

From: [Pelren, David](#)
To: [Adams, Joshua](#)
Subject: RE: [EXTERNAL] Ridgeline Coordination
Date: Friday, January 27, 2023 12:15:00 PM

Thanks, sir!

-Dave Pelren

From: Adams, Joshua <Joshua.Adams@stantec.com>
Sent: Friday, January 27, 2023 12:07 PM
To: Pelren, David <david_pelren@fws.gov>
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Subject: [EXTERNAL] Ridgeline Coordination

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Dave,

Thank you for taking the time to take my call yesterday, as discussed while preparing survey reports, I noticed that during survey efforts I neglected to provide written notification that HMB Engineers (Todd McDaniel and Eric Smith, TE 129703-6) would be helping with mist net surveys in 2022. Additionally despite reporting gray bat captures to you verbally during the fall surveys, I failed to follow up with an email containing specifics, see below.

Gray Bat Captures				
Date	Lat	Long	Sex	Repro.
9/21/2022	36.273606	-85.645054	M	NR
9/21/2022	36.273606	-85.645054	M	NR
9/21/2022	36.273606	-85.645054	F	NR
9/27/2022	36.273606	-85.645054	M	TD

Let me know if you need any additional information or have any questions.

Thanks

Josh Adams

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Preliminary Findings 2022 Freshwater Mussel Surveys

Ridgeline Expansion Project

March 14, 2023

Prepared for:

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2022 Freshwater Mussel Presence/Probable Absence Surveys Preliminary Findings

Revision	Description	Author	Date	Quality Check	Date	Independent Review	Date



2022 Freshwater Mussel Presence/Probable Absence Surveys Preliminary Findings

The conclusions in the Report titled 2022 Freshwater Mussel Presence/Probable Absence Surveys Preliminary Findings are Stantec's professional opinion, as of the time of the Report, and concerning the scope described in the Report. The opinions in the document are based on conditions and information existing at the time the scope of work was conducted and do not take into account any subsequent changes. The Report relates solely to the specific project for which Stantec was retained and the stated purpose for which the Report was prepared. The Report is not to be used or relied on for any variation or extension of the project, or for any other project or purpose, and any unauthorized use or reliance is at the recipient's own risk.

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EXECUTIVE SUMMARY

East Tennessee Natural Gas, LLC (ETNG) proposes to construct the Ridgeline Expansion Natural Gas Pipeline Project (Project), an approximately 123-mile natural gas pipeline within portions of Trousdale, Smith, Jackson, Putnam, Overton, Fentress, Morgan, and Roane Counties, Tennessee. The approximately 300 feet-wide Project right-of-way (ROW) traverses approximately 123 miles, the Study Corridor, between Castalian Springs, Tennessee, and the Tennessee Valley Authority's (TVA) Kingston Fossil Plant in Harriman, Tennessee. Stantec Consulting Services Inc. (Stantec) has been retained by ETNG to assist with obtaining necessary authorizations related to the Project. Several streams, rivers, and embayments are proposed to be crossed as part of the Project; these resources have the potential to contain native freshwater mussel habitat. The Endangered Species Act of 1973, as amended (ESA), and the Tennessee Nongame and Endangered or Threatened Wildlife Species Conservation Act of 1974 (TCA), prohibit the unauthorized taking of listed threatened and endangered species. The purpose of this assessment was to determine the presence or probable absence of freshwater mussels within the Project portions of the waterbodies.

Through coordination with the United States Fish and Wildlife Service (USFWS) and Tennessee Wildlife Resources Agency (TWRA), Stantec proposed to use a three-step approach to determine which waterbody crossings were likely to contain native freshwater mussels, as follows: Step 1. Desktop Review and Site Reconnaissance, Step 2. Environmental DNA (eDNA) Sampling and Analysis, and Step 3. Visual and Tactile Surveys.

Stantec malacologists determined through regional experience and Desktop Review (Step 1) that suitable habitat for rare freshwater mussels native to the region generally occurs in waterbodies with a minimum wetted width of 20 feet and either perennial or intermittent streamflow duration. Previous field investigations for waterbodies by Stantec identified 553 waterbody crossings within the Survey Corridor; 277 with perennial streamflow duration, 264 with intermittent, and 12 with ephemeral. Of the 541 waterbodies identified with either perennial or intermittent streamflow duration, 48 were determined to have a wetted width of at least 20 feet. Stantec malacologists conducted a Preliminary Site Reconnaissance (Step 1) of the 48 waterbodies and identified common indicators of suitable habitat for freshwater mussels at 36 of the crossings. The 36 crossings were categorized as 30 small streams, 5 embayments, and 1 large River.

From June 13 - 19, 2022, water samples were collected for eDNA analysis from 29 of the 30 Small Stream crossings (Step 2). Three samples were collected at each crossing location; at the crossing, 30 meters downstream, and 30 meters upstream. Genetic material from native freshwater mussels was detected from 12 water samples collected at 7 of the 29 sampled small streams.

From October 5 - 12, 2022, four of these small streams and three of the embayment crossings assumed to have mussels were further evaluated for freshwater mussels with Visual and Tactile Surveys (Step 3). The Visual and Tactile Surveys recovered live mussels at two of the four small stream crossings and at all three embayment crossings. Overall abundance and richness were low regardless of the survey technique, eDNA or visual and tactile. Although eDNA detected the potential presence of the federally endangered *Lampsilis virescens* (Alabama lampmussel) at one of the small stream crossings, Site 165 – Emory River,



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no species listed as threatened or endangered under either the ESA or TCA were identified during the Visual and Tactile Surveys.

Further surveys will be completed in 2023 to collect water samples for eDNA analysis and perform Visual and Tactile Surveys of the remaining crossings.



ACRONYMS / ABBREVIATIONS

§	Section
°	Degree
µS/mL	Microseimens Per Millimeter
C	Celsius
CPUE	Catch Per Unit Effort
CWA	Clean Water Act
DNA	Deoxyribonucleic Acid
eDNA	Environmental DNA
ESA	Endangered Species Act of 1973
>	greater than
HTS	High-Throughput Sequencing
HUC	Hydrologic Unit Code
<	less than
mg/L	Milligrams Per Liter
MIQE	Minimum Information for Publication of Quantitative Real-time PCR Experiments
mm	millimeter
OHWM	Ordinary High Water Mark
p	Probability of Detection
%	percent
PCR	Polymerase Chain Reaction
qPCR	Quantitative PCR
ROW	Right-of-Way
SCUBA	Self-Contained Underwater Breathing Apparatus
SD	Standard Deviation
SP	species
TCA	Wildlife Species Conservation Act of 1974
TN	Tennessee State Route
TVA	Tennessee Valley Authority
TWRA	Tennessee Wildlife Resources Agency
U.S.	United States
US	U.S. Route
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
ψ	PSI - Probability of Species Occupancy



1.0 INTRODUCTION

Stantec Consulting Services Inc. (Stantec) has been retained by East Tennessee Natural Gas, LLC (ETNG) to assess the presence or probable absence of freshwater mussels within the proposed Ridgeline Expansion Natural Gas Pipeline Project (Project). ENTG proposes to construct an approximately 123-mile natural gas pipeline within portions of Trousdale, Smith, Jackson, Putnam, Overton, Fentress, Morgan, and Roane Counties, Tennessee, hereafter referred to as the Survey Corridor. Beginning in 2022, a combination of methods was, and will continue to be, utilized to assess presence or probable absence, including the collection of environmental deoxyribonucleic acid (eDNA) and visual and tactile searches. Additional assessments are planned for the 2023 survey season. This report presents the preliminary findings of the surveys conducted during 2022.

1.1 PURPOSE

The purpose of the study was to assess the presence or probable absence of freshwater mussels within the portions of the waterbodies surveyed during 2022 located within the Survey Corridor (Figure 1; Appendix A). The 2022 surveys were completed in accordance with the *Proposed Study Plan, Mussel Survey for the Proposed East Tennessee Ridgeline Pipeline Project* (Study Plan; Appendix B), as approved by the United States Fish and Wildlife Service (USFWS) and Tennessee Wildlife Resources Agency (TWRA). Specifically, the portion of the study conducted in 2022 assessed the distribution and abundance of freshwater mussels at 29 crossings through eDNA analysis and 7 crossings through Visual and Tactile Surveys.

1.2 STUDY AREA

The approximately 123-mile (197-kilometer) long Survey Corridor begins approximately 2.8 miles east of Castalian Springs, Tennessee, near the northeast corner of the intersection of U.S. Route (US)-231 and Tennessee State Route (TN)-10 (Figure 1). The Survey Corridor is an approximately 300 feet wide right-of-way (ROW) and generally traverses northwest to southeast across portions of Trousdale, Smith, Jackson, Putnam, Overton, Fentress, Morgan, and Roane Counties, Tennessee. The Project terminus is located within the Tennessee Valley Authority's (TVA) Kingston Fossil Plant in Harriman, Tennessee.

1.3 REGULATORY FRAMEWORK

The Project is subject to both the federal Endangered Species Act of 1973 (ESA), as amended, and the Tennessee Nongame and Endangered or Threatened Wildlife Species Conservation Act of 1974 (TCA) Section (§) 70-8-101 to 112.

1.3.1 Endangered Species Act

Species listed as endangered or threatened by the USFWS are protected by the ESA, which prohibits "take." "Take" is defined in the ESA as "harass, harm, pursue, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct." "Harm" has been defined to include activities that modify or



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degrade habitat in a way that significantly impairs essential behavior patterns and results in death or injury. Alteration of the quality and/or quantity of endangered species habitat may or may not “harm” the listed species that inhabit those areas. A number of potential impacts, directly or indirectly related to human activities, are of concern to USFWS and may be regulated by that agency to prevent “take” or “harm” of these listed species.

1.3.2 Tennessee Wildlife Conservation Act

Within the State of Tennessee, nongame wildlife, which includes native freshwater mussels, are protected under state law following TCA §70-8-101 to 112. It is unlawful to take or attempt to “possess, transport, export, process, sell or offer for sale or ship nongame wildlife” without a proper collection permit. Scientific collection permits are issued by the TWRA under the authority of TCA §70-2-213.

1.3.3 Agency Correspondence

Stantec submitted the Study Plan (Appendix B) to USFWS on September 8, 2022, and to TWRA on September 15, 2022. USFWS provided written approval of the Study Plan via email on September 26, 2022 (Appendix C). On September 27, 2022, TWRA issued a Scientific Collection Permit (Permit 5635; Appendix D) authorizing the freshwater mussel surveys associated with the Project. All mussels were handled according to, and by those approved under, ESA Section 10(a)(1)(a) Permit Numbers ES-38821A (Appendix D) and TE21570C-0, and TWRA Scientific Collection Permit Number 5635 (Appendix D).

2.0 METHODS

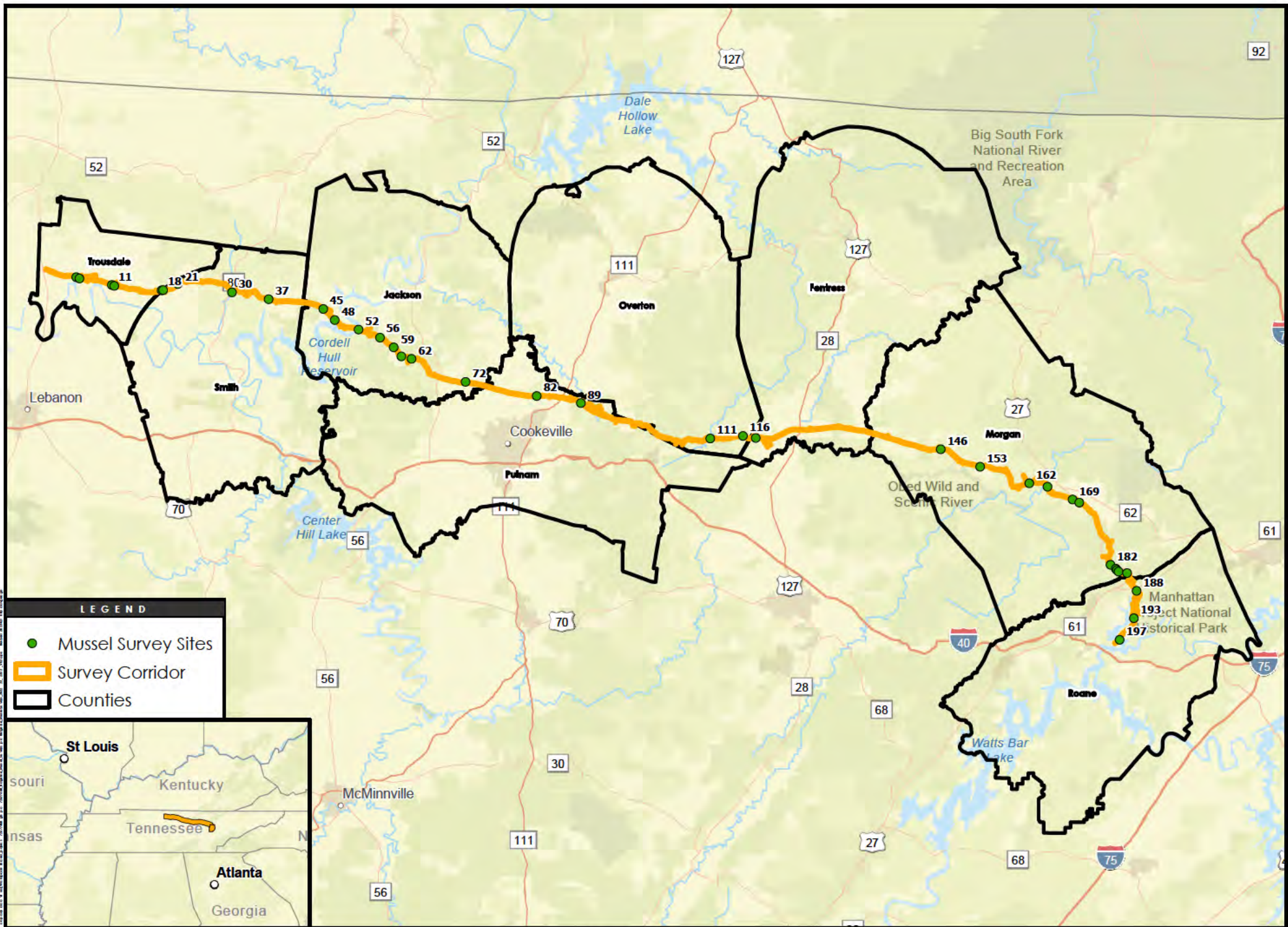
Stantec scientists conducted both a desktop review and on-site surveys to assess the presence or probable absence of freshwater mussels within the Survey Corridor. Stantec biologists working on the Project were either named within or operating under the direct, on-site supervision of the malacologists named under the permits (Appendix D) as follows:

- USFWS Federal Recovery Permit Numbers ES-38821A and TE21570C-0; and
- TWRA Scientific Collection Permit Number 5635.

Stantec biologists conducted a three-step process to assess the presence or probable absence of freshwater mussels within the Survey Corridor as follows:

- Step 1. Desktop Review and Preliminary Site Reconnaissance;
- Step 2. Environmental DNA (eDNA) Sampling and Analysis; and
- Step 3. Visual and Tactile Surveys.





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Ridgeline Expansion Project

Mussel Survey Overview Map

February 2023

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0 50 000 Feet

Prepared by: D.G. 03/10/23
Technical Review by: M.P. 12/05/22
Independent Review by: N.M. 12/05/22

Desktop Review and Preliminary Site Reconnaissance (Step 1) were conducted to determine which streams within the Survey Corridor had the potential to support freshwater mussels. Environmental DNA Sampling and Analysis (Step 2) was conducted in the streams identified during the desktop review as having the potential to support freshwater mussels. Water samples were collected and analyzed for the detection of genetic material associated with freshwater mussels, thereby indicating the presence of freshwater mussels within or upstream of the Survey Corridor. Visual and Tactile Surveys (Step 3) were then conducted in the streams within the Survey Corridor, and within upstream and downstream buffers, where eDNA samples identified the potential presence of freshwater mussels and large waterbodies where eDNA was not taken prior to the initiation of these surveys.

2.1 DESKTOP REVIEW AND PRELIMINARY SITE RECONNAISSANCE (STEP 1)

Prior to developing the Study Plan (Appendix B), as part of the environmental due diligence for the Ridgeline Project, Stantec biologists identified waterbody crossings within the Survey Corridor. To assess which of these crossings had the potential to support the presence of freshwater mussels, Stantec malacologists conducted a desktop review to assess the species that could be present within the Survey Corridor and their habitat requirements. Utilizing the information from the desktop review, Stantec malacologists performed a preliminary site reconnaissance of the waterbodies at the crossings that could potentially contain suitable habitat to assess whether suitable habitat could be identified or if it was evidently absent. The outcome of the Desktop Review and Preliminary Site Reconnaissance (Step 1) was utilized to focus efforts for eDNA Sampling and Analysis (Step 2) and Visual and Tactile Surveys (Step 3) to those waterbody crossings where freshwater mussels had the potential to be present based on the physical environment.

2.1.1 Desktop Review

Stantec scientists knowledgeable of applicable regulations and competent in the field identification of aquatic resources regulated under Section 404 of the Clean Water Act (CWA) performed field investigations to identify waters of the United States (U.S.) within the Survey Corridor. Where apparent, personnel measured the width of the ordinary high water mark (OHWM) along the length of waterways and identified the streamflow duration of each waterway as perennial, intermittent, or ephemeral. The Survey Corridor crosses 553 waterbodies, excluding off-channel stock ponds. Of the 553 waterbody crossings, 12 have ephemeral streamflow duration, 264 have intermittent, and 277 have perennial.

Stantec malacologists knowledgeable of the freshwater mussels native to the Survey Corridor conducted a desktop analysis of the freshwater mussels, including their habitats, known to occur within the river basins occurring within the Survey Corridor. The results of the desktop review indicated that suitable habitat for rare freshwater mussels native to the region generally occurs in waterbodies with a width of at least 20 feet. Additionally, as freshwater mussels require perennial surface or shallow sub-surface flow, all ephemeral streams and those intermittent streams without the potential for perennial pools or shallow sub-surface flow were not considered for further evaluation. The Survey Corridor crosses 48 waterbodies that are at least 20 feet wide and have either perennial or intermittent flow. Stantec scientists determined during field investigations that of the 48, 41 have perennial surface flow duration and 7 have intermittent.



2.1.2 Preliminary Site Reconnaissance

A preliminary site reconnaissance was then conducted of the crossings identified during the desktop review by Stantec federally permitted malacologists knowledgeable of the freshwater mussels native to the region. The purpose of the preliminary site reconnaissance was to further evaluate the probability of freshwater mussel presence or absence through the observation of common regional field indicators of potential mussel presence including, but not limited to: channel substrate, flow duration, recently dead mussel shells, and habitat characteristics commonly associated with federally protected mussels of the region. The purpose of the analysis was to identify the streams within the Survey Corridor where rare freshwater mussel habitat was suitable for further evaluation through the collection and analysis of eDNA.

Stantec malacologists conducted a preliminary site reconnaissance of the 48 waterbodies identified during the desktop review to look for common indicators, or the lack, of suitable habitat for freshwater mussels, including, but not limited to, the following:

- shells, single valves, or shell fragments;
- substrate composition, where visible; and
- perennial streamflow, pools, or shallow-subsurface flow.

Potential suitable habitat was presumed to be present where the malacologists had either insufficient visibility or lack of access to view the crossing location.



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A total of 36 crossing locations were identified for further evaluation through eDNA and/or Visual and Tactile Surveys, as follows (Appendix A):

- Site 5 – Cumberland River Embayment
- Site 6 - Cumberland River Embayment
- Site 11a – Big Goose Creek
- Site 11 – Little Goose Creek
- Site 18 – Glasgow Branch
- Site 19 – Lick Creek
- Site 21 – Dixon Creek
- Site 30 – Peyton Creek
- Site 37 – Defeated Creek
- Site 45 – Salt Lick Creek
- Site 48 – Cumberland River Embayment
- Site 52 – Cumberland River
- Site 56 – Flynn Creek
- Site 59 – Flynn Creek
- Site 60 – Flynn Creek
- Site 62 – Flynn Creek
- Site 72 – Blackburn Fork
- Site 82 – Bear Creek
- Site 89 – Spring Creek
- Site 111 – East Fork Obey River
- Site 116 – Little Hurricane Creek
- Site 118 – Hurricane Creek
- Site 146 – White Creek
- Site 153 – Little Clear Creek
- Site 162 – Campground Creek
- Site 165 – Emory River
- Site 169 – Crooked Fork
- Site 170 – Crooked Fork
- Site 182 – Bitter Creek
- Site 183c – Bitter Creek (up)
- Site 183b – Bitter Creek (middle)
- Site 183a – Bitter Creek (down)
- Site 185 – Little Emory River
- Site 188 – Watts Bar Lake Embayment
- Site 193 – Kings Creek
- Site 197 – Emory River

The 36 crossings (Appendix A) are located within 4 sub-basins: 8 sites are within hydrologic unit code (HUC) 05130201: Lower Cumberland-Old Hickory Lake, 11 sites are within HUC 05130106: Upper Cumberland-Cordell Hull Reservoir, 3 sites are within 05130105: Obey, and 14 sites are within 06010208: Emory (Table 1). The waterbody types at each crossing were categorized as a small stream, large river embayment, or large river. Of the 36 crossings, 30 are small streams, 5 are large river embayments, and 1 is a large river (Table 1).

One site, Site 197 – Emory River (Watts Bar Lake) was removed from further evaluation based on previous survey data provided by TVA and coordination with USFWS (Appendix A, Appendix C).



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Table 1. Sub-basins of the 36 crossing locations.

Sub-Basin (HUC 8)	Site Number	Site Name	Type
05130201 Lower Cumberland- Old Hickory Lake	5	Cumberland River Embayment (Old Hickory Lake 1)	Embayment
	6	Cumberland River Embayment (Old Hickory Lake 2)	Embayment
	11a	Big Goose Creek	Small Stream
	11	Little Goose Creek	Small Stream
	18	Glasgow Branch	Small Stream
	19	Lick Creek	Small Stream
	21	Dixon Creek	Small Stream
05130106 Upper Cumberland- Cordell Hull Reservoir	30	Peyton Creek	Small Stream
	37	Defeated Creek	Small Stream
	45	Salt Lick Creek	Small Stream
	48	Cumberland River Embayment (Salt Lick Creek)	Embayment
	52	Cumberland River	Large River
	56	Flynn Creek	Small Stream
	59	Flynn Creek	Small Stream
	60	Flynn Creek	Small Stream
	62	Flynn Creek	Small Stream
	72	Blackburn Fork	Small Stream
05130105 Obey	82	Bear Creek	Small Stream
	89	Spring Creek	Small Stream
	111	East Fork Obey River	Small Stream
06010208 Emory	116	Little Hurricane Creek	Small Stream
	118	Hurricane Creek	Small Stream
	146	White Creek	Small Stream
	153	Little Clear Creek	Small Stream
	162	Campground Creek	Small Stream
	165	Emory River	Small Stream
	169	Crooked Fork	Small Stream
	170	Crooked Fork (Crossing)	Small Stream
	182	Bitter Creek	Small Stream
	183c	Bitter Creek (up)	Small Stream
	183b	Bitter Creek (middle)	Small Stream
	183a	Bitter Creek (down)	Small Stream
	185	Little Emory River	Small Stream
	188	Watts Bar Lake Embayment (Elverton Branch)	Embayment
	193	Kings Creek	Small Stream
	197	Emory River (Watts Bar Lake)	Embayment

2.2 eDNA SAMPLING AND ANALYSIS (STEP 2)

Environmental DNA is genetic material released from an organism into the environment (i.e., urine, waste, mucus, or sloughed cells). The analysis of eDNA is increasingly integrated into natural resource surveys designed to detect the presence of rare species and/or describe entire community assemblages (Beng & Corlett 2020, Deiner et al. 2021, Rojahn et al. 2021). Environmental DNA has the potential to provide



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information on multiple taxa and is therefore utilized as a tool for studying multiple species and community dynamics (Deiner et al. 2017). Analysis of eDNA using quantitative Polymerase Chain Reactions (qPCR) or metabarcoding approaches have been used to detect and describe entire freshwater mussel assemblages in river systems (Prié et al. 2020, Coghlan et al. 2021, Marshall et al. 2022). Environmental DNA surveys provide a complementary sampling method to Visual and Tactile Surveys to assess the presence of freshwater mussels and can provide a preliminary survey tool for identifying stream crossings of interest.

2.2.1 Sample Collection Methods

Within each Small Stream crossing, a total of three water samples were collected. At 27 of these crossings, the three samples were collected across three separate locations along the stream as follows:

- Approximately 30 meters downstream of the crossing,
- At the ROW crossing, and
- Approximately 30 meters upstream of the crossing.

Samples were first collected at the downstream location and then progressing upstream to avoid potential contamination from surveyors and equipment within the stream.

Access was limited at Site 11 – Little Goose Creek and Site 11a – Big Goose Creek so all three replicate water samples were taken directly at the ROW crossing (Appendix A).

From June 13 - 19, 2022, 29 of the 30 Small Stream crossings were sampled for mussel eDNA (Appendix A). Site 56 - Flynn Creek, was completely dewatered at the time of sampling and thus no sample could be collected. From October 11 - 13, 2022, three of the embayment crossings were sampled for mussel eDNA; Site 5 – Cumberland River Embayment (Old Hickory Lake 1), Site 6 – Cumberland River Embayment (Old Hickory Lake 2), and Site 48 – Cumberland River Embayment (Salt Lick Creek). The other two embayment crossings, Site 52 – Cumberland River and Site 188 - Watts Bar Lake (Elverton Branch), are proposed to be surveyed in 2023.

The water samples were collected using a peristaltic pump (Masterflex L/S Easy Load Pump Head) and a filter head with tubing attached to a painter pole. The inlet of the filter head was positioned approximately 10 centimeters above the stream substrate and positioned in the upstream direction away from the surveyor. To account for potential spatial heterogeneity of eDNA within the Small Streams, at each sampling location, water was collected across a transect spanning the wetted width of the stream. The stream water was pumped through a 47-millimeter-diameter glass microfiber grade C filter (nominal pore size 1.2 microns; GE Healthcare Life Science, MA, USA) located within the filter head until 1000 milliliters of water had passed through, or the filter clogged from sediment.

At each embayment site, a total of six water samples were collected across a transect that was evenly divided along the width of the Embayment. Water was collected from approximately 50 centimeters from the substrate using a weighted tube line attached to a peristaltic pump from a boat. The water was pumped through a 47-millimeter-diameter glass microfiber grade C filter GF/C until clogging. Samples were collected



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in the fall of 2022 and laboratory results are not currently available. Preliminary results are expected in early 2023.

After sample collection, filters were placed into separate coin envelopes which were then placed in sealed plastic storage bags with silicone desiccant beads and immediately placed on ice. All filters were shipped on ice to Genidaqs for DNA extraction and eDNA analysis, which included eDNA assay development for qPCR and metabarcoding analysis of total mussel eDNA.

2.2.2 Laboratory Processing and Analysis

Stantec's quality assurance and quality control procedures included at least one negative field control sample during each sampling event to monitor potential contamination between sampling sites. For this field negative control, a sterile container of 500 milliliters of distilled water was taken into the field and filtered following the same protocol as the field collected environmental samples. Standardized sample collection, filtration, handling, and shipment procedures were implemented by Stantec field staff to protect the integrity of eDNA collected and avoid degradation.

Stantec has procured the services of a commercial eDNA laboratory, Genidaqs – Cramer Fish Sciences, for processing collected samples. Quality assurance and quality control aspects were built into the laboratory services and were used during interpretation of eDNA results.

Prior to DNA sample sequencing, the samples were processed with a Zymo Research One Step PCR Inhibitor Removal kit to remove the presence of PCR inhibitors (e.g., humic, phytic, and tannic acids) which can reduce the efficiency of DNA analysis. The laboratory analysis included running all samples with high-throughput sequencing DNA metabarcoding, to detect the presence of freshwater mussel eDNA. Furthermore, this metabarcoding approach allowed any present mussel eDNA to be detected and subsequently identified, enabling Stantec to distinguish species identities within each sample. The metabarcoding was performed using a 16S gene assay that has been specifically designed for freshwater mussels (Prié et al. 2020) and validated by the laboratory partner (Marshall et al. 2022).

In addition, the laboratory assessed a SYBR green based qPCR assay that may provide higher sensitivity for eDNA detection. However, this assay provided inconsistent quantification results across positive control samples with known mussel DNA. Furthermore, the assay commonly resulted in false positive detections within no-template control samples (i.e., blank samples containing all test reagents with the exception of mussel DNA). These two results suggest the qPCR assay can lead to erroneous quantification, and ultimately false detections. Therefore, we evaluated the presence of mussel eDNA using the metabarcoding dataset alone. Detection of any mussel species with eDNA metabarcoding subsequently triggered a Visual and Tactile Survey (Step 3).

2.2.3 eDNA Data Analysis

Occupancy modeling is often used in ecological surveys to account for imperfect detection of rare and/or elusive animals. These models use data collected from repeated surveys at each sampling location to estimate occurrence of a species while accounting for false-negative errors in detection. Due to the replicated design in eDNA surveys (e.g., multiple water samples collected per stream crossing), occupancy



modeling techniques are a useful analysis to improve understanding of detection probability and estimating species presence.

Single-season occupancy models developed by MacKenzie et al. (2002) were used to estimate both the detection probability of mussel eDNA (p) and the proportion of sites occupied by a mussel (ψ). Occupancy models were analyzed in the R package unmarked (Fiske & Chandler 2010). In the model, Small Stream crossings were processed as sampling units and the replicate transect samples within each stream crossing were treated as repeated surveys. The estimated mussel occupancy (ψ) was then compared to the proportion of sampling sites with a positive eDNA detection during the June 2022 survey (i.e., the naïve occupancy).

The estimated probability of detection was used to evaluate the eDNA survey by calculating the probability of detection based on triplicate water samples collected within a Small Stream crossing. This was calculated using the equation $1-(1-p)^n$, where p is the estimated probability of eDNA detection and n is the number of water samples collected.

2.3 VISUAL AND TACTILE SURVEYS (STEP 3)

During the Visual and Tactile Surveys Stantec biologists measured routine water quality parameters and substrate at each of the three Embayments and the four Small Stream survey sites (Appendix A). Following the collection of water quality data, surveys were conducted within each survey area based on the methods approved in the Study Plan (Appendix B) for each waterbody category. Surveyors documented substrate composition during survey activities.

2.3.1 Water Quality Parameters

At each new survey area, prior to surveyors entering the water, Stantec biologists utilized a YSI 55A Dissolved Oxygen Instrument to record water temperature in degrees Celsius (°C) and dissolved oxygen in milligrams per Liter (mg/L) and a Hanna Low Range Combo Tester was used to record the water's conductivity in microsiemens per milliliter (µS/mL) and pH.

2.3.2 Visual and Tactile Surveys

Stantec biologists named within or operating under the direct, on-site supervision of the permitted malacologists conducted visual and tactile searches of the substrates of the streams and rivers either identified as containing genetic material from freshwater mussels or large waterbodies where freshwater mussels were assumed to be present. At water depths of less than 2.5 feet, surveyors utilized masks and snorkels. Self-contained underwater breathing apparatus (SCUBA) were utilized at water depths greater than 2.5 feet.

At each crossing location, surveyors used a combination of visual and tactile survey techniques. When water clarity allowed, surveyors conducted a visual search of the substrate surface prior to disturbing sediment. In waterbodies where flow was present, surveyors began searching at the downstream extent of a survey area and progressed towards the upstream extent. Following any visual searches, surveyors



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conducted tactile searches of at least the upper five centimeters of the substrate, including but not limited to, moving cobble and woody debris and hand sweeping away silt, sand, and other small detritus.

The crossing locations selected for Visual and Tactile Surveys were divided into three categories (Table 1) as follows:

- embayments;
- large rivers; and
- small streams.

Survey methods were developed for each category. Individual mussels collected and substrate composition were recorded for each survey unit, time unit or transect increment. Individual mussels were identified to species and sex, if identifiable; length recorded; and representative vouchers were photographed for each species.

2.3.2.1 Embayments

Where the Survey Corridor crossed an embayment, a lentic area within a large reservoir, surveyors conducted wandering timed searches (Appendix B). The survey area within an embayment included the ROW plus an additional 25-meter-wide area on each side of the alignment. The survey area was then divided into equidistant sample locations and searched for two 45-minute periods, a total of 90 minutes of survey duration at each sample location. At the end of each 45-minute search period, surveyors brought any live or shell-only mussels to the surface and documented. At the end of the 90-minute search duration and after each mussel had been documented, the mussels and shells were returned to the water in the approximate location where they were found. Total survey time at each embayment surveyed was based on the length of the survey area, where total survey time was longer at wider crossings.

2.3.2.2 Large River

The approved survey methodology used transect based field methods where the Survey Corridor crossed Large Rivers (Appendix B). Stantec scientists surveyed the wetted width of the river from bank to bank along a one meter-wide transect. Each transect was divided into 10-meter-long segments and searched at a survey rate of 1 minute per square meter. Two transects were surveyed within the ROW, 5 transects downstream, and 3 transects upstream. The space between transects was no less than 10 meters and no more than 30 meters. While submerged, surveyors noted the segment where the mussel was collected and used different survey bags to segregate mussels identified within different segments. At the end of each dive, surveyors brought any live or shell-only mussels to the surface and documented, and the mussels and shells returned to the water in the approximate location where they were found. Qualitative timed searches of 30-minute duration were implemented in areas of similar habitat where mussel densities reached 0.5 live mussel per square meter or live federally-listed or proposed listed were identified.



2.3.2.3 Small Streams

The approved survey plan allowed for timed searches where the Survey Corridor crosses Small Streams (Appendix B). At these stream crossings the wetted width was surveyed for the width of the ROW, 100 meters downstream, and 50 meters upstream. Surveyors began searching at the downstream extent of the survey area and progressed upstream. A combination of visual and tactile searches was utilized. As water clarity allowed, surveyors visually searched the substrate surface within an area prior to conducting tactile searches. Substrates were searched for a minimum of 9 hours at each Small Stream crossing. Stantec biologists predominately utilized snorkeling equipment to survey; however, surveyors utilized SCUBA in areas where water depths were greater than 2.5 feet.

2.3.3 Substrate

Surveyors estimated the substrate composition of each survey area division while surveying as a percentage of the total substrate to document the physical habitat of the area being searched. Specifically, surveyors estimated the percent (%) present of boulders, cobble, gravel, sand, silt, bedrock, woody material, detritus, and clay.

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The Small Streams identified during the Desktop Review and Preliminary Site Reconnaissance (Step 1) were sampled and analyzed for freshwater mussel genetic material. The waterbodies where freshwater mussel DNA was detected during the eDNA Sampling and Analysis (Step 2) were further evaluated with Visual and Tactile Surveys (Step 3). Water samples for eDNA analysis at the Embayment sites were conducted concurrently with the Visual and Tactile Surveys. During the Visual and Tactile Surveys, Stantec scientists collected water quality data, recorded the substrate composition of each area surveyed, and documented the individual mussels recovered (Appendix A, Appendix E).

3.1 eDNA DETECTION

Through the metabarcoding analysis, 7 of the 29 Small Stream sites sampled in June 2022 were positive for mussel eDNA (Table 2; Appendix A). Positive detections occurred in three of the four sub-basins the Project occurs in, two positive sites in the Lower Cumberland-Old Hickory Lake sub-basin, two in the Upper Cumberland-Cordell Hull Reservoir sub-basin, and three in the Emory sub-basin. No positive detections occurred in the Obey sub-basin.



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Table 2. The location of positive detection from each of seven Small Stream crossings with freshwater mussel eDNA detection during the June 2022 survey.

Sample Location	Site 11a Big Goose Creek	Site 11 Little Goose Creek	Site 45 Salt Lick Creek	Site 89 Spring Creek	Site 146 White Creek	Site 165 Emory River	Site 193 Kings Creek
30 meters Downstream	N/S	N/S	–	–	+	–	–
At ROW crossing	+ + –	– + –	–	+	+	+	–
30 meters Upstream	N/S	N/S	+	+	+	+	+
Note: The three replicate water samples were all collected from the right-of-way crossing at Big Goose Creek (Site 11a) and Little Goose Creek (Site 11). N/S = Not Sampled, + = positive eDNA detection, – = non-eDNA detection							

Mussels were detected at seven Small Stream locations. Where samples were taken at all three sampling locations, only Site 146 – White Creek produced positive detections at all three sample locations and was also the only site with a positive eDNA detection at the 30-meter downstream sample location (Table 2; Appendix A). A positive detection occurred at the 30-meter upstream location for all of the five Small Streams with positive detections that were sampled at all three sampling locations (Table 2; Appendix A). Three of the seven sites, Site 11a – Big Goose Creek, Site 89 – Spring Creek, and Site 165 – Emory River, had two positive detections (Table 2; Appendix A). The positive detections at Site 89 – Spring Creek and Site 165 – Emory River occurred at the ROW crossing and 30-meter upstream sampling locations. Site 11a – Big Goose Creek was sampled three times at the ROW Crossing location, due to access constraints at the 30-meter upstream and 30-meter downstream locations and returned two positive eDNA detections (Table 2; Appendix A). Similarly, Site 11 – Little Goose Creek was sampled three times at the ROW crossing location due to access constraints and returned a single positive eDNA detection (Table 2; Appendix A).

3.1.1 Evaluating eDNA Survey

Within the eDNA survey, 7 of the 29 sites displayed a positive detection along the Survey Corridor, a naïve estimate of occupancy of 0.24 (Figure 2). From the occupancy modeling analysis, the mussel estimated true occupancy across these 29 sites was similarly found to be 0.27 (Figure 2). This suggests the eDNA survey detected mussels at a similar proportion of sites to their predicted occupancy along the Survey Corridor.

The probability of detection (p) of mussel eDNA when collecting a single water sample was estimated to be 0.50 (0.26-0.74 SE) (Figure 3). Based on the survey design of collecting three water samples per stream crossing, the probability of successful detection was raised to 0.88 (0.59-0.98 SE) at a stream crossing (Figure 3).



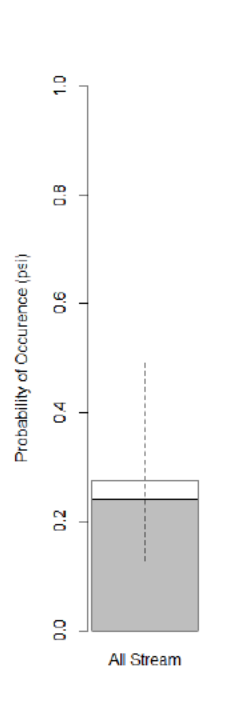


Figure 2. Freshwater mussel estimated occupancy (ψ) from 29 small stream crossings evaluated with the eDNA survey in June 2022. Error bars represent 95% confidence intervals. The naïve occupancy is indicated by shading.

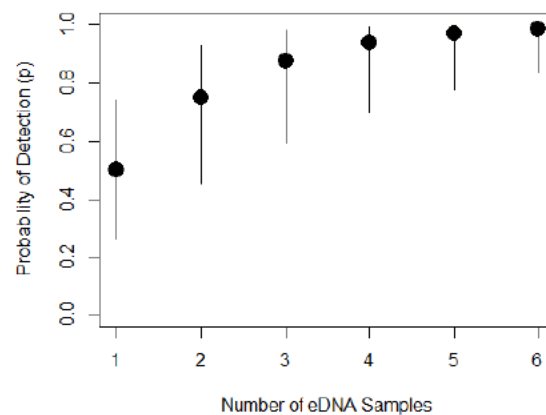


Figure 3. Estimated detection probability (p) of freshwater mussel eDNA from 29 small stream crossings evaluated with the eDNA survey in June 2022. Error bars represent 95% confidence intervals.



3.1.2 Species Identified with eDNA

No single Small Stream crossing site was found to have greater than two species detected (Table 3). Six of the eDNA sequences matched with greater than (>) 97% similarity to a known species within the curated genetic database, and thus were identified to the species-level (Marshall et al. 2022). *Cambarunio iris* (rainbow mussel) was detected at three sites; three species were detected at two sites, *Utterbackia imbecillis* (Paper Pondshell), *Toxolasma parvum* (lilliput), and *Pyganodon grandis* (giant floater); and two species were detected at a single site, *Actinonaias ligamentina* (mucket) and *Lampsilis fasciola* (wavy-rayed lampmussel).

Table 3. Freshwater mussel species detected with eDNA from seven Small Stream crossings during the June 2022 survey.

Species	Site 11a	Site 11	Site 45	Site 89	Site 146	Site 165	Site 193
	Goose Creek	Little Goose Creek	Salt Lick Creek	Spring Creek	White Creek	Emory River	Kings Creek
<i>Actinonaias ligamentina</i>				X			
<i>Cambarunio iris</i>				X	X	X	
<i>Lampsilis fasciola</i>					X		
<i>Lampsilis</i> sp. (<i>L. virescens</i>)*						X	
<i>Pyganodon grandis</i>			X				X
<i>Toxolasma parvum</i>	X						X
<i>Utterbackia imbecillis</i>	X	X					
* <i>Lampsilis</i> sp. was classified to the genus-level, but has a high probability of originating from <i>L. virescens</i>							

At Site 165 – Emory River, a DNA sequence was detected with the closest genetic match to several *Lampsilis* species with less than (<) 95 % similarity and thus it was unable to be definitively identified to the species-level (Table 3; Appendix A). However, based on the close similarity to *Lampsilis*, it was able to be classified to the genus-level. Based on known species within this genus in the Emory River, this sequence was ultimately identified as a probable *L. virescens* (Alabama lampmussel).

3.2 VISUAL AND TACTILE SURVEYS

Stantec biologists conducted Visual and Tactile Surveys of four Small Streams and three Embayments from October 5 – 12, 2022 (Appendix A, Appendix E).

3.2.1 Survey Site Conditions

At the four Small Stream sites water temperature ranged from 11.9 °C to 17.1 °C while the water temperature at the three Embayments was higher, ranging from 16.6 °C to 21.2 °C (Table 4). The measured pH followed a similar pattern with the four Small Streams ranging from 7.03 to 8 and the three Embayments ranging from 7.75 to 8.55 (Table 4). Dissolved oxygen was similar across all seven sites; however, the four Small Streams measured slightly lower, ranging from 8.73 mg/L to 10.3 mg/L and the three Embayments



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ranging from 8.23 mg/L to 10.51 mg/L (Table 4). Conductivity followed an inverse pattern with the three Embayments generally having a lower conductivity, 130 μ S/mL to 182 μ S/mL, than the four Small Streams, 96 μ S/mL to 630 μ S/mL (Table 4).

Table 4. Observed water quality during 2022 Visual and Tactile Surveys.

Category	Site		Date	Water Temp (°C)	Conductivity (μ S/mL)	DO Saturation	DO (mg/L)	pH
Small Stream	Site 11a	Big Goose Creek	10/12/2022	17.1	266	101.2	10.3	7.91
	Site 45	Salt Lick Creek	10/7/2022	18.48	436	100	9.36	8
	Site 146	White Creek	10/5/2022	12.01	630	87.5	9.43	7.27
	Site 165	Emory River	10/6/2022	11.9	96	80.9	8.73	7.03
Embayment	Site 5	Cumberland River (Old Hickory Lake 1)	10/10/2022	16.6	182	107.8	10.51	8.55
	Site 48	Cumberland River (Salt Lick Creek)	10/13/2022	17.4	170	112.63	10.8	8.19
	Site 188	Watts Bar Lake	10/5/2022	21.2	130	92.65	8.23	7.75

3.2.2 Substrate

The sites sampled were overall of low to moderate quality with dominant bed materials often being comprised of the fine, unstable particle sizes (sand, silt, clay) or bedrock (Table 5). At the Small Stream sites stable gravel-cobble bars or boulders surrounded by aggregated materials provided the best available habitat for mussels that reside in smaller waterbodies (Table 5; Appendix A).



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Table 5. Percent range estimates of substrate surface composition across all sampling cells at each site during Visual and Tactile Surveys.

Category	Small Stream				Embayment		
	Site 11a	Site 45	Site 146	Site 165	Site 5	Site 48	Site 188
Site	Big Goose Creek	Salt Lick Creek	White Creek	Emory River	Cumberland River (Old Hickory Lake 1)	Cumberland River (Salt Lick Creek)	Watts Bar Lake
Boulder	0	5-20	0-10	0	0	5-15	0
Cobble	10	5-40	5-10	5	10	0-5	5
Gravel	10-60	5-10	0-10	5-20	20-100	2.5-5	15-20
Sand	30-60	0-10	10-20	30	30	2.5-7.5	15-60
Silt and Clay	10-60	0-10	0-5	10-100	0-90	0-2.5	15-100
Bedrock	0	20-75	60-70	0	0	70-90	0
Woody	10	0	0	5	10-30	0	20
Detritus	0	0	0	5-10	60	0-5	0

3.2.3 Small Stream Crossings

Surveyors were able to clearly view the substrate from the water surface at the four Small Stream sites utilizing a mask and snorkel. Four of the seven Small Stream crossings where eDNA sampling detected freshwater mussel genetic material were surveyed with a Visual and Tactile Survey in 2022 (Appendix A), as follows:

- Site 11a – Big Goose Creek;
- Site 45 – Salt Lick Creek;
- Site 146 – White Creek; and
- Site 165 – Emory River.

Live mussels were identified at Site 146 – White Creek and Site 165 – Emory River (Table 6; Appendix A). Both sites had live specimens of *C. iris*. Site 146 – White Creek additionally had one individual of *L. fasciola* (Table 6; Appendix A, Appendix E). Although eDNA detected a *Lampsilis* sp. at Site 165 – Emory River, no *Lampsilis* was found during the Visual and Tactile Survey. Mussel density was low, with both sites only recovering three mussels, a 0.33 catch per unit effort (CPUE).

No live mussels were identified at Site 11a – Big Goose Creek and Site 45 – Salt Lick Creek. One single valve, sub-fossil *Amblema plicata* (threeridge) was recovered at Site 45 – Salt Lick Creek (Table 6; Appendix A).



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Table 6. Mussel abundance collected from the four Small Streams and three Embayments surveyed during the October 2022 Visual and Tactile Surveys.

Species	Small Stream				Embayment		
	Site 11a	Site 45	Site 146	Site 165	Site 5	Site 48	Site 188
	Big Goose Creek	Salt Lick Creek	White Creek	Emory River	Cumberland River Embayment	Cumberland River Embayment	Watts Bar Lake
<i>Amblema plicata</i>		SF					
<i>Anodonta suborbiculata</i>					12	19	11
<i>Cambarunio iris</i>			2	3			
<i>Cyclonaias pustulosa</i>							1
<i>Lampsilis fasciola</i>			1				
<i>Leptodea fragilis</i>						WD	FD
<i>Obliquaria reflexa</i>							2
<i>Potamilus alatus</i>							4
<i>Potamilus ohioensis</i>					FD	1	1
<i>Pyganodon grandis</i>						WD	8
<i>Toxolasma parvum</i>							FD
<i>Utterbackia imbecillis</i>					1		

*FD = Fresh Dead, WD = Weathered Dead, SF = Sub-Fossil.

3.2.4 Large River Embayments

Three large river embayments were surveyed with a Visual and Tactile Survey in 2022. Water visibility at the three embayment survey areas ranged from 8 to 12 inches.

The wetted width of Site 5 – Cumberland River Embayment (Old Hickory Lake 1) was approximately 500 meters and a total of 12 sample locations were surveyed twice for a total survey time of approximately 1,080 minutes (Table 7; Appendix A). Site 48 – Cumberland River Embayment (Salt Lick Creek) had a wetted width of approximately 110 meters and Site 188 – Watts Bar Lake Embayment (Elverton Branch) had a wetted width of approximately 150 meters (Table 7). Each site was divided into 8 sample locations that were surveyed twice for a total survey time of approximately 720 minutes (Table 7).



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Table 7. Large River Embayment crossing widths, sample locations, timed searches, and search times.

Site	Site Name	Approximate Width (meters)	Sample Locations (count)	Timed Searches (count)	Search Time (minutes)
5	Cumberland River Embayment	500	12	24	1080
48	Cumberland River Embayment	110	8	16	720
188	Watts Bar Lake	150	8	16	720

Higher mussel densities were identified at the embayment crossings than the small stream crossings, ranging from 13-27 individuals identified (Table 6). Both Site 5 – Cumberland River Embayment (Old Hickory Lake 1) and Site 48 – Cumberland River Embayment (Salt Lick Creek) had a species richness of two. The two species recovered at Site 5 – Cumberland River Embayment (Old Hickory Lake 1) were *Anodonta suborbiculata* (flat floater) and *U. imbecillis* (Table 6; Appendix A, Appendix E). While the species recovered at Site 48 – Cumberland River Embayment (Salt Lick Creek) consisted of *A. suborbiculata* and *Potamilus ohioensis* (pink papershell) (Table 6; Appendix A, Appendix E). The survey of Site 188 – Watts Bar Lake (Elverton Branch) displayed a species richness of six (Table 6; Appendix A). The recovered species consisted of *A. suborbiculata*, *Obliquaria reflexa* (threehorn wartyback), *Potamilus alatus* (pink heelsplitter), *P. ohioensis*, *P. grandis*, and *Cyclonaias pustulosa* (pimpleback) (Table 6; Appendix E). *A. suborbiculata* was the dominant species at all three Embayment crossings, ranging from 41% to 95% of the mussels captured (Table 6; Appendix E).

3.2.5 Mussel Lengths

Of the 66 live mussels collected from 9 species, *A. suborbiculata* was the most abundant species recovered (Table 8). A variety of size classes was observed for *A. suborbiculata*, including the smallest and largest species, 33 mm and 205 mm, respectively (Table 8; Figure 4). Ten individuals less than 50 mm were observed across five species, as follows (Table 8; Figure 4):

- *A. suborbiculata*,
- *C. iris*,
- *O. reflexa*,
- *P. ohioensis*, and
- *C. pustulosa*.

The median length of mussels collected ranged from 39 mm for *O. reflexa* to 134.3 mm for *P. alatus* (Table 8; Figure 4).

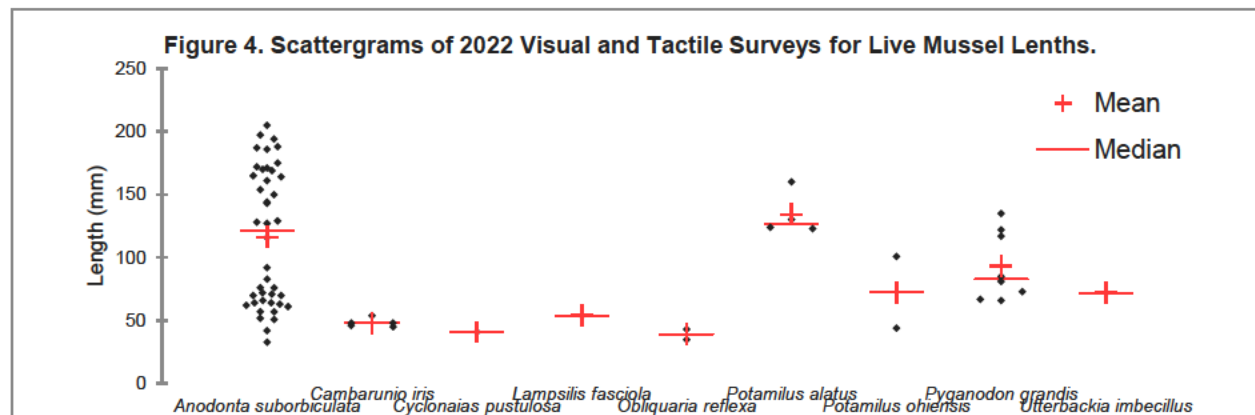


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Table 8. Summary of 2022 Visual and Tactile Surveys Live Mussel Lengths.

Species	Number of Captured Mussels	Minimum Length (mm)	Maximum Length (mm)	Median Length (mm)	Mean Length [SD] (mm)
<i>Anodonta suborbiculata</i>	42	33	205	121.5	116.1 [54.03]
<i>Cambarunio iris</i>	5	45	54	48	48.2 [3.49]
<i>Cyclonaias pustulosa</i>	1	41	41	41	41
<i>Lampsilis fasciola</i>	1	54	54	54	54
<i>Obliquaria reflexa</i>	2	35	43	39	39 [5.66]
<i>Potamilus alatus</i>	4	123	160	127	134.3 [17.44]
<i>Potamilus ohioensis</i>	2	44	101	73	72.5 [40.31]
<i>Pyganodon grandis</i>	8	66	135	83	93.25 [27.24]
<i>Utterbackia imbecillis</i>	1	72	72	72	72



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During the 2022 sampling events, four of the seven Small Stream crossings with a positive eDNA detection were further surveyed with Visual and Tactile Surveys. Of these four crossings, only two yielded live mussels, Site 146 – White Creek and Site 165 – Emory River (Table 6; Appendix A). At Site 146 – White Creek, three total mussels were found comprising two species, *C. iris* and *L. fasciola*, both of which were detected with the eDNA survey at this same crossing (Table 3, Table 6; Appendix A, Appendix E). At Site 165 – Emory River, three individuals from a single species, *C. iris*, were found during the Visual and Tactile Survey, a species also detected during the eDNA survey at this same crossing (Table 3, Table 6; Appendix A, Appendix E).

The Visual and Tactile Surveys found very low mussel abundance ($n=3$) and CPUE (0 to 0.33 mussels per hour of search) at the Small Stream crossings with positive eDNA detections, indicating the eDNA survey was capable of successfully detecting mussels at very low densities. In addition, occupancy modeling



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analysis estimated an 87.5% probability of successful detection if a mussel was present at a crossing. This estimated probability of detection despite low mussel density is likely related to multiple components of the sampling methods, including the collection of triplicate water samples per stream crossing, the collection of water across transects spanning the width of the stream, and the shallow nature of these Small Streams. All of these factors likely reduced the heterogeneity of patchily distributed eDNA within a stream, thus allowing for high likelihood of successful collection of eDNA if present at a sampling location.

Positive eDNA detections occurred at two of the Small Streams, Site 11a – Big Goose Creek and Site 45 – Salt Lick Creek, but no mussels were found during the Visual and Tactile Surveys at these locations. Desktop review of aerial photographs near Site 45 – Salt Lick Creek identified a small pool just upstream of the crossing, outside of the buffer zone, which may have provided pool-habitat for some mussel species (Appendix A). At this crossing, the eDNA survey at this crossing detected *P. grandis*, a species likely to inhabit such a pool (Table 3, Appendix A, Appendix E). Furthermore, the only positive detection occurred in the 30-meter upstream sample location (Table 2). Detection may represent an eDNA signal originating within this upstream pool and subsequently flowing into the sampling region.

Site 11a – Big Goose Creek and Site 11 – Little Goose Creek are adjacent backwater channels off the Cumberland River and provided the deepest Small Stream crossing sites (Appendix A). Although eDNA was detected for two backwater species, *U. imbecillis* and *T. parvum*, the Visual and Tactile Survey of Site 11 – Goose Creek did not yield any live mussels (Table 3). Detection may represent an eDNA signal originating within the Cumberland River or a site upstream of the survey areas and subsequently flowing through the sampling region.

The eDNA survey additionally provided a possible detection of *L. virescens*, a federally endangered mussel, at Site 165 – Emory River (Table 2, Table 3; Appendix A, Appendix E). This species does not currently have a genetic voucher for the eDNA assay used in this study and thus it cannot be definitively identified in the current dataset. Analysis comparing genetic similarities between *L. virescens* with other *Lampsilis* across a separate gene region (cytochrome oxidase I; data from Stodola et al. 2021) displays a similar relationship pattern as that from the eDNA sequence found at this stream crossing. Additionally, *L. virescens* is the only *Lampsilis* species found in the Emory River drainage that is lacking a reference genetic voucher within the curated database, further suggesting the identity of this eDNA sequence. Furthermore, a 2011 survey discovered a population of *L. virescens* within the Emory River in Morgan County, Tennessee, upstream of this crossing (Moyer et al. 2012). Due to the known population within the Emory River and close genetic similarity of the unknown sequence, it is probable this a probable detection of *L. virescens*; however, this cannot be definitively concluded until a reference genetic sequence is obtained.

The Visual and Tactile Survey at Site 165 – Emory River did not find any *L. virescens* individuals. The positive eDNA detections for *L. virescens* occurred in the two most upstream sample locations at this Small Stream crossing (Table 2). Within flowing systems, eDNA may be transported with the hydrological dynamics of the stream or river. In some instances, the transport distance of eDNA has been estimated to exceed three kilometers from the source (Deiner et al. 2014, Wood et al. 2021, Shea et al. 2022) even in small streams (Van Driessche et al. 2022). Considering potential eDNA transport distances and the spatial extent of the Visual and Tactile Surveys, limited to 50 meters upstream of the ROW crossing, positive



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detection of *L. virescens* may be an indication of a viable population further upstream of where the Visual and Tactile Survey occurred.

Overall, positive eDNA detections predominately occurred within the 30-meter upstream sampling locations, indicating that mussels are likely present upstream of the survey areas at the Small Stream crossings where Visual and Tactile Surveys were conducted in 2022 (Table 2). Therefore, even though mussels are likely present within some of the waterbodies that transect the Survey Corridor, based on the Visual and Tactile Surveys, they are not necessarily present within the Survey Corridor and may only be detected through eDNA due to the effects of stream transport. As such, the three-step approach has allowed Stantec to efficiently identify the waterbodies where mussels are likely present through eDNA and focus Visual and Tactile Survey efforts to confirm mussel presence or probable absence within the Survey Corridor and further evaluate species identity.

Within the 2022 Embayment Visual and Tactile Surveys, only Site 188 – Watts Bar Lake had more than two live species surveyed, six total species. The mussel community at all three Embayment sites was dominated by *A. suborbiculata*. The three Embayment sites all provided a higher mussel abundance than the surveyed Small Stream sites, a range of 13-27 individuals at the Embayment sites compared to 0-3 individuals at the Small Stream sites.

The majority of mussels recovered during the Visual and Tactile surveys were greater than 50 mm in size. The low number of smaller individuals is not likely an artifact of detectability, but rather due to the low amount of preferred mussel habitat within each site. The exception to this is *A. suborbiculata* within the Embayment sites, which prefers mucky backwater areas (Parmalee and Bogan, 1998). Nonetheless, ten individuals less than 50 mm were observed for five species. Mussels in this size class are an indication of recent recruitment for most species. These observations indicate recruitment of mussels to these areas is occurring in low numbers at the Project sites and also surveyors were able to detect the presence of small individuals when present.

5.0 NEXT STEPS

In 2023, eDNA surveys will be conducted at one large river crossing, Site 52 – Cumberland River, and one embayment, Site 188 – Watts Bar Lake Embayment (Elverton Branch), that were not sampled in 2022 (Appendix A). Visual and tactile surveys will also be conducted at Site 52 – Cumberland River (Appendix A). In addition, Visual and Tactile Surveys will be completed at the three Small Stream crossings that resulted in positive eDNA detections in 2022, but not surveyed in 2022; Site 11 – Little Goose Creek, Site 89 – Spring Creek, and Site 193 – Kings Creek (Table 2; Appendix A).

Analysis of eDNA data from the October 2022 sampling survey will be processed and evaluated for the presence of mussel eDNA in comparison to the Visual and Tactile Surveys that were completed concurrently. Additionally, eDNA was collected at Site 6 – Cumberland River Embayment (Old Hickory Lake 2) in October 2022 (Appendix A), and Visual and Tactile Surveys are tentatively scheduled to be conducted in 2023. The portion of this waterbody within the Survey Corridor is suspected to experience extended



2022 Freshwater Mussel Presence/Probable Absence Surveys Preliminary Findings

5.0 NEXT STEPS

periods of drying. The decision to conduct these surveys is under review pending additional monitoring of water levels, the results of the water sampling for eDNA analysis, and coordination with USFWS.



6.0 WORKS CITED

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2022 Freshwater Mussel Presence/Probable Absence Surveys Preliminary Findings
6.0 WORKS CITED

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APPENDICES

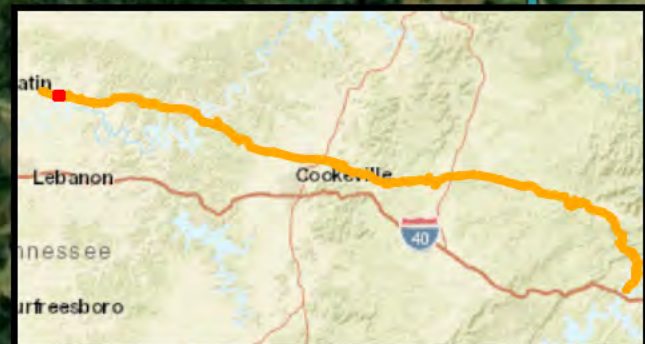
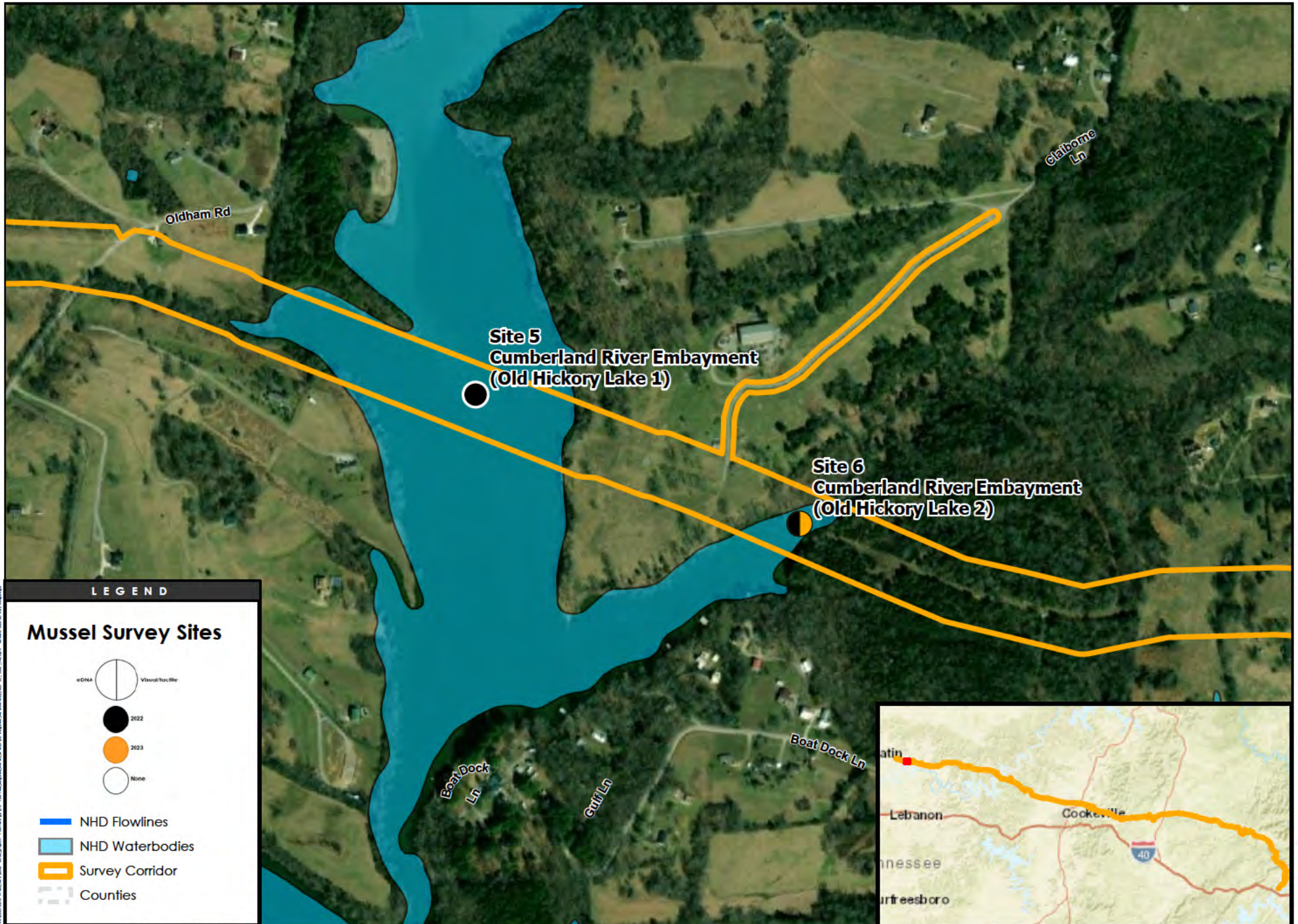
Appendix A. Freshwater Mussel Survey Crossing Locations and Evaluation Status
Appendix B. Proposed Study Plan
Appendix C. Agency Correspondence
Appendix D. Scientific Collection Permits
Appendix E. Photographic Log

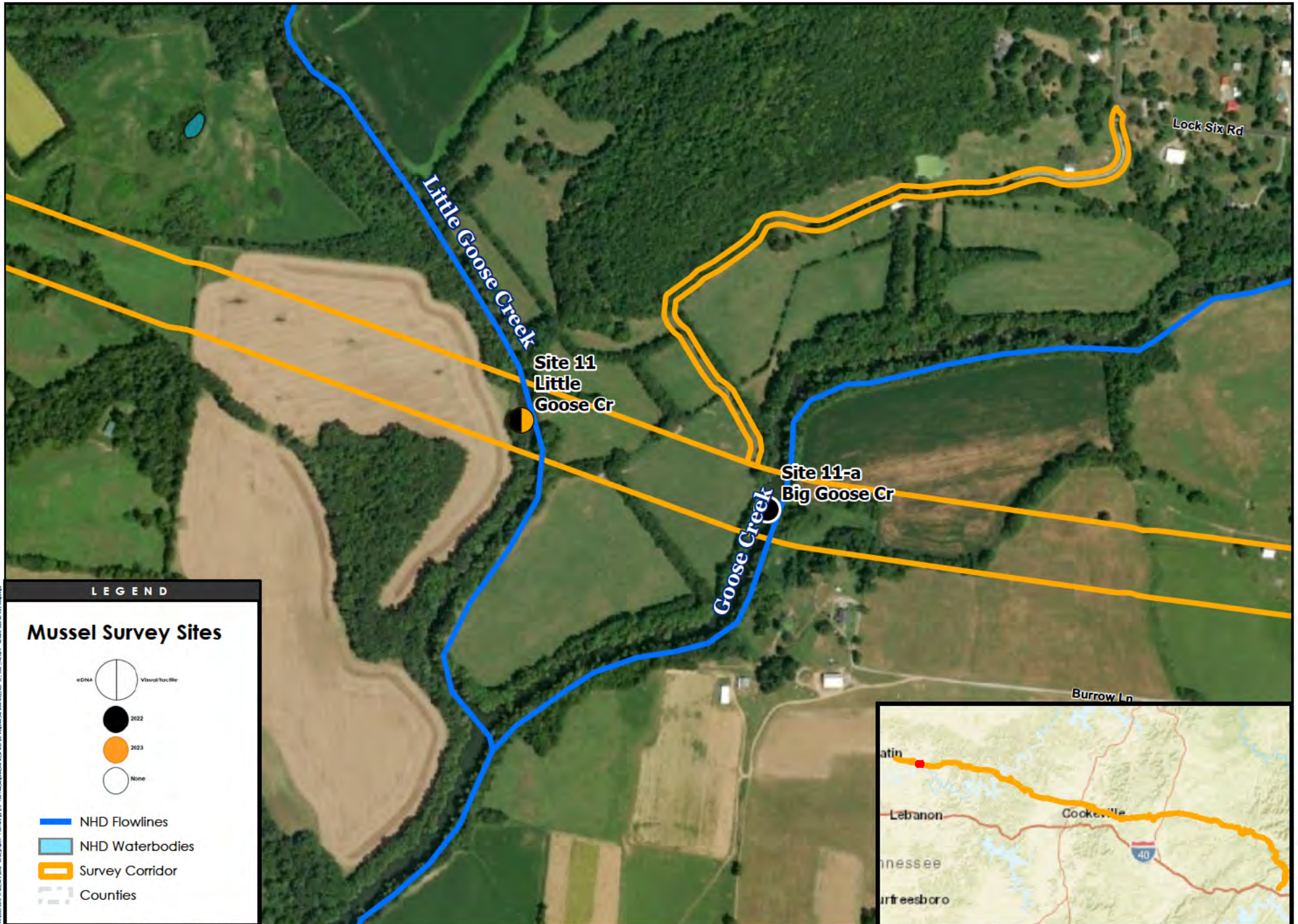


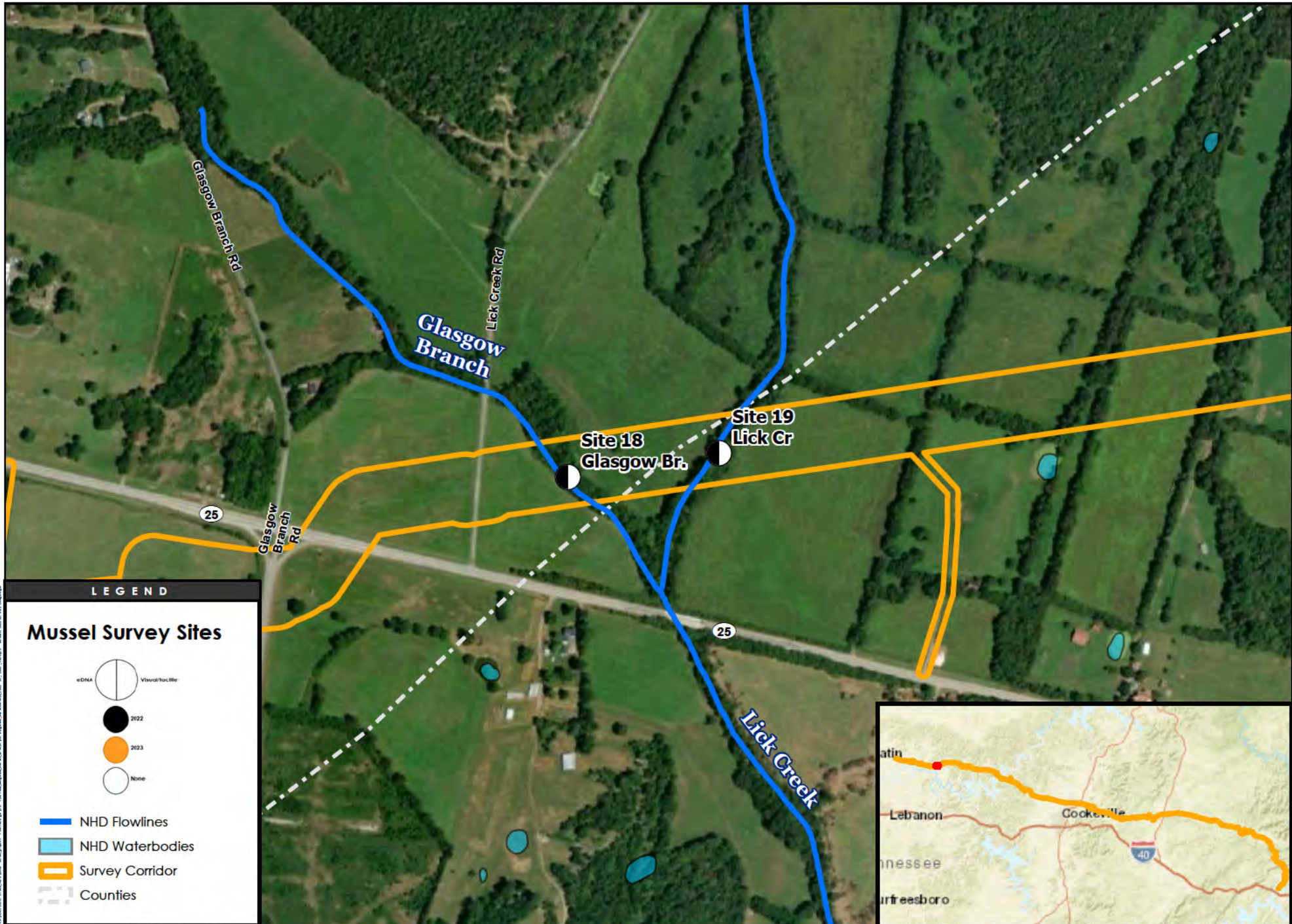
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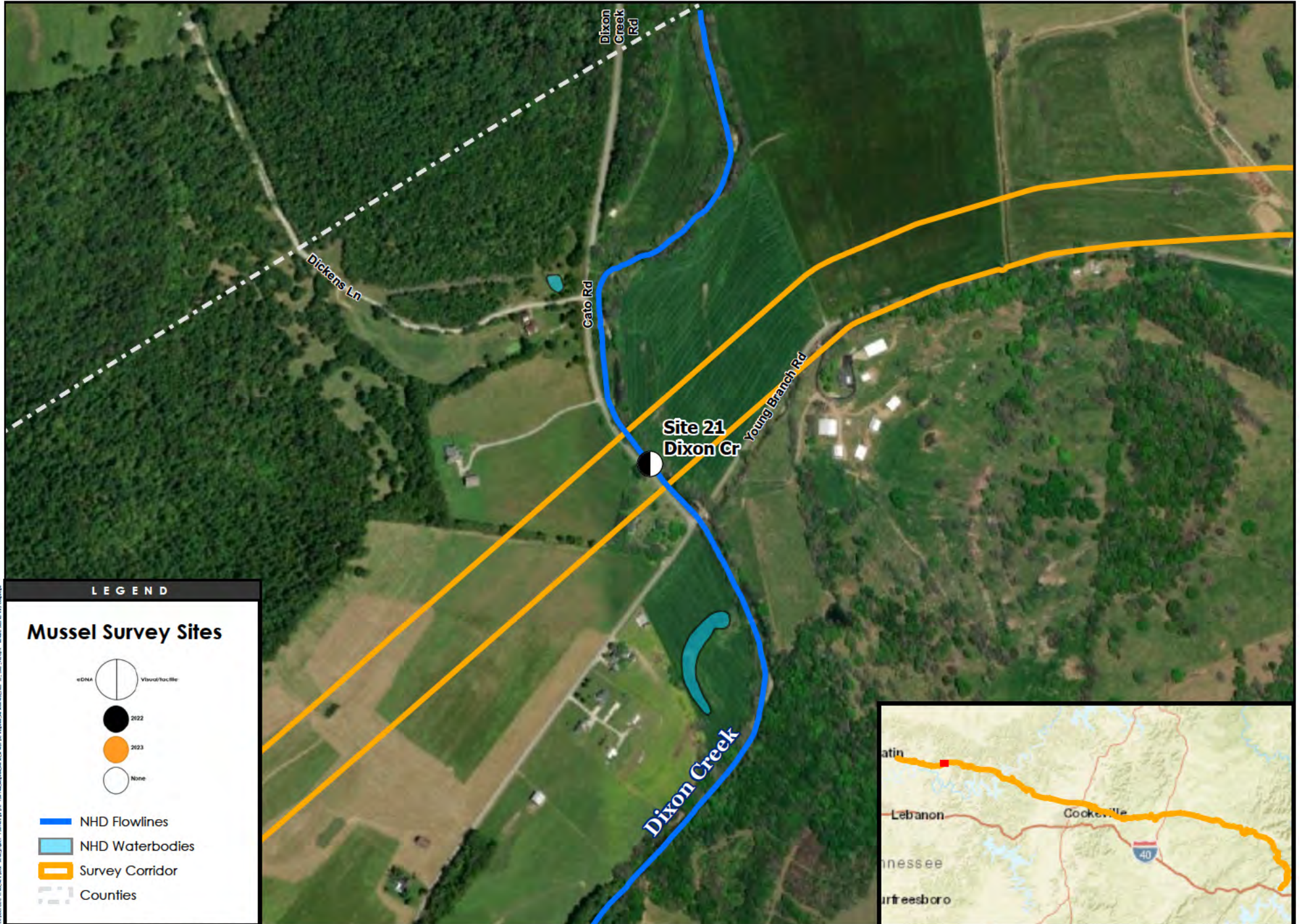
Freshwater Mussel Survey Crossing Locations and Evaluation Status











