.1.2 – Currituck County .....	7
5.2 MYSE Capture Site Results and Habitat Descriptions.....	7
5.2.1 – North River Game Land within Camden County .....	8
5.2.2 – North River Game Land within Currituck County .....	8
5.3 Summary of Findings – Mist-Net Captures .....	9
5.4 – Wing Punches, Hair Samples, and Swabs .....	12
5.5 - MYSE Roost Site Habitat Descriptions.....	13
5.5.1 - MYSE 150.502 Roosts A-E, Camden County .....	13
5.5.2 – MYSE 150.500 Roosts A-D, Camden County .....	13
5.5.3 – MYSE 150.945 Roosts A & B, Camden County .....	13
5.5.4 – MYSE 150.543 Roosts A-H, Currituck County.....	14
5.5.5 – MYSE 150.705 Roost A, Currituck County.....	14
5.5.6 – MYSE 150.623 Roosts A-H, Currituck County.....	14
5.5.7 – MYSE 150.982 Roosts A-C, Currituck County .....	14
5.5.8 – MYSE 150.901 Roosts A & B, Currituck County.....	15
5.6 Summary of Findings - Radio Tracking, Roosts, and Emergence Surveys .....	15
5.7 Habitat Characterization Results .....	18
6.0 DISCUSSION .....	19
7.0 REFERENCES.....	22

### LIST OF TABLES and CHARTS

Table 1 – Mist-Net Site Summary 2019 – North River Game Land within Camden County .....	6
Table 2 – Mist-Net Site Summary 2019 – North River Game Land within Currituck County .....	7
Table 3 – Mist-Net 2019 Capture Summary in Camden County .....	9
Table 4 – Mist-Net 2019 Capture Summary in Currituck County.....	10
Table 5 – Total MYSE Captured.....	10
Table 6 – Captured MYSE Female and Reproductive Status.....	11
Chart 1 – Captured MYSE Female Reproductive Status .....	12
Table 7 – Wing Punches, Hair Samples, and WNS Swabs – North River Game Land 2019.....	13
Table 8 – MYSE Tracking, Roost, & Emergence Summary .....	16
Table 9 – MYSE Capture Site to Roost Distance .....	17
Table 10 – Mist-Net Site Habitat Analysis.....	18
Table 11 – Habitat Analysis for Roost Trees.....	19

## FIGURES

- Figure 1. Project Location Map
- Figure 2. Survey Area, Camden & Currituck Counties Map
- Figure 3. Historical Northern Long-eared Bat Captures and Roost Camden County-Index
- Figure 3a. Historical Northern Long-eared Bat Captures and Roost Camden County Map
- Figure 4. Historical Northern Long-eared Bat Captures and Roost Currituck County-Index
- Figure 4a. Historical Northern Long-eared Bat Captures and Roost Camden County Map
- Figure 5. Mist-Net Survey & NLEB Capture Sites 2019, Camden County-Index
- Figure 5a. Mist-Net Survey & NLEB Capture Sites 2019, Camden County Map
- Figure 5b. Mist-Net Survey & NLEB Capture Sites 2019, Camden County Map
- Figure 5c. Mist-Net Survey & NLEB Capture Sites 2019, Camden County Map
- Figure 5d. Mist-Net Survey & NLEB Capture Sites 2019, Camden County Map
- Figure 6. Mist-Net Survey & NLEB Capture Sites 2019, Currituck County-Index
- Figure 6a. Mist-Net Survey & NLEB Capture Sites 2019, Camden County Map
- Figure 6b. Mist-Net Survey & NLEB Capture Sites 2019, Camden County Map
- Figure 7. Northern Long-eared Bat Roost Tree Sites 2019, Camden County – Index
- Figure 7a. Northern Long-eared Bat Roost Tree Sites 2019, Camden County Map
- Figure 7b. Northern Long-eared Bat Roost Tree Sites 2019, Camden County Map
- Figure 7c. Northern Long-eared Bat Roost Tree Sites 2019, Camden County Map
- Figure 8. Northern Long-eared Bat Roost Tree Sites 2019, Currituck County – Index
- Figure 8a. Northern Long-eared Bat Roost Tree Sites 2019, Currituck County Map
- Figure 8b. Northern Long-eared Bat Roost Tree Sites 2019, Currituck County Map
- Figures 9a-c. NLEB Capture Site to Roost Distances, Camden County Map
- Figures 10a-e. NLEB Capture Site to Roost Distances, Currituck County Map

## APPENDICES

- Appendix A Mist-Net Site Photographs
- Appendix B Habitat Photographs
- Appendix C Representative Captured Bat Species Photographs
- Appendix D Representative Captured MYSE Photographs
- Appendix E MYSE Roost Photographs
- Appendix F Other Representative Photographs
- Appendix G Mist-Net Data Sheets
- Appendix H MYSE Tracking, Roost, and Emergence Data Sheets
- Appendix I Agency Coordination Emails

## DIGITAL ENCLOSURES

### OVERALL:

GIS data and tables of mist-net, MYSE captures, and MYSE roosts (Shapefiles), and copies of agency reports and year-end permit reports

## 1.0 PROJECT DESCRIPTION

The North Carolina Department of Transportation (NCDOT) requested VHB Engineering NC, P.C. (VHB) to assist in conducting portions of a research study of the northern long-eared bat (*Myotis septentrionalis*, or MYSE) in eastern North Carolina. Mist-net surveys were conducted in the North Carolina Wildlife Resources Commission (NCWRC) North River Game Land (N. River Game Land) located within Camden and Currituck Counties (Figures 1 & 2). The objectives of the study were:

- Conduct mist-netting and radio telemetry on pregnant/lactating MYSE to locate and characterize day roosts during the maternity season, and
- Determine the timing of the maternity season for this unique population of MYSE.

This report includes results of 18 mist-net surveys (also referred to as crew nights), eight MYSE tracked, and 30 emergence surveys; all occurring between April 23<sup>rd</sup> to June 26<sup>th</sup>, 2019. Referencing historical data (Figures 3, 4, & 4a) VHB biologists selected and conducted mist-net surveys at nine sites (seven in Camden and two in Currituck), all located within the N. River Game Land boundary (Figures 5, 5a-d, 6, & 6a-b). Site numbers and their respective counties are listed below. Results and detailed site descriptions, conditions, and survey dates are presented in Tables 1-4.

### Spring/Summer 2019:

1. Camden County; seven sites (Sites NR2, NR3, NR5, NR6, NR7, NR8, and NR9)
2. Currituck County; two sites (Sites NR1 and NR4)

All surveys were conducted within suitable roosting and foraging habitat for MYSE and were conducted by qualified bat biologists currently permitted by the US Fish and Wildlife Service (USFWS) and the NC Wildlife Resources Commission (NCWRC). Special use permits were obtained for access and work on the N. River Game Land. Mist-netting was conducted with the goal of catching pregnant or lactating MYSE. Captured pregnant or lactating MYSE were fitted with transmitters and subsequently tracked to locate roosts. Emergence counts were performed following USFWS protocols when roost sites were considered safe and when weather conditions allowed.

## 2.0 SPECIES INFORMATION

The northern long-eared bat (MYSE) has been listed since 2015 as threatened with a final 4d rule in 2016. Historically, North Carolina's coastal areas were well outside of the predicted distribution for MYSE. Since the first documentation in 2007 of a MYSE in Washington County, results from focused research have supported a range change or update to include coastal NC, and that a reproductive population is currently present. Although there have been numerous new records (captures) and proof of over-winter activity, no confirmed maternity roosts had been previously documented in coastal NC.

## 3.0 QUALIFICATIONS

In addition to field surveys and data analysis, VHB staff provided project administration, coordination, quality assurance, field support, and deliverable preparation on this contract. All surveys were conducted by qualified biologists authorized to perform bat surveys under applicable USFWS and NCWRC permits.

Dottie Brown served as Project Manager and Principal Investigator on this project, leading efforts pertaining to site selection, mist-net, radio tracking, roost and emergence surveys. Dottie also oversaw data analysis and report writing for this project. Dottie holds a Federal USFWS Section

10 permit (TE94704A-2) as well as a NCWRC (19-ES00367) Scientific Collection permit. She has 13 years of experience performing bat surveys in the southeastern United States, Central America, and Africa, utilizing techniques such as pit tagging, emergence surveys, acoustic surveys, harp traps and mist-nets, radio telemetry, roost surveys, and hibernacula surveys. Since 2015, Ms. Brown has conducted numerous surveys for MYSE in the Coastal Plains of North and South Carolina.

Lane Sauls served as Contract Manager. His experience includes 25 years working in the natural resources field as Project Scientist, Project Manager, and Contract Manager for numerous projects across North Carolina.

David Cooper assisted with tracking, habitat characterization, report preparation, and quality assurance. David has 20 years of work experience in the natural resources field, including four years of experience assisting with bat surveys.

## 4.0 METHODOLOGY

This section describes the methods used to perform mist-net, tracking, and emergence surveys. Survey methodology followed procedures and protocols set forth by the 2019 NCDOT Project Scope (Scope) and the USFWS 2019 Range-Wide Indiana Bat Summer Survey Guidelines (USFWS 2019). All surveys adhered to the protocols stipulated in the USFWS National White Nose Syndrome Decontamination Protocol (USFWS 2018), NC's White-nose Syndrome Surveillance and Response Plan (NCWRC 2013), and NC Department of Transportation's (NCDOT) Decontamination Protocol (NCDOT 2014). Due to previous coordination with the USFWS, site-specific survey plans were not required.

### 4.1 Mist-Net Surveys

Mist-net surveys were performed with the goal of capturing pregnant or lactating MYSE in Camden and Currituck Counties within the N. River Game Land. The most suitable mist-net sites for the target species were selected by permitted bat ecologist Dottie Brown. Net deployments were individually tailored to specific available habitats and flight corridors, and configurations utilized combinations of nets sized between four and eighteen meters in length, single or stacked between one net panel and three net panels in height. Between five and nine net sets were deployed at each survey site per calendar night of mist-net surveys. Each mist-net site was photographed and GPS-located. Figures 5, 5a-d, 6, & 6a-b depict the sites of mist-net sites. Surveys were completed for a minimum of 5.0 hours each night and individual nets were checked every eight to ten minutes. NCDOT mist-net data sheets, which also require documentation of all information contained in the USFWS Sample Data Sheet for Indiana Bat Surveys (USFWS 2019), were used to record mist-net site and capture data.

Under the direction of the lead biologist, a tissue sample (3-mm biopsy punch or wing punch) was taken from the plagiopatagium of each wing on all captured MYSE that were not fitted with transmitters. In addition, hair samples for DNA and swabs for the detection of *Pseudogymnoascus destructans* (Pd), a fungus and the causative agent of White Nose Syndrome (WNS) were collected per the request of W. Mark Ford PhD with the Virginia Polytechnic Institute and State University (Virginia Tech) in Blacksburg, Virginia.

## 4.2 Radio Tracking

The initial scope requested that up to six healthy, visually-pregnant or lactating female MYSE were approved for attachment of transmitters. Through coordination with USFWS and NCDOT during the course of radio tracking, approval was given to replace two tracked bats (150.502 and 150.705) with two additional bats. VHB ultimately attached transmitters to a total of eight MYSE. MYSE 150.502 was captured and fitted with a transmitter on April 25<sup>th</sup>, 2019. Since MYSE 150.502 was in the very early stages of pregnancy, with a less than 100% confidence in diagnosis, tracking efforts may have not provided a maternity roost. MYSE 150.705 was captured on May 7<sup>th</sup>. One emergence was conducted on her roost tree on May 8<sup>th</sup> and she did not emerge during the survey. On May 9<sup>th</sup>, she was found deceased of unknown causes in her roost. In both instances, NCDOT and USFWS approved replacing MYSE 150.502 and 150.705 with another bat.

Holohil Systems Ltd. LB-2X 12-day radio transmitters in the 150-frequency range were attached on all eight MYSE. Transmitter attachment adhered to methodology described in the 2019 Range-wide Indiana Bat Summer Survey Guidelines (USFWS 2019). Bats were tracked daily for a minimum of 12 days to locate the diurnal roost, unless the transmitter failed or was dropped. Radio tracking was performed primarily by pedestrian means using a handheld three or five-element antenna. In the event a transmitter signal was lost, methods used to relocate the signal included expanded pedestrian transects and vehicular transects using an elevated, pole-mounted five-element antenna. NCDOT, USFWS, NCWRC, and N. River Game Land biologist were notified within 24 hours in the event a transmitter was attached to a MYSE. Copies of agency coordination emails can be found in Appendix I.

## 4.3 Roost Inspection/Emergence Surveys

Roost documentation was conducted utilizing the USFWS Emergence Survey Datasheet (USFWS 2019). Each roost was photographed and GPS-located. Figures 7 a-c and 8a-b depict the sites of roosts documented in each county. Emergence counts were performed at each roost within the parameters of the agreed-upon scope, to include:

- The emergence count duration was from one-half hour before dusk to one hour after dusk.
- Bats exiting the roost were counted in five-minute intervals.
- Emergence counts were not performed at every roost for every bat due to unsafe conditions (location of roost or bears), rain, or high winds.

## 4.4 Habitat Characterization

Prior to performing field surveys, a desktop Geographic Information System (GIS) assessment using the most recent available color aerials of the study area was performed to determine availability of potentially suitable habitat for MYSE. This information was utilized to guide preliminary site selection. A pre-netting site visit was conducted March 14<sup>th</sup> and 15<sup>th</sup> to select and finalize mist-net site sites.

Habitat at each mist-net site was characterized by community type as described in *The Guide to the Natural Communities of North Carolina, Third Approximation* (Schafale, 1990). In addition, each mist-net site's habitat was scored as either:

- 1) pine/hardwood/mixed/unforested;
- 2) upland/bottomland;
- 3) managed (thinned, burned, or pine plantation)/unmanaged;

- 4) mature forest/ <20 years old forest or cutover; or, natural (>50% wooded), rural (>50% agricultural land)/mixed (primary land use is not wooded or agricultural) with
- 5) clutter estimates as either,
  - (1) sparse/no, <10% cover;
  - (2) low, 10-39% cover;
  - (3) medium, 40-75% cover;
  - (4) high, >75% cover

For each documented MYSE roost, a USFWS Indiana Bat Roost data sheet was completed and habitat was characterized by community type.

## 5.0 FINDINGS

This section describes the results of habitat assessments, mist-net surveys and captures, tracking efforts, and roost documentation and emergence surveys during Spring/Summer (April 23<sup>rd</sup> to June 26<sup>th</sup>) 2019.

### 5.1 Mist-Net Sites and Habitat Descriptions

Mist-net sites were selected based on the availability of suitable habitat for MYSE, proximity to foraging areas and flight corridors, and historical capture data. During the 2019 Phase VII Spring/Summer session, mist-net surveys were conducted at seven sites in Camden County, and two sites in Currituck County, accounting for a total of 18 crew nights. Seven sites in Camden County were sampled for 14 crew nights and two (2) sites in Currituck County were sampled for four (4) crew nights. On average, four to nine nets were deployed per night. Mist-net sites are described in the following sections. Additional mist-net site data and dates sampled are presented in Tables 1, 2, 3, and 4. Please refer to Figures 5 a-d and 6 a-b for mist-net sites.

#### 5.1.1 – Camden County

**Mist-Net Site NR 2-Camden** is in the southeastern portion of N. River Game Land. Nets were placed in a curve of a gated forest access road off Sassafras Lane and Indian Isle Road near Shiloh, NC. The net site location is at approximately 36.27885°, -75.990072°. This site was situated in a mixed pine and hardwood bottomland forest surrounded by a larger Cypress Gum Swamp. This community type consists of a canopy of loblolly pine (*Pinus taeda*), red bay (*Persea borbonia*), red maple (*Acer rubrum*), sweetgum (*Liquidambar styraciflua*), swamp laurel oak (*Quercus laurifolia*), sweetbay magnolia (*Magnolia virginiana*), and tulip poplar (*Liriodendron tulipifera*). The understory is partially open and includes wax myrtle (*Morella cerifera*), fetterbush (*Lyonia lucida*), vaccinium (*Vaccinium* spp.), giant cane (*Arundinaria gigantea*), and greenbrier (*Smilax* spp.). The community type in proximity to the mist-net site is identified as Cypress Gum Swamp (Blackwater Subtype).

**Mist-Net Site NR 3-Camden** is in the southeastern portion of N. River Game Land. Nets were placed along a straight stretch of a gated forest access road off Sassafras Lane and Indian Isle Road, near Shiloh, NC. The net site location is at approximately 36.271414°, -75.989225°. The site was situated in a mixed pine and hardwood bottomland forest surrounded by a larger Cypress Gum Swamp. This community type includes a canopy of red maple, tulip poplar, loblolly pine, sweetgum, and red bay. The understory is partially open and consists of wax myrtle, fetterbush, vaccinium, and greenbrier. The community type in proximity to the mist-net site is Cypress Gum Swamp (Blackwater Subtype).

**Mist-Net Site NR 5-Camden** is also located in the southeastern portion of N. River Game Land. Nets were placed along the road at the intersection of Sassafras Lane and a gated forest access road. The net site

location is at approximately 36.279770°, -75.998350°. The site was situated in a mixed pine and hardwood bottomland forest surrounded by a larger Cypress Gum Swamp. This community type includes of a canopy of water oak (*Quercus nigra*), sweetgum, red maple, water tupelo (*Nyssa aquatica*), and loblolly pine. The understory species are fetterbush, large gallberry (*Ilex coriacea*), greenbrier, wax myrtle, and giant cane. Community types in proximity to the mist-net site include Nonriverine Wet Hardwood Forest and Cypress Gum Swamp (Blackwater Subtype).

**Mist-Net Site NR 6-Camden** is in the southern portion of N. River Game Land near the Indian Trail impoundment ponds. Nets were placed along Indian Trail road and at the intersection of Indian Trail Road and two gated forest access roads. The net site location is at approximately 36.28535°, -75.98419°. The site was situated in a bottomland mixed pine and hardwood forest surrounded by a large Cypress Gum Swamp. This community type includes a canopy of swamp chestnut oak (*Quercus michauxii*), sweetgum, red maple, loblolly pine, slippery elm (*Ulmus rubra*), black oak (*Quercus velutina*), Atlantic white cedar (*Chamaecyparis thuyoides*), and red cedar (*Juniperus virginiana*). The understory includes species typical of peatland communities, including fetterbush, wax myrtle, greenbrier, and giant cane. Community types in proximity to the mist-net site include Cypress Gum Swamp (Blackwater Subtype) and managed loblolly pine.

**Mist-Net Site NR 7-Camden** is in the southern portion of N. River Game Land. Nets were placed along Sassafras Lane/Indian Trail Road. The net site location is at approximately 36.28543°, -75.99110°. The site is within a mix of upland and bottomland, unmanaged/ mature, natural, forest with approximately 40-75% cover. This mixed pine and hardwood forest along the road bordered by a large Cypress Gum Swamp. This community type includes a canopy of water oak, sweetgum, red maple, water tupelo, slippery elm, swamp chestnut oak, red bay, loblolly bay, pond pine (*Pinus serotina*), and loblolly pine. The understory contains fetterbush, large gallberry, wax myrtle, greenbrier, and giant cane. The community type in proximity to the mist-net site is Nonriverine Swamp Forest.

**Mist-Net Site NR 8-Camden** is in the southern portion of N. River Game Land. Nets were placed along Sassafras Road which runs between an upland and bottomland unmanaged forest with approximately 40-75% cover. The net site location is at approximately 36.27193°, -76.02613°. The site was situated in a mix of upland and bottomland, mature pine and hardwood bottomland forest surrounded by a large Cypress Gum Swamp. This community type consists of a canopy of water oak, sweetgum, bald cypress (*Taxodium distichum*), tulip poplar, black willow (*Salix nigra*), water tupelo, and loblolly pine. The understory includes fetterbush, wax myrtle, and giant cane. Community types in proximity to the mist-net site include Nonriverine Swamp Forest and Cypress Gum Swamp (Blackwater Subtype).

**Mist-Net Site NR 9-Camden** is in the southern portion of N. River Game Land along a gated forest road near Sassafras Lane. Nets were placed at approximately 36.27338°, -75.98689°. The site was situated in a mix of upland and bottomland, pine and hardwood forest along the road bordered by a large Cypress Gum Swamp. This community type includes a canopy of sweetgum, red maple, water tupelo, bald cypress, loblolly bay, and loblolly pine. The understory contains fetterbush, large gallberry, vaccinium, wax myrtle, and giant cane. The community type in proximity to the mist-net site is Cypress Gum Swamp (Blackwater Subtype).

**Table 1 – Mist-Net Site Summary 2019 – North River Game Land within Camden County**

<u>Site #</u>	<u>Lat, Long</u>	<u>County</u>	<u>Community Type (per Schafale 1990, unless otherwise noted)</u>	<u>Date</u>	<u>Comments</u>
NR 2	36.27885°, -75.990072°	Camden	Cypress Gum Swamp (Blackwater Subtype)	4/23/2019	No MYSE captured
				4/24/2019	No MYSE captured
				6/22/2019	2 MYSE captured both juveniles
NR 3	36.271414°, -75.989225°	Camden	Cypress Gum Swamp (Blackwater Subtype)	4/25/2019	2 MYSE captured 1 fitted with transmitter 150.502
				4/27/2019	2 MYSE captured
				4/28/2019	No MYSE captured
NR 5	36.279770°, -75.998350°	Camden	Cypress Gum Swamp (Blackwater Subtype)	5/15/2019	No MYSE captured
NR 6	36.28535°, -75.98419°	Camden	Cypress Gum Swamp (Blackwater Subtype) and Managed Loblolly Pine (Managed Community)	6/1/2019	1 MYSE captured 1 fitted with transmitter 150.945
				6/2/2019	No MYSE captured
NR 7	36.28543°, -75.99110°	Camden	Nonriverine Swamp Forest	6/4/2019	3 MYSE captured All males
				6/13/2019	No MYSE captured
NR 8	36.2793°, -76.02613°	Camden	Nonriverine Swamp Forest and Cypress Gum Swamp (Blackwater Subtype)	6/8/2019	2 MYSE captured 1 fitted with transmitter 150.500
				6/11/2019	No MYSE captured
NR 9	36.27338°, -75.98689°	Camden	Cypress Gum Swamp (Blackwater Subtype)	6/16/2019	4 MYSE captured 1 <sup>st</sup> juvenile captured for project

### 5.1.2 – Currituck County

**Mist-Net Site NR 1-Currituck** is in the northeastern portion of N. River Game Land. The net site is located at approximately 36.3835°, -76.00794°. The mist-net site was situated along a forest road that travels through a mesic upland mixed hardwood forest that borders a larger Cypress Gum Swamp. This community type consists of a canopy of water oak, swamp chestnut oak, sweetgum, tulip poplar, American beech, and a few loblolly pines. The understory is partially open and includes wax myrtle, fetterbush, vaccinium, and greenbrier. Community types in proximity to the mist-net site include Mesic Mixed Hardwood Forest (Coastal Plain Subtype) and Cypress Gum Swamp (Blackwater Subtype).

**Mist-Net Site NR 4-Currituck** is also located within the northeastern portion of N. River Game Land. The mist net site is located along a gated forest access road off Swains Lane. The net site location is at approximately 36.36849°, -75.99693°. The site is situated in a mixed pine and hardwood bottomland forest surrounded by a larger forested wetland/swamp to the east and large agricultural fields to the west. This community type includes a canopy of red maple, loblolly pine, sweetgum, water tupelo, red bay, American beech, and American hornbeam (*Carpinus caroliniana*). The understory is partially open and consists of wax myrtle, fetterbush, vaccinium, and greenbrier. Community type in proximity to the mist-net site is Nonriverine Swamp Forest.

**Table 2 – Mist-Net Site Summary 2019 – North River Game Land within Currituck County**

<u>Site #</u>	<u>Lat, Long</u>	<u>County</u>	<u>Community Type (per Schafale 1990, unless otherwise noted)</u>	<u>Dates</u>	<u>Comments</u>
NR 1	36.38350°, -76.00794°	Currituck	Mesic Mixed Hardwoods, (Coastal Plain Subtype), and Cypress Gum Swamp (Blackwater Subtype)	5/7/2019	5 MYSE captured 2 fitted with transmitter 150.543 & 705 1 escaped from net
				5/18/2019	9 MYSE captured 1 fitted with transmitter 150.982
NR 4	36.36849°, -75.99693°	Currituck	Nonriverine Swamp Forest	5/9/2019	4 MYSE captured 1 fitted with transmitter 150.623
				6/17/2019	3 MYSE captured 1 fitted with transmitter 150.901

### 5.2 MYSE Capture Site Results and Habitat Descriptions

A total of 37 MYSE were captured in both Camden and Currituck Counties during mist-net surveys at eight of the nine sites sampled. NCDOT, USFWS and state agencies were notified within 24 hours of a capture in accordance with the requirements of all federal and state permits. Copies of capture notifications are presented in Appendix I. All *Myotis* species were photographed. Capture sites are described below. Additional mist-net capture data are presented in Tables 3 and 4. Please refer to the Figures accompanying this report for the locations of mist-net sites.

### 5.2.1 – North River Game Land within Camden County

**Mist-Net Site NR 2 - Camden** two juvenile MYSE, a male and a female were captured on 06/22/2019. The site is situated in a Cypress Gum Swamp in the southern portion of N. River Game Land along a gated forest road off Sassafras Lane at approximately 36.27885°, -75.990072°. This site is in proximity of historical MYSE captures in 2017 and 2018.

**Mist-Net Site NR 3 - Camden** four MYSE were captured. Two adult female MYSE were captured on 4/25/2018 and two adults (one female and one male) were captured on 4/27/2019. One of the females captured on 4/25/2019 was observed to be in the very early stages of pregnancy and a transmitter was attached with frequency 150.502. Both MYSE captured on 4/27/2019 were non-reproductive. The site is situated in a Cypress Gum Swamp at the end of a gated forest road off Sassafras Road at approximately 36.271414°, -75.989225°.

**Mist-Net Site NR 5 - Camden** no MYSE were captured at this location.

**Mist-Net Site NR 6 - Camden** one pregnant female MYSE was captured on 6/1/2019. A transmitter with frequency 150.945 was attached. The site is situated in an area at the end of Sassafras Lane, that is referred to as Indian Island, at approximately 36.28535°, -75.98419°. Community types in proximity to the mist-net site include Cypress Gum Swamp and managed loblolly pine.

**Mist-Net Site NR 7 - Camden** three adult male MYSE were captured on 6/4/2019. The site is situated in a curve in Sassafras Lane immediately beyond a gated forest road at approximately 36.28543°, -75.99110°. It is within a Nonriverine Swamp Forest.

**Mist-Net Site NR 8 - Camden** two adult MYSE (one male and one female) were captured on 6/8/2019. The female was observed as lactating and a transmitter with frequency 150.500 was attached. The site is situated in a curve in the Sassafras Road just after the second entrance gate at approximately 36.27193°, -75.02613°. The capture site is bordered on one side by a large swamp/wetland and to the north a large mixed pine and hardwood forest. Community types in proximity to the mist-net site include Nonriverine Swamp Forest and Cypress Gum Swamp.

**Mist-Net Site NR 9 - Camden** four MYSE, one adult male, two juvenile females, and one post-lactating female, were captured on 6/16/2019. The site is situated along an unnamed forest road that travels through a mix of upland and bottomland, pine and hardwood forest, at approximately 36.27338°, -75.98689°. The capture site is in a Cypress Gum Swamp.

### 5.2.2 – North River Game Land within Currituck County

**Mist-Net Site NR 1 - Currituck** 14 MYSE were captured over two nights of mist-net surveys. The captures included five males and nine females. One MYSE escaped from the net before sexing. Seven of the nine females were pregnant and three were transmitted and tracked to diurnal roosts. Two pregnant females captured on 5/7/2019 were fitted with transmitters (frequencies 150.543 and 150.705). One pregnant female captured on 5/18/2019 was fitted with a transmitter (frequency 150.982). This site is situated in the northeastern portion of the game land along an unnamed forest road at approximately 36.3835°, -76.00794°. This site is also the location of the first fall/winter MYSE captured within the N. River Game Land in 2015. This site is located approximately 0.33 miles off NC Hwy 158 (Shortcut Road). It is bordered on one side by a very large swamp/wetland, and on the other side by a mix of upland mixed pine and hardwood forest and agriculture fields.

**Mist-Net Site NR 4 - Currituck** seven MYSE were captured; four on 5/9/2019 and three on 6/17/2019. Five of the seven were female and two were male. The females captured on 5/9/2019 were all pregnant, and one was transmitted with frequency 150.623. Of the two females captured a month later on 6/17/2019, one was a juvenile and one was lactating. The lactating female was fitted with a transmitter with frequency 150.901. This is the first site that a juvenile MYSE was documented during this research. This site is situated in the northeastern portion of the Game Land off Swains Lane west of Coinjock Bay at approximately 36.36849°, -75.99693°. The capture site borders a large wetland/swamp area and is situated within a Nonriverine Swamp Forest.

### 5.3 Summary of Findings – Mist-Net Captures

Mist-net sites were chosen by permitted biologists based on optimal habitats and flight corridors. A total of 181 bats were captured, representing eight of the 17 bat species typically found in NC (Tables 3 and 4). Of the 37 MYSE captured, 16 were in Camden County and 21 were in Currituck County. A total of 18 mist-net surveys were conducted; 14 in Camden County and four in Currituck County. Approximately 20 percent of the total bats captured were MYSE. Of the 37 MYSE captured, 23 (62.16 percent) were female and 13 (35.14 percent) were male. Of the 23 female MYSE captured, 12 (52.17 percent) were pregnant, four were lactating, and two were post lactating (Tables 5 and 6).

Per the request of Mark Ford, PhD, with Virginia Tech in Blacksburg, Virginia, MYSE and any species with questionable Wing Index scores were swabbed to test for the presence of Pd, a fungus responsible for the disease White Nose Syndrome (WNS) see Table 7. All captured *Myotis* species were photographed (Appendix D).

Tables 3 and 4 provide a summary of all bat species captured during mist-netting. Please refer to the figures accompanying this report for the locations of mist-net sites. Please refer to Appendix A for mist-net site photographs, Appendix C and D for photographs of captured bats including MYSE, and Appendix G for mist-net data sheets.

**Table 3 – Mist-Net 2019 Capture Summary in Camden County**

Site No.	Lat, Long	Night	Date	CORA	EPFU	LABO	LASE	MYAU	MYSE	NYHU	PESU	TOTAL
NR-2 Camden	36.27885°, -75.990072°	1	4/23	1	5	12	2			5		25
		2	4/24	1	3	1	1			5		11
		3	6/22		2	1			2	4		9
NR-3 Camden	36.271414°, -75.989225°	1	4/25	1	1				2	9		13
		2	4/27	1		1	1		2			5
		3	4/28		1							1
NR-5 Camden	36.279770°, -75.998350°	1	5/15			7			1		8	
NR-6 Camden	36.28535°, -75.98419°	1	6/1	1		5			1	2		9
		2	6/2		2						1	3
NR-7 Camden	36.28543°, -75.99110°	1	6/4		2	5			3	4		14
		2	6/13			2				3		5
NR-8 Camden	36.27193°, -76.02613°	1	6/8		3	1		6	2			12
		2	6/11		1	7		2		1		11

<u>Site No.</u>	<u>Lat, Long</u>	<u>Night</u>	<u>Date</u>	<u>CORA</u>	<u>EPFU</u>	<u>LABO</u>	<u>LASE</u>	<u>MYAU</u>	<u>MYSE</u>	<u>NYHU</u>	<u>PESU</u>	<u>TOTAL</u>
NR-9 Camden	36.27338°, -75.98689°	1	6/16					1	4	4		9
TOTAL		2		5	20	42	4	9	16	38	1	135

**CORA** = *Corynorhinus rafinesquii*, Rafinesque's Big-eared Bat; **EPFU** = *Eptesicus fuscus*, Big Brown Bat; **LABO** = *Lasiurus borealis*, Red Bat; **LASE** = *Lasiurus seminolus*, Seminole Bat; **MYAU** = *Myotis austroriparius*, Southeastern Myotis; **MYSE** = *Myotis septentrionalis*, Northern Long-eared Bat; **NYHU** = *Nycticeius humeralis*, Evening Bat; **PESU** = *Perimyotis subflavus*, Tricolored Bat

**Table 4 – Mist-Net 2019 Capture Summary in Currituck County**

<u>Site No.</u>	<u>Lat, Long</u>	<u>Night</u>	<u>Date</u>	<u>CORA</u>	<u>EPFU</u>	<u>LABO</u>	<u>LASE</u>	<u>MYAU</u>	<u>MYSE</u>	<u>NYHU</u>	<u>PESU</u>	<u>TOTAL</u>
NR-1 Currituck	36.38350, -76.00794	1	5/7		1	1	1	1	5			9
		2	5/18		2			4	9	2	1	18
NR- 4 Currituck	36.36849°, -75.99693°	1	5/9		1			1	4	1		7
		2	6/17		1	1		2	3	4	1	12
TOTAL					5	2	1	8	21	7	2	46

**CORA** = *Corynorhinus rafinesquii*, Rafinesque's Big-eared Bat; **EPFU** = *Eptesicus fuscus*, Big Brown Bat; **LABO** = *Lasiurus borealis*, Red Bat; **LASE** = *Lasiurus seminolus*, Seminole Bat; **MYAU** = *Myotis austroriparius*, Southeastern Myotis; **MYSE** = *Myotis septentrionalis*, Northern Long-eared Bat; **NYHU** = *Nycticeius humeralis*, Evening Bat; **PESU** = *Perimyotis subflavus*, Tricolored Bat

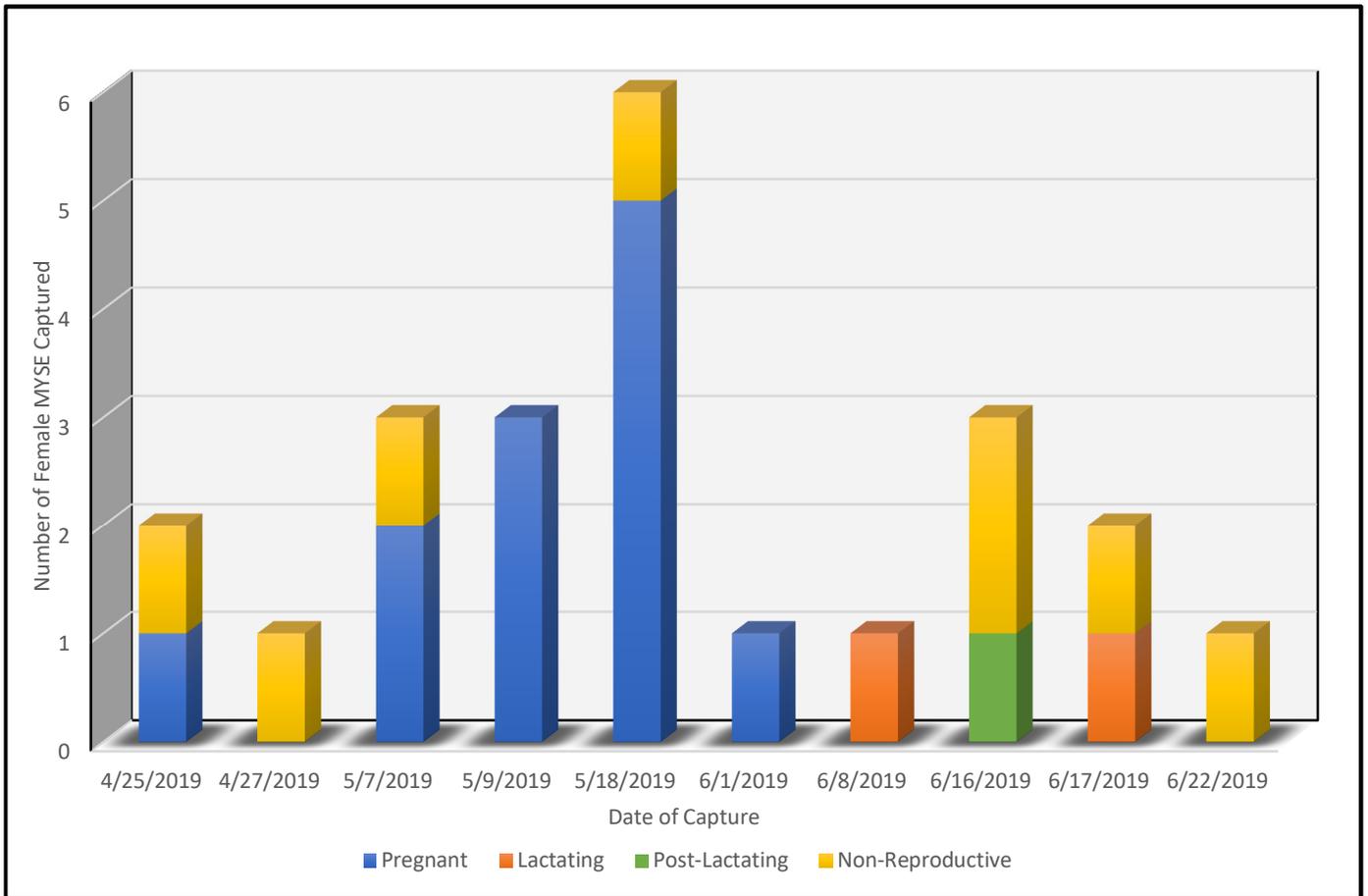
**Table 5 – Total MYSE Captured**

<u>Mist Net Site Name</u>	<u>Date</u>	<u>Adult Female</u>	<u>Adult Male</u>	<u>Juvenile Female</u>	<u>Juvenile Male</u>	<u>Escaped from Net</u>	<u>Total Each Night</u>
NR3	4/25/2019	2					2
NR3	4/27/2019	1	1				2
NR1	5/7/2019	3	1			1	5
NR4	5/9/2019	3	1				4
NR1	5/18/2019	6	3				9
NR6	6/1/2019	1					1
NR7	6/4/2019		3				3
NR8	6/8/2019	1	1				2
NR9	6/16/2019	1	1	2			4
NR4	6/17/2019	1		1	1		3
NR2	6/22/2019			1	1		2
TOTAL		19	11	4	2	1	37
% of TOTAL		51.35%	29.73%	10.81%	5.41%	2.70%	100%

NR1 and NR4 are in Currituck County. NR2, NR3, NR6, NR7, NR8, NR9 are all located in Camden County.

**Table 6 – Captured MYSE Female and Reproductive Status**

<u>Date</u>	<u>Pregnant</u>	<u>Lactating</u>	<u>Post-Lactating</u>	<u>Non-Reproductive</u>	<u>Comments</u>
4/25/2019	1			1	Site NR3. MYSE 150.502 captured and observed in very early stages of pregnancy. Tracked to five roosts.
4/27/2019				1	Site NR3. Female was observed to be non-reproductive or too early to confirm pregnancy.
5/7/2019	2			1	Site NR1. Both pregnant MYSE were fitted with transmitters 150.705 and 150.543. 150.705 was found deceased in roost and 150.543 was tracked to eight roosts. Emergence survey observations recorded fourteen bats from Roost A on May 8 <sup>th</sup> , 22 bats from Roost B on May 9 <sup>th</sup> , and 15 bats from Roost C on May 10 <sup>th</sup> . For all other roosts, 1-2 bats were observed emerging.
5/9/2019	3				Site NR4. Three pregnant MYSE were captured and transmitter 150.623 was attached to one. 150.623 was tracked to eight roosts and roosted alone except for May 16 <sup>th</sup> and 17 <sup>th</sup> .
5/18/2019	5			1	Site NR1. Of the five pregnant MYSE, one was transmitted, 150.982. Note – other species females captured were also pregnant. 150.982 was tracked to three roosts where emergence surveys observed six bats at roost A, fifteen bats at Roost B, and 24 bats at Roost C. Emergence behavior observed may suggest that 150.982 gave birth between May 20 <sup>th</sup> and 22 <sup>nd</sup> . On May 22 <sup>nd</sup> , she left the roost at 20:24 and returned eight minutes later and remained at the roost.
6/1/2019	1				Site NR 6. 150.945 was captured and tracked to two roosts. 150.945 was located on the fifth day of tracking approximately 1.54 miles from the capture site.
6/8/2019		1			Site NR8. 150.500 was observed as lactating and other female species captured that night were also lactating. 150.500 was tracked to four roosts.
6/16/2019			1	2	Site NR9. First MYSE juveniles and post lactating female captured.
6/17/2019		1		1	Site NR4. MYSE lactating female was fitted with 150.901 frequency transmitter. She was located on the fifth day roosting approximately 1.33 miles from her capture site. A MYSE juvenile was also captured.
6/22/2019				1	One MYSE juvenile female was captured. Other species juveniles were captured
<b>TOTAL</b>	<b>12</b>	<b>2</b>	<b>1</b>	<b>8</b>	

**Chart 1 – Captured MYSE Female Reproductive Status and Occurrence**

Based on the data collected, the number of occurrences of pregnant females from April 25<sup>th</sup>, 2019 to June 1<sup>st</sup>, 2019, supports a potential timeline for reproductive females and a pup rearing season in the N. River Game Land.

#### 5.4 – Wing Punches, Hair Samples, and Swabs

Tissue and hair samples were only collected from northern long-eared bats. Upon the request of Dr. Ford, random MYSE were swabbed, and in addition, other bat species captured with multiple wing scars or flaking skin on forearms were also swabbed. One swab was collected from each **Southeastern bat (*Myotis austroriparius*)** and a **big brown bat (*Eptesicus fuscus*)** (Table 7). All samples were shipped to Virginia Tech on July 29<sup>th</sup>, 2019.

**Table 7 – Wing Punches, Hair Samples, and WNS Swabs – North River Game Land 2019**

<u>Bat Species</u>	<u>Sample Type</u>	<u>Number Collected (Females)</u>	<u>Number Collected (Males)</u>	<u>Number Collected (Total)</u>
Northern Long-eared Bat	Tissue Sample (biopsy punch or wing punch)	9	11	20
Northern Long-eared Bat	Hair Sample	18	12	30
8-Northern Long-eared Bats, 1- Southeastern Bat and 1- Big brown Bat	WNS Swab	5	5	10

### 5.5 - MYSE Roost Site Habitat Descriptions

VHB successfully documented a total of 33 roost sites within N. River Game Land and on adjoining privately owned property. Community types at MYSE roost sites are described below. Additional roost data are presented in Table 8. Refer to Figures 7a – 8b for the locations of MYSE roosts and Figures 9a-10e for distances between capture sites and roost trees.

#### 5.5.1 - MYSE 150.502 Roosts A-E, Camden County

This MYSE, captured on April 25<sup>th</sup> at mist-net site NR3 in Camden County, was tracked to five roosts (A, B, C, D, and E). This bat was thought to be in the very early stages of pregnancy. All roosts were located within Cypress Gum Swamp with standing water between two and four feet deep. The first three days of tracking, MYSE 150.502 changed roost trees every night between live water tupelo and a red maple in the southern portion of the Game Land. All roosts were located on private property owned by the Coastal Forest Resources Company except for Roost E. Roost E was located within the N. River Game Land Boundary. Roosts D and E, both water tupelo, were used for multiple days each. All five roosts were within .25 miles of the capture site. Please refer to the description of mist-net site NR3 in section 5.1.1 for a description of the habitat for Roost C at this locality.

#### 5.5.2 – MYSE 150.500 Roosts A-D, Camden County

MYSE 150.500, was lactating when captured on June 8<sup>th</sup>. This bat was captured at mist-net site NR8 in Camden County where she was tracked to a total of four roosts (A, B, C, and D). Roost A was a live loblolly bay and Roost B was a red maple, both located within a Cypress Gum Swamp with standing water between two and three feet deep. Please refer to the description of mist-net site NR8 in section 5.1.1 for a description of the habitat for roosts at this locality. Most roosts were used for one night except Roost D, which was used for five nights. MYSE 150.500 was located on the fourth day of tracking when she returned to roost within .24 miles of the capture site. She roosted in proximity to the capture site for one night and was located on the following day 1.60 miles east of the capture site, roosting in a dead snag with exfoliating bark and multiple cavities. Since she was lactating and based on the long distance traveled between roosts, this snag looked promising as a potential maternity roost with newly volant juveniles. An emergence survey at this roost was disrupted by a female bear and two cubs. MYSE 150.500 returned to the first roosting area the next day.

#### 5.5.3 – MYSE 150.945 Roosts A & B, Camden County

MYSE 150.945 was pregnant when captured on June 1<sup>st</sup> at mist-net site NR6 in Camden County. She was tracked to two roosts (A and B). Roost A was located on the 5<sup>th</sup> day of tracking a little over 1.5 miles

northwest of the capture site and into deep swamp in proximity to Great Creek. Her transmitter was found stuck to a tree on the 11<sup>th</sup> day of tracking. Both roost trees were in declining health or dead in a Cypress Gum Swamp community. Standing water between one and approximately three feet deep is present throughout this community type. Roost A was used for one day and Roost B was used for two days before the transmitter was dropped.

#### **5.5.4 – MYSE 150.543 Roosts A-H, Currituck County**

MYSE 150.543 was pregnant when captured on May 7<sup>th</sup> at mist-net site NR1 in Currituck County where she was tracked to eight roosts (A - H). Roosts A, C, F, G, & H were located on a section of the swamp that is privately owned. Roosts B, D, & E were located on N. River Game Land. MYSE 150.543 was tracked for 11 days when the dropped transmitter was found. Roost trees were in a Cypress Gum Swamp community with standing water between approximately 30 inches and two feet deep. Distances from the capture site to roosts ranged from 0.12 to 0.42 miles. During emergence surveys at Roosts A, B, & C, between 14 and 22 bats were observed leaving the roosts.

#### **5.5.5 – MYSE 150.705 Roost A, Currituck County**

MYSE 150.705 was pregnant when captured on May 7<sup>th</sup> at mist-net site NR1 in Currituck County and was tracked two days to a water tupelo on private property. Roost A was located within a Cypress Gum Swamp with standing water between approximately two and three feet deep. After release, MYSE 150.705 foraged to the southwest for at least two hours and was still foraging when VHB left the site around 3 A.M. She was tracked to Roost A on May 8<sup>th</sup> and was roosting in a tiny cavity approximately 1.5 meters off the ground/water. During the emergence survey on May 8<sup>th</sup> she did not leave the roost; however, her transmitter antenna was seen slightly sticking out of the tiny cavity. On May 9<sup>th</sup> she was still in the same tree and black ants were observed moving in and out of the cavity. After close examination, 150.705 was found deceased. Her skeleton was all that remained.

#### **5.5.6 – MYSE 150.623 Roosts A-H, Currituck County**

MYSE 150.623 was pregnant when captured on May 9<sup>th</sup> at mist-net site NR4 in Currituck County and tracked to eight roosts (A - H). The roosts were located within a Cypress Gum Swamp with standing water between approximately two and three feet deep. MYSE 150.623 mostly roosted in small cracks and cavities in sweetbay magnolia, Carolina ash, and red maple. MYSE 150.623 roosted over a mile from her capture site. She was observed with her transmitter antenna stuck on the tree at two individual roost trees, Roosts C and H, during emergence surveys.

#### **5.5.7 – MYSE 150.982 Roosts A-C, Currituck County**

MYSE 150.982 was pregnant when captured on May 18<sup>th</sup> at mist-net site NR1 in Currituck County. This bat was tracked to three roosts (A - C). All three roosts, a red maple and two slippery elms, were dead with loose bark. The roosts were located within a Cypress Gum Swamp with standing water between approximately two and three feet deep. A few pine snags were also observed in this vicinity. The understory is generally sparse, and includes few specimens of fetterbush, vaccinium, and saw greenbrier. The emergence survey at Roost C documented 24 bats emerging.

### **5.5.8 – MYSE 150.901 Roosts A & B, Currituck County**

MYSE 150.901 was lactating when captured on June 17<sup>th</sup> at mist-net site NR4 in Currituck County and tracked to two roosts (A & B). Roost A was in a red maple and Roost B was in a water tupelo, both of which were located approximately .25 miles west of NC Highway 158 within Cypress Gum Swamp. Standing water between approximately two and three feet deep was present throughout this area.

### **5.6 Summary of Findings - Radio Tracking, Roosts, and Emergence Surveys**

As previously mentioned, a total of 37 MYSE were captured during mist-net surveys (Tables 3, 4 and 5). Of the 37 MYSE captured, transmitters were placed on three MYSE in Camden County (Figures 5 and 5a-d), and five in Currituck County (Figures 6 and 6a-b). The first pregnant MYSE was captured and fitted with a transmitter on April 25<sup>th</sup>. Although she was in the very early stages of pregnancy, NCDOT and USFWS requested tracking to continue.

All eight transmitted MYSE were tracked to a total of 33 roost sites; 11 in Camden County and 22 in Currituck County (Figures 7a – 8b). Roost trees varied in species, age, condition, diameter at breast height (DBH), height, and observable cracks, crevices, cavities, and sloughing bark for roosting (Table 8). Although seven different tree species were used for roosts, the most commonly used were red maple, water tupelo, and Carolina ash. Documented roosts for each transmitted MYSE were grouped within radii ranging from 0.05 to 0.54 miles. Roosting activities observed were typical of commonly documented MYSE behavior, where roost switching is frequent, and trees vary in size and species. Typically, MYSE change roosts every two to five days (USFWS 2014b).

Table 8 – MYSE Tracking, Roost, &amp; Emergence Summary

MYSE Sex, *Condition & Freq.	Band No.	Dates Tracked	Roost Dates	Roost No.	Tree Species	DBH (inches)	Lat, Long	County	Emergence Surveys		Notes
									Emergence Date	Bats Observed Emerging	
150.502 Female P	NCWRC A3282	4/26 – 5/7	4/26	A	<i>Nyssa aquatica</i>	3.3	36.26852°, -75.98619°	Camden	N/A	0	Bat was observed in cavity. No emergence survey completed on 4/26 due to storms.
			4/27	B	<i>Nyssa aquatica</i>	6.4	36.26777°, -75.98724°		4/27	1	Bat flew E
			4/28	C	<i>Acer rubrum</i>	7.5	36.26835°, -75.98667°		4/28	1	Bat flew E
			4/29-5/1	D	<i>Nyssa aquatica</i>	5	36.26831°, -75.98663°		4/29	1	Bat flew NW
			5/2-5/4	E	<i>Nyssa aquatica</i>	9	36.27264°, -75.99317°		5/2, 5/4	0	Emergence stopped on 5/2 due to sudden wind and storm and conducted on 5/4. USFWS requested netting tree; however, bat left roost and was not re- located.
150.500 Female L	DB 1282	6/9 – 6/19	6/11	A	<i>Gordonia lasianthus</i>	20.9	36.27457°, -76.01586°	Camden	6/11	1	Bat flew N
			6/12	B	<i>Acer rubrum</i>	10.1	36.28378°, -76.00140°		6/12	0	Survey was stopped due to mom bear and cubs entered survey area
			6/13	C	<i>Acer rubrum</i>	9.1	36.27407°, -76.01672°		6/13	1	Emergence detected via telemetry
			6/14- 6/18	D	<i>Nyssa aquatica</i>	2.4	36.27496°, -76.01630°		6/14	0	Did not emerge
150.945 Female P	DB 1274	6/2-6/12	6/6	A	<i>Acer rubrum</i>	10.25	36.28626°, -76.01110°	Camden	NA	0	No emergence survey completed on 6/6 due to storms
			6/8-6/12	B	<i>Acer rubrum</i>	10.6	36.28624°, -76.01121°		6/11	0	Bat did not emerge. Transmitter observed sticking on tree on 6/12
150.543 Female P	NCWRC A3270	5/8-5/18	5/8	A	<i>Pinus taeda</i>	11	36.38034°, -76.01436°	Currituck	5/8	14	543 left first and flew E
			5/9	B	<i>Pinus taeda</i>	15	36.38061°, -76.01508°		5/9	22	543 left 3 <sup>rd</sup> and flew NE
			5/10	C	<i>Acer rubrum</i>	8	36.38227°, -76.01175°		5/10	15	Bat flew NE
			5/11	D	<i>Fraxinus caroliniana</i>	5	36.38199°, -76.00970°		5/11	0	Did not emerge during survey, was detected foraging later at 21:00
			5/12 & 5/13	E	<i>Fraxinus caroliniana</i>	5	36.38243°, -76.00971°		5/12	1	Bat flew N
			5/14	F	<i>Fraxinus caroliniana</i>	3.5	36.38017°, -76.01184°		5/14	1	Bat flew W
			5/15	G	<i>Acer rubrum</i>	5	36.38251°, -76.01230°		5/15	2	Bat flew NW
			5/16	H	<i>Pinus taeda</i>	8.4	36.38002°, -76.01366°		5/16	2	Bat flew NE
150.705 Female P	NCWRC A3257	5/8-5/9	5/8 & 5/9	A	<i>Nyssa aquatica</i>	3.3	36.38177°, -76.01228°	Currituck	5/8	0	Did not emerge. Bat was found dead in roost on 5/9
150.623 Female P	NCWRC A3262	5/10- 5/21	5/11	A	<i>Magnolia virginiana</i>	7.6	36.37895°, -76.01075°	Currituck	5/11	1	Bat flew SE
			5/12	B	<i>Fraxinus caroliniana</i>	3.4	36.37963°, -76.01102°		5/12	1	
			5/13	C	<i>Fraxinus caroliniana</i>	4.9	36.37991, -76.01155°		5/13	1	Antenna was stuck on tree and bat was unable to fly off and was released by technician
			5/14	D	<i>Acer rubrum</i>	6.6	36.37941°, -76.01067°		5/14	1	Bat flew SE
			5/15 & 5/18- 5/20	E	<i>Acer rubrum</i>	2.4	36.37891°, -76.01082°		5/15	1	Bat flew N
			5/16	F	<i>Acer rubrum</i>	4.2	36.37940°, -76.01067°		5/16	2	623 emerged and flew N to return to roost area ~ 5 minutes later
			5/17	G	<i>Fraxinus caroliniana</i>	5.4	36.37825°, -76.00957°		5/17	4	Bat flew NE after circling roost multiple times
			5/21	H	<i>Taxodium distichum</i>	5.3	36.37958°, -76.01157°		5/21	1	Antenna was stuck on tree and bat was able to break free after 45 minutes
150.982 Female P	NCWRC A3269	5/19- 5/30	5/19	A	<i>Acer rubrum</i>	10	36.38356°, -76.01372°	Currituck	5/19	6	7 more bats were observed flying in the immediate area
			5/20 & 5/21	B	<i>Ulmus rubra</i>	11.4	36.38338°, -76.01232°		5/20	15	Bat flew S
			5/22- 5/30	C	<i>Ulmus rubra</i>	14	36.38342°, -76.01205°		5/22	24	Multiple bats returned to roost tree after ~5 minutes of emergence. Some flew around the tree and left, and some returned to roost and stayed.
150.901 Female L	DB 1278	6/18- 6/25	6/22	A	<i>Nyssa aquatica</i>	3.7	36.36137°, -75.97473°	Currituck	N/A	0	No emergence survey completed on 6/22 due to safety reasons (Bear)
			6/23- 6/25	B	<i>Acer rubrum</i>	5.5	36.35981°, -75.97118°		6/24	2	Both bats flew SE

\*Condition: P= Pregnant, L= Lactating, PL= Post-lactating, NR= Non-reproductive, SC= Scrotal

**Table 9 – MYSE Capture Site to Roost Distance**

<b><u>MYSE Sex &amp; Freq.</u></b>	<b><u>Capture Site</u></b>	<b><u>Roost No.</u></b>	<b><u>Distance from Roost to Capture Site (km/miles) *</u></b>
<b>150.502 Female</b>	Camden NR 3	A	0.42/0.26
		B	0.44/0.27
		C	0.41/0.26
		D	0.42/0.26
		E	0.38/0.24
<b>150.500 Female</b>	Camden NR 8	A	0.97/0.60
		B	2.58/1.60
		C	0.88/0.55
		D	0.95/0.59
<b>150.945 Female</b>	Camden NR 6	A	2.42/1.50
		B	2.43/1.51
<b>150.543 Female</b>	Currituck NR 1	A	0.67/0.42
		B	0.73/0.45
		C	0.37/0.23
		D	0.23/0.14
		E	0.20/0.12
		F	0.51/0.32
		G	0.41/0.25
		H	0.64/0.40
<b>150.705 Female</b>	Currituck NR 1	A	0.43/0.27
<b>150.623 Female</b>	Currituck NR 4	A	1.70/1.06
		B	1.77/1.10
		C	1.82/1.13
		D	1.73/1.07
		E	1.70/1.06
		F	1.73/1.07
		G	1.57/0.97
		H	1.80/1.12
<b>150.982 Female</b>	Currituck NR 1	A	0.52/0.32
		B	0.39/0.24
		C	0.37/0.23
<b>150.901 Female</b>	Currituck NR 4	A	2.14/1.33
		B	2.50/1.56

\*NOTE: Distance from roosts to capture sites does not reflect the longest distance traveled

## 5.7 Habitat Characterization Results

A habitat assessment was completed at all mist-net sites and roost sites. Each site was characterized by community type as described in The Guide to the Natural Communities of North Carolina, Third Approximation (Schafale, 1990). In addition, each mist-net site's habitat was scored on type of tree cover and age, topography, primary land use, and amount of clutter.

**Table 10 – Mist-Net Site Habitat Analysis**

<u>County</u>	<u>Mist Net Name</u>	<u>Habitat Community Type (Schafale 1990)</u>	<u>Pine, Hardwood or Mixed</u>	<u>Upland or bottomland</u>	<u>Managed or Unmanaged</u>	<u>Mature, &lt;20 years old or Cutover</u>	<u>Natural, Rural or Mixed</u>	<u>Clutter (1-4)</u>
Currituck	NR 1	Mesic Mixed Hardwood Forest (Coastal Plain Subtype) & Cypress-Gum Swamp (Blackwater Subtype)	mixed	upland & bottomland	unmanaged	mature	natural	3
Camden	NR 2	Cypress-Gum Swamp (Blackwater Subtype)	mixed	bottomland	unmanaged	mature	natural	3
Camden	NR 3	Cypress-Gum Swamp (Blackwater Subtype)	mixed	bottomland	unmanaged	mature	natural	3
Currituck	NR 4	Nonriverine Swamp Forest	mixed	bottomland	unmanaged	mature	natural	3
Camden	NR 5	Nonriverine Swamp Forest & Cypress-Gum Swamp (Blackwater Subtype)	mixed	bottomland	unmanaged	mature	natural	3
Camden	NR 6	Mesic Mixed Hardwood Forest (Coastal Plain Subtype) & Cypress-Gum Swamp (Blackwater Subtype)	mixed	bottomland	unmanaged	mature	natural	3
Camden	NR 7	Nonriverine Wet Hardwood Forest	mixed	upland & bottomland	unmanaged	mature	natural	3
Camden	NR 8	Mesic Mixed Hardwood Forest (Coastal Plain Subtype) & Cypress-Gum Swamp (Blackwater Subtype)	mixed	upland & bottomland	unmanaged	mature	natural	3
Camden	NR 9	Cypress-Gum Swamp (Blackwater Subtype)	mixed	upland & bottomland	unmanaged	mature	natural	3

Clutter (1-4) = (1) sparse/no, < 10% cover, (2) low, 10-39% cover, (3) medium, 40-75% cover, (4) high, > 75% cover

**Table 11 – Habitat Analysis for Roost Trees**

<u>Roost Name</u>	<u>County</u>	<u>Habitat Community Type (Schafale 1990)</u>	<u>Pine, Hardwood or Mixed</u>	<u>Upland or Bottomland</u>	<u>Managed or Unmanaged</u>	<u>Mature, &lt;20 years old or Cutover</u>	<u>Natural, Rural or Mixed</u>	<u>Clutter (1-4)</u>
502 A- D	Camden	Cypress Gum Swamp (Blackwater Subtype)	mixed	bottomland	unmanaged	mature	natural	3
502 E	Camden	Cypress Gum Swamp (Blackwater Subtype)	mixed	bottomland	unmanaged	mature	natural	4
500 A	Camden	Cypress Gum Swamp (Blackwater Subtype)	mixed	bottomland	unmanaged	mature	natural	3
500 B	Camden	Cypress Gum Swamp (Blackwater Subtype)	mixed	bottomland	unmanaged	mature	natural	3
500 C & D	Camden	Cypress Gum Swamp (Blackwater Subtype)	mixed	bottomland	unmanaged	mature	natural	3
945 A & B	Camden	Cypress Gum Swamp (Blackwater Subtype)	mixed	bottomland	unmanaged	mature	natural	3
543 A, C, F, G, & H	Currituck	Cypress Gum Swamp (Blackwater Subtype)	mixed	bottomland	managed (has not been cut in many years)	mature	natural	3
543 B, D, E,	Currituck	Cypress Gum Swamp (Blackwater Subtype)	mixed	bottomland	unmanaged	mature	natural	3
705 A	Currituck	Cypress Gum Swamp (Blackwater Subtype)	mixed	bottomland	managed (has not been cut in many years)	mature	natural	3
623 A-H	Currituck	Cypress Gum Swamp (Blackwater Subtype)	mixed	bottomland	unmanaged	mature	natural	3
982 A - C	Currituck	Cypress Gum Swamp (Blackwater Subtype)	mixed	bottomland	managed (has not been cut in many years)	mature	natural	3
901 A & B	Currituck	Cypress Gum Swamp (Blackwater Subtype)	mixed	bottomland	unmanaged	mature	natural	3

4) = (1) sparse/no, < 10% cover, (2) low, 10-39% cover, (3) medium, 40-75% cover, (4) high, > 75% cover

## 6.0 DISCUSSION

During Spring/Summer Phase VII research, a total of 18 surveys (crew nights) were conducted in nine sites within both Camden and Currituck Counties, North Carolina, and all within the North River Game Land. Although 181 bats of eight species were documented, surveys were focused on the capture of reproductive MYSE females and the documentation of their maternity roost sites. Of the total of 37 MYSE captured (16 captures in Camden County and 21 captures in Currituck County), 12 were pregnant females. Eight of the 12 pregnant MYSE captured, were fitted with transmitters and tracked to maternity roosts (Table 6). A total of 33 active roosts were documented (Figures 7 – 8b). Roosts were located within the N. River Game Land and privately-owned adjacent properties. Of the 33 confirmed roosts, 8 different tree species were documented (Table 8). Mist-netting was conducted from April 23<sup>rd</sup> to June 22<sup>nd</sup>. Tracking was completed on June 25<sup>th</sup>.

