

Northern Long-eared Bat Research Project
Eastern North Carolina
Survey Phase 2: Summer 2016
Northeast Section Report

TIP 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

November 2016

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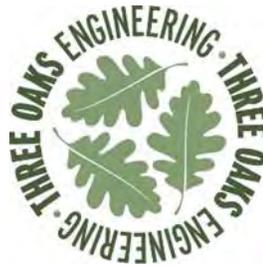
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1.0 PROJECT DESCRIPTION

The North Carolina Department of Transportation (NCDOT) contracted with Three Oaks Engineering (Three Oaks) to assist in conducting part of a research study of the federally Threatened northern long-eared bat (*Myotis septentrionalis*; NLEB) in eastern North Carolina. The objective of this summer study was to determine the distribution of NLEB in eastern North Carolina.

Three Oaks sampled six pre-determined locations with mist-nets while running an acoustic detector near each mist-net site (grouping of mist-nets). NCDOT coordinated sampling locations with state and federal resource agencies to avoid duplicating efforts. All locations addressed in this report were situated in north central or northeastern North Carolina. This report includes results of the second phase of the overall Eastern NC NLEB Programmatic Agreement research project, designated "Phase 2." This research project was developed to occur over five years to collect data on the distribution, habitat characteristics and behavior of NLEB in eastern NC. Phase 2 surveys occurred during the summer of 2016 from May to August.

Survey work occurred during the summer of 2016, with the goal of catching the target species, NLEB. Surveys were conducted within suitable summer roosting and foraging habitat for NLEB. All surveys were conducted by a qualified bat biologist with current US Fish and Wildlife Service (USFWS) and NC Wildlife Resources Commission (NCWRC) permits (Section 4.0 Investigator Qualifications).

2.0 METHODS

This section describes the methods used to perform habitat assessments, surveys, and detailed acoustic analysis. Survey methodology followed procedures and protocols set forth by the NCDOT project scope and the Standardization for NLEB Research document provided by NCDOT (2016). All surveys performed were consistent with the protocols stipulated in the National White Nose Syndrome Decontamination Protocol (USFWS 2016b), North Carolina's White-nose Syndrome (WNS) Surveillance and Response Plan (NCWRC 2013), USFWS Guidance and Justification for Decontamination in North Carolina (USFWS 2016c), and the NCDOT WNS Decontamination Protocol (NCDOT 2014).

For the purpose of this study, a maximum of 36 calendar nights of mist-netting were to be conducted, with six nights of netting at each of six locations. The locations were:

- Lee Game Land (aka CP&L or Duke Energy-Progress Game Land), Lee County†
- Palmetto Peartree Preserve (P3), Tyrrell County‡
- Howell Woods Environmental Learning Center, Johnston County*
- Roanoke River Game Land, Martin County*
- Chowan Swamp Game Land, Hertford County†
- Medoc Mountain State Park, Halifax County*

*-sites with no previous survey work

†-sites with previous acoustic survey work in 2015

‡-site with previous acoustic & mist-net survey work in 2015

2.1 Habitat Characterization

As noted in Section 3.0, several locations had not previously been surveyed. An initial desktop-GIS assessment was performed using the latest orthoimagery to determine potential mist-netting sites for NLEB at each new location. (A location was considered new if NCDOT contractors had not previously conducted field work in 2015.)

At each survey site, the habitat was described. The natural community type was characterized using the Classification of the Natural Communities of North Carolina, Fourth Approximation (Schafale 2012).

Habitat in the survey area was scored by selecting one from each of the following:

- 1) Pine/Hardwood/Mixed
- 2) Upland/Bottomland
- 3) Managed (thinned, burned, or pine plantation)/Unmanaged
- 4) Cutover/Immature forest/Mature forest
- 5) Clutter* (Classifications 1-4)
 - (1) Sparse/no, < 10% cover (ex: open for 40m in all directions)
 - (2) Low, 10–39% cover (low clutter stands typically contain <6 or >95-year-old trees, example: microphone pointed outward from edge habitat)
 - (3) Medium, 40–75% cover (medium clutter stands typically contain 70–100 year-old trees, example: at least 10-m wide travel corridor, fairly open above)
 - (4) High, > 75% cover (high clutter stands typically contain 10–25 year-old trees, example: closed canopy & travel corridor < 10-m wide)
- 6) Natural (>50% wooded)/Rural (>50% agricultural land)/Mixed (primary land use is not wooded or agricultural)

*Clutter was characterized visually as an average cover of all strata for the forested area within the cone of reception for the bat detector microphone.

Where NLEB were captured, additional habitat data were collected: forest basal area (m²/ha) was assessed using a 10-factor prism and canopy cover was assessed using a sighting tube at 10 random locations within a 0.05-ha circular plot around each site (Cook et al. 1995, Ford et al. 2006).

2.2 Acoustic Surveys

Acoustic surveys were performed to help determine the presence and/or absence of NLEB and overall bat activity at the site. Bat detectors were deployed in high-quality foraging habitat near mist-net sites. Sites within suitable habitat were chosen by the permitted biologist and the physical location and orientation of each bat detector was determined in the field such that high quality recordings of bat calls could be obtained, following the guidelines in NCDOT's Standardization for NLEB Research (2016). For locations where acoustic survey work had previously occurred (Lee County Game Land, Chowan Swamp, and P3), Three Oaks used previous acoustic sites to the extent practicable, especially targeting sites where potential NLEB calls were recorded in 2015. Maps and shape files were provided for these sites by NCDOT.

An Anabat SD2 detector (Titley Electronics Pty. Ltd., Queensland, Australia) was deployed near each of the mist-net survey sites. A stainless-steel microphone was attached to the bat detector via a cable. The microphone was weatherproofed with a 1.5 inch PVC tube at a 45-degree bend, while the bat detector itself was placed in a Pelican case.

A second SD2 bat detector was usually deployed near the bat work-up station to record the calls of hand-released bats and as a back-up to the main bat detector. Bat detectors had been serviced within the last year to ensure they were functioning properly.

Acoustic survey locations were recorded using a handheld GPS unit. Bat detector microphones were placed at least 10 feet above the ground. Detectors ran nightly for approximately five hours starting before sunset. Three Oaks completed NCDOT acoustic data forms for all acoustic survey locations, and digital photographs were taken of each acoustic survey site and microphone placement (Appendix A). Each time a bat detector was deployed in the field or retrieved, verification was made that it was functioning by rubbing two fingers together in front of the microphone and listening to the bat detector to ensure the sound was picked up. Data were downloaded and reviewed daily to ensure that equipment was functioning properly.

Detector locations were selected in the field with the goal of being able to sample potential foraging habitat for determining probable presence or absence of NLEB. In general, the detector was placed to sample potential travel corridors and foraging areas such as dirt roads, utility corridors, or streams. The detector was placed away from mist-nets and work stations to avoid extraneous noise. Canopy gaps and smaller travel corridors were prioritized over larger flyways in an effort to capture the calls of forest interior species. Edge habitat was utilized only when other potential travel corridors were not available.

Where possible, detectors were placed to blend in with vegetative clutter and to listen out into a flyway. Microphones were at least five feet from vegetation or other obstructions, with minimal vegetation within 33 feet in front of the microphone.

Acoustic surveys were repeated if rainfall occurred for more than 30 minutes, wind speeds were sustained greater than nine miles/hour, or if equipment malfunctioned. The natural community type was determined per Schafale (2012) for each acoustic site (Table 1).

2.3 Acoustic Analysis

Acoustic data were processed through two acoustic autoclassifier programs approved in the 2016 Range-wide Indiana Bat Summer Survey Guidelines (USFWS 2016a): Echoclass version 3.1 and BatCall ID (BCID) version 2.7d. Default settings were used for both programs. Echoclass was operated using species set 1, which includes bat species occurring in North Carolina. BCID was operated using the same set of species. Call files identified as NLEB by both programs, and each file within five minutes prior to and five minutes after the NLEB files, were examined manually by an experienced bat biologist. For each file tentatively identified as a NLEB by the autoclassifier programs or by qualitative review, a rationale was provided in support of the manual identification and reported in Table 1. No filters were used for manual review of calls. When measuring slope and highest frequency for analyzing calls, the least fragmented pulses within a file were used.

A library of calls recorded from hand-released bats (captured during this project and elsewhere) was used as reference material, in addition to the call library provided by Titley Scientific. Representative sonograms of each file qualitatively determined to be a NLEB were prepared using screen shots to show call characteristics (Appendix B). Each screen shot is shown at two views: compressed with selected manual cleaning in order to isolate the most representative pulses for analysis, and uncompressed.

Species settings used for BCID and Echoclass processing included gray bat (*Myotis grisescens*), Indiana bat (*Myotis sodalis*), and small-footed bat (*Myotis leibii*). None of these species is known to occur in central or eastern North Carolina. Files attributed to these species by either autoclassifier were assumed to be false positives.

2.4 Mist-net Surveys

Surveys were conducted between May 9 and August 18, 2016. The most suitable mist-net sites for capturing NLEB within each location were selected in the field by Three Oaks' bat biologist, except in cases where sites had already been selected during the 2015 survey session by NCDOT contractors. Three Oaks first reviewed these previously selected sites to determine if they could be used again. Maps and shape files were provided for these previously selected sites from NCDOT. There were three locations (Howell Woods, Medoc Mountain State Park, and Roanoke River Game Land) where acoustic or mist-net surveys had not been conducted yet, so scouting was conducted to locate sites. A variety of community types were selected for sampling. Sites were recorded using a handheld GPS unit.

Three Oaks' bat biologist determined the location and number of nets to set per calendar night using best professional judgement. Net sites were placed in high quality foraging/roosting habitat within each study location. Digital photographs were taken showing each net set placement (Appendix C). Mist-net surveys followed methodologies as outlined by the USFWS 2016 Range-Wide Indiana Bat Summer Survey Guidelines (USFWS 2016a) and the NCDOT document, Standardization for NLEB Research (2016). Surveys were repeated if winds moved the nets more than 50 percent of the time, or if rain/fog persisted for 30 minutes or continued intermittently throughout the survey period. Mist-netting did not take place if ambient air temperatures fell below 50° Fahrenheit.

Nets were checked for bats every eight to ten minutes. Data (e.g., bat captures, weather, habitat type) were recorded on waterproof NCDOT mist-netting data sheets (Appendix C). For each bat capture, data collection included time of capture, species, age, sex, reproductive condition, weight, and right forearm length. All bats were banded with a uniquely-numbered Porzana band on the right forearm (males) or left forearm (females).

Nets remained open at least five hours a night unless the target species (NLEB) was captured. Netting and acoustic surveys were stopped at each location once a NLEB was captured. Prior to release, NLEB were photographed (Appendix D) following techniques provided in the USFWS 2016 Indiana bat survey guidelines, as were other *Myotis* species.

3.0 FINDINGS

3.1 Habitat Characterization

Natural community types at each mist-net site were as follows (communities may vary somewhat from acoustic survey sites):

1. Lee County Game Land
 - Site 1 - Piedmont Bottomland Forest (High Subtype)
 - Site 2 - Piedmont Alluvial Forest
 - Site 3 - Piedmont Alluvial Forest
 - Site 4 - Piedmont Bottomland Forest (Low Typic Subtype)
 2. Palmetto Peartree Preserve
 - Site 1* - Nonriverine Swamp Forest (Mixed subtype)
 - Site 2* - Nonriverine Swamp Forest (Mixed subtype)
 - Site 3* - Nonriverine Swamp Forest (Mixed subtype)
 - Site 5 - Nonriverine Swamp Forest (Sweetgum subtype)
 3. Howell Woods
 - Site 1 - Mesic Mixed Hardwood Forest
 - Site 2 - Piedmont Bottomland Forest (High Subtype)
 - Site 3 - Disturbed Pine Forest
 - Site 4 - Piedmont Bottomland Forest (Low Typic Subtype)
 4. Roanoke River Game Land
 - Site 1 - Brownwater Levee Forest (man-made)
 - Site 2 - Brownwater Levee Forest & Cypress Gum Swamp
 - Site 3 - Mesic Mixed Hardwood Forest (Coastal Plain Subtype)
 5. Chowan Swamp Game Land
 - Site 1b* Brownwater Bottomland Hardwoods (High Subtype)
 - Site 1b-NCDOT Mesic Mixed Hardwood Forest
 - Site 1b-3Oaks Brownwater Bottomland Hardwoods (High Subtype)
 - Site 2b* Mesic Mixed Hardwood Forest (Coastal Plain Subtype)
 6. Medoc Mountain State Park
 - Site 1 - Mesic Mixed Hardwood Forest (Piedmont Subtype)
 - Site 2 - Dry-mesic Oak-hickory Forest (Piedmont Subtype)
 - Site 3 - Mesic Mixed Hardwood Forest (Piedmont Subtype)
- *site numbering system follows survey work conducted in 2015

3.2 Acoustic Surveys

Acoustic recordings were collected on 36 calendar nights. Only two hours of recordings were made at Chowan Swamp Game Land on July 26th; the night ended early due to continuous fog. This night was made up at later date. Only 4.5 nights of survey work occurred at Roanoke River Game Land due to a NLEB capture on June 28th. An equipment failure with the primary bat detector occurred on June 22 (only a couple files were recorded). The recordings from the secondary bat detector were substituted on this night.

Note that two survey sites in Lee County (1 and 3) were located based on proximity to acoustic survey sites from in 2015; sites 1 and 3 were also selected due to access issues at gated game land property. The two sites, however, were later determined to be near, but not actually on, the Lee County Game Land.

Bat detectors were set at sensitivity level 7 whenever possible; however, at some sites the sensitivity had to be reduced due to excessive insect noise. The bat detector was occasionally moved from one night to another within a site; it was typically not moved more than 50 meters. Although clutter at each of the acoustic sites was rated as either high or medium, each site consisted of a forest opening or a gap beneath the forested canopy that would be suitable for a forest interior species to use as a flyway or foraging area. A comprehensive list of acoustic survey sites and relevant data is provided in Table 1 (organized chronologically). Data forms and photos for each acoustic set-up are provided in Appendix A.

3.3 Acoustic Analysis

Echoclass identified NLEB calls at each of the six locations surveyed. Chowan Swamp and Roanoke River Game Lands had the most NLEB files, according to Echoclass (100 and 50, respectively), while Palmetto Peartree had only one NLEB file attributed to it (note that in Echoclass, a single file is not allowed to determine presence). Overall, the main species identified was the eastern red bat (*Lasiurus borealis*), with a total of 1,014 files attributed to it. The species with the second most numerous call files identified was NLEB, with a total of 164 files. Eighteen nights were reported to have NLEB calls; 14 of those nights had an acceptable p value.

BCID identified NLEB calls at four of the six locations. Medoc Mountain State Park and Palmetto had no NLEB calls, while Lee County Game Land had only one NLEB file attributed to it. Chowan Swamp and Roanoke River Game Lands had the most NLEB files, according to BCID (23 and 19, respectively). Overall, the main species identified by BCID was the evening bat (*Nycticeius humeralis*), with a total of 413 files. The species with the second most numerous files was the eastern red bat, with a total of 352 files. Only 49 files were identified as NLEB calls. Fifteen nights were reported to have NLEB calls, but only five of those nights had an acceptable p value. Note that the Seminole bat (*Lasiurus seminolus*) is not included as a species in either Echoclass or BCID, so some calls attributed to red bats are likely to be from Seminoles.

During qualitative analysis, consistent spacing between pulses was used to identify feeding buzzes or the presence of a second bat. The characteristic slope of a file (S_c) was determined using multiple pulses and selecting the least fragmented pulses within a file; this measurement is useful for differentiating some *Myotis* calls. Differentiating NLEB calls from Southeastern bats (*Myotis austroriparius*) is a concern in eastern North Carolina. Southeastern bats can have highly variable calls; some pulses may have more than one break in slope (appearing somewhat sigmoidal), while other pulses in the same call sequence have no break at all. This variability was used to help distinguish the two species.

During the manual review of NLEB calls identified by both autotransformers, some files could not be ruled out as NLEB despite a preponderance of fragmented pulses; however, the level of confidence for identifying these calls was not high. Calls determined to be NLEB with a moderate level of confidence after manual review were based on seeing consistently steep,

nearly vertical pulses with little to no break in slope ($Sc > 200$ octaves per second), a consistent characteristic frequency (F_c), a downward toe for each pulse, and high frequencies over 100 kHz. All files deemed to be NLEB based on manual review were done so with a moderate level of confidence.

A higher level of confidence for the identification of NLEB calls could have been obtained if, in addition to the above characteristics, there was a long sequence of unfragmented pulses (10-20) with high frequencies well above 100 kHz and if the call appeared to be “quiet,” that is, the dots within each pulse were more widely spaced than for other species. NLEB are slow fliers so a long call sequence of pulses can be indicative of the species.

There were three locations where both autoclassifier programs identified the same files as NLEB: Chowan Swamp Game Land, Howell Woods, and Roanoke River Game Land. Fifteen files matched; however, after manual review, only three were determined to be NLEB. Manual review five minutes before and five minutes after the 15 matching files resulted in three additional files identified as NLEB, for a total of six NLEB files occurring across three nights (Table 1). Details of the qualitative analysis results are presented in Appendix B. Echoclass and BCID failed to agree about any potential NLEB calls at the Roanoke River Game Land site where a NLEB was captured.

Both autoclassifiers identified more Indiana bat calls than Southeastern bat calls. Since quite a few Southeastern bats were captured and no Indiana bats were captured, it appears that both programs have a difficult time distinguishing the two species. Some of this is to be expected, since the programs are intended to err on the conservative side when it comes to endangered species. Unfortunately, Echoclass only identified one file as a Southeastern bat, compared to 49 Indiana bat files; BCID identified 53 Southeastern bat files compared to 144 Indiana bats. More reliable results could be obtained from BCID if extralimital species such as Indiana bats were excluded from the program’s analysis. (Removing individual species is not possible in Echoclass.)

Table 1. Acoustic Site Summary

Loc.	Site No.	Lat, Long	Community Type	Date 2016	Start, End Times	Hours	Weather (low temp)	# MYSE Files & Autoclassifier	# MYSE Files Qualitative	Notes
Lee County Game Land	1	35.567319, -79.055681	Piedmont Bottomland Forest (High Subtype)	5/9	20:37 3:00	6.3	Humid 66° F	0 Echo 1 BCID		
				5/16	20:39 1:30	4.8	Partly cloudy 53° F	0 Echo 0 BCID		
	2	35.54944, -79.049173	Piedmont Alluvial Forest	5/10	20:30 1:30	5	Clear 59° F	0 Echo 0 BCID		
				5/11	20:30 1:30	5	Clear 60° F	2 Echo 0 BCID		
	3	35.558877, -79.054237	Piedmont Alluvial Forest	5/18	20:10 1:30	5.3	Cloudy 60° F	1 Echo 0 BCID		
4	35.555268, -79.042984	Piedmont Bottomland Forest (Typic Low Subtype)	5/19	20:40 1:40	5	Cloudy 58° F	0 Echo 0 BCID			
Palmetto Peartree Preserve	1*	35.984361, -76.072562	Nonriverine Swamp Forest (Mixed Subtype)	6/7	20:40 1:45	5	Clear 65° F	0 Echo 0 BCID		
				6/8	20:40 1:45	5	Clear 64.5° F	0 Echo 0 BCID		
	2*	35.971448, -76.052637	Nonriverine Swamp Forest (Mixed Subtype)	6/1	19:55 1:29	5.5	Humid 70.5° F	0 Echo 0 BCID		
				6/2	20:34 1:16	4.75	Humid 68.5° F	0 Echo 0 BCID		
	3*	35.985696, -76.145092	Nonriverine Swamp Forest (Mixed Subtype)	6/9	20:50 1:40	4.8	Humid 50.5° F	1 Echo 0 BCID		
5	35.904955, -76.054906	Non-riverine Swamp Forest (Sweetgum Subtype)	8/10	20:20 1:20	5	Breezy, humid 77° F	0 Echo 0 BCID			

Loc.	Site No.	Lat, Long	Community Type	Date 2016	Start, End Times	Hours	Weather (low temp)	# MYSE Files & Autoclassifier	# MYSE Files Qualitative	Notes
Howell Woods	1	35.361806, -78.298903	Mesic Mixed Hardwood Forest	6/20	20:00 1:30	5.5	Light breeze 74° F	2 Echo 3 BCID 1 match	3	Two additional NLEB files ID'd through manual review (in addition to autoclassifier match)
				6/21	20:00 1:30	5.5	Light breeze 74° F	0 Echo 2 BCID		
	2	35.361661, -78.300022	Piedmont Bottomland Forest (High Subtype)	6/20	20:00 1:30	5.5	Partly cloudy 68° F	1 Echo 1 BCID		
				6/21	20:00 1:30	5.5	Light breeze 68° F	5 Echo 0 BCID		
	3	35.365687, -78.304323	Disturbed Pine Forest	6/22	20:00 1:30	5.5	Partly cloudy 76° F	0 Echo 0 BCID		
	4	35.406496, -78.287498	Piedmont Bottomland Forest (Low Typic Subtype)	6/22	20:00 1:20	5.3	Partly cloudy 76° F	0 Echo 0 BCID		Equipment failure, used bat detector stationed at truck
Roanoke River Game Land	1	35.873365, -77.045230	Cypress Gum Swamp	6/14	20:25 1:25	5	Humid 70° F	14 Echo 9 BCID 3 matches	1	
				6/15	20:25 2:30	6	Humid 70° F	10 Echo 5 BCID 1 match		Rain at midnight
	2	35.864532, -77.043826	Cypress Gum Swamp	6/16	20:25 1:35	5.2	Humid 76° F	9 Echo 3 BCID 1 match		
				6/27	20:15 1:40	5.5	Humid 74° F	12 Echo 1 BCID 1 match		
	3	35.884420, -77.144520	Mesic Mixed Hardwood Forest (Coastal Plain Subtype)	6/28	20:15 23:40	3.5	Humid 74° F	5 Echo 1 BCID		Ended early due to NLEB capture, which was approximately 100m from the bat detector location.

Loc.	Site No.	Lat, Long	Community Type	Date 2016	Start, End Times	Hours	Weather (low temp)	# MYSE Files & Autoclassifier	# MYSE Files Qualitative	Notes
Chowan Swamp Game Land	1b*	36.457338, -76.995960	Brownwater Bottomland Hardwoods (High Subtype)	7/25	20:14 1:30	5.25	Humid 80° F	11 Echo 3 BCID		
				7/26	19:55 22:20	2.3	Fog 86° F	6 Echo 2 BCID		Ended early due to fog
				7/27	20:15 1:15	5	Humid 80° F	16 Echo 9 BCID 3 matches	2	Brief rain at 22:00; one additional MYSE file ID'd through manual review (in addition to autoclassifier matches)
	1b-NCDOT	36.454783, -76.998339	Mesic Mixed Hardwood Forest	8/9	19:45 1:30	5.75	Humid 74° F	0 Echo 1 BCID		
	1b-3Oaks	36.454783, -76.998339	Brownwater Bottomland Hardwoods (High Subtype)	8/9	20:25 1:25	5	Very humid 76° F	3 Echo 1 BCID 1 match		
	2b*	36.425296, -77.011617	Mesic Mixed Hardwood Forest (Coastal Plain Subtype)	7/28	19:50 1:15	5.5	Humid 79° F	63 Echo 5 BCID 3 matches		
8/8				20:15 1:15	5	Humid 72° F	1 Echo 2 BCID 1 match			
Medoc Mountain State Park	1	36.261006, -77.896599	Mesic Mixed Hardwood Forest (Piedmont Subtype)	8/2	20:15 1:15	5	Humid 75° F	2 Echo 0 BCID		
	2	36.260432, -77.891985	Mesic Mixed Hardwood Forest (Piedmont Subtype)	8/3	19:55 1:15	5.25	Humid 69° F	0 Echo 0 BCID		
				8/17	20:00 1:00	5	Humid 74° F	0 Echo 0 BCID		
				8/18	20:00 1:00	5	Humid 74° F	0 Echo 0 BCID		
	3	36.229661, -77.888681	Mesic Mixed Hardwood Forest (Piedmont Subtype)	8/15	19:50 1:00	5.2	Humid 78° F	0 Echo 0 BCID		
				8/16	19:50 1:00	5.2	Humid 78° F	0 Echo 0 BCID		

*numbering system follows survey work conducted in 2015

Descriptions of acoustic survey sites where the six NLEB files were recorded are as follows:

- **Chowan Swamp Game Land**, Site 1b, July 27, 2016. 36.457338°, -76.995960°. Mature Brownwater Bottomland Hardwoods (High Subtype); medium clutter; sensitivity 7. The bat detector was placed at the edge of a gravel road that cut through the forest. The microphone pointed north up the road toward the Meherrin River, which was a few hundred feet away. Based on qualitative analysis, two files were identified as NLEB, occurring within a few seconds of each other. (The second file was found through manual review.)
- **Howell Woods**, Site 1, June 20, 2016. 35.361806°, -78.298903°. Mesic Mixed Hardwood Forest, 20-30 years old; high clutter; sensitivity 7. The bat detector microphone was pointed down a trail that formed a tight funnel for a bat flyway; the trail led into another trail named Loblolly Lane. A mature bottomland hardwood forest was nearby. Three files were identified as NLEB after qualitative analysis, all occurring within a few minutes of each other. (Two of these files were found through manual review.)
- **Roanoke River Game Land**, Site 1 (River Road), June 14, 2016. 35.873365°, -77.045230°. Mature Cypress Gum Swamp; high clutter; sensitivity 7. The bat detector was placed a few dozen feet off a gravel road with the microphone pointed into an open understory within a swamp. The microphone was at least fifteen feet away from standing water. The site was north of a game land kiosk and not far from an eastern bend in the Roanoke River. One file was identified as NLEB after qualitative analysis.

Photographs of each site set-up are provided in Appendix A. Sonogram screen shots of manually vetted files are provided in Appendix B.

3.4 Mist-net Surveys

Thirty-five full nights of mist-netting were conducted, with three nights conducted by NCDOT staff (a thirty-sixth night of netting was not completed due to the capture of a NLEB on June 28th, at which point netting was concluded at the Roanoke River Game Land per the project scope). Netting was conducted from approximately 20:00 to 1:00 Eastern Daylight time. Weather conditions varied from clear to 100% overcast, while the nightly temperature ranged from 50.5-86° Fahrenheit.

Three or four nets were typically erected at each net site; most nets were stacked double-high or triple-high. Some nets were moved from one night to another within a site in order to sample an alternative fly-way. A summary of mist-netting captures is given in Table 2 (organized chronologically). One-hundred eighty-nine (189) bats were captured in total, representing nine species. Howell Woods was the location with the fewest bats captured (nine), while Chowan Swamp Game Land had the most (66). The most commonly captured species was the eastern red bat. One individual was captured for each of the two following species: NLEB and little brown bat (*Myotis lucifugus*). Only two tri-colored bats (*Perimyotis subflavus*) were captured. Captures per night ranged from zero to 26 bats. Data sheets and photos for each mist-net site are provided in Appendix C.

One bat observed during the survey, a big brown bat (*Eptesicus fuscus*) captured at Palmetto Peartree the night of June 8th, had a significant amount of scarring on its wings, which warranted a rating of two on the Reichard wing index score (2009). It is not known if this was due to WNS or some other cause. The bat was an adult male and appeared healthy otherwise.

The NLEB was captured on June 28th at Roanoke River Game Land in Martin County near the NCWRC depot. The bat was a juvenile male, which indicates that breeding occurred in the area. The bat's wing condition was rated as zero; forearm length was 37 mm; weight was 5.5g. The bat was banded on the right forearm with 3OAKSNC1337.

NLEB capture site:

Roanoke River Game Land, Site 3, 35.884044°, -77.144931°. Mature Mesic Mixed Hardwood Forest (Coastal Plain Subtype); high clutter. Two double-high nets, 6m and 9m, were set along a wooded gravel road running between forested habitat and agricultural land. The NLEB was captured in a third net, a 6m double-high placed across a small, unnamed stream running perpendicular to the road. Trees included tulip poplars (*Liriodendron tulipifera*), sweet gum (*Liquidambar styraciflua*), red maple (*Acer rubrum*), American elm (*Ulmus americana*), sycamore (*Platanus occidentalis*), loblolly pine, (*Pinus taeda*), beech (*Fagus grandifolia*), water oak (*Quercus nigra*), and Chinese privet (*Ligustrum sinense*). Basal area was 7 m²/ha; canopy coverage was 80.4%.

Table 1. Mist-netting Capture Summary

Loc	Site No.	Night	Date (2016)	CORA	EPFU	LABO	LASE	MYAU	MYSE	MYLU	NYHU	PESU	TOTAL	NOTES
Lee County Game Land	1	1	5/9			3							3	
		2	5/16			1							1	
	2	1	5/10			4							4	
		2	5/11			2							2	
	3	1	5/18										0	
4	1	5/19			3							3		
Palmetto Peartree Preserve	1*	1	6/7		2								2	
		2	6/8		1	2							3	EPFU with scarred wings
	2*	1	6/1			3							3	
		2	6/2		1						1		2	
	3*	1	6/9		1	2						1	4	
5	1	8/10	1	1	2							4		
Howell Woods	1	1	6/20	1				3					4	
		2	6/21					3					3	
	2	1	6/20			1		1					2	
		2	6/21										0	
	3	1	6/22										0	
4	1	6/22										0		
Roanoke River Game Land	1	1	6/14			1		6					7	
		2	6/15					10					10	Brief rain at midnight
	2	1	6/16		1	1		3					5	
		2	6/27		2			6			3	1	12	
	3	1	6/28	1		1		4	1				7	Ended early due to MYSE capture: juv male 3oaksnc1337
Chowan Swamp Game Land	1b*	1	7/25	1	6	7	11	1					26	
		2	7/26				3						3	Ended at 22:20 due to fog
		3	7/27		1		10	3					14	Brief rain at 22:00
	1b-3Oaks	1	8/9		2	2							4	
	1b-DOT	1	8/9		1			1					2	
	2b*	1	7/28	1	1		5							7
2		8/8			3	5							8	
Medoc Mtn. State Park	1	1	8/2			3							3	
		1	8/3			17				1	1		19	
	2	2	8/17				3	1					4	
		3	8/18			1	3						4	
	3	1	8/15		1	2	6						9	
2		8/16			2	3						5		
Totals				5	21	63	49	42	1	1	5	2	189	

*numbering system follows survey work conducted in 2015

4.0 INVESTIGATOR QUALIFICATIONS

Investigator:	Mary Frazer
Education:	M.E.M., Resource Ecology, Duke University B.S. Zoology, University of Wisconsin
Experience:	Environmental Specialist, Three Oaks Engineering, July 2015-present Environmental Program Consultant, NCDOT, 2000-2015 Environmental Specialist, Wisc. Coastal Mgt Program, 1996-2000 Water Regulation Specialist, Wisc. Dept Natural Resources, 1994-1996 Biologist, Soil and Environmental Consultants, 1992-1994
Permits:	NCWRC 16-ES0024 & 16-SC00161; USFWS TE54578B-0
Responsibilities:	Field survey, acoustic analysis, document preparation
Investigator:	Cheryl Gregory
Education:	M.S. Forestry, North Carolina State University B.S. Natural Resource Management & Ecology, Colorado State University
Experience:	Environmental Program Consultant, NCDOT, Raleigh, NC, 2014-present Environmental Specialist NCDWQ, Raleigh, NC, 2011-2013 Environmental Specialist, NCDOT, Raleigh, NC, 2003 - 2009
Expertise:	Section 7 field surveys & consultation, biotic community mapping and assessment, benthic macroinvertebrate collection, surface water identification & determinations, GIS mapping and technical report writing.
Responsibilities:	Field survey, oversight
Investigator:	Nathan Howell
Education:	B.S. Fisheries, Wildlife, and Conservation Biology, North Carolina State University, 2013 M.S. Plant and Microbial Biology, North Carolina State University, 2015
Experience:	Environmental Scientist, Three Oaks Engineering, 2015-Present
Internship:	Species Inventory, Monitoring, and Research in NC State Parks
Responsibilities:	Field survey, document preparation
Investigator:	Nancy Scott
Education:	M.E.M., Water Resources, Duke University, 2011 B.S. Environmental Science, University of Delaware, 2006
Experience:	Environmental Scientist, Three Oaks Engineering, 2015-Present Environmental Scientist, The Catena Group, 2012-2015
Responsibilities:	Field survey, document preparation
Investigator:	Hannah Slyce
Education:	B.S. Environmental Science, University of South Carolina, 2016
Experience:	Environmental Scientist, Three Oaks Engineering, May 2016- present
Responsibilities:	Field survey, document preparation

Investigator: Hayley Wood
Education: B.S. Earth and Environmental Sciences, University of North Carolina-Charlotte, 2017 (anticipated)
Experience: Natural Resources Assistant, Three Oaks Engineering, Summer 2016
Responsibilities: Field survey

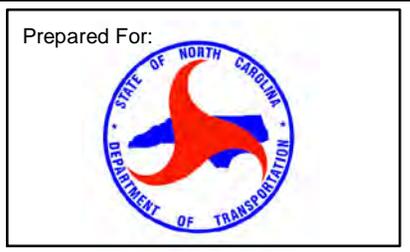
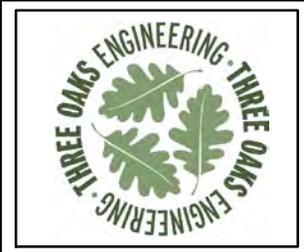
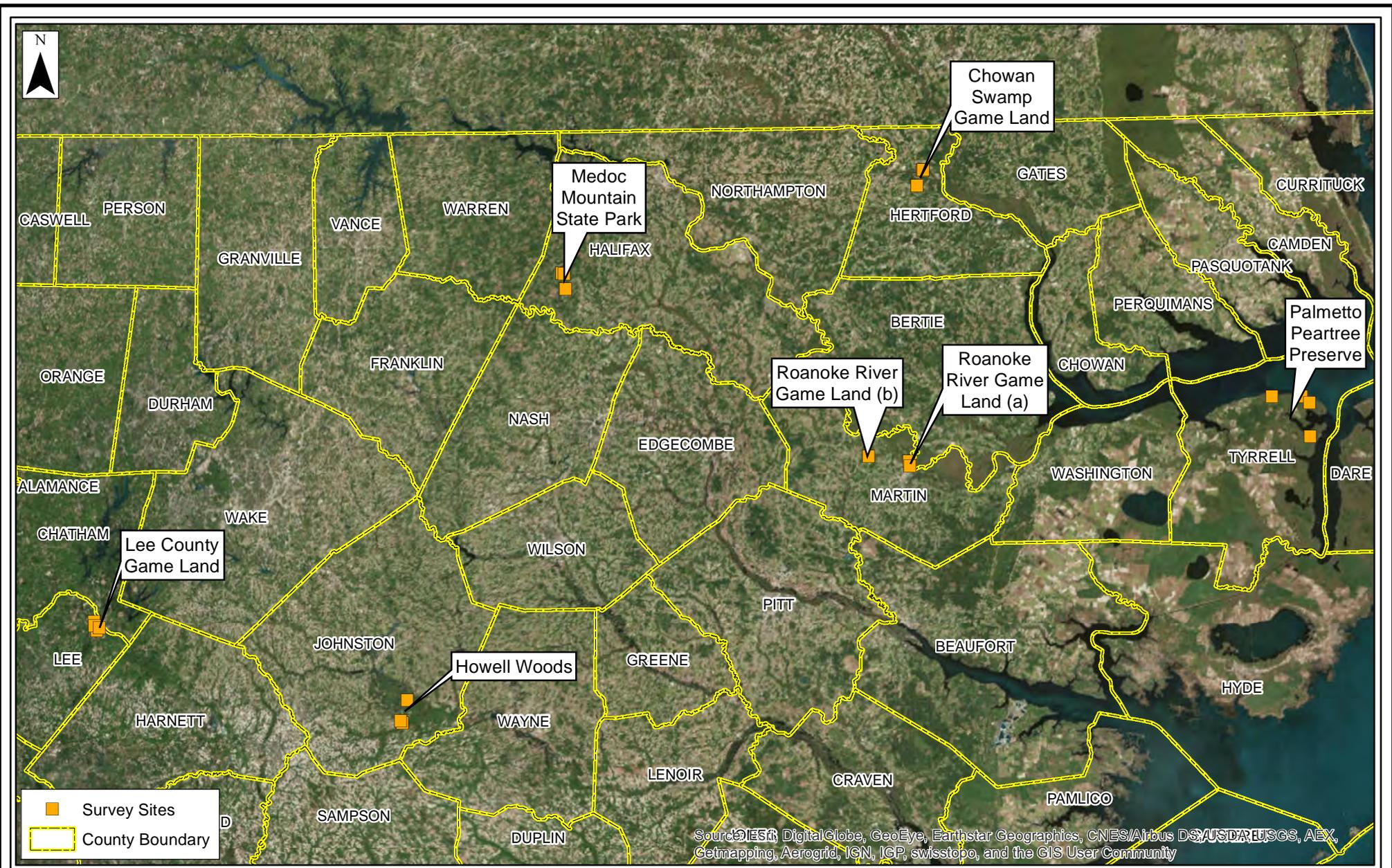
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FIGURES



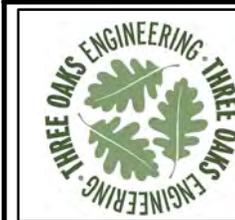
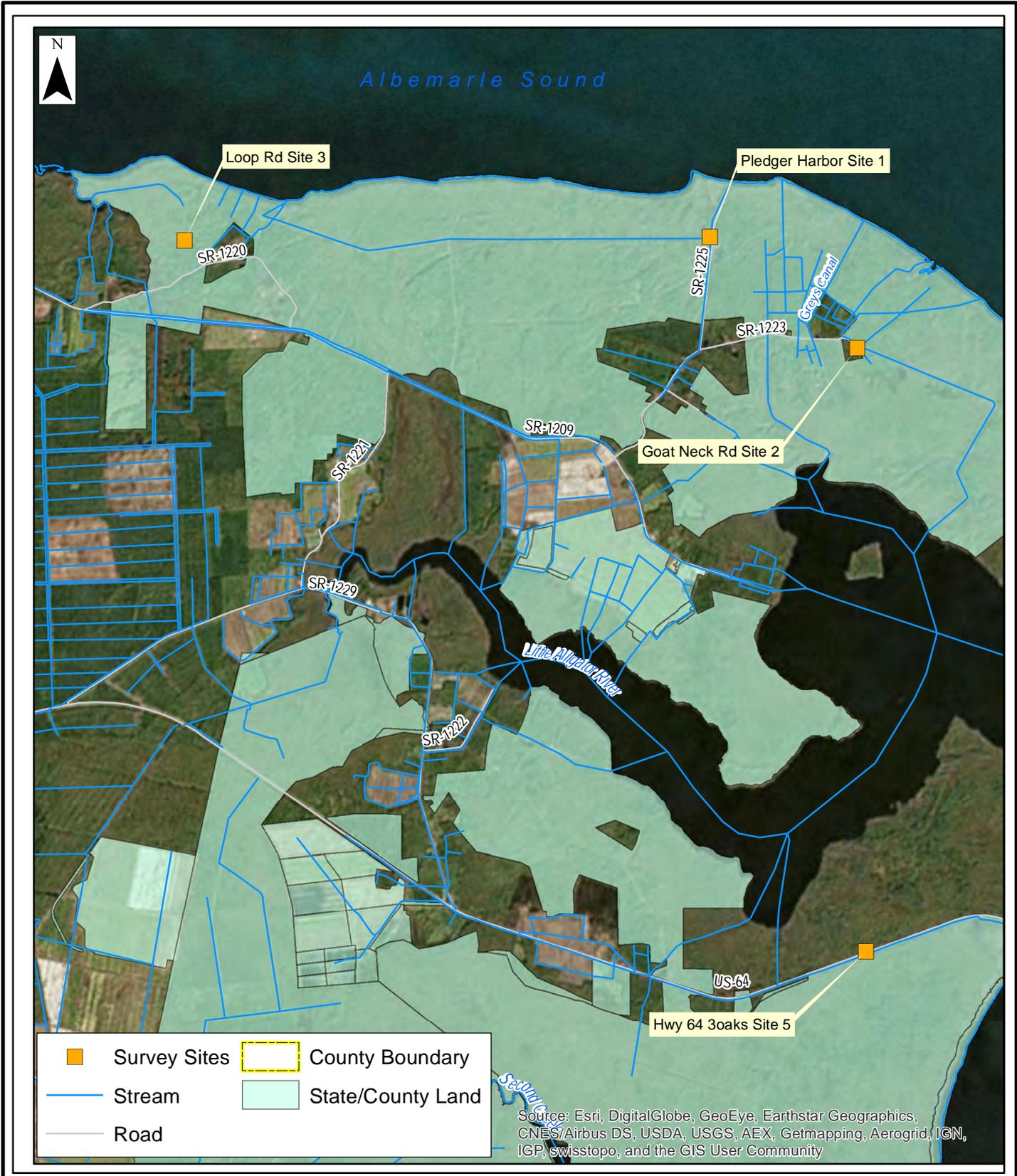
**Eastern North Carolina
Northern Long-eared Bat Research Project**

Mist Net/Acoustic Survey Locations

Lee, Halifax, Hertford, Tyrrell, Martin, & Johnston Counties,
North Carolina

Date:	October 2016
Scale:	0 5 10 Miles
Job No.:	16-309
Drawn By:	KS
Checked By:	MF