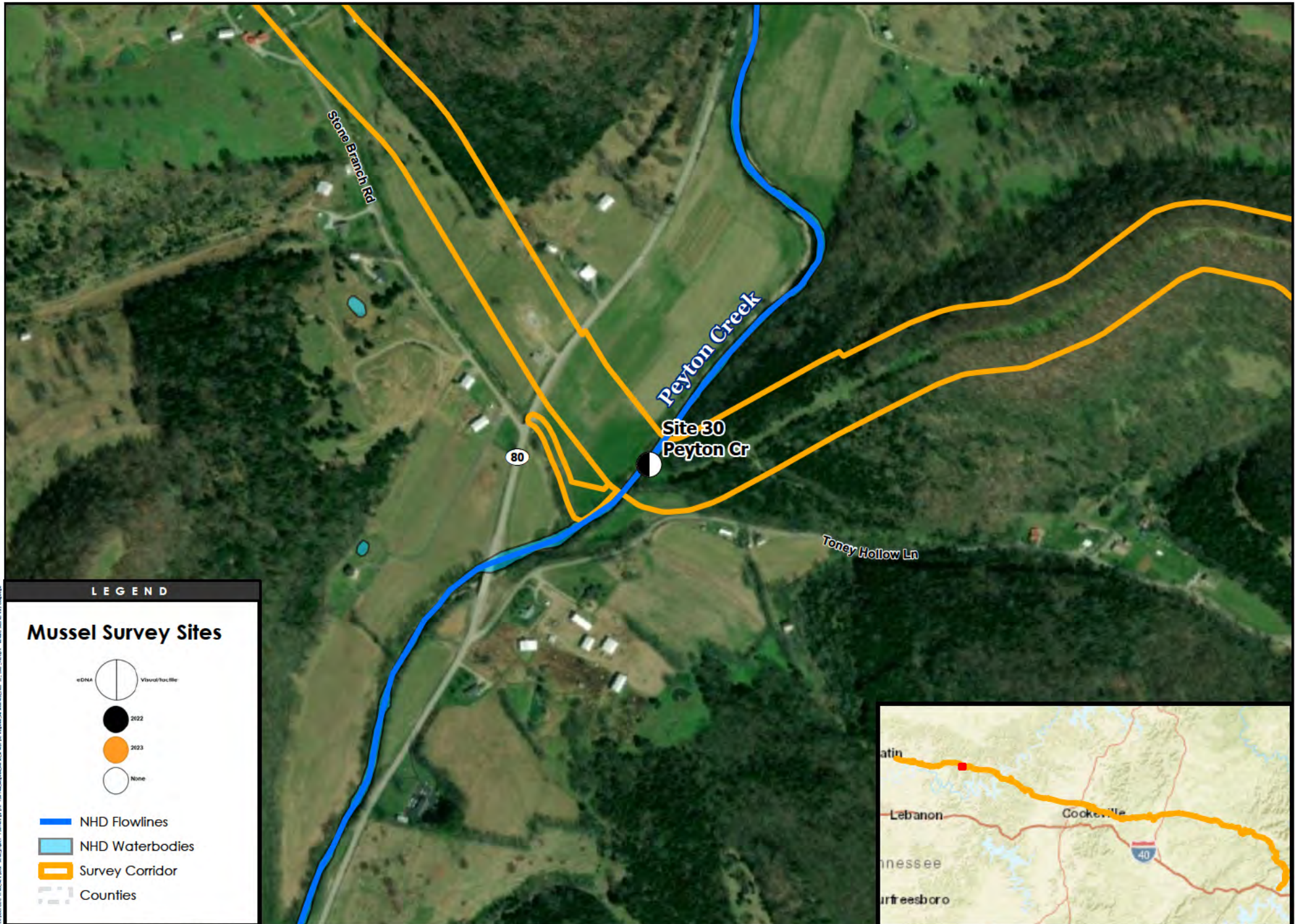
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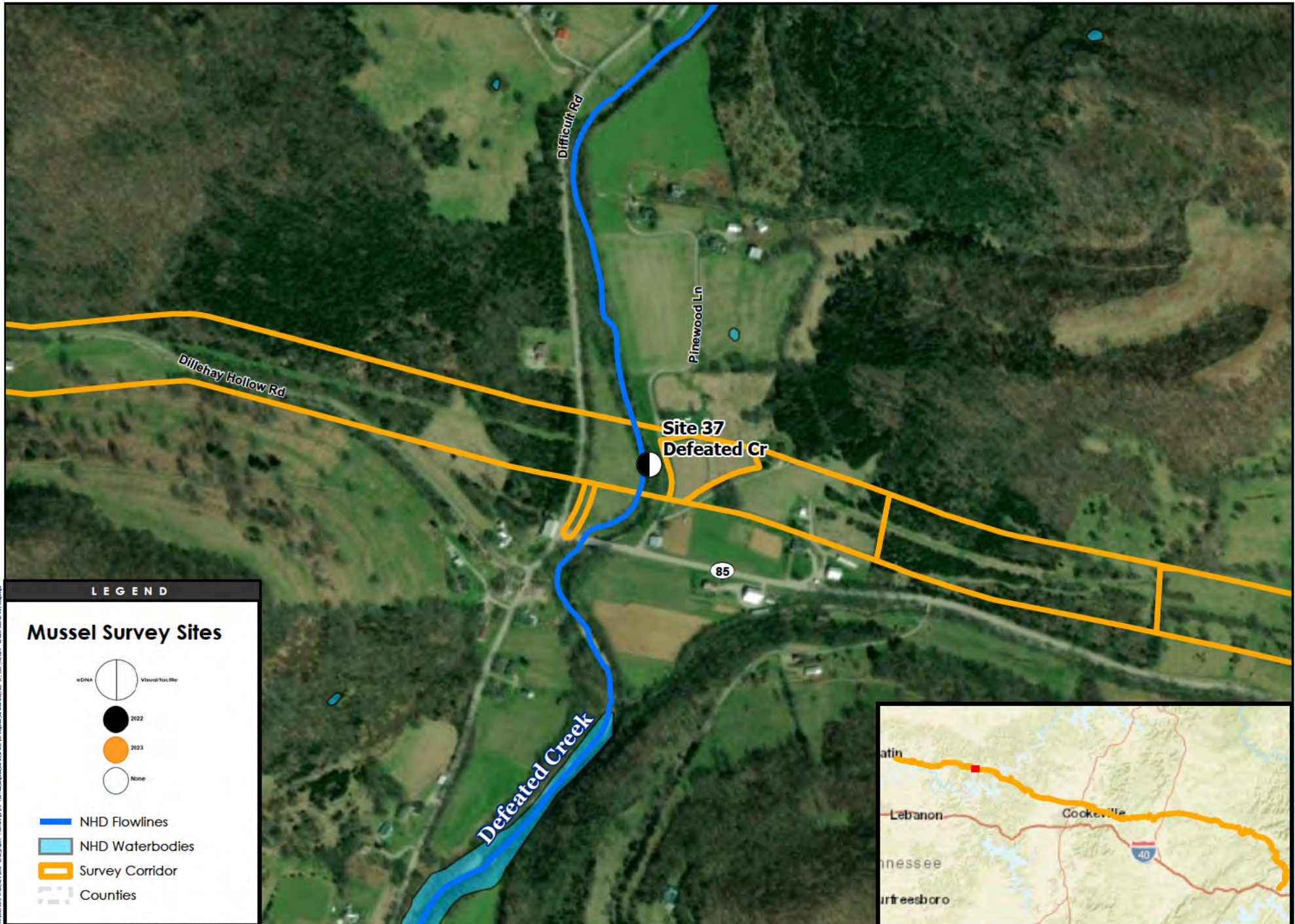
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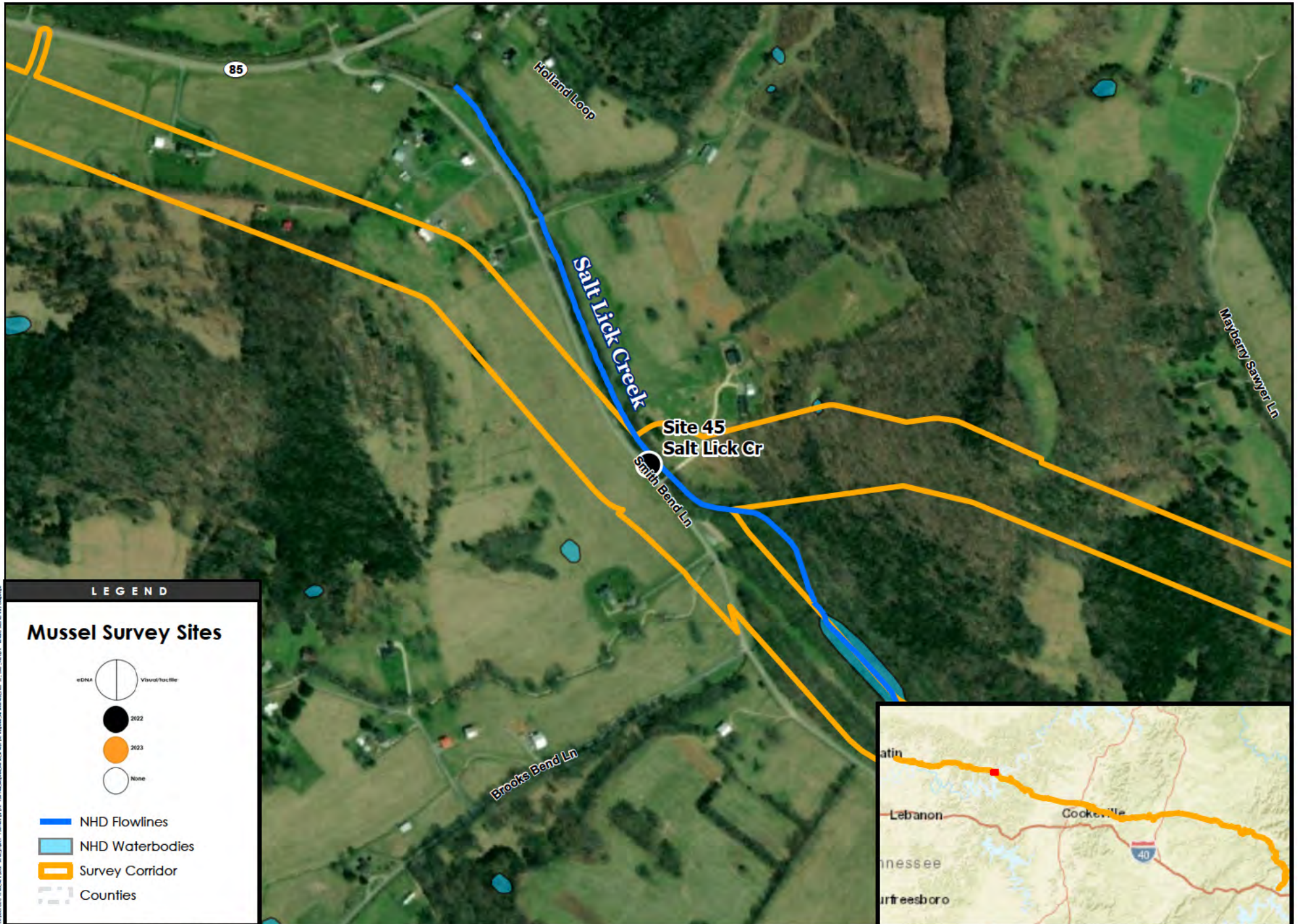
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- NHD Waterbodies
- Survey Corridor
- Counties







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LEGEND

Mussel Survey Sites

eDNA Visual/Noctile

2022

2023

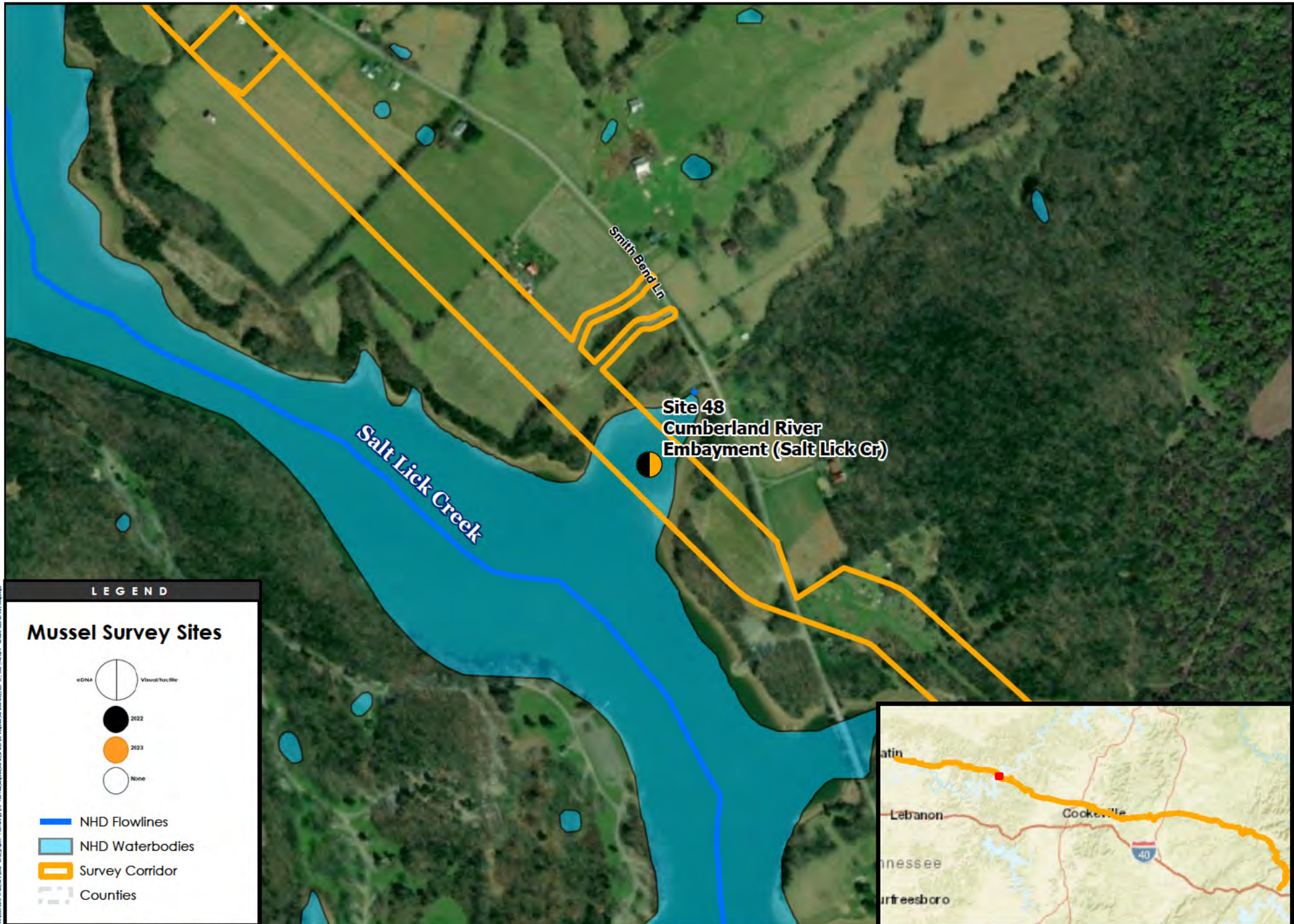
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NHD Waterbodies

Survey Corridor

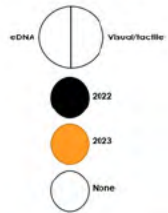
Counties





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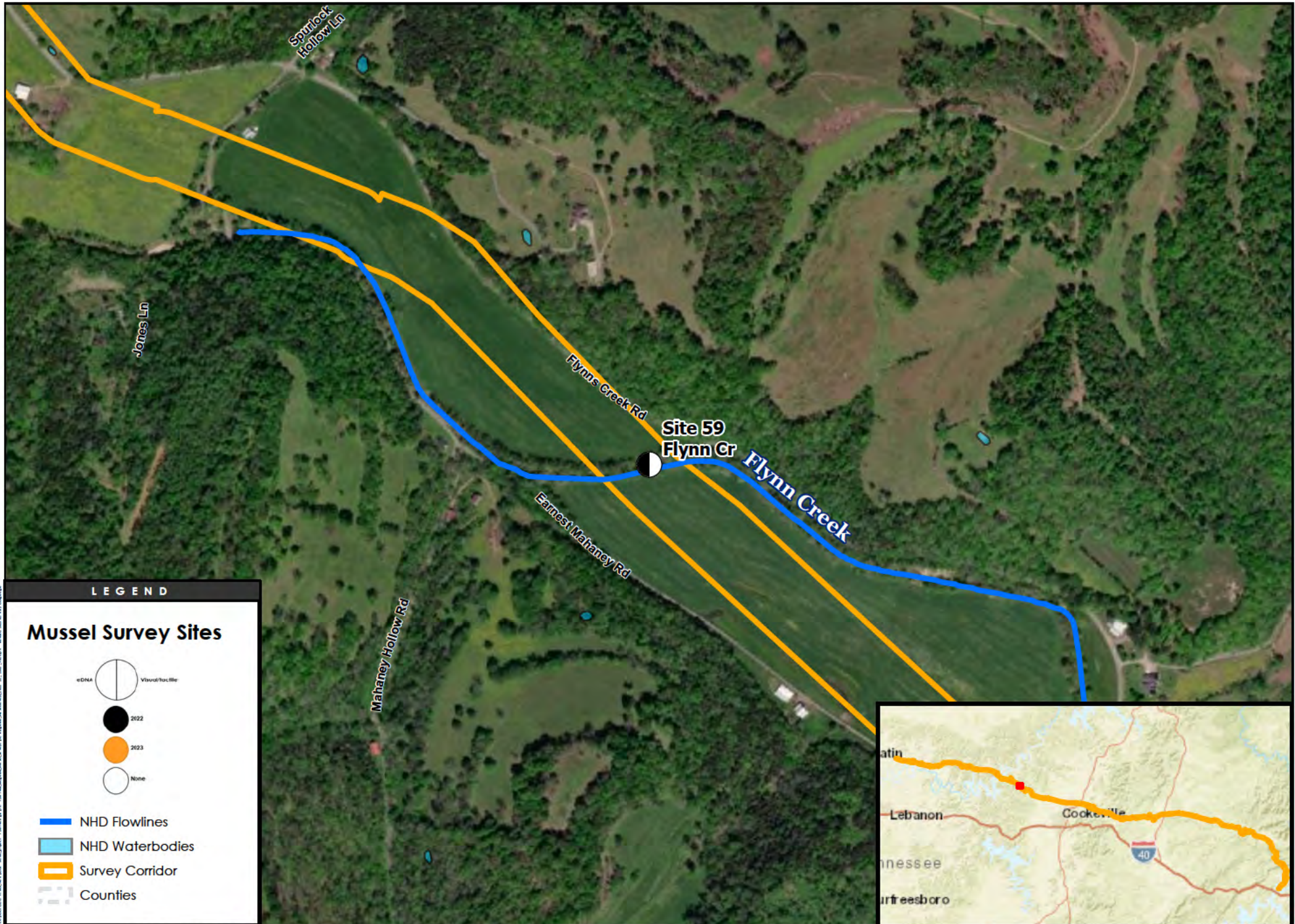
Mussel Survey Sites



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- Survey Corridor
- Counties



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LEGEND

Mussel Survey Sites

eDNA

Visual/locally

2022

2023

None

NHD Flowlines

NHD Waterbodies

Survey Corridor

Counties

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Ridgeline Expansion Project

Mussel Survey Map

February 2023

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Nashville TN 37211

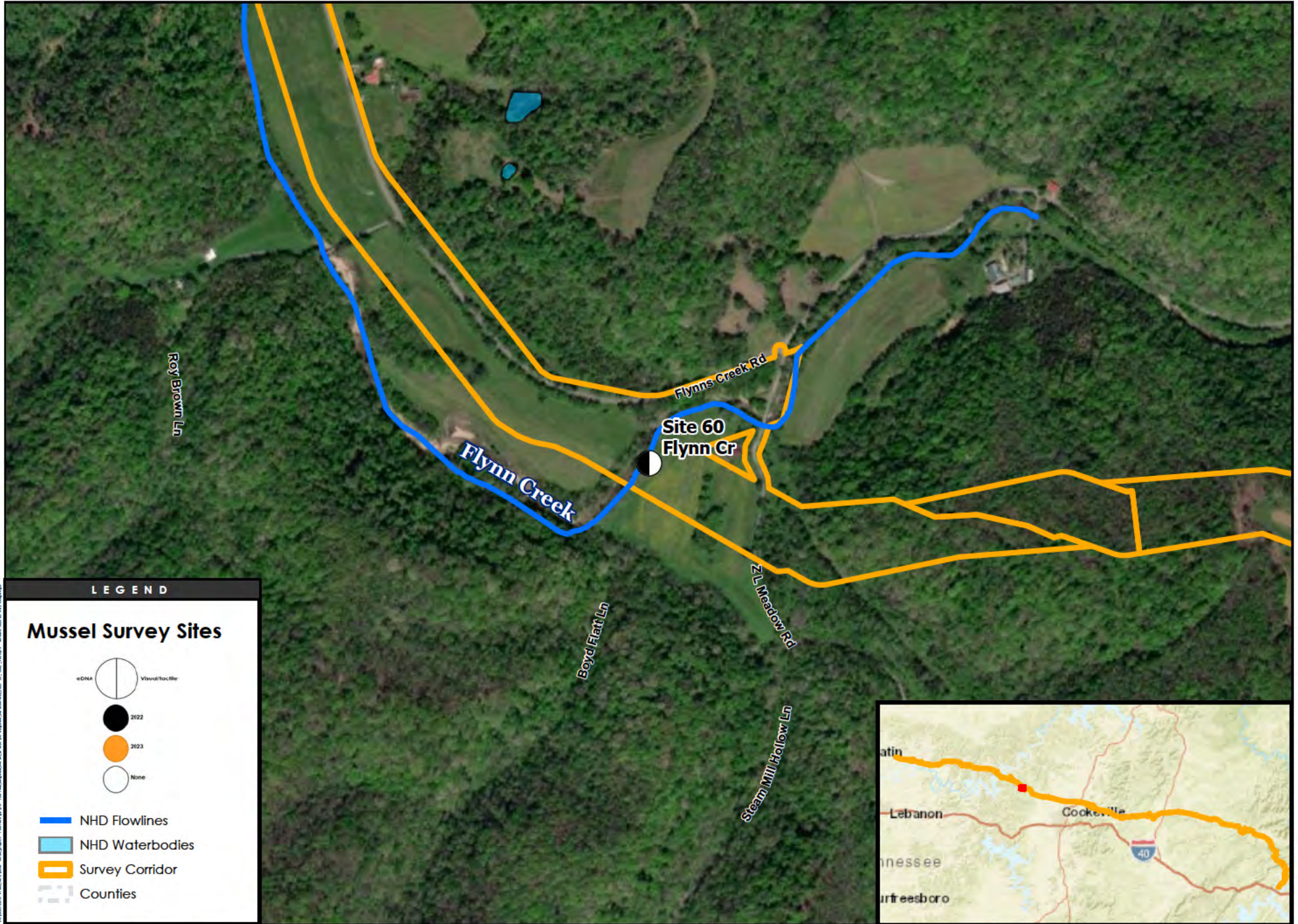
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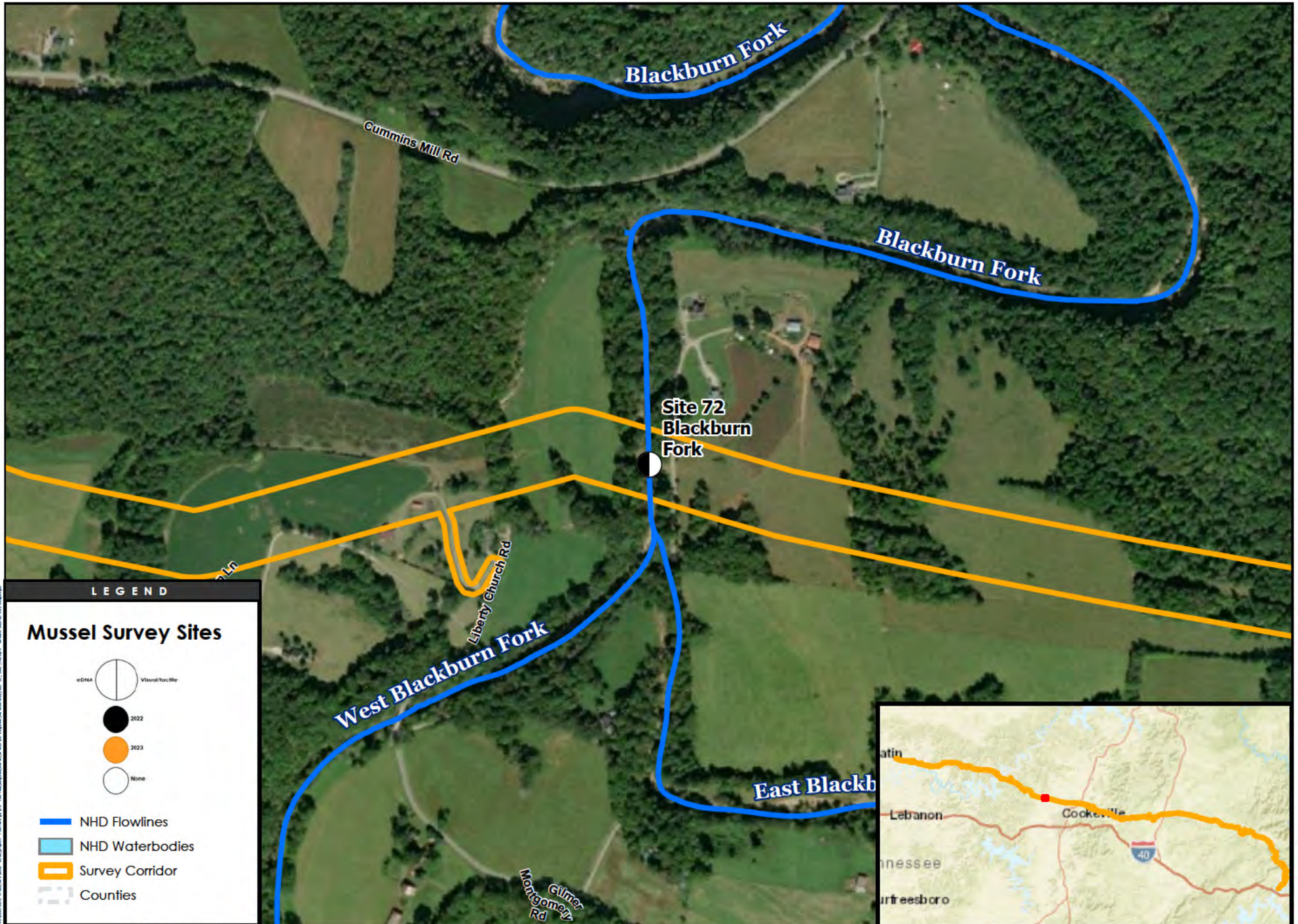
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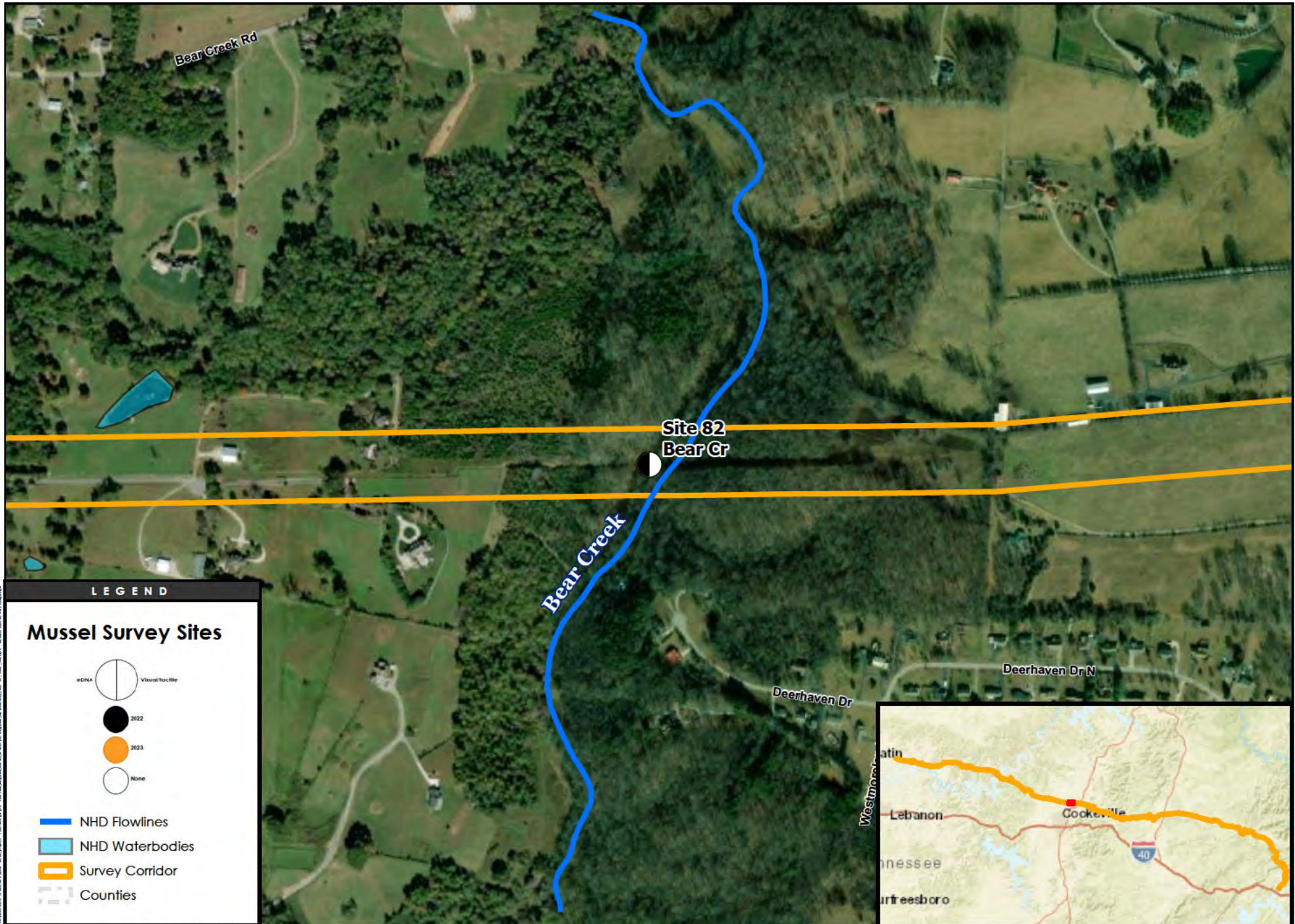


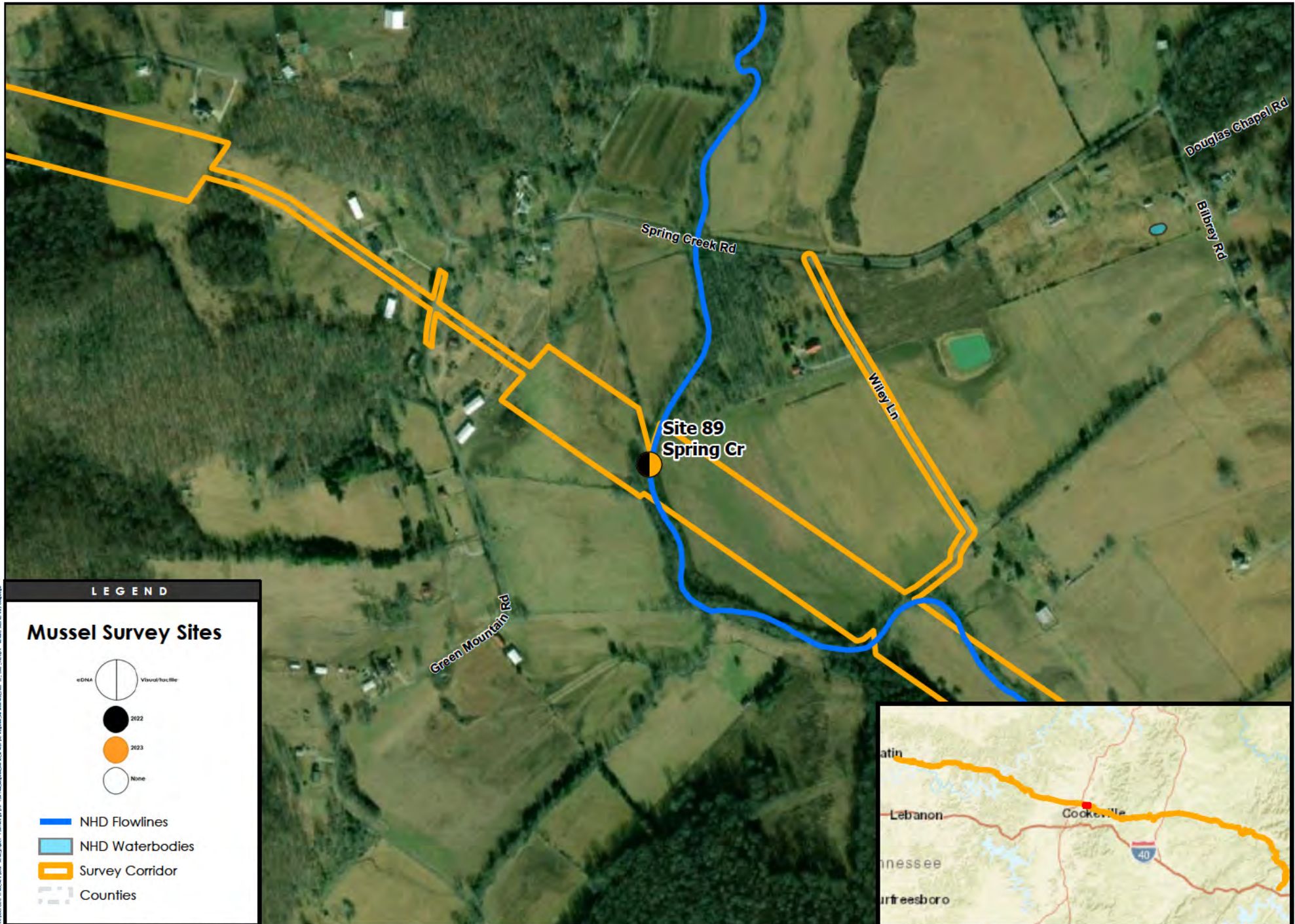


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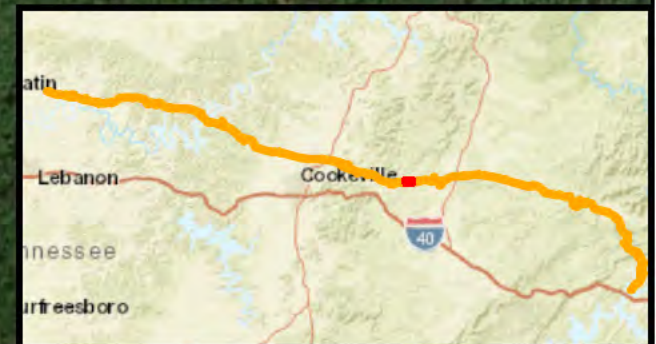
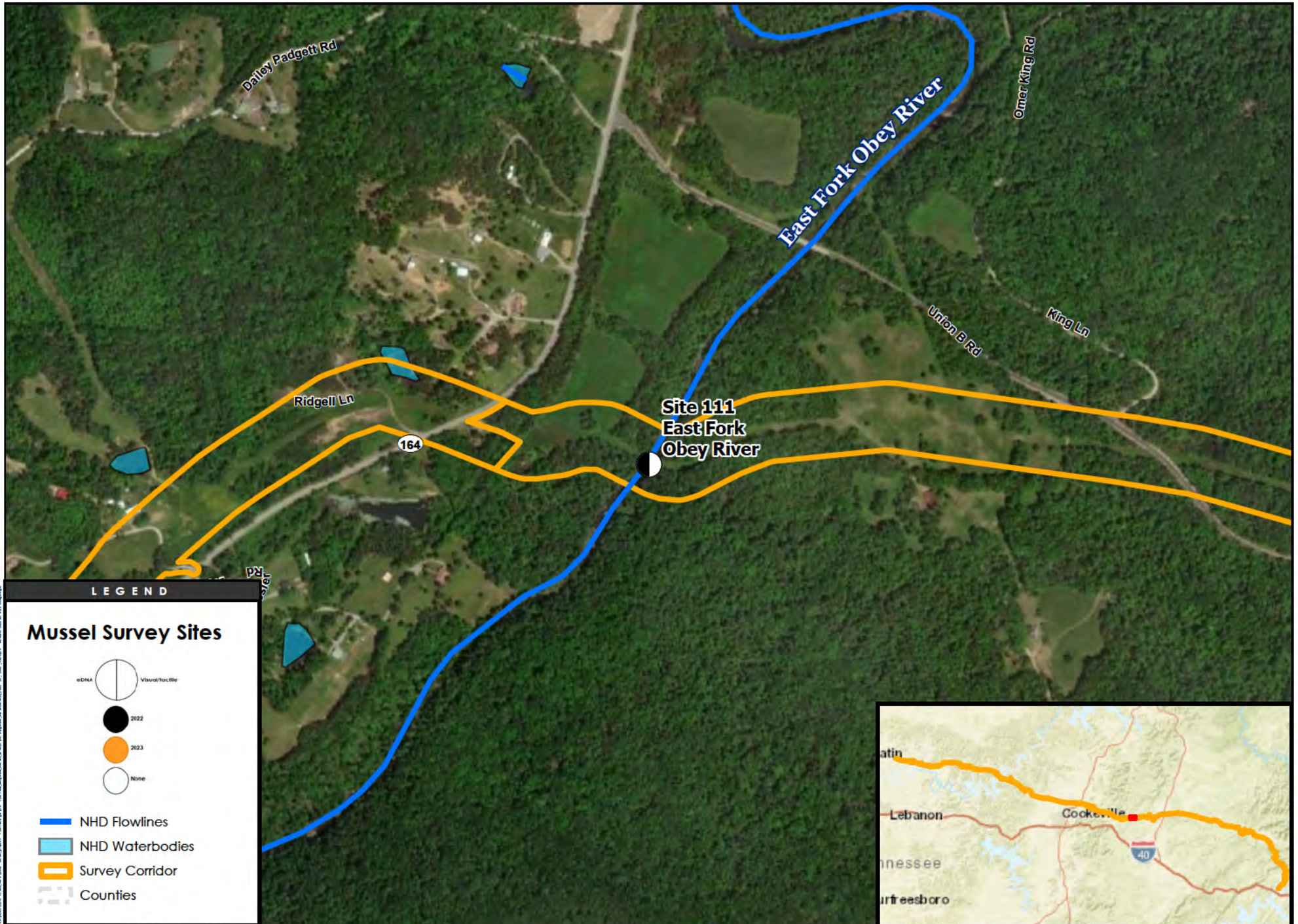


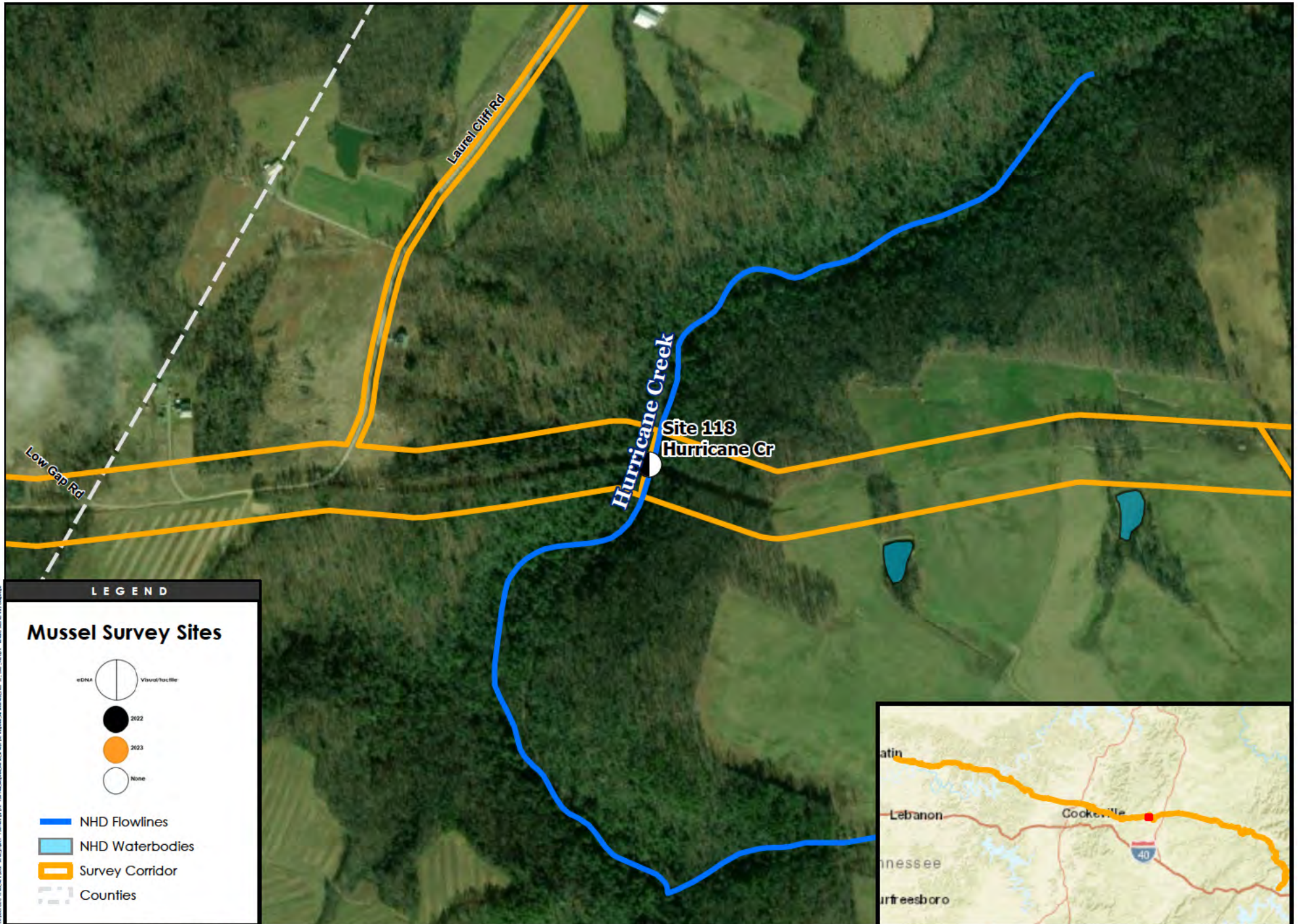
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Mussel Survey Sites



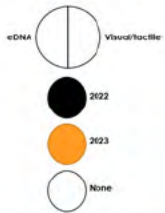
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- NHD Waterbodies
- Survey Corridor
- Counties





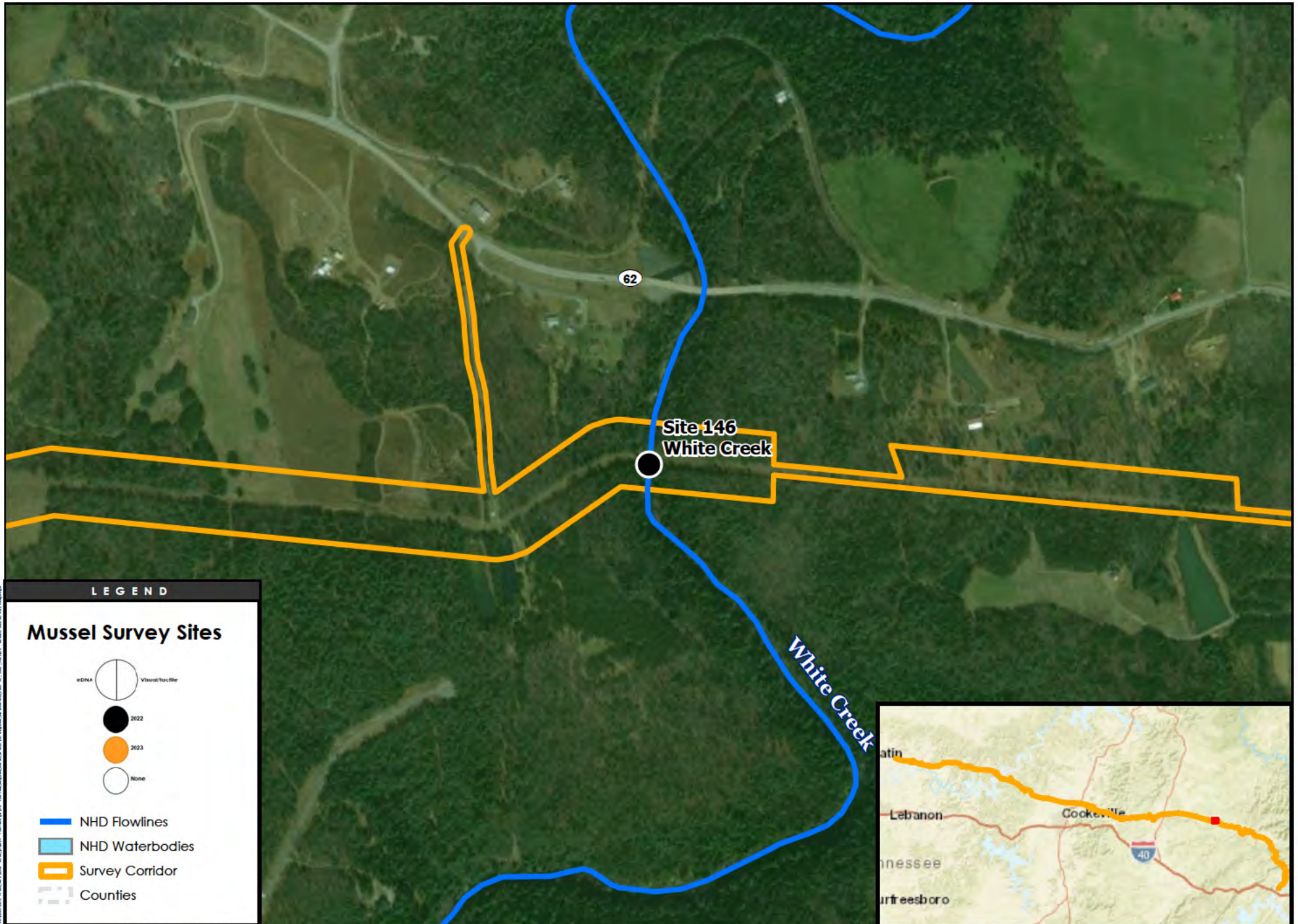
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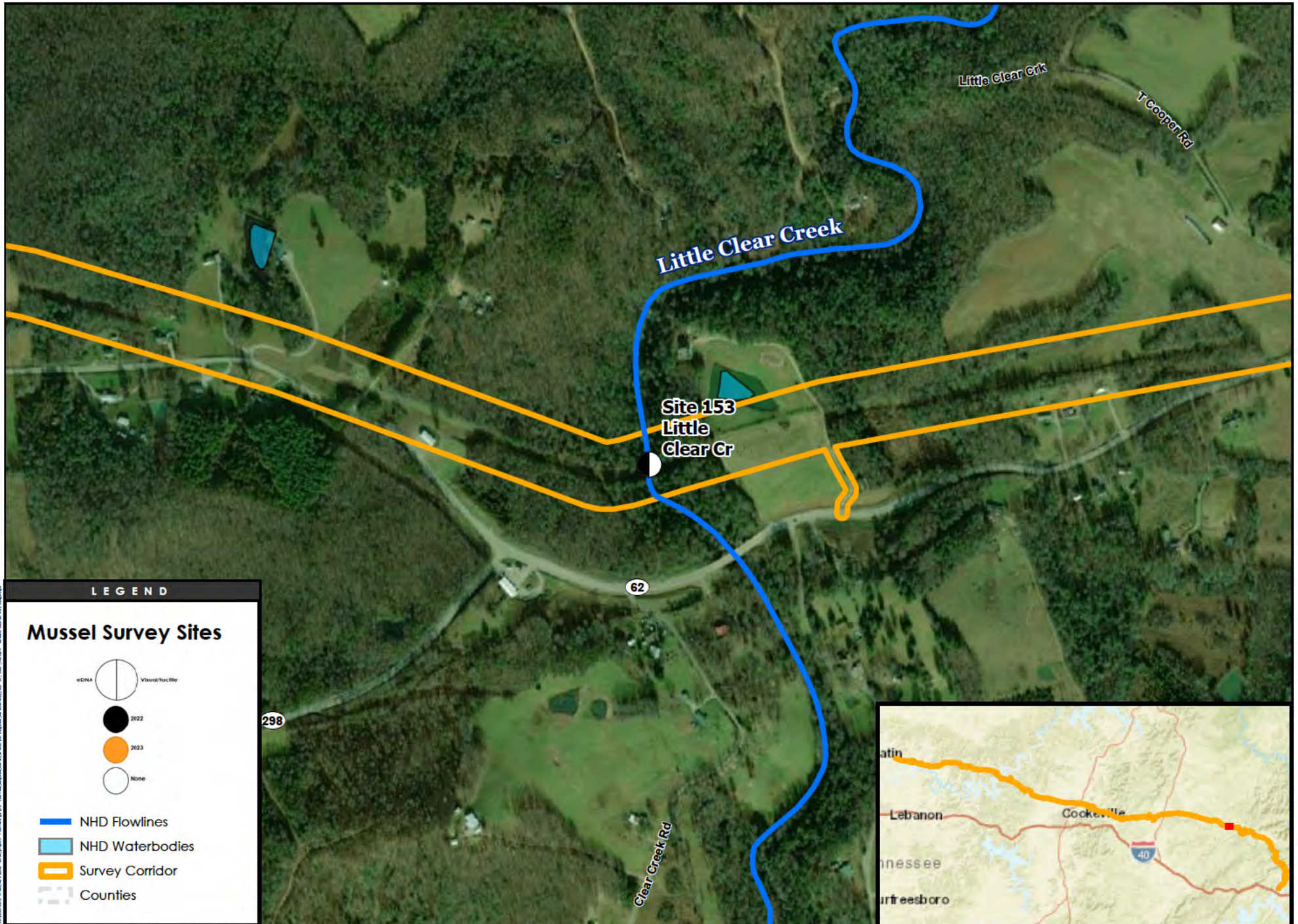
Mussel Survey Sites



- NHD Flowlines
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- Survey Corridor
- Counties







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Mussel Survey Sites

eDNA Visual/hoofbe

2022

2023

None

NHD Flowlines

NHD Waterbodies

Survey Corridor

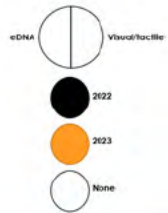
Counties





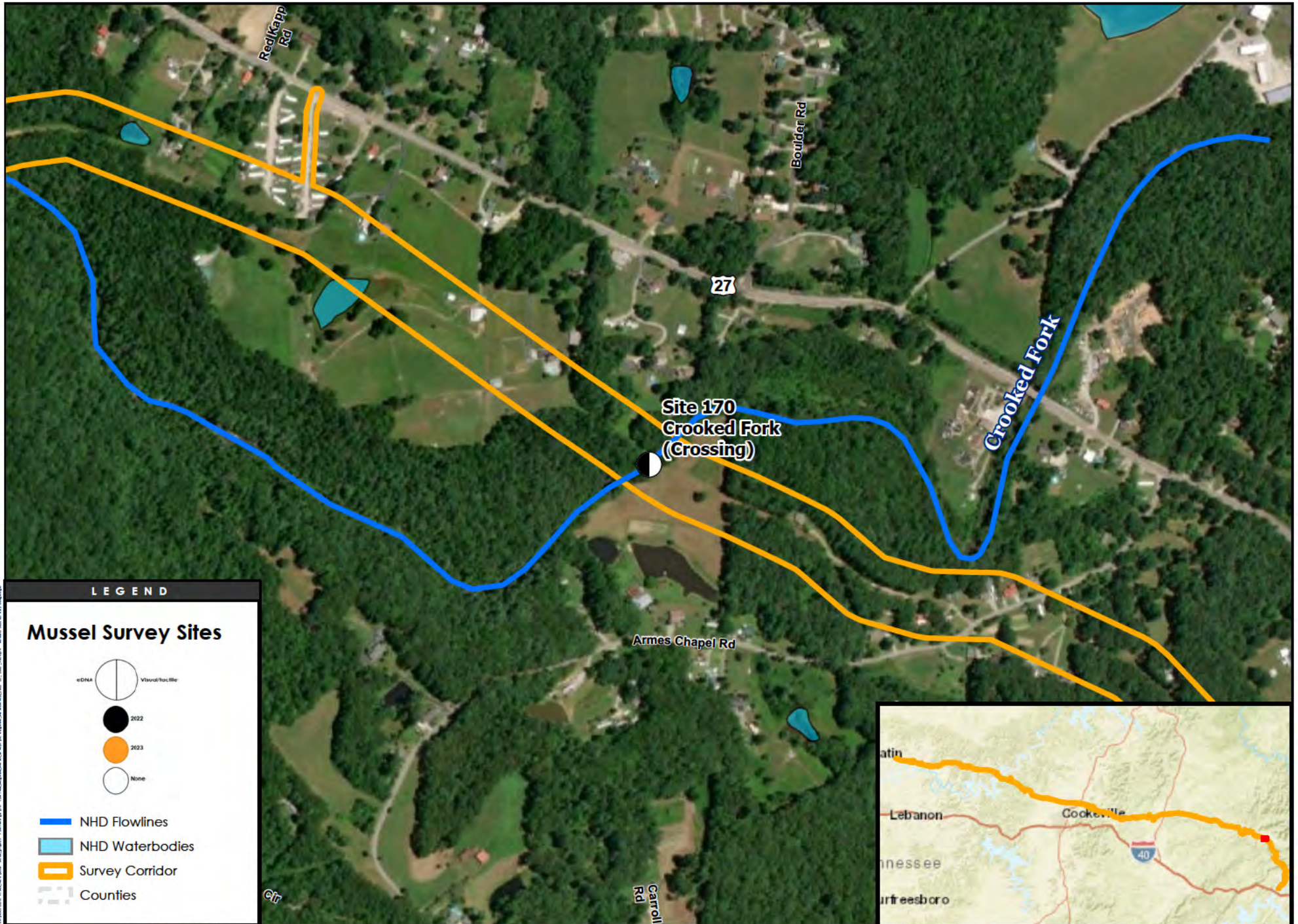
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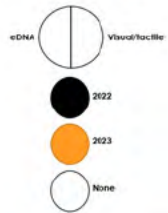
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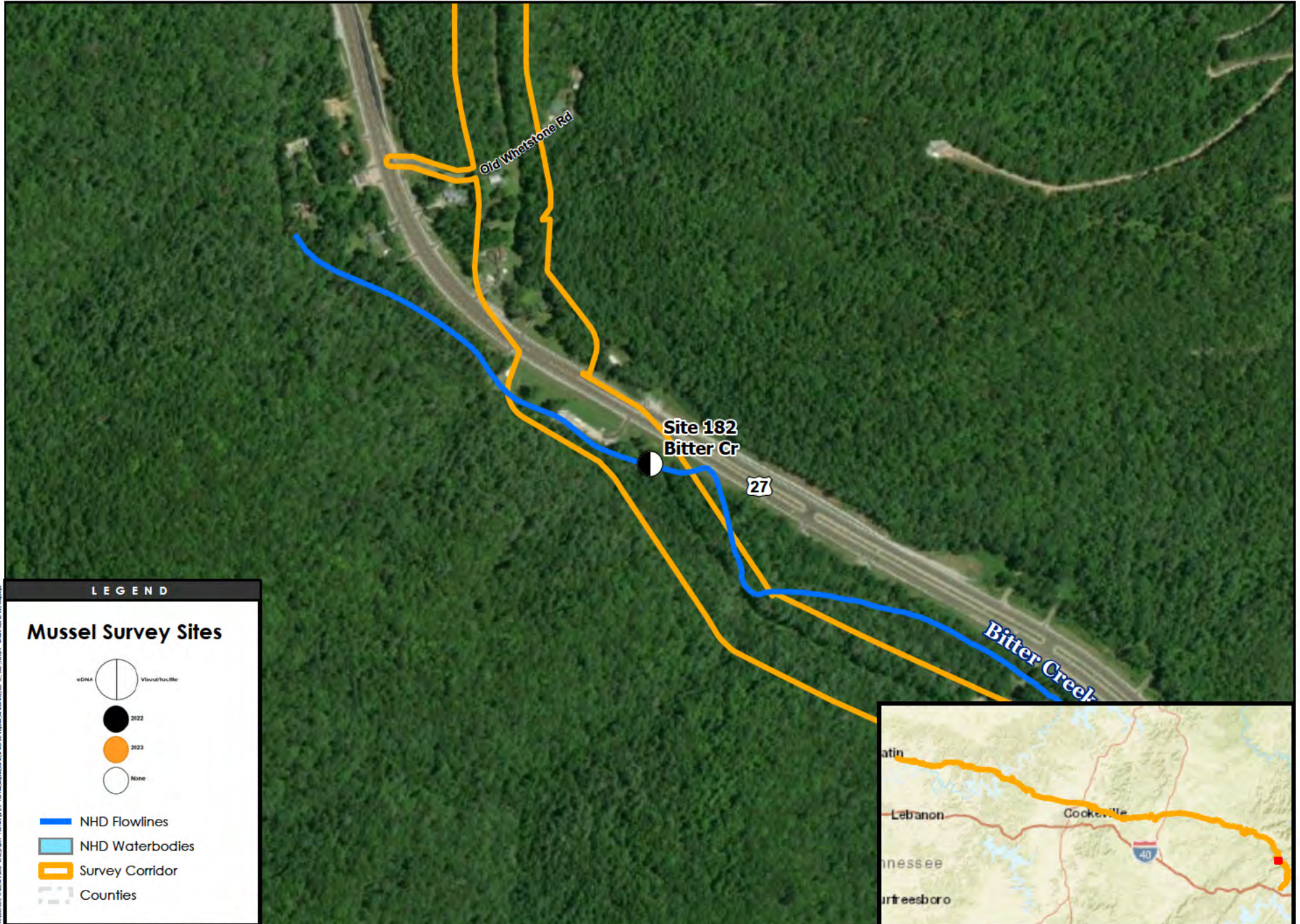


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Mussel Survey Sites

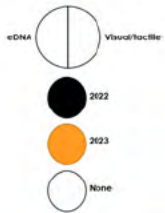


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- Survey Corridor
- Counties



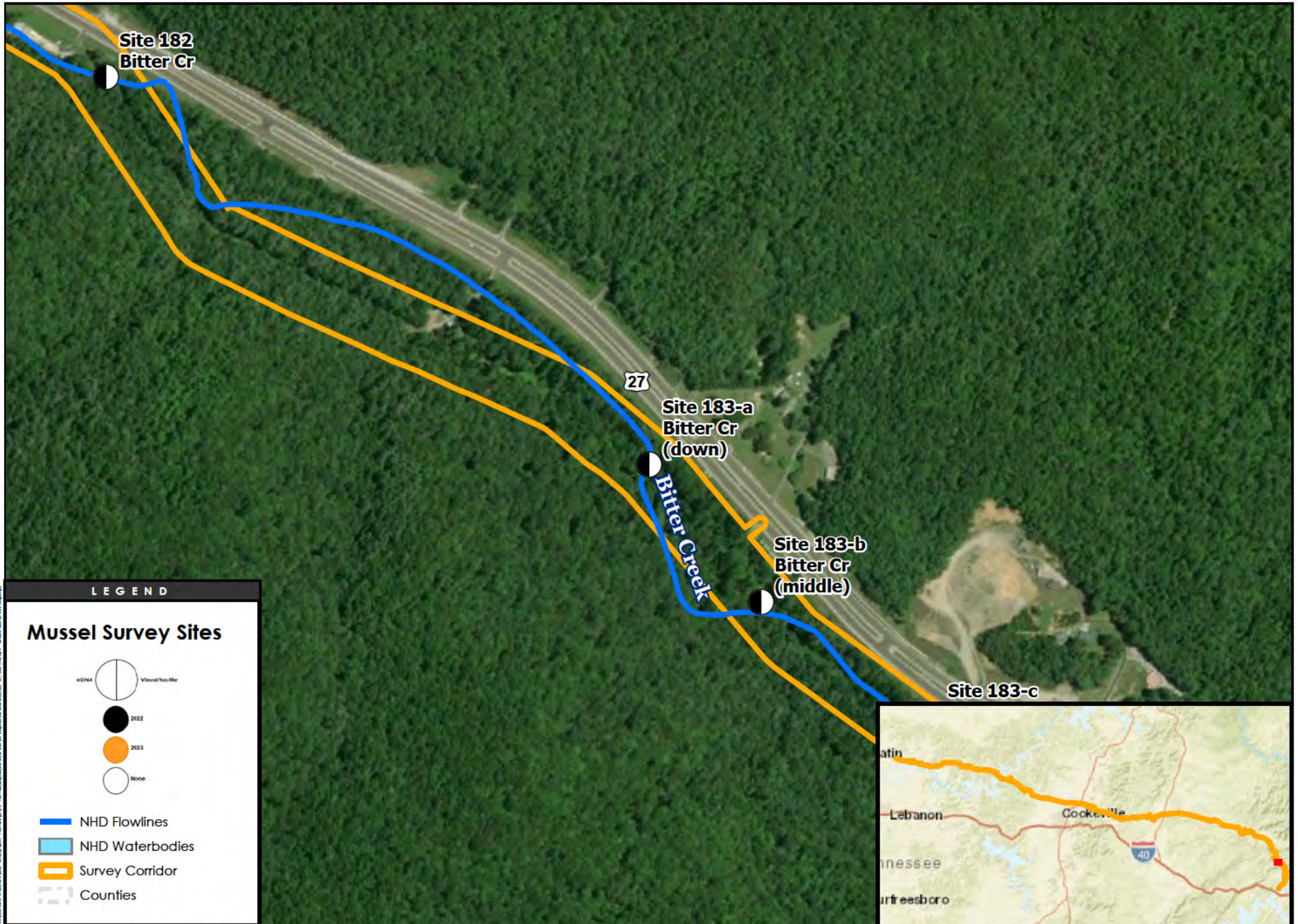
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Mussel Survey Sites



- NHD Flowlines
- NHD Waterbodies
- Survey Corridor
- Counties





LEGEND

Mussel Survey Sites

eDNA Visual/tactile

2022

2023

None

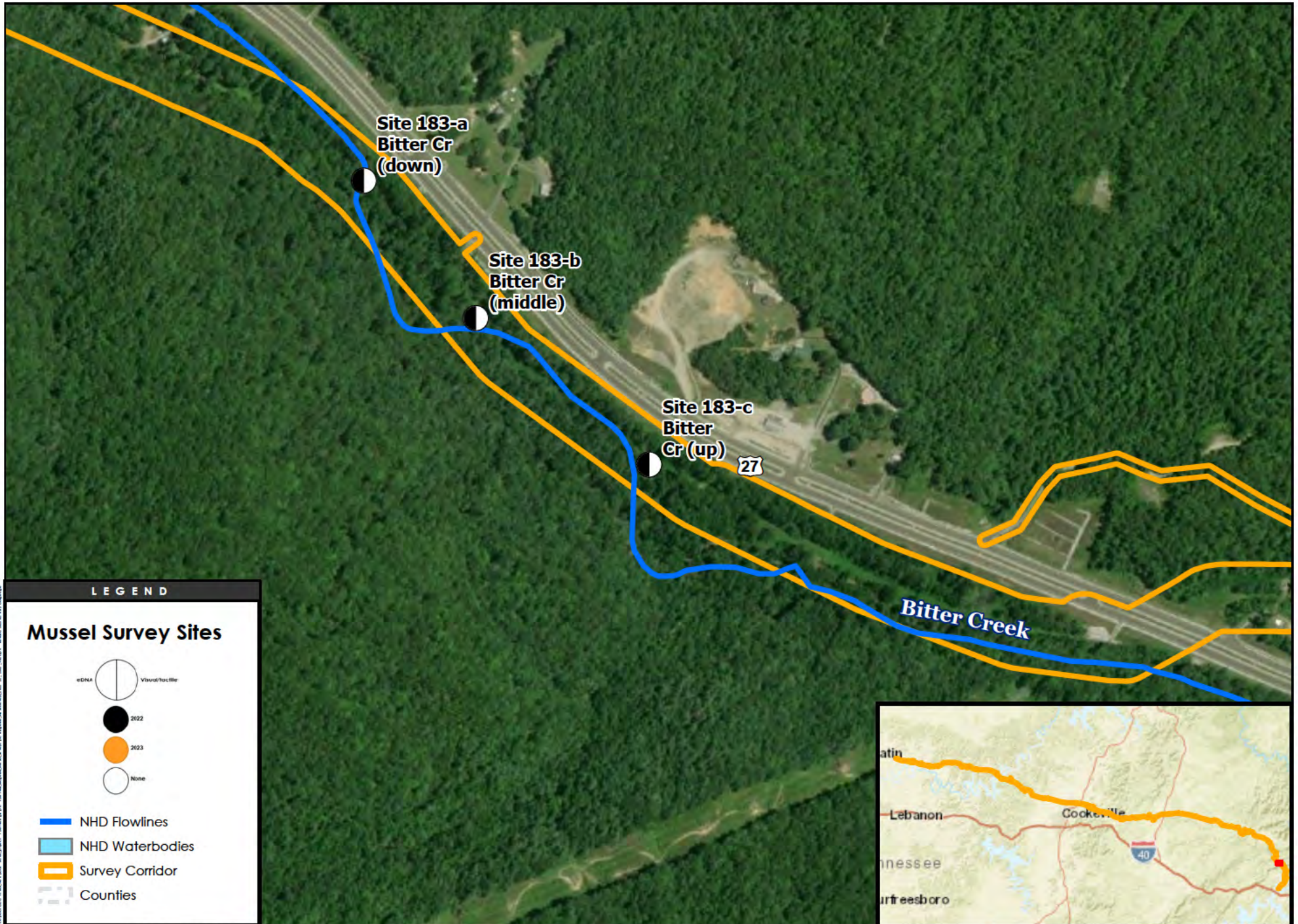
NHD Flowlines

NHD Waterbodies

Survey Corridor

Counties





LEGEND

Mussel Survey Sites

eDNA Visual/locally

2022

2023

None

NHD Flowlines

NHD Waterbodies

Survey Corridor

Counties



LEGEND

Mussel Survey Sites

eDNA

Visual/tactile

2022

2023

None

NHD Flowlines

NHD Waterbodies

Survey Corridor

Counties

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Coordinates are: NAD 83 UTM Zone 18N UTM 18N 18N
 2000000 1000000 1000000
 2000000 1000000 1000000

Ridgeline Expansion Project

Mussel Survey Map

February 2023

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Stantec

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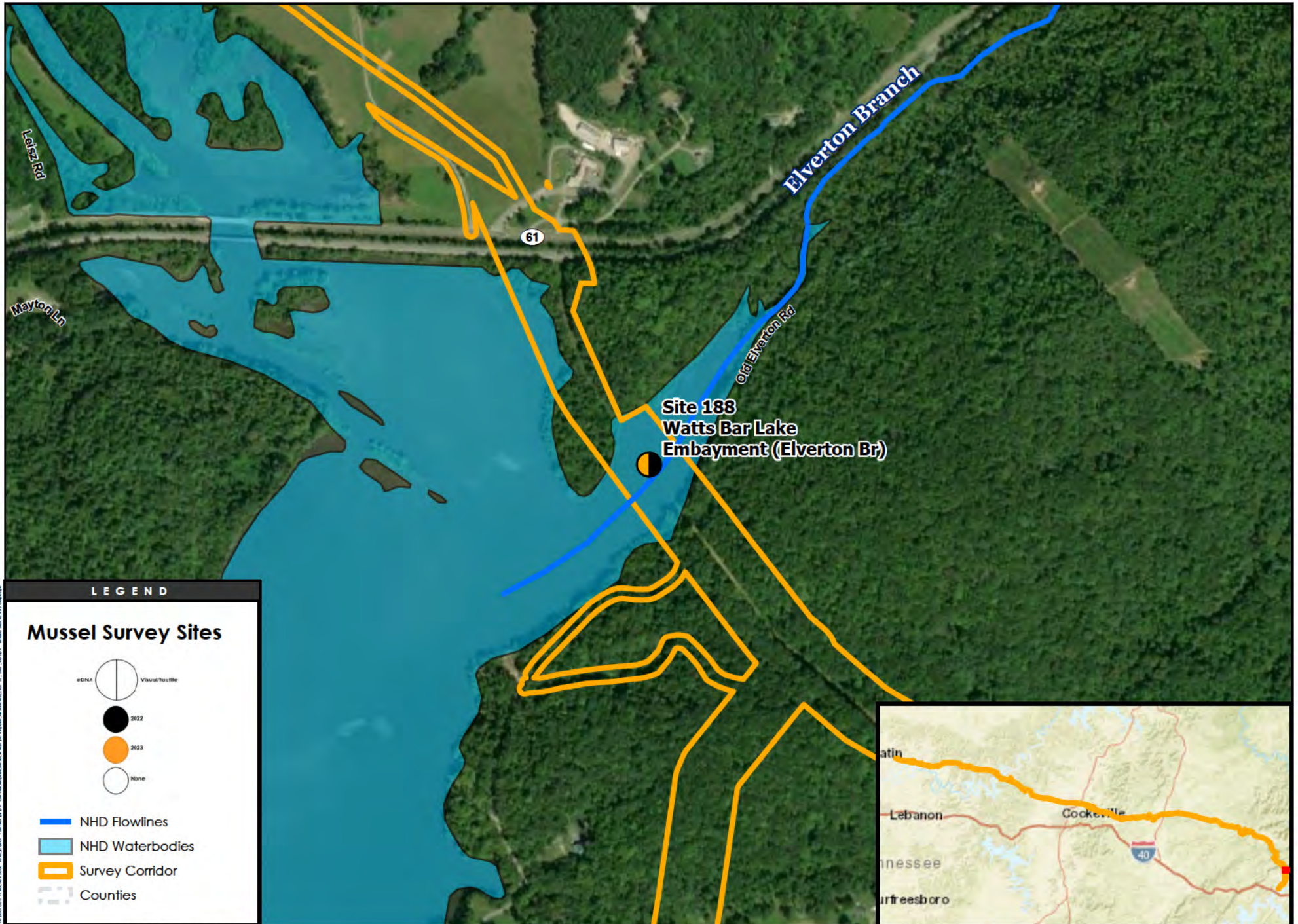
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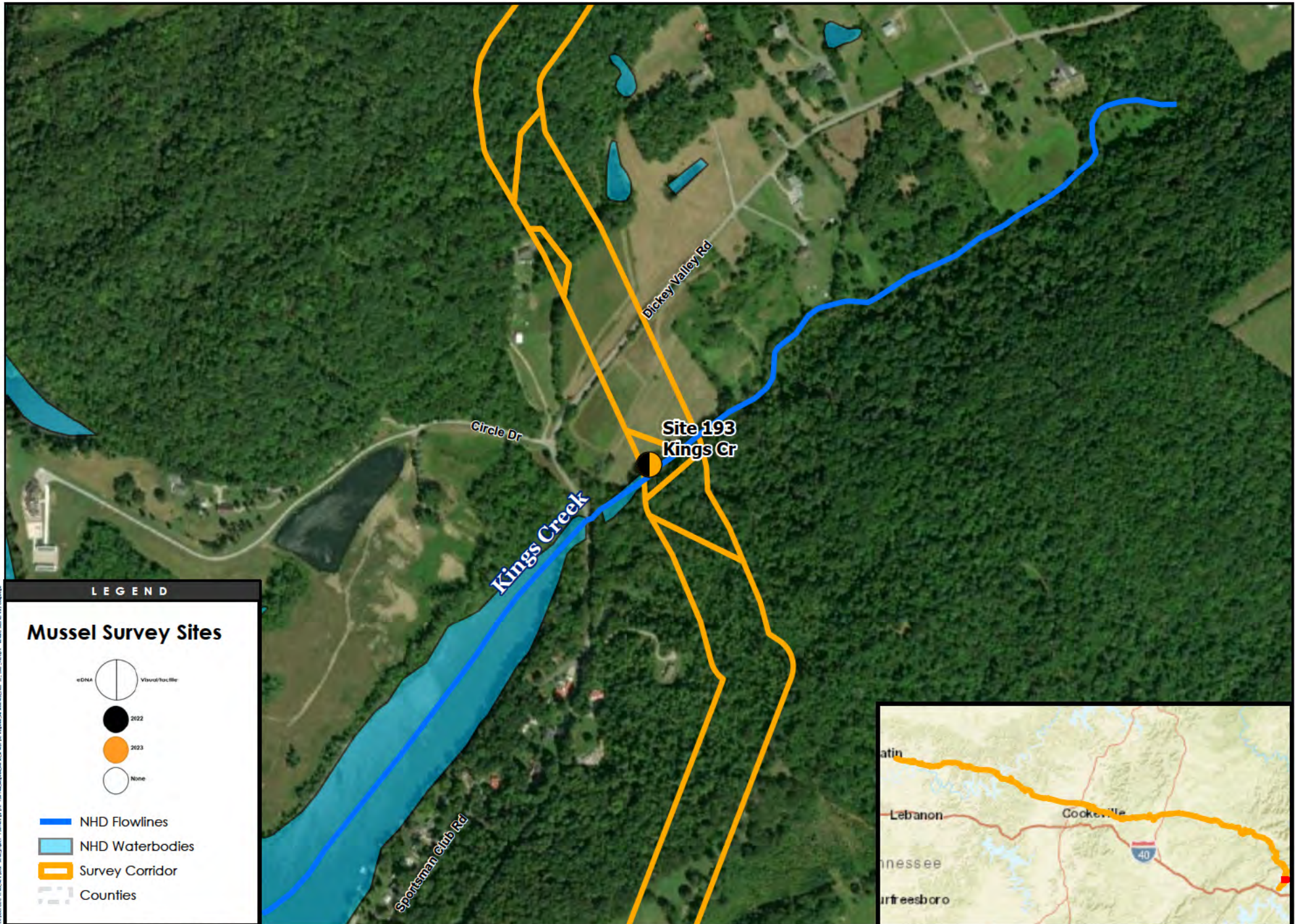
North Arrow

Prepared by: D.C. 02/10/23

Technical Review by: M.P. 12/08/22

Independent Review by: N.M. 12/08/22





Appendix B

Proposed Study Plan



September 2, 2022
David Pelren
Page 1 of 8

Reference: Proposed Study Plan, Mussel Survey for the Proposed East Tennessee Ridgeline Pipeline Project-

September 2, 2022
File: 172677408

Attention: David Pelren
Fish and Wildlife Biologist
U.S. Fish and Wildlife Service
446 Neat St.
Cookeville, TN 38501

Dear Mr. Pelren,

Reference: Proposed Study Plan, Mussel Survey for the Proposed East Tennessee Ridgeline Pipeline Project- Trousdale, Smith, Jackson, Putnam, Overton, Fentress, Morgan, and Roane Counties Tennessee

Background

This study is part of a larger effort to assess the potential presence or probable absence of freshwater mussels along the alignment of the proposed Ridgeline Pipeline Project (Attachment A). Stantec previously collected eDNA samples in June of 2022, to assess potential presence of mussels at proposed crossings of small streams. This effort was part of a phased approach where detection of freshwater mussel genetic material would trigger traditional surveys. Results from eDNA sampling are still under review but initial indications suggest that seven of 30 small stream sites should be surveyed using traditional methods (Table 1).

eDNA samples were not collected at the large waterbody sites (i.e., embayments and large rivers) in June, but eDNA data will be collected concurrently with traditional mussel surveys (Table 1). Traditional methods are proposed for these sites because it is assumed freshwater mussels are present. Although the exact position of the proposed pipeline is currently unknown, it is assumed it will be placed within the existing and/or proposed right-of-way (ROW). This study plan describes methods to be used for traditional surveys.

This correspondence was prepared to seek your approval of the methods proposed below. Field studies will be led by James Kiser, Cody Fleece, Triston Mullins, or Don Hubbs. Our Federal Endangered Species Collecting Permit is presented in Attachment B and credential for these individuals are presented in Attachment C.

Technical Approach

The large river and embayment project sites will be surveyed using timed searches and/or transect based field methods. Timed search surveys will be used for small streams. Mussels will be collected by visual or surface searches, including moving cobble and woody debris, hand sweeping away silt, sand, and/or small

Reference: Proposed Study Plan, Mussel Survey for the Proposed East Tennessee Ridgeline Pipeline Project-

detritus, and disturbing/probing the upper five centimeters (two inches) of substrate. If federally protected species are encountered during surveys, USFWS will be contacted for guidance on how to proceed.

Table 1. Sites proposed for mussel surveys.

Site	Pipeline Mile Post	Latitude	Longitude	Drainage	Habitat
5	2.9	36.382598°	-86.208823°	Cumberland River	Embayment
6	3.3	36.380843°	-86.203523°	Cumberland River	Embayment
48	29.7	36.325964°	-85.784254°	Cumberland River	Embayment
52	32.1	36.313377°	-85.745160°	Cumberland River	Large River
188	116.6	35.966868°	-84.467185°	Emory River	Embayment
11	6.8	36.373194°	-86.150556°	Little Goose Cr - Cumberland River	Small streams
11a	6.8	36.373194°	-86.134407°	Big Goose Cr - Cumberland River	Small streams
45	28.0	36.340047°	-85.802222°	Salt Lick Cr - Cumberland River	Small streams
89	55.3	36.215833°	-85.379921°	Spring Cr	Small streams
146	90.7	36.154722°	-84.788889°	White Creek - Emory River	Small streams
165	102.5	36.105167°	-84.613333°	Emory River	Small streams
193	120.0	35.930139°	-84.471944°	Kings Cr - Emory River	Small streams

Embayments

The proposed pipeline crossings currently traverse four lentic areas (embayments) within large reservoirs. These areas are likely depositional in nature, aggradating fine materials (e.g. sand, silt, and detritus), but are still in close proximity to riverine waterbodies (Table 1; Figure 1). Thick, fine-grained sediment deposits typically provide poor habitat for freshwater mussels because they are often unstable and anoxic.