The first transmitted MYSE (150.502) captured on April 25<sup>th</sup> was thought to be in the very early stages of pregnancy. On May 7<sup>th</sup>, two MYSE and a Southeastern Myotis (*Myotis austroriparius* [MYAU]) were captured and observed to be pregnant. Pregnant MYSE were also documented on May 9<sup>th</sup> and 18<sup>th</sup>, and on June 1<sup>st</sup>. These occurrences may suggest a gestation period from mid-April to early June. The first lactating bat documented was a big brown (*Eptesicus fuscus*) on June 2<sup>nd</sup>. Shortly thereafter, the first lactating MYSE was captured on June 8<sup>th</sup>, along with five lactating MYAU. The second lactating MYSE was documented on June 17<sup>th</sup>. These observations may suggest a parturition period in late May to early June. Additionally, MYSE juveniles were first documented on June 16<sup>th</sup> and a post-lactating MYSE was documented on June 16<sup>th</sup> which is consistent if parturition is in late May, juveniles are typically volant three weeks after birth. Although the last adult female MYSE captured on June 17<sup>th</sup> was observed as lactating, it still supports a maternity season for N. River Game Land between April and late June with most births in the later part of May and into early June.

In mid-June, Virginia Tech sent a student to assess MYSE maternity roost and capture more reproductive females. Site NR1 located in Currituck County was mist-netted by Virginia Tech staff for several nights. On June 24<sup>th</sup>, they recaptured female 150.623 (band NC-WRC A3262) that was originally captured on May 9<sup>th</sup> a little more than six weeks earlier. She was documented as pregnant during the first capture on May 9<sup>th</sup>, and her weight at the time of capture was 7 grams, where other pregnant MYSE captured that night weighed between 7.5 - 8 grams. Therefore, she may have been in an earlier stage of pregnancy. Upon her recapture on June 24<sup>th</sup>, Virginia Tech recorded her as either lactating or post lactating, and surveyors stated that it was difficult to confirm which. If she had another week or two of gestation left when originally captured and add three weeks which is typical before a pup becomes volant, 150.623 may have been post-lactating. She did roost alone in most of her roost; however, she did roost with other bats the last few days of tracking on May 16<sup>th</sup> and 17<sup>th</sup>. Although, there were thoughts that she may be joining a maternity roost, she roosted alone on the last day of tracking. Her recapture was confirmation of her reproductive success and survival. During emergence surveys for 150.623, she was observed with her transmitter antenna stuck on the tree at two individual roost trees (Roosts C and H). She was freed by a technician the first time and was able to free herself after a 45-minute struggle the second time.

MYSE NC-WRC A3276, originally captured on May 18<sup>th</sup> at NR1 in Currituck County was another recapture by Virginia Tech on June 25<sup>th</sup>. VA Tech recorded her as either lactating or post lactating and they could not be sure; however, observations during the original capture on May 18<sup>th</sup> this bat was documented as non-reproductive with a weight of 6.5 grams. All MYSE captured on May 18<sup>th</sup> that were documented as pregnant, five in total had weights between 8 and 9 grams. Her recapture on June 25<sup>th</sup>, was about five weeks later. She too may have been in the very early stages of pregnancy where it was too difficult to confirm 100 percent. However, the occurrences of pregnant females recorded starting from April 25<sup>th</sup>, 2019 to June 1<sup>st</sup>, 2019, and data collected from recaptures supports a potential timeline of April - June for reproductive females and a pup rearing season in the N. River Game Land (Chart 1).

Overall, all captured bat species were observed to be healthy. A few Myotis species had flaking forearms and noticeable wing scars. Swabs taken on bats captured before June 1<sup>st</sup> for analyzing the potential presence of Pd were collected on eight MYSE, one southeastern bat and one big brown bat. A total of ten bat swabs were sent to Dr. Ford for analysis. The results were all negative for Pd.

Although most of the roosts were located within the boundaries of the Game Land, several were documented on privately owned properties. Five of the eight bats tracked, bats 502 in Camden County and 982, 543, 705, and 623 in Currituck County, had roost trees in an area outside of Game Land boundaries. These roosts were observed to have the higher numbers of bats documented during emergence surveys. Groups of snags were not commonly found in the Game Land; however, there were noticeably more snags used as roosts in this area. The owner of this portion of land stated that he had a contract to log this area (Figure 8a).

MYSE capture sites were all located along accessible N. River Game Land access roads. Although the terrain and existing conditions made tracking difficult, most of the roosts were in reasonable proximity to accessible roads and trails. However, MYSE 150.945 and 150.901 traveled more than a mile, 1.51 miles and 1.56 miles respectively, to roost deeper in the swamp and in remote areas with no accessibility (Figures 9c and 10d). Mist netting these remote areas would be very difficult if not impossible; therefore, these outliers may support the conclusion that a much larger population and wider distribution occurs in the Game Land. Additional surveys in this area of the state are needed in order to fully assess the N. River Game Land population size, reproductive activity, and MYSE seasonal movements within the Coastal Plain.

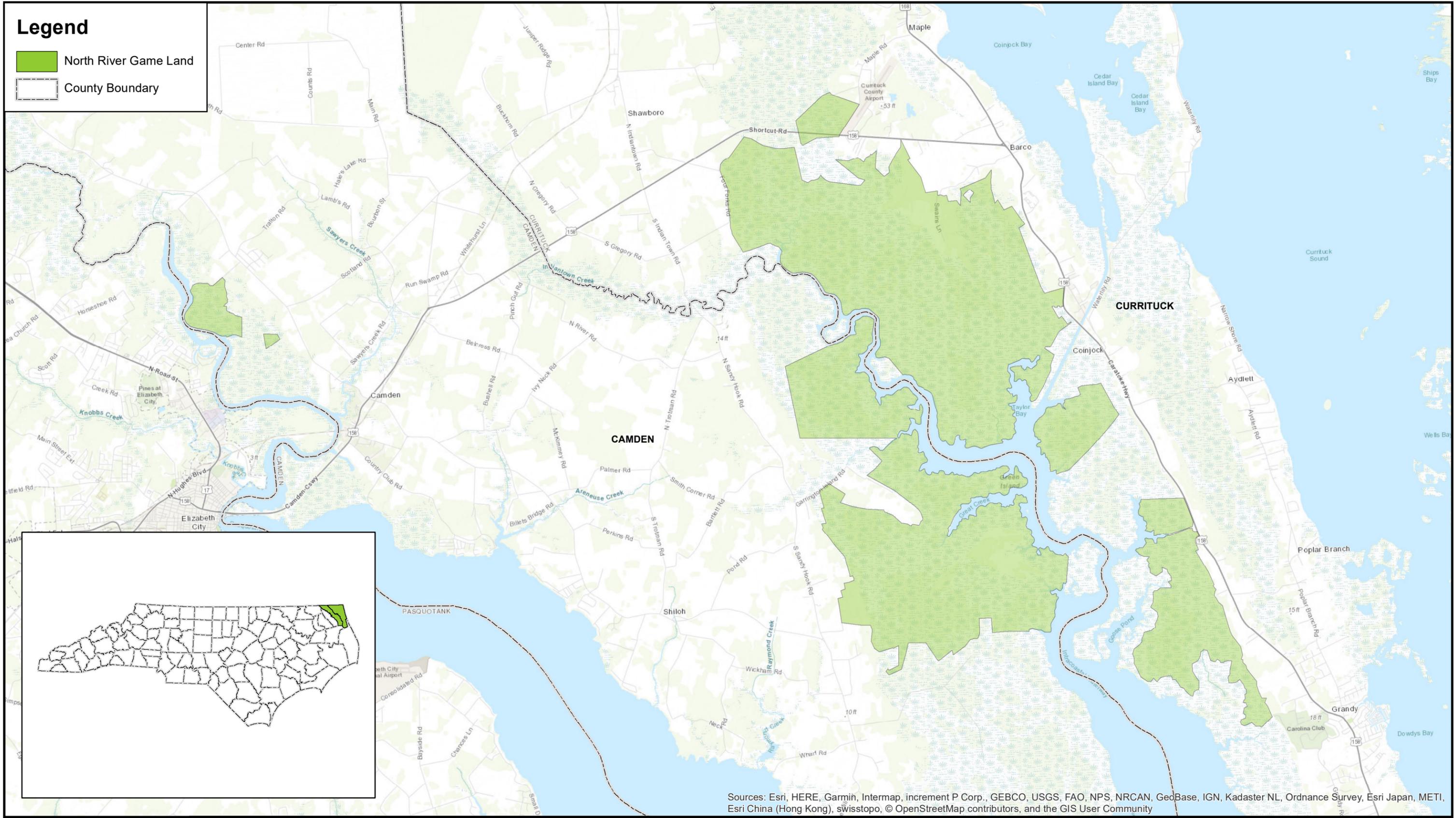
## 7.0 REFERENCES

- North Carolina Department of Transportation (NCDOT) Bat Habitat Assessment Protocols. 2017. NCDOT 2017. NCDOT WNS Decontamination Protocol for North Carolina. Version 3.
- North Carolina Wildlife Resources Commission (NCWRC). 2013. NCWRC 2013. North Carolina’s White-nose Syndrome Surveillance and Response Plan.
- Schafale, M. P. and Alan S. Weakley. 1990. Classification of the Natural Communities of North Carolina Third Approximation. North Carolina Natural Heritage Program Division of Parks and Recreation Department of Environmental and Natural Resources. Raleigh, North Carolina
- United States Fish and Wildlife Service (USFWS 2018). 2018. USFWS 2018. White-nose Syndrome.org. <http://www.whitenosesyndrome.org>.
- United States Fish and Wildlife Service (USFWS 2014)a. 2014. USFWS 2014a. Guidance and Justification for Summer WNS Decontamination in North Carolina.
- United States Fish and Wildlife Service (USFWS 2014b). 2014. USFWS 2014b. *Northern Long-eared Bat Interim Conference and Planning Guidance*. U.S. Fish and Wildlife Service, Regions 2, 3, 4, 5, & 6. 25 pp.
- United States Fish and Wildlife Service (USFWS 2019). 2019. USFWS 2019. Range-wide Indiana Bat Summer Survey Guidelines. U.S. Fish and Wildlife Service, Northeast and Appalachian Recovery Unit. 40 pp.

## Figures

**Legend**

- North River Game Land
- County Boundary



Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community

Prepared by:



Prepared for:



**Figure 1: Project Location Map**



North Carolina Department of Transportation  
 Eastern North Carolina Northern Long-eared Bat  
*(Myotis septentrionalis)* Research Study  
 Spring/Summer 2019, Phase VII  
 Camden and Currituck Counties, NC  
 within the North River Game Land



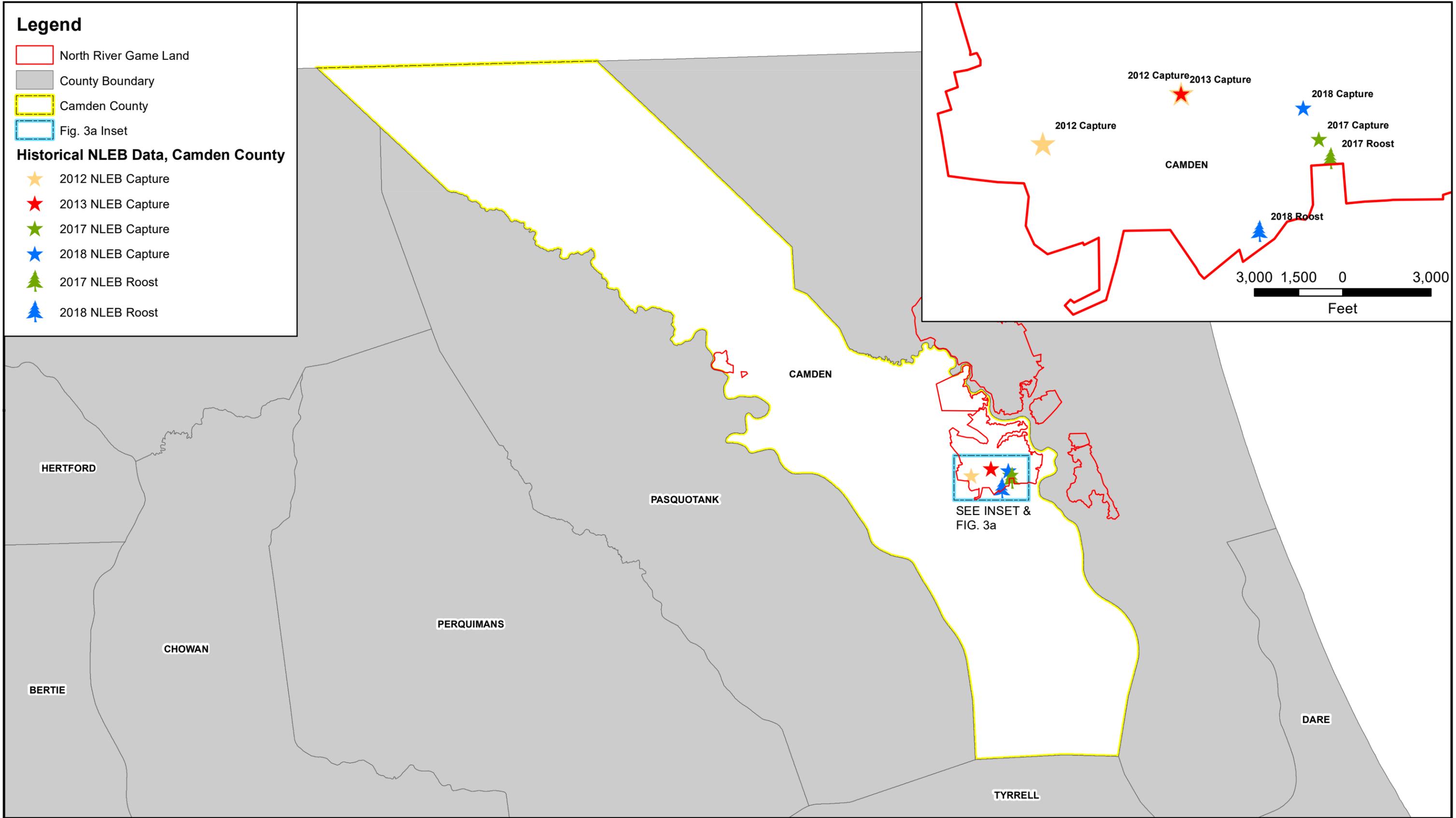


**Legend**

- North River Game Land
- County Boundary
- Camden County
- Fig. 3a Inset

**Historical NLEB Data, Camden County**

- ★ 2012 NLEB Capture
- ★ 2013 NLEB Capture
- ★ 2017 NLEB Capture
- ★ 2018 NLEB Capture
- 🌲 2017 NLEB Roost
- 🌲 2018 NLEB Roost



Prepared by:



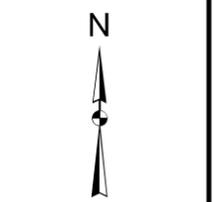
Prepared for:

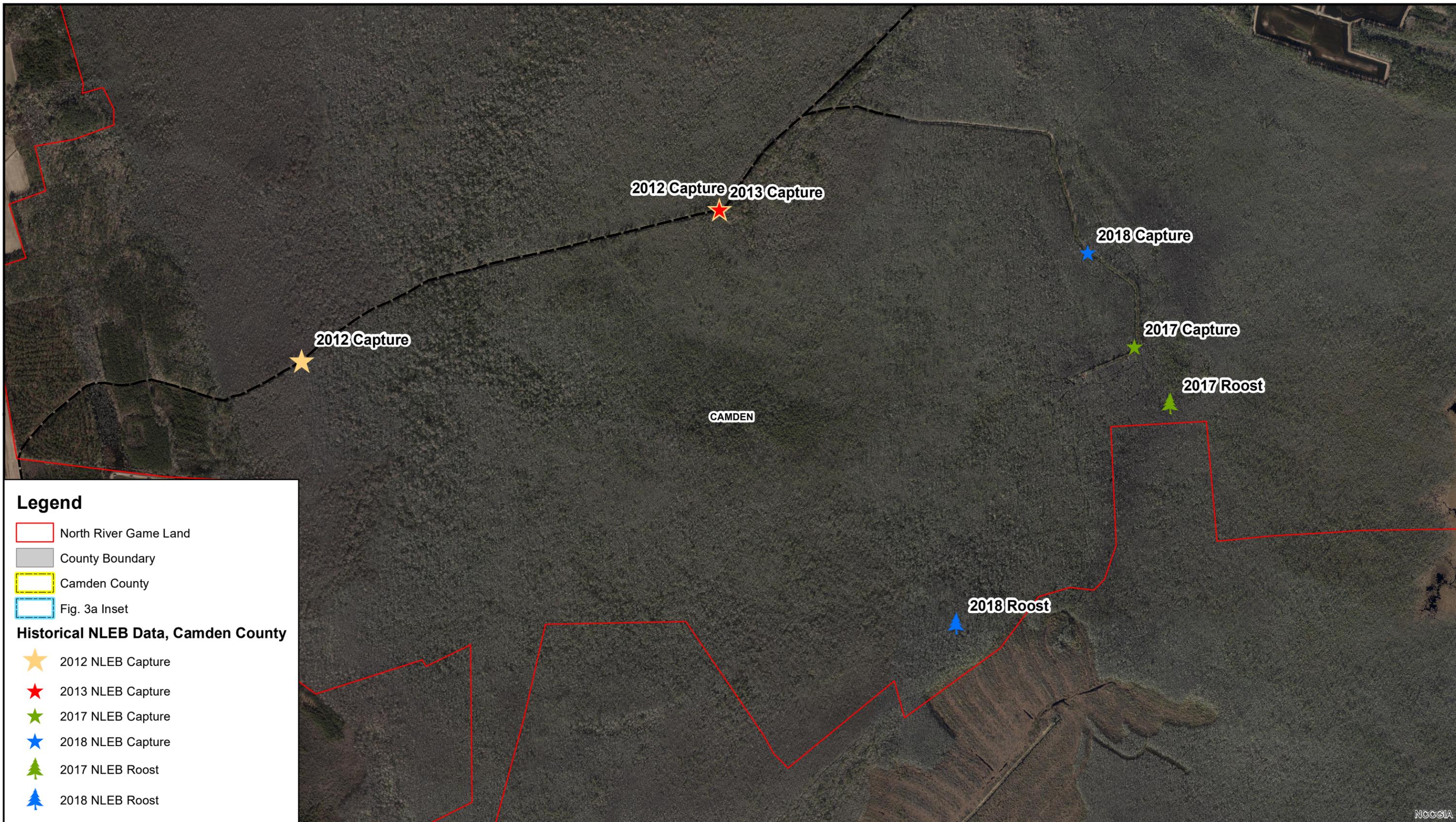


**Figure 3: Historical Capture Sites & Roost Sites in North River Game Land, Camden County**



North Carolina Department of Transportation  
 Eastern North Carolina Northern Long-eared Bat  
 (*Myotis septentrionalis*) Research Study  
 Spring/Summer 2019, Phase VII  
 Camden and Currituck Counties, NC  
 within the North River Game Land





Prepared by:  


Prepared for:  


**Figure 3a: Historical Capture Sites & Roost Sites in North River Game Land, Camden County**

North Carolina Department of Transportation  
 Eastern North Carolina Northern Long-eared Bat  
 (*Myotis septentrionalis*) Research Study  
 Spring/Summer 2019, Phase VII  
 Camden and Currituck Counties, NC  
 within the North River Game Land

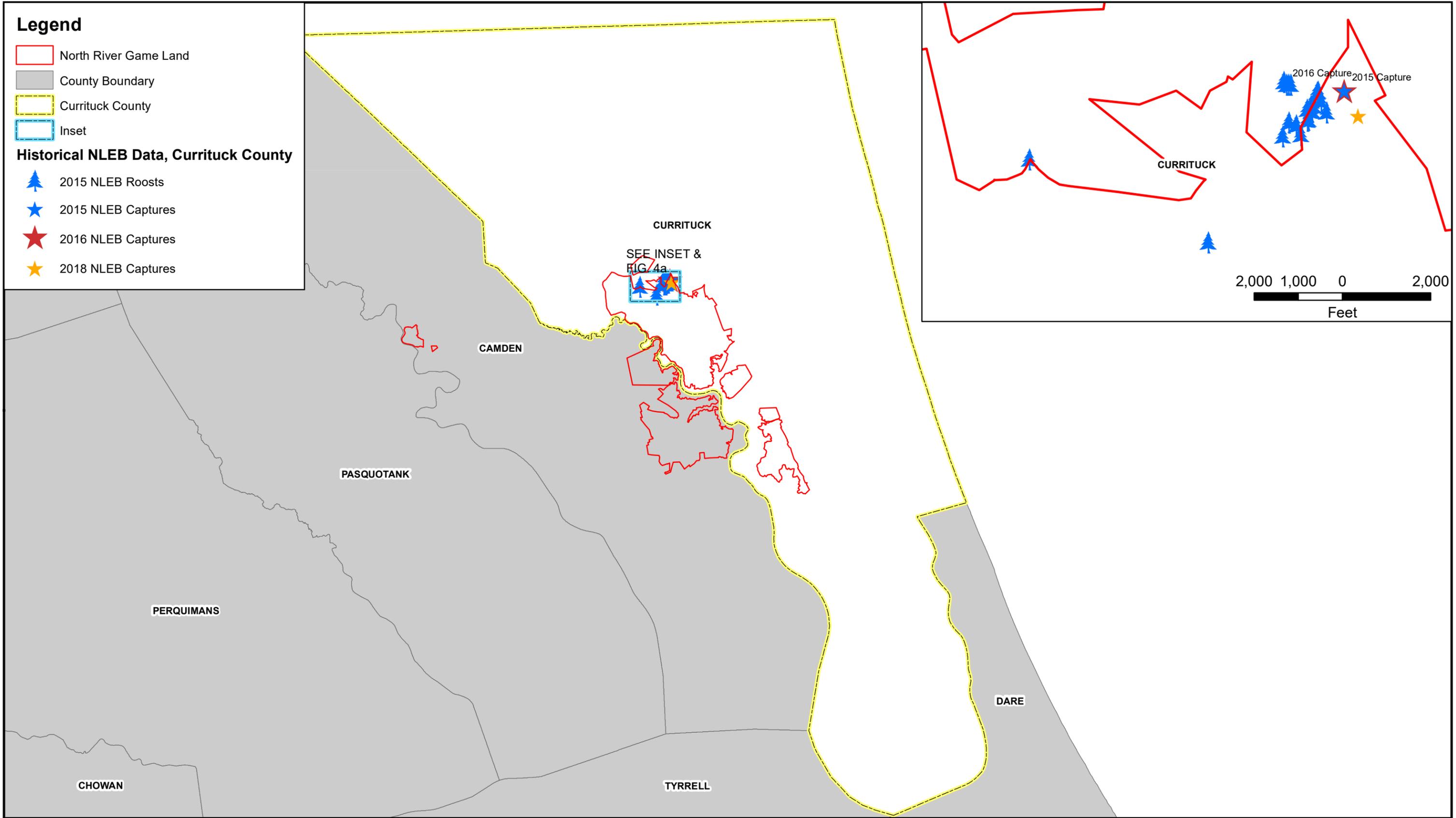
NCCGIA

**Legend**

-  North River Game Land
-  County Boundary
-  Currituck County
-  Inset

**Historical NLEB Data, Currituck County**

-  2015 NLEB Roosts
-  2015 NLEB Captures
-  2016 NLEB Captures
-  2018 NLEB Captures



Prepared by:



Prepared for:

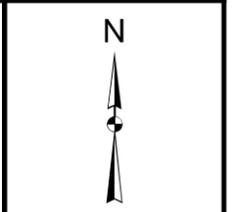


**Figure 4: Historical Capture Sites & Roost Sites in North River Game Land, Currituck County**



4 2 0 4  
Miles

North Carolina Department of Transportation  
 Eastern North Carolina Northern Long-eared Bat  
*(Myotis septentrionalis)* Research Study  
 Spring/Summer 2019, Phase VII  
 Camden and Currituck Counties, NC  
 within the North River Game Land

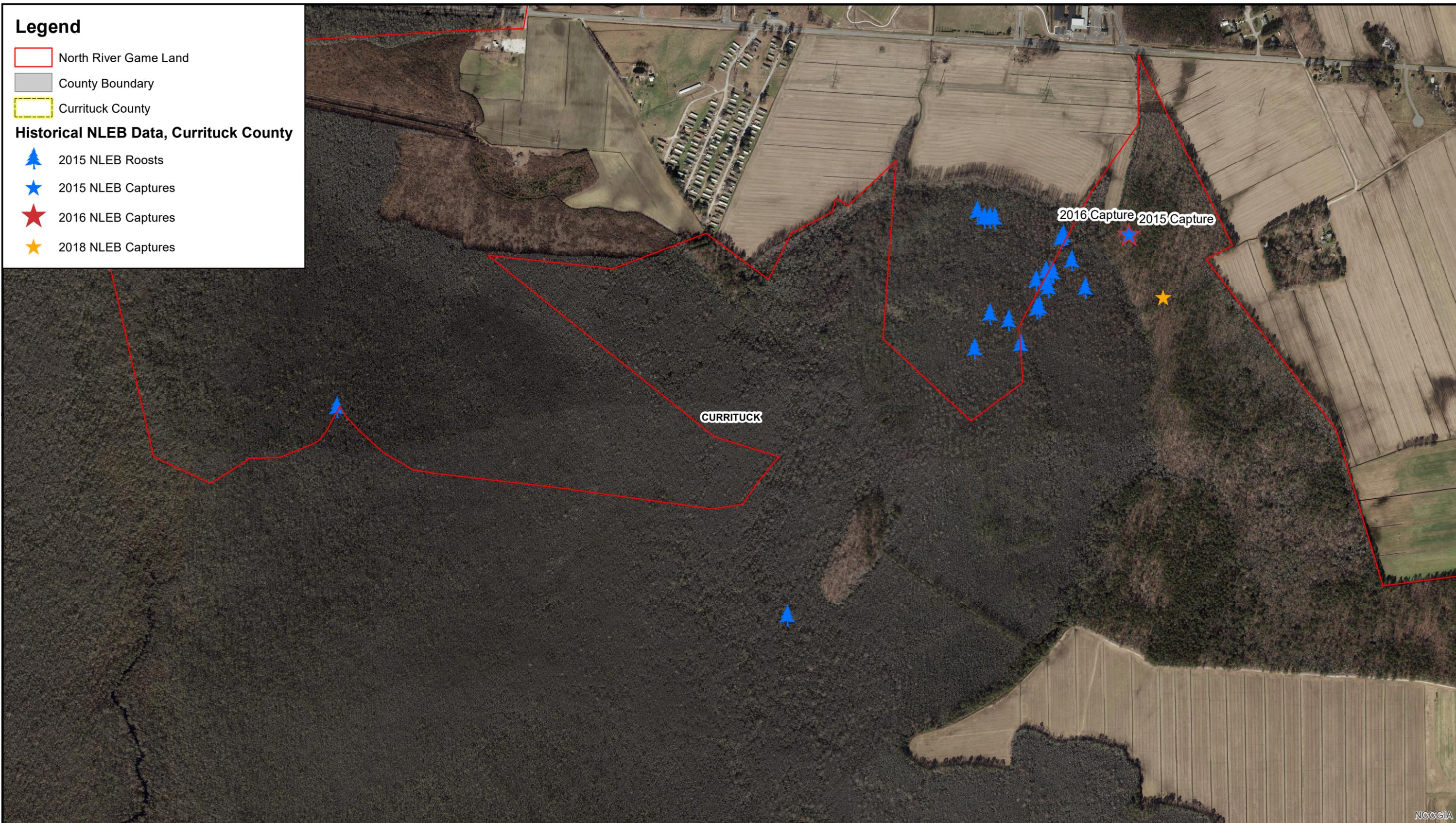


**Legend**

-  North River Game Land
-  County Boundary
-  Currituck County

**Historical NLEB Data, Currituck County**

-  2015 NLEB Roosts
-  2015 NLEB Captures
-  2016 NLEB Captures
-  2018 NLEB Captures



Prepared by:



Prepared for:



**Figure 4a: Historical Capture Sites & Roost Sites in North River Game Land, Currituck County**



800 400 0 800  
Feet

North Carolina Department of Transportation  
Eastern North Carolina Northern Long-eared Bat  
(*Myotis septentrionalis*) Research Study  
Spring/Summer 2019, Phase VII  
Camden and Currituck Counties, NC  
within the North River Game Land



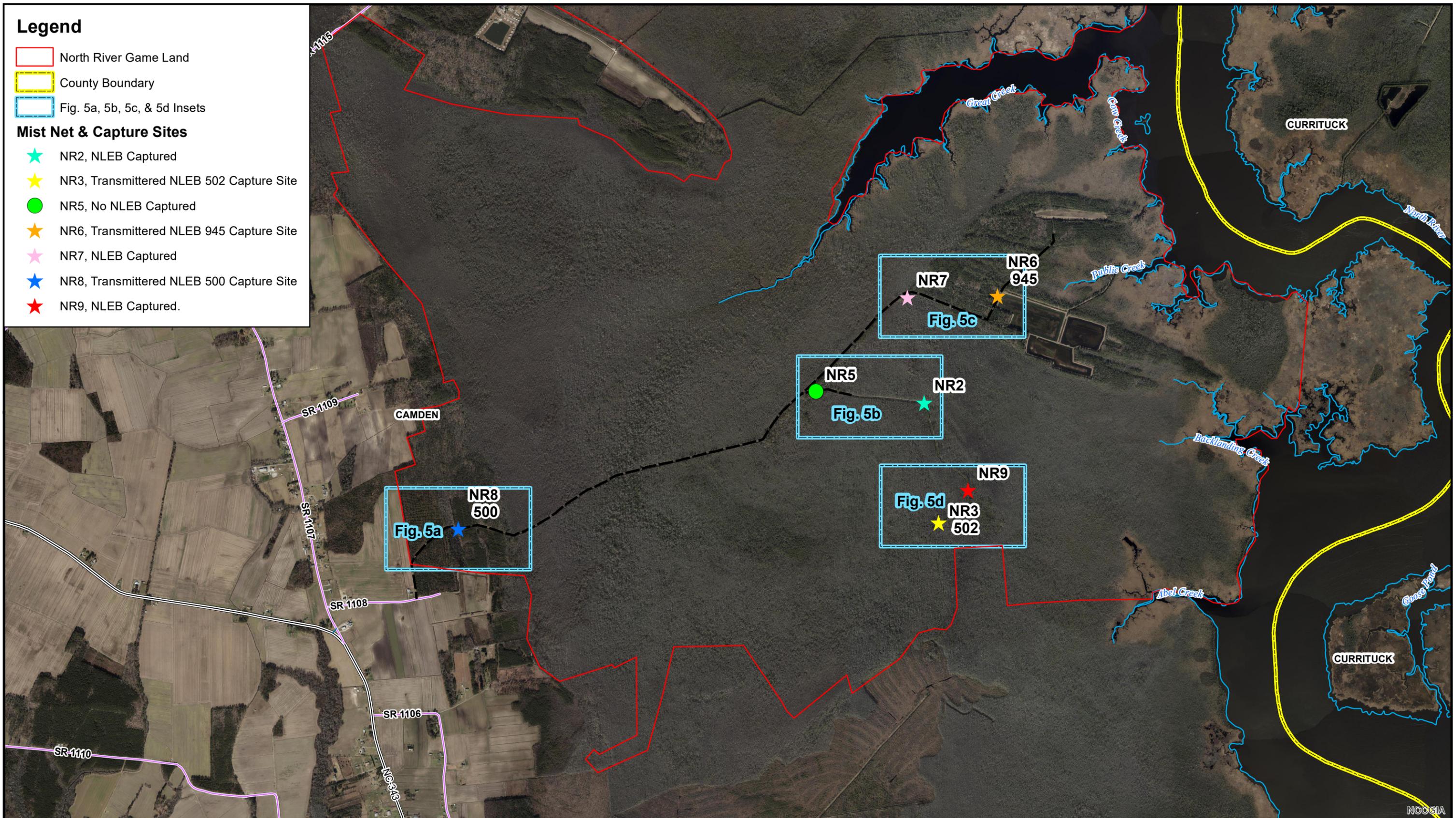
N

**Legend**

- North River Game Land
- County Boundary
- Fig. 5a, 5b, 5c, & 5d Insets

**Mist Net & Capture Sites**

- ★ NR2, NLEB Captured
- ★ NR3, Transmitted NLEB 502 Capture Site
- NR5, No NLEB Captured
- ★ NR6, Transmitted NLEB 945 Capture Site
- ★ NR7, NLEB Captured
- ★ NR8, Transmitted NLEB 500 Capture Site
- ★ NR9, NLEB Captured.



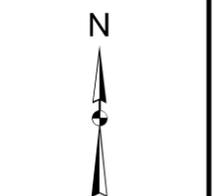
Prepared by:  


Prepared for:  


**Figure 5: Mist Net Survey & NLEB Capture Sites 2019, Camden County**

  
 Feet

North Carolina Department of Transportation  
 Eastern North Carolina Northern Long-eared Bat  
 (*Myotis septentrionalis*) Research Study  
 Spring/Summer 2019, Phase VII  
 Camden and Currituck Counties, NC  
 within the North River Game Land



**Legend**

 North River Game Land

 County Boundary

**Mist Net & Capture Sites**

 NR8, Transmitted NLEB 500 Capture Site



NCCGIA

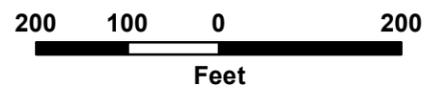
Prepared by:



Prepared for:



**Figure 5a: Mist Net Survey & NLEB Capture Sites 2019, Camden County**



North Carolina Department of Transportation  
Eastern North Carolina Northern Long-eared Bat  
(*Myotis septentrionalis*) Research Study  
Spring/Summer 2019, Phase VII  
Camden and Currituck Counties, NC  
within the North River Game Land



**Legend**

 North River Game Land

 County Boundary

**Mist Net & Capture Sites**

 NR2, NLEB Captured

 NR5, No NLEB Captured



NCCGIA

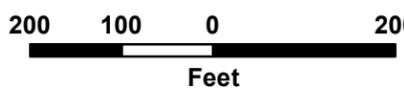
Prepared by:



Prepared for:



**Figure 5b: Mist Net Survey & NLEB Capture Sites 2019, Camden County**



North Carolina Department of Transportation  
Eastern North Carolina Northern Long-eared Bat  
(*Myotis septentrionalis*) Research Study  
Spring/Summer 2019, Phase VII  
Camden and Currituck Counties, NC  
within the North River Game Land

N



**Legend**

 North River Game Land

 County Boundary

**Mist Net & Capture Sites**

 NR6, Transmitted NLEB 945 Capture Site

 NR7, NLEB Captured



NCCGIA

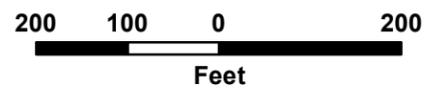
Prepared by:



Prepared for:



**Figure 5c: Mist Net Survey & NLEB Capture Sites 2019, Camden County**



North Carolina Department of Transportation  
Eastern North Carolina Northern Long-eared Bat  
(*Myotis septentrionalis*) Research Study  
Spring/Summer 2019, Phase VII  
Camden and Currituck Counties, NC  
within the North River Game Land

N



**Legend**

 North River Game Land

 County Boundary

**Mist Net & Capture Sites**

 NR3, Transmitted NLEB 502 Capture Site

 NR9, NLEB Captured.



NCCGIA

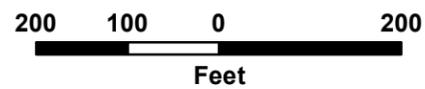
Prepared by:



Prepared for:



**Figure 5d: Mist Net Survey & NLEB Capture Sites 2019, Camden County**



North Carolina Department of Transportation  
Eastern North Carolina Northern Long-eared Bat  
(*Myotis septentrionalis*) Research Study  
Spring/Summer 2019, Phase VII  
Camden and Currituck Counties, NC  
within the North River Game Land



**Legend**

- North River Game Land
- County Boundary
- Fig. 6a & 6b Insets

**Mist Net & Capture Sites**

- NR1, Transmitted NLEB 543, 705, & 982 Capture Site
- NR4, Transmitted NLEB 623 & 901 Capture Site



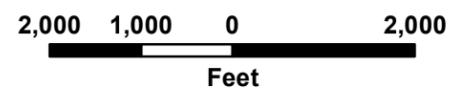
Prepared by:



Prepared for:



**Figure 6: Mist Net Survey & NLEB Capture Sites 2019, Currituck County**



North Carolina Department of Transportation  
Eastern North Carolina Northern Long-eared Bat  
(*Myotis septentrionalis*) Research Study  
Spring/Summer 2019, Phase VII  
Camden and Currituck Counties, NC  
within the North River Game Land

N



**Legend**

 North River Game Land

 County Boundary

**Mist Net & Capture Sites**

 NR1, Transmitted NLEB 543, 705, & 982 Capture Site



NCCGIA

Prepared by:



Prepared for:



**Figure 6a: Mist Net Survey & NLEB Capture Sites 2019, Currituck County**



200 100 0 200  
Feet

North Carolina Department of Transportation  
Eastern North Carolina Northern Long-eared Bat  
(*Myotis septentrionalis*) Research Study  
Spring/Summer 2019, Phase VII  
Camden and Currituck Counties, NC  
within the North River Game Land

N



**Legend**

 North River Game Land

 County Boundary

**Mist Net & Capture Sites**

 NR4, Transmittered NLEB 623 & 901 Capture Site



NCCGIA

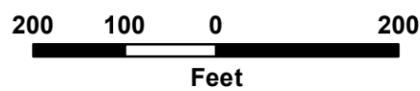
Prepared by:



Prepared for:



**Figure 6b: Mist Net Survey & NLEB Capture Sites 2019, Currituck County**



200 100 0 200  
Feet

North Carolina Department of Transportation  
Eastern North Carolina Northern Long-eared Bat  
(*Myotis septentrionalis*) Research Study  
Spring/Summer 2019, Phase VII  
Camden and Currituck Counties, NC  
within the North River Game Land



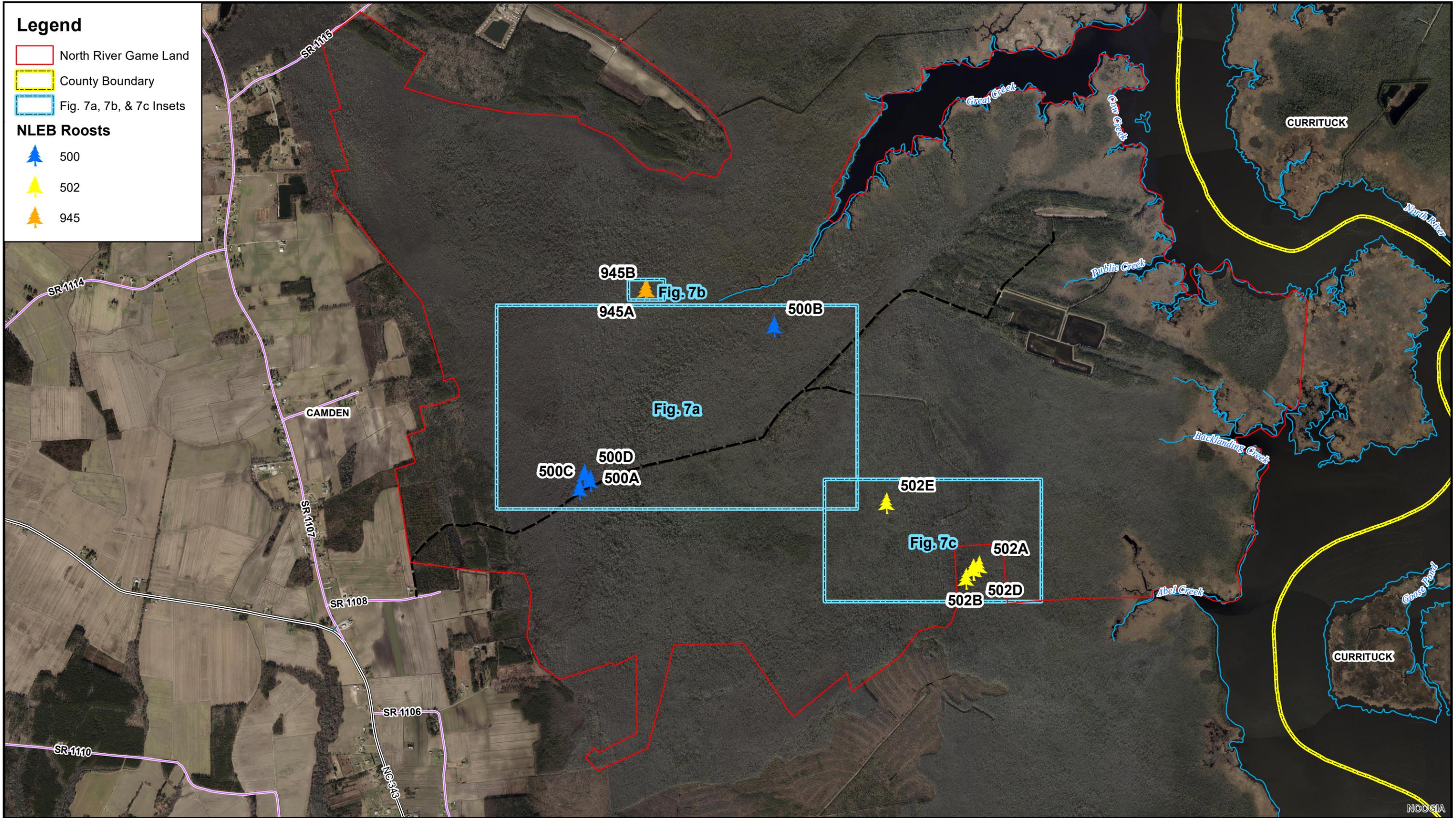
N

**Legend**

- North River Game Land
- County Boundary
- Fig. 7a, 7b, & 7c Insets

**NLEB Roosts**

- ▲ 500
- ▲ 502
- ▲ 945



Prepared by:



Prepared for:



**Figure 7: Northern Long-eared Bat Roost Tree Sites 2019, Camden County**



Feet

North Carolina Department of Transportation  
 Eastern North Carolina Northern Long-eared Bat  
 (*Myotis septentrionalis*) Research Study  
 Spring/Summer 2019, Phase VII  
 Camden and Currituck Counties, NC  
 within the North River Game Land

N



**Legend**

 North River Game Land

 County Boundary

**NLEB Roosts**

 500



NGCGIA

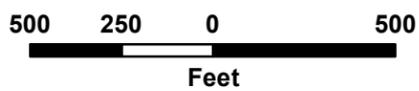
Prepared by:



Prepared for:



**Figure 7a: Northern Long-eared Bat Roost Tree Sites 2019, Camden County**



North Carolina Department of Transportation  
Eastern North Carolina Northern Long-eared Bat  
(*Myotis septentrionalis*) Research Study  
Spring/Summer 2019, Phase VII  
Camden and Currituck Counties, NC  
within the North River Game Land

N



**Legend**

 North River Game Land

 County Boundary

 Inset

**NLEB Roosts**

 945

CAMDEN

945B

945A

NCCGIA

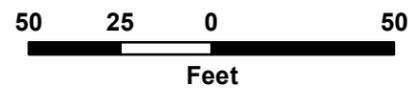
Prepared by:



Prepared for:



**Figure 7b: Northern Long-eared Bat Roost Tree Sites 2019, Camden County**



North Carolina Department of Transportation  
Eastern North Carolina Northern Long-eared Bat  
(*Myotis septentrionalis*) Research Study  
Spring/Summer 2019, Phase VII  
Camden and Currituck Counties, NC  
within the North River Game Land



**Legend**

-  North River Game Land
-  County Boundary
-  Inset
- NLEB Roosts**
-  502



NCCGIA

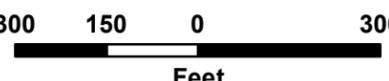
Prepared by:



Prepared for:



**Figure 7c: Northern Long-eared Bat Roost Tree Sites 2019, Camden County**



North Carolina Department of Transportation  
Eastern North Carolina Northern Long-eared Bat  
(*Myotis septentrionalis*) Research Study  
Spring/Summer 2019, Phase VII  
Camden and Currituck Counties, NC  
within the North River Game Land

N



**Legend**

- North River Game Land
- County Boundary
- Fig. 8a & 8b Insets

**NLEB Roosts**

- ▲ 543
- ▲ 623
- ▲ 705
- ▲ 901
- ▲ 982



**Legend**

 North River Game Land

 County Boundary

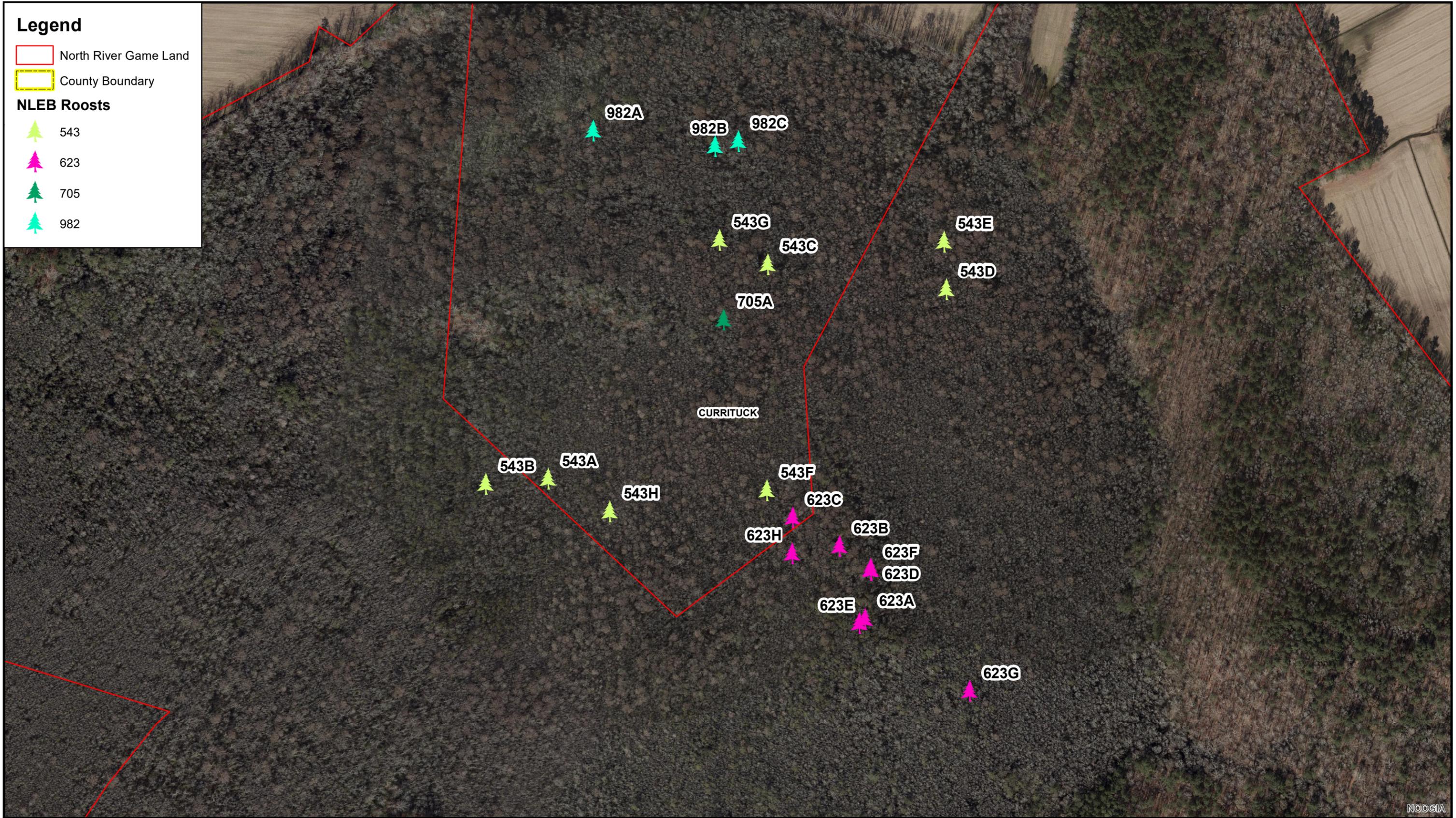
**NLEB Roosts**

 543

 623

 705

 982



NCCGIA

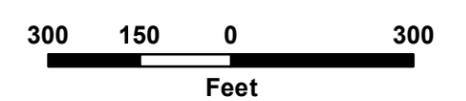
Prepared by:



Prepared for:



**Figure 8a: Northern Long-eared Bat Roost Tree Sites 2019, Currituck County**



North Carolina Department of Transportation  
Eastern North Carolina Northern Long-eared Bat  
(*Myotis septentrionalis*) Research Study  
Spring/Summer 2019, Phase VII  
Camden and Currituck Counties, NC  
within the North River Game Land

N



**Legend**

 North River Game Land

 County Boundary

**NLEB Roosts**

 901



NCCGIA

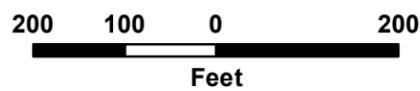
Prepared by:



Prepared for:



**Figure 8b: Northern Long-eared Bat Roost Tree Sites 2019, Currituck County**



North Carolina Department of Transportation  
Eastern North Carolina Northern Long-eared Bat  
(*Myotis septentrionalis*) Research Study  
Spring/Summer 2019, Phase VII  
Camden and Currituck Counties, NC  
within the North River Game Land

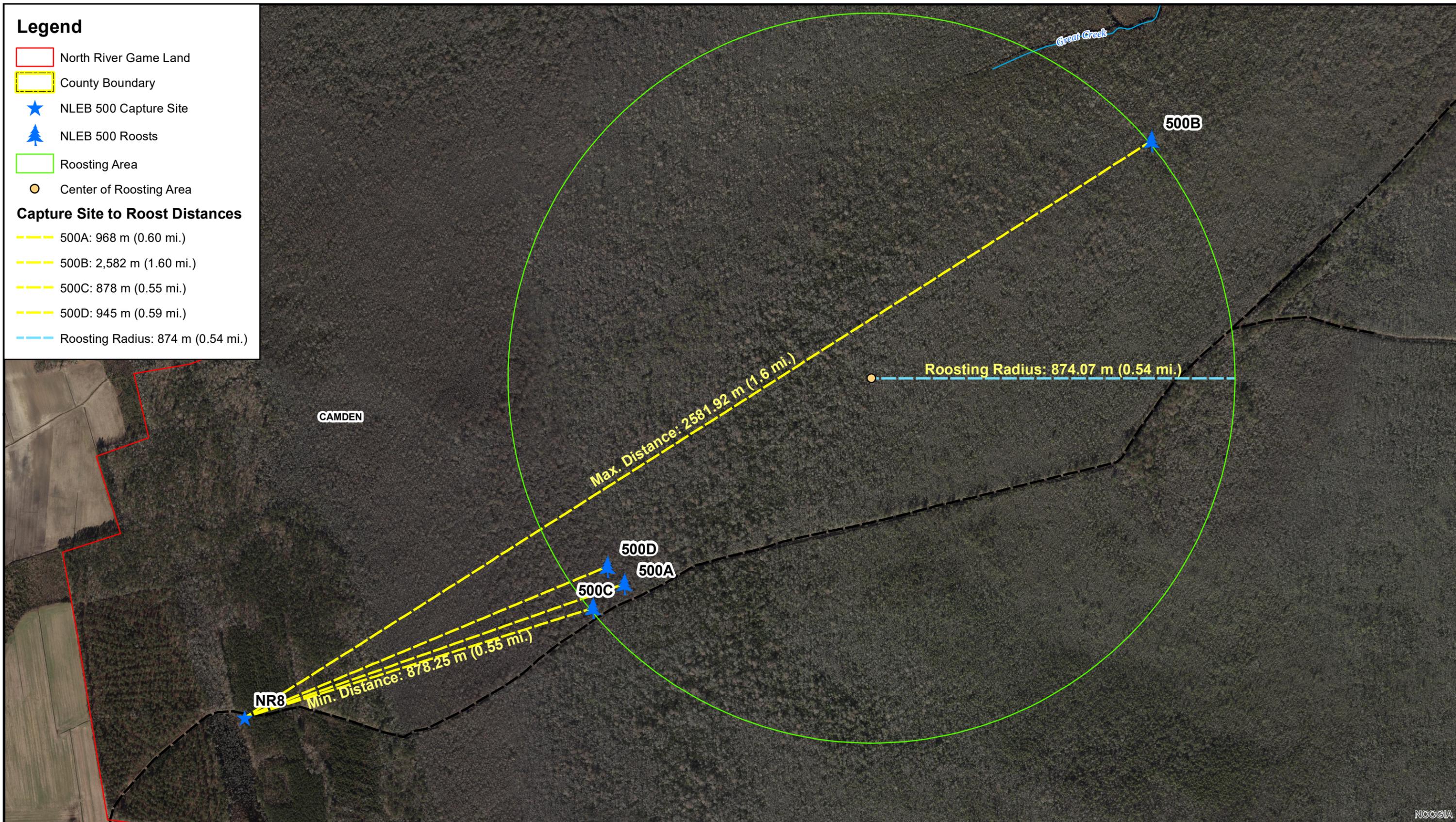


**Legend**

- North River Game Land
- County Boundary
- ★ NLEB 500 Capture Site
- ▲ NLEB 500 Roosts
- Roosting Area
- Center of Roosting Area

**Capture Site to Roost Distances**

- 500A: 968 m (0.60 mi.)
- 500B: 2,582 m (1.60 mi.)
- 500C: 878 m (0.55 mi.)
- 500D: 945 m (0.59 mi.)
- Roosting Radius: 874 m (0.54 mi.)

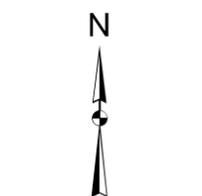


Prepared by:  


Prepared for:  


**Figure 9a: NLEB Capture Site to Roost Distances, Camden County**

North Carolina Department of Transportation  
 Eastern North Carolina Northern Long-eared Bat  
 (*Myotis septentrionalis*) Research Study  
 Spring/Summer 2019, Phase VII  
 Camden and Currituck Counties, NC  
 within the North River Game Land



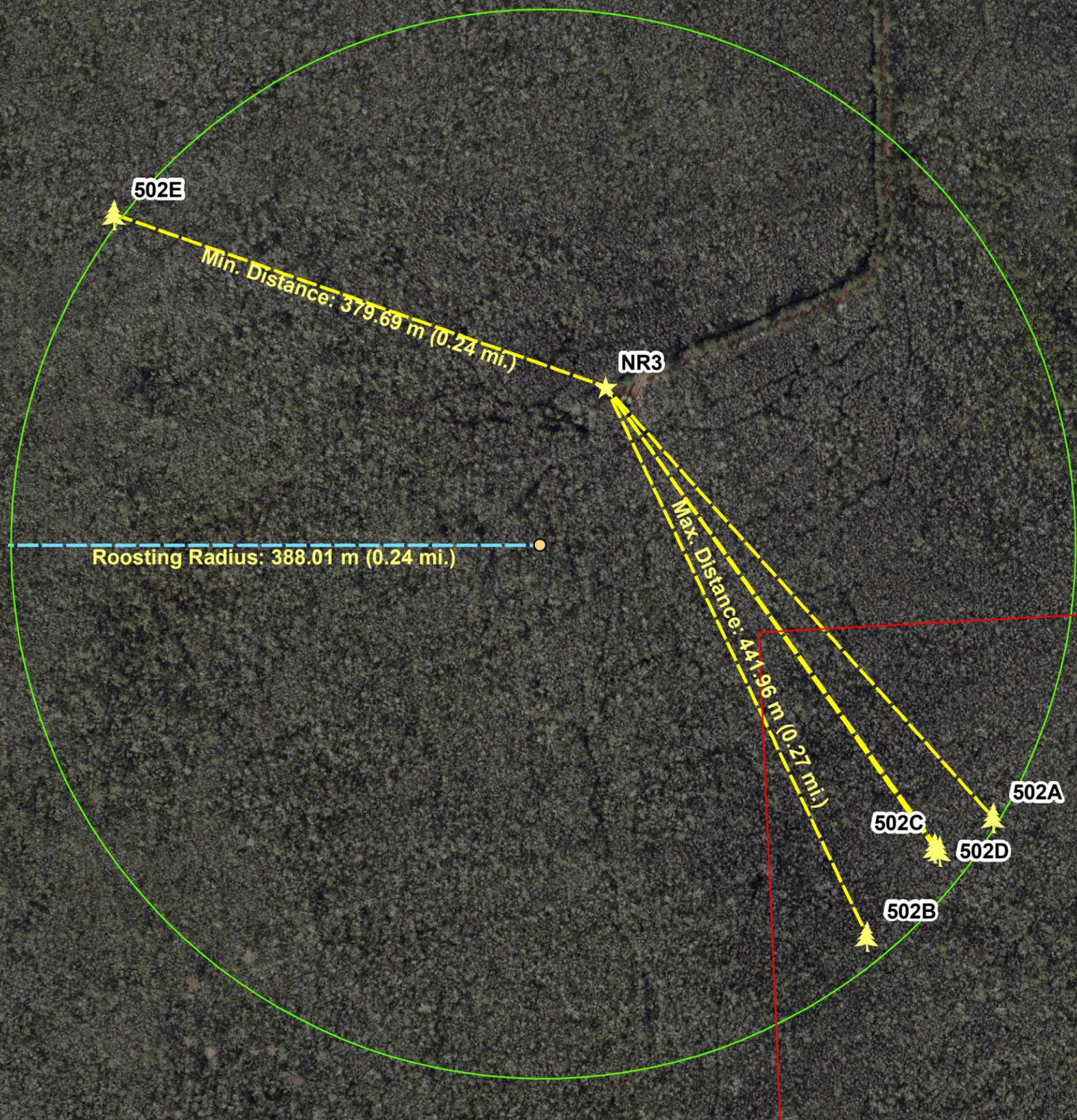
NCCGIA

**Legend**

- North River Game Land
- County Boundary
- ★ NLEB 502 Capture Site
- 🌲 NLEB 502 Roosts
- Roosting Area
- Center of Roosting Area

**Capture Site to Roost Distances**

- - - 502A: 421 m (0.26 mi.)
- - - 502B: 442 m (0.27 mi.)
- - - 502C: 412 m (0.26 mi.)
- - - 502D: 416 m (0.26 mi.)
- - - 502E: 380 m (0.24 mi.)
- - - RoostingRadius: 388 m (0.24 mi.)



CAMDEN

Roosting Radius: 388.01 m (0.24 mi.)

Min. Distance: 379.69 m (0.24 mi.)

Max. Distance: 441.96 m (0.27 mi.)

NCCGIA

Prepared by:



Prepared for:



**Figure 9b: NLEB Capture Site to Roost Distances, Camden County**



Feet

North Carolina Department of Transportation  
 Eastern North Carolina Northern Long-eared Bat  
*(Myotis septentrionalis)* Research Study  
 Spring/Summer 2019, Phase VII  
 Camden and Currituck Counties, NC  
 within the North River Game Land

N



**Legend**

- North River Game Land
- County Boundary
- ★ NLEB 945 Capture Site
- 🌲 NLEB 945 Roosts
- Roosting Area
- Center of Roosting Area

**Capture Site to Roost Distances**

- 945A: 2,420 m (1.50 mi.)
- 945B: 2,430 m (1.51 mi.)
- Roosting Radius: 5m (0.00 mi.)



945B 945A  
CAMDEN  
SEE INSET

Min. Distance: 2419.71 m (1.5 mi.)  
Max. Distance: 2429.5 m (1.51 mi.)

NR6

Prepared by:



Prepared for:



**Figure 9c: NLEB Capture Site to Roost Distances, Camden County**

600 300 0 600  
Feet

North Carolina Department of Transportation  
Eastern North Carolina Northern Long-eared Bat  
(*Myotis septentrionalis*) Research Study  
Spring/Summer 2019, Phase VII  
Camden and Currituck Counties, NC  
within the North River Game Land

N

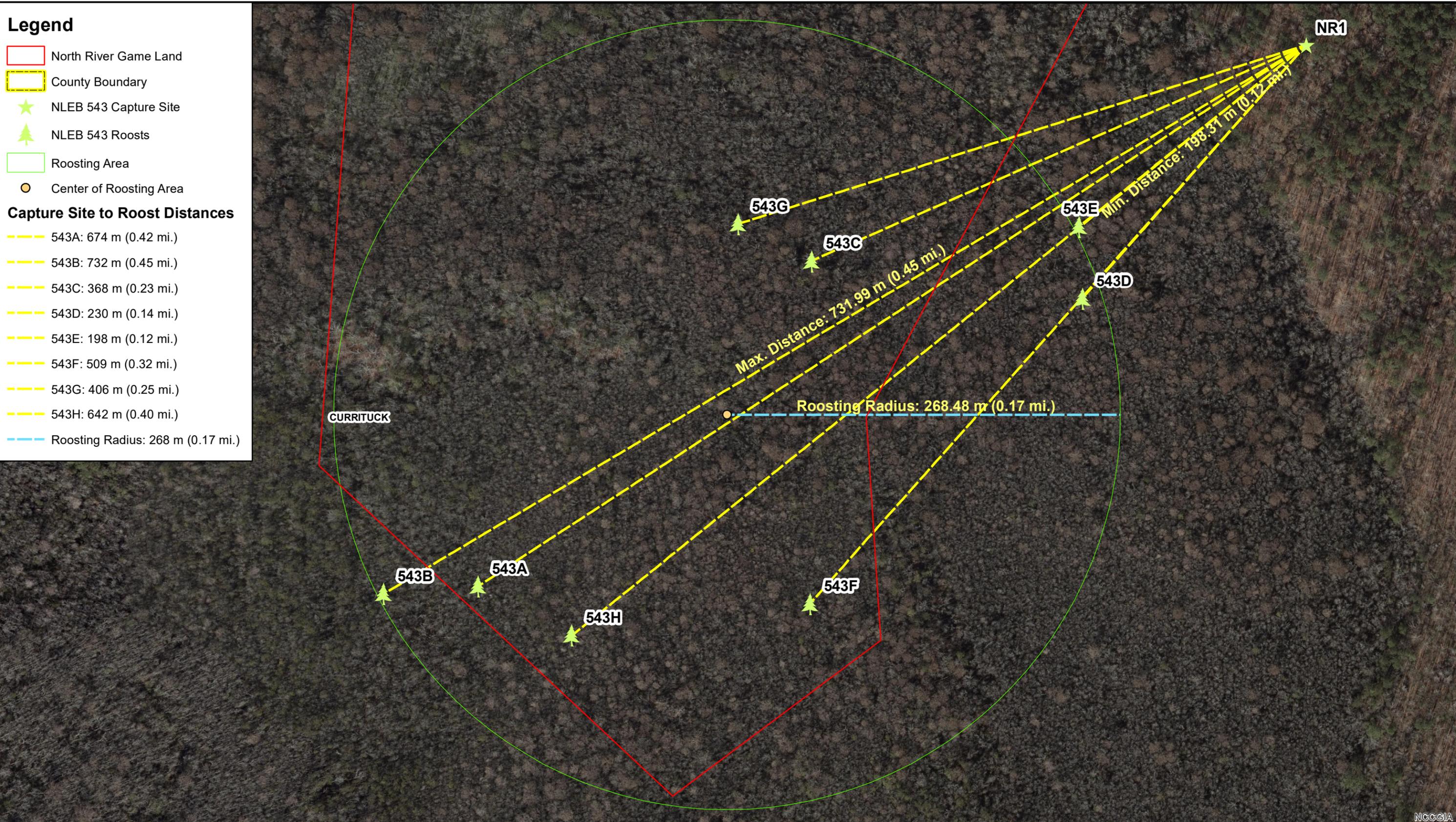


**Legend**

- North River Game Land
- County Boundary
- ★ NLEB 543 Capture Site
- 🌲 NLEB 543 Roosts
- Roosting Area
- Center of Roosting Area

**Capture Site to Roost Distances**

- 543A: 674 m (0.42 mi.)
- 543B: 732 m (0.45 mi.)
- 543C: 368 m (0.23 mi.)
- 543D: 230 m (0.14 mi.)
- 543E: 198 m (0.12 mi.)
- 543F: 509 m (0.32 mi.)
- 543G: 406 m (0.25 mi.)
- 543H: 642 m (0.40 mi.)
- Roosting Radius: 268 m (0.17 mi.)