Figure
1



Eastern North Carolina
Northern Long-eared Bat
Research Project

Palmetto Peartree Preserve
Tyrrell County, North Carolina

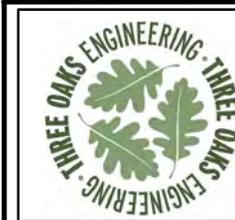
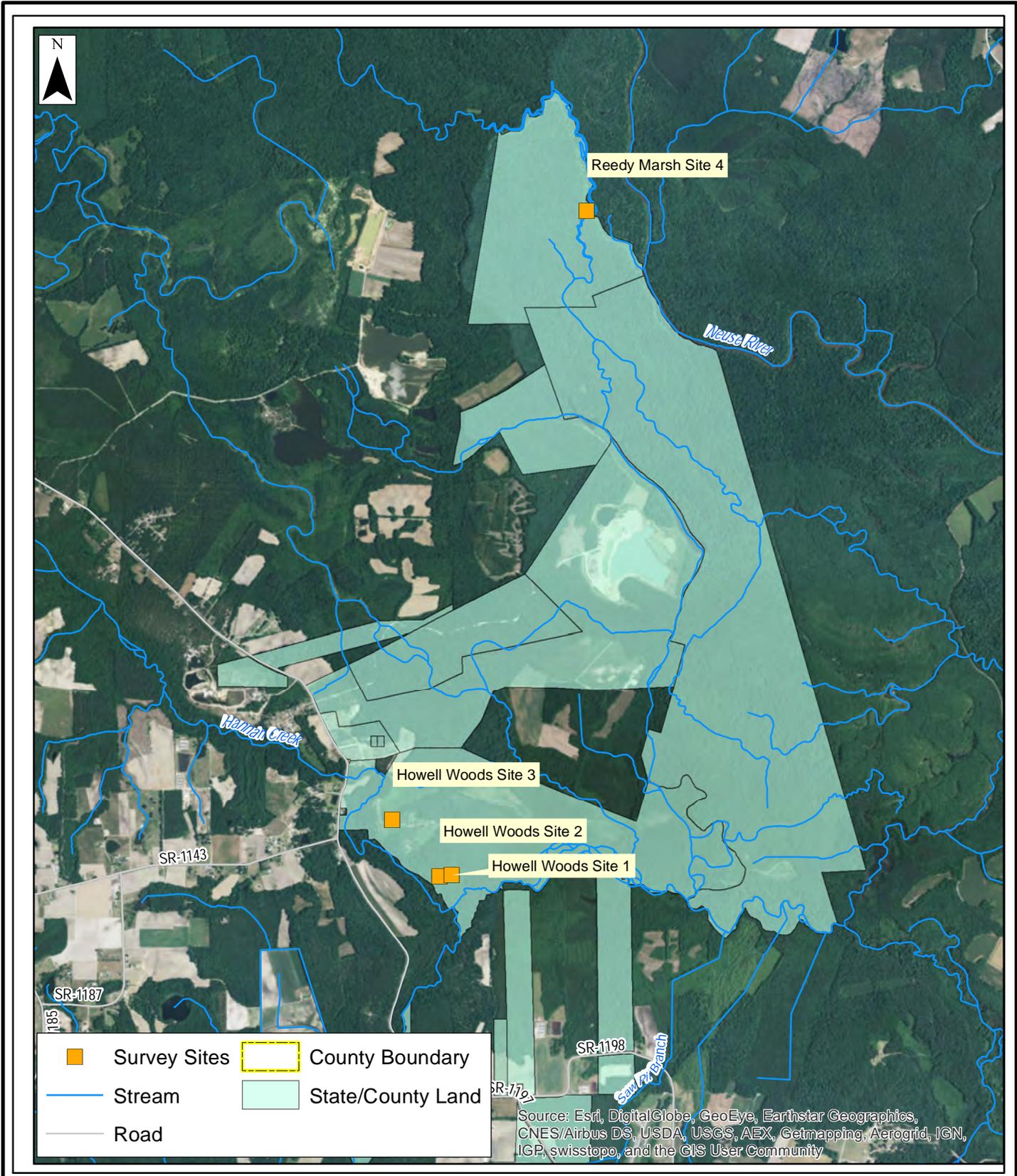
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Job No.: 16-309

Drawn By: KS Checked By: MF

Figure
1-2



Prepared For:

**Eastern North Carolina
Northern Long-eared Bat
Research Project**

Howell Woods
Johnston County, North Carolina

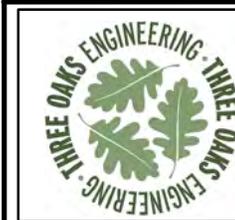
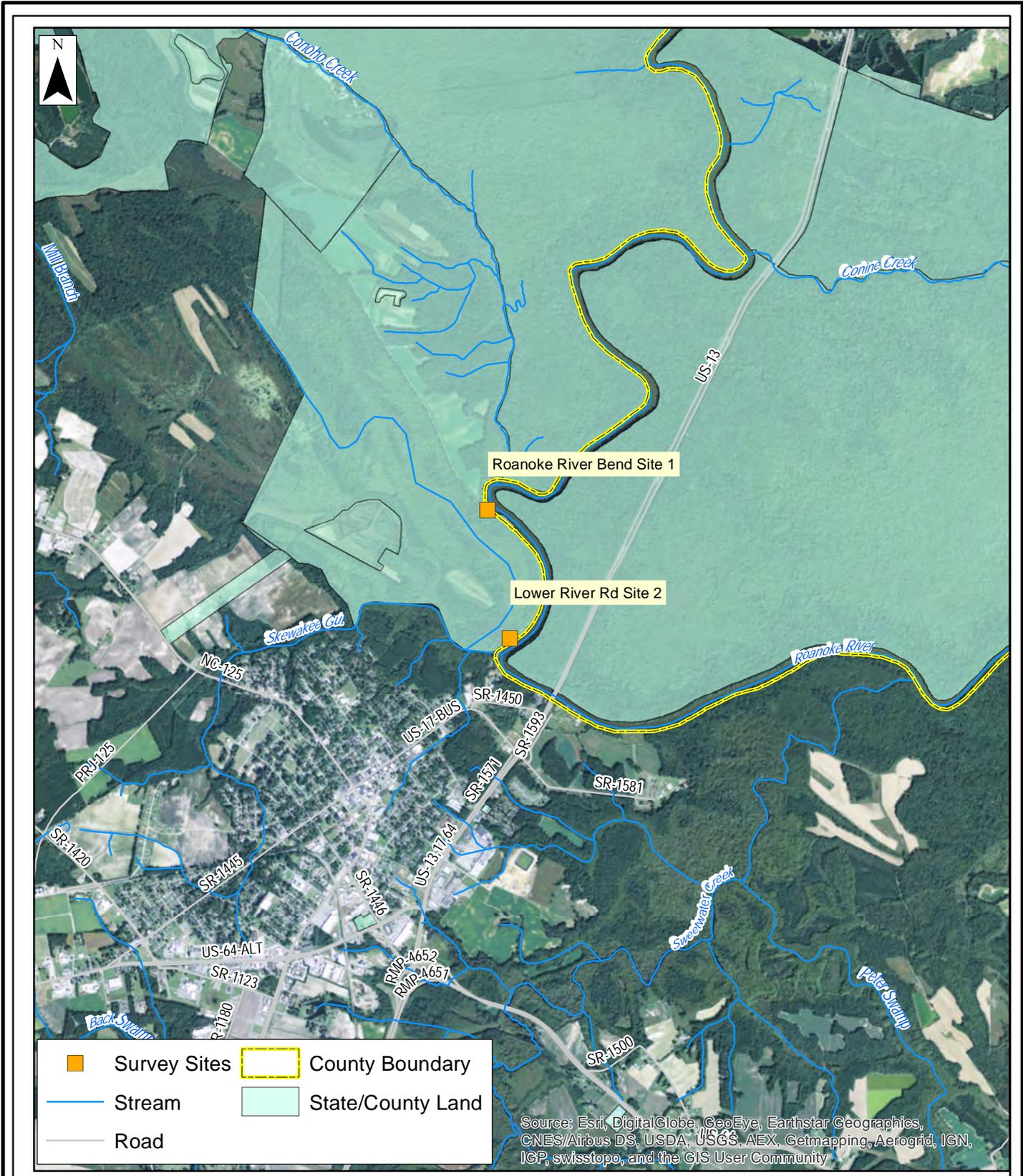
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Job No.: 16-309

Drawn By: KS Checked By: MF

Figure
1-3



**Eastern North Carolina
Northern Long-eared Bat
Research Project**

Roanoke River Game Land
Martin County, North Carolina

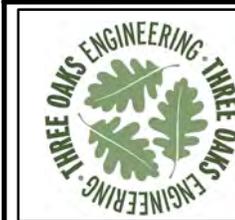
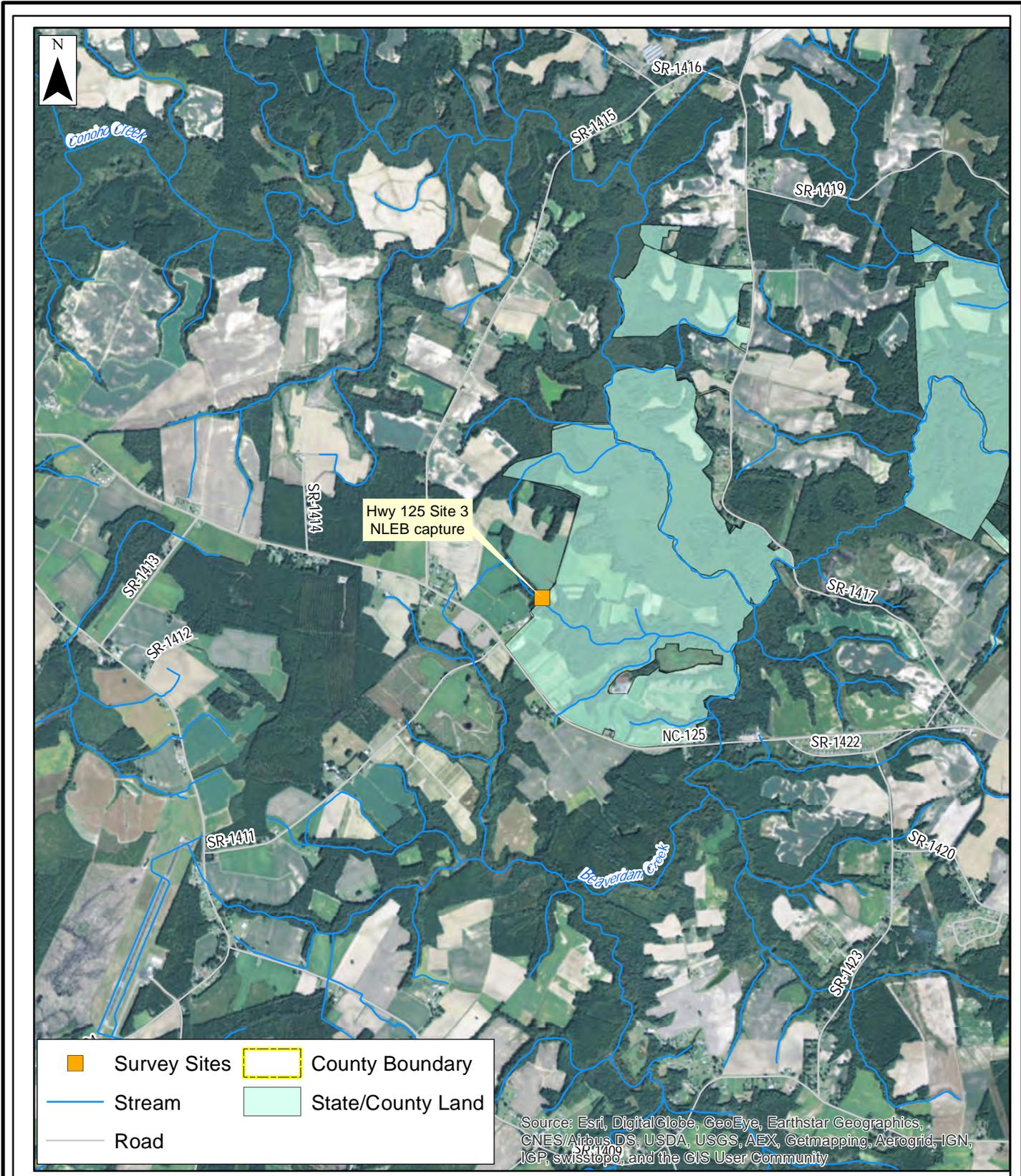
Date: October 2016

Scale: 0 1,000 2,000 Feet

Job No.: 16-309

Drawn By: KS Checked By: MF

Figure
1-4a



Prepared For:

**Eastern North Carolina
Northern Long-eared Bat
Research Project**

Roanoke River Game Land
Martin County, North Carolina

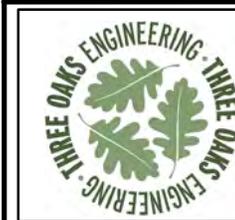
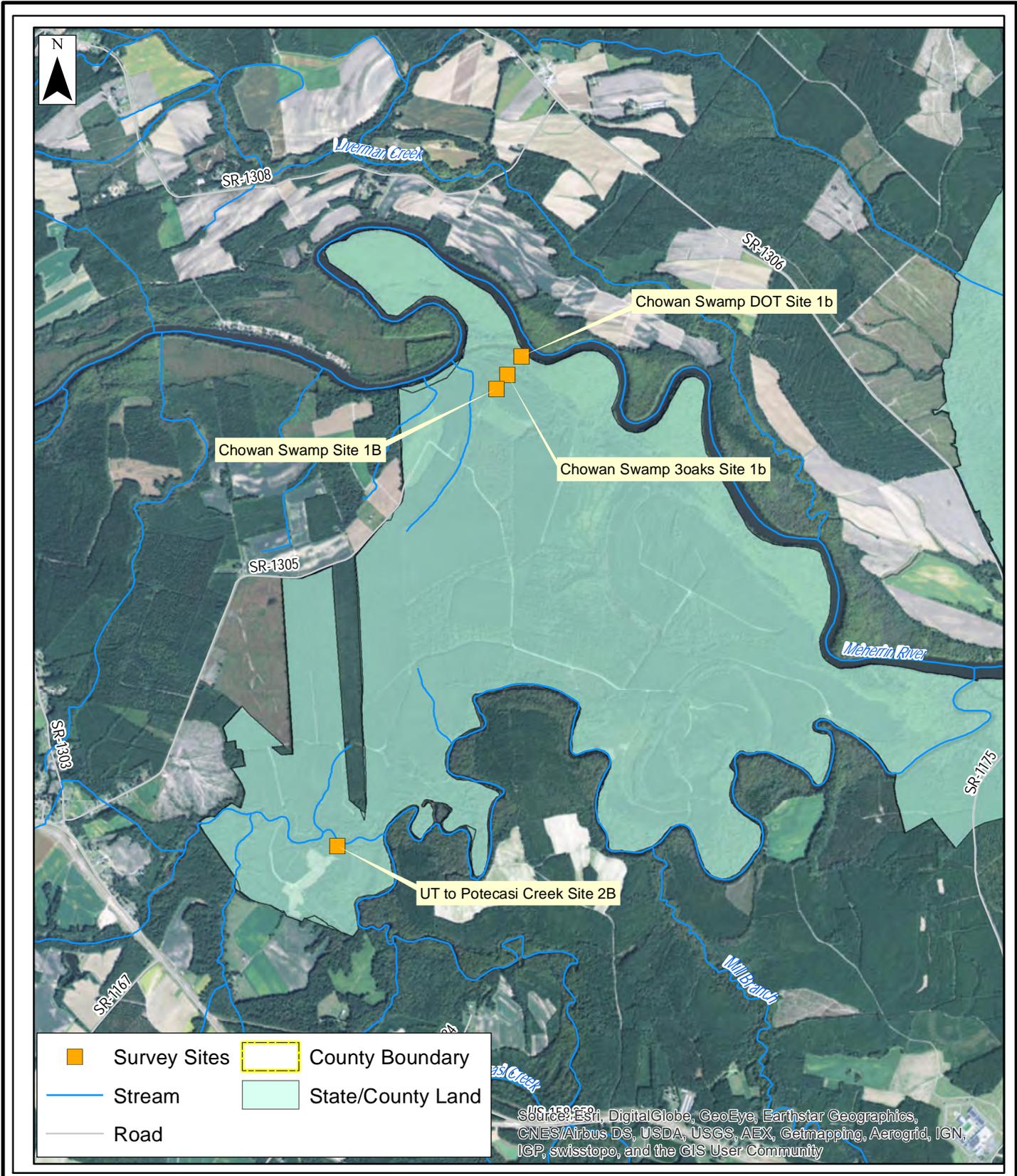
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Scale: 0 1,000 2,000 Feet

Job No.: 16-309

Drawn By: KS Checked By: MF

Figure
1-4b



Eastern North Carolina
Northern Long-eared Bat
Research Project

Chowan Swamp Game Land
Hertford County, North Carolina

Date: October 2016

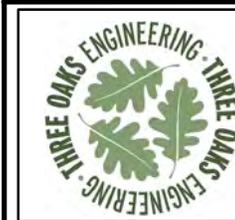
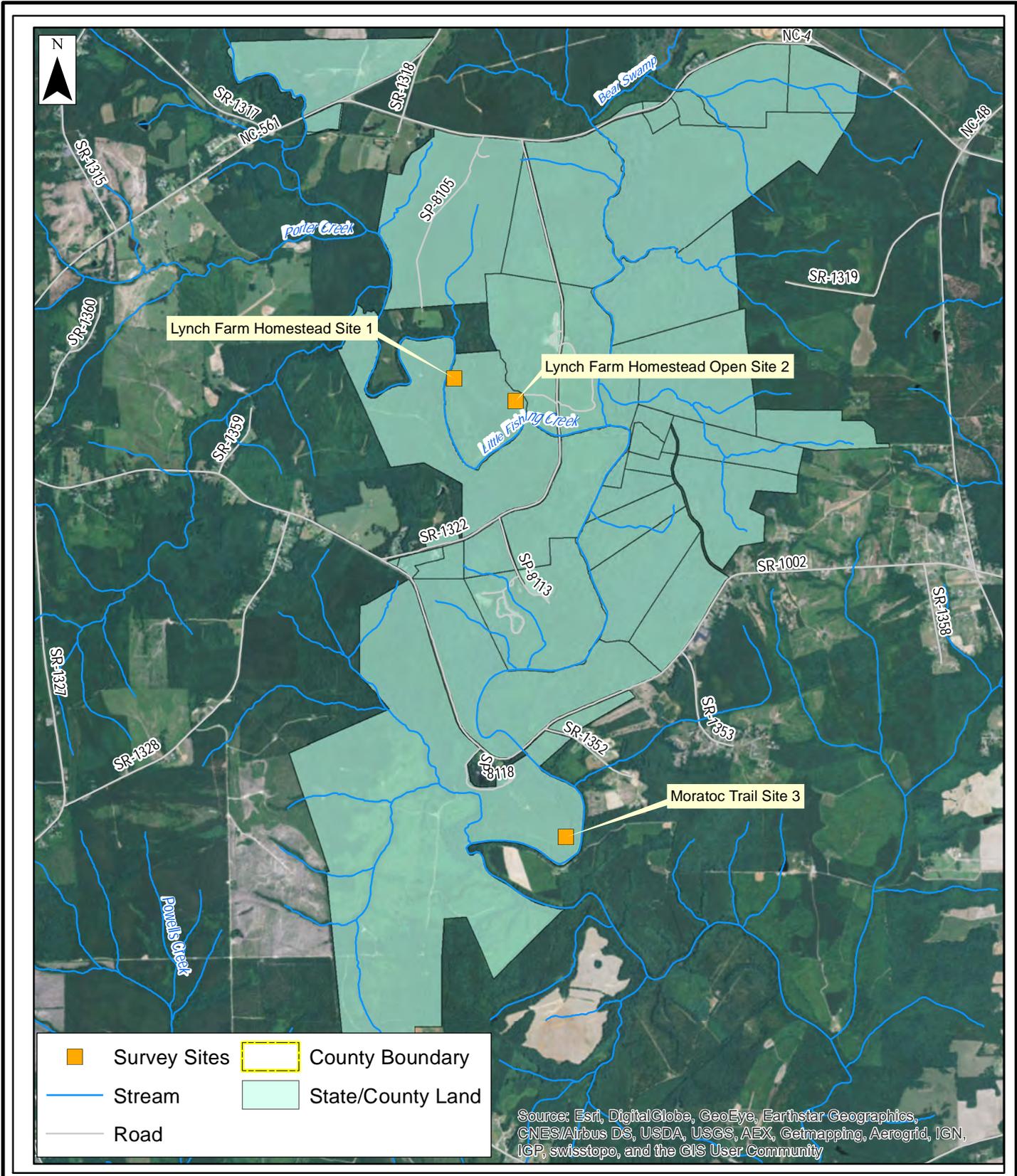
Scale: 0 1,000 2,000 Feet

Job No.: 16-309

Drawn By: KS

Checked By: MF

Figure
1-5



**Eastern North Carolina
 Northern Long-eared Bat
 Research Project**
 Medoc Mountain State Park
 Halifax County, North Carolina

Date:	October 2016
Scale:	0 950 1,900 Feet
Job No.:	16-309
Drawn By:	KS
Checked By:	MF

Figure
1-6

APPENDICES

Appendix A

Acoustic Data Forms and Photographs

NCDOT Acoustic Survey Data Form

Net Site #1

Lee Co. Game land

Project Name: ^{NLEB} Research		Proj #: R-9999	County: Lee	Site#: Acoustic: 1A	Night#: 1	Site Name: Lower River Rd @ LA					
Start Date: 5/9/16			End Date: 5/10/16		Start Time: 20:37		End Time: 3:00 AM				
Nearest town: Sanford			Biologists/observers Present: Frazer, Scott, Howell								
*Conditions:		Time 20:30	Temp 73°F	Wind none	Clouds partly	Precip/humidity -	Time 1:30 AM	Temp 66°F	Wind none	Clouds -	Precip/humidity humid
Moon Effect: none (waxing crescent)		Start: sunset	Land Use: Urban / Agriculture / Forest / Water / Wetland / Barren / Other (describe):								
		Stop: 22:30									
Bat Detector #	Detector make & model	Firmware	Mic type	Weather-proofing type	Latitude	Longitude	Elevation				
1	Kabat SD2	4062g	Steel	45 PVC							
Bat Detector #	Functioning of detector verified?	Mic direction (N/S/E/W)	Mic orientation (degree of angle)	Mic height	Clutter** no/lo/med/hi	Sensitivity /gain	Div ratio/trigger	Interval	Photo?		
1	yes	N	45° downward	10 ft	med	S - insect noise everywhere!			Y		
Habitat & Site Description: Opening created in forest for timber thinning.					<p>light drizzle began at 2:30 AM</p> <p>Piedmont Bottomland Forest</p> <p>Remarks: sensitivity turned up to 7 @ 22:05 due to lower insect noise</p> <p>see mist-netting sketch</p> <p>Site sketch (label to match BD# above)</p>						

* Weather: record conditions at end of sampling period & at the coldest point of the sampling period.

**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). Record clutter class estimates in a zone of 20 x 50 m in the direction that the microphone is pointed.

Habitat Info – please circle the option that best fits

Pine / hardwood / mixed / unforested

Upland / bottomland on the edge between upl / bottomland

Managed (thinned, burned, pine plantation or otherwise disturbed) / unmanaged - only partial thinning in areas. Mostly unmanaged.

Mature forest / <20 years old forest or cutover

Clutter

(1) sparse/no, < 10% cover (ex: open for 40m in all directions)

(2) low, 10–39% cover (low clutter stands typically contain <6 or >95 year old trees, ex: microphone pointed outward from edge habitat)

(3) medium, 40–75% cover (medium clutter stands typically contain 70–100 year old trees, ex: at least 10-m wide travel corridor, fairly open above)

(4) high, > 75% cover (high clutter stands typically contain 10–25 year old trees, ex: closed canopy & travel corridor < 10-m wide)

Natural (>50% wooded), rural (>50% agricultural land)/mixed (primary land use is not wooded or agricultural)

Habitat Notes:

NCDOT Acoustic Survey Data Form

Project Name: MLEB Research		Proj #: R-9999	County: Lee	Site#: A B	Night#: 2	Site Name: Lower River Rd @ RR tracks					
Start Date: 5/16/16			End Date: 5/17/16		Start Time: 8:39 pm		End Time: 1:30 AM				
Nearest town: Sanford		Biologists/observers Present: M. Frizer, H Wood									
*Conditions:		Time 9:40 AM	Temp 61°F	Wind 1 mph	Clouds overcast	Precip/humidity none	Time 01:30 AM	Temp 53°F	Wind —	Clouds clear	Precip/humidity none
Moon Effect: half moon (1st quarter) — not on bat detector		Start: sunset	Stop: —	Land Use: Urban / Agriculture / <u>Forest</u> / Water / Wetland / Barren / Other (describe): canopy gaps (thin) in bottomland forest							
Bat Detector #	Detector make & model	Firmware	Mic type	Weather-proofing type	Latitude	Longitude	Elevation				
1	Anabat SD2	4002g	steel	45 PVC							
Bat Detector #	Functioning of detector verified?	Mic direction (N/S/E/W)	Mic orientation (degree of angle)	Mic height	Clutter** no/lo/med/hi	Sensitivity /gain	Div ratio/trigger	Interval	Photo?		
1	Y	S	45° down	10 ft	med	7	—	—	Y		
Habitat & Site Description: See night #1			<p>Site sketch (label to match BD# above)</p>								
Predmont bottomland forest											
Remarks: insect noise not as bad as night 1											

* Weather: record conditions at end of sampling period & at the coldest point of the sampling period.
 **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). Record clutter class estimates in a zone of 20 × 50 m in the direction that the microphone is pointed.

Habitat Info – please circle the option that best fits

Pine / hardwood / mixed / unforested

Upland / bottomland

Managed (partially thinned (patches) / thinned, burned, pine plantation or otherwise disturbed) / unmanaged

Mature forest / <20 years old forest or cutover

Clutter

(1) sparse/no, < 10% cover (ex: open for 40m in all directions)

(2) low, 10–39% cover (low clutter stands typically contain <6 or >95 year old trees, ex: microphone pointed outward from edge habitat)

(3) medium, 40–75% cover (medium clutter stands typically contain 70–100 year old trees, ex: at least 10-m wide travel corridor, fairly open above)

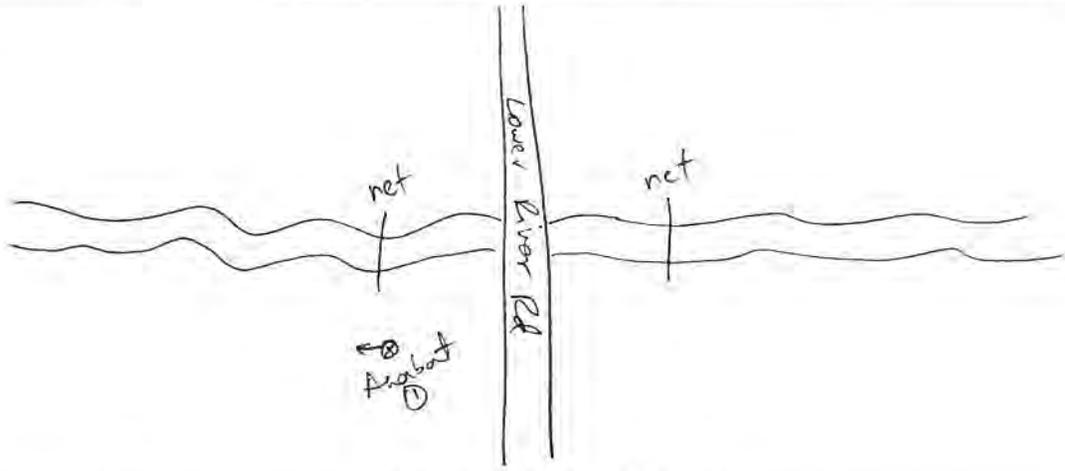
(4) high, > 75% cover (high clutter stands typically contain 10–25 year old trees, ex: closed canopy & travel corridor < 10-m wide)

Natural (>50% wooded), rural (>50% agricultural land) / mixed (primary land use is not wooded or agricultural)

Habitat Notes: see night 1

NCDOT Acoustic Survey Data Form

Net Site# 2

Project Name: <i>NLEB Research</i>		Proj #: <i>R-9999</i>		County: <i>Lee</i>		Site#: <i>Acoustic 2 ZA</i>		Night#: <i>1</i>		Site Name: <i>Trib. to S. Lick creek</i>	
Start Date: <i>5/10/16</i>				End Date: <i>5/11/16</i>				Start Time: <i>8:30 pm</i>		End Time: <i>1:30 AM</i>	
Nearest town: <i>Somford</i>			Biologists/observers Present: <i>M. Frazer, M. Scott, M. Howell</i>								
*Conditions:		Time: <i>8:30 PM</i>	Temp: <i>67°F</i>	Wind: <i>brly noticeable</i>	Clouds: <i>clear</i>	Precip/humidity: <i>-</i>	Time: <i>1:15 AM</i>	Temp: <i>59°F</i>	Wind: <i>-</i>	Clouds: <i>clear</i>	Precip/humidity: <i>-</i>
Moon Effect: <i>sliver (waxing crescent) no effect</i>		Start: <i>sun set</i> Stop: <i>10:50</i>		Land Use: <i>Urban / Agriculture / Forest / Water / Wetland / Barren / Other (describe): Bottomland hardwood adjacent to creek</i>							
Bat Detector #	Detector make & model	Firmware	Mic type	Weather-proofing type	Latitude	Longitude	Elevation				
<i>1</i>	<i>Titlag SD2</i>	<i>4062g</i>	<i>steel</i>	<i>45° PVC</i>							
Bat Detector #	Functioning of detector verified?	Mic direction (N/S/E/W)	Mic orientation (degree of angle)	Mic height	Clutter** (no/lo/med/hi)	Sensitivity /gain	Div ratio/trigger	Interval	Photo?		
<i>1</i>	<i>Y</i>		<i>45° down</i>	<i>10 ft</i>	<i>high</i>	<i>7</i>					
Habitat & Site Description: <i>old, short jeep track cut through bottomland forest adjacent to creek. Under canopy.</i>											
<i>Piedmont bottomland Forest</i>											
Remarks: <i>leaky duds</i>											
<i>detector 2 on hood of truck pointing straight up</i>					Site sketch (label to match BD# above)						

* Weather: record conditions at end of sampling period & at the coldest point of the sampling period.
 **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). Record clutter class estimates in a zone of 20 x 50 m in the direction that the microphone is pointed.

Habitat Info – please circle the option that best fits

Pine ~~(hardwood)~~ mixed / unforested

Upland ~~(bottomland)~~

Managed (thinned, burned, pine plantation or otherwise disturbed) ~~(unmanaged)~~

~~(Mature forest)~~ <20 years old forest or cutover

Clutter

(1) sparse/no, < 10% cover (ex: open for 40m in all directions)

(2) low, 10–39% cover (low clutter stands typically contain <6 or >95 year old trees, ex: microphone pointed outward from edge habitat)

(3) medium, 40–75% cover (medium clutter stands typically contain 70–100 year old trees, ex: at least 10-m wide travel corridor, fairly open above)

~~(4)~~ high, > 75% cover (high clutter stands typically contain 10–25 year old trees, ex: closed canopy & travel corridor < 10-m wide)

~~(Natural)~~ (>50% wooded), rural (>50% agricultural land)/mixed (primary land use is not wooded or agricultural)

Habitat Notes:

Old deep track ~ 8m wide, under canopy, but provides a defined flyway.

NCDOT Acoustic Survey Data Form

Net Site # 2

Project Name: NLEB Research		Proj #: R-9999		County: Lee		Site#: Acoustic 2		Night#: 1		Site Name: UT to Lick Creek	
Start Date: 8:30 PM 5/11/16			End Date: 5/12/16			Start Time: 8:30 PM			End Time: 01:30 am		
Nearest town: Sanford			Biologists/observers Present: Frazer, Scott, Howell								
*Conditions:		Time: 8:50 PM	Temp: 70°F	Wind: -	Clouds: clear	Precip/humidity: low	Time: 1:20 AM	Temp: 60°F	Wind: -	Clouds: clear	Precip/humidity: low
Moon Effect: sliver moon, not on Anabat (waxing crescent)		Start: sunset	Stop: 11:15 PM	Land Use: Urban / Agriculture / Forest / <u>Water</u> / Wetland / Barren / Other (describe): Creek in bottom land hard wood							
Bat Detector #	Detector make & model	Firmware	Mic type	Weather-proofing type	Latitude	Longitude	Elevation				
1	Titley SD2	4002g	steel	45° PVC							
Bat Detector #	Functioning of detector verified?	Mic direction (N/S/E/W)	Mic orientation (degree of angle)	Mic height	Clutter** (no/lo/med/hi)	Sensitivity /gain	Div ratio/trigger	Interval	Photo?		
1	Y	NNE	45° down	10 ft	high	7	-	-	Y		
Habitat & Site Description:					<p>Detector in canopy gaps at creek, set back 10-12 ft from water</p> <p>Piedmont Bottomland Forest</p> <p>Remarks:</p> <p>Anabat 2 on truck hood pointing straight up</p> <p style="text-align: right;">see sketch from net data form Site sketch (label to match BD# above)</p>						

* Weather: record conditions at end of sampling period & at the coldest point of the sampling period.

**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). Record clutter class estimates in a zone of 20 x 50 m in the direction that the microphone is pointed.

Habitat Info – please circle the option that best fits

Pine / hardwood / mixed / unforested

Upland / bottomland

Managed (thinned, burned, pine plantation or otherwise disturbed) / unmanaged

Mature forest / <20 years old forest or cutover

Clutter

(1) sparse/no, < 10% cover (ex: open for 40m in all directions)

(2) low, 10–39% cover (low clutter stands typically contain <6 or >95 year old trees, ex: microphone pointed outward from edge habitat)

(3) medium, 40–75% cover (medium clutter stands typically contain 70–100 year old trees, ex: at least 10-m wide travel corridor, fairly open above)

(4) high, > 75% cover (high clutter stands typically contain 10–25 year old trees, ex: closed canopy & travel corridor < 10-m wide)

Natural (>50% wooded), rural (>50% agricultural land)/mixed (primary land use is not wooded or agricultural)

Habitat Notes:

NCDOT Acoustic Survey Data Form

Project Name: <i>WLEB Research</i>	Proj #: <i>R-9999</i>	County: <i>Lee</i>	Site#: <i>3</i>	Night#: <i>1</i>	Site Name: <i>Lick Creek</i>					
Start Date: <i>5/18/16</i>	End Date: <i>5/19/16</i>	Start Time: <i>~ 8:10 pm</i>	End Time: <i>1:30 AM</i>							
Nearest town: <i>Sanford</i>	Biologists/observers Present: <i>M. Frazer, G. Jordan, N. Howell, H. Wood</i>									
*Conditions:	Time: <i>9:18 PM</i>	Temp: <i>59°F</i>	Wind: <i>—</i>	Clouds: <i>cloudy</i>	Precip/humidity: <i>humid</i>	Time: <i>1:22 AM</i>	Temp: <i>60°F</i>	Wind: <i>—</i>	Clouds: <i>cloudy</i>	Precip/humidity: <i>low</i>

Moon Effect: *none* Start: *—* Stop: *—* Land Use: Urban / Agriculture / ~~Forest~~ / ~~Water~~ / Wetland / Barren / Other (describe):

Bat Detector #	Detector make & model	Firmware	Mic type	Weather-proofing type	Latitude	Longitude	Elevation
<i>1</i>	<i>Anabat SD2</i>	<i>40v2g</i>	<i>steel</i>	<i>75° PVC</i>			

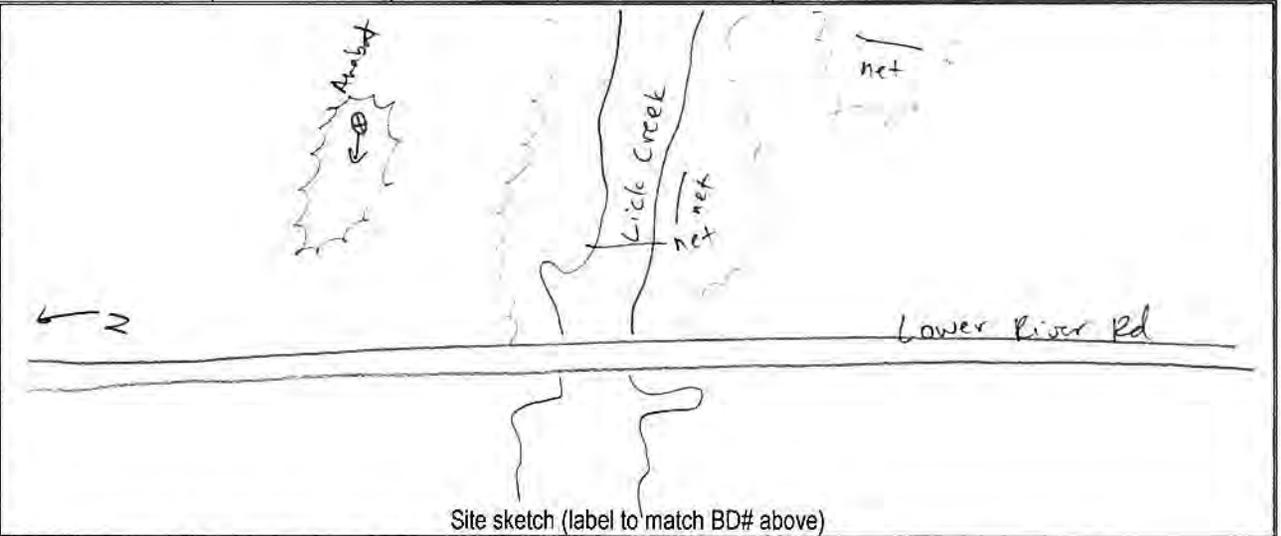
Bat Detector #	Functioning of detector verified?	Mic direction (N/S/E/W)	Mic orientation (degree of angle)	Mic height	Clutter** (no/lo/med/hi)	Sensitivity /gain	Div ratio/trigger	Interval	Photo?
<i>1</i>	<i>Y</i>	<i>W</i>	<i>45° down</i>	<i>10 ft</i>	<i>high</i>	<i>7</i>	<i>—</i>	<i>—</i>	<i>Y</i>

Habitat & Site Description:

See net data sheet

Diedmont Alluvial Forest

Remarks:



* Weather: record conditions at end of sampling period & at the coldest point of the sampling period.
 **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). Record clutter class estimates in a zone of 20 x 50 m in the direction that the microphone is pointed.

AAA tree clutter

Habitat Info – please circle the option that best fits

Pine / hardwood / mixed / unforested

Upland / bottomland

Managed (thinned, burned, pine plantation or otherwise disturbed) / unmanaged

Mature forest / <20 years old forest or cutover

Clutter

(1) sparse/no, < 10% cover (ex: open for 40m in all directions)

(2) low, 10–39% cover (low clutter stands typically contain <6 or >95 year old trees, ex: microphone pointed outward from edge habitat)

(3) medium, 40–75% cover (medium clutter stands typically contain 70–100 year old trees, ex: at least 10-m wide travel corridor, fairly open above)

(4) high, > 75% cover (high clutter stands typically contain 10–25 year old trees, ex: closed canopy & travel corridor < 10-m wide)

Natural (>50% wooded), rural (>50% agricultural land)/mixed (primary land use is not wooded or agricultural)

Habitat Notes: *Mixed-age, mature flood plain forest*

NCDOT Acoustic Survey Data Form

Project Name: <i>NLEB Research</i>		Proj #: <i>2-9999</i>	County: <i>Lee</i>	Site#: <i>4</i>	Night#: <i>1</i>	Site Name: <i>Game Land Interior</i>					
Start Date: <i>5/19/16</i>			End Date: <i>5/20/16</i>		Start Time: <i>20:40</i>		End Time: <i>1:40</i>				
Nearest town: <i>Sanford</i>			Biologists/observers Present: <i>M. Frazer, N. Scott, H. Wood</i>								
*Conditions:		Time: <i>21:50</i>	Temp: <i>59°F</i>	Wind: <i>—</i>	Clouds: <i>overcast</i>	Precip/humidity: <i>humid</i>	Time: <i>1:30</i>	Temp: <i>58°F</i>	Wind: <i>light</i>	Clouds: <i>cloudy</i>	Precip/humidity: <i>humid</i>
Moon Effect: <i>—</i>		Start: <i>—</i>	Land Use: Urban / Agriculture / Forest Water / Wetland / Barren/ Other (describe): <i>Mostly ~25% o. managed loblolly forest w/ patches of bottomland hardwood.</i>								
Bat Detector #		Detector make & model		Firmware	Mic type	Weather-proofing type		Latitude	Longitude	Elevation	
<i>1</i>		<i>Anabat SD2</i>		<i>4062g</i>	<i>steel</i>	<i>45° pvc</i>					
Bat Detector #		Functioning of detector verified?	Mic direction (N/S/E/W)	Mic orientation (degree of angle)	Mic height	Clutter** no/lo/med/hi	Sensitivity /gain	Div ratio/trigger	Interval	Photo?	
<i>1</i>		<i>Y</i>	<i>NW</i>	<i>45° down</i>	<i>10 ft</i>	<i>med</i>	<i>7</i>	<i>—</i>	<i>—</i>	<i>✓</i>	
Habitat & Site Description:		<i>See mist net data form.</i>									
		<i>Piedmont Bottomland Forest</i>									
Remarks:		<i>Rain during the day; humid & 100% overcast. Light mist @ midnight.</i>									
		<p>The sketch shows a detector labeled 'Anabat' positioned near a river. A road labeled 'to Lower River Rd' is to the north, and the river is to the south. Three mist nets are indicated by lines labeled 'net'. A north arrow is also present.</p>									

* Weather: record conditions at end of sampling period & at the coldest point of the sampling period.

**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). Record clutter class estimates in a zone of 20 x 50 m in the direction that the microphone is pointed.