Stantec proposes wandering timed search surveys at equidistant locations along the proposed pipeline crossing. An equal number of sample locations will be placed upstream and downstream of the proposed line. Starting points for searches will be placed within 25 meters of the proposed alignment. Divers will wander randomly searching for mussels and/or good habitat. Two searches will be conducted at each location for a duration of 45 minutes (90 minutes total search time). Search times will be longer at larger sites (Table 2).

Large Rivers

The proposed pipeline crossings currently traverse one riverine area (Table 1. Riverine; Figure 1). It is a perennial waterbody with high potential of native freshwater mussels being present. It will be surveyed

Reference: Proposed Study Plan, Mussel Survey for the Proposed East Tennessee Ridgeline Pipeline Project-

using transect based field methods. Divers will search a one-meter band along transects spanning bank to bank. Transects will be divided into 10-meter segments and searched at a rate of minute per square meter. Two transects will be placed within the ROW, three transects upstream of the ROW, and five transects downstream of the ROW. These transects would be spaced no less than 10m apart and no more than 30m apart. If mussel densities of 0.5/m² or if any live federally protected or proposed to be detected individuals are encountered within a 10m segment of a transect, Stantec would initiate qualitative timed searches within similar habitat for 30 minutes.

Table 2. Embayment search effort.

Site	Pipeline Mile Post (mile)	Approximate Width (m)	Sample Locations (count)	Timed Searches (count)	Search Time (min)
5	2.9	500	12	24	1080
6	3.3	80	4	8	360
48	29.7	110	8	16	720
188	116.6	150	8	16	720

Small Streams

Genetic material for unionid mussels was detected at seven of the 30 proposed pipeline crossings. Small streams with positive eDNA detections for unionids are presented in Table 1. Additional surveys are not proposed for remaining 23 streams where genetic material was not detected. Small streams where mussels are believed present, will be surveyed using timed search field methods. Searches will occur between 50m upstream and 100m downstream of the ROW for a total of 9 search hours within available habitat. Searchers will begin at the downstream end of the site and proceed in an upstream direction while collecting mussels. It is assumed that snorkelling will be the primary search technique, but field personnel may rely on SCUBA if channel depths are greater than 2.5 feet.

Mussels will be identified to species and recorded according to the searcher that found them at each site. All mussels will be returned to the approximate location where found after data collection. Federally listed species will be hand placed in the substrate when ambient river temperatures range between 5 and 10 degrees Celsius (°C). Sampling will only occur when ambient air temperatures are above 0 °C or when nearby USGS Gauges are less than or near the seasonal median. Mussels will be identified to species level and sexed where possible. Individual lengths will be measured, and representative specimens will be photographed as vouchers.

Physical habitat will be visually assessed by divers and recorded for each survey lane. Substrates will be characterized using a modified Wentworth scale (Table 3) and coverage will be estimated to the nearest five percent.

Reference: Proposed Study Plan, Mussel Survey for the Proposed East Tennessee Ridgeline Pipeline Project-

Table 3. Substrate grain size classifications

Category	Size Range
Silt/clay	<1 – 62.5 µm
Sand	62.5 µm – 1 mm
Gravel	2 -64 mm
Cobble	64 – 256 mm
Boulder	>256 mm
Bedrock	Not applicable
Hardpan	Not applicable
Detritus	Not applicable
Wood	Not applicable
Aquatic vegetation	Not applicable

Key:

µm = micrometer

mm = millimeter

Reporting

Upon completion of the field survey, Stantec personnel will prepare a report describing:

- Habitat conditions at the survey sites;
- Methods used to complete the survey;
- Level of effort; and
- Photographs of representative specimens.

The results of the eDNA study will be submitted under separate cover.

Reference: Proposed Study Plan, Mussel Survey for the Proposed East Tennessee Ridgeline Pipeline Project-

Conclusion

Please respond, at the earliest opportunity, with any questions, comments, or concerns you may have regarding the proposed study plan. If you have none, please respond with authorization to proceed with field studies according to the study plan outlined above.

Thank you for your time and attention.

Regards,

Stantec Consulting Services Inc.



Cody Fleece
Principal, Aquatic Ecologist
Phone: 513 842 8238
Cody.Fleece@stantec.com



Josh Adams
Principal
Phone: 502 718 9512
Joshua.Adams@stantec.com

Attachment: A – Project Maps
B – Federal Collecting Permit
C – Resumes for Key Personnel

- c. Gus McLachlan, Enbridge
Triston Mullins, Stantec
James Kiser, Stantec
Justin Casey, Stantec
Jeff Benefiel, Stantec
Jessica Haider, Stantec
Nicole Sikula, USFWS

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September 2, 2022

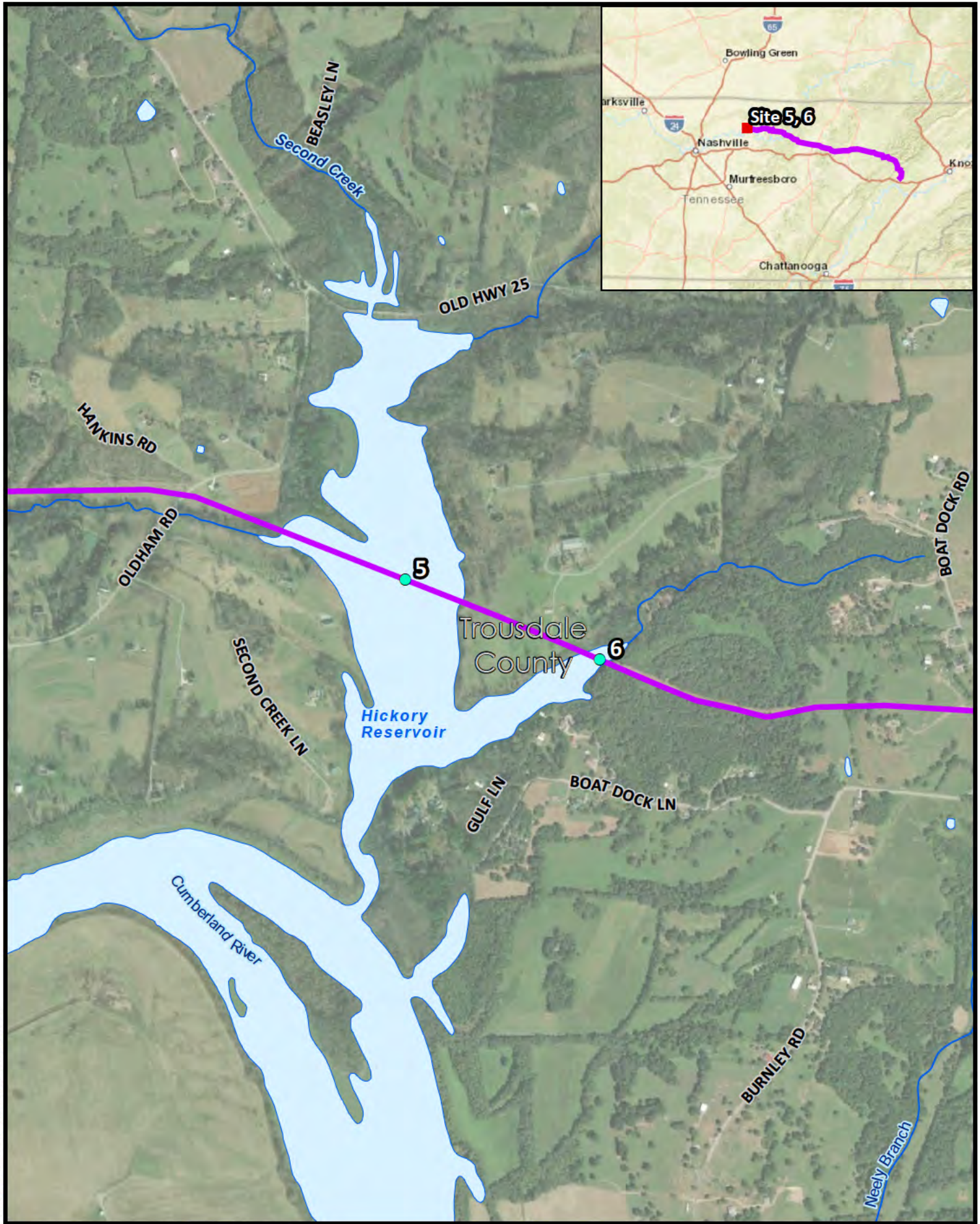
David Pelren

Page 6 of 8

Reference: Proposed Study Plan, Mussel Survey for the Proposed East Tennessee Ridgeline Pipeline Project-

ATTACHMENT A

Project Area Maps



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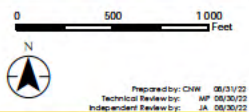
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 2. Source data: Field Derived by Stantec, ESRI
 3. Imagery: ESRI

Proposed Mussel Survey Location

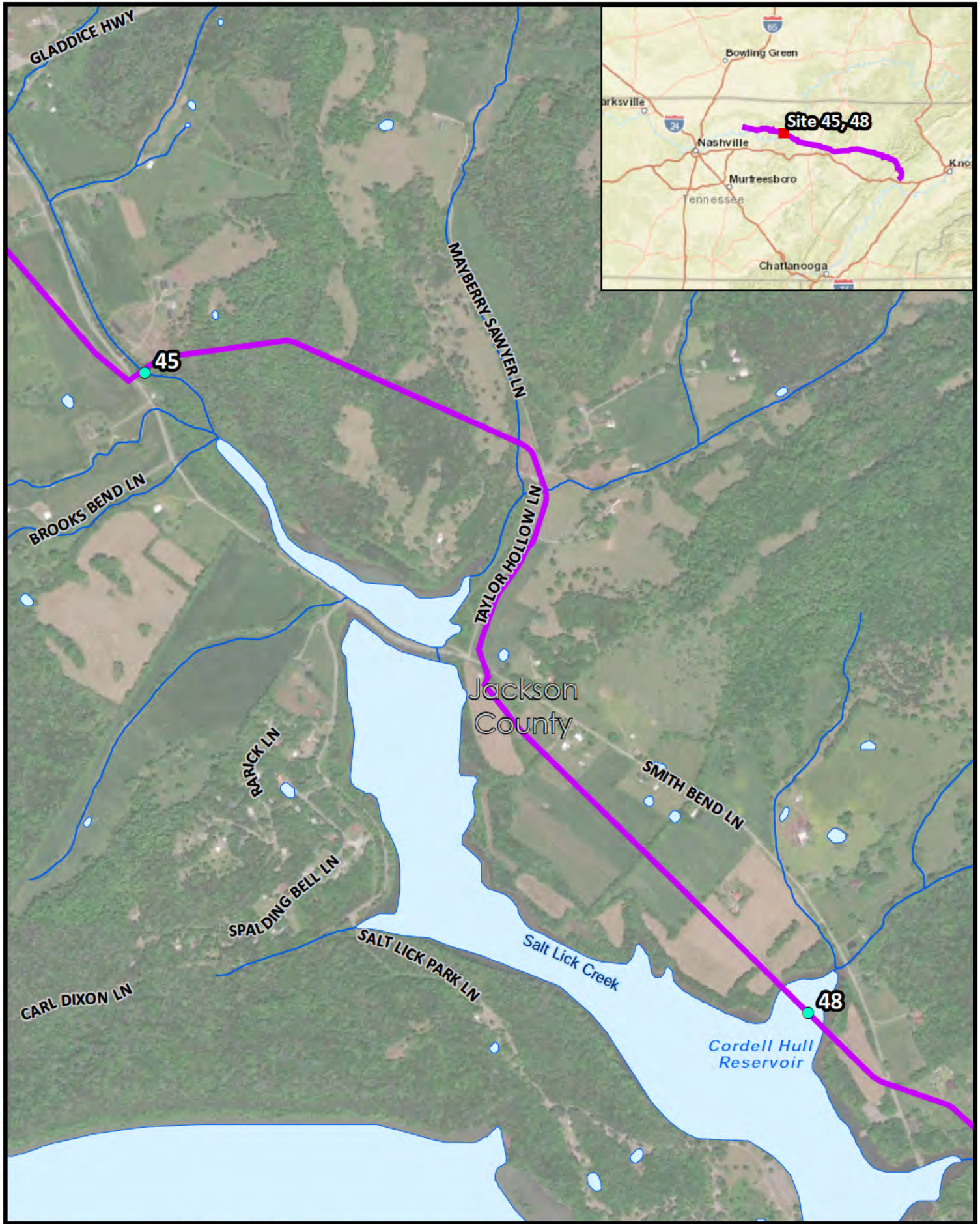
Ridgeline Pipeline Project

August 2022

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 Tel 813.223.9500
 Fax 813.223.0009



Prepared by: CHW 08/31/22
 Technical Review by: JAF 08/30/22
 Independent Review by: JAF 08/30/22



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Proposed Mussel Survey Location

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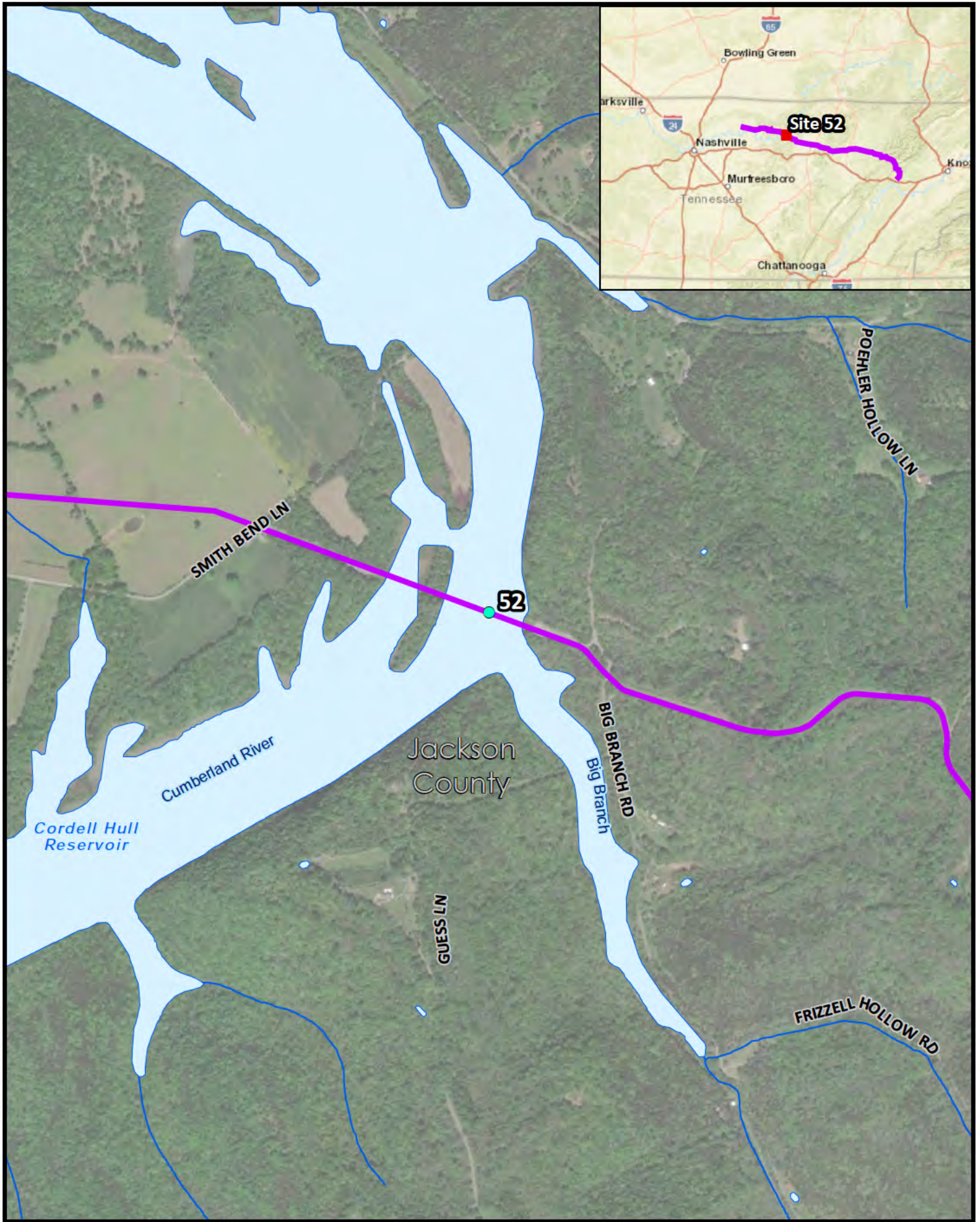
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0 500 1000 Feet



Prepared by: CHW 08/31/22
Technical Review by: JAK 09/06/22
Independent Review by: JAK 09/06/22



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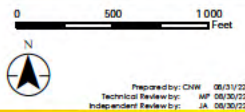
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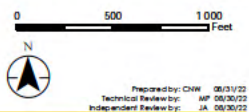
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Proposed Mussel Survey Location

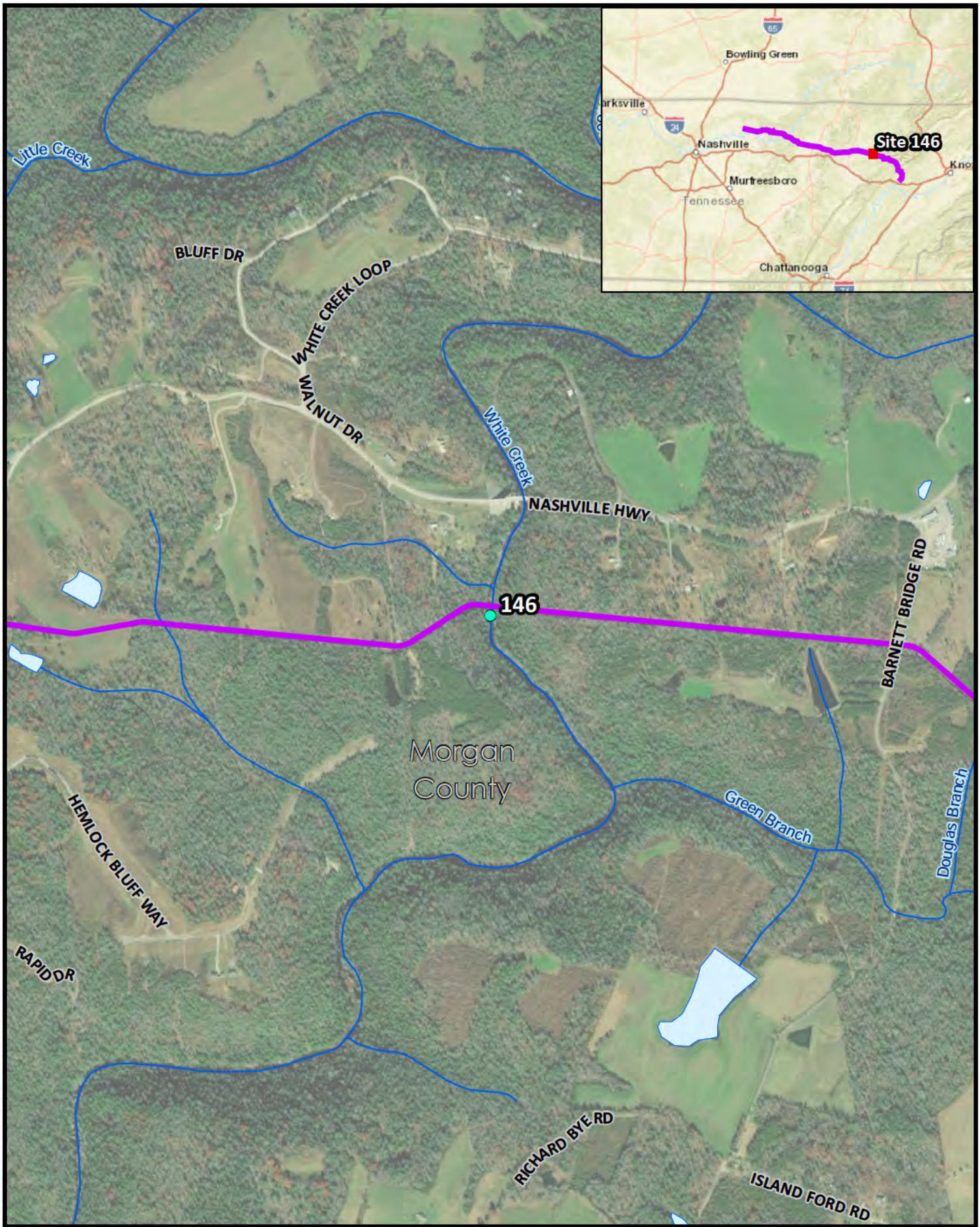
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Prepared by: CHW 08/31/22
 Technical Review by: JAW 09/20/22
 Independent Review by: JAW 09/20/22



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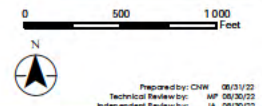
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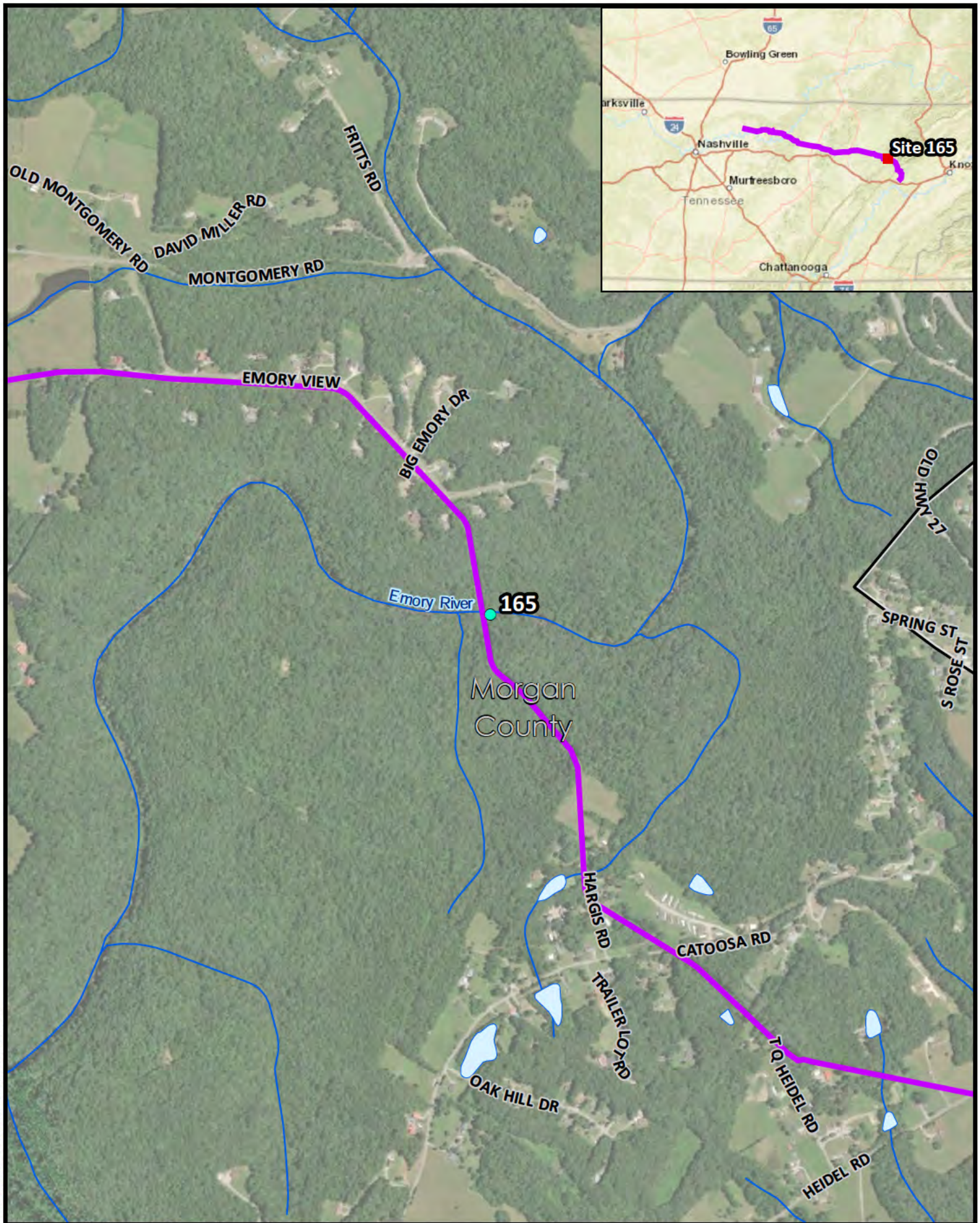
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Technical Review by: JAK 09/02/22
Independent Review by: JAK 09/02/22



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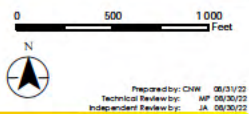
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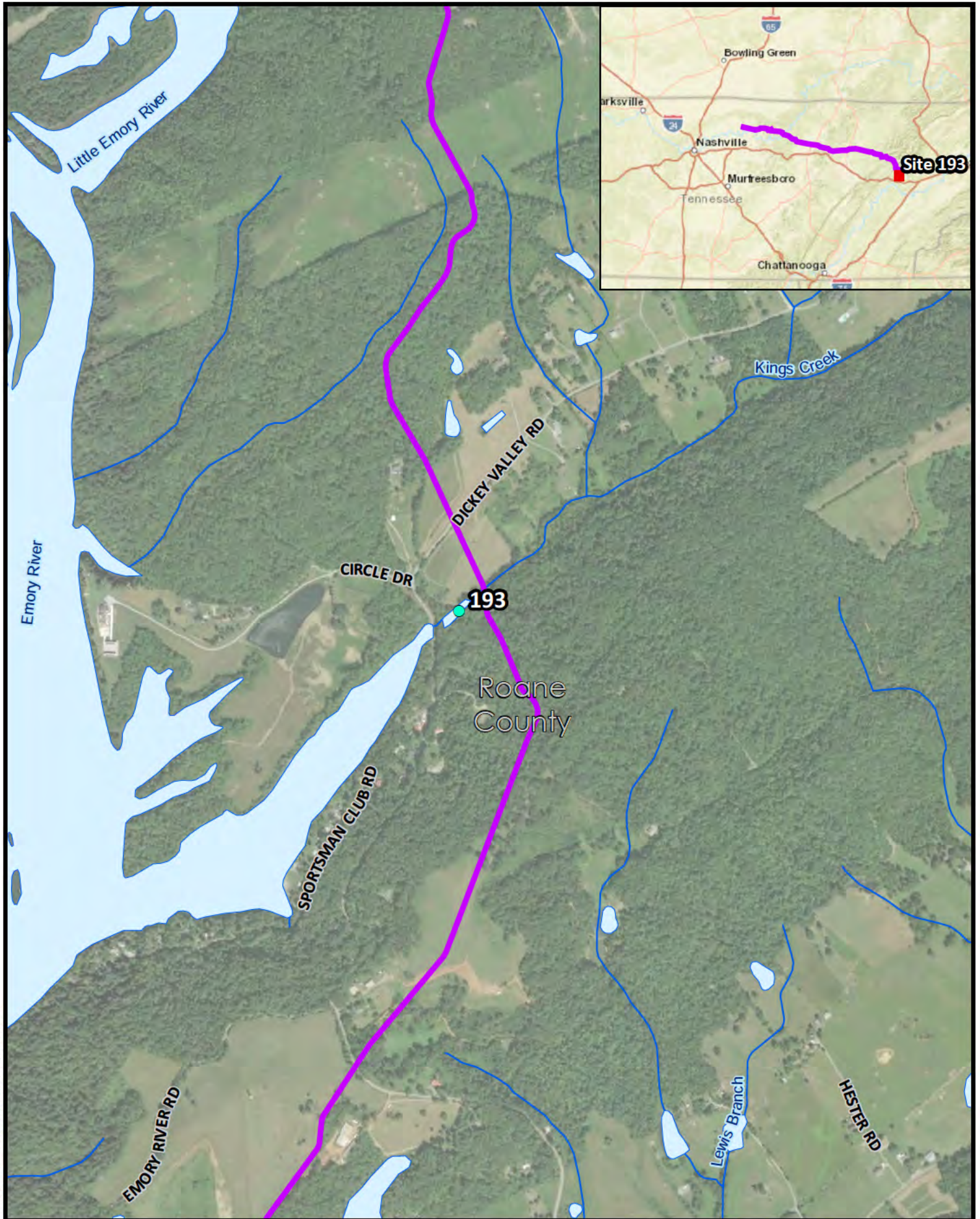
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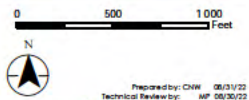
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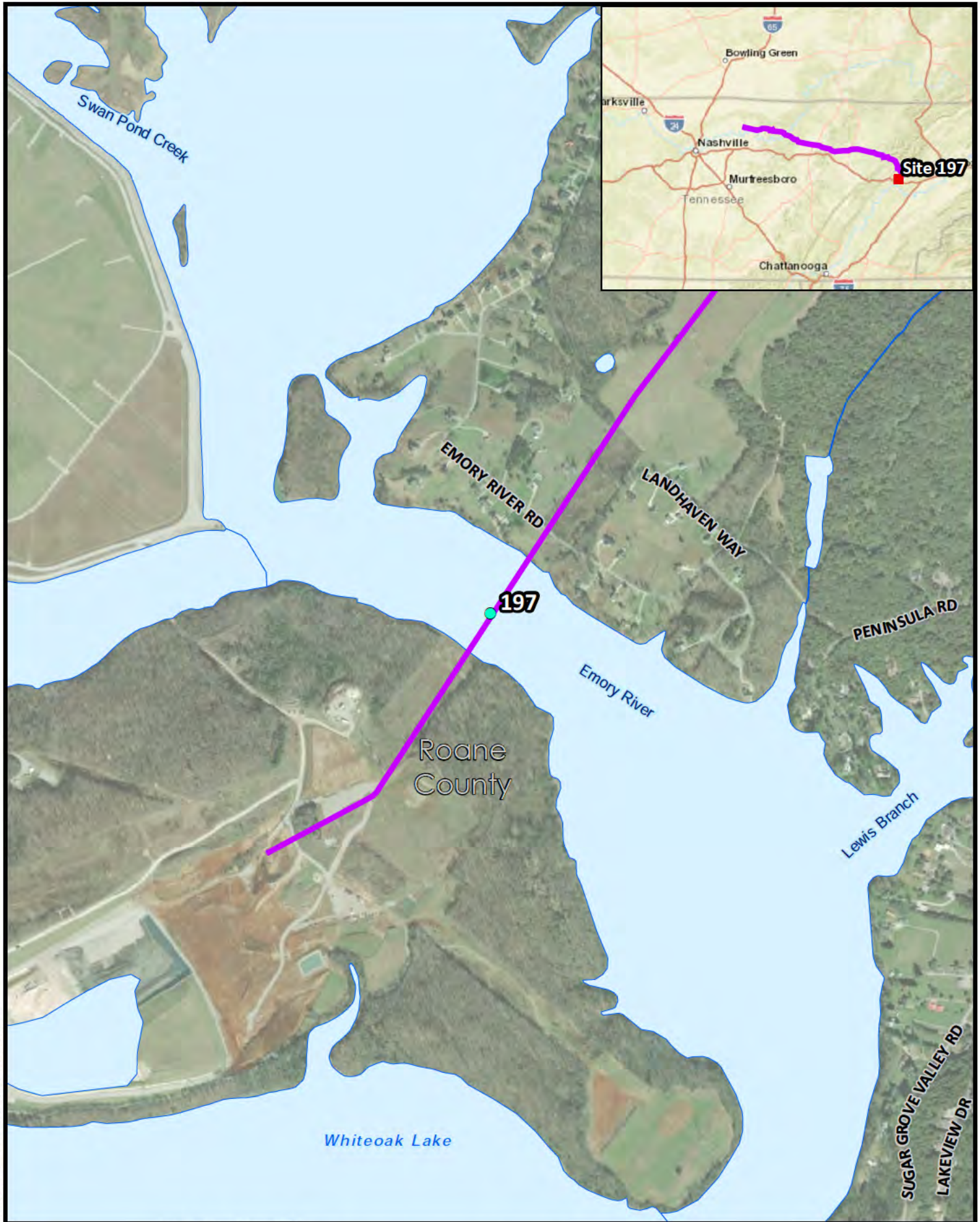
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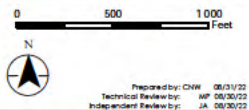
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Prepared by: CHW 08/31/22
 Technical Review by: JAK 09/20/22
 Independent Review by: JAK 09/20/22

September 2, 2022

David Pelren

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Reference: Proposed Study Plan, Mussel Survey for the Proposed East Tennessee Ridgeline Pipeline Project-

ATTACHMENT B

Federal Collecting Permit



NATIVE ENDANGERED & THREATENED SP.
RECOVERY

Permit Number: ES38821A

Version Number: 5

Effective: 2022-05-20 **Expires:** 2026-12-31

Issuing Office:

Department of the Interior

U.S. FISH AND WILDLIFE SERVICE

ES Bloomington Permit Office

5600 American Boulevard, West, Suite 990

Bloomington, Minnesota 55437-1458

permitsR3ES@fws.gov

Digitally signed by

Acting Endangered Species Division, Program Manager

Permittee:

STANTEC CONSULTING SERVICES

10509 TIMBERWOOD CIRCLE SUITE 100

LOUISVILLE, KY 40223-2177

US

Authority: Statutes and Regulations: 16 U.S.C. 1539 (a), 16 U.S.C. 1533 (d) 50 CFR 17.22, 50 CFR 17.32, 50 CFR 13

Location where authorized activity may be conducted:

ON LANDS SPECIFIED WITHIN THE ATTACHED SPECIAL TERMS AND CONDITIONS

Reporting requirements:

ANNUAL REPORTS DUE: 1/31

See permit conditions for reporting requirements

Authorizations and Conditions:



NATIVE ENDANGERED & THREATENED SP.
RECOVERY

Permit Number: ES38821A

Version Number: 5

Effective: 2022-05-20 **Expires:** 2026-12-31

- A. General Conditions set out in Subpart B of 50 CFR 13, and specific Conditions contained in Federal regulations cited above, are hereby made a part of this permit. All activities authorized herein must be carried out in accord with and for the purposes described in the application submitted. Continued validity, or renewal of this permit is subject to complete and timely compliance with all applicable Conditions, including the filing of all required information and reports.
- B. The validity of this permit is also conditioned upon strict observance of all applicable foreign, state, local, tribal, or other federal law. Necessary state and/or local permits where applicable, must also be acquired and observed; this permit is invalid without such permits.
- C. Valid for use by those identified in the List of Authorized Individuals.

C.1. Authorized Individuals:

Only individuals on the attached List of Authorized Individuals (LAI) are authorized to conduct activities pursuant to this permit. The LAI, printed on U.S. Fish and Wildlife Service (USFWS) letterhead, and signed and dated by the Region 3 permit issuing office or a Region 3 lead species Field Office, may identify special Conditions or circumstances under which individuals can conduct authorized activities and it must be retained with these Authorizations and Conditions. Each named individual shall be responsible for compliance with the Authorizations and Conditions of this permit.

Trained assistants not named on the attached LAI may work on permitted activities under the direct and on-site supervision of the individuals named on the LAI. "On-site supervision" is defined as having the Permittee at a distance close enough to enable immediate assistance to a supervised individual, as needed, while the supervised individual conducts an authorized activity. Trained assistants may not work independently at a site.

Permittee shall replace outdated LAIs and attach the subsequent current updated version of the LAI to this recovery permit upon receipt. **This permit will be considered invalid without a current attached LAI.**



NATIVE ENDANGERED & THREATENED SP.
RECOVERY

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Version Number: 5

Effective: 2022-05-20 **Expires:** 2026-12-31

C.2. To request changes to the LAI, the Permittee (Principal Officer for business permits) shall submit an amendment request via ePermits (epermits.fws.gov). The request shall be submitted at least 30 days prior to the desired effective date. The Permittee shall submit a \$50.00 processing fee unless fee exempt [see 50 CFR 13.11 (d)], the request should include a desired effective date and shall include the following information:

- a. The name of each individual (first name, middle initial, last name) to be appended to the LAI, confirmation that the individual is not permitted under another business or individual Federal recovery permit, and indicate the species they will be working with and the activities they will be conducting;
- b. The resume/qualifications of each person, including specific information on previous professional experience working with the species/activity affected by the request. Information should include: the approximate number of hours of focused activity with each species in occupied habitat; approximate numbers of each species the applicant has worked with at each site (i.e., indicate the number specimens at specific sites or specific activities); names, dates, and location of areas surveyed; and experience with similar species;
- c. For each individual: the names, titles, organizations, emails, and telephone numbers of a minimum of two references who can verify experience with the species (reference letters are preferred and always appreciated); and
- d. The names of any individuals to be deleted from the LAI.

D. Acceptance of this permit serves as evidence that the Permittee understands and agrees to abide by the terms of this permit and all sections of Title 50 Code of Federal Regulations (CFR), Parts 13 and 17, pertinent to issued permits (<https://fwsepermits.servicenowservices.com/fws>). Section 11 of the Endangered Species Act of 1973, as amended, provides for civil and criminal penalties for failure to comply with permit conditions.

A request for permit renewal and the \$100 application processing fee must be received **at least 30 days prior to the expiration date** of this permit to continue conducting authorized activities under the expired permit while your application is being processed (subject to compliance with 50 CFR, Parts 13.21 and 13.22). Please use <https://fwsepermits.servicenowservices.com/fws> to obtain specific information regarding the new ePermitting process to apply for and submit your digital recovery permit application and application processing fee. When these requirements are not met, this permit becomes invalid on the expiration date.



NATIVE ENDANGERED & THREATENED SP.
RECOVERY

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Version Number: 5

Effective: 2022-05-20 **Expires:** 2026-12-31

Unless otherwise instructed within the Authorizations and Conditions, **annual reports** are due by January 31 following each year your permit is in effect and shall be submitted to all offices identified in the permit Conditions

- E. Permittee is authorized to take Indiana bat (*Myotis sodalis*), gray bat (*Myotis grisescens*), northern long-eared bat (*Myotis septentrionalis*), Ozark big-eared bat (*Corynorhinus townsendii ingens*), Virginia big-eared bat (*Corynorhinus townsendii virginianus*), listed mussel and fish species identified in the tables below, copperbelly water snake (*Nerodia erythrogaster neglecta*), and big sandy crayfish (*Cambarus callianus*) and for scientific research aimed at recovery of the species: presence/absence surveys, studies to document habitat use, population monitoring, and to evaluate potential impacts. This permit does **not** authorize the collection of voucher specimens.

Fish Species

<i>Etheostoma chienense</i>	Relict darter
<i>Etheostoma percnurum</i>	Duskytail darter
<i>Etheostoma spilotum</i>	Kentucky arrow darter
<i>Notropis albizonatus</i>	Palezone shiner
<i>Phoxinus cumberlandensis</i>	Blackside dace
<i>Scaphirhynchus albus</i>	Pallid sturgeon

Freshwater Mussel Species

<i>Alasmodonta atropurpurea</i>	Cumberland elktoe
<i>Cumberlandia monodonta</i>	Spectaclecase
<i>Cyprogenia stegaria</i>	Fanshell
<i>Dromus dromas</i>	Dromedary pearlymussel
<i>Epioblasma brevidens</i>	Cumberlandian combshell
<i>Epioblasma capsaeformis</i>	Oyster mussel
<i>Epioblasma florentina walkeri</i>	Tan riffleshell
<i>Epioblasma obliquata perobliqua</i>	White catpaw
<i>Epioblasma obliquata obliquata</i>	Purple catpaw
<i>Epioblasma torulosa gubernaculum</i>	Green blossom pearlymussel
<i>Epioblasma torulosa rangiana</i>	Northern riffleshell



NATIVE ENDANGERED & THREATENED SP.
RECOVERY

Permit Number: ES38821A

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<i>Epioblasma triquetra</i>	Snuffbox
<i>Epioblasma turgidula</i>	Turgid blossom pearlymussel
<i>Fusconaia cuneolus</i>	Finerayed pigtoe
<i>Fusconaia cor</i>	Shiny pigtoe
<i>Hemistena lata</i>	Cracking pearlymussel
<i>Lampsilis abrupta</i>	Pink mucket
<i>Lampsilis altilis</i>	Finelined pocketbook
<i>Lampsilis higginsii</i>	Higgins eye pearlymussel
<i>Lemiox rimosus</i>	Birdwing pearlymussel
<i>Leptodea leptodon</i>	Scaleshell
<i>Obovaria retusa</i>	Ring pink
<i>Pegias fabula</i>	Littlewing pearlymussel
<i>Plethobasus cicatricosus</i>	White wartyback pearlymussel
<i>Plethobasus cooperianus</i>	Orangefoot pimpleback pearlymussel
<i>Plethobasus cyphus</i>	Sheepnose
<i>Pleurobema clava</i>	Clubshell
<i>Pleuorbema gibberum</i>	Cumberland pigtoe
<i>Pleurobema plenum</i>	Rough pigtoe
<i>Pleuonaia dolabelloides</i>	Slabside pearlymussel
<i>Potamilus capas</i>	Fat pocketbook
<i>Ptychobranhus subtentus</i>	Fluted kidneyshell
<i>Quadrula cylindrica cylindrica</i>	Rabbitsfoot
<i>Quadrula cylindrica strigillata</i>	Rough rabbitsfoot
<i>Quadrula fragosa</i>	Winged mapleleaf
<i>Quadrula intermedia</i>	Cumberland monkeyface pearlymussel
<i>Quadrula sparsa</i>	Appalachian monkeyface pearlymussel
<i>Toxolasma cylindrellus</i>	Pale lilliput pearlymussel
<i>Villosa fabalis</i>	Rayed bean
<i>Villosa perpurpurea</i>	Purple bean
<i>Villosa trabilis</i>	Cumberland bean



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RECOVERY

Permit Number: ES38821A

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F. Activities are authorized at the following locations:

- F.1. Within U.S. Fish and Wildlife Service (USFWS) Southwest Region 2: Texas and Oklahoma, upon receipt of written concurrence from the Field Supervisor, and upon coordination with Ozark Plateau National Wildlife Refuge prior to (1) surveys of caves known to be used by federally-listed bats, and (2) examinations of caves suspected of containing federally-listed bat species (some presence/absence surveys may require the presence of a U.S. Fish and Wildlife Service Biologist), and as outlined in Condition G.
- F.2. Within USFWS Midwest Region 3: Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, Ohio, and Wisconsin, upon receipt of written concurrence from the Field Supervisor, as outlined in Condition G.
- F.3. Within USFWS Southeast Region 4: Alabama, Arkansas, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, and Tennessee, upon receipt of written concurrence from the Field Supervisor, as outlined in Condition G.
- F.4. Within USFWS Northeast Region 5: Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, Virginia and West Virginia, upon receipt of written concurrence from the Field Supervisor, as outlined in Condition G.
- F.5. Within USFWS Mountain-Prairie Region 6: Colorado, Kansas, Montana, Nebraska, North Dakota, South Dakota, and Wyoming, upon receipt of written concurrence from the Field Supervisor, as outlined in Condition G.

- G. For bats and mussels permittee shall notify and request approval from the USFWS Field Supervisor for the state in which activities are proposed to occur (Condition U.) at least 15 days prior to conducting any activities.

For fish and Copperbelly water snake permittee shall notify and request approval from the USFWS Species Recovery Lead Office Field Supervisor *and* the USFWS Field Supervisor for the state in which activities are proposed to occur (Condition U.) at least 15 days prior to conducting any activities.



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For Big sandy crayfish permittee shall notify and request approval from the USFWS Species Recovery Lead Office Field Supervisor *and* the USFWS Field Supervisor for the state in which activities are proposed to occur (Condition U.) at least 30 days prior to conducting any activities.

Contact information is available at: <https://www.fws.gov/service/3-200-59-scientific-purposes-enhancement-propagation-or-survival-permits-recovery-permits>. Your request for this site-specific approval must be in writing and must indicate:

- G.1. Species for which proposed activities are being conducted.
- G.2. Location of proposed activities, including project site, county, and state.
- G.3. A complete description of activities (i.e., proposed project plan, including purpose and need, surveys, methods, etc.).
- G.4. Dates when the project is proposed to take place.
- G.5. Evidence that Permittee has received any required contracts to complete the activities.
- G.6. Whether all annual reporting requirements have been fulfilled.

You may proceed with only the activities described in your written concurrence letter, upon receipt from the applicable USFWS Field Supervisor. ***Your concurrence letter must be carried with this permit to authorize site-specific activities.***

H. **BAT SPECIES:** Permittee is authorized to take (capture with mist-nets or harp traps, handle, identify, band, radio-tag, collect non-intrusive measurements, enter hibernacula, and release). Permittee shall adhere to the following conditions:

- H.1. Bats may be captured with mist nets following the protocol included in the Range-wide Indiana Bat and Northern Long-eared Bat Survey Guidelines. Guidelines are available at:

<https://fws.gov/media/range-wide-indiana-bat-and-northern-long-eared-bat-survey-guidelines>.

Note: Permittee must use the most up-to-date version of the Summer Survey Guidelines, available on



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RECOVERY

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Effective: 2022-05-20 **Expires:** 2026-12-31

the USFWS website page, for your summer surveys. The monitoring interval for mist nets is +/- 10 minutes and may not exceed 15 minutes. Captured bats may be held for a maximum of 30 minutes, unless injured. In extenuating circumstances, bats shall be held for no longer than 45 minutes.

- H.2. Bats may be captured with harp traps with written concurrence from the Field Supervisor in the state in which trapping is proposed. **Harp traps must be continually monitored.** Captured bats may be held for a maximum of 30 minutes, unless injured. In extenuating circumstances, bats shall be held for no longer than 45 minutes.

At least one named Permittee must remain present at each mist-net and harp trap site while it is being operated.

- H.3. Permittee shall carry out non-intrusive measurements on all captured bats. Data shall be recorded for all bats captured and include, but not be limited to, the data requested in any automated or species-specific data sheet provided by the USFWS (e.g., Bat Reporting Spreadsheet). Handling should be limited to the maximum extent practicable and should cease immediately at signs of undue stress (e.g., bat becoming unresponsive, etc.). Bats that appear stressed from handling should be placed in a dark, quiet location away from activity where it can safely fly away after recovery, and should be checked to ensure successful recovery before leaving the study site. Photographs of the identifying characteristics for each individual federally-listed species captured are encouraged. The Permittee may be requested to provide individual photographs after submittal of annual reporting data.
- H.4. Lipped metal bands having a unique identifier may be applied to the forearm of captured bats prior to release. No more than one band per bat may be used. Bands should be applied to the forearm of captured bats prior to release. Position the band on the wing so that when the bat is hanging upside down, the band numbers are right-side up. A single band should be placed on the right forearm of each male and the left forearm of each female bat.
- H.5. Radio transmitters may be applied during spring, summer, and fall roosting and migration periods via nontoxic skin bond adhesive. The total weight of the transmitter may not exceed 5% of the bat's body weight and the total weight of the package (forearm band, transmitter and adhesive) may not exceed 6% of the bat's body weight. The lightest package (both transmitter and adhesive) capable of accomplishing the required task should be used, especially with pregnant females and newly volant



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juveniles. Bats carrying transmitters must be monitored daily for at least three days, or until the transmitter falls off, whichever occurs first. *Although not required as a condition of this permit, in order to gather needed information to promote the conservation of the northern long-eared bat, it is recommended that the permittee radio-track female and juvenile northern long-eared bats captured when conducting mist-netting and radio-tracking of Indiana bats within the white-nose syndrome (WNS) zone of the range of the northern long-eared bat. Specifics on the number of females and juvenile bats-to be tracked will be determined in coordination with the appropriate Field Office, as specified in Condition G.*

- H.6. No trapping activities shall occur within 20 meters of a known Indiana bat maternity roost site, either natural or artificial roosts, unless Permittee receives prior written approval from the USFWS Field Supervisor for the state in which the activities are proposed to occur.
- H.7. Equipment used to capture and handle bats shall be cleaned and decontaminated, including personal gear such as boots and gloves, using products cited in decontamination guidelines and in compliance with label directions. The most recent decontamination guidance is found on the web at: <https://www.whitenosesyndrome.org/topics/decontamination>.
- H.8. Caves, mines, or other suitable hibernation sites may be quietly searched in a manner that minimizes disturbance by utilizing the minimum number of people and time required to complete the survey. Surveys should not be repeated more often than once every other year in any given hibernaculum that is occupied by endangered or threatened bats. Where hibernacula area and safety conditions allow, individuals entering caves are recommended to utilize night vision goggles or red-filtered light and to remain in the cave no more than 90 minutes to complete the work.
- H.9. You shall immediately remove Ozark big-eared bats (*Corynorhinus townsendii ingens*) and Virginia big-eared bats (*C. t. virginianus*) from the net/trap after capture, then process and release each individual. When there are multiple bats in the net, Ozark big-eared bats (OZBB) and Virginia big-eared bats (VABB) shall be removed first and processed as quickly as possible. If this is not possible, the species shall be placed into a **HOLDING CAGE** and held no longer than 10 minutes. Place the cage in a dark, quiet location, and process all as soon as possible. **Do not put these bat species in holding bags, nor in an individual holding bag or container** (*C. t. ingens* and *C. t. virginianus* are highly social and being held individually in a bag increases stress and can lead to mortality). Holding cage



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options include small rubber/plastic/vinyl coated soft-sided (mesh) pet carriers or modified standard minnow traps with rubber coated mesh where the top of the trap is either a plastic bucket or flower pot with a hole in the center (contact the OZBB or VABB Lead Recovery Biologist for further information on acceptable enclosures -- see Condition U. for contact information). A holding cage shall contain only multiple OZBBs, or only multiple VABBs (avoid overcrowding). Do not place other species/subspecies in either cage(s). Holding cages shall be decontaminated using the most current White-nose Syndrome decontamination guidance after a night of use (<https://www.whitenosesyndrome.org/topics/decontamination>). Do not decontaminate holding cages within a single net night.

When an OZBB or VABB appear to be going into shock (i.e., becomes limp and unresponsive), place the bat in a dark, quiet location either on a rock or other flat surface considered the safest option for the bat in that situation to recover (removed from capture activities and predators) and monitor it periodically. **Do not continue to handle the bat, nor place it in a holding cage or in a holding cage with other OZBBs or VABBs.** If the stressed bat recovers, release it immediately without an attempt to gather additional data, collect samples, apply a band or a transmitter, etc.

H.10. **Wes Cunningham and Lynda Mills** are not authorized to take Ozark big-eared bat (*Corynorhinus townsendii ingens*) and Virginia big-eared bat (*C. t. virginianus*). The USFWS acknowledges that incidental (unintentional) capture of these co-occurring listed bat species may potentially occur while conducting lawful survey activities directed at authorized bat species. Wes Cunningham and Lynda Mills **are not authorized to conduct** any activities for the specific purpose of capture of Ozark or Virginia big-eared bats. Permittee shall be observant and cautious to eliminate or minimize "take" of co-occurring listed species to the maximum extent practicable. In the event of incidental (unintentional) capture of Ozark big-eared bat or Virginia big-eared bat, Permittee shall immediately remove the bat(s) from the net/trap after capture, document with a photograph and release at the capture site. **Do not put these bat species in holding cages, bags, or containers.** Within 48 hours, you must notify the USFWS in the state in which you are working of the incidental capture (see <https://www.fws.gov/service/3-200-59-scientific-purposes-enhancement-propagation-or-survival-permits-recovery-permits>).



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- I. **MUSSEL SPECIES:** Permittee is authorized to take (capture, handle, release, and relocate under special circumstances) mussels by hand via wading, snorkeling, or diving. Permittee shall adhere to the following conditions:
- I.1. Permittee may take (remove from the substrate, by hand, for identification and data collection) mussels via wading, snorkeling, or diving and temporarily hold healthy specimens.
 - I.2. Permittee may temporarily hold specimens in mesh bags, either suspended in the water or held in a container containing river water, while awaiting identification and data collection. Specimens may be held for up to three hours if they are held in the water in bags that allow free movement of water in the river from which the mussels were taken or held in containers of water that is changed every hour [every half-hour when air temperatures are at or above 80° Fahrenheit (F)] and replaced with water freshly taken from the water where the mussels were collected. When practicable, specimens held in containers must remain in the shade. Specimens must be returned to the locality from which they were taken. Live specimens that cannot be identified at the site must be photographed for identification purposes.
 - I.3. Collection of live mussel specimens must be done only when the water temperature is above 40° F. Mussels must be returned by hand to suitable habitat, by divers if necessary. When air temperatures are below 32° F or above 90 ° F, specific details regarding collection and handling activities as well as how mussels should be placed (i.e., reburial instructions) shall be coordinated with the field office(s) where activities are occurring (Condition U).
 - I.4. All live mussels shall be measured (length and height) and, if possible, sexed and aged. No intrusive activities are permitted. Data collected shall include descriptions of external morphometry and reproductive status. All specimens of federally listed species – or a representative sample for each species – must be photographed prior to release.
 - I.5. Capture and relocation shall be authorized under this permit only under special circumstances when listed mussels are anticipated to be harmed by dewatering and/or stranding and only with written approval from the USFWS Field Supervisor for the state(s) in which the activity is proposed and in accordance with the conditions described below. Such specimens may be moved into deeper water at the survey site; to a suitable location near the survey site; or, to an alternative location within the



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same HUC 12 watershed, coordinated with and approved by the appropriate U.S. Fish and Wildlife Field office. Capture and relocation under other circumstances shall be authorized under this permit only in Michigan and requires written approval from the USFWS Field Supervisor in the Michigan Ecological Services Field Office. In Michigan, any relocation would also be conducted in accordance with the Michigan Freshwater Mussel Survey Protocols and Relocation Procedures.

- I.5.a. Take (remove from the substrate by hand) the species via wading, snorkeling or diving.
- I.5.b. For transportation purposes, Permittee may temporarily hold specimens in either river water within aerated holding tanks or in ice chests draped in damp burlap and may move specimens to relocation site(s) as authorized in writing by the U.S. Fish and Wildlife Service Field Office. In all cases, handling and exposure shall be kept to a minimum during relocation effort.
- I.5.c. Specimens shall be measured, photographed, and tagged prior to transporting them to approved relocation sites. Tagging of mussels may be omitted under special circumstances, such as emergency salvage, when time does not allow for adherence to established tagging procedures. The locations for replanting must have a stable substrate and characteristics (temperature and water chemistry) conducive to survival of specimens. Permittee should loosen substrate by hand or with a small tool to a depth of about one-half the length of the mussel. Place the mussel approximately half way into the loosened substrate, near the center of the loosened area, siphon (posterior) end up and pointing upstream.
- I.5.d. Permittee may temporarily hold specimens in mesh bags, either suspended in the water or held in a container containing river water, while awaiting identification and data collection. Specimens may be held for up to 3 hours provided that they are held in the water in bags that allow free movement of water in the water body from which the mussels were taken from or held in buckets containers of water that is changed every hour [every half-hour when air temperatures are at or above 80o Fahrenheit (F)] and replaced with water freshly taken from the water where the mussels were collected. When practicable, specimens held in containers must remain in the shade. Live specimens that cannot be identified at the site must be photographed for identification purposes.



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I.5.e. Collection of live mussel specimens for prior approved relocation must be done only when the air temperature is above 32° Fahrenheit and the water temperature is above 40° Fahrenheit. *Specimens may not be collected and transported to a new location when air temperature is above 90°F.*

I.5.f. Specimens must be returned to a suitable locality. A suitable location for replanting of specimens shall be determined prior to taking mussels from the original site. The location for replanting must have a stable substrate and have characteristics similar to the substrate from which the specimens are collected (and approved by the Michigan Ecological Services Field Office as explained in Condition G.).

I.5.g. The permittee shall obtain, record, and report the geographic coordinates of the specific relocation site(s) using a GPS receiver. In addition to GPS data, the permittee shall describe the general relocation area using unique river or bank identifiers to provide a general location of the site using triangulation. Live mussels must be returned unharmed to the substrate within three hours of collection. Divers should follow the protocol in H.3., above to position the relocated specimens in the substrate by hand.

I.5.h. The USFWS Field Supervisor in the Michigan Ecological Services Field Office will specify in writing whether all listed mussels shall be marked or etched with a unique identifier and will also describe in writing the nature of marking (e.g., shellfish tag vs. etching) to be used. This USFWS field office may convey this in any site-specific authorization provided or in writing separately.

I.6. The shells of all live specimens collected or captured temporarily must be thoroughly inspected for the presence of zebra mussels (*Dreissena polymorpha*). Unionids with zebra mussels attached must be cleaned by scrubbing prior to returning to the substrate. Document the incidence of zebra mussels and Asiatic clams (*Corbicula fluminea*) at project sites.

I.7. Any dead endangered or threatened mussel shells and any specimens accidentally killed or that are moribund or freshly-dead and contain soft tissue are to be preserved according to standard museum practices, properly identified and indexed (collection site, UTM coordinates, site conditions when collected, date collected, and permit authorizing collection). All dead specimens shall be sent to a



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public scientific or educational facility or museum in the state the individuals were collected along with a copy of the permit(s) under which they were collected. All specimens retained under this permit remain the property of the United States Government and must clearly be identified as such.

-

J. FISH SPECIES: Permittee is authorized to take (capture, temporary hold, collect non-intrusive measurements and release) fish. Permittee shall adhere to the following conditions:

- J.1. Permittee may hold specimens for a maximum of 15 minutes for photographic documentation, non-intrusive data collection, and release unharmed at the point of capture.
- J.2. Electrofishing surveys are only authorized by written concurrence of the U.S. Fish and Wildlife Service Field Supervisor for the state in which the activity is proposed.

K. COPPERBELLY WATER SNAKE: Permittee is authorized to take (capture, handle, collect non-intrusive measurements, and release) Copperbelly water snake (*Nerodia erythrogaster neglecta*). The following conditions apply to activities related to presence/absence surveys for Copperbelly water snake:

- K.1. Activities may be conducted by visual searches of habitat to assess habitat quality and to determine presence or absence of Copperbelly water snake.
- K.2. Time searches shall be based on protocol developed and discussed by Bruce Kingsbury (Attachment # 1).
- K.3. Drift fences may also be employed for more quantifiable population estimates.

L. BIG SANDY CRAYFISH: Permittee is authorized to take (capture, handle, and release) Big sandy crayfish (*Cambarus callainus*). The following conditions apply to the activities to survey for the presence/absence of the Big sandy crayfish:

- L.1. USFWS Ecological Services Field Office authorization is required prior to conducting surveys. Permittee must submit survey plan 30 days prior to proposed survey dates.



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- L.2. Surveys shall be conducted following the protocol attached to this permit (Attachment #2), entitled, Big Sandy and Guyandotte River Crayfish Survey Protocol.
- L.3. Permittee may capture Big sandy crayfish using an 8' x 4' seine, with double leads and double floats, and 1/8 inch netting.
- L.4. Big sandy crayfish shall be removed from the net and placed into trolling buckets and retained in the stream until processing. Crayfish specimens must be held out of the water for processing for the shortest time possible, no more than 5 minutes.
- L.5. Non-intrusive measurements, data collection, and photographs may be taken. Standardized data sheets will be provided by the authorizing Ecological Services Field Office and the natural resources agency for the state in which surveys are proposed. All data required by the USFWS and the state shall be collected for any Big sandy crayfish that are captured under the authority of this permit. You must also record location and physical attributes of habitat where discovered, such as substrate, water velocity, riffles, channelization, etc.
- L.6. All Big sandy crayfish shall be released unharmed immediately upstream of capture site.
- L.7. Any discovery of Big sandy crayfish shall be reported to the USFWS West Virginia Field Office (Condition U.12.) within 48 hours.
- M. Upon determination that endangered or threatened species are present at previously undocumented sites, Permittee shall notify the following within 48 hours: the USFWS Regional Recovery Permit Coordinator, the Species Recovery Lead (Condition U.), and the USFWS Field Office within the geographic location of study areas (<https://www.fws.gov/media/region-3-recovery-permit-contact-information>).
- N. Accidental injury or mortality of bats, mussels, fish, or crayfish may not exceed two (2) specimens of any listed species. In the event that any accidental injury or mortality occurs, all activities must cease. The Permittee must report any species mortality or serious injury within 24 hours to the applicable USFWS Field Office in the state in which the incident occurred (contact information provided at: <https://www.fws.gov/media/region-3-recovery-permit-contact-information>). Written notification must also be made within 48 hours to the Midwest Region 3 Recovery Permit Coordinator and the Species Recovery



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Lead (Condition U.). The Permittee's statement must document the cause of the injury or mortality, and identify all remedial measures employed by the Permittee to eliminate future mortality or injury events. Based on consultation between the USFWS offices, decisions will be made regarding remedial measures that will be implemented and whether and/or when any of the authorized activities may continue. The Species Recovery Lead Office will provide a decision within five (5) business days concerning the disposition of any injured or dead specimen. Dead or moribund species may be retained for further study only with the written permission of the USFWS. Any species that are not authorized for retention are to be chilled and promptly transferred to the USFWS Species Recovery Lead for potential necropsy and/or contaminants analysis. Permitted activities may resume upon receipt of written approval from the Species Recovery Lead Office.

- O. No injury or mortality is anticipated or allowed as a result of Copperbelly water snake surveys. In the event that injury or mortality occurs, all activities must cease. The circumstances of any injury or mortality must be reported in writing within 48 hours to the office listed in Condition U.1., the USFWS Ohio Ecological Services Field Office (Condition U.13.), and the nearest USFWS Law Enforcement, Special Agent Office (<https://www.fws.gov/visit-us>). Before you reinitiate studies authorized by this permit, you must receive written authorization from the USFWS Ohio Ecological Services Field Office (Condition U.13.). Dead or moribund specimens may be retained for further study only with the written permission of the USFWS Ohio Ecological Services Field Office. Any specimens that are not authorized for retention are to be chilled and promptly transferred to the USFWS for potential necropsy and/or contaminants analysis (Condition U.14.).
- P. This permit is non-transferable.
- Q. Permittee must carry a copy of this permit at all times when conducting the authorized activities. Shipments of collected biological materials should also be accompanied by a copy of this permit. Note that this permit is limited to the above activities and identified species.
- R. Issuance of this permit does not constitute permission to conduct these activities on National Wildlife Refuges or any other public or private lands; such permission must be obtained separately from the appropriate landowner or land manager before beginning these authorized activities. This permit, neither directly nor by implication, grants the right of trespass.
- S. Upon locating a dead, injured, or sick federally listed species, under circumstances not addressed in this authorization, initial notification must be made immediately to the USFWS Field Office in the State in which the specimen is found (<https://www.fws.gov/media/region-3-recovery-permit-contact-information>).



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Notification should also be made by the next business day to the USFWS Midwest Region 3 Recovery Permit Coordinator identified below. Those offices will confer with the USFWS' Division of Law Enforcement as appropriate and determine next steps. Care should be taken in handling sick, injured, or dead specimens to ensure effective treatment or to preserve biological materials for later analysis. In conjunction with the care of sick or injured endangered or threatened species, and the preservation of biological materials from a dead individual, the finder should take responsible steps to ensure that the site is not unnecessarily disturbed.

T. An Annual Report of all activities conducted under the authority of this permit is due by January 31 following **each year** this permit is in effect. When assisting with netting, the permit number of the individual responsible for each capture should be recorded on the data collection form. Reports shall be sent electronically and your transmittal email must cite your Federal permit number, Permittee name, and the Annual Report year in the subject line (***Note: thumb drives/flash drives and links to documents cannot be accepted***). In addition, copies of all publications and reports resulting from work conducted under this permit must be submitted as they become available. Failure to furnish any reports required by this permit is cause for permit revocation and/or denial of future permit applications. At a minimum, your report shall include:

T.1. A complete discussion of field procedures, data collection methods, results, and conclusions.

T.2. Information on any injuries and/or mortalities and disposition of specimens.

T.3. Copies of any separate reports and/or publications resulting from work conducted under the authority of this permit.

T.4. Copies of all site specific authorization letters required under Condition G.

T.5. A description of locations surveyed where no specimens were encountered.

T.6. Electronic copies of all field data sheets.

T.7. The date, time, geographic locations (state, county, locality, UTM coordinates or GIS data with projection information), species, age, sex, weight (bats), water depth, substrate composition, sedimentation, where specimens were returned (mussels), and any other relevant data for all specimens encountered. We would also appreciate receiving this information for all candidate mussel species encountered.



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- T.8. A complete description of injuries and/or mortalities to listed species while in your possession, the dates of occurrence, any circumstances surrounding the incidents, and a description of any steps taken to reduce the likelihood that such injuries and/or mortalities will occur in the future.
- T.9. The "Bat Reporting Spreadsheet" is required for reporting data and can be found on the FWS Midwest Permits website (<https://www.fws.gov/midwest/endangered/mammals/inba/inbasummersurveyguidance.html>). Prior to reporting, check the permits website to ensure you are using the most up to date form. Using the reporting form will help standardize data collection and increase efficiency in reporting.
- T.10. If applicable, any identification numbers or marks added to live specimens and band numbers of all bats banded.
- T.11. Location and characteristics of roost trees and bat colonies.
- T.12. A completed data collection sheet as found in the Survey Guidelines, cited in Condition H.1.
- T.13. Data shall be submitted for all bats captured and include, but not be limited to, the data requested in any automated or species-specific data sheet provided by the USFWS (e.g., the reporting spreadsheets found on the current Rangewide Indiana Bat Summer Survey Guidelines website cited in Condition H.1., or other species specific data sheets). Photographs of the identifying characteristics for each individual federally listed species captured are encouraged. The Permittee may be requested to provide individual photographs after submittal of annual reporting data.
- T.14. The "3-2523_USFWS Freshwater Mussel Reporting Form" is required for reporting data and can be found on the FWS Midwest Permits website (<https://www.fws.gov/service/3-200-59-scientific-purposes-enhancement-propagation-or-survival-permits-recovery-permits>). Prior to reporting, check the permits website to ensure you are using the most up to date form. Using the reporting form will help standardize data collection and increase efficiency in reporting.



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T.15. The size, estimated age, sex and condition (if determinable) of any listed individuals encountered, and any other data you may have collected for individual naiads, such as evidence of damage or injury, and observations of zebra mussel (*Dreissena polymorpha*) and/or Asiatic clam (*Corbicula fluminea*) infestation.

T.16. Photographs of the identifying characteristics for each individual federally-listed species captured are encouraged, but not required.

IF NO ACTIVITIES OCCURRED OVER THE COURSE OF THE YEAR, INDICATION OF SUCH SHALL BE SUBMITTED AS AN ANNUAL REPORT.

U. Copies of your reports shall be sent to **all offices** indicated below. Your transmittal letter (or email) must cite your Federal permit number, Permittee name, and the Annual Report year in the subject line. Electronic copies shall be submitted in MS Word, Portable Document Format, Rich Text Format, or other file format that is compatible with the receiving office (**thumb drives/flash drives and links to documents cannot be accepted**).

U.1. Regional Recovery Permit Coordinator (Region 3)

U.S. Fish and Wildlife Service
Ecological Services – Endangered Species
5600 American Blvd. W., Suite 990
Bloomington, Minnesota 55437-1458
(612/713-5343; fax 612/713-5292)
permitsR3ES@fws.gov

U.2. Regional Recovery Permit Coordinator (Region 2)

U.S. Fish and Wildlife Service
Endangered Species Permits Office
P.O. Box 1306
Albuquerque, New Mexico 87103-1306
(505/248-6420; fax 505/248-6788)
permitsR2ES@fws.gov



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U.3. Regional Recovery Permit Coordinator (Region 4)

U.S. Fish and Wildlife Service
Endangered Species Permits Office
1875 Century Blvd.
Atlanta, Georgia 30345-3301
(404/679-7097; fax 404/679-7081)
permitsR4ES@fws.gov

U.4. Regional Recovery Permit Coordinator (Region 5)

U.S. Fish and Wildlife Service
Endangered Species Division
300 Westgate Center Drive
Hadley, Massachusetts 01035-9589
(413/253-8212; fax 413/253-8482)
permitsR5ES@fws.gov

U.5. Regional Recovery Permit Coordinator (Region 6)

U.S. Fish and Wildlife Service
Endangered Species Permits Office
Denver Federal Center, P.O. Box 25486
Denver, Colorado 80225-0489
(303/236-4224; fax 303/236-0027)
permitsR6ES@fws.gov

Additionally, based on species, reports and publications shall be submitted to the following:

U.6. ***For any bat species:***

Keith Lott
U.S. Fish and Wildlife Service
Keith_Lott@fws.gov

U.7. ***For studies involving gray bat:***

Vona Kuczynska



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U.S. Fish and Wildlife Service
Missouri Field Office
101 Park DeVille Drive, Suite A
Columbia, Missouri 65203-0007
(573/234-2132; fax 573/234-2181)
vona_kuczynska@fws.gov

U.8. *For studies involving Indiana bat:*

Lori Pruitt
U.S. Fish and Wildlife Service
Indiana Field Office
620 S. Walker Street
Bloomington, Indiana 47403-2121
(812/334-4261; fax 812/334-4273)
lori_pruitt@fws.gov

U.9. *For studies involving northern long-eared bat:*

Jill Utrup
U.S. Fish and Wildlife Service
Minnesota-Wisconsin Field Office
4101 American Blvd. E.
Bloomington, Minnesota 55425-1665
(952/252-0092; fax 952/646-2873)
jill_utrump@fws.gov

U.10. *For studies involving Ozark big-eared bat:*

Richard Stark
U.S. Fish and Wildlife Service
Ozark Plateau National Wildlife Refuge
9014 East 21st Street
Tulsa, Oklahoma 74129
(918/382-4520; fax 918/581-7467)
richard_stark@fws.gov



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U.11. ***For studies involving Virginia big-eared bat:***

Liz Stout

U.S. Fish and Wildlife Service

West Virginia Field Office

6263 Appalachian Highway

Davis, West Virginia 26260

elizabeth_stout@fws.gov

U.12. ***For studies involving Big sandy crayfish:***

West Virginia Field Office

U.S. Fish and Wildlife Service

90 Vance Dr.

Elkins, West Virginia 26241

(304/636-6586)

FW5_WVFO@fws.gov

U.13. ***For studies involving Copperbelly water snake:***

Ohio Ecological Services Field Office

U.S. Fish and Wildlife Service

4625 Morse Rd. Suite 104

Columbus, Ohio 43230

(614/416-8993)

U.14. Additionally, based on geographic area, **reports and publications shall be submitted to** the applicable offices under "For Fish and Wildlife Permit Holders" at: <https://www.fws.gov/media/region-3-recovery-permit-contact-information>.

cc: FWS/Regional Offices – Regions 2, 4, 5, 6 (Attn: Regional Recovery Permit Coordinator)

FWS, TE Coordinator: Illinois-Iowa, Indiana, Michigan, Minnesota-Wisconsin, Missouri, Ohio

DNR/DOC, TE Coordinator: Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, Ohio, Wisconsin

END



United States Department of the Interior

FISH AND WILDLIFE SERVICE

5600 American Boulevard West, Suite 990
Bloomington, Minnesota 55437-1458



IN REPLY REFER TO:

FWS-AES/TE

LIST OF AUTHORIZED INDIVIDUALS

TE38821A-5

Terry VanDeWalle (Principal Officer)

C.1. Individuals authorized to independently conduct activities under this permit:

The following individuals are authorized to conduct scientific research in accordance with all conditions in this permit.

- James Kiser: Authorized to conduct all activities described for all listed bats, fish, freshwater mussels, Copperbelly water snake (*Nerodia erythrogaster neglecta*), and Big Sandy crayfish (*Cambarus callainus*).
- David Saugey, Joseph Johnson, and Lindsay Wight: Authorized for all activities described for all listed bat species.
- Wes Cunningham and Lynda Mills: Authorized for all activities described for gray bat (*Myotis grisescens*), Indiana bat (*Myotis sodalis*), and northern long-eared bat (*Myotis septentrionalis*) only.
- Cody Fleece: Authorized to conduct all activities described for all listed freshwater mussels and fish species, with the exception of Kentucky arrow darter (*Etheostoma spilotum*).
- Daniel Symonds: Authorized to conduct all activities with listed freshwater mussel species, with the exception of Appalachian monkeyface (*Quadrula sparsa*).
- Douglas Stephens: Authorized to conduct all activities described for listed bats, fish, and freshwater mussels, with the exception of Appalachian monkeyface (*Quadrula sparsa*).
- Triston Mullins: Authorized to conduct all activities described for listed freshwater mussels, with the exception of Higgins eye pearlymussel (*Lampsilis higginsii*), Finerayed pigtoe (*Fusconaia cuneolus*), Purple bean (*Villosa perpurpurea*), Rough rabbitsfoot (*Quadrula cylindrica strigillata*), Shiny pigtoe (*Fusconaia cor*), Turgid blossom pearlymussel (*Epioblasma turgidula*), Finelined pocketbook (*Lampsilis altalis*), Cumberland pigtoe (*Pleurobema gibberum*), Cumberland monkeyface pearlymussel (*Quadrula intermedia*), Appalachian monkeyface (*Quadrula sparsa*), and Pale lilliput pearlymussel (*Toxolasma cylindrellus*).

Unnamed trained assistants may conduct activities pursuant to this permit only under the direct and on-site supervision of an above-named individual. "On-site supervision" is defined as having the Permittee at a distance close enough to enable immediate assistance to a supervised individual, as needed, while the supervised individual conducts an authorized activity.

Acting, Chief, Division of Endangered Species
Region 3, U.S. Fish & Wildlife Service

Date

This List of Authorized Individuals (LAI) is valid only when it is dated on or after the permit issuance date. Federal Permit TE38821A-5 will be considered invalid without this LAI.

PROTOCOL FOR COPPERBELLY SURVEYORS

The following guidelines are being distributed to all those working on the surveys for the Copperbelly Water Snake Conservation Agreement, or who are conducting other surveys and wish to follow the same protocol. If there are questions regarding any aspect of this protocol, contact Bruce Kingsbury, Department of Biology, Indiana-Purdue University, Fort Wayne, IN 46805-1499, 219-481-5755 (W), 219-486-6300 (H), (219) 437-6876 (M), kingsbur@ipfw.edu.

Replicate surveys. You have been assigned a set of survey sites, and an approximate order in which to survey them. You must conduct the surveys in the assigned order: other surveyors will be visiting the same sites at other times. Sites that have already been visited will have the general path of the survey determined. However, if you are the first one on the site, you will have the responsibility of defining the path and length of the transect. Check your maps and directions to determine what you need to do. When delineating a transect, keep the following points in mind. The goal for survey duration is two hours, although the survey does not have to be exactly that. Care should be taken to avoid overlapping the same transect line (i.e., going around a wetland and crossing over where you've already been) or flushing snakes, thus risking the potential of counting the same snakes twice. Once a new transect has been delineated, details should immediately be relayed to Bruce Kingsbury for transmittal to other surveyors.

Presence/Absence surveys. P/A surveys are opportunistic in nature, and have no formal structure. Potential areas for these surveys are indicated on some of your maps, but you will very likely see other areas of interest. The main goal of these surveys is to establish if copperbellies or other *Nerodia* (l) are present. We are also particularly curious about other species such as mud snakes (*Farancia*) and cottonmouths (*Agkistrodon*), as these are unusual finds. Scouting out areas and searching under things such as trash or boards can be informative. If you are at a good chunk of habitat and can do a replicate-style survey, use the data form for those surveys. A brief examination of a site does not require strict adherence to filling out all of the details on the data sheet- but if you plan to survey the site for an extended time, the additional information would be useful. If you think that you have found a future replicate survey site, please communicate this right away to Bruce Kingsbury. You should also report opportunistic surveys that produced no copperbellies, as negative information is also useful. Also, please be sensitive to concerns about trespassing.

Surveys will be conducted by traveling the survey path (transect) and counting the snakes seen over a known time and estimated distance. Surveyors should move slowly and cautiously with frequent stops (pauses) of one or more minutes to scan both sides of the transect for snakes. The duration of pauses is left to the discretion of the surveyor, but should be long enough to allow careful examination of the field of view before moving on. An initial suggestion for distance to move between pauses is 10 paces. Transect length will be approximated as accurately as possible using the

corresponding topo map. The time will be recorded at the beginning and end of the transect, as well as each time the habitat type, as defined by the habitat classification below, changes. Habitat classification should default to the more open habitat when a decision must be made between two types. If you are walking along a shrub/scrub vs. palustrine forest boundary, you are surveying shrub/scrub. To minimize the impact of inclement weather, surveys will only be conducted on partly sunny days of at least 70 F, or sunny days between 65-90 F, to maximize chance of seeing the snakes out basking and traveling. Also, as the weather turns hot, observations will be made in early morning and late afternoon to avoid hot temperatures that drive the snakes to cooler microhabitats.