NCCGIA

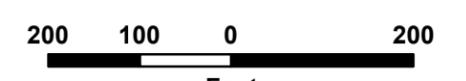
Prepared by:



Prepared for:



**Figure 10a: NLEB Capture Site to Roost Distances, Currituck County**

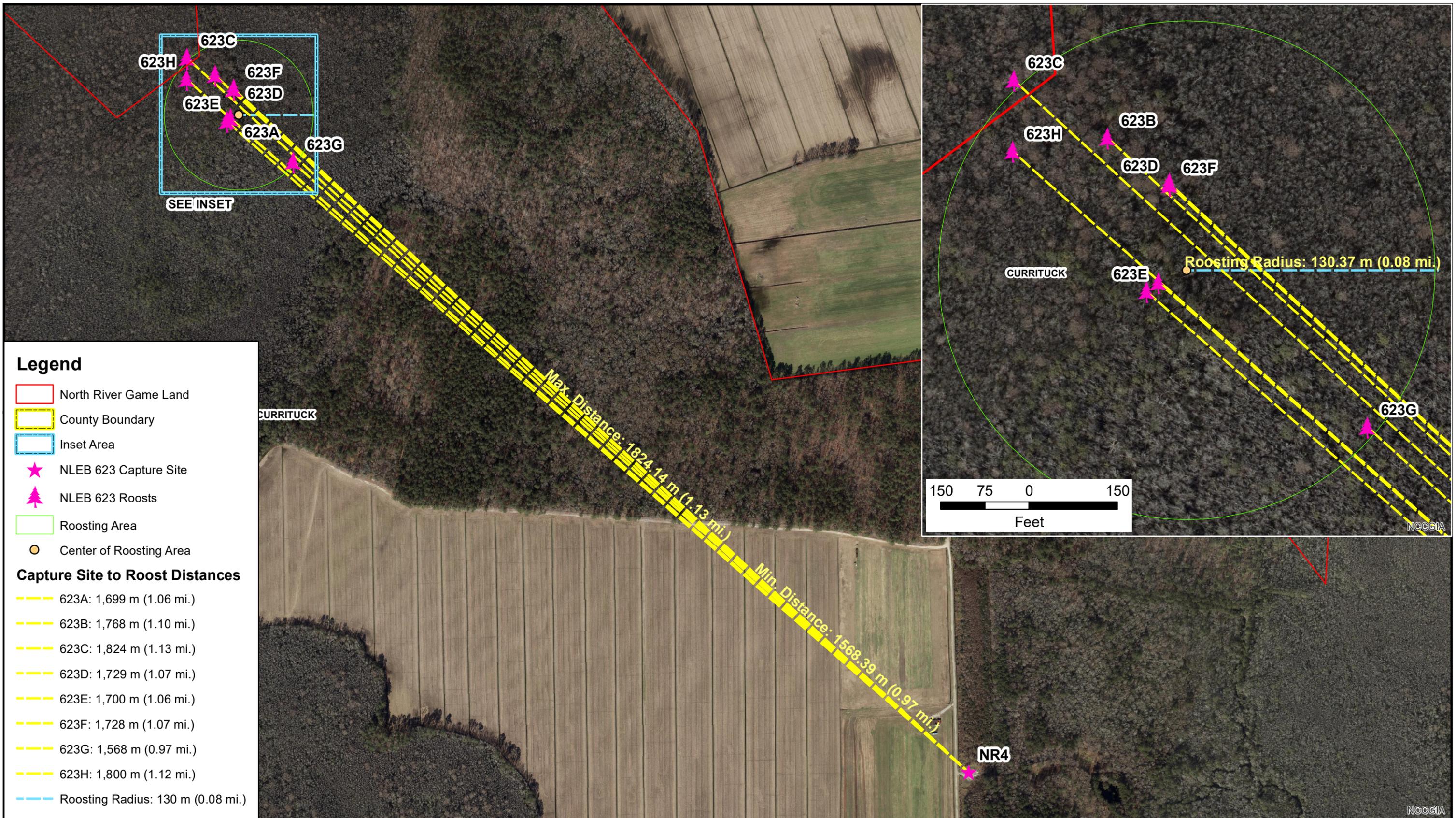


Feet

North Carolina Department of Transportation  
 Eastern North Carolina Northern Long-eared Bat  
 (*Myotis septentrionalis*) Research Study  
 Spring/Summer 2019, Phase VII  
 Camden and Currituck Counties, NC  
 within the North River Game Land

N



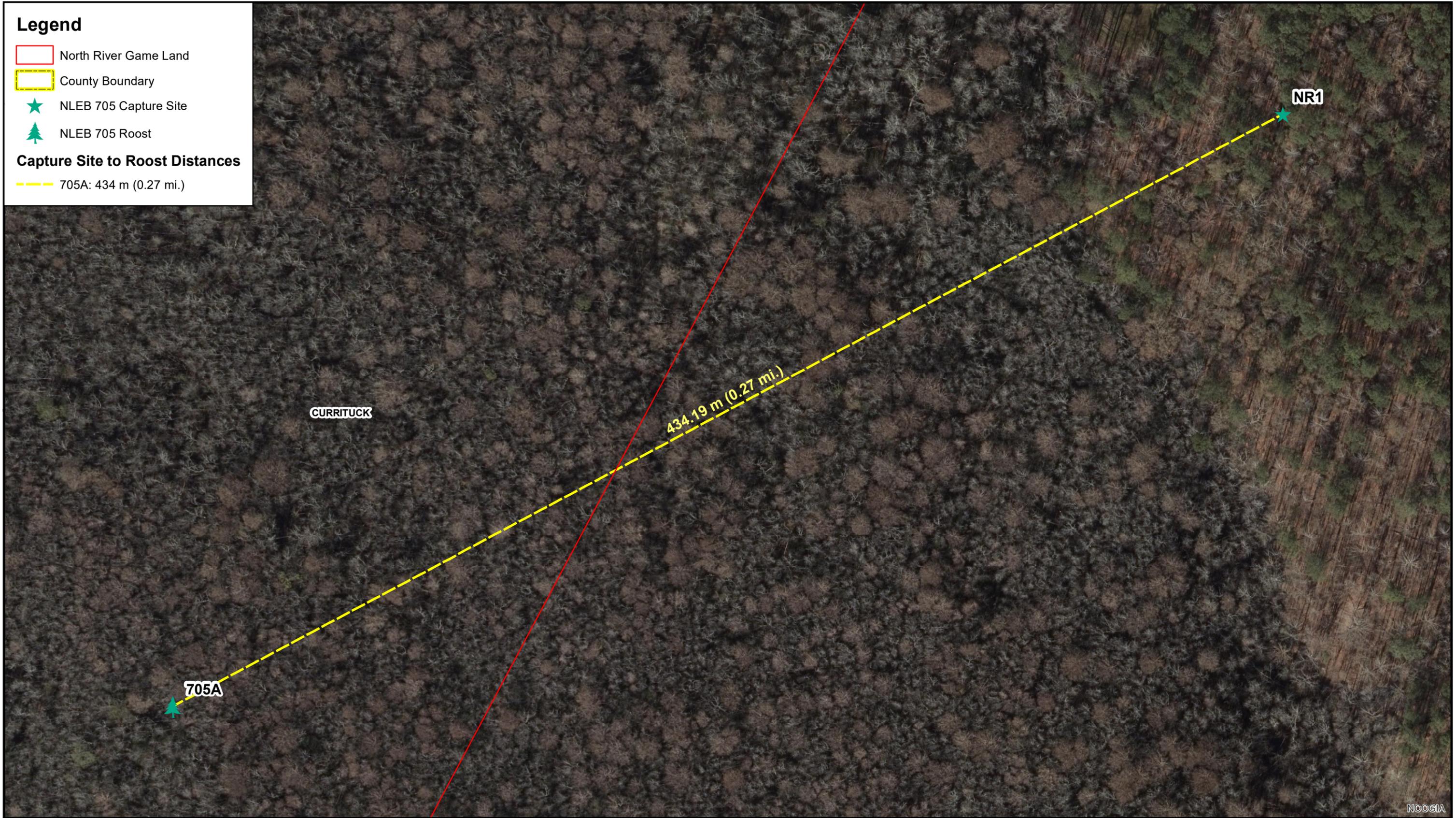


**Legend**

-  North River Game Land
-  County Boundary
-  NLEB 705 Capture Site
-  NLEB 705 Roost

**Capture Site to Roost Distances**

-  705A: 434 m (0.27 mi.)



NCCGIA

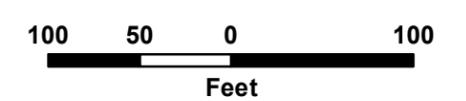
Prepared by:



Prepared for:



**Figure 10c: NLEB Capture Site to Roost Distances, Currituck County**

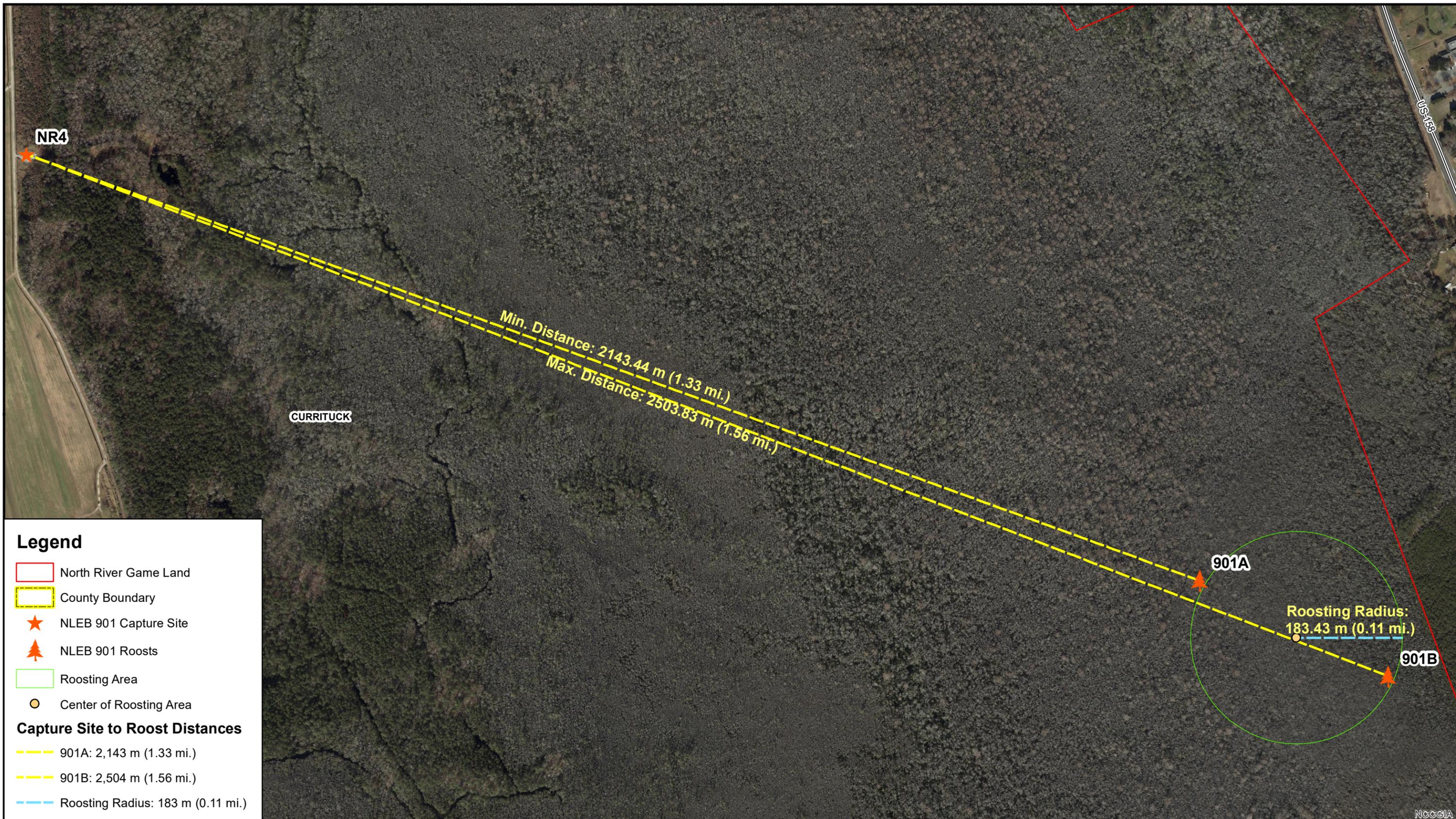


Feet

North Carolina Department of Transportation  
Eastern North Carolina Northern Long-eared Bat  
(*Myotis septentrionalis*) Research Study  
Spring/Summer 2019, Phase VII  
Camden and Currituck Counties, NC  
within the North River Game Land



N



**Legend**

- North River Game Land
- County Boundary
- ★ NLEB 901 Capture Site
- 🌲 NLEB 901 Roosts
- Roosting Area
- Center of Roosting Area

**Capture Site to Roost Distances**

- 901A: 2,143 m (1.33 mi.)
- 901B: 2,504 m (1.56 mi.)
- Roosting Radius: 183 m (0.11 mi.)

NCCGIA

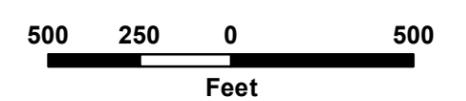
Prepared by:



Prepared for:



**Figure 10d: NLEB Capture Site to Roost Distances, Currituck County**



500 250 0 500  
Feet

North Carolina Department of Transportation  
 Eastern North Carolina Northern Long-eared Bat  
 (*Myotis septentrionalis*) Research Study  
 Spring/Summer 2019, Phase VII  
 Camden and Currituck Counties, NC  
 within the North River Game Land

N



**Legend**

- North River Game Land
- County Boundary
- ★ NLEB 982 Capture Site
- ▲ NLEB 982 Roosts
- Roosting Area
- Center of Roosting Area

**Capture Site to Roost Distances**

- - - 982A: 519 m (0.32 mi.)
- - - 982B: 393 m (0.24 mi.)
- - - 982C: 369 m (0.23 mi.)
- - - Roosting Radius: 76 m (0.05 mi.)



NCCGIA

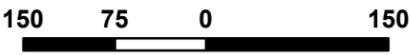
Prepared by:



Prepared for:



**Figure 10e: NLEB Capture Site to Roost Distances, Currituck County**



Feet

North Carolina Department of Transportation  
 Eastern North Carolina Northern Long-eared Bat  
 (*Myotis septentrionalis*) Research Study  
 Spring/Summer 2019, Phase VII  
 Camden and Currituck Counties, NC  
 within the North River Game Land

N



**Appendix A**  
**Mist Net Site Photographs**

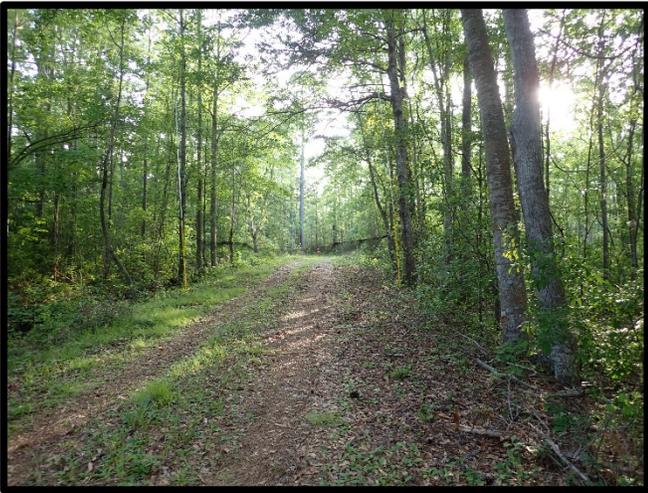
**Representative Mist Net Site Photographs**



**Camden County Mist Net Site NR 2**



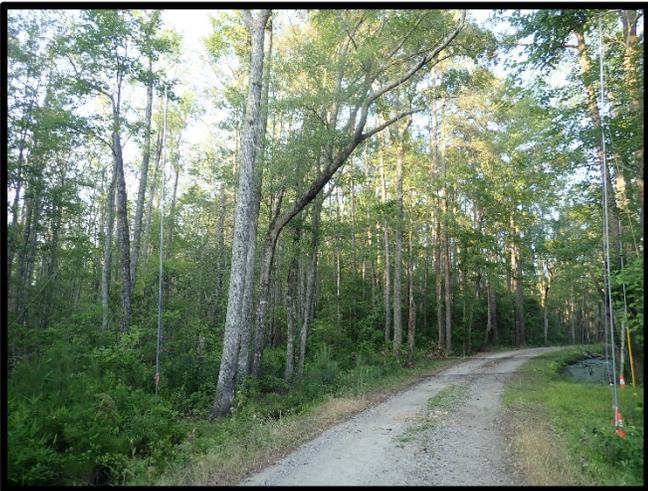
**Camden County Mist Net Site NR 3**



**Camden County Mist Net Site NR 5**



**Camden County Mist Net Site NR 6**



**Camden County Mist Net Site NR 7**



**Camden County Mist Net Site NR 8**



**Camden County Mist Net Site NR 9**



**Currituck County Mist Net Site NR 1**



**Currituck County Mist Net Site NR 4**

**Appendix B**  
**Habitat Type Photographs**

**Representative Habitat Type Photographs**



**Cypress-Gum Swamp (Blackwater Subtype)**



**Cypress-Gum Swamp (Blackwater Subtype)**



**Cypress-Gum Swamp (Blackwater Subtype)**



**Cypress-Gum Swamp (Blackwater Subtype)**



**Managed Loblolly Pine**



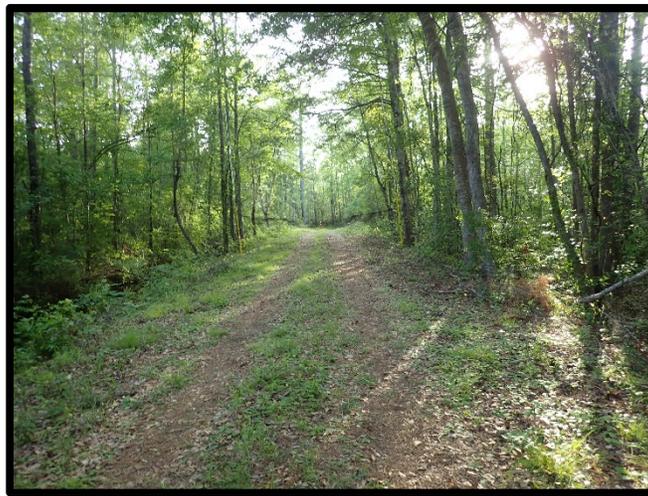
**Mesic Mixed Hardwoods (Coastal Plain Subtype)**



**Mesic Mixed Hardwoods (Coastal Plain Subtype)**



**Nonriverine Swamp Forest (Sweet Gum Subtype)**



**Nonriverine Wet Hardwood Forest**

**Appendix C**  
**Representative Captured**  
**Bat Species Photographs**

Representative Captured Bat Species Photographs



Rafinesque's Big-eared Bat (*Corynorhinus rafinesquii*)



Big Brown Bat (*Eptesicus fuscus*)



Eastern Red Bat (*Lasiurus borealis*)



Seminole Bat (*Lasiurus seminolus*)



Southeastern Bat (*Myotis austroriparius*)



Southeastern Bat (*Myotis austroriparius*)



Northern Long-eared Bat (*Myotis septentrionalis*)



Evening Bat (*Nycticeius humeralis*)



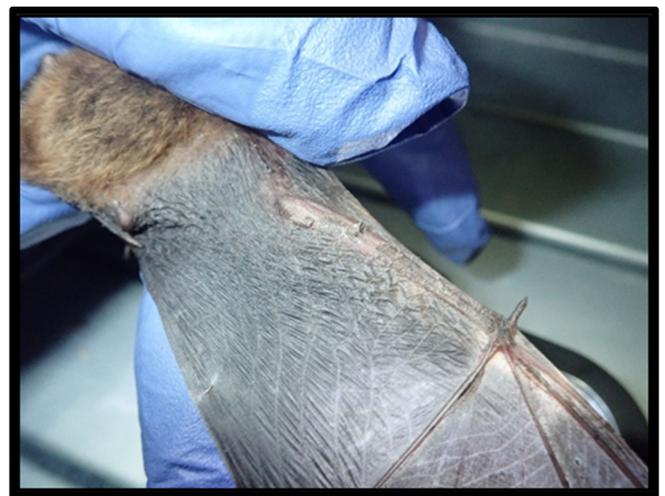
Tricolored Bat (*Perimyotis subflavus*)



Evening Bat with Skin Peeling off Muzzle



Tricolored Bat (*Perimyotis subflavus*)



Evening Bat with Flaky Skin on Forearm

**Appendix D**  
**Representative Photos of**  
**Captured Northern Long-eared**  
**Bats (NLEB)**

Representative Photographs of Captured Northern Long-eared Bats (NLEB)



NLEB 150.502 Female Site NR 3 Camden County



NLEB 150.543 Female Site NR 1 Currituck County



NLEB 150.543 Pregnant



NLEB 150.705 Female Site NR 1 Currituck County



NLEB 150.623 Female Site NR 4 Currituck County



NLEB 150.623 with Transmitter



NLEB 150.982 Female Site NR 1 Currituck County



NLEB 150.945 Female Site NR 6 Camden County



NLEB 150.500 Female Site NR 8 Camden County



NLEB 150.901 Female Site NR 4 Currituck County



NLEB 150.91 Lactating



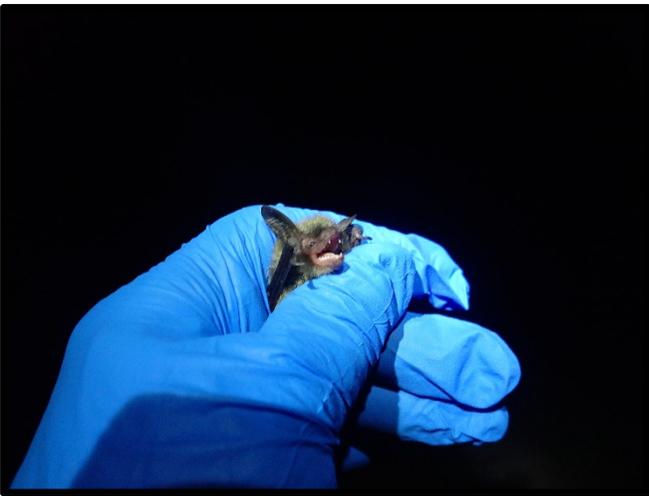
NLEB NCWRC A3255 Site NR 1 Currituck County



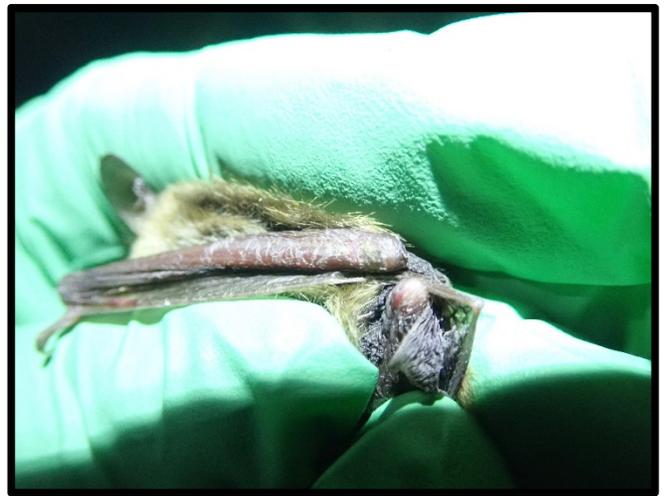
NLEB #DB1255 Post-Lactating Site NR 9



NLEB #DB1297 Female Juvenile Camden County



NLEB (no band) Male Juvenile Camden County



NLEB NCWRC A3255 with Flaky Arms



NLEB Keeled Calcar



NLEB #DB1297 Juvenile Cartilaginous Plates

**Appendix E**  
**Representative Photos of**  
**Northern Long-eared Bat**  
**Roosts**

Representative Photographs of Northern Long-eared Bat Roosts



NLEB 150.502 Roost A, *Nyssa aquatica*



NLEB 150.502 in Roost A



NLEB 150.502 Roost B, *Nyssa aquatica*



NLEB 150.502 Roost C, *Acer rubrum*



NLEB 150.502 Roost D, *Nyssa aquatica*



NLEB 150.502 Roost D, *Nyssa aquatica*



NLEB 150.543 Roost A, *Pinus taeda*



NLEB 150.543 Roost B, *Pinus taeda*



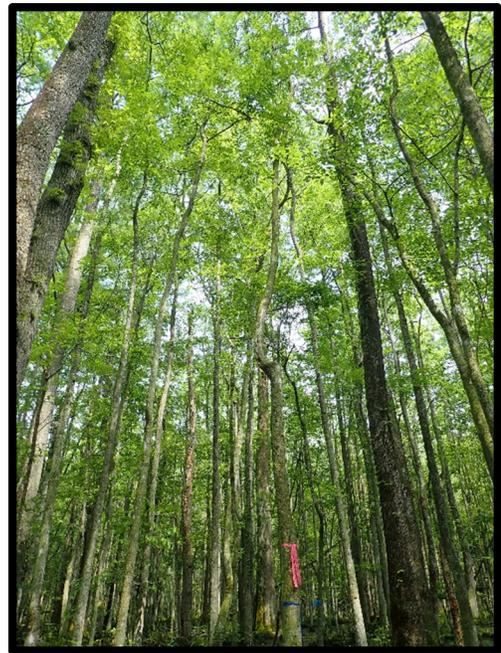
NLEB 150.543 Roost C, *Acer rubrum*



NLEB 150.543 Roost D, *Fraxinus caroliniana*



NLEB 150.543, Roost D Tree Cavity



NLEB 150.543 Roost E, *Fraxinus caroliniana*



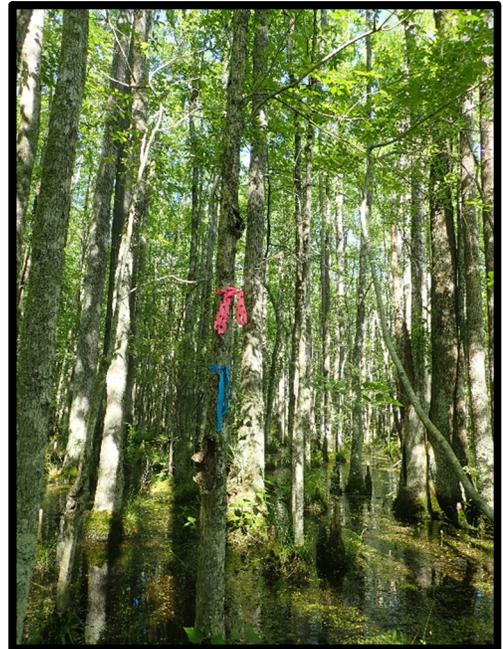
NLEB 150.543 Roost F, *Fraxinus caroliniana*



NLEB 150.543 Roost G, *Acer rubrum*



NLEB 150.543, Roost H, *Pinus taeda*



NLEB 150.705 Roost A, *Nyssa aquatica*



NLEB 150.623 Roost A, *Persea palustris*



NLEB 150.623 Roost B, *Fraxinus caroliniana*



NLEB 150.623 Roost B, Bat in Cavity



NLEB 150.623 Roost C, *Fraxinus caroliniana*



NLEB 150.623 Roost D, *Acer rubrum*



NLEB 150.623 Roost E, *Acer rubrum*



NLEB 150.623 Roost F, *Acer rubrum*



NLEB 150.623 Roost G, *Fraxinus caroliniana*



**NLEB 150.623 Roost H, *Taxodium distichum***



**NLEB 150.982 Roost A, *Acer rubrum***



**NLEB 150.982 Roost B, *Ulmus rubra***



**NLEB 150.982 Roost C, *Ulmus rubra***



NLEB 150.945 Roost A, *Acer rubrum*



NLEB 150.945 Roost B, *Acer rubrum*



NLEB 150.500 Roost A, *Gordonia lasianthus*



NLEB 150.500 Roost B, *Acer rubrum*



NLEB 150.500 Roost C, *Acer rubrum*



NLEB 150.500 Roost D, *Nyssa aquatica*



NLEB 150.901 Roost A, *Nyssa aquatica*



NLEB 150.901 Roost B, *Acer rubrum*

**Appendix F**  
**Other Representative Photos**

Other Representative Photographs



NLEB 150.705, Deceased in Roost A



NLEB 150.705 Remains



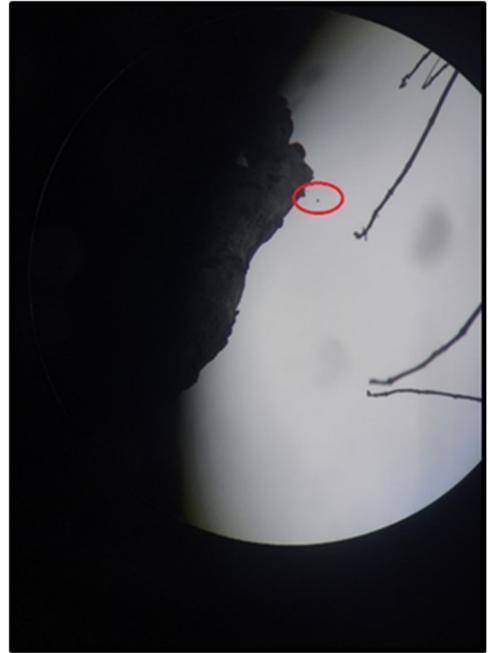
Eastern Black Carpenter Ant (*Camponotus pennsylvanicus*)



Fishing Spider (*Dolomedes* sp.)



**Fishing Spider Predation on Juvenile  
Southeastern Bat (Alabama)**



**NLEB 150.945 Roost B, Transmitter Stuck in Tree**

**Appendix G**  
**Mist-Net Data Sheets**

# NCDOT Mist-Netting & Acoustic Survey Data Form

Project:	NCDOT NLEB Phase VII		County:	Camden	Site#:	NR 2	Night#:	1	Site Name:	Sassafras Ln Gated Rd Curve	Date:	23-April-2019		
Latitude: 36.27885°					Longitude: -75.990072°				Datum:	NAD 83	Elevation:	29 feet	ID By:	Dottie Brown
Observers: Dottie Brown, Johnny Manuel, & Anna Weaver									Start Time: 19:40		End Time: 0:40			
Conditions:	Time	Temp	Wind	Clouds	Time	Temp	Wind	Clouds	Time	Temp	Wind	Clouds		
	19:40	73°	0	0	22:00	66°	1	0	0:40	66°	1	0		
Moon Effect: 75.8%		Start: N/A		Land Use: Urban / Agriculture / <u>Forest</u> / <u>Water</u> / <u>Wetland</u> / Barren (describe):										
Waning Gibbous		Stop: N/A		N. River Game Land - Forest mixed/43 – Water canals/51 - Wetland forested/61										
NETS/TRAPS:	A: 36.27887°, -75.99023°		B: 36.27835°, -75.98993°		C: 36.27810°, -75.98984°		D: 36.27754°, -75.98973°		E: 36.27732°, -75.98956°		F:			
Pool size WxL	N/A		N/A		N/A		N/A		N/A		N/A			
Swoop WxL	N/A		N/A		N/A		N/A		N/A		N/A			
Photo? or #	yes		yes		yes		yes		yes		yes			
BD#	Latitude		Longitude		Mic	Ht	Acoustic Clutter*	gain	trigger	interval	Start time	Stop Time	Photo?	
N/A	N/A		N/A		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Site Description:					<p>Site sketch (label to match Nets/Traps and BD# above)</p>									
Cypress-Gum Swamp (Blackwater Type)														
Trees: loblolly pine, red maple, sweetgum, tulip poplar, swamp bay, red bay														
Swamp laurel oak														
Mixed/upland & bottomland/unmanaged/mature/natural/clutter=medium (3)														
40-75% cover														

\*Clutter: Physical/structural components of the environment that block and/or deflect sound waves; high amounts of clutter can negatively affect ability to detect bat calls. Consider all vegetative strata together when estimating cover (shrub, mid and canopy). For **acoustics**, record clutter class estimates in a zone of 20 × 50 m in the direction that the microphone is pointed. For **mist net sites**, record clutter as an average number representing the surrounding forest where all nets were set, not specifically the flyway (see pg3).

# Bat Survey Data Form

Project: NCDOT NLEB Phase VII													County: Camden													Site# NR 2													Night# 1													Site Name: Sassafra Ln Gated Rd Curve													Date: 23-April-2019												
	TIME	SPECIES	Sex	Age	P / L / PL / NR	FA	Bag WT	WT	Net #	Height	Band / WS	Comment / Photo #																																																																	
1	20:32	LASE	F	A	NR	43mm	7.5g	10.5g	A	4m	N/A/OP																																																																		
2	20:35	LABO	M	A	NR	38mm	7.5g	8g	A	3m	N/A/OP																																																																		
3	20:40	LABO	M	A	NR	39mm	7.5g	8.5g	D	2.5m	N/A/OP																																																																		
4	20:41	LABO	F	A	P	42mm	7.5g	13g	D	2m	N/A/OP																																																																		
5	20:42	LABO	M	A	NR	38mm	7.5g	8g	D	1m	N/A/OP																																																																		
6	20:45	EPFU	F	A	P	44mm	8g	15.5g	E	3.5m	N/A/OP																																																																		
7	21:00	EPFU	F	A	NR	46mm	7.5g	18.5g	A	4m	N/A/OP																																																																		
8	21:00	EPFU	F	A	NR	49mm	7.5g	20g	B	4m	N/A/OP																																																																		
9	21:02	EPFU	F	A	NR	45mm	8g	17g	A	.5m	N/A/OP																																																																		
10	21:05	LABO	M	A	NR	39mm	7.5g	11.5g	A	3m	N/A/OP																																																																		
11	21:10	NYHU	M	A	NR	34mm	7.5g	9g	D	1.5m	N/A/OP																																																																		
12	21:10	NYHU	M	A	NR	34mm	7.5g	9.5g	E	2m	N/A/OP																																																																		
13	22:13	NYHU	M	A	NR	35mm	7.5g	8g	E	1.5m	NCWRC A3265/ OP																																																																		
14	22:34	NYHU	M	A	NR	35mm	7.5g	8.5g	A	3m	NCWRC A1814/ OP																																																																		
15	22:37	CORA	M	A	TD	42mm	7.75g	8.25g	D	.25m	N/A/OP																																																																		
16	22:37	EPFU	F	A	NR	45mm	7.5g	19g	D	2m	N/A/OP																																																																		
17	22:55	NYHU	M	A	NR	35mm	7.5g	8.5g	A	1.5m	N/A/OP																																																																		
18	23:25	LASE	F	A	NR	42mm	7.5g	11g	B	2m	N/A/OP																																																																		
19	23:23	LABO	F	A	NR	43mm	7.5g	12g	A	5m	N/A/OP																																																																		
20	23:25	LABO	M	A	NR	39mm	7.5g	9g	E	2.5m	N/A/OP																																																																		

	TIME	SPECIES	SEX	AGE	P/L/PL/NR	FA	BAG WT	WT	NET#	HEIGHT	BAND/WS	COMMENT/PHOTO #
21	2350	LABO	F	A	NR	39mm	7.5g	11g	E	3m	N/A/0P	
22	2350	LABO	M	A	NR	40mm	7.5g	11g	A	2m	N/A/0P	
23	0018	LABO	F	A	NR	40mm	8g	10.5g	C	4m	N/A/0P	
24	0100	LABO	-	-	-	-	-	-	A	3m	N/A/0P	Escape from net
25	0101	LABO	F	A	NR	39mm	8g	11g	A	2m	N/A/0P	

# NCDOT Mist-Netting & Acoustic Survey Data Form

Project:	NCDOT NLEB Phase VII		County:	Camden	Site#:	NR 2	Night#:	2	Site Name:	Sassafras Ln Gated Rd Curve	Date:	24-April-2019		
Latitude: 36.27885°					Longitude: -75.990072°				Datum:	NAD 83	Elevation:	29 feet	ID By:	Dottie Brown
Observers: Dottie Brown, Johnny Manuel, Anna Weaver									Start Time: 19:40		End Time: 0:40			
Conditions:	Time	Temp	Wind	Clouds	Time	Temp	Wind	Clouds	Time	Temp	Wind	Clouds		
	19:40	78°	0	0	22:05	69°	0	0	0:40	65°	0	0		
Moon Effect: 69% Waning Gibbous		Start: N/A Stop: N/A		Land Use: Urban / Agriculture / <u>Forest</u> / <u>Water</u> / <u>Wetland</u> / Barren (describe): N. River Game Land – Forest mixed/43 - Water canals/51 - Wetland forested/61										
NETS/TRAPS:	A: 36.27202°, -75.98711°		B: 36.27835°, -75.98993°		C: 36.27810°, -75.98984°		D: 36.27754°, -75.98973°		E: 36.27732°, -75.98956°		F:			
Pool size WxL	N/A		N/A		N/A		N/A		N/A					
Swoop WxL	N/A		N/A		N/A		N/A		N/A					
Photo? or #	yes		yes		yes		yes		yes					
BD#	Latitude		Longitude		Mic	Ht	Acoustic Clutter*	gain	trigger	interval	Start time	Stop Time	Photo?	
N/A	N/A		N/A		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Site Description:														
Cypress-Gum Swamp (Blackwater Subtype)														
Mesic Mixed Hardwoods (Coastal Plain Subtype)														
Trees: loblolly pine, red maple, sweetgum, tulip poplar, swamp bay, red bay, swamp laurel oak														
Mixed/upland & bottomland/unmanaged/mature/natural/clutter=medium (3)														
40-75% cover														
<p>Site sketch (label to match Nets/Traps and BD# above)</p>														

\*Clutter: Physical/structural components of the environment that block and/or deflect sound waves; high amounts of clutter can negatively affect ability to detect bat calls. Consider all vegetative strata together when estimating cover (shrub, mid and canopy). For **acoustics**, record clutter class estimates in a zone of 20 × 50 m in the direction that the microphone is pointed. For **mist net sites**, record clutter as an average number representing the surrounding forest where all nets were set, not specifically the flyway (see pg3).



# NCDOT Mist-Netting & Acoustic Survey Data Form

Project:	NCDOT NLEB Phase VII		County:	Camden	Site#:	NR 3	Night#:	1	Site Name:	Sassafras Ln Gated Rd end		Date:	25-April-2019		
Latitude: 36.271414°					Longitude: -75.989225°					Datum:	NAD 83	Elevation:	86 feet	ID By:	Dottie Brown
Observers: Dottie Brown, Johnny Manuel, Anna Weaver									Start Time: 19:45			End Time: 0:49			
Conditions:	Time	Temp	Wind	Clouds	Time	Temp	Wind	Clouds	Time	Temp	Wind	Clouds			
	19:46	75°	3	25%	22:30	73°	0	50%	0:30	72°	1	50%			
Moon Effect: 57.8% Waning Gibbous		Start: N/A Stop: N/A		Land Use: Urban / Agriculture <del>Forest</del> <del>Water</del> <del>Wetland</del> Barren (describe): N. River Game Land – Forest mixed/43 - Water canals/51 - Wetland forested/61											
NETS/TRAPS:	A: 36.27202°, -75.98711°		B: 36.27194°, -75.98737°		C: 36.27192°, -75.98749°		D: 36.27176°, -75.98817°		E: 36.27163°, -75.98837°		F: 36.27156°, -75.98855°				
Pool size WxL	N/A		N/A		N/A		N/A		N/A		N/A				
Swoop WxL	N/A		N/A		N/A		N/A		N/A		N/A				
Photo? or #	yes		yes		yes		yes		yes		yes				
BD#	Latitude		Longitude		Mic	Ht	Acoustic Clutter*	gain	trigger	interval	Start time	Stop Time	Photo?		
N/A	N/A		N/A		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
Site Description:															
Cypress-Gum Swamp (Blackwater Subtype)															
Trees: loblolly pine, red maple, sweetgum, tulip poplar, swamp bay, red bay, fetterbush, smilax															
Mixed/upland & bottomland/unmanaged/mature/natural/clutter=medium (3)															
40-75% cover															
Net G: 36.27146°, -75.98896°															

\*Clutter: Physical/structural components of the environment that block and/or deflect sound waves; high amounts of clutter can negatively affect ability to detect bat calls. Consider all vegetative strata together when estimating cover (shrub, mid and canopy). For **acoustics**, record clutter class estimates in a zone of 20 × 50 m in the direction that the microphone is pointed. For **mist net sites**, record clutter as an average number representing the surrounding forest where all nets were set, not specifically the flyway (see pg3).



# NCDOT Mist-Netting & Acoustic Survey Data Form

Project:	NCDOT NLEB Phase VII		County:	Camden	Site#:	NR 3	Night#:	2	Site Name:	Sassafras Ln Gated Rd end		Date:	27-April-2019		
Latitude: 36.271414°					Longitude: -75.989225°					Datum:	NAD 83	Elevation:	86 feet	ID By:	Dottie Brown
Observers: Dottie Brown, Johnny Manuel, Anna Weaver									Start Time: 19:40			End Time: 0:49			
Conditions:	Time	Temp	Wind	Clouds	Time	Temp	Wind	Clouds	Time	Temp	Wind	Clouds			
	19:45	67°	0	0	22:47	60°	0	0	0:30	57°	1	0			
Moon Effect: 44.7% Waning Crescent		Start: N/A Stop: N/A		Land Use: Urban / Agriculture / <del>Forest</del> / <del>Water</del> / <del>Wetland</del> Barren (describe): N. River Game Land – Forest mixed/43 - Water canals/51 - Wetland forested/61											
NETS/TRAPS:	A: 36.27192°, -75.98711°		B: 36.27194°, -75.98737°		C: 36.27170°, -75.98817°		D: 36.27163°, -75.98837°		E: 36.27156°, -75.98855°		F: 36.27145°, -75.98896°				
Pool size WxL	N/A		N/A		N/A		N/A		N/A		N/A				
Swoop WxL	N/A		N/A		N/A		N/A		N/A		N/A				
Photo? or #	yes		yes		yes		yes		yes		yes				
BD#	Latitude		Longitude		Mic	Ht	Acoustic Clutter*	gain	trigger	interval	Start time	Stop Time	Photo?		
N/A	N/A		N/A		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
Site Description:					<p>Site sketch (label to match Nets/Traps and BD# above)</p>										
Cypress-Gum Swamp (Blackwater Subtype)															
Trees: loblolly pine, red maple, sweetgum, tulip poplar, red bay, water tupelo															
Mixed/upland & bottomland/unmanaged/mature/natural/clutter=medium (3)															
40-75% cover															

\*Clutter: Physical/structural components of the environment that block and/or deflect sound waves; high amounts of clutter can negatively affect ability to detect bat calls. Consider all vegetative strata together when estimating cover (shrub, mid and canopy). For **acoustics**, record clutter class estimates in a zone of 20 × 50 m in the direction that the microphone is pointed. For **mist net sites**, record clutter as an average number representing the surrounding forest where all nets were set, not specifically the flyway (see pg3).



# NCDOT Mist-Netting & Acoustic Survey Data Form

Project:	NCDOT NLEB Phase VII		County:	Camden	Site#:	NR 3	Night#:	3	Site Name:	Sassafras Ln Gated Rd end	Date:	28-April-2019	
Latitude: 36.271414°					Longitude: -75.989225°					Datum: NAD 83	Elevation: 86 feet	ID By: Dottie Brown	
Observers: Dottie Brown, Johnny Manuel, Anna Weaver									Start Time: 19:40		End Time: 0:50		
Conditions:	Time 19:39	Temp 73°	Wind 0	Clouds 0	Time 22:30	Temp 72°	Wind 0	Clouds 0	Time 0:30	Temp 70°	Wind 1	Clouds 0	
Moon Effect: 35.1% Waxing gibbous		Start: N/A Stop: N/A		Land Use: Urban / Agriculture <del>Forest</del> <del>Water</del> <del>Wetland</del> Barren (describe): N. River Game Land – Forest mixed/43 - Water canals/51 - Wetland forested/61									
NETS/TRAPS:	A: 36.27192°, -75.98711°		B: 36.27194°, -75.98737°		C: 36.27170°, -75.98819°		D: 36.27163°, -75.98837°		E: 36.27156°, -75.98855°		F: 36.27145°, -75.98896°		
Pool size WxL	N/A		N/A		N/A		N/A		N/A		N/A		
Swoop WxL	N/A		N/A		N/A		N/A		N/A		N/A		
Photo? or #	yes		yes		yes		yes		yes		yes		
BD#	Latitude		Longitude		Mic	Ht	Acoustic Clutter*	gain	trigger	interval	Start time	Stop Time	Photo?
N/A	N/A		N/A		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Site Description:					<p>Site sketch (label to match Nets/Traps and BD# above)</p>								
Cypress-Gum Swamp (Blackwater Subtype)													
Trees: loblolly pine, red maple, sweetgum, tulip poplar, water tupelo, red bay													
Mixed/upland & bottomland/unmanaged/mature/natural/clutter=medium (3)													
40-75% cover													

\*Clutter: Physical/structural components of the environment that block and/or deflect sound waves; high amounts of clutter can negatively affect ability to detect bat calls. Consider all vegetative strata together when estimating cover (shrub, mid and canopy). For **acoustics**, record clutter class estimates in a zone of 20 × 50 m in the direction that the microphone is pointed. For **mist net sites**, record clutter as an average number representing the surrounding forest where all nets were set, not specifically the flyway (see pg3).



# NCDOT Mist-Netting & Acoustic Survey Data Form

Project:	NCDOT NLEB Phase VII		County:	Currituck	Site#:	NR 1	Night#:	1	Site Name:	Billboard / Airport rd.	Date:	7-May-2019		
Latitude: 36.38350°					Longitude: -76.00794°				Datum:	NAD 83	Elevation:	78 feet	ID By:	Dottie Brown
Observers: Dottie Brown, Johnny Manuel, Anna Weaver									Start Time: 19:57		End Time: 0:59			
Conditions:	Time	Temp	Wind	Clouds	Time	Temp	Wind	Clouds	Time	Temp	Wind	Clouds		
	20:00	67°	0	0	22:30	67°	0	0	0:30	64°	0	0		
Moon Effect: 9.2% Waxing Crescent		Start: 20:15 Stop: 22:12		Land Use: Urban <del>(Agriculture)</del> <del>(Forest)</del> <del>(Water)</del> <del>(Wetland)</del> Barren (describe): <b>N. River Game Land – Mixed Pine / Hardwood Forest &amp; Swamp</b>										
NETS/TRAPS:	A: 36.38385°, -76.00813°		B: 36.38391°, -76.00815°		C: 36.38387°, -76.00817°		D: 36.38372°, -76.00806°		E: 36.38347°, -76.00796°		F: 36.38293°, -76.00752°			
Pool size WxL	N/A		N/A		N/A		N/A		N/A		N/A			
Swoop WxL	N/A		N/A		N/A		N/A		N/A		N/A			
Photo? or #	yes		yes		yes		yes		yes		yes			
BD#	Latitude		Longitude		Mic	Ht	Acoustic Clutter*	gain	trigger	interval	Start time	Stop Time	Photo?	
N/A	N/A		N/A		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Site Description:														
Cypress Gum Swamp (Blackwater Subtype)														
Mesic Mixed Hardwood Forest (Coastal Plain Subtype)														
Trees: Water oak, swamp chestnut oak, sweetgum, loblolly pine, tulip poplar, American beech														
Mixed/upland & bottomland/unmanaged/mature/natural/clutter=medium (3)														
40-75% cover														
<b>Net G: 36.38294°, -76.00751°</b>														

\*Clutter: Physical/structural components of the environment that block and/or deflect sound waves; high amounts of clutter can negatively affect ability to detect bat calls. Consider all vegetative strata together when estimating cover (shrub, mid and canopy). For **acoustics**, record clutter class estimates in a zone of 20 × 50 m in the direction that the microphone is pointed. For **mist net sites**, record clutter as an average number representing the surrounding forest where all nets were set, not specifically the flyway (see pg3).



# NCDOT Mist-Netting & Acoustic Survey Data Form

Project:	NCDOT NLEB Phase VII		County:	Currituck	Site#:	NR 4	Night#:	1	Site Name:	Swain Lane	Date:	9-May-2019	
Latitude: 36.36849°					Longitude: -75.99693°				Datum: NAD 83	Elevation: 60 feet	ID By: Dottie Brown		
Observers: Dottie Brown, Johnny Manuel, Nick Newberry								Start Time: 19:55		End Time: 01:00			
Conditions:	Time 20:00	Temp 71°	Wind 1	Clouds 0	Time 23:00	Temp 69°	Wind 0	Clouds 0	Time 0:55	Temp 62°	Wind 0	Clouds 0	
Moon Effect: 29.2% Waxing Crescent		Start: N/A Stop: N/A		Land Use: Urban / Agriculture / <del>Forest</del> <del>Water</del> <del>Wetland</del> Barren (describe): N. River Game Land – Forest mixed/43 - Water canals/51 - Wetland forested/61									
NETS/TRAPS:	A: 36.36858°, -75.99477°		B: 36.36857°, -75.99503°		C: 36.36847°, -75.99516°		D: 36.36842°, -75.99596°		E: 36.36853°, -75.99609°		F: 36.36848°, -75.99632°		
Pool size WxL	N/A		N/A		N/A		N/A		N/A		N/A		
Swoop WxL	N/A		N/A		N/A		N/A		N/A		N/A		
Photo? or #	yes		yes		yes		yes		yes		yes		
BD#	Latitude		Longitude		Mic	Ht	Acoustic Clutter*	gain	trigger	interval	Start time	Stop Time	Photo?
N/A	N/A		N/A		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Site Description:					<p>Site sketch (label to match Nets/Traps and BD# above)</p>								
Nonriverine Swamp Forest (Sweetgum Subtype)													
Trees: Water tupelo, red bay, red maple, loblolly pine, sweetgum,													
American beech, hornbeam													
Mixed/upland & bottomland/unmanaged/mature/natural/clutter=medium (3)													
40-75% cover													

\*Clutter: Physical/structural components of the environment that block and/or deflect sound waves; high amounts of clutter can negatively affect ability to detect bat calls. Consider all vegetative strata together when estimating cover (shrub, mid and canopy). For **acoustics**, record clutter class estimates in a zone of 20 × 50 m in the direction that the microphone is pointed. For **mist net sites**, record clutter as an average number representing the surrounding forest where all nets were set, not specifically the flyway (see pg3).



# NCDOT Mist-Netting & Acoustic Survey Data Form

Project:	NCDOT NLEB Phase VII		County:	Camden	Site#:	NR 5	Night#:	1	Site Name:	Sassafras Ln Gated Rd.	Date:	15-May-2019	
Latitude: 36.279770°					Longitude: -75.998350°					Datum: NAD 83	Elevation: 82 feet	ID By: Dottie Brown	
Observers: Dottie Brown, Johnny Manuel, Nick Newberry, Anna Weaver									Start Time: 20:00		End Time: 01:10		
Conditions:	Time 20:03	Temp 61°	Wind 0	Clouds 20%	Time 22:00	Temp 58°	Wind 0	Clouds 0	Time 01:00	Temp 53°	Wind 0	Clouds 0	
Moon Effect: 89% Waxing Gibbous		Start: N/A Stop: N/A		Land Use: Urban / Agriculture ( <del>Forest</del> ) ( <del>Water</del> ) ( <del>Wetland</del> ) Barren (describe): N. River Game Land – Forest mixed/43 - Water canals/51 - Wetland forested/61									
NETS/TRAPS:	A: 36.27989°, -75.99820°		B: 36.27978°, -75.99821°		C: 36.27985°, -75.99872°		D: 36.27981°, -75.99915°		E: 36.27976°, -75.99934°		F:		
Pool size WxL	N/A		N/A		N/A		N/A		N/A		N/A		
Swoop WxL	N/A		N/A		N/A		N/A		N/A		N/A		
Photo? or #	yes		yes		yes		yes		yes		yes		
BD#	Latitude		Longitude		Mic	Ht	Acoustic Clutter*	gain	trigger	interval	Start time	Stop Time	Photo?
N/A	N/A		N/A		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Site Description:					<p>Site sketch (label to match Nets/Traps and BD# above)</p>								
Cypress-Gum Swamp (Blackwater Subtype)													
Nonriverine Wet Hardwood Forest													
Trees: Sweetgum, water tupelo, red maple, loblolly pine, water oak,													
Mixed/upland & bottomland/unmanaged/mature/natural/clutter=medium (3)													
40-75% cover													

\*Clutter: Physical/structural components of the environment that block and/or deflect sound waves; high amounts of clutter can negatively affect ability to detect bat calls. Consider all vegetative strata together when estimating cover (shrub, mid and canopy). For **acoustics**, record clutter class estimates in a zone of 20 × 50 m in the direction that the microphone is pointed. For **mist net sites**, record clutter as an average number representing the surrounding forest where all nets were set, not specifically the flyway (see pg3).



# NCDOT Mist-Netting & Acoustic Survey Data Form

Project:	NCDOT NLEB Phase VII		County:	Currituck	Site#:	NR 1	Night#:	2	Site Name:	Billboard / Airport Rd.	Date:	18-May-2019	
Latitude: 36.38350°					Longitude: -76.00794°				Datum: NAD 83	Elevation: 78 feet	ID By: Dottie Brown		
Observers: Dottie Brown, Johnny Manuel, Nick Newberry, Anna Weaver								Start Time: 20:00		End Time: 01:10			
Conditions:	Time 20:00	Temp 64°	Wind 0	Clouds 25%	Time 22:00	Temp 65°	Wind 0	Clouds 0	Time 23:59	Temp 69°	Wind 0	Clouds 0	
Moon Effect: 99.7% Waxing Gibbous		Start: N/A Stop: N/A		Land Use: Urban <del>(Agriculture)</del> <del>(Forest)</del> <del>(Water)</del> <del>(Wetland)</del> Barren (describe): N. River Game Land – Mixed Pine / Hardwood Forest & Swamp									
NETS/TRAPS:	A: 36.38382°, -76.00825°		B: 36.38393°, -76.00822°		C: 36.38395°, -76.00810°		D: 36.38374°, -76.00799°		E: 36.38304°, -76.00753°		F: 36.38243°, -76.00719°		
Pool size WxL	N/A		N/A		N/A		N/A		N/A		N/A		
Swoop WxL	N/A		N/A		N/A		N/A		N/A		N/A		
Photo? or #	yes		yes		yes		yes		yes		yes		
BD#	Latitude		Longitude		Mic	Ht	Acoustic Clutter*	gain	trigger	interval	Start time	Stop Time	Photo?
N/A	N/A		N/A		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Site Description:					<p>Site sketch (label to match Nets/Traps and BD# above)</p>								
Mesic Mixed Hardwoods (Coastal Plain Subtype)													
Cypress-Gum Swamp (Blackwater Subtype)													
Trees: Sweetgum, water tupelo, red maple, loblolly pine, water oak, swamp chestnut oak, tulip poplar, American beech													
Mixed/upland & bottomland/unmanaged/mature/natural/clutter=medium (3) 40-75% cover													
Net G: 36.38225°, -76.00713° Net H: 36.38231°, -76.00700° Net I: 36.38187°, -76.00691°													

\*Clutter: Physical/structural components of the environment that block and/or deflect sound waves; high amounts of clutter can negatively affect ability to detect bat calls. Consider all vegetative strata together when estimating cover (shrub, mid and canopy). For **acoustics**, record clutter class estimates in a zone of 20 × 50 m in the direction that the microphone is pointed. For **mist net sites**, record clutter as an average number representing the surrounding forest where all nets were set, not specifically the flyway (see pg3).



# NCDOT Mist-Netting & Acoustic Survey Data Form

Project:	NCDOT NLEB Phase VII		County:	Camden	Site#:	NR 6	Night#:	1	Site Name:	Impoundment Ponds	Date:	1-June-2019	
Latitude: 36.28535°					Longitude: -75.98419°				Datum: NAD 83	Elevation: 18 feet	ID By: Dottie Brown		
Observers: Dottie Brown, Johnny Manuel, Anna Weaver, Kaitlyn Torrey									Start Time: 20:10		End Time: 01:15		
Conditions:	Time 20:30	Temp 74°	Wind 1	Clouds 25%	Time 23:40	Temp 67°	Wind 0	Clouds 0	Time 01:00	Temp 66°	Wind 0	Clouds 0	
Moon Effect: 2.0% Waning Crescent		Start: N/A Stop: N/A		Land Use: Urban / Agriculture / <u>Forest</u> Water <u>Wetland</u> / Barren (describe): N. River Game Land – Forest mixed/43 - Wetland forested/61									
NETS/TRAPS:	A: 36.28553°, -75.98392°		B: 36.28581°, -75.98375°		C: 36.28584°, -75.98359°		D: 36.28568°, -75.98366°		E: 36.28511°, -75.98428°		F: 36.28490°, -75.98439°		
Pool size WxL	5' X 25'		N/A		N/A		N/A		N/A		N/A		
Swoop WxL	5' X 25'		N/A		N/A		N/A		N/A		N/A		
Photo? or #	yes		yes		yes		yes		yes		yes		
BD#	Latitude		Longitude		Mic	Ht	Acoustic Clutter*	gain	trigger	interval	Start time	Stop Time	Photo?
N/A	N/A		N/A		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Site Description:					<p>Site sketch (label to match Nets/Traps and BD# above)</p>								
Managed loblolly pine (managed community)													
Trees: loblolly pine, red maple, sweetgum, black oak, red cedar													
Atlantic white cedar, slippery elm													
Mixed/upland & bottomland/unmanaged/mature/natural/clutter=medium (3)													
40-75% cover													
<b>Net G: 36.28482°, -75.98435° Net H: 36.28479°, -75.98432°</b>													

\*Clutter: Physical/structural components of the environment that block and/or deflect sound waves; high amounts of clutter can negatively affect ability to detect bat calls. Consider all vegetative strata together when estimating cover (shrub, mid and canopy). For **acoustics**, record clutter class estimates in a zone of 20 × 50 m in the direction that the microphone is pointed. For **mist net sites**, record clutter as an average number representing the surrounding forest where all nets were set, not specifically the flyway (see pg3).



# NCDOT Mist-Netting & Acoustic Survey Data Form

Project:	NCDOT NLEB Phase VII		County:	Camden		Site#:	NR 6		Night#:	2		Site Name:	Impoundment Ponds		Date:	2-June-2019	
Latitude: 36.28535°			Longitude: -75.98419°			Datum: NAD 83			Elevation: 18 feet			ID By: Dottie Brown					
Observers: Dottie Brown, Johnny Manuel, Anna Weaver, Kaitlyn Torrey									Start Time: 20:10			End Time: 01:16					
Conditions:	Time: 21:09	Temp: 77°	Wind: 0	Clouds: 0	Time: 23:00	Temp: 74°	Wind: 0	Clouds: 0	Time: 00:30	Temp: 72°	Wind: 0	Clouds: 0					
Moon Effect: 0.7% Waning Crescent		Start: N/A Stop: N/A		Land Use: Urban / Agriculture <u>Forest</u> / Water <u>Wetland</u> / Barren (describe): N. River Game Land – Forest mixed/43 - Wetland forested/61													
NETS/TRAPS:	A: 36.28553°, -75.98392°		B: 36.28581°, -75.98375°		C: 36.28584°, -75.98359°		D: 36.28568°, -75.98366°		E: 36.28511°, -75.98428°		F: 36.28490°, -75.98439°						
Pool size WxL	5' X 25'		N/A		N/A		N/A		N/A		N/A						
Swoop WxL	5' X 25'		N/A		N/A		N/A		N/A		N/A						
Photo? or #	yes		yes		yes		yes		yes		yes						
BD#	Latitude		Longitude		Mic	Ht	Acoustic Clutter*	gain	trigger	interval	Start time	Stop Time	Photo?				
N/A	N/A		N/A		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A				
Site Description:					<p>Site sketch (label to match Nets/Traps and BD# above)</p>												
Managed loblolly pine (managed community)																	
Trees: loblolly pine, red maple, sweetgum, black oak, red cedar																	
Atlantic white cedar, slippery elm																	
Mixed/upland & bottomland/unmanaged/mature/natural/clutter=medium (3)																	
40-75% cover																	
<b>Net G: 36.28482°, -75.98435° Net H: 36.28479°, -75.98432°</b>																	

\*Clutter: Physical/structural components of the environment that block and/or deflect sound waves; high amounts of clutter can negatively affect ability to detect bat calls. Consider all vegetative strata together when estimating cover (shrub, mid and canopy). For **acoustics**, record clutter class estimates in a zone of 20 × 50 m in the direction that the microphone is pointed. For **mist net sites**, record clutter as an average number representing the surrounding forest where all nets were set, not specifically the flyway (see pg3).