Habitat Info – please circle the option that best fits

Pine / hardwood / mixed / unforested

Upland / bottomland

Managed (thinned, burned, pine plantation or otherwise disturbed) / unmanaged *Some patches of unmanaged forest*

Mature forest / <20 years old forest or cutover *- a few older patches*

Clutter

(1) sparse/no, < 10% cover (ex: open for 40m in all directions)

(2) low, 10–39% cover (low clutter stands typically contain <6 or >95 year old trees, ex: microphone pointed outward from edge habitat)

(3) medium, 40–75% cover (medium clutter stands typically contain 70–100 year old trees, ex: at least 10-m wide travel corridor, fairly open above)

(4) high, > 75% cover (high clutter stands typically contain 10–25 year old trees, ex: closed canopy & travel corridor < 10-m wide)

Natural (>50% wooded), rural (>50% agricultural land)/mixed (primary land use is not wooded or agricultural)

Habitat Notes:

NCDOT Acoustic Survey Data Form

P3

two nights

Project Name: NLEB Research		Proj #: R-9999		County: Tyrell		Site#: 1		Night#: 1 & 2		Site Name: Pledger Harbor Rd	
Start Date: 6/7/16				End Date: 6/9/16				Start Time: 20:40		End Time: 01:45	
Nearest town: Columbia			Biologists/observers Present: Frazer, Scott, H. Wood, ^{coldest temp of both nights}								
*Conditions:		Time: 21:00	Temp: 82°F	Wind: —	Clouds: —	Precip/humidity: low	Time: 01:47	Temp: 64.5°	Wind: —	Clouds: —	Precip/humidity: moderate
Moon Effect: low crescent moon - no effect		Start: sunset	Stop: 22:20	Land Use: Urban / Agriculture / <u>Forest / Water</u> / Wetland / Barren / Other (describe): Flooded pine forest w/ short maintenance road							
Bat Detector #	Detector make & model	Firmware	Mic type	Weather-proofing type	Latitude	Longitude	Elevation				
1	Anabat SD2	40629	steel	45° PVC							
Bat Detector #	Functioning of detector verified?	Mic direction (N/S/E/W)	Mic orientation (degree of angle)	Mic height	Clutter** (no/lo/med/hi)	Sensitivity /gain	Div ratio/trigger	Interval	Photo?		
1	Y	SW	45° down	12 ft	high	7	—	—	Y		
Habitat & Site Description: open canopy & dense understory of saplings, phragmites, etc. See netting data sheet				<p>Site sketch (label to match BD# above)</p>							
Remarks: green tree frogs early in evening, cricket frogs later.											

* Weather: record conditions at end of sampling period & at the coldest point of the sampling period.

**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). Record clutter class estimates in a zone of 20 x 50 m in the direction that the microphone is pointed.

Habitat Info – please **circle** the option that best fits

Pine / hardwood / mixed / unforested

Upland / bottomland

Managed (thinned, burned, pine plantation or otherwise disturbed) / unmanaged

Mature forest / < 20 years old forest or cutover

Clutter

(1) sparse/no, < 10% cover (ex: open for 40m in all directions)

(2) low, 10–39% cover (low clutter stands typically contain <6 or >95 year old trees, ex: microphone pointed outward from edge habitat)

(3) medium, 40–75% cover (medium clutter stands typically contain 70–100 year old trees, ex: at least 10-m wide travel corridor, fairly open above)

(4) high, > 75% cover (high clutter stands typically contain 10–25 year old trees, ex: closed canopy & travel corridor < 10-m wide)

Natural (>50% wooded), rural (>50% agricultural land)/mixed (primary land use is not wooded or agricultural)

Habitat Notes: *Very wet forested area (flooded) w/ open canopy; denser growth below.*

NCDOT Acoustic Survey Data Form

P3

Project Name: <i>MLEB Research</i>		Proj #: <i>29999</i>	County: <i>Tyrell</i>	Site#: <i>net site 2a</i>	Night#: <i>1</i>	Site Name: <i>P3 - Gord Neck Rd</i>					
Start Date: <i>6/1/16</i>		End Date: <i>6/2/16</i>		Start Time: <i>19:55</i>		End Time: <i>01:26 AM</i>					
Nearest town: <i>Columbia</i>		Biologists/observers Present: <i>Frazer, Scott, Wood</i>									
*Conditions:		Time: <i>20:40</i>	Temp: <i>81°F</i>	Wind: <i>mild</i>	Clouds: <i>fw</i>	Precip/humidity: <i>humid</i>	Time: <i>01:16</i>	Temp: <i>70.5°F</i>	Wind: <i>-</i>	Clouds: <i>-</i>	Precip/humidity: <i>humid</i>
Moon Effect: <i>none</i>		Start: <i>-</i>	Stop: <i>-</i>	Land Use: Urban / Agriculture / Forest / Water / Wetland / Barren / Other (describe): <i>flooded pine forest</i>							
Bat Detector #	Detector make & model	Firmware	Mic type	Weather-proofing type	Latitude	Longitude	Elevation				
<i>1</i>	<i>Anabat SD2</i>	<i>4002 g</i>	<i>steel</i>	<i>45 PVC</i>	<i>76.052637</i>	<i>35.971448</i>	<i>20</i>				
Bat Detector #	Functioning of detector verified?	Mic direction (N/S/E/W)	Mic orientation (degree of angle)	Mic height	Clutter** no/lo/med/hi	Sensitivity /gain	Div ratio/trigger	Interval	Photo?		
<i>1</i>	<i>Y</i>	<i>W</i>	<i>45° down</i>	<i>10'</i>	<i>lo</i>	<i>7</i>	<i>-</i>	<i>-</i>	<i>Y</i>		
Habitat & Site Description: <i>see mist net data form + back side of this sheet</i>				<p style="text-align: center;">Site sketch (label to match BD# above)</p>							
Remarks: <i>☺</i>											

* Weather: record conditions at end of sampling period & at the coldest point of the sampling period.

**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). Record clutter class estimates in a zone of 20 x 50 m in the direction that the microphone is pointed.

Habitat Info – please **circle** the option that best fits

Pine / hardwood / mixed / unforested

Upland / bottomland

Managed (thinned, burned, pine plantation or otherwise disturbed) / unmanaged

Mature forest / <20 years old forest or cutover

Clutter

(1) sparse/no, < 10% cover (ex: open for 40m in all directions)

(2) low, 10–39% cover (low clutter stands typically contain <6 or >95 year old trees, ex: microphone pointed outward from edge habitat)

(3) medium, 40–75% cover (medium clutter stands typically contain 70–100 year old trees, ex: at least 10-m wide travel corridor, fairly open above)

(4) high, > 75% cover (high clutter stands typically contain 10–25 year old trees, ex: closed canopy & travel corridor < 10-m wide)

Natural (>50% wooded), rural (>50% agricultural land)/mixed (primary land use is not wooded or agricultural)

Habitat Notes: clutter was med/low along road when bat detector was placed,
within forested area clutter was very high.
(adj.)

NCDOT Acoustic Survey Data Form

* only BD 2
lost data from BD 2

Project Name: NLEB Research	Proj #: R-9999	County: Tyrrell	Site#: 26	Night#: 2	Site Name: P3 Goat Neck Rd	
Start Date: 6/2/16	End Date: 6/3/16	Start Time: 2-20:34 B.D. 1 - 20:54	End Time: ~1:00 - BD1 1:30 - BD2			
Nearest town: Columbia	Biologists/observers Present: M. Frazer, N. Scott, H. Wood					
*Conditions:	Time: 20:53	Temp: 83°F	Wind: none	Clouds: Partly	Precip/humidity: humid	
Moon Effect: none	Start: -	Stop: -	Land Use: Urban / Agriculture / Forest Water / Wetland / Barren / Other (describe): maintenance	Time: 01/16	Temp: 68.5	
				Wind: -	Clouds: none	Precip/humidity: very

Bat Detector #	Detector make & model	Firmware	Mic type	Weather-proofing type	Latitude	Longitude	Elevation
2	Anabat SD2	40629	steel	45° PVC			~0
1	" "		" "	" "	35.971448	-76.052637	~0

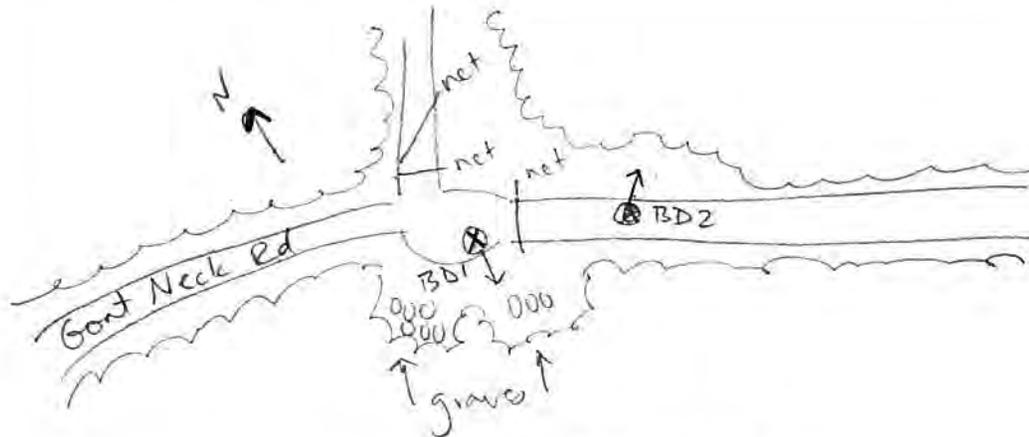
Bat Detector #	Functioning of detector verified?	Mic direction (N/S/E/W)	Mic orientation (degree of angle)	Mic height	Clutter** no/lo/med/hi	Sensitivity /gain	Div ratio/trigger	Interval	Photo?
2	Y	NNE	45° down	10ft	high	7	-	-	Y
1	Y	S	" "	8ft	high	7	-	-	Y

Habitat & Site Description:

Flyways & nets are low clutter;
BD mics pointed into high clutter habitat.

BD-1 battery died before 1:16? NO
BD-2 1:30 end

Remarks: Cricket frog noise may be affecting
BD 2 starting after dusk.



Site sketch (label to match BD# above)

* Weather: record conditions at end of sampling period & at the coldest point of the sampling period.

**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). Record clutter class estimates in a zone of 20 x 50 m in the direction that the microphone is pointed.

Habitat Info – please circle the option that best fits

Pine / hardwood / mixed / unforested

Upland / bottomland

Managed (thinned, burned, pine plantation or otherwise disturbed) / unmanaged

Mature forest / <20 years old forest or cutover

Clutter

(1) sparse/no, < 10% cover (ex: open for 40m in all directions)

(2) low, 10–39% cover (low clutter stands typically contain <6 or >95 year old trees, ex: microphone pointed outward from edge habitat)

(3) medium, 40–75% cover (medium clutter stands typically contain 70–100 year old trees, ex: at least 10-m wide travel corridor, fairly open above)

(4) high, > 75% cover (high clutter stands typically contain 10–25 year old trees, ex: closed canopy & travel corridor < 10-m wide)

Natural (>50% wooded), rural (>50% agricultural land)/mixed (primary land use is not wooded or agricultural)

Habitat Notes:

NCDOT Acoustic Survey Data Form

P3

Project Name: NLEB		Proj #: 2-9999	County: Tyrrell	Site#: 3	Night#: 1	Site Name: Loop Rd off pot locker rd					
Start Date: 6/9/16			End Date: 6/10/16		Start Time: 20:50		End Time: 01:40				
Nearest town: Columbia		Biologists/observers Present: M. Frazer, H. Wood, N. Scott									
*Conditions:		Time: 21:04	Temp: 72°F	Wind light: breeze	Clouds: clear	Precip/humidity: low	Time: 01:30	Temp: 50.5	Wind: —	Clouds: —	Precip/humidity: high
Moon Effect: crescent moon		Start: sunset	Land Use: Urban / Agriculture / Forest Water / Wetland / Barren/ Other (describe):								
		Stop: 22:30	loblolly Forested Wetland								
Bat Detector #	Detector make & model	Firmware	Mic type	Weather-proofing type	Latitude	Longitude	Elevation				
1	Anabat SD2	4062 g	steel	45° PVC							
Bat Detector #	Functioning of detector verified?	Mic direction (N/S/E/W)	Mic orientation (degree of angle)	Mic height	Clutter** no/lo/med/hi	Sensitivity /gain	Div ratio/trigger	Interval	Photo?		
1	Y	SSW	45° down	10 ft	medium low	7	—	—	Y		
					↖ along flyway. (Adj. habitat = high)						
Habitat & Site Description: maintenance road, ~6m wide w/ open canopy above				<p style="text-align: center;">Site sketch (label to match BD# above)</p>							
Remarks:											

* Weather: record conditions at end of sampling period & at the coldest point of the sampling period.
 **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). Record clutter class estimates in a zone of 20 × 50 m in the direction that the microphone is pointed.

Habitat Info – please circle the option that best fits

Pine / hardwood / mixed / unforested

Upland / bottomland

Managed (thinned, burned, pine plantation or otherwise disturbed) / unmanaged

Mature forest / <20 years old forest or cutover

Clutter

(1) sparse/no, < 10% cover (ex: open for 40m in all directions)

(2) low, 10–39% cover (low clutter stands typically contain <6 or >95 year old trees, ex: microphone pointed outward from edge habitat)

(3) medium, 40–75% cover (medium clutter stands typically contain 70–100 year old trees, ex: at least 10-m wide travel corridor, fairly open above)

(4) high, > 75% cover (high clutter stands typically contain 10–25 year old trees, ex: closed canopy & travel corridor < 10-m wide)

Natural (>50% wooded), rural (>50% agricultural land)/mixed (primary land use is not wooded or agricultural)

Habitat Notes:

NCDOT Acoustic Survey Data Form

Project Name: <i>NLEB Research</i>		Proj #: <i>R-9999</i>		County: <i>Tyrrell</i>		Site#: <i>5-30AK1</i>		Night#: <i>1</i>		Site Name: <i>P3-Hwy 164</i>	
Start Date: <i>8/10/16</i>				End Date: <i>8/11/16</i>				Start Time: <i>20:20</i>		End Time: <i>01:20</i>	
Nearest town: <i>COLUMBIA</i>				Biologists/observers Present: <i>MF, NS, HS</i>							
*Conditions:		Time: <i>20:00</i>	Temp: <i>82°F</i>	Wind: <i>2</i>	Clouds: <i>partly</i>	Precip/humidity: <i>humid</i>	Time: <i>01:00</i>	Temp: <i>77°</i>	Wind: <i>none</i>	Clouds: <i>none</i>	Precip/humidity: <i>humid</i>
Moon Effect: <i>none</i> <i>waxing crescent</i>		Start: <i>-</i>	Stop: <i>-</i>	Land Use: <i>Urban / Agriculture / Forest / Water / Wetland / Barren / Other (describe): dirt road in</i> <i>400y. swampy hardwood forest</i>							
Bat Detector #	Detector make & model	Firmware	Mic type	Weather-proofing type	Latitude	Longitude	Elevation				
<i>2</i>	<i>Anabat CD2</i>	<i>V4062g</i>	<i>steel</i>	<i>45° PVC</i>	<i>35.904955</i>	<i>-76.054906</i>					
<i>(retrofit)</i>											
Bat Detector #	Functioning of detector verified?	Mic direction (N/S/E/W)	Mic orientation (degree of angle)	Mic height	Clutter** (no/lo/med/hi)	Sensitivity /gain	Div ratio/trigger	Interval	Photo?		
<i>2</i>	<i>Y</i>	<i>NNE</i>	<i>45° down</i>	<i>10ft</i>	<i>high</i>	<i>7</i>	<i>-</i>	<i>-</i>	<i>Y</i>		
Habitat & Site Description: <i>see mist net form for site 5-30ak1</i> <i>Nonriverine swamp forest (sweet gum subtype)</i> Remarks: <i>Lots of insect noise</i>											
<p style="text-align: center;">Site sketch (label to match BD# above)</p>											

* Weather: record conditions at end of sampling period & at the coldest point of the sampling period.

**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 x 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.

Habitat Info – please circle the option that best fits

Pine / hardwood / mixed / unforested

Upland / bottomland

Managed (thinned, burned, pine plantation or otherwise disturbed) / unmanaged

Mature forest / <20 years old forest or cutover *A few trees maybe 20-30 y.o., but most are < 20 y.o.*

Clutter

(1) sparse/no, < 10% cover (ex: open for 40m in all directions)

(2) low, 10–39% cover (low clutter stands typically contain <6 or >95 year old trees, ex: microphone pointed outward from edge habitat)

(3) medium, 40–75% cover (medium clutter stands typically contain 70–100 year old trees, ex: at least 10-m wide travel corridor, fairly open above)

(4) high, > 75% cover (high clutter stands typically contain 10–25 year old trees, ex: closed canopy & travel corridor < 10-m wide)

mostly open above

Natural (>50% wooded), rural (>50% agricultural land)/mixed (primary land use is not wooded or agricultural)

Habitat Notes: _____

NCDOT Acoustic Survey Data Form

Project Name: R 9999	Proj #: NLEB Research	County: Johnston	Site#: 1	Night#: 1,2	Site Name: Howell Woods				
Start Date: 6/20/16	End Date: 6/22/16	Start Time: 20:00	End Time: 1:30						
Nearest town: Smithfield	Biologists/observers Present: CLG MRM CDM, MEF, Gary Jordan								
*Conditions:	Time: 8:15	Temp: 80	Wind: 1-2	Clouds: clear	Precip/humidity: 0/				
Moon Effect: Full	Time: 1:30	Temp: 74°	Wind: 1-2	Clouds: clear	Precip/humidity: 0/				
Start:	Stop:	Land Use: Urban / Agriculture / Forest / Water / Wetland / Barren/ Other (describe): mixed = 43							
Bat Detector #	Detector make & model	Firmware	Mic type	Weather-proofing type	Latitude	Longitude	Elevation		
	Anabat SD2	4062g	directional	1150 Pelican case 1.5" PVC @ 45°	35°21'42.503"N	-78°17'56.052"W	160'		
Bat Detector #	Functioning of detector verified?	Mic direction (N/S/E/W)	Mic orientation (degree of angle)	Mic height	Clutter** no/lo/med/hi	Sensitivity /gain	Div ratio/trigger	Interval	Photo?
	Y	S	45°	10'	hi	7	16		Y CG
Habitat & Site Description:				<p>Site sketch (label to match BD# above)</p>					
See back									
Remarks:									

* Weather: record conditions at end of sampling period & at the coldest point of the sampling period.

**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 x 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.

Habitat Info – please circle the option that best fits

Pine / hardwood / mixed / unforested

Upland / bottomland

Managed (thinned, burned, pine plantation or otherwise disturbed) / unmanaged

Mature forest / <20 years old forest or cutover

20-30 yr old mid successional forest

Clutter

(1) sparse/no, < 10% cover (ex: open for 40m in all directions)

(2) low, 10–39% cover (low clutter stands typically contain <6 or >95 year old trees, ex: microphone pointed outward from edge habitat)

(3) medium, 40–75% cover (medium clutter stands typically contain 70–100 year old trees, ex: at least 10-m wide travel corridor, fairly open above)

(4) high, > 75% cover (high clutter stands typically contain 10–25 year old trees, ex: closed canopy & travel corridor < 10-m wide)

Natural (>50% wooded), rural (>50% agricultural land)/mixed (primary land use is not wooded or agricultural)

Habitat Notes:

Dense forest w/ trails throughout, good funneling flyways on the edge of a more mature bottomland HW to the north.

NCDOT Acoustic Survey Data Form

2 nights

Project Name: NLEB Research	Proj #: R-9999	County: Johnston	Site#: 2	Night#: 1-2	Site Name: Howell Woods Site 2
Start Date: June 20, 2016	End Date: June 22 2016	Start Time: 20:00	End Time: 01:30	Nearest town: Four Oaks	
Biologists/observers Present: Mary Frazer, Hannah Sijce, Hayley Wood					

*Conditions:	Time 21:29	Temp 80°F	Wind none	Clouds partly	Precip/humidity none	Time 01:25	Temp 68°F	Wind mild e/c breezy 6/c	Clouds mostly clear	Precip/humidity moderate/low
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Moon Effect: full moon, but not on B.D.	Start: -	Stop: -	Land Use: Urban / Agriculture / <u>Forest</u> / Water / Wetland / Barren / Other (describe):
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Bat Detector #	Detector make & model	Firmware	Mic type	Weather-proofing type	Latitude	Longitude	Elevation
1	Arabat SD2	402g	steel	45° PVC			

Bat Detector #	Functioning of detector verified?	Mic direction (N/S/E/W)	Mic orientation (degree of angle)	Mic height	Clutter** no/lo/med/hi	Sensitivity /gain	Div ratio/trigger	Interval	Photo?
1	Y	NNE	45° down	10'	medium	7 *	-	-	Y

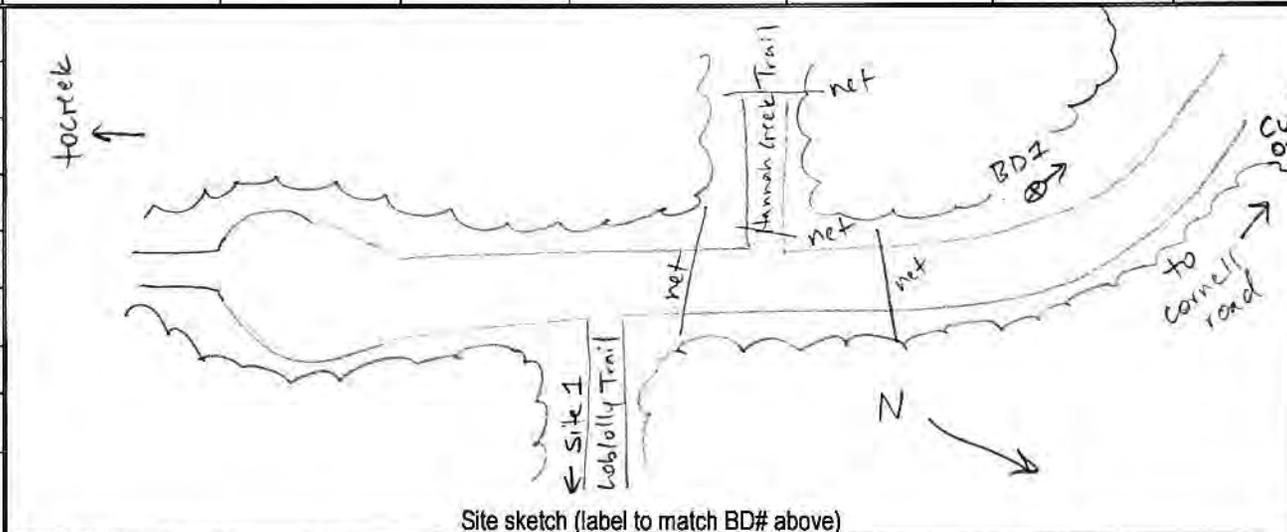
Habitat & Site Description: see site 2

mist net data form

coastal plain bottomland hardwood (brownwater subtype)

* Set at 6 until 24:20 due to overwhelming cricket noise

Remarks: ^{loud} cricket noise every where after sunset. Breezy night of 6/21-22



* Weather: record conditions at end of sampling period & at the coldest point of the sampling period.

**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). Record clutter class estimates in a zone of 20 x 50 m in the direction that the microphone is pointed.

Habitat Info – please circle the option that best fits

Pine / hardwood / mixed / unforested

~~Upland~~ / bottomland

Managed (thinned, burned, pine plantation or otherwise disturbed) / unmanaged

Mature forest / <20 years old forest or cutover

- Clutter
- (1) sparse/no, < 10% cover (ex: open for 40m in all directions)
 - (2) low, 10–39% cover (low clutter stands typically contain <6 or >95 year old trees, ex: microphone pointed outward from edge habitat)
 - (3) medium, 40–75% cover (medium clutter stands typically contain 70–100 year old trees, ex: at least 10-m wide travel corridor, fairly open above)
 - (4) high, > 75% cover (high clutter stands typically contain 10–25 year old trees, ex: closed canopy & travel corridor < 10-m wide)

Natural (>50% wooded), rural (>50% agricultural land)/mixed (primary land use is not wooded or agricultural)

Habitat Notes:

NCDOT Acoustic Survey Data Form

Project Name: NLEC Research	Proj #: R-9999	County: Johnston	Site#: 3	Night#: 3	Site Name: Havelle Woods				
Start Date: 6/22/16	End Date: 6/23/16	Start Time: 8:00 pm	End Time: 1:30 am						
Nearest town: Smithfield	Biologists/observers Present: CLG MRM COM								
*Conditions:	Time: 8:15	Temp: 82	Wind: 0	Clouds: 25%	Precip/humidity: 0				
	Time: 1:30	Temp: 76	Wind: 0	Clouds: 75%	Precip/humidity: 0				
Moon Effect: Full	Start:	Land Use: Urban / Agriculture / Forest / Water / Wetland / Barren / Other (describe): 42-crocker							
Stop:									
Bat Detector #	Detector make & model	Firmware	Mic type	Weather-proofing type	Latitude	Longitude	Elevation		
	Anabat S02	40ezig	directional	1.50 lithium case 1.5" PVC @ 45° A	35°21'56.472" N	78°18'15.562" W	100'		
Bat Detector #	Functioning of detector verified?	Mic direction (N/S/E/W)	Mic orientation (degree of angle)	Mic height	Clutter** no/lo/med/hi	Sensitivity /gain	Div ratio/trigger	Interval	Photo?
	Y	S	45°	10'	hi	7	11p		Y CG
Habitat & Site Description:		<p>Dense Young Pines</p> <p>Trail</p> <p>Processing station</p> <p>Diversity Dr.</p> <p>open LL pine forest</p> <p>open LL pine forest</p> <p>Cornell Dr.</p> <p>North Arrow</p>							
10-12 yr old dense									
Remarks:									

* Weather: record conditions at end of sampling period & at the coldest point of the sampling period.

**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 x 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.

Habitat Info – please circle the option that best fits

Pine / hardwood / mixed / unforested

Upland / bottomland

Managed (thinned, burned, pine plantation or otherwise disturbed) / unmanaged

Mature forest / <20 years old forest or cutover

Clutter

(1) sparse/no, < 10% cover (ex: open for 40m in all directions)

(2) low, 10–39% cover (low clutter stands typically contain <6 or >95 year old trees, ex: microphone pointed outward from edge habitat)

(3) medium, 40–75% cover (medium clutter stands typically contain 70–100 year old trees, ex: at least 10-m wide travel corridor, fairly open above)

(4) high, > 75% cover (high clutter stands typically contain 10–25 year old trees, ex: closed canopy & travel corridor < 10-m wide)

except in front of net on trail

Natural (>50% wooded), rural (>50% agricultural land)/mixed (primary land use is not wooded or agricultural)

Habitat Notes:

NCDOT Acoustic Survey Data Form

GPS 062222A

Project Name: NLEB Research		Proj #: R99 99	County: Johnston	Site#: 4	Night#: 1	Site Name: Reedy Marsh Station					
Start Date: June 22, 2016			End Date: June 23, 2016		Start Time: 20:00		End Time: 1:20				
Nearest town: Four Oaks		Biologists/observers Present: Mary Frazer, Hannah Slyce, Hayley Wood									
*Conditions:		Time 20:50	Temp 78°F	Wind —	Clouds clear	Precip/humidity humid	Time 1:30	Temp 76°	Wind —	Clouds cloudy	Precip/humidity humid
Moon Effect: none		Start: —	Land Use: Urban / Agriculture / Forest / Water / Wetland / Barren/ Other (describe): Small swampy pond in bottom land hardwood								
Stop: —											
Bat Detector #	Detector make & model	Firmware	Mic type	Weather-proofing type	Latitude	Longitude	Elevation				
1	Anabat SD2	4062 g	steel	45° PVC							
2	"	"	"	none							
Bat Detector #	Functioning of detector verified?	Mic direction (N/S/E/W)	Mic orientation (degree of angle)	Mic height	Clutter** no/lo/med/hi	Sensitivity /gain	Div ratio/trigger	Interval	Photo?		
1	Y	W	45° down	10'	high	7	—	—	Y		
2	Y	E	45° up	5'	med	5	—	—	N		
Habitat & Site Description: small swampy pond. See mist net data forms. 1											
One storm front came near; a 2nd approached ~ 1:30 AM.											
BD 1 → equip failure											
BD 2 OK											
Remarks: lots of katydid noise @ road											
coastal plain bottomland hardwood											

Site sketch (label to match BD# above)

* Weather: record conditions at end of sampling period & at the coldest point of the sampling period.

**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). Record clutter class estimates in a zone of 20 × 50 m in the direction that the microphone is pointed.

Habitat Info – please circle the option that best fits

Pine / hardwood / mixed / unforested

Upland / bottomland

Managed (thinned, burned, pine plantation or otherwise disturbed) / unmanaged

Mature forest / <20 years old forest or cutover

Clutter

(1) sparse/no, < 10% cover (ex: open for 40m in all directions)

(2) low, 10–39% cover (low clutter stands typically contain <6 or >95 year old trees, ex: microphone pointed outward from edge habitat)

(3) medium, 40–75% cover (medium clutter stands typically contain 70–100 year old trees, ex: at least 10-m wide travel corridor, fairly open above)

(4) high, > 75% cover (high clutter stands typically contain 10–25 year old trees, ex: closed canopy & travel corridor < 10-m wide)

Natural (>50% wooded), rural (>50% agricultural land)/mixed (primary land use is not wooded or agricultural)

Habitat Notes: . Swampy pond w/ dense canopy

NCDOT Acoustic Survey Data Form

Roanoke River
G.L.

very humid
night 5/15
6/15

light rain
for ~1 hr @
midnight 6/16

Project Name: NLERB Research		Proj #: R-9999	County: Martin	Site#: 1	Night#: 1-2	Site Name: Roanoke River Bend					
Start Date: 06/14/2016			End Date: 06/16/2016		Start Time: 20:25		End Time: (6/15) (6/16) 1:25 2:30am				
Nearest town: Williamston			Biologists/observers Present: Frazer, Wood, Howell								
*Conditions:		Time 21:10	Temp 79°F	Wind mild	Clouds clear	Precip/humidity humid	Time 01:20	Temp 70°F	Wind mid	Clouds clear	Precip/humidity humid
Moon Effect: none in swamp		Start: -	Land Use: Urban / Agriculture / Forest Water / Wetland / Barren / Other (describe): Dirt road between swamp + Roanoke River. Good stretch of canopy coverage.								
Stop: -											
Bat Detector #	Detector make & model	Firmware	Mic type	Weather-proofing type	Latitude	Longitude	Elevation				
1	Anabat SD2		steel	45° PVC							
Bat Detector #	Functioning of detector verified?	Mic direction (N/S/E/W)	Mic orientation (degree of angle)	Mic height	Clutter** no/lo/med/hi	Sensitivity /gain	Div ratio/trigger	Interval	Photo?		
1	Y	W	45° down	10ft	high	7	-	-	Y		
Habitat & Site Description:			<p>Canopy - <i>Carya aquatica</i>, <i>Liquidambar styraciflua</i>, <i>Nyssa aquatica</i>, <i>Taxodium distichum</i>, Subcanopy/shrubs - <i>Acer rubrum</i>, <i>Ulmus rubra</i>, <i>Platanus occidentalis</i>, Vines & herbs - <i>Muscadina rotundifolia</i>, <i>Smilax sp.</i>, <i>Vitis sp.</i>, <i>Carex sp.</i>, etc.</p>								
Remarks:			<p style="text-align: center;">Site sketch (label to match BD# above)</p>								
Cypress-gum Swamp											

* Weather: record conditions at end of sampling period & at the coldest point of the sampling period.

**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). Record clutter class estimates in a zone of 20 x 50 m in the direction that the microphone is pointed.

Habitat Info – please circle the option that best fits

Pine / hardwood / mixed / unforested

Upland / bottomland

Managed (thinned, burned, pine plantation or otherwise disturbed) / unmanaged

Mature forest / <20 years old forest or cutover

Clutter

(1) sparse/no, < 10% cover (ex: open for 40m in all directions)

(2) low, 10–39% cover (low clutter stands typically contain <6 or >95 year old trees, ex: microphone pointed outward from edge habitat)

(3) medium, 40–75% cover (medium clutter stands typically contain 70–100 year old trees, ex: at least 10-m wide travel corridor, fairly open above)

(4) high, > 75% cover (high clutter stands typically contain 10–25 year old trees, ex: closed canopy & travel corridor < 10-m wide)

Natural (>50% wooded), rural (>50% agricultural land)/mixed (primary land use is not wooded or agricultural)

Habitat Notes: BD 1 at edge of / pointing into swamp w/ dense canopy & little understory.

Habitat Info – please circle the option that best fits

Pine / hardwood / mixed / unforested

Upland / bottomland

Managed (thinned, burned, pine plantation or otherwise disturbed) / unmanaged

Mature forest / <20 years old forest or cutover

Clutter

(1) sparse/no, < 10% cover (ex: open for 40m in all directions)

(2) low, 10–39% cover (low clutter stands typically contain <6 or >95 year old trees, ex: microphone pointed outward from edge habitat)

(3) medium, 40–75% cover (medium clutter stands typically contain 70–100 year old trees, ex: at least 10-m wide travel corridor, fairly open above)

(4) high, > 75% cover (high clutter stands typically contain 10–25 year old trees, ex: closed canopy & travel corridor < 10-m wide)

Natural (>50% wooded), rural (>50% agricultural land)/mixed (primary land use is not wooded or agricultural)

Habitat Notes: *Dense canopy & open understory. Flooded.*

NCDOT Acoustic Survey Data Form

Project Name: NLEB Research		Proj #: R-9999	County: Martin	Site#: 2	Night#: 2	Site Name: Lower River Rd					
Start Date: June 27, 2010			End Date: June 28, 2010		Start Time: 20:15		End Time: 01:40				
Nearest town: WILKINSON			Biologists/observers Present: Mary Frazer, Hannah Slye, Hayley Wood								
*Conditions:		Time 21:30	Temp 75°F	Wind none	Clouds clear	Precip/humidity humid	Time 01:30	Temp 74°F	Wind none	Clouds clear	Precip/humidity slightly humid
Moon Effect: waning waning crescent		Start: none	Land Use: Urban / Agriculture / <u>Forest</u> / Water / Wetland / Barren / Other (describe):								
Stop: —											

Bat Detector #	Detector make & model	Firmware	Mic type	Weather-proofing type	Latitude	Longitude	Elevation
1	Anabat SD2	40025	steel	45° PVC	35.864532	77.043826	
2	" "	" "	" "	" "	35.864762	77.042599	

Bat Detector #	Functioning of detector verified?	Mic direction (N/S/E/W)	Mic orientation (degree of angle)	Mic height	Clutter** no/lo/med/hi	Sensitivity /gain	Div ratio/trigger	Interval	Photo?
1	Y	W	45° down	10'	high	7	—		Y
2	Y	NNE	" "	10'	low	7	—		Y

Habitat & Site Description:	
① Swamp → cypress gum	
② gravel levee road (levee forest)	
see data form for night 1 at this site	
Remarks: katydids	
Error message on BD 1 "	

Site sketch (label to match BD# above)

* Weather: record conditions at end of sampling period & at the coldest point of the sampling period.

**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.

Habitat Info – please circle the option that best fits

Pine / hardwood / mixed / unforested

Upland / bottomland

Managed (thinned, burned, pine plantation or otherwise disturbed) / unmanaged

Mature forest / <20 years old forest or cutover

Clutter

(1) sparse/no, < 10% cover (ex: open for 40m in all directions)

BD 2 (2) low, 10–39% cover (low clutter stands typically contain <6 or >95 year old trees, ex: microphone pointed outward from edge habitat)

(3) medium, 40–75% cover (medium clutter stands typically contain 70–100 year old trees, ex: at least 10-m wide travel corridor, fairly open above)

BD 1 (4) high, > 75% cover (high clutter stands typically contain 10–25 year old trees, ex: closed canopy & travel corridor < 10-m wide)

Natural (>50% wooded), rural (>50% agricultural land)/mixed (primary land use is not wooded or agricultural)

Habitat Notes:

BD 1 - swamp

BD 2 - road or levee

gate combo 8314

NCDOT Acoustic Survey Data Form

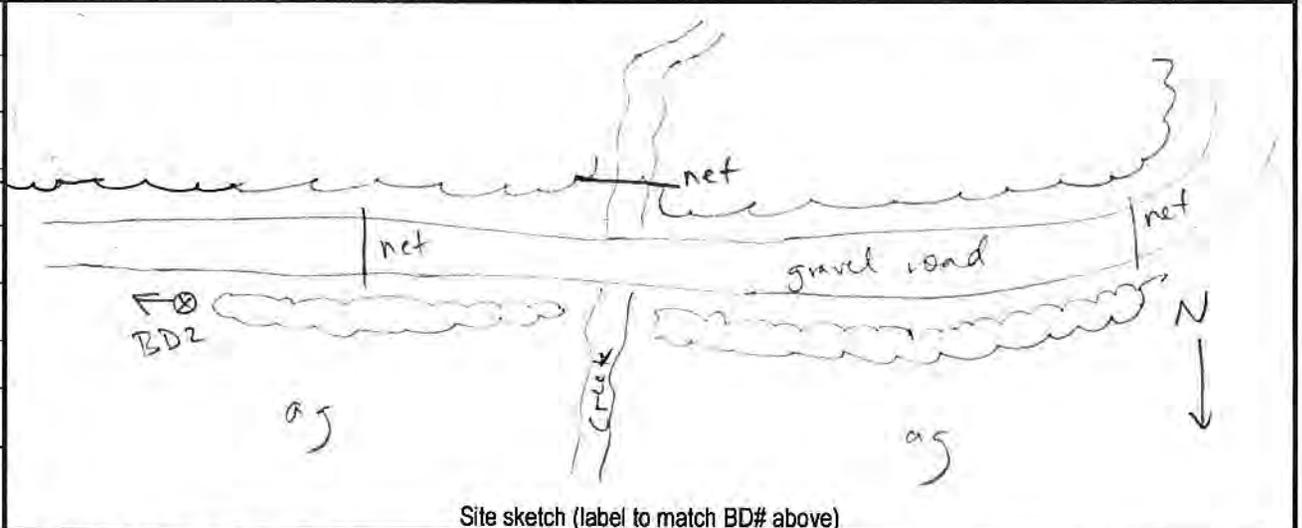
off hwy 125

Project Name: NLEB RESEARCH	Proj #:	County: Martin	Site#: 3	Night#: 1	Site Name: WRC depot
Start Date: June 28, 2016	End Date: June 29, 2016	Start Time: 20:15	End Time: 23:40		
Nearest town: Williamston		Biologists/observers Present: Mary Frater, Hannah Slyce, Hayley Wood			
*Conditions:	Time 21:04	Temp 75°F	Wind none	Clouds cloudy	Precip/humidity humid
				Time 23:42	Temp 74°
				Wind —	Clouds partly cloudy
					Precip/humidity high humidity
Moon Effect: none waning crescent	Start: —	Stop: —	Land Use: Urban / Agriculture / Forest / Water / Wetland / Barren / Other (describe):		

Bat Detector #	Detector make & model	Firmware	Mic type	Weather-proofing type	Latitude	Longitude	Elevation
2	Anabat SD2	4062g	steel	45° PVC	35.884420	-77.144520	

Bat Detector #	Functioning of detector verified?	Mic direction (N/S/E/W)	Mic orientation (degree of angle)	Mic height	Clutter** no/lo/med/hi	Sensitivity /gain	Div ratio/trigger	Interval	Photo?
2	Y	E	45° down	10'	low	7	—	—	Y

Habitat & Site Description: ag land
beside a bottomland hardwood
Roanoke River G.L.
Remarks: mic pointed along road parallel to tree line



* Weather: record conditions at end of sampling period & at the coldest point of the sampling period.
 **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 x 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.

Habitat Info – please circle the option that best fits

Pine / hardwood / mixed / unforested

Upland / bottomland

Managed (thinned, burned, pine plantation or otherwise disturbed) / unmanaged

Mature forest / <20 years old forest or cutover

Clutter

(1) sparse/no, < 10% cover (ex: open for 40m in all directions)

(2) low, 10–39% cover (low clutter stands typically contain <6 or >95 year old trees, ex: microphone pointed outward from edge habitat)

(3) medium, 40–75% cover (medium clutter stands typically contain 70–100 year old trees, ex: at least 10-m wide travel corridor, fairly open above)

(4) high, > 75% cover (high clutter stands typically contain 10–25 year old trees, ex: closed canopy & travel corridor < 10-m wide)

Natural (>50% wooded), rural (>50% agricultural land)/mixed (primary land use is not wooded or agricultural)

Habitat Notes:

NCDOT Acoustic Survey Data Form

3 nights @ this site - total

Project Name: NLEB		Proj #: 2-9999	County: HERTFORD	Site#: 1b	Night#: 1-3	Site Name: Chocoma Swamp 1B					
Start Date: 7/25/16			End Date: 7/28/16		Start Time: night one 20:14	night 2 10:55	End Time: night 1 - 1:30 night 3 - 1:15				
Nearest town: Mapleton		Biologists/observers Present: M. FRAZER, N. HOWELL, H. SYLVE									
*Conditions:	Time 20:30	Temp 86°F	Wind none-light	Clouds partly	Precip/humidity humid	Time 01:15	Temp 80°F	Wind —	Clouds none	Precip/humidity humid	
Moon Effect: none (waning gibbous)	Start: —	Stop: —	Land Use: Urban / Agriculture / Forest Water / Wetland / Barren / Other (describe): Dirt road in bottomland forest; near creek.								
Bat Detector #	Detector make & model	Firmware	Mic type	Weather-proofing type	Latitude	Longitude	Elevation				
2	Ababat SD2	V4062g	steel	45° PVC	-76.005960° W	36.457338° N	~9ft				
(1 @ car) → audio 32 data 10											
Bat Detector #	Functioning of detector verified?	Mic direction (N/S/E/W)	Mic orientation (degree of angle)	Mic height	Clutter** no/lo/med/hi	Sensitivity /gain	Div ratio/trigger	Interval	Photo?		
2	Y	N	45° down	10 ft	med	7	8000:32:10:10	—	Y		
Habitat & Site Description: see mist net site info					<p>Site sketch (label to match BD# above)</p>						
Night 2 ended ~ 22:20 due to fog.											
Night 3: rain from 22:00 - 22:30.											
Brown water bottomland hardwoods (high sub type)											
Remarks: lots of katydid noise											
Night 2: light rain ending @ sunset											

* Weather: record conditions at end of sampling period & at the coldest point of the sampling period.

**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). Record clutter class estimates in a zone of 20 x 50 m in the direction that the microphone is pointed.