Copperbellies are very mobile and can be found in all sorts of habitat. However, empirical evidence shows that copperbellies prefer 1) the edge habitat between open canopy areas, such as shrub-scrub wetlands, and forest, to bask and rest, and 2) extremely shallow waters (<15 cm (6")), to forage. They do not spend much time in open, deep water (>30 cm), or fast moving water. However, they commonly seen basking on platforms over deep water, and will not hesitate to swim across open water. They are not as easily found in forest, but sometimes can be found at pools of water. Surveyors are most likely to find stationary snakes basking on horizontal surfaces just above the water, such as on nearly sunken logs or branches, or a little higher on living branches of bushes such as buttonbush (*Cephalanthus occidentalis*). Foraging snakes may be seen cruising shorelines. Ripples on the water's surface may also indicate the presence of a foraging or traveling snake, and should be investigated.

Equipment. Surveyors should always bring binoculars and use them. They are vital for examining complex habitats such as brush, and for properly identifying snakes to species. A watch is needed for timing transects. If you are marking a new transect, you will need flagging tape and markers. A compass is also handy, especially for the directionally challenged. A thermometer is needed as well, and we can provide one for you if needed. Surveyors will need to consider footwear. Hip or chest waders may keep you dry, but are tiring to wear for any length of time, and can get hot. Pull-on farm boots work okay unless there is any flooding. Once the water has warmed, I just go ahead and get wet, wearing "Army" boots to protect my feet. Use pencil to keep your notes- pen will smear and run if it gets wet, erasing your data. Ziplock bags are good for keeping things dry.

Data Sheet Explanation

At the top of the data sheet, *Date*, *Site ID Code & Name* (provided for you), *Surveyors*, and *Weather Summary (Beg.)* comments are filled out prior to beginning the survey. *Start* time is entered when the survey actually begins. *Finish* time is entered when the survey is suspended. Times should be recorded in military time (1200 is 12 noon, 1400 is 2PM). *Weather Summary (End)* is for indicating what things are like when you stop.

Initial and final temperatures should be taken in the sun, shade, and water. The sun (in nearest opening in canopy) and shade (under nearest canopy) temperatures should be taken at waist height with no direct light hitting the instrument (use your body or hand to block light from striking the thermometer bulb). Water temperatures should be taken approximately 5 cm below the surface. Keep in mind that a wet bulb will give a cooler temperature than a dry bulb. Substantive changes in the weather should be indicated on data rows between observations.

Transect length is the best estimate of the transect length based on your route and the scale on your map. Length should be recorded in kilometers. *Travel method* would be foot or boat. Additionally, a line is provided to *summarize* your observations: number of each species observed.

Data: The codes for data entries are described in the survey code descriptions provided below. The last column (*Comm*) is for a reference number for additional comments in the space at the bottom of the page. Additional comments could also be made on the back. Surveyor comments will be used to help establish habitat extent and quality throughout the range of the snake, so surveyors are encouraged to make note of their surroundings (including apparent condition of water). You might also comment on directions to the site. Weather comments would include cloud cover, wind, etc. In the field, comments can also be inserted on the data row(s) beneath the relevant observation. If habitat changes during the length of the transect, times and lengths of subtransects should be recorded by habitat. *Time* is when you start a new habitat classification, *elapsed time* is the total time surveying that habitat. *Species* of snake is coded: at least all *Nerodia* should be included. *Age* is the apparent age class of the snake. *Behavior* is the activity of the snake at time of observation.

Three distances are recorded: *Trans* is the distance from the transect line to the snake (perpendicular distance to you). *Shore* is the distance the snake is from shore (distance to shore will be negative for terrestrial observations). A range-finder is useful here, and we can provide you with one if you request it. Since the transect line may be the shore in a shoreline survey, *Trans* and *Shore* may be the same value. *Vertical* is the distance above the substrate. All measurements should be in meters, not yards.

Habitat and *Microhabitat* are coded as indicated in the attached habitat classification (based on a simplification of Cowardin et al.'s wetland classification system). Code should be strictly adhered to, and deviation from the code should be well-documented with comments. *In sun* asks whether or not the snake is in direct sunlight (Y/N).

Final comments: pursuit of individual snakes may not only be illegal for some surveyors, but will also disrupt the continuity of the survey. Snakes should be approached only to the extent that species identification is certain. Lastly, if you have any suggestions for improvement of the survey, feel free to let me know.

SURVEY CODE DESCRIPTIONS

Habitats

This classification was designed to be suitable for studying habitat use by the copperbelly water snake. It is intended to be relatively compatible with the National Wetlands Inventory (NWI) classification developed by Cowardin et al. (1979). Habitat is a large-scale measure: if a habitat area cannot be mapped discretely on a topographic map, it should be incorporated into a neighboring habitat type.

SYSTEM	SUBSYSTEM	CODE	DESCRIPTION
<i>Aquatic Habitats</i>			
Palustrine- shallow (0<2m) water wetlands without extensive open water: vegetated with some trees, shrubs, or emergent vegetation			
	Forested	PF	-floodplain forest, with greater than 30% canopy cover by trees
	Scrub-shrub	PS	-shrub-scrub cover exceeds 30%, but tree cover does not
	Emergent	PE	-emergent vegetation present (cats, etc.) but not enough shrubs to be PS
	Open water	PO	-open water of palustrine system

Note: moist soil units should be commented as such, but would be classified as PE or PO.

Lacustrine- deep water (>2m) wetlands such as large ponds and lakes, lacking emergent vegetation except near shore. The limnetic (deep water) portion of a lacustrine system is termed as LD, while the littoral zone (shoreline zone) will follow the palustrine subsystem, substituting L for P: LF, LS, LE, LO.

Riverine- flowing water all or part of the year. Pooled water in partially dried river is still riverine.			
	Lower perennial	RL	- slow moving stream- muddy or silty bottom, water usually present
	Upper perennial	RU	- faster flowing stream- rocky or cobbly bottom, water usually present
	Intermittent	RI	- only temporarily running

Upland Classification

Just in case you find yourself with dry feet...

Forest-	UF	- greater than 30% canopy cover by trees, elevated above any potential flooding by sloping topography
Scrub-Shrub	US	-not forest, but >30% cover by shrubs such as berry bushes, willows, crab-apples and hawthorns.
Oldfield	OF	-fallow fields well-covered with herbaceous or grassy cover. CRP lands would often be included here.

Agricultural-Is highly disturbed, and includes activities such as farming, substantial grazing, and repeatedly mowed areas

Crops	AC	-farm fields, croplands
Grazed	AG	-grazed or mowed areas

Residential	RS	-all space used for living by people
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Microhabitat Classification

Microhabitat classification is somewhat similar to habitat, but on a smaller scale. Its use as a category allows the specific position (substrate) of the animal to vary to some degree from its general surroundings.

Shrub	-up in a bush
Tree	-up in a tree
Grass	-in a patch of grass
Rock	-on a rock or rocks
Log	-on a log
Herbaceous	-in a patch of herbs
Water	-in the water
Barren (soil)	-on bare soil
Island	-on a small hummock
Detritus	-on leafy debris, such as leaves

Behavioral Classification

Basking	-at rest in sunny location
Resting	-resting in non-basking position
Courting	-male pursuing female, female, being pursued by male
Mating	-actually copulating (much less likely than courting)
Foraging	-moving slowly and methodically through shallow water or on shore
Traveling	-moving continuously in linear path, with little investigative behavior along the way
Unknown	-behavior ambiguous or snake disturbed before behavior observed: <i>something that happens all the time!</i>

Miscellaneous

Species- N- copperbelly (*N.e. neglecta*), D- diamondback (*N. rhombifera*), M- midland (*N. sipedon*), Y- yellowbelly water snake (*N. e. flavigaster*), F- mud snake (*Farancia abacura*), A- cottonmouth (*Agkistrodon piscivorus*), U-unknown

Canopy- Tree and shrub canopy cover in the general vicinity of the snake (ca. within 10 m radius) should be characterized as:
1=sparse: little or no cover,
2=moderate: forest margin or broken canopy as at treefall or in select cut woods,
3=complete: complete or nearly complete.

Age- Three categories:
Y=juvenile: young of the year, retaining juvenile striped color pattern;
S=subadult: adult coloration, or nearly so, but not yet having attained lg. adult body size;
A=adult: large-bodied, classic copperbelly coloration.

Big Sandy and Guyandotte River Crayfish Survey Protocol

Project-specific survey plans shall be coordinated with and approved by the U.S. Fish and Wildlife Service (USFWS) at the address below prior to conducting any surveys within potential habitat for the Big Sandy crayfish (*Cambarus callainus*) or the Guyandotte River crayfish (*C. veteranus*). Survey plans should be submitted at least 30 days prior to the proposed start of surveys. When surveys are conducted to evaluate whether a proposed project may affect the species, surveys should be conducted early in project planning so that project modifications can be made to avoid and minimize project effects. Surveyors must have a valid Scientific Collecting Permit from the West Virginia Division of Natural Resources (WVDNR) prior to conducting the work.

Surveys are not permitted from July 20 through September 10 due to egg extrusion and rearing of juveniles by females. Surveys must be conducted when water conditions/temperatures are conducive to detecting *C. callainus*/*C. veteranus*. Water temperature must be above 50° F/ 10° C and surveys cannot be completed for 72 hours after a precipitation greater than 0.5in/1.3cm to ensure clear water and that suitable sampling conditions are present.

Surveys should be conducted throughout the entire reach of stream that may be affected by a potential project; total upstream and downstream distance to be sampled from the point of direct impact will be determined for each project by the USFWS. Once the survey area has been delineated, the area should be divided into sampling reaches and each reach sampled following the approved protocol.

Each sampling reach should be approximately 125 meters (m) in length and include at least one riffle, run, or both riffle and run habitats. Crayfish sampling shall be performed using an 8'x4' seine, with double leads and double floats, and 1/8" netting. Sampling shall be performed by hauling a seine at a minimum of 10 locations within the 125m stream reach. Seine hauls will be completed by overturning every slab boulder (rocks approximately 1m wide x 1m long; 5cm

high) present per 2m linear upstream/downstream distance in riffles and runs. One to two slab boulders can be sampled per seine haul.

Seine hauls should be completed with at minimum a two-person team using the seine. One crew member will hold both handles/brails, with the seine spread approximately 2m in width. Handles should be held at a 40°-50° angle from the stream surface. The other crew members should ensure that the seines lead line is making contact with the stream substrate and that the lead line is not resting on substrate items that are planned to be sampled in the ensuing haul. Once these conditions are met, surveyors charged with flipping substrate items should do so quickly and assertively. When each substrate item is overturned, the surveyor should kick in the direction of the seine over the area of stream substrate uncovered by moving rocks being sampled.

Slab boulders should always be given sampling priority given *C. callainus*/*C. veteranus* association with them. If a sampling reach does not contain sufficient slab boulders, the following substrate features should be given sampling priority in the following order of importance: boulders, large cobble, coarse woody debris, and artificial cover. All substrate items should be placed back in their original position immediately following the seine hauls in which they were dislodged from the substrate.

At the end of each haul, surveyors must ensure that the lead line is removed from the water prior to the float line so all captured organisms remain in the net bellows and are not dumped back into the stream following sampling. At this time, crayfishes should be removed from the net and placed into trolling buckets. All substrate items should be placed back in their original position immediately following the seine hauls in which they were dislodged from the substrate.

All crayfishes collected shall be housed temporarily in trolling bait buckets that do not leave the stream proper until processing begins. No more than five adult *C. callainus*/*C. veteranus* are to be housed in one bucket at one time; multiple buckets are suggested. Buckets are to be anchored in the stream or attached to collectors during active sampling.

Data must be recorded on the standardized datasheets provided with your collecting permit. A minimum of ten seine hauls per sampling reach is required; the total number of seine hauls employed at a reach shall be recorded as well as the total number of crayfish collected of each species per seine haul. Electric fishing gear should never be used at potential *C. callainus* and *C.*

veteranus sites. Electric fishing gear is not considered efficient gear for the collection of stream crayfishes.

When sampling is completed, collectors are required to identify all captured crayfish to species, sex all captured crayfish (Form I, Form II, Female, Female Glair, Female-Ovig, Female-Attached Juveniles), and record total carapace length (TCL) in millimeters for each *C. callainus*/*C. veteranus* encountered using calipers. Data shall be recorded on the standardized WVDNR Crayfish Morphometric Datasheet. A photographic voucher is required for all *C. callainus*/*C. veteranus* captured prior to release; representatives of other crayfish species should also be photographed. Every effort should be undertaken to ensure animals are outside of water for the briefest period of time possible (5 minute maximum, but a shorter period is preferred). Following data collection, animals are to be returned to the stream bottom upstream of their home rocks and guided back to their rock or other substrate debris.

Collection of water quality and physical habitat metrics are required at each collection locale. At each sampling site, pH, temperature, percent dissolved oxygen, turbidity, and conductivity are to be measured. In addition to water quality, physical habitat will be evaluated through completion of a Qualitative Habitat Evaluation Index (QHEI; OEPA 2006).

If any *C. callainus* or *C. veteranus* are captured, the WVDNR and USFWS shall be notified within 48 hours of collection via a reporting spreadsheet provided by the WVDNR. Written reports of all survey efforts shall be provided to the WVDNR and USFWS and shall include, at a minimum, information on the survey dates and water conditions, who conducted the survey, the methods used, survey results including results per seine haul, photographs of *C. callainus* or *C. veteranus* specimens and of the survey area, and all water quality and QHEI data gathered.

Agency Contact Information:

West Virginia Division of Natural Resources, PO Box 67, Elkins, WV 26241

(304) 637-0245

U.S. Fish and Wildlife Service, West Virginia Field Office, 90 Vance Drive, Elkins WV 26241

(304) 636-6586

September 2, 2022

David Pelren

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Reference: Proposed Study Plan, Mussel Survey for the Proposed East Tennessee Ridgeline Pipeline Project-

ATTACHMENT C

Key Personnel

CURRICULUM VITAE

Don W. Hubbs

Mollusk Recovery Coordinator
Tennessee Wildlife Resources Agency
Office: 3905 Hwy 641 South
Post Office Box 70, Camden, TN 38320
(731) 441-1941 Tnmussels@aol.com

ACADEMIC PREPARATION:

M.S. in Biology, 1988, Tennessee Technological University

Concentrations: Fisheries Science, Environmental Science

Thesis: *Assessment of Spawning Habitat of Lake Trout (Salvelinus namaycush) and Muskellunge (Esox masquinongy) in Dale Hollow Reservoir*

Advisor: Dr. R. Don Estes

Dr. David Stansbery, Ohio State University Museum - Malacology course taught at Tennessee Tech Aqua Field Station July 1987

B.S. in Wildlife Management, 1986, Tennessee Technological University

Concentrations: Wildlife and Fisheries Management

Minor: French

RESEARCH SKILLS and CERTIFICATIONS:

- Aquatic habitat survey and evaluation techniques
- Scientific Diver Certified, 2013 Scuba Educators International
- DRAM Certified (Dive Rescue and Accident Management), 2012, Scuba Educators International
- SCUBA Diver Certified, Advanced Open Water, Search and Recovery, 1999, NASE
- SCUBA Diver Certified, Open Water I, 1992, NAUI
- American Heart Association Basic Life Saver, CPR & AED and O2 admin. 1995-2019
- Experienced surveyor of fish populations employing entanglement and electro-fishing gear
- Experienced operator of boats of various types and sizes

- Experienced surveyor of freshwater mussel populations in small streams to large rivers and reservoirs
- Design and implementation of mussel propagation techniques and systems

PROFESSIONAL EXPERIENCE:

Wildlife Biologist 3, 1992- February 2020, Fisheries and Environmental Services Divisions, Tennessee Wildlife Resources Agency Nashville, TN. Freshwater mussel recovery program coordinator responsible for data collection and analysis, report preparation, management recommendations, and strategic planning process of Tennessee's freshwater mussel resources. Coordinated TWRA's annual mussel restoration activities that began in 2004, and in the last 12 years, supervised the stocking of ~60,000 mussels of 35 species including 11 federal endangered mussel species into 11 rivers at 20 different sites. Additional duties include monitoring of mussel populations, research and survey design, proposal development and execution to achieve strategic plan objectives concerning freshwater mussels. Serve as a member and chairman of TWRA's scientific dive team, experienced in underwater diving in rivers and reservoirs where water depths and/or velocities preclude hand collecting. SCUBA and surface supplied air systems are used to perform freshwater mussel surveys and aquatic habitat evaluations in water depths of one to twenty-five meters. A variety of equipment is used to assure safety and efficiency during sampling including: two-way radio communication between diver and support craft, diver tending lines, and sampling transect lines. Participate in various fishery research projects along with other statewide fish research biologists.

Senior Staff Scientist/Geographic Information System Manager, 1988-1992 Young-Morgan & Associates/Woodward & Clyde Consultants, Franklin, TN. Project Manager of endangered freshwater mussel surveys in Tennessee and Virginia associated with the TVA Duck River Columbia Dam project. Additional responsibilities included: completing benthic, mussel and fish population surveys and data analysis from Superfund, RI/FS, CERCLA and monitoring sites in Virginia, Iowa, Indiana, Tennessee, Kentucky, South Carolina, Louisiana and New York. Managed pcARC/INFO geographic information system (GIS) production of digital map databases for habitat modeling, land use analysis, fish movement studies, and contaminant monitoring.

Research Assistant. 1986-1988. Tennessee Technological University Cooperative Fishery Research Unit, Cookeville, TN.

- Developed geographic information system model of fish spawning habitat in Dale Hollow Reservoir
- Assisted fellow students collecting data on stream, river and reservoir fishery evaluation surveys

Fisheries Intern. Tennessee Valley Authority (TVA) Land Between the Lakes Golden Pond, KY. Summer 1985.

- Conducted channel catfish (*Ictalurus punctulatus*) cage culture demonstration project
- Assisted fishery biologists with pond seine surveys, reservoir rotenone surveys
- Assisted graduate student with collection of paddlefish (*Polydon spatula*) for age and growth analysis

PUBLICATIONS:

Otter RR, McKinney D, Brown B, Lainer S, Monroe W, Hubbs D, Read B.

Bioaccumulation of metals in three freshwater mussel species exposed in situ during and after dredging at a coal ash spill site (Tennessee Valley Authority Kingston Fossil Plant).

Environ Monit. Assess. 2015 Jun; 187(6):334. doi: 10.1007/s10661-015-4578-3. Epub 2015 May 9.

Jones, J., S. Ahlstedt, B. Ostby, B. Beaty, M. Pinder, N. Eckert, R. Butler, D. Hubbs, C. Walker, S. Hanlon, J. Schmerfeld, and R. Neves. 2014. **Clinch River freshwater mussels upstream of Norris Reservoir, Tennessee and Virginia: A quantitative assessment from 2004 to 2009.** Journal of the American Water Resources Association 50(4):820-836

Bettoli, P.W., G.D. Scholten and D. W. Hubbs. 2010. **Anchoring Submersible Ultrasonic Receivers in River Channels with Stable Substrate.** *North American Journal of Fisheries Management* 2010; 30: 989-992 doi: 10.1577/M10-015.1

Jones, J.W., R.J. Neves, S.A. Ahlstedt, D.W. Hubbs, and M. Johnson, H. Dan and B.J.K. Ostby. 2009. **Life History and Demographics of the Endangered Birdwing Pearlymussel (*Lemiox rimosus*) (*Bivalvia: Unionidae*).** *The American Midland Naturalist* 163:335-350.

D.W. Hubbs, D. McKinney, D. Sims, S. Lanier and P. Black. 2006. **Aggregate Extraction Impacts on Unionid Mussel Species Richness and Density.** *Proc. Annu. Conf. Southeast. Assoc. Fish and Wildl. Agencies* 60:169–173.

Ahlstedt S. A., S. Bakaletz, M. T. Fagg, D.W. Hubbs, M. W. Treece, and R. S. Butler. 2004. **Current status of freshwater mussels (*Bivalvia: Unionidae*) in the Big South Fork National River Recreation Area of the Cumberland River and Recreation Area of the Cumberland River, Tennessee and Kentucky (1999–2002). Evidence of faunal recovery.** 2003–2004, *Walkerana* 14(31): 33–77.

Ahlstedt, S. A., J. R. Powell, R. S. Butler, M. T. Fagg, D.W. Hubbs, S. F. Novak, S. R. Palmer, and P. D. Johnson. 2004. **Historical and current examination of freshwater mussels (Bivalvia: Margaritiferidae, Unionidae) in the Duck River basin Tennessee.** Final Report: Tennessee Wildlife Resources Agency, Nashville, TN. Contract No.: FA-02-14725-00. 213p.

Ahlstedt, S. A., J. R. Powell, D. W. Hubbs, and D. Sims. 2002. **Assessment of freshwater mussels in the Harpeth and East Fork Stones River, Tennessee.** Final Report: Tennessee Wildlife Resources Agency, Nashville TN and U.S. Fish and Wildlife Service, Asheville, NC. 7p.

D. W. Hubbs. 1998. **Augmentation of natural reproduction by freshwater mussels to sustain shell harvests.** Pages 49-51 in Tankersley, R.A., D.I. Warmolts, G.T. Watters, B.J. Armitage, P.D. Johnson, and R.S. Butler (editors). © 2000. Freshwater Mollusk Symposia Proceedings. Ohio Biological Survey, Columbus, Ohio. xxi + 274.

RESEARCH SUBMITTED IN PREPARATION AND RECENT REPORTS:

Inherent variability in the freshwater mussel *Fusconaia ebena*: A reference site meta-analysis

Ryan R. Otter¹, Amber Hills¹, David M Simms², Susan Lainer², Don Hubbs², David McKinney². ¹Department of Biology, Middle Tennessee State University, Murfreesboro TN USA. ²Tennessee Wildlife Resources Agency, Nashville TN USA.

2019 TWRA Annual Mussel Recovery Activity Report for Project 7775. D Hubbs. Tennessee Wildlife Resources Agency, Nashville TN USA.

2019 Clinch River Dive Survey for Federal and State Protected Mussel Species. United States Fish & Wildlife Service Asheville, NC Field Office Grant Award F18AP00734. Tennessee Wildlife Resources Agency, Nashville TN USA.

2018 TWRA Annual Mussel Recovery Activity Report for Project 7775. D Hubbs. Tennessee Wildlife Resources Agency, Nashville TN USA.

2017 TWRA Annual Mussel Recovery Activity Report for Project 7775. D Hubbs. Tennessee Wildlife Resources Agency, Nashville TN USA.

2016 TWRA Annual Mussel Recovery Activity Report for Project 7775. D Hubbs. Tennessee Wildlife Resources Agency, Nashville TN USA.

2015 Duck River Quantitative Mussel Survey. D Hubbs. Tennessee Wildlife Resources Agency, Nashville TN USA.

CURRENT RESEARCH INTERESTS:

Design, setup, and operation of freshwater mussel propagation facilities
Stocking and translocation as conservation techniques for freshwater mussels

Freshwater mussel population survey and monitoring

PROFESSIONAL MEMBERSHIPS:

Mississippi Interstate Cooperative Resource Association

Freshwater Mollusk Conservation Society, founding member (1998)

American Fisheries Society, Tennessee Chapter

Divers Alert Network

PROFESSIONAL SERVICE:

Chair (since 2001) Native Mussel Committee, Mississippi Interstate Cooperative Resource Association

Chair (since 2012) TWRA Scientific Dive Control Board

Chair (since 2011) Tennessee Endangered Mollusk Committee

Past President (2007) Tennessee Chapter American Fisheries Society

James Kiser

Senior Environmental Scientist
32 years of experience · Louisville, Kentucky

James has more than 3 decades of ecological and environmental services experience. He has conducted numerous endangered species surveys and habitat assessments throughout the eastern United States. He understands how the Endangered Species Act (ESA) is implemented and how to streamline the process while maintaining integrity and insuring protection of listed species. He has completed both informal and formal consultation with the US Fish and Wildlife Service on projects involving Indiana bats, gray bats, Virginia big-eared bats, and endangered freshwater mussels. He has published several papers and presented oral papers at scientific meetings on small mammals and bats. James is proficient in the use of various field techniques (e.g., Anabat II echolocation detectors, mist net and harp trap surveys, radio telemetry, hibernacula surveys, bat banding, emergence counts, and habitat analysis) to investigate the presence, distribution, and habitat use of endangered bats. He has also conducted freshwater mussel surveys in both deep water and wadeable aquatic habitats. Since 1990, James has focused much of his time conducting surveys for the federally endangered Indiana bat. These efforts have been extensive, resulting in more than 1,000 nights of mist netting in 16 eastern and midwestern states. Much of this effort was for ESA compliance on development projects. In recent years he has also conducted many freshwater mussel surveys in some of North America's best remaining rivers, including the Green, Licking, Ohio, and Tennessee rivers in Kentucky; Clinch and Powell rivers in Tennessee and Virginia; and Stillwater and Ohio rivers in Ohio.

EDUCATION

MS, Biology, Coursework Completed, Eastern Kentucky University, Richmond, Kentucky, 1995

BS, Biology, Morehead State University, Morehead, Kentucky, 1992

CERTIFICATIONS & TRAINING

West Virginia Approved Mussel Surveyor, West Virginia Department of Natural Resources, Various Locations, 2012

TE38821A-1, Federal Bat & Mussel Permit, United States Fish & Wildlife Service, Kentucky, 2014

PROJECT EXPERIENCE

AQUATIC ECOLOGY

Freshwater Mussel Survey on Green River at Rush Island Watershed and Wildlife Conservation Area | Hart County, Kentucky | Aquatic Biologist

During the autumn of 2015, James conducted a freshwater mussel survey for Kentucky Division of Water along a 1-mile section of the Green River, Hart County, Kentucky. The purpose of this survey was to inventory all species of mussel occurring within this section of river with an emphasis on endangered species. James was responsible for preparing and coordinating a survey plan with state and federal agencies, locating and identifying mussels, and reviewing the final report. He along with fellow biologists found more than 750 mussels in two days of effort, representing 28 species. These mussels included the endangered fanshell (*Cyprogenia stegaria*) and sheepnose (*Plethobasus cyphus*).

Freshwater Mussel Rescue for the West Milton Dam Removal | Stillwater River, Miami County, Ohio | Aquatic Biologist

During the autumn of 2014, James conducted a freshwater mussel rescue on the Stillwater River during the removal of the West Milton Dam, Miami County, Ohio. James was responsible for leading a team, rescuing and identifying stranded freshwater mussels that were left in shallow water, on drying gravel/sand bars and mud flats in the Stillwater River as the dam was being removed. He found 10 of the 15 live federally endangered snuffbox (*Epioblasma triquetra*) mussels, and was responsible for temporarily stopping construction once the number of mussels allowed by the "Incidental Take Statement" outlined in the Biological Opinion was obtained. James helped collect, identify and relocate approximately 3,000 freshwater mussels, representing 15 species during this two week long effort.

Endangered Mussel Survey – Ellick Road Improvement Project | East Fork Little Miami River, Batavia, Ohio | Aquatic Biologist

In preparation for a proposed road improvement and river bank stabilization project on the East Fork Little Miami River in Batavia, Ohio, the USFWS and Ohio Department of Natural Resources requested a freshwater mussel survey to determine the presence/probable absence of the Federal endangered mussel, the rayed bean (*Villosa fabalis*). James implemented the Ohio Mussel Survey Protocols (dated May 2013) and utilized viewing scopes, snorkeling, and SCUBA to successfully complete the survey. Surveying efforts documented approximately 20 live mussels. No protected species were found.

Freshwater Mussel Rescue for the Main Street Dam Removal | Scioto River, Columbus, Ohio | Aquatic Biologist

During the autumn of 2013, James conducted a freshwater mussel rescue on the Scioto River and Olentangy River during the removal of the Main Street Dam, Columbus, Ohio. James was responsible for leading a team, rescuing and identifying stranded freshwater mussels that were left in shallow water, on drying sand bars and mud flats in the Scioto and Olentangy Rivers as the dam was being removed. James helped collect, identify and relocate approximately 8,000+ freshwater mussels during this two week long effort.

Freshwater Mussel Rescue for the 5th Avenue Dam Removal | Olentangy River, Columbus, Ohio | Aquatic Biologist

During the summer of 2012, James conducted a freshwater mussel rescue on the 5th Avenue dam removal, Olentangy River, Columbus, Ohio. James was responsible for rescuing and identifying stranded freshwater mussels that were left in shallow water, on drying sand bars and mud flats in the Olentangy River as the 5th Avenue dam was being removed. James helped collect, identify and relocate approximately 6,000+ freshwater mussels during this week-long effort.

Endangered Mussel Survey – Indian Creek Stream Restoration & Bank Stabilization Project | Butler County, Ohio | Aquatic Biologist

In preparation for a proposed stream restoration & bank stabilization project on Indian Creek, Butler County, Ohio, the USFWS and Ohio Department of Natural Resources requested a freshwater mussel survey to determine the presence/probable absence of the federally endangered mussel, the rayed bean (*Villosa fabalis*). James implemented the West Virginia Mussel Survey Protocol and utilized viewing scopes to successfully complete the survey. Surveying efforts documented no live mussels and found the substrates and streambanks to be very unstable, preventing the colonization of freshwater mussels.

Endangered Mussel Survey – 3rd Street Bridge Project | Great Miami River, Dayton, Ohio | Aquatic Biologist

In preparation for a proposed bridge project on the Great Miami River in Dayton, Ohio, the USFWS and Ohio Department of Natural Resources requested a freshwater mussel survey to determine the presence/probable absence of three federally endangered mussels, the snuffbox (*Epioblasma triquetra*), the clubshell (*Pleurobema clava*) and the rayed bean (*Villosa fabalis*). James implemented the Ohio Mussel Survey Protocols (dated May 2013) and utilized viewing scopes and SCUBA to successfully complete the survey. Surveying efforts documented only one live mussel and identified seven species from relic shells. No protected species were found.

U.S. Route 25 McBean Creek Mussel Survey* | Georgia | 1995

James assisted another biologist with freshwater mussel surveys on McBean, Walnut, and Spirit creeks to determine the presence/probable absence of rare mussels, including the green floater (*Lasmigona subviridis*) and Atlantic pigtoe (*Fusconaia masoni*), so high-way improvements could be completed on U.S. Route 25 between Hephzibah and Waynesboro, Georgia. He used both visual and tactile methods to locate freshwater mussels within the three streams. Mussels were found in all three streams with the greatest diversity (4 species) and greatest abundance (1,188 mussels/5.25 man-hours of effort) documented in McBean Creek.

Industrial Parkway East Fork Little Sandy River Mussel Survey* | Boyd, Carter, and Greenup Counties, Kentucky | 1997

While completing field investigations for preparation of a terrestrial and aquatic ecological impact assessment for the proposed Industrial Parkway from Interstate 64 to U.S. Route 23, James conducted freshwater mussel surveys on East Fork Little Sandy River. Survey efforts documented two extensive mussel beds, each containing fatmucket (*Lampsilis siliquodea*), fragile papershell (*Leptodea fragilis*), mapleleaf (*Quadrula quadrula*), pink heelsplitter (*Potamilus alatus*), Wabash pigtoe (*Fusconaia flava*), plain pocketbook (*Lampsilis cardium*), and pimpleback (*Quadrula pustulosa*).

Jackson County Lake Project Endangered Mussel Survey* | Jackson County, Kentucky | 1998

James along with two other biologists completed field investigations for endangered Cumberlandian mussels along 1.3 miles of Laurel Creek, a tributary to Rockcastle River. He utilized both viewing buckets (scopes) and snorkeling to complete the survey. The survey found more than 100 live mussels, representing eight species. Four live Cumberland bean pearly mussels (*Villosa trabalis*), a federally endangered species, were found in the middle section of proposed impoundment. Additional species located included slippershell mussel (*Alasmidonta viridis*), spike (*Elliptio dilatata*), plain pocketbook (*Lampsilis cardium*), wavyrayed lampmussel (*Lampsilis fasciola*), kidneyshell (*Ptychobranhus fasciolaris*), rainbow (*Villosa iris*), and painted creekshell (*Villosa taeniata*).

Pennington Gap Waterline Extension Mussel Survey* | Powell River,, Virginia | 2004

James was contracted by Gress Engineering to conduct a freshwater mussel habitat assessment and survey on the North Fork Powell River between Reed Creek and Rocklick Branch, near Purcell, Lee County, Virginia. Survey efforts were restricted to 100 meter section of river near the three proposed waterline crossings as directed by Mr. Mike Pinder of Virginia Department Game and Inland Fisheries. James utilized snorkeling and viewing buckets to assess freshwater mussel populations within and adjacent to the proposed crossings. No freshwater mussels (live, fresh dead, or subfossil) were found during this survey. He assisted Gress Engineering with the preparation of the final report, which was submitted to State agencies.

Harold Keene Coal Preparation Plant Clinch River Mussel Survey* | Gardner, Virginia | 2004

James was contracted by Gress Engineering to conduct a freshwater mussel survey on the Clinch River between Swords Creek and Little River to assess the effects of a black-water spill on the local fauna. He followed methodologies suggested by Mr. Brian Watson of Virginia Department Game and Inland Fisheries to survey the freshwater mussel communities. SCUBA and snorkeling efforts found live individuals of six non-listed mussel species and found no evidence that the black-water spill caused a mussel kill below the discharge point. James compared data from this survey to those collected by Steve Ahlstedt in 1984 and found the data to be very similar. He assisted Gress Engineering with the preparation of the final report, which was submitted to State agencies.

Daniel Boone National Forest's Jellico Creek Dispersed Campsites Biological Evaluation Mussel Survey* | Kentucky | 2005

While completing field investigations to prepare a Biological Evaluation so the U.S. Forest Service improved several dispersed campsites along the Jellico River, James located an unknown population of federally endangered mussel, the Cumberland elktoe (*Alasmidonta atropurpurea*), within the river at the project site. Upon inserting stringent sediment and erosion guidelines within the project plans, he was able to obtain a "May Affect – not likely to adversely affect" determination from the U.S. Fish and Wildlife Service for the project.

U.S. Route 60 Tennessee River Bridge Mussel Relocation | McCracken and Livingston Counties, Kentucky | 2006

James reinitiated formal consultation with the U.S. Fish and Wildlife Service to amend the construction activities for the U.S. Route 60 bridge over the Tennessee River. The presence of large concentration of freshwater mussels in this section of river required him to prepare a biological assessment, a mussel relocation/salvage plan, and to implement the recovery phase of the project. Along with a team of Stantec certified divers, James salvaged, identified, and relocated 148 freshwater mussels from a small area along the western shore of the river. He also transported two species back to Kentucky Department of Fish and Wildlife Resources Freshwater Mussel Propagation Center for breeding purposes.

Owensboro River Port Authority's Whaylon D. Coleman Terminal Mussel Survey | Ohio River, Kentucky | 2006-2007

James coordinated an endangered mussel habitat assessment and survey on the Ohio River for a new terminal proposed by Owensboro River Port Authority. Due to poor visibility in the river during October 2006, he laid out transects and directed Stantec's Certified Divers to collect substrate data so potential freshwater mussel habitat could be located within the project area. During July 2007, James returned to the project site with the divers during excellent surveying conditions and found 12 species of native freshwater mussels in low concentrations within potential habitat.

Endangered Mussel Survey - State Route 22 Licking River Bridge* | Falmouth, Kentucky | 2003 | Biologist

James completed an endangered mussel survey on the Licking River, Falmouth, Kentucky, for a new bridge. This survey was initiated by the U.S. Fish and Wildlife Service (USFWS) because this river contains one of the last remaining populations of endangered fanshell mussel. James prepared a mussel survey plan and after obtaining approval from the USFWS completed field surveys along approximately 3,600 feet of river channel. Along with a team of certified divers, James' survey effort was restricted to 36 transects located 100 feet apart and perpendicular to the river channel. The survey found 114 live mussels representing 15 species and documented areas containing unsuitable habitat. An additional 16 species, including the fanshell, was represented by empty shells. Survey results, specifically habitat data, provided Kentucky Transportation Cabinet appropriate information to choose an alternative that would not directly impact rare mussels.

Mussel Relocation - US 60 Tennessee River Bridge | McCracken County, Kentucky | 2006 | Biologist

James reinitiated formal consultation with the U.S. Fish and Wildlife Service to amend the construction activities for the U.S. Route 60 Bridge over the Tennessee River, McCracken and Livingston Counties, Kentucky. The presence of large concentrations (beds) of freshwater mussels in this section of river required James to prepare a biological assessment and mussel relocation/salvage plan, and to implement the recovery phase of the project. Along with a team of Stantec certified divers, James salvaged, identified, and relocated 148 freshwater mussels from the 0.23 acre project area along the western shore of the river.

William Cody Fleece

Senior Associate Malacologist



Mr. Fleece is an aquatic ecologist, restoration specialist, and consultant whose clients include state, federal, and local governments, hydroelectric utilities, watershed planning groups, military installations, and non-governmental organizations. He is Stantec's National Technical Lead for Freshwater Ecosystems, an initiative to improve the quality of services delivered in this discipline. Mr. Fleece is authorized by the Federal government to survey for listed fish and freshwater mussels and has held state-collecting permits in Ohio, Michigan, Kentucky, Tennessee, Wisconsin, Minnesota, Illinois, Texas, West Virginia, Virginia, North Carolina, California, Oregon, Washington, and Alaska. In addition to his work with listed fish and mussels his endangered species work includes formal and informal consultation under Section 7 of the Endangered Species Act for an array of plants, mammals, reptiles, amphibians, mussels, and freshwater, marine, and anadromous fish. Mr. Fleece is also a restoration ecologist with 18 dam removals to his credit and multiple stream restoration projects. Much of his recent work has focused on incorporating the habitat requirements of listed fish and mussels into restoration design. Mr. Fleece has a reputation for executing well designed study plans and delivering scientifically defensible work products. His credibility with those in the regulatory community facilitates quick and efficient resolution of potential conflicts related to threatened and endangered species.

EDUCATION

MS, Environmental Studies, University of Oregon,
Eugene, Oregon, 2000

BS, Political Science, Ball State University, Muncie,
Indiana, 1990

CERTIFICATIONS

Federal Endangered Species Permit TE38821A-4

Authorized Mussel Surveyor (All Groups) Ohio

Authorized Mussel Surveyor (All Groups) West
Virginia

Authorized Mussel Surveyor (All Groups) Minnesota

PROJECT EXPERIENCE

SR-35 Endangered Bat and Mussel Surveys, Green
County, Tennessee

*TDOT was preparing to implement highway improvements to a 3.9 mile section of SR-35. Due to the presence of potential summer Indiana bat (*Myotis sodalis*) habitat on the project site, and potential freshwater mussel habitat in the Nolichucky River, TDOT was requested by USFWS to conduct surveys to determine the presence or probable absence of Indiana bats and listed freshwater mussels within the project area. Mr. Fleece was responsible for planning, executing, and reporting on elements of the project related to freshwater mussels. A total of 70 live freshwater mussels were found within the study area comprising 10 species. However no federally listed mussels were found. *Cyclonaias tuberculata* (n = 17) and *Lampsilis fasciola* (n = 11) were the most numerous species observed. Fresh dead valves were found for two additional species, *Fusconaia subrotunda* and *Pleuroaia barnesiana*, suggesting low-level abundance for these species in the project area. Based on the data collected during Indiana bat and freshwater mussel surveys a May Affect – Not Likely to Adversely Affect determination was received from the USFWS's Tennessee Field Office.*

* denotes projects completed with other firms

William Cody Fleece

Senior Associate Malacologist

Freshwater Mussel Survey, Green River at Rush Island Watershed and Wildlife Conservation Area
The Kentucky Division of Water's Wild Rivers Program contract with Stantec for a mussel survey at the 135-acre Rush Island Watershed and Wildlife Conservation Area. The purpose of this survey was to identify and enumerate any species of freshwater mussels present within this property as part of a biodiversity inventory to determine the ecological value of the area. Mr. Fleece was the Project Manager and Technical Lead for field surveys and reporting.

Wabash River Stream and Floodplain Restoration, Tippecanoe County, Indiana
*Mr. Fleece was the aquatic habitat lead for a 905b feasibility study examining restoration opportunities along the main stem Wabash River and tributaries in Tippecanoe County under contract to the U.S. Army Corps of Engineers, Louisville District. His responsibilities included understanding the distribution and abundance of aquatic species within the project area and developing restoration concepts that could potentially benefit aquatic communities. Potential restoration targets included "Great Rivers" fishes (e.g., shovelnose sturgeon, paddlefish) and special status freshwater mussels (e.g., *Pleurobema clava* (clubshell), *Cyprogenia stegaria* (fanshell), *Plethobasus cyphus* (sheepnose), and rayed bean (*Villosa fabalis*)). Stantec personnel identified over 30 viable bank stabilization, wetland enhancement and instream habitat improvement projects. The total value of this work was estimated at over \$18,000,000.*

Freshwater Mussel Environmental DNA Study, Walhonding River, Warsaw, Ohio.

Mr. Fleece was the project manager and technical lead on a U.S. Fish and Wildlife Service and the Ohio Department of Transportation research grant using environmental DNA (eDNA) to detect rare mussels. The Six Mile Dam pool was lowered in October of 2020 as part of removal of the dam. A freshwater mussel rescue was scheduled to coincide with drawdown of the impoundment. Search efficiency is generally high in this kind of effort and represented a unique opportunity to test the ability of eDNA to detect the presence or probable absence of unionid species in the project area. Prior to removal of the dam, field personnel collected triplicate water samples at 22 stations at 150 meter increments along the length of the impoundment. Water samples were filtered and DNA metabarcoding was used to detect genetic material released from unionid mussels. As part of the drawdown mussel rescue, we collected over 12,000 mussels, representing 24 species, in 362.5 hours of searching. The total included 127 Sheepnose and 632 Rabbitsfoot. Twenty-two of the 25 species collected by traditional methods were also detected using eDNA, including the federally listed species. The study demonstrated that eDNA metabarcoding can be used as an effective tool to assess the presence or probable absence of freshwater unionids in riverine systems.

Claytor Hydroelectric Project FERC No. 739 Mussel Survey, Radford, VA

Stantec Consulting was contracted to conduct water quality and mussel surveys on the New River as a condition of Appalachian Power Company's FERC license for the Claytor Hydroelectric project. This study is part of a Freshwater Mussel Adaptive Management Plan (the Plan) that is designed to determine if flow, temperature, and/or occasionally depressed dissolved oxygen (DO) concentrations are affecting freshwater mussels downstream of Claytor Dam over the term of the new license. This work was part of a ten-year program designed to gain insight into mussel resources in the project area. Water quality is being monitored at 4 sites and mussel populations at 7 sites on a biannual basis for the life of the contract. Mr. Fleece is the project manager and technical lead for all elements of the project. In the most recent phase of the project Stantec personnel have been collecting gravid mussels for use in propagation. Juveniles produced at the hatchery will be placed back into the river in cages as part of in situ studies of growth and survival over time.

* denotes projects completed with other firms

William Cody Fleece

Senior Associate Malacologist

Byllesby-Buck Hydroelectric Project FERC No. 2514-186 Malacological Services, Ivanhoe, VA

Stantec Consulting was contracted to assist American Electrical Power with relicensing of the Byllesby-Buck Hydroelectric Project. Specifically, Stantec prepared freshwater mussel survey study plans and responded to agency comments. Field studies were delayed by COVID-19 and begin in the summer of 2021.

Freshwater Mussel Surveys for the USDA Big Walnut Creek Nutrient Loading Studies

Stantec Consulting was contracted by the USDA to assist with freshwater mussel surveys as part of a long term monitoring program investigating the influences of agricultural practices on water quality in the Big Walnut Creek watershed. Mr. Fleece was the Project Manager and Field Lead for the surveys.

Ohio Brush Creek Mussel Surveys, Cincinnati, Ohio

*Mr. Fleece is collaborating with the Cincinnati Natural History Museum in monitoring long term population changes in the mussel fauna of Ohio Brush Creek in south-central Ohio. In the course of these studies Mr. Fleece assisted with capture, handling, and identification of freshwater mussels. He also assisted with a mark-recapture study intended to characterize mussel movement with the study reaches and examine age and growth relationships for the collected individuals. The Ohio Brush Creek is rich in mussel species and Mr. Fleece has collected state-listed taxa including *Lampsilis ovata*, *Ligumia recta*, *Truncilla donaciformis* as well State of Ohio species of concern including *Truncilla truncata*, *Alasmidonta marginata*, and *Lasmigona compressa*.*

The Ohio State University Transmission Line Mussel Relocation Project, Columbus, Ohio

The Ohio State University installed a new transmission line across the Olentangy River in Columbus, Ohio. Attempts to use directional drilling for installation of the line proved unsuccessful. Consequently the university was required, as a condition of their 404 permit, to rescue and relocate freshwater mussels present in the project area prior to excavation in the channel. Mussels were initially located using visual search techniques in conjunction with demolition of the 5th Avenue Dam. SCUBA surveys were conducted in habitats too deep to effectively survey using wading techniques

.5th Avenue Dam Mussel Rescue and Relocation, Columbus, Ohio

As a condition of the 404 permit authorizing demolition of the 5th Avenue Dam, the City of Columbus was required to rescue and relocate freshwater mussels in the project area. Potential impacts to mussels could potentially occur as a result of construction activities (e.g., movement of heavy equipment, placement of fill in the channel, etc.) or through stranding as a result of rapid lowering of the dam pool. Mr. Fleece developed rescue and relocation plans in consultation with the Ohio Department of Natural Resources, The Ohio State University, and the City of Columbus. Mr. Fleece also supervised the rescue effort which involved numerous Stantec personnel as well as local volunteers. The dam was demolished in stages over approximately two weeks. The rescue effort consisted of 219 total hours of search effort and a total of 7,513 mussels were relocated to nearby sites.

Englewood Low Dam Removal and Stillwater River Restoration Project, Englewood, Ohio

The Five Rivers MetroParks demolished the Englewood Lowhead Dam in the fall of 2009. Stantec was contracted to monitor water quality and aquatic habitat in the Project Area to determine the response of these indicators to restoration actions. A before-after-control-impact (BACI) experimental design was used for the monitoring program. Water quality, fish communities, and aquatic macroinvertebrate communities were monitored at three sites prior to the removal in 2008 and again after demolition in 2010 and 2011. Vegetation communities were monitored at three plots in 2008, 2009, and 2011. Freshwater mussel assemblages were monitored prior to dam removal in 2007 and again in 2011. Mr. Fleece was the primary investigator and lead author for the post restoration studies. The study found that ecosystems in the project area were recovering from the presence of the dam but had not recovered. Several of the metrics pointed toward substantial progress. For example, the number of intolerant fish species increased in the restored reach over the study duration as did total taxa counts for aquatic macroinvertebrates.

* denotes projects completed with other firms

William Cody Fleece

Senior Associate Malacologist

Six-Mile Dam Removal, Moscow, Ohio (Technical Lead)

Mr. Fleece was the technical lead for regulatory approvals including 404 and 401 permit applications and formal consultation under Section 7 of the Endangered Species Act. He was responsible for preparation of a Biological Assessment, technical support for USFWS in preparation of a Biological Opinion, and rescue and relocation of over 12,000 freshwater mussels. Included in this total were 127 sheepsnose (federal endangered) and 742 rabbitsfoot (federal threatened). Cody was the liaison between the client, the engineering team, and USFWS on conservation measures associated with impoundment drawdown and dam demolition. Demolition of Six Mile Dam began in 2020 and is expected to finish in the spring of 2022.

Ballville Dam Removal Project, Fremont, Ohio (Permitting Task Leader)

Mr. Fleece was the Task Leader for permitting and regulatory compliance for efforts to remove the 407-foot-long, 35-foot-high structure that was originally constructed in 1911. This multi-million-dollar project opened over 22 miles of main stem spawning habitat for the Sandusky River walleye stock. Population size for this stock is currently thought to be limited by spawning habitat availability. His work included informal consultation on impacts to listed species (including freshwater mussels) under the Endangered Species Act, coordination of efforts focused on the Section 106 of the National Historic Preservation Act, Clean Water Act 404 and 401 permitting, consultation with Ohio DNR on the Scenic Rivers Act, and preparation of an Environmental Impact Statement under the National Environmental Policy Act. Ballville Dam was removed from the Sandusky River in the summer of 2018 and lake sturgeon were observed 4 miles upstream of the former dam location in the following spring.

Deer Creek Dam Removal, Williamsport, Ohio

Mr. Fleece was the project manager and technical lead for the pre and post-removal biological surveys. Freshwater mussel surveys were required to determine if Federally listed mussels were present in the project area. Visual and tactile searches were conducted to locate mussels in the construction footprint and in adjacent areas. Total search effort was approximately 12 hours and twenty-three live animals representing nine species were collected. The presence of fresh dead valves suggested that at least twelve species were present somewhere within the project area. No special status mussel species were found. Fish were surveyed using a fourteen-foot aluminum john boat equipped with a Smith-Root GPP 5.0 electrofisher. In total the pre-restoration surveys, 34 species were captured in the project area, 27 from the downstream study reach and 23 from upstream of the dam. Surveyors captured Bluebreast Darter, Banded Darter, River Redhorse, Rosyface Shiner, Silver Shiner, and Stonecat Madtom, all species indicative of exceptional water quality. Data generated in these studies were used to inform the design of post-removal habitat features. Post-restoration fish surveys demonstrated substantial improvement in the project area.

Scioto Greenways/Main Street Dam Removal, Columbus, Ohio

*Approximately 4,455 live mussels comprising 9 species were rescued and relocated as part of this effort. The rescue and relocation involved more than 25 people and 507 search hours over the course of six days. One Ohio State Threatened species, pondhorn (*Uniomereus tetralasmus*), and one Ohio State Species of Concern, elktoe (*Alasmidonta marginata*) were observed during the rescue. The dam pool was dominated by facultative and lentic species. The combined total of rescued giant floaters (*Pyganodon grandis*) and mapleleafs (*Quadrula quadrula*) was 3,707 or approximately 83 percent of the live individuals. Species diversity in the Main Street Dam Pool (1.0 – 3.5) was lower than observed in the 5th Avenue Dam Pool (2.2 – 5.2) as was overall richness (9 vs. 16 species). Mussels were relocated in the vicinity of the former 5th Avenue Dam on the Olentangy River, as well as a free-flowing reach downstream of the former dam location.*

* denotes projects completed with other firms

William Cody Fleece

Senior Associate Malacologist

West Milton Dam Removal

*Stantec provided assisted the Village of West Milton with the demolition of West Milton Dam in the fall of 2014. Services rendered to the village included grant writing assistance, engineering design, regulatory compliance, construction oversight, and post-construction monitoring. Mr. Fleece was the project manager and was the technical lead on Clean Water Act 404 permitting, Endangered Species Act consultation, and National Historic Preservation Act consultation. The federally endangered snuffbox mussel (*Epioblamia triquetra*) was collected in pre-project surveys. Mr. Fleece led the formal consultation, including preparation of a Biological Assessment, on behalf of the Village. He also led field surveys that rescued and relocated 14 snuffbox (and ~2,900 other mussels) stranded with the drawdown of the dam pool. Post-project monitoring of the restoration response is ongoing.*

Olentangy River Freshwater Mussel Surveys, Columbus, Ohio

*Columbia Gas of Ohio plans to install a new 20" steel welded, natural gas pipeline below the Olentangy River in one of two locations upstream of Doddridge Dam. Ohio DNR completed a review of the proposed project and requested a survey of freshwater mussels in the vicinity of the pipeline. Mr. Fleece planned, executed, and summarized surveys designed to detect the presence or probable absence of special status species in the project area. SCUBA divers searched substrates along transects in the stream channel. Timed searches and fixed area substrate excavations were conducted in suitable habitats along the channel margins. No Federal or State endangered, threatened, or proposed endangered/threatened mussels were found during the September 19-23, 2011 surveys. A total of 133 live freshwater mussels, comprised of 12 species were found to occur within the Project Area. *Lasmigona complanata* (white heelsplitter), *Amblema plicata* (three-ridge), and *Lampsilis radiata luteola* (fat mucket) were the three most numerous species observed (n=55, 41%, n=23, 23%, n=20, 15%, respectively). Two live *P. sintoxia* (Ohio Species of Concern) and one *L. fasciola* (Ohio Species of Concern) was observed during sampling. *Alasmodonta marginata* and *Toxolasma parvus* were not observed as live specimens, but were collected as Fresh Dead shells, suggesting low level abundance in the Project Area. Due to the presumed absence of Federal and State endangered and threatened taxa within the project area, an agency determination of may affect but not likely to adversely affect is anticipated.*

Biological Assessment for Route 609 Bridge, Brunswick County, Virginia

*VDOT is proposing replacement of the existing bridge over the Nottoway River in Brunswick County, Virginia. Mr. Fleece was the technical lead for a Biological Assessment addressing the Atlantic Pigtoe (*Fusconaia masoni*), Yellow Lance (*Elliptio lanceolata*), and the Roanoke Logperch (*Percina rex*). He authored sections of the effects analysis and assisted with agency consultation.*

I-74 Bridge Replacement Biological Opinion, Moline, Illinois

*Mr. Fleece was the project manager, technical expert, and lead author for preparation of a Biological Opinion under the direction of the USFWS. Approximately 2,000,000 freshwater mussels, including 3 federally endangered species were present in the footprint of the existing and proposed Interstate 74 bridge over the Mississippi River. Faced with the prospect of a lengthy Endangered Species Act formal consultation process for sheepsnose (*Plethobasus cyphus*), Higgins' eye pearly mussel (*Lampsilis higginsii*), and spectaclecase (*Cumberlandia monodonta*) and a narrow construction window, the Iowa Department of Transportation (Iowa DOT) contracted with Stantec to provide technical assistance to the U.S. Fish and Wildlife Service Rock Island Field Office (RIFO). Specifically, Stantec was tasked with assisting the RIFO in the preparation of a Biological Opinion. Although Stantec was directly funded by Iowa DOT all documents and work products were prepared under the direct supervision of the RIFO. Elements of the scope of work included preparation of 1) a chronology of the consultation history, 2) a description of the proposed action, 3) the status of listed species found in the action area, 4) an environmental baseline, 5) characterization of the effects of the action, and 6) citations for the literature used in the body of the document. Stantec also assisted with elements of an incidental take statement for the draft and final Biological Opinion.*

I-74 Bridge Replacement Mussel Relocation, Moline, Illinois

*Mr. Fleece assisted the Iowa Department of Transportation (Iowa DOT) with identification, processing, and relocation of thousands of freshwater mussels including sheepsnose (*Plethobasus cyphus*), Higgins' eye pearly mussel (*Lampsilis higginsii*), and spectaclecase (*Cumberlandia monodonta*). Over 125,000 mussels were relocated as part of this effort.*

* denotes projects completed with other firms

William Cody Fleece

Senior Associate Malacologist

I-74 Bridge Demolition Mussel Relocation, Moline, Illinois

Mr. Fleece assisted the Iowa Department of Transportation (Iowa DOT) with relocation of freshwater mussels around the soon to be decommissioned bridge piers for the I-74 bridge over the Mississippi River near Moline, IL. Mr. Fleece was the task lead for the contract. Field crews were on site for 2 months and roughly 40,000 mussels were salvaged and relocated. Mr. Fleece served as scientific diver and also assisted with identification, processing, and tagging of mussels. Listed species collected included sheepnose (*Plethobasus cyphus*), Higgins' eye pearly mussel (*Lampsilis higginsii*), and spectaclecase (*Cumberlandia monodonta*).

Freshwater Mussel Relocation Chatham Bridge Route 3 over the Rappahannock River, Virginia

Stantec was contracted by the Virginia Department of Transportation to relocate freshwater mussels from the construction footprint of the Route 3 bridge in Fredricksburg, Virginia. Field surveys occurred in June and July of 2020 and yielded over 4,200 mussels in 70 hours of searching. The assemblage was dominated by Eastern Elliptio (*Elliptio complanta*) but also included the Alewife floater (*Utterbackia implanata*) (n = 585), Tidewater Mucket (*Leptodea ochracea*) (n = 69), Green Floater (*Lasmigonia subviridis*) (n = 30) and Northern Lance (*Elliptio fisheriana*) (n = 7). Mr. Fleece was the task lead and scientific diver for the project.

US-23/Olentangy River Mussel Relocation, Delaware County, Ohio

Columbia Gas of Ohio (COH) had a leaking pipeline in the Olentangy River and needed to make repairs. Stantec was contracted to prepare study plans, conduct presence/absence surveys, and relocate mussels in the vicinity of the pipeline. During presence/absence surveys total of 36 living freshwater mussels were collected representing 10 different species. One federally threatened species (*Q. cylindrica*) was found along with two sets of sub fossil valves approximately 15 meters downstream of the area of direct impact. This species had not been observed in the Olentangy River since 1962. Ohio species of concern Purple wartyback (*Cyclonaias tuberculata*) and Kidneyshell (*Ptychobranthus fasciolaris*) were present (n=21 and n=1). Mr. Fleece worked with COH and the USFWS on developing measures that enabled the repairs to proceed without formal Section 7 consultation.

Kentor Pipeline Mussel Habitat Assessment, Greene County, Pennsylvania

Chesapeake Midstream proposed to construct a new natural gas pipeline across the South Fork of Tenmile Creek in Greene County, Pennsylvania. The crossing was proposed using traditional trenching methods. The Pennsylvania Fish and Boat Commission expressed concern that the proposed project would adversely affect the state-listed Wabash Pigtoe (*Fusconaia flava*). Mr. Fleece walked approximately 2,300 feet of the channel. He concluded that habitat was suitable for freshwater mussel presence and that the Wabash Pigtoe was likely present in the streams based on observations of spent valves. Chesapeake Midstream altered the proposed project and proposed to use directional drilling to accomplish the stream crossing. Mr. Fleece prepared correspondence with the Pennsylvania Fish and Boat Commission and received a no-effect determination that allowed the project to proceed.

Cincinnati Museum Center Malacology Collection*, Cincinnati, Ohio (Research Associate)

Mr. Fleece is a research associate working to organize and maintain the malacology collection at the Cincinnati Natural History Museum. The collection consists of over 16,400 catalogued lots including specimens collected by Thomas Say and Edward Drinker Cope. Mr. Fleece recently helped to identify and catalogue thousands of valves donated by archaeologist Kent Vickery. He has worked with material for numerous listed or candidate species including *Pleurobema clava*, *Epioblasma torulosa rangiana*, *Epioblasma triquetra*, *Potamilus capax*, *Obovaria retusa*, *Lampsilis abrupta*, *Lampsilis higginsii*, *Cyprogenia stegaria*, *Plethobasus cyphus*, *Plethobasus cooperianus*, and *Villosa fabalis* among others.

Green River Lock and Dam 3, Freshwater Mussel Survey, Rochester, Kentucky

Rochester Dam Regional Water Commission contracted with Stantec Consulting Services Inc. (Stantec) to conduct a freshwater mussel survey on the Green River in Ohio, Muhlenberg, and Butler Counties, Kentucky. The primary objective of this project was to determine the presence or probable absence of and special status mussel species within the project area. The proposed project involved modifications to the Green River Lock and Dam 3 to reduce leakage through the dam structure and help secure the water supply for the surrounding community.

* denotes projects completed with other firms

William Cody Fleece

Senior Associate Malacologist

*The mussel survey was conducted between August 27th and August 30th, 2018 by divers using surface supplied air. Total search effort was approximately 12.7 hours and consisted of transect surveys and wandering timed searches. A total of 67 live mussels were collected during the survey effort for a total of 12 species. The most abundant species were *M. nervosa* (n=14), *A. plicata* (n=13) and *P. alatus* (n=13), and *C. nodulata* (n=11). Also collected during the survey were *Q. quadrula* (n=6), *O. reflexa* (n=2), *E. lineolata* (n=2), *A. confragosus* (n=2). The following species were represented by single specimens: *L. complanata* (n=1), *L. teres* (n=1), *P. ohioensis* (n=1) and *C. pustulosa* (n=1). An additional 11 species were observed as spent valves. No live special status mussels were collected during this survey. Mr. Fleece was the task lead and permitted malacologist for this project.*

Blanchard River Mussel Relocation, Findlay, Ohio

As part of efforts of flood control efforts the City of Findlay, Ohio and the Maumee Watershed Conservancy District sought to remove four low head dam/riffle structures in the Blanchard River. The 401 Water Quality Certification required a mussel relocation which occurred in two phases 1) mussels were collected and relocated from the instream impact areas (i.e. construction footprints) surrounding the dams and bridge and 2) During deconstruction of the dam/riffle structures, stranded mussels were rescued from exposed substrate as water levels decreased upstream of the dams. All collected mussels were relocated upstream of the project area into areas deemed suitable, with existing mussel communities like those being relocated. The mussel relocation within the construction footprints was performed on July 25 and July 27-31, 2018. Total search effort was approximately 37.8 person hours between the five survey areas. During this effort, 408 mussels were collected and relocated. Mussel rescue and relocation during the four dam/riffle drawdowns were performed between November 12 to 15, 2018. Total search effort was approximately 53.63 hours between the four structures. A total of 729 live mussels comprising nine species were rescued and relocated during the drawdowns. Mr. Fleece was task lead and permitted malacologist during some phases of the project.

Byllesby Dam Mussel Relocation, Ivanhoe, Virginia

*The Appalachian Power Company lowered the water surface elevation of the Byllesby Dam impoundment in order to conduct repairs on the Byllesby Dam on the New River in Carroll County, Virginia between April 30 and May 1, 2018. While the rate of drawdown was relatively slow, it was anticipated to exceed the rate at which mussels could move to maintain immersion in the water. Stantec conducted surveys to find freshwater mussels stranded along the margins of the dam pool and relocated them to a site upstream of the project area. Over the two-day search period, only four live mussels were found comprised of two species, *L. subviridis* (n=1) and *C. tuberculata* (n=3). These animals were relocated to areas of equal or better habitat upstream of the project area. Mr. Fleece was the Project Manager.*

Buck Dam Mussel Relocation, Ivanhoe, Virginia

*Between July 10 and July 11, 2018, American Electric Power (AEP) conducted a drawdown at Buck Dam on the New River in Carroll County, Virginia. This was done in order to perform repairs on the dam itself. To complete the repairs the dam pool was lowered approximately nine feet (ft) over a 24-hour period. The rate of pool draw down was anticipated to exceed the rate at which mussel could relocate to maintain immersion in water. Stantec Consulting Services, Inc. (Stantec) was contracted by AEP to relocate freshwater mussels stranded on habitat exposed by the dam pool drawdown to areas outside of the disturbance zone. The search effort focused on potential mussel habitat exposed along channel margins and the island at the upstream end of the dam pool. The mussel relocation was performed on July 11, 2018. The total search effort was 15.5 person-hours covering approximately 2,700 linear meters of streambank. During the effort, two live mussels, both identified as Wavy-Rayed Lampmussel (*Lampsilis fasciola*) were collected and relocated to an area of suitable habitat outside of the drawdown impact area. Mr. Fleece was the Project Manager and lead malacologist for the project.*

* denotes projects completed with other firms

William Cody Fleece

Senior Associate Malacologist

Middle Fork Vermilion Threatened & Endangered Species Consultations, Oakwood, Illinois

*Mr. Fleece managed threatened and endangered species tasks a bank stabilization project adjacent to a decommissioned coal plant in the Middle Fork Vermilion River, Vermilion County, Illinois. Stantec surveyed for mussels on September 16 and 17, 2018 and total search effort was approximately 13.3 person-hours. During this effort 33 live mussels were collected, measured, aged, and sexed. Total live species richness was eight, with an additional 16 species represented by spent shells. Special status species found during the survey include live and shell specimens of *L. fasciola* (Illinois Endangered) and shells of *Epioblasma rangiana* (Northern riffleshell, Illinois and Federal Endangered). Field personnel also collected shells for the following Illinois listed species: *Villosa lienosa* (Little Spectaclecase, n=1), *Alasmidonta viridis* (Slippershell, n=1), *Ptychobranhus fasciolaris* (Kidneyshell, n=1), and *Cyclonaias tuberculata* (Purple Wartyback, n=1). Stantec, during the mussel survey, also observed a live Bluebreast Darter (*Etheostoma camurum*), a state endangered species in Illinois.*

Mr. Fleece also led efforts to assist Dynegy Midwest Generation in obtaining incidental take authorization for both state and federally listed species. Stantec prepared a Conservation Plan and Implementing Agreement covering two mussels and three fish for the State of Illinois. Mr. Fleece also led formal consultation under the federal Endangered Species Act including preparation of a Biological Assessment for three mussels, two bats, and two plants. Construction is anticipated in 2019.

Batavia Dam Removal Mussel Survey, Batavia, Ohio

*Mr. Fleece was Project Manager, permit lead, and permitted malacologist for the Batavia Dam removal project. The Valley View Foundation removed the Batavia Low Head Dam on the East Fork of the Little Miami River near Batavia, Clermont County, OH. The East Fork of the Little Miami River is a Group 2 stream as designated by ODNR. Correspondence with the USFWS indicated the possible presence of 12 special status taxa within the project footprint. Stantec Consulting conducted a freshwater mussel survey over two mobilizations, the first being July 17th-July 19th, 2018 and the second on October 3rd- October 7th, 2018. During this survey a total of 367 living mussels were collected, comprised of 13 species. One live Ohio state Endangered *P. cordatum* was observed within the project area. Four live Ohio Species of Concern were also observed: *L. fasciola*, *P. fasciolaris*, *P. sintoxia* and *T. truncata*. The most abundant species collected were *E. dilatata* (n=107) followed by *P. sintoxia* (n=91) and *F. flava* (n=57).*

Mussel densities varied, especially between upstream and downstream sites. The calculated density from Phase 2 sampling downstream of the dam was 0.2 mussels per m², while upstream of the dam it ranged from 0 to 3 mussels per m². Overall, most species appear to be recruiting with some species not present in high enough numbers to determine successful recruitment. No federally listed species were collected live or as spent shells during this survey.

Belle River Mussel Survey, Calhoun County, MI

*Stream restoration is proposed for a reach of the Belle River in Columbus Township, Michigan. The Belle River is one of a small number of waterbodies in Michigan known or expected to support federally listed species and has been assigned a Group 3 classification by state and federal agencies. Between September 19 and 21, 2018, Stantec Consulting conducted freshwater mussel surveys within the project area to determine the presence or probable absence of special status taxa. During this survey a total of 284 living individuals were collected, comprised of 11 species. The two most abundant species were *Eurynia dilatata* (n=101) and *Villosa iris* (n=84) which is a Michigan Species of Concern. Also, during this survey, a weathered *Epioblasma triquetra* shell, a Federally Endangered species, was collected. One live *Alasmidonta viridis*, which is listed as Threatened in the State of Michigan, was observed.*

Mussel densities were high (>7.6 per m²) in isolated areas within the survey area. Opportunistic species characteristic of impaired systems were rare. Overall species richness (n = 11) was high for a small river with a base flow wetted width of less than 20 meters. Most species appeared to have reproductive success based on the range of size classes observed. Mr. Fleece was task lead and permitted malacologist on this project.

Malacological Services for Potential I-69 Bridge Site Near Henderson, KY and Evansville, IN

Mr. Fleece was the task lead for a study was to assess the presence or probable absence of special status freshwater mussel species within the I-69 Ohio River Crossing (ORX) project corridor, specifically in the area of the three proposed Ohio River bridge alignments. The Western Corridor contains two alignments and is adjacent to the existing U.S. Route 41 (US 41) bridge, while the Central Corridor is approximately 1 mile downriver from the confluence of the Green River, Henderson County, Kentucky.

* denotes projects completed with other firms

William Cody Fleece

Senior Associate Malacologist

*Stantec conducted a freshwater mussel survey from October 9-15, and 27-31, 2018 on the Ohio River between Evansville, IN and Henderson, KY. Divers surveyed one hundred and eight (108) (65ft x 65ft) search cells for a total search time exceeding 47 hours. Depths ranged between 10 and 48 feet and included areas within the federal navigation channel. A total of 452 live mussels were collected, representing 20 species. Several special status species were collected as live animals or as spent shells including 11 live Longsolid (*Fusconaia subrotunda*, Kentucky Special Concern), 1 spent Fat Pocketbook (*Potamilus capax*, Federally Endangered) shell, 2 spent Pyramid Pigtoe (*Pleurobema rubrum*, Kentucky Endangered) shells, and 1 spent Pocketbook (*Lampsilis ovata*, Kentucky Endangered) shell. Mussel habitats along the Central Corridor were considerably more productive, especially those classified as coarse gravel/cobble/hardpan/bedrock by the side-scan sonar acoustic data. Three hundred and ten (310) of the 452 total live mussels were collected in only 15 cells of this substrate type. Divers also assessed the accuracy of side scan sonar classification of submerged substrates in conjunction with the mussel surveys. Data indicate that the acoustic substrate classification system had poor accuracy for silt/clay habitat, but excellent accuracy for the mussel bed habitat (coarse gravel/cobble/ hardpan/bedrock).*

Mr. Fleece was the technical lead for preparation of the freshwater mussel portions of the Biological Assessment and led agency meetings focused on this topic.

Ground-truthing of Side Scan Sonar River Bed Substrate Classification for Potential I-69 Bridge Site Near Henderson, KY and Evansville, IN

This study was conducted to provide needed information on habitat conditions for regulatory processes associated with the proposed Interstate 69 Ohio River Crossing (ORX) near Henderson, Kentucky and Evansville, Indiana area. Acoustic side scan sonar data were collected in November of 2017 for the purpose of mapping substrate types to evaluate the suitability of mussel habitat within the West and Central Corridor impact areas (River Miles 784.1- 787.5). Mr. Fleece led field studies to ground-truth the substrate types related to each acoustic class. Ground-truthing of river substrate took place between December 12-15, 2017 and occurred 100 m upstream and 300 m downstream of the West and Central Corridor impact areas. A chain-rigged Van Veen sediment sampler was used to collect river bed material. The Van Veen was deployed using a davit and motorized winch system mounted to a 24 ft. V-gull Monarch boat. Substrate sampling effort was weighted proportionally to the area of each acoustic class (i.e. stratified random sampling), such that more effort was placed on acoustic classes with larger areas. The field verification effort generally confirmed the desktop classifications, particularly the widespread presence of sand substrates within the survey area. Evidence of freshwater mussels was only detected in acoustic class 7 which apparently consists of cobble over some kind of impermeable layer. Except for unstable sand in the center of the channel, most of these classes appeared capable of supporting freshwater mussels.

William Cody Fleece

Senior Associate Malacologist

North Keowee Street Bridge Replacement Mussel Survey and Relocation

*Mr. Fleece was the Task Manager and lead field biologist for mussel survey and relocation at the Keowee Street Bridge project in Dayton, Ohio. The Ohio Department of Transportation (ODOT) and the Montgomery County Engineer's Office contracted with Stantec for malacological services. The mussel relocation was performed on August 8 – 12, 2017. During the effort, 389 live mussels were collected and relocated upstream. The most abundant live species collected were *Quadrula quadrula* (mapleleaf; n=180) and *Pyganodon grandis* (giant floater; n=119). Other species collected during the mussel relocation included *Lasmigona costata* (fluted shell; n=40), *Lampsilis cardium* (plain pocketbook; n=16), *Lampsilis silquoidea* (fat mucket; n=9), *Alasmidonta marginata* (elktoe; n=9), *Utterbackia imbecillis* (paper pondshell; n=9), *Lasmigona compressa* (creek heelsplitter; n=3), *Strophitus undulatus* (creeper; n=2), *Anodontoides ferussacianus*; n=1), and *Cyclonaias tuberculata* (purple wartyback; n=1). *Alasmidonta marginata* and *Cyclonaias tuberculata* are both Ohio species of concern. Mussels within the project footprint were relocated to nearby areas of equal or better habitat.*

Tait Station Dam Removal Mussel Survey and Relocation

*Mr. Fleece was the Task Manager and lead field biologist for mussel survey and relocation at the Tait Station Dam Removal project in Dayton, Ohio. The Ohio Department of Transportation (ODOT) contracted with Stantec to relocate freshwater mussels from habitat located within the proposed restoration area upstream of the dam to areas outside of the disturbance zone. The mussel relocation was performed on August 29 – 31, 2017. The total search effort was approximately 31 hours and approximately 2,140 m² (23,035 ft²) were searched. During the effort, 51 live mussels were collected and relocated to an area of equal or better habitat approximately 0.8 km (0.5 mi) downstream of the dam. The most abundant live species were *Quadrula quadrula* (mapleleaf; n=20) and *Lampsilis cardium* (plain pocketbook; n=12). Other species collected during the mussel relocation included *Lasmigona costata* (fluted shell; n=8), *Pyganodon grandis* (giant floater; n=5), *Lampsilis silquoidea* (fat mucket; n=1), *Alasmidonta marginata* (elktoe; n=4), *Utterbackia imbecillis* (paper pondshell; n=1). *Alasmidonta marginata* is listed as an Ohio species of Concern. Mussels within the project footprint were relocated to nearby areas of equal or better habitat.*

Charles M. Bolton Water Treatment Plant Great Miami River Bank Stabilization Mussel Survey

*The Greater Cincinnati Water Works proposes to stabilize an area of eroding river bank along approximately 650 meters of the Great Miami River near the Charles M. Bolton Water Treatment Plant in the City of Fairfield, Butler County, Ohio. Mr. Fleece was the technical lead on permitting and supervised work related to preparation of the 404 Department of the Army Permit. The Great Miami at this location was designated as a Group 4 stream by the U.S. Fish and Wildlife Service, due to the potential presence of rayed bean or other federally-listed mussels. Mr. Fleece led field studies to ascertain the presence or probable absence of special status taxa in the project area. The mussel survey was performed on October 4 – 5, 2017. During the effort, 11 live mussels were collected. The most abundant live species collected was *Potamilus alatus* (pink heelsplitter; n=7). Other live species collected during the mussel survey included *Leptodea fragilis* (fragile papershell; n=2) and *Lasmigona complanata* (white heelsplitter; n=2). Despite the sampling effort, no live state or federally-listed species were observed. Based on the data collected during search efforts, the apparent absence of *Villosa fabalis*, a May Affect – Not Likely to Adversely Affect determination is anticipated from the U.S. Fish and Wildlife Service Ohio Field Office.*

Freshwater Mussel Survey in the Wisconsin River as part of the Badger Coulee Transmission Line

Stantec was contracted by American Transmission Company (ATC) to conduct freshwater mussel surveys on the Wisconsin River, Columbia County, Wisconsin as part of the Badger Coulee 345 kV Transmission line Project. Mr. Fleece led field studies and reporting for elements related to freshwater mussels. Over 500 mussels were collected between at four sites with 422 at Site A, 75 at Site B, 11 at Site C and 24 at Site D. Mussel densities were highest at Site A and lower at the remaining locations. Based upon size frequency data some species appear to have successful reproduction at these sites. No federally listed species were observed, but one state threatened species, the buckhorn, was found at Site A as well as the Mucket which is listed as a species of special concern and is fully protected in Wisconsin.

* denotes projects completed with other firms

William Cody Fleece

Senior Associate Malacologist

Freshwater Mussel Salvage and Relocation in the Wisconsin River as part of the Badger Coulee Transmission Line

*As part of the Badger Coulee 345 kV Transmission Line Project (the Project) construction was necessary within the Wisconsin River. Removal of trees along the right of way, temporary barge staging areas, and timber mat bridges had the potential to adversely affect aquatic habitats and aquatic organisms. Prior studies documented the presence of two Federally listed freshwater mussels, Higgins eye pearly mussel (*Lampsilis higginsii*) and sheepnose (*Plethobasus cyphus*) in nearby habitats. The USFWS (2016) issued a Biological Opinion and Incidental Take Statement on July 1, 2016 that required, among other things, salvage and relocation of freshwater mussels at affected areas in the Wisconsin River. Mussels were salvaged from four sites: A, B, C, and D. More than 125 hours of searching occurred during 15 days in the field as part of the salvage effort. This effort collected and relocated over 4,300 freshwater mussels of 22 species, including 5 sheepnose, from within the Wisconsin River Crossing Site (WRCS) footprint to areas of equal or better habitat.*

Freshwater Mussel Survey Spooner – Minong Trego Interchange US Highway 63 – US Highway 53.

The Wisconsin Department of Transportation (WisDOT) proposed to upgrade the crossings to USH 53 and USH 63 intersections in Washburn County, near Trego, Wisconsin. Construction is proposed at Potato Creek and the Namekagon River. Surveys were conducted to determine the presence or probable absence of freshwater mussels near these two crossings. Potato Creek was surveyed by snorkeling and qualitative timed search methods. The Namekagon River was surveyed primarily by SCUBA divers using transects placed at fixed intervals along the channel. A total of 460 mussels, comprised of eleven species, were observed during the survey.