# NCDOT Mist-Netting & Acoustic Survey Data Form

Project:	NCDOT NLEB Phase VII		County:	Camden	Site#:	NR 7	Night#:	1	Site Name:	Sassafras 300°	Date:	4-June-2019	
Latitude: 36.28543°					Longitude: -75.99110°				Datum: NAD 83	Elevation: 29 feet	ID By: Dottie Brown		
Observers: Dottie Brown, Johnny Manuel, Nick Newberry, Phil Bailey								Start Time: 20:12		End Time: 01:20			
Conditions:	Time 20:00	Temp 71°	Wind 0	Clouds 0	Time 23:00	Temp 67°	Wind 0	Clouds 0	Time 01:00	Temp 63°	Wind 0	Clouds 0	
Moon Effect: 2.3% Waxing Crescent		Start: N/A Stop: N/A		Land Use: Urban / Agriculture ( <del>Forest</del> ) ( <del>Water</del> ) ( <del>Wetland</del> ) Barren (describe): N. River Game Land – Forest mixed/43 - Water canals/51 - Wetland forested/61									
NETS/TRAPS:	A: 36.28533°, -75.98940°		B: 36.28533°, -75.98956°		C: 36.28565°, -75.99048°		D: 36.28569°, -75.99092°		E: 36.28571°, -75.99113°		F:		
Pool size WxL	N/A		N/A		N/A		N/A		N/A				
Swoop WxL	N/A		N/A		N/A		N/A		N/A				
Photo? or #	yes		yes		yes		yes		yes				
BD#	Latitude		Longitude		Mic	Ht	Acoustic Clutter*	gain	trigger	interval	Start time	Stop Time	Photo?
N/A	N/A		N/A		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Site Description:					<p style="text-align: right;">mixed/upland + bottomland/ unmanaged/mature, natural, clutter 40-75%</p> <p style="text-align: center;">Site sketch (label to match Nets/Traps and BD# above)</p>								
Nonriverine Swamp Forest (Sweetgum Subtype)													
Trees: water oak, sweetgum, water tupelo, loblolly pine, slippery elm,													
Red maple, tulip poplar, red bay, loblolly bay, chestnut oak, pond pine													
Mixed/upland & bottomland/unmanaged/mature/natural/clutter=medium (3)													
40-75% cover													

\*Clutter: Physical/structural components of the environment that block and/or deflect sound waves; high amounts of clutter can negatively affect ability to detect bat calls. Consider all vegetative strata together when estimating cover (shrub, mid and canopy). For **acoustics**, record clutter class estimates in a zone of 20 × 50 m in the direction that the microphone is pointed. For **mist net sites**, record clutter as an average number representing the surrounding forest where all nets were set, not specifically the flyway (see pg3).



# NCDOT Mist-Netting & Acoustic Survey Data Form

Project:	NCDOT NLEB Phase VII		County:	Camden	Site#:	NR 8	Night#:	1	Site Name:	Sassafras Ln 1 <sup>st</sup> Gate	Date:	8-June-2019		
Latitude: 36.27193°					Longitude: -76.02613°				Datum:	NAD 83	Elevation:	3 feet	ID By:	Dottie Brown
Observers: Dottie Brown, Johnny Manuel, Nick Newberry, Phil Bailey									Start Time: 20:10		End Time: 01:22			
Conditions:	Time	Temp	Wind	Clouds	Time	Temp	Wind	Clouds	Time	Temp	Wind	Clouds		
	20:30	72°	0	0	22:30	69°	0	0	00:30	67°	0	0		
Moon Effect: 35.2% Waxing Gibbous		Start: 21:46 Stop: 23:09		Land Use: Urban / Agriculture / <del>Forest</del> <del>Water</del> <del>Wetland</del> Barren (describe): N. River Game Land – Forest mixed/43 - Water canals/51 - Wetland forested/61										
NETS/TRAPS:	A: 36.27185°, -76.02722°		B: 36.27195°, -76.02713°		C: 36.27200°, -76.02702°		D: 36.27195°, -76.02686°		E: 36.27196°, -76.02666°		F: 36.27206°, -76.02664°			
Pool size WxL	N/A		N/A		N/A		N/A		20' X 30'		N/A			
Swoop WxL	N/A		N/A		N/A		N/A		30' X 50'		N/A			
Photo? or #	yes		yes		yes		yes		yes		yes			
BD#	Latitude		Longitude		Mic	Ht	Acoustic Clutter*	gain	trigger	interval	Start time	Stop Time	Photo?	
N/A	N/A		N/A		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Site Description:					<p>Habitat - mixed forest upland + bottomland, unmanaged, mature forest, clutter (3) med 40-75%</p> <p>Site sketch (label to match Nets/Traps and BD# above)</p>									
Nonriverine Wet Hardwood Forest and Cypress-Gum Swamp (Blackwater Subtype)														
Nonriverine Swamp Forest (Sweetgum Subtype) Cypress-Gum Swamp (Sweetgum Subtype)														
Trees: tulip poplar, water oak, bald cypress, sweetgum, loblolly pine, water tupelo														
black willow														
Mixed/upland & bottomland/unmanaged/mature/natural/clutter=medium (3) 40-75% cover														
Net G: 36.27198°, -76.02648° Net H: 36.27209°, -76.02649°														
Net I: 36.27198°, -76.02638°														

\*Clutter: Physical/structural components of the environment that block and/or deflect sound waves; high amounts of clutter can negatively affect ability to detect bat calls. Consider all vegetative strata together when estimating cover (shrub, mid and canopy). For **acoustics**, record clutter class estimates in a zone of 20 × 50 m in the direction that the microphone is pointed. For **mist net sites**, record clutter as an average number representing the surrounding forest where all nets were set, not specifically the flyway (see pg3).



# NCDOT Mist-Netting & Acoustic Survey Data Form

Project:	NCDOT NLEB Phase VII		County:	Camden	Site#:	NR 8	Night#:	2	Site Name:	Sassafras Ln 1 <sup>st</sup> Gate	Date:	11-June-2019	
Latitude: 36.27193°					Longitude: -76.02613°				Datum: NAD 83	Elevation: 3 feet	ID By: Dottie Brown		
Observers: Dottie Brown, Anna Weaver, Nick Newberry, David Cooper									Start Time: 20:15		End Time: 01:25		
Conditions:	Time 20:30	Temp 79°	Wind 0	Clouds 25%	Time 22:30	Temp 76°	Wind 0	Clouds 25%	Time 01:15	Temp 63°	Wind 0	Clouds 25%	
Moon Effect: 60.9% Waxing gibbous		Start: 21:09 Stop: 01:15		Land Use: Urban / Agriculture / <del>Forest</del> <del>Water</del> <del>Wetland</del> Barren (describe): N. River Game Land – Forest mixed/43 - Water canals/51 - Wetland forested/61									
NETS/TRAPS:	A: 36.27185°, -76.02722°		B: 36.27195°, -76.02713°		C: 36.27200°, -76.02702°		D: 36.27195°, -76.02686°		E: 36.27196°, -76.02666°		F: 36.27206°, -76.02664°		
Pool size WxL	N/A		N/A		N/A		N/A		N/A		N/A		
Swoop WxL	N/A		N/A		N/A		N/A		N/A		N/A		
Photo? or #	yes		yes		yes		yes		yes		yes		
BD#	Latitude		Longitude		Mic	Ht	Acoustic Clutter*	gain	trigger	interval	Start time	Stop Time	Photo?
N/A	N/A		N/A		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Site Description:													
Cypress-Gum Swamp (Blackwater Subtype)													
Nonriverine Swamp Forest (Sweetgum subtype)													
Trees: tulip poplar, water oak, bald cypress, sweetgum, loblolly pine, swamp tupelo													
Mixed/upland & bottomland/unmanaged/mature/natural/clutter=medium (3)													
40-75% cover													
Net G: 36.27198°, -76.02648° Net H: 36.27209°, -76.02649°													
Net I: 36.27198°, -76.02638°													

\*Clutter: Physical/structural components of the environment that block and/or deflect sound waves; high amounts of clutter can negatively affect ability to detect bat calls. Consider all vegetative strata together when estimating cover (shrub, mid and canopy). For **acoustics**, record clutter class estimates in a zone of 20 × 50 m in the direction that the microphone is pointed. For **mist net sites**, record clutter as an average number representing the surrounding forest where all nets were set, not specifically the flyway (see pg3).





# NCDOT Mist-Netting & Acoustic Survey Data Form

Project:	NCDOT NLEB Phase VII		County:	Camden	Site#:	NR 7	Night#:	2	Site Name:	Sassafras 300°	Date:	13-June-2019	
Latitude: 36.28543°					Longitude: -75.99110°				Datum: NAD 83	Elevation: 29 feet	ID By: Dottie Brown		
Observers: Dottie Brown, Anna Weaver, Nick Newberry, Phil Bailey								Start Time: 20:20		End Time: 01:23			
Conditions:	Time 20:20	Temp 62°	Wind 1	Clouds 25%	Time 22:46	Temp 73°	Wind 1	Clouds 25%	Time 01:00	Temp 71°	Wind 1	Clouds 25%	
Moon Effect: 87.0% Waxing gibbous		Start: 20:31 Stop: 00:47		Land Use: Urban / Agriculture (Forest) (Water) (Wetland) Barren (describe): N. River Game Land – Forest mixed/43 - Water canals/51 - Wetland forested/61									
NETS/TRAPS:	A: 36.28533°, -75.98940°		B 36.28533°, -75.98956°		C: 36.28565°, -75.99048°		D: 36.28569°, -75.99092°		E: 36.28571°, -75.99113°		F:		
Pool size WxL	N/A		N/A		N/A		N/A		N/A				
Swoop WxL	N/A		N/A		N/A		N/A		N/A				
Photo? or #	yes		yes		yes		yes		yes				
BD#	Latitude		Longitude		Mic	Ht	Acoustic Clutter*	gain	trigger	interval	Start time	Stop Time	Photo?
N/A	N/A		N/A		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Site Description:					<p>mixed/upland + bottomland/ unmanaged/mature, natural/ clutter 40-75%</p> <p>A 2x9    B 2x9    C 2x9    D 2x6    E 2x6</p> <p>Site sketch (label to match Nets/Traps and BD# above)</p>								
Nonriverine Swamp Forest (Sweetgum subtype)													
Trees: loblolly pine, water oak, red maple, chestnut oak, tulip poplar, Sweetgum, red bay, loblolly bay, pond pine													
Mixed/upland & bottomland/unmanaged/mature/natural/clutter=medium (3)													
40-75% cover													

\*Clutter: Physical/structural components of the environment that block and/or deflect sound waves; high amounts of clutter can negatively affect ability to detect bat calls. Consider all vegetative strata together when estimating cover (shrub, mid and canopy). For **acoustics**, record clutter class estimates in a zone of 20 × 50 m in the direction that the microphone is pointed. For **mist net sites**, record clutter as an average number representing the surrounding forest where all nets were set, not specifically the flyway (see pg3).



# NCDOT Mist-Netting & Acoustic Survey Data Form

Project:	NCDOT NLEB Phase VII		County:	Camden	Site#:	NR 9	Night#:	1	Site Name:	Sassafras Ln Rd, Gated Forest Rd.	Date:	16-June-2019		
Latitude: 36.27338°					Longitude: -75.98689°				Datum:	NAD 83	Elevation:	3 feet	ID By:	Dottie Brown
Observers: Dottie Brown, Anna Weaver, Nick Newberry, Phil Bailey									Start Time: 20:20		End Time: 01:24			
Conditions:	Time	Temp	Wind	Clouds	Time	Temp	Wind	Clouds	Time	Temp	Wind	Clouds		
	20:10	82°	2	0	23:00	78°	2	0	01:00	75°	2	0		
Moon Effect: 92.5%		Start: 21:13			Land Use: Urban / Agriculture ( <del>Forest</del> ) ( <del>Water</del> ) ( <del>Wetland</del> ) Barren (describe):									
Waxing gibbous		Stop: 01:24			N. River Game Land – Forest mixed/43 - Water canals/51 - Wetland forested/61									
NETS/TRAPS:	A: 36.27287°, -75.98659°		B 36.28533°, -75.98694°		C: 36.27398°, -75.98689°		D: 36.27409°, -75.98699°		E: 36.27425°, -75.98705°		F: 36.27433°, -75.98721°			
Pool size WxL	N/A		N/A		N/A		N/A		N/A		N/A			
Swoop WxL	N/A		N/A		N/A		N/A		N/A		N/A			
Photo? or #	yes		yes		yes		yes		yes		yes			
BD#	Latitude		Longitude		Mic	Ht	Acoustic Clutter*	gain	trigger	interval	Start time	Stop Time	Photo?	
N/A	N/A		N/A		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Site Description:					<p>Sassafras Lane</p> <p>Gate</p> <p>mixed/upland &amp; bottomland/unmanaged, mature, natural clutter (3) medium 40-75% cover</p> <p>Forested Swamp</p> <p>canal</p> <p>A 2x6 B 2x6 C 2x6 D 2x6 E 2x6 G 2x6</p> <p>Forested Swamp</p> <p>Site sketch (label to match Nets/Traps and BD# above)</p>									
Cypress-Gum Swamp (Blackwater Subtype)														
Trees: loblolly pine, red maple, sweetgum, loblolly bay, red bay, water														
tupelo, bald cypress														
Mixed/upland & bottomland/unmanaged/mature/natural/clutter=medium (3)														
40-75% cover														
Net G: 36.27436°, -75.98730°														

\*Clutter: Physical/structural components of the environment that block and/or deflect sound waves; high amounts of clutter can negatively affect ability to detect bat calls. Consider all vegetative strata together when estimating cover (shrub, mid and canopy). For **acoustics**, record clutter class estimates in a zone of 20 × 50 m in the direction that the microphone is pointed. For **mist net sites**, record clutter as an average number representing the surrounding forest where all nets were set, not specifically the flyway (see pg3).



# NCDOT Mist-Netting & Acoustic Survey Data Form

Project:	NCDOT NLEB Phase VII		County:	Currituck	Site#:	NR 4	Night#:	2	Site Name:	Swain Lane	Date:	17-June-2019	
Latitude: 36.36849°					Longitude: -75.99693°				Datum: NAD 83	Elevation: 60 feet	ID By: Dottie Brown		
Observers: Dottie Brown, Anna Weaver, Nick Newberry, Phil Bailey								Start Time: 20:15		End Time: 01:25			
Conditions:	Time 20:00	Temp 82°	Wind 1	Clouds 25%	Time 22:00	Temp 80°	Wind 1	Clouds 25%	Time 01:00	Temp 78°	Wind 1	Clouds 25%	
Moon Effect: 99.9%		Start: 21:20		Land Use: Urban / Agriculture / <del>Forest</del> / <del>Water</del> / <del>Wetland</del> / Barren (describe):									
Waxing gibbous		Stop: 01:25		N. River Game Land – Forest mixed/43 - Water canals/51 - Wetland forested/61									
NETS/TRAPS:	A: 36.36849°, -75.99693°		B 36.36857°, -75.99503°		C: 36.36847°, -75.99516°		D: 36.36842°, -75.99596°		E: 36.36853°, -75.99609°		F: 36.36848°, -75.99632°		
Pool size WxL	N/A		N/A		N/A		N/A		N/A		N/A		
Swoop WxL	N/A		N/A		N/A		N/A		N/A		N/A		
Photo? or #	yes		yes		yes		yes		yes		yes		
BD#	Latitude		Longitude		Mic	Ht	Acoustic Clutter*	gain	trigger	interval	Start time	Stop Time	Photo?
N/A	N/A		N/A		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Site Description:					<p>Hand-drawn site sketch showing trap locations I through F with dimensions. A note at the top right reads: "mixed forest bottomland/unmanaged mature forest, natural, med (3) 40-75% cover". The traps are labeled: I 1x12, H 2x12, G 2x12, F 2x12, D 2x9, E 2x12, C 2x9, B 2x18, and A. A vertical line on the left is labeled "Swain Lane".</p>								
Nonriverine Swamp Forest (Sweetgum Subtype)													
Trees: red maple, loblolly pine, sweetgum, water tupelo, red bay, American													
Beech, hornbeam													
Mixed/upland & bottomland/unmanaged/mature/natural/clutter=medium (3)													
40-75% cover													
Net G: 36.27436°, -75.98730°					Site sketch (label to match Nets/Traps and BD# above)								

\*Clutter: Physical/structural components of the environment that block and/or deflect sound waves; high amounts of clutter can negatively affect ability to detect bat calls. Consider all vegetative strata together when estimating cover (shrub, mid and canopy). For **acoustics**, record clutter class estimates in a zone of 20 × 50 m in the direction that the microphone is pointed. For **mist net sites**, record clutter as an average number representing the surrounding forest where all nets were set, not specifically the flyway (see pg3).



# NCDOT Mist-Netting & Acoustic Survey Data Form

Project:	NCDOT NLEB Phase VII		County:	Camden	Site#:	NR 2	Night#:	3	Site Name:	Sassafras Ln, Gated Rd Curve		Date:	22-June-2019		
Latitude: 36.27885°					Longitude: -75.990072°					Datum:	NAD 83	Elevation:	29 feet	ID By:	Dottie Brown
Observers: Dottie Brown, Anna Weaver, Nick Newberry									Start Time: 20:16			End Time: 01:30			
Conditions:	Time	Temp	Wind	Clouds	Time	Temp	Wind	Clouds	Time	Temp	Wind	Clouds			
	19:55	72°	0	25%	22:00	70°	0	0	01:30	68°	0	0			
Moon Effect: 74% Waning gibbous		Start: 00:12 Stop: 01:30		Land Use: Urban / Agriculture / <u>Forest</u> / <u>Water</u> / <u>Wetland</u> / Barren (describe): N. River Game Land – Forest mixed/43 - Water canals/51 - Wetland forested/61											
NETS/TRAPS:	A: 36.27887°, -75.99023°		B 36.27835°, -75.98993°		C: 36.27810°, -75.98984°		D: 36.27254°, -75.98973°		E: 36.27732°, -75.98956°		F:				
Pool size WxL	N/A		N/A		N/A		N/A		N/A						
Swoop WxL	N/A		N/A		N/A		N/A		N/A						
Photo? or #	yes		yes		yes		yes		yes						
BD#	Latitude		Longitude		Mic	Ht	Acoustic Clutter*	gain	trigger	interval	Start time	Stop Time	Photo?		
N/A	N/A		N/A		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
Site Description:					<p>Site sketch (label to match Nets/Traps and BD# above)</p>										
Cypress-Gum Swamp (Blackwater Subtype)															
Trees: red maple, loblolly pine, sweetgum, tulip poplar, swamp bay, red bay,															
Water tupelo, bald cypress															
Mixed/upland & bottomland/unmanaged/mature/natural/clutter=medium (3)															
40-75% cover															

\*Clutter: Physical/structural components of the environment that block and/or deflect sound waves; high amounts of clutter can negatively affect ability to detect bat calls. Consider all vegetative strata together when estimating cover (shrub, mid and canopy). For **acoustics**, record clutter class estimates in a zone of 20 × 50 m in the direction that the microphone is pointed. For **mist net sites**, record clutter as an average number representing the surrounding forest where all nets were set, not specifically the flyway (see pg3).



## **Appendix H**

### **MYSE Tracking, Roost, and Emergence Data Sheets**

Bat Frequency 150.502

## USFWS INDIANA BAT ROOST DATASHEET

Biologists (Full Name): Dottie Brown, Johnny Manuel, Anna Weaver Date: 26-April-2019

UTM: Zone \_\_\_\_\_ Easting \_\_\_\_\_ Northing \_\_\_\_\_ OR

LAT 36.26852° LONG -75.98619°

Property Owner NC Wildlife Resources Commission Phone# (607) - 847-9859

State NC County Camden Site # NR3

Roost # 502-A Roost Location N. River Game Land

### Roost Tree Data

Tree Species: Water Tupelo (Nyssa aquatica) Live  Snag  Other

(If other, explain) \_\_\_\_\_

DBH (inches) 3.3in Total Roost Height (meters) 10m

Height of roost area (if known) 31° Dist. from capture site 0.26 miles

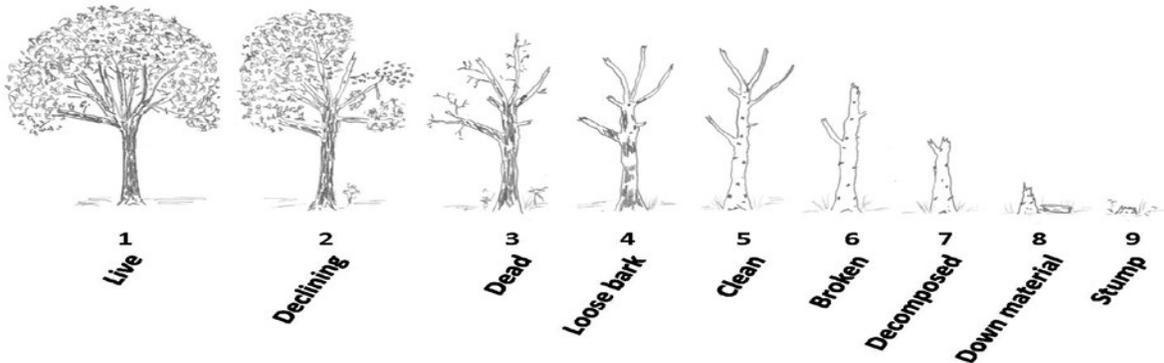
Roost position aspect (deg) 0% Roost type (cavity, crack, bark, etc.) \_\_\_\_\_

Exfoliating bark on bole (%) 0% Describe: sloughing  platy  tight

Cavities present?  Yes  if so, describe: Small cavity / crack in trunk of tree

Roost tree or snag canopy position: Dominant  Co-Dominant  Suppressed

Roost Decay State:  1 2 3 4 5 6 7 8 9 Other



**Surrounding Habitat Condition**

Canopy closure at roost (%) 15%

Approximate woodlot size (acres) >19,892 Distance to non-forest (meters) 2.10 miles

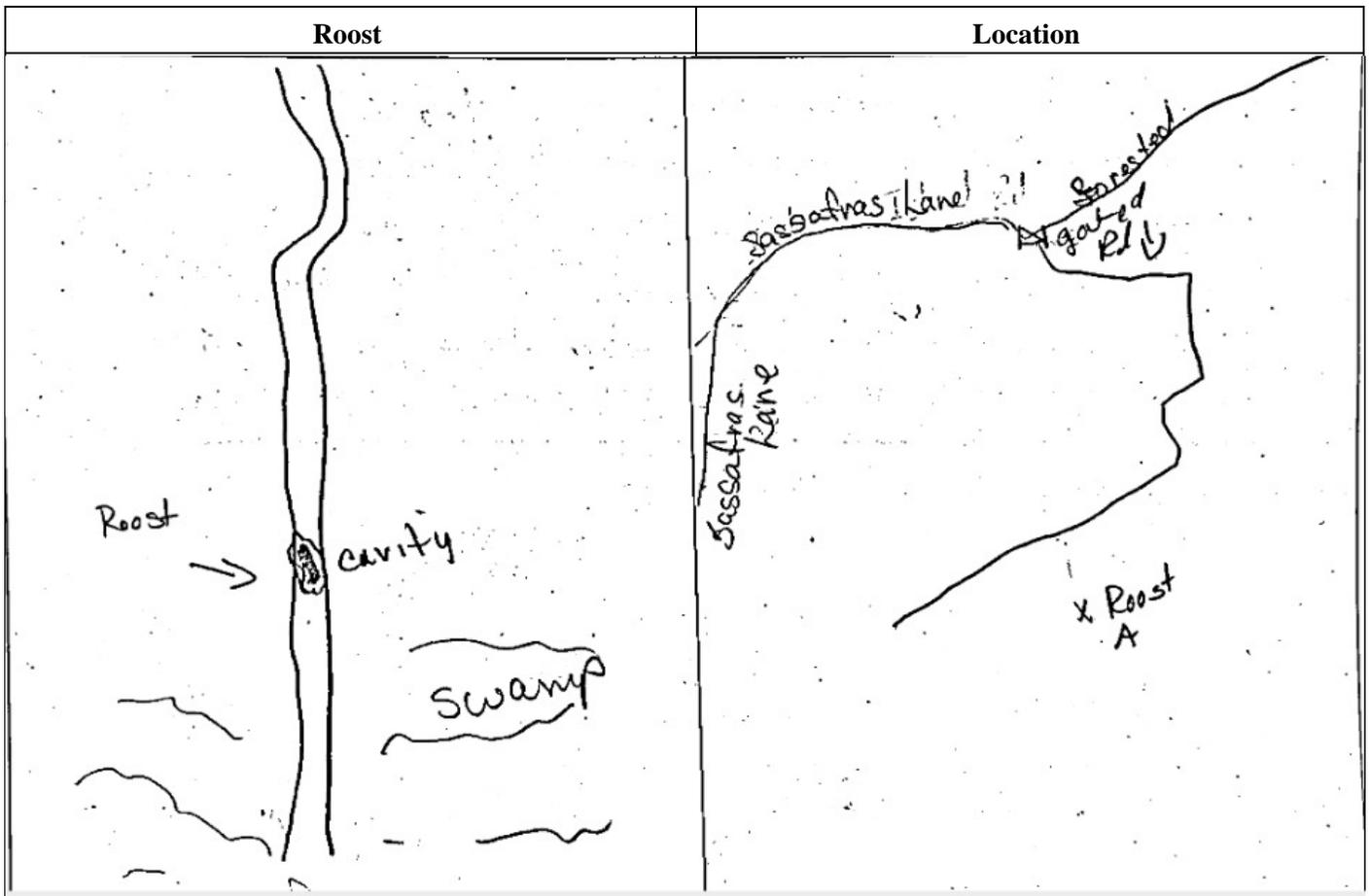
Describe forest/woodlot current condition (mature, partially cut-over, burned, insect damage, etc.)

Cypress-Gum Swamp (Blackwater Subtype)

Vegetation: Sweetgum, water tupelo, loblolly pine, red maple, red bay, fetterbush.

Additional Comments Observed bat just inside the crack/cavity.

**Diagram**



Dates in Roost 4/26



Bat Frequency 105.502

## USFWS INDIANA BAT ROOST DATASHEET

Biologists (Full Name): Johnny Manuel, Anna Weaver Date: 27-April-2019

UTM: Zone \_\_\_\_\_ Easting \_\_\_\_\_ Northing \_\_\_\_\_ OR

LAT 36.26777° LONG -75.98724°

Property Owner NC Wildlife Resources Commission Phone# (607)-847-9859

State NC County Camden Site # NR3

Roost # 502-B Roost Location N. River Game Land

### Roost Tree Data

Tree Species: Water Tupelo (Nyssa aquatica) Live  Snag  Other

(If other, explain) \_\_\_\_\_

DBH (inches) 6.4in Total Roost Height (meters) 16.5m

Height of roost area (if known) 3.5m Dist. from capture site 0.27 miles

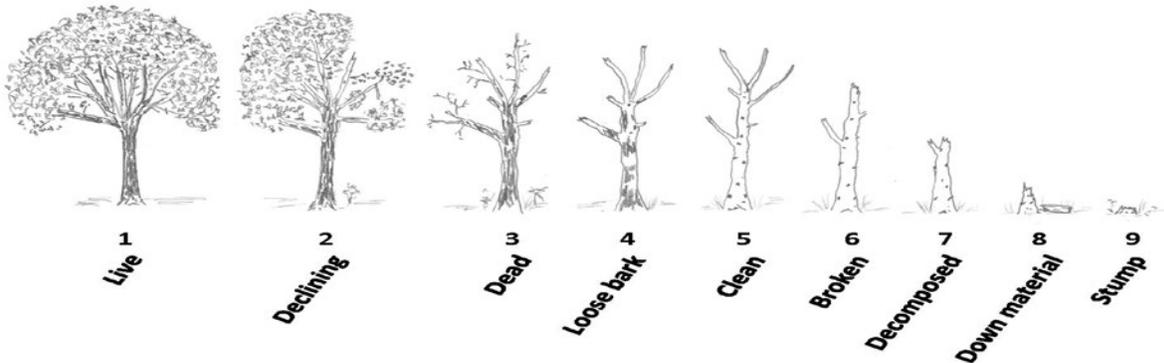
Roost position aspect (deg) 122° Roost type (cavity, crack, bark, etc.) Cavity

Exfoliating bark on bole (%) 0% Describe: sloughing  platy  tight

Cavities present?  Yes if so, describe: Abundance of cavities on tree trunk

Roost tree or snag canopy position: Dominant  Co-Dominant  Suppressed

Roost Decay State:  1  2  3  4  5  6  7  8  9 Other



**Surrounding Habitat Condition**

Canopy closure at roost (%) 30%

Approximate woodlot size (acres) >19,892 Distance to non-forest (meters) 1.86 miles

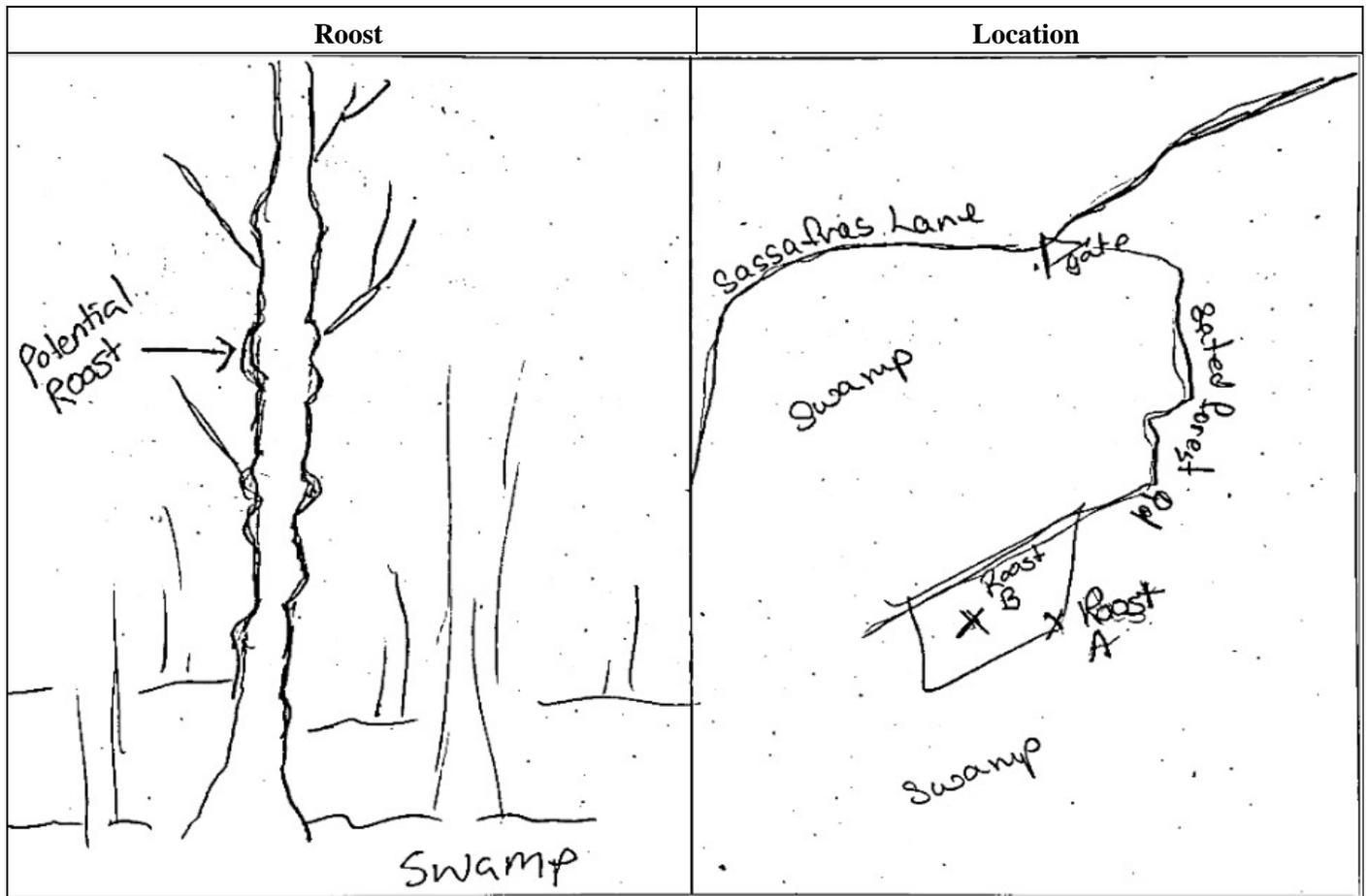
**Describe forest/woodlot current condition (mature, partially cut-over, burned, insect damage, etc.)**

Cypress-Gum Swamp (Blackwater Subtype) Vegetation: \_\_\_\_\_

Water tupelo, red maple, red bay, sweetgum, maleberry

Additional Comments \_\_\_\_\_

**Diagram**



Dates in Roost 4/27



Bat Frequency 150.502

## USFWS INDIANA BAT ROOST DATASHEET

Biologists (Full Name): Johnny Manuel, Anna Weaver Date: 28-April-2019

UTM: Zone \_\_\_\_\_ Easting \_\_\_\_\_ Northing \_\_\_\_\_ OR

LAT 36.26833° LONG -75.98667°

Property Owner NC Wildlife Resources Commission Phone# (607)-847-9859

State NC County Camden Site # NR3

Roost # 502-C Roost Location N. River Game Land

### Roost Tree Data

Tree Species: Red Maple (Acer rubrum) Live  Snag  Other

(If other, explain) \_\_\_\_\_

DBH (inches) 7.5in Total Roost Height (meters) 15m

Height of roost area (if known) 6m Dist. from capture site 0.26 miles

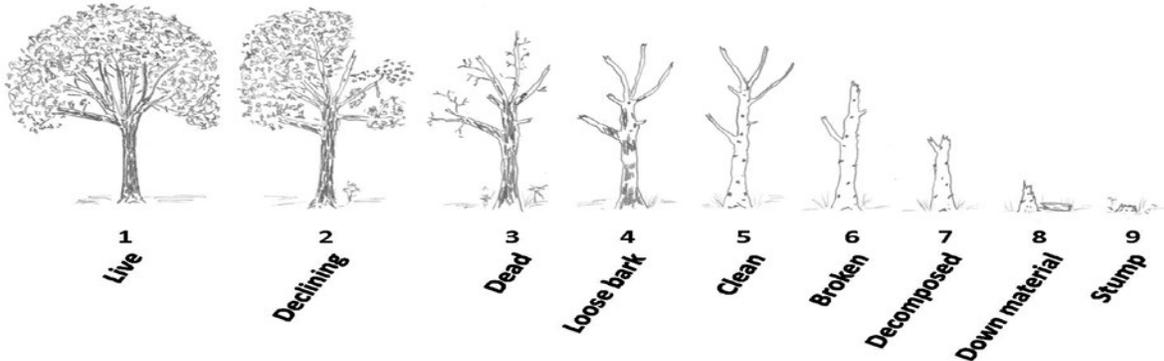
Roost position aspect (deg) 28° Roost type (cavity, crack, bark, etc.) Cavity

Exfoliating bark on bole (%) 5% Describe: sloughing  platy  tight

Cavities present?  Yes  if so, describe: Cavities in dead limbs

Roost tree or snag canopy position: Dominant  Co-Dominant  Suppressed

Roost Decay State: 1  2  3  4  5  6  7  8  9  Other



**Surrounding Habitat Condition**

Canopy closure at roost (%) 30%

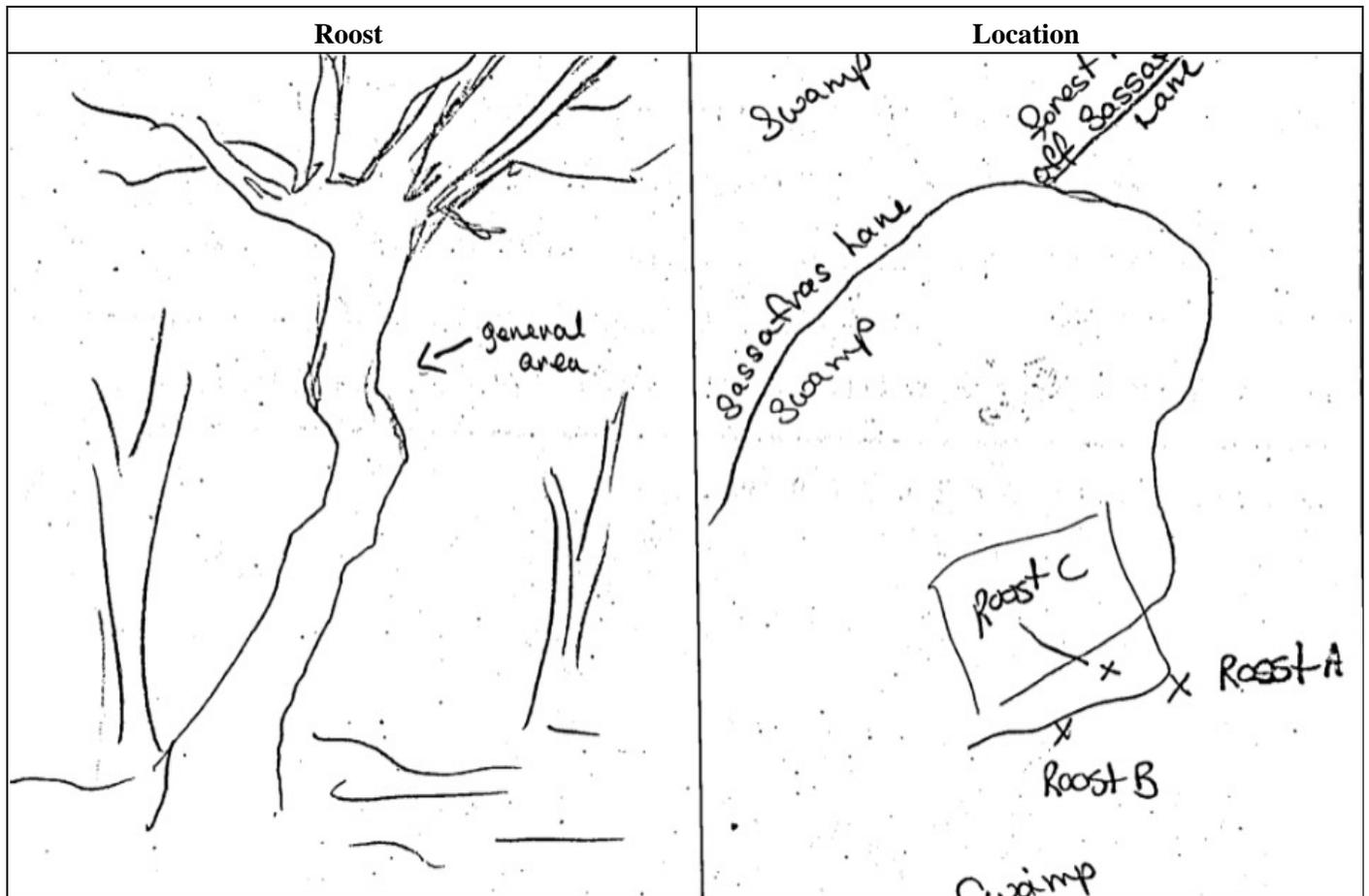
Approximate woodlot size (acres) >19,892 Distance to non-forest (meters) 1.88 miles

Describe forest/woodlot current condition (mature, partially cut-over, burned, insect damage, etc.)

Cypress-Gum Swamp (Blackwater Subtype)  
Mature hardwood forest with water tupelo, red maple sweetgum, red bay. Forest is moderately cluttered in understory and midstory.

Additional Comments \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Diagram**



Dates in Roost 4/28



Bat Frequency 150.502

## USFWS INDIANA BAT ROOST DATASHEET

Biologists (Full Name): Johnny Manuel, Anna Weaver Date: 29-April-2019

UTM: Zone \_\_\_\_\_ Easting \_\_\_\_\_ Northing \_\_\_\_\_ OR

LAT 36.26831° LONG -75.98663°

Property Owner NC Wildlife Resources Commission Phone# (607)-847-9859

State NC County Camden Site # NR3

Roost # 502-D Roost Location N. River Game Land

### Roost Tree Data

Tree Species: Water Tupelo (Nyssa aquatica) Live  Snag  Other

(If other, explain) \_\_\_\_\_

DBH (inches) 5in Total Roost Height (meters) 10.75m

Height of roost area (if known) 6.5m Dist. from capture site 0.26 miles

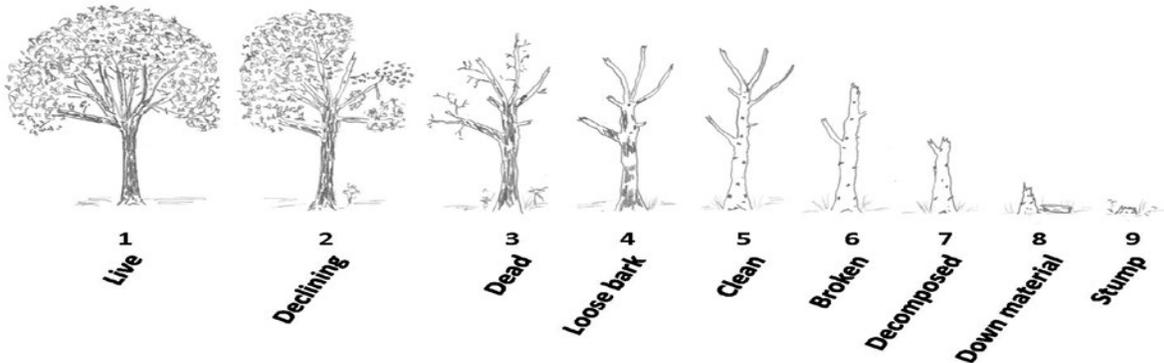
Roost position aspect (deg) 265° Roost type (cavity, crack, bark, etc.) Cavity

Exfoliating bark on bole (%) 0% Describe: sloughing  platy  tight

Cavities present?  Yes  if so, describe: Cavities in tree trunk

Roost tree or snag canopy position: Dominant  Co-Dominant  Suppressed

Roost Decay State: 1  2  3  4  5  6  7  8  9  Other



**Surrounding Habitat Condition**

Canopy closure at roost (%) 30%

Approximate woodlot size (acres) >19,892 Distance to non-forest (meters) 1.94 miles

**Describe forest/woodlot current condition (mature, partially cut-over, burned, insect damage, etc.)**

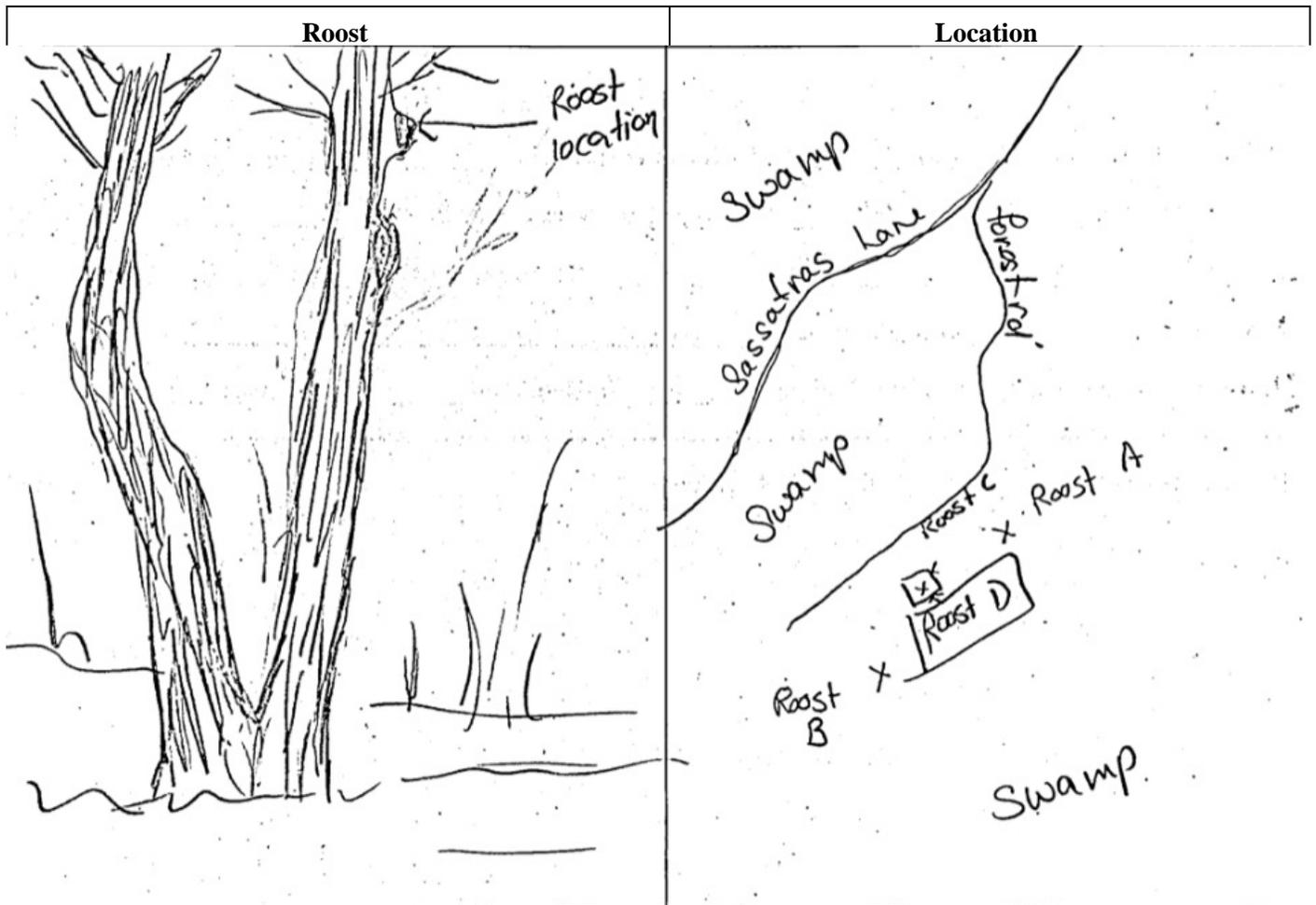
Cypress-Gum Swamp (Blackwater Subtype)

Mature forest with cluttered understory and midstory.

Vegetation: Water tupelo, red maple, red bay, sweetgum, muleberry

**Additional Comments** Witnessed 502 leave roost on 4/29. Found her in same roost tree on 4/30 and 5/1.

**Diagram**



Dates in Roost 4/29, 4/30, 5/1



Bat Frequency 150.502

## USFWS INDIANA BAT ROOST DATASHEET

Biologists (Full Name): Johnny Manuel, Anna Weaver Date: 2-May-2019

UTM: Zone \_\_\_\_\_ Easting \_\_\_\_\_ Northing \_\_\_\_\_ OR

LAT 36.27264° LONG -75.99317°

Property Owner NC Wildlife Resources Commission Phone# (607)-847-9859

State NC County Camden Site # NR3

Roost # 502-E Roost Location N. River Game Land

### Roost Tree Data

Tree Species: Water Tupelo (Nyssa aquatica) Live  Snag  Other

(If other, explain) \_\_\_\_\_

DBH (inches) 9in Total Roost Height (meters) 16m

Height of roost area (if known) 8m Dist. from capture site 0.24 miles

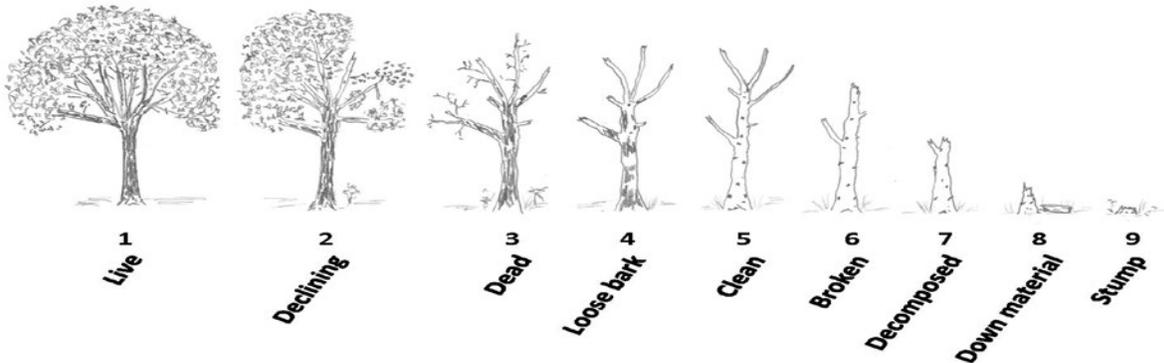
Roost position aspect (deg) 140° Roost type (cavity, crack, bark, etc.) Cavity

Exfoliating bark on bole (%) 5% Describe: sloughing  platy  tight

Cavities present?  Yes  No if so, describe: Cavities and cracks in dead branches

Roost tree or snag canopy position: Dominant  Co-Dominant  Suppressed

Roost Decay State:  1 2 3 4 5 6 7 8 9 Other



**Surrounding Habitat Condition**

Canopy closure at roost (%) 30%

Approximate woodlot size (acres) >19,892 Distance to non-forest (meters) 1.75 miles

**Describe forest/woodlot current condition (mature, partially cut-over, burned, insect damage, etc.)**

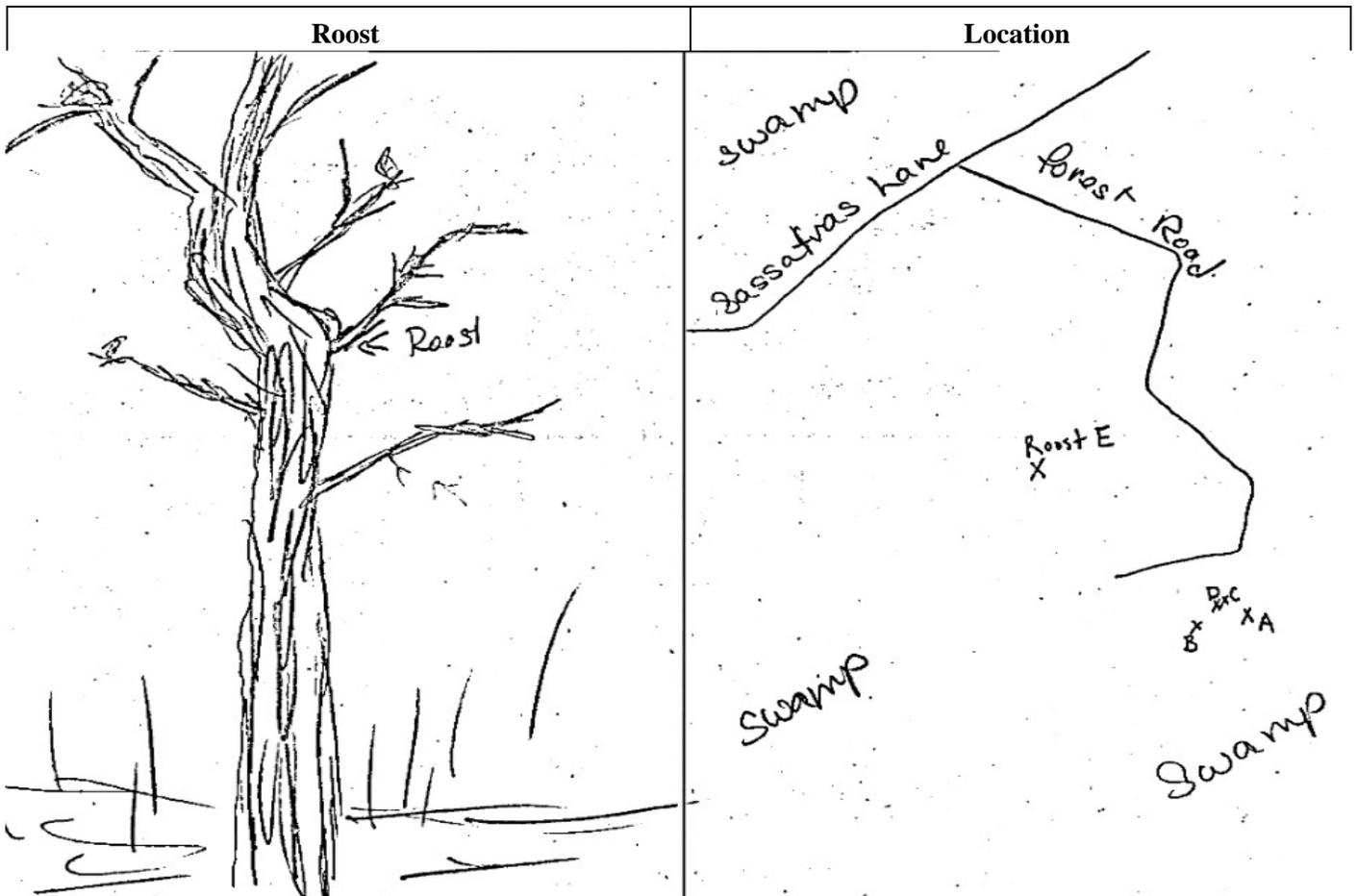
Cypress-Gum Swamp (Blackwater Subtype)

Semi-mature forest with water tupelo, red maple, and sweetgum in canopy. Red bay in midstory and maleberry and blueberry in understory. Highly cluttered understory and midstory.

Additional Comments \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Diagram**



Dates in Roost 5/2, 5/3, 5/4























### BAT TELEMETRY TRACKING

Species MYSE Sex F Bat Frequency 150.502 Capture Date 25-April-2019  
 Capture Site/GPS 36.27137°, -75.98906° Comment \_\_\_\_\_

DATE	OBSERVERS	ROOST Y/N/#	ROOST TREE SPECIES	GPS LAT/LONG	COMMENTS Azimuth/Signal Strength
4-25-2019	Anna Weaver, Dottie Brown, Johnny Manuel	N	n/a	36.27137°, -75.98906°	Tracked from net site as she foraged to the southeast
4-26-2019	Anna Weaver, Dottie Brown, Johnny Manuel	N	n/a	36.27137°, -75.98901°	99°/Poor
4-26-2019	Anna Weaver, Dottie Brown, Johnny Manuel	N	n/a	36.27214°, -75.98697°	180°/Good
4-26-2019	Anna Weaver, Dottie Brown, Johnny Manuel	N	n/a	36.27204°, -75.98717°	157°/Good
4-26-2019	Anna Weaver, Dottie Brown, Johnny Manuel	Y/A	Water tupelo	36.26852°, -75.98619°	Observed bat in roost
4-27-2019	Anna Weaver, Johnny Manuel	N	n/a	36.27116°, -75.98897°	174°/Poor
4-27-2019	Anna Weaver, Johnny Manuel	N	n/a	36.27178°, -75.98792°	187°/Good
4-27-2019	Anna Weaver, Johnny Manuel	N	n/a	36.27218°, -75.98705°	200°/Poor
4-27-2019	Anna Weaver, Johnny Manuel	Y/B	Water tupelo	36.26777°, -75.98724°	
4-28-2019	Anna Weaver, Johnny Manuel	N	n/a	36.27139°, -75.98912°	119°/Poor
4-28-2019	Anna Weaver, Johnny Manuel	N	n/a	36.27166°, -75.98816°	188°/Poor
4-28-2019	Anna Weaver, Johnny Manuel	N	n/a	36.27192°, -75.98748°	212°/Poor
4-28-2019	Anna Weaver, Johnny Manuel	Y/C	Red maple	36.26835°, -75.98667°	



### BAT TELEMTRY TRACKING

Species MYSE Sex F Bat Frequency 150.502 Capture Date 25-April-2019  
 Capture Site/GPS 36.27137°, -75.98906° Comment \_\_\_\_\_

DATE	OBSERVERS	ROOST Y/N/#	ROOST TREE SPECIES	GPS LAT/LONG	COMMENTS Azimuth/Signal Strength
4-29-2019	Johnny Manuel, Anna Weaver	N	n/a	36.27132°, -75.98897°	186°/Good
4-29-2019	Johnny Manuel, Anna Weaver	N	n/a	36.27164°, -75.98831°	193°/Good
4-29-2019	Johnny Manuel, Anna Weaver	N	n/a	36.27183°, -75.98764°	219°/Poor
4-29-2019	Johnny Manuel, Anna Weaver	Y/D	Water tupelo	36.26831°, -75.98663°	About 10 feet from Roost C
4-30-2019	Johnny Manuel, Anna Weaver	Y/D	Water tupelo	36.26831°, -75.98663°	Same roost as previous day
5-1-2019	Johnny Manuel, Anna Weaver	Y/D	Water tupelo	36.26831°, -75.98663°	Same roost as previous day
5-2-2019	Johnny Manuel, Anna Weaver	N	n/a	36.27143°, -75.98909°	309°/Poor
5-2-2019	Johnny Manuel, Anna Weaver	Y/E	Water tupelo	36.27264°, -75.99317°	
5-3-2019	Johnny Manuel, Anna Weaver	Y/E	Water tupelo	36.27264°, -75.99317°	Same tree
5-4-2019	Johnny Manuel, Anna Weaver	Y/E	Water tupelo	36.27264°, -75.99317°	Same tree
5-5-2019	Johnny Manuel, Anna Weaver	N	n/a		No signal
5-6-2019	Johnny Manuel, Anna Weaver	N	n/a		No signal
5-7-2019	Johnny Manuel, Anna Weaver	N	n/a		No signal



## BAT EMERGENCE COUNTS

Species MYSE Sex F Bat Frequency 150.502 Capture Date 25-April-2019  
 Capture Site/GPS NR3 - 36.271414°, -75.989225° Comment \_\_\_\_\_

DATE	OBSERVERS	ROOST #	GPS LAT/LONG	Bat Count	COMMENTS
4/26/2019	No emergence due to thunderstorms	A	36.26852°, -75.98619°	N/A	Bat was observed at entrance of cavity
4/27/2019	Johnny Manuel, Anna Weaver	B	36.26777°, -75.98724°	1	150.502 Flew east
4/28/2019	Johnny Manuel, Anna Weaver	C	36.26830°, -75.98666°	1	150.502 Flew east
4/29/2019	Johnny Manuel, Anna Weaver	D	36.26831°, -75.98663°	1	150.502 Flew northwest
4/30/2019	-	D	-	N/A	Same roost as 4/29
5/1/2019	-	D	-	N/A	Same roost as 4/29
5/2/2019	Johnny Manuel, Anna Weaver	E	36.27264°, -75.99317°	0	150.502 Did not emerge. Wind increased during survey.
5/3/2019	-	E	-	N/A	Same roost as 5/2
5/4/2019	Johnny Manuel, Anna Weaver	E	36.27264°, -75.99317°	0	150.502 Did not emerge / signal stopped
5/5/2019	-	-	-	-	150.502 not located
5/6/2019	-	-	-	-	150.502 not located
5/7/2019	-	-	-	-	150.502 not located



Bat Frequency 150.543

## USFWS INDIANA BAT ROOST DATASHEET

Biologists (Full Name): Johnny Manuel, Dottie Brown Date: 8-May-2019

UTM: Zone \_\_\_\_\_ Easting \_\_\_\_\_ Northing \_\_\_\_\_ OR

LAT 36.38034° LONG 76.01436°

Property Owner James Barco Phone# (252)-207-4230

State NC County Currituck Site # NR1

Roost # 543-A Roost Location N. River Game Land

### Roost Tree Data

Tree Species: Loblolly Pine (Pinus taeda) Live \_\_\_\_\_ Snag  Other \_\_\_\_\_

(If other, explain) \_\_\_\_\_

DBH (inches) 11in Total Roost Height (meters) 6m

Height of roost area (if known) 3m Dist. from capture site 0.42 miles

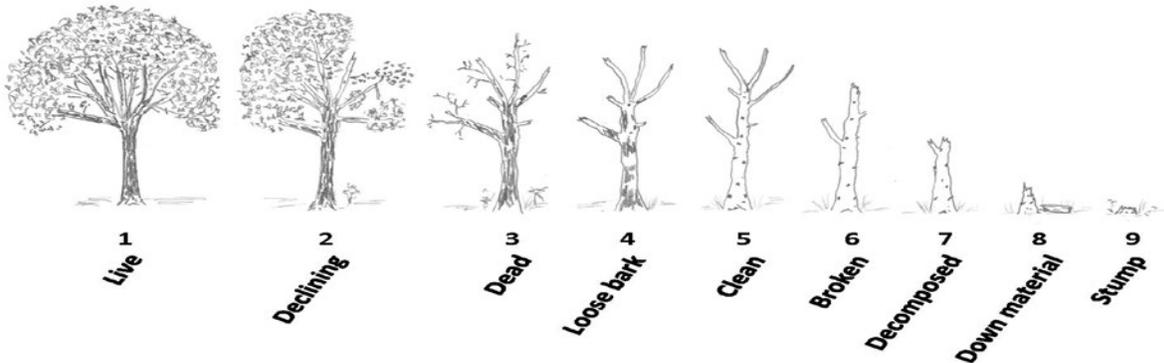
Roost position aspect (deg) 213° Roost type (cavity, crack, bark, etc.) Bark

Exfoliating bark on bole (%) 45% Describe: sloughing \_\_\_\_\_ platy  tight \_\_\_\_\_

Cavities present? No if so, describe: \_\_\_\_\_

Roost tree or snag canopy position: Dominant \_\_\_\_\_ Co-Dominant \_\_\_\_\_ Suppressed

Roost Decay State: 1 2 3 4 5 6 **7** 8 9 Other



**Surrounding Habitat Condition**

Canopy closure at roost (%) 20%

Approximate woodlot size (acres) >19,892 Distance to non-forest (meters) 0.32 miles

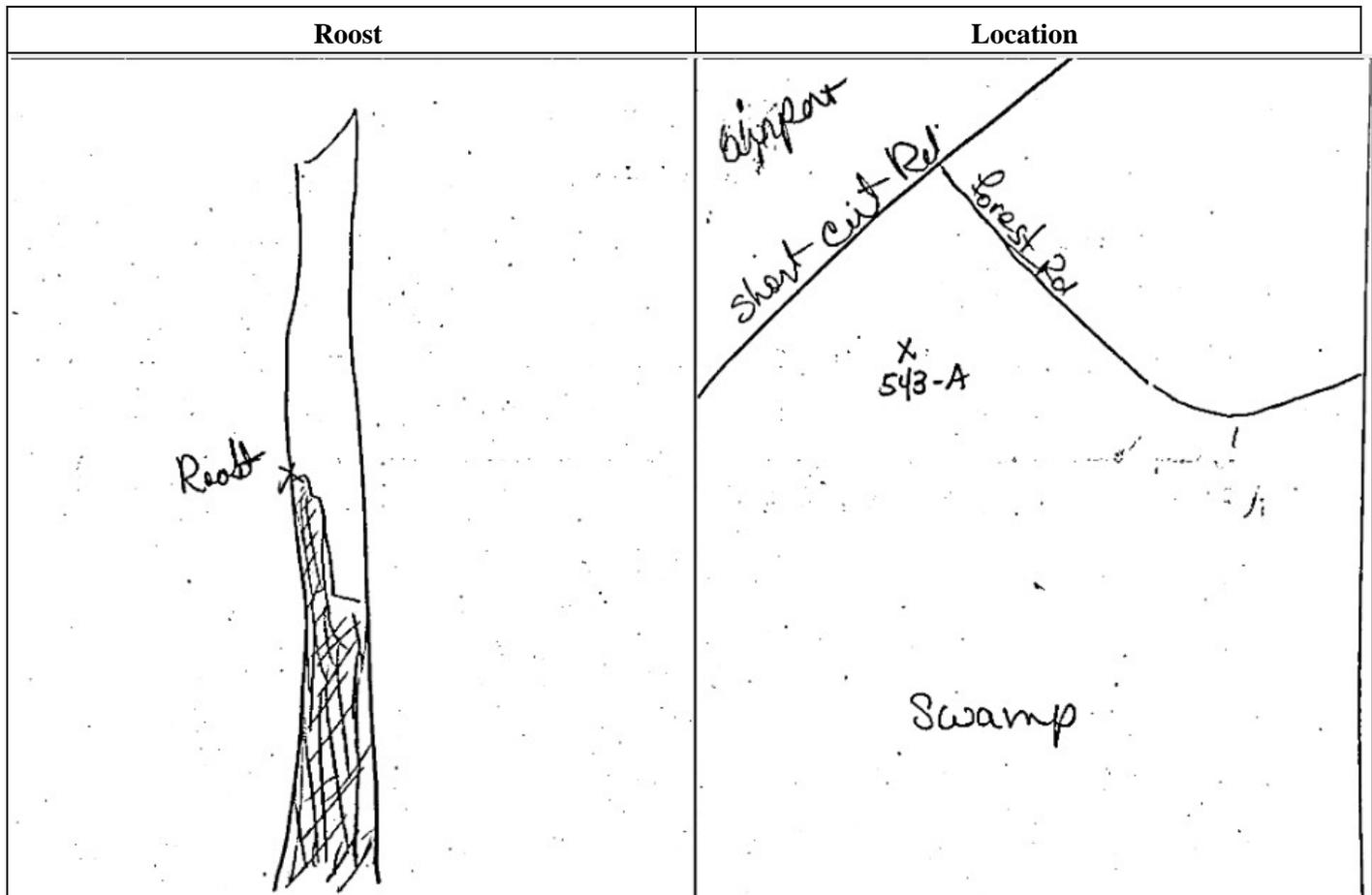
Describe forest/woodlot current condition (mature, partially cut-over, burned, insect damage, etc.)