Habitat Info – please circle the option that best fits

Pine / hardwood / mixed / unforested

Upland / bottomland

Managed (thinned, burned, pine plantation or otherwise disturbed) / unmanaged

Mature forest / <20 years old forest or cutover

Clutter

(1) sparse/no, < 10% cover (ex: open for 40m in all directions)

(2) low, 10–39% cover (low clutter stands typically contain <6 or >95 year old trees, ex: microphone pointed outward from edge habitat)

(3) medium, 40–75% cover (medium clutter stands typically contain 70–100 year old trees, ex: at least 10-m wide travel corridor, fairly open above)

(4) high, > 75% cover (high clutter stands typically contain 10–25 year old trees, ex: closed canopy & travel corridor < 10-m wide)

Natural (>50% wooded), rural (>50% agricultural land)/mixed (primary land use is not wooded or agricultural)

Habitat Notes: *Bottomland forest near creek. Road (dirt) running through it.*

NCDOT Acoustic Survey Data Form

Project Name: <i>NLER Research</i>		Proj #: <i>R.9999</i>		County: <i>Hertford</i>		Site#: <i>1b-NCDOT</i>		Night#: <i>1</i>		Site Name: <i>Chowan Swamp</i>	
Start Date: <i>8/9/16</i>				End Date: <i>8/10/16</i>		Start Time: <i>7:45 PM</i>			End Time: <i>1:30 AM</i>		
Nearest town: <i>Murfreesboro</i>				Biologists/observers Present: <i>CLG, CDM, Gary Jordan, MEF.</i>							
*Conditions:		Time: <i>8:00</i>	Temp: <i>77</i>	Wind: <i>0</i>	Clouds: <i>100%</i>	Precip/humidity: <i>100%</i>	Time: <i>1:20</i>	Temp: <i>74°</i>	Wind: <i>0</i>	Clouds: <i>0%</i>	Precip/humidity: <i>no precip</i>
Moon Effect: <i>phase - waxing crescent</i>		Start: <i>no effect</i>		Land Use: <i>Urban / Agriculture / Forest / Water / Wetland / Barren/ Other (describe):</i>							
		Stop: <i>on nets</i>		<i>43</i>							
Bat Detector #	Detector make & model	Firmware	Mic type	Weather-proofing type	Latitude	Longitude	Elevation				
<i>3</i>	<i>Anabat ED2</i>	<i>4062g</i>	<i>directional</i>	<i>pelican case w/ PVC cover mic</i>	<i>-36.454782°N</i>	<i>-76.998339</i>	<i>1'</i>				
Bat Detector #	Functioning of detector verified?	Mic direction (N/S/E/W)	Mic orientation (degree of angle)	Mic height	Clutter** (no/lo/med/hi)	Sensitivity /gain	Div ratio/trigger	Interval	Photo?		
<i>3</i>	<i>Y</i>	<i>NW</i>	<i>45°</i>	<i>10'</i>	<i>no</i>	<i>5.5</i>	<i>16</i>		<i>Y/CG</i>		
Habitat & Site Description:											
<i>nets along dirt road in mixed age mixed hardwood/pine forest</i>											
Remarks: <i>It rained just before we opened the nets. Sky cleared up but fog remained @ ground level through the night</i>				Site sketch (label to match BD# above)							

* Weather: record conditions at end of sampling period & at the coldest point of the sampling period.

**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 x 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.

Habitat Info – please circle the option that best fits

Pine / hardwood / mixed / unforested

Upland / bottomland

Managed (thinned, burned, pine plantation or otherwise disturbed) / unmanaged

Mature forest / <20 years old forest or cutover

Clutter (*Microphone pointed over dirt road + then beyond road it was high clutter @ about 25 m*)

(1) sparse/no, < 10% cover (ex: open for 40m in all directions)

(2) low, 10–39% cover (low clutter stands typically contain <6 or >95 year old trees, ex: microphone pointed outward from edge habitat)

(3) medium, 40–75% cover (medium clutter stands typically contain 70–100 year old trees, ex: at least 10-m wide travel corridor, fairly open above)

(4) high, > 75% cover (high clutter stands typically contain 10–25 year old trees, ex: closed canopy & travel corridor < 10-m wide)

Natural (>50% wooded), rural (>50% agricultural land)/mixed (primary land use is not wooded or agricultural)

Habitat Notes:

NCDOT Acoustic Survey Data Form

Project Name: NLEB <i>research</i>		Proj #: <i>R-9999</i>	County: <i>Hertford</i>	Site#: <i>1B3oaks</i>	Night#: <i>1</i> (at <i>2b</i>) <i>1</i> for <i>1b3oaks</i>	Site Name: <i>Chowan Swamp 1B</i>				
Start Date: <i>8/9/16</i>		End Date: <i>8/10/16</i>		Start Time: <i>20:25</i>		End Time: <i>1:25</i>				
Nearest town: <i>Murphersboro</i>		Biologists/observers Present: <i>M.F, N.S, H.S (G, G), C.M</i>								
*Conditions:	Time: <i>20:51</i>	Temp: <i>77</i>	Wind: <i>none</i>	Clouds: <i>partly</i>	Precip/humidity: <i>humid</i>	Time: <i>01:10</i>	Temp: <i>76°</i>	Wind: <i>-</i>	Clouds: <i>clear</i>	Precip/humidity: <i>very humid</i>
Moon Effect: <i>none</i> <i>waxing crescent</i>		Start:	Land Use: Urban / Agriculture / <u>Forest</u> / Water / Wetland / Barren / Other (describe): <i>dirt road in old hardwood forest.</i>							
Stop:										

Bat Detector #	Detector make & model	Firmware	Mic type	Weather-proofing type	Latitude	Longitude	Elevation
<i>2</i>	<i>Anabat SD2</i>	<i>V4062g</i>	<i>steel</i>	<i>45° PVC</i>	<i>36.454783°N</i>	<i>-76.998339°W</i>	<i>11'</i>

Bat Detector #	Functioning of detector verified?	Mic direction (N/S/E/W)	Mic orientation (degree of angle)	Mic height	Clutter** no/lo/med/hi	Sensitivity /gain	Div ratio/trigger	Interval	Photo?
<i>2</i>	<i>Y</i>	<i>SSW</i>	<i>45° down</i>	<i>10'</i>	<i>med</i>	<i>7</i>	<i>-</i>	<i>-</i>	<i>Y</i>

Habitat & Site Description: <i>see description on mist-net data form for night 1.</i> <i>lots of katydid noise</i> Remarks: <i>Brief rain @ sunset</i>	<p style="text-align: center;">Site sketch (label to match BD# above)</p>
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* Weather: record conditions at end of sampling period & at the coldest point of the sampling period.

**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 x 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.

Habitat Info – please circle the option that best fits

Pine / hardwood / mixed / unforested

Upland / bottomland

Managed (thinned, burned, pine plantation or otherwise disturbed) / unmanaged

Mature forest / <20 years old forest or cutover

Clutter

(1) sparse/no, < 10% cover (ex: open for 40m in all directions)

(2) low, 10–39% cover (low clutter stands typically contain <6 or >95 year old trees, ex: microphone pointed outward from edge habitat)

(3) medium, 40–75% cover (medium clutter stands typically contain 70–100 year old trees, ex: at least 10-m wide travel corridor, fairly open above)

(4) high, > 75% cover (high clutter stands typically contain 10–25 year old trees, ex: closed canopy & travel corridor < 10-m wide)

Natural (>50% wooded), rural (>50% agricultural land)/mixed (primary land use is not wooded or agricultural)

Habitat Notes:

NCDOT Acoustic Survey Data Form

Project Name: NLEB Research		Proj #: 12-9999	County: Hertford	Site#: 2b	Night#: 1	Site Name: UT to Potocas Creek					
Start Date: 7/28/16			End Date: 7/29/16		Start Time: 19:50		End Time: 01:15				
Nearest town: Mapleton			Biologists/observers Present: Frazer, Slyce, Howell								
*Conditions:		Time: 22:20	Temp: 83°F	Wind: —	Clouds: partly	Precip/humidity: humid	Time: 01:20	Temp: 79°	Wind: —	Clouds: —	Precip/humidity: humid
Moon Effect: none (waning crescent)		Start: —	Stop: —	Land Use: Urban / Agriculture / Forest / Water / Wetland / Barren / Other (describe): Bottomland forest mixed adjacent to creek							
Bat Detector #	Detector make & model	Firmware	Mic type	Weather-proofing type	Latitude	Longitude	Elevation				
2	SDZ Anabat	V4062g	steel	45° PVC	36.425296° N	77.011617°	86 ft				
(1 @ truck, audio 16, data 8)											
Bat Detector #	Functioning of detector verified?	Mic direction (N/S/E/W)	Mic orientation (degree of angle)	Mic height	Clutter** no/lo/med/hi	Sensitivity /gain	Div ratio/trigger	Interval	Photo?		
2	Y	N	45° down	10 ft	high	* 7 set to 6 @ 22:45 due to insects.	—	—	Y		
Habitat & Site Description: see description on mist-net form			<p>Site sketch (label to match BD# above)</p>								
Mesic mixed hardwood forest (coastal plain subtype)											
Remarks: * Katy did noise everywhere. Cannot find an area where insect noise is not overwhelming @ sensitivity 7.											

* Weather: record conditions at end of sampling period & at the coldest point of the sampling period.

**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). Record clutter class estimates in a zone of 20 × 50 m in the direction that the microphone is pointed.

Habitat Info – please circle the option that best fits

Pine / hardwood / mixed / unforested

Upland / bottomland

Managed (thinned, burned, pine plantation or otherwise disturbed) / unmanaged

Mature forest / <20 years old forest or cutover

Clutter

(1) sparse/no, < 10% cover (ex: open for 40m in all directions)

(2) low, 10–39% cover (low clutter stands typically contain <6 or >95 year old trees, ex: microphone pointed outward from edge habitat)

(3) medium, 40–75% cover (medium clutter stands typically contain 70–100 year old trees, ex: at least 10-m wide travel corridor, fairly open above)

(4) high, > 75% cover (high clutter stands typically contain 10–25 year old trees, ex: closed canopy & travel corridor < 10-m wide)

Natural (>50% wooded), rural (>50% agricultural land)/mixed (primary land use is not wooded or agricultural)

Habitat Notes: Bottomland hardwood near swampy creek.

NCDOT Acoustic Survey Data Form

Project Name: NLEB	Proj #: R-9999	County: HERTFORD	Site#: 2B	Night#: 2	Site Name: CHOWAN SWAMP 2B						
Start Date: 8/8/16	End Date: 8/9/16	Start Time: 20:15	End Time: 01:15								
Nearest town: Murfreesboro	Biologists/observers Present: MF, NS, HS, CG, GJ										
*Conditions:	Time 20:15	Temp 74°	Wind none	Clouds partly	Precip/humidity humid	Time 01:05	Temp 72°F	Wind —	Clouds cloudy	Precip/humidity humid	
Moon Effect: none (waxing crescent)	Start: —	Stop: —	Land Use: Urban / Agriculture / Forest / Water / Wetland / Barren / Other (describe): wooded slope above stream/swamp complex								
Bat Detector #	Detector make & model	Firmware	Mic type	Weather-proofing type	Latitude	Longitude	Elevation				
2	Anabat SD2	V4062 g	Steel	45° PVC							
Bat Detector #	Functioning of detector verified?	Mic direction (N/S/E/W)	Mic orientation (degree of angle)	Mic height	Clutter** no/lo/med/hi	Sensitivity /gain	Div ratio/trigger	Interval	Photo?		
2	Y	E	45° down	10'	high	7 *set to 6.5 @ 22:25	—	—	Y		
Habitat & Site Description: see mist-netting data form for night one											
Remarks: *overwhelming latydid noise everywhere											

Site sketch (label to match BD# above)

* Weather: record conditions at end of sampling period & at the coldest point of the sampling period.

**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 x 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.

Habitat Info – please circle the option that best fits

Pine / hardwood / mixed / unforested

Upland / bottomland

Managed (thinned, burned, pine plantation or otherwise disturbed) / unmanaged

Mature forest / <20 years old forest or cutover

Clutter

(1) sparse/no, < 10% cover (ex: open for 40m in all directions)

(2) low, 10–39% cover (low clutter stands typically contain <6 or >95 year old trees, ex: microphone pointed outward from edge habitat)

(3) medium, 40–75% cover (medium clutter stands typically contain 70–100 year old trees, ex: at least 10-m wide travel corridor, fairly open above)

(4) high, > 75% cover (high clutter stands typically contain 10–25 year old trees, ex: closed canopy & travel corridor < 10-m wide)

Natural (>50% wooded), rural (>50% agricultural land)/mixed (primary land use is not wooded or agricultural)

Habitat Notes: *small opening in woods beneath canopy. Near creek.*

NCDOT Acoustic Survey Data Form

Medoc Mtn

Project Name: NLED Research		Proj #: 12-9999	County: Halifax	Site#: 1	Night#: 1	Site Name: Lynch Farm Homestead					
Start Date: 8/2/16			End Date: 8/3/16		Start Time: 20:15		End Time: 01:15				
Nearest town: Hollister			Biologists/observers Present: M. Frazer, Ed Corcoran, N. Scott, A. Slyce								
*Conditions:		Time 8/2 20:20	Temp 77°F	Wind none	Clouds 100% cloudy	Precip/humidity	Time 1:15	Temp 75°	Wind —	Clouds mostly clear	Precip/humidity humid
Moon Effect: none (new moon)		Start: —	Land Use: Urban / Agriculture / Forest / Water / Wetland / Barren / Other (describe): forest opening in young hardwood forest adj. to creek								
Stop: —											
Bat Detector #	Detector make & model	Firmware	Mic type	Weather-proofing type	Latitude	Longitude	Elevation				
2	SD2 Akabat	V4062g	steel	45° PVC	36.261006°	-77.896599°					
Bat Detector #	Functioning of detector verified?	Mic direction (N/S/E/W)	Mic orientation (degree of angle)	Mic height	Clutter** no/lo/med/hi	Sensitivity /gain	Div ratio/trigger	Interval	Photo?		
2	Y	NE	45° down	10ft	high	7	—	—	Y		
Habitat & Site Description: see mist net site description.		<p>Site sketch (label to match BD# above)</p>									
Remarks: Lots of insect noise											

* Weather: record conditions at end of sampling period & at the coldest point of the sampling period.

**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). Record clutter class estimates in a zone of 20 x 50 m in the direction that the microphone is pointed.

Halifax Co, night 1, site 1

Habitat Info – please circle the option that best fits

Pine / hardwood / mixed / unforested

Upland / bottomland

Managed (thinned, burned, pine plantation or otherwise disturbed) / unmanaged

Mature forest / <20 years old forest or cutover young forest, not much older than 20 yrs.

Clutter

(1) sparse/no, < 10% cover (ex: open for 40m in all directions)

(2) low, 10–39% cover (low clutter stands typically contain <6 or >95 year old trees, ex: microphone pointed outward from edge habitat)

(3) medium, 40–75% cover (medium clutter stands typically contain 70–100 year old trees, ex: at least 10-m wide travel corridor, fairly open above)

(4) high, > 75% cover (high clutter stands typically contain 10–25 year old trees, ex: closed canopy & travel corridor < 10-m wide)

Natural (>50% wooded), rural (>50% agricultural land)/mixed (primary land use is not wooded or agricultural)

Habitat Notes: Regenerating forest

NCDOT Acoustic Survey Data Form

Project Name: NLEB Research		Proj #: 2-9999	County: Halifax	Site#: 2	Night#: 1	Site Name: Lynch Homestead - open					
Start Date: 8/3/16			End Date: 8/4/16		Start Time: 19:55		End Time: 01:15				
Nearest town: Hollister		Biologists/observers Present: M. Frazer, E. Corey, N. Scott, H. Slye									
*Conditions:		Time: 20:45	Temp: 73°	Wind: none	Clouds: partly	Precip/humidity: humid	Time: 01:11	Temp: 69°F	Wind: —	Clouds: clear	Precip/humidity: humid
Moon Effect: none new moon		Start: —	Stop: —	Land Use: Urban / Agriculture / Forest / Water / Wetland / Barren / Other (describe): Regenerating forest w/ dirt roads, old homestead							
Bat Detector #	Detector make & model	Firmware	Mic type	Weather-proofing type	Latitude	Longitude	Elevation				
2	Anabat SD2	V4062g	steel	45° PVC	36.260432°N	77.891985°W	194'				
(1 @ truck)											
Bat Detector #	Functioning of detector verified?	Mic direction (N/S/E/W)	Mic orientation (degree of angle)	Mic height	Clutter** no/lo/med/hi	Sensitivity /gain	Div ratio/trigger	Interval	Photo?		
2	Y		45° down	10 ft	high	7	—	—	Y		
Habitat & Site Description: see mist		<p>Site sketch (label to match BD# above)</p>									
ret site description											
Remarks: continual loud insect noise											

* Weather: record conditions at end of sampling period & at the coldest point of the sampling period.

**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 x 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.

Habitat Info – please circle the option that best fits

Pine / hardwood / mixed / unforested

Upland / bottomland

Managed (thinned, burned, pine plantation or otherwise disturbed) / unmanaged

Mature forest / <20 years old forest or cutover *Regenerating forest, not much older than 20 yrs*

Clutter

(1) sparse/no, < 10% cover (ex: open for 40m in all directions)

(2) low, 10–39% cover (low clutter stands typically contain <6 or >95 year old trees, ex: microphone pointed outward from edge habitat)

(3) medium, 40–75% cover (medium clutter stands typically contain 70–100 year old trees, ex: at least 10-m wide travel corridor, fairly open above)

(4) high, > 75% cover (high clutter stands typically contain 10–25 year old trees, ex: closed canopy & travel corridor < 10-m wide)

Natural (>50% wooded), rural (>50% agricultural land)/mixed (primary land use is not wooded or agricultural)

Habitat Notes: *Old home site - several dirt roads converging*

NCDOT Acoustic Survey Data Form

2 nights

Medoc Mtn

Project Name: NLEB reservoir	Proj #: R-50099	County: Halifax	Site#: 2	Night#: 2-3	Site Name: LINKS HOMESTEAD open
Start Date: 8/17/16	End Date: 8/18/16	Start Time: 20:00	End Time: 01:00		

Nearest town: Hollister Biologists/observers Present: M. Frazer, E. Corey, H. Slyke, H. Wood.

*Conditions:	Time: 20:19	Temp: 76	Wind: none	Clouds: 100%	Precip/humidity: humid 75%	Time: 00:47	Temp: 74°	Wind: —	Clouds: partly	Precip/humidity: humid
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Moon Effect: nets all shaded 99% full Start: — Stop: — Land Use: Urban / Agriculture / Forest / Water / Wetland / Barren / Other (describe): converging jeep tracks in regenerating forest @ old homestead.

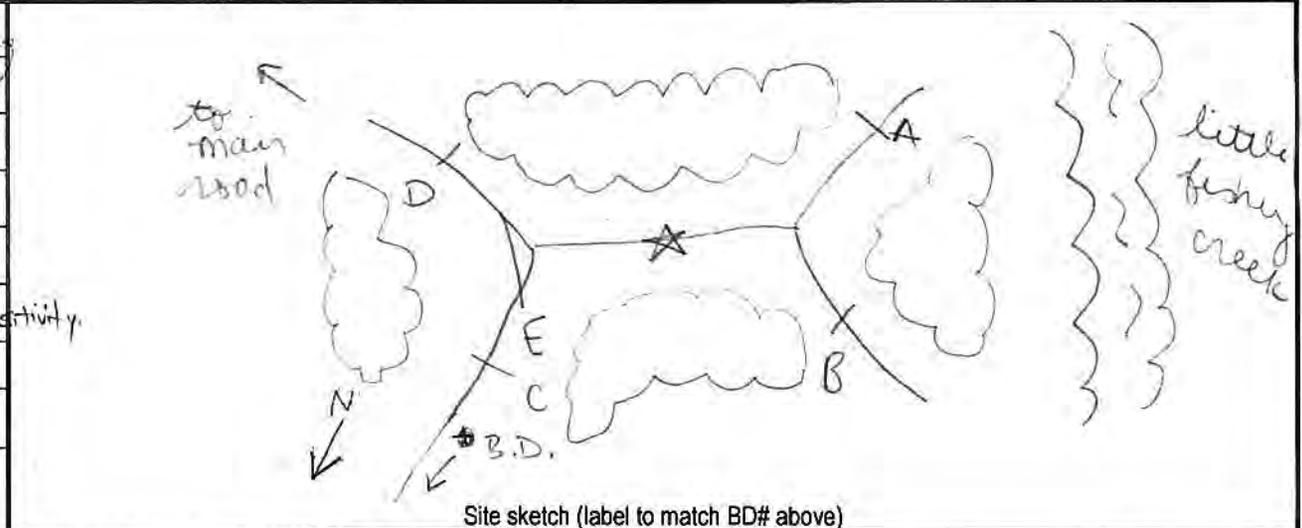
Bat Detector #	Detector make & model	Firmware	Mic type	Weather-proofing type	Latitude	Longitude	Elevation
2	Arrobat SD2	V4062g	steel	45° PVC	see night 1		

Bat Detector #	Functioning of detector verified?	Mic direction (N/S/E/W)	Mic orientation (degree of angle)	Mic height	Clutter** no/lo/med/hi	Sensitivity /gain	Div ratio/trigger	Interval	Photo?
2	Y	N	45° low	10'	high	6.5*	—	—	Y

Habitat & Site Description: see mist-netting form for night 1.

* lots of katydid noise - overwhelming the mic @ 7 sensitivity.

Remarks: 8/17 Rain fell briefly just before sunset. Thunder/lightning continued afterwards until ~ 21:00.



Site sketch (label to match BD# above)

* Weather: record conditions at end of sampling period & at the coldest point of the sampling period.
 **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 x 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.

Habitat Info – please circle the option that best fits

Pine / hardwood / mixed / unforested

Upland / bottomland

Managed (thinned, burned, pine plantation or otherwise disturbed) / unmanaged

Mature forest / <20 years old forest or cutover *not much older than 20 yrs.*

Clutter

(1) sparse/no, < 10% cover (ex: open for 40m in all directions)

(2) low, 10–39% cover (low clutter stands typically contain <6 or >95 year old trees, ex: microphone pointed outward from edge habitat)

(3) medium, 40–75% cover (medium clutter stands typically contain 70–100 year old trees, ex: at least 10-m wide travel corridor, fairly open above)

(4) high, > 75% cover (high clutter stands typically contain 10–25 year old trees, ex: closed canopy & travel corridor < 10-m wide)

Natural (>50% wooded), rural (>50% agricultural land)/mixed (primary land use is not wooded or agricultural)

Habitat Notes: *Re generating home stead*

NCDOT Acoustic Survey Data Form

2 nights Medoc Mtn

Project Name: <i>NCS Research</i>	Proj #: <i>R-9099</i>	County: <i>Halifax</i>	Site#: <i>3</i>	Night#: <i>1-2</i>	Site Name: <i>Moratoe trail</i>					
Start Date: <i>8/15/16</i>	End Date: <i>8/17/16</i>	Start Time: <i>19:50</i>	End Time: <i>01:00</i>							
Nearest town: <i>Halvister</i>	Biologists/observers Present: <i>MF, HW, HS, GJ, JEC</i>									
*Conditions:	Time: <i>20:11</i>	Temp: <i>80</i>	Wind: <i>none</i>	Clouds: <i>none</i>	Precip/humidity: <i>humid</i>	Time: <i>01:00</i>	Temp: <i>78°</i>	Wind: <i>—</i>	Clouds: <i>partly cloudy</i>	Precip/humidity: <i>humid</i>

Moon Effect: *none waxing gibbous* Start: ~~01:00~~ Stop: *—* Land Use: ~~Urban / Agriculture / Forest / Water / Wetland / Barren / Other~~ (describe): *converging dirt trails in young forest*

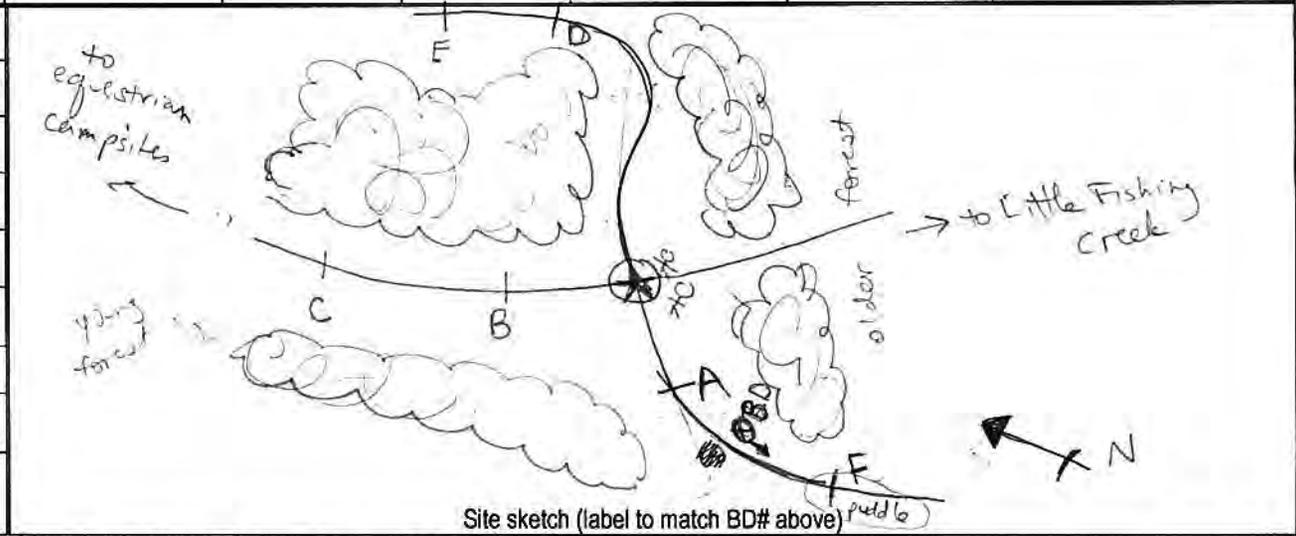
Bat Detector #	Detector make & model	Firmware	Mic type	Weather-proofing type	Latitude	Longitude	Elevation
<i>2</i>	<i>Anabat SD2</i>	<i>V4062g</i>	<i>steel</i>	<i>45° PVC</i>	<i>36.229661°</i>	<i>-77.888681°</i>	

Bat Detector #	Functioning of detector verified?	Mic direction (N/S/E/W)	Mic orientation (degree of angle)	Mic height	Clutter** (no/lo/med/hi)	Sensitivity /gain	Div ratio/trigger	Interval	Photo?
<i>2</i>	<i>Y</i>	<i>west</i>	<i>45° down</i>	<i>10'</i>	<i>med/high</i>	<i>6-7*</i>	<i>—</i>	<i>—</i>	<i>Y</i>

Habitat & Site Description: *see mist net data form*

mesic mixed hardwood forest (Piedmont subtype)

Remarks: **Lots of insect noise! Insects everywhere, overwhelming the mic.*



* Weather: record conditions at end of sampling period & at the coldest point of the sampling period.
 **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 x 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.

Habitat Info – please circle the option that best fits

Pine / hardwood / mixed / unforested

Upland / bottomland

Managed (thinned, burned, pine plantation or otherwise disturbed) / unmanaged

Mature forest / <20 years old forest or cutover ~ slightly older than 20 years?

Clutter

(1) sparse/no, < 10% cover (ex: open for 40m in all directions)

(2) low, 10–39% cover (low clutter stands typically contain <6 or >95 year old trees, ex: microphone pointed outward from edge habitat)

(3) medium, 40–75% cover (medium clutter stands typically contain 70–100 year old trees, ex: at least 10-m wide travel corridor, fairly open above)

(4) high, > 75% cover (high clutter stands typically contain 10–25 year old trees, ex: closed canopy & travel corridor < 10-m wide)

Natural (>50% wooded), rural (>50% agricultural land)/mixed (primary land use is not wooded or agricultural)

Habitat Notes:

Lee County Game Land Acoustic Sites



Site 1



Site 2



Site 3



Site 4

Palmetto Peartree Preserve (Tyrell County) Acoustic Sites



Site 1



Site 2



Site 3



Site 5

Howell Woods (Johnston County) Acoustic Sites



Site 1(+)



Site 2



Site 3



Site 4 – used secondary bat detector (at truck) due to equip failure

Roanoke River Game Land (Martin County) Acoustic Sites



Site 1(+)



Site 2, facing direction of microphone



Site 3

Chowan Swamp Game Land (Hertford County) Acoustic Sites



Site 1b(+)



Site 1b-3Oaks



Site 1b-DOT - bat detector behind net, off to the left



Site 2

Medoc Mountain State Park (Halifax County) Acoustic Sites



Site 1, microphone directed at camera



Site 2



Site 3

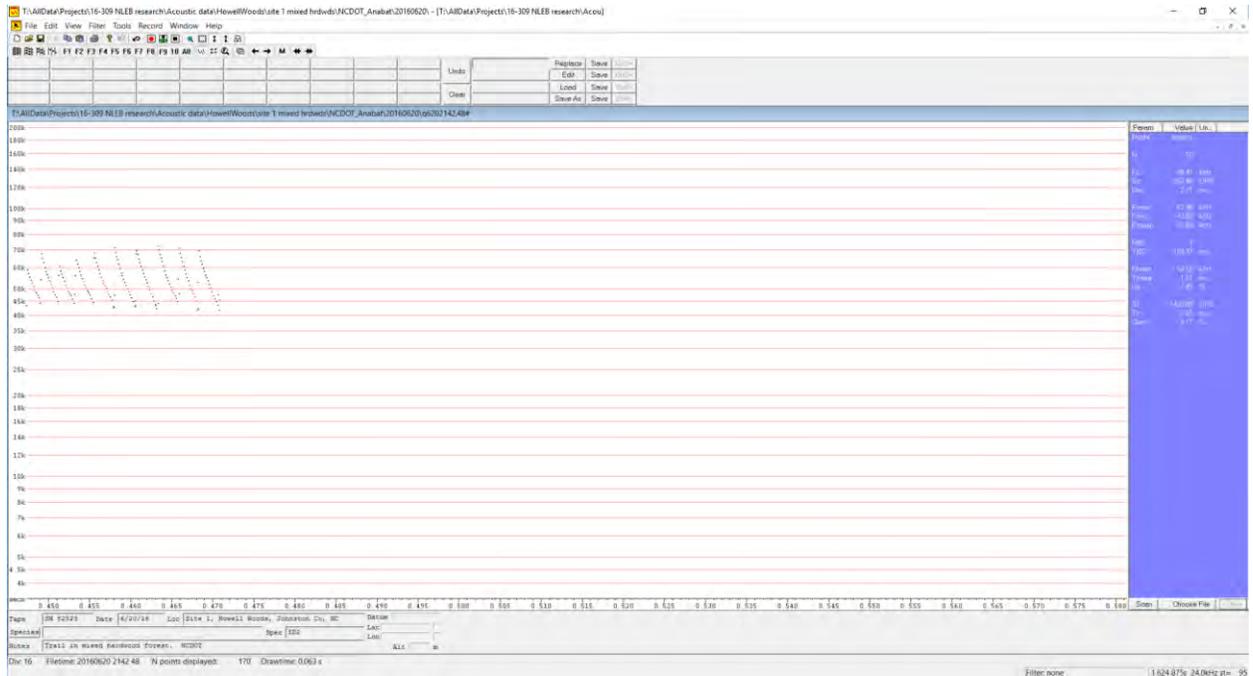
Appendix B

Acoustic Analysis Table and Sonograms

Autoclassifier & Qualitatively Identified MYSE Call Files

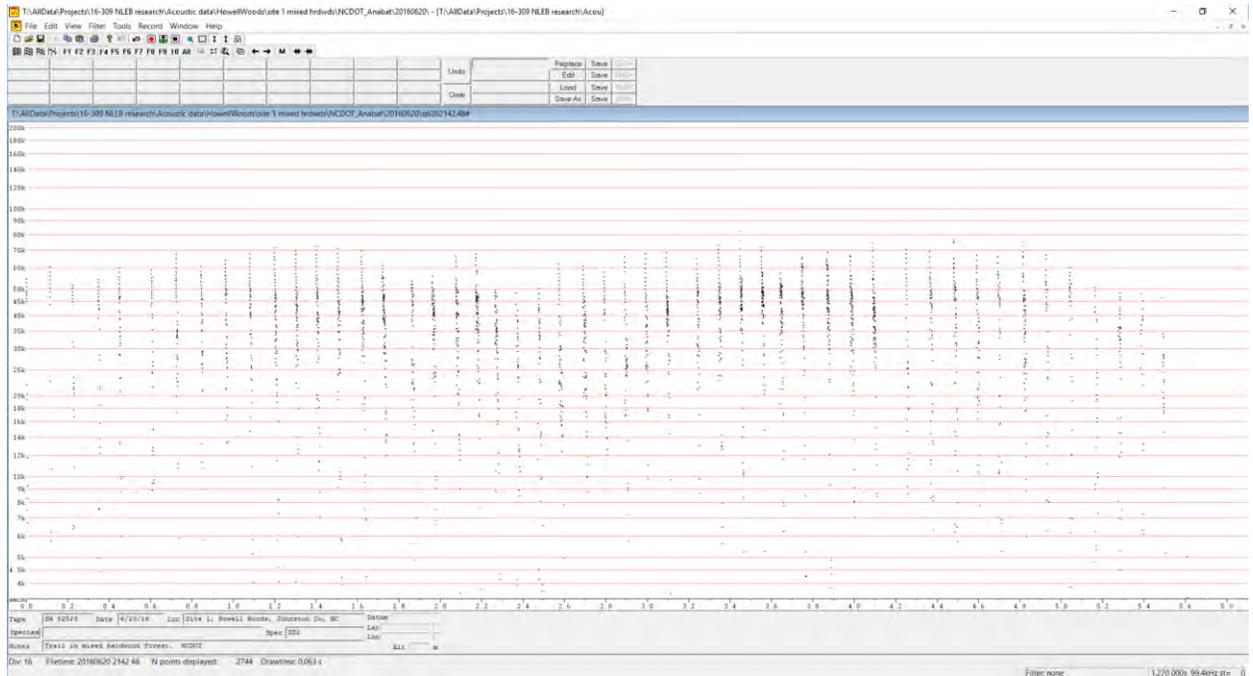
Loc.	Site No.	Night	File	Date (2016)	Echoclass Species ID	BCID Species ID	Qualitative Species ID by Mary Frazer	Rationale for Qualitative ID
Howell Woods	1	1	Q6202142.48#	6/20	MYSE	MYSE	MYSE	Steep slope (Sc >200 OPS), long call sequence and quiet call. Calls within +/- five minutes are similar.
		1	Q6202141.59#	6/20	MYSE	MYAU	MYSE	Steep slope (Sc >200 OPS), long call sequence and quiet call.
		1	Q6202143.10#	6/20	No ID	MYAU	MYSE	Steep slope (Sc >200 OPS), long call sequence and quiet call are indicative of MYSE.
Roanoke River Game Land	1	1	Q6142107.09#	6/14	MYSE	MYSE	MYSE	Steep slope (Sc >200 OPS) and high frequency pulses. Fairly long call sequence. Calls in the five minutes after this file have similarly steep slopes and high frequencies, but sigmoidal pulses are present. No calls in the 5 minutes preceding this file.
		1	Q6142143.09#	6/14	MYSE	MYSE	MYAU	Steep slope (Sc >200 OPS), high frequency pulses, and fairly long call sequence; however, some pulses are sigmoidal. Calls within +/- five minutes of this file have similar sigmoidal pulses.
		1	Q6142150.51#	6/14	MYSE	MYSE	MYAU	High frequency pulses, but average Sc <200 OPS. Shorter pulses are sigmoidal. Longer pulses have shallower slope. Calls preceding this file have sigmoidal pulses; files following it have fragmented or sigmoidal pulses.
		2	Q6152230.55#	6/15	MYSE	MYSE	MYAU	Steep slope (Sc >200 OPS). Several pulses are fragmented and some appear to have more than one break in slope. No other calls within +/- five minutes.
	2	1	Q6162339.03#	6/16	MYSE	MYSE	MYAU	Average Sc >200 OPS; however, pulses are variable, some with multiple breaks in slope. No other calls within +/- five minutes.
		2	Q6272202.25#	6/27	MYSE	MYSE	MYAU	Average slope is steep (Sc >200 OPS), and some pulses reach high frequencies, but most are shorter. Variability in pulse shape with multiple slope breaks. No calls within previous five minutes. Similar call within 5 minutes after this file.
Chowan Swamp Game Land	1b	3	Q7272146.01#	7/27	MYSE	MYSE	MYSE	Steep slope (Sc >200 OPS), high frequency pulses, and no obvious breaks in slope. No similar calls in the prior 5 minutes; one similar call immediately following.
		3	Q7272146.04#	7/27	MYSE	MYSE	MYSE	Steep slope (Sc >200 OPS), high frequency pulses and no obvious breaks in slope.
		3	Q7272241.12#	7/27	MYSE	MYSE	No ID	Steep slope (Sc >200 OPS), but pulses fragmented. Call sequence fairly short. Calls in preceding 5 minutes appear to be LABO/PESU. No calls within the following 5 minutes.
		3	Q7280149.03#	7/27	MYSE	MYSE	MYAU	Steep slope (Sc ~ 200 OPS) and high frequency pulses and fairly long call sequence. However, many pulses have a distinct knee and some appear sigmoidal. No similar calls within +/- 5 minutes.
	1b-3Oaks	1	Q8092347.37#	8/9	MYSE	MYSE	No ID	Average slope is steep (Sc >200), but pulses are fragmented and there is variability in pulse shape. Call sequence is short; too few pulses to identify.
	2b	1	Q7290019.22#	7/28	MYSE	MYSE	No ID	Steep slope (Sc >200 OPS), but pulses fragmented and some may have more than one break in slope. Short call sequence; feeding buzz occurs and two bats appear to be present. Similar-looking files within 5 minutes after this call; all very fragmented.
		1	Q7290029.32#	7/28	MYSE	MYSE	MYAU	Steep slope (Sc >200 OPS), but pulses are short and may have more than one break in slope. Many similar-looking files within +/- 5 minutes of this call; all have rather short pulses.
		1	Q7290039.37#	7/28	MYSE	MYSE	MYAU	Steep slope (Sc >200 OPS) and fairly long call sequence, but many pulses appear sigmoidal. Many similar-looking files within +/-5 minutes of this call; most pulses are fragmented or short.
2		Q8082315.01#	8/8	MYSE	MYSE	MYAU	Average slope is steep (Sc >200). Highest frequency ~ 80 kHz. Most pulses very short, some are sigmoidal.	

Sonograms Identified as MYSE by both autoclassifiers or by manual review of calls within +/- 5 minutes

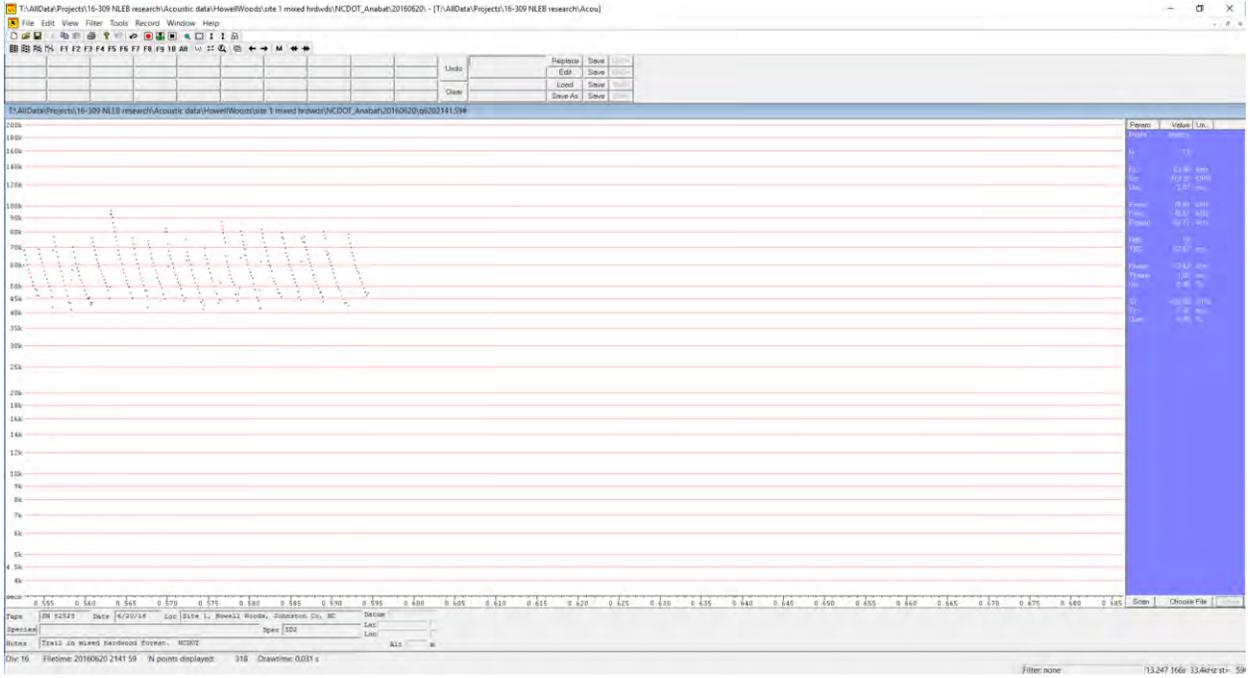


Sonogram 1. Howell Woods, Site 1, File Q6202142.48# F9, compressed, manual cleaning

MYSE. Steep slope ($Sc > 200$ OPS), long call sequence and quiet call are indicative of MYSE. Calls within five minutes before and after this file are similar.