*Most of the mussels (n = 434) were collected in Potato Creek. Twenty-nine round pigtoe (*Pleurobema sintoxia*) and one creek heelsplitter (*Lasmigona compressa*), both Wisconsin species of concern (SC/P), were collected in Potato Creek. Two black sandshell (*Ligumia recta*) and six mucklets (*Actinonaias ligamentina*), also Wisconsin SC/P, were collected in the Namekagon River. Mussels were distributed along the length of both survey sites although densities were far lower in the Namekagon River than in Potato Creek.*

*Approximately 760 live mussels were collected over the course of three days. A total of 28 live species including several protected species such as the elktoe (*Alasmodonta marginata*, n=1), fanshell (*Cyprogenia stegaria*, n= 13), pocketbook (*Lampsilis ovata*, n=20), Sheepnose (*Plethobasus cyphus*, n=2), and pyramid pigtoe (*Pluerobema rubrum*, n=2). The length measurements demonstrate that many of the species collected have had recent reproductive success. The federally listed *C. stegaria*, which was the 10th most abundant species, is apparently recruiting successfully in the study area. Based on these results it is clear that the Rush Island Watershed and Wildlife Conservation Area is a valuable aquatic resource for freshwater mussels.*

Freshwater Mussel Survey for Proposed Outfall, Menominee County, Michigan

*Stantec was contracted by a confidential client to conduct freshwater mussel surveys in Menominee County, Michigan. Permitting associated with the proposed project required construction of an outfall discharge to the Menominee River in Menominee County, Michigan. Mr. Fleece led all phases of the mussel survey from conception to completion. Mussel surveys were conducted at two potential locations to assist with siting decisions. Mussels were collected along fixed linear transects within the potential construction footprint and within buffer areas upstream, downstream, and offshore of the potential direct impact areas. Over 800 live mussels were observed in this study with 521 observed in the vicinity of the 1st potential outfall location and 296 in the second. Overall mussel densities were very high and, based on the size class distributions, several species were reproducing successfully. No Federally listed species were observed but species with special status conferred by the State of Michigan included the hickorynut (*Obovaria olivaria*) (State Endangered), black sandshell (*Ligumia recta*) (State Endangered), and the round pigtoe (*Pleurobema sintoxia*) (Species of Concern). Mr. Fleece was responsible for all aspects of this work including agency coordination, study plan development, field surveys, and reporting.*

Mussel Surveys, Ashland and Iron Counties, Wisconsin

*Mr. Fleece was contracted by a confidential client to ascertain presence or probable absence freshwater mussels in seven creeks within the proposed project boundaries. Only 2 of the 15 study sites were observed to harbor mussels. The cylindrical papershell (*Anodontoides ferussacianus*) was observed at both sites while the creek heelsplitter (*Lasmigona compressa*) was observed at only one location.*

* denotes projects completed with other firms

William Cody Fleece

Senior Associate Malacologist

Endangered Species Surveys, Clermont County, Ohio

*The Clermont County Engineers Office contracted Stantec to conduct endangered species surveys in the vicinity of Ellick Street in the East Fork Little Miami River in Clermont County, Ohio. Two Federally Endangered freshwater mussels historically occurred in the East Fork Little Miami River, rayed bean (*Villosa fabalis*) and snuffbox (*Epioblasma triquetra*) as did Running Buffalo Clover (*Trifolium stoloniferum*) a Federally Endangered plant.*

*Stantec personnel conducted the Phase I survey on October 22 and 23, 2014. Eleven live mussels were observed, including wavy-rayed lampmussel (*Lampsilis fasciola* [Ohio Species of Concern]) and kidneyshell (*Ptychobranchus fasciolaris* [Ohio Species of Concern]). No Federally listed species were observed. Three of the thirty search cells triggered the species requirement for a Phase II survey. No live mussels were found during the Phase II survey quadrat excavations on October 24, 2014. After the Phase II survey was completed, mussels were relocated from the search cells. One live Wabash pigtoe (*Fusconaia flava*) was observed during the relocation effort. A combined total of 10.23 person hours was spent in the search cells for the relocation effort. Mussels were relocated to an area 250 feet (76.2 meters) upstream of the search cells in an area with equal or better habitat.*

*No populations of running buffalo clover were found within the project area. Searches of the project area yielded 127 species of plants, including three species of *Trifolium* clover. The clovers found were suckling clover (*T. dubium*), red clover (*T. pratense*), and white clover (*T. repens*). All three of these clovers are non-native and represent a portion of the non-native plants (17 percent) encountered on the site during October field surveys. Based on the apparent absence of special status species was received from USFWS's Ohio Field Office. Mr. Fleece was the project manager and technical director for the project.*

Miller-Coors Great Miami River Mussel Survey

Lateral bank erosion jeopardized the Miller Coors brewery wastewater outfall on the Great Miami River in Butler County, Ohio. Necessary repairs would require the placement of fill in the waters of the U.S. Stantec was contracted to determine if special status freshwater mussels were present within the project footprint. Mr. Fleece was the task manager and technical lead for all elements of this work. Stantec personnel used SCUBA gear to survey in and around the proposed project area. Despite two days of searching for a total of 7.4 hours, no live mussels were observed. The absence of mussels was likely due to the lateral instability of the channel.

Freshwater Mussel Survey for Proposed Park, Lucas County, Ohio

Toledo Metroparks is proposed to excavate a cove along the Maumee River in the vicinity of the Clayton Street Bridge, Lucas County, Ohio for the purpose of allowing small, non-motorized water craft to have direct access to the river. According to the Ohio Mussel Survey Protocol, the Maumee River in Lucas County was a Group 3 stream, suggesting that Federally listed species were not expected in the project area. The objective of this study was to determine the presence or probable absence of special status species at the potential cove site, and if no Federally listed species were observed, relocate all mussels found within the project area.

*Stantec personnel conducted initial surveys at the site on Oct. 2, 2014. A total of 36 live animals and 1 fresh dead valve was observed during the survey. No Federally listed species or state listed species were observed during the initial mussel survey. Since no Federally listed species were present during the survey, Stantec personnel were able to begin the relocation effort on October 4, 2014. A seiche occurred during the relocation effort as a result of strong southwesterly winds. As a result, the river receded approximately 10 meters from the shoreline during the relocation surveys, exposing many small and juvenile mussels. A total of 376 live mussels were collected and relocated during the surveys. No Federally listed species were observed, but two live Ohio Species of Concern were observed during the relocation, one *Alasmidonta marginata* and one *Truncilla truncata*. A combined total of 9.62 hours was spent in the search cells for the relocation effort. Mussels were relocated approximately 100 meters upstream in the Maumee River to an area with equal or better habitat. Mr. Fleece was responsible for all aspects of this work including agency coordination, study plan development, field surveys, and reporting.*

3rd Avenue Bridge, Great Miami Mussel Survey

*The Montgomery County Engineer's office sought to replace or rehabilitate the 3rd Street Bridge over the Great Miami River in Dayton, Ohio. Stantec was contracted to determine the presence or probable absence of special status freshwater mussel taxa within the project footprint. Mr. Fleece was the task manager and technical lead for agency coordination, study plan development, field surveys, and reporting. Nearly 9 hours of search effort yielded only one live mussel, the elktote (*Alasmidonta marginata*) an Ohio Species of Concern.*

* denotes projects completed with other firms

William Cody Fleece

Senior Associate Malacologist

Freshwater Mussel Survey on the St. Croix River, Hudson, Wisconsin (Project Manager)

Mr. Fleece was the project manager and lead biologist for freshwater mussel surveys conducted on the St. Croix River in St. Croix County near Hudson, Wisconsin. These surveys were necessary to complete agency consultation under Section 7 of the Endangered Species Act as part of a proposed dredging project for the St. Croix Yacht Club. The proposed project fell within a National Scenic Riverway and four Federally endangered freshwater mussels, Higgins eye pearlymussel, snuffbox, spectaclecase, and winged mapleleaf, were known to occur close by. Stantec surveyed the area in the fall of 2013 and found 113 live animals comprised of nine species. Overall abundance was strongly skewed toward a single species, with over 84% of the individuals observed identified as the threeidge. No special status Federal species were observed but the flat floater and mapleleaf, both Wisconsin species of concern, were captured. Stantec personnel prepared the summary report for the survey that was subsequently approved by the U.S. Fish and Wildlife Service and the Wisconsin Department of Natural Resources thereby concluding endangered species consultation on the project.

Line 5 Endangered Mussel Survey, St. Clair County, Michigan (Lead Biologist, Task Manager)

*Enbridge Energy Limited Partnership needed to conduct maintenance to the Line 5 pipeline at its intersection with the Pine River in St. Clair County, Michigan. The proposed maintenance included excavation of the pipeline within the stream bed. The Pine River was known for populations of two Federally Endangered mussel species, the snuffbox (*Epioblasma triquetra*) and rayed bean (*Villosa fabalis*). Stantec conducted surveys to determine the presence or probable absence of these species in the Area of Direct Impact and in buffers above and below. A total of 48 live native mussels comprising ten species were observed in the project area. Two live specimens of the State Threatened slippershell (*Alasmidonta viridis*) and the State Species of Concern rainbow (*Villosa iris*) were encountered in the surveyed areas but no Federally listed species were observed.*

After coordination between the construction engineer and the resource agencies, it was determined that mussels would need to be relocated to suitable habitats outside the influence of construction activities. Mr. Fleece and the project team relocated over 130 mussels, comprised of 12 species. Mussels were marked with uniquely numbered tags and moved upstream approximately 500 feet. As part of this effort Stantec personnel encountered two live snuffbox mussels at the relocation site, constituting new locality records for this species. Mr. Fleece coordinated with agency personnel and the construction engineer regarding this discovery and both the relocation effort and project construction were allowed to proceed as

Mussel Survey for Proposed Generating Station, South-Central, Ohio

*A confidential client proposed construction of a pipeline in the Ohio River along the West Virginia/Ohio state line. Mr. Fleece was the technical lead for agency coordination, study design, field surveys, and reporting. Two field crews surveyed 126 transects measuring between 30 and 60 meters in length. This effort yielded 1,397 live mussels comprising 22 species. No Federally listed species were observed but a substantial proportion of the live animals were designated as endangered, threatened, or of concern by the State of Ohio. The most numerous species, three-horned wartyback (*Obliquaria reflexa*), was designated as threatened by the State of Ohio and accounted for 469 individuals or about 34 percent of the live animals observed. The State threatened black sandshell (*Ligumia recta*) was also very numerous and accounted for 10 percent of the live animals captured. Other State listed species included monkeyface (*Quadrula metanerva*), butterfly (*Ellipsaria lineolata*), washboard (*Megalania nervosa*), Ohio pigtoe (*Pleurobema cordatum*), pocketbook (*Lampsillis ovata*), round pigtoe (*Pleurobema sintoxia*), and deertoe (*Truncilla truncata*). Information generated in the study was used to avoid and minimize potential impacts to freshwater mussels. The data informed both project design and site selection.*

* denotes projects completed with other firms

William Cody Fleece

Senior Associate Malacologist

Dominion Monroe County Outlet Project Mussel Habitat Surveys, Monroe County, Ohio

Dominion East Ohio, Inc. (EOG) proposed construction of a new 16" natural gas gathering pipeline, known as the Monroe County Outlet Project, in Monroe County, Ohio, extending approximately 25.1 miles. The Ohio Department of Natural Resources (Ohio DNR) completed a review of the proposed project and requested a survey of freshwater mussels in the vicinity of the pipeline. The request came after survey windows for the mussel surveys had closed so EOG contracted with Stantec to assess habitats in the project area for evidence of mussel presence or absence. Stantec personnel evaluated habitat conditions including water chemistry, channel width and depth, and substrate composition at 11 stream crossings. Surveyors also conducted visually searched the channel for evidence of live animals and/or spent valves. Definitive evidence of freshwater mussel presence was observed at only one of the 11 streams. Five of the streams were deemed unsuitable for mussel presence due insufficient flow, bedrock outcrops, and/or water chemistry. The remaining streams were identified as potentially suitable and detailed surveys were recommended if trenching was proposed for construction.

Possum Hollow Mussel Habitat Assessment, Carbo, Virginia

Stantec was contracted by American Electric Power to conduct a mussel habitat assessment in a headwater tributary called Possum Hollow as one of several supporting studies for a proposed landfill project at the Clinch River Power Plant near Carbo, Virginia. Federally listed mussel species known to occur in the vicinity included Cumberlandian combshell, oyster mussel, purple bean, rough rabbitsfoot, cracking pearly mussel, fine-rayed pigtoe, and shiny pigtoe. Mr. Fleece assisted with field studies, examined the distribution, abundance and habitat utilization of federally listed species in the Clinch River basin and made determinations regarding the potential for project actions to affect these species.

* denotes projects completed with other firms

William Cody Fleece

Senior Associate Malacologist

PUBLICATIONS/PRESENTATIONS

Fleece, W.C., and B. Johnson. 2017. A desktop review of federally listed freshwater mussels, host fish and the potential pathways for impacts from water intakes. Clean Water Act §316(b) Technical Challenges for Ohio/Tennessee River Basin Power Plants and Annual Meeting of the Ohio River Ecological Research Program (ORERP). Oral Presentation. March 14-15, 2017 • American Electric Power Company, 1 Riverside Plaza, Columbus, Ohio.

Fleece, W.C., E.A. Bockstiegel, and J.D. Kiser. In revision. Freshwater mussel distribution and abundance in the pool of a lowhead dam as determined from collection and relocation following pool drawdown associated with dam removal on the Stillwater River, Miami County, Ohio. *Freshwater Mollusk Biology and Conservation*.

Matter, S.F., F.Borrero, and W.C. Fleece. Modeling the Survival and Population Growth of the Freshwater Mussel, *Lampsilis radiata luteola*. *American Midland Naturalist*, 2013.



Triston Mullins M.S.

Malacologist/Fisheries Biologist
9 years of experience · Louisville, Kentucky

Mr. Mullins currently serves as a fisheries biologist specializing in malacology out of Stantec's Louisville, Ky office. He has environmental industry experience as both a chemist and biologist, and he is proficient in the identification of benthic macroinvertebrates to family and genus level and southeastern fish and herptofauna to the species taxonomic level. Mr. Mullins is also recognized as an approved mussel surveyor for state protected species in West Virginia and Ohio and a federally permitted malacologist authorized for the handling of over 30 federally protected mussels within the Ohio and Upper Mississippi River drainages.

Mr. Mullins has regularly drafted study plans for state and federally protection species and led the subsequent presence absence surveys (i.e. crayfish, mussels, fish, and bats), been a field team leader for jurisdictional waters determination surveys, prepared technical reports, and assisted with mitigation site assessment, maintenance, and monitoring (i.e. macroinvertebrate, fish, and flora. His additional duties include leading technical research for novel ecological management methodologies including acoustic bat deterrence, environmental DNA sampling design, and aquatic resource management.

EDUCATION

B.S. Environmental Studies minor Chemistry,
Georgetown College, Georgetown, Kentucky, United States, 2011

M.S. Biology, Eastern Kentucky University,
Richmond, Kentucky, United States, 2017

CERTIFICATIONS & TRAINING

Approved Mussel Surveyor (95% Overall; 100% T&E), Ohio Division of Natural Resources, Columbus, Ohio, United States, 2022

Approved Mussel Surveyor (97% Overall; 100% T&E), West Virginia Division of Natural Resources, Elkins, West Virginia, United States, 2020

Appalachian Crayfishes Identification Workshop; Big Sandy and Guyandotte River Crayfish Survey Protocol, West Liberty University and USFWS, The Breaks Interstate Park, Kentucky and Virginia, United States, 2016

Essential Skills for Next Generation Sequencing and Data Analysis Workshop, University of Kentucky, Lexington, Kentucky, United States, 2015

Waters of the U.S. Wetland Training, Richard Chinn's Wetland Delineation Training Program, Louisville, Kentucky, United States, 2018

MEMBERSHIPS

Member, Freshwater Mollusk Conservation Society

Member, Society for Freshwater Science

Member, Ohio River Valley Mollusk Group

PROJECT EXPERIENCE

AQUATIC ECOLOGY

Brent Spence Mussel Survey | KYTC and ODOT | Cincinnati, OH, USA | Lead Malacologist

The Ohio Department of Transportation (ODOT) and Kentucky Transportation Cabinet (KYTC) jointly funding the design build for rehabilitation improvements and an adjacent bridge at the Brent Spence Bridge carrying I-71 and I-75 across the Ohio River between Cincinnati, OH and Covington, KY. The Brent Spence Bridge is in need of necessary maintenance, and the project addresses the on-going deterioration and extends the life of the bridge. In order to properly assess the mussel fauna assemblages within the proposed ROW of the new bridge, KYTC had HMB contract Stantec to perform surveys on both banks of the river. Triston served as the federally permitted malacologist on site and scientific diver, which included the coordination of activities with state and federal agencies and oversaw the handling of all freshwater mussels found during the surveys.

Mussel Survey Services – Portsmouth Water Treatment Plant (WTP) and Boat Ramp for the City of Portsmouth, Ohio (Owner) | Portsmouth, Ohio | Lead Malacologist

The City of Portsmouth (City) planned to undertake improvements to its Water Treatment Plant and to a boat ramp near Offnere Street along the Ohio River shoreline. Two 36-inch water intake lines will be constructed in the Ohio River to support drinking water needs for the City and surrounding municipalities. In order to assess the presence or likely absence of state and federally protected freshwater mussel species, Stantec was contracted to perform mussel surveys at the respective sites. As lead malacologist on site, Triston coordinated with the relevant state and federal agencies and oversaw the handling and identification of all freshwater mussel found on site.

Claytor Hydroelectric Project FERC No. 739
Freshwater Mussel Adaptive Management Monitoring
| Pulaski County, Virginia | Aquatic Biologist

Stantec Consulting was contracted to conduct water quality and mussel surveys on the New River as a condition of Appalachian Power Company's FERC license for the Claytor Hydroelectric project. This study is part of a Freshwater Mussel Adaptive Management Plan (the Plan) that is designed to determine if flow, temperature, and/or occasionally depressed dissolved oxygen (DO) concentrations are affecting freshwater mussels downstream of Claytor Dam over the term of the new license. Mr. Mullins supported the deployment and continued monitoring of mussel species placed into the Clinch River system. Duties including the handling and care for juvenile mussels, appropriate placement and installation of monitoring silos, and the collection of physiochemical and mussel biometric data.

Bridging Kentucky Program | Kentucky Transportation Cabinet | Kentucky, United States | 2018-Present | Ecologist/Biologist

Triston performed ecological resource surveys, mussel surveys, Section 404/401 permitting and biological assessment preparation for the rehabilitation, repair, or replacement of critical bridge structures associated with the KYTC Bridging Kentucky Program in all 120 KY counties. As a sub-consultant to Stantec, Triston conducted protect species habitat assessments at over 200 bridges and organized over 60 field efforts for the surveying of federally protected fish, mussels, and crayfish. Some surveys had multiple reaches sampled per a survey effort. During each field effort as field team leader, Triston has worked with subject matter experts (federally permitted biologists) so that the team was able to gather the correct data according to each survey protocol and project specific study plans and aided with the identification of common and rare/protected species. For bridge projects needing formal Section 7 consultation, Triston drafted study plans and organized field efforts for species relocation efforts. At the conclusion of each survey, Triston provided the needed materials and technical language in order to complete the associated Biological Assessments.

Kentucky Department of Fish & Wildlife Resources
Fee In-Lieu of Mitigation Program * | Kentucky
Department of Fish and Wildlife Resources |
Kentucky, United States | Ecology Technical Team
Lead at Eco-Tech Consultants

The Kentucky Division of Fish and Wildlife Resources (KDFWR) Wetland and Stream Mitigation "Fee In-Lieu of" (FILO) Program provides a way to fulfill compensatory mitigation requirements associated with the Clean Water Act, Section 404 and 401. The intent of the mitigation is to compensate for the permanent loss of aquatic functions within a defined watershed or regional area. Beginning in 2016, Triston has led and assisted field teams to perform wetland and stream delineations, aquatic surveys for benthic macroinvertebrates and fish, and botanical monitoring that support the design and construction of stream and wetland mitigation sites under the FILO program. Additionally, Triston identified all fish specimens, catalogued photo vouchers of specimens, calculated all stream health metrics, and prepared language for reporting of the interpretation of the biotic integrity and water quality measurements observed.

Mother Ann Lee Hydroelectric Facility FERC Re-Licensing * | Lock 7 Hydro Partners, LLC | High Bridge, Jessamine County, KY, USA | Aquatic Biologist/ Field Lead at Eco-Tech Consultants

Lock 7 Hydropartners required assistance in responding to environmental issues raised during the Federal Energy Regulatory Commission (FERC). Triston prepared an assessment of available habitat for the federally protected sheepsnose mussel (*Plethobasus cyphus*) in the Kentucky River. In order gather data, Triston characterized the river substrate through snorkelling and freediving to the river bottom being supported by a teammate in a watercraft.

Kentucky River Lock and Dam No. 13 Endangered Species Coordination * | Appalachian Hydro Associates | Mercer County, KY, USA | Aquatic Biologist/Field Lead at Eco-Tech Consultants

Appalachian Hydro Associates required Endangered Species Act coordination in order to document environmental activities as directed by U.S. Fish and Wildlife Service (USFWS) and the Federal Energy Regulatory Commission (FERC). Triston prepared an assessment of available habitat for the federally protected snuffbox (*Epioblasma triquetra*), rabbitsfoot (*Quadrula cylindrica cylindrica*), and sheepsnose mussel (*Plethobasus cyphus*) in the Kentucky River. In order gather data, Triston characterized the river substrate through snorkelling and freediving to the river bottom being supported by a teammate on the shoreline.

Mussel Survey for a Proposed Pipeline Replacement across the Great Miami River * | Civil and Environmental, Inc./Duke Energy | Middletown, Butler, OH, USA | Aquatic Biologist at Eco-Tech Consultants

A pipeline crossing was proposed at the Great Miami River and so a mussel survey was contracted with the federally protected rayed bean (*Villosa fabilis*) being listed as extant in the vicinity by the U.S. Fish and Wildlife Service (USFWS). Triston drafted the study plan presented to USFWS and Ohio Division of Natural Resources (ODNR), and he aided the permitted malacologist in organization and implementation of field surveys. Triston prepared and submitted the subsequent survey report. Aquatic

Assessment at Proposed Seven Hills Mine along Pigeon Creek * | Peabody Energy | Warrick County, IN, USA | Aquatic Biologist at Eco-Tech Consultants

As part of the environmental activities required to be performed by United States Army Corps of Engineers (USACE) and the Indiana Department of Environmental Management (IDEM) at the proposed Seven Hills surface mine permit area, an aquatic assessment was contracted mirroring the methodology and assessment performed in 2011. Triston organized and led fish and macroinvertebrate surveys. Post surveys, Triston identified all fish voucher specimens, calculated all stream health metrics, and prepared an assessment report, interpreting the biotic integrity and water quality measurements observed.

2016 Freshwater Mussel Transect Monitoring of the Muskingum River Dresden Plant Intake Facility* | Marine Solutions, Inc./American Electric Power | Dresden, Muskingum County, OH, USA | Aquatic Biologist at Eco-Tech Consultants

To facilitate cooling at the power generation facility an intake is operated from a bank of the Muskingum River, which needs to be dredged periodically in order to remove the sediment obstructing the intake. Annual monitoring and translocation of native mussels was required by U.S. Fish and Wildlife Service (USFWS) and Ohio Division of Natural Resources (ODNR) because the Muskingum River is known to be habitat for the federally protected snuffbox mussel (*Epioblasma triquetra*) and rabbitsfoot (*Quadrula cylindrica cylindrica*). Triston assisted with the field efforts and drafting of the final monitoring report.

SCIENTIFIC RESEARCH

Environmental DNA Collection and Extraction Research* | Eastern Kentucky University | Richmond, KY, USA | Graduate Researcher at Eastern Kentucky University

As a student researcher, Mr. Mullins worked in a lab concentrated on the capture, extraction, sequencing, and bioinformatic analysis of DNA, specifically freshwater invertebrates. He spearheaded the research for comparing and modifying existing eDNA capture and DNA extraction protocols. As part of his thesis project, he designed field protocols and devices for the capture of eDNA. Post field collection, Mr. Mullins used metabarcoding of eDNA consisting of a section of the cytochrome oxidase 1 (COI) gene region (~700 bp). Using a gene library of species previously identified at the site by state agencies, he designed a bioinformatics pipeline for making taxonomic assignments. The result was being able to compare common methodologies for DNA extraction by multivariate statistical analysis.

PUBLICATIONS

Mullins, M.T.. *Sample Collection and DNA Extraction Methods for Environmental DNA Metabarcoding in Headwater Streams*, 2017.

PRESENTATIONS

A River Runs Through It: An Ecological Assessment of Taylor Fork Ecological Area. *Eastern Kentucky University Biological Sciences Department, Spring 2015 Posters*, 2015.

Appendix C Agency Correspondence



From: [Fleece, Cody](#)
To: [Wallgren, Eric](#); [Mullins, Triston](#); [Adams, Joshua](#)
Subject: Fwd: [EXTERNAL] Mussel Study Plan for the Ridgeline Pipeline Project
Date: Friday, December 2, 2022 10:38:40 AM

Triston
Eric

Make sure this gets into the project file.

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From: Pelren, David <david_pelren@fws.gov>
Sent: Friday, December 2, 2022 11:25 AM
To: tmamacker@tva.gov <tmamacker@tva.gov>; Adams, Joshua <Joshua.Adams@stantec.com>
Cc: Sikula, Nicole R <nicole_sikula@fws.gov>; Gus McLachlan <gus.mclachlan@enbridge.com>; Benefiel, Jeffrey <Jeff.Benefiel@stantec.com>; Casey, Justin <Justin.Casey@stantec.com>; Haider, Jessica <Jess.Haider@stantec.com>; Fleece, Cody <Cody.Fleece@stantec.com>; Tennessee ES, FWS <tennesseeES@fws.gov>; Ford, Anthony <anthony_ford@fws.gov>; Hamrick, Elizabeth Burton <ecburton@tva.gov>; Sikula, Nicole R <nicole_sikula@fws.gov>
Subject: RE: [EXTERNAL] Mussel Study Plan for the Ridgeline Pipeline Project

Todd, thank you for providing this information relative to the Ridgeline gasline project. It is very helpful in developing a mussel sampling plan based on the best available information.

Josh, we believe that Todd has provided ample information in support of his statement that "it is highly unlikely that the area in question harbors federally listed mussel species". We agree with his argument that conducting a mussel survey in the area of the Kingston plant is not warranted. Therefore, we recommend that the gasline crossing site at the Kingston plant be deleted from the mussel survey plan and that such resources be utilized in mussel-rich locations where rare federally listed mussel species may occur.

We appreciate the thorough consideration of the need for mussel sampling in this situation. Feel free to contact me for further discussion.

David Pelren
Fish and Wildlife Biologist
Ecological Services
U.S. Fish and Wildlife Service
446 Neal St.
Cookeville, TN 38501
office phone: 931-525-4974
mobile phone: 931-261-5844

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From: Amacker, Todd M <tmamacker@tva.gov>

Sent: Wednesday, October 19, 2022 2:26 PM

To: Pelren, David <david_pelren@fws.gov>; Adams, Joshua <Joshua.Adams@stantec.com>

Cc: Sikula, Nicole R <nicole_sikula@fws.gov>; Gus McLachlan <gus.mclachlan@enbridge.com>; Benefiel, Jeffrey <Jeff.Benefiel@stantec.com>; Casey, Justin <Justin.Casey@stantec.com>; Haider, Jessica <Jess.Haider@stantec.com>; Fleece, Cody <Cody.Fleece@stantec.com>; Tennessee ES, FWS <tennesseeES@fws.gov>; Ford, Anthony <anthony_ford@fws.gov>; Hamrick, Elizabeth Burton <ecburton@tva.gov>

Subject: RE: [EXTERNAL] Mussel Study Plan for the Ridgeline Pipeline Project

Hi All –

Apologies for the delay in providing this data. I have had an ongoing discussion with Tyler Baker, our Limnologist, about this and just wanted to provide a few documents and a little biological context around the proposed pipeline crossing in question.

Benthic invertebrates:

The benthic community transects closest to the proposed pipeline crossing are ERM 1.0 and ERM 2.2. The attached 2017 KIF report provides a high-level summary of the benthic invertebrate community results. Benthic community sampling was conducted along transects that crossed the width of the reservoir perpendicular to the direction of flow. Discrete grab samples were collected from 10 approximately equally spaced locations along each transect using a standard Ponar dredge.

EPT richness may be the biggest take home. While the observed values for Average EPT richness are within the range commonly observed in TVA mainstream reservoirs, both Average EPT Richness and Total EPT Richness is considered low and categorized as 'severely impacted', as reservoirs obviously aren't natural systems. Generally, a few more EPT taxa are collected at the upstream most transects on the Emory and Clinch Rivers because both rivers are transitioning from more-riverine to more-lacustrine (increased depositional sediments) within the study area.

Average EPT richness is the total number of distinct EPT taxa in each substrate sample, divided by the total number of samples. Therefore, if *Hexagenia* (a highly ecologically tolerant taxon) was the only EPT collected, and each sample had at least one *Hexagenia*, then the metric value would be 1.0.

At KIF, *Hexagenia* account for about 70% of the EPT richness. Approximately 1156 individual substrate samples have been collected in the vicinity of KIF. If *Hexagenia* are excluded from the EPT counts, then about 70% of the individual samples would not contain an EPT. *Oecetis* is the second most collected EPT taxa. Exclude *Hexagenia* and *Oecetis*, then 85% of the samples would not contain an EPT. Stoneflies have been collected in 15

of the 1156 samples; a grand total of 21 individuals, and all but one was collected in the Emory River.

Freshwater Mussels:

Also attached is a (somewhat dated) freshwater mussel survey from 2005. In my experience, unfortunately, continued degradation of the federally listed mussel fauna is the norm in the main stem Tennessee River, with a few exceptions. Given this general trend, combined with the results of the 2005 survey, it is highly unlikely that the area in question harbors federally listed mussel species. Broadly speaking, I am supportive of freshwater mussel surveys as they provide data that inform decisions that agencies make on a weekly basis, but I just don't think that this particular site warrants the time, effort, and money that could be better utilized in more mussel-rich locations.

*Also attached is a list of freshwater mussels (albeit rare) that have been accidentally 'grabbed' by the ponar since 2009 in areas directly adjacent to Kingston Fossil Plant. They represent common, widespread species that you would expect to find in degraded habitat.

If I can be of any further assistance, please let me know. Thanks!

-TA

From: Pelren, David <david_pelren@fws.gov>

Sent: Monday, September 26, 2022 3:11 PM

To: Adams, Joshua <Joshua.Adams@stantec.com>

Cc: Sikula, Nicole R <nicole_sikula@fws.gov>; Gus McLachlan <gus.mclachlan@enbridge.com>; Benefiel, Jeffrey <Jeff.Benefiel@stantec.com>; Casey, Justin <Justin.Casey@stantec.com>; Haider, Jessica <Jess.Haider@stantec.com>; Fleece, Cody <Cody.Fleece@stantec.com>; Tennessee ES, FWS <tennesseeES@fws.gov>; Sikula, Nicole R <nicole_sikula@fws.gov>; Ford, Anthony <anthony_ford@fws.gov>; Hamrick, Elizabeth Burton <ecburton@tva.gov>; Amacker, Todd M <tmamacker@tva.gov>

Subject: RE: [EXTERNAL] Mussel Study Plan for the Ridgeline Pipeline Project

This is an EXTERNAL EMAIL from outside TVA. THINK BEFORE you CLICK links or OPEN attachments. If suspicious, please click the "Report Phishing" button located on the Outlook Toolbar at the top of your screen.

Mr. Josh Adams
Stantec Consulting Services, Inc.

Josh –

We have reviewed the mussel study plan that you provided for the Ridgeline gasline project. We understand that eDNA samples were collected during June 2022 in order to provide foundational data for preparation of this plan. The survey would be initiated this fall, and the plan involves use of traditional methods for sampling of seven small stream sites. EDNA would be collected at larger waterbody sites (i.e., five sites at reservoir embayments and a large river) in conjunction with

methods suitable for the habitats.

We approve of the plan as provided for the purpose of documenting presence / likely absence of threatened and endangered mussel species. As noted during the meeting at our office on September 22, 2022, the Tennessee Valley Authority will provide biological information in support of further evaluation of the need to survey for mussels at the proposed crossing site adjacent to the Kingston plant. Upon review of that information, we will discuss the extent of survey needs at the site.

Feel free to contact me if need for revision of the plan becomes apparent or for further discussion.

David Pelren
Fish and Wildlife Biologist
Ecological Services
U.S. Fish and Wildlife Service
446 Neal St.
Cookeville, TN 38501
office phone: 931-525-4974
mobile phone: 931-261-5844

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From: Adams, Joshua <Joshua.Adams@stantec.com>
Sent: Thursday, September 8, 2022 8:02 AM
To: Pelren, David <david_pelren@fws.gov>
Cc: Sikula, Nicole R <nicole_sikula@fws.gov>; Gus McLachlan <gus.mclachlan@enbridge.com>; Benefiel, Jeffrey <Jeff.Benefiel@stantec.com>; Casey, Justin <Justin.Casey@stantec.com>; Haider, Jessica <Jess.Haider@stantec.com>; Fleece, Cody <Cody.Fleece@stantec.com>
Subject: [EXTERNAL] Mussel Study Plan for the Ridgeline Pipeline Project

This email has been received from outside of DOI - Use caution before clicking on links, opening attachments, or responding.

Dave,

Please find attached the survey plan for the mussel surveys we are planning on initiating this fall.

Josh Adams

Natural Resource Team Lead, Terrestrial Wildlife Technical Lead, Principal

Direct: 502 212-5011
Mobile: 502-718-9512
Fax: 502 212-5055
Joshua.Adams@stantec.com

Stantec
9200 Shelbyville Road Suite 800
Louisville KY 40222-5136



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Appendix D

Scientific Collection Permits





NATIVE ENDANGERED & THREATENED SP.
RECOVERY

Permit Number: ES38821A

Version Number: 5

Effective: 2022-05-20 **Expires:** 2026-12-31

Issuing Office:

Department of the Interior

U.S. FISH AND WILDLIFE SERVICE

ES Bloomington Permit Office

5600 American Boulevard, West, Suite 990

Bloomington, Minnesota 55437-1458

permitsR3ES@fws.gov

Digitally signed by

Acting Endangered Species Division, Program Manager

Permittee:

STANTEC CONSULTING SERVICES

10509 TIMBERWOOD CIRCLE SUITE 100

LOUISVILLE, KY 40223-2177

US

Authority: Statutes and Regulations: 16 U.S.C. 1539 (a), 16 U.S.C. 1533 (d) 50 CFR 17.22, 50 CFR 17.32, 50 CFR 13

Location where authorized activity may be conducted:

ON LANDS SPECIFIED WITHIN THE ATTACHED SPECIAL TERMS AND CONDITIONS

Reporting requirements:

ANNUAL REPORTS DUE: 1/31

See permit conditions for reporting requirements

Authorizations and Conditions:



NATIVE ENDANGERED & THREATENED SP.
RECOVERY

Permit Number: ES38821A

Version Number: 5

Effective: 2022-05-20 **Expires:** 2026-12-31

- A. General Conditions set out in Subpart B of 50 CFR 13, and specific Conditions contained in Federal regulations cited above, are hereby made a part of this permit. All activities authorized herein must be carried out in accord with and for the purposes described in the application submitted. Continued validity, or renewal of this permit is subject to complete and timely compliance with all applicable Conditions, including the filing of all required information and reports.
- B. The validity of this permit is also conditioned upon strict observance of all applicable foreign, state, local, tribal, or other federal law. Necessary state and/or local permits where applicable, must also be acquired and observed; this permit is invalid without such permits.
- C. Valid for use by those identified in the List of Authorized Individuals.

C.1. Authorized Individuals:

Only individuals on the attached List of Authorized Individuals (LAI) are authorized to conduct activities pursuant to this permit. The LAI, printed on U.S. Fish and Wildlife Service (USFWS) letterhead, and signed and dated by the Region 3 permit issuing office or a Region 3 lead species Field Office, may identify special Conditions or circumstances under which individuals can conduct authorized activities and it must be retained with these Authorizations and Conditions. Each named individual shall be responsible for compliance with the Authorizations and Conditions of this permit.

Trained assistants not named on the attached LAI may work on permitted activities under the direct and on-site supervision of the individuals named on the LAI. "On-site supervision" is defined as having the Permittee at a distance close enough to enable immediate assistance to a supervised individual, as needed, while the supervised individual conducts an authorized activity. Trained assistants may not work independently at a site.

Permittee shall replace outdated LAIs and attach the subsequent current updated version of the LAI to this recovery permit upon receipt. **This permit will be considered invalid without a current attached LAI.**



NATIVE ENDANGERED & THREATENED SP.
RECOVERY

Permit Number: ES38821A

Version Number: 5

Effective: 2022-05-20 **Expires:** 2026-12-31

C.2. To request changes to the LAI, the Permittee (Principal Officer for business permits) shall submit an amendment request via ePermits (epermits.fws.gov). The request shall be submitted at least 30 days prior to the desired effective date. The Permittee shall submit a \$50.00 processing fee unless fee exempt [see 50 CFR 13.11 (d)], the request should include a desired effective date and shall include the following information:

- a. The name of each individual (first name, middle initial, last name) to be appended to the LAI, confirmation that the individual is not permitted under another business or individual Federal recovery permit, and indicate the species they will be working with and the activities they will be conducting;
- b. The resume/qualifications of each person, including specific information on previous professional experience working with the species/activity affected by the request. Information should include: the approximate number of hours of focused activity with each species in occupied habitat; approximate numbers of each species the applicant has worked with at each site (i.e., indicate the number specimens at specific sites or specific activities); names, dates, and location of areas surveyed; and experience with similar species;
- c. For each individual: the names, titles, organizations, emails, and telephone numbers of a minimum of two references who can verify experience with the species (reference letters are preferred and always appreciated); and
- d. The names of any individuals to be deleted from the LAI.

D. Acceptance of this permit serves as evidence that the Permittee understands and agrees to abide by the terms of this permit and all sections of Title 50 Code of Federal Regulations (CFR), Parts 13 and 17, pertinent to issued permits (<https://fwsepermits.servicenowservices.com/fws>). Section 11 of the Endangered Species Act of 1973, as amended, provides for civil and criminal penalties for failure to comply with permit conditions.

A request for permit renewal and the \$100 application processing fee must be received **at least 30 days prior to the expiration date** of this permit to continue conducting authorized activities under the expired permit while your application is being processed (subject to compliance with 50 CFR, Parts 13.21 and 13.22). Please use <https://fwsepermits.servicenowservices.com/fws> to obtain specific information regarding the new ePermitting process to apply for and submit your digital recovery permit application and application processing fee. When these requirements are not met, this permit becomes invalid on the expiration date.



NATIVE ENDANGERED & THREATENED SP.
RECOVERY

Permit Number: ES38821A

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Effective: 2022-05-20 **Expires:** 2026-12-31

Unless otherwise instructed within the Authorizations and Conditions, **annual reports** are due by January 31 following each year your permit is in effect and shall be submitted to all offices identified in the permit Conditions

- E. Permittee is authorized to take Indiana bat (*Myotis sodalis*), gray bat (*Myotis grisescens*), northern long-eared bat (*Myotis septentrionalis*), Ozark big-eared bat (*Corynorhinus townsendii ingens*), Virginia big-eared bat (*Corynorhinus townsendii virginianus*), listed mussel and fish species identified in the tables below, copperbelly water snake (*Nerodia erythrogaster neglecta*), and big sandy crayfish (*Cambarus callianus*) and for scientific research aimed at recovery of the species: presence/absence surveys, studies to document habitat use, population monitoring, and to evaluate potential impacts. This permit does **not** authorize the collection of voucher specimens.

Fish Species

<i>Etheostoma chienense</i>	Relict darter
<i>Etheostoma percnurum</i>	Duskytail darter
<i>Etheostoma spilotum</i>	Kentucky arrow darter
<i>Notropis albizonatus</i>	Palezone shiner
<i>Phoxinus cumberlandensis</i>	Blackside dace
<i>Scaphirhynchus albus</i>	Pallid sturgeon

Freshwater Mussel Species

<i>Alasmodonta atropurpurea</i>	Cumberland elktoe
<i>Cumberlandia monodonta</i>	Spectaclecase
<i>Cyprogenia stegaria</i>	Fanshell
<i>Dromus dromas</i>	Dromedary pearlymussel
<i>Epioblasma brevidens</i>	Cumberlandian combshell
<i>Epioblasma capsaeformis</i>	Oyster mussel
<i>Epioblasma florentina walkeri</i>	Tan riffleshell
<i>Epioblasma obliquata perobliqua</i>	White catspaw
<i>Epioblasma obliquata obliquata</i>	Purple catspaw
<i>Epioblasma torulosa gubernaculum</i>	Green blossom pearlymussel
<i>Epioblasma torulosa rangiana</i>	Northern riffleshell



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Effective: 2022-05-20 **Expires:** 2026-12-31

<i>Epioblasma triquetra</i>	Snuffbox
<i>Epioblasma turgidula</i>	Turgid blossom pearlymussel
<i>Fusconaia cuneolus</i>	Finerayed pigtoe
<i>Fusconaia cor</i>	Shiny pigtoe
<i>Hemistena lata</i>	Cracking pearlymussel
<i>Lampsilis abrupta</i>	Pink mucket
<i>Lampsilis altilis</i>	Finelined pocketbook
<i>Lampsilis higginsii</i>	Higgins eye pearlymussel
<i>Lemiox rimosus</i>	Birdwing pearlymussel
<i>Leptodea leptodon</i>	Scaleshell
<i>Obovaria retusa</i>	Ring pink
<i>Pegias fabula</i>	Littlewing pearlymussel
<i>Plethobasus cicatricosus</i>	White wartyback pearlymussel
<i>Plethobasus cooperianus</i>	Orangefoot pimpleback pearlymussel
<i>Plethobasus cyphus</i>	Sheepnose
<i>Pleurobema clava</i>	Clubshell
<i>Pleuorbema gibberum</i>	Cumberland pigtoe
<i>Pleurobema plenum</i>	Rough pigtoe
<i>Pleuonaia dolabelloides</i>	Slabside pearlymussel
<i>Potamilus capas</i>	Fat pocketbook
<i>Ptychobranhus subtentus</i>	Fluted kidneyshell
<i>Quadrula cylindrica cylindrica</i>	Rabbitsfoot
<i>Quadrula cylindrica strigillata</i>	Rough rabbitsfoot
<i>Quadrula fragosa</i>	Winged mapleleaf
<i>Quadrula intermedia</i>	Cumberland monkeyface pearlymussel
<i>Quadrula sparsa</i>	Appalachian monkeyface pearlymussel
<i>Toxolasma cylindrellus</i>	Pale lilliput pearlymussel
<i>Villosa fabalis</i>	Rayed bean
<i>Villosa perpurpurea</i>	Purple bean
<i>Villosa trabilis</i>	Cumberland bean



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F. Activities are authorized at the following locations:

- F.1. Within U.S. Fish and Wildlife Service (USFWS) Southwest Region 2: Texas and Oklahoma, upon receipt of written concurrence from the Field Supervisor, and upon coordination with Ozark Plateau National Wildlife Refuge prior to (1) surveys of caves known to be used by federally-listed bats, and (2) examinations of caves suspected of containing federally-listed bat species (some presence/absence surveys may require the presence of a U.S. Fish and Wildlife Service Biologist), and as outlined in Condition G.
- F.2. Within USFWS Midwest Region 3: Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, Ohio, and Wisconsin, upon receipt of written concurrence from the Field Supervisor, as outlined in Condition G.
- F.3. Within USFWS Southeast Region 4: Alabama, Arkansas, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, and Tennessee, upon receipt of written concurrence from the Field Supervisor, as outlined in Condition G.
- F.4. Within USFWS Northeast Region 5: Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, Virginia and West Virginia, upon receipt of written concurrence from the Field Supervisor, as outlined in Condition G.
- F.5. Within USFWS Mountain-Prairie Region 6: Colorado, Kansas, Montana, Nebraska, North Dakota, South Dakota, and Wyoming, upon receipt of written concurrence from the Field Supervisor, as outlined in Condition G.

- G. For bats and mussels permittee shall notify and request approval from the USFWS Field Supervisor for the state in which activities are proposed to occur (Condition U.) at least 15 days prior to conducting any activities.

For fish and Copperbelly water snake permittee shall notify and request approval from the USFWS Species Recovery Lead Office Field Supervisor *and* the USFWS Field Supervisor for the state in which activities are proposed to occur (Condition U.) at least 15 days prior to conducting any activities.



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For Big sandy crayfish permittee shall notify and request approval from the USFWS Species Recovery Lead Office Field Supervisor *and* the USFWS Field Supervisor for the state in which activities are proposed to occur (Condition U.) at least 30 days prior to conducting any activities.

Contact information is available at: <https://www.fws.gov/service/3-200-59-scientific-purposes-enhancement-propagation-or-survival-permits-recovery-permits>. Your request for this site-specific approval must be in writing and must indicate:

- G.1. Species for which proposed activities are being conducted.
- G.2. Location of proposed activities, including project site, county, and state.
- G.3. A complete description of activities (i.e., proposed project plan, including purpose and need, surveys, methods, etc.).
- G.4. Dates when the project is proposed to take place.
- G.5. Evidence that Permittee has received any required contracts to complete the activities.
- G.6. Whether all annual reporting requirements have been fulfilled.

You may proceed with only the activities described in your written concurrence letter, upon receipt from the applicable USFWS Field Supervisor. ***Your concurrence letter must be carried with this permit to authorize site-specific activities.***

H. **BAT SPECIES:** Permittee is authorized to take (capture with mist-nets or harp traps, handle, identify, band, radio-tag, collect non-intrusive measurements, enter hibernacula, and release). Permittee shall adhere to the following conditions:

- H.1. Bats may be captured with mist nets following the protocol included in the Range-wide Indiana Bat and Northern Long-eared Bat Survey Guidelines. Guidelines are available at:

<https://fws.gov/media/range-wide-indiana-bat-and-northern-long-eared-bat-survey-guidelines>.

Note: Permittee must use the most up-to-date version of the Summer Survey Guidelines, available on



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the USFWS website page, for your summer surveys. The monitoring interval for mist nets is +/- 10 minutes and may not exceed 15 minutes. Captured bats may be held for a maximum of 30 minutes, unless injured. In extenuating circumstances, bats shall be held for no longer than 45 minutes.

- H.2. Bats may be captured with harp traps with written concurrence from the Field Supervisor in the state in which trapping is proposed. **Harp traps must be continually monitored.** Captured bats may be held for a maximum of 30 minutes, unless injured. In extenuating circumstances, bats shall be held for no longer than 45 minutes.

At least one named Permittee must remain present at each mist-net and harp trap site while it is being operated.

- H.3. Permittee shall carry out non-intrusive measurements on all captured bats. Data shall be recorded for all bats captured and include, but not be limited to, the data requested in any automated or species-specific data sheet provided by the USFWS (e.g., Bat Reporting Spreadsheet). Handling should be limited to the maximum extent practicable and should cease immediately at signs of undue stress (e.g., bat becoming unresponsive, etc.). Bats that appear stressed from handling should be placed in a dark, quiet location away from activity where it can safely fly away after recovery, and should be checked to ensure successful recovery before leaving the study site. Photographs of the identifying characteristics for each individual federally-listed species captured are encouraged. The Permittee may be requested to provide individual photographs after submittal of annual reporting data.
- H.4. Lipped metal bands having a unique identifier may be applied to the forearm of captured bats prior to release. No more than one band per bat may be used. Bands should be applied to the forearm of captured bats prior to release. Position the band on the wing so that when the bat is hanging upside down, the band numbers are right-side up. A single band should be placed on the right forearm of each male and the left forearm of each female bat.
- H.5. Radio transmitters may be applied during spring, summer, and fall roosting and migration periods via nontoxic skin bond adhesive. The total weight of the transmitter may not exceed 5% of the bat's body weight and the total weight of the package (forearm band, transmitter and adhesive) may not exceed 6% of the bat's body weight. The lightest package (both transmitter and adhesive) capable of accomplishing the required task should be used, especially with pregnant females and newly volant



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juveniles. Bats carrying transmitters must be monitored daily for at least three days, or until the transmitter falls off, whichever occurs first. *Although not required as a condition of this permit, in order to gather needed information to promote the conservation of the northern long-eared bat, it is recommended that the permittee radio-track female and juvenile northern long-eared bats captured when conducting mist-netting and radio-tracking of Indiana bats within the white-nose syndrome (WNS) zone of the range of the northern long-eared bat. Specifics on the number of females and juvenile bats-to be tracked will be determined in coordination with the appropriate Field Office, as specified in Condition G.*

- H.6. No trapping activities shall occur within 20 meters of a known Indiana bat maternity roost site, either natural or artificial roosts, unless Permittee receives prior written approval from the USFWS Field Supervisor for the state in which the activities are proposed to occur.
- H.7. Equipment used to capture and handle bats shall be cleaned and decontaminated, including personal gear such as boots and gloves, using products cited in decontamination guidelines and in compliance with label directions. The most recent decontamination guidance is found on the web at: <https://www.whitenosesyndrome.org/topics/decontamination>.
- H.8. Caves, mines, or other suitable hibernation sites may be quietly searched in a manner that minimizes disturbance by utilizing the minimum number of people and time required to complete the survey. Surveys should not be repeated more often than once every other year in any given hibernaculum that is occupied by endangered or threatened bats. Where hibernacula area and safety conditions allow, individuals entering caves are recommended to utilize night vision goggles or red-filtered light and to remain in the cave no more than 90 minutes to complete the work.
- H.9. You shall immediately remove Ozark big-eared bats (*Corynorhinus townsendii ingens*) and Virginia big-eared bats (*C. t. virginianus*) from the net/trap after capture, then process and release each individual. When there are multiple bats in the net, Ozark big-eared bats (OZBB) and Virginia big-eared bats (VABB) shall be removed first and processed as quickly as possible. If this is not possible, the species shall be placed into a **HOLDING CAGE** and held no longer than 10 minutes. Place the cage in a dark, quiet location, and process all as soon as possible. **Do not put these bat species in holding bags, nor in an individual holding bag or container** (*C. t. ingens* and *C. t. virginianus* are highly social and being held individually in a bag increases stress and can lead to mortality). Holding cage



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options include small rubber/plastic/vinyl coated soft-sided (mesh) pet carriers or modified standard minnow traps with rubber coated mesh where the top of the trap is either a plastic bucket or flower pot with a hole in the center (contact the OZBB or VABB Lead Recovery Biologist for further information on acceptable enclosures -- see Condition U. for contact information). A holding cage shall contain only multiple OZBBs, or only multiple VABBs (avoid overcrowding). Do not place other species/subspecies in either cage(s). Holding cages shall be decontaminated using the most current White-nose Syndrome decontamination guidance after a night of use (<https://www.whitenosesyndrome.org/topics/decontamination>). Do not decontaminate holding cages within a single net night.

When an OZBB or VABB appear to be going into shock (i.e., becomes limp and unresponsive), place the bat in a dark, quiet location either on a rock or other flat surface considered the safest option for the bat in that situation to recover (removed from capture activities and predators) and monitor it periodically. **Do not continue to handle the bat, nor place it in a holding cage or in a holding cage with other OZBBs or VABBs.** If the stressed bat recovers, release it immediately without an attempt to gather additional data, collect samples, apply a band or a transmitter, etc.

H.10. **Wes Cunningham and Lynda Mills** are not authorized to take Ozark big-eared bat (*Corynorhinus townsendii ingens*) and Virginia big-eared bat (*C. t. virginianus*). The USFWS acknowledges that incidental (unintentional) capture of these co-occurring listed bat species may potentially occur while conducting lawful survey activities directed at authorized bat species. Wes Cunningham and Lynda Mills **are not authorized to conduct** any activities for the specific purpose of capture of Ozark or Virginia big-eared bats. Permittee shall be observant and cautious to eliminate or minimize "take" of co-occurring listed species to the maximum extent practicable. In the event of incidental (unintentional) capture of Ozark big-eared bat or Virginia big-eared bat, Permittee shall immediately remove the bat(s) from the net/trap after capture, document with a photograph and release at the capture site. **Do not put these bat species in holding cages, bags, or containers.** Within 48 hours, you must notify the USFWS in the state in which you are working of the incidental capture (see <https://www.fws.gov/service/3-200-59-scientific-purposes-enhancement-propagation-or-survival-permits-recovery-permits>).



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- I. **MUSSEL SPECIES:** Permittee is authorized to take (capture, handle, release, and relocate under special circumstances) mussels by hand via wading, snorkeling, or diving. Permittee shall adhere to the following conditions:
- I.1. Permittee may take (remove from the substrate, by hand, for identification and data collection) mussels via wading, snorkeling, or diving and temporarily hold healthy specimens.
- I.2. Permittee may temporarily hold specimens in mesh bags, either suspended in the water or held in a container containing river water, while awaiting identification and data collection. Specimens may be held for up to three hours if they are held in the water in bags that allow free movement of water in the river from which the mussels were taken or held in containers of water that is changed every hour [every half-hour when air temperatures are at or above 80° Fahrenheit (F)] and replaced with water freshly taken from the water where the mussels were collected. When practicable, specimens held in containers must remain in the shade. Specimens must be returned to the locality from which they were taken. Live specimens that cannot be identified at the site must be photographed for identification purposes.
- I.3. Collection of live mussel specimens must be done only when the water temperature is above 40° F. Mussels must be returned by hand to suitable habitat, by divers if necessary. When air temperatures are below 32° F or above 90 ° F, specific details regarding collection and handling activities as well as how mussels should be placed (i.e., reburial instructions) shall be coordinated with the field office(s) where activities are occurring (Condition U).
- I.4. All live mussels shall be measured (length and height) and, if possible, sexed and aged. No intrusive activities are permitted. Data collected shall include descriptions of external morphometry and reproductive status. All specimens of federally listed species – or a representative sample for each species – must be photographed prior to release.
- I.5. Capture and relocation shall be authorized under this permit only under special circumstances when listed mussels are anticipated to be harmed by dewatering and/or stranding and only with written approval from the USFWS Field Supervisor for the state(s) in which the activity is proposed and in accordance with the conditions described below. Such specimens may be moved into deeper water at the survey site; to a suitable location near the survey site; or, to an alternative location within the



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same HUC 12 watershed, coordinated with and approved by the appropriate U.S. Fish and Wildlife Field office. Capture and relocation under other circumstances shall be authorized under this permit only in Michigan and requires written approval from the USFWS Field Supervisor in the Michigan Ecological Services Field Office. In Michigan, any relocation would also be conducted in accordance with the Michigan Freshwater Mussel Survey Protocols and Relocation Procedures.

- I.5.a. Take (remove from the substrate by hand) the species via wading, snorkeling or diving.
- I.5.b. For transportation purposes, Permittee may temporarily hold specimens in either river water within aerated holding tanks or in ice chests draped in damp burlap and may move specimens to relocation site(s) as authorized in writing by the U.S. Fish and Wildlife Service Field Office. In all cases, handling and exposure shall be kept to a minimum during relocation effort.
- I.5.c. Specimens shall be measured, photographed, and tagged prior to transporting them to approved relocation sites. Tagging of mussels may be omitted under special circumstances, such as emergency salvage, when time does not allow for adherence to established tagging procedures. The locations for replanting must have a stable substrate and characteristics (temperature and water chemistry) conducive to survival of specimens. Permittee should loosen substrate by hand or with a small tool to a depth of about one-half the length of the mussel. Place the mussel approximately half way into the loosened substrate, near the center of the loosened area, siphon (posterior) end up and pointing upstream.
- I.5.d. Permittee may temporarily hold specimens in mesh bags, either suspended in the water or held in a container containing river water, while awaiting identification and data collection. Specimens may be held for up to 3 hours provided that they are held in the water in bags that allow free movement of water in the water body from which the mussels were taken from or held in buckets containers of water that is changed every hour [every half-hour when air temperatures are at or above 80o Fahrenheit (F)] and replaced with water freshly taken from the water where the mussels were collected. When practicable, specimens held in containers must remain in the shade. Live specimens that cannot be identified at the site must be photographed for identification purposes.



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I.5.e. Collection of live mussel specimens for prior approved relocation must be done only when the air temperature is above 32° Fahrenheit and the water temperature is above 40° Fahrenheit. *Specimens may not be collected and transported to a new location when air temperature is above 90°F.*

I.5.f. Specimens must be returned to a suitable locality. A suitable location for replanting of specimens shall be determined prior to taking mussels from the original site. The location for replanting must have a stable substrate and have characteristics similar to the substrate from which the specimens are collected (and approved by the Michigan Ecological Services Field Office as explained in Condition G.).

I.5.g. The permittee shall obtain, record, and report the geographic coordinates of the specific relocation site(s) using a GPS receiver. In addition to GPS data, the permittee shall describe the general relocation area using unique river or bank identifiers to provide a general location of the site using triangulation. Live mussels must be returned unharmed to the substrate within three hours of collection. Divers should follow the protocol in H.3., above to position the relocated specimens in the substrate by hand.

I.5.h. The USFWS Field Supervisor in the Michigan Ecological Services Field Office will specify in writing whether all listed mussels shall be marked or etched with a unique identifier and will also describe in writing the nature of marking (e.g., shellfish tag vs. etching) to be used. This USFWS field office may convey this in any site-specific authorization provided or in writing separately.

I.6. The shells of all live specimens collected or captured temporarily must be thoroughly inspected for the presence of zebra mussels (*Dreissena polymorpha*). Unionids with zebra mussels attached must be cleaned by scrubbing prior to returning to the substrate. Document the incidence of zebra mussels and Asiatic clams (*Corbicula fluminea*) at project sites.

I.7. Any dead endangered or threatened mussel shells and any specimens accidentally killed or that are moribund or freshly-dead and contain soft tissue are to be preserved according to standard museum practices, properly identified and indexed (collection site, UTM coordinates, site conditions when collected, date collected, and permit authorizing collection). All dead specimens shall be sent to a



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public scientific or educational facility or museum in the state the individuals were collected along with a copy of the permit(s) under which they were collected. All specimens retained under this permit remain the property of the United States Government and must clearly be identified as such.

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J. FISH SPECIES: Permittee is authorized to take (capture, temporary hold, collect non-intrusive measurements and release) fish. Permittee shall adhere to the following conditions:

- J.1. Permittee may hold specimens for a maximum of 15 minutes for photographic documentation, non-intrusive data collection, and release unharmed at the point of capture.
- J.2. Electrofishing surveys are only authorized by written concurrence of the U.S. Fish and Wildlife Service Field Supervisor for the state in which the activity is proposed.

K. COPPERBELLY WATER SNAKE: Permittee is authorized to take (capture, handle, collect non-intrusive measurements, and release) Copperbelly water snake (*Nerodia erythrogaster neglecta*). The following conditions apply to activities related to presence/absence surveys for Copperbelly water snake:

- K.1. Activities may be conducted by visual searches of habitat to assess habitat quality and to determine presence or absence of Copperbelly water snake.
- K.2. Time searches shall be based on protocol developed and discussed by Bruce Kingsbury (Attachment # 1).
- K.3. Drift fences may also be employed for more quantifiable population estimates.

L. BIG SANDY CRAYFISH: Permittee is authorized to take (capture, handle, and release) Big sandy crayfish (*Cambarus callainus*). The following conditions apply to the activities to survey for the presence/absence of the Big sandy crayfish:

- L.1. USFWS Ecological Services Field Office authorization is required prior to conducting surveys. Permittee must submit survey plan 30 days prior to proposed survey dates.



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- L.2. Surveys shall be conducted following the protocol attached to this permit (Attachment #2), entitled, Big Sandy and Guyandotte River Crayfish Survey Protocol.
- L.3. Permittee may capture Big sandy crayfish using an 8' x 4' seine, with double leads and double floats, and 1/8 inch netting.
- L.4. Big sandy crayfish shall be removed from the net and placed into trolling buckets and retained in the stream until processing. Crayfish specimens must be held out of the water for processing for the shortest time possible, no more than 5 minutes.
- L.5. Non-intrusive measurements, data collection, and photographs may be taken. Standardized data sheets will be provided by the authorizing Ecological Services Field Office and the natural resources agency for the state in which surveys are proposed. All data required by the USFWS and the state shall be collected for any Big sandy crayfish that are captured under the authority of this permit. You must also record location and physical attributes of habitat where discovered, such as substrate, water velocity, riffles, channelization, etc.
- L.6. All Big sandy crayfish shall be released unharmed immediately upstream of capture site.
- L.7. Any discovery of Big sandy crayfish shall be reported to the USFWS West Virginia Field Office (Condition U.12.) within 48 hours.
- M. Upon determination that endangered or threatened species are present at previously undocumented sites, Permittee shall notify the following within 48 hours: the USFWS Regional Recovery Permit Coordinator, the Species Recovery Lead (Condition U.), and the USFWS Field Office within the geographic location of study areas (<https://www.fws.gov/media/region-3-recovery-permit-contact-information>).
- N. Accidental injury or mortality of bats, mussels, fish, or crayfish may not exceed two (2) specimens of any listed species. In the event that any accidental injury or mortality occurs, all activities must cease. The Permittee must report any species mortality or serious injury within 24 hours to the applicable USFWS Field Office in the state in which the incident occurred (contact information provided at: <https://www.fws.gov/media/region-3-recovery-permit-contact-information>). Written notification must also be made within 48 hours to the Midwest Region 3 Recovery Permit Coordinator and the Species Recovery



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Lead (Condition U.). The Permittee's statement must document the cause of the injury or mortality, and identify all remedial measures employed by the Permittee to eliminate future mortality or injury events. Based on consultation between the USFWS offices, decisions will be made regarding remedial measures that will be implemented and whether and/or when any of the authorized activities may continue. The Species Recovery Lead Office will provide a decision within five (5) business days concerning the disposition of any injured or dead specimen. Dead or moribund species may be retained for further study only with the written permission of the USFWS. Any species that are not authorized for retention are to be chilled and promptly transferred to the USFWS Species Recovery Lead for potential necropsy and/or contaminants analysis. Permitted activities may resume upon receipt of written approval from the Species Recovery Lead Office.

- O. No injury or mortality is anticipated or allowed as a result of Copperbelly water snake surveys. In the event that injury or mortality occurs, all activities must cease. The circumstances of any injury or mortality must be reported in writing within 48 hours to the office listed in Condition U.1., the USFWS Ohio Ecological Services Field Office (Condition U.13.), and the nearest USFWS Law Enforcement, Special Agent Office (<https://www.fws.gov/visit-us>). Before you reinitiate studies authorized by this permit, you must receive written authorization from the USFWS Ohio Ecological Services Field Office (Condition U.13.). Dead or moribund specimens may be retained for further study only with the written permission of the USFWS Ohio Ecological Services Field Office. Any specimens that are not authorized for retention are to be chilled and promptly transferred to the USFWS for potential necropsy and/or contaminants analysis (Condition U.14.).
- P. This permit is non-transferable.
- Q. Permittee must carry a copy of this permit at all times when conducting the authorized activities. Shipments of collected biological materials should also be accompanied by a copy of this permit. Note that this permit is limited to the above activities and identified species.
- R. Issuance of this permit does not constitute permission to conduct these activities on National Wildlife Refuges or any other public or private lands; such permission must be obtained separately from the appropriate landowner or land manager before beginning these authorized activities. This permit, neither directly nor by implication, grants the right of trespass.
- S. Upon locating a dead, injured, or sick federally listed species, under circumstances not addressed in this authorization, initial notification must be made immediately to the USFWS Field Office in the State in which the specimen is found (<https://www.fws.gov/media/region-3-recovery-permit-contact-information>).



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Notification should also be made by the next business day to the USFWS Midwest Region 3 Recovery Permit Coordinator identified below. Those offices will confer with the USFWS' Division of Law Enforcement as appropriate and determine next steps. Care should be taken in handling sick, injured, or dead specimens to ensure effective treatment or to preserve biological materials for later analysis. In conjunction with the care of sick or injured endangered or threatened species, and the preservation of biological materials from a dead individual, the finder should take responsible steps to ensure that the site is not unnecessarily disturbed.

T. An Annual Report of all activities conducted under the authority of this permit is due by January 31 following **each year** this permit is in effect. When assisting with netting, the permit number of the individual responsible for each capture should be recorded on the data collection form. Reports shall be sent electronically and your transmittal email must cite your Federal permit number, Permittee name, and the Annual Report year in the subject line (***Note: thumb drives/flash drives and links to documents cannot be accepted***). In addition, copies of all publications and reports resulting from work conducted under this permit must be submitted as they become available. Failure to furnish any reports required by this permit is cause for permit revocation and/or denial of future permit applications. At a minimum, your report shall include:

T.1. A complete discussion of field procedures, data collection methods, results, and conclusions.

T.2. Information on any injuries and/or mortalities and disposition of specimens.

T.3. Copies of any separate reports and/or publications resulting from work conducted under the authority of this permit.

T.4. Copies of all site specific authorization letters required under Condition G.

T.5. A description of locations surveyed where no specimens were encountered.

T.6. Electronic copies of all field data sheets.

T.7. The date, time, geographic locations (state, county, locality, UTM coordinates or GIS data with projection information), species, age, sex, weight (bats), water depth, substrate composition, sedimentation, where specimens were returned (mussels), and any other relevant data for all specimens encountered. We would also appreciate receiving this information for all candidate mussel species encountered.



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- T.8. A complete description of injuries and/or mortalities to listed species while in your possession, the dates of occurrence, any circumstances surrounding the incidents, and a description of any steps taken to reduce the likelihood that such injuries and/or mortalities will occur in the future.
- T.9. The "Bat Reporting Spreadsheet" is required for reporting data and can be found on the FWS Midwest Permits website (<https://www.fws.gov/midwest/endangered/mammals/inba/inbasummersurveyguidance.html>). Prior to reporting, check the permits website to ensure you are using the most up to date form. Using the reporting form will help standardize data collection and increase efficiency in reporting.
- T.10. If applicable, any identification numbers or marks added to live specimens and band numbers of all bats banded.
- T.11. Location and characteristics of roost trees and bat colonies.
- T.12. A completed data collection sheet as found in the Survey Guidelines, cited in Condition H.1.
- T.13. Data shall be submitted for all bats captured and include, but not be limited to, the data requested in any automated or species-specific data sheet provided by the USFWS (e.g., the reporting spreadsheets found on the current Rangewide Indiana Bat Summer Survey Guidelines website cited in Condition H.1., or other species specific data sheets). Photographs of the identifying characteristics for each individual federally listed species captured are encouraged. The Permittee may be requested to provide individual photographs after submittal of annual reporting data.
- T.14. The "3-2523_USFWS Freshwater Mussel Reporting Form" is required for reporting data and can be found on the FWS Midwest Permits website (<https://www.fws.gov/service/3-200-59-scientific-purposes-enhancement-propagation-or-survival-permits-recovery-permits>). Prior to reporting, check the permits website to ensure you are using the most up to date form. Using the reporting form will help standardize data collection and increase efficiency in reporting.



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T.15. The size, estimated age, sex and condition (if determinable) of any listed individuals encountered, and any other data you may have collected for individual naiads, such as evidence of damage or injury, and observations of zebra mussel (*Dreissena polymorpha*) and/or Asiatic clam (*Corbicula fluminea*) infestation.

T.16. Photographs of the identifying characteristics for each individual federally-listed species captured are encouraged, but not required.

IF NO ACTIVITIES OCCURRED OVER THE COURSE OF THE YEAR, INDICATION OF SUCH SHALL BE SUBMITTED AS AN ANNUAL REPORT.

U. Copies of your reports shall be sent to **all offices** indicated below. Your transmittal letter (or email) must cite your Federal permit number, Permittee name, and the Annual Report year in the subject line. Electronic copies shall be submitted in MS Word, Portable Document Format, Rich Text Format, or other file format that is compatible with the receiving office (**thumb drives/flash drives and links to documents cannot be accepted**).

U.1. Regional Recovery Permit Coordinator (Region 3)

U.S. Fish and Wildlife Service
Ecological Services – Endangered Species
5600 American Blvd. W., Suite 990
Bloomington, Minnesota 55437-1458
(612/713-5343; fax 612/713-5292)
permitsR3ES@fws.gov

U.2. Regional Recovery Permit Coordinator (Region 2)

U.S. Fish and Wildlife Service
Endangered Species Permits Office
P.O. Box 1306
Albuquerque, New Mexico 87103-1306
(505/248-6420; fax 505/248-6788)
permitsR2ES@fws.gov



NATIVE ENDANGERED & THREATENED SP.
RECOVERY

Permit Number: ES38821A

Version Number: 5

Effective: 2022-05-20 **Expires:** 2026-12-31

U.3. Regional Recovery Permit Coordinator (Region 4)

U.S. Fish and Wildlife Service
Endangered Species Permits Office
1875 Century Blvd.
Atlanta, Georgia 30345-3301
(404/679-7097; fax 404/679-7081)
permitsR4ES@fws.gov

U.4. Regional Recovery Permit Coordinator (Region 5)

U.S. Fish and Wildlife Service
Endangered Species Division
300 Westgate Center Drive
Hadley, Massachusetts 01035-9589
(413/253-8212; fax 413/253-8482)
permitsR5ES@fws.gov

U.5. Regional Recovery Permit Coordinator (Region 6)

U.S. Fish and Wildlife Service
Endangered Species Permits Office
Denver Federal Center, P.O. Box 25486
Denver, Colorado 80225-0489
(303/236-4224; fax 303/236-0027)
permitsR6ES@fws.gov

Additionally, based on species, reports and publications shall be submitted to the following:

U.6. ***For any bat species:***

Keith Lott
U.S. Fish and Wildlife Service
Keith_Lott@fws.gov

U.7. ***For studies involving gray bat:***

Vona Kuczynska



NATIVE ENDANGERED & THREATENED SP.
RECOVERY

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U.S. Fish and Wildlife Service
Missouri Field Office
101 Park DeVille Drive, Suite A
Columbia, Missouri 65203-0007
(573/234-2132; fax 573/234-2181)
vona_kuczynska@fws.gov

U.8. *For studies involving Indiana bat:*

Lori Pruitt
U.S. Fish and Wildlife Service
Indiana Field Office
620 S. Walker Street
Bloomington, Indiana 47403-2121
(812/334-4261; fax 812/334-4273)
lori_pruitt@fws.gov

U.9. *For studies involving northern long-eared bat:*

Jill Utrup
U.S. Fish and Wildlife Service
Minnesota-Wisconsin Field Office
4101 American Blvd. E.
Bloomington, Minnesota 55425-1665
(952/252-0092; fax 952/646-2873)
jill_utrump@fws.gov

U.10. *For studies involving Ozark big-eared bat:*

Richard Stark
U.S. Fish and Wildlife Service
Ozark Plateau National Wildlife Refuge
9014 East 21st Street
Tulsa, Oklahoma 74129
(918/382-4520; fax 918/581-7467)
richard_stark@fws.gov



NATIVE ENDANGERED & THREATENED SP.
RECOVERY

Permit Number: ES38821A

Version Number: 5

Effective: 2022-05-20 **Expires:** 2026-12-31

U.11. ***For studies involving Virginia big-eared bat:***

Liz Stout

U.S. Fish and Wildlife Service

West Virginia Field Office

6263 Appalachian Highway

Davis, West Virginia 26260

elizabeth_stout@fws.gov

U.12. ***For studies involving Big sandy crayfish:***

West Virginia Field Office

U.S. Fish and Wildlife Service

90 Vance Dr.

Elkins, West Virginia 26241

(304/636-6586)

FW5_WVFO@fws.gov

U.13. ***For studies involving Copperbelly water snake:***

Ohio Ecological Services Field Office

U.S. Fish and Wildlife Service

4625 Morse Rd. Suite 104

Columbus, Ohio 43230

(614/416-8993)

U.14. Additionally, based on geographic area, **reports and publications shall be submitted to** the applicable offices under "For Fish and Wildlife Permit Holders" at: <https://www.fws.gov/media/region-3-recovery-permit-contact-information>.

cc: FWS/Regional Offices – Regions 2, 4, 5, 6 (Attn: Regional Recovery Permit Coordinator)

FWS, TE Coordinator: Illinois-Iowa, Indiana, Michigan, Minnesota-Wisconsin, Missouri, Ohio

DNR/DOC, TE Coordinator: Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, Ohio, Wisconsin

END



United States Department of the Interior

FISH AND WILDLIFE SERVICE

5600 American Boulevard West, Suite 990
Bloomington, Minnesota 55437-1458



IN REPLY REFER TO:

FWS-AES/TE

LIST OF AUTHORIZED INDIVIDUALS

TE38821A-5

Terry VanDeWalle (Principal Officer)

C.1. Individuals authorized to independently conduct activities under this permit:

The following individuals are authorized to conduct scientific research in accordance with all conditions in this permit.

- James Kiser: Authorized to conduct all activities described for all listed bats, fish, freshwater mussels, Copperbelly water snake (*Nerodia erythrogaster neglecta*), and Big Sandy crayfish (*Cambarus callainus*).
- David Saugey, Joseph Johnson, and Lindsay Wight: Authorized for all activities described for all listed bat species.
- Wes Cunningham and Lynda Mills: Authorized for all activities described for gray bat (*Myotis grisescens*), Indiana bat (*Myotis sodalis*), and northern long-eared bat (*Myotis septentrionalis*) only.
- Cody Fleece: Authorized to conduct all activities described for all listed freshwater mussels and fish species, with the exception of Kentucky arrow darter (*Etheostoma spilotum*).
- Daniel Symonds: Authorized to conduct all activities with listed freshwater mussel species, with the exception of Appalachian monkeyface (*Quadrula sparsa*).
- Douglas Stephens: Authorized to conduct all activities described for listed bats, fish, and freshwater mussels, with the exception of Appalachian monkeyface (*Quadrula sparsa*).
- Triston Mullins: Authorized to conduct all activities described for listed freshwater mussels, with the exception of Higgins eye pearlymussel (*Lampsilis higginsii*), Finerayed pigtoe (*Fusconaia cuneolus*), Purple bean (*Villosa perpurpurea*), Rough rabbitsfoot (*Quadrula cylindrica strigillata*), Shiny pigtoe (*Fusconaia cor*), Turgid blossom pearlymussel (*Epioblasma turgidula*), Finelined pocketbook (*Lampsilis altalis*), Cumberland pigtoe (*Pleurobema gibberum*), Cumberland monkeyface pearlymussel (*Quadrula intermedia*), Appalachian monkeyface (*Quadrula sparsa*), and Pale lilliput pearlymussel (*Toxolasma cylindrellus*).

Unnamed trained assistants may conduct activities pursuant to this permit only under the direct and on-site supervision of an above-named individual. "On-site supervision" is defined as having the Permittee at a distance close enough to enable immediate assistance to a supervised individual, as needed, while the supervised individual conducts an authorized activity.

Acting, Chief, Division of Endangered Species
Region 3, U.S. Fish & Wildlife Service

Date

This List of Authorized Individuals (LAI) is valid only when it is dated on or after the permit issuance date. Federal Permit TE38821A-5 will be considered invalid without this LAI.

PROTOCOL FOR COPPERBELLY SURVEYORS

The following guidelines are being distributed to all those working on the surveys for the Copperbelly Water Snake Conservation Agreement, or who are conducting other surveys and wish to follow the same protocol. If there are questions regarding any aspect of this protocol, contact Bruce Kingsbury, Department of Biology, Indiana-Purdue University, Fort Wayne, IN 46805-1499, 219-481-5755 (W), 219-486-6300 (H), (219) 437-6876 (M), kingsbur@ipfw.edu.

Replicate surveys. You have been assigned a set of survey sites, and an approximate order in which to survey them. You must conduct the surveys in the assigned order: other surveyors will be visiting the same sites at other times. Sites that have already been visited will have the general path of the survey determined. However, if you are the first one on the site, you will have the responsibility of defining the path and length of the transect. Check your maps and directions to determine what you need to do. When delineating a transect, keep the following points in mind. The goal for survey duration is two hours, although the survey does not have to be exactly that. Care should be taken to avoid overlapping the same transect line (i.e., going around a wetland and crossing over where you've already been) or flushing snakes, thus risking the potential of counting the same snakes twice. Once a new transect has been delineated, details should immediately be relayed to Bruce Kingsbury for transmittal to other surveyors.

Presence/Absence surveys. P/A surveys are opportunistic in nature, and have no formal structure. Potential areas for these surveys are indicated on some of your maps, but you will very likely see other areas of interest. The main goal of these surveys is to establish if copperbellies or other *Nerodia* (l) are present. We are also particularly curious about other species such as mud snakes (*Farancia*) and cottonmouths (*Agkistrodon*), as these are unusual finds. Scouting out areas and searching under things such as trash or boards can be informative. If you are at a good chunk of habitat and can do a replicate-style survey, use the data form for those surveys. A brief examination of a site does not require strict adherence to filling out all of the details on the data sheet- but if you plan to survey the site for an extended time, the additional information would be useful. If you think that you have found a future replicate survey site, please communicate this right away to Bruce Kingsbury. You should also report opportunistic surveys that produced no copperbellies, as negative information is also useful. Also, please be sensitive to concerns about trespassing.

Surveys will be conducted by traveling the survey path (transect) and counting the snakes seen over a known time and estimated distance. Surveyors should move slowly and cautiously with frequent stops (pauses) of one or more minutes to scan both sides of the transect for snakes. The duration of pauses is left to the discretion of the surveyor, but should be long enough to allow careful examination of the field of view before moving on. An initial suggestion for distance to move between pauses is 10 paces. Transect length will be approximated as accurately as possible using the

corresponding topo map. The time will be recorded at the beginning and end of the transect, as well as each time the habitat type, as defined by the habitat classification below, changes. Habitat classification should default to the more open habitat when a decision must be made between two types. If you are walking along a shrub/scrub vs. palustrine forest boundary, you are surveying shrub/scrub. To minimize the impact of inclement weather, surveys will only be conducted on partly sunny days of at least 70 F, or sunny days between 65-90 F, to maximize chance of seeing the snakes out basking and traveling. Also, as the weather turns hot, observations will be made in early morning and late afternoon to avoid hot temperatures that drive the snakes to cooler microhabitats.