Cypress-Gum Swamp (Blackwater Subtype)

Vegetation: Water tupelo, red maple, loblolly bay, red bay, silver bay, magnolia, sweetgum, maleberry

Additional Comments \_\_\_\_\_

**Diagram**



Dates in Roost 5/8



Bat Frequency 150.543

## USFWS INDIANA BAT ROOST DATASHEET

Biologists (Full Name): Johnny Manuel Date: 9-May-2019

UTM: Zone \_\_\_\_\_ Easting \_\_\_\_\_ Northing \_\_\_\_\_ OR

LAT 36.38061° LONG -76.01508°

Property Owner NC Wildlife Resources Commission Phone# (252)-426-2255

State NC County Currituck Site # NR1

Roost # 543-B Roost Location N. River Game Land

### Roost Tree Data

Tree Species: Loblolly Pine (Pinus taeda) Live \_\_\_\_\_ Snag  Other \_\_\_\_\_

(If other, explain) \_\_\_\_\_

DBH (inches) 15in Total Roost Height (meters) 13m

Height of roost area (if known) 6.5m Dist. from capture site 0.45 mile

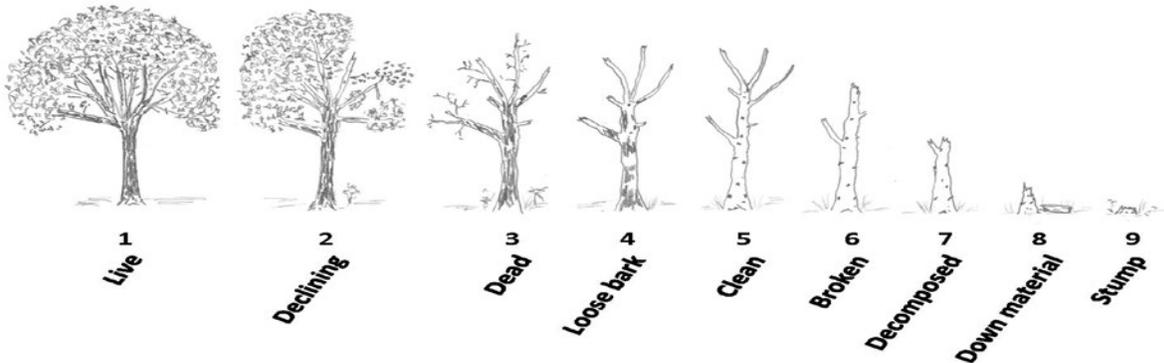
Roost position aspect (deg) 222° Roost type (cavity, crack, bark, etc.) Loose Bark

Exfoliating bark on bole (%) 40% Describe: sloughing  platy \_\_\_\_\_ tight \_\_\_\_\_

Cavities present?  Yes if so, describe: Woodpecker cavities, cracks

Roost tree or snag canopy position: Dominant \_\_\_\_\_ Co-Dominant  Suppressed \_\_\_\_\_

Roost Decay State: 1 2 3  4 5 6 7 8 9 Other



**Surrounding Habitat Condition**

Canopy closure at roost (%) 20%

Approximate woodlot size (acres) >19,892 Distance to non-forest (meters) 0.31 miles

**Describe forest/woodlot current condition (mature, partially cut-over, burned, insect damage, etc.)**

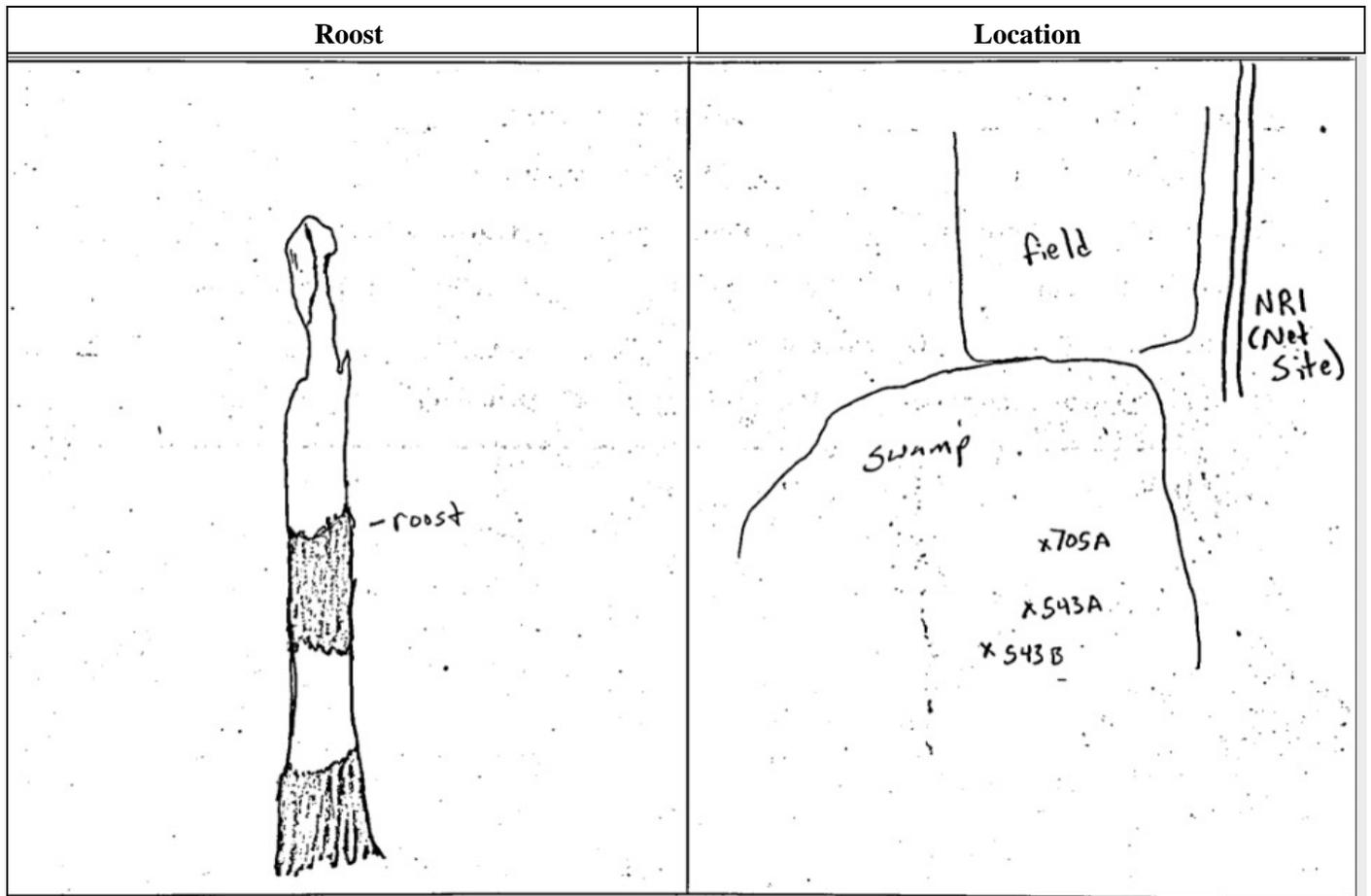
Cypress-Gum Swamp (Blackwater Subtype)

Semi-mature swamp forest. High mortality rate of canopy trees.

Vegetation: Water Tupelo, red maple, loblolly bay, red bay, silver bay, sweet gum, magnolia, maleberry

**Additional Comments**

**Diagram**



Dates in Roost 5/9



Bat Frequency 150.543

## USFWS INDIANA BAT ROOST DATASHEET

Biologists (Full Name): David Cooper, Johnny Manuel Date: 10-May-2019

UTM: Zone \_\_\_\_\_ Easting \_\_\_\_\_ Northing \_\_\_\_\_ OR

LAT 36.38227° LONG -76.01175°

Property Owner James Barco Phone# (252)-207-4230

State NC County Currituck Site # NR1

Roost # 543-C Roost Location N. River Game Land

### Roost Tree Data

Tree Species: Red Maple (Acer rubrum) Live  Snag  Other

(If other, explain) \_\_\_\_\_

DBH (inches) 8in Total Roost Height (meters) 13m

Height of roost area (if known) 3.5m Dist. from capture site 0.23 miles

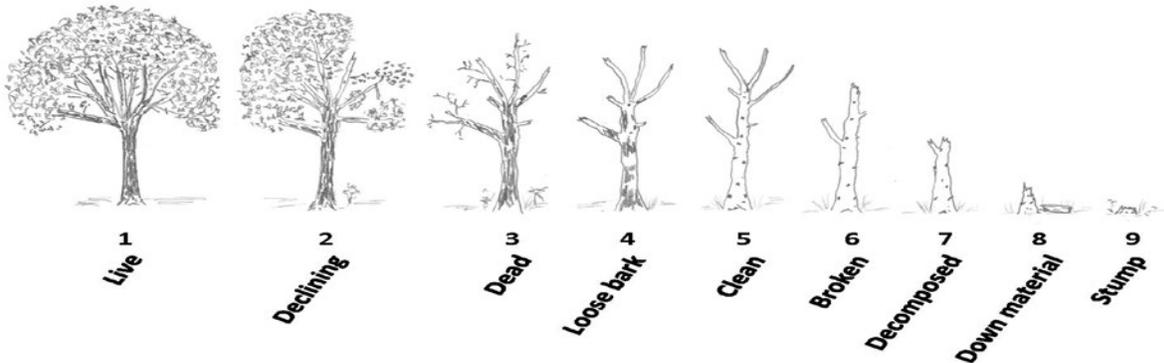
Roost position aspect (deg) 290° Roost type (cavity, crack, bark, etc.) Cavity

Exfoliating bark on bole (%) 3% Describe: sloughing  platy  tight

Cavities present?  Yes  if so, describe: Cankers / Cavities on a branch

Roost tree or snag canopy position: Dominant  Co-Dominant  Suppressed

Roost Decay State: 1  3 4 5 6 7 8 9 Other



**Surrounding Habitat Condition**

Canopy closure at roost (%) 30%

Approximate woodlot size (acres) >19,892 Distance to non-forest (meters) 0.18 miles

Describe forest/woodlot current condition (mature, partially cut-over, burned, insect damage, etc.)

Cypress-Gum Swamp (Blackwater Subtype)

Mature forest. Roost tree is located in gap of the canopy.

Vegetation: Bald cypress, pond cypress, loblolly pine, water tupelo, sweet gum, red maple

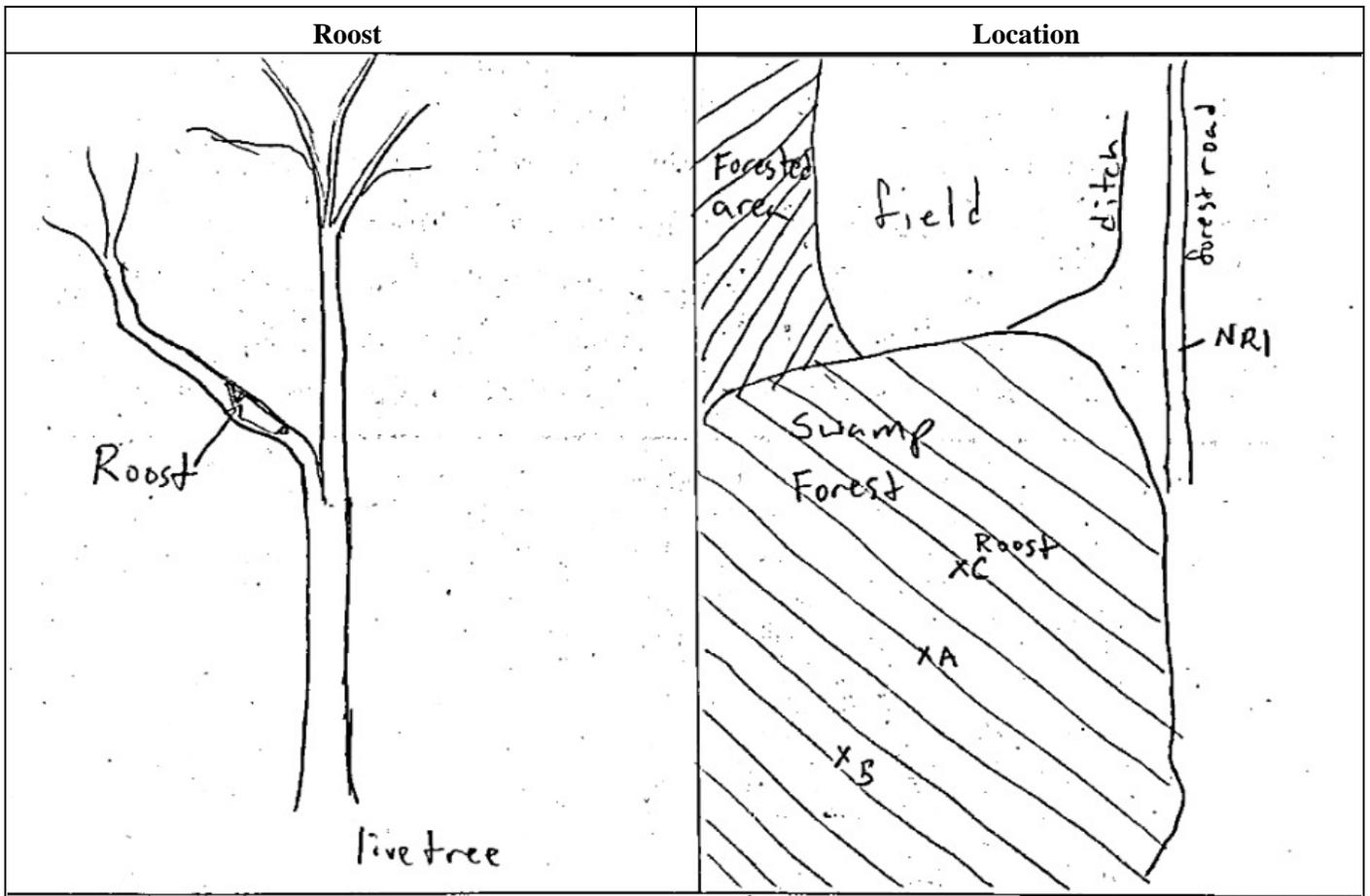
Additional Comments \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Diagram**



Dates in Roost 5/10

Bat Frequency 150.543

### USFWS INDIANA BAT ROOST DATASHEET

Biologists (Full Name): Johnny Manuel, Phil Bailey Date: 11-May-2019

UTM: Zone \_\_\_\_\_ Easting \_\_\_\_\_ Northing \_\_\_\_\_ OR

LAT 36.38199° LONG -76.00970°

Property Owner NC Wildlife Resources Commission Phone# (252)-426-2255

State NC County Currituck Site # NR1

Roost # 543-D Roost Location N. River Game Land

**Roost Tree Data**

Tree Species: Carolina Ash (Fraxinus caroliniana) Live  Snag  Other

(If other, explain) \_\_\_\_\_

DBH (inches) 5in Total Roost Height (meters) 11.5m

Height of roost area (if known) 4m Dist. from capture site 0.14 miles

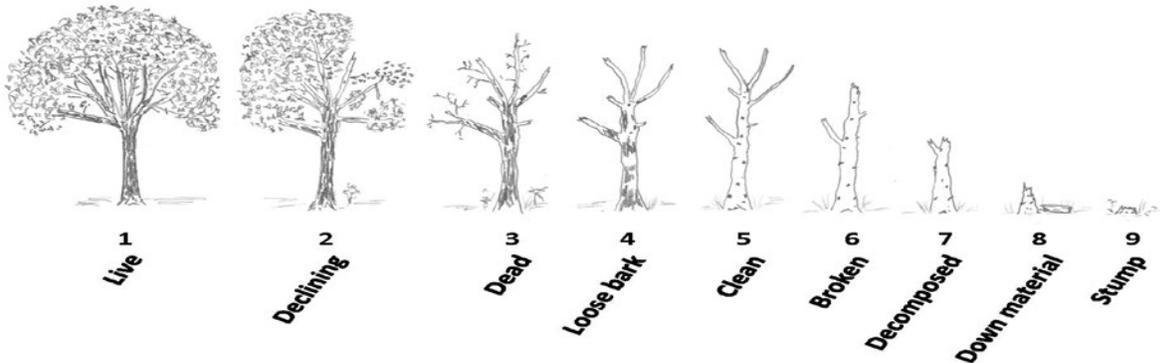
Roost position aspect (deg) 162° Roost type (cavity, crack, bark, etc.) Cavity

Exfoliating bark on bole (%) 5% Describe: sloughing  platy  tight

Cavities present?  Yes  if so, describe: Cavities in woodpecker holes and dead branches

Roost tree or snag canopy position: Dominant  Co-Dominant  Suppressed

Roost Decay State: 1  3 4 5 6 7 8 9 Other



**Surrounding Habitat Condition**

Canopy closure at roost (%) 60%

Approximate woodlot size (acres) >19,892 Distance to non-forest (meters) 0.15 miles

**Describe forest/woodlot current condition (mature, partially cut-over, burned, insect damage, etc.)**

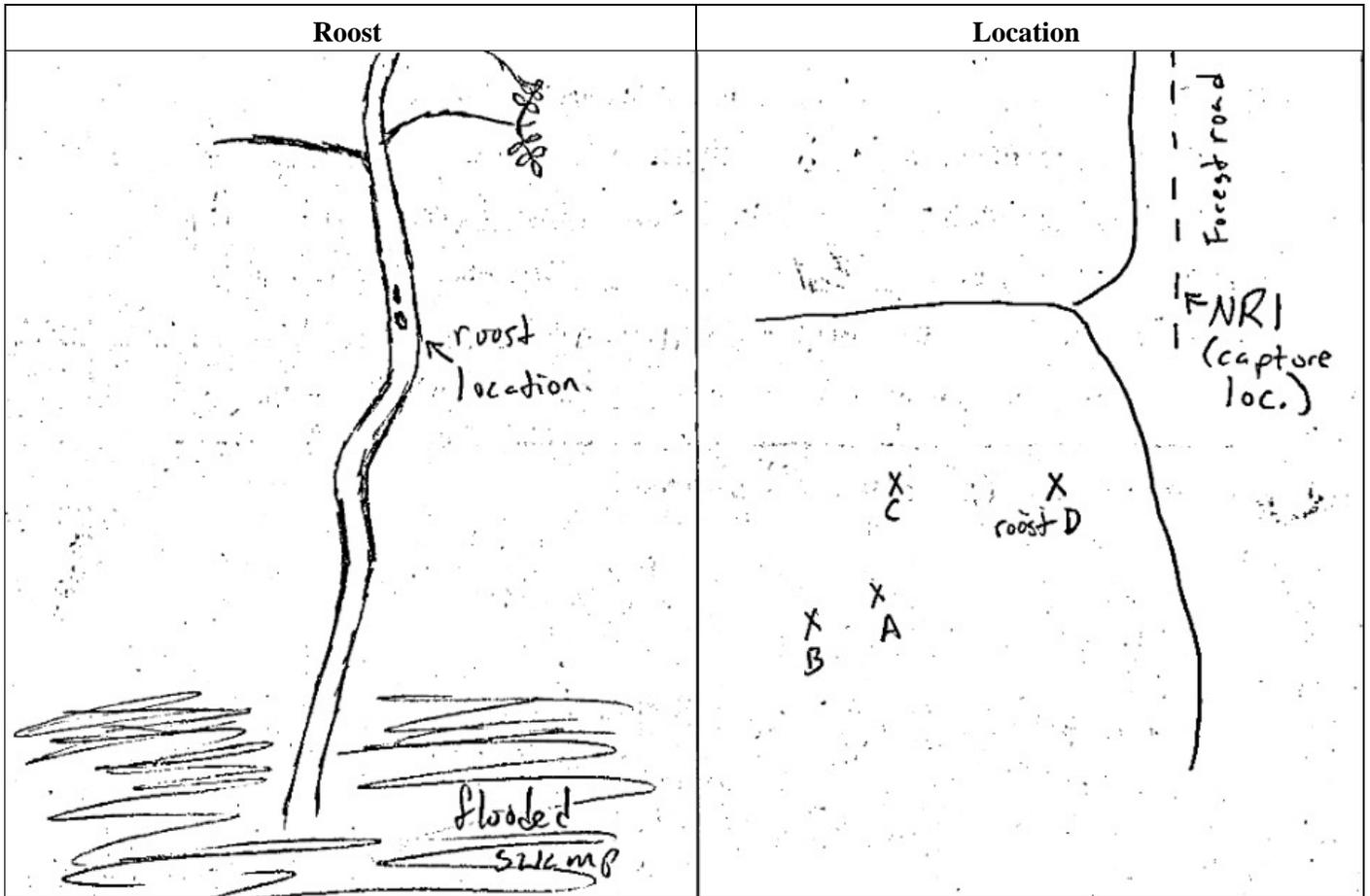
Cypress-Gum Swamp (Blackwater Subtype)

Mature forest consisting of water tupelo, bald cypress, Carolina ash, red bay, and red maple.

Open understory.

**Additional Comments**

**Diagram**



Dates in Roost 5/11



Bat Frequency 150.543

## USFWS INDIANA BAT ROOST DATASHEET

Biologists (Full Name): Phil Bailey, Johnny Maunel Date: 12-May-2019

UTM: Zone \_\_\_\_\_ Easting \_\_\_\_\_ Northing \_\_\_\_\_ OR

LAT 36.38243° LONG -76.00971°

Property Owner NC Wildlife Resources Commission Phone# (252)-426-2255

State NC County Currituck Site # NR1

Roost # 543-E Roost Location N. River Game Land

### Roost Tree Data

Tree Species: Carolina Ash (*Fraxinus caroliniana*) Live  Snag  Other

(If other, explain) \_\_\_\_\_

DBH (inches) 5in Total Roost Height (meters) 12.5m

Height of roost area (if known) 3.5m Dist. from capture site 0.12 miles

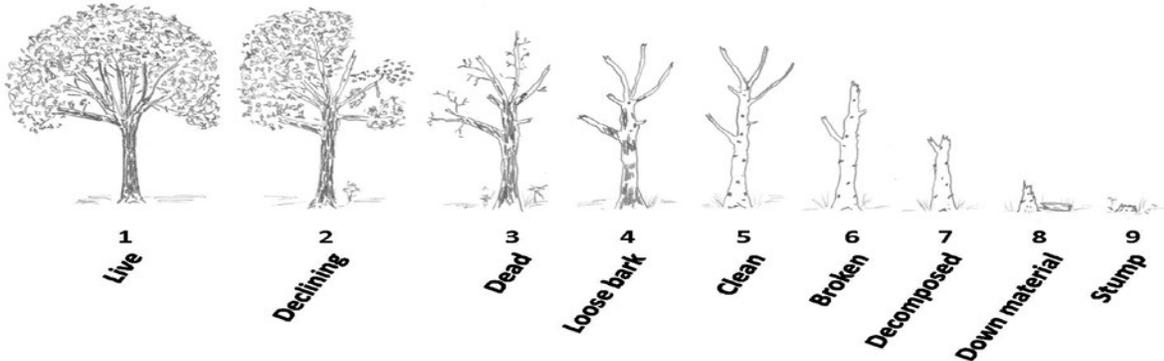
Roost position aspect (deg) 310° Roost type (cavity, crack, bark, etc.) Cavity

Exfoliating bark on bole (%) 0% Describe: sloughing  platy  tight

Cavities present?  Yes  if so, describe: Cavities in old woodpecker holes and dead branches

Roost tree or snag canopy position: Dominant  Co-Dominant  Suppressed

Roost Decay State: 1  2  3  4  5  6  7  8  9  Other



**Surrounding Habitat Condition**

Canopy closure at roost (%) 65%

Approximate woodlot size (acres) >19,892 Distance to non-forest (meters) 0.11 miles

**Describe forest/woodlot current condition (mature, partially cut-over, burned, insect damage, etc.)**

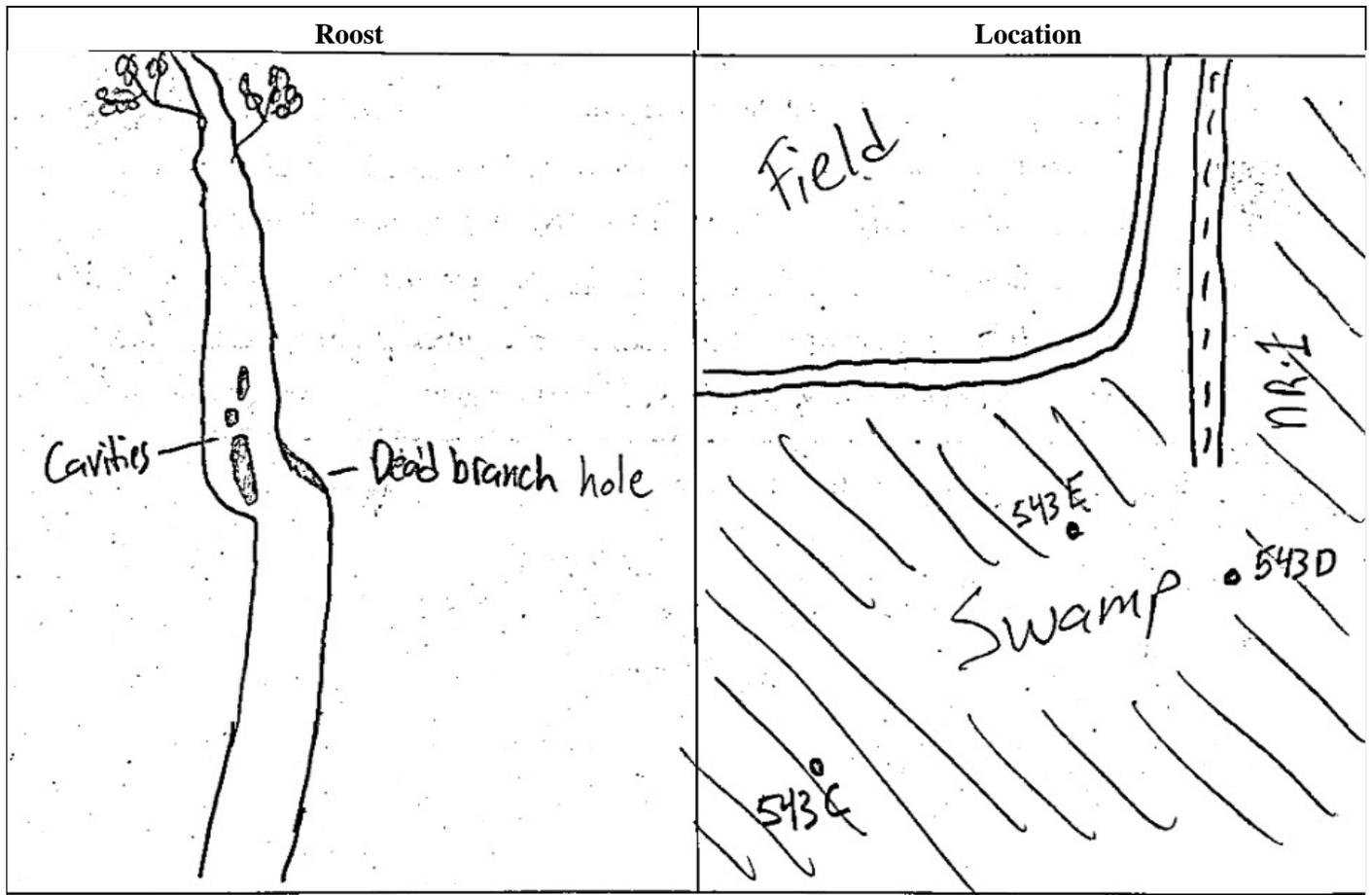
Cypress-Gum Swamp (Blackwater Subtype)

Mature forest with bald cypress, black gum, carolina ash, red maple, blueberry, lizzards tail and carex.

Open understory.

**Additional Comments**

**Diagram**



Dates in Roost 5/12, 5/13



Bat Frequency 150.543

## USFWS INDIANA BAT ROOST DATASHEET

Biologists (Full Name): Anna Weaver, Johnny Manuel Date: 14-May-2019

UTM: Zone \_\_\_\_\_ Easting \_\_\_\_\_ Northing \_\_\_\_\_ OR

LAT 36.38017° LONG -76.01184°

Property Owner James Barco Phone# (252)-207-4230

State NC County Currituck Site # NR1

Roost # 543-F Roost Location N. River Game Land

### Roost Tree Data

Tree Species: Carolina Ash (*Fraxinus caroliniana*) Live  Snag  Other

(If other, explain) \_\_\_\_\_

DBH (inches) 3.5in Total Roost Height (meters) 10m

Height of roost area (if known) 0.75m Dist. from capture site 0.32 miles

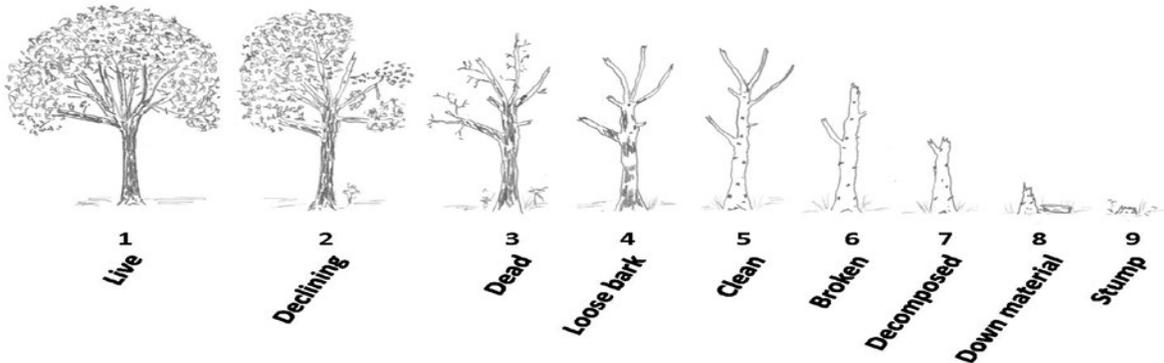
Roost position aspect (deg) 100° Roost type (cavity, crack, bark, etc.) Cavity

Exfoliating bark on bole (%) 1% Describe: sloughing  platy  tight

Cavities present?  Yes  if so, describe: Cavities in base of tree

Roost tree or snag canopy position: Dominant  Co-Dominant  Suppressed

Roost Decay State: 1  3 4 5 6 7 8 9 Other



**Surrounding Habitat Condition**

Canopy closure at roost (%) 40%

Approximate woodlot size (acres) >19,892 Distance to non-forest (meters) 0.30 miles

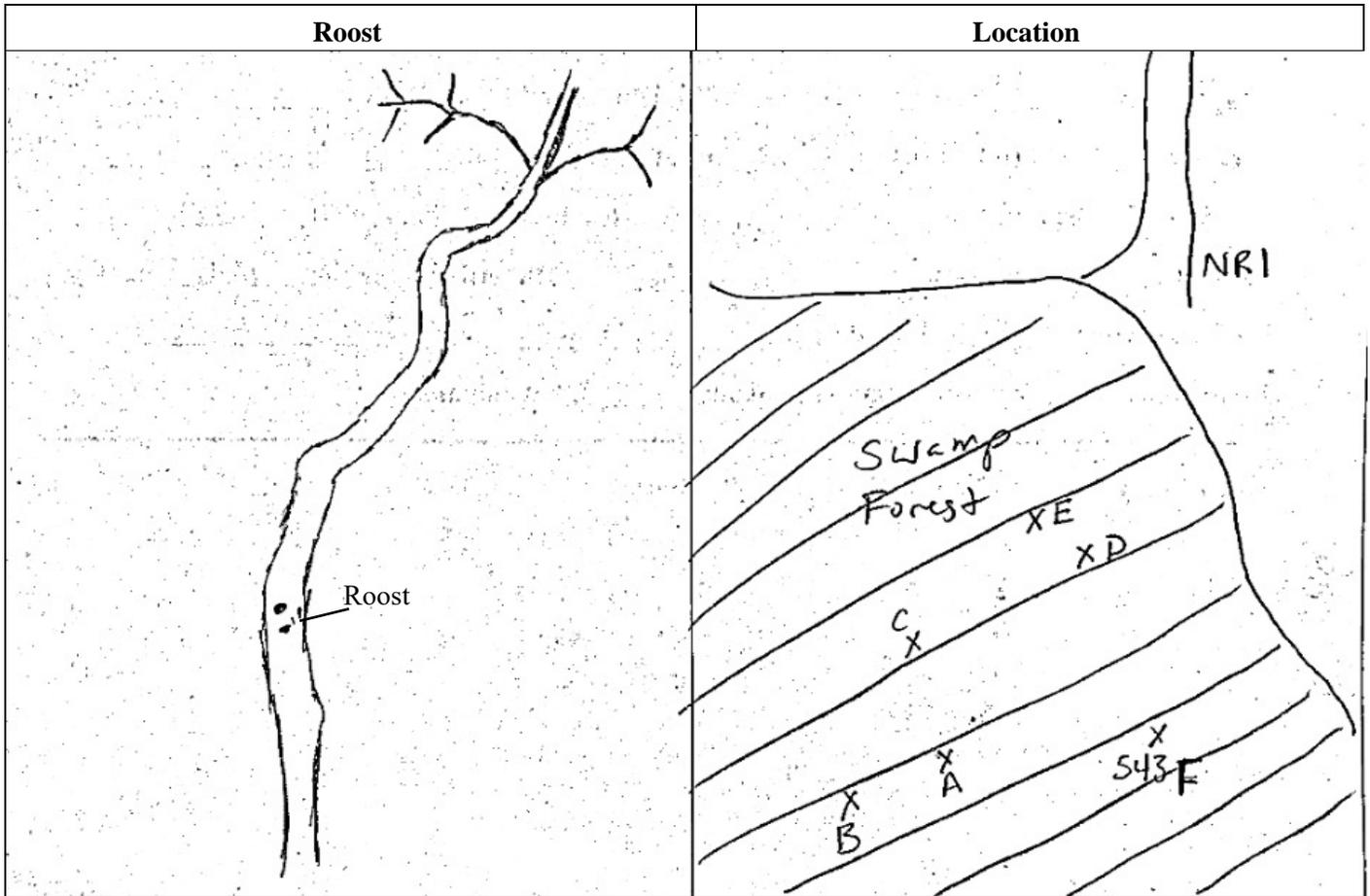
Describe forest/woodlot current condition (mature, partially cut-over, burned, insect damage, etc.)

Cypress-Gum Swamp (Blackwater Subtype)

Vegetation: Water tupelo, pond cypress, bald cypress, red maple, red bay, loblolly pine.

Additional Comments \_\_\_\_\_

**Diagram**



Dates in Roost 5/14



Bat Frequency 150.543

## USFWS INDIANA BAT ROOST DATASHEET

Biologists (Full Name): Anna Weaver, Johnny Manuel Date: 15-May-2019

UTM: Zone \_\_\_\_\_ Easting \_\_\_\_\_ Northing \_\_\_\_\_ OR

LAT 36.38251° LONG -76.01230°

Property Owner James Barco Phone# (252)-207-4230

State NC County Currituck Site # NR1

Roost # 543G Roost Location N. River Game Land

### Roost Tree Data

Tree Species: Red maple (Acer rubrum) Live  Snag  Other

(If other, explain) \_\_\_\_\_

DBH (inches) 5in Total Roost Height (meters) 12m

Height of roost area (if known) 2m Dist. from capture site 0.25 miles

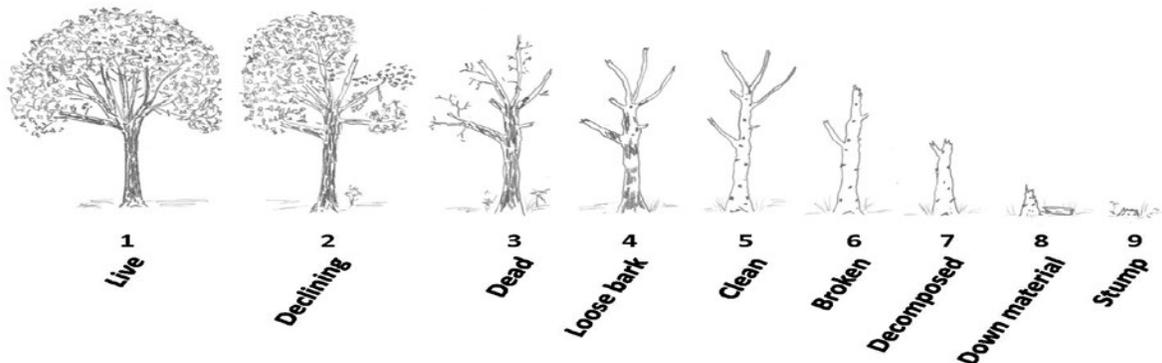
Roost position aspect (deg) 40° Roost type (cavity, crack, bark, etc.) Cavity

Exfoliating bark on bole (%) 10% Describe: sloughing  platy  tight

Cavities present?  Yes  No if so, describe: Cavities in base of tree - Hollow

Roost tree or snag canopy position: Dominant  Co-Dominant  Suppressed

Roost Decay State: 1  3  4  5  6  7  8  9  Other



**Surrounding Habitat Condition**

Canopy closure at roost (%) 35%

Approximate woodlot size (acres) >19,892 Distance to non-forest (meters) 0.16 miles

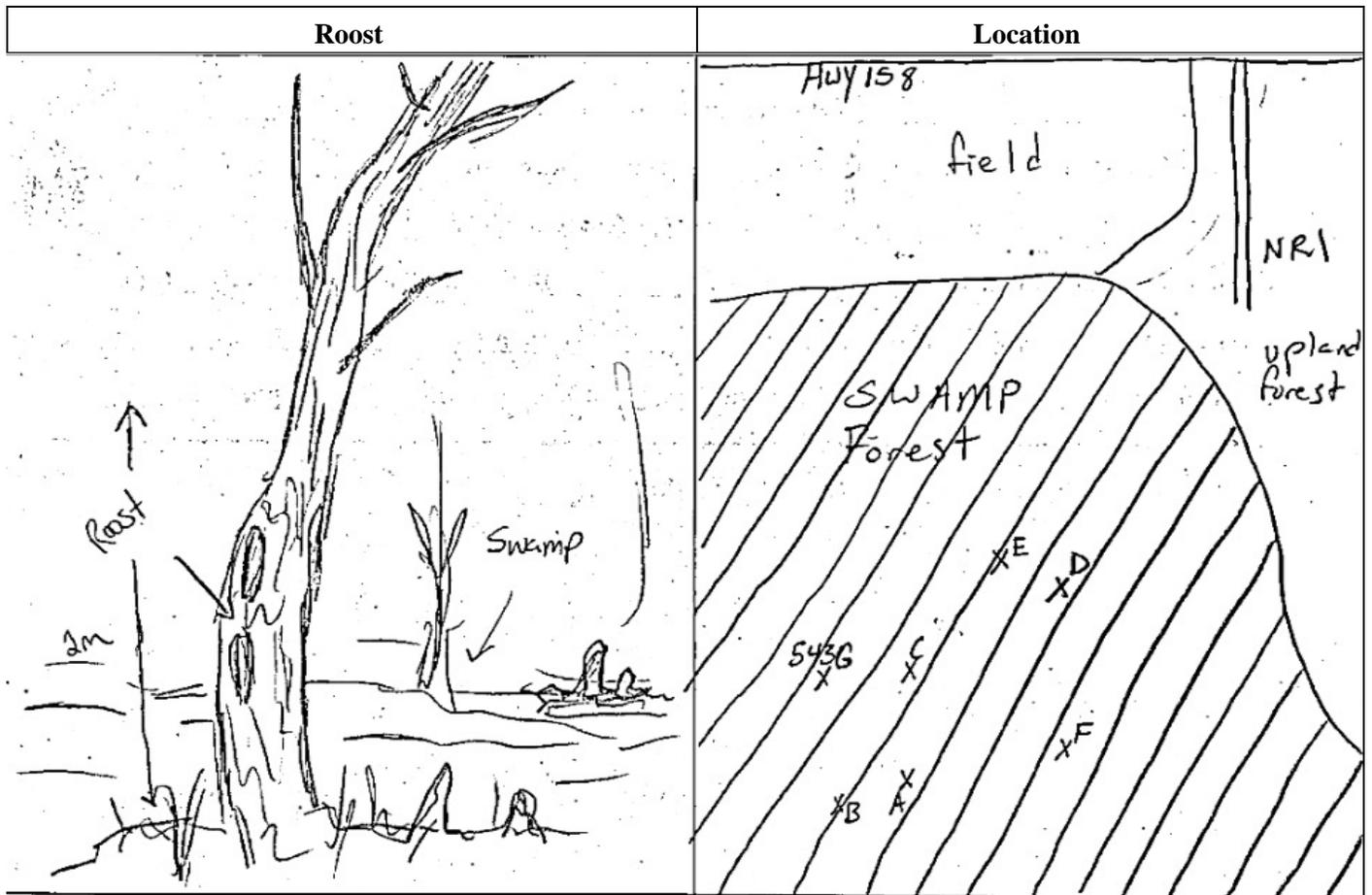
Describe forest/woodlot current condition (mature, partially cut-over, burned, insect damage, etc.)

Cypress-Gum Swamp (Blackwater Subtype)

Vegetation: Pond Cypress, water tupelo, willow oak, red maple, sweetgum, vaccinium spp.

Additional Comments \_\_\_\_\_

**Diagram**



Dates in Roost 5/15



Bat Frequency 150.543

## USFWS INDIANA BAT ROOST DATASHEET

Biologists (Full Name): Dottie Brown, Anna Weaver Date: 16-May-2019

UTM: Zone \_\_\_\_\_ Easting \_\_\_\_\_ Northing \_\_\_\_\_ OR

LAT 36.38002° LONG -76.01366°

Property Owner James Barco Phone# (252)-207-4230

State NC County Currituck Site # NR1

Roost # 543-H Roost Location N. River Game Land

### Roost Tree Data

Tree Species: Loblolly Pine (Pinus taeda) Live \_\_\_\_\_ Snag X Other \_\_\_\_\_

(If other, explain) \_\_\_\_\_

DBH (inches) 8.4in Total Roost Height (meters) 21m

Height of roost area (if known) 5.5m Dist. from capture site 0.40 miles

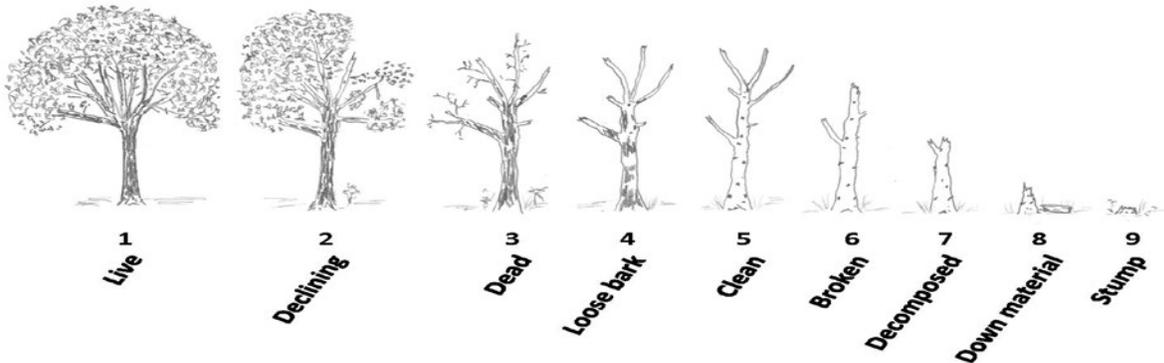
Roost position aspect (deg) 104° Roost type (cavity, crack, bark, etc.) Loose bark

Exfoliating bark on bole (%) 90% Describe: sloughing \_\_\_ platy \_\_\_ tight \_\_\_

Cavities present? No if so, describe: \_\_\_\_\_

Roost tree or snag canopy position: Dominant \_\_\_\_\_ Co-Dominant X Suppressed \_\_\_\_\_

Roost Decay State: 1 2 3 **4** 5 6 7 8 9 Other



**Surrounding Habitat Condition**

Canopy closure at roost (%) 70%

Approximate woodlot size (acres) >19,892 Distance to non-forest (meters) 0.34 miles

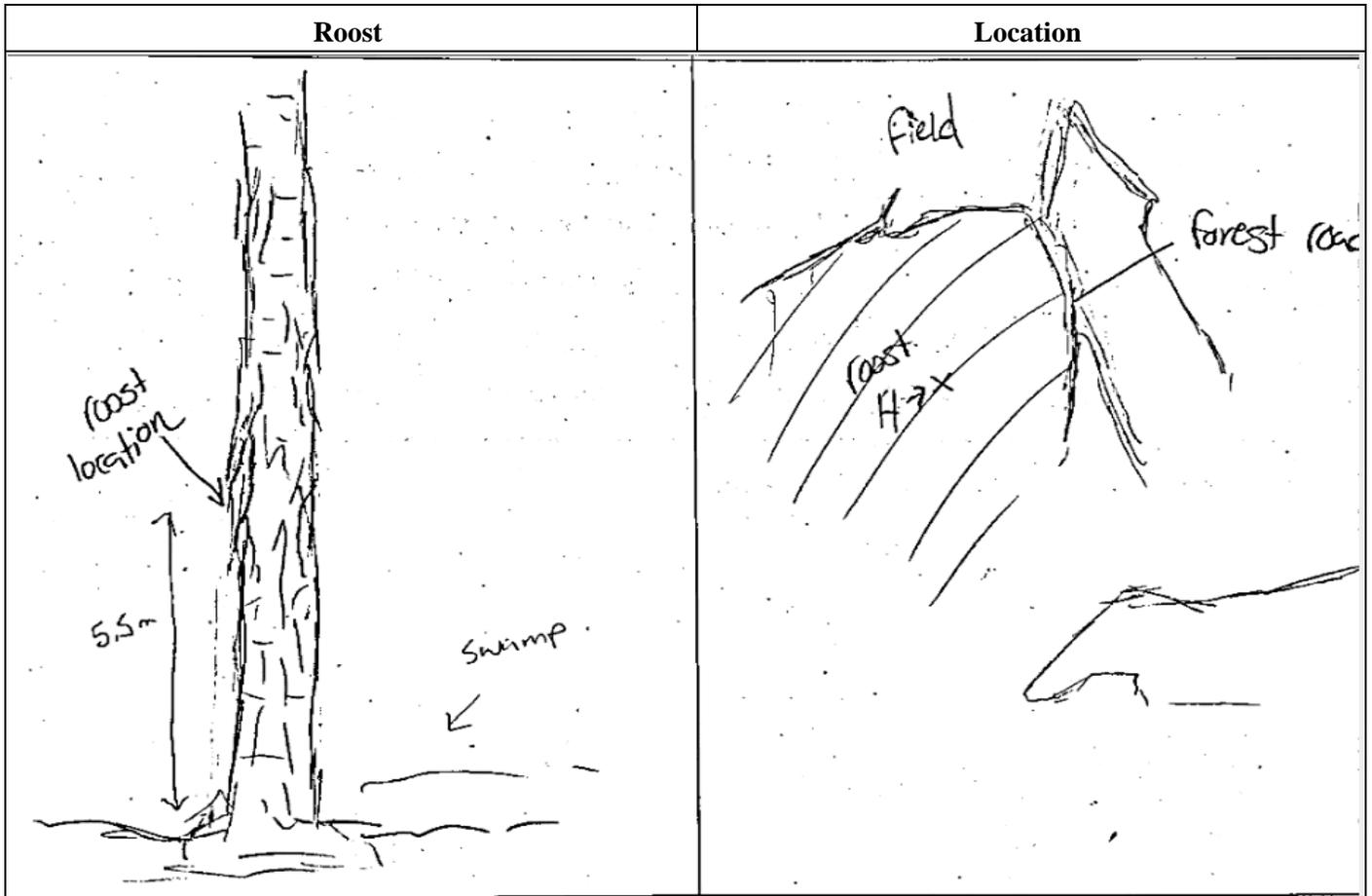
Describe forest/woodlot current condition (mature, partially cut-over, burned, insect damage, etc.)

Cypress-Gum Swamp (Blackwater Subtype)

Vegetation: Pond cypress, water tupelo, willow oak, red maple, sweet gum, vaccinium spp.

Additional Comments One bat flew out of roost while taking data.

**Diagram**



Dates in Roost 5/16



































## BAT TELEMETRY TRACKING

Species MYSE Sex F Bat Frequency 150.543 Capture Date 7-May-2019  
 Capture Site/GPS 36.3853°, -76.00794° Comment \_\_\_\_\_

DATE	OBSERVERS	ROOST Y/N/#	ROOST TREE SPECIES	GPS LAT/LONG	COMMENTS Azimuth/Signal Strength
5-8-2019	Johnny Manuel, Dottie Brown	Y/A	Loblolly Pine	36.38034°, -76.01436°	snag
5-9-2019	Nick Newberry, Johnny Manuel	Y/B	Loblolly pine	36.38061°, -76.01508°	snag
5-10-2019	David Cooper, Johnny Manuel	Y/C	Red maple	36.38227°, -76.01175°	
5-11-2019	Phillip Bailey, Johnny Manuel	Y/D	Carolina ash	36.38199°, -76.00970°	
5-12-2019	Phillip Bailey, Johnny Manuel	Y/E	Carolina ash	36.38243°, -76.00971°	
5-13-2019	Phillip Bailey, Johnny Manuel	Y/E	Carolina ash	36.38243°, -76.00971°	Same roost from 5/12
5-14-2019	Anna Weaver, Johnny Manuel	Y/F	Carolina ash	36.38017°, -76.01184°	
5-15-2019	Anna Weaver, Johnny Manuel	Y/G	Red maple	36.38251°, -76.01230°	
5-16-2019	Anna Weaver, Dottie Brown, Nick Newberry	Y/H	Loblolly pine	36.38002°, -76.01366°	No signal or bat located
5-17-2019	Johnny Manuel, Nick Newberry	N	-	-	No signal or bat located
5-18-2019	Dottie Brown, Johnny Manuel	N	-	36.39529°, -76.00555°	Strong signal 120°
5-18-2019	Dottie Brown, Johnny Manuel	N	-	36.39396°, -76.00340°	Good signal 339°
5-18-2019	Dottie Brown, Johnny Manuel	N	-	36.39436°, -76.00367°	Dropped transmitter found



## BAT EMERGENCY COUNTS

Species MYSE Sex F Bat Frequency 150.543 Capture Date 7-May-2019  
 Capture Site/GPS 36.3835°, -76.00794° Comment \_\_\_\_\_

DATE	OBSERVERS	ROOST #	GPS LAT/LONG	Bat Count	COMMENTS
5-8-2019	Johnny Manuel	A	36.38034°,-76.01436°	14	150.543 left first from roost
5-9-2019	Johnny Manuel	B	36.38031°, -76.01508°	22	150.543 left in 3 <sup>rd</sup> group
5-10-2019	Johnny Manuel	C	36.38227°, -76.01175°	15	
5-11-2019	Phil Bailey, Johnny Manuel	D	36.38199°, -76.00970°	0	
5-12-2019	Johnny Manuel	E	36.38243°, -76.00971°	1	150.543 flew north
5-13-2019	Johnny Manuel	E	36.38243°, -76.00971°	-	2 <sup>nd</sup> night in roost E
5-14-2019	Johnny Manuel	F	36.38017°, -76.01184°	1	150.543 flew west
5-15-2019	Johnny Manuel	G	36.38251°, -76.01230°	2	150.543 flew northwest
5-16-2019	Dottie Brown, Anna Weaver, Nick Newberry	H	36.38002°, -76.01366°	2	150.543 flew northeast
5-17-2019	-	-	-	-	No signal from transmitter and no bat located
5-18-2019	-	-	-	-	Transmitter found – no bat



Bat Frequency 150.705

## USFWS INDIANA BAT ROOST DATASHEET

Biologists (Full Name): Dottie Brown, Johnny Manuel Date: 8-May-2019

UTM: Zone \_\_\_\_\_ Easting \_\_\_\_\_ Northing \_\_\_\_\_ OR

LAT 36.38177° LONG -76.01228°

Property Owner James Barco Phone# (252)-207-4230

State NC County Currituck Site # NR1

Roost # 705-A Roost Location N. River Game Land

### Roost Tree Data

Tree Species: Water Tupelo (*Nyssa aquatica*) Live  Snag  Other

(If other, explain) \_\_\_\_\_

DBH (inches) 3.3in Total Roost Height (meters) 5m

Height of roost area (if known) 1m Dist. from capture site 0.27 miles

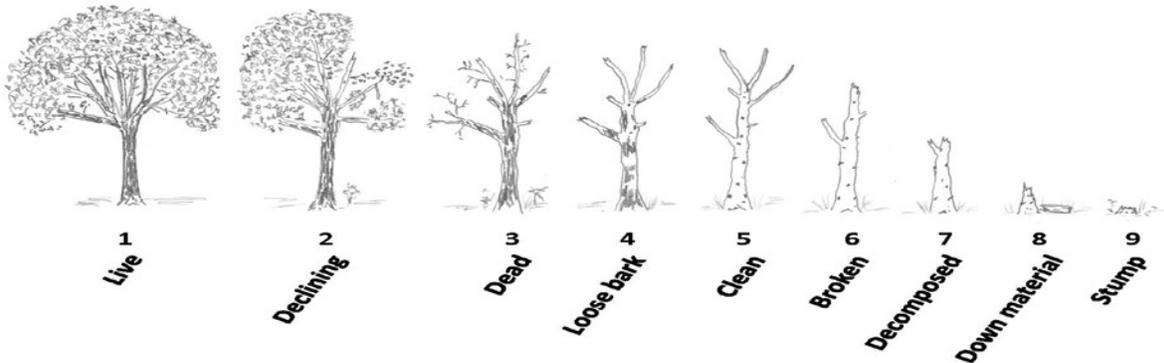
Roost position aspect (deg) 255° Roost type (cavity, crack, bark, etc.) Cavity

Exfoliating bark on bole (%) 0% Describe: sloughing  platy  tight

Cavities present?  Yes  No if so, describe: Several throughout trunk of tree

Roost tree or snag canopy position: Dominant  Co-Dominant  Suppressed

Roost Decay State:  1  2  3  4  5  6  7  8  9 Other



**Surrounding Habitat Condition**

Canopy closure at roost (%) 30%

Approximate woodlot size (acres) >19,892 Distance to non-forest (meters) 0.32 miles

Describe forest/woodlot current condition (mature, partially cut-over, burned, insect damage, etc.)

Cypress-Gum Swamp (Blackwater Subtype) Large swamp/ wetland, mature forest.

Vegetation: swamp tupelo, red maple, bald cypress, loblolly pine, sweetgum, fetterbush, wax myrtle arrow root, cinnamon fern, blueberry.

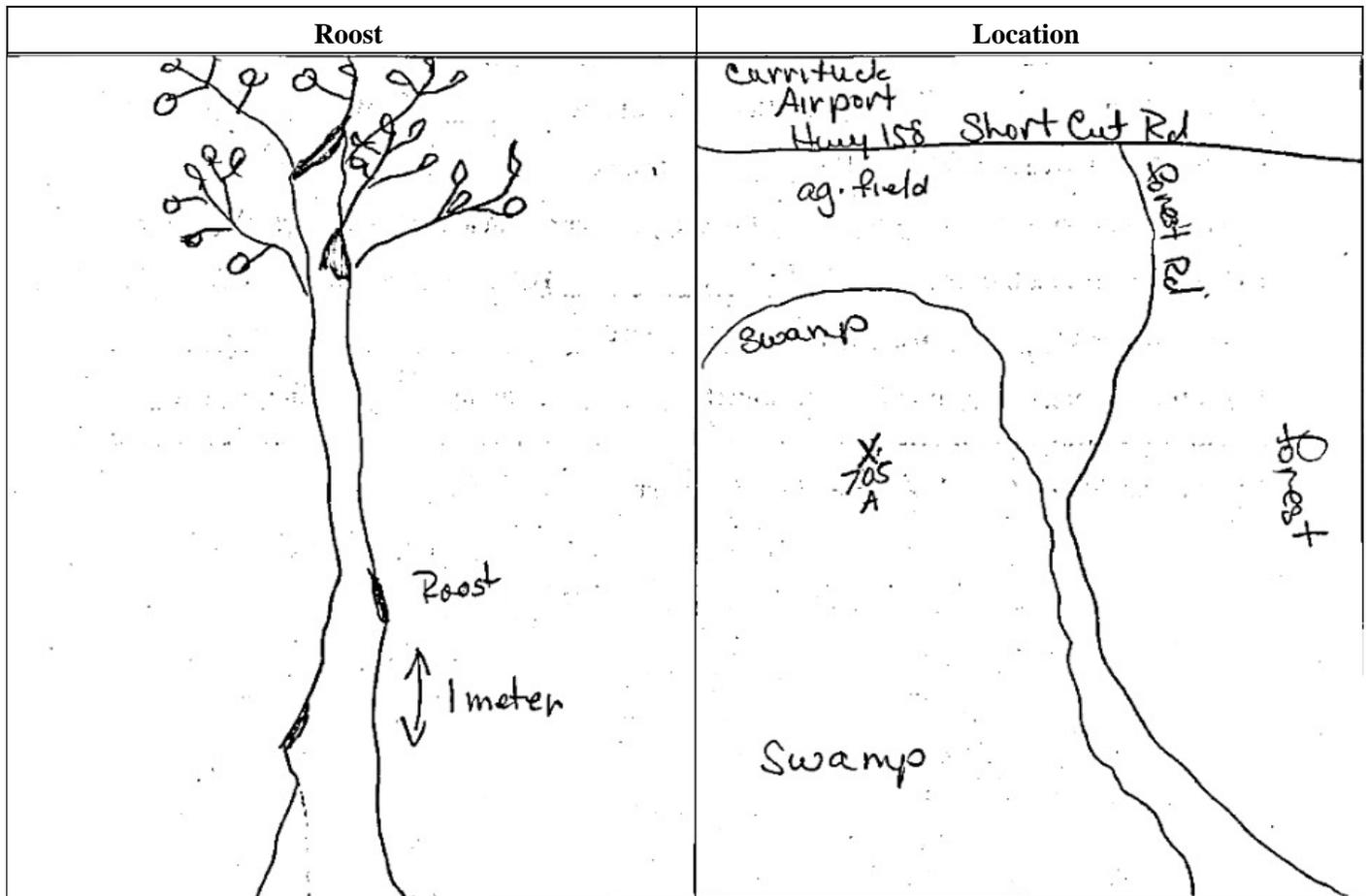
Additional Comments \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Diagram**



Dates in Roost 5/8, 5/9











Bat Frequency 150.623

### USFWS INDIANA BAT ROOST DATASHEET

Biologists (Full Name): Dottie Brown, Nick Newberry Date: 11-May-2019

UTM: Zone \_\_\_\_\_ Easting \_\_\_\_\_ Northing \_\_\_\_\_ OR

LAT 36.37895° LONG -76.01075°

Property Owner North Carolina Wildlife Resource Commission Phone# 250-426-2255

State North Carolina County Currituck Site # NR4

Roost # 623-A Roost Location N River Game Land

#### Roost Tree Data

Tree Species: Sweetbay magnolia (*Magnolia virginiana*) Live  Snag  Other

(If other, explain) \_\_\_\_\_

DBH (inches) 7.6in Total Roost Height (meters) 9m

Height of roost area (if known) 29m Dist. from capture site 1.06 miles

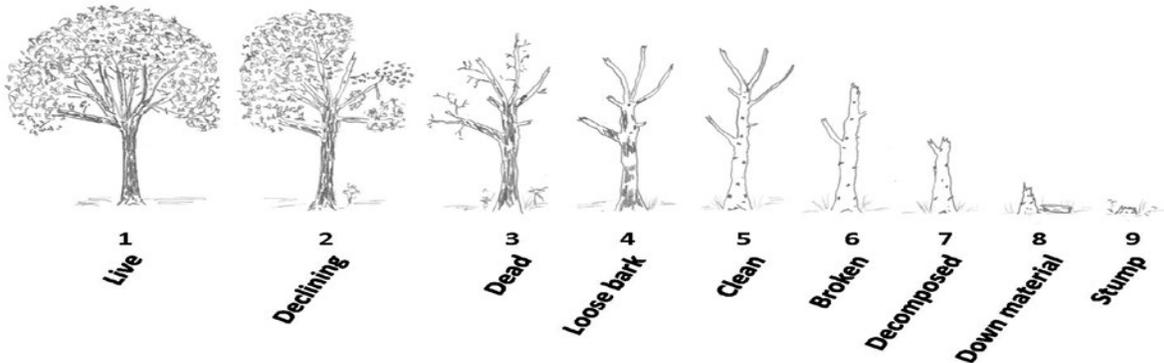
Roost position aspect (deg) 221° Roost type (cavity, crack, bark, etc.) Cavity

Exfoliating bark on bole (%) 0% Describe: sloughing  platy  tight

Cavities present?  Yes  if so, describe: small hole.