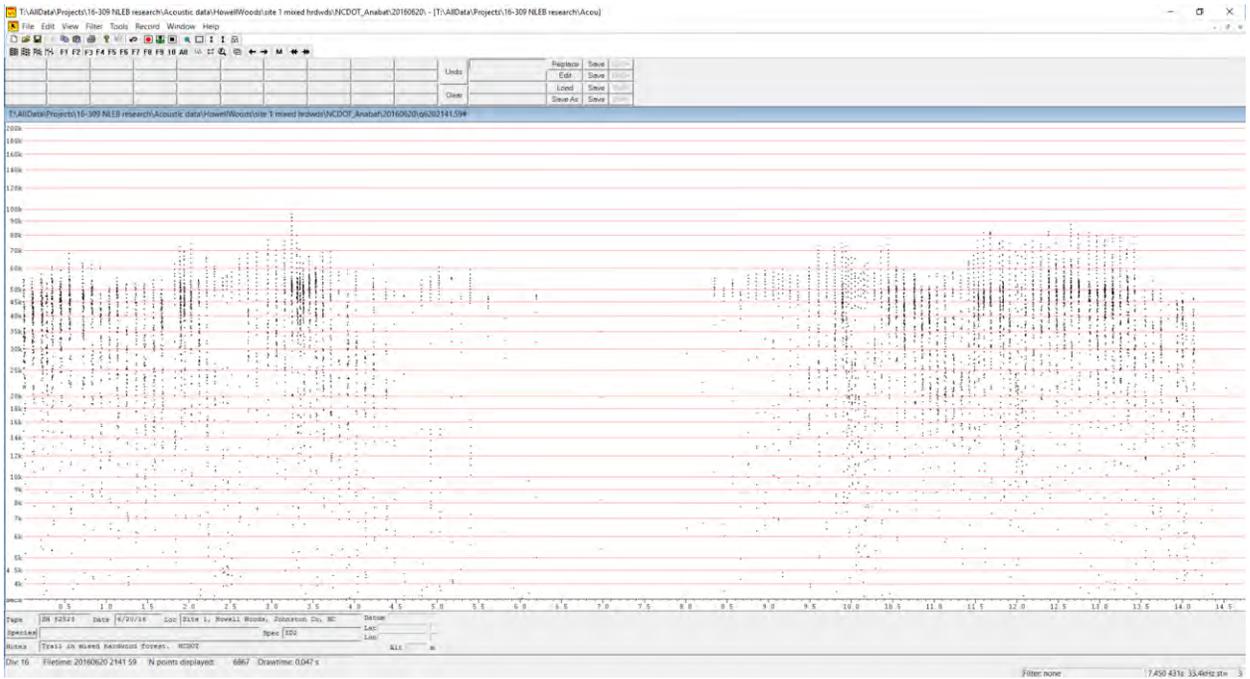


Sonogram 2. Howell Woods, Site 1, File Q6202142.48# F4, uncompressed

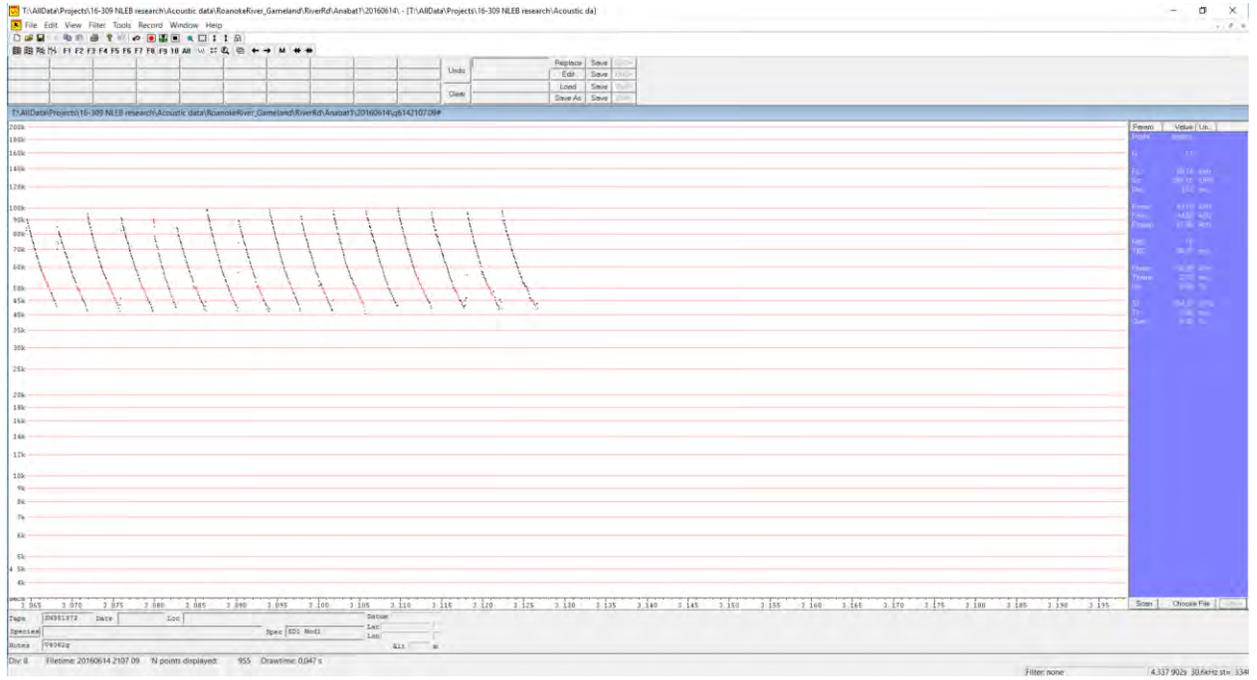


Sonogram 3. Howell Woods, Site 1, File Q6202141.59#, F9, compressed, manual cleaning

MYSE. Steep slope ($Sc > 200$ OPS), long call sequence and quiet call are indicative of MYSE. Feeding buzz present. From manual review. Echoclass prominent species=MYSE, BCID=MYAU

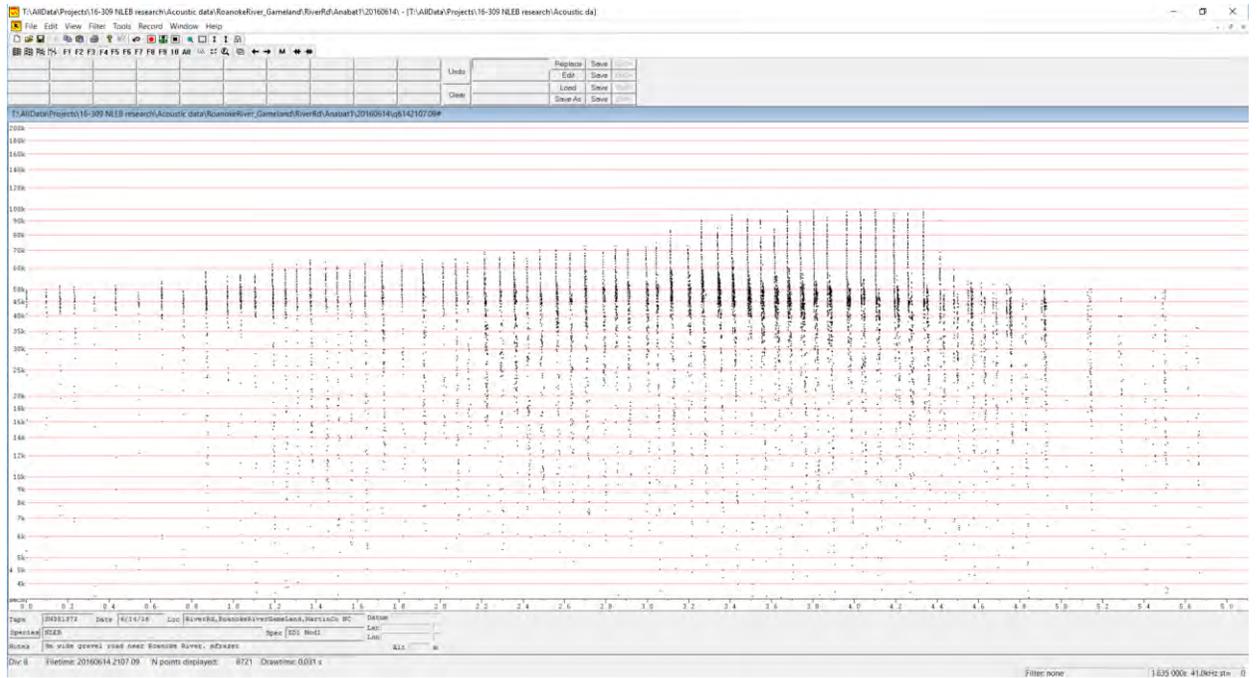


Sonogram 4. Howell Woods, Site 1, File Q6202141.59#, F3, uncompressed

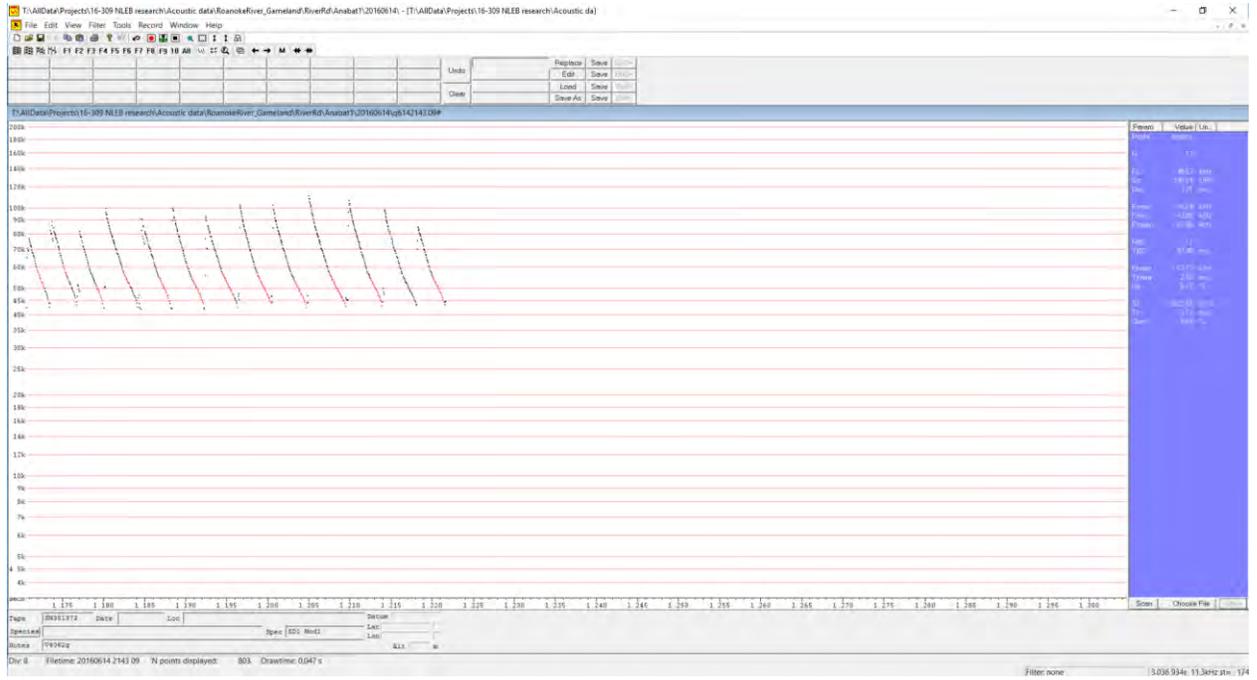


Sonogram 6. Roanoke River Game Land, Site 1, File Q6142107.09#, F9, compressed, manual cleaning

MYSE. Steep slope ($Sc > 200$ OPS) and high frequency pulses. Fairly long call sequence. Calls in the five minutes after this file have similarly steep slopes and high frequencies, but sigmoidal pulses are present. No calls in the 5 minutes preceding this file.

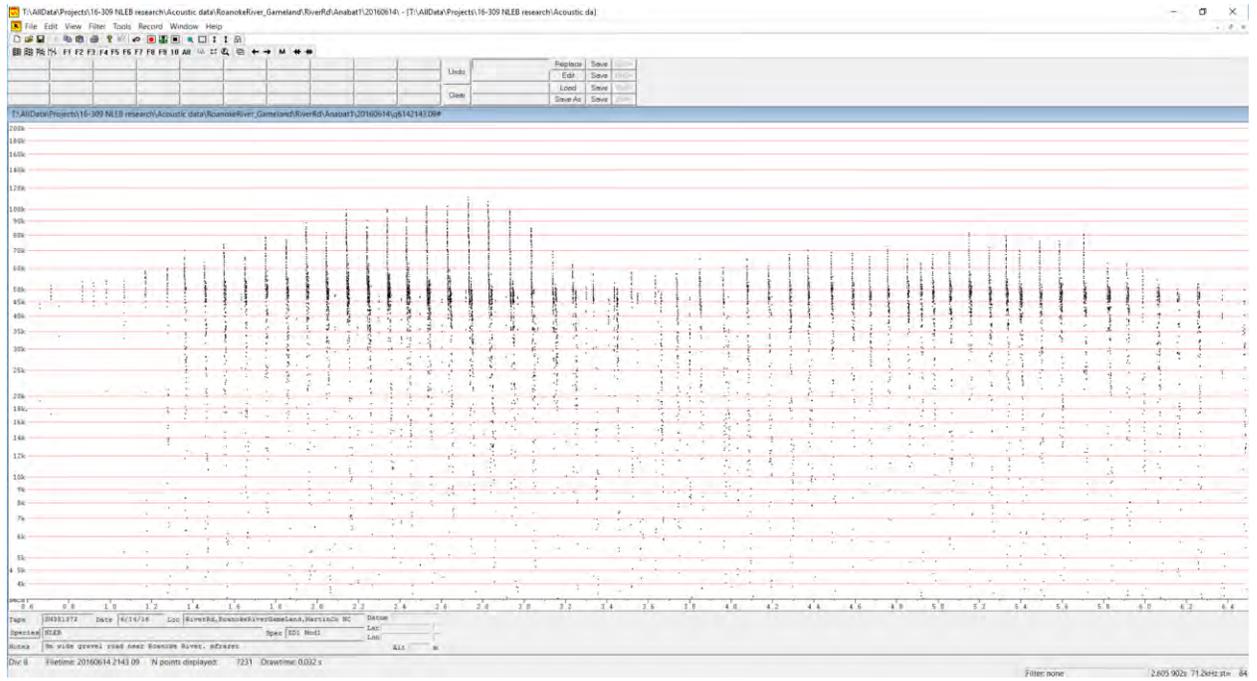


Sonogram 7. Roanoke River Game Land, Site 1, File Q6142107.09#, F4, uncompressed

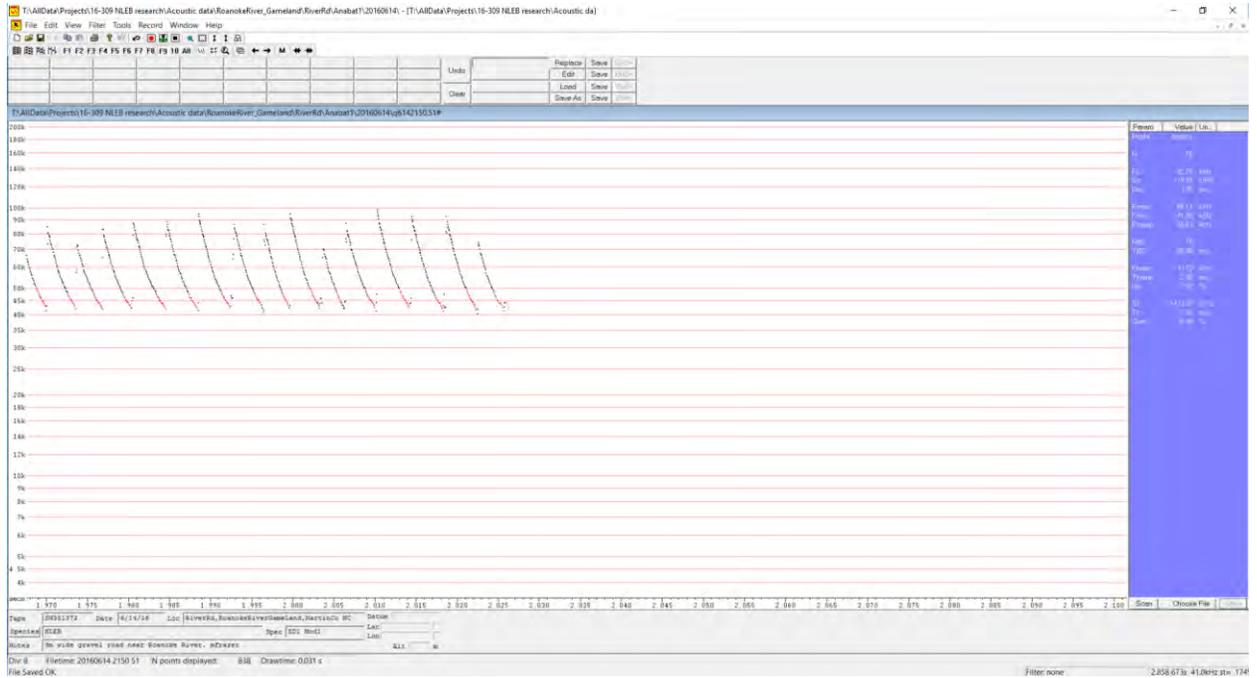


Sonogram 8. Roanoke River Game Land, Site 1, File Q6142143.09#, F9, compressed, manual cleaning

Not MYSE. Steep slope ($Sc > 200$ OPS), high frequency pulses, and fairly long call sequence; however, some pulses are sigmoidal, suggesting MYAU. Calls in the five minutes before and after this file have similar sigmoidal pulses.

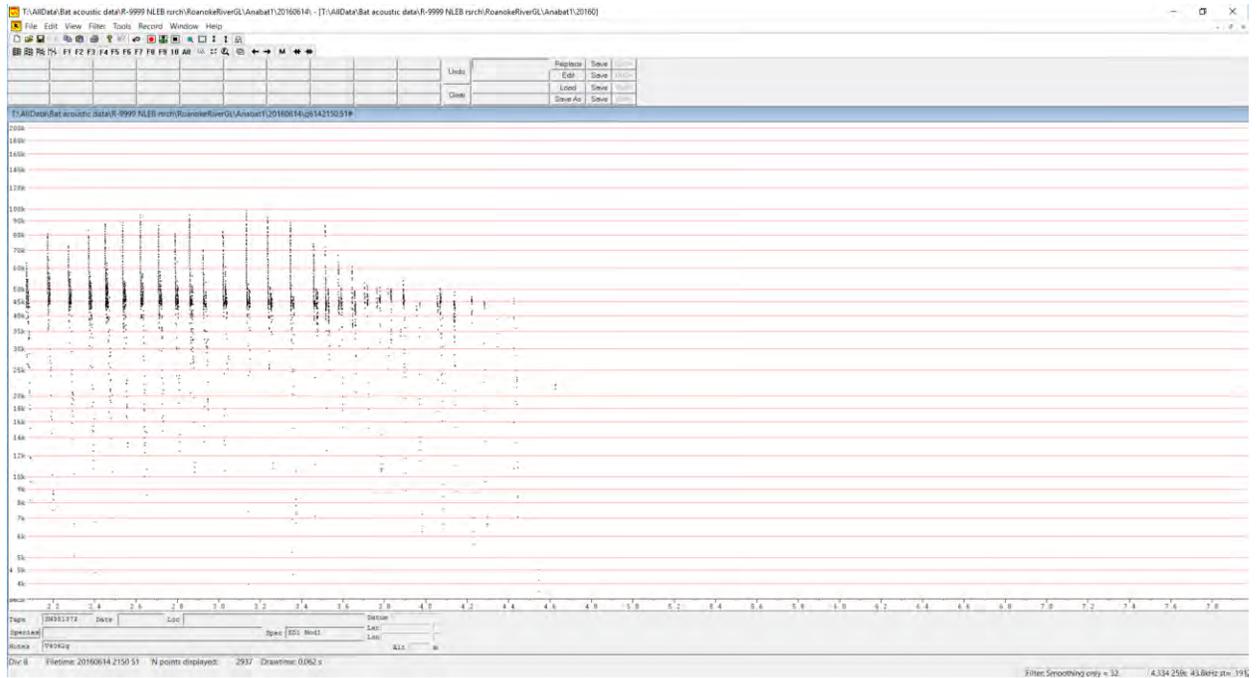


Sonogram 9. Roanoke River Game Land, Site 1, File Q6142143.09#, F4, uncompressed

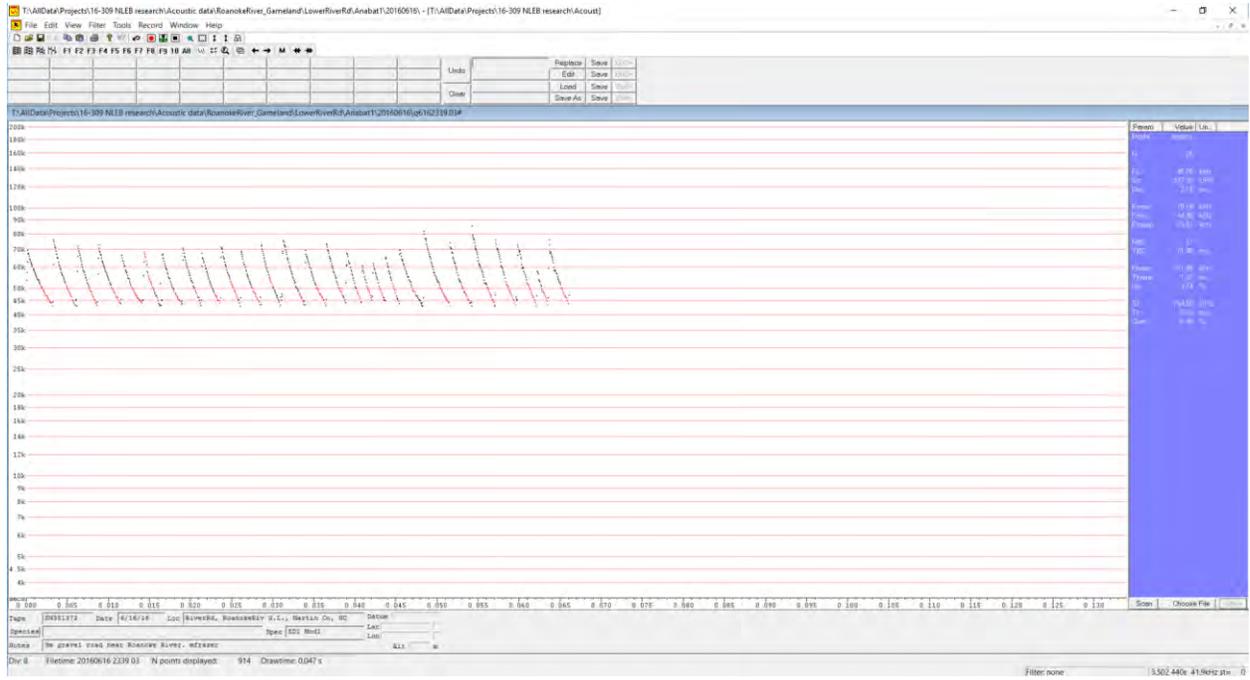


Sonogram 10. Roanoke River Game Land, Site 1, File Q6142150.51#, F9, compressed, manual cleaning

Not MYSE. High frequency pulses, but average $S_c < 200$ OPS. Shorter pulses are sigmoidal, suggesting MYAU. Longer pulses have shallower slope. Calls preceding this file have sigmoidal pulses; files following it have fragmented or sigmoidal pulses.

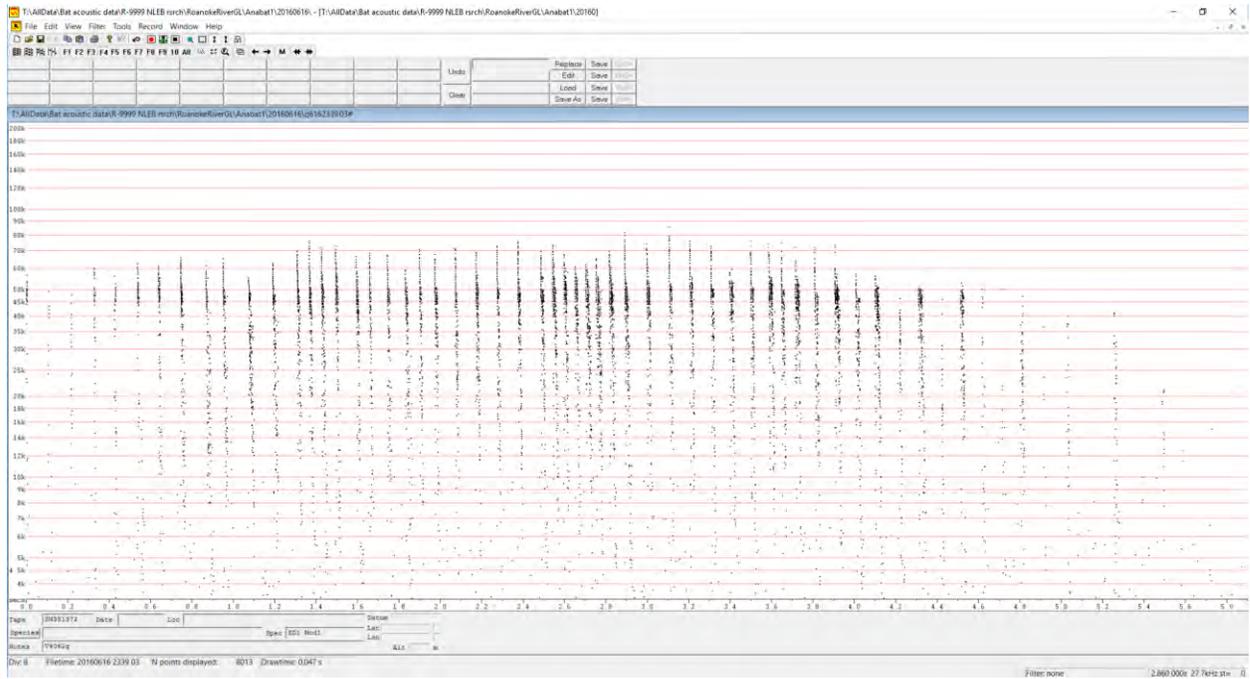


Sonogram 11. Roanoke River Game Land, Site 1, File Q6142150.51#, F4, uncompressed

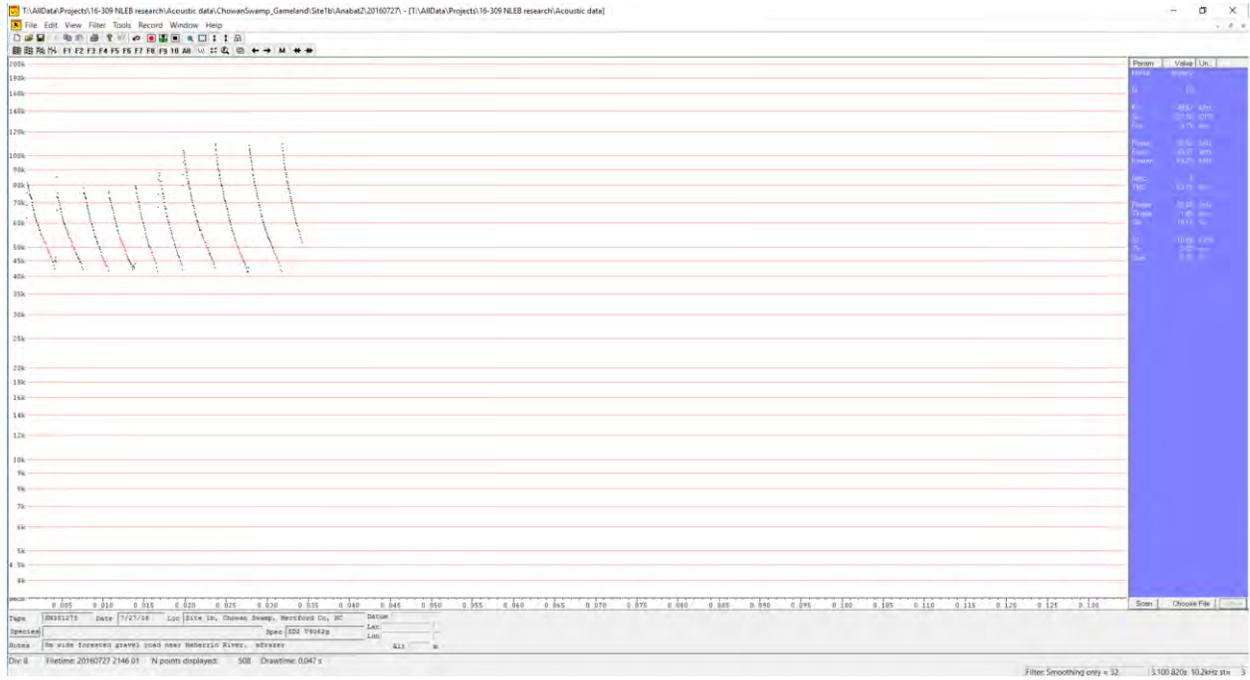


Sonogram 14. Roanoke River Game Land, Site 2, File Q6162339.03#, F9, compressed, manual cleaning

Not MYSE. Average Sc >200 OPS; however, pulses are variable, some with multiple breaks in slope, suggesting MYAU. No other calls within +/- five minutes.

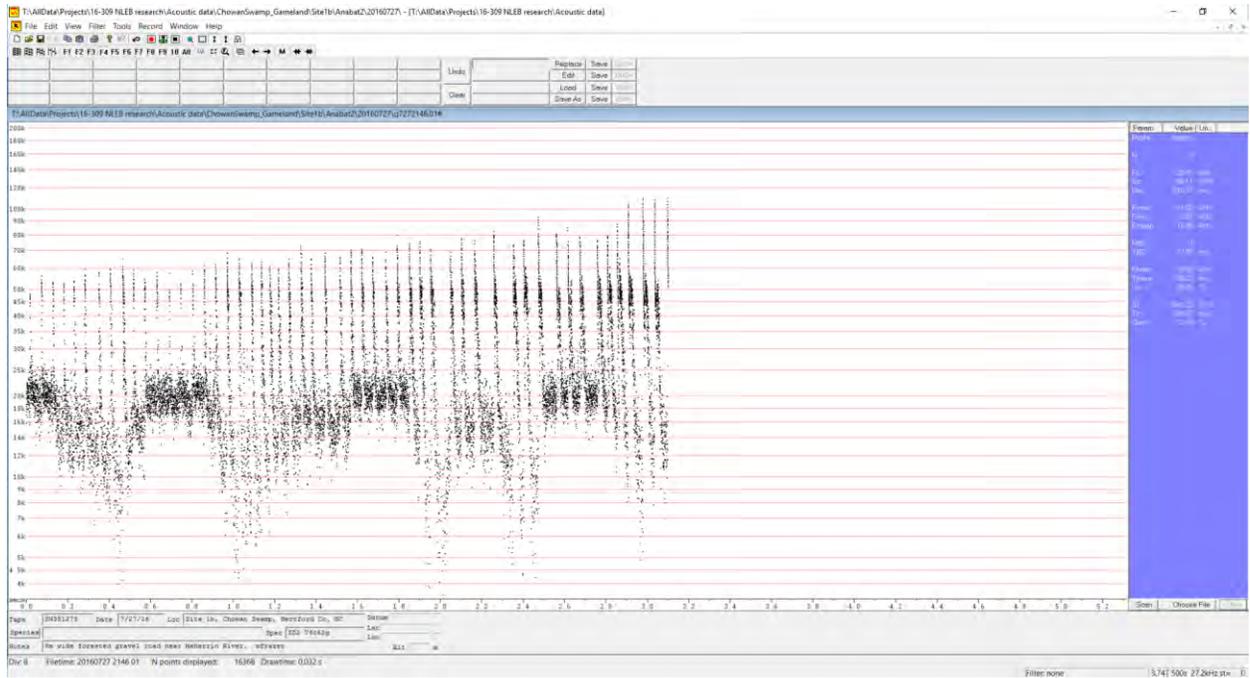


Sonogram 15. Roanoke River Game Land, Site 2, File Q6162339.03#, F4, uncompressed

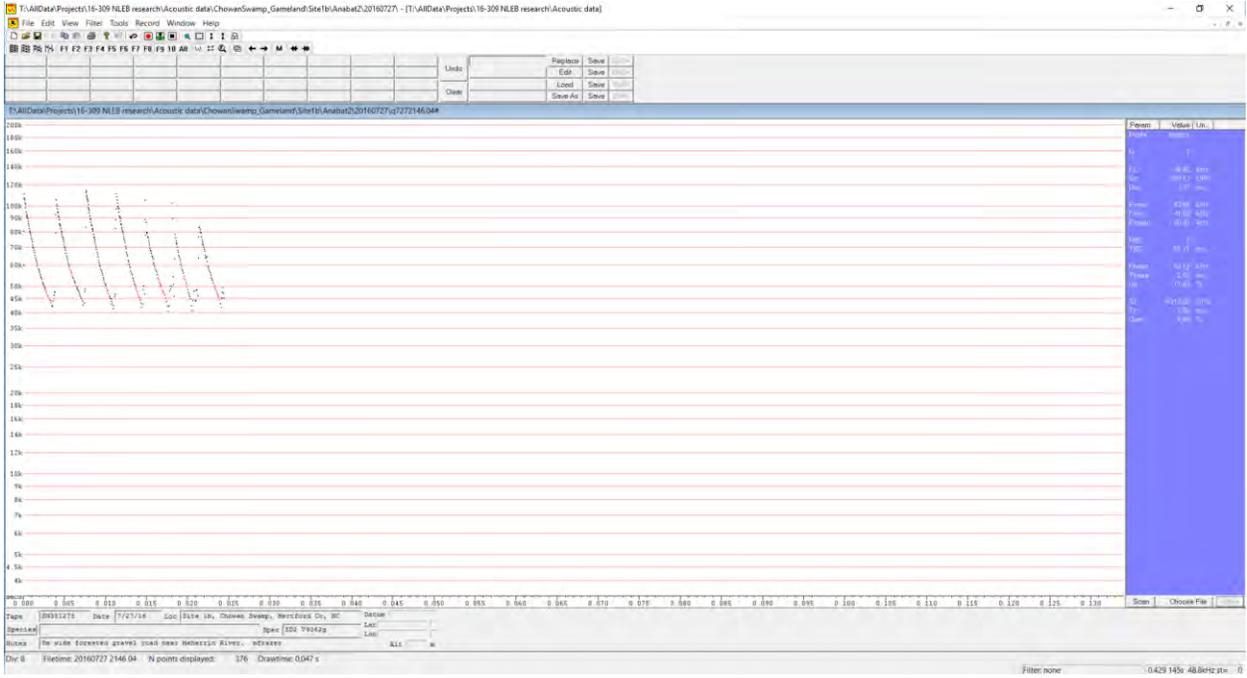


Sonogram 18. Chowan Swamp Game Land, Site 1b, File Q7272146.01#, F9, compressed, manual cleaning

MYSE. Steep slope with the characteristic slope (S_c) >200 octaves per second (OPS), high frequency pulses, and no obvious breaks in slope. Most pulses appear fragmented; only a few are >100 kHz. No similar calls in the prior 5 minutes; one similar call immediately following.

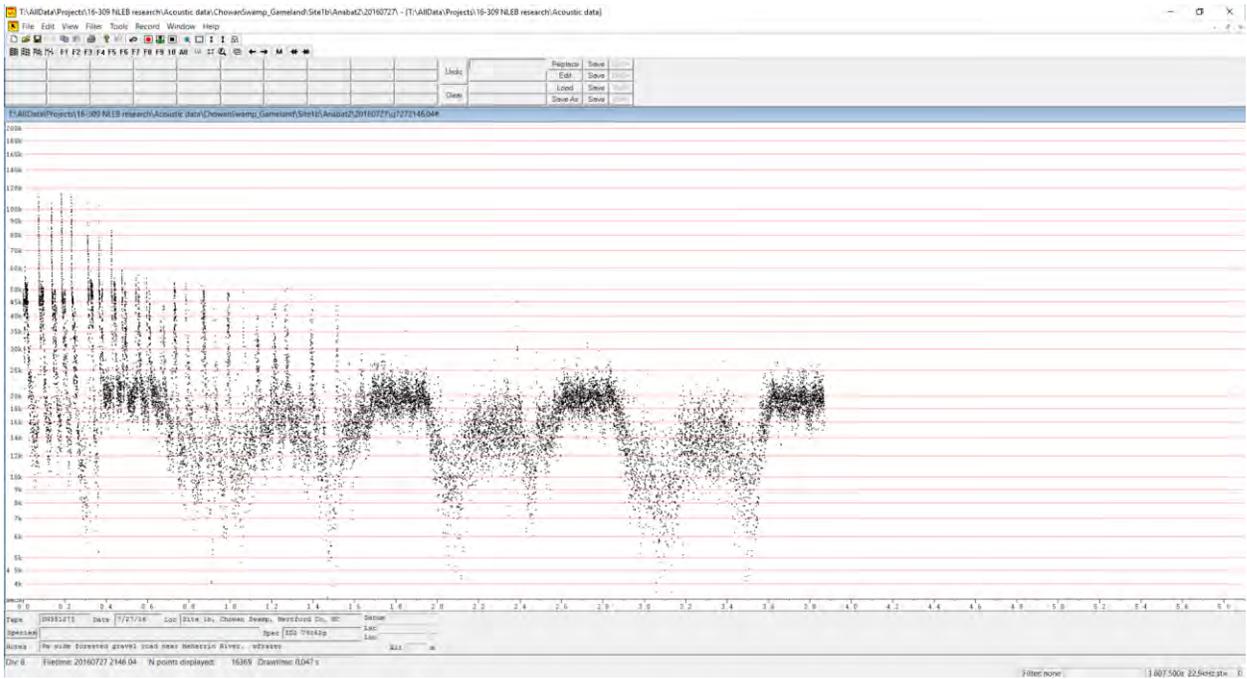


Sonogram 19. Chowan Swamp Game Land, Site 1b, File Q7272146.01#, F4, uncompressed

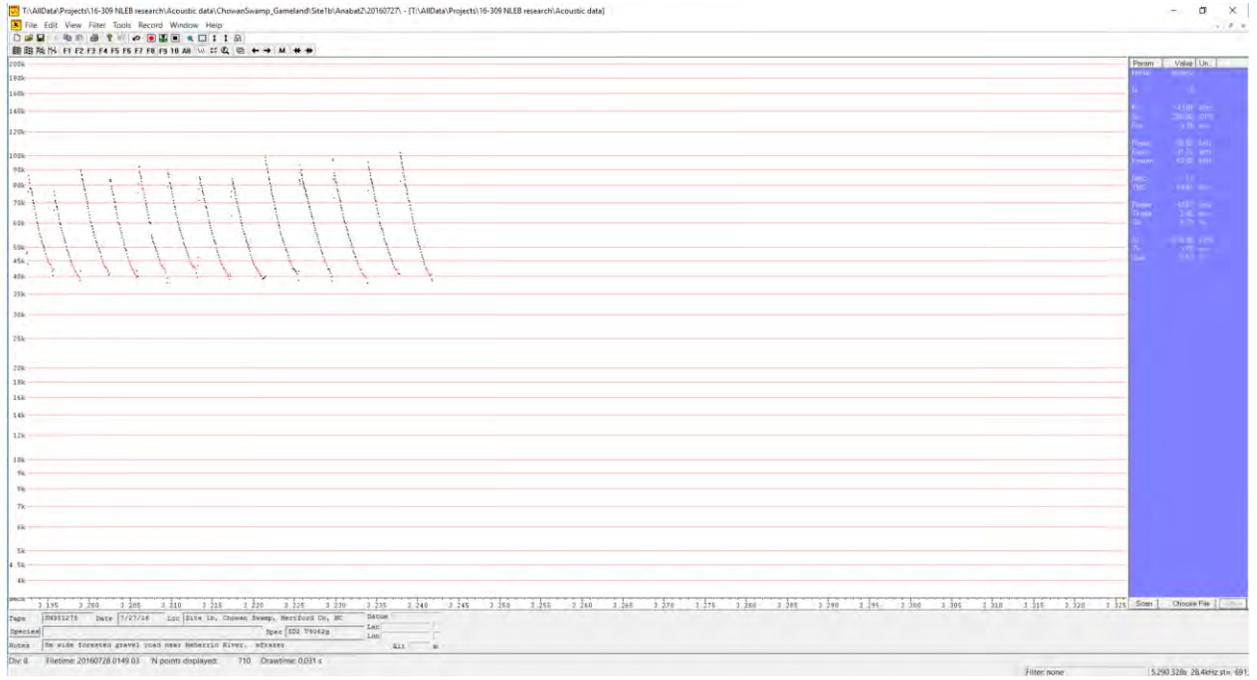


Sonogram 20. Chowan Swamp Game Land, Site 1b, File Q7272146.04#, F9, compressed, manual cleaning

MYSE. Steep slope ($Sc > 200$ OPS), high frequency pulses and no obvious breaks in slope. From manual review. Echoclass prominent species=MYLE, BCID=MYSE

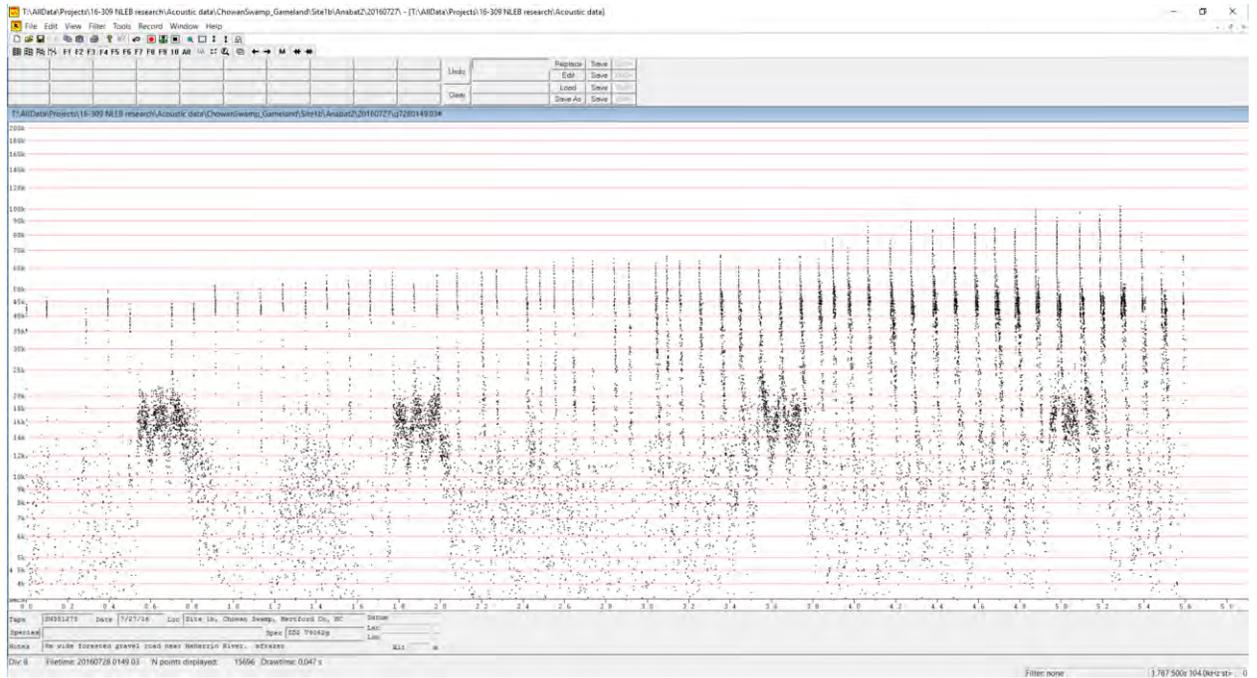


Sonogram 21. Chowan Swamp Game Land, Site 1b, File Q7272146.04#, F4, uncompressed

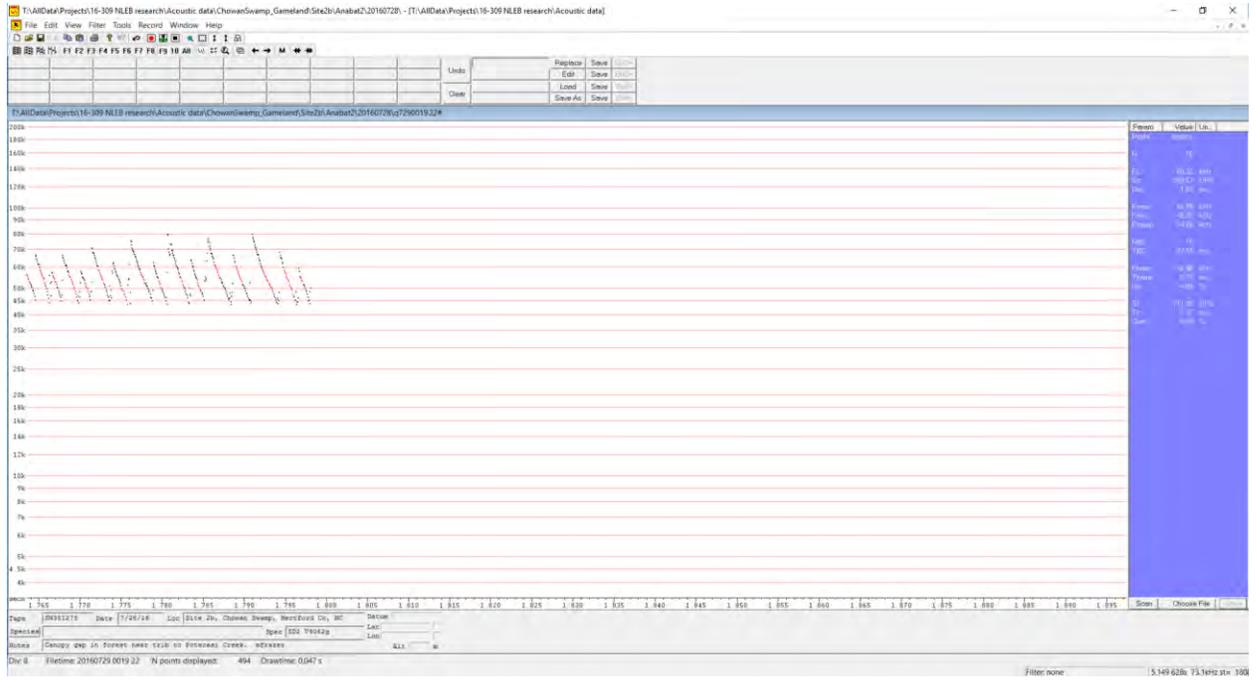


Sonogram 24. Chowan Swamp Game Land, Site 1b, File Q7280149.03#, F9, compressed, manual cleaning

Not MYSE. Steep slope ($Sc \sim 200$ OPS) and high frequency pulses and fairly long call sequence. However, many pulses have a distinct knee and some appear sigmoidal, suggesting MYAU. No similar calls in preceding or following 5 minutes.