Copperbellies are very mobile and can be found in all sorts of habitat. However, empirical evidence shows that copperbellies prefer 1) the edge habitat between open canopy areas, such as shrub-scrub wetlands, and forest, to bask and rest, and 2) extremely shallow waters (<15 cm (6")), to forage. They do not spend much time in open, deep water (>30 cm), or fast moving water. However, they commonly seen basking on platforms over deep water, and will not hesitate to swim across open water. They are not as easily found in forest, but sometimes can be found at pools of water. Surveyors are most likely to find stationary snakes basking on horizontal surfaces just above the water, such as on nearly sunken logs or branches, or a little higher on living branches of bushes such as buttonbush (*Cephalanthus occidentalis*). Foraging snakes may be seen cruising shorelines. Ripples on the water's surface may also indicate the presence of a foraging or traveling snake, and should be investigated.

Equipment. Surveyors should always bring binoculars and use them. They are vital for examining complex habitats such as brush, and for properly identifying snakes to species. A watch is needed for timing transects. If you are marking a new transect, you will need flagging tape and markers. A compass is also handy, especially for the directionally challenged. A thermometer is needed as well, and we can provide one for you if needed. Surveyors will need to consider footwear. Hip or chest waders may keep you dry, but are tiring to wear for any length of time, and can get hot. Pull-on farm boots work okay unless there is any flooding. Once the water has warmed, I just go ahead and get wet, wearing "Army" boots to protect my feet. Use pencil to keep your notes- pen will smear and run if it gets wet, erasing your data. Ziplock bags are good for keeping things dry.

Data Sheet Explanation

At the top of the data sheet, *Date*, *Site ID Code & Name* (provided for you), *Surveyors*, and *Weather Summary (Beg.)* comments are filled out prior to beginning the survey. *Start* time is entered when the survey actually begins. *Finish* time is entered when the survey is suspended. Times should be recorded in military time (1200 is 12 noon, 1400 is 2PM). *Weather Summary (End)* is for indicating what things are like when you stop.

Initial and final temperatures should be taken in the sun, shade, and water. The sun (in nearest opening in canopy) and shade (under nearest canopy) temperatures should be taken at waist height with no direct light hitting the instrument (use your body or hand to block light from striking the thermometer bulb). Water temperatures should be taken approximately 5 cm below the surface. Keep in mind that a wet bulb will give a cooler temperature than a dry bulb. Substantive changes in the weather should be indicated on data rows between observations.

Transect length is the best estimate of the transect length based on your route and the scale on your map. Length should be recorded in kilometers. *Travel method* would be foot or boat. Additionally, a line is provided to *summarize* your observations: number of each species observed.

Data: The codes for data entries are described in the survey code descriptions provided below. The last column (*Comm*) is for a reference number for additional comments in the space at the bottom of the page. Additional comments could also be made on the back. Surveyor comments will be used to help establish habitat extent and quality throughout the range of the snake, so surveyors are encouraged to make note of their surroundings (including apparent condition of water). You might also comment on directions to the site. Weather comments would include cloud cover, wind, etc. In the field, comments can also be inserted on the data row(s) beneath the relevant observation. If habitat changes during the length of the transect, times and lengths of subtransects should be recorded by habitat. *Time* is when you start a new habitat classification, *elapsed time* is the total time surveying that habitat. *Species* of snake is coded: at least all *Nerodia* should be included. *Age* is the apparent age class of the snake. *Behavior* is the activity of the snake at time of observation.

Three distances are recorded: *Trans* is the distance from the transect line to the snake (perpendicular distance to you). *Shore* is the distance the snake is from shore (distance to shore will be negative for terrestrial observations). A range-finder is useful here, and we can provide you with one if you request it. Since the transect line may be the shore in a shoreline survey, *Trans* and *Shore* may be the same value. *Vertical* is the distance above the substrate. All measurements should be in meters, not yards.

Habitat and *Microhabitat* are coded as indicated in the attached habitat classification (based on a simplification of Cowardin et al.'s wetland classification system). Code should be strictly adhered to, and deviation from the code should be well-documented with comments. *In sun* asks whether or not the snake is in direct sunlight (Y/N).

Final comments: pursuit of individual snakes may not only be illegal for some surveyors, but will also disrupt the continuity of the survey. Snakes should be approached only to the extent that species identification is certain. Lastly, if you have any suggestions for improvement of the survey, feel free to let me know.

SURVEY CODE DESCRIPTIONS

Habitats

This classification was designed to be suitable for studying habitat use by the copperbelly water snake. It is intended to be relatively compatible with the National Wetlands Inventory (NWI) classification developed by Cowardin et al. (1979). Habitat is a large-scale measure: if a habitat area cannot be mapped discretely on a topographic map, it should be incorporated into a neighboring habitat type.

SYSTEM	SUBSYSTEM	CODE	DESCRIPTION
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Aquatic Habitats

Palustrine- shallow (0<2m) water wetlands without extensive open water: vegetated with some trees, shrubs, or emergent vegetation

Forested	PF	-floodplain forest, with greater than 30% canopy cover by trees
Scrub-shrub	PS	-shrub-scrub cover exceeds 30%, but tree cover does not
Emergent	PE	-emergent vegetation present (cats, etc.) but not enough shrubs to be PS
Open water	PO	-open water of palustrine system

Note: moist soil units should be commented as such, but would be classified as PE or PO.

Lacustrine- deep water (>2m) wetlands such as large ponds and lakes, lacking emergent vegetation except near shore. The limnetic (deep water) portion of a lacustrine system is termed as LD, while the littoral zone (shoreline zone) will follow the palustrine subsystem, substituting L for P: LF, LS, LE, LO.

Riverine- flowing water all or part of the year. Pooled water in partially dried river is still riverine.

Lower perennial	RL	- slow moving stream- muddy or silty bottom, water usually present
Upper perennial	RU	- faster flowing stream- rocky or cobbly bottom, water usually present
Intermittent	RI	- only temporarily running

Upland Classification

Just in case you find yourself with dry feet...

Forest-	UF	- greater than 30% canopy cover by trees, elevated above any potential flooding by sloping topography
Scrub-Shrub	US	-not forest, but >30% cover by shrubs such as berry bushes, willows, crab-apples and hawthorns.
Oldfield	OF	-fallow fields well-covered with herbaceous or grassy cover. CRP lands would often be included here.

Agricultural-Is highly disturbed, and includes activities such as farming, substantial grazing, and repeatedly mowed areas

Crops	AC	-farm fields, croplands
Grazed	AG	-grazed or mowed areas

Residential	RS	-all space used for living by people
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Microhabitat Classification

Microhabitat classification is somewhat similar to habitat, but on a smaller scale. Its use as a category allows the specific position (substrate) of the animal to vary to some degree from its general surroundings.

Shrub	-up in a bush
Tree	-up in a tree
Grass	-in a patch of grass
Rock	-on a rock or rocks
Log	-on a log
Herbaceous	-in a patch of herbs
Water	-in the water
Barren (soil)	-on bare soil
Island	-on a small hummock
Detritus	-on leafy debris, such as leaves

Behavioral Classification

Basking	-at rest in sunny location
Resting	-resting in non-basking position
Courting	-male pursuing female, female, being pursued by male
Mating	-actually copulating (much less likely than courting)
Foraging	-moving slowly and methodically through shallow water or on shore
Traveling	-moving continuously in linear path, with little investigative behavior along the way
Unknown	-behavior ambiguous or snake disturbed before behavior observed: <i>something that happens all the time!</i>

Miscellaneous

Species- N- copperbelly (*N.e. neglecta*), D- diamondback (*N. rhombifera*), M- midland (*N. sipedon*), Y- yellowbelly water snake (*N. e. flavigaster*), F- mud snake (*Farancia abacura*), A- cottonmouth (*Agkistrodon piscivorus*), U-unknown

Canopy- Tree and shrub canopy cover in the general vicinity of the snake (ca. within 10 m radius) should be characterized as:
1=sparse: little or no cover,
2=moderate: forest margin or broken canopy as at treefall or in select cut woods,
3=complete: complete or nearly complete.

Age- Three categories:
Y=juvenile: young of the year, retaining juvenile striped color pattern;
S=subadult: adult coloration, or nearly so, but not yet having attained lg. adult body size;
A=adult: large-bodied, classic copperbelly coloration.

Big Sandy and Guyandotte River Crayfish Survey Protocol

Project-specific survey plans shall be coordinated with and approved by the U.S. Fish and Wildlife Service (USFWS) at the address below prior to conducting any surveys within potential habitat for the Big Sandy crayfish (*Cambarus callainus*) or the Guyandotte River crayfish (*C. veteranus*). Survey plans should be submitted at least 30 days prior to the proposed start of surveys. When surveys are conducted to evaluate whether a proposed project may affect the species, surveys should be conducted early in project planning so that project modifications can be made to avoid and minimize project effects. Surveyors must have a valid Scientific Collecting Permit from the West Virginia Division of Natural Resources (WVDNR) prior to conducting the work.

Surveys are not permitted from July 20 through September 10 due to egg extrusion and rearing of juveniles by females. Surveys must be conducted when water conditions/temperatures are conducive to detecting *C. callainus*/*C. veteranus*. Water temperature must be above 50° F/ 10° C and surveys cannot be completed for 72 hours after a precipitation greater than 0.5in/1.3cm to ensure clear water and that suitable sampling conditions are present.

Surveys should be conducted throughout the entire reach of stream that may be affected by a potential project; total upstream and downstream distance to be sampled from the point of direct impact will be determined for each project by the USFWS. Once the survey area has been delineated, the area should be divided into sampling reaches and each reach sampled following the approved protocol.

Each sampling reach should be approximately 125 meters (m) in length and include at least one riffle, run, or both riffle and run habitats. Crayfish sampling shall be performed using an 8'x4' seine, with double leads and double floats, and 1/8" netting. Sampling shall be performed by hauling a seine at a minimum of 10 locations within the 125m stream reach. Seine hauls will be completed by overturning every slab boulder (rocks approximately 1m wide x 1m long; 5cm

high) present per 2m linear upstream/downstream distance in riffles and runs. One to two slab boulders can be sampled per seine haul.

Seine hauls should be completed with at minimum a two-person team using the seine. One crew member will hold both handles/brails, with the seine spread approximately 2m in width. Handles should be held at a 40°-50° angle from the stream surface. The other crew members should ensure that the seines lead line is making contact with the stream substrate and that the lead line is not resting on substrate items that are planned to be sampled in the ensuing haul. Once these conditions are met, surveyors charged with flipping substrate items should do so quickly and assertively. When each substrate item is overturned, the surveyor should kick in the direction of the seine over the area of stream substrate uncovered by moving rocks being sampled.

Slab boulders should always be given sampling priority given *C. callainus*/*C. veteranus* association with them. If a sampling reach does not contain sufficient slab boulders, the following substrate features should be given sampling priority in the following order of importance: boulders, large cobble, coarse woody debris, and artificial cover. All substrate items should be placed back in their original position immediately following the seine hauls in which they were dislodged from the substrate.

At the end of each haul, surveyors must ensure that the lead line is removed from the water prior to the float line so all captured organisms remain in the net bellows and are not dumped back into the stream following sampling. At this time, crayfishes should be removed from the net and placed into trolling buckets. All substrate items should be placed back in their original position immediately following the seine hauls in which they were dislodged from the substrate.

All crayfishes collected shall be housed temporarily in trolling bait buckets that do not leave the stream proper until processing begins. No more than five adult *C. callainus*/*C. veteranus* are to be housed in one bucket at one time; multiple buckets are suggested. Buckets are to be anchored in the stream or attached to collectors during active sampling.

Data must be recorded on the standardized datasheets provided with your collecting permit. A minimum of ten seine hauls per sampling reach is required; the total number of seine hauls employed at a reach shall be recorded as well as the total number of crayfish collected of each species per seine haul. Electric fishing gear should never be used at potential *C. callainus* and *C.*

veteranus sites. Electric fishing gear is not considered efficient gear for the collection of stream crayfishes.

When sampling is completed, collectors are required to identify all captured crayfish to species, sex all captured crayfish (Form I, Form II, Female, Female Glair, Female-Ovig, Female-Attached Juveniles), and record total carapace length (TCL) in millimeters for each *C. callainus*/*C. veteranus* encountered using calipers. Data shall be recorded on the standardized WVDNR Crayfish Morphometric Datasheet. A photographic voucher is required for all *C. callainus*/*C. veteranus* captured prior to release; representatives of other crayfish species should also be photographed. Every effort should be undertaken to ensure animals are outside of water for the briefest period of time possible (5 minute maximum, but a shorter period is preferred). Following data collection, animals are to be returned to the stream bottom upstream of their home rocks and guided back to their rock or other substrate debris.

Collection of water quality and physical habitat metrics are required at each collection locale. At each sampling site, pH, temperature, percent dissolved oxygen, turbidity, and conductivity are to be measured. In addition to water quality, physical habitat will be evaluated through completion of a Qualitative Habitat Evaluation Index (QHEI; OEPA 2006).

If any *C. callainus* or *C. veteranus* are captured, the WVDNR and USFWS shall be notified within 48 hours of collection via a reporting spreadsheet provided by the WVDNR. Written reports of all survey efforts shall be provided to the WVDNR and USFWS and shall include, at a minimum, information on the survey dates and water conditions, who conducted the survey, the methods used, survey results including results per seine haul, photographs of *C. callainus* or *C. veteranus* specimens and of the survey area, and all water quality and QHEI data gathered.

Agency Contact Information:

West Virginia Division of Natural Resources, PO Box 67, Elkins, WV 26241

(304) 637-0245

U.S. Fish and Wildlife Service, West Virginia Field Office, 90 Vance Drive, Elkins WV 26241

(304) 636-6586



TENNESSEE WILDLIFE RESOURCES AGENCY

ELLINGTON AGRICULTURAL CENTER
P. O. BOX 40747
NASHVILLE, TENNESSEE 37204

Scientific Collection Permit : 5635

Issue date: 9/27/2022

Expiration date: 9/27/2023

Pursuant to authority of T.C.A. 70-2-213: James D. Kiser

and the following additional permittees:

Don Hubbs
William Cody Fleece, Stantec Consulting
Michael Triston Mullins, Stantec Consulting

are granted permission to take the following species:

Native freshwater mussels (Unionidae) found along the proposed pipeline project within the Cumberland River and Emory River drainages between Hartsville, TN and Kingston, TN. Specifically there is the potential to handle Alabama Lampmussel (*Lampsilis virescens*), Cumberland Bean (*Villosa trabilis*), Cumberland Elktoe (*Alasmodonta atropurpurea*), Cumberlandian Combshell (*Epioblasma brevidens*), Dromedary Pearlmussel (*Dromus dromas*), Fanshell (*Cyprogenia stegaria*), Finerayed Pigtoe (*Fusconaia cuneolus*), Fluted Kidneyshell (*Ptychobranhus subtentus*), Orangefoot Pimpleback (*Plethobasus cooperianus*), Pink Mucket (*Lampsilis abrupta*), Purple Bean (*Villosa perpurpurea*), Ring Pink (*Obovaria retusa*), Rough Pigtoe (*Pleurobema plenum*), Spectaclecase (*Cumberlandia monodonta*), Tubercled Blossom (*Epioblasma torulosa torulosa*), and Turgid Blossom (*Epioblasma turgidula*).



TENNESSEE WILDLIFE RESOURCES AGENCY

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Pursuant to authority of T.C.A. 70-2-213: James D. Kiser

and the following additional permittees:

Don Hubbs
William Cody Fleece, Stantec Consulting
Michael Triston Mullins, Stantec Consulting

Restricted to the following locations:

Pipeline Mile Post 2.9 - 36.382598, -86.208823, Pipeline Mile Post 3.3 - 36.380843, -86.203523, Pipeline Mile Post 29.7 - 36.325964, -85.784254, Pipeline Mile Post 32.1 - 36.313377, -85.745160, Pipeline Mile Post 116.6 - 35.966868, -84.467185, Pipeline Mile Post 6.8 - 36.373194, -86.150556, Pipeline Mile Post 6.8 - 36.373194, -86.134407, Pipeline Mile Post 28.0 - 36.340047, -85.802222, Pipeline Mile Post 55.3 - 36.215833, -85.379921, Pipeline Mile Post 90.7 - 36.154722, -84.788889, Pipeline Mile Post 102.5 - 36.105167, -84.613333, Pipeline Mile Post 120 - 35.930139, -84.471944,



TENNESSEE WILDLIFE RESOURCES AGENCY

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Pursuant to authority of T.C.A. 70-2-213:

James D. Kiser

and the following additional permittees:

Don Hubbs

William Cody Fleece, Stantec Consulting

Michael Triston Mullins, Stantec Consulting

Restricted to the following collection methods:

The large river and embayment project sites will be surveyed using timed searches and/or transect based field methods. Timed search surveys will be used for small streams. Mussels will be collected by visual or surface searches, including moving cobble and woody debris, hand sweeping away silt, sand, and/or small detritus, and disturbing/probing the upper five centimeters (two inches) of substrate. If federally protected species are encountered during surveys, USFWS will be contacted for guidance on how to proceed., , The proposed pipeline crossings currently traverse four lentic areas (embayments) within large reservoirs. These areas are likely depositional in nature, aggradating fine materials (e.g. sand, silt, and detritus), but are still in close proximity to riverine waterbodies. Thick, fine-grained sediment deposits typically provide poor habitat for freshwater mussels because they are often unstable and anoxic. Stantec proposes wandering timed search surveys at equidistant locations along the proposed pipeline crossing. An equal number of sample locations will be placed upstream and downstream of the proposed line. Starting points for searches will be placed within 25 meters of the proposed alignment. Divers will wander randomly searching for mussels and/or good habitat. Two searches will be conducted at each location for a duration of 45 minutes (90 minutes total search time). Search times will be longer at larger sites., , The proposed pipeline crossings currently traverse one riverine area. It is a perennial waterbody with high potential of native freshwater mussels being present. It will be surveyed Project using transect based field methods. Divers will search a one-meter band along transects spanning bank to bank. Transects will be divided into 10-meter segments and searched at a rate of minute per square meter. Two transects will be placed within the ROW, three transects upstream of the ROW, and five transects downstream of the ROW. These transects would be spaced no less than 10m apart and no more than 30m apart. If mussel densities of 0.5/m² or if any live federally protected or proposed to be detected individuals are encountered within a 10m segment of a transect, Stantec would initiate qualitative timed searches within similar habitat for 30 minutes., , Genetic material for unionid mussels was detected at seven of the 30 proposed pipeline crossings. Small streams with

Subject to the following rules:

Wildlife may not be held longer than 24 hours without prior approval. All containers and equipment utilized in the collection of amphibians and reptiles shall be decontaminated and disinfected for ranavirus and other pathogens. This permit is invalid unless accompanied by all applicable federal permits.

No species listed by TWRA as endangered, threatened, in need of management, or of greatest conservation need may be taken without approval; release these species immediately. Report the occurrence of endangered or threatened species to TWRA within five days.

Prior to collecting in the field, you are required to notify the TWRA Regional Dispatcher with the name(s) of person(s) doing the collecting, where, when and what species you will be collecting. Contact information is attached.

Executive Director, Tennessee Wildlife Resources Agency

9/27/2022

Date



The State of Tennessee



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Appendix E Photographic Log





Client:	East Tennessee Natural Gas, LLC	Project:	172677408
Site Name:	Ridgeline Expansion Project	Site Location:	Tennessee
Photograph ID: 1			
Description: Site 11 - Little Goose Creek			
Direction: Upstream			
Survey Date: 6/14/2022			
Comments:			
Photograph ID: 2			
Description: Site 11a - Big Goose Creek			
Direction: Upstream			
Survey Date: 6/14/2022			
Comments:			



Client:	East Tennessee Natural Gas, LLC	Project:	172677408
Site Name:	Ridgeline Expansion Project	Site Location:	Tennessee
Photograph ID: 3			
Description: Site 18 - Glasgow Branch			
Direction: Downstream			
Survey Date: 6/14/2022			
Comments:			
Photograph ID: 4			
Description: Site 19 - Lick Creek			
Direction: Downstream			
Survey Date: 6/14/2022			
Comments:			



Client:	East Tennessee Natural Gas, LLC	Project:	172677408
Site Name:	Ridgeline Expansion Project	Site Location:	Tennessee
Photograph ID: 5			
Description: Site 30 - Peyton Creek			
Direction: Downstream			
Survey Date: 6/15/2022			
Comments:			
Photograph ID: 6			
Description: Site 37 - Defeated Creek			
Direction: Downstream			
Survey Date: 6/15/2022			
Comments:			

Client:	East Tennessee Natural Gas, LLC	Project:	172677408
Site Name:	Ridgeline Expansion Project	Site Location:	Tennessee
Photograph ID: 7			
Description: Site 45 - Salt Lick Creek			
Direction: Upstream			
Survey Date: 6/15/2022			
Comments:			
Photograph ID: 8			
Description: Site 56 - Flynn Creek			
Direction: Downstream			
Survey Date: 6/15/2022			
Comments:			



Client:	East Tennessee Natural Gas, LLC	Project:	172677408
Site Name:	Ridgeline Expansion Project	Site Location:	Tennessee
Photograph ID: 9			
Description: Site 59 - Flynn Creek			
Direction: Upstream			
Survey Date: 6/15/2022			
Comments:			
Photograph ID: 10			
Description: Site 60 - Flynn Creek			
Direction: Downstream			
Survey Date: 6/15/2022			
Comments:			



Client:	East Tennessee Natural Gas, LLC	Project:	172677408
Site Name:	Ridgeline Expansion Project	Site Location:	Tennessee
Photograph ID: 11			
Description: Site 62 - Flynn Creek			
Direction: Downstream			
Survey Date: 6/15/2022			
Comments:			
Photograph ID: 12			
Description: Site 72 - Blackburn Fork			
Direction: Downstream			
Survey Date: 6/16/2022			
Comments:			


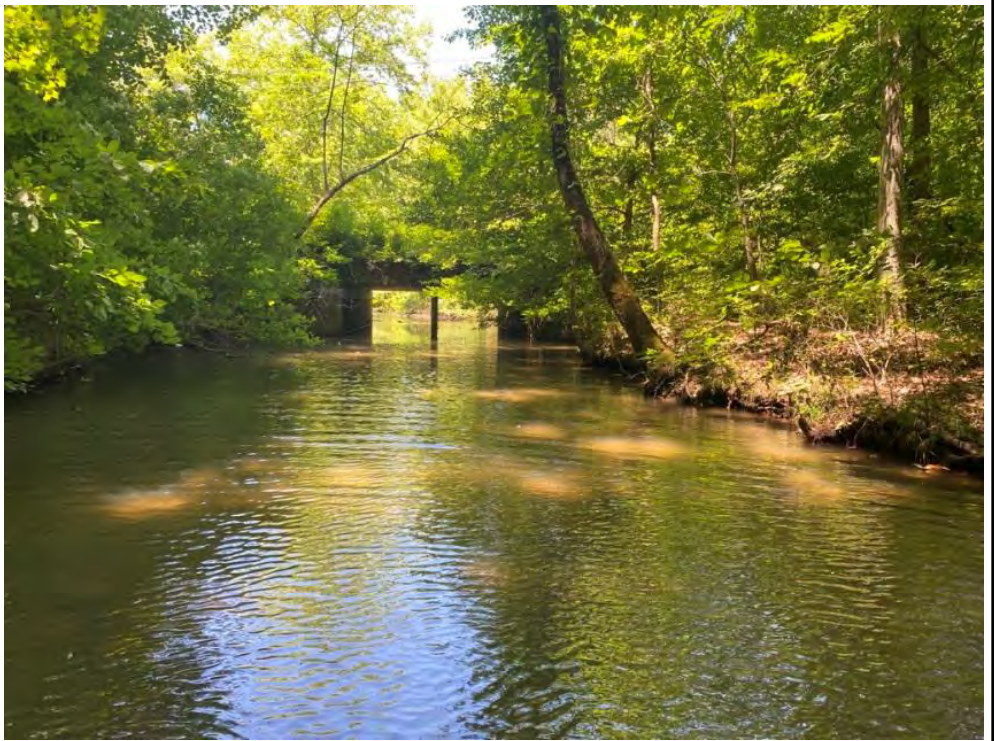
Client:	East Tennessee Natural Gas, LLC	Project:	172677408
Site Name:	Ridgeline Expansion Project	Site Location:	Tennessee
Photograph ID: 13			
Description: Site 89 - Spring Creek			
Direction: Downstream			
Survey Date: 6/13/2022			
Comments:			
Photograph ID: 14			
Description: Site 116 - Little Hurricane Creek			
Direction: Upstream			
Survey Date: 6/16/2022			
Comments:			



Client:	East Tennessee Natural Gas, LLC	Project:	172677408
Site Name:	Ridgeline Expansion Project	Site Location:	Tennessee
Photograph ID: 15			
Description: Site 118 - Hurricane Creek			
Direction: Downstream			
Survey Date: 6/16/2022			
Comments:			
Photograph ID: 16			
Description: Site 146 - White Creek			
Direction: Downstream			
Survey Date: 6/17/2022			
Comments:			



Client:	East Tennessee Natural Gas, LLC	Project:	172677408
Site Name:	Ridgeline Expansion Project	Site Location:	Tennessee
Photograph ID: 17			
Description: Site 153 - Little Clear Creek			
Direction: Downstream			
Survey Date: 6/17/2022			
Comments:			
Photograph ID: 18			
Description: Site 162 - Campground Creek			
Direction: Downstream			
Survey Date: 6/18/2022			
Comments:			



Client:	East Tennessee Natural Gas, LLC	Project:	172677408
Site Name:	Ridgeline Expansion Project	Site Location:	Tennessee
Photograph ID: 19			
Description: Site 165 - Emory River			
Direction: Upstream			
Survey Date: 6/17/2022			
Comments:			
Photograph ID: 20			
Description: Site 169 - Crooked Fork			
Direction: Upstream			
Survey Date: 6/18/2022			
Comments:			



Client:	East Tennessee Natural Gas, LLC	Project:	172677408
Site Name:	Ridgeline Expansion Project	Site Location:	Tennessee
Photograph ID: 21			
Description: Site 182 - Bitter Creek			
Direction: Upstream			
Survey Date: 6/18/2022			
Comments:			
Photograph ID: 22			
Description: Site 183b - Bitter Creek (middle)			
Direction: Upstream			
Survey Date: 6/18/2022			
Comments:			

Client:	East Tennessee Natural Gas, LLC	Project:	172677408
Site Name:	Ridgeline Expansion Project	Site Location:	Tennessee
Photograph ID: 23			
Description: Site 185 - Little Emory River			
Direction: Downstream			
Survey Date: 6/18/2022			
Comments:			
Photograph ID: 24			
Description: Site 193 - Kings Creek			
Direction: Downstream			
Survey Date: 6/18/2022			
Comments:			

Client:	East Tennessee Natural Gas, LLC	Project:	172677408
Site Name:	Ridgeline Expansion Project	Site Location:	Tennessee
Photograph ID: 25			
Description: Anodonta suborbiculata			
Direction:			
Survey Date: 10/9/2022			
Comments:			
Photograph ID: 26			
Description: Cambarunio iris			
Direction:			
Survey Date: 10/6/2022			
Comments:			

Client:	East Tennessee Natural Gas, LLC	Project:	172677408
Site Name:	Ridgeline Expansion Project	Site Location:	Tennessee
Photograph ID: 27			
Description: Lampsilis fasciola			
Direction:			
Survey Date: 10/5/2022			
Comments:			
Photograph ID: 28			
Description: Obliquaria reflexa			
Direction:			
Survey Date: 10/6/2022			
Comments:			

Client:	East Tennessee Natural Gas, LLC	Project:	172677408
Site Name:	Ridgeline Expansion Project	Site Location:	Tennessee
Photograph ID: 29			
Description: Potamilus alatus			
Direction:			
Survey Date: 10/6/2022			
Comments:			
Photograph ID: 30			
Description: Potamilus ohioensis			
Direction:			
Survey Date: 10/6/2022			
Comments:			

Client:	East Tennessee Natural Gas, LLC	Project:	172677408
Site Name:	Ridgeline Expansion Project	Site Location:	Tennessee
Photograph ID: 31			
Description: Pyganodon grandis			
Direction:			
Survey Date: 10/6/2022			
Comments:			
Photograph ID: 32			
Description: Utterbackia imbecillis			
Direction:			
Survey Date: 10/8/2022			
Comments:			

From: [Adams, Joshua](#)
To: [Pelren, David](#)
Subject: [EXTERNAL] Adams, Joshua shared the folder "Ridgeline 2022 Mussel Report" with you.
Date: Tuesday, March 14, 2023 3:33:44 PM
Attachments: [AttachedImage](#)
[AttachedImage](#)
[AttachedImage](#)
[AttachedImage](#)
[AttachedImage](#)

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Adams, Joshua shared a folder with you

Dave,

Apologies, I had your email incorrect on the initial submittal. I have uploaded a copy of the mussel report to the onedrive linked on this email. Please let me know if you have any issues accessing the file or if you have any questions.

Thanks



Ridgeline 2022 Mussel Report



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From: [Adams, Joshua](#)
To: [Benefiel, Jeffrey](#); [Casey, Justin](#); [Gus McLachlan](#); [Haider, Jessica](#); [Pelren, David](#); nicole_sikula@fws.com
Subject: [EXTERNAL] Adams, Joshua shared the folder "Ridgeline Bat Reports" with you.
Date: Friday, March 17, 2023 12:57:51 PM
Attachments: [AttachedImage](#)
[AttachedImage](#)
[AttachedImage](#)
[AttachedImage](#)
[AttachedImage](#)

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Adams, Joshua shared a folder with you

Dave,

As with the mussel report, I have uploaded both the summer and fall swarming bat reports to this folder for your review. Please let me know if you have any questions or need some additional information.

Thanks



Ridgeline Bat Reports



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Summer 2022 Bat Mist Net Survey
Ridgeline Expansion Project

Report Date

Prepared for:
East Tennessee Natural Gas, LLC
555 Marriott Drive, Suite 600
Nashville, Tennessee 37214

Prepared by:
Stantec Consulting Services, Inc.
601 Grassmere Park Road, Ste 200
Nashville, Tennessee 37211

Project Number:
172677408



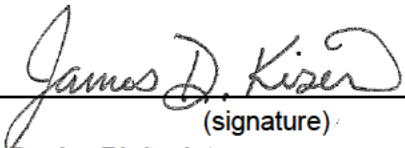
2022 SUMMER BAT SURVEYS

This conclusions in the Report Titled 2022 Summer Bat Surveys are Stantec's professional opinion, as of the time of the Report, and concerning the scope described in the Report. The opinions in the document are based on conditions and information existing at the time the scope of work was conducted and do not take into account any subsequent changes. The Report relates solely to the specific project for which Stantec was retained and the stated purpose for which the Report was prepared. The Report is not to be used or relied on for any variation or extension of the project, or for any other project or purpose, and any unauthorized use or reliance is at the recipient's own risk.

Stantec has assumed all information received from East Tennessee Natural Gas, LLC (the "Client") and third parties in the preparation of the Report to be correct. While Stantec has exercised a customary level of judgment or due diligence in the use of such information, Stantec assumes no responsibility for the consequences of any error or omission contained therein.

This Report is intended solely for use by the Client in accordance with Stantec's contract with the Client. While the Report may be provided to applicable authorities having jurisdiction and others for whom the Client is responsible, Stantec does not warrant the services to any third party. The report may not be relied upon by any other party without the express written consent of Stantec, which may be withheld at Stantec's discretion.

Prepared by  _____
(signature)
Joshua Adams, Principal Environmental Services

Reviewed by  _____
(signature)
James Kiser, Senior Biologist


Approved by  _____
(signature)
Brian Newman, Associate



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APPENDIX F	RADIO TELEMETRY DATA SHEETS AND PHOTOGRAPHS



EXECUTIVE SUMMARY

East Tennessee Natural Gas, LLC (ETNG) proposes construction of the Ridgeline Expansion Project (Project), an approximately 123-mile (198 km) natural gas pipeline within portions of Trousdale, Smith, Jackson, Putnam, Overton, Fentress, Morgan, and Roane Counties, Tennessee. Stantec Consulting Services Inc. (Stantec) has been retained by ETNG to assist with obtaining necessary authorizations and permits related to the Project. Since the Project may impact forested habitat within the range of multiple bat species, bat mist net and acoustic surveys were conducted in order to determine the presence or probable absence of listed bat species, including the Indiana bat (*Myotis sodalis*), the northern long-eared bat (*M. septentrionalis*), and the gray bat (*M. grisescens*), within the Project survey corridor. Bat surveys focused on those species either currently listed or under consideration for listing under the Endangered Species Act of 1973, as amended (ESA), and the Tennessee Nongame and Endangered or Threatened Wildlife Species Conservation Act of 1974 (TCA), both of which prohibit the unauthorized taking of listed threatened and endangered species.

Through coordination with the United States Fish and Wildlife Service (USFWS) Cookeville Field Office and the Tennessee Wildlife Resources Agency (TWRA), Stantec proposed presence, probable absence surveys to assess bat populations within or near the Project survey corridor. Survey methods followed the U.S. Fish and Wildlife Service (USFWS) 2022 Range-wide Summer Survey Guidelines dated March 2022, and the USFWS guidance dealing with COVID dated June 12, 2020. Weather restrictions outlined in the above guidance were also followed, and mist netting was conducted in areas with potentially suitable summer habitat for Indiana and northern long-eared bats. Additionally, acoustic surveys were conducted in areas with suitable habitat for both species where suitable mist-net locations were not found. Site specific authorization of survey methods were received from the USFWS Tennessee Field Office on April 29, 2022, and email notification was provided to TWRA prior to initiating surveys.

In addition to bat species currently listed under the ESA, due to the duration of the project, Stantec included eastern tri-colored bats (*Perimyotis subflavus*) and little brown bats (*M. lucifugus*) in the study plan, as well as radio telemetry efforts to collect habitat use data in the event that either of these species become federally listed prior to the completion of the Project.

During summer 2022 survey efforts, a total of 112 sites were surveyed with mist nets and an additional 34 were surveyed using acoustics. A total of 1,061 bats representing nine (9) species were captured (Table 3.1, Appendix D). Nine (9) individual bats escaped nets prior to being identified by biologists. The Summer 2022 survey efforts did not result in any Indiana or northern long-eared bat captures; However, 149 federally endangered gray bats and 25 eastern tri-colored bats, a candidate for federal listing, were captured. In addition, 450 eastern red bats (*Lasiurus borealis*), 245 big brown bats (*Eptesicus fuscus*), 168 evening bats (*Nycticeius humeralis*), six hoary bats (*Lasiurus cinereus*), four little brown bats, four silver-haired bats (*Lasionycteris noctivigans*), and one Rafinesque's big-eared bat (*Corynorhinus rafinesquii*) were captured while conducting 2022 summer mist netting survey activities.

In attempts to identify roosting habitat, seven (7) eastern tri-colored and one (1) little brown bat were fitted with a radio-transmitter and tracked to seven roost sites. Radio-tracking the seven eastern tri-colored bats



2022 SUMMER BAT SURVEYS

and the single little brown bat resulted in the identification of a seven roost trees for two individual bats. Most of the forested area within the Project corridor provided potentially suitable summer habitat for both the Indiana and northern long-eared bat. Based on the data collected during mist net surveys and radio-tracking study for the Project corridor following USFWS approved guidelines, and the apparent absence of the northern long-eared bat and Indiana bat, a May Affect Not Likely to Adversely Affect determination is anticipated from the USFWS's Tennessee Field Office for these species. The capture of 25 eastern tri-colored bats, including reproductive (pregnant, lactating, post-lactating, and juvenile bats), indicates the species use the Project survey corridor as maternity habitat. On September 13, 2022, USFWS issued a proposed rule that eastern tri-colored bats were warranted to be listed as endangered. At the time of writing this report, it is unknown what a listing of this species will entail; however, if this listing becomes official, additional coordination with USFWS will be needed for this species. Additional surveys will be completed in 2023 at sites where access was limited during 2022 survey period.



ACRONYMS/ABBREVIATIONS

%	Percent
°	Degree
≥	Greater Than or Equal To
C	Celsius
F	Fahrenheit
ft	Foot
m	Meter
km	Kilometer
Stantec	Stantec Consulting Services
ETNG	East Tennessee Natural Gas, LLC
ESA	Endangered Species Act
TCA	Threatened Wildlife Species Conservation Act
ROW	Right-of-Way
TVA	Tennessee Valley Authority
USFWS	U.S. Fish and Wildlife Service
TWRA	Tennessee Wildlife Resource Agency
CDC	Center for Disease Control
WNS	White Nose Syndrome
DBH	Diameter at Breast Height
EPA	Environmental Protection Agency



1.0 INTRODUCTION

Stantec Consulting Services Inc. (Stantec) has been retained by East Tennessee Natural Gas, LLC (ETNG) to assist with obtaining necessary authorizations and permits related to the Project, an approximately 123-mile (198 km) natural gas pipeline within portions of Trousdale, Smith, Jackson, Putnam, Overton, Fentress, Morgan, and Roane Counties, Tennessee. A portion of Stantec's duties were to assess the presence or probable absence of listed bats within the Project survey corridor (typically a 300-foot-wide area centered over the proposed pipeline centerline) during the maternity season. Bat surveys focused on those species either currently listed or under consideration for listing under the Endangered Species Act of 1973, as amended (ESA), and the Tennessee Nongame and Endangered or Threatened Wildlife Species Conservation Act of 1974 (TCA), both of which prohibit the unauthorized taking of listed threatened and endangered species. Beginning in 2022, a combination of methods were and will continue to be utilized to assess presence or probable absence of listed bat species, including both mist net and acoustic surveys. Additional assessments are anticipated to be completed during the 2023 survey season on sections of the corridor that weren't surveyed in 2022. This report presents the preliminary findings of the surveys conducted during 2022. The objectives of this survey were as follows:

- Determine presence or probable absence of the Indiana bat (*Myotis sodalis*), the northern long-eared bat (*M. septentrionalis*), the gray bat (*M. grisescens*), the eastern tri-colored bat (*Perimyotis subflavus*), and the little brown bat (*M. lucifugus*) in the Project survey corridor;
- Establish baseline data on bat species composition within the Project survey corridor; and
- If captured, radio-track: Indiana, northern long-eared, eastern tri-colored, and little brown bats to determine their roosting habitat and locations.

1.1 PROJECT LOCATION DESCRIPTION

The approximately 123-mile (198 km) long Project corridor begins approximately 2.8 miles east of Castalian Springs, Tennessee, near the northeast corner of the intersection of U.S. Route (US)-231 and Tennessee State Route (TN)-10 (Figure 1, Appendix A). The Project corridor is an approximately 300 feet (91 m) wide right-of-way (ROW) and generally traverses northwest to southeast across portions of Trousdale, Smith, Jackson, Putnam, Overton, Fentress, Morgan, and Roane Counties, Tennessee. The eastern Project terminus is located within the Tennessee Valley Authority's (TVA) Kingston Fossil Plant in Harriman, Tennessee. Because of the extent of the Project, it crosses multiple ecoregions and watersheds throughout its route. The predominant vegetative community that will be impacted by construction of the Project is agricultural, making up over 40 percent of the total Project area. Mixed forest and grassland are also prevalent. Vegetative community types within each Project facility are detailed in Table 3.2, Appendix D.

1.2 REGULATORY SETTINGS

The federal Endangered Species Act (ESA) [16 U.S.C. 1531 et seq.] became law in 1973. This law provides for the listing, conservation, and recovery of endangered and threatened species of plants and wildlife. Under the ESA, the U. S. Fish and Wildlife Service (USFWS) strives to protect and monitor the numbers and populations of listed species. Many states have enacted similar laws.

Section 7(a)(2) of the ESA states that each federal agency shall ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of a listed species or result in destruction or adverse modification of designated critical habitat. Federal actions include (1) expenditure of federal funds for roads, buildings, or other construction projects, and (2) approval of a permit or license, and the activities resulting from such permit or license. This is true regardless of whether involvement is apparent, such as issuance of a federal permit, or less direct, such as federal oversight of a state-operated program, or federal funding of state highways.

Section 9 of the ESA prohibits the take of listed species. Take is defined by the ESA as “to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect.” The definition of harm includes adverse habitat modification. Actions of federal agencies that do not result in jeopardy or adverse modification, but that could result in a take, must be addressed under Section 7 of the ESA.

Within the State of Tennessee, nongame wildlife, which includes native bat species, are protected under state law following T.C.A. §70-8-101 to 112. It is unlawful to take or attempt to “possess, transport, export, process, sell or offer for sale or ship nongame wildlife” without a proper collection permit. Scientific collection permits are issued by the TWRA under the authority of T.C.A. §70-2-213.

1.1 PURPOSE OF REPORT

The purpose of this document is to provide a scientifically defensible report detailing the bat survey activities, both mist net and acoustical survey efforts, for ETNG or designated agency to use in consultation with USFWS. The report includes a description of the methods, results and summarized data, and discussion regarding the bat survey efforts. Maps, field data sheets, representative photographs, and data tables are provided as appendices in the report (Appendices A, B, C, and D respectively). This report will also be used by Stantec for annual coordination of our federal permit activities with USFWS and the Tennessee Wildlife Resource Agency (TWRA).

2.0 METHODS

Through coordination with the United States Fish and Wildlife Service (USFWS) Cookeville Field Office and Tennessee Wildlife Resources Agency (TWRA), Stantec proposed presence, probable absence surveys to assess bat populations within or near the Project corridor. Based on the number of kilometers (km), 186, where potential bat habitat could be impacted by the Project, a combination of 604 net nights of mist-netting and 140 nights of acoustic survey effort was needed to meet the standards listed in the USFWS 2022 Range-wide Indiana Bat & Northern Long-Eared Bat Summer Survey Guidance (USFWS 2022). During the 2022 survey season, a total of 146 sites were surveyed, 112 by mist netting and 34 utilizing acoustic

methods. Mist net sites were surveyed over two calendar nights with two net sets per night, resulting in four net nights of effort, while acoustic sites were surveyed with one detector for four calendar nights resulting in 144 detector nights of effort during 2022. Two sites, 107 and 128, could not be fully completed due to equipment failure and will be re-sampled in 2023. Additional surveys are planned in 2023 to complete the effort recommended by the USFWS summer survey guidance requirements for linear projects located outside of the Appalachian Recovery Unit. Surveys were conducted within the Project corridor from May 16 to August 14, 2022. Site specific authorization of survey methods were received from the USFWS Tennessee Field Office on April 29, 2022, and email notification was provided to TWRA prior to initiating surveys. Additionally, Center for Disease Control (CDC; 2021) and USFWS (2020) guidance was followed to ensure all precautions were taken regarding COVID-19 safety protocols.

2.1 MIST NETTING AND ACOUSTIC SURVEY GUIDELINES

Environmental factors can be highly variable in field settings, leading to a variety of bat survey techniques. However, the USFWS has standardized certain netting and acoustic practices for endangered bat surveys, which are outlined in the USFWS 2022 Range-Wide Indiana Bat & Northern Long-Eared Bat Summer Survey Guidelines (USFWS 2022). These guidelines, a summary of which can be found below, were adhered to during this survey. In order to reduce or eliminate exposure to *Pseudogymnoascus destructans*, the fungus that causes White Nose Syndrome in bats (Frick et al. 2016), extra precaution was taken to follow the USFWS White Nose Syndrome (WNS) Disinfectant Protocols (version 10.14.2020; WNS Decontamination Team 2020) during the survey

USFWS Range-Wide Indiana Bat and Northern Long-Eared Bat Survey Guidelines
<ol style="list-style-type: none"> Netting Season: May 15 to 15 August, when Indiana bats occupy summer habitat in Tennessee. Equipment (Mist-nets): Constructed of the finest, lowest visibility mesh commercially available – monofilament or black nylon – with the mesh size approximately 38 mm (1¼ – 1¾ in). (Acoustic Detectors) Wildlife Acoustics Song Meter 4 Mini. Net Placement: Mist-nets are traditionally placed over travel corridors in forest (e.g., streams, logging roads, two-tracks) that extend from ground- (or water-) level to overhanging canopy and are bounded by foliage on the sides. Net width and height are adjusted for the fullest coverage of the flight corridor and, when possible, extend beyond the boundaries of the corridor to prevent bats from flying around net edges. When possible, nets are placed so they bisect bends in the corridor. A “typical” net set consists of nets “stacked” on top of one another with heights from 5 m (16 ft) up to 8 m (30 ft); width may vary from 4 m (13 ft) up to 18 m (60 ft). <p>For surveys targeting northern long-eared bats, mist-nets should be placed in traditional (described above) and non-traditional locations, such as small forest openings, ponds, and interior forest. Sampling non-traditional locations ensures their preferred microhabitats are sampled, which can differ slightly from the Indiana bat.</p> <p>For km sections of the Project corridor containing limited amounts of forest habitat and where no apparent mist net survey site could be identified from aerial photography within the Project corridor then Stantec identified these sections as acoustical survey sites. Detectors were placed in more open canopy sites where bats are expected to forage, or travel.</p>

4. Netting Protocols

- ◆ No disturbance near the nets between checks
- ◆ Sample Period: begin at sunset (or when darkness falls) and net for minimum of 5 hours
- ◆ Nets are monitored at approximately 10-minute intervals
- ◆ Maximum of three consecutive nights of netting at any given location. After two consecutive nights of netting at the same location without capturing Indiana or northern long-eared bats, net locations must be changed, or netting must pause and resume at this location after at least two calendar nights.

Midwest and Ozark-Central Indiana Bat Recovery Unit:

- ◆ Linear projects: a minimum of two net nights per kilometer (0.6 miles) of suitable summer habitat.
- ◆ Non-linear projects: a minimum of nine net nights per 0.5 square kilometer (123 acres) of suitable summer habitat.

Northern Long-eared Bat (Range-wide):

- ◆ Linear projects: a minimum of four net nights per kilometer (0.6 miles) of suitable summer habitat.
- ◆ Non-linear projects: a minimum of 16 net nights per 0.5 square kilometer (123 acres) of suitable summer habitat.

5. Acoustic Protocols

- ◆ Acoustic Survey Season: 15 May to 15 August, when Indiana bats and northern long-eared bats occupy summer habitat
- ◆ Equipment:
 - Full-spectrum and/or zero-crossing detectors
 - Directional, hemispherical, or omnidirectional microphones
- ◆ Acoustic Detector Placement:
 - At least 3 meters (m; 10 feet [ft]) in any direction from vegetation or other obstructions
 - In areas without vegetation or with minimal vegetation within 10 m (33 ft) in front of microphone
 - Parallel to woodlands
 - At least 15 m (49 ft) from known or suitable roosts (e.g., trees/snags, buildings, bridges, bat houses, caves, or mine portals)
 - Placed in: forest canopy openings, near water sources, wooded fence lines, adjacent to large openings or connecting two larger blocks of suitable habitat, Blocks of recently logged forest where some potential roost trees remain, Road or stream corridors with open tree canopies or canopy height more than 10 m (33 ft), or Woodland edges

- ◆ Acoustic Detector Spacing:
 - Acoustic sites should be a minimum of 200 m (656 ft) apart.
- ◆ Minimum Level of Effort:
 - Linear projects – a minimum of 4 detector nights per 0.62 mile (1 kilometer) of suitable summer habitat
 - Acoustic sampling period begins at sunset and ends at sunrise
 - Four (4) detector nights must consist of at least 4 calendar nights
- ◆ Orientation of Acoustic Detector: Directional and omnidirectional microphones should be oriented towards the majority of the flight path, while hemispherical microphones should be oriented vertically.
- ◆ Weatherproofing Acoustic Detector: If necessary, detectors should be placed within weatherproof containers. Wildlife Acoustics SM4BAT acoustic detectors and SMM-U2 acoustic microphones are both weatherproof, requiring no after-market alterations.

6. **Weather Conditions:** Net only if the following weather conditions are met, for acoustic surveys, data can only be kept if the below conditions are met for the first five hours of the survey:

- ◆ Precipitation, including rain and/or heavy fog, does not exceed a total of 30 minutes (including intermittently) during the survey period
- ◆ Temperature $\geq 10^{\circ}\text{C}$ (50°F)
- ◆ Sustained wind speeds do not exceed nine miles/hour or a “3” on Beaufort Wind Scale.

7. **Moonlight:** Avoid net sets with direct exposure to a moon $\frac{1}{2}$ -full or greater – typically by utilizing forest canopy cover

2.2 SITE SELECTION

A qualified Indiana bat mist net surveyor chose suitable survey locations within the Project corridor. Mist net site selection targeted areas throughout the Project corridor that were suspected to have a high amount of bat activity. Net site selection was also influenced by property access. Net placement was based on a variety of characteristics, including canopy cover, presence of potential flight areas, proximity to water, and forest conditions found within the Project corridor.

Acoustic sites were located in areas where potential bat habitat was present, but netting was not suitable due to access requirements or lack of suitable net sites. Wildlife Acoustics SM4 Bat Mini's were deployed by staff familiar with acoustic surveys and in accordance with the USFWS 2022 Range-Wide Indiana Bat & Northern Long-Eared Bat Summer Survey Guidelines.

General habitat types selected included the following characteristics:

- Large trees (>16 inches diameter-at-breast height [DBH]) that could support primary maternity roosts;
- An open canopy, allowing solar exposure for warming of roost sites;
- An open, uncluttered understory used for travel and foraging; and
- Stream area (or other water source) for drinking and prey presence

While riparian areas often provide successful mist net sites, upland areas (e.g., trails or logging roads) also provide suitable sites (Kiser and MacGregor 2005). In upland areas, water-filled road ruts or other areas of standing water frequently facilitate the capture of a variety of bat species. The actual location and orientation of each mist net was determined in the field.

2.3 HABITAT ASSESSMENT

A habitat description and a sketch of the mist net location was completed on bat mist net datasheets (Appendix B). The descriptions on these data sheets emphasized habitat form: size and relative abundance of large trees and snags that may potentially serve as roost trees, canopy closure, understory clutter/openness, distance to water, stream or pond characteristics (if mist net was placed over them), and flight areas. Habitat form is emphasized because target bats are known to roost in several different species of trees. Tree species composition is included in the assessment because it provides insight to edaphic conditions of each site.

Habitat characterization identifies components of the dominant canopy species (DBH >16 inches) and subdominant canopy species (DBH < 16 inches). As defined in the Indiana Bat Habitat Suitability Index Model (3D/Environmental 1995), dominant trees are the large trees in the canopy (> 16 inches DBH) that have the greatest likelihood of being used by maternity colonies of Indiana bats. Many smaller trees are also often found in the canopy, and in some situations, the canopy can be entirely composed of smaller-diameter trees.

Habitat for the northern long-eared bat is less understood, but apparently far more general than that of the Indiana bat (Schultes and Elliott 2002; Whitaker and Mumford 2009). While some studies have found this species using larger, older forests and roosts (Lacki and Schwierjohann 2001; Henderson and Broders 2008), others have found the species using smaller roosts and forest tracts (Whitaker and Mumford 2009; Schultes and Elliott 2002). Therefore, conditions for capture of the Indiana bat were considered adequate for sampling northern long-eared bats as well.

The subcanopy, or understory, vegetation layer is well defined in classical ecological literature. It is that portion of the forest structure between the ground vegetation to approximately 0.6 m (2 ft) and the canopy layers, usually beginning at about 7.6 m (25 ft).

Vegetation in the understory may come from:

- Lower branches of overstory trees;
- Young overstory trees; or
- Small trees and shrubs that are confined to the understory

The amount of vegetation in the understory is termed clutter. Many species of bats, including the Indiana bat, tend to avoid areas of high clutter; however, northern long-eared bats are often found in areas of relatively high clutter (Carter and Feldhamer 2005).

2.4 BAT CAPTURE AND PROCESSING

Protocols for bat capture, handling, and equipment decontamination for WNS were followed at each mist net site. Additionally, USFWS COVID-19 guidance was followed during the surveys. The survey was conducted under multiple USFWS and TWRA collecting permits (Table 2.1).

Table 2.4.1. Bat Collection Permit Numbers and Associated Biologists.

USFWS Permit Number	Permitted Biologists Covered by Permit
TE38821A-4	James Kiser, Wes Cunningham, Lynda Mills, and Doug Stephens
ES15027A	Kimberly Carter, Jody Nicholson, Angela Sjollema, Hannah Stoffs, and Matt Denzler.
TE91733B-0	Joshua Adams
TE13580D-1	Julia Wilson
TE98673B-0	Jason Thomas (JT) Layne
TE56515D-0	Leslie Meade
TE94849B-1	Zachary Baer, Theresa Wetzell, Ian Burns, Kelsie Eshler, Crystal Birdsall, Malachia Evans
TE129703-6	Todd McDaniel and Eric Smith

TWRA Permit Numbers	Permitted Biologists Covered by Permit
1491	James Kiser, Josh Adams, Wes Cunningham, Kim Carter, Lynda Mills, Doug Stephens, Angela Sjollem, Hannah Stoffs, Matt Denzler, JT Layne, Jeff Brown, Shane Kelley, and Julia Wilson.
3050	Zachary Baer, Theresa Wetzel, Ian Burns, Kelsie Eshler, Crystal Birdsall, Malachia Evans, and Leslie Meade
5513	Todd McDaniel and Eric Smith

2.5 RADIO TELEMETRY

As outlined in the study plan, any reproductive or juvenile Indiana or northern long-eared bats, as well as select eastern tri-colored and little brown bats would be fitted with radio-transmitters to locate their maternity roost. Radio-transmitters used during the survey were model LB-2X with a frequency of 150 MHz, were manufactured by Holohill Systems Ltd. (Ontario, Canada), and had a mass of 0.28 grams, which was less than 5 percent of the focal bats body weight. The expected battery life of the LB-2X transmitters was between 10 - 14 days. Application of the transmitter was achieved by removing a small area of fur from between the scapula of the bat to provide a good bonding surface attachment. Once the transmitter was activated and the bat's fur was removed, the transmitter was attached to the bat's bare skin between the scapula using Uro-Bond III surgical cement. Signal strength was checked once the transmitter was applied to ensure that biologists were tracking the frequency with the strongest signal. As required by Stantec's Federal Recovery Permit, the transmitter and associated surgical cement represented no more than 6% of the bat's body mass. Once it was determined the surgical cement was completely dried and the bat was alert and in good condition, the bat was released at the capture location.

Radio-tracking each transmitted bat was accomplished with the aid of a Wildlife Material, Inc. TRX1000s receiver or similar device, and tracking was initiated the following day in attempts to locate roost sites. If property access couldn't be obtained where bat was roosting, then biologists used triangulations to obtain and approximate location of the roosting bat. Triangulating a roosting bat didn't provide the exact microhabitat the bat was roosting in but did provide an estimated distance from the Project corridor.

Because the primary objective of applying transmitters on select bats was to locate potential roost sites, bats were tracked for seven days, or until transmitter failure was suspected. Each roost found was mapped using a handheld GPS unit and the roost was photographed to illustrate roosting conditions. The biologists recorded the following information for each roost:

- bat number (transmitter frequency and/or band number) using roost

- type of roost (trees, building, bridges, rockshelter, etc.)

Once a roost site was located, biologists conducted emergence counts for at least two calendar nights in order to verify the type of roost and to get an estimate of colony size.

2.6 WEATHER

Weather conditions were monitored for each night of the survey. Conditions recorded included: temperature, wind speed and direction, percent cloud cover, and moon phase (if visible). A standard digital thermometer was used to record temperature, wind speed was estimated by using the Beaufort wind scale, and cloud cover was visually estimated.

3.0 RESULTS

3.1 HABITAT DESCRIPTION

From west to east, the Project corridor passes through the following EPA Level IV Ecoregions: Outer Nashville Basin, Eastern Highland Rim, Plateau Escarpment, Cumberland Plateau, Southern Limestone/Dolomite Valleys and Low Rolling Hills, and Southern Dissected Ridge and Knob (Griffith et al. 1997).

The Outer Nashville Basin ecoregion plant communities include cedar glades and thickets, cedar-hardwood forests, and deciduous forests. Pasture and hay fields are common, with few row crops. The soils are generally shallow and thus cropland is generally in small tracts on terraces or narrow bottoms (Griffith et al. 1997).

The vegetation of the Eastern Highland Rim is primarily oak-hickory forests. The area is transitional between the oak-hickory in the west and mixed mesophytic forests of the Cumberland Plateau to the east. The forest communities are xeric and sub-xeric oak-hickory forests; mesic upland forests of tulip poplar (*Liriodendron tulipifera*), maple (*Acer* spp.), and American beech (*Fagus grandifolia*); mixed mesophytic forests of maples, American beech, white oak (*Quercus alba*), black walnut (*Juglans nigra*), yellow buckeye (*Aesculus flava*), and white basswood (*Tilia americana* var. *heterophylla*); bottomland forests of silver maple (*Acer saccharinum*), box elder (*Acer negundo*), red maple (*Acer rubrum*), sycamore (*Platanus occidentalis*), and slippery elm (*Ulmus rubra*); and rare eastern hemlock (*Tsuga canadensis*) forests that have a mixed mesophytic component (Griffith et al. 1997).

The Plateau Escarpment and Cumberland Plateau regions of the Southwest Appalachian Region are known for high-gradient streams, deep ravines, and gorges with a variety of microclimates. Vegetation includes mixed oak (*Quercus* spp.) on upper slopes, mixed mesophytic forest on the middle and lower slopes made up of American beech, tulip poplar, sugar maple (*Acer saccharum*), and white ash (*Fraxinus americana*), eastern hemlock along rocky stream sides, and river birch (*Betula nigra*) along floodplain terraces (Griffith et al. 1997). The Cumberland Plateau is primarily mixed oak and oak-hickory communities. White oak is the most common species, but scarlet oak (*Quercus coccinea*) and black oak (*Quercus*

velutina) are also frequently observed in drier acid soils. Upper slopes, as well as old fields and cliff edges, contain Virginia pine (*Pinus virginiana*).

Common vegetation in the Southern Limestone/Dolomite Valleys and Low Rolling Hills include white oak forests, bottomland oak forests, and sycamore-ash-elm riparian forests. Pine plantations occur in some areas of this ecoregion. Grassland barrens are also common in non-forested areas within this ecoregion (Griffith et al. 1997).

The Southern Dissected Ridges and Knobs include oak and pine (*Pinus* spp.) forests typically occurring at higher elevations, and white oak, mixed mesophytic, and tulip poplar forests on the middle and lower slopes. Limited agriculture in this ecoregion includes livestock pastures and cropland where slopes are less steep (Griffith et al. 1997).

3.1.1 Existing Vegetation

Plant community types within the Project corridor were determined based on a review of aerial photography, existing land use classifications, and field surveys. For mapping and discussion purposes, similar habitat types from each EPA Level IV Ecoregion have been consolidated into the following vegetative communities: agricultural, bottomland hardwood forests, deciduous forests, evergreen forests, mixed evergreen deciduous forests, grasslands/herbaceous, shrub-scrub, and emergent wetlands.

The predominant vegetative community that will be impacted by construction of the Project is agricultural, as this community makes up over 40 percent of the total Project corridor. However, mixed forest and grassland are also prevalent. Vegetative community types within each Project facility are detailed in Table 3.2, Appendix D. The following sections provide a summary of each vegetation community.

Agricultural

These areas include row crops, hay fields, and livestock pastures. Most agricultural areas are located in the western half of the Project corridor, where slopes are gentler.

Bottomland Hardwood Forest

Bottomland hardwood forest occurs in alluvial soils within areas prone to flooding. This vegetative community includes maple-sycamore-elm-river birch forests, as mentioned above. Other tree species that typically occur in this forest type include cottonwood (*Populus deltoides*), willows (*Salix* spp.), sweetgum (*Liquidambar styraciflua*), and hackberry (*Celtis occidentalis*). Older bottomland forests are typically comprised of various types of red oaks and hickories.

Deciduous Forest

Upland deciduous forest species composition varies from each ecoregion within the Project corridor. However, white oak, post oak (*Quercus stellata*), and mesic to xeric hickory species are consistent members of the deciduous forest vegetative community. Other representative species include tulip poplar, American beech, and some maples in more mesic transitional zones.

Evergreen Forest

Evergreen forests are dominated by pines and hemlock, including Virginia pine, shortleaf pine (*Pinus echinata*), pitch pine (*Pinus rigida*), eastern white pine (*Pinus strobus*), and eastern hemlock, that are greater than five meters tall and that make up greater than 20 percent of the total vegetation cover. More than 75 percent of the trees in this forest type are evergreen. Various species of pine are found on upper slopes, cliff edges, and old fields. Some planted pine plantations are found along portions of the Project corridor. Additionally, eastern hemlock and eastern white pine-dominant forest occurs in narrow gorges and streamsides. Within the mixed mesophytic forest areas, yellow pines such as shortleaf pine and pitch pine can be common in some areas.

Mixed Evergreen-Deciduous Forest

Mixed evergreen-deciduous forests are dominated by trees greater than five meters tall and which make up more than 20 percent of the total vegetation cover. Neither deciduous nor evergreen species make up more than 75 percent of the total tree cover. Within the mixed-mesophytic forest region, shortleaf pine, pitch pine, and some Virginia pine can be found intermixed with oak species. Yellow pines may be associated with oak or may be the dominant species.

Grassland/Herbaceous

Areas classified as grassland/herbaceous are areas greater than 80 percent graminoids or herbaceous vegetation. This vegetative community within the Project corridor is primarily made up of an already existing, maintained ROW associated with the existing East Tennessee Gas 3100 Pipeline or other various utilities. Some natural, xeric grasslands are intermixed within the Project corridor. Grasslands within Tennessee can contain broomsedge (*Andropogon virginicus*), little bluestem (*Schizachyrium scoparium*), Indiangrass (*Sorghastrum nutans*), switchgrass (*Panicum virgatum*), purpletop (*Tridens flavus*), and other grass species. Disturbed grassland areas may be dominated by broomsedge. The existing open canopy areas associated with pipeline corridors, utility corridors, and roadsides often contain unique herbaceous plant species that are now rare within the forested landscape due to fire suppression.

Shrub-Scrub

Areas classified as shrub-scrub consist of areas with greater than 20 percent of canopy cover that is less than 15 feet tall. These areas are typically considered early successional vegetation communities and include shrubs, young trees, and other herbaceous cover. Some of the common plant species that make up these areas can include blackberries and dewberries (*Rubus* spp.), sumac (*Rhus* spp.), and other early successional species. Young trees that make up these areas are typically dependent on trees that grew before a disturbance occurred.

Emergent Wetlands

Emergent wetlands are classified as wetlands with perennial herbaceous vegetation. Emergent wetlands typically occur adjacent to riverine and lacustrine systems, but they can be isolated. Common plants that can be found in emergent wetlands include rushes (*Juncus* spp.), sedges (*Carex* spp.), spotted jewelweed (*Impatiens capensis*), cardinal flower (*Lobelia cardinalis*), and beggarticks (*Bidens* spp.).

3.2 ACOUSTIC RESULTS

No Indiana or northern long-eared bats were detected during acoustic surveys; however, a number of calls identified as tri-color bats were collected during summer 2022 acoustic surveys. A complete acoustic survey memo can be found in Appendix E.

3.3 BAT CAPTURE

A total of 1,061 bats representing nine (9) species were captured (Table 3.1, Appendix D). Nine (9) individual bats escaped nets prior to being identified by biologists. The summer 2022 survey efforts did not result in any Indiana or northern long-eared bat captures. However, 149 endangered gray bats were captured. Additionally, 25 eastern tri-colored bats were captured, and on September 13, 2022, USFWS issued a ruling that this species may be eligible for federally endangered status under the Endangered Species Act, and it officially was proposed endangered. In addition, 450 eastern red bats, 245 big brown bats, 168 evening bats, six hoary bats, four little brown bats, four silver-haired bats, and one Rafinesque's big-eared bat were captured while conducting 2022 summer mist netting survey activities. (Table 3.1, Appendix D). Table 3.1 in Appendix D shows the number of bat species captured and age, sex, and reproductive data taken during the survey. Field data sheets containing morphometric data, capture locations, and time of capture for individual bats can be found in Appendix B. Morphometric data for listed species as well as those under consideration for listing can be found in Tables 3.3 and 3.4 in Appendix D.

3.4 WEATHER AND TEMPERATURE

Weather during the survey period varied from low fifties to high eighties. Temperatures generally dropped after sunset and throughout the night into the low fifties to mid-seventies. Cloud cover ranged from zero percent to 100 percent during the survey period. Overall, winds were mostly calm with the maximum reading of 2 on the Beaufort wind speed indicators during the entire survey period. Table 3.5 in Appendix D contains onsite weather data collected during the summer survey period.

3.5 RADIO TELEMETRY

Seven eastern tri-colored bats (five adult females and two juveniles) and a single adult male little brown bat had radio transmitters attached and were tracked for at least four hours a day for a duration of either seven calendar days or until the transmitter failed, whichever came first. Additional information can be found in Table 3.6 in Appendix D. Radio tracking, roost tree, and emergence data sheets as well as photographs of roost trees can be found in Appendix F.

Tri-colored bat identified as RLM15-Trousdale-PESU1 was captured and tagged on 5/17/2022. The band applied to this bat was TWRA-04466. Tracking began on 5/18/2022 and ended on 5/24/2022. The bat was triangulated off project corridor near the netting location at 1 location (36.385885, -86.204358) near Second Creek. Crews attempted to detect a signal from this bat within a 5-mile buffer around the project site, especially at last known locations and at all reasonable high elevation points. Tracking concluded after day seven of tracking

Eastern tri-colored bat labeled RLM15-Trousdale-PESU2 was captured and tagged on 5/17/2022. The band applied to this bat was TWRA-04465. Tracking began on 5/18/2022 and ended on 5/24/2022. Crews attempted to detect a signal from this bat within a 5-mile buffer around the project site, especially at last known locations and at all reasonable high elevation points. The bat was triangulated off project corridor near the netting location at 4 different locations ((36.385479, -86.206817), (36.38688, -86.20635), (36.385885, -86.204358), and (36.387063, -86.222073)) near Second Creek. Tracking concluded after day seven of tracking.

Eastern tri-colored bat identified as 21-Smith-PESU1 was captured and tagged on 5/21/2022. The band applied to this bat was TWRA-A04474. On the first tracking day the bat was triangulated to 36.368016, -86.034436. This bat was not found on any of the following tracking days. Tracking crews searched a 5-mile buffer around the project site, especially at last known locations and at all reasonable high elevation points. Tracking ended on 5/25/2022.

Little brown bat identified as 46-Smith-MYLU1 was captured and tagged on 6/1/2022. The band applied to this bat was TWRA-10144. On tracking day one and two the team triangulated the bat to 36.345469, -85.794162. The signal was very strong and appeared to come from either a couple of small non-human dwelling buildings, or the nearby human occupied dwelling. This bat was not found on any of the following tracking days. Crews attempted to detect a signal from this bat within a 5-mile buffer around the project site, especially at last known locations and at all reasonable high elevation points. Tracking ended on 6/8/2022.

Eastern tri-colored bat labeled as M57-Jackson-PESU1 was captured and tagged on 6/12/2022. There was no band applied to this bat due to it being late stage pregnant and fear of overstressing the bat. Tracking was conducted from 6/13/2022 to 6/17/2022. On 6/13/2022 crews tracked the bat to roost tree 57-Jackson-PESU-R1 (36.292816, -85.698633). On day two (6/14/2022) of tracking there was no signal found for the bat after searching a 5-mile buffer and high points near of the capture site. On day three (6/15/2022) of tracking crews located the bat at roost tree 57-Jackson-PESU1-R2 (36.292300, -85.699170). On day four (5/16/2022) of tracking crews tracked this bat to roost tree 57-Jackson-PESU1-R3 (36.292300, -85.699170). On day five (5/17/2022) crews tracked this bat to roost tree 57-Jackson-PESU1-R4 (36.293378, -85.699430). Tracking concluded after day five of tracking.

Eastern tri-colored bat identified as 72-Jackson-PESU2 was captured and tagged on 6/15/2022. The band applied to this bat was TWRA-A03853. On day one (6/16/2022) of tracking only one point was taken while hearing the bat at 36.245698, -85.568667 with an azimuth of 255. The crew was only able to hear it from this location with a 5-element. On day two (6/17/2022) of tracking the crew located bat at roost tree 72-Jackson-PESU2-1 at 36.24553, -85.569584. On day three (6/17/2022) of tracking crews located roost tree 72-Jackson-PESU2-R2 at 36.245553, -85.569584. On day four (6/18/2022) of tracking crews located bat at roost tree 72-Jackson-PESU2-R2 at 36.245506, -85.569576. On day four and five (6/19-6/20/2022) of tracking crews located the bat returning to roost tree 72-Jackson-PESU2-R2. On day six (6/21/2022) of tracking crews located the bat at a new roost tree, 72-Jackson-PESU2-R3 at 36.245884, -85.569529. Tracking concluded after day 6 of tracking.

Eastern tri-colored bat identified as 163-Morgan-PESU1 was captured and tagged on 8/4/2022. The band applied to this bat was TWRA-07275. Crews were unable to get a signal on this bat during the tracking

period of six days, 8/4/2022-8/10/2022. Crews searched a 5-mile buffer around the capture site and on all navigable roads and high points North, South, and West of the town of Wartburg. Tracking concluded after day six of tracking with no signal being detected.

Eastern tri-colored bat labeled as 165-Morgan-PESU2 was captured and tagged on 8/5/2022. The band applied to this bat was TWRA-07276. Crews attempted to detect a signal from this bat within a tracked 5-mile buffers around the project site, especially from all reasonable high elevation points. Crews were unable to get a signal on this bat during the tracking and tracking ended on 8/11/2022 after a period of six days.

4.0 DISCUSSION

During summer 2022 survey efforts, a total of 112 sites were surveyed with mist nets and an additional 34 were surveyed using acoustics. A total of 1,061 bats representing nine (9) species were captured (Table 3.1, Appendix D). Nine (9) individual bats escaped nets prior to being identified by biologists. Summer 2022 survey efforts did not result in any Indiana or northern long-eared bat captures. However, 149 endangered gray bats were captured. Additionally, 25 federally proposed endangered eastern tri-colored bats were captured. In addition, 450 eastern red bats, 245 big brown bats, 168 evening bats, six hoary bats, four little brown bats, four silver-haired bats, and one Rafinesque's big-eared bat were captured while conducting 2022 summer mist netting survey activities.

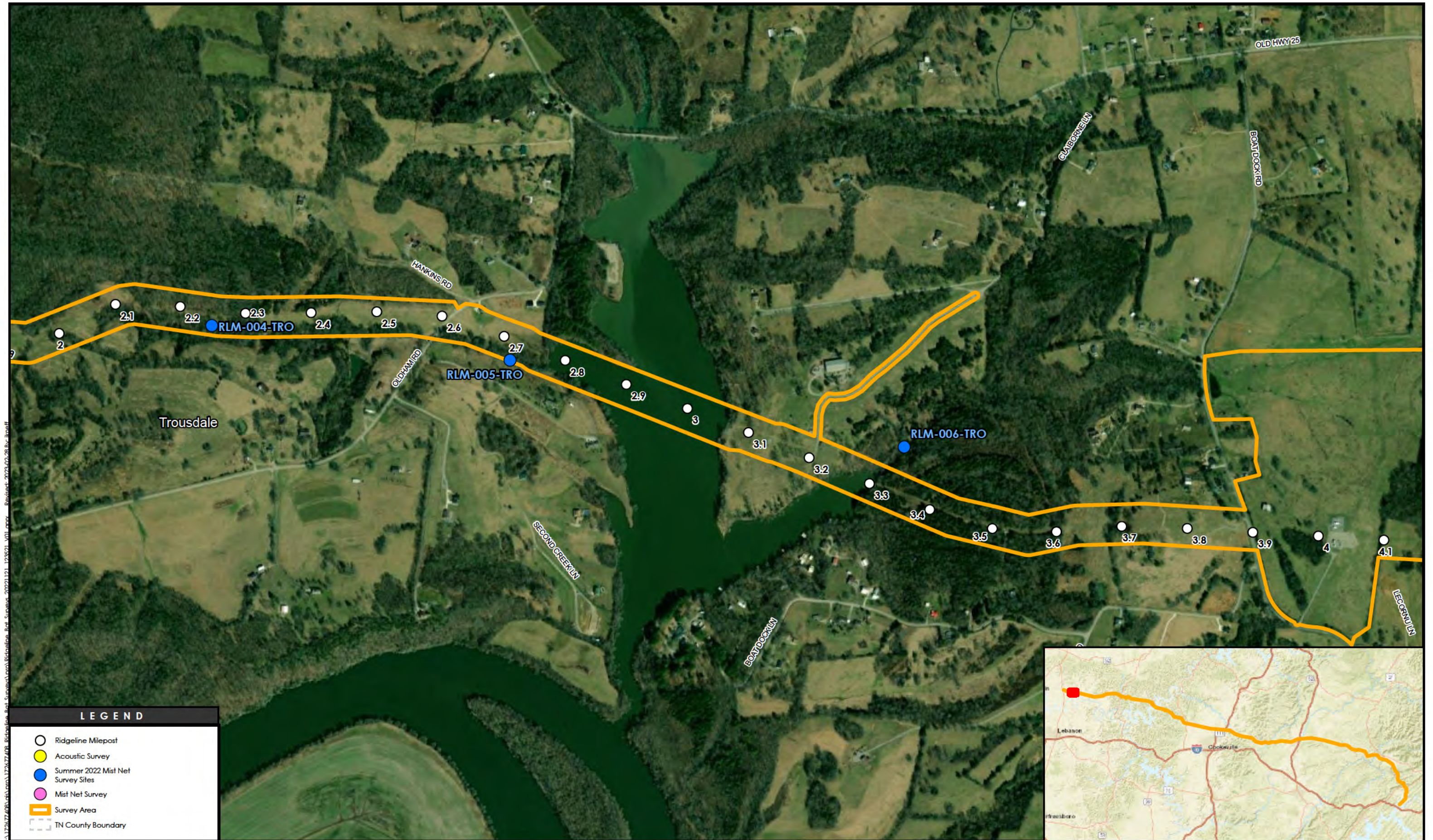
Most of the forested area within the Project corridor provided potentially suitable summer habitat for both the Indiana and northern long-eared bat. Based on the data collected during mist net surveys and radio-tracking study for the Project corridor following USFWS approved guidelines, and the apparent absence of the northern long-eared bat and Indiana bat, a May Affect Not Likely to Adversely Affect determination is anticipated from the USFWS's Tennessee Field Office for these species. The capture of 25 eastern tri-colored bats, including reproductive (pregnant, lactating, post-lactating, and juvenile bats), indicates the species use the Project corridor as maternity habitat. On September 13, 2022, USFWS issued a proposed rule that eastern tri-colored bats were warranted to be listed as endangered. At the time of writing this report, it is unknown what a listing of this species will look like; however if this listing becomes official, additional coordination with USFWS will be needed for this species. Additional surveys will be completed in 2023 at sites where access was limited during the 2022 survey period.