Roost tree or snag canopy position: Dominant  Co-Dominant  Suppressed

Roost Decay State:  1 2 3 4 5 6 7 8 9 Other



**Surrounding Habitat Condition**

Canopy closure at roost (%) 10%

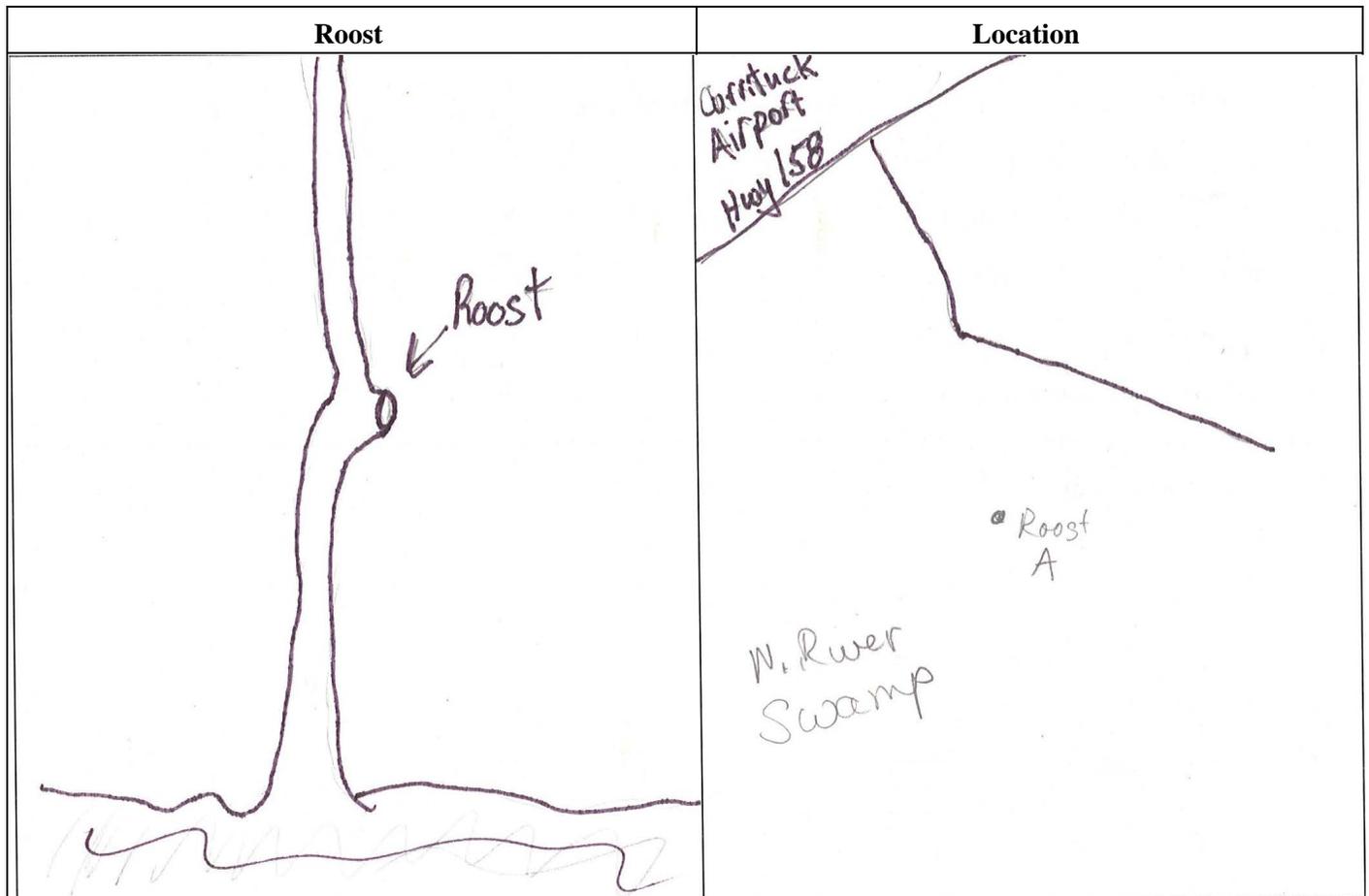
Approximate woodlot size (acres) >19,982ac Distance to non-forest (meters) 0.39 mi

**Describe forest/woodlot current condition (mature, partially cut-over, burned, insect damage, etc.)**

Trees: Carolina ash, loblolly bay, red maple, sweetgum, bald cypress, water tupelo, swamp chestnut oak  
Cypress/gum swamp (blackwater subtype)

Additional Comments lizards tail, giant cane, highbush blueberry, common greenbrier, bottle brush sedge.  
cavity ~4in diameter

**Diagram**



Dates in Roost 5/11



Bat Frequency 150.623

# USFWS INDIANA BAT ROOST DATASHEET

Biologists (Full Name): Dottie Brown, Nick Newberry Date: 12-May-2019

UTM: Zone \_\_\_\_\_ Easting \_\_\_\_\_ Northing \_\_\_\_\_ OR

LAT 36.37963° LONG -76.01102°

Property Owner North Carolina Wildlife Resource Commission Phone# 250-426-2255

State North Carolina County Currituck Site # NR4

Roost # 623-B Roost Location N River Game Land

### Roost Tree Data

Tree Species: Carolina ash (*Fraxinus caroliniana*) Live  Snag  Other

(If other, explain) \_\_\_\_\_

DBH (inches) 3.4in Total Roost Height (meters) 7m

Height of roost area (if known) 0.7m Dist. from capture site 1.10 miles

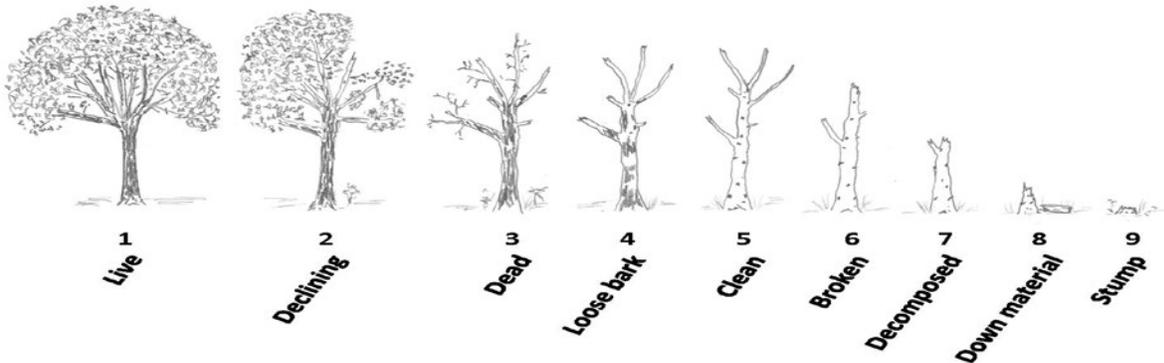
Roost position aspect (deg) 57° Roost type (cavity, crack, bark, etc.) Cavity

Exfoliating bark on bole (%) 0% Describe: sloughing  platy  tight

Cavities present?  Yes  No if so, describe: small hole, cavity at base.

Roost tree or snag canopy position: Dominant  Co-Dominant  Suppressed

Roost Decay State:  1 2 3 4 5 6 7 8 9 Other



**Surrounding Habitat Condition**

Canopy closure at roost (%) 75%

Approximate woodlot size (acres) >19,982 ac Distance to non-forest (meters) 0.38

**Describe forest/woodlot current condition (mature, partially cut-over, burned, insect damage, etc.)**

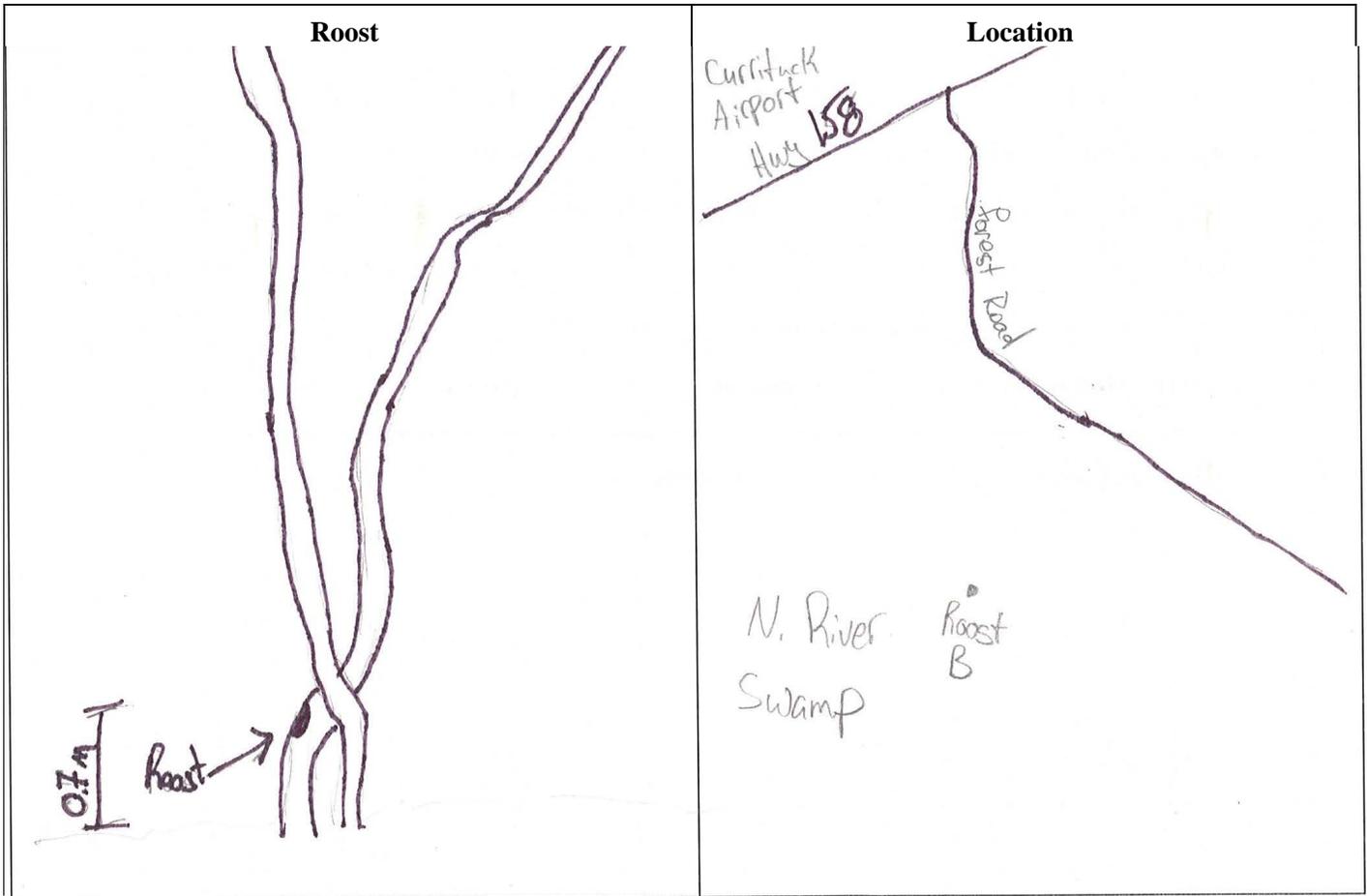
Trees: White ash, sweetbay magnolia, loblolly pine, red maple, sweetgum, bald cypress, water tupelo, wax myrtle, highbush blueberry.

Herbaceous vegetation: smilax rotundifolia, giant cane, fetterbush, poison ivy.

Cypress/gum swamp (blackwater subtype)

**Additional Comments**

**Diagram**



Dates in Roost 5/12



Bat Frequency 150.623

### USFWS INDIANA BAT ROOST DATASHEET

Biologists (Full Name): Dottie Brown, Nick Newberry Date: 13-May-2019

UTM: Zone \_\_\_\_\_ Easting \_\_\_\_\_ Northing \_\_\_\_\_ OR

LAT 36.37991° LONG -76.01155°

Property Owner North Carolina Wildlife Resource Commission Phone# 250-426-2255

State North Carolina County Currituck Site # NR4

Roost # 623-C Roost Location N River Game Land

**Roost Tree Data**

Tree Species: Carolina ash (*Fraxinus caroliniana*) Live  Snag  Other

(If other, explain) \_\_\_\_\_

DBH (inches) 4.9 in Total Roost Height (meters) 9 m

Height of roost area (if known) 0.7 m Dist. from capture site 1.13 miles

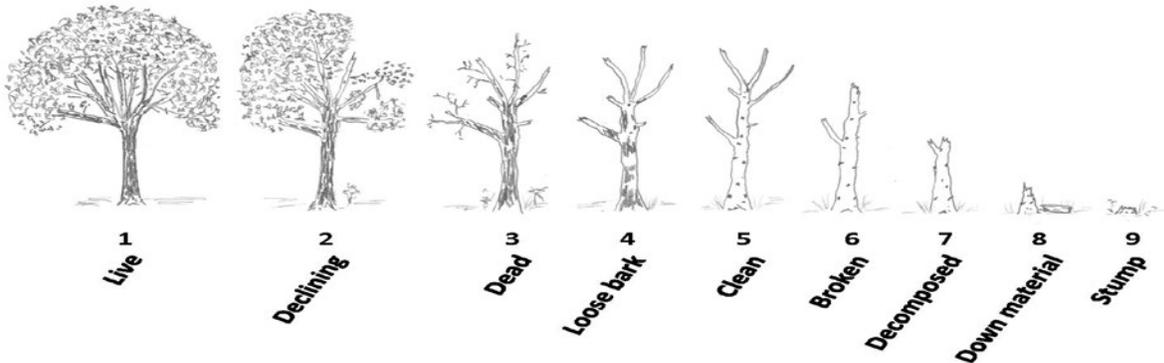
Roost position aspect (deg) 284° Roost type (cavity, crack, bark, etc.) Cavity

Exfoliating bark on bole (%) 0% Describe: sloughing  platy  tight

Cavities present?  Yes  if so, describe: small hole.

Roost tree or snag canopy position: Dominant  Co-Dominant  Suppressed

Roost Decay State:  1 2 3 4 5 6 7 8 9 Other



**Surrounding Habitat Condition**

Canopy closure at roost (%) 90%

Approximate woodlot size (acres) >19,982 ac Distance to non-forest (meters) 0.39 mi

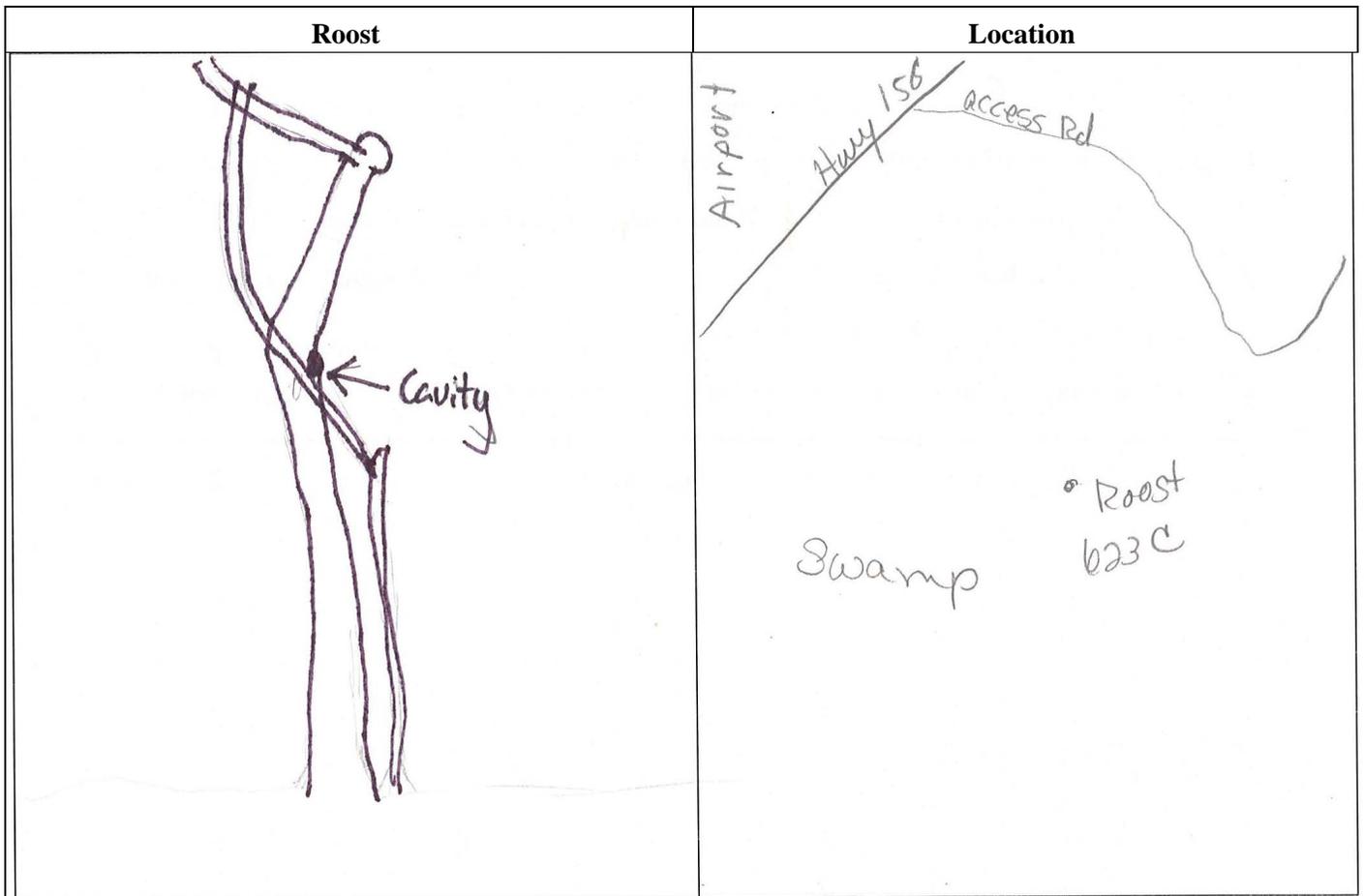
**Describe forest/woodlot current condition (mature, partially cut-over, burned, insect damage, etc.)**

Trees: Carolina ash, loblolly bay, red maple, sweetgum, bald cypress, water tupelo.

Cypress/gum swamp (blackwater subtype)

**Additional Comments**

**Diagram**



Dates in Roost 5/13



Bat Frequency 150.623

## USFWS INDIANA BAT ROOST DATASHEET

Biologists (Full Name): Dottie Brown, Nick Newberry Date: 14-May-2019

UTM: Zone \_\_\_\_\_ Easting \_\_\_\_\_ Northing \_\_\_\_\_ OR

LAT 36.37941° LONG -76.01067°

Property Owner North Carolina Wildlife Resource Commission Phone# 250-426-2255

State North Carolina County Currituck Site # NR4

Roost # 623-D Roost Location N River Game Land

### Roost Tree Data

Tree Species: Red maple (*Acer rubrum*) Live  Snag  Other

(If other, explain) \_\_\_\_\_

DBH (inches) 6.6 in Total Roost Height (meters) 11 m

Height of roost area (if known) 9 m Dist. from capture site 1.06 miles

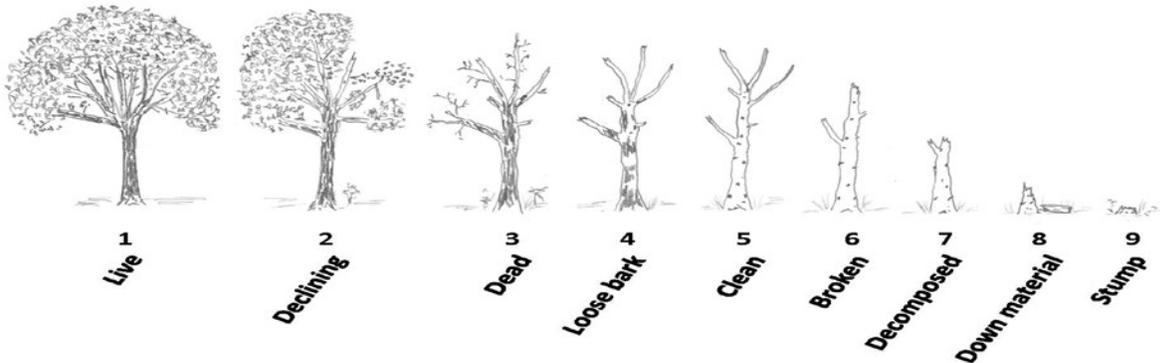
Roost position aspect (deg) 20° Roost type (cavity, crack, bark, etc.) Cavity

Exfoliating bark on bole (%) 0% Describe: sloughing  platy  tight

Cavities present?  Yes  if so, describe: small cavity at old branch breakoff point.

Roost tree or snag canopy position: Dominant  Co-Dominant  Suppressed

Roost Decay State: 1  2 3 4 5 6 7 8 9 Other



**Surrounding Habitat Condition**

Canopy closure at roost (%) 25%

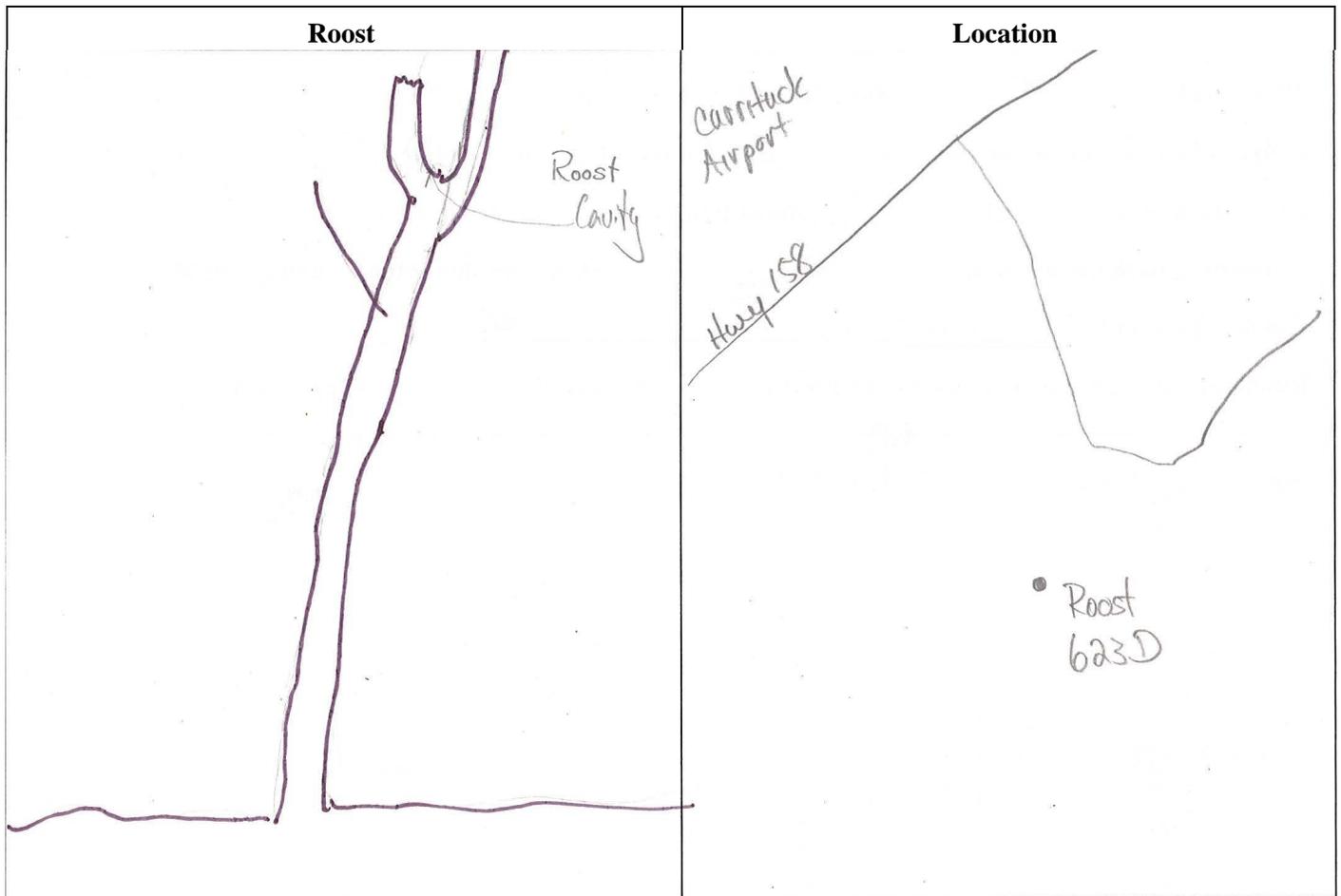
Approximate woodlot size (acres) >19,982 ac Distance to non-forest (meters) 0.39

**Describe forest/woodlot current condition (mature, partially cut-over, burned, insect damage, etc.)**

Vegetation: Carolina ash, loblolly bay, red maple, sweetgum, bald cypress, water tupelo, loblolly pine, wax myrtle, lizards tail.  
Cypress/gum swamp (blackwater subtype)

**Additional Comments** Base of tree is cluttered with vegetation but top half of tree is open and gets lots of sun.

**Diagram**



Dates in Roost 5/14



Bat Frequency 150.623

# USFWS INDIANA BAT ROOST DATASHEET

Biologists (Full Name): Dottie Brown, Nick Newberry Date: 15-May-2019

UTM: Zone \_\_\_\_\_ Easting \_\_\_\_\_ Northing \_\_\_\_\_ OR

LAT 36.37891° LONG -76.01082°

Property Owner North Carolina Wildlife Resource Commission Phone# 250-426-2255

State North Carolina County Currituck Site # NR4

Roost # 623-E Roost Location N River Game Land

### Roost Tree Data

Tree Species: Red maple (*Acer rubrum*) Live  Snag  Other

(If other, explain) \_\_\_\_\_

DBH (inches) 2.4 in Total Roost Height (meters) 4.0 m

Height of roost area (if known) 0.6 m Dist. from capture site 1.06 miles

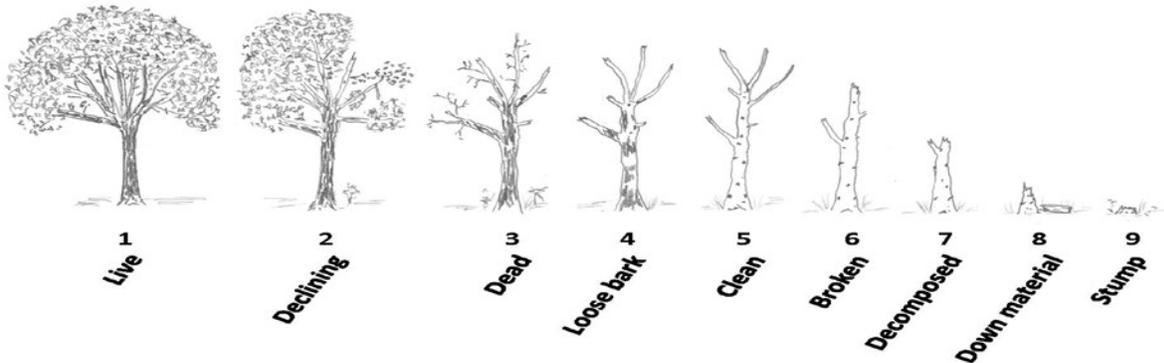
Roost position aspect (deg) 163° Roost type (cavity, crack, bark, etc.) Cavity

Exfoliating bark on bole (%) 0% Describe: sloughing  platy  tight

Cavities present?  Yes  if so, describe: one small cavity.

Roost tree or snag canopy position: Dominant  Co-Dominant  Suppressed

Roost Decay State: 1  3 4 5 6 7 8 9 Other



**Surrounding Habitat Condition**

Canopy closure at roost (%) 45%

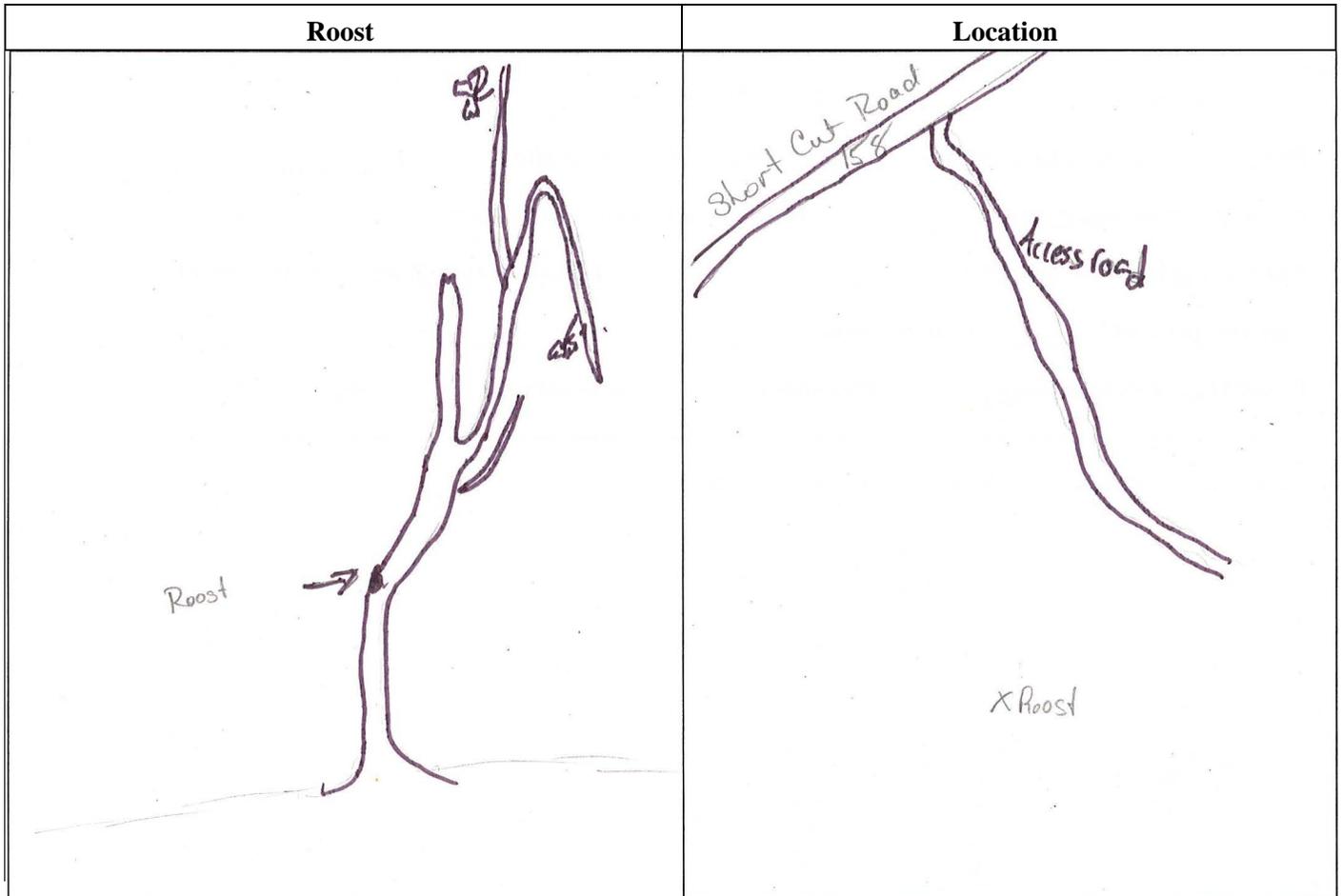
Approximate woodlot size (acres) >19,982 ac Distance to non-forest (meters) 0.33 mi

**Describe forest/woodlot current condition (mature, partially cut-over, burned, insect damage, etc.)**

Vegetation: Carolina ash, loblolly bay, red maple, sweetgum, bald cypress, water tupelo, loblolly pine, wax myrtle, lizards tail, giant cane, highbush blueberry.  
Cypress/gum swamp (blackwater subtype)

**Additional Comments**  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Diagram**



Dates in Roost 5/15, 5/18, 5/19, 5/20



Bat Frequency 150.623

### USFWS INDIANA BAT ROOST DATASHEET

Biologists (Full Name): Nick Newberry, Johnny Manuel Date: 16-May-2019

UTM: Zone \_\_\_\_\_ Easting \_\_\_\_\_ Northing \_\_\_\_\_ OR

LAT 36.37940° LONG -76.01067°

Property Owner North Carolina Wildlife Resource Commission Phone# 250-426-2255

State North Carolina County Currituck Site # NR4

Roost # 623-F Roost Location N River Game Land

#### Roost Tree Data

Tree Species: Red maple (*Acer rubrum*) Live \_\_\_\_\_ Snag  Other \_\_\_\_\_

(If other, explain) \_\_\_\_\_

DBH (inches) 4.2 in Total Roost Height (meters) 9 m

Height of roost area (if known) 3 m Dist. from capture site 1.07 mi

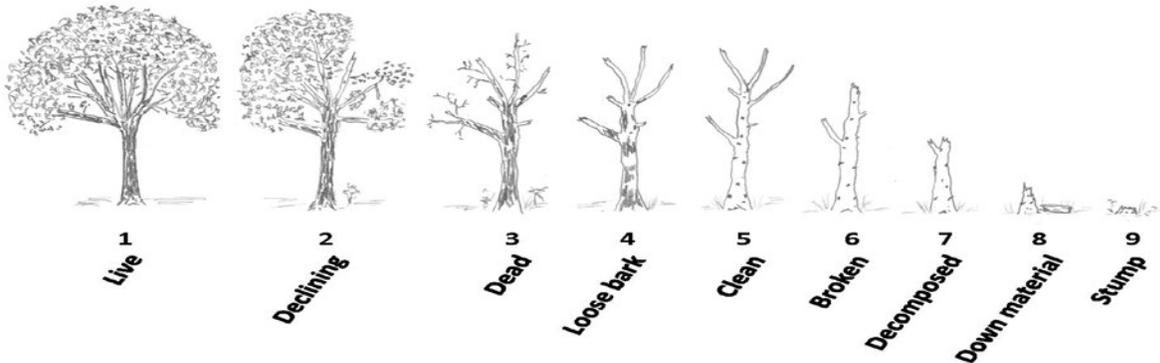
Roost position aspect (deg) 163° Roost type (cavity, crack, bark, etc.) Cavity

Exfoliating bark on bole (%) 0% Describe: sloughing \_\_\_ platy \_\_\_ tight

Cavities present? Yes if so, describe: 2 small cavities.

Roost tree or snag canopy position: Dominant \_\_\_\_\_ Co-Dominant \_\_\_\_\_ Suppressed

Roost Decay State: 1 2  3 4 5 6 7 8 9 Other



**Surrounding Habitat Condition**

Canopy closure at roost (%) 20%

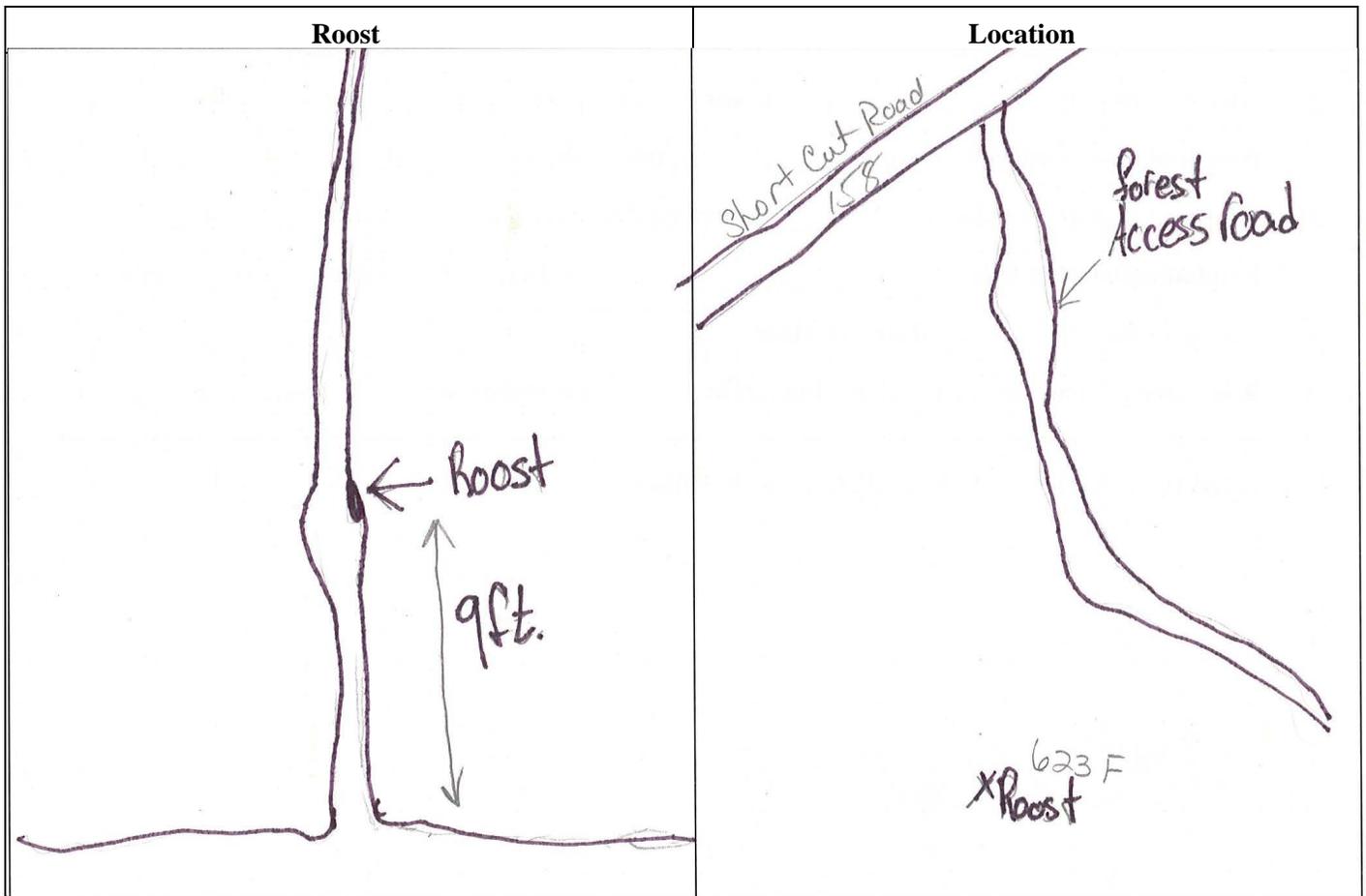
Approximate woodlot size (acres) >19,982 ac Distance to non-forest (meters) 0.33 mi

**Describe forest/woodlot current condition (mature, partially cut-over, burned, insect damage, etc.)**

Vegetation: Carolina ash, red maple, sweetgum, bald cypress, loblolly pine, giant cane, wax myrtle, highbush blueberry, bottle brush sedge, lizards tail.  
Cypress/gum swamp (blackwater subtype)

**Additional Comments**

**Diagram**



Dates in Roost 5/16



Bat Frequency 150.623

### USFWS INDIANA BAT ROOST DATASHEET

Biologists (Full Name): Dottie Brown, Anna Weaver Date: 17-May-2019

UTM: Zone \_\_\_\_\_ Easting \_\_\_\_\_ Northing \_\_\_\_\_ OR

LAT 36.37825° LONG -76.00957°

Property Owner North Carolina Wildlife Resource Commission Phone# 250-426-2255

State North Carolina County Currituck Site # NR4

Roost # 623-G Roost Location N River Game Land

#### Roost Tree Data

Tree Species: Carolina ash (*Fraxinus caroliniana*) Live \_\_\_\_\_ Snag  Other \_\_\_\_\_

(If other, explain) \_\_\_\_\_

DBH (inches) 5.4 in Total Roost Height (meters) 11 m

Height of roost area (if known) 11 m Dist. from capture site 0.97 mi

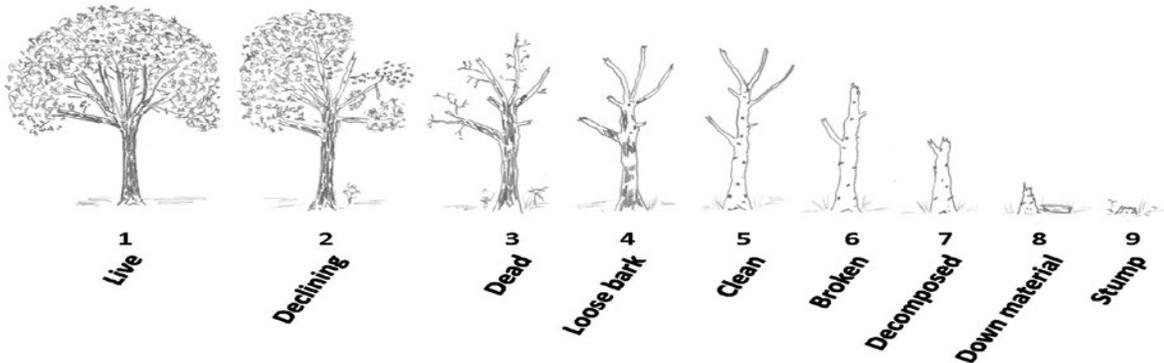
Roost position aspect (deg) 313° Roost type (cavity, crack, bark, etc.) Cavity

Exfoliating bark on bole (%) 5% Describe: sloughing \_\_\_ platy \_\_\_ tight

Cavities present?  Yes  No if so, describe: Cavity at top of snag.

Roost tree or snag canopy position: Dominant \_\_\_\_\_ Co-Dominant \_\_\_\_\_ Suppressed

Roost Decay State: 1 2  3 4 5 6 7 8 9 Other



**Surrounding Habitat Condition**

Canopy closure at roost (%) 25%

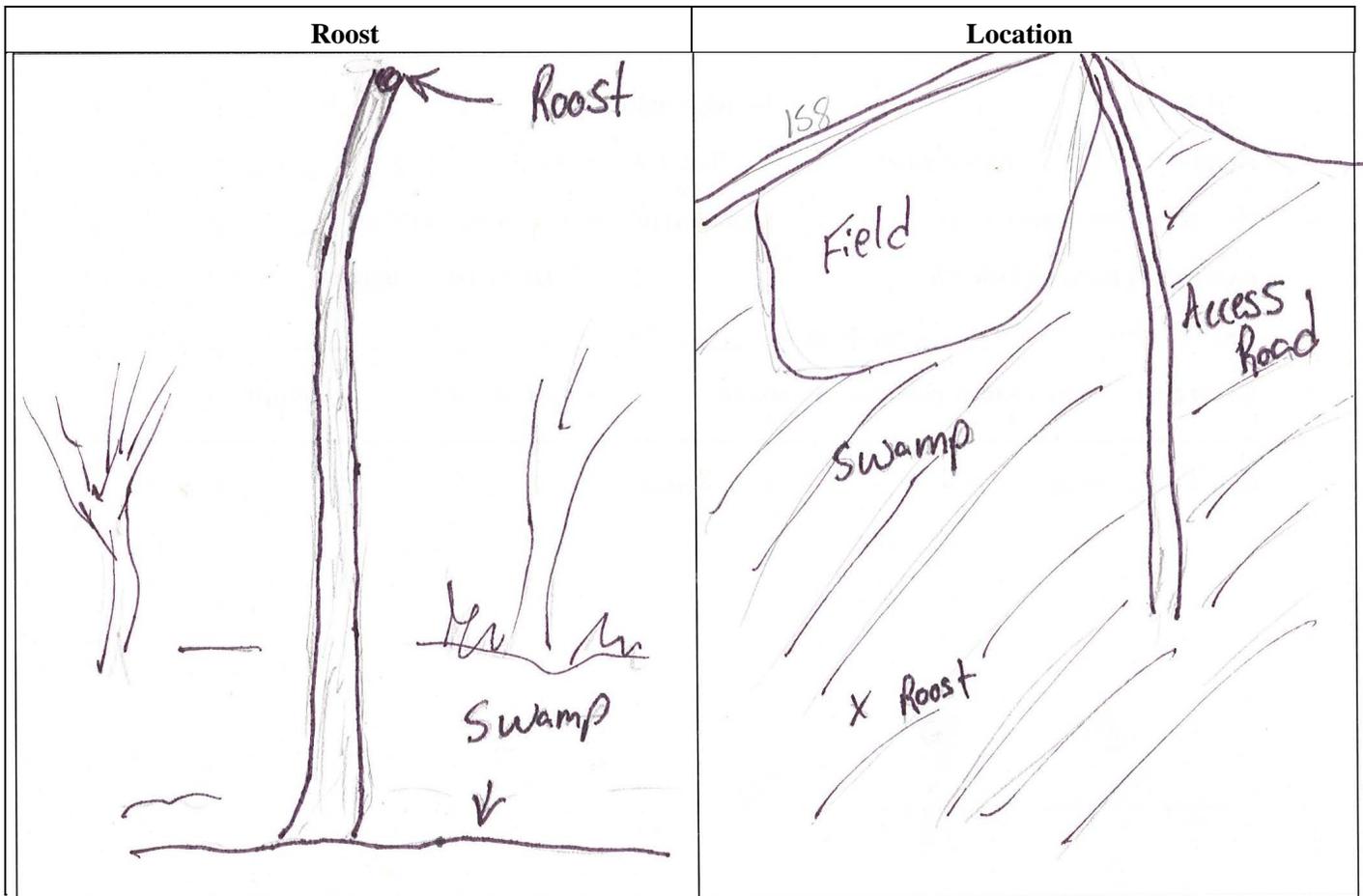
Approximate woodlot size (acres) >19,982 ac Distance to non-forest (meters) 0.33 mi

**Describe forest/woodlot current condition (mature, partially cut-over, burned, insect damage, etc.)**

Vegetation: Carolina ash, red maple, sweetgum, bald cypress, water tupelo, loblolly pine.  
Cypress/gum swamp (blackwater subtype)

**Additional Comments**

**Diagram**



Dates in Roost 5/17



Bat Frequency 150.623

### USFWS INDIANA BAT ROOST DATASHEET

Biologists (Full Name): Nick Newberry, Johnny Manuel Date: 21-May-2019

UTM: Zone \_\_\_\_\_ Easting \_\_\_\_\_ Northing \_\_\_\_\_ OR

LAT 36.37958° LONG -76.01157°

Property Owner North Carolina Wildlife Resource Commission Phone# 250-426-2255

State North Carolina County Currituck Site # NR4

Roost # 623-H Roost Location N River Game Land

**Roost Tree Data**

Tree Species: Bald cypress (*Taxodium distichum*) Live  Snag  Other

(If other, explain) \_\_\_\_\_

DBH (inches) 5.3 in Total Roost Height (meters) 6.8 m

Height of roost area (if known) 4 m Dist. from capture site 1.12 mi

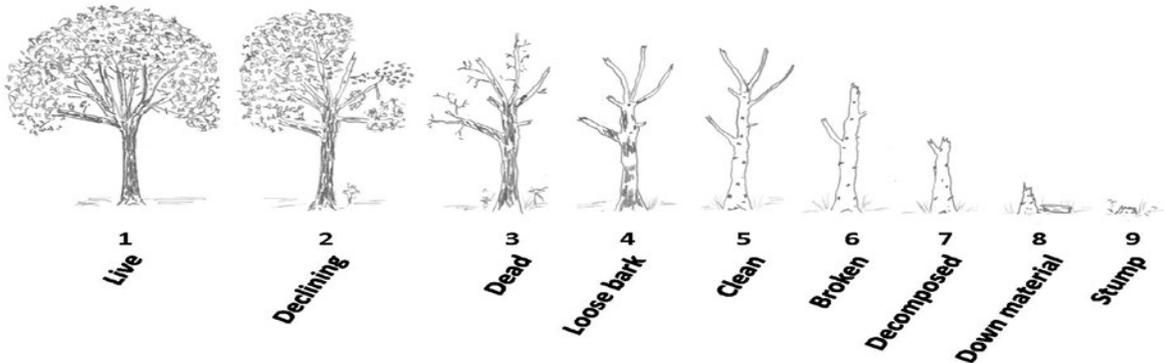
Roost position aspect (deg) 254° Roost type (cavity, crack, bark, etc.) Cavity

Exfoliating bark on bole (%) 0% Describe: sloughing  platy  tight

Cavities present?  Yes  if so, describe: Small cavity in swollen part of trunk.

Roost tree or snag canopy position: Dominant  Co-Dominant  Suppressed

Roost Decay State:  1 2 3 4 5 6 7 8 9 Other



**Surrounding Habitat Condition**

Canopy closure at roost (%) 80%

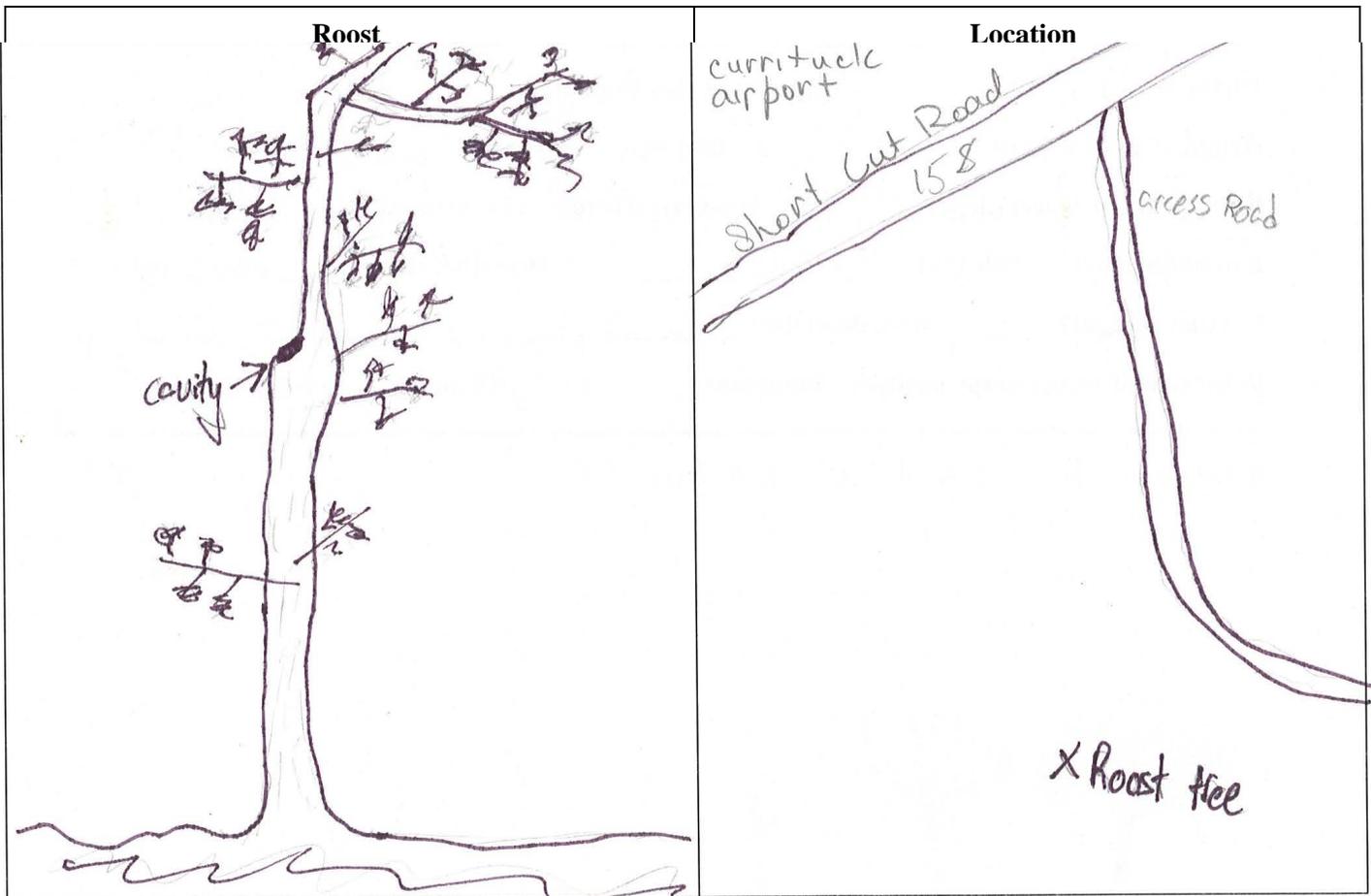
Approximate woodlot size (acres) >19,982 ac Distance to non-forest (meters) 0.33 mi

**Describe forest/woodlot current condition (mature, partially cut-over, burned, insect damage, etc.)**

Vegetation: Carolina ash, red maple, sweetgum, bald cypress, giant cane, wax myrtle, highbush blueberry.  
Cypress/gum swamp (blackwater subtype)

**Additional Comments**

**Diagram**



Dates in Roost 5/21



































## BAT TELEMTRY TRACKING

Species MYSE Sex F Bat Frequency 150.623 Capture Date 9-May-2019  
 Capture Site/GPS 36.36849°, -75.99693° Comment \_\_\_\_\_

DATE	OBSERVERS	ROOST Y/N/#	ROOST TREE SPECIES	GPS LAT/LONG	COMMENTS Azimuth/Signal Strength
5-9-2019	Johnny Manuel	N	n/a	Capture site	Foraging in area
5-10-2019	Dottie Brown, Nick Newberry	N	n/a	Capture site	No signal
5-10-2019	Dottie Brown, Nick Newberry	N	n/a	Staff hiked swamp towards SE to try and get a signal and drove all roads and trails associated with Swain Lane. Waited until dusk to see if she was foraging in the area and picked up a signal at 17:30 from the NW. Johnny picked up signal in his section of the swamp near 150.543 roost.	
	Dottie Brown, Nick Newberry		n/a		
	Dottie Brown, Nick Newberry		n/a		
5-11-2019	Dottie Brown, Nick Newberry	Y/A	Sweetbay magnolia	36.37895°, -76.010757°	N/A
5-12-2019	Dottie Brown, Nick Newberry	Y/B	Carolina ash	36.37963°, -76.01102°	N/A
5-13-2019	Dottie Brown, Nick Newberry	Y/C	Carolina ash	36.37991°, -76.01155°	N/A
5-14-2019	Nick Newberry	Y/D	Red maple	36.37941°, -76.01067°	N/A
5-15-2019	Dottie Brown, Nick Newberry	Y/E	Red maple	36.37891°, -76.01082°	N/A
5-16-2019	Johnny Manuel	Y/F	Red maple	36.37940°, -76.01067°	N/A
5-17-2019	Anna Weaver, Dottie Brown	Y/G	Carolina ash	36.37825°, -76.00957°	N/A
5-18-2019	Anna Weaver, Nick Newberry	Y/E	Red maple	36.37891°, -76.01082°	Same tree/hole as 5/15



**BAT TELEMTRY TRACKING**

Species MYSE Sex F Bat Frequency 150.623 Capture Date 9-May-2019  
 Capture Site/GPS 36.36849°, -75.99693° Comment \_\_\_\_\_

DATE	OBSERVERS	ROOST Y/N/#	ROOST TREE SPECIES	GPS LAT/LONG	COMMENTS Azimuth/Signal Strength
5-19-2019	Nick Newberry	Y/E	Red maple	36.37891°, -76.01082°	Same tree/hole. Guano observed at base of cavity
5-20-2019	Nick Newberry, Johnny Manuel	Y/E	Red maple	36.37891°, -76.01082°	Same as 5/19
5-21-2019	Nick Newberry, Johnny Manuel	Y/H	Bald cypress	36.37958°, -76.01157°	Small cavity in bald cypress



### BAT EMERGENCY COUNTS

Species MYSE Sex F Bat Frequency 150.623 Capture Date 9-May-2019  
 Capture Site/GPS 36.36849°, -75.99693° Comment \_\_\_\_\_

DATE	OBSERVERS	ROOST #	GPS LAT/LONG	Bat Count	COMMENTS
5-10-2019	No roost located	N/A	N/A	N/A	N/A
5-11-2019	Nick Newberry, Dottie Brown	A	36.37898°, -76.01075°	1	Flew SE and foraged
5-12-2019	Nick Newberry, Phil Bailey	B	36.37963°, -76.01102°	1	
5-13-2019	Nick Newberry, Phil Bailey	C	36.37991°, -76.01155°	1	Bat got antenna stuck at roost entrance
5-14-2019	Nick Newberry	D	36.37941°, -76.01067°	1	
5-15-2019	Nick Newberry	E	36.37891°, -76.01082°	1	Flew north and foraged near by
5-16-2019	Johnny Manuel	F	36.37940°, -76.01067°	2	Flew north, returned, and left again
5-17-2019	Nick Newberry	G	36.37825°, -76.00957°	4	Circled roost, flew NE
5-18-2019	N/A	E	36.37891°, -76.01082°	N/A	Emergence already conducted
5-19-2019	N/A	E	36.37891°, -76.01082°	N/A	Emergence already conducted
5-20-2019	N/A	E	36.37891°, -76.01082°	N/A	Emergence already conducted
5-21-2019	Anna Weaver, Johnny Manuel	H	36.37958°, -76.01157°	1	Bat got stuck in cavity and freed itself within an hour



### USFWS INDIANA BAT ROOST DATASHEET

Biologists (Full Name): Anna Weaver, Johnny Manuel Date: 19-May-2019

UTM: Zone \_\_\_\_\_ Easting \_\_\_\_\_ Northing \_\_\_\_\_ OR

LAT 36.38356° LONG -76.01372°

Property Owner James Barco Phone# 252-207-4230

State NC County Currituck Site # NR1

Roost # 982A Roost Location North River Game Land

**Roost Tree Data**

Tree Species: Red Maple (*Acer rubrum*) Live  Snag  Other

(If other, explain) \_\_\_\_\_

DBH (inches) 10 in Total Roost Height (meters) 19 m

Height of roost area (if known) <6 meters Dist. from capture site 0.32 miles

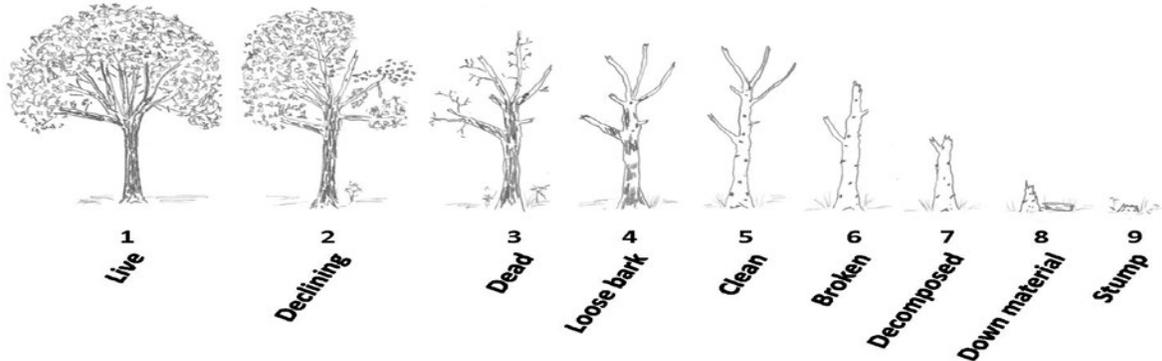
Roost position aspect (deg) 250° Roost type (cavity, crack, bark, etc.) Bark

Exfoliating bark on bole (%) 55 Describe: sloughing  platy  tight

Cavities present?  Yes  if so, describe: Small cavities present (woodpecker holes, etc.)

Roost tree or snag canopy position: Dominant  Co-Dominant  Suppressed

Roost Decay State: 1 2 3  4 5 6 7 8 9 Other



**Surrounding Habitat Condition**

Canopy closure at roost (%) 15%

Approximate woodlot size (acres) >19,892 Distance to non-forest (meters) 0.10 miles

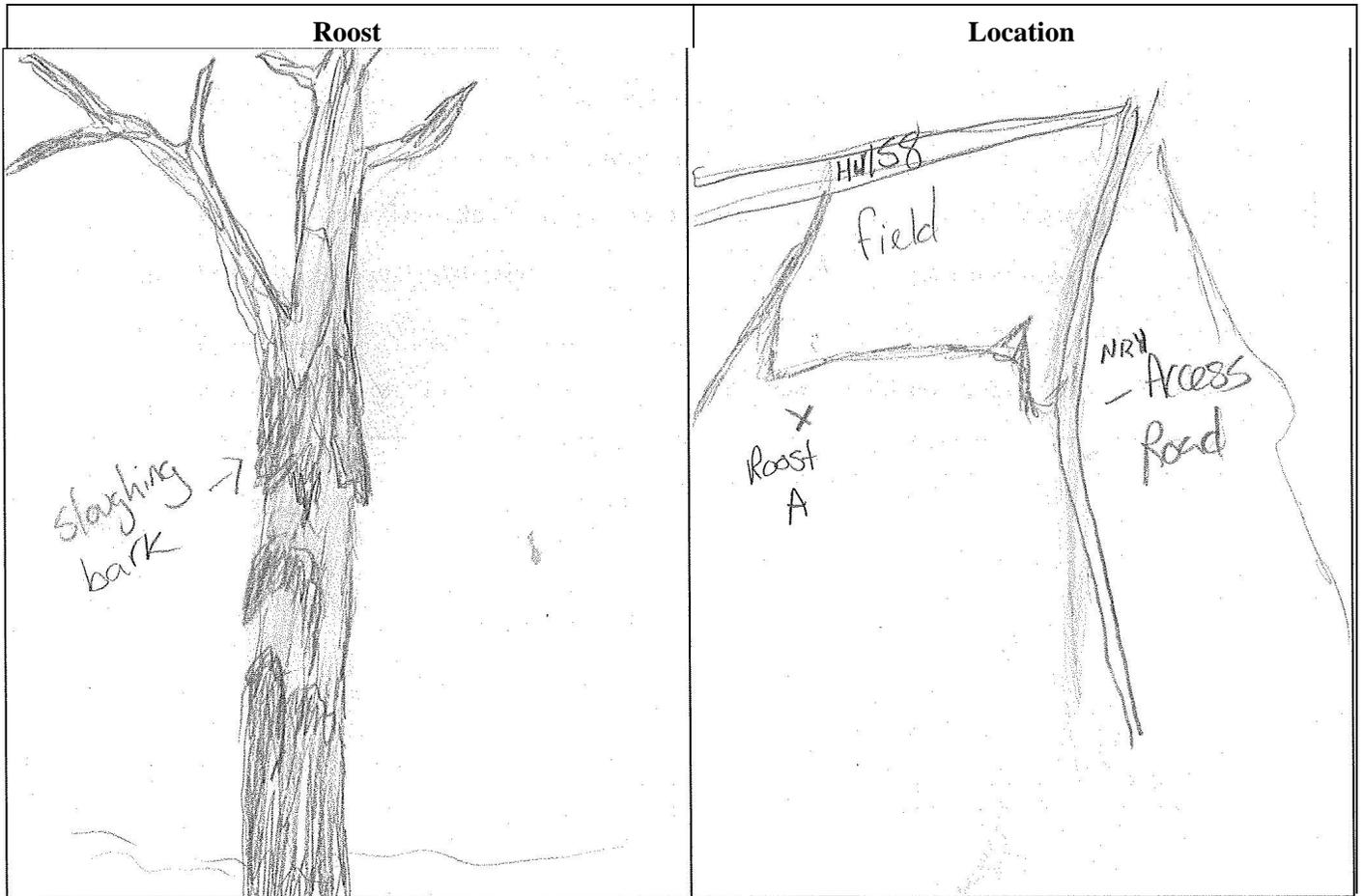
Describe forest/woodlot current condition (mature, partially cut-over, burned, insect damage, etc.)