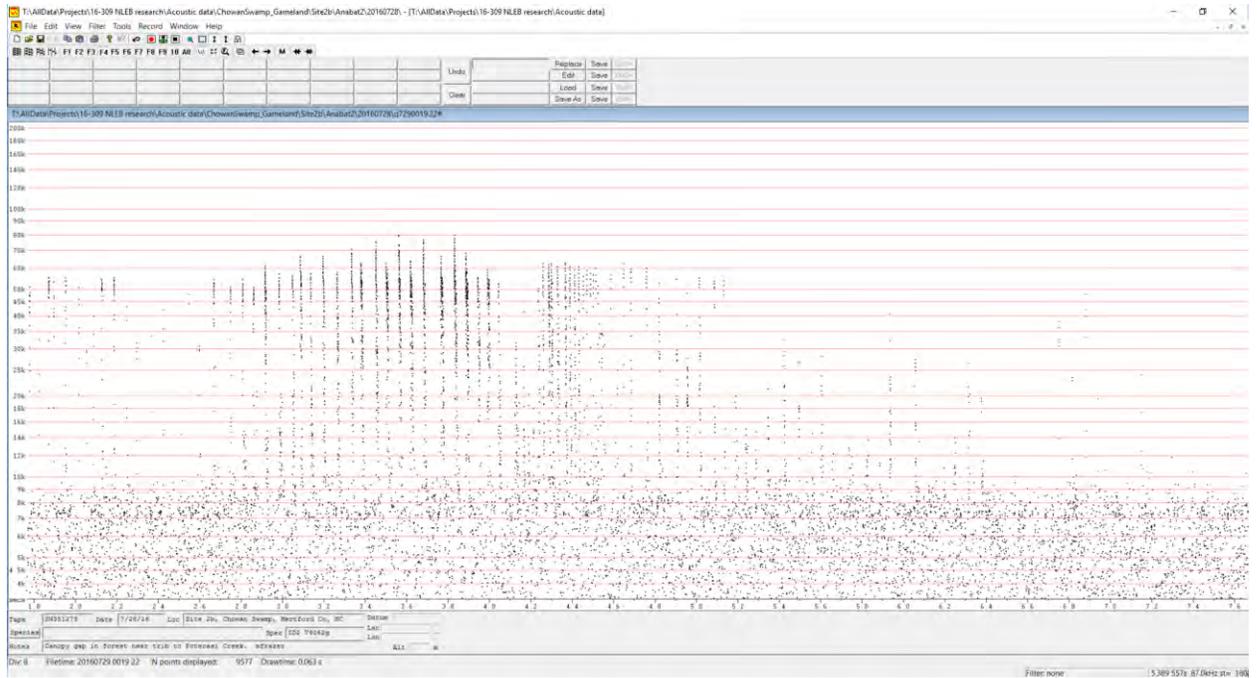


Sonogram 25. Chowan Swamp Game Land, Site 1b, File Q7280149.03#, F4, uncompressed

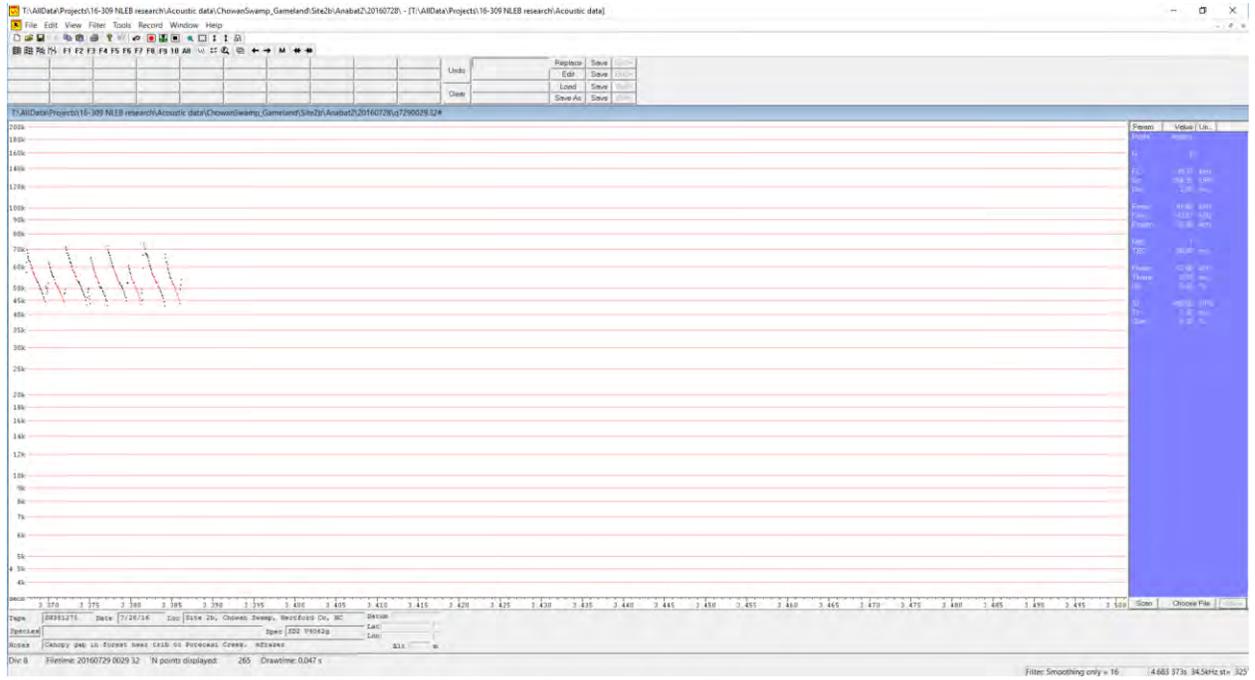


Sonogram 26. Chowan Swamp Game Land, Site2b, Q7290019.22#, F9, compressed

Species cannot be determined. Steep slope ($Sc > 200$ OPS), but pulses fragmented and some may have more than one break in slope, suggesting MYAU. Feeding buzz occurs and two bats appear to be present. Similar-looking files within 5 minutes after this call; all very fragmented.

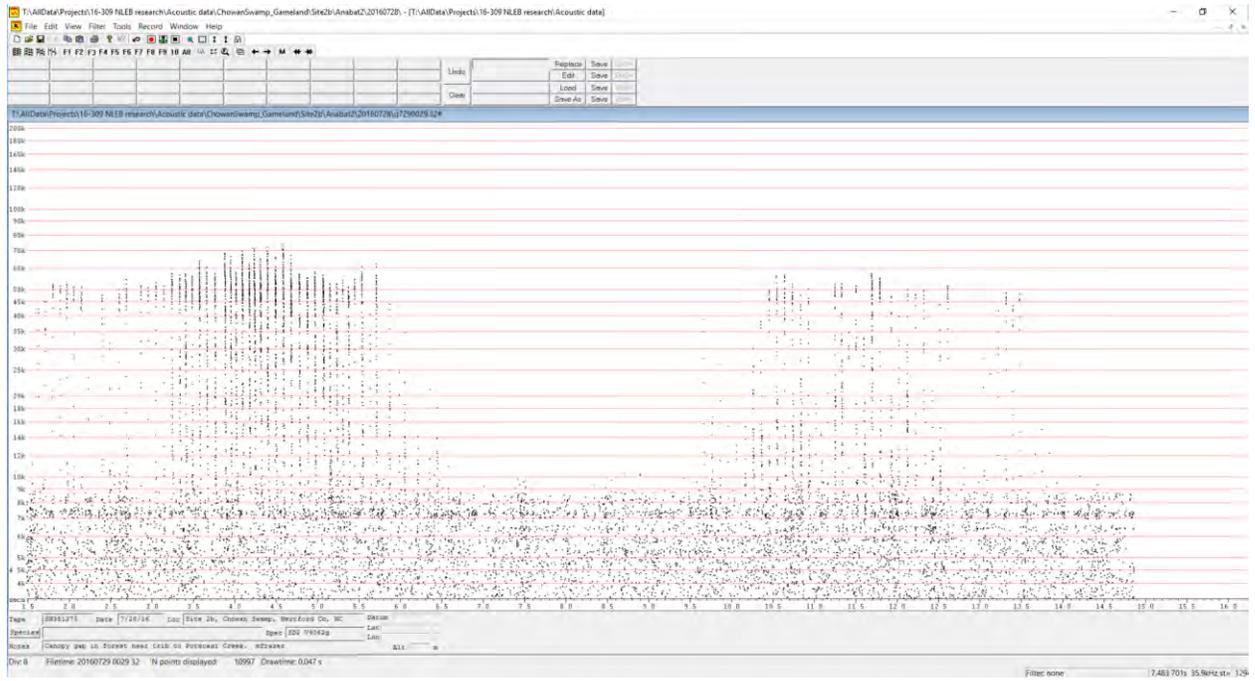


Sonogram 27. Chowan Swamp Game Land, Site2b, Q7290019.22#, F4 uncompressed

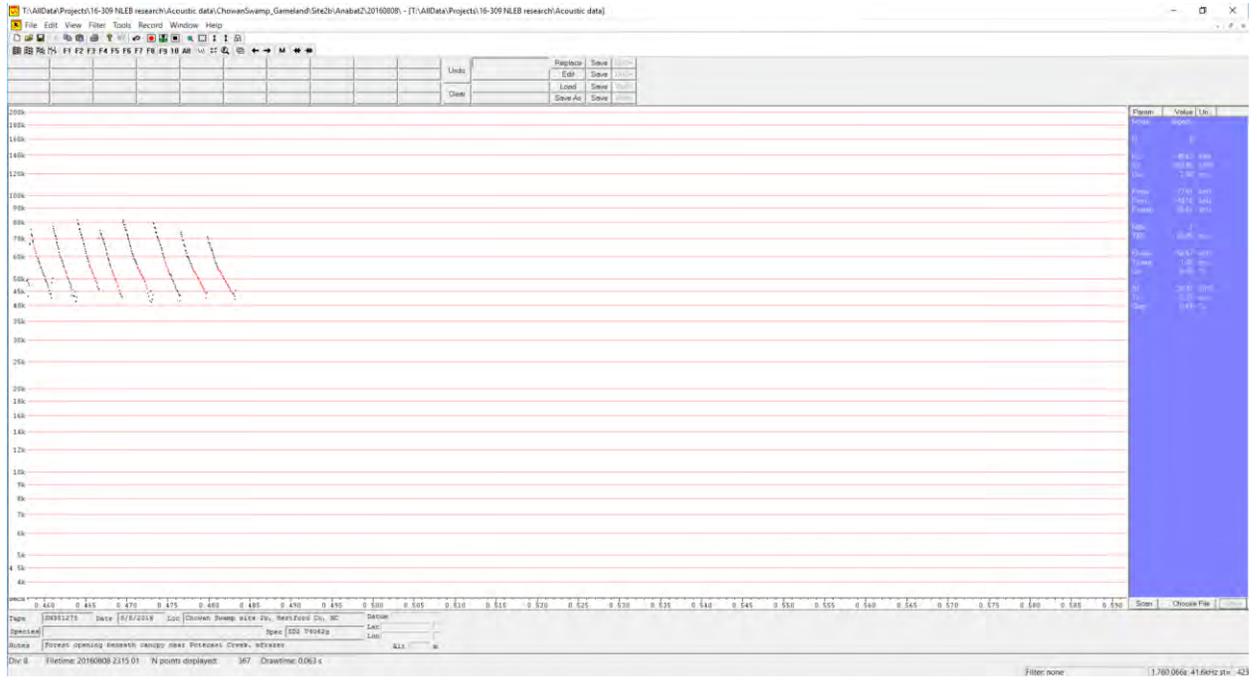


Sonogram 28. Chowan Swamp Game Land, Site 2b, File Q7290029.32#, F9, compressed

Not MYSE. Steep slope ($Sc > 200$ OPS), but pulses are short and may have more than one break in slope, suggesting MYAU. Many similar-looking files within 5 minutes before and after this call; all have rather short pulses.

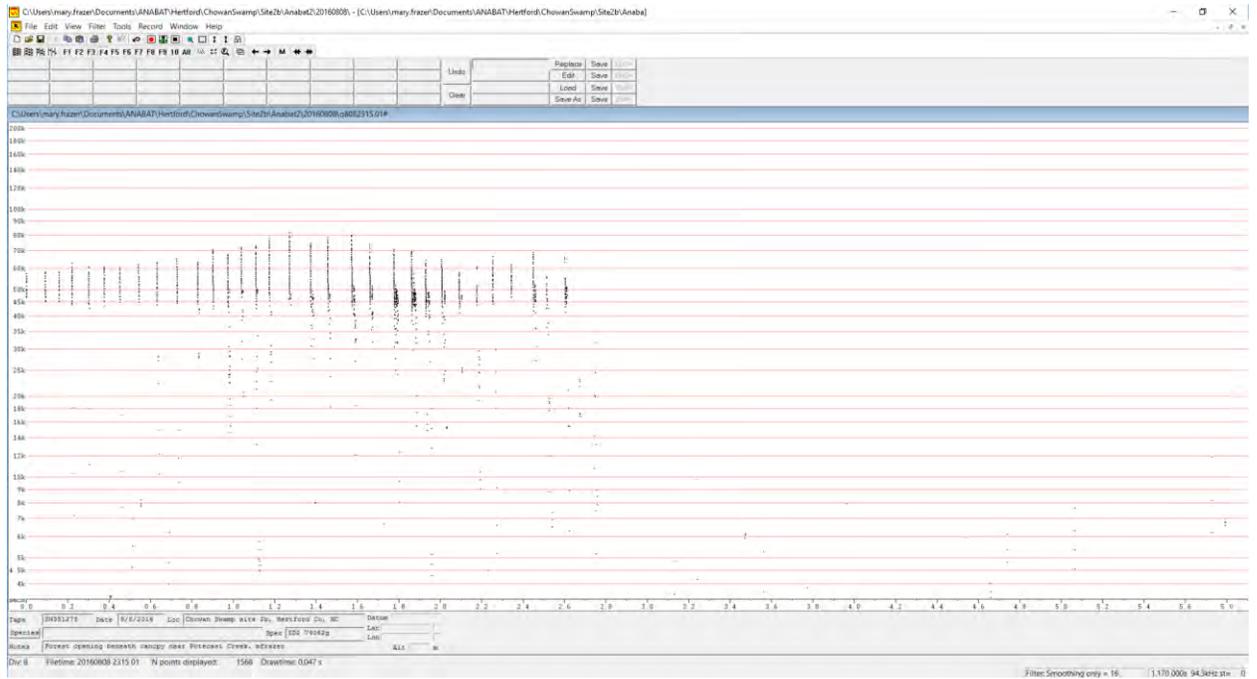


Sonogram 29. Chowan Swamp Game Land, Site 2b, File Q7290029.32#, F3, uncompressed

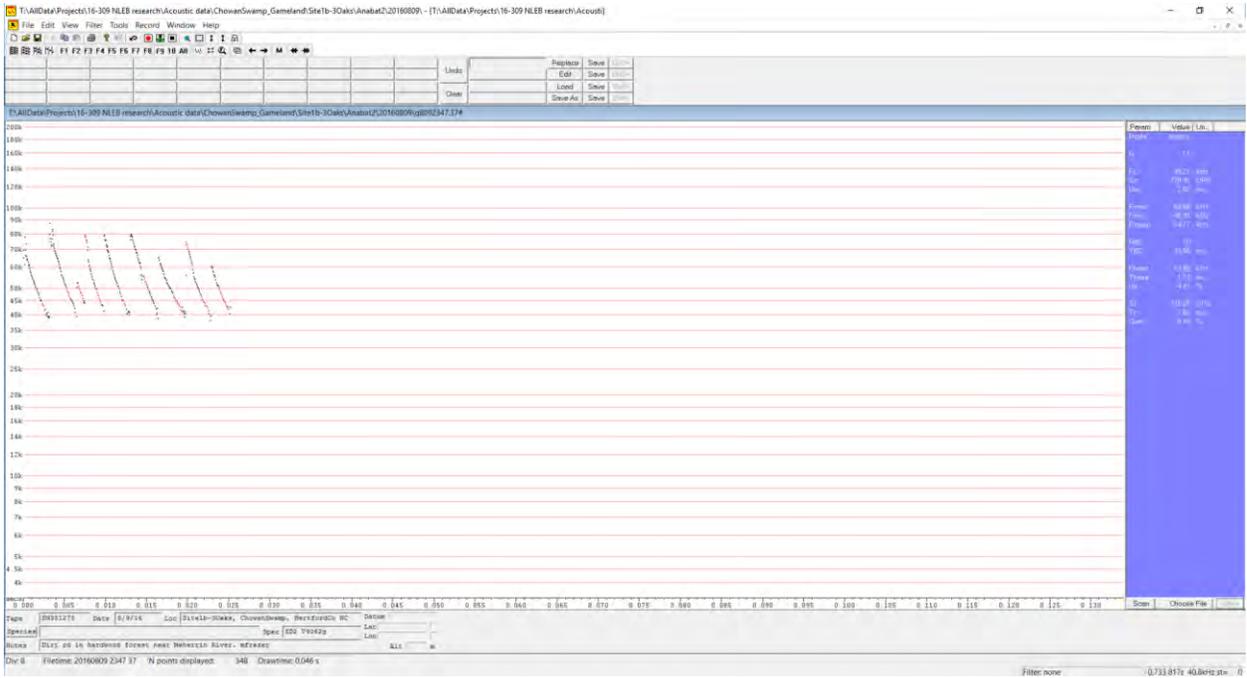


Sonogram 32. Chowan Swamp Game Land, Site 2b, File Q8082315.01#, F9, compressed, manual cleaning

Not MYSE. Average slope is steep ($Sc > 200$). Highest frequency ~ 80 kHz. Most pulses very short, some are sigmoidal, suggesting MYAU.

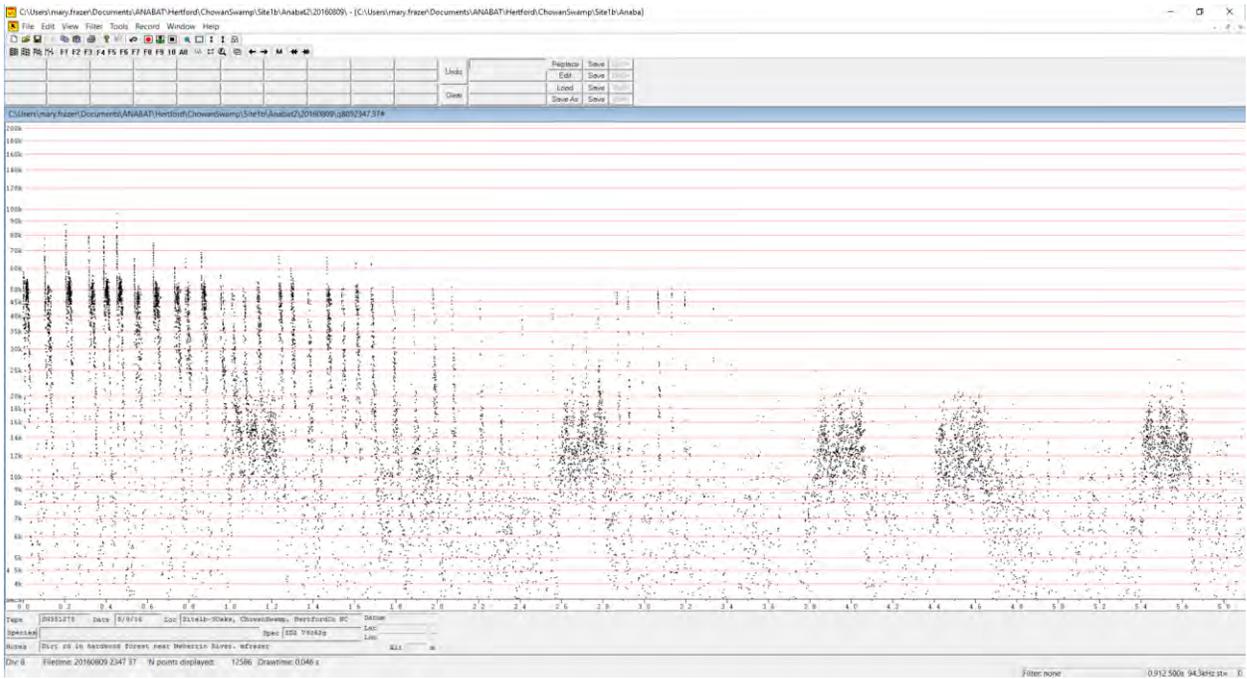


Sonogram 33. Chowan Swamp Game Land, Site 2b, File Q8082315.01#, F4, uncompressed.



Sonogram 34. Chowan Swamp Game Land, Site 1b – 3Oaks, File Q8092347.37#, F9, compressed, manual cleaning

Cannot be determined. Average slope is steep ($Sc > 200$), but pulses are fragmented and there is variability in pulse shape. Call sequence is short; too few pulses to identify.



Sonogram 35. Chowan Swamp Game Land, Site 1b-3Oaks, File Q8092347.37#, F4, uncompressed

Appendix C

Mist-net Survey Data Forms and Photographs

NCDOT Mist-Netting & Acoustic Survey Data Form

Project: NLEB research	County: Lee	Site#: 1	Night#: 1	Site Name: Lower River Rd @ RR	Date: 05/09/2016
Latitude: 35.567319	Longitude: -79.055681	Datum: NAD 83	Elevation: 200'	ID By: Frazer	
Observers: Nathan Howell, Nancy Scott, Mary Frazer				Start Time: 8:30 pm	End Time: 1:35 AM

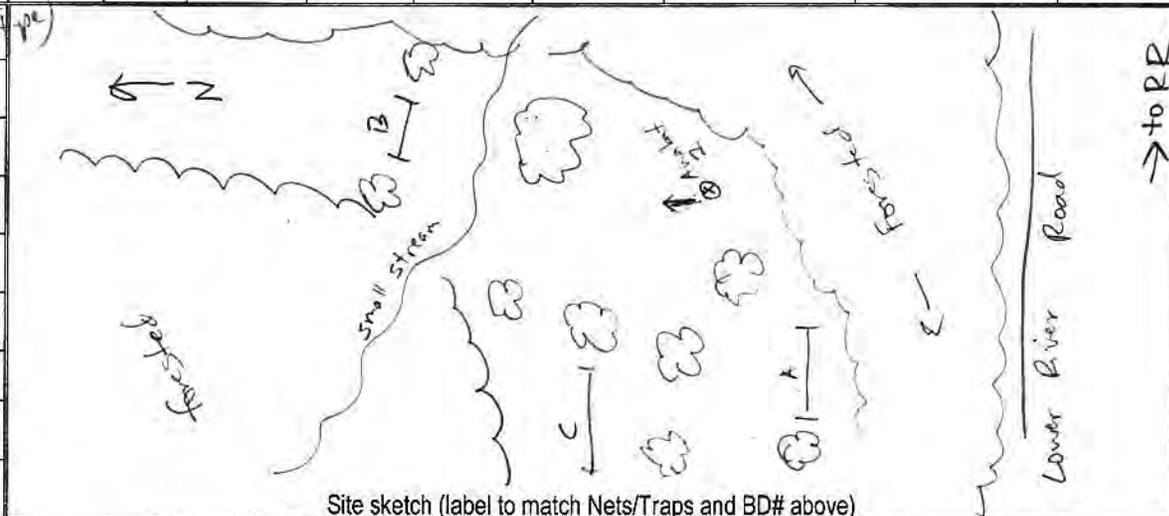
Conditions:	Time 8:30 PM	Temp 73° F	Wind None	Clouds Partly	Time 11:14 PM	Temp 69° F	Wind none	Clouds none	Time 01:30 AM	Temp 66° F	Wind none	Clouds none
-------------	--------------	------------	-----------	---------------	---------------	------------	-----------	-------------	---------------	------------	-----------	-------------

Moon Effect: sliver moon, (waxing crescent) no effect
 Start: sunset
 Stop: 10:30 pm
 Land Use: Urban / Agriculture / Forest / Water / Wetland / Barren (describe): large canopy gaps in forest near hwy & RR.

NETS/TRAPS:	A: 9m triple	B: 6m triple	C: 12m double	D:	E:	F:
Pool size WxL						
Swoop WxL						
Photo? or #						

BD#	Latitude	Longitude	Mic	Ht	clutter	gain	trigger	interval	Start time	Stop Time	Photo?
1			steel	10ft	med.	sensitivity	5 → 7		8:37 pm		yes

Site Description: Piedmont Bottomland Forest (W2 type)
 overstory: Pinus taeda, Quercus phellos, Liquidambar
 tulipifera, Quercus velutina / Subcanopy: Acer rubrum,
 Liquidambar styraciflua, Platanus occidentalis / shrub:
 Celtis occidentalis, Alnus incana



Remarks: lots of insect noise - continual
 gray tree frogs, barred owl, bullfrog. Beetles in nets!
 Whippoorwill

Site sketch (label to match Nets/Traps and BD# above)

Habitat: mixed, bottomland, thinned, mature, natural. ~~pedic~~ Clutter - open canopy in areas where thinning occurred up 9-15m travel corridor

NCDOT Mist-Netting & Acoustic Survey Data Form

Project:	NLEB Research	County:	Lee	Site#:	1	Night#:	2	Site Name:	Lower River Rd @ RR tracks	Date:	5/16/16	
Latitude:	35.567469			Longitude:	-79.055803			Datum:	NAD83	Elevation:	200'	
Observers:	H. Wood, M. Frazer						Start Time:	8:40 PM		End Time:	1:40 AM	
Conditions:	Time	Temp	Wind	Clouds	Time	Temp	Wind	Clouds	Time	Temp	Wind	Clouds
	9:40 PM	61°F	1 mph	overcast	11:10 PM	55°F	none	clear	1:30 AM	53°F	—	clear
Moon Effect:	(1st Quarter) Half full, not shining on net		Start:	Sunset		Stop:	midnight		Land Use:	Urban / Agriculture / Forest Water / Wetland / Barren (describe): canopy gaps (-partial thinning) in bottomland forest		
NETS/TRAPS:	A: 9m triple		B: 6m triple		C: 4m double		D:	E:	F:			
Pool size WxL							D:	E:	F:			
Swoop WxL							D:	E:	F:			
Photo? or #							D:	E:	F:			
BD#	Latitude	Longitude	Mic	Ht	clutter	gain	trigger	interval	Start time	Stop Time	Photo?	
1			Steel	10 ft	med	7 sens.	—	—	8:39		Y	
Site Description:			see description from night #1									
			Didmont Bottomland Forest									
Remarks:			a few beetles in net. 1 luna moth Barred owls, whipperwills, chuckwills widow									
			<p>Site sketch (label to match Nets/Traps and BD# above)</p>									

RR tracks #

Bat Survey Data Form

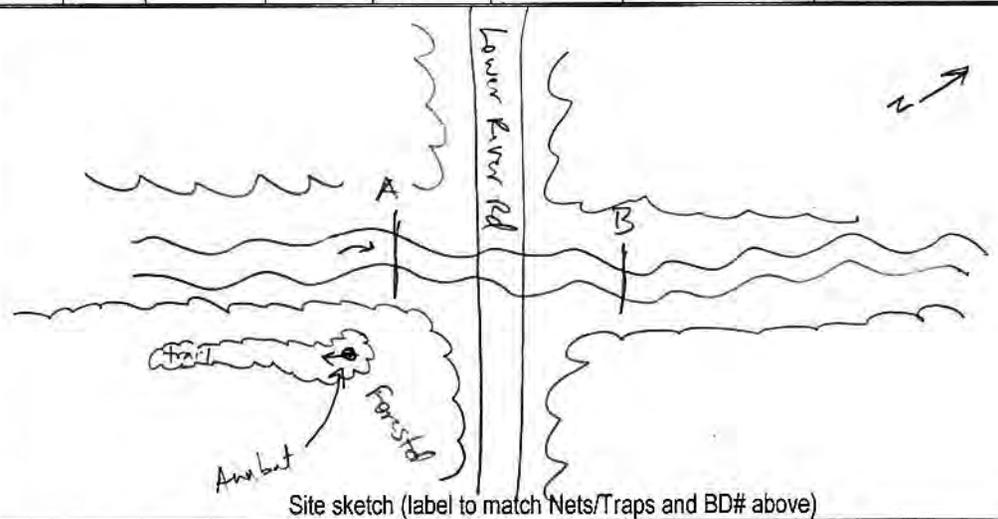
Project: NLEB Research County: Lee Site# 1 Night# 2 Site Name: Lower River Rd @ RR Tracks Date: 5/16/16

	TIME	SPECIES	Sex	Age	P/L/PL/NR	FA	EAR	WT	Net #	Height	Band / WS	Comment / Photo #
1	9:18 pm	LABO	F	A	P	42mm	—	11.0 13.4g	A	3m	3 ORS NC 1298 / 0	
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												

bat + bag
bat alone

NCDOT Mist-Netting & Acoustic Survey Data Form

Project: NLEB Research		County: Lee		Site#: 2	Night#: 1	Site Name: Trib to Lick Creek		Date: 5/10/16				
Latitude: 35.54944				Longitude: -79.049173			Datum: NAD83	Elevation: 170'	ID By: Frazer			
Observers: N. Scott, N. Howell, M. Frazer						Start Time: 8:30 pm		End Time: 1:30 AM				
Conditions:	Time: 8:30 PM	Temp: 61°F	Wind: barely noticeable	Clouds: clear	Time: 11:11 PM	Temp: 62°	Wind: -	Clouds: clear	Time: 1:15 AM	Temp: 59°F	Wind: -	Clouds: clear
Moon Effect: waning crescent sliver - no effect		Start: sunset		Stop: 10:50		Land Use: Urban / Agriculture / Forest / Water / Wetland / Barren (describe): Creek running through bottomland hardwood @ Lower River Rd						
NETS/TRAPS:		A: 4m dbl	B: 6m dbl	C:	D:	E:	F:					
Pool size WxL												
Swoop WxL												
Photo? or #												
BD#	Latitude	Longitude	Mic	Ht	clutter	gain	trigger	interval	Start time	Stop Time	Photo?	
1			steel	10ft	high	sensitivity = 7			8:30 PM		4	
<p><i>Piedmont Bottomland Forest</i></p> <p>Site Description: many beetles in net, 1st couple hours</p> <p>overstory: Pinus taeda, Liquidambar styraciflua, Carya sp.</p> <p>Quercus velutina, Ulmus rubra, Fraxinus sp.</p> <p>mid story/shrub: Acer rubrum, Sambucus canadensis, Cornus amomum, Viburnum sp., Cercis canadensis</p> <p>Herbs/Vines: Smilax sp., Lonicera japonica, Tradescantia, Arundinaria</p> <p>Remarks: ^{tree} Muscadine (cordifolia), Corchorus sp., Houstonia sp., Chrysopsis virginicum</p> <p>wh. piper w. ll, chuck will's widow, cuckoo, barred owl,</p> <p>green tree frogs, bullfrogs</p>												



NCDOT Mist-Netting & Acoustic Survey Data Form

Project:	NLEB Research	County:	Lee	Site#:	2	Night#:	2	Site Name:	VT to Lick Creek	Date:	5/11/16	
Latitude: 35.54944			Longitude: -79.049173			Datum: NAD83		Elevation: 170'		ID By: Frazer		
Observers: M. Frazer, N. Scott, N. Howell								Start Time: 8:30 PM		End Time: 1:30 AM		
Conditions:	Time 8:50 PM	Temp 70°F	Wind -	Clouds clear	Time 11:34 PM	Temp 62°F	Wind -	Clouds -	Time 1:20 AM	Temp 60°F	Wind -	Clouds clear
Moon Effect: partial moon < 1/2 not shining on net		Start: sunset		Stop: 11:15 pm		Land Use: Urban / Agriculture / Forest (Water) Wetland / Barren (describe): creek in bottomland hardwood @ Lower River Rd						
NETS/TRAPS:	A: 4m dbl	B: 6m dbl	C: 6m dbl	D:	E:	F:						
Pool size WxL												
Swoop WxL												
Photo? or #	y		y		y							
BD#	Latitude	Longitude	Mic	Ht	clutter	gain	trigger	interval	Start time	Stop Time	Photo?	
1			steel	10 ft		sens. = 7			8:30 pm		y	
Site Description: see sheet from Night 1												
Piedmont Bottomland Forest												
barred owls @ 11:43												
Remarks: beetles in net												
whippoorwill, chuckwillow-villow, green-tree frog												
coyotes in distance, chat			Site sketch (label to match Nets/Traps and BD# above)									

battery tester
binder clips
futility
mallet/tree saw
batteries
rubber gloves (Coleman)
AAA batteries
shred/chord
piper 2007

NCDOT Mist-Netting & Acoustic Survey Data Form

Project: NLEB Research	County: Lee	Site#: 3	Night#: 1	Site Name: Lick Creek	Date: 5/18/16						
Latitude: 35.558877		Longitude: -79.054237		Datum: NAD83	Elevation: 164'						
Observers: M. Howell, H. Wood, G. Jordan, M. Frazer				Start Time: 8:30 PM	End Time: 1:30 AM						
Conditions:	Time: 9:18 PM	Temp: 59°F	Wind: —	Clouds: cloudy	Time: 11:30 PM						
		Temp: 61°F	Wind: —	Clouds: cloudy	Time: 1:22 AM						
		Temp: 60°F	Wind: —	Clouds: cloudy							
Moon Effect: none	Start: —	Stop: —	Land Use: Urban / Agriculture / Forest Water / Wetland / Barren (describe):								
NETS/TRAPS:	A: double 12m	B: double 6m	C: triple 9m	D:	E:						
Pool size WxL											
Swoop WxL											
Photo? or #											
BD#	Latitude	Longitude	Mic	Ht	clutter	gain	trigger	interval	Start time	Stop Time	Photo?
1			steel	10ft	hi	7sens.	—	—	8:10? AM		Y
Site Description: Piedmont Alluvial forest at creek			<p>Site sketch (label to match Nets/Traps and BD# above)</p>								
A. negundo, Ilex decidua, Fraxinus pennsylvanica											
Ulmus rubra, Betula nigra, Liriodendron, P.l.											
C. caroliniana, Carex sp., Saururus cernuus											
Chasmanthium latifolium, L. gutierrezense											
Remarks: Rained previous night, Not much bird or insect activity. 100% cloud cover.											
Periodic beaver splashing.											

Bat Survey Data Form

Project: NLEB project County: Lee Site# 3 Night# 1 Site Name: Lick Creek Date: 5/18/16

	TIME	SPECIES	Sex	Age	P/L/PL/NR	FA	EAR	WT	Net #	Height	Band / WS	Comment / Photo #
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												

)"

NCDOT Mist-Netting & Acoustic Survey Data Form

Project: NLEB Research	County: Lee	Site#: 4	Night#: 1	Site Name: Graveland Inter	Date: 5/19/16						
Latitude: 35.555268		Longitude: -79.042984		Datum: NAD83	Elevation: 160'						
Observers: N. Scott, H. Wood, M. Frazer				Start Time: 20:50	End Time: 1:50						
Conditions:	Time 21:50	Temp 59°F	Wind —	Clouds Yes	Time 23:30						
					Temp 58°F						
					Wind —						
					Clouds Yes						
					Time 1:30						
					Temp 58°F						
					Wind Very light						
					Clouds cloudy						
Moon Effect: none	Start: —	Land Use: Urban / Agriculture & Forest / Water / Wetland / Barren (describe): Primarily ~25 yr old, loblolly managed forest w/ patches of bottomland hardwood.									
	Stop: —										
NETS/TRAPS:	A: 6m triple	B: 9m triple	C: 4m double	D: 4m double	E:						
Pool size WxL											
Swoop WxL											
Photo? or #											
BD#	Latitude	Longitude	Mic	Ht	clutter	gain	trigger	interval	Start time	Stop Time	Photo?
1			steel	10'	med	7 sensitivity	—	—	20:40		Y
	Predominant Bottomland Forest (typical lowland types)										
Site Description: End of dirt road (access across from Gunther Rd) off Lower River Rd.											
P. taeda, Q. prinus, Ulmus alata, Carya sp.,											
L. styraciflua, L. tulipifera, Prunus serotina, A. rubra,											
U. americana, Crataegus sp., Anemone sp.											
Remarks: Rain during day. Humid + 100% overcast.											
Frog calls, yellow-breasted chat, barred owl											
only one beetle in net. Light mist in mid and night, but nets look & feel dry.											