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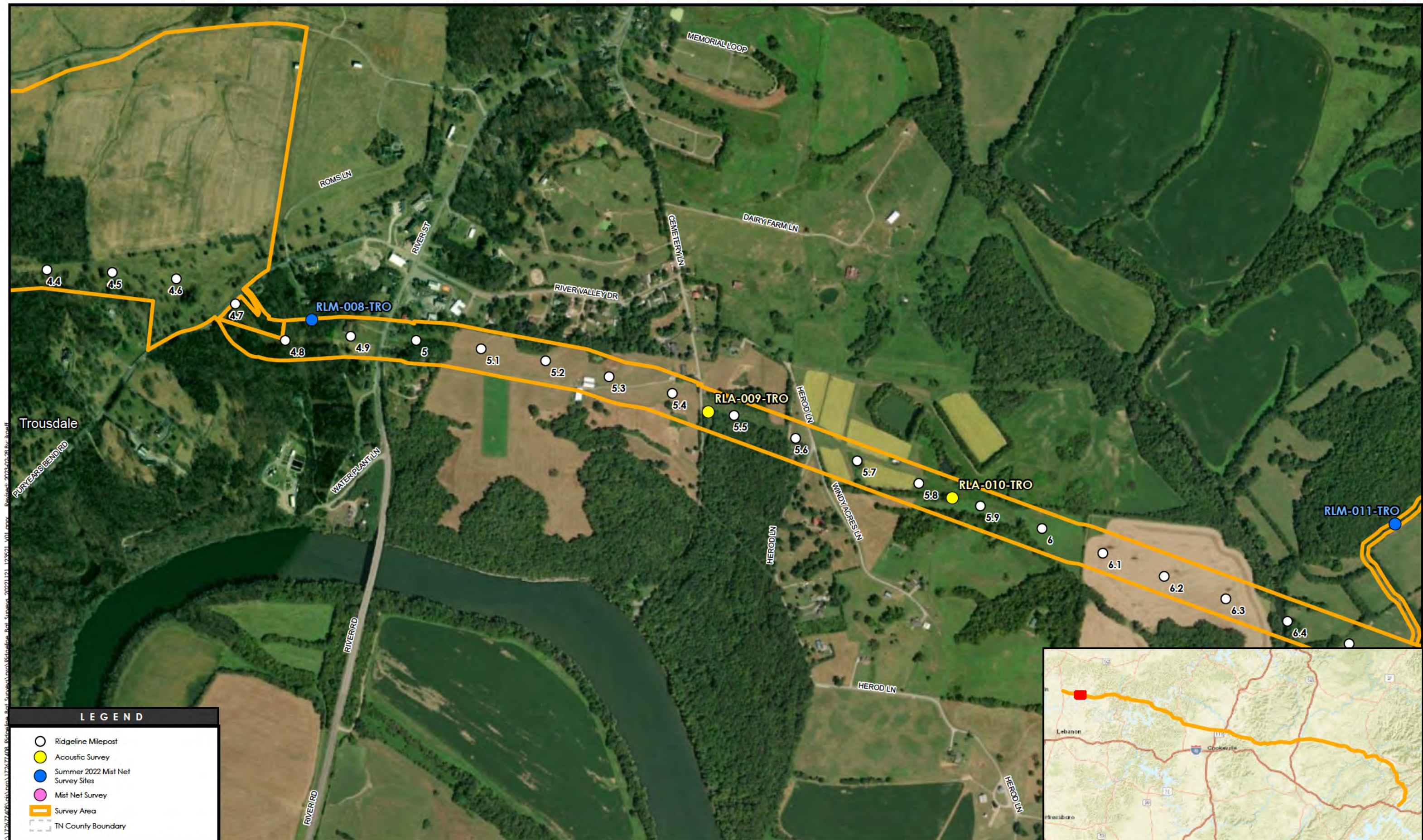
APPENDIX A

Project Area Map



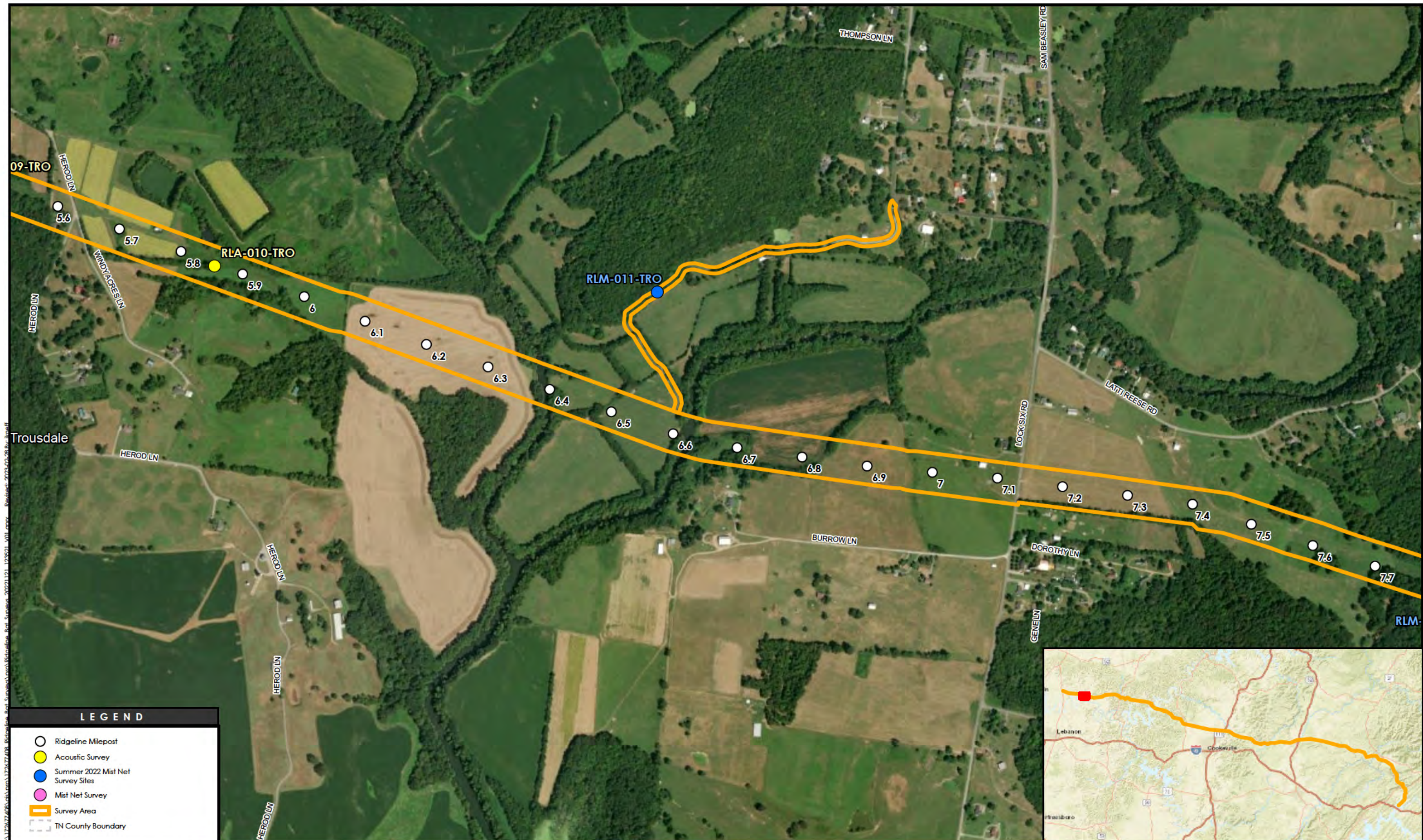
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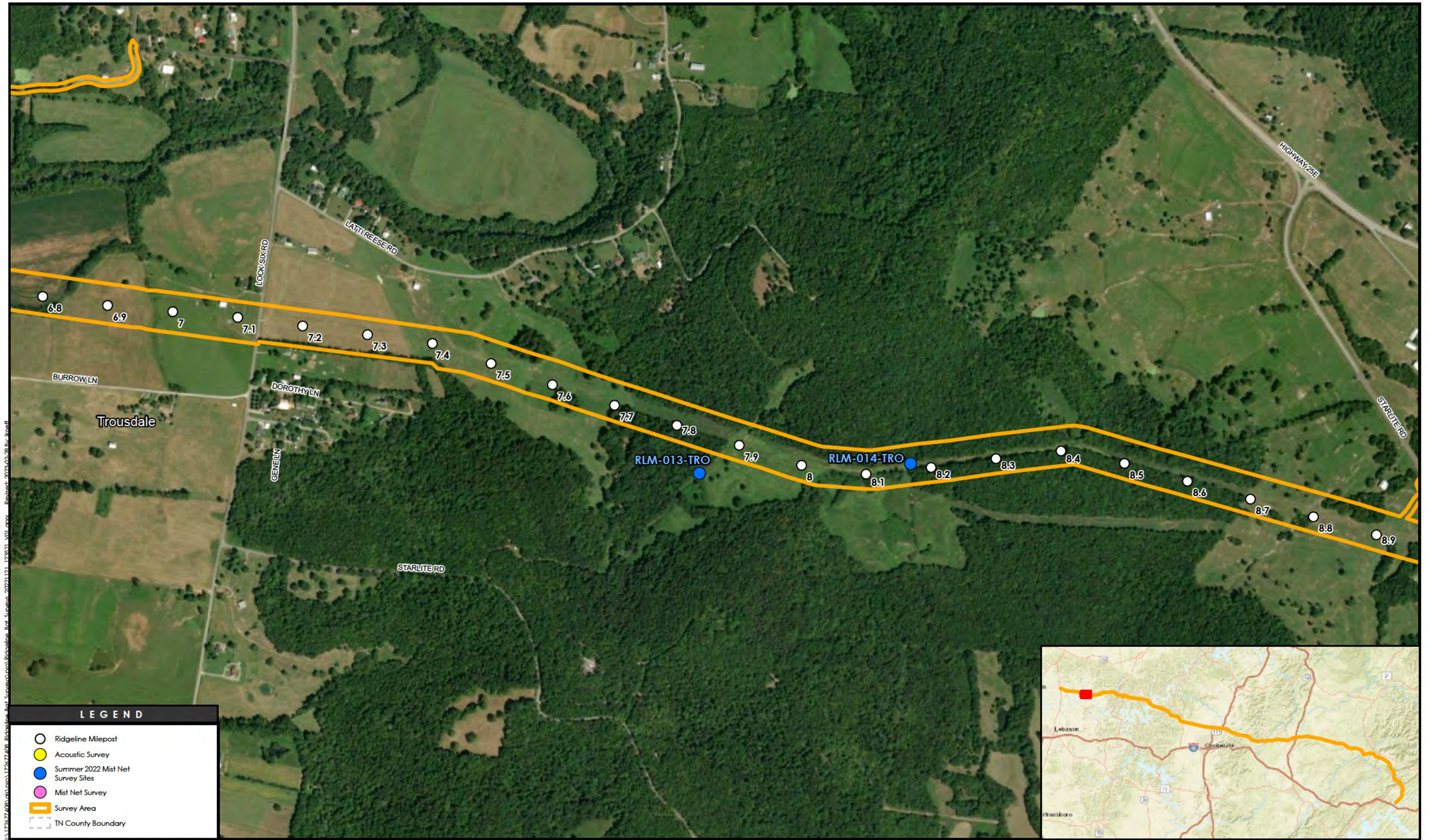
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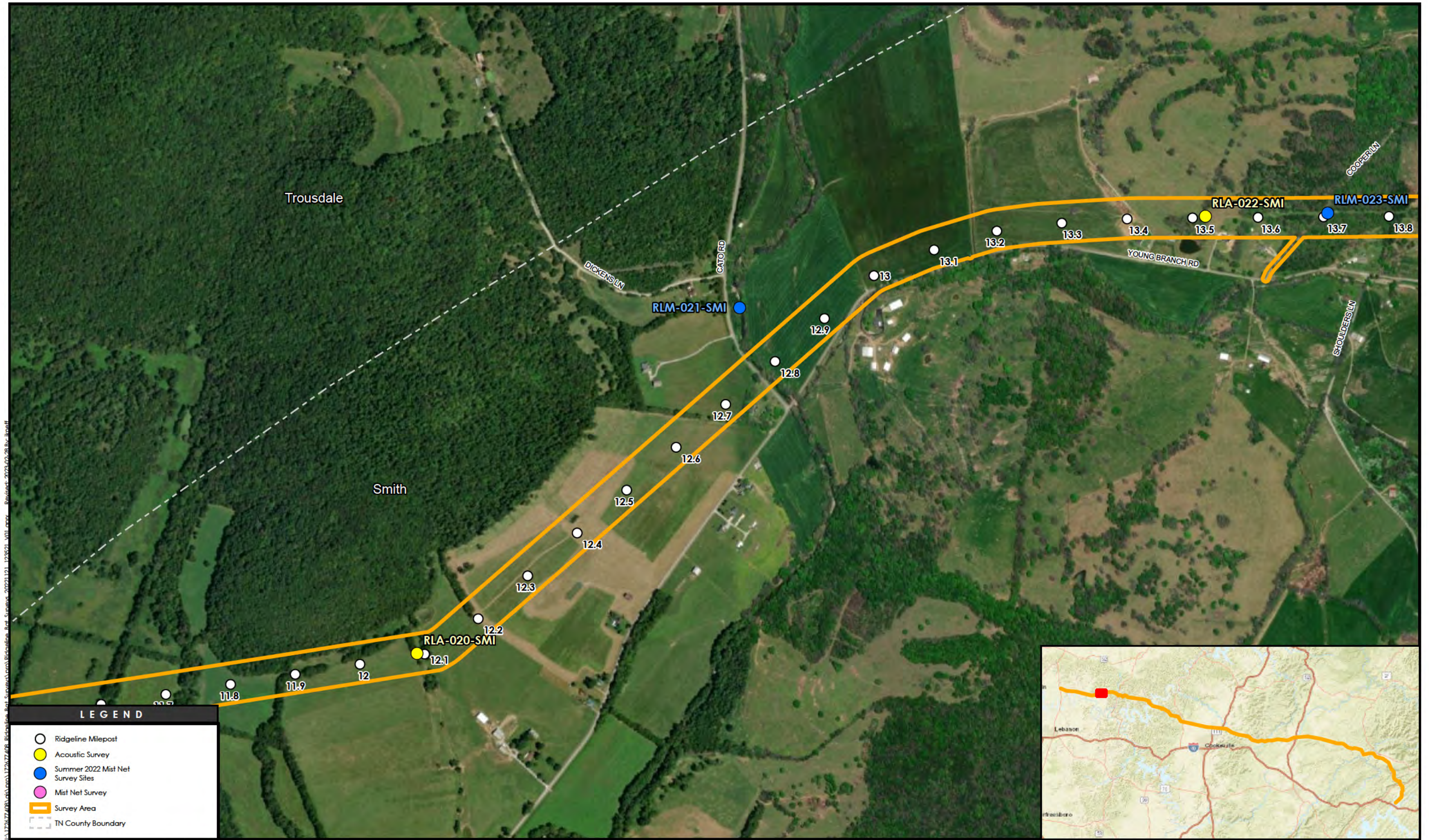
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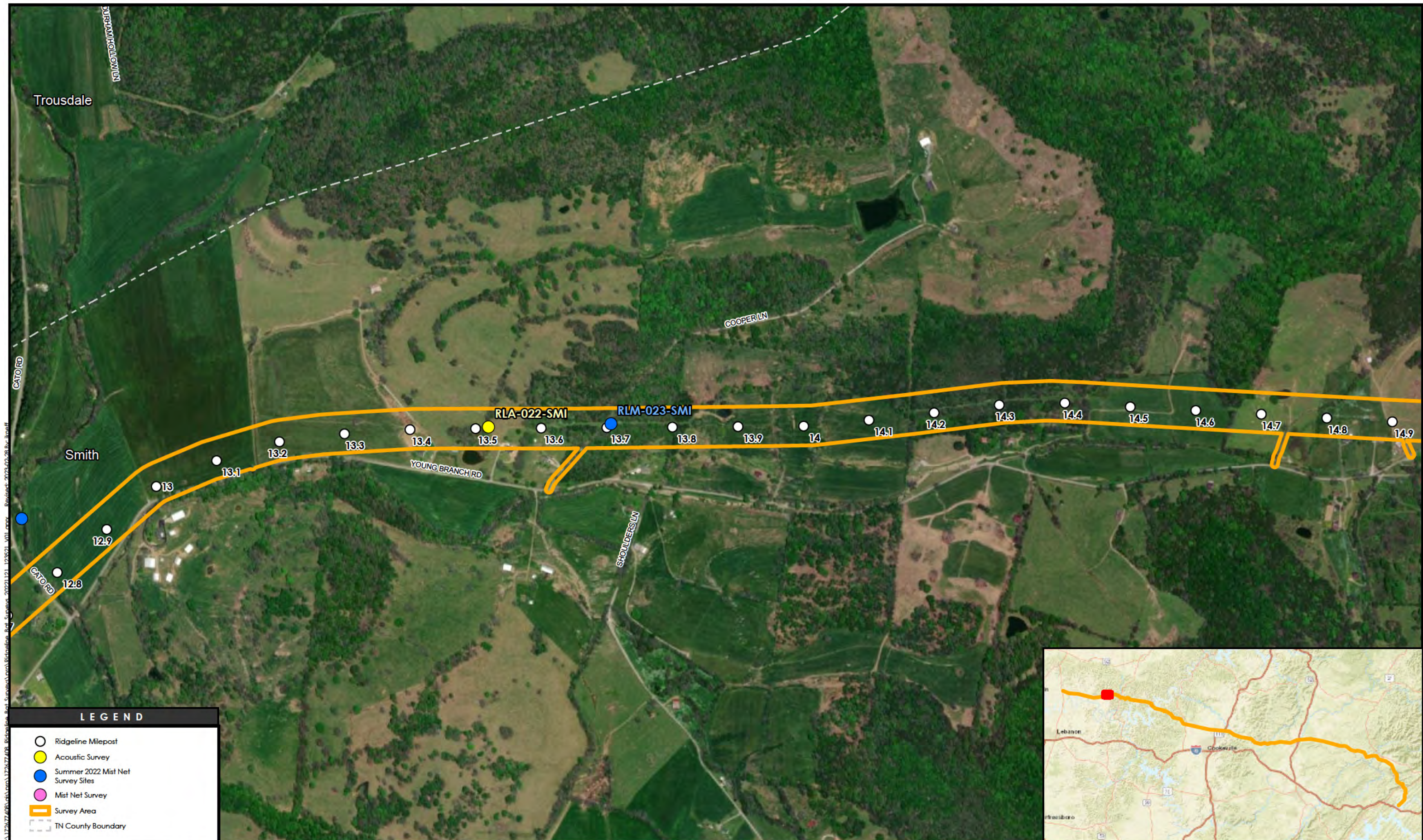




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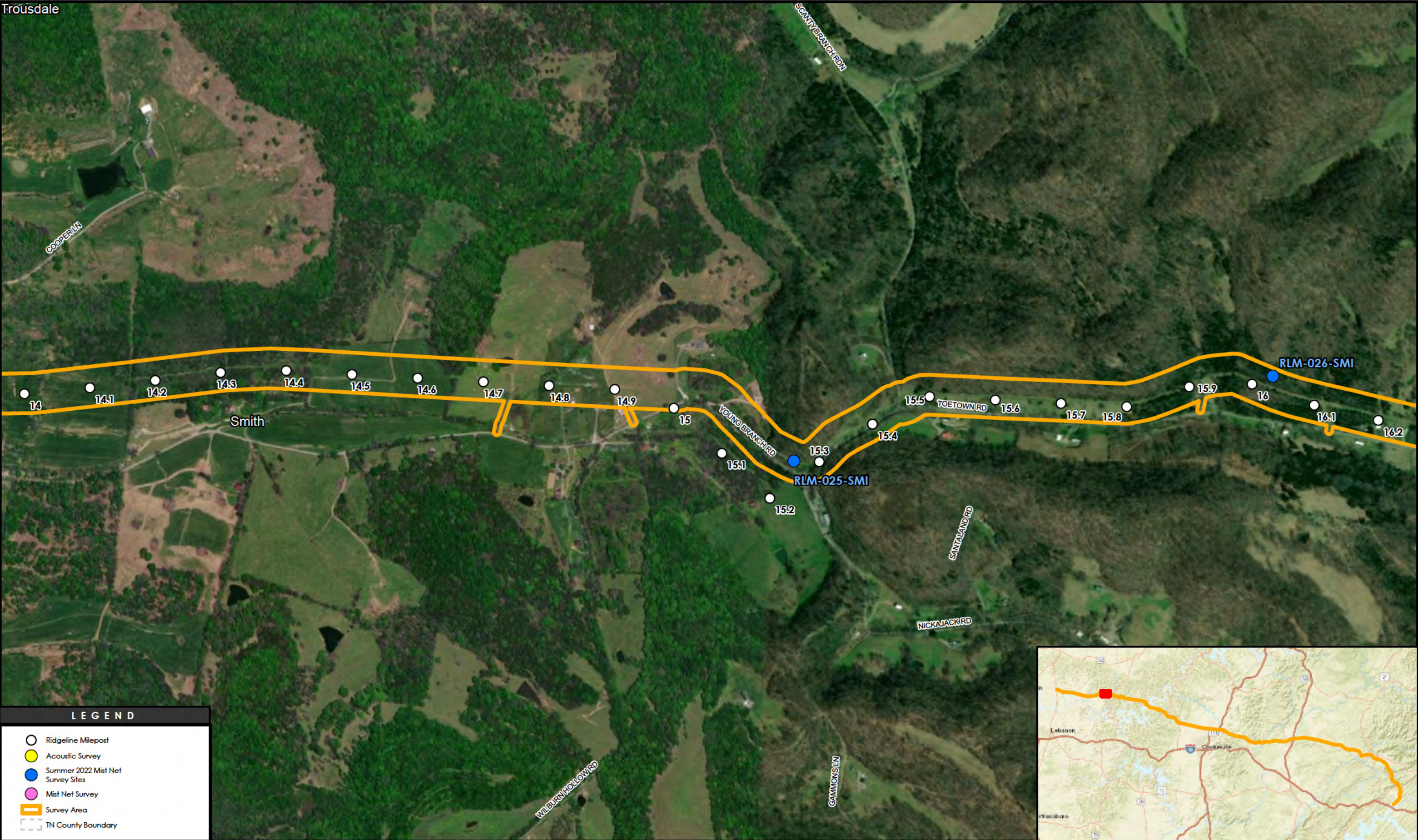






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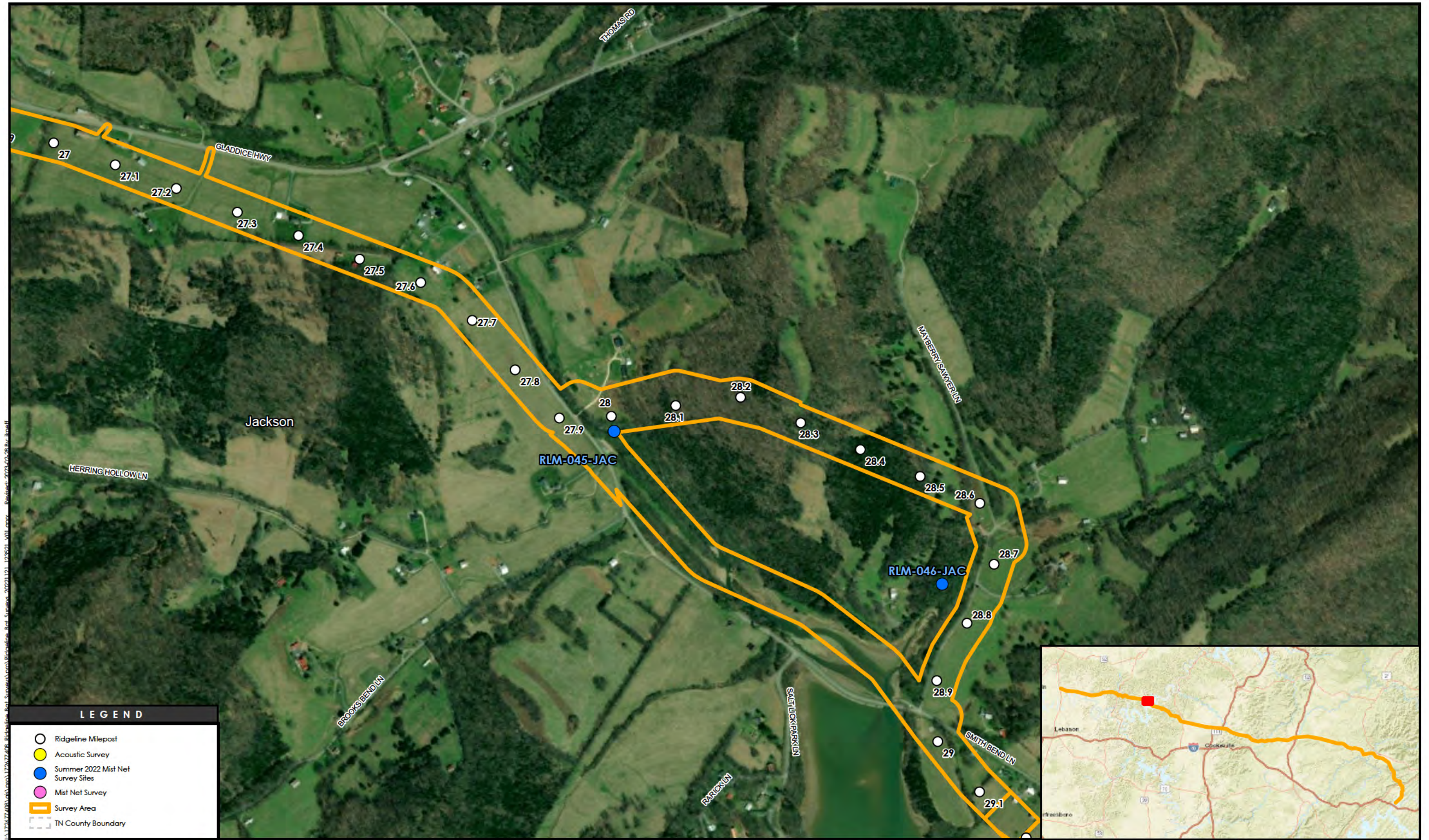
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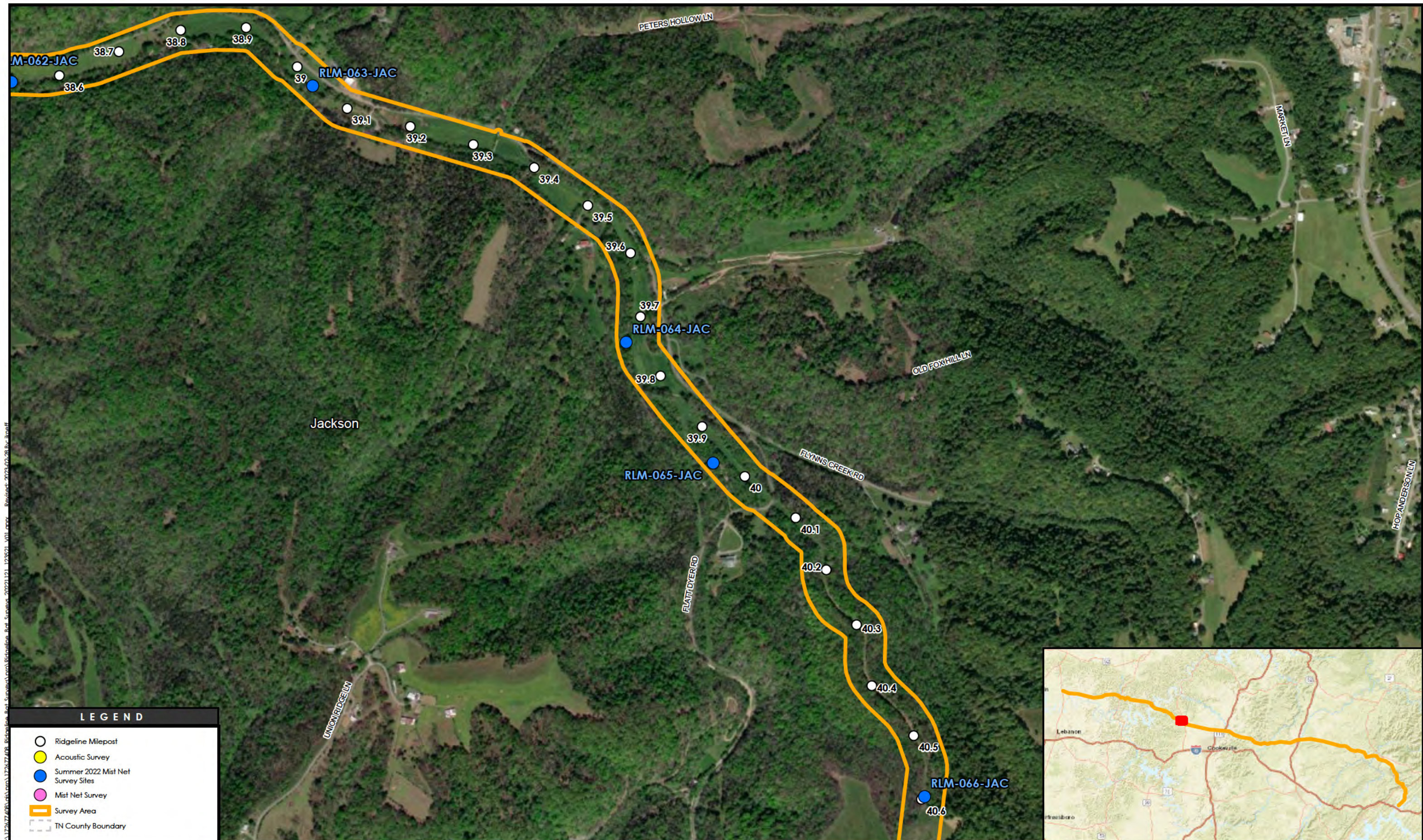
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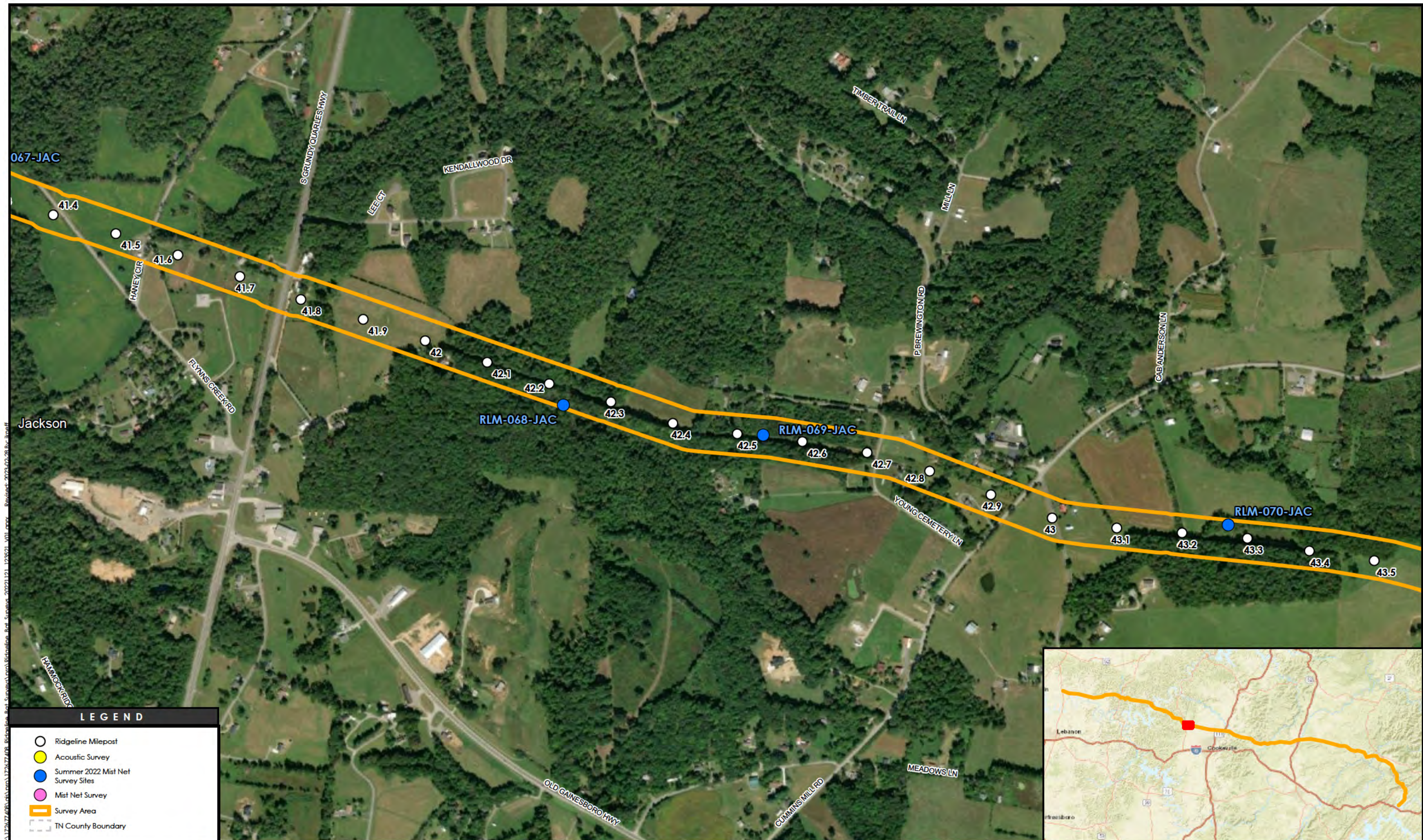


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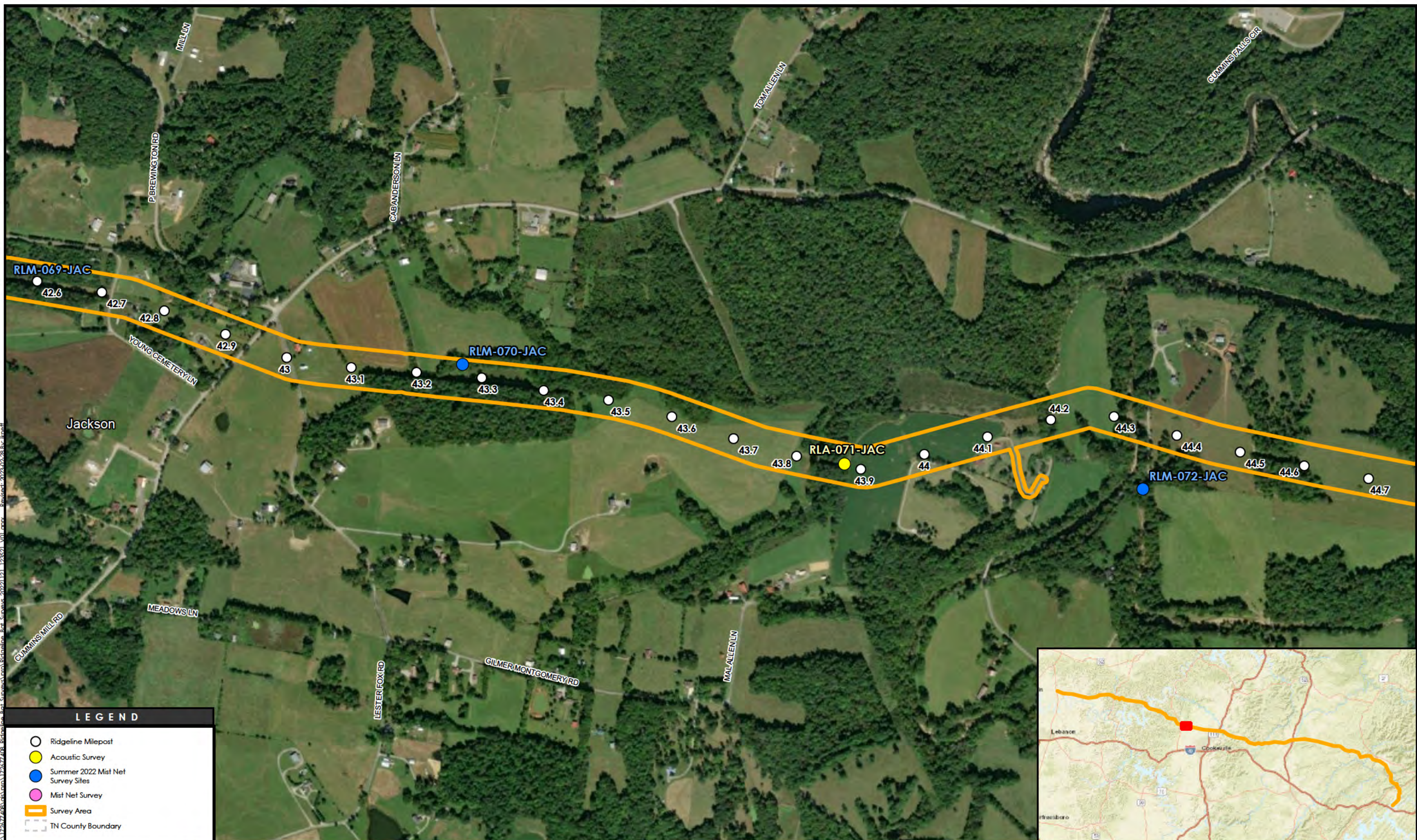


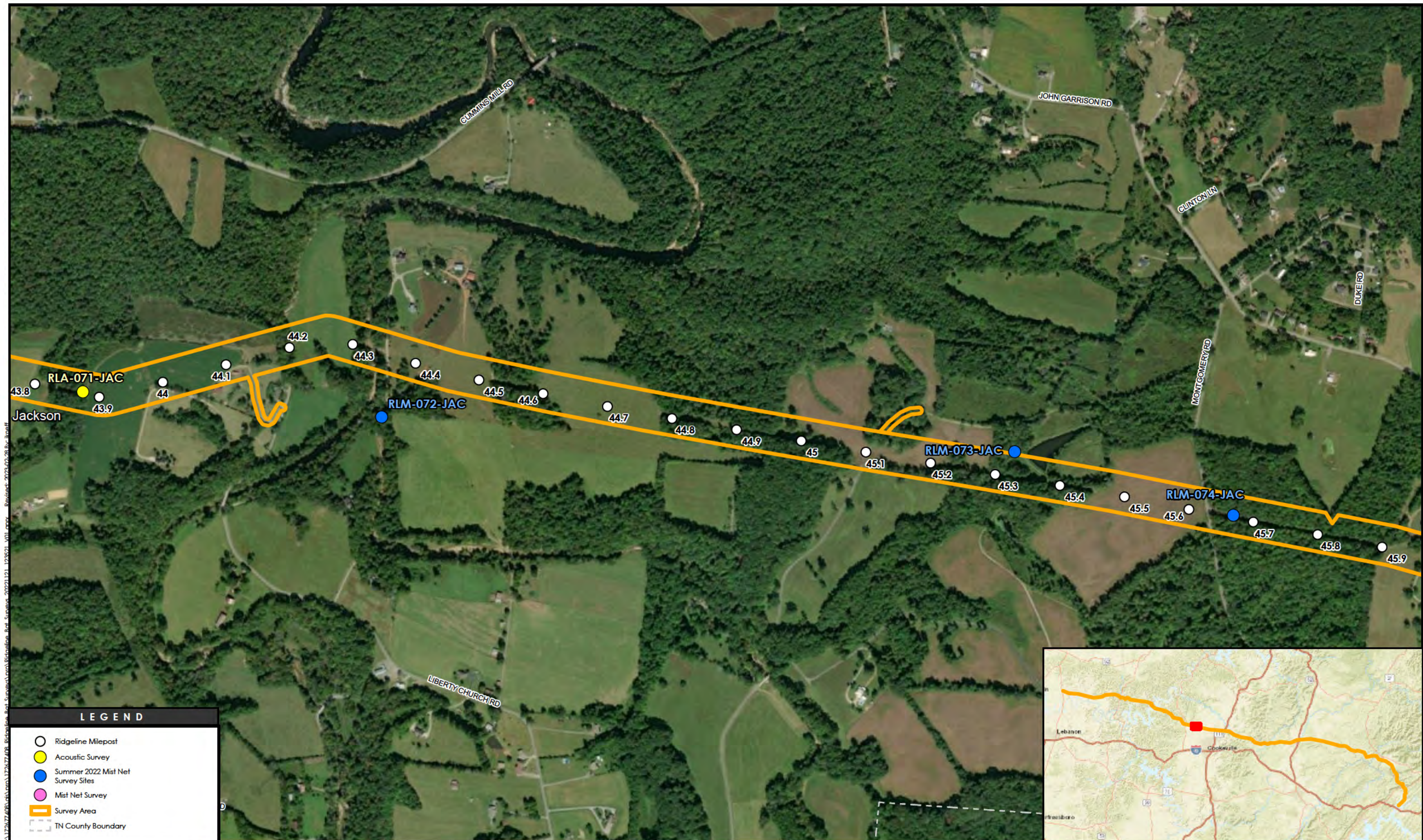


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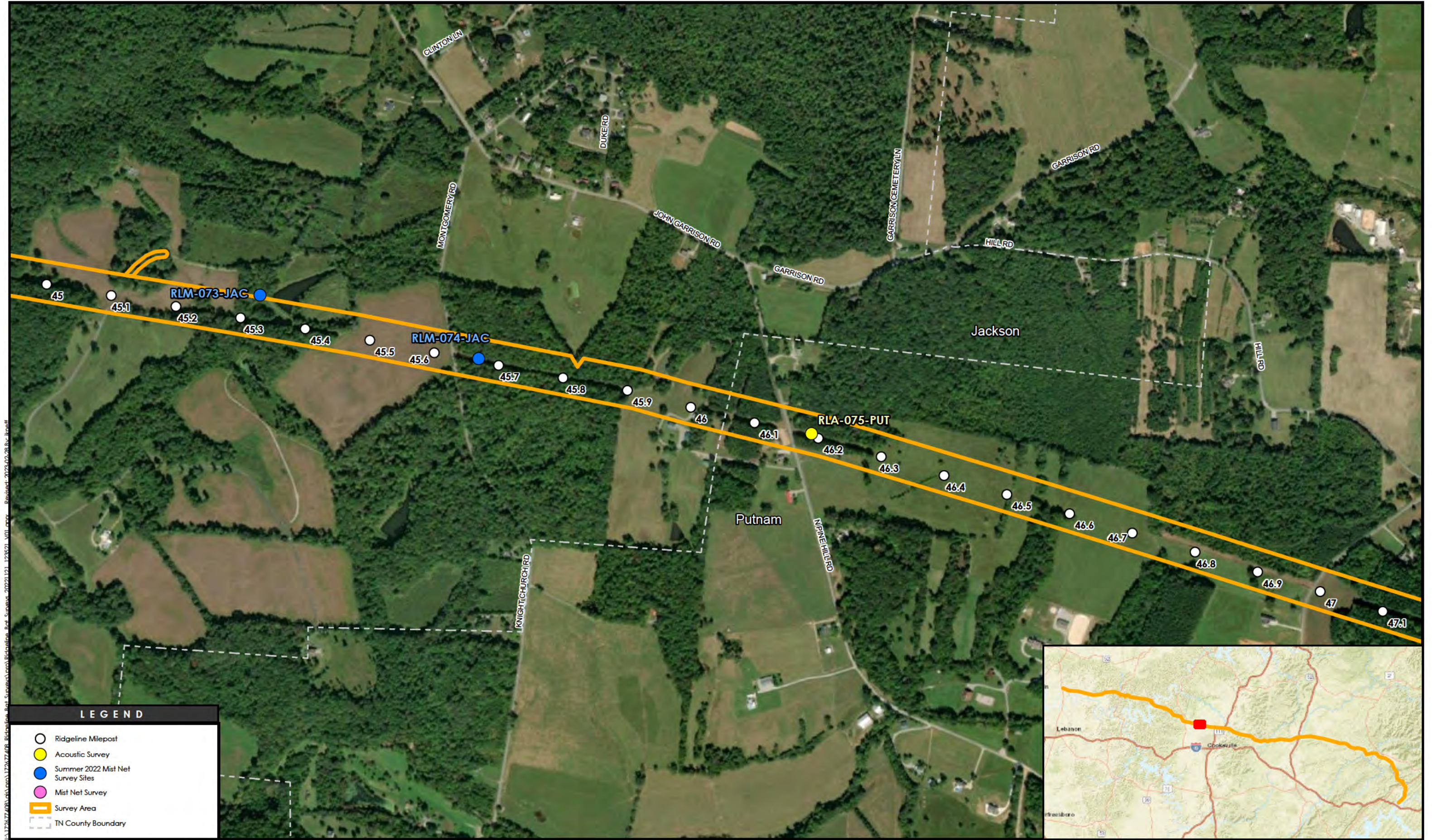
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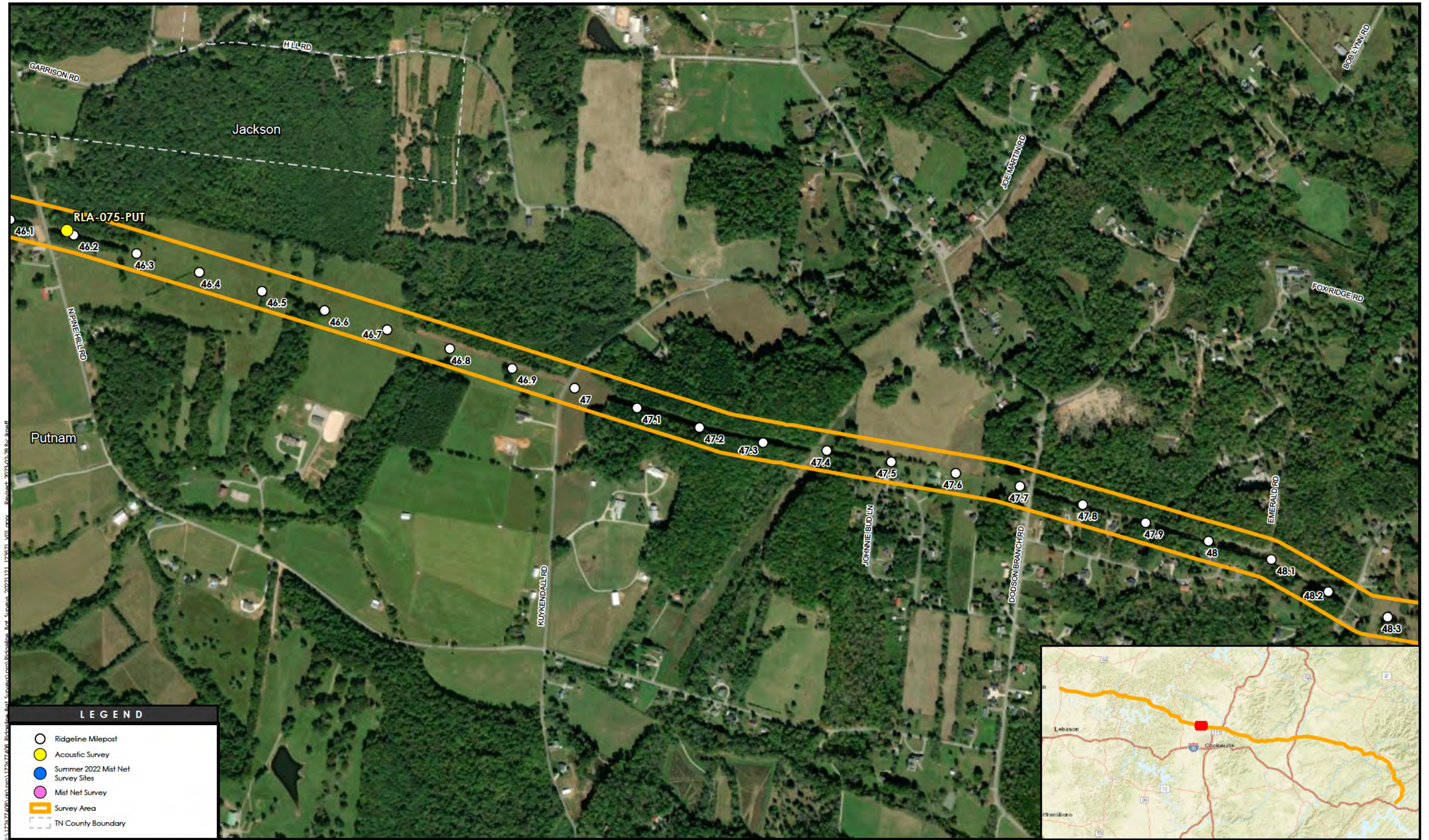


Ridgeline Expansion Pipeline Project

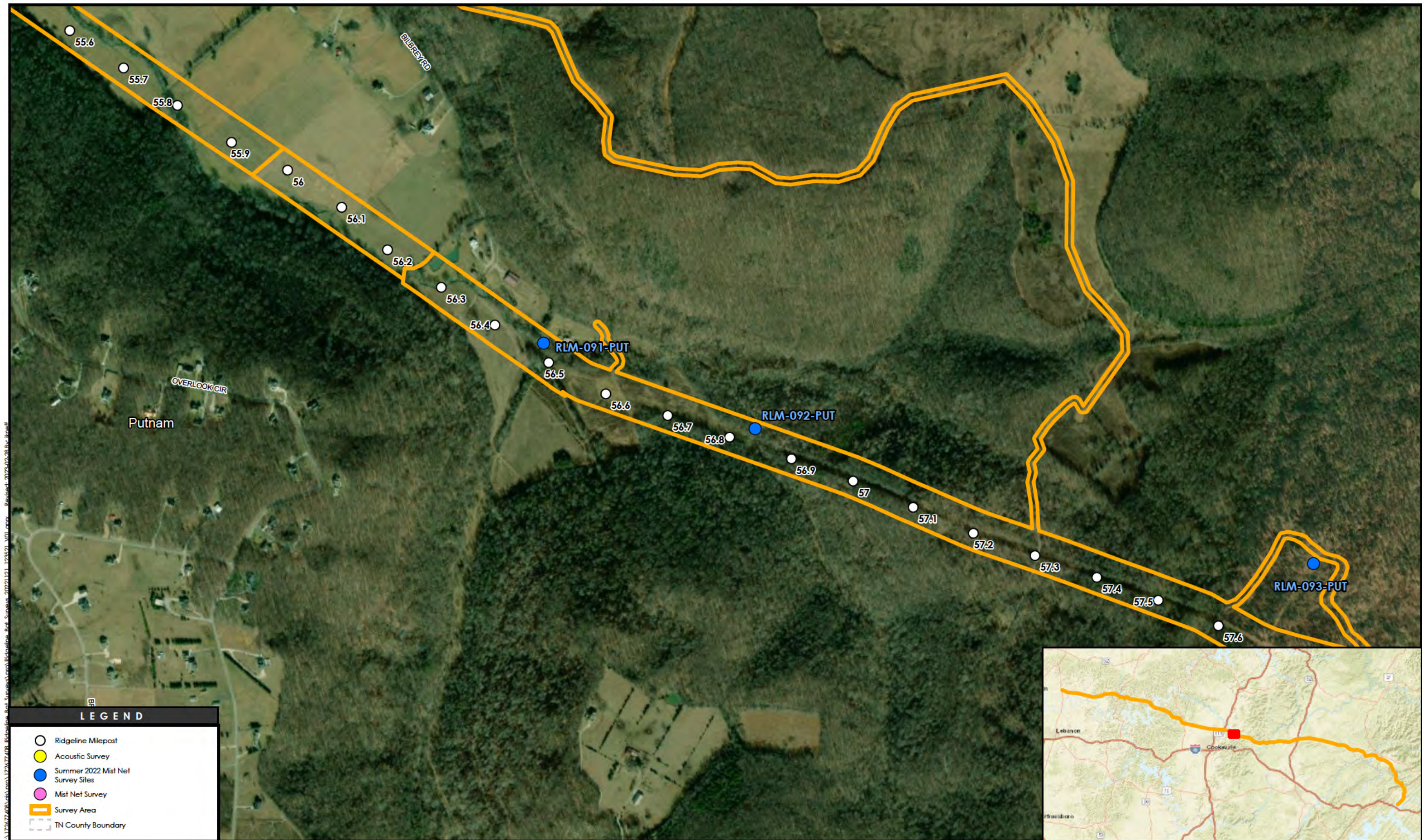
Bat Survey Sites - February, 2023

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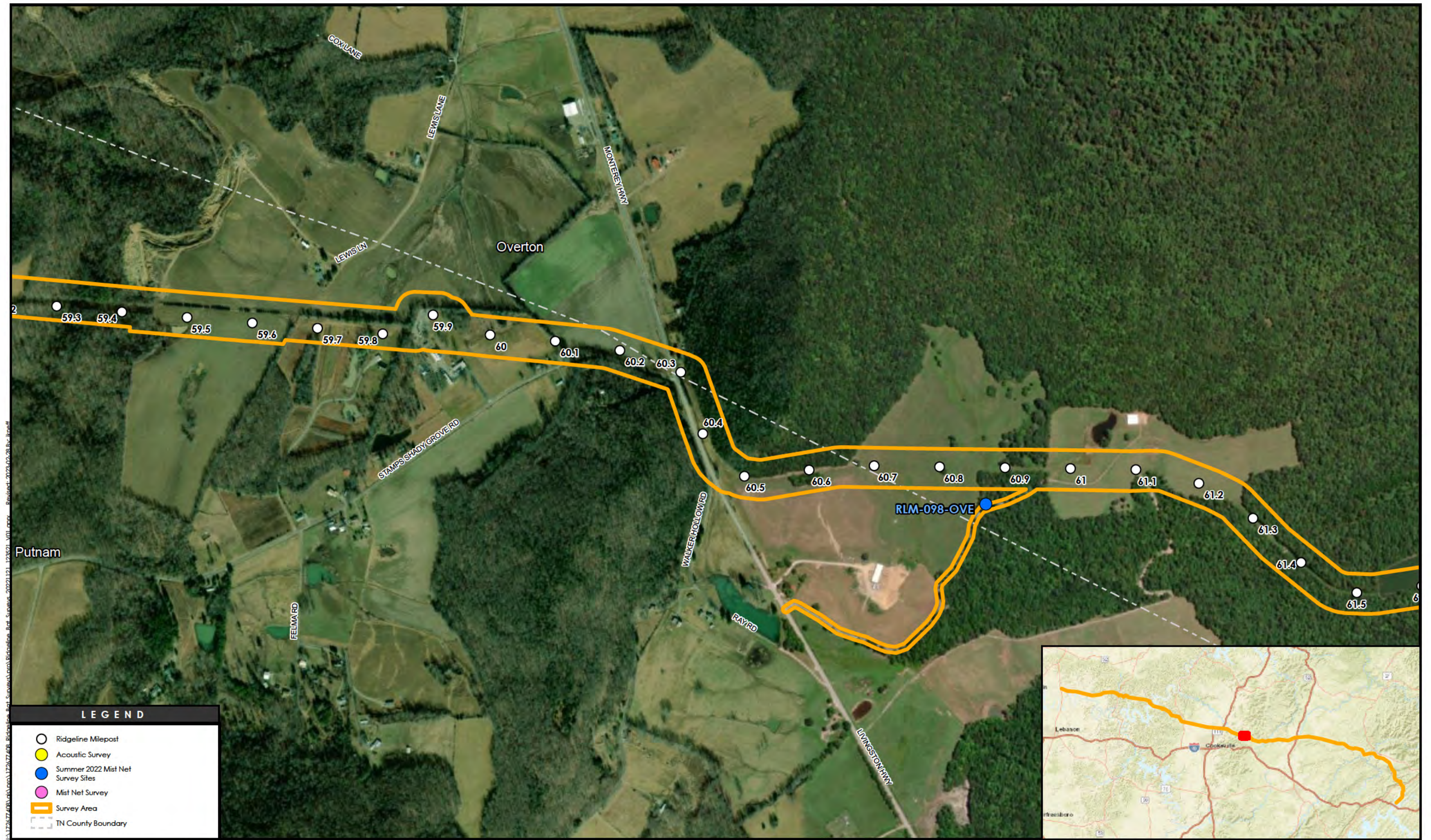
Bat Survey Sites - February, 2023

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0 350 700
Feet
1 inch = 700 feet

Prepared by: J.N 02/28/23
Technical Review by: M.P. MM/DD/YY
Independent Review by: J.A. MM/DD/YY



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LEGEND

Ridgeline Milepost

Acoustic Survey

Summer 2022 Mist Net Survey Sites

Mist Net Survey

Survey Area

TN County Boundary

Disclaimer: Stantec assumes no responsibility for data supplied in electronic format. The recipient accepts full responsibility for verifying the accuracy and completeness of the data. The recipient releases Stantec, its officers, employees, consultants and agents, from any and all claims arising in any way from the content or provision of the data.

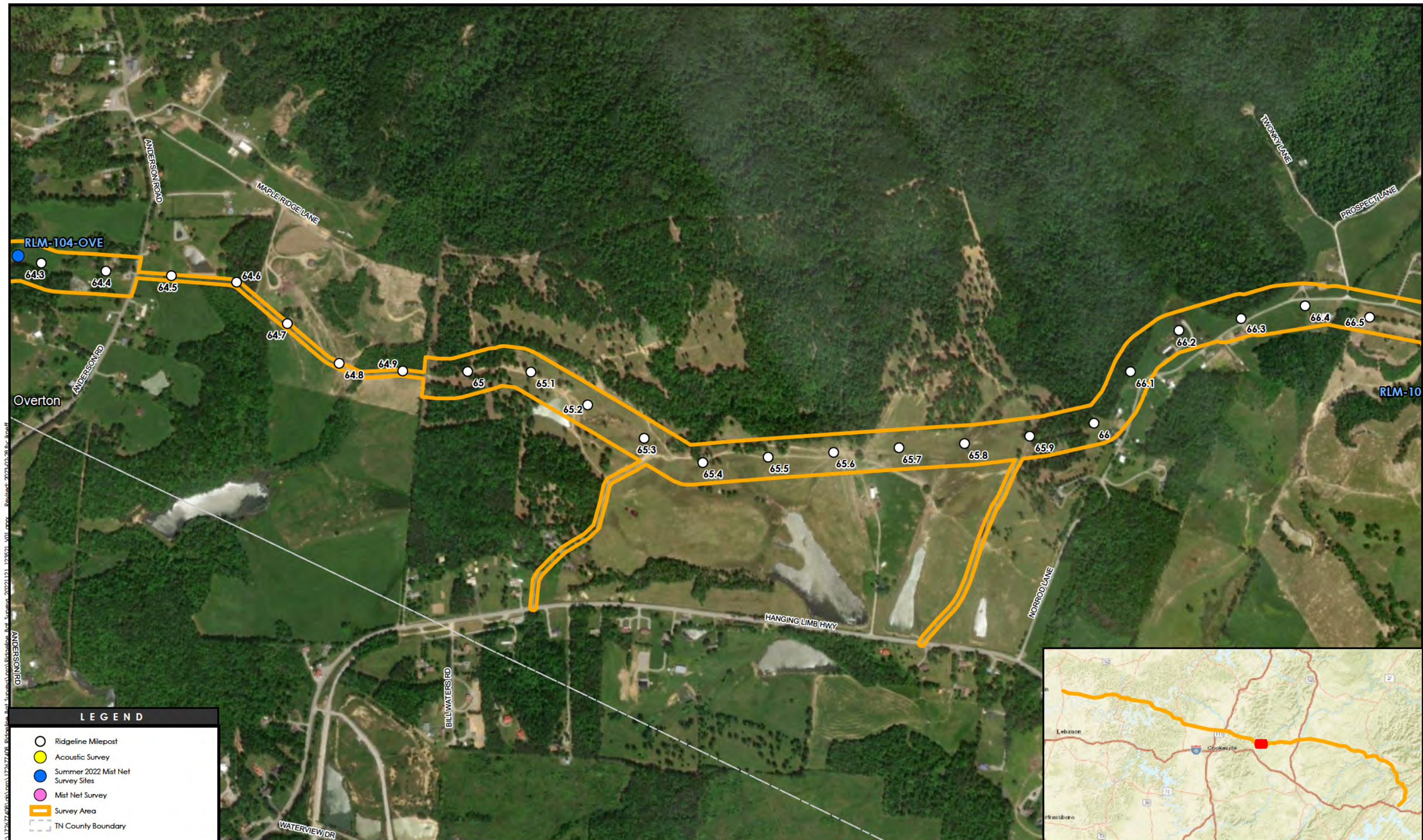
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3. Imagery: ESRI Imagery

East Tennessee Natural Gas, LLC

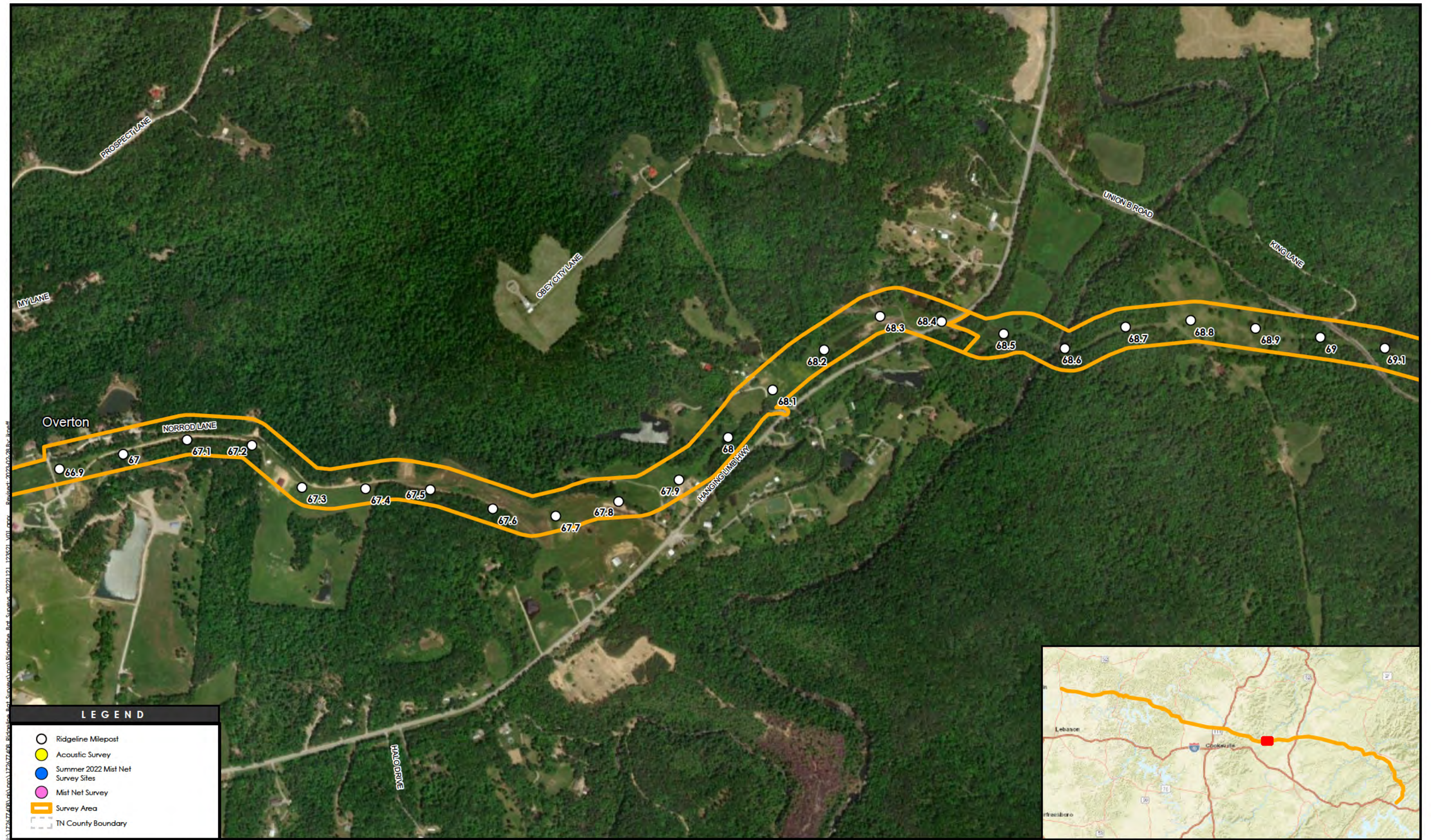
Stantec Consulting Services Inc.
601 Grassmere Park Road, Suite 22
Nashville, TN 37211
tel 615-885-1144

1 inch = 700 feet

Prepared by: J.N 02/28/23
Technical Review by: M.P. MM/DD/YY
Independent Review by: J.A. MM/DD/YY



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LEGEND

Ridgeline Milepost

Acoustic Survey

Summer 2022 Mist Net Survey Sites

Mist Net Survey

Survey Area

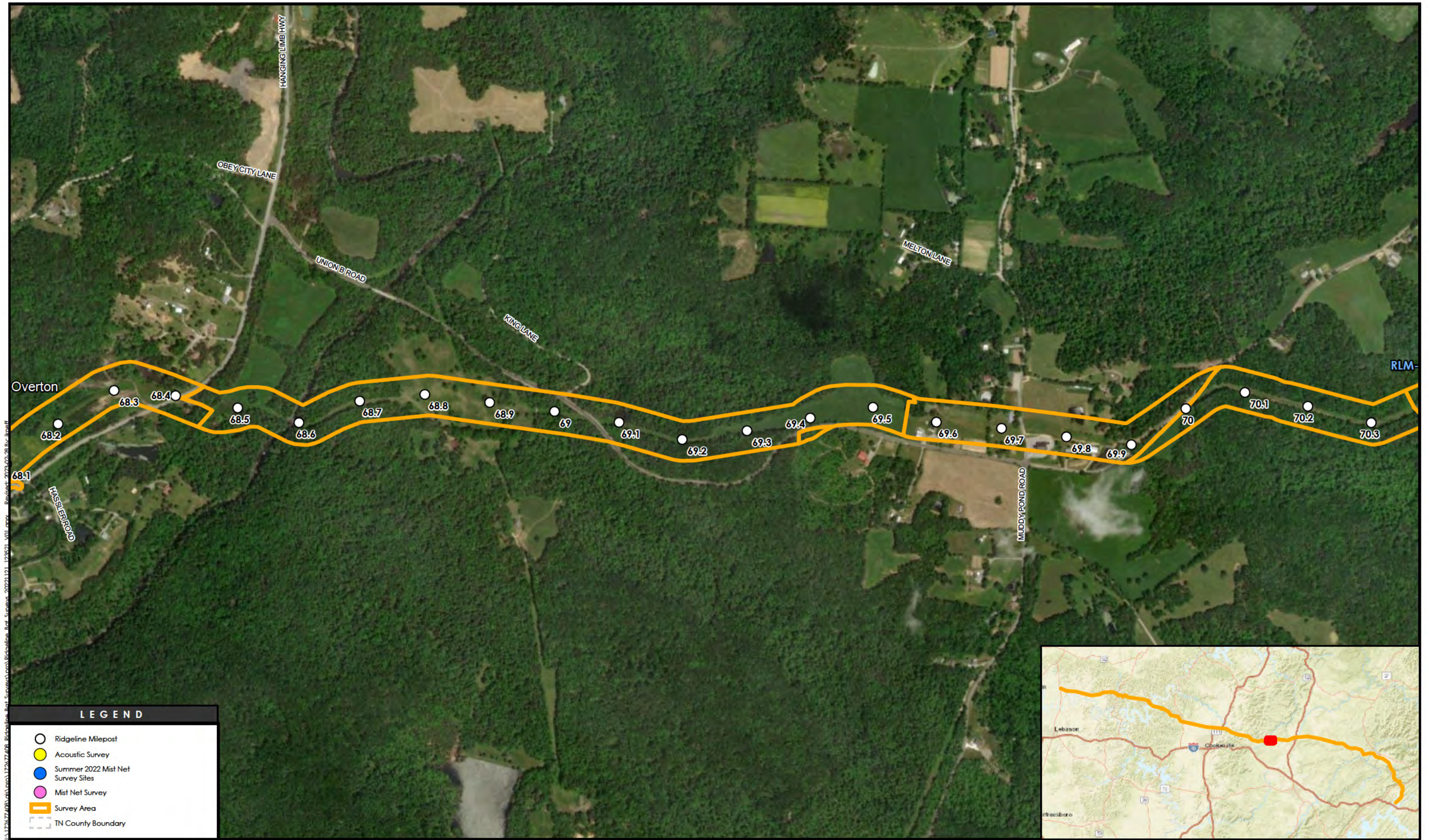
TN County Boundary



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Notes:
 1. Coordinate System: NAD 1983 StatePlane Tennessee FIPS 4100 Feet
 2. Source data: TN Assessor, Stantec
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LEGEND

Ridgeline Milepost

Acoustic Survey

Summer 2022 Mist Net Survey Sites

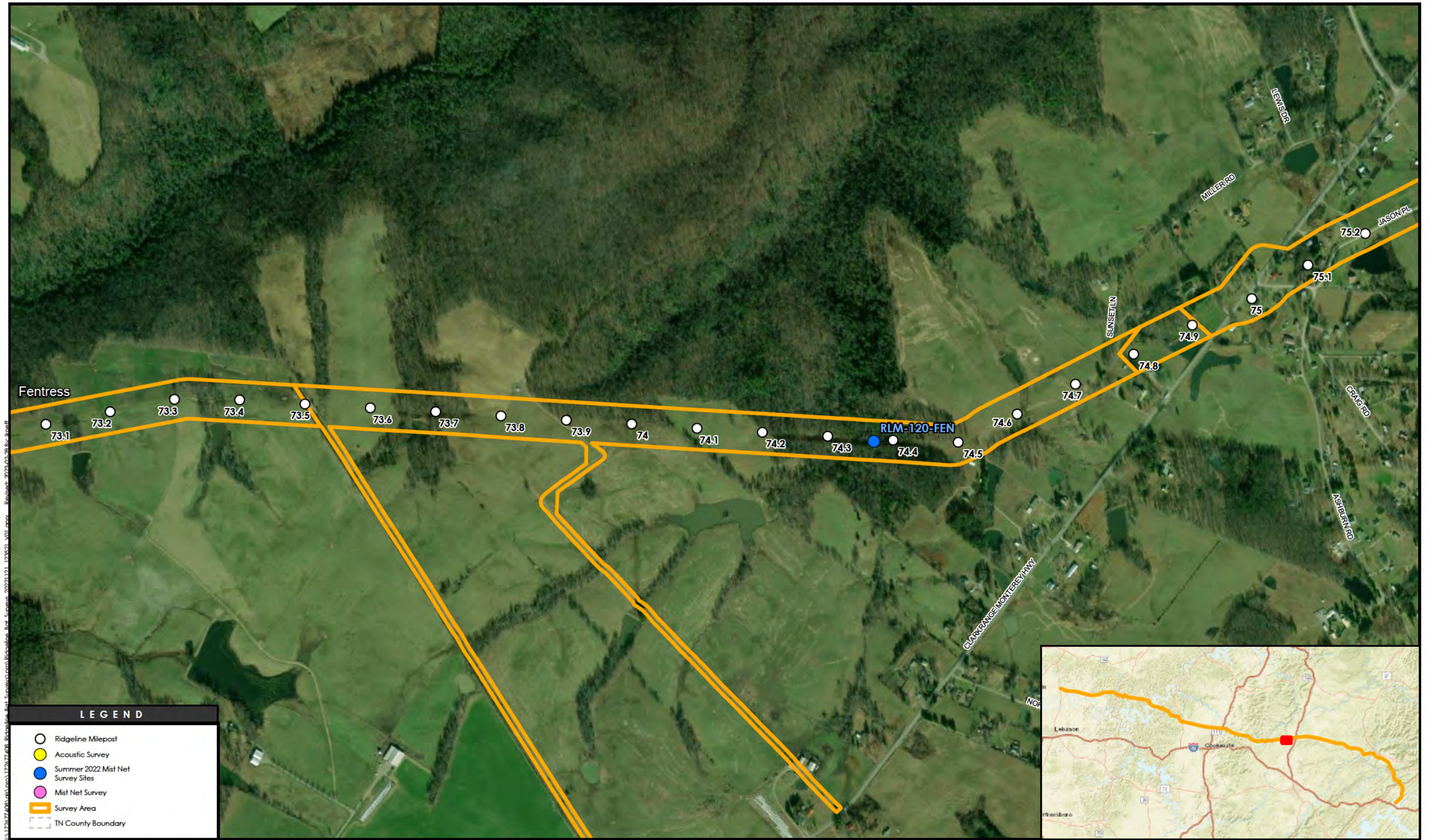
Mist Net Survey

Survey Area

TN County Boundary

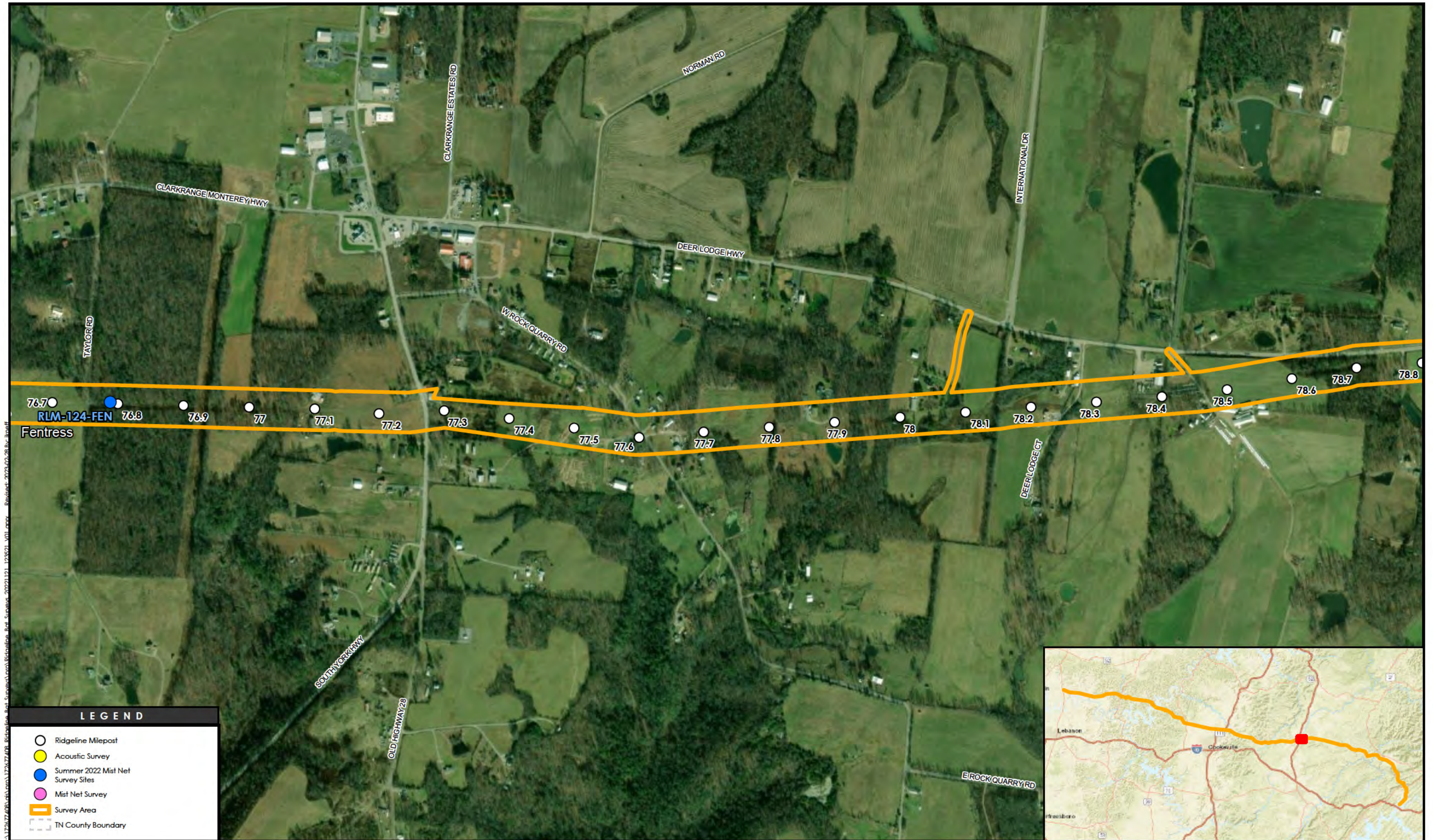


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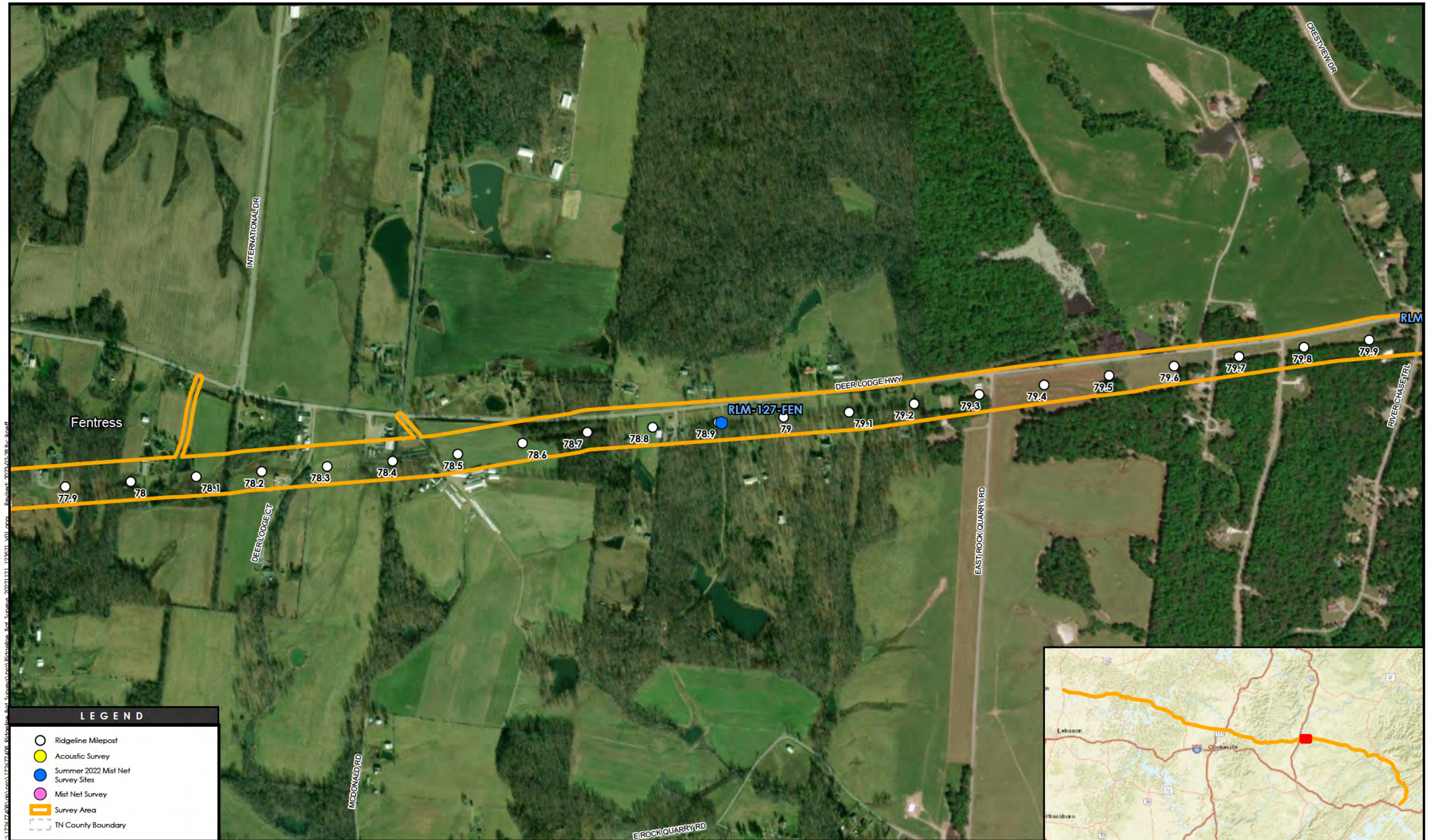
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LEGEND