Cypress-Gum Swamp (Blackwater Subtype)

Vegetation: Cypress, red maple, sweetgum, tupelo, loblolly (snags) pine, vaccinium spp., lizard's tail, sparganium spp.

Additional Comments Sunny area

**Diagram**



Dates in Roost 5/19



Bat Frequency 150.982

### USFWS INDIANA BAT ROOST DATASHEET

Biologists (Full Name): Anna Weaver, Johnny Manuel Date: 20-May-2019

UTM: Zone \_\_\_\_\_ Easting \_\_\_\_\_ Northing \_\_\_\_\_ OR

LAT 36.38338° LONG -76.01232°

Property Owner James Barco Phone# 252-426-2255

State North Carolina County Currituck Site # NR1

Roost # 982B Roost Location North River Game Land

**Roost Tree Data**

Tree Species: Slippery Elm (*Ulmus rubra*) Live \_\_\_\_\_ Snag  Other \_\_\_\_\_

(If other, explain) \_\_\_\_\_

DBH (inches) 11.4 inches Total Roost Height (meters) 20 meters

Height of roost area (if known) >5 meters Dist. from capture site 0.24 miles

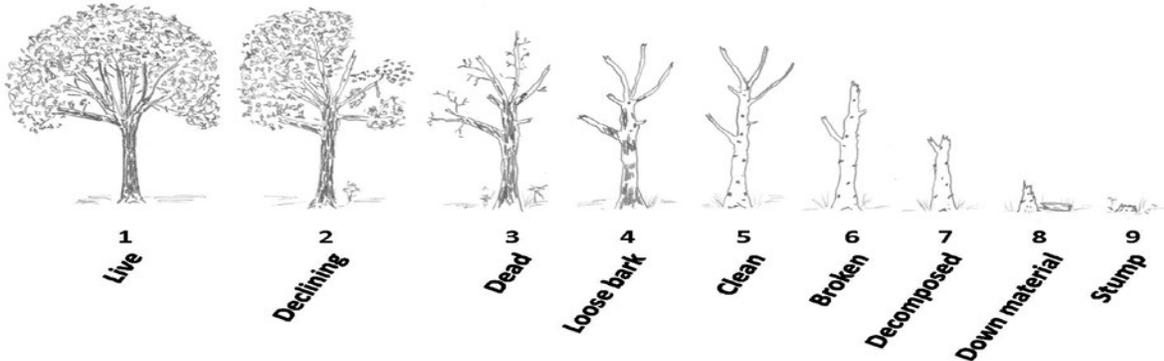
Roost position aspect (deg) 200° Roost type (cavity, crack, bark, etc.) Bark

Exfoliating bark on bole (%) 50% Describe: sloughing  platy \_\_\_\_\_ tight \_\_\_\_\_

Cavities present? No if so, describe: \_\_\_\_\_

Roost tree or snag canopy position: Dominant \_\_\_\_\_ Co-Dominant  Suppressed \_\_\_\_\_

Roost Decay State: 1 2 3  4 5 6 7 8 9 Other



**Surrounding Habitat Condition**

Canopy closure at roost (%) 5%

Approximate woodlot size (acres) >19,982 Distance to non-forest (meters) 0.08 miles

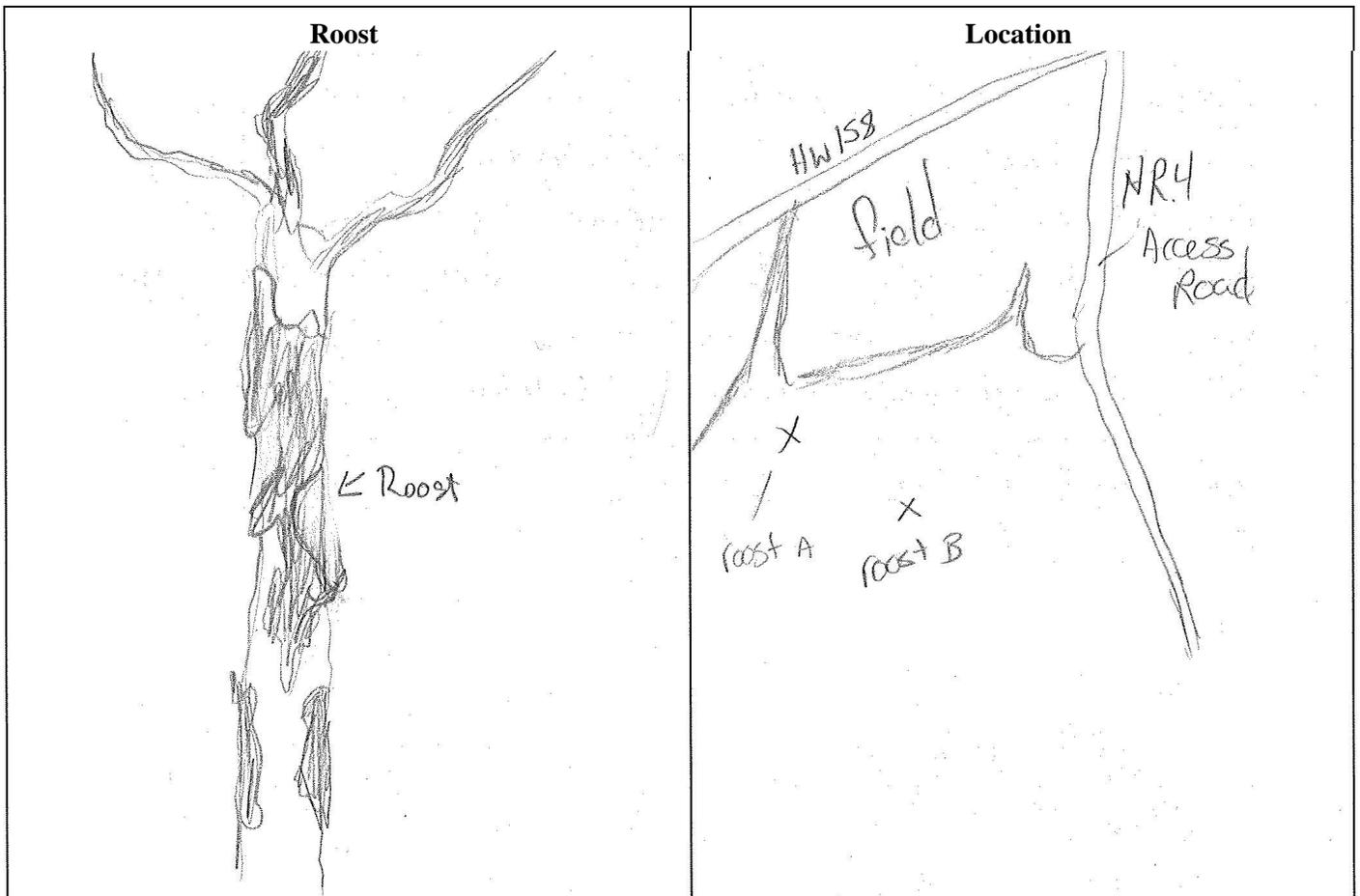
**Describe forest/woodlot current condition (mature, partially cut-over, burned, insect damage, etc.)**

Cypress-Gum Swamp (Blackwater subtype)

Cypress, red maple, sweet gum, tupelo, loblolly pine, lizards tail, sparganium

Additional Comments Sunny area

**Diagram**



Dates in Roost 5/20, 5/21



Bat Frequency 150.982

### USFWS INDIANA BAT ROOST DATASHEET

Biologists (Full Name): Nick Newberry, Johnny Manuel Date: 22-May-2019

UTM: Zone \_\_\_\_\_ Easting \_\_\_\_\_ Northing \_\_\_\_\_ OR

LAT 36.38342° LONG -76.01205°

Property Owner James Barco Phone# 252-207-4236

State North Carolina County Currituck Site # NR1

Roost # 982C Roost Location North River Game Land

**Roost Tree Data**

Tree Species: Slippery Elm (*Ulmus rubra*) Live \_\_\_\_\_ Snag  Other \_\_\_\_\_

(If other, explain) \_\_\_\_\_

DBH (inches) 14 inches Total Roost Height (meters) 14.6 meters

Height of roost area (if known) 8 meters Dist. from capture site 0.23 miles

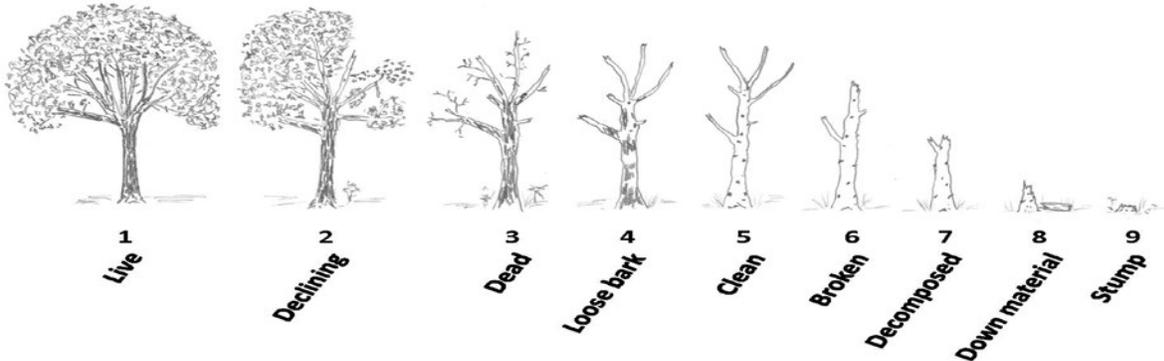
Roost position aspect (deg) 10° Roost type (cavity, crack, bark, etc.) Bark

Exfoliating bark on bole (%) 50% Describe: sloughing  platy \_\_\_\_\_ tight \_\_\_\_\_

Cavities present? No if so, describe: \_\_\_\_\_

Roost tree or snag canopy position: Dominant \_\_\_\_\_ Co-Dominant \_\_\_\_\_ Suppressed

Roost Decay State: 1 2 3  4 5 6 7 8 9 Other



**Surrounding Habitat Condition**

Canopy closure at roost (%) 70%

Approximate woodlot size (acres) >19,982 Distance to non-forest (meters) 0.09 miles

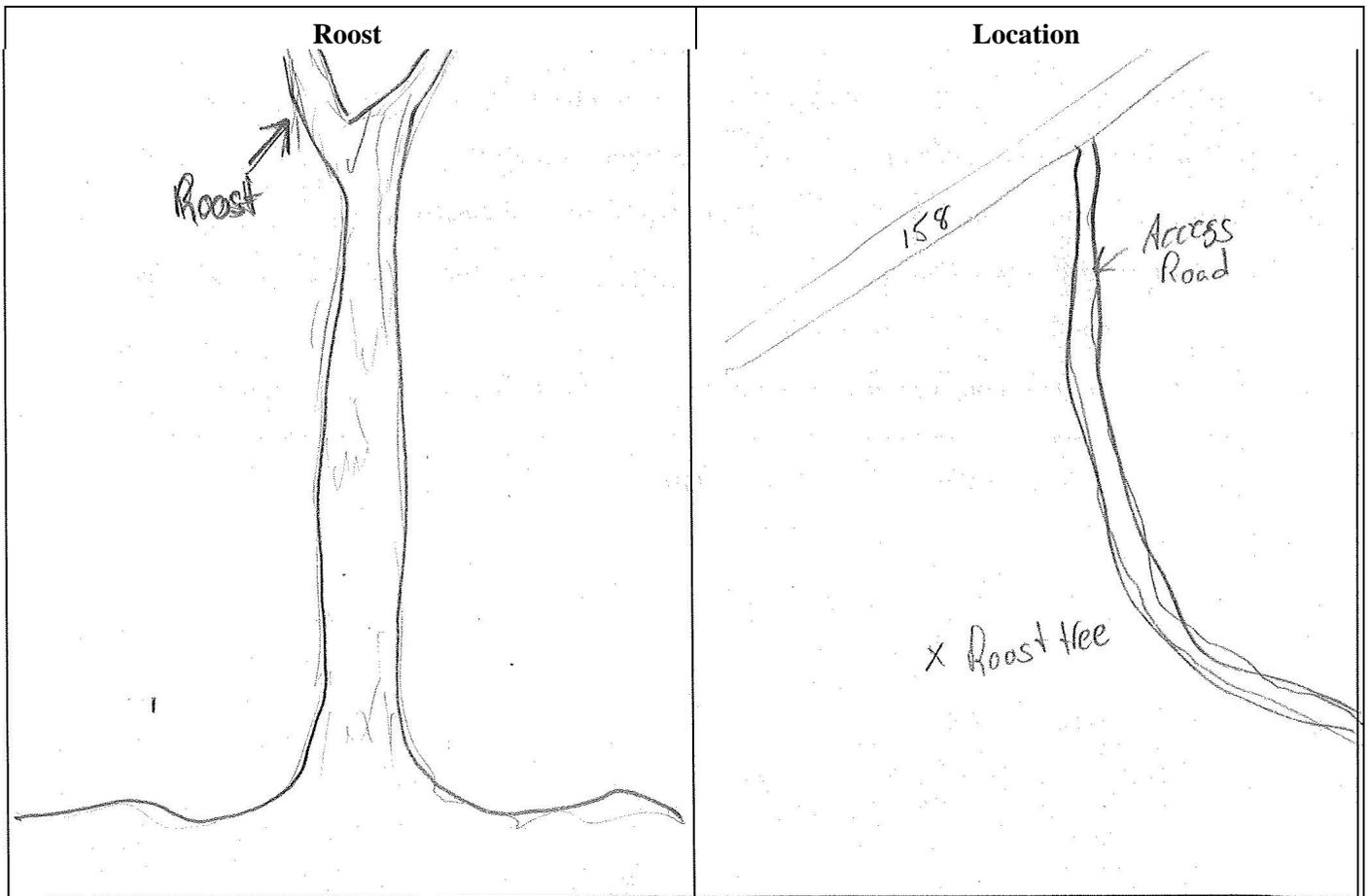
**Describe forest/woodlot current condition (mature, partially cut-over, burned, insect damage, etc.)**

Cypress-Gum Swamp (Blackwater subtype)  
red maple, slippery elm, water tupelo, Carolina ash, bald cypress, sweet gum, lizardstail, highbush blueberry  
American bur-reed

**Additional Comments** \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Diagram**



Dates in Roost 5/22, 5/23, 5/24, 5/25, 5/26, 5/27, 5/28, 5/29, 5/30









Site Name/#: NR1      Roost #: 982B    Bat Frequency 150.982

Time	Number of Bats Leaving Roost*	Comments / Notes
Total Number of Bats Observed Emerging from the Roost/Feature During the Survey:	15	150.982 emerged at 20:25

\* If any bats return to the roost during the survey, then they should be subtracted from the tally.

**Describe Emergence:** Did bats emerge simultaneously, fly off in the same direction, loiter, circle, disperse, etc. If a radio-tagged bat was roosting in the tree, at what time did it emerge?

No bats lingered in the area after emerging. One bat circled the tree a single time before heading off.

---



---



### USFWS BAT EMERGENCE SURVEY DATASHEET

Date: 22-May-2019 Surveyor(s) Full Name: Johnny Manuel, Nick Newberry

State: NC County: Currituck Project Name: NCDOT NLEB Phase VII

Site Name/#: NR1 Roost Name/# 982C

Lat/Long or UTM of Roost: 36.38342°, -76.01205°

Description of Roost/Habitat Feature Surveyed: Dead tree with sloughing bark throughout

Bat Species Known to be using this Roost/Feature (if not known, leave blank):

MYSE

Other Suspected Bat Species (explain): No

Weather Conditions during Survey (temperature, precipitation, wind speed):

70°F, clear skies, wind 0 miles per hour

Survey Start Time: 19:30 Time of Sunset: 20:09 Survey End Time: 20:55

**NOTE:** Emergence surveys should begin ½ hour before sunset and continue for a minimum of 1 hour or until it is otherwise too dark to see emerging bats. The surveyor(s) should position him or herself so that emerging bats will be silhouetted against the sky as they exit the roost. Tallies of emerging bats should be recorded every few minutes or as natural breaks in bat activity allow. Please ensure that surveyor(s) are close enough to the roost to observe all exiting/returning bats, but not close enough to influence emergence (i.e., do not stand directly beneath the roost and do not make unnecessary noise and/or conversation, and minimize use of lights other than a small flashlight to record data, if necessary). Do not shine a light on the roost tree crevice/cave/mine entrance itself as this may prevent or delay bats from emerging. If available, use of an infra-red, night vision, or thermal-imaging video camera or spotting scope and an ultrasonic bat detector are strongly recommended but not required.

Time	Number of Bats Leaving Roost*	Comments / Notes
20:24	2	
20:27	4	
20:29	5	
20:31	8	Staggered throughout 2 minutes. 150.982 emerged
20:33	2	
20:35	2	
20:37	1	



### BAT TELEMETRY TRACKING

Species MYSE Sex F Bat Frequency 150.982 Capture Date 18-May-2019  
 Capture Site/GPS 36.38350, -76.00794 Comment Captured at site NR1

DATE	OBSERVERS	ROOST Y/N/#	ROOST TREE SPECIES	GPS LAT/LONG	COMMENTS Azimuth/Signal Strength
5-18-2019	Anna Weaver, Johnny Manuel	N	n/a	36.38350°, -76.00794°	Tracked from net site as she foraged to the south
5-19-2019	Anna Weaver, Johnny Manuel	Y/A	Red Maple	36.38356°, -76.01372°	Located roost tree
5-20-2019	Anna Weaver, David Cooper	Y/B	Slippery Elm	36.38338°, -76.01232°	Located roost tree
5-21-2019	Anna Weaver, Dottie Brown	Y/B	Slippery Elm	36.38338°, -76.01232°	Same roost
5-22-2019	Johnny Manuel, Nick Newberry	Y/C	Slippery Elm	36.38342°, -76.01205°	Located roost tree
5-23-2019	Johnny Manuel, Nick Newberry	Y/C	Slippery Elm	36.38342°, -76.01205°	Same roost
5-24-2019	Johnny Manuel, Nick Newberry	Y/C	Slippery Elm	36.38342°, -76.01205°	Same roost
5-25-2019	Johnny Manuel, Nick Newberry	Y/C	Slippery Elm	36.38342°, -76.01205°	Same roost
5-26-2019	Johnny Manuel, Nick Newberry	Y/C	Slippery Elm	36.38342°, -76.01205°	Same roost
5-27-2019	Anna Weaver, Johnny Manuel	Y/C	Slippery Elm	36.38342°, -76.01205°	Same roost
5-28-2019	Anna Weaver, Johnny Manuel	Y/C	Slippery Elm	36.38342°, -76.01205°	Same roost
5-29-2019	Anna Weaver, Johnny Manuel	Y/C	Slippery Elm	36.38342°, -76.01205°	Same roost
5-30-2019	Anna Weaver, Johnny Manuel	Y/C	Slippery Elm	36.38342°, -76.01205°	Same roost



**BAT EMERGENCY COUNTS**

Species MYSE Sex F Bat Frequency 150.982 Capture Date 18-May-2019  
 Capture Site/GPS 36.38350, -76.00794 Comment Captured at site NR1

DATE	OBSERVERS	ROOST #	GPS LAT/LONG	Bat Count	COMMENTS
5-19-2019	Anna Weaver, Johnny Manuel, Nick Newberry	A	36.38356°, -76.01372°	6	7 others in vicinity
5-20-2019	Anna Weaver, Johnny Manuel, Nick Newberry	B	36.38338°, -76.01232°	15	150.982 left at 20:24
5-21-2019	n/a	B	36.38338°, -76.01232°	n/a	No emergence conducted
5-22-2019	Nick Newberry, Johnny Manuel	C	36.38342°, -76.01205°	24	150.982 left at 20:32
5-23-2019	n/a	C	36.38342°, -76.01205°	n/a	No emergence conducted
5-24-2019	n/a	C	36.38342°, -76.01205°	n/a	No emergence conducted
5-25-2019	n/a	C	36.38342°, -76.01205°	n/a	No emergence conducted
5-26-2019	n/a	C	36.38342°, -76.01205°	n/a	No emergence conducted
5-27-2019	n/a	C	36.38342°, -76.01205°	n/a	No emergence conducted
5-28-2019	n/a	C	36.38342°, -76.01205°	n/a	No emergence conducted
5-29-2019	n/a	C	36.38342°, -76.01205°	n/a	No emergence conducted
5-30-2019	n/a	C	36.38342°, -76.01205°	n/a	No emergence conducted



--	--	--	--	--	--

Bat Frequency 150.945

### USFWS INDIANA BAT ROOST DATASHEET

Biologists (Full Name): Phil Bailey, Nick Newberry Date: 6-June-2019

UTM: Zone \_\_\_\_\_ Easting \_\_\_\_\_ Northing \_\_\_\_\_ OR

LAT 36.28626° LONG -76.01110°

Property Owner North Carolina Wildlife Resource Commission Phone# 250-426-2255

State North Carolina County Camden Site # NR6

Roost # 945-A Roost Location N River Game Land

#### Roost Tree Data

Tree Species: Red maple (*Acer rubrum*) Live  Snag  Other

(If other, explain) \_\_\_\_\_

DBH (inches) 10.25 in Total Roost Height (meters) 17 m

Height of roost area (if known) 6 m Dist. from capture site 1.50 miles

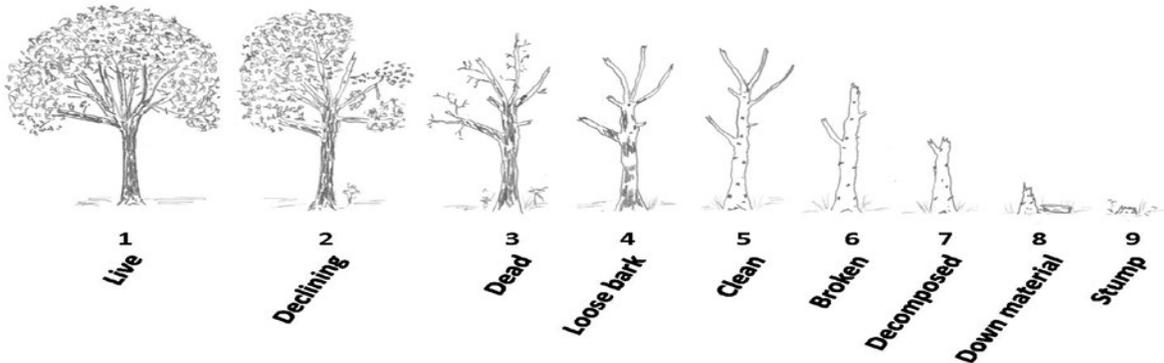
Roost position aspect (deg) 246° Roost type (cavity, crack, bark, etc.) Cavity

Exfoliating bark on bole (%) 5% Describe: sloughing  platy  tight

Cavities present?  Yes  if so, describe: Apparent cavity in dead limb.

Roost tree or snag canopy position: Dominant  Co-Dominant  Suppressed

Roost Decay State: 1  3 4 5 6 7 8 9 Other



**Surrounding Habitat Condition**

Canopy closure at roost (%) 10%

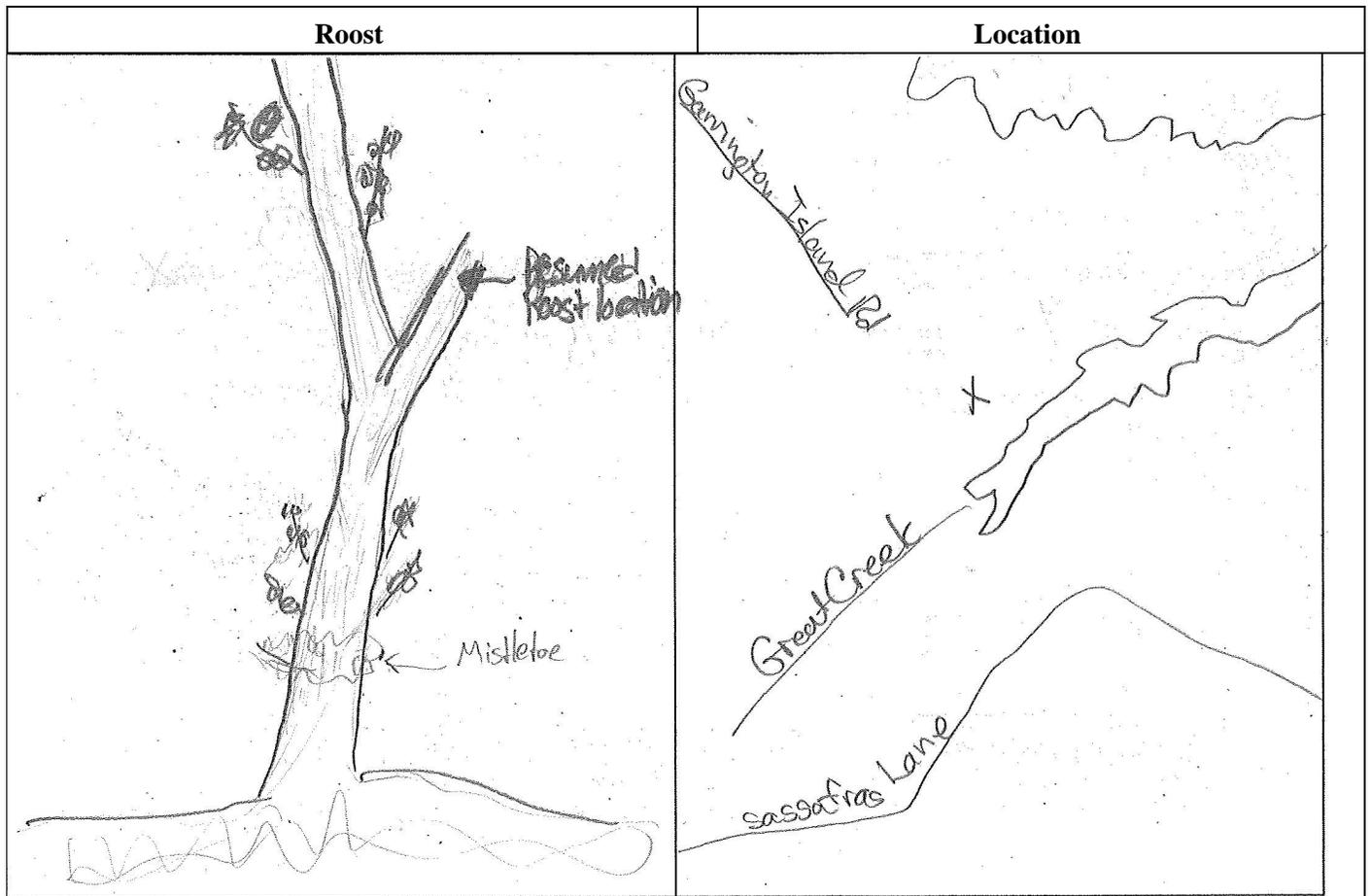
Approximate woodlot size (acres) >19,982ac Distance to non-forest (meters) 1.08 mi

**Describe forest/woodlot current condition (mature, partially cut-over, burned, insect damage, etc.)**

Vegetation: Carolina ash, loblolly bay, red maple, sweetbay magnolia, sweetgum, bald cypress, water tupelo, swamp chestnut oak, highbush blueberry, lizards tail  
Cypress/gum swamp (blackwater subtype)

Additional Comments Roost tree is located ~0.5 mi into swamp on NW side of Great Creek. Possible that roost is in cavity.

**Diagram**



Dates in Roost 6/6



Bat Frequency 150.945

### USFWS INDIANA BAT ROOST DATASHEET

Biologists (Full Name): Phil Bailey, Nick Newberry Date: 8-June-2019

UTM: Zone \_\_\_\_\_ Easting \_\_\_\_\_ Northing \_\_\_\_\_ OR

LAT 36.28624° LONG -76.01120°

Property Owner North Carolina Wildlife Resource Commission Phone# 250-426-2255

State North Carolina County Camden Site # NR6

Roost # 945-B Roost Location N River Game Land

#### Roost Tree Data

Tree Species: Red maple (*Acer rubrum*) Live \_\_\_\_\_ Snag  Other \_\_\_\_\_

(If other, explain) \_\_\_\_\_

DBH (inches) 10.6in Total Roost Height (meters) 17 m

Height of roost area (if known) 12 m Dist. from capture site 1.51 miles

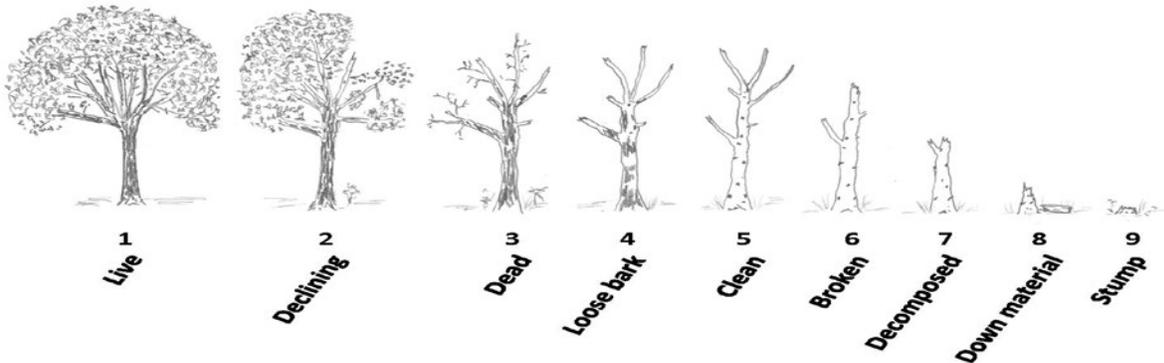
Roost position aspect (deg) 118° Roost type (cavity, crack, bark, etc.) Bark

Exfoliating bark on bole (%) 20% Describe: sloughing  platy  tight

Cavities present?  Yes  if so, describe: Old woodpecker cavities and holes from lost limbs.

Roost tree or snag canopy position: Dominant \_\_\_\_\_ Co-Dominant  Suppressed \_\_\_\_\_

Roost Decay State: 1 2 3  4 5 6 7 8 9 Other



**Surrounding Habitat Condition**

Canopy closure at roost (%) 5%

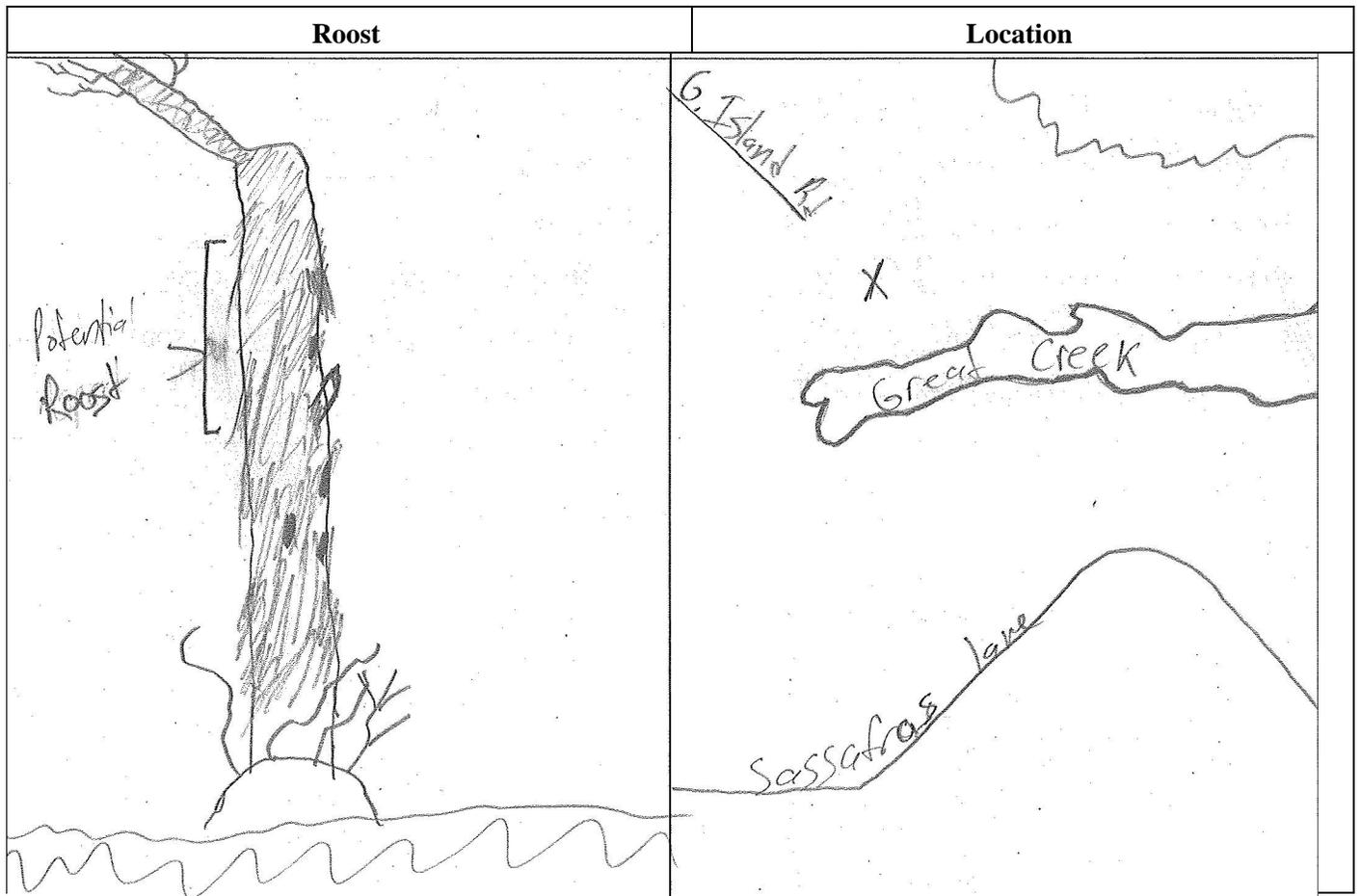
Approximate woodlot size (acres) >19,982ac Distance to non-forest (meters) 1.08 mi

**Describe forest/woodlot current condition (mature, partially cut-over, burned, insect damage, etc.)**

Vegetation: Carolina ash, loblolly bay, red maple, sweetbay magnolia, sweetgum, bald cypress, water tupelo, swamp chestnut oak, highbush blueberry, cinnamon fern, lizards tail  
Cypress/gum swamp (blackwater subtype)

Additional Comments Roost tree is located ~0.7 mi into swamp on NW side of Great Creek. Possible that roost is in cavity.

**Diagram**



Dates in Roost 6/8, 6/9, 6/10, 6/11







## BAT TELEMTRY TRACKING

Species MYSE Sex F Bat Frequency 150.945 Capture Date 1-June-2019  
 Capture Site/GPS 36.28535°, -75.98419° Comment Pregnant

DATE	OBSERVERS	ROOST Y/N/#	ROOST TREE SPECIES	GPS LAT/LONG	COMMENTS Azimuth/Signal Strength
6-2-2019	Anna Weaver, Johnny Manuel	N	N/A	Checked roads around NR6 and gated road leading to NR3.	No signal
6-2-2019	Johnny Manuel	N	N/A	36.28539°, -75.98411°	262° very weak (foraging)
6-2-2019	Johnny Manuel	N	N/A	36.28539°, -75.99169°	300° weak (foraging)
6-3-2019	Dottie Brown, Nick Newberry	N	N/A	36.28539°, -75.99169°	303° weak (foraging)
6-3-2019	Phil Bailey, Johnny Manuel	N	N/A	36.28539°, -75.98411°	300° very weak (foraging). Hiked ~0.4mi into swamp, drove Sassafras Rd and all roads associated. Set up stations at dusk and got signal. Will hike to potential area on 6/4. Potential area 36.29009°, -75.99950° near Great Creek
6-4-2019	Phil Bailey, Johnny Manuel	N	N/A	36.28817°, -75.99798° (triangulation)	280° weak from edge of Great Creek
6-4-2019	Phil Bailey, Johnny Manuel	N	N/A	36.28701°, -75.99990° (triangulation)	277° weak from edge of Great Creek
6-4-2019	Phil Bailey, Johnny Manuel	N	N/A	36.28718°, -76.00796° (triangulation)	275° staff was likely ~200 ft from roost when 945 emerged
6-5-2019	N/A	N	N/A	N/A	No tracking due to severe storms



## BAT TELEMETRY TRACKING

**Species** MYSE      **Sex** F      **Bat Frequency** 150.945      **Capture Date** 1-June-2019  
**Capture Site/GPS** 36.28535°, -75.98419°      **Comment** Pregnant

DATE	OBSERVERS	ROOST Y/N/#	ROOST TREE SPECIES	GPS LAT/LONG	COMMENTS Azimuth/Signal Strength
6-6-2019	Phil Bailey, Nick Newberry, Johnny Manuel	Y/A	Red maple	36.28626°, -76.00796°	Roost was in a large cavity at fork in tree. Multiple snags in surrounding area.
6-7-2019	N/A	N	N/A	N/A	No tracking due to severe storms.
6-8-2019	Phil Bailey, Nick Newberry	Y/B	Red maple	36.28624°, -76.01121°	
6-9-2019	Phil Bailey, Nick Newberry	Y/B	Red maple	36.28624°, -76.01121°	
6-10-2019	Phil Bailey, David Cooper	Y/B	Red maple	36.28624°, -76.01121°	
6-11-2019	Phil Bailey, Nick Newberry	Y/B	Red maple	36.28624°, -76.01121°	
6-12-2019	Phil Bailey, Nick Newberry	Y/B	Red maple	36.28624°, -76.01121°	Transmitter seen sticking out of tree; Clear it had been unglued from the bat



### BAT EMERGENCY COUNTS

Species MYSE Sex F Bat Frequency 150.945 Capture Date 1-June-2019  
 Capture Site/GPS 36.28535°, -75.98419° Comment Pregnant at capture

DATE	OBSERVERS	ROOST #	GPS LAT/LONG	Bat Count	COMMENTS
6-3-2019	N/A	N/A	N/A	N/A	Unable to locate roost
6-4-2019	N/A	N/A	N/A	N/A	Bat emerged before we could locate the roost
6-5-2019	N/A	N/A	N/A	N/A	Severe storms in area, unable to locate roost
6-6-2019	N/A	A	36.28626°, -76.01110°	N/A	Severe storms in area, unable to conduct survey
6-7-2019	N/A	A	36.28626°, -76.01110°	N/A	Severe storms in area, unable to conduct survey
6-8-2019	N/A	B	36.28624°, -76.01121°	N/A	Severe storms in area, unable to conduct survey
6-9-2019	N/A	B	36.28624°, -76.01121°	N/A	Severe storms in area, unable to conduct survey
6-10-2019	N/A	B	36.28624°, -76.01121°	N/A	Severe storms in area, unable to conduct survey
6-11-2019	Phil Bailey, Nick Newberry	B	36.28624°, -76.01121°	0	Bat did not emerge
6-12-2019	N/A	B	36.28624°, -76.01121°	N/A	Dropped transmitter was seen sticking out of snag



Bat Frequency 150.500

### USFWS INDIANA BAT ROOST DATASHEET

Biologists (Full Name): Anna Weaver, Dottie Brown, David Cooper Date: 11-June-2019

UTM: Zone \_\_\_\_\_ Easting \_\_\_\_\_ Northing \_\_\_\_\_ OR

LAT 36.27457° LONG -76.01586°

Property Owner NC Wildlife Resources Commission Phone# 252-426-2255

State NC County Camden Site # NR8

Roost # 500A Roost Location North River Game Land

#### Roost Tree Data

Tree Species: Loblolly Bay (*Gordonia lasianthus*) Live  Snag \_\_\_\_\_ Other \_\_\_\_\_

(If other, explain) \_\_\_\_\_

DBH (inches) 20.9 inches Total Roost Height (meters) 24 meters

Height of roost area (if known) 6.5 meters Dist. from capture site 0.60 miles

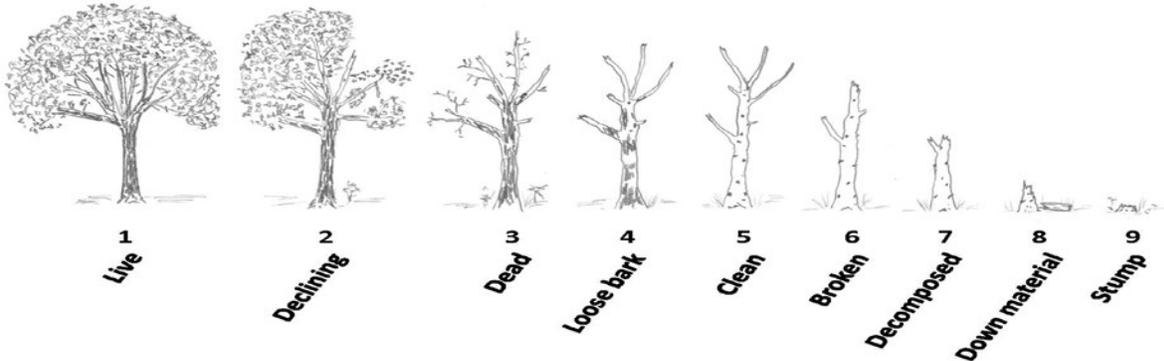
Roost position aspect (deg) 138° Roost type (cavity, crack, bark, etc.) Cavity

Exfoliating bark on bole (%) 0% Describe: sloughing \_\_\_ platy \_\_\_ tight

Cavities present? Yes if so, describe: Cavities in "Y" of several branches

Roost tree or snag canopy position: Dominant  Co-Dominant \_\_\_\_\_ Suppressed \_\_\_\_\_

Roost Decay State:  1  2  3  4  5  6  7  8  9 Other



**Surrounding Habitat Condition**

Canopy closure at roost (%) 75%

Approximate woodlot size (acres) >19,982 Distance to non-forest (meters) 0.77 miles

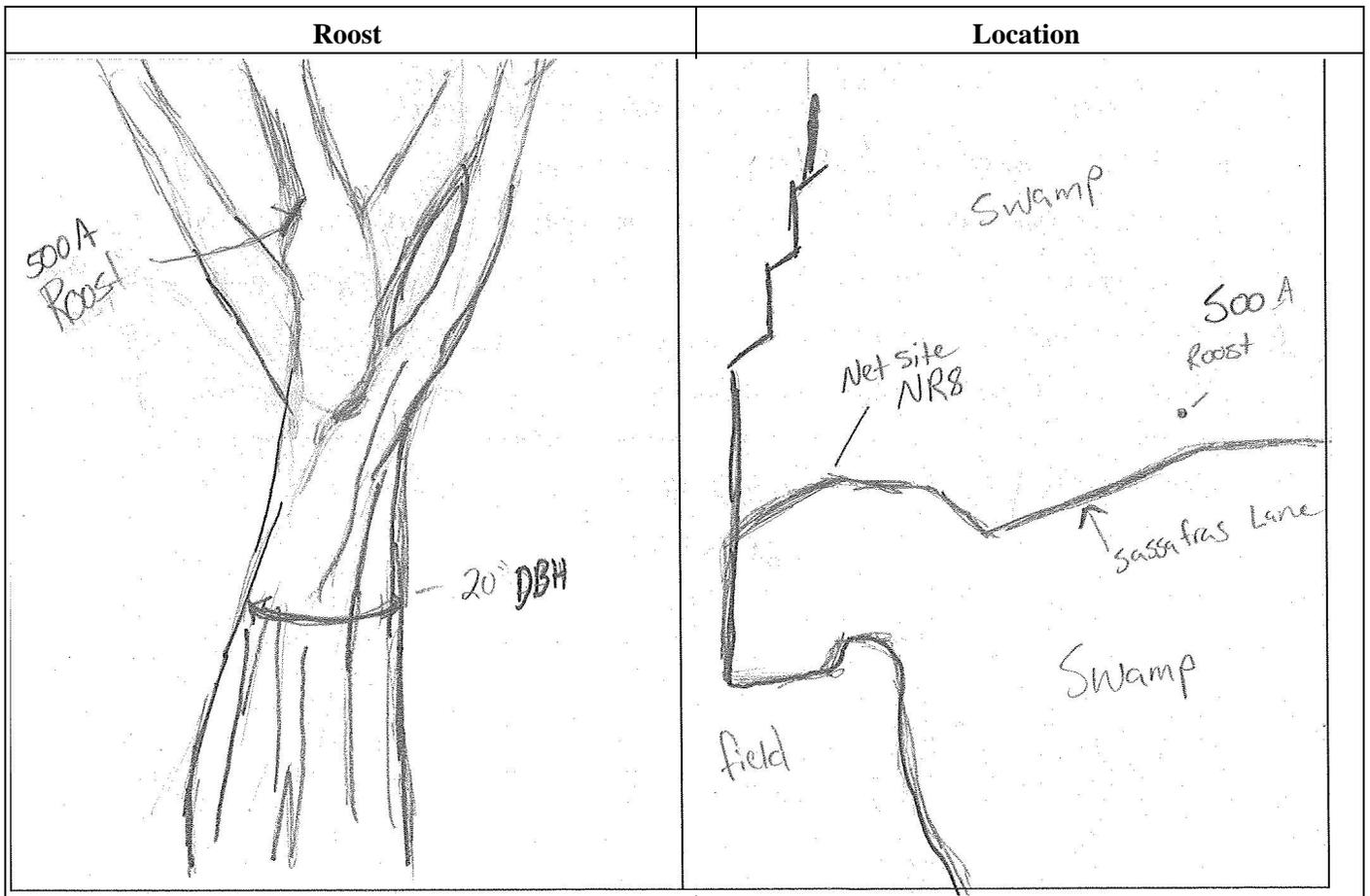
Describe forest/woodlot current condition (mature, partially cut-over, burned, insect damage, etc.)

Cypress-Gum Swamp (Blackwater Subtype)

Vegetation: Cypress, red maple, sweetgum, loblolly bay, red bay, live oak

Additional Comments

**Diagram**



Dates in Roost 6/11



Bat Frequency 150.500

### USFWS INDIANA BAT ROOST DATASHEET

Biologists (Full Name): Anna Weaver, Dottie Brown Date: 12-June-2019

UTM: Zone \_\_\_\_\_ Easting \_\_\_\_\_ Northing \_\_\_\_\_ OR

LAT 36.28378° LONG -76.00140°

Property Owner NC Wildlife Resources Commission Phone# 252-426-2255

State North Carolina County Camden Site # NR8

Roost # 500B Roost Location North River Game Land

**Roost Tree Data**

Tree Species: Red Maple (*Acer rubrum*) Live \_\_\_\_\_ Snag  Other \_\_\_\_\_

(If other, explain) \_\_\_\_\_

DBH (inches) 10.1 inches Total Roost Height (meters) 8 meters

Height of roost area (if known) 5 meters Dist. from capture site 1.60 miles

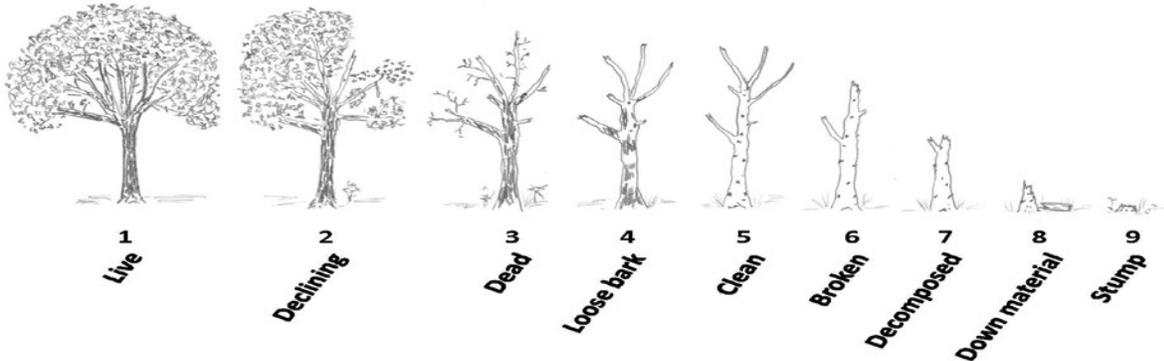
Roost position aspect (deg) 22° Roost type (cavity, crack, bark, etc.) Bark

Exfoliating bark on bole (%) 20% Describe: sloughing  platy  tight \_\_\_\_\_

Cavities present? No if so, describe: \_\_\_\_\_

Roost tree or snag canopy position: Dominant \_\_\_\_\_ Co-Dominant  Suppressed \_\_\_\_\_

Roost Decay State: 1 2 3  4 5 6 7 8 9 Other



**Surrounding Habitat Condition**

Canopy closure at roost (%) 25%

Approximate woodlot size (acres) >19,982 Distance to non-forest (meters) 1.53 miles

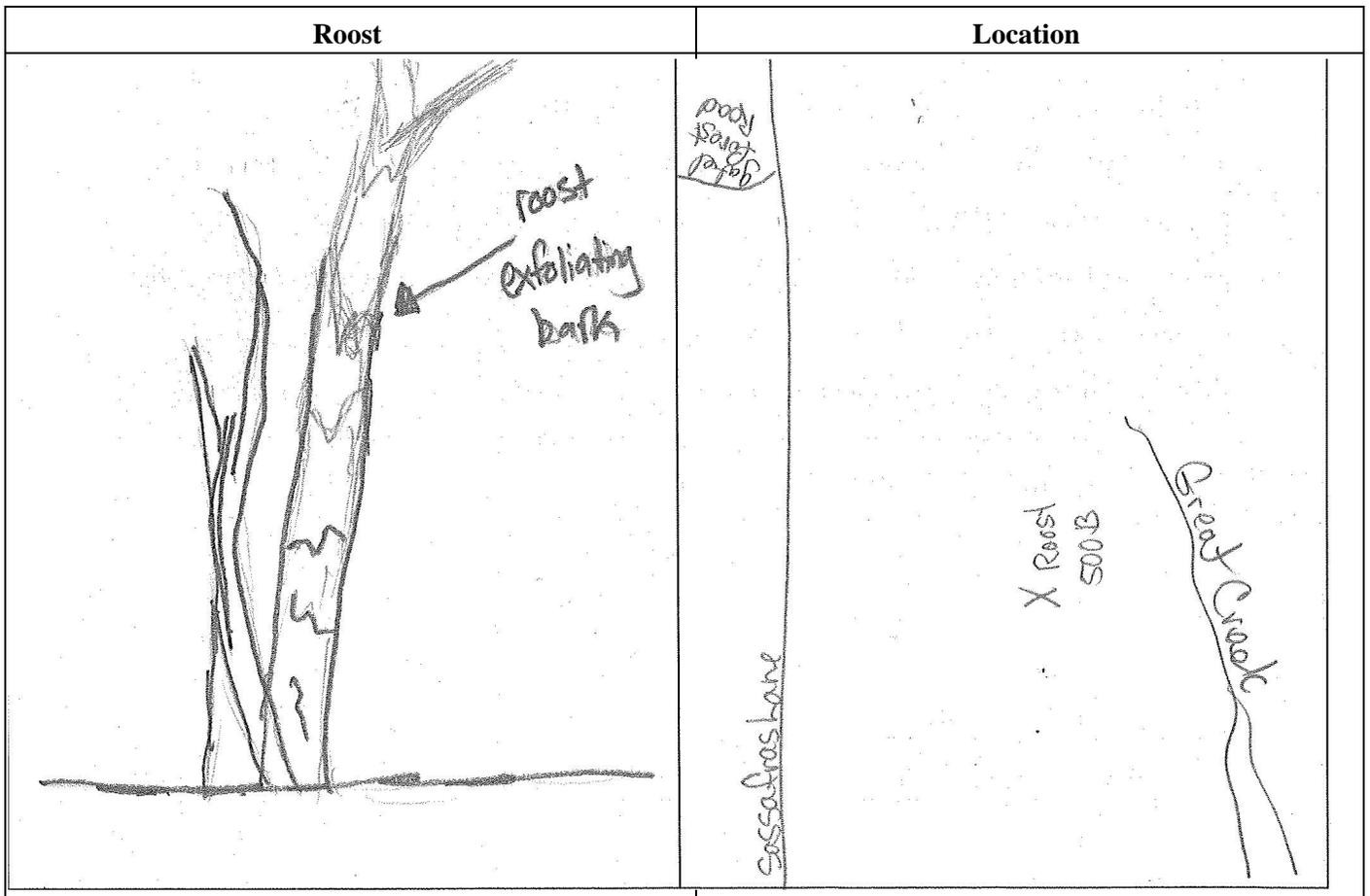
Describe forest/woodlot current condition (mature, partially cut-over, burned, insect damage, etc.)  
Brownwater Bottomland Hardwoods (Swamp Transition Type)

Vegetation: water tupelo, red maple, loblolly pine, Carolina ash, bald cypress, loblolly bay, red bay

Additional Comments \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Diagram**



Dates in Roost 6/12



Bat Frequency 150.500

### USFWS INDIANA BAT ROOST DATASHEET

Biologists (Full Name): Dottie Brown, Nick Newberry, Phillip Bailey Date: 13-June-2019

UTM: Zone \_\_\_\_\_ Easting \_\_\_\_\_ Northing \_\_\_\_\_ OR

LAT 36.27407° LONG -76.01672°

Property Owner NC Wildlife Resources Commission Phone# 252-426-2255

State North Carolina County Camden Site # NR8

Roost # 500C Roost Location North River Game Land

**Roost Tree Data**

Tree Species: Red Maple (*Acer rubrum*) Live  Snag  Other \_\_\_\_\_

(If other, explain) \_\_\_\_\_

DBH (inches) 9.1 inches Total Roost Height (meters) 16 meters

Height of roost area (if known) 6 meters Dist. from capture site 0.55 miles

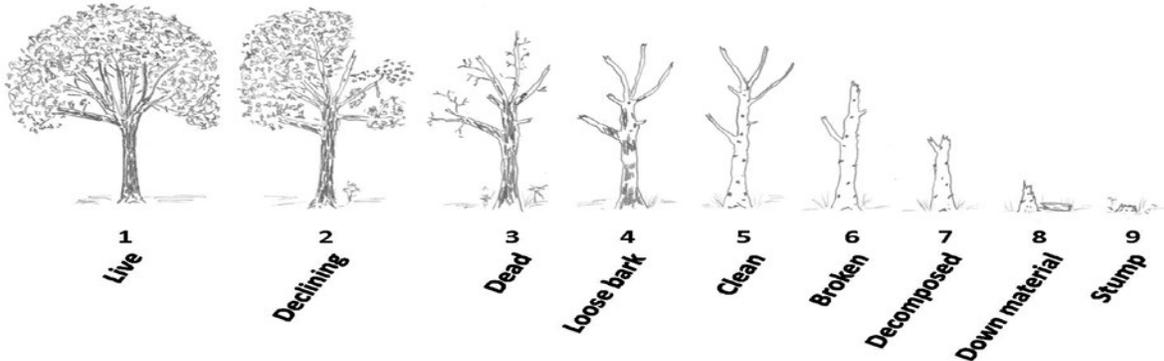
Roost position aspect (deg) 215° Roost type (cavity, crack, bark, etc.) Bark

Exfoliating bark on bole (%) 25% Describe: sloughing  platy  tight

Cavities present?  Yes  if so, describe: Few small cavities from birds on bark-free trunk

Roost tree or snag canopy position: Dominant \_\_\_\_\_ Co-Dominant  Suppressed \_\_\_\_\_

Roost Decay State: 1 2 3  4 5 6 7 8 9 Other



**Surrounding Habitat Condition**

Canopy closure at roost (%) 75%

Approximate woodlot size (acres) >19,982 Distance to non-forest (meters) 0.74 miles

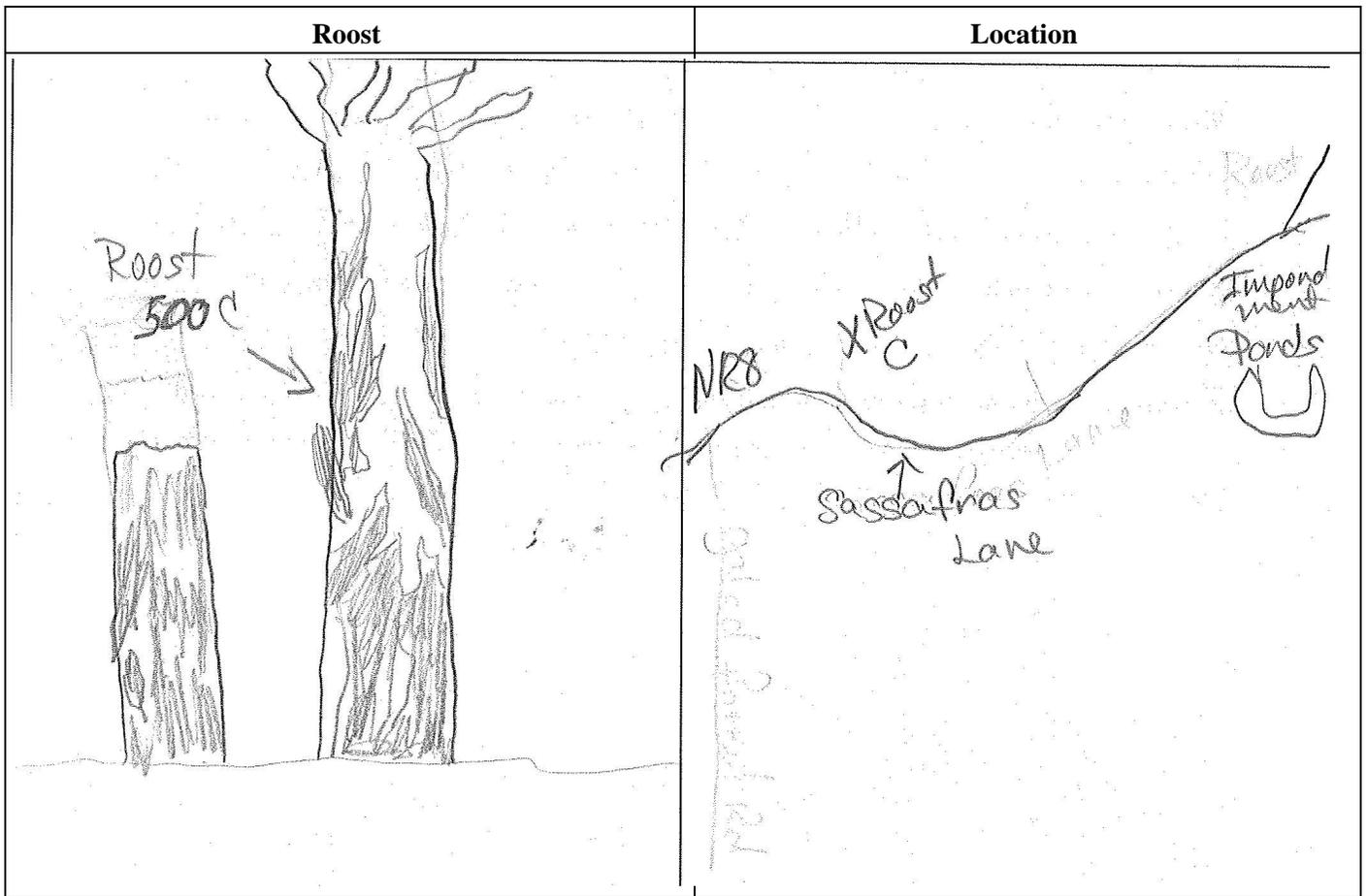
Describe forest/woodlot current condition (mature, partially cut-over, burned, insect damage, etc.)