Site sketch (label to match Nets/Traps and BD# above)

NCDOT Mist-Netting & Acoustic Survey Data Form

Palmetto Peartree

Project:	MEB Research	County:	Tyrell	Site#:	1	Night#:	1	Site Name:	Pledger Harbor Rd	Date:	6/7/16		
Latitude:	35.984361			Longitude:	-76.072562			Datum:	NAD83	Elevation:	0	ID By:	Frazer
Observers:	N. Scott, H. Wood, M. Frazer						Start Time:	20:45		End Time:	1:45		
Conditions:	Time	Temp	Wind	Clouds	Time	Temp	Wind	Clouds	Time	Temp	Wind	Clouds	
	21:00	82°F	—	none	23:23	71.5°F	light breeze	none	01:37	71.5°	—	clear	
Moon Effect:	crescent moon little to no effect		Start:	sunset		Stop:	22:10		Land Use:	Urban / Agriculture / <u>Forest</u> / Water / Wetland / Barren (describe): Flooded pine forests w/ maintenance road.			
NETS/TRAPS:	A: double 4m	B: triple 6m	C: triple 9m	D:	E:	F:							
Pool size WxL													
Swoop WxL													
Photo? or #	Y	Y	Y										
BD#	Latitude	Longitude	Mic	Ht	clutter	gain	trigger	interval	Start time	Stop Time	Photo?		
1			steel	10ft	high	7=sens.	-	-	20:40	1:45	Y		
Site Description: P. taeda, (old trees)													
Myrica, Vaccinium, Arundinaria, Quercus nigra													
Liquidambar, Phragmites, Persea borbonica													
Maintenance roads in pine swamp. ECW cavity trees in area.													
Nonriverine swamp forest (Subtype) ^{mixed}													
Remarks: FROGS! Insects!			green tree frogs bull frogs s. cricket frogs narrow mouth toads carpenter frog										
Anabat 2 @ truck													
Heavy rain from tropical storm Colin on 6/6/16.													

rebar thermometer

NCDOT Mist-Netting & Acoustic Survey Data Form

Project:	NLEB Research	County:	Tyrell	Site#:	1	Night#:	2	Site Name:	Pledger Harbor Rd	Date:	6/8/16		
Latitude:	35.984361			Longitude:	-76.072562			Datum:	NAD 83	Elevation:	0	ID By:	Frazer
Observers:	N. Scott, H. Wood, M. Frazer						Start Time:	20:47		End Time:	01:47		
Conditions:	Time	Temp	Wind	Clouds	Time	Temp	Wind	Clouds	Time	Temp	Wind	Clouds	
	21:00	70°F	breeze	few	23:21	68°F	breeze	clear	01:47	64.5	none	clear	
Moon Effect:	crescent moon - only on net B			Start:	sunset			Land Use:	Urban / Agriculture / <u>Forest</u> / Water / Wetland / Barren (describe): road in flooded pine forest. maintenance				
NETS/TRAPS:	A: 4m double		B: 6m triple		C: 9m triple		D:	E:		F:			
Pool size WxL													
Swoop WxL													
Photo? or #													
BD#	Latitude	Longitude	Mic	Ht	clutter	gain	trigger	interval	Start time	Stop Time	Photo?		
1			steel	12'	high	7-gain	-	-	20:30	1:30	4		
Site Description:	Unmanaged, flooded pine forest. See data form from night 1.												
	BD 2 outtruck; pointing to other side of												
Remarks:	Much frog activity. Midge hatch. Hole appeared in net! Many tiny moths.												
	littlegreen frog? owl, swamp possum, white												

Site sketch (label to match Nets/Traps and BD# above)

NCDOT Mist-Netting & Acoustic Survey Data Form

Project: NLEB ^{R-9999} research	County: Tyrell	Site#: 2	Night#: 1	Site Name: P3 - Goat Neck Rd	Date: 6/1/16							
Latitude: 35.971448	Longitude: -76.052637			Datum: NAD 83	Elevation: 20							
Observers: N. Scott, H. Wood, M. Frazer				Start Time: 20:35	End Time: 1:35							
Conditions:	Time 20:40	Temp 81°F	Wind mild	Clouds mostly clear	Time 23:07	Temp 71°F	Wind —	Clouds clear	Time 01:16	Temp 70.5°F	Wind —	Clouds —
Moon Effect: none	Start: —	Stop: —	Land Use: Urban / Agriculture / <u>Forest</u> / Water / Wetland / Barren (describe): <u>maint. road in flooded pine forest</u>									
NETS/TRAPS:	A: 9m triple	B: 6m triple	C: 18m double	D:	E:	F:						
Pool size WxL												
Swoop WxL												
Photo? or #	Y	Y	Y									
BD#	Latitude	Longitude	Mic	Ht	clutter	gain	trigger	interval	Start time	Stop Time	Photo?	
1			stel	10'	med low	7 = sens.	—	—	19:56		Y	
Site Description: P. taeda, L. styraciflua, A. rubrum, Persea borbonica, similar, vitis sp. Morica												
Anabat 2 on truck pointing straight up; pointing horizontal as of 22:30.												
2 bats high overhead @ sunset. Probably EPFU.												
Non riverine swamp forest (mixed subtype)												
Remarks: cricket frogs, narrow mouth toads, green tree frogs, leopard frogs, bullfrogs, 2-toed amphiuma												
FROGS EVERYWHERE!			Site sketch (label to match Nets/Traps and BD# above)									

Bat Survey Data Form

Project: <i>NLEB Research</i> County: <i>Tyrell</i> Site# <i>2</i> Night# <i>1</i> Site Name: <i>P3 - Goat Neck Rd</i> Date: <i>6/1/16</i>												
	TIME	SPECIES	Sex	Age	P/L/PL/NR	FA	EAR	WT	Net #	Height	Band / WS	Comment / Photo #
1	23:12	LABO	F	A	L	40.0	/	11g	A	5m	1299 / 0 5 marks	
2	23:38	LABO	F	A	P	41.0	/	24.5 - 7.5 = 17g	A	<1m	/ 0	escaped before banded pale fur
3	00:07	LABO	F	A	P	41.0	/	22.5 - 7.5 = 15g	B	4m	0271 / 0	brick red ?
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												

NCDOT Mist-Netting & Acoustic Survey Data Form

Project:	NLEB Research	County:	Tyrrell	Site#:	2	Night#:	2	Site Name:	P3-Goat Neck Rd	Date:	6/2/16		
Latitude:	35.971448			Longitude:	-76.052637			Datum:	NAD83	Elevation:	0'	ID By:	M. Frazer
Observers:	M. Frazer, N. Scott, H. Wood						Start Time:	20:40		End Time:	01:40		
Conditions:	Time	Temp	Wind	Clouds	Time	Temp	Wind	Clouds	Time	Temp	Wind	Clouds	
	20:53	83°F	none	Partly	23:12	69.5°F	—	none	01:16	68.5°F	—	none	
Moon Effect:	none			Start:	—			Land Use:	Urban / Agriculture / <u>Forest</u> / Water / Wetland / Barren (describe):				
				Stop:	—								
NETS/TRAPS:	A: 9m triple		B: 6m triple		C: 18m double		D:		E:		F:		
Pool size WxL													
Swoop WxL													
Photo? or #													
BD#	Latitude		Longitude		Mic	Ht	clutter	gain	trigger	interval	Start time	Stop Time	Photo?
1					steel	10ft	hi	7-sens.	—	—	20:34	1:35	Y
Site Description: Non-riverine swamp forest (mixed subtype)													
→ Clutter @ nets is low; clutter @ BD 1 is is high. 2-3 large bats flying over the canopy at dusk.													
Remarks: Many beetles in net. Many Frogs. 2 two-toed amphiumas in giant puddle across road.													
<p style="text-align: center;">Site sketch (label to match Nets/Traps and BD# above)</p>													

NCDOT Mist-Netting & Acoustic Survey Data Form

P3

Project:	NLEB	County:	Tyrrell	Site#:	3	Night#:	1	Site Name:	Loop Rd (Pot Licker)	Date:	6/9/10	
Latitude:	35.985696	Longitude:	-76.145092	Datum:	NAD83	Elevation:	2'	ID By:	M. Frazer			
Observers:	N. Scott, H. Wood, M. Frazer						Start Time:	20:50	End Time:	1:50		
Conditions:	Time: 21:04	Temp: 72°F	Wind: light breeze	Clouds: clear	Time: 23:30	Temp: 61°F	Wind: —	Clouds: —	Time: 01:30	Temp: 50.5	Wind: —	Clouds: —
Moon Effect:	crescent on A+B	Start:	20:50	Stop:	22:30	Land Use:	Urban / Agriculture / Forest / Water / Wetland / Barren (describe): maintenance road in flooded loblolly forest					
NETS/TRAPS:	A: 9m triple	B: 12m double	C: 6m triple	D:	E:	F:						
Pool size WxL												
Swoop WxL												
Photo? or #												
BD#	Latitude	Longitude	Mic	Ht	clutter	gain	trigger	interval	Start time	Stop Time	Photo?	
1			steel	10'	medium low	sens. 7	—	—	~20:20		4	
Site Description:			<p>P. taeda, A. rubrum, Arundinaria, D. nigra, Persea, Myrica</p> <p>BD @ truck. Recording bats brought to wake station</p> <p>Nonriver mes swamp forest (mixed subtype)</p> <p>Remarks: bullfrogs + cricket frogs</p> <p>Mosquitoes? what mosquitoes?</p>									
			<p>Site sketch (label to match Nets/Traps and BD# above)</p> <p>The sketch shows a truck (marked with an X) on the left. A north arrow points towards the bottom-left. Three nets are indicated by circles labeled A, B, and C. Net A is on a raised bank, Net B is in an open area in a swamp, and Net C is on another bank. A detector is marked with an arrow pointing right, and a note says 'to Pot Licker Rd'.</p>									

18, 12, 9, 6m
wks

NCDOT Mist-Netting & Acoustic Survey Data Form

GPS: P3-Tirell

Project: NCB Research	County: Tyrone	Site#: 530443	Night#: 1	Site Name: P3-Hwy 64	Date: 8/10/16
Latitude: 35.903542	Longitude: -76.053979	Datum: NAD 83	Elevation: 0	ID By: MF	
Observers: MF, NS, HS	Start Time: 20:20	End Time: 01:20			

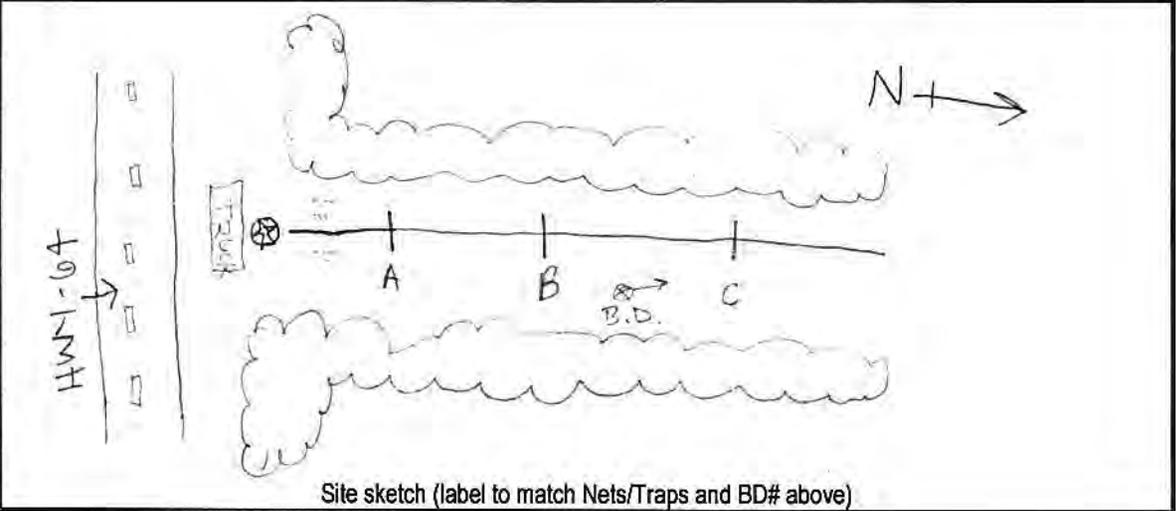
Conditions:	Time: 20:00	Temp: 82°	Wind: 2	Clouds: partly	Time: 22:57	Temp: 74	Wind: 1	Clouds: clear	Time: 01:00	Temp: 77	Wind: none	Clouds: none
Moon Effect: none waxing crescent	Start: -	Stop: -	Land Use: Urban / Agriculture / Forest / Water / Wetland / Barren (describe): dirt road in a young, swampy hardwood forest									

NETS/TRAPS:	A: double 6m	B: triple 4m	C: double 10m	D:	E:	F:
Pool size WxL						
Swoop WxL						
Photo? or #						

BD#	Latitude	Longitude	Mic	Ht	clutter	gain	trigger	interval	Start time	Stop Time	Photo?
Z	35.904955	-76.054906	steel	10ft	high	7 = sens.	-	-	19:45		Y
(1 @ truck)											

Site Description: *A. rubrum*, *L. styraciflua*,
P. taeda, *Magn. virginiana*, *Nyssa biflora*,
Salix nigra?, *Myrica*, *Lyonia lucida*,
Juncus effusus, *Eleocharis*, *Cyperus*
 Nonriverine swamp forest (sweetgum subtype) mosquitoes!!
 barred owl ~ 21:30

Remarks: Picked up leopard, s. cricket & carpenter frogs. several bats foraging over hwy 64 @ sunset.



Bat Survey Data Form

NCDOT

Project: R-9999 NCEB Research	County: Johnston	Site #: 1	Night #: 1	Site name: Howell Woods	Date: 6-20-16
Directions to site: South on Cornell east on Loblolly lane		Latitude: 35 21'42.503"N	Longitude: -83 78°17'56.052W	Elevation: 100'	
ID person(s): MAM, MEF			Observers: CEG, CDM, Gary Tordon	Net open time: 8:30	Net close time: 1:30
Sky:	DUSK-time, temp, description 8:15, 85, clear, calm	MID-SAMPLE-time, temp, description 11:15, 78, clear, breezier	END-time, temp, description 1:30, 74, clear & breezy		
Wind:	0=no wind 1=smoke drifts vertically 2=wind felt on face 3=hair disturbed 0.5-2, more breeze throughout night	4=small branches in motion 5=small trees sway 6=large branches in motion 3	7=hard to walk 8=twigs break from trees; go home, this is a gale! 3		
Moon effect: (moon phase, start/stop time visible, # nets illuminated) full, summer solstice, none illuminated					
Number/type of nets: (1) 9m double high (1) 6m single high* (1) 4m (C) *used 8 poles so net was higher but technically not double high					
Site description: (net placement, stream data, Habitat description, dominant species, canopy cover) ~20-30 yr old ^{mid-} successional forest w/ pines virginiana, Liquidambar styraciflua, Quercus phellos, Vitis rotundifolia, Arundinaria gigantea					
Dense forest w/ trails throughout that we are using for net sites, good funneling flyways on edge of more native bottomland HW to the north					
Disturbance: (List 3 most signif. disturbances within 500m) road clearings moved					
ANABAT file name:					
ANABAT location(s):					
Remarks: (rain events, other wildlife, etc.)					
<p>Site sketch (net labels, north arrow, landmarks)</p>					

Bat Survey Data Form

NCDOT

Project: R-9999 MEB Research		County: Johnston	Site #: 1	Night #: 2	Site name: Howler Woods	Date: 8-21-16
Directions to site: south on Carrell feast		Latitude: 35° 21' 42.503" N	Longitude: -83° 17' 56.052" W		Elevation: 100'	
Directions, cont. on Loblolly Lane						
I.D. person(s): MEM MEB			Observers: CUG, COM, Gary Jordan		Net open time: 8:30	Net close time: 1:30
Sky:	DUSK-time, temp, description 8:15, 82°, cloudy, calm	MID-SAMPLE-time, temp, description 11:00, 78°, cloudy, breezier	END-time, temp, description 1:30, 78°, cloudy, breezy, humid			
Wind:	0=no wind 1=smoke drifts vertically 2=wind felt on face 3=hair disturbed 1 → 2, 9 nets to a 4	4=small branches in motion 5=small trees sway 6=large branches in motion			7=hard to walk 8=twigs break from trees; go home, this is a gale!	
Moon effect: (moon phase, start/stop time visible, # nets illuminated) full, none illuminated						
Number/type of nets: (label & include size) (A) (1) 4m single high * (B) (1) 6m single high * (C) (1) 4m single high						
Site description: (net placement, stream data, Habitat description, dominant species, canopy cover) *used 8 pole so net was higher but technically not double high						
~20-30 yr old successional forest, <i>Pinus virginiana</i> , <i>Liquidambar styraciflua</i> , <i>Quercus phellos</i> , <i>Vitis rotundifolia</i> , <i>Arcuticarpa gigantea</i> dense forest w/ trails throughout we used for net sites - good funnel flyways on edge of more mature bottomland hardwood to the north						
Disturbance: (List 3 most signif. disturbances within 500m)						
roads, mowed clearing						
ANABAT file name:						
ANABAT location(s): see map →						
Remarks: (rain events, other wildlife, etc.) moved net A location from yesterday to new site south of clearing						
Site sketch (net labels, north arrow, landmarks)						

NCDOT Mist-Netting & Acoustic Survey Data Form

GPS R062023A

Project: NLEB Research	County: Johnston	Site#: 2	Night#: 1	Site Name: Howell Woods Site 2	Date: 6/20/16							
Latitude: 35.361661		Longitude: -78.300022		Datum: NAD83	Elevation: 92'							
Observers: Mary Frazer, Hannah Slyce, Hayley Wood				Start Time: 20:40	End Time: 01:40							
Conditions:	Time 21:29	Temp 80°F	Wind none	Clouds partly	Time 23:15	Temp 70°F	Wind mild	Clouds mostly clear	Time 01:25	Temp 68°F	Wind mild	Clouds mostly clear
Moon Effect: full moon to partly shining on A	Start: 24:45	Stop: 01:40	Land Use: Urban / Agriculture / <u>Forest</u> / Water / Wetland / Barren (describe): mesic bottomland old growth forest adj to 20 y.o. forest									
NETS/TRAPS:	A: 4m double	B: 4m double	C: 2.6m single	D: 6m triple	E:	F:						
Pool size WxL												
Swoop WxL												
Photo? or #												
BD#	Latitude	Longitude	Mic	Ht	clutter	gain	trigger	interval	Start time	Stop Time	Photo?	
7			steel	10'	high/medium	7=sens.	-	-	20:00	01:15	Y	
					old growth forest							
2 → at truck												
Site Description: A. rubrum, L. styraciflua, E. opaca, P. taeda, Q. phellos, Q. nigra, Carya spp., Smilax, Vitis, Q. michauxii = old growth forest			<p>Site sketch (label to match Nets/Traps and BD# above)</p>									
Piedmont bottomland forest (high subtype)												
Remarks: chuck will's widow, distant barred owl												

Bat Survey Data Form

Project: NLEB Research County: Johnston Site# 2 Night# 1 Site Name: Howell Woods Site 2 wings													Date: June 20, 16	
	TIME	SPECIES	Sex	Age	P/L/PL/NR	FA	EAR	WT	Net #	Height	Band / WS	Comment / Photo #		
1	20:45	MYAU	F	A	L	37	—	14.3- 7.2 (7.3)	A	1.5m	309KS 1341 / 0	mites / wing punch (2) + took hair sample (E9-NC)		
2	22:35	LATBO	M	—	—	—	—	—	A	.5M	—	EFN released ~ 21:15		
3	23:03	EFN	—	—	—	—	—	—	A	1.5M	—	EFN		
4	23:32	EFN	—	—	—	—	—	—	A	2	—	EFN		
5														
6														
7														
8														
9														
10														
11														
12														
13														
14														
15														
16														
17														
18											DOT fur in E11-NC	24:03 CORA NCDOT 0318		
19											DOT fur in E18-NC	23:45 MYAU rel. NCDOT 0312		
20											DOT bat, fur collected	21:25 MYAU rel. bag E10-NC		

NCDOT Mist-Netting & Acoustic Survey Data Form

Project: NLEB Research	County: Johnston	Site#: 2	Night#: 2	Site Name: Howell Woods Site 2	Date: June 21, 16							
Latitude: 35.361661	Longitude: -78.300022	Datum: NAD83	Elevation: 92'	ID By: Frazer								
Observers: Mary Frazer, Hannah Slyce, Hayley Wood			Start Time: 20:45	End Time: 01:45								
Conditions:	Time 21:22	Temp 82°F	Wind 1-3	Clouds overcast	Time 23:32	Temp 78°F	Wind 1-2	Clouds overcast	Time 01:20	Temp 78°F	Wind 1-2	Clouds overcast
Moon Effect: none - too cloudy	Start: -	Stop: -	Land Use: Urban / Agriculture / Forest / Water / Wetland / Barren (describe): mostly old forest, except for nets A+C in 20yr old regrowth									
NETS/TRAPS:	A: 4m double	B: 4m double	C: 2.6 m single	D: 6 m triple	E:	F:						
Pool size WxL												
Swoop WxL												
Photo? or #												
BD#	Latitude	Longitude	Mic	Ht	clutter	gain	trigger	interval	Start time	Stop Time	Photo?	
1			steel	10'	medium ↑ old growth forest	-	6-7 = pers.		20:30		Y	
B.D. 2 - CF flash issues												
Site Description: see night 1 for older forest spp. (nets B & D). → 20yr - old forest (nets A & C) = <i>L. styraciflua</i> , <i>A. rubrum</i> , <i>O. phellos</i> , <i>Q. nigra</i> , water oak, <i>Magnolia virg.</i> , <i>Carya</i> , <i>P. taeda</i> , <i>Q. falcata</i> , <i>Q. michauxii</i> Piedmont bottomland forest (high subtype)			<p>Site sketch (label to match Nets/Traps and BD# above)</p>									
Remarks: A few beetles in net, breezy												

1-2 - felt on face
Gusts - 4 (small branches in motion) 3 - hair disturbed

Bat Survey Data Form

NCDOT

Project: R-9999 ^{NLEB} _{recorder}	County: Johnston	Site #: 3	Night #: 3	Site name: Hazel Woods	Date: 6/22/16
Directions to site: Muir Trail, North		Latitude: 35° 21' 56.472"N	Longitude: -83 78° 18' 15.562"W	Elevation: 100'	
Directions, cont. off Diversity Trail		ID person(s): MRM		Observers: CUG CDM	Net open time: 8:30
Net close time: 1:30 am		Sky: DUSK-time, temp, description 8:15, 82° clear, calm humid		MID-SAMPLE-time, temp, description 11:30 76° cloudy calm humid 1kl	
END-time, temp, description 1:30 76° cloudy calm humid		Wind: 0=no wind 1=smoke drifts vertically 2=wind felt on face 3=hair disturbed 0 start + finish		4=small branches in motion 5=small trees sway 6=large branches in motion ○	
7=hard to walk 8=twigs break from trees; go home, this is a gale! ○		Moon effect: (moon phase, start/stop time visible, # nets illuminated) full			
Number/type of nets: (3) 4m single high * used 6 poles for 2 so net was higher but not double nets.					
Site description: (net placement, stream data, Habitat description, dominant species, canopy cover)					
10-12 yr old dense pine, open up into very open LL pine forest surrounding.					
Disturbance: (List 3 most signif. disturbances within 500m)					
road (dirt)					
ANABAT file name:					
ANABAT location(s): see map →					
Remarks: (rain events, other wildlife, etc.)					
Site sketch (net labels, north arrow, landmarks)					

NCDOT Mist-Netting & Acoustic Survey Data Form

Project: NLEB Research	County: Johnston	Site#: 4	Night#: 1	Site Name: Reedy Marsh Station	Date: June 22, 16						
Latitude: 35.406496		Longitude: -78.287498		Datum: NAD83	Elevation: 94'						
Observers: Mary Frazer, Hannah Slyce, Hayley Wood				Start Time: 20:35	End Time: 01:35						
Conditions:	Time 20:50	Temp 78°F	Wind —	Clouds clear	Time 23:20						
					Temp 75°F						
					Wind —						
					Clouds Overcast						
					Time 01:30						
					Temp 76°						
					Wind —						
					Clouds cloudy						
Moon Effect: none - cloudy	Start: —	Land Use: Urban / Agriculture / Forest / Water / Wetland / Barren (describe): on gravel road, next to trail and swamp.									
	Stop: —										
NETS/TRAPS:	A: 4m triple	B: 6m double	C: 2.6m double	D:	E:						
Pool size WxL											
Swoop WxL											
Photo? or #											
BD#	Latitude	Longitude	Mic	Ht	clutter	gain	trigger	interval	Start time	Stop Time	Photo?
1 →	* equipment failure - only recorded a couple calls		steel	10'	high	7- sens.	—	—	20:00		Y
2			steel	5'	med	5					N
	BD 2 @ truck - check Sens. = 5 due to catydid's										
Site Description:											
A. rubrum, Carya sp,											
Q. pagodifolia, Celtis, U. americana,											
Q. peltos, Taraxacum, Smilax, Fraxinus,											
Q. michauxii, Arundinaria, Carpinus											
Nearby owls 23:00, 24:30 green frogs											
Remarks: Many stag beetles in nets, until ~ 23:30.											
Distant thunder 22:00 - 23:00. Distant lightning.											
More thunder @ 00:30											

Predomant bottomland forest (typic low subtype)

GPS
cam
allison
substation

Site sketch (label to match Nets/Traps and BD# above)

500 ft
4 types
hill
E. card

Roanoke River
game land

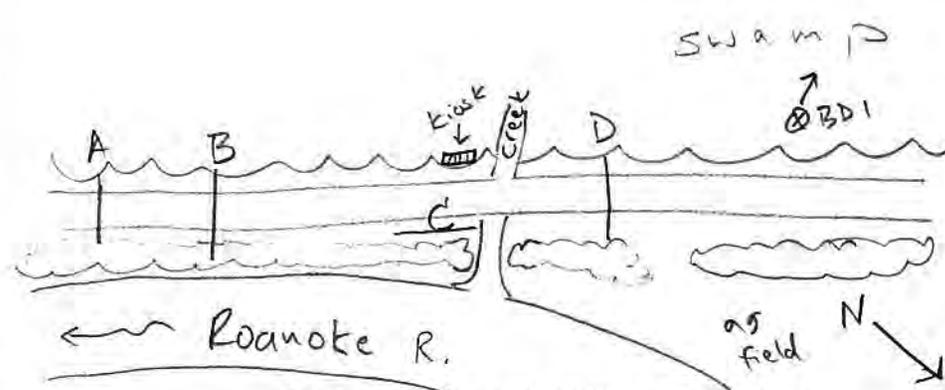
GPS file R 061420A

NCDOT Mist-Netting & Acoustic Survey Data Form

Project:	NLEB research	County:	Martin	Site#:	1	Night#:	1	Site Name:	Roanoke River bend	Date:	06/14/2016	
Latitude:	35.873365	Longitude:	-77.045230	Datum:	NAD 83	Elevation:	4'	ID By:	Frazer			
Observers:	Nathan Howell, Mary Frazer, Hayley Wood						Start Time:	20:45	End Time:	01:45		
Conditions:	Time 21:10	Temp 79°F	Wind mild	Clouds clear	Time 23:30	Temp 70°F	Wind mild	Clouds clear	Time 01:20	Temp 70°F	Wind mild	Clouds clear
Moon Effect:	1/2 full, but only on net C	Start: (Sunset)	Stop: 23:10	Land Use:	Urban / Agriculture / Fores / Water / Wetland / Barren (describe): old growth swamp forest near Roanoke River.							
NETS/TRAPS:	A: 9m double	B: 9m double	C: 6m triple	D: 12m double	E:	F:						
Pool size WxL												
Swoop WxL												
Photo? or #												

BD#	Latitude	Longitude	Mic	Ht	clutter	gain	trigger	interval	Start time	Stop Time	Photo?
1			steel	10'	high	7 = sens.	-	-	20:25		4
	BD2@ truck										

Site Description: *Carony - Acer sp.*, *Quercus phellos*, *Fraxinus pennsylvanica*, *Celtis laciniata*, *Taxodium distichum*. Subcanopy/shrub - *Ligustrum sinense*, *Acer negundo*, *Betula nigra*, *Acer rubrum*, *Vitis vulpina*. Vines - *Toxicodendron radicans*, *Campsis radicans*, *P. quinquefolia* (floodplain / levee community).
Remarks: Many small flying insects. Owls. gar + tiny eels along shore.
 Brown water levee forest (man-made)



Site sketch (label to match Nets/Traps and BD# above)

NCDOT Mist-Netting & Acoustic Survey Data Form

(River Rd)

Project: NLEP Research	County: Martin	Site#: 1	Night#: 2	Site Name: Roanoke River bend	Date: 06/15/2016
Latitude: 35.873365		Longitude: -77.045230		Datum: NAD 83	Elevation: 4'
Observers: Nathan Howell, Mary Frazer, Hayley Wood				Start Time: 20:40	End Time: 02:40
Conditions:	Time 20:56	Temp 76°F	Wind None	Clouds Partly	Time 23:27
					Temp 74°F
					Wind none
					Clouds light rain
					Time 02:31
					Temp 74°F
					Wind none
					Clouds Partly
Moon Effect: minor effect on net C		Start: 21:17	Land Use: Urban / Agriculture / Forest / Water / Wetland / Barren (describe): Gravel road between Roanoke River + swamp		
		Stop: 22:20			
NETS/TRAPS:	A: 9m double	B: 9m double	C: 6m triple	D: 12m double	E:
Pool size WxL					
Swoop WxL					
Photo? or #					
BD#	Latitude	Longitude	Mic	Ht	clutter
1			steel	10'	high
					7 = sens. -
					-
					-
Site Description: see info for night 1			<p>Roanoke R</p> <p>River Rd</p> <p>Swamp</p> <p>Gravel</p> <p>BD 1</p> <p>BD 2</p> <p>BD 3</p> <p>BD 4</p> <p>BD 5</p> <p>→ N</p>		
Many June bugs in net D; lots of small flying insects around					
BD 2 most' + off					
Remarks: Very humid					
Barred owls					
Brown water Levee forest (man made)			Site sketch (label to match Nets/Traps and BD# above)		

NCDOT Mist-Netting & Acoustic Survey Data Form

GPS R061622A

Project: NLEB Research	County: Martin	Site#: 2	Night#: 1	Site Name: Lower River Rd.	Date: June 16, 2016							
Latitude: 35.664137	Longitude: -77.043518		Datum: NAD 83	Elevation: 4'	ID By: Frazer							
Observers: Mary Frazer, Nathan Howell, Hayley Wood			Start Time: 20:45		End Time: 01:45							
Conditions:	Time 21:12	Temp 78°F	Wind none	Clouds clear	Time 23:12	Temp 76°F	Wind none	Clouds clear	Time 01:35	Temp 76°F	Wind windy	Clouds cloudy
Moon Effect: @ not A only	Start: 22:20		Land Use: Urban / Agriculture (Forest) / Water / Wetland / Barren (describe): Gravel Road Between Roanoke River and Swamp, + dirt road in swamp									
NETS/TRAPS:	A: 6m triple	B: 9m triple	C: 12m double	D:	E:	F:						
Pool size WxL												
Swoop WxL												
Photo? or #												
BD#	Latitude	Longitude	Mic	Ht	clutter	gain	trigger	interval	Start time	Stop Time	Photo?	
1			steel	10'	high	7	gens	-	20:25	1:25	Y	
2	@ truck - noise from work station											
Site Description:			<p><i>Acer saccharinum</i>, <i>Acer rubrum</i>, <i>Taxodium</i> <i>distichum</i>, <i>Nyssa aquatica</i>, <i>Quercus fellos</i>, <i>Saururus</i> <i>cernuus</i>, <i>Platanus occidentalis</i>, <i>Fraxinus pennsylvanica</i>, <i>Morus rubra</i>, <i>Pachymatis cylindrica</i>, <i>Nyssa biflora</i></p> <p>storm @ end of night! June bugs + a couple dobson flies in net. Early in night only.</p>									
Remarks:			GBH crashed into net A + B (brown water) (base made) (BAC) Levee forest A cypress-gum swamp A few toads + green tree frogs.									
			<p>Site sketch (label to match Nets/Traps and BD# above)</p>									

NCDOT Mist-Netting & Acoustic Survey Data Form

Project: NLEB Research	County: Martin	Site#: 2	Night#: 2	Site Name: Lower River Rd	Date: 06/27/16							
Latitude: 33.043372° W	Longitude: 85.863894° N	Datum: NAD 83	Elevation: 4'	ID By: Frazer								
Observers: Mary Frazer, Hayley Wood, Hannah Style				Start Time: 20:40	End Time: 01:40							
Conditions:	Time 21:38	Temp 75°F	Wind None	Clouds Clear	Time 00:10	Temp 74°F	Wind —	Clouds Clear	Time 01:30	Temp 74°F	Wind None	Clouds Clear
Moon Effect: waning crescent	Start: no effect	Land Use: Urban / Agriculture (Forest) Water / Wetland / Barren (describe): Levee road between swamp & river.										
NETS/TRAPS:	A: 6m triple	B: 9m triple	C: 12m double	D:	E:	F:						
Pool size WxL												
Swoop WxL												
Photo? or #												
BD#	Latitude	Longitude	Mic	Ht	clutter	gain	trigger	interval	Start time	Stop Time	Photo?	
1	33.043826	85.864532	steel	10'	high	7 = sens.		—	20:15		Y	
2	33.042599	85.864762			low	" "		—	20:35		Y	
Site Description: see mist net form for night 1			<p>Swamp</p> <p>River Rd</p> <p>Gate</p> <p>River Rd</p> <p>Roanoke River</p> <p>BD1</p> <p>BD2</p> <p>A</p> <p>B</p> <p>C</p> <p>N</p>									
cypress-gum swamp + brown water levee forest (man-made)												
Remarks: GBH; gar in creek 1 owl hooting briefly												
Site sketch (label to match Nets/Traps and BD# above)												

Roanoke R. lowland

NCDOT Mist-Netting & Acoustic Survey Data Form

off HW 125

Project: NLEB Research	County: Martin	Site#: 3	Night#: 1	Site Name: WRC depot	Date: 06/28/16
Latitude: 35.884044° N		Longitude: -77.144931° W		Datum: NAD 83	Elevation: 53'
Observers: Mary Frazer, Hayley Wood, Hannah Slyce				Start Time: 20:45	End Time: 23:30

Conditions:	Time 21:04	Temp 75°F	Wind none	Clouds cloudy	Time 23:42	Temp 74°	Wind -	Clouds partly cloudy	Time -	Temp -	Wind -	Clouds -
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Moon Effect: none
waning crescent

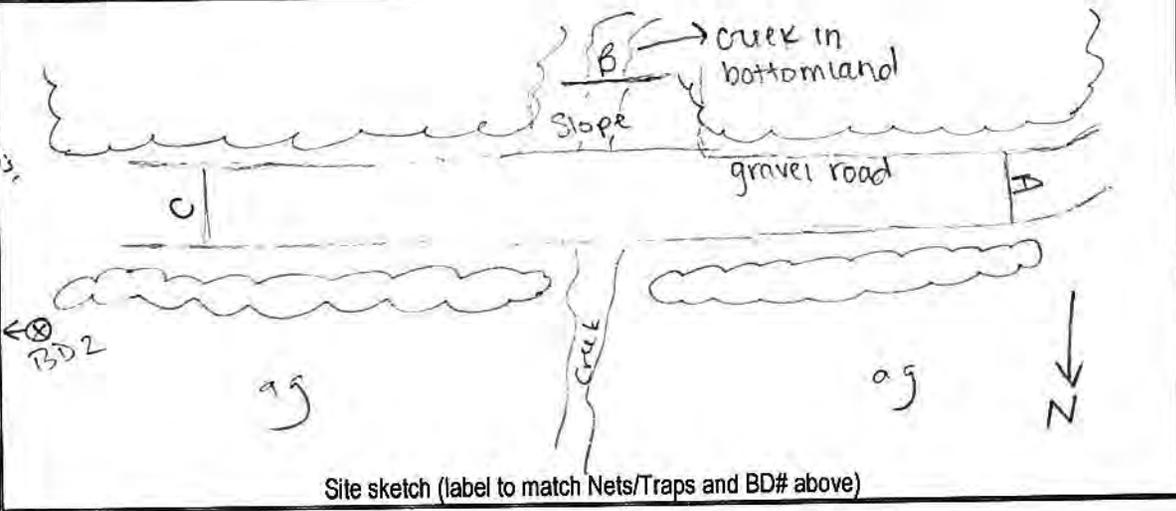
Start: -
Stop: -

Land Use: Urban / Agriculture / Forest / Water / Wetland / Barren (describe): See below

NETS/TRAPS:	A: 6m double	B: 6m double	C: 9m double	D:	E:	F:
Pool size WxL		3x3m				
Swoop WxL		6m x 9m				
Photo? or #	Y	Y	Y			

BD#	Latitude	Longitude	Mic	Ht	clutter	gain	trigger	interval	Start time	Stop Time	Photo?
2	35.884420°	-77.144520°	shel	10'	low	7 = sens.	-	-	20:15		Y
	BD 7 @ truck										

Site Description: gravel road between ag land & bottom land hard wood. *L. styraciflua*, *A. rubrum*, *Ulmus*, *Platanus occidentalis*, *L. tulipifera*, *Ligustrum sinense*, *P. taeda*
 Mesic mixed hard wood forest (coastal plain s. type)
 Roanoke River G.L.
Remarks: bobwhite quail, green frogs



Bat Survey Data Form

HW 125

Project: NLEB Research		County: Martin		Site# 3		Night# 1		Site Name: WRC depot			Date: 06/28/16	
	TIME	SPECIES	Sex	Age	P/L/PL/NR	FA	EAR	WT(g)	Net #	Height	Band / WS	Comment / Photo #
1	21:13	LABO	F	A	L	39mm	—	20.0- 8.0= 12.0	B	1m	500RS 1265/0	recaptured @ 22:30
2	22:33	CORA	F	A	L	44mm	—	18.0- 6.5= 11.5	A	1.5m	—/0	Two wing pinch - Ell-N-C small hole, short wing. 10:43 rel.
3	22:45	MYSE	M	J	NR	37mm	15mm	13.6- 8.1= 5.5	B	2.5m	1337/0	Ear extends well past nose dull fur, brown fur [released at 2:59
4	23:05	MYAU	M	J	NR.	33mm	—	13.0-7.5 =5.5	B	1.5m	—/0	Ell-N-C fur rel. ~ 23:13
5	23:20	MYAU	F	J	NR	36mm	12mm	—	C	2m	—/0	belly fur dark gray @ wrist fur brown - dull tinged ears
6	23:25	MYAU	M	J	NR	35mm	—	13.0g- 8.0-5.0	A	1.5m	—/0	rel. 23:38
7	23:25	MYAU	M	J	NR	35mm	—	14.2g- 8.0-6.2	A	2.0m	—/0	notes rel. 23:37
8												
9												
10												
11												did not band CORA due to potential band issues
12												" " " juveniles due to small size + poor flying ability
13												ability
14												
15												
16												
17												
18												
19												
20												

attempt to close nets

NCDOT Mist-Netting & Acoustic Survey Data Form

gps = Chowan IB file

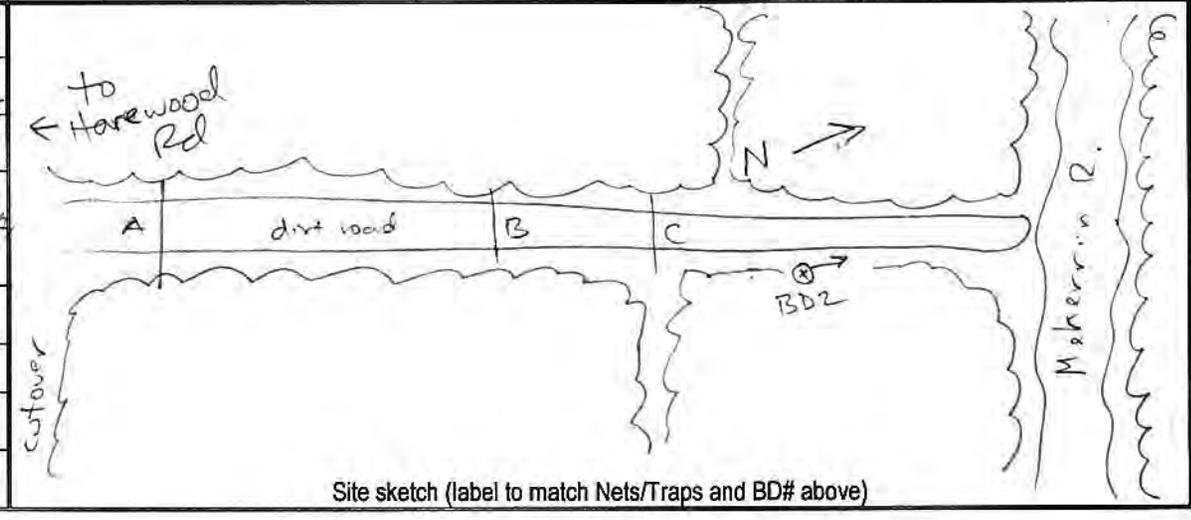
Chowan Swamp

Project: NLES RESEARCH	County: Hertford	Site#: 1b	Night#: 1	Site Name: CHOWAN SWAMP 1B	Date: 07/25/2016
Latitude: 36.455649		Longitude: -76.997592		Datum: NAD 83	Elevation: 4
Observers: Nathan Howell, Mary Frazer, Hannah Slyce				Start Time: 20:30	End Time: 01:30
Conditions:	Time: 20:30	Temp: 86°F	Wind: None - Light	Clouds: Clear - Part	Time: 23:23
					Temp: 82°F
					Wind: None - Light
					Clouds: Clear
					Time: 01:15
					Temp: 80°F
					Wind: —
					Clouds: Clear
Moon Effect: None waning gibbous	Start: —	Stop: —	Land Use: Urban / Agriculture / <u>Forest</u> / Water / <u>Wetland</u> / Barren (describe): Dirt road in bottomland forest; near creek		
NETS/TRAPS:	A: 12m triple	B: 9m triple	C: 6m triple	D:	E:
Pool size WxL					
Swoop WxL					
Photo? or #					

BD#	Latitude	Longitude	Mic	Ht	clutter	gain	trigger	interval	Start time	Stop Time	Photo?
2	36.457338° N	76.995960° W	steel	10ft	med	7-secs	—	—	20:14		Y
	(1 e truck) → audio data										
		32									
		16									

Site Description: overstory: *Pinus taeda*, *L. styraciflua*, *Betula nigra*, *Alnus rubra*, *Populus heterophylla*, *Acer rubrum*, *Quercus pagoda*. Mid-story / shrub: *Magnolia virginiana*, *Clethra alnifolia*, *Vaccinium* sp., *Ilex opaca*, *Nyctanthes* sp., *Arundinaria taeda*. Vines: *Coccoloba radicans*, *Toxicaria radicans*, *Smilax* sp.

Remarks: ~~observed~~ tiny leopard/pinkish frogs all over road. Lots of katydid noise. Brown water bottomland hardwoods (high subtype)



Bat Survey Data Form

Project: NLEB Research		County: HERTFORD		Site# 13		Night# 1		Site Name: CHOWAN SWAMP 1B		Date: 7/25/10		
	TIME	SPECIES	Sex	Age	P/L/PL/NR	FA	EAR	WT(g)	Net #	Height	Band / WS	Comment / Photo #
1	20:35	LABO	M	J	NR	40mm		16.5g - 8 = 8.5	A	2.5	304KNC 1297 10*	3 tiny pinholes
2	20:35	LASE	F	J	NR	42mm		17.3g - 8 = 9.8	A	2.5	1262/0	
3	20:55	LABO	M	J	NR	38mm		11.6g - 8.4 = 8.4g	B	1	1325/0	
4	21:00	LABO	F	A	L	43mm		20.5g - 8g = 12.5	A	1	0292/0	LABO
5	21:00	EFN										EFN
6	21:00	EFN										EFN
7	21:14	EPFU	M	A	NR	46mm		23 - 7.4 = 15.1	A	2.5m	1786 / 0	
8	21:10	CORA	M	J	NR	42mm		15g - 8 = 7g	A	.5m	- / 0	live!
9	21:30	LABO	M	A	=	40mm		17.5g - 8 = 9.9	A	2.5m	- / 0	Not banded due to lime crunch
10	21:08	LASE	F	S	NR	41mm		17.5 - 8.2 = 9.3	C	1.5m	- / 0*	2 pinholes right wing. Release @ 21:45. No band due to lime crunch
11	21:55	EPFU	M	A	NR	44mm		22 - 8 = 14g	A	3m	1970 / 0	no recording
12	22:25	LASE	F	J	NR	39mm		17.2 - 8g = 9.2	A	2.5m	0290 / 0	
13	22:25	LASE	M	J	NR	35mm		15g - 8 = 7g	A	1.5m	0304 / 0	RECAPTURE 1:25
14	22:45	LABO							C			EFN
15	22:50	LABO	M	J	NR	48mm		17.2g - 8 = 9.2	A	4.5m	1276 / 0	
16	22:50	LASE	F	J	NR	38mm		15.5g - 8g = 7.5g	A	5m	1319 / 0*	HOLE IN RIGHT WING (RR) 23:07 TOR
17	22:55	LABO	M	J	NR	42mm		17.5g - 8 9.5g	A	3m	1305 / 0	*RECAPTURE 23:20
18	23:10	LASE	F	J	NR	40mm		17.3g - 8 0.3g	C	2.5m	0320 / 0	TOR: 23:17
19	23:30	EPFU	F	A	NR	46mm		22.5g - 8 = 14.5	B	3.5m	0962 / 0*	faint modest mottles
20	23:55	MYAU	M	A	NR	38mm	14mm	15.2g - 6.1 = 7.1	C	3m	0338 / 0	molting 08:16 release

NCDOT Mist-Netting & Acoustic Survey Data Form

night cut short due to weather

Project: NLEB Research	County: Hertford	Site#: 1b	Night#: 2	Site Name: Chocoma Swamp 1B	Date: 07/26/2016						
Latitude: 36.455649		Longitude: -76.997592		Datum: NAD83	Elevation: 4						
Observers: Nathan Howell, Mary Frazer, Hannah Slyce				Start Time: 20:30	End Time: 22:20						
Conditions:	Time: 20:11	Temp: 79° F	Wind: None	Clouds: Cloudy	Time: 22:06						
					Temp: 77						
					Wind: NONE						
					Clouds: CLOUDY						
Moon Effect: none (last quarter)	Start: - light	Land Use: Urban / Agriculture / Forest / Water / Wetland / Barren (describe): dirt road in bottomland forest									
	Stop: - fog										
NETS/TRAPS:	A: 12 m triple	B: 9 m triple	C: 6 m triple	D:	E:						
Pool size WxL											
Swoop WxL											
Photo? or #											
BD#	Latitude	Longitude	Mic	Ht	clutter	gain	trigger	interval	Start time	Stop Time	Photo?
2	36.457338° N	76.995960° W	Steel	10FL	Med	7	-	-	19:55	22:10	Y
Site Description: see night 1 for vegetation information			<p>The sketch shows a horizontal dirt road with three sections labeled A, B, and C. Section A is on the left, B in the middle, and C on the right. A trap labeled 'BD2' is located in section C. The road is flanked by the Meherrin River to the right and a creek to the left. A north arrow points up, and an arrow points left towards 'Harewood Rd'.</p>								
Net closed @ 22:20 due to continuing fog											
Brown water bottomland hardwoods (high subtype)											
Remarks: light rain ending at sunset											
Site sketch (label to match Nets/Traps and BD# above)											

NCDOT Mist-Netting & Acoustic Survey Data Form

Project: NLEB Research	County: Hertford	Site#: 1B	Night#: 3	Site Name: Chowan Swamp 1B	Date: 07/27/2016							
Latitude: 36.455649	Longitude: -76.997592		Datum: NAD 83	Elevation:	ID By: Mary Frazer							
Observers: Mary Frazer, Hannah Slyce, Nathan Howell			Start Time: 20:30		End Time: 02:10							
Conditions:	Time 20:41	Temp 84°F	Wind None	Clouds Partly	Time 01:00	Temp 79°	Wind None	Clouds Partly	Time 02:00	Temp 79	Wind NW	Clouds Partly
Moon Effect: little to no effect Waning Crescent	Start: —	Stop: —	Land Use: Urban / Agriculture / Forest / Water / Wetland / Barren (describe): Dirt road in Bottomland forest									
NETS/TRAPS:	A: 12 m Triple	B: 9 m Triple	C: 6 m Triple	D:	E:	F:						
Pool size WxL												
Swoop WxL												
Photo? or #												
BD#	Latitude	Longitude	Mic	Ht	clutter	gain	trigger	interval	Start time	Stop Time	Photo?	
2	36.457338	76.995960	steel	10ft	med	7	-	-	21:52	2:00	4	
(BD 1 and 032 / data 16 - stopped at again)												
(BD 1 worked a bit on trees)												
Site Description: See night 1 for vegetation			<p>TO Harewood Rd ←</p> <p>A Dirt Road B C</p> <p>Meherrin River</p> <p>BD2</p>									
*Net closed for rain 22:00 - 22:35												
Distant Thunder ~ 23:00 - 23:30. Lightning later												
Parrot owls nearby 23:15 & 23:45.												
Brown water bottomland hardwoods (high subtype)												
A few beetles in net & 2 atlas moths.												
Remarks: katydid noise. lots of small pickered frogs. Treefrogs (H. vericolor) calling.												
*RAIN (LIGHT): 21:45												

Site sketch (label to match Nets/Traps and BD# above)

* 2317P 0270

Bat Survey Data Form

Project: NLEB Research		County: Hartford		Site# 13		Night# 3		Site Name: Chohan Swamp			Date: 07/27/2016	
	TIME	SPECIES	Sex	Age	P/L/PL/NR	FA	EAR	WT	Net #	Height	Band / WS	Comment / Photo #
1	20:50	LASE	F	A	NR	44mm		17.2 7.8=5.4	A	2.5m	0381 30hr WC / 0	released @ 20:54
2	21:16	LASE							A	1m		EFN
3	21:16	EPFU	M	A	NR	42mm		27-8= 19.9	C	1m	0965 / 0	*recaptured at 21:35
4	21:30	MYAU	M	A	NR	40mm		16.2- 8.4=7.8	B	5.5m	0263 / 0	molting; tiny larvae Recorded @ 21:42
5	21:30	LASE	F	J	NR	43mm		20-8.5 11.5	A	5.5m	* / 0	released 21:45
6	21:30	LASE	M	A	NR	36mm		17-8.1 8.9	B	1m	* / 0	
7	21:50	LASE	M	A	NR	39mm		17-8.1 8.9	A	1m	0303 / 0	
8	23:00	MYAU	F	A	FL	37mm		16-7.4 8.6	A	1.5m	0303 / 0	release 23:25
9	23:30	LASE	M	A	NR	38mm		17.8-8.5 9.3	B	5.5m	0575 / 0	F 23:32
10	00:00	LASE	F	J	NR	42mm		20-8.5 12.0	A	3m	1373 / 0	R 00:03
11	00:55	LASE	M	A	NR	37mm		15.3-7.9 8.3	A	2.5m	0355 / 0	
12	01:04	LASE	F	A	NR	42mm		20-8.5 12.0	C	1m	0301 / 0	2 Small needles put in wings
13	02:05	MYAU	F	A	PU				A	0.5m	/ 0	molting released at net caught @ end of flight
14	02:05	LASE	F	J	NR				A	2m	/ 0	released at net, end of flight
15												
16												* not banded in order to minimize processing time
17												
18												
19												
20												

flying squirrel net @ 22:55.

Bat Survey Data Form

NCDOT

Project: EPBR/R-9999	County: Herford	Site #: 18DOT	Night #: 6	Site name: Chowan Swamp	Date: 8/9/16
Directions to site:		Latitude: 35 36.454783°N	Longitude: -83 -76.998339°W		Elevation: 11
Directions, cont.					
ID person(s): Mary		Observers: CM, CG, GJ		Net open time: 8:25	Net close time: 1:30
Sky:	DUSK-time, temp, description 8:06, 77°, Cloudy/rainy	MID-SAMPLE-time, temp, description 11:07, 76°, partly cloudy	END-time, temp, description 1:20, 74°, clear		
Wind:	0=no wind 1=smoke drifts vertically 2=wind felt on face 3=hair disturbed ①C	4=small branches in motion 5=small trees sway 6=large branches in motion		7=hard to walk 8=twigs break from trees; go home, this is a gale!	
Moon effect: (moon phase, start/stop time visible, # nets illuminated) Waxing Crescent but no nets affected					
Number/type of nets: 1 triple high (6m); 1 double high (9m); 1 single (4m) (label & include size)					
Site description: (net placement, stream data, Habitat description, dominant species, canopy cover)					
dirt road in old hardwood forest - swampy toward northern end @ Meherrin River					
Disturbance: (List 3 most signif. disturbances within 500m)					
ANABAT file name:					
ANABAT location(s):					
Remarks: (rain events, other wildlife, etc.)					
Rained just before we opened the nets. Cleared up but fog remained @ ground level through the night					
<div style="display: flex; align-items: center;"> <div style="flex: 1;"> <p>Site sketch (net labels, north arrow, landmarks)</p> </div> </div>					

NCDOT Mist-Netting & Acoustic Survey Data Form

163oaks

163oaks

Project: NLEB Research	County: Hertford	Site#: 16	Night#: 4	Site Name: Chowan Swamp 16	Date: 8/9/16
Latitude: 36.456587	Longitude: -76.996649			Datum: NAD 83	Elevation: 4
Observers: MF, NS, HS, CG, GJ, CM				Start Time: 20:25	End Time: 1:25

Conditions:	Time 20:50	Temp 77°	Wind none	Clouds flurries	Time 23:10	Temp 76°	Wind none	Clouds clear	Time 01:10	Temp 76°	Wind —	Clouds clear
Moon Effect: none waxing crescent	Start:	Land Use: Urban / Agriculture / Forest Water / Wetland / Barren (describe): Dirt road in old hardwood forest										

NETS/TRAPS:	A: 9 ^m triple	B: 6 ^m triple	C: 12 ^m triple	D:	E:	F:
Pool size WxL						
Swoop WxL						
Photo? or #						

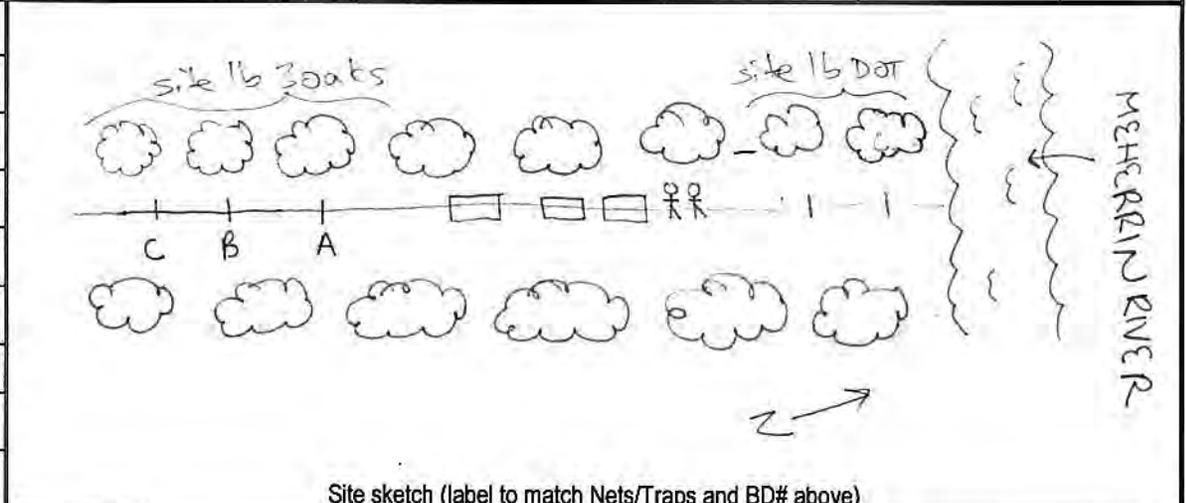
BD#	Latitude	Longitude	Mic	Ht	clutter	gain	trigger	interval	Start time	Stop Time	Photo?
2	36.454783°N	76.998339°W	steel	10'	med.	7 = sens.	-	-	20:25*		Y
									*delayed start due to rain		

Site Description: see description for mist-net data form. night 1.

imperial moths on net

cope's gray tree frogs, narrow mouth toad

Remarks: Brief rain @ sunset



Site sketch (label to match Nets/Traps and BD# above)

Gates, dashed w/ RC
Passgate - 300'

NCDOT Mist-Netting & Acoustic Survey Data Form

gps - chowan 7/25

Project: NLEB Research	County: Hertford	Site#: 2b	Night#: 7	Site Name: UT to Potocasi Creek	Date: 07/28/2016
Latitude: 36.425043		Longitude: -77.011608		Datum: NAD 83	Elevation: 15'
Observers: Mary Frazer, Hannah Sibley, Nathan Howell				Start Time: 20:30	End Time: 1:30
Conditions:	Time 21:20	Temp 83°	Wind —	Clouds Partly	Time 23:51
					Temp 70°F
					Wind 1 mph breeze
					Clouds Clear
					Time 01:20
					Temp 79°
					Wind None
					Clouds Clear
Moon Effect: none (waning crescent)	Start: —	Land Use: Urban / Agriculture / Forest Water / Wetland / Barren (describe): Bottom land (mix) forest adjacent to creek; end of access road			
NETS/TRAPS:	A: 6m Triple	B: 12m double	C: 9m single	D:	E:
Pool size WxL					
Swoop WxL					
Photo? or #					

BD#	Latitude	Longitude	Mic	Ht	clutter	gain	trigger	interval	Start time	Stop Time	Photo?
2	36.425296° N	77.011617° W	steel	10'	high	7 = sens.	—	—	19:50	1:15	Y
(1 @ truck - normal audio/data)											

Site Description:

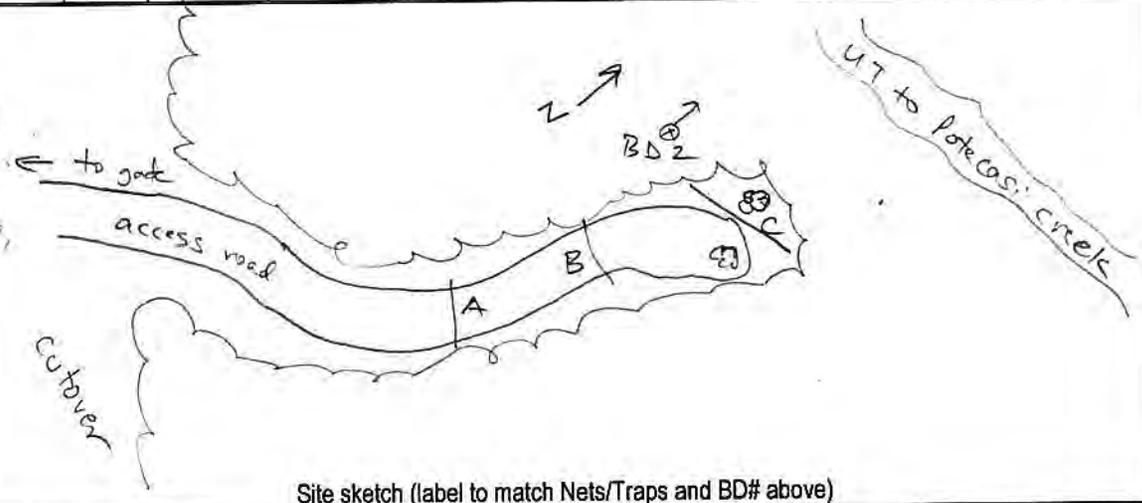
Mastory & Quercus alba, Fagus grandifolia, Liriodendron tulipifera, Liquidambar styraciflua, Platanus occidentalis, Quercus falcata; Mastory; Carpinus caroliniana, Liquidambar styraciflua, F. grandifolia, Calycarpus americanus; Herb + vines; Polystichum acrostichoides, Muscadinia rotundifolia

Remarks:

barred out @ sunset. Coyotes nearby @ 21:30

lots of moths! 3 moths laid eggs on net

Mesic mixed hardwood forest (coastal plain subtype)



Site sketch (label to match Nets/Traps and BD# above)

NCDOT Mist-Netting & Acoustic Survey Data Form

Project:	NLEBRSEARCH		County:	HERTFORD		Site#:	2B		Night#:	2		Site Name:	CHOWAN SWAMP 2B		Date:	8/8/10		
Latitude:	36.425043				Longitude:	-77.011608				Datum:	NAD83		Elevation:	15'		ID By:		
Observers:	MENS, HS, C.G., GJ								Start Time:	20:15				End Time:	01:20			
Conditions:	Time	Temp	Wind	Clouds	Time	Temp	Wind	Clouds	Time	Temp	Wind	Clouds						
	20:15	74°	none	partly	23:41	72°	none	partly	01:05	72°	—	cloudy						
Moon Effect:	none (waxing crescent)		Start:	—		Stop:	—		Land Use:	Urban / Agriculture / Forest / Water / Wetland / Barren (describe): in hardwood forest, adj. to swamp/creek								
NETS/TRAPS:	A: triple 6m		B: double 12m		C: double 25m		D:		E:		F:							
Pool size WxL																		
Swoop WxL																		
Photo? or #																		
BD#	Latitude	Longitude	Mic	Ht	clutter	gain	trigger	interval	Start time	Stop Time	Photo?							
2			steel	10'	high	7-sens.	—	—	19:40		Y							
Site Description:			see dataform for night 1.															
			<i>chasmodon</i> , <i>epatorium</i> , <i>calicarpa americana</i> <i>smoothskin</i> , <i>Carpinus</i>															
Remarks:																		

Site sketch (label to match Nets/Traps and BD# above)

NCDOT Mist-Netting & Acoustic Survey Data Form

Medoc Mtn

Project: NLEB Research	County: Halifax	Site#: 1	Night#: 1	Site Name: Lynch Farm Home Street	Date: 8/2/16							
Latitude: 36.26123	Longitude: -77.896322			Datum: NAD 83	Elevation: 154'							
Observers: MF, JEC, NS, HS <small>Frazier Corey Scott Steve</small>				Start Time: 20:30	End Time: 01:30							
Conditions:	Time 20:20	Temp 77°	Wind None	Clouds 100%	Time 23:03	Temp 75°	Wind None	Clouds mostly clear	Time 01:15	Temp 75°F	Wind —	Clouds mostly clear
Moon Effect: none NEW MOON	Start: —	Stop: —	Land Use: Urban / Agriculture / Forest / Water / Wetland / Barren (describe): dirt road in young oak hardwood forest adj. to creek									
NETS/TRAPS:	A: 6m double	B: 1m triple	C: 4m double	D: 1m single	E:	F:						
Pool size WxL												
Swoop WxL												
Photo? or #												
BD#	Latitude	Longitude	Mic	Ht	clutter	gain	trigger	interval	Start time	Stop Time	Photo?	
2	-77.896599	36.261006	steel	10ft	high	7 = sense.	—	—	20:10		Y	
Site Description: Acer rubrum, L. styraciflua, ^{Carpinus} ^{caroliniana} Betula nigra, L. tulipifera, N. sylvatica(?), ^{Fagus} ^{grandifolia} Ligustrum, Asimina triloba, Polystichum, Fraxinus acrostichoides, Athyrium filix-femina, Asplenium, Ophellos, Elephantopus, P. taeda Young forest - regenerated Mesic mixed hardwood forest (Piedmont subtype)			<p>to Medoc State Park Rd</p> <p>C. H. Fishing Creek</p> <p>N</p>									
Remarks: Cope's gray treefrogs, narrow mouth toads A couple beetles & several imperial moths in net.												

Site sketch (label to match Nets/Traps and BD# above)

NCDOT Mist-Netting & Acoustic Survey Data Form

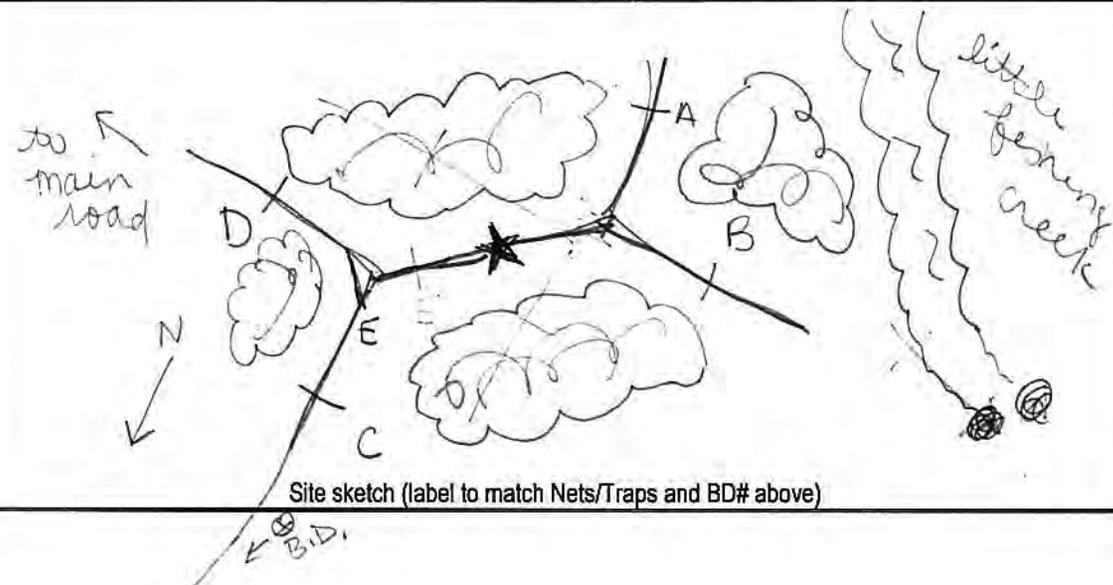
GPS Madoc M42

Project: NLE RESEARCH		County: HALIFAX	Site#: 2	Night#: 1	Site Name: LYNETT HOMESTEAD OPEN		Date: 8/3/16					
Latitude: 36.25963 Fraser edney		Longitude: -77.891255			Datum: NAD83	Elevation: 160'	ID By: MF, JEC					
Observers: MF, JEC, NS, HS					Start Time: 20:35		End Time: 01:35					
Conditions:	Time: 20:45	Temp: 73°F	Wind: NONE	Clouds: partly	Time: 21:00	Temp: 71°	Wind: none	Clouds: partly	Time: 01:11	Temp: 69°F	Wind: -	Clouds: clear
Moon Effect: none (new moon)		Start: -	Stop: -	Land Use: Urban / Agriculture / Forest / Water / Wetland / Barren (describe): dirt roads (BIG RED) in regenerating forest, old homestead.								
NETS/TRAPS:		A: SINGLE 4m	B: DOUBLE 9m	C: DOUBLE 6m	D: DOUBLE 9m	E:	F:					
Pool size WxL												
Swoop WxL												
Photo? or #												
BD#	Latitude	Longitude	Mic	Ht	clutter	gain	trigger	interval	Start time	Stop Time	Photo?	
2	36.260432°N	-77.891985°	steel	10ft	high (med. high)	7-	sens. -	-	19:55	1:15	Y	
<p>Site Description: <i>L. styraciflua</i>, <i>P. taeda</i>, <i>B. nigra</i> <i>Juniperus virginiana</i>, <i>Prunus serotina</i>, <i>Fraxinus</i>, <i>Pennsylv.</i> <i>Q. nigra</i>, <i>A. rubrum</i></p> <p>mesic mixed hardwood forest (Piedmont subtype)</p> <p>Remarks: Several ^{many} imperial moths in nets.</p>												
Site sketch (label to match Nets/Traps and BD# above)												

NCDOT Mist-Netting & Acoustic Survey Data Form

Medoc Mtn

Project:	NLEB research	County:	Halifax	Site#:	2	Night#:	2	Site Name:	WINNIE HOMESTEAD OPEN	Date:	8/17/16	
Latitude:	36.25963	Longitude:	-77.891255	Datum:	NAD 83	Elevation:	160'	ID By:	MFrazer			
Observers:	MF, JEC, HS, HW						Start Time:	20:00	End Time:	01:00		
Conditions:	Time 20:18	Temp 76°F	Wind none	Clouds 100%	Time 20:43	Temp 75	Wind none	Clouds 100%	Time 00:47	Temp 74°	Wind —	Clouds partly
Moon Effect:	none	Start:	-	Land Use: Urban / Agriculture / Forest / Water / Wetland / Barren (describe):								
	99% full	Stop:	-	jeep tracks in regenerating forest / old homestead.								
NETS/TRAPS:	A: single 6m	B: double 6m	C: double 6m	D: double 6m	E: single 6m	F:						
Pool size WxL												
Swoop WxL												
Photo? or #												
BD#	Latitude	Longitude	Mic	Ht	clutter	gain	trigger	interval	Start time	Stop Time	Photo?	
2			steel	10'		*6.5	=sens.	-	19:45	00:45	Y	
Site Description:			See night 1 data forms									
			* too much insect noise for sensitivity to be set @ 7.									
			Brief rain just before sunset, + continuing thunder & lightning after, until ~ 21:00.									
Remarks:												



NCDOT Mist-Netting & Acoustic Survey Data Form

Medoc Mtn

Project: NLEB Research	County: Halifax	Site#: 2	Night#: 3	Site Name: Lynch Homestead - open	Date: 8/18/16						
Latitude: 36.25963		Longitude: -77.891255		Datum: NAD 83	Elevation: 160'						
Observers: E. Corey, H. Wood, N. Howell, M. Frazer				Start Time: 20:20	End Time: 01:20						
Conditions:	Time 20:30	Temp 77°F	Wind -	Clouds partly	Time 23:30						
					Temp 74°						
					Wind -						
					Clouds clear						
					Time 01:16						
					Temp 73°F						
					Wind None						
					Clouds partly						
Moon Effect: most nets shaded full moon	Start: 21:30	Land Use: Urban / Agriculture / Forest / Water / Wetland / Barren (describe): converging jeep tracks in regenerating forest.									
	Stop: 1:20										
NETS/TRAPS:	A: single 6M	B: double 9M	C: double 6M	D: double 6M	E: single 9M						
Pool size WxL											
Swoop WxL											
Photo? or #											
BD#	Latitude	Longitude	Mic	Ht	clutter	gain	trigger	interval	Start time	Stop Time	Photo?
2			steel	10'	high	*6.5 sens.	-	-	20:00	1:00	Y
Site Description: see data form for night 1.											
* too many insects / noisy.											
Remarks: a couple dung beetles in net.											

Site sketch (label to match Nets/Traps and BD# above)

to Medoc Park road

NCDOT Mist-Netting & Acoustic Survey Data Form

Medoc Mtn

Project: NLEB Research	County: Halifax	Site#: 3	Night#: 1	Site Name: Morator trail	Date: 8/15/16						
Latitude: 36.230205		Longitude: -77.887459		Datum: NAD 83	Elevation: 145'						
Observers: MF, LW, HS, GJ, JEC				Start Time: 20:11	End Time: 01:11						
Conditions:	Time 20:11	Temp 80°	Wind none	Clouds none	Time 23:00						
					Temp 78°F						
					Wind none						
					Clouds partly						
					Time 01:00						
					Temp 78°						
					Wind —						
					Clouds partly						
Moon Effect: little to none waxing gibbous	Start: 21:30	Land Use: Urban / Agriculture (Forest) / Water / Wetland / Barren (describe): converging dirt trails in young forest									
	Stop: 01:11										
NETS/TRAPS:	A: double 1m	B: double 4m	C: double 4m	D: triple 1m	E: single 1m	F: single 2.6					
Pool size WxL											
Swoop WxL											
Photo? or #											
BD#	Latitude	Longitude	Mic	Ht	clutter	gain	trigger	interval	Start time	Stop Time	Photo?
2	36.229661	-77.888681	steel	10'	medium high	7: sens.	—	—	19:50	1:00	Y
Site Description: A. rubrum, P. taeda, L. styraciflua, Ulmus alata, Carya spp, Q. nigra, Q. phellos, I. opaca, I. decida, C. florida, U. americana, Morella, Betula nigra, G. pectorum, Cleplantopus, Carpinus caroliniana						<p>Site sketch (label to match Nets/Traps and BD# above)</p>					
Remarks: Mesic mixed hardwood forest (Piedmont subtype)											

Handwritten notes and signatures at the bottom left of the page.

NCDOT Mist-Netting & Acoustic Survey Data Form

Medoc Mtn

Project: NLEB Research	County: Halifax	Site#: 3	Night#: 2	Site Name: Morata trail	Date: 8/10/16
Latitude: 36.230205	Longitude: -77.887459			Datum: NAD83	Elevation: 145'
Observers: M. Frazer, E. Corey, H. Slya, H. Wood				Start Time: 20:11	End Time: 01:11

Conditions:	Time 21:19	Temp 75	Wind none	Clouds none	Time 23:15	Temp 70	Wind none	Clouds none	Time 01:00	Temp 76F	Wind none	Clouds none
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Moon Effect: most nets shaded mostly full (waxing gibbous)	Start: 21:30	Stop: -	Land Use: Urban / Agriculture / Forest / Water / Wetland / Barren (describe): jeep tracks between young & old mesic mixed forest.
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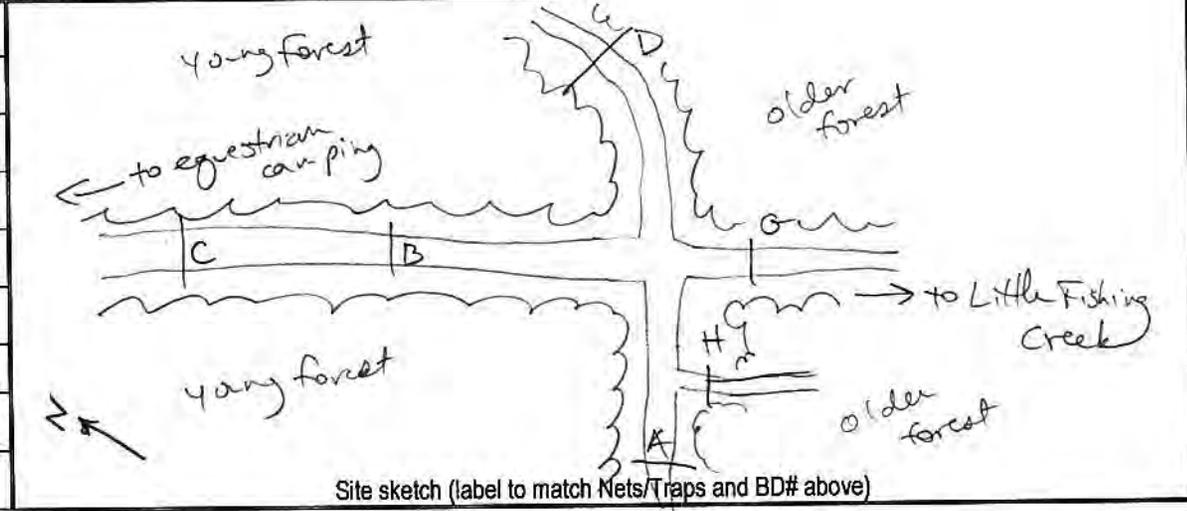
NETS/TRAPS:	A: double 6m	B: double 4m	C: double 4m	D: triple 6m	G: single 9m	H: single 2.6m
Pool size WxL						
Swoop WxL						
Photo? or #						

BD#	Latitude	Longitude	Mic	Ht	clutter	gain	trigger	interval	Start time	Stop Time	Photo?
2	same as night 1	1	steel	10'	high	*6-7 = sens.		-	19:55	1:05	Y

Site Description: see night 1 data form

coyote family near by
screech owl @ 00:30.

Remarks: not many moths/beetles in nets. *Lots of katydid noise
had to turn sensitivity down.



Site sketch (label to match Nets/Traps and BD# above)

Bat Survey Data Form

Project: NLEB Research County: Halifax Site# 3 Night# 2 Site Name: Maratoc trail ^{wings} ↓ Date: 8/16/16

	TIME	SPECIES	Sex	Age	P/L/PL/NR	FA	EAR	WT	Net #	Height	Band / WS	Comment / Photo #
1	20:35	LASE	F	J	NR	—		17.5- 7.5=10.0	H	1	Boaks NC 0369 / 0	pinhole in rt wing
2	20:35	LASE	F	J	NR	45		18.1- 7.5=10.6	H	2	0391 / 0	
3	21:17	LABO	M	J	NR	38		16.5-8 8.5g	B	1.5	0357 / 0	pinhole right wing high hole left wing (3mm)
4	00:48	LASE	F	J	NR	43		17.5- 8.0=9.5	A	2	0039 / 0	1 pinhole in left wing
5	01:10	LABO	F		NR	40		21.5- 8=13.5g	H	.5	0291 / 0	✓
6												
7												
8												
9												
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11												
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16												
17												
18												
19												
20												

225046
235527

Lee County Game Land Mist-nets



Site 1, Net A



Site 1, Net B



Site 1, Net C

Lee County Game Land Mist-nets



Site 2, Net A



Site 2, Net B



Site 2, Net C (used 5/11)

Lee County Game Land Mist-nets



Site 3, Net A



Site 3, Net B



Site 3, Net C

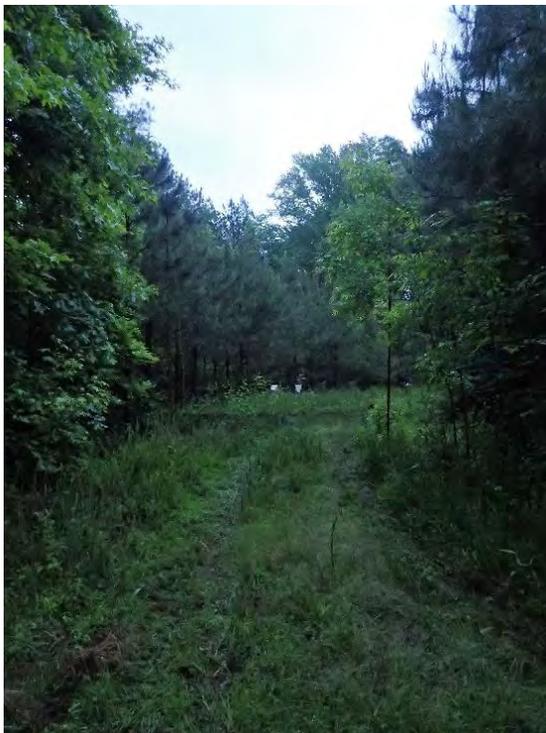
Lee County Game Land Mist-nets



Site 4, Net A



Site 4, Net B



Site 4, Net C



Site 4, Net D

Palmetto Peartree Preserve Mist-nets (Tyrell County)



Site 1, Net A



Site 1, Net B



Site 1, Net C

Palmetto Peartree Preserve Mist-nets (Tyrell County)



Site 2, Net A



Site 2, Net B



Site 2, Net C

Palmetto Peartree Preserve Mist-nets (Tyrell County)



Site 3, Net A



Site 3, Net B



Site 3, Net C

Palmetto Peartree Preserve Mist-nets (Tyrell County)



Site 5, Net A



Site 5, Net B



Site 5, Net C

Howell Woods Mist-nets (Johnston County)



Site 1, Net A



Site 1, Net B



Site 1, Net C

Howell Woods Mist-nets (Johnston County)



Site 2, Net A



Site 2, Net B



Site 2, Net C



Site 2, Net D

Howell Woods Mist-nets (Johnston County)



Site 3, Net A



Site 3, Net B



Site 3, Net C

Howell Woods Mist-nets (Johnston County)



Site 4, Net A



Site 4, Net B



Site 4, Net C

Roanoke River Game Land Mist-nets (Martin County)



Site 1, Net A



Site 1, Net B



Site 1, Net C



Site 1, Net D

Roanoke River Game Land Mist-nets (Martin County)



Site 2, Net A



Site 2, Net B



Site 2, Net C

Roanoke River Game Land Mist-nets (Martin County)



Site 3, Net A



Site 3, Net B (+)



Site 3, Net C

Chowan Swamp Game Land Mist-nets (Hertford County)



Site 1b, Net A



Site 1b, Net B



Site 1b, Net C

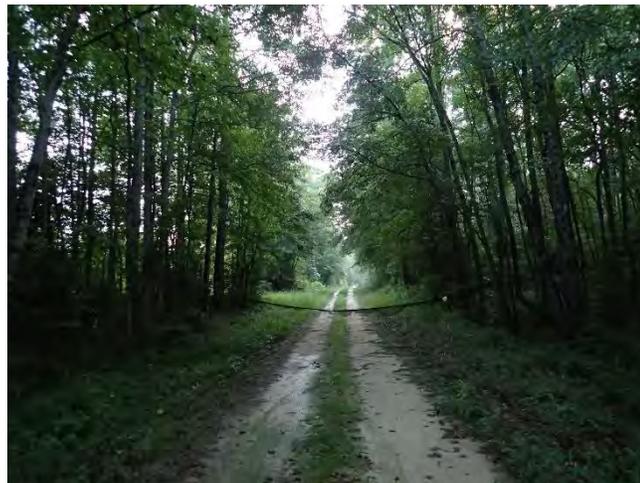
Roanoke River Game Land Mist-nets (Martin County)



Site 1b, Net A



Site 1B, Net B



Site 1b, Net C

Roanoke River Game Land Mist-nets (Martin County)



Site 1b DOT, Net A



Site 1b DOT, Net B



Site 1b DOT, Net C

Roanoke River Game Land Mist-nets (Martin County)



Site 2b, Net A



Site 2b, Net B



Site 2b, Net C

Medoc Mountain State Park Mist-nets (Halifax County)



Site 1, Net A



Site 1, Net B



Site 1, Net C



Site 1, Net D

Medoc Mountain State Park Mist-nets (Halifax County)



Site 2 Net A



Site 2, Net B



Site 2, Net C



Site 2, Net D



Site 2, Net E (used 8/17 & 8/18)

Medoc Mountain State Park Mist-nets (Halifax County)



Site 3, Net A



Site 3, Net B



Site 3, Net C



Site 3, Net D

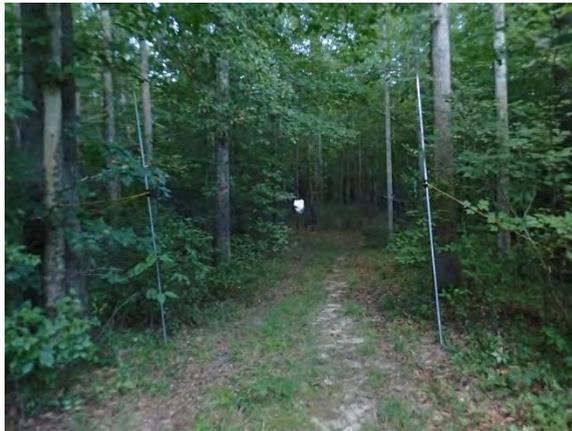
Medoc Mountain State Park Mist-nets (Halifax County)



Site 3, Net E (used 8/15 only)



Site 3, Net F (used 8/15 only)



Site 3, Net G (used 8/16 only)



Site 3, Net H (used 8/16 only)

Appendix D

Representative MYSE & MYLU Photographs



1. MYSE



2. MYSE profile, showing tragus



3. MYSE calcar



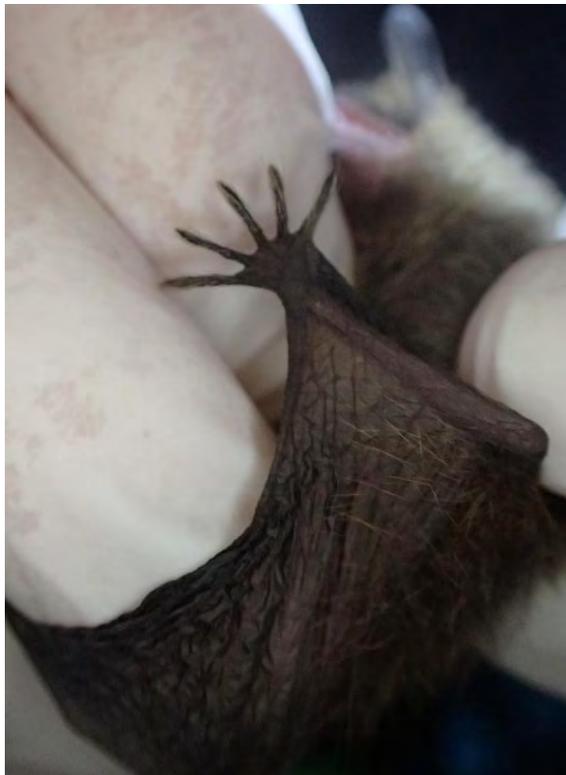
4. MYSE foot and toe hair



5. MYLU



6. MYLU profile, showing tragus



7. MYLU foot and calcar



8. MYLU belly fur (not black at base as with MYAU)