Cypress Gum Swamp (Blackwater subtype)

Vegetation: sweet gum, water tupelo, bald cypress, red maple, sweet bay, red bay, highbush blueberry, giant cane, fern (*Woodwardia areolata*), laurel leaf greenbriar, loblolly pine

Additional Comments

**Diagram**



Dates in Roost 6/13



Bat Frequency 150.500

### USFWS INDIANA BAT ROOST DATASHEET

Biologists (Full Name): Nick Newberry, Anna Weaver Date: 14-June-2019

UTM: Zone \_\_\_\_\_ Easting \_\_\_\_\_ Northing \_\_\_\_\_ OR

LAT 36.27496° LONG -76.01630°

Property Owner NC Wildlife Resources Commission Phone# 252-426-2255

State North Carolina County Camden Site # NR8

Roost # 500D Roost Location North River Game Land

**Roost Tree Data**

Tree Species: Water Tupelo (Nyssa aquatica) Live  Snag  Other

(If other, explain) \_\_\_\_\_

DBH (inches) 2.4 inches Total Roost Height (meters) 10 meters

Height of roost area (if known) 5 meters Dist. from capture site 0.59 miles

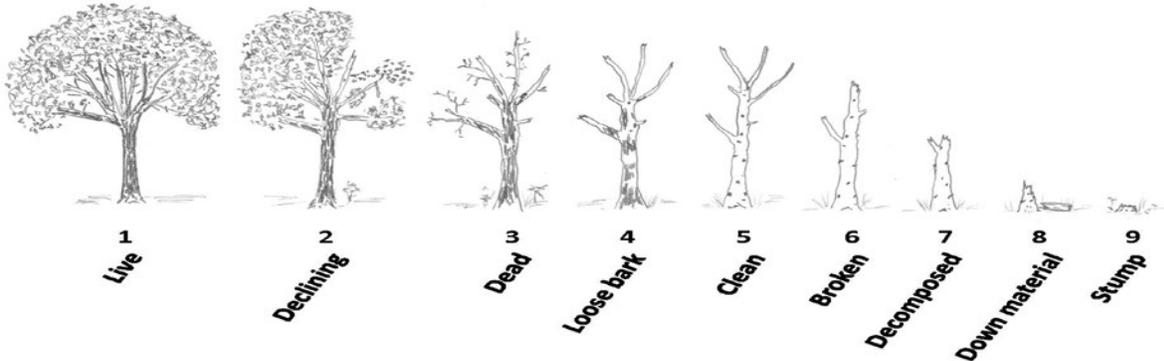
Roost position aspect (deg) 21° Roost type (cavity, crack, bark, etc.) Cavity

Exfoliating bark on bole (%) 0% Describe: sloughing  platy  tight

Cavities present?  Yes  if so, describe: Small, no larger than 0.75 inches in diameter

Roost tree or snag canopy position: Dominant  Co-Dominant  Suppressed

Roost Decay State:  2 3 4 5 6 7 8 9 Other



**Surrounding Habitat Condition**

Canopy closure at roost (%) 90%

Approximate woodlot size (acres) >19,982 Distance to non-forest (meters) 0.81 miles

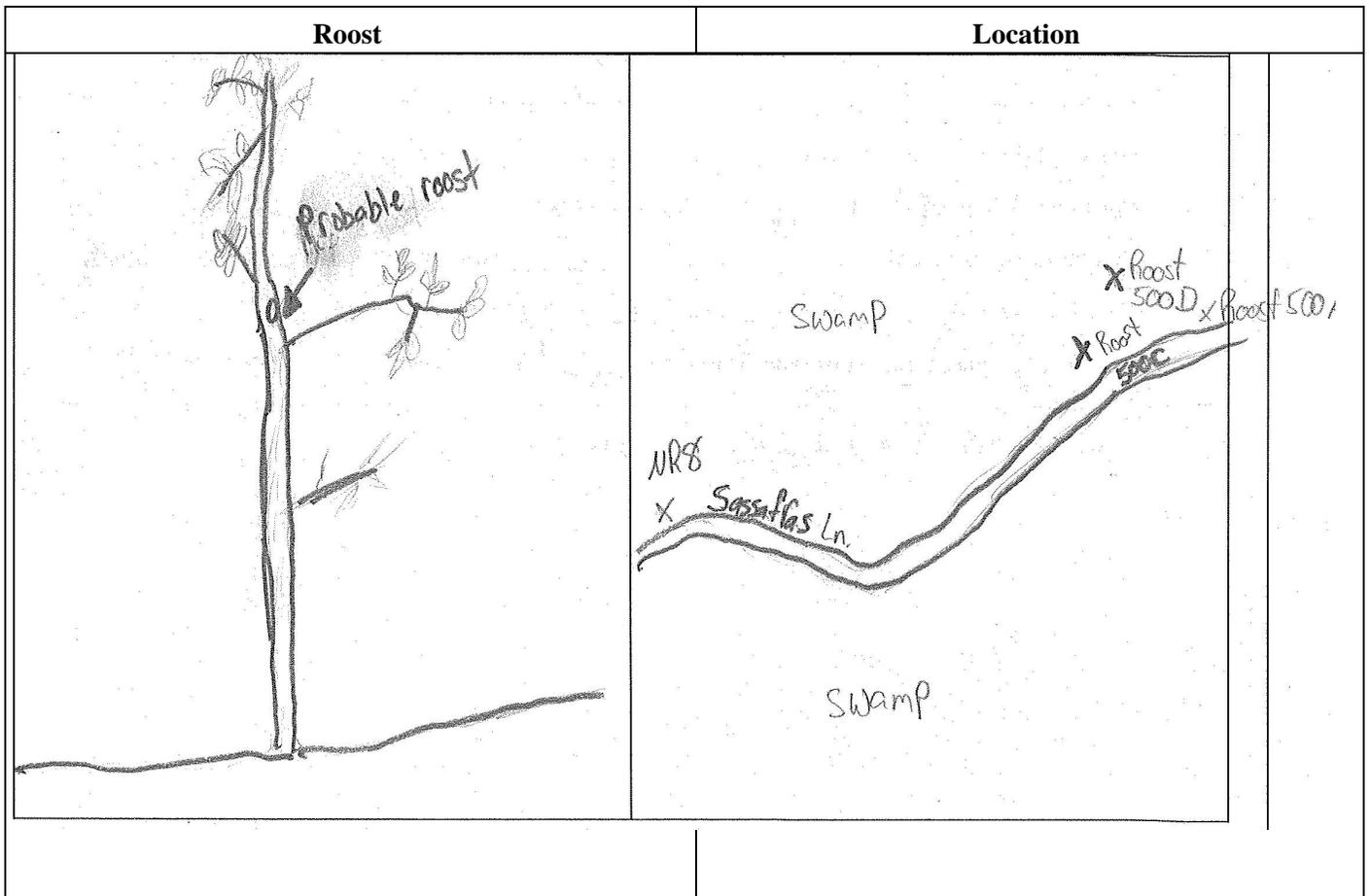
Describe forest/woodlot current condition (mature, partially cut-over, burned, insect damage, etc.)

Cypress Gum Swamp (Blackwater subtype)

Vegetation: water tupelo, sweetbay magnolia, red maple, bald cypress, loblolly pine, sweet gum,, lizardstail, highbush blueberry

Additional Comments

**Diagram**



Dates in Roost 6/14, 6/15, 6/16, 6/17, 6/18









Site Name/#: NR8      Roost #: 500B    Bat Frequency 150.500

Time	Number of Bats Leaving Roost*	Comments / Notes
<b>Total Number of Bats Observed Emerging from the Roost/Feature During the Survey:</b>	<b>0</b>	No survey conducted due to mother bear with young cubs in the immediate area

\* If any bats return to the roost during the survey, then they should be subtracted from the tally.

**Describe Emergence:** Did bats emerge simultaneously, fly off in the same direction, loiter, circle, disperse, etc. If a radio-tagged bat was roosting in the tree, at what time did it emerge?

No survey conducted due to mother bear with young cubs  
in the immediate area  
 \_\_\_\_\_  
 \_\_\_\_\_









## BAT TELEMETRY TRACKING

Species MYSE Sex F Bat Frequency 150.500 Capture Date 8-June-2019  
 Capture Site/GPS 36.27193°, -76.02613° Comment \_\_\_\_\_

DATE	OBSERVERS	ROOST Y/N/#	ROOST TREE SPECIES	GPS LAT/LONG	COMMENTS Azimuth/Signal Strength
6-8-2019	Nick Newberry, Phillip Bailey, Johnny Manuel	N	n/a	36.27262°, -76.02453°	15° @23:45
6-9-2019 (night of 6/8)	Nick Newberry, Phillip Bailey, Johnny Manuel	N	n/a	36.27198°, -76.02032°	85° @00:00
6-9-2019 (night of 6/8)	Nick Newberry, Phillip Bailey, Johnny Manuel	N	n/a	36.27313°, -76.01820°	60° @00:10
6-9-2019 (night of 6/8)	Nick Newberry, Phillip Bailey, Johnny Manuel	N	n/a	36.27596°, -76.00796°	156°/Strong @00:25
6-9-2019 (night of 6/8)	Nick Newberry, Phillip Bailey, Johnny Manuel	N	n/a	36.27639°, -76.00510°	Flew over survey location @00:35
6-9-2019	Dottie Brown, Johnny Manuel	N	n/a	36.27558°, -76.02368° 36.27864°, -76.02519° 36.28020°, -76.02586° 36.27389°, -76.02599° 36.26904°, -76.02415°	No signal
6-9-2019	Dottie Brown, Johnny Manuel	N	n/a	36.27378°, -76.01678°	196°/Strong @20:48
6-10-2019	Anna Weaver, Dottie Brown, Nick Newberry	N	n/a	36.27042°, -76.01516° 36.26652°, -76.01632° 36.26833°, -76.01557° 36.27202°, -76.01502°	No signal
6-11-2019	Anna Weaver, Dottie Brown, David Cooper	Y/A	Loblolly Bay	36.27457°, -76.01586°	Roost tree A
6-12-2019	Anna Weaver, Dottie Brown	N	n/a	36.27683°, -76.00272°	33°/Good



## BAT TELEMETRY TRACKING

Species MYSE Sex F Bat Frequency 150.500 Capture Date 8-June-2019  
 Capture Site/GPS 36.27193°, -76.02613° Comment \_\_\_\_\_

DATE	OBSERVERS	ROOST Y/N/#	ROOST TREE SPECIES	GPS LAT/LONG	COMMENTS Azimuth/Signal Strength
6-12-2019	Anna Weaver, Dottie Brown	N	n/a	36.27736°, -76.00212°	7°
6-12-2019	Dottie Brown, Anna Weaver	N	n/a	36.27994°, -75.99895°	61°/Good
6-12-2019	Dottie Brown, Anna Weaver	N	n/a	36.28103°, -75.99758°	291°/Good
6-12-2019	Dottie Brown, Anna Weaver	Y/B	Red Maple	36.28378°, -76.00140°	
6-13-2019	Johnny Manuel, Anna Weaver	N	n/a	36.271827°, -76.02047°	273°/Good
6-13-2019	Johnny Manuel, Anna Weaver	Y/C	Red Maple	36.27407°, -76.01672°	
6-14-2019	Johnny Manuel, Anna Weaver	N	n/a	36.27170°, -76.02314°	12°/Poor
6-14-2019	Johnny Manuel, Anna Weaver	Y/D	Water Tupelo	36.27496°, -76.01630°	
6-15-2019	Johnny Manuel, Anna Weaver	Y/D	Water tupelo	36.27496°, -76.01630°	Same tree
6-16-2019	Johnny Manuel, Anna Weaver	Y/D	Water tupelo	36.27496°, -76.01630°	Same tree
6-17-2019	Johnny Manuel, Anna Weaver	Y/D	Water tupelo	36.27496°, -76.01630°	Same tree
6-18-2019	Johnny Manuel, Anna Weaver	Y/D	Water Tupelo	36.27496°, -76.01630°	Same tree
6-19-2019	Johnny Manuel, Anna Weaver	Y/D	Water Tupelo	36.27496°, -76.01630°	Same tree



### BAT EMERGENCE COUNTS

Species MYSE Sex F Bat Frequency 150.500 Capture Date 8-June-2019  
 Capture Site/GPS 36.27193°, -76.02613° Comment \_\_\_\_\_

DATE	OBSERVERS	ROOST #	GPS LAT/LONG	Bat Count	COMMENTS
6-9-2019	n/a	n/a	n/a	n/a	No roost located
6-10-2019	n/a	n/a	n/a	n/a	No roost located
6-11-2019	Anna Weaver, David Cooper	A	36.27457°, -76.01586°	1	1 bat emerged
6-12-2019	Anna Weaver, Nick Newberry	B	36.28378°, -76.00140°	n/a	No emergence count conducted due to nearby bears
6-13-2019	Anna Weaver, Nick Newberry	C	36.27407°, -76.01672°	1	1 bat
6-14-2019	Anna Weaver, Nick Newberry	D	36.27496°, -76.01630°	0	Did not emerge
6-15-2019	n/a	D	n/a	n/a	No emergence, 2 <sup>nd</sup> day at roost D
6-16-2019	n/a	D	n/a	n/a	No emergence, 3 <sup>rd</sup> day at roost D
6-17-2019	n/a	D	n/a	n/a	No emergence, 4 <sup>th</sup> day at roost D
6-18-2019	n/a	D	n/a	n/a	No emergence, 5 <sup>th</sup> day at roost D
6-19-2019	n/a	D	n/a	n/a	No emergence, 6 <sup>th</sup> day at roost D



Bat Frequency 150.901

## USFWS INDIANA BAT ROOST DATASHEET

Biologists (Full Name): Dottie Brown, Nick Newberry, Anna Weaver Date: 22-June-2019

UTM: Zone \_\_\_\_\_ Easting \_\_\_\_\_ Northing \_\_\_\_\_ OR

LAT 36.36137° LONG -75.97473°

Property Owner NC Wildlife Resources Commission Phone# (252)-426-2255

State NC County Currituck Site # NR4

Roost # 901-A Roost Location N. River Game Land

### Roost Tree Data

Tree Species: Water Tupelo (*Nyssa aquatica*) Live  Snag  Other

(If other, explain) \_\_\_\_\_

DBH (inches) 3.7in Total Roost Height (meters) 9m

Height of roost area (if known) 2m Dist. from capture site 1.33 miles

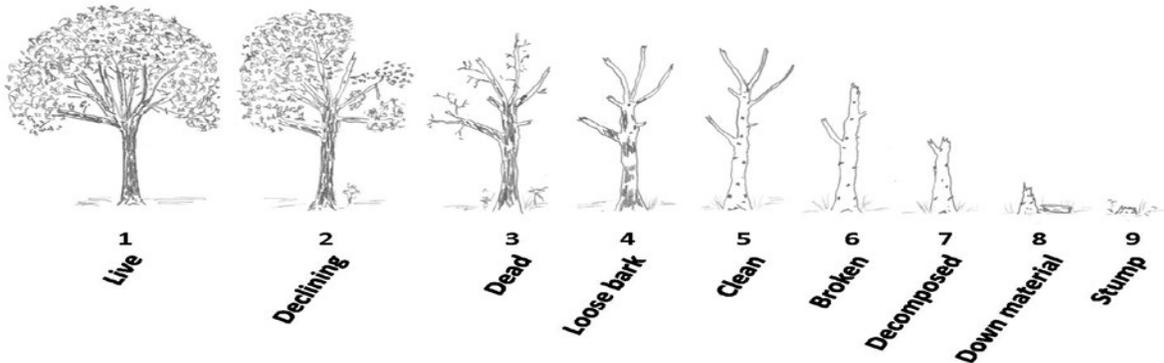
Roost position aspect (deg) 116° Roost type (cavity, crack, bark, etc.) Cavity

Exfoliating bark on bole (%) 0% Describe: sloughing  platy  tight

Cavities present?  Yes  No if so, describe: Roost cavity 2m from base of tree

Roost tree or snag canopy position: Dominant  Co-Dominant  Suppressed

Roost Decay State:  1 2 3 4 5 6 7 8 9 Other



**Surrounding Habitat Condition**

Canopy closure at roost (%) 75%

Approximate woodlot size (acres) >19,892 Distance to non-forest (meters) 0.42 miles

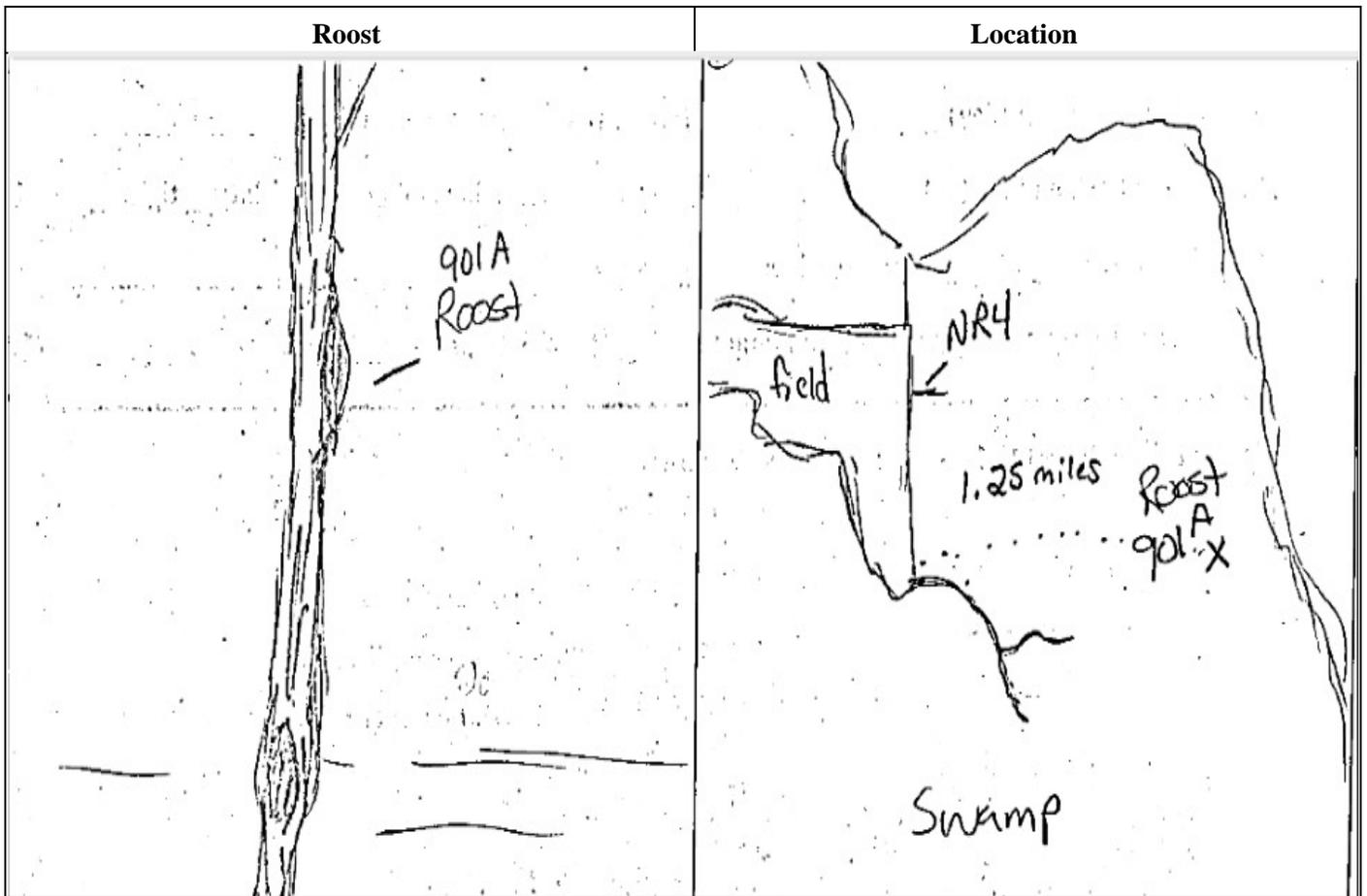
**Describe forest/woodlot current condition (mature, partially cut-over, burned, insect damage, etc.)**

Cypress-Gum Swamp (Blackwater Subtype)

Mature swamp with sweetgum, bald cypress, pond cypress, red maple, red bay, loblolly bay, fetterbush  
smilax sp. false nettle, lizzards tail, American holly, shortleaf pine, water tupelo, blueberry, wax myrtle.

Additional Comments \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Diagram**



Dates in Roost 6/22



Bat Frequency 150.901

## USFWS INDIANA BAT ROOST DATASHEET

Biologists (Full Name): Nick Newberry, Dottie Brown, Anna Weaver Date: 23-June-2019

UTM: Zone \_\_\_\_\_ Easting \_\_\_\_\_ Northing \_\_\_\_\_ OR

LAT 36.35981° LONG -75.97118°

Property Owner NC Wildlife Resources Commission Phone# (252)-426-2255

State NC County Currituck Site # NR4

Roost # 901-B Roost Location N. River Game Land

### Roost Tree Data

Tree Species: Red Maple (Acer rubrum) Live \_\_\_\_\_ Snag \_\_\_\_\_ Other X

(If other, explain) Declining on top

DBH (inches) 5.5in Total Roost Height (meters) 22m

Height of roost area (if known) 13m Dist. from capture site 1.56 miles

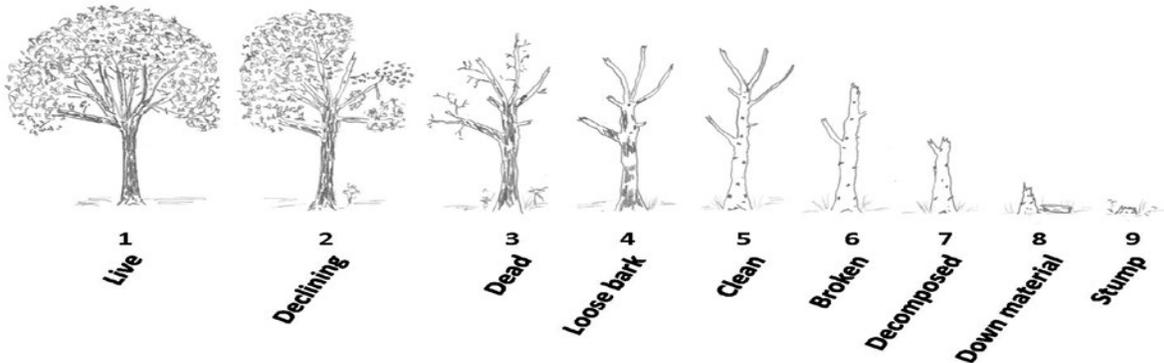
Roost position aspect (deg) 244° Roost type (cavity, crack, bark, etc.) bark

Exfoliating bark on bole (%) 20% Describe: sloughing X platy X tight X

Cavities present? Yes if so, describe: A few small cavities present

Roost tree or snag canopy position: Dominant \_\_\_\_\_ Co-Dominant X Suppressed \_\_\_\_\_

Roost Decay State: 1 (2) 3 4 5 6 7 8 9 Other



**Surrounding Habitat Condition**

Canopy closure at roost (%) 20%

Approximate woodlot size (acres) >19,892 Distance to non-forest (meters) 0.33 miles

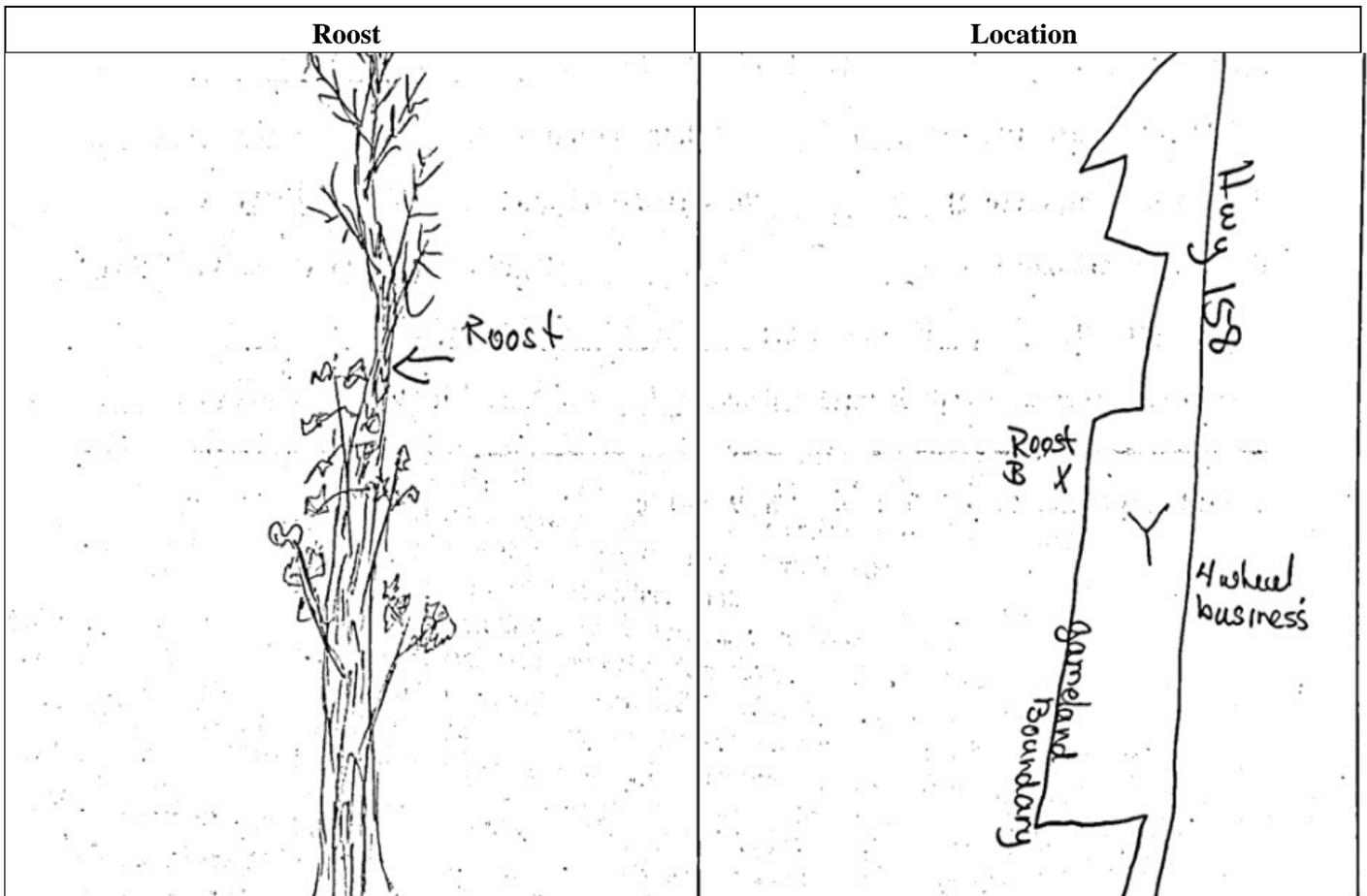
**Describe forest/woodlot current condition (mature, partially cut-over, burned, insect damage, etc.)**

Cypress-Gum Swamp (Blackwater Subtype)

Mature forest with red maple, sweetgum, water tupelo, sweetbay magnolia, loblolly pine, fetterbush  
high-bush blueberry, lizzards tail, wax myrtle.

**Additional Comments**

**Diagram**



Dates in Roost 6/23, 6/24, 6,25







**BAT TELEMETRY TRACKING**

Species MYSE Sex F Bat Frequency 150.901 Capture Date 17-June-2019  
 Capture Site/GPS 36.36849°, -75.99693° Comment \_\_\_\_\_

DATE	OBSERVERS	ROOST Y/N/#	ROOST TREE SPECIES	GPS LAT/LONG	COMMENTS Azimuth/Signal Strength
6-17-2019	Nick Newberry, Phillip Bailey, Anna Weaver	N	n/a	36.36845°, -75.99644°	After release, 150.901 foraged awhile and then flew out of range @123° (faint) @23:00
6-18-2019	Dottie Brown, Phillip Bailey, Nick Newberry, Anna Weaver	N	n/a	36.36323°, -75.98911°	Checked all the fields and roads around NR4. Hiked in 0.75 miles into swamp. No signal.
6-18-2019	Dottie Brown, Phillip Bailey, Nick Newberry, Anna Weaver	N	n/a	36.37515°, -76.01760°	Checked net area NR1 and along road to fields near NR4. Headed out to upland island. No signal.
6-19-2019	Dottie Brown, Phil Bailey, Nick Newberry, Anna Weaver	N	n/a	36.35923°, -75.99136°	Re-checked Swain Lane and all roads associated with NR4 site and fields. Hiked in overgrown forest road south of NR4. Hiked canal and swamp southeast of NR4. Heard signal @ 36.35923°, -75.99136° @89°, but unable to locate roost due to thunderstorms
6-20-2019	Dottie Brown, Anna Weaver	N	n/a	36.35923°, -75.99136°	Signal in two locations in canals 0.30 miles in, very weak. Left due to severe thunderstorms



6-21-2019	n/a	N	n/a	n/a	No tracking due to high winds
6-22-2019	Dottie Brown, Anna Weaver, Nick Newberry	Y/A	Water Tupelo	36.36137°, -75.97473°	No emergence due to safety concerns, 2-hour hike out and impending storms
6-23-2019	Dottie Brown, Anna Weaver, Nick Newberry	Y/B	Red Maple	36.35981°, -75.97118°	No emergence due to weather
6-24-2019	Anna Weaver, Nick Newberry, David Cooper	Y/B	Red Maple	36.35981°, -75.97118°	Same roost-emergence completed
6-25-2019	Anna Weaver, Nick Newberry, David Cooper	Y/B	Red Maple	36.35981°, -75.97118°	Same roost-no emergence



**BAT EMERGENCE COUNTS**

Species MYSE Sex F Bat Frequency 150.901 Capture Date 17-June-2019  
 Capture Site/GPS 36.36849°, -75.99693° Comment \_\_\_\_\_

DATE	OBSERVERS	ROOST #	GPS LAT/LONG	Bat Count	COMMENTS
6-18-2019	n/a	n/a	n/a	n/a	No roost found yet
6-19-2019	n/a	n/a	n/a	n/a	No roost found yet
6-20-2019	n/a	n/a	n/a	n/a	No roost found yet
6-21-2019	n/a	n/a	n/a	n/a	No roost found yet
6-22-2019	n/a	A	36.36137°, -75.97473°		No emergence due to safety concerns
6-23-2019	n/a	B	36.35981°, -75.97118°		No emergence conducted due to storms
6-24-2019	n/a	B	36.35981°, -75.97118°		2 bats emerged from roost tree
6-25-2019	n/a	B	36.35981°, -75.97118°		Same roost, no emergence conducted



**Appendix I**  
**Agency Coordination**

**From:** [Brown, Dottie](#)  
**To:** [permitsR4ES@fws.gov](mailto:permitsR4ES@fws.gov)  
**Cc:** [Jordan, Gary](#); [Katherine Caldwell Etchison](#); [David P Turner](#); [Chris Manley \(cdmanley@ncdot.gov\)](mailto:cdmanley@ncdot.gov); [Sauls, Lane](#)  
**Subject:** northern long-eared bat captures  
**Date:** Saturday, April 27, 2019 2:14:00 AM  
**Attachments:** [image001.png](#)

---

In accordance with the conditions associated with the U.S. Fish and Wildlife Service Native Endangered & Threatened Species Recovery Endangered & Threatened Wildlife Permit TE94704A-2 issued to Dorothy Brown, please accept this email as a report for the capture of two federally listed as threatened northern long-eared bats (NLEB). Two female NLEB, both adults, were captured on Thursday April 25 within the portion of the North Carolina Wildlife and Resources Commission (NCWRC) North River Game Land located within Camden County, NC, approximately at 36.98906, -75.98906. One of the females was transmitted and is currently being tracked in accordance with the objectives of the North Carolina Department of Transportation (NCDOT) NLEB Phase VII research project.

Please let me know if you have any questions or concerns.

Thanks you

**Dottie Brown**  
Senior Bat Ecologist



Venture I  
940 Main Campus Drive, Suite 500  
Raleigh, NC 27606-5217  
**Mobile** 828-244-1898  
**P** 919.741.5781 | **F** 919.833.0034  
[dottiebrown@vhb.com](mailto:dottiebrown@vhb.com)

**Engineers | Scientists | Planners | Designers**  
[www.vhb.com](http://www.vhb.com)

[Proud to be named 2018 WTS Employer of the Year](#)

**From:** [Brown, Dottie](#)  
**To:** [permitsR4ES@fws.gov](mailto:permitsR4ES@fws.gov)  
**Cc:** [Jordan, Gary](#); [Katherine Caldwell Etchison](#); [David P Turner](#); [Chris Manley \(cdmanley@ncdot.gov\)](mailto:cdmanley@ncdot.gov); [Sauls, Lane](#)  
**Subject:** RE: northern long-eared bat captures April 27th  
**Date:** Sunday, April 28, 2019 3:11:00 AM  
**Attachments:** [image001.png](#)

---

FYI

In accordance with the conditions associated with the U.S. Fish and Wildlife Service Native Endangered & Threatened Species Recovery Permit TE94704A-2 issued to Dorothy Brown, please accept this email as a report for the capture of two federally listed as threatened northern long-eared bats (NLEB). One female and one male, both adults, were captured on Saturday, April 27 within the portion of the North Carolina Wildlife and Resources Commission (NCWRC) North River Game Land located within Camden County, NC, approximately at 36.98906, -75.98906. Neither bat was transmitted. The female was not pregnant and therefore she was not transmitted in accordance with the objectives of the North Carolina Department of Transportation (NCDOT) NLEB Phase VII research project.

Please let me know if you have any questions or concerns.

Thanks you

**Dottie Brown**  
Senior Bat Ecologist



Venture I  
940 Main Campus Drive, Suite 500  
Raleigh, NC 27606-5217  
**Mobile** 828-244-1898  
**P** 919.741.5781 | **F** 919.833.0034  
[dottiebrown@vhb.com](mailto:dottiebrown@vhb.com)

**Engineers | Scientists | Planners | Designers**  
[www.vhb.com](http://www.vhb.com)

[Proud to be named 2018 WTS Employer of the Year](#)

**From:** [Brown, Dottie](#)  
**To:** [permitsR4ES@fws.gov](mailto:permitsR4ES@fws.gov)  
**Cc:** [Jordan, Gary](#); [Chris Manley \(cdmanley@ncdot.gov\)](mailto:cdmanley@ncdot.gov); [Katherine Caldwell Etchison](#); [David P Turner](#); [Sauls, Lane](#)  
**Subject:** northern long-eared bat capture May 7th 2019  
**Date:** Wednesday, May 8, 2019 4:57:00 AM  
**Attachments:** [image001.png](#)

---

FYI

In accordance with the conditions associated with the U.S. Fish and Wildlife Service Native Endangered & Threatened Species Recovery Permit TE94704A-2 issued to Dorothy Brown, please accept this email as a report for the capture of 5 federally listed as threatened northern long-eared bats (NLEB). Three females, one male, and one escaped (from net), were captured on Tuesday, May 7<sup>th</sup> within the portion of the North Carolina Wildlife and Resources Commission (NCWRC) North River Game Land located within Currituck County, NC, approximately at 36.3835, -76.00794. Two of the females were pregnant and fitted with transmitters in accordance with the objectives of the North Carolina Department of Transportation (NCDOT) NLEB Phase VII research project. We will begin tracking immediately.

Please let me know if you have any questions or concerns.

Thanks you

**Dottie Brown**  
Senior Bat Ecologist



Venture I  
940 Main Campus Drive, Suite 500  
Raleigh, NC 27606-5217  
**Mobile** 828-244-1898  
**P** 919.741.5781 | **F** 919.833.0034  
[dottiebrown@vhb.com](mailto:dottiebrown@vhb.com)

**Engineers | Scientists | Planners | Designers**  
[www.vhb.com](http://www.vhb.com)

[Proud to be named 2018 WTS Employer of the Year](#)

,-

**From:** [Brown, Dottie](#)  
**To:** [permitsR4ES@fws.gov](mailto:permitsR4ES@fws.gov); [Jordan, Gary](#)  
**Cc:** [Chris Manley \(cdmanley@ncdot.gov\)](mailto:Chris.Manley@ncdot.gov); [Katherine Caldwell Etchison](#); [David P Turner](#); [Sauls, Lane](#)  
**Subject:** deceased NLEB  
**Date:** Friday, May 10, 2019 3:53:00 AM  
**Attachments:** [image001.png](#)

---

FYI

I am reporting the discovery of transmitted bat (150.543) deceased in its roost. This bat was captured in the North River Game Land, NC by Dottie Brown under U.S. Fish and Wildlife Service Native Endangered & Threatened Species Recovery Endangered & Threatened Wildlife Permit TE94704A-2. Bat 150.543 was fitted with a transmitter and released after capture on 5/6. She flew off fine and foraged for 2 hours. She was still foraging when we left the site around 3 am. She was tracked to her roost on 5/8 and was discovered roosting in a tiny cavity (opening about the size of 2 quarters) about 1.5 meters off the ground/water. This site is located in a very large swamp. Although she did not emerge on the night of 5/8, her transmitter antenna was seen slightly sticking out of her tiny hole and it moved. On 5/9 she was still in the same tree and hole. Observed was very large ants going in the hole. We noticed these ants the first day but did not think much of it as they are seen on trees throughout this swamp. Today we noticed her skeleton lying at the entrance of the hole. There was not a piece of flesh left on her. We have since noticed these ants going in and out of tree holes and cavities throughout this swamp. She was fine when she was released and continued to forage. I have to assume that the ants attacked her in her roost? I have tracked bats in this swamp previously where I have documented numerous NLEB roosting in these tiny tree holes low to the ground/water. This ant is very large and may be a predator that hunts for small prey hiding in these low cavities? They may check holes for roosting bats and other small animals? Please let me know if you have any questions or need additional information on this discovery?

Thank you

**Dottie Brown**  
Senior Bat Ecologist



Venture I  
940 Main Campus Drive, Suite 500  
Raleigh, NC 27606-5217  
**Mobile** 828-244-1898  
**P** 919.741.5781 | **F** 919.833.0034  
[dottiebrown@vhb.com](mailto:dottiebrown@vhb.com)

**Engineers | Scientists | Planners | Designers**  
[www.vhb.com](http://www.vhb.com)

[Proud to be named 2018 WTS Employer of the Year](#)

**From:** [Brown, Dottie](#)  
**To:** [permitsR4ES@fws.gov](mailto:permitsR4ES@fws.gov); [Jordan, Gary](#)  
**Cc:** [Chris Manley \(cdmanley@ncdot.gov\)](#); [Katherine Caldwell Etchison](#); [David P Turner](#); [Sauls, Lane](#)  
**Subject:** RE: deceased NLEB correction 150.705  
**Date:** Friday, May 10, 2019 4:01:00 AM  
**Attachments:** [image001.png](#)

---

Sorry for the mistake on the transmitter number, The deceased bat was bat 150.705 and not 543.

**Dottie Brown**  
Senior Bat Ecologist

P 919.741.5781  
[www.vhb.com](http://www.vhb.com)

---

**From:** Brown, Dottie  
**Sent:** Friday, May 10, 2019 3:53 AM  
**To:** [permitsR4ES@fws.gov](mailto:permitsR4ES@fws.gov); [Jordan, Gary <gary\\_jordan@fws.gov>](mailto:Jordan, Gary <gary_jordan@fws.gov>)  
**Cc:** [Chris Manley \(cdmanley@ncdot.gov\) <cdmanley@ncdot.gov>](mailto:Chris Manley (cdmanley@ncdot.gov) <cdmanley@ncdot.gov>); [Katherine Caldwell Etchison <katherine.caldwell@ncwildlife.org>](mailto:Katherine Caldwell Etchison <katherine.caldwell@ncwildlife.org>); [David P Turner <David.Turner@ncwildlife.org>](mailto:David P Turner <David.Turner@ncwildlife.org>); [Sauls, Lane <lsauls@vhb.com>](mailto:Sauls, Lane <lsauls@vhb.com>)  
**Subject:** deceased NLEB

FYI

I am reporting the discovery of transmitted bat (150.543) deceased in its roost. This bat was captured in the North River Game Land, NC by Dottie Brown under U.S. Fish and Wildlife Service Native Endangered & Threatened Species Recovery Endangered & Threatened Wildlife Permit TE94704A-2. Bat 150.543 was fitted with a transmitter and released after capture on 5/6. She flew off fine and foraged for 2 hours. She was still foraging when we left the site around 3 am. She was tracked to her roost on 5/8 and was discovered roosting in a tiny cavity (opening about the size of 2 quarters) about 1.5 meters off the ground/water. This site is located in a very large swamp. Although she did not emerge on the night of 5/8, her transmitter antenna was seen slightly sticking out of her tiny hole and it moved. On 5/9 she was still in the same tree and hole. Observed was very large ants going in the hole. We noticed these ants the first day but did not think much of it as they are seen on trees throughout this swamp. Today we noticed her skeleton lying at the entrance of the hole. There was not a piece of flesh left on her. We have since noticed these ants going in and out of tree holes and cavities throughout this swamp. She was fine when she was released and continued to forage. I have to assume that the ants attacked her in her roost? I have tracked bats in this swamp previously where I have documented numerous NLEB roosting in these tiny tree holes low to the ground/water. This ant is very large and may be a predator that hunts for small prey hiding in these low cavities? They may check holes for roosting bats and other small animals? Please let me know if you have any questions or need additional information on this discovery?

Thank you

**Dottie Brown**  
Senior Bat Ecologist



Venture I  
940 Main Campus Drive, Suite 500  
Raleigh, NC 27606-5217  
**Mobile** 828-244-1898

P 919.741.5781 | F 919.833.0034  
[dottiebrown@vhb.com](mailto:dottiebrown@vhb.com)

**Engineers | Scientists | Planners | Designers**  
[www.vhb.com](http://www.vhb.com)

[Proud to be named 2018 WTS Employer of the Year](#)

**From:** [Brown, Dottie](#)  
**To:** [permitsR4ES@fws.gov](mailto:permitsR4ES@fws.gov)  
**Cc:** [Jordan, Gary](#); [Chris Manley \(cdmanley@ncdot.gov\)](mailto:cdmanley@ncdot.gov); [Katherine Caldwell Etchison](#); [David P Turner](#); [Sauls, Lane](#)  
**Subject:** northern long-eared bat capture May 9th 2019  
**Date:** Friday, May 10, 2019 4:05:00 AM  
**Attachments:** [image001.png](#)

---

FYI

In accordance with the conditions associated with the U.S. Fish and Wildlife Service Native Endangered & Threatened Species Recovery Endangered & Threatened Wildlife Permit TE94704A-2 issued to Dorothy Brown, please accept this email as a report for the capture of a federally listed as threatened northern long-eared bat (NLEB). One male, adult and three pregnant female NLEB were captured on Sunday May 9 within the North River Game Land located within Currituck County, NC, approximately at 36.36849, -76.99693. One pregnant NLEB (bat 150.623) was transmitted and is currently being tracked in accordance with the objectives of the NCDOT NLEB research project.

Please let me know if you have any questions or concerns.

Thanks you

**Dottie Brown**  
Senior Bat Ecologist



Venture I  
940 Main Campus Drive, Suite 500  
Raleigh, NC 27606-5217  
**Mobile** 828-244-1898  
**P** 919.741.5781 | **F** 919.833.0034  
[dottiebrown@vhb.com](mailto:dottiebrown@vhb.com)

**Engineers | Scientists | Planners | Designers**  
[www.vhb.com](http://www.vhb.com)

[Proud to be named 2018 WTS Employer of the Year](#)

**From:** [Brown, Dottie](#)  
**To:** [permitsR4ES@fws.gov](mailto:permitsR4ES@fws.gov)  
**Cc:** [Jordan, Gary](#); [Chris Manley \(cdmanley@ncdot.gov\)](mailto:cdmanley@ncdot.gov); [Katherine Caldwell Etchison](#); [David P Turner](#); [Sauls, Lane](#)  
**Subject:** RE: northern long-eared bat captures May 18th 2019  
**Date:** Sunday, May 19, 2019 4:28:00 AM

---

FYI

In accordance with the conditions associated with the U.S. Fish and Wildlife Service Native Endangered & Threatened Species Recovery Endangered & Threatened Wildlife Permit TE94704A-2 issued to Dorothy Brown, please accept this email as a report for the capture of 9 federally listed as threatened northern long-eared bat (NLEB). All adults, three males, one non-reproductive female, and five extremely pregnant female NLEB were captured on Saturday, May 18<sup>th</sup> within the North River Game Land located within Currituck County, NC, approximately at 36.3835, -76.00794. One pregnant NLEB (bat 150.982) was transmitted and is currently being tracked in accordance with the objectives of the NCDOT NLEB research project.

Please let me know if you have any questions or concerns.

Thanks you

**Dottie Brown**  
Senior Bat Ecologist

P 919.741.5781  
[www.vhb.com](http://www.vhb.com)

**From:** [Brown, Dottie](#)  
**To:** [permitsR4ES@fws.gov](mailto:permitsR4ES@fws.gov)  
**Cc:** [Jordan, Gary](#); [Chris Manley \(cdmanley@ncdot.gov\)](mailto:cdmanley@ncdot.gov); [Katherine Caldwell Etchison](#); [David P Turner](#); [Sauls, Lane](#)  
**Subject:** NLEB capture 6-1-2019  
**Date:** Sunday, June 2, 2019 3:46:00 AM  
**Attachments:** [image001.png](#)

---

FYI

In accordance with the conditions associated with the U.S. Fish and Wildlife Service Native Endangered & Threatened Species Recovery Endangered & Threatened Wildlife Permit TE94704A-2 issued to Dorothy Brown, please accept this email as a report for the capture of 1 federally listed as threatened northern long-eared bat (NLEB). One adult, extremely pregnant female NLEB was captured on Friday, June 1<sup>st</sup> within the North River Game Land located within Camden County, NC, approximately at 36.28535, -75.98419. Pregnant NLEB (bat 150.945) was transmitted and is currently being tracked in accordance with the objectives of the NCDOT NLEB research project.

Please let me know if you have any questions or concerns.

Thanks you

**Dottie Brown**  
Senior Bat Ecologist



Venture I  
940 Main Campus Drive, Suite 500  
Raleigh, NC 27606-5217  
**Mobile** 828-244-1898  
**P** 919.741.5781 | **F** 919.833.0034  
[dottiebrown@vhb.com](mailto:dottiebrown@vhb.com)

**Engineers | Scientists | Planners | Designers**  
[www.vhb.com](http://www.vhb.com)

[Proud to be named 2018 WTS Employer of the Year](#)

**From:** [Brown, Dottie](#)  
**To:** [permitsR4ES@fws.gov](mailto:permitsR4ES@fws.gov)  
**Cc:** [Jordan, Gary](#); [Chris Manley \(cdmanley@ncdot.gov\)](mailto:cdmanley@ncdot.gov); [Katherine Caldwell Etchison](#); [David P Turner](#); [Sauls, Lane](#)  
**Subject:** RE: NLEB capture 6-4 -2019  
**Date:** Wednesday, June 5, 2019 4:03:00 AM  
**Attachments:** [image001.png](#)

---

FYI

In accordance with the conditions associated with the U.S. Fish and Wildlife Service Native Endangered & Threatened Species Recovery Endangered & Threatened Wildlife Permit TE94704A-2 issued to Dorothy Brown, please accept this email as a report for the capture of 3 federally listed as threatened northern long-eared bats (NLEB). Three adult, male NLEB were captured on Tuesday, June 4<sup>th</sup> within the North River Game Land located within Camden County, NC, approximately at 36.28543, 75.99110. No transmitters were attached to male NLEB in accordance with the objectives of the NCDOT NLEB research project.

Please let me know if you have any questions or concerns.

Thanks you

**Dottie Brown**  
Senior Bat Ecologist



Venture I  
940 Main Campus Drive, Suite 500  
Raleigh, NC 27606-5217  
**Mobile** 828-244-1898  
**P** 919.741.5781 | **F** 919.833.0034  
[dottiebrown@vhb.com](mailto:dottiebrown@vhb.com)

**Engineers | Scientists | Planners | Designers**  
[www.vhb.com](http://www.vhb.com)

[Proud to be named 2018 WTS Employer of the Year](#)

**From:** [Brown, Dottie](#)  
**To:** ["permitsR4ES@fws.gov"](mailto:permitsR4ES@fws.gov)  
**Cc:** ["Jordan, Gary"](#); [Chris Manley \(cdmanley@ncdot.gov\)](mailto:cdmanley@ncdot.gov); [Katherine Caldwell Etchison](#); [David P Turner](#); [Sauls, Lane](#)  
**Subject:** RE: NLEB capture 6- 8 -2019  
**Date:** Sunday, June 9, 2019 3:50:00 AM  
**Attachments:** [image001.png](#)

---

FYI

In accordance with the conditions associated with the U.S. Fish and Wildlife Service Native Endangered & Threatened Species Recovery Endangered & Threatened Wildlife Permit TE94704A-2 issued to Dorothy Brown, please accept this email as a report for the capture of 2 federally listed as threatened northern long-eared bats (NLEB). One adult, male NLEB and one adult, lactating female was captured on Saturday, June 8<sup>th</sup> within the North River Game Land located within Camden County, NC, approximately at 36.27193, -76.02613. A transmitter (150.500) was attached to the female. She is being tracked in accordance with the objectives of the NCDOT NLEB research project.

Please let me know if you have any questions or concerns.

Thanks you

**Dottie Brown**  
Senior Bat Ecologist

P 919.741.5781  
[www.vhb.com](http://www.vhb.com)

---

**From:** Brown, Dottie  
**Sent:** Wednesday, June 5, 2019 4:03 AM  
**To:** [permitsR4ES@fws.gov](mailto:permitsR4ES@fws.gov)  
**Cc:** Jordan, Gary <[gary\\_jordan@fws.gov](mailto:gary_jordan@fws.gov)>; Chris Manley ([cdmanley@ncdot.gov](mailto:cdmanley@ncdot.gov)) <[cdmanley@ncdot.gov](mailto:cdmanley@ncdot.gov)>; Katherine Caldwell Etchison <[katherine.caldwell@ncwildlife.org](mailto:katherine.caldwell@ncwildlife.org)>; David P Turner <[David.Turner@ncwildlife.org](mailto:David.Turner@ncwildlife.org)>; Sauls, Lane <[lsauls@vhb.com](mailto:lsauls@vhb.com)>  
**Subject:** RE: NLEB capture 6-4 -2019

FYI

In accordance with the conditions associated with the U.S. Fish and Wildlife Service Native Endangered & Threatened Species Recovery Endangered & Threatened Wildlife Permit TE94704A-2 issued to Dorothy Brown, please accept this email as a report for the capture of 3 federally listed as threatened northern long-eared bats (NLEB). Three adult, male NLEB were captured on Tuesday, June 4<sup>th</sup> within the North River Game Land located within Camden County, NC, approximately at 36.28543, 75.99110. No transmitters were attached to male NLEB in accordance with the objectives of the NCDOT NLEB research project.

Please let me know if you have any questions or concerns.

Thanks you

**Dottie Brown**  
Senior Bat Ecologist



Venture I  
940 Main Campus Drive, Suite 500  
Raleigh, NC 27606-5217

**Mobile** 828-244-1898  
**P** 919.741.5781 | **F** 919.833.0034  
[dottiebrown@vhb.com](mailto:dottiebrown@vhb.com)

**Engineers | Scientists | Planners | Designers**  
[www.vhb.com](http://www.vhb.com)

Proud to be named 2018 WTS Employer of the Year

**From:** [Brown, Dottie](#)  
**To:** [permitsR4ES@fws.gov](mailto:permitsR4ES@fws.gov)  
**Cc:** [Jordan, Gary](#); [Chris Manley \(cdmanley@ncdot.gov\)](mailto:cdmanley@ncdot.gov); [Katherine Caldwell Etchison](#); [David P Turner](#); [Sauls, Lane](#)  
**Subject:** NLEB capture 6- 16 -2019  
**Date:** Monday, June 17, 2019 4:54:00 AM  
**Attachments:** [image001.png](#)

---

FYI

In accordance with the conditions associated with the U.S. Fish and Wildlife Service Native Endangered & Threatened Species Recovery Endangered & Threatened Wildlife Permit TE94704A-2 issued to Dorothy Brown, please accept this email as a report for the capture of 4 federally listed as threatened northern long-eared bats (NLEB). Two adults, one male and one post-lactating female, and two female juveniles were captured on Sunday, June 16<sup>th</sup> within the North River Game Land located within Camden County, NC, approximately at 36.27338, -75.98689. This was our first juveniles. No transmitters were attached per the scope requiring pregnant and lactating females only. As of 6/16/2019 we have captured 31 NLEB in the NCWRC North River Game Land, transmitted 7, and documented 31 roost.

Please let me know if you have any questions or concerns.  
Thanks you

**Dottie Brown**  
Senior Bat Ecologist

P 919.741.5781  
[www.vhb.com](http://www.vhb.com)

---

**From:** Brown, Dottie  
**Sent:** Sunday, June 9, 2019 3:50 AM  
**To:** [permitsR4ES@fws.gov](mailto:permitsR4ES@fws.gov)  
**Cc:** Jordan, Gary <[gary\\_jordan@fws.gov](mailto:gary_jordan@fws.gov)>; Chris Manley ([cdmanley@ncdot.gov](mailto:cdmanley@ncdot.gov)) <[cdmanley@ncdot.gov](mailto:cdmanley@ncdot.gov)>; Katherine Caldwell Etchison <[katherine.caldwell@ncwildlife.org](mailto:katherine.caldwell@ncwildlife.org)>; David P Turner <[David.Turner@ncwildlife.org](mailto:David.Turner@ncwildlife.org)>; Sauls, Lane <[lsauls@vhb.com](mailto:lsauls@vhb.com)>  
**Subject:** RE: NLEB capture 6- 8 -2019

FYI

In accordance with the conditions associated with the U.S. Fish and Wildlife Service Native Endangered & Threatened Species Recovery Endangered & Threatened Wildlife Permit TE94704A-2 issued to Dorothy Brown, please accept this email as a report for the capture of 2 federally listed as threatened northern long-eared bats (NLEB). One adult, male NLEB and one adult, lactating female was captured on Saturday, June 8<sup>th</sup> within the North River Game Land located within Camden County, NC, approximately at 36.27193, -76.02613. A transmitter (150.500) was attached to the female. She is being tracked in accordance with the objectives of the NCDOT NLEB research project.

Please let me know if you have any questions or concerns.  
Thanks you

**Dottie Brown**  
Senior Bat Ecologist

P 919.741.5781  
[www.vhb.com](http://www.vhb.com)

---

**From:** Brown, Dottie  
**Sent:** Wednesday, June 5, 2019 4:03 AM  
**To:** [permitsR4ES@fws.gov](mailto:permitsR4ES@fws.gov)  
**Cc:** Jordan, Gary <[gary\\_jordan@fws.gov](mailto:gary_jordan@fws.gov)>; Chris Manley ([cdmanley@ncdot.gov](mailto:cdmanley@ncdot.gov))

<[cdmanley@ncdot.gov](mailto:cdmanley@ncdot.gov)>; Katherine Caldwell Etchison <[katherine.caldwell@ncwildlife.org](mailto:katherine.caldwell@ncwildlife.org)>; David P Turner <[David.Turner@ncwildlife.org](mailto:David.Turner@ncwildlife.org)>; Sauls, Lane <[lsauls@vhb.com](mailto:lsauls@vhb.com)>

**Subject:** RE: NLEB capture 6-4 -2019

FYI

In accordance with the conditions associated with the U.S. Fish and Wildlife Service Native Endangered & Threatened Species Recovery Endangered & Threatened Wildlife Permit TE94704A-2 issued to Dorothy Brown, please accept this email as a report for the capture of 3 federally listed as threatened northern long-eared bats (NLEB). Three adult, male NLEB were captured on Tuesday, June 4<sup>th</sup> within the North River Game Land located within Camden County, NC, approximately at 36.28543, 75.99110. No transmitters were attached to male NLEB in accordance with the objectives of the NCDOT NLEB research project.

Please let me know if you have any questions or concerns.

Thanks you

**Dottie Brown**

Senior Bat Ecologist



Venture I  
940 Main Campus Drive, Suite 500  
Raleigh, NC 27606-5217  
**Mobile** 828-244-1898  
**P** 919.741.5781 | **F** 919.833.0034  
[dottiebrown@vhb.com](mailto:dottiebrown@vhb.com)

**Engineers | Scientists | Planners | Designers**  
[www.vhb.com](http://www.vhb.com)

[Proud to be named 2018 WTS Employer of the Year](#)

## Smith, Heather

---

**Sent:** Tuesday, June 18, 2019 4:08 AM  
**To:** 'permitsR4ES@fws.gov'  
**Cc:** 'Jordan, Gary'; Chris Manley (cdmanley@ncdot.gov); Katherine Caldwell Etchison; David P Turner; Sauls, Lane  
**Subject:** NLEB capture 6- 17 -2019

FYI

In accordance with the conditions associated with the U.S. Fish and Wildlife Service Native Endangered & Threatened Species Recovery Endangered & Threatened Wildlife Permit TE94704A-2 issued to Dorothy Brown, please accept this email as a report for the capture of 3 federally listed as threatened northern long-eared bats (NLEB). One adult, lactating female, and two juveniles, a male and a female, were captured on Monday, June 17<sup>th</sup> within the North River Game Land located within Currituck County, NC, approximately at 36. 36849-75.99693. A transmitter (150.901) was attached to the lactating female. She is being tracked in accordance with the objectives of the NCDOT NLEB research project.

Please let me know if you have any questions or concerns.

Thanks you

**Dottie Brown**  
Senior Bat Ecologist

P 919.741.5781  
[www.vhb.com](http://www.vhb.com)

---

**From:** Brown, Dottie  
**Sent:** Monday, June 17, 2019 4:56 AM  
**To:** permitsR4ES@fws.gov  
**Cc:** Jordan, Gary <gary\_jordan@fws.gov>; Chris Manley (cdmanley@ncdot.gov) <cdmanley@ncdot.gov>; Katherine Caldwell Etchison <katherine.caldwell@ncwildlife.org>; David P Turner <David.Turner@ncwildlife.org>; Sauls, Lane <lsauls@vhb.com>  
**Subject:** NLEB capture 6- 16 -2019

FYI

In accordance with the conditions associated with the U.S. Fish and Wildlife Service Native Endangered & Threatened Species Recovery Endangered & Threatened Wildlife Permit TE94704A-2 issued to Dorothy Brown, please accept this email as a report for the capture of 4 federally listed as threatened northern long-eared bats (NLEB). Two adults, one male and one post-lactating female, and two female juveniles were captured on Sunday, June 16<sup>th</sup> within the North River Game Land located within Camden County, NC, approximately at 36. 27338, -75.98689. This was our first juveniles. No transmitters were attached per the scope requiring pregnant and lactating females only. As of 6/16/2019 we have captured 31 NLEB in the NCWRC North River Game Land, transmitted 7, and documented 31 roost.

Please let me know if you have any questions or concerns.

Thanks you

**Dottie Brown**

Senior Bat Ecologist

P 919.741.5781  
[www.vhb.com](http://www.vhb.com)

---

**From:** Brown, Dottie

**Sent:** Sunday, June 9, 2019 3:50 AM

**To:** [permitsR4ES@fws.gov](mailto:permitsR4ES@fws.gov)

**Cc:** Jordan, Gary <[gary\\_jordan@fws.gov](mailto:gary_jordan@fws.gov)>; Chris Manley ([cdmanley@ncdot.gov](mailto:cdmanley@ncdot.gov)) <[cdmanley@ncdot.gov](mailto:cdmanley@ncdot.gov)>; Katherine Caldwell Etchison <[katherine.caldwell@ncwildlife.org](mailto:katherine.caldwell@ncwildlife.org)>; David P Turner <[David.Turner@ncwildlife.org](mailto:David.Turner@ncwildlife.org)>; Sauls, Lane <[lsauls@vhb.com](mailto:lsauls@vhb.com)>

**Subject:** RE: NLEB capture 6- 8 -2019

FYI

In accordance with the conditions associated with the U.S. Fish and Wildlife Service Native Endangered & Threatened Species Recovery Endangered & Threatened Wildlife Permit TE94704A-2 issued to Dorothy Brown, please accept this email as a report for the capture of 2 federally listed as threatened northern long-eared bats (NLEB). One adult, male NLEB and one adult, lactating female was captured on Saturday, June 8<sup>th</sup> within the North River Game Land located within Camden County, NC, approximately at 36.27193, -76.02613. A transmitter (150.500) was attached to the female. She is being tracked in accordance with the objectives of the NCDOT NLEB research project.

Please let me know if you have any questions or concerns.

Thanks you

**Dottie Brown**

Senior Bat Ecologist

P 919.741.5781  
[www.vhb.com](http://www.vhb.com)

---

**From:** Brown, Dottie

**Sent:** Wednesday, June 5, 2019 4:03 AM

**To:** [permitsR4ES@fws.gov](mailto:permitsR4ES@fws.gov)

**Cc:** Jordan, Gary <[gary\\_jordan@fws.gov](mailto:gary_jordan@fws.gov)>; Chris Manley ([cdmanley@ncdot.gov](mailto:cdmanley@ncdot.gov)) <[cdmanley@ncdot.gov](mailto:cdmanley@ncdot.gov)>; Katherine Caldwell Etchison <[katherine.caldwell@ncwildlife.org](mailto:katherine.caldwell@ncwildlife.org)>; David P Turner <[David.Turner@ncwildlife.org](mailto:David.Turner@ncwildlife.org)>; Sauls, Lane <[lsauls@vhb.com](mailto:lsauls@vhb.com)>

**Subject:** RE: NLEB capture 6-4 -2019

FYI

In accordance with the conditions associated with the U.S. Fish and Wildlife Service Native Endangered & Threatened Species Recovery Endangered & Threatened Wildlife Permit TE94704A-2 issued to Dorothy Brown, please accept this email as a report for the capture of 3 federally listed as threatened northern long-eared bats (NLEB). Three adult, male NLEB were captured on Tuesday, June 4<sup>th</sup> within the North River Game Land located within Camden County, NC, approximately at 36.28543, 75.99110. No transmitters were attached to male NLEB in accordance with the objectives of the NCDOT NLEB research project.

Please let me know if you have any questions or concerns.

Thanks you

**Dottie Brown**

Senior Bat Ecologist



Venture I  
940 Main Campus Drive, Suite 500  
Raleigh, NC 27606-5217  
**Mobile** 828-244-1898  
**P** 919.741.5781 | **F** 919.833.0034  
dottiebrown@vhb.com

**Engineers | Scientists | Planners | Designers**  
**[www.vhb.com](http://www.vhb.com)**

Proud to be named 2018 WTS Employer of the Year

**From:** [Brown, Dottie](#)  
**To:** [permitsR4ES@fws.gov](mailto:permitsR4ES@fws.gov); [Jordan, Gary](#); [Chris Manley \(cdmanley@ncdot.gov\)](mailto:Chris.Manley@ncdot.gov); [Katherine Caldwell Etchison](#); [David P Turner](#); [Sauls, Lane](#)  
**Subject:** NLEB capture June 22nd  
**Date:** Monday, June 24, 2019 10:30:00 AM  
**Attachments:** [image001.png](#)

---

FYI

In accordance with the conditions associated with the U.S. Fish and Wildlife Service Native Endangered & Threatened Species Recovery Endangered & Threatened Wildlife Permit TE94704A-2 issued to Dorothy Brown, please accept this email as a report for the capture of 2 federally listed as threatened northern long-eared bats (NLEB). Two juveniles, a male and a female were captured on Saturday, June 22<sup>nd</sup> within the North River Game Land located within Camden County, NC, approximately at 36.27885, -75.990072. No transmitters were attached. This was the final night of netting as all in objectives have been met for the NCDOT NLEB research project.

Please let me know if you have any questions or concerns.

Thanks you

**Dottie Brown**  
Senior Bat Ecologist



Venture I  
940 Main Campus Drive, Suite 500  
Raleigh, NC 27606-5217  
**Mobile** 828-244-1898  
**P** 919.741.5781 | **F** 919.833.0034  
[dottiebrown@vhb.com](mailto:dottiebrown@vhb.com)

**Engineers | Scientists | Planners | Designers**  
[www.vhb.com](http://www.vhb.com)

[Proud to be named 2018 WTS Employer of the Year](#)