- Ridgeline Milepost
- Acoustic Survey
- Summer 2022 Mist Net Survey Sites
- Mist Net Survey
- Survey Area
- TN County Boundary

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Notes:
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Ridgeline Expansion Pipeline Project

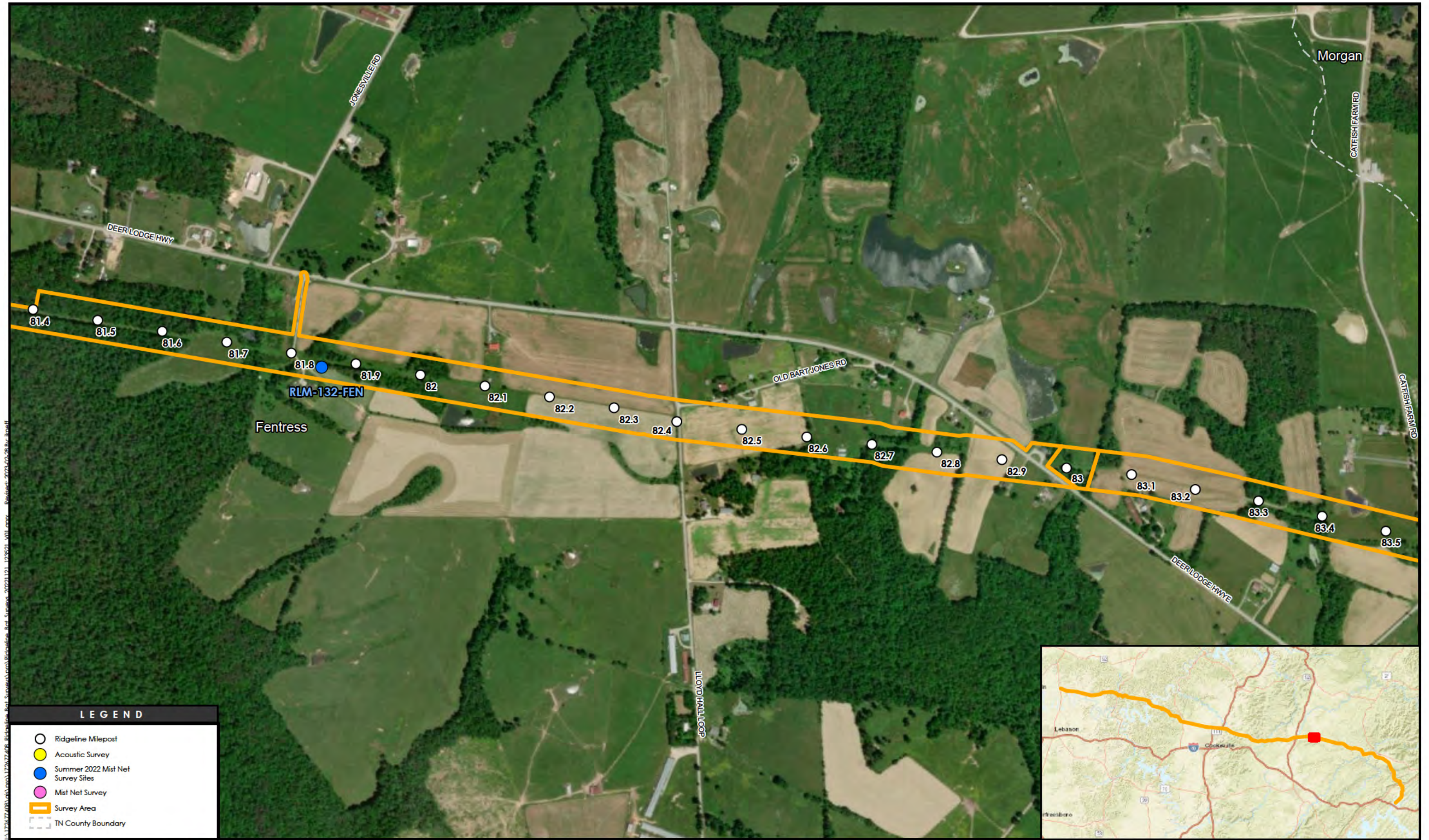
Bat Survey Sites - February, 2023

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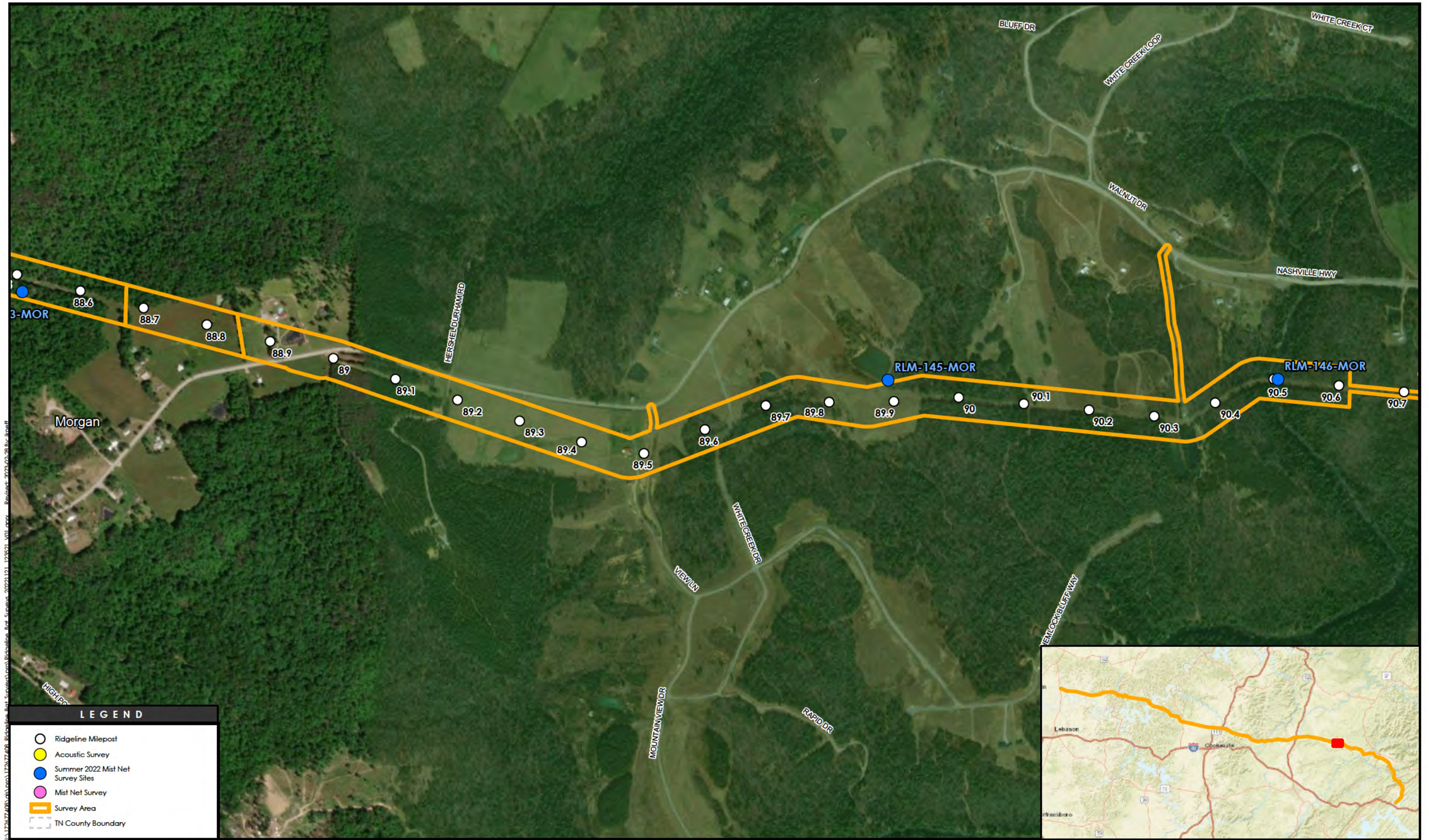


0 350 700
 Feet
 1 inch = 700 feet

Prepared by: J.N 02/28/23
 Technical Review by: M.P. MM/DD/YY
 Independent Review by: J.A. MM/DD/YY

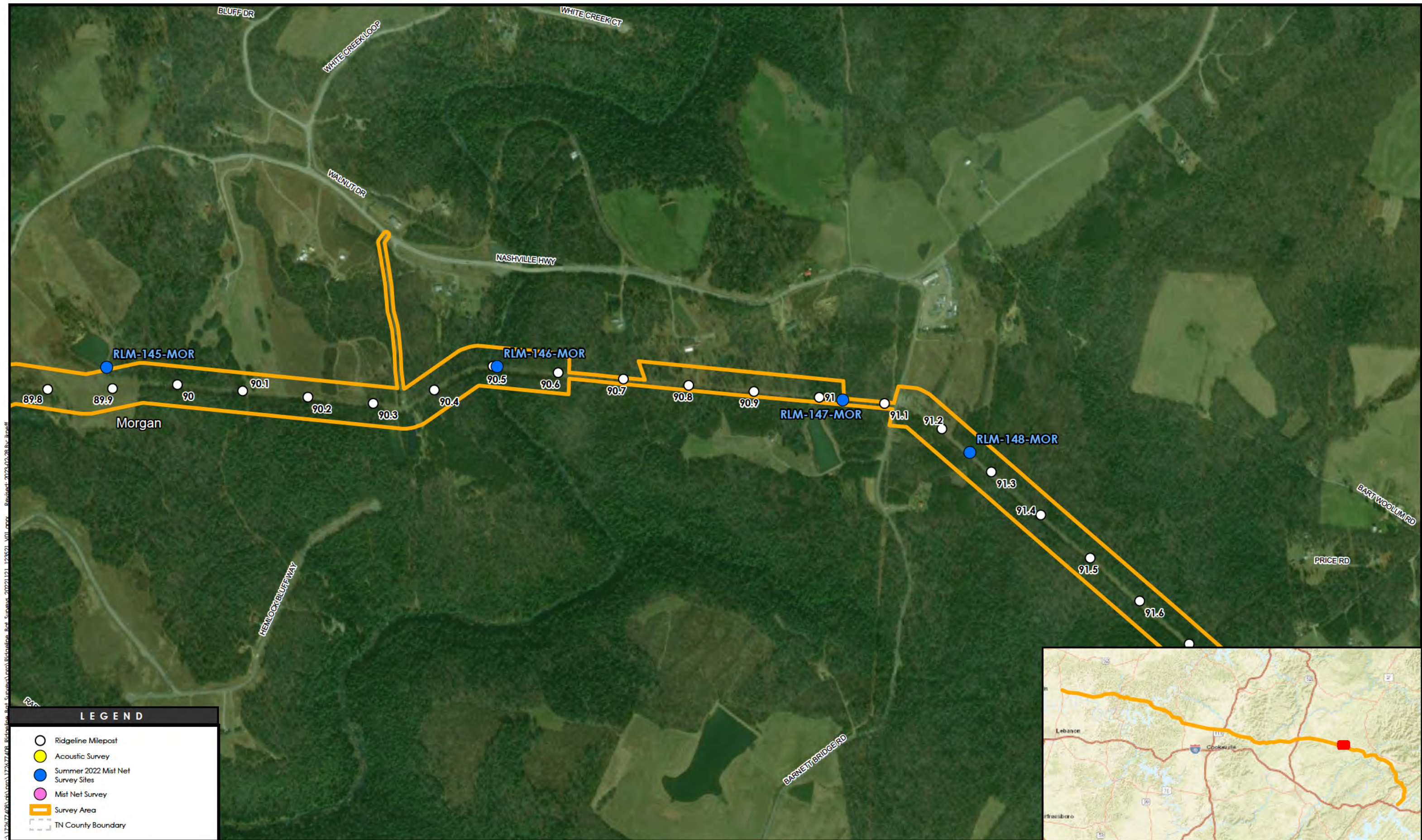


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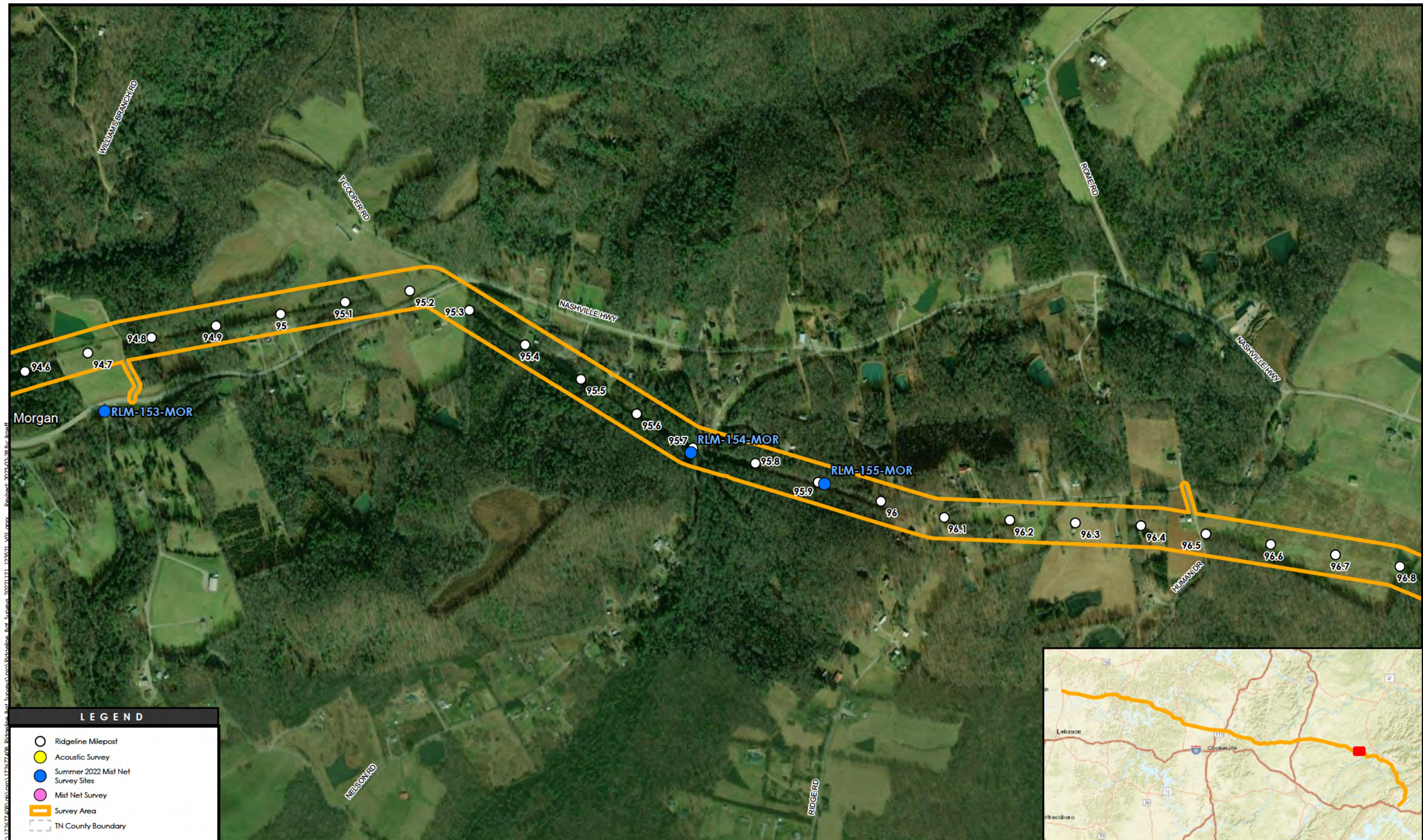
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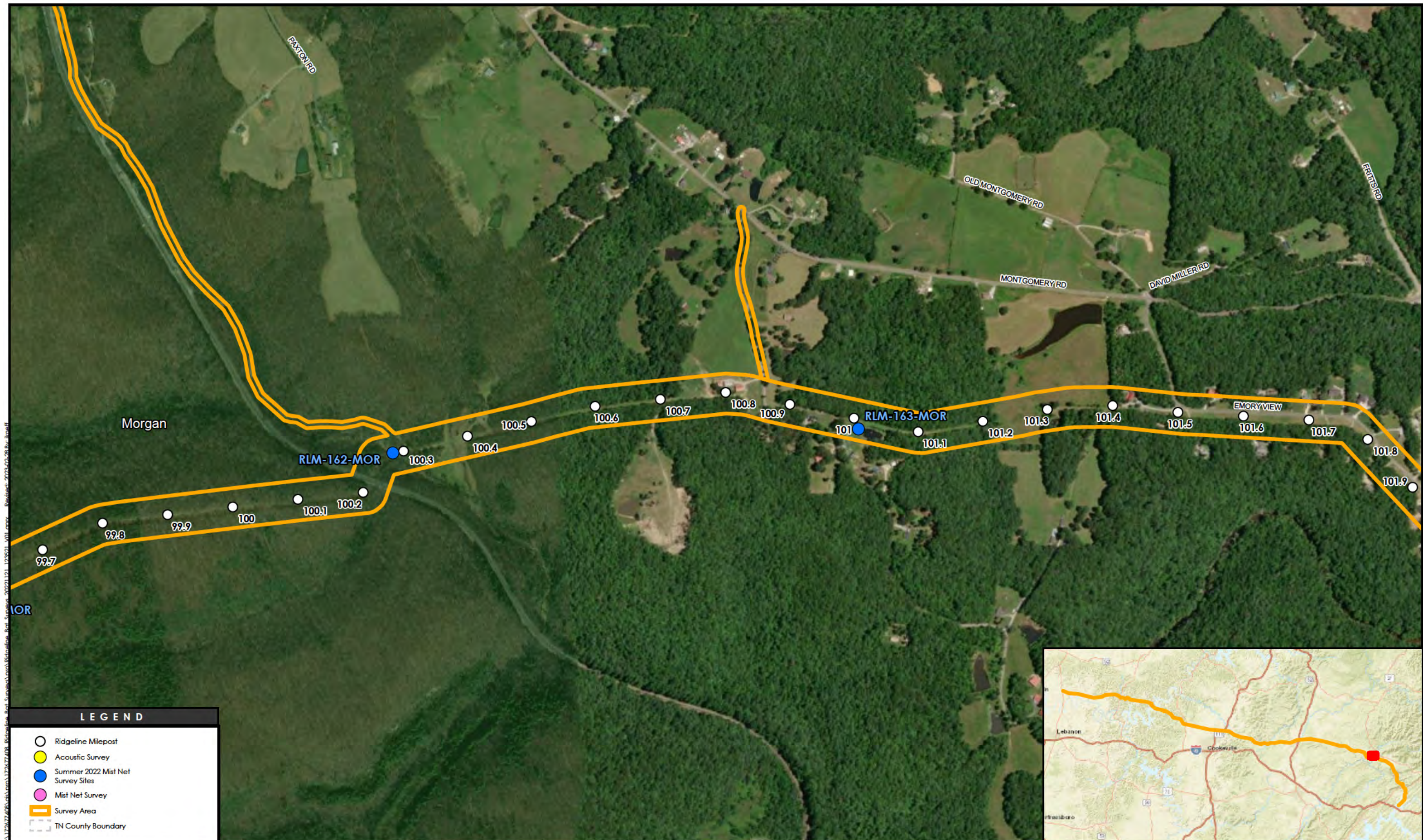




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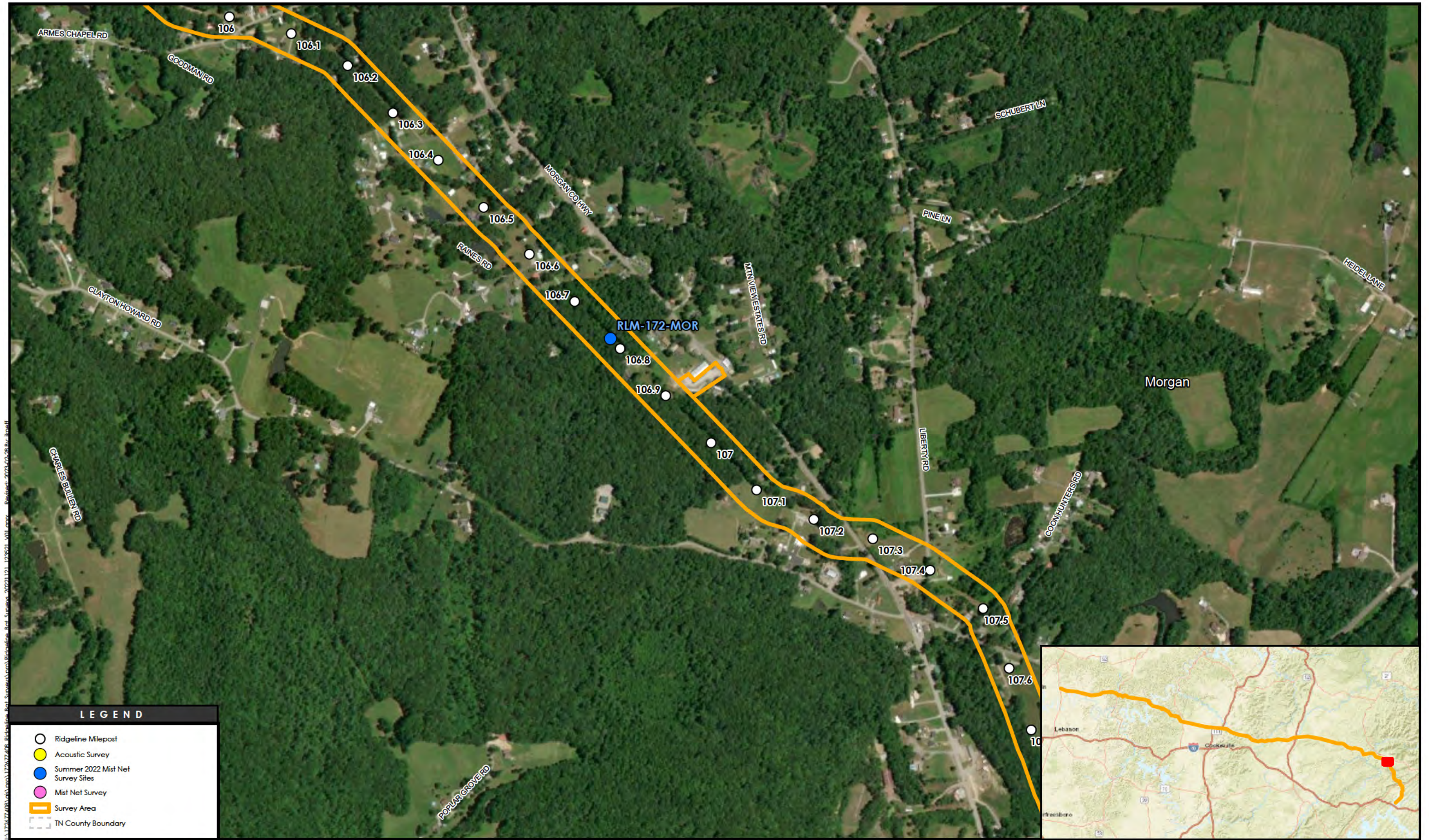




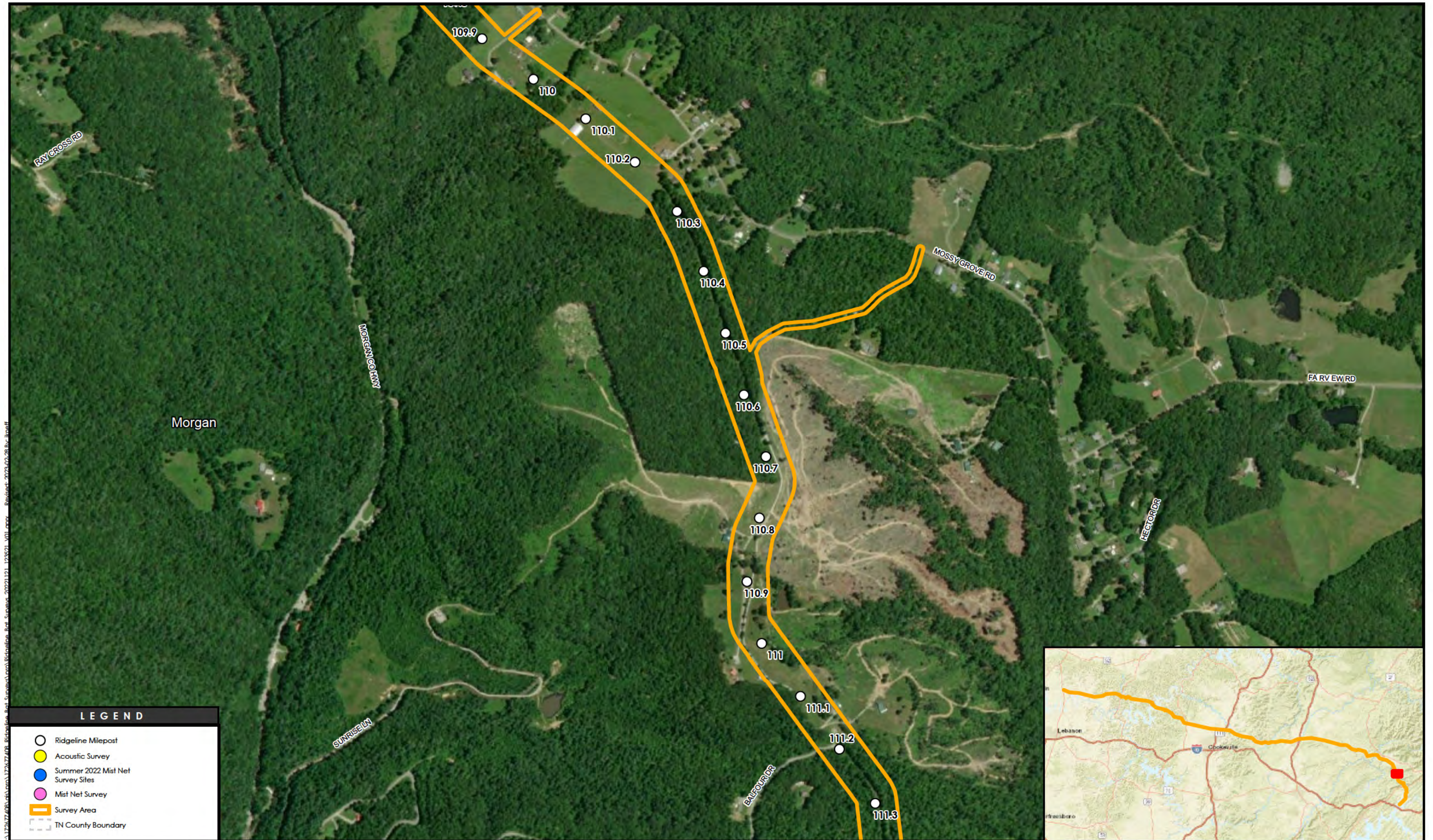


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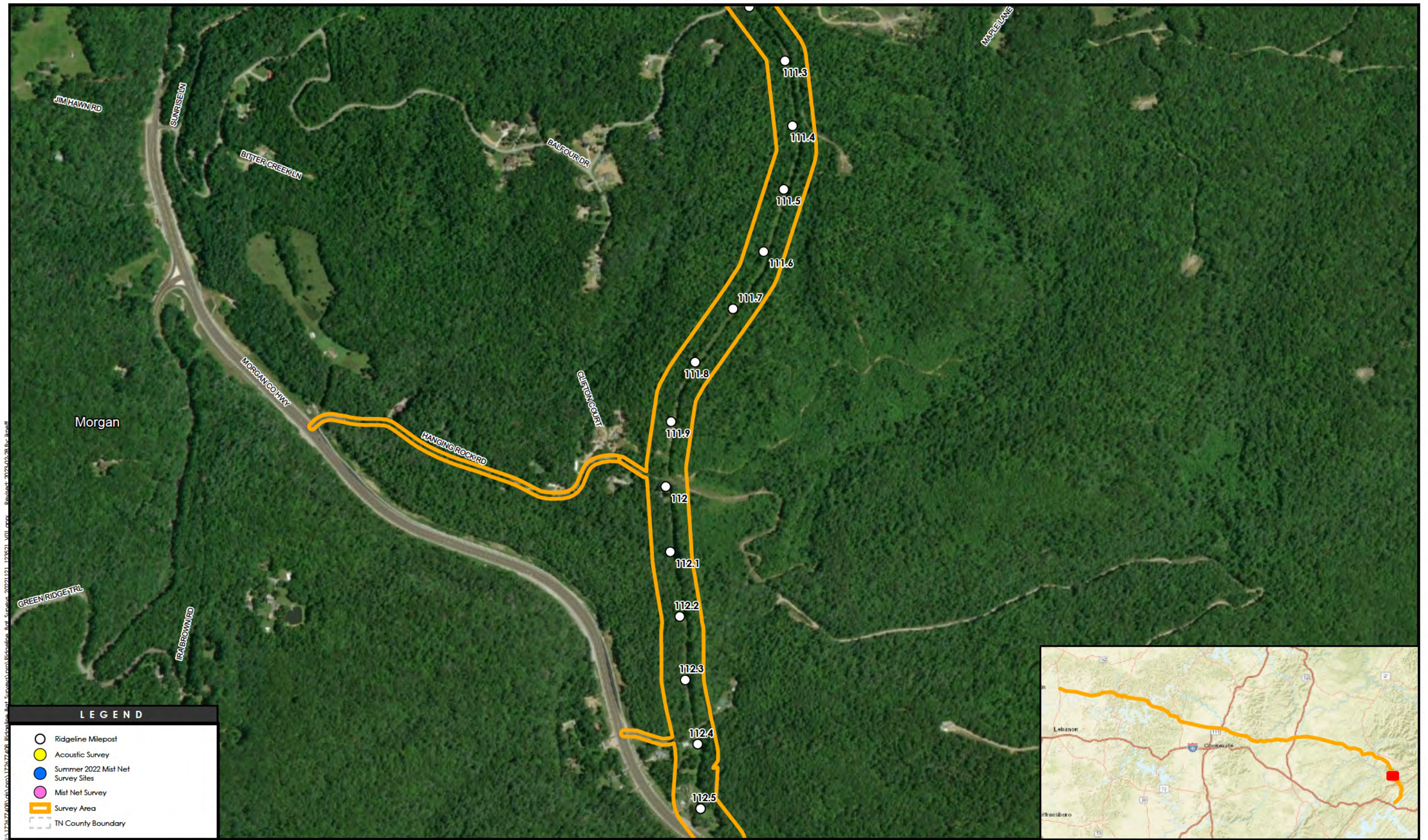


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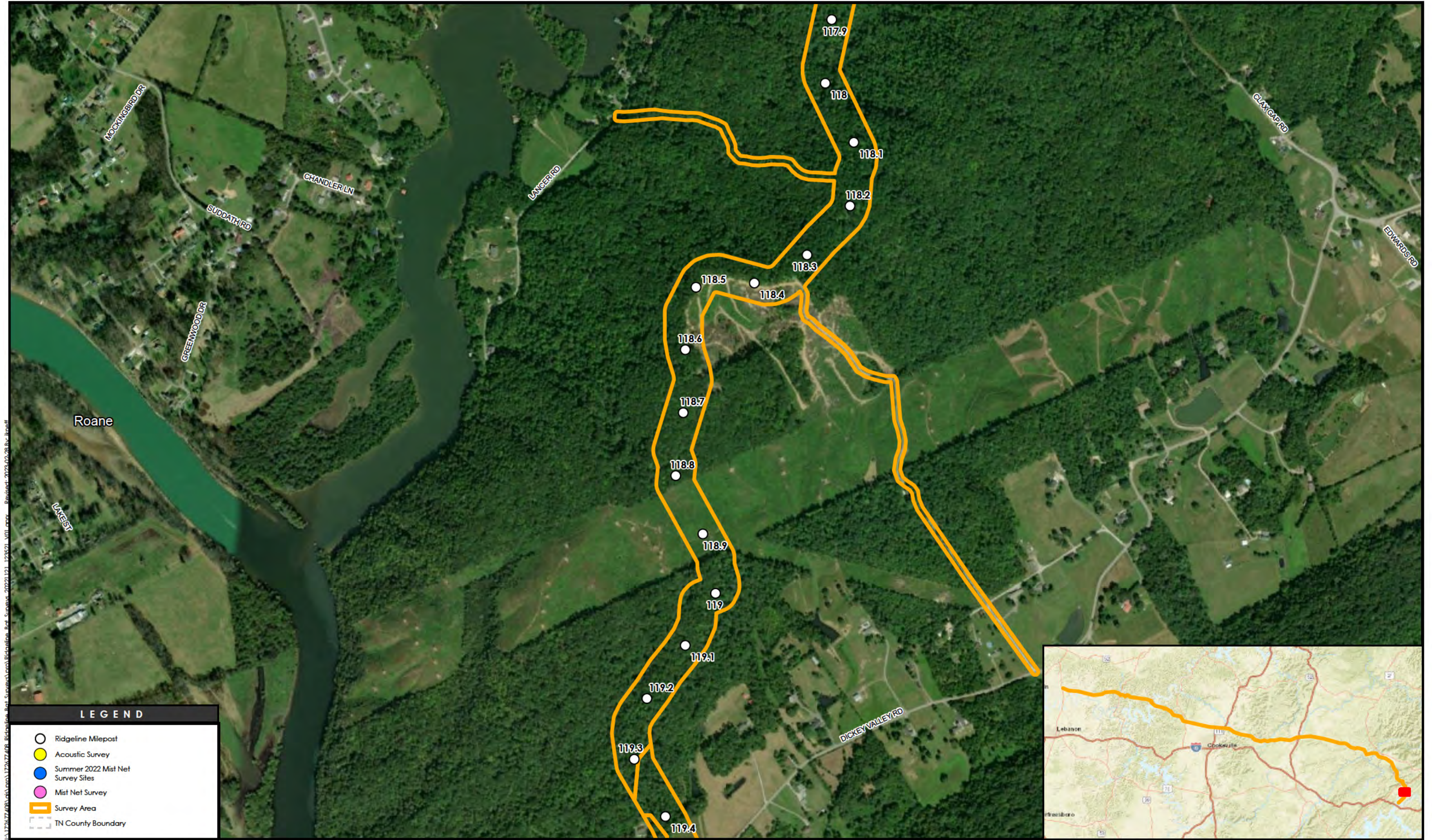
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Ridgeline Expansion Pipeline Project

Bat Survey Sites - February, 2023

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APPENDIX B

Bat Mist Net Data Sheets



Bat Capture Datasheet

Page 1 of 2

Project Name/No.: Ridgeline / 172677408

Date: 16 May 2022

Biologist(s): Zack Baer, Katherine Bouska, Courtney Ramser

Site ID: RLM-04-Trousdale

County/State: Trousdale/TN

Moon Phase: Full

Sunset: 1945 h

Map Kilometer No./Quad: KM-04/Hartsville

Latitude: 36.38424° Longitude: -86.22129°

Moonrise: 2046 h

Moonset: 0552h

General Site Description: Riparian corridor with semi-dry stream bed and forested corridor.

Nets Open: 1945 h

Nets Closed: 0045h

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	69	0	0
21:00	63	0	0
22:00	61	0	0
23:00	59	0	0
00:00	58	0	0
01:00	57	0	0

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments: calm, clear night

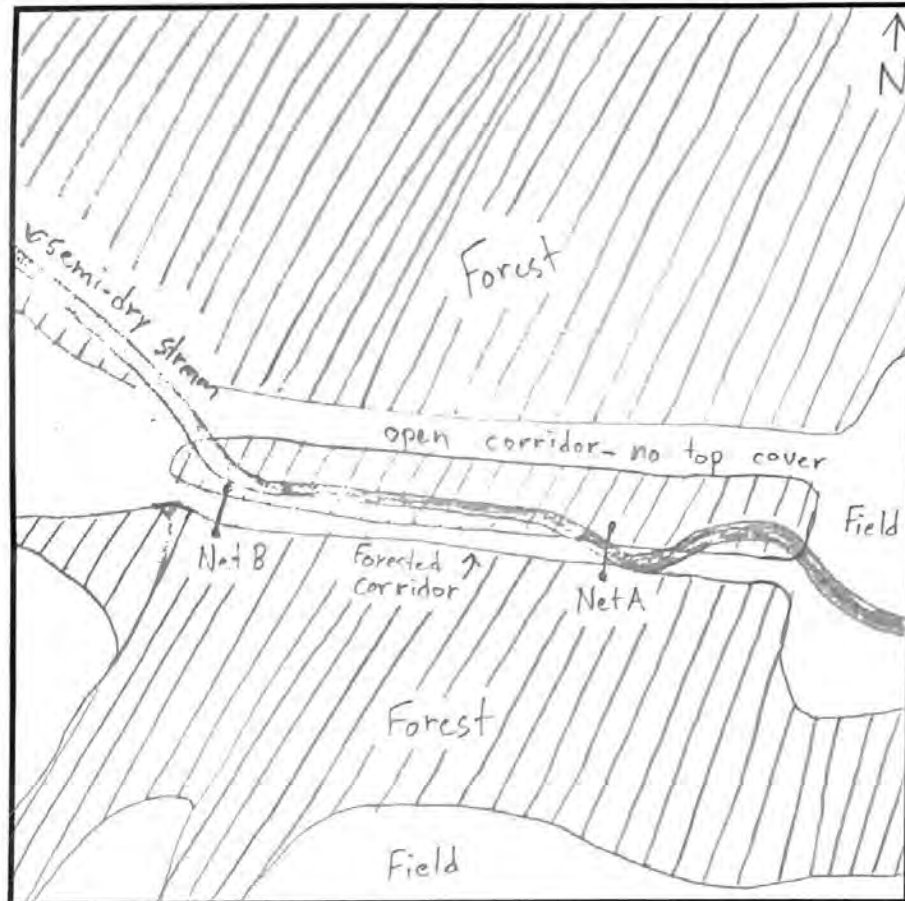
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¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats



¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Project Name/No.: Ridgeline/172677408 Date: 16 May 2022

Site ID: RLM-04-Trousdale

Est. Distance to Water (ft): 0

Site on Stream

VEGETATION

Primary Habitat Type¹: creek / riparian

Potential Roost: Large Trees Snags Both Other (e.g., structure)

Roost Tree Potential: High Moderate Low

Dominant Canopy Species Avg. Canopy DBH range (in): 13

1. Platanus occidentalis 2. Celtis occidentalis 3. Juglans nigra

Canopy Closure: Closed (80%+) Moderate (40-80%) Open (0-40%)

Dominant Subcanopy Species Avg. Subcanopy DBH range (in): 9

1. Platanus occidentalis 2. Celtis occidentalis 3. Carya ovata

Sub-Canopy Clutter: High (60%+) Moderate (30-60%) Low (0-30%)

Dominant Shrub/Understory Species

1. Celtis occidentalis 2. Carya ovata 3. Asimina triloba

Shrub/Understory Clutter: High (60%+) Moderate (30-60%) Low (0-30%)

STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): 1 Channel Width: 6 ft Stream Width: N/A

Riparian Width right bank: 20 ft left bank: 100 ft Avg. Water Depth: 2 in

Other Wildlife Observed: Barred owl call

Additional Comments: Stream is mostly dry with sporadic pools, is open and accessible for drinking bats in some locations.



Bat Capture Datasheet

Page 2 of 2

Project Name/No.: Ridgeline/172677408 Date: 17 May 2022 Biologist(s): Zack Baer, Katherine Bouska, Courtney Ramirez
 Site ID: RLM-04-Trousdale County/State: Trousdale/TN Moon Phase: Waning Gibbous Sunset: 1946h
 Map Kilometer No./Quad: RM-04/Hartsville Latitude: 36.38424° Longitude: -86.22129° Moonrise: 2201h Moonset: 0638h
 General Site Description: Riparian corridor with semi-dry stream bed and forested corridor Nets Open: 1946h Nets Closed: 0046h

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	69	0	0
21:00	63	0	0
22:00	61	0	50%
23:00	60	0	50%
00:00	58	0	50%
01:00	58	0	50%

Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	6	5	30m ²	36.38413	-86.22139		✓			
B	9	7.5	67.5m ²	36.38429	-86.22263	✓				

* One net at full extension - 2.5m high

Weather Comments: _____

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	Lasiurus cinereus	2155	A	F	P	57	30+	0	B	0.5	—	Maxed out 30g scale
2	Lasiurus borealis	2224	A	F	P	42	14.25	0	A	3.0	—	
3	Lasiurus cinereus	2225	A	F	P	58	30+	0	B	4.0	—	Maxed out 30g scale
4	Lasiurus cinereus	2345	A	F	P	53	29.75	0	B	5.5	—	

¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to **LEFT** arm for females and **RIGHT** arm for males

Note: U (unknown) only to be used for **escaped** bats

Confidential Data. If found, please return to:
 Stantec Consulting Services, 9200 Shelbyville Road Suite 800, Louisville Kentucky 40222 US



Bat Capture Datasheet

Page 1 of 1

Project Name/No.: Ridgeline/172677408 Date: 16 May 2022 Biologist(s): James Kiser, Ryan Rasmussen
 Site ID: RLM-05; Oldham Rd. Site County/State: Trussdale/TN Moon Phase: Full Sunset: 1945h
 Map Kilometer No./Quad: KM-05/Harksville Latitude: 36.38349° Longitude: 86.21314° Moonrise: 2048h Moonset: 0553h
 General Site Description: Site is located @ confluence of small stream and Lake behind (east) of Pipeline Valve Station Nets Open: 1940h Nets Closed: 0050h

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	65.3	1	25
21:00	56.0	1	0
22:00	53.6	1	0
23:00	51.9	0	0
00:00	51.6	0	0
01:00	50.9	0	0

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments: Warm today with high temps in mid 80's, cooled down quickly after sunset.

[illegible]

1. **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

* Apply band to left arm for females and right arm for males.

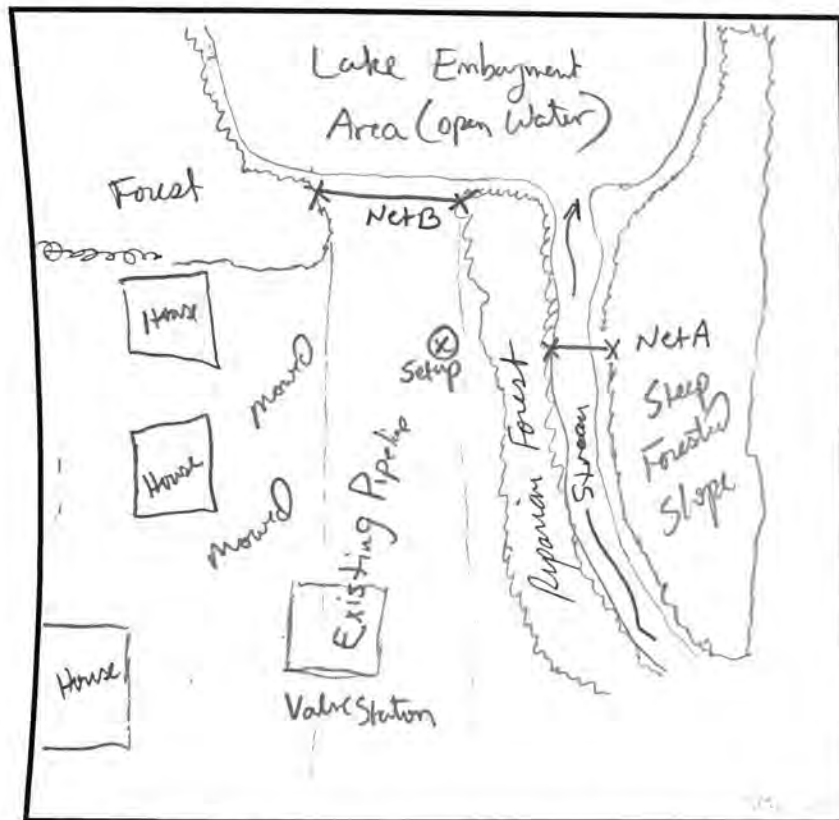
* Apply band to LEFT arm for females and RIGHT arm for males.

Note: U (unknown) only to be used for **escaped** bats.

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Net Site Description

Page 2 of 2



Project Name/No.: Ridge line/172677408 Date: 16 May 2022
 Site ID: RLM-05; Diddham Rd. Est. Distance to Water (ft): 0

VEGETATION

Primary Habitat Type¹: Riparian/Lakeside forest
 Potential Roost: Large Trees | Snags | Both | Other (e.g., structure)
 Roost Tree Potential: High | Moderate | Low

Dominant Canopy Species Avg. Canopy DBH range (in): 10-16
 1. Sycamore 2. Box Elder 3. N. Red Oak

Canopy Closure: Closed (80%+) | Moderate (40-80%) | Open (0-40%)

Dominant Subcanopy Species Avg. Subcanopy DBH range (in): 4-8
 1. Box Elder 2. Sugar Maple 3. Celtis occidentalis

Sub-Canopy Clutter: High (60%+) | Moderate (30-60%) | Low (0-30%)

Dominant Shrub/Understory Species
 1. Privet 2. Box Elder (sup) 3. Rosa multiflora

Shrub/Understory Clutter: High (60%+) | Moderate (30-60%) | Low (0-30%)

STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): 2-3 ft Channel Width: 20 ft Stream Width: 4-12 ft
 Riparian Width right bank: 8 ft left bank: 10 m Avg. Water Depth: 12"

¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Other Wildlife Observed: Common Nighthawk (1+Vo), N. Cardinal (2), Great Blue Heron (Vo), Rana catesbeiana (Vo), Pseudacris crucifer (Vo), Acis crepitans (Vo), Rana clamitans (5), Queen Snake (2), Plethodon glutinosus (1-Dead)
 Additional Comments: Eurycea longicauda (1), Eurycea virigera (1), Eastern Screech Owl (Vo), Great-horned Owl (Vo), Barn Owl (Vo), Rana sphenoccephala (Vo), Eurycea lucifuga (1)

Bat Capture Datasheet

Page 1 of 2

Project Name/No.: Ridgeline/172677408 Date: 17 May 2022 Biologist(s): James Kiser, Ryan Rasmussen
 Site ID: RLM-05; Oldham Rd. Site County/State: Trousdale/TN Moon Phase: Waning Gibbous Sunset: 1946h
 Map Kilometer No./Quad: KM-05/Hartsville Latitude: 36.38349° Longitude: -86.21314° Moonrise: 2204h Moonset: 0036h
 General Site Description: Site is located @ Confluence of small stream and Lake Nets Open: 1930h Nets Closed: 0055h
1930 64.3 1 20% behind (east) of Pipeline Valve station

Time	Temp (F)	Wind ¹	% Cloud Cover	Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
20:00	60.8	1	10	A	6	5	30m ²	36.38351	-86.21270		✓			
21:00	58.8	0	0	B	18	7.5	135m ²	36.38357	-86.21225				domin	
22:00	57.2	1	0											
23:00	55.4	0	0											
00:00	55.4	0	75											
01:00	55.1	0	75											

* One net at full extension ~ 2.5m high

Weather Comments: Warmer than previous day, today's highs were in low 80's with nighttime temps in mid 50's

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	<i>Perimyotis subflavus</i>	2030	A	F	P	33.8	6.2	0	B	5	TWRA-04465	6203, DSC 6224, Trans: 150.088
2	<i>Perimyotis subflavus</i>	↓	A	F	NR	34.6	5.7	0	B	6	TWRA-04465	6225, Photos DSC 6242, Trans: 150.514
3	<i>Lasiurus borealis</i>	2155	A	F	P	40.1	14.6	0	B	5	—	
4	<i>Nycticeius inornatus</i>	↓	A	M	NR	36.5	9.6	0	B	6	—	Photos, DSC 6243-6249
	<i>Glaucocorys v. volans</i>	2000	—	—	—	—	—	—	A	5	—	
5	<i>Lasiurus borealis</i>	2308	A	M	NR	EFH	—	0	B	4	—	
6	<i>Lasiurus borealis</i>	↓	A	M	NR	41.2	10.6	0	B	6	—	

Post-Mass 6.7 @ 9:15
Post-Mass 6.0 @ 9:30

¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats



Bat Capture Datasheet

Page 1 of 2

Project Name/No.: Ridgeline/172671408

Date: 5/16/22

Biologist(s): Julia Wilson, Shane Kelley

Site ID: RLM-06-Trousdale

County/State: Trousdale/TN

Moon Phase: Full

Sunset: 19:45

Map Kilometer No./Quad: KM-06

Latitude: 36.381591

Longitude: -86.202367

Moonrise: 2048

Moonset: 0553

General Site Description: Backwater Forested wetland area adjacent to lake

Nets Open: 1945

Nets Closed: 0045

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	63.5	0.5	10
21:00	59.7	0	0
22:00	56.8	0	0
23:00	55.0	0	0
00:00			
01:00			

Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	9	7.5	67.5	36.381623	-86.202451				X	Perpendicular to stream
B	12	5	60	36.381457	-86.202036				X	Interior forest opening

* One net at full extension ~ 2.5m high

Weather Comments: _____

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	Lasiurus borealis	20:00	U	U	U	U	U	-	A	6	—	escaped
2	Nyctecicus humeralis	20:00	A	M	NR	35.6	8.75	0	A	5	—	
3	Lasiurus borealis	20:45	A	F	P	41.1	15.25	0	A	7	—	
4	Lasiurus borealis	23:15	A	F	NR	41.6	12.75	0	A	6	—	

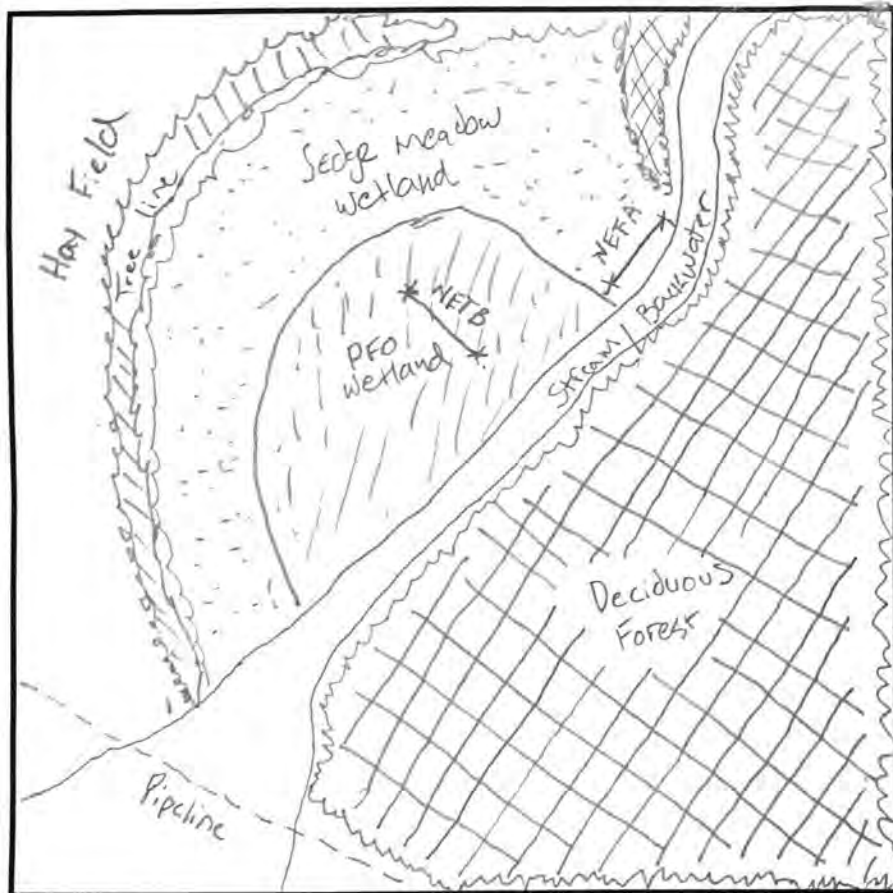
¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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Project Name/No.: Baseline/172677003 Date: 5/16/22

Site ID: RLM-06-Trousdale Est. Distance to Water (ft): 10

VEGETATION

Primary Habitat Type¹: Cornell/Riparian, Bottomland Forest

Potential Roost: Large Trees Snags Both Other (e.g., structure)

Roost Tree Potential: High Moderate Low

Dominant Canopy Species Avg. Canopy DBH range (in): 15

1. Platanus occidentalis 2. Ulmus americana 3. Acer rubrum

Canopy Closure: Closed (80%+) Moderate (40-80%) Open (0-40%)

Dominant Subcanopy Species Avg. Subcanopy DBH range (in):

1. Ulmus americana 2. Platanus Occ. 3. Acer rubrum

Sub-Canopy Clutter: High (60%+) Moderate (30-60%) Low (0-30%)

Dominant Shrub/Understory Species

1. Ulmus americana 2. Fraxinus pennsylvanica 3. Ligustrum sinense

Shrub/Understory Clutter: High (60%+) Moderate (30-60%) Low (0-30%)

STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): 3 Channel Width: 8 Stream Width: 12

Riparian Width right bank: 70 left bank: 100 Avg. Water Depth: 2-3
¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Other Wildlife Observed: YTWA, PIWD, CACH, NUPA, CONI, FISP, KEWA, domestic peacock
WEVI, SOSP, INBU, WOTH

Additional Comments: Caught a chickadee



Bat Capture Datasheet

Page 1 of 3Project Name/No.: Rebeling / 172677408Date: 5/17/22Biologist(s): Julia Wilson, Shane KelleySite ID: BLM-06 - TrousdaleCounty/State: Trousdale / TNMoon Phase: Waning Gibbous Sunset: 19:47Map Kilometer No./Quad: KM-06Latitude: 36.381591Longitude: -86.202367 Moonrise: 2202 Moonset: 0735General Site Description: Backwater forested wetland adjacent to lake Nets Open: 1940 Nets Closed: 2049

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	65.1	0	0
21:00	68.2	0	0
22:00	59.3	0	0
23:00	58.6	0	0
00:00	55.5	0	10
01:00	56.7	0	20

Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	9	7.5	67.5	36.381623	-86.202451		X		X	Perpet. culvert on stream
B	12	5	60	36.381457	-86.203036				X	Interior forest opening

* One net at full extension ~ 2.5m high

Weather Comments: _____

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band #	Comments (e.g., samples taken, transmitter #, disposition)
1	<i>Lasiurus borealis</i>	2150	A	F	P	42.9	17.0	0	A	5	—	

¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to **LEFT** arm for females and **RIGHT** arm for males

Note: U (unknown) only to be used for **escaped** bats

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172677408

Bat Capture Datasheet

Page 1 of 2

Project Name/No.: Entbridge Ridge/Line Express Date: 5/16/22 Biologist(s): Matt Densler, Chris Knobel
 Site ID: RLM-07-Trousdale County/State: Trousdale/TN Moon Phase: Full Sunset: 1945
 Map Kilometer No./Quad: KM-07/ Latitude: 36.379697 Longitude: 86.187945 Moonrise: 2048 Moonset: 0553
 General Site Description: Side is located in ROW and in deciduous forest. Mowed field with small pond adjacent. Nets Open: 1930 Nets Closed: 0045

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	70	1-	0
21:00	66	1	0
22:00	65	1	0
23:00	61	1	0
00:00	60	1	0
01:00			

Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	18	7.5	135	36.379565	-86.187007				Flow	
B	6	5.0	30	36.379249	-86.188001				Flow	
									Flow	

* One net at full extension - 2.5m high

Weather Comments:

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	LABO	2035	A	M	NR	40	91.5g	0	A	1.5	NA	
2	LABO	2120	U	U					A	3.5	NA	Escaped From Net.
3	LABO	2245	A	F	P	42	145	0	B	1.5	NA	
4	LABO	2245	U	U	U					2.5	NA	Escaped From net
5	LABO	0030	A	F	P	40	140g	0	A	6.0	NA	

¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

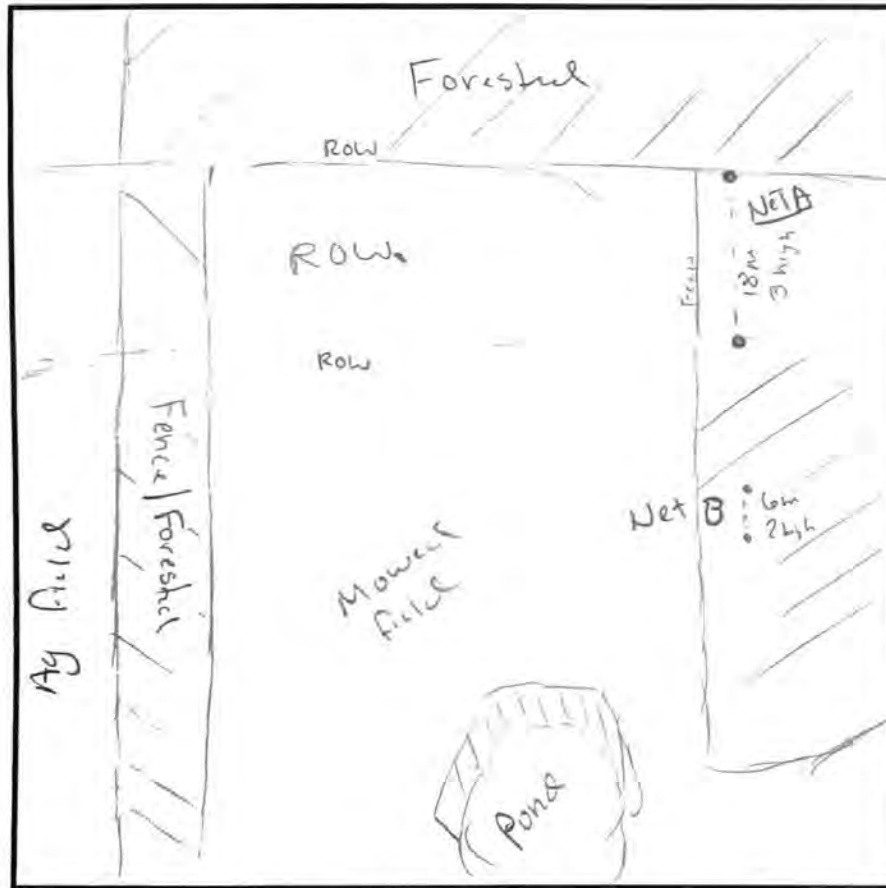
² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for escaped bats

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Net Site Description

Page 2 of 2


Project Name/No.: Bridge 172677408 Date: 5/16/22
 Site ID: RLM-07-forestal Est. Distance to Water (ft): 75m

VEGETATION

Primary Habitat Type¹: Deciduous Forest

Potential Roost:	Large Trees	Snags	Both	Other (e.g., structure)
Roost Tree Potential:	High	Moderate		Low

Dominant Canopy Species Avg. Canopy DBH range (in): 14-20
 1. Quercus muhlenbergii 2. Celtis laevigata 3. Juglans nigra

Canopy Closure:	Closed (80%+)	Moderate (40-80%)	Open (0-40%)

Dominant Subcanopy Species Avg. Subcanopy DBH range (in): 4-8
 1. Celtis laevigata 2. Celtis laevigata 3. Celtis laevigata

Sub-Canopy Clutter:	High (60%+)	Moderate (30-60%)	Low (0-30%)

Dominant Shrub/Understory Species
 1. Ligustrum sinense 2. Symphoricarpos viticulus 3.

Shrub/Understory Clutter:	High (60%+)	Moderate (30-60%)	Low (0-30%)

STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): NA Channel Width: NA Stream Width: NA
 Riparian Width right bank: NA left bank: NA Avg. Water Depth: NA

¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Other Wildlife Observed: WOTH, INBU, GLEL, COMI, ATHA, BROW, Gray Treefrog, American Bullfrog, Green Frog

Additional Comments: _____



Bat Capture Datasheet

Page 1 of 2

Project Name/No.: Ridgeline / 172677408

Date: 05/17/2022

Biologist(s): Matt Demeler, Chris Knabel

Site ID: PLM-07-Throvsdale

County/State: Trousdale / TN

Moon Phase: Waxing Gibbous

Sunset: 1947

Map Kilometer No./Quad: KM-07/H₂-7-6

Latitude: 36.379697

Longitude: 86.187995

Moonrise: 2202

Moonset: 0735

General Site Description: Site located in Row 8 is deciduous Net
Forest, mowed field w/ small pond adjacent

Nets Open: 1432

Nets Closed: 0047

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	72	1	20
21:00	70	1	20
22:00	67	1	30
23:00	64	1	30
00:00	62	1	40
01:00			

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments:[illegible]

¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats



Bat Capture Datasheet

Page ____ of ____

Project Name/No.: 172677408

Date: 5/16/2022

Biologist(s): L. MEADE, M. ANGEL, A. BLAIR

Site ID: RLM-08 - TROUSDALE

County/State: TROUSDALE / TN Moon Phase: FULL MOON

Sunset: 19:45

Map Kilometer No./Quad: KM-81

Latitude: 36.378852 Longitude: 86.176713 Moonrise: 20:46

Moonset: 05:52

General Site Description: ATV TRAIL

IN VALLEY BOTTOM Nets Open: 19:52

Nets Closed: 00:55

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	69.6	0	0
21:00	63.3	0	0
22:00	61	0	0
23:00	59	0	0
00:00	58	0	0
01:00	57	0	0

[illegible]

* One net at full extension ~ 2.5m high

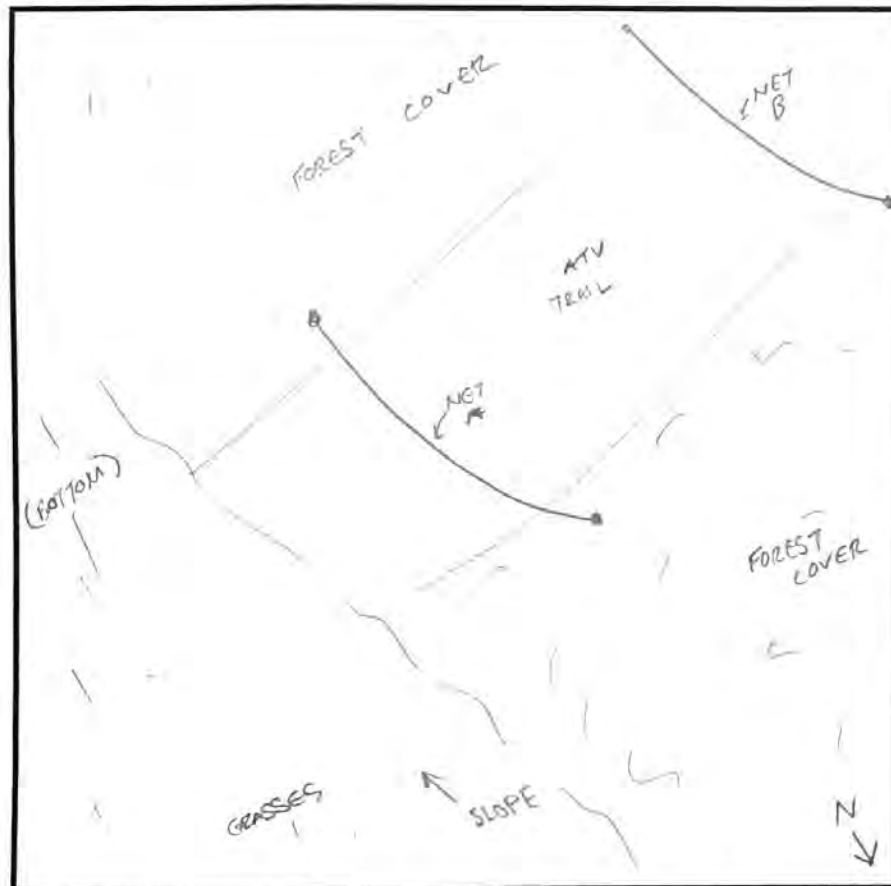
Weather Comments:[illegible]

¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats



Project Name/No.: 172677408 Date: 5/11/22
 Site ID: RLM-08-TRIOUSDALE Est. Distance to Water (ft): 11.41-10.211

VEGETATION

Primary Habitat Type¹: DRY STREAMBED / ATV ROAD IN RIPARIAN FOREST

Potential Roost:

Large Trees	Snags	Both	Other (e.g., structure)
High	Moderate	Low	

Dominant Canopy Species Avg. Canopy DBH range (in): 12-16
 1. BOXELDER 2. SUGAR MAPLE 3. AMERICAN ELM

Canopy Closure:

Closed (80%+)	Moderate (40-80%)	Open (0-40%)
---------------	-------------------	--------------

Dominant Subcanopy Species Avg. Subcanopy DBH range (in): 3-7
 1. BOXELDER 2. SUGAR MAPLE 3. _____

Sub-Canopy Clutter:

High (60%+)	Moderate (30-60%)	Low (0-30%)
-------------	-------------------	-------------

Dominant Shrub/Understory Species
 1. CHINESE PRIVET 2. POISON IVY 3. _____

Shrub/Understory Clutter:

High (60%+)	Moderate (30-60%)	Low (0-30%)
-------------	-------------------	-------------

STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): 4 IN Channel Width: 4 FT Stream Width: 8 FT

Riparian Width right bank: VARIES 1-5 FT left bank: VARIES 1-5 FT Avg. Water Depth: 0

¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Other Wildlife Observed: SCREECH OWL (CAUGHT IN A)

Additional Comments: _____



Bat Capture Datasheet

Page ____ of ____

Project Name/No.: 172677408

Date: 5/17/2022

Biologist(s): L. MCADDE M. ANGEL A. BLAIR

Site ID: RLM-08-TROUSDALE

County/State: TROUSDALE/TN

Moon Phase: WAXING GIBBOUS Sunset: 19:47

Map Kilometer No./Quad: KM-0

Latitude: 36.378852

Longitude: 86.176713 Moonrise: 22:04 Moonset: 6:38

General Site Description: ATV TRAIL IN VALLEY BOTTOM

Nets Open: 19147 Nets Closed: 00147

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	70	0	0
21:00	67	0	0
22:00	65	0	0
23:00	63	0	0
00:00	61	0	0
01:00	60	0	0

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments:

[illegible]

¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats



Bat Capture Datasheet

Page 1 of 2

Project Name/No.: Ridge line/172677408 Date: 20 May 2022 Biologist(s): James Kiser Ryan Rasmussen
 Site ID: RLM-11/Big Goose Cr. Upland County/State: Transdale/TN Moon Phase: Waning Gibbous Sunset: 1949h
 Map Kilometer No./Quad: KM-11/Bellwood Latitude: 36.37438 Longitude: -86.14709 Moonrise: 0038h Moonset: 1030h
 General Site Description: located on Farm Lane (Thompson Property) between Lash 6 Rd and the confluence of Little Big Goose Creeks. Nets Open: 1930h Nets Closed: 0100h

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	86.0	0	25
21:00	77.5	0	0
22:00	76.5	0	0
23:00	76.8	1	0
00:00	76.1	1	0
01:00	75.2	1	0

Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	9	7.5				✓				DSC-6314-6320
B	0	7.5		36.37407	-86.14761	✓				DSC-6312-6313

* One net at full extension - 2.5m high

Weather Comments: Weather today was hot & humid with high temps in mid 90's. Evening was cooler and calm.

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	<u>Lasurus borealis</u>	2015	A	F	P	40.7	15.5	0	A	4	—	Hair - TR-11-13
	<u>Glaucomys volans</u>	2100	—	—	—	—	—	—	B	3	—	—
2	<u>Nycticeius humeralis</u>	2150	A	M	TD	39.5	9.5	0	B	1	—	—
3	<u>Nycticeius humeralis</u>	2310	A	M	NR	34.9	9.0	0	B	3	—	—

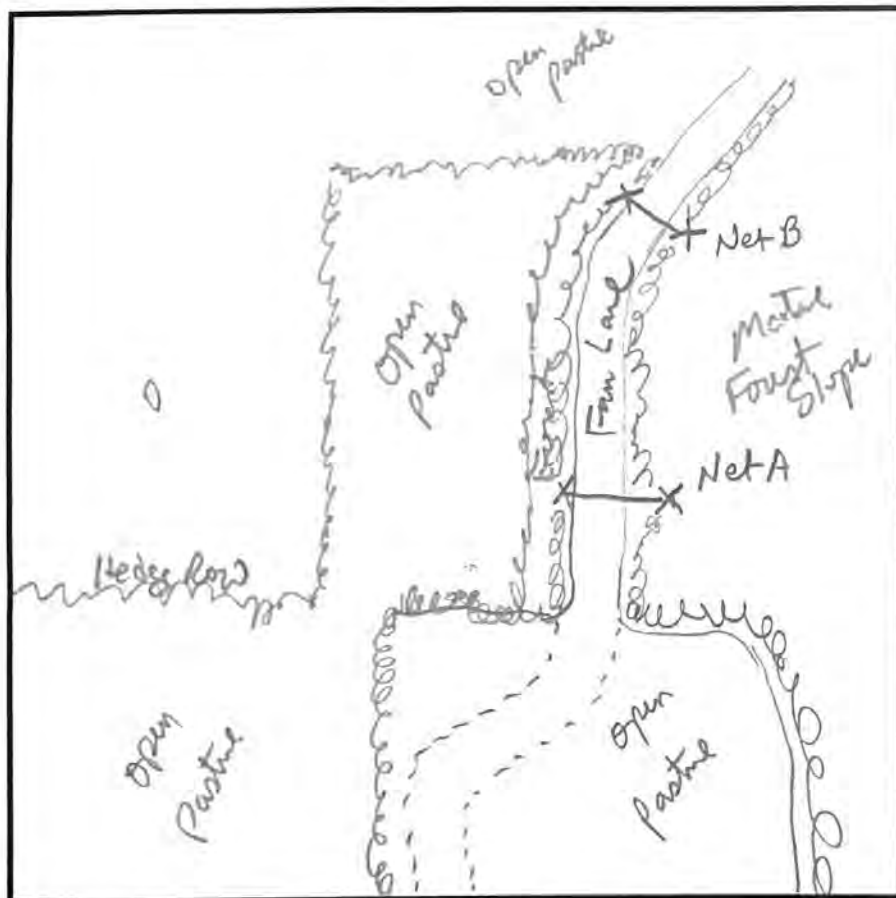
¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Project Name/No.: Ridgeline/172677408 Date: 20 May 2022
Site ID: RLM-11/Big Goose Cr. Upld Est. Distance to Water (ft): ~200m

VEGETATION

Primary Habitat Type¹: Mature Mixed mesophytic Forest/Adjacent Fields

Potential Roost: Large Trees Snags Both Other (e.g., structure)

Roost Tree Potential: High Moderate Low

Dominant Canopy Species Avg. Canopy DBH range (in): 18-36"

1. N. Red Oak 2. Quercus muhlenbergii 3. Carya cordiformis

Canopy Closure: Closed (80%+) Moderate (40-80%) Open (0-40%)

Dominant Subcanopy Species Avg. Subcanopy DBH range (in): 6-10"

1. Sugar maple 2. Celtis occidentalis 3. Ostrya virginica 4. Red Cedars

Sub-Canopy Clutter: High (60%+) Moderate (30-60%) Low (0-30%)

Dominant Shrub/Understory Species

1. Red Cedar 2. Pawpaw 3. Rosa multiflora

Shrub/Understory Clutter: High (60%+) Moderate (30-60%) Low (0-30%)

STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): NA Channel Width: NA Stream Width: NA

Riparian Width right bank: NA left bank: NA Avg. Water Depth: NA

Other Wildlife Observed: E. Wood Pewee (Vo), Wood Duck (2), Barred Owl (Vo), Yellow-billed Cuckoo (Vo),
* Hyla carolinensis (Vo - distant), Hyla chrysocelis (Vo), Plethodon glutinosus (5)

Additional Comments:



Bat Capture Datasheet

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Project Name/No.: 172677408 Date: 5/18/2022 Biologist(s): L. MEADE, M. ANGEL, A. BLAIR
Site ID: RLM-13 - TROUSDALE County/State: TROUSDALE/TN Moon Phase: WAXING GIBBOUS Sunset: 19:47
Map Kilometer No./Quad: KM-13 Latitude: 36.366841 Longitude: 86.125133 Moonrise: 13:13 Moonset: 7:35
General Site Description: OLD DIRT ROAD CORRIDOR Nets Open: 19:47 Nets Closed: 00:47

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	75	0	5
21:00	72	0	5
22:00	74	1	5
23:00	74	1	5
00:00	72	1	5
01:00	71	1	5

Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	6	5.2m	31.2m ²	36.366837	86.125093	X				TRAIL CORRIDOR
B	6	5.2m	31.2m ²	36.366242	86.125945	X				TRAIL CORRIDOR

* One net at full extension ~ 2.5m high

Weather Comments: _____

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	Lasiurus borealis	21:50	A	F	P	41	14.0	0	B	4	—	WAXING GIBBOUS FIRST BAT
2	Lasiurus borealis	22:34	A	F	PL	43	15.0	0	A	3	—	
3	Lasiurus borealis	23:36	A	F	P	40	15.25	0	B	3.5	—	
4	Lasiurus borealis	24:47	U	U	—	—	—	—	B	—	—	FLW OUT OF NET BEFORE CAPTURE

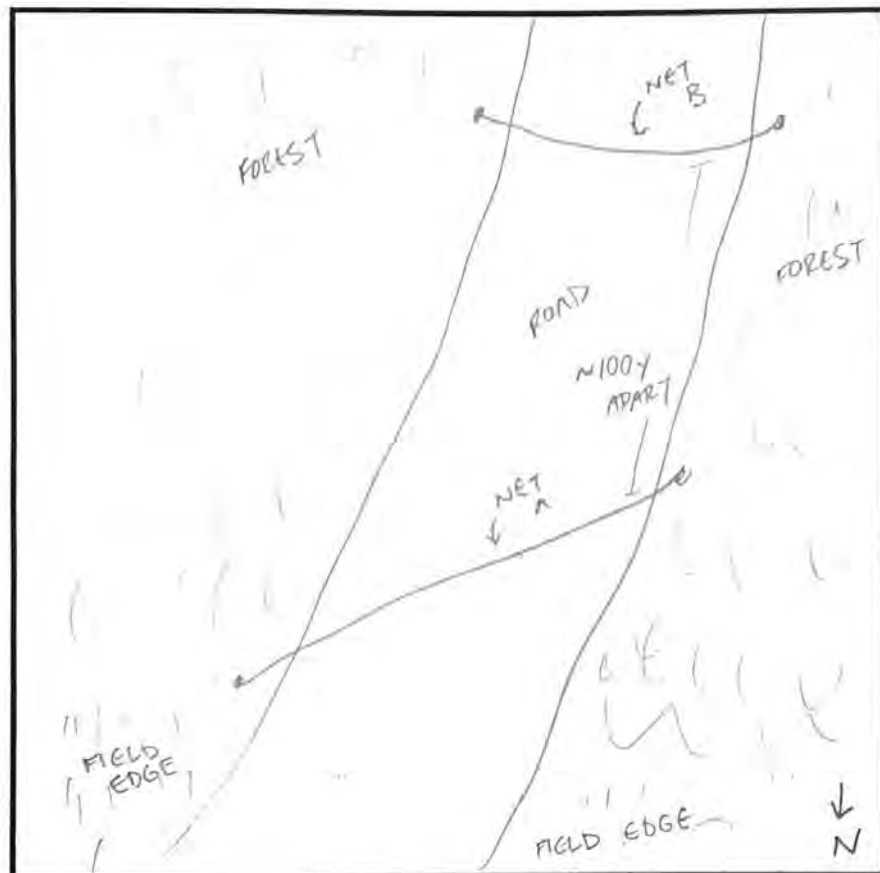
¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Project Name/No.: 172677408 Date: 5/18/2022
 Site ID: ELM-13-TROUSDALE Est. Distance to Water (ft): UNKNOWN
 (SMALL ROAD BUT NEAR NET A)

VEGETATION

Primary Habitat Type¹: WET FOREST NEAR OLD FIELD

Potential Roost:	Large Trees	Snags	Both	Other (e.g., structure)
Roost Tree Potential:	High	Moderate	Low	

Dominant Canopy Species Avg. Canopy DBH range (in): 10-14
 1. AMERICAN Sycamore 2. CHESTNUT OAK 3. HACKBERRY

Canopy Closure:	Closed (80% +)	Moderate (40 - 80%)	Open (0 - 40%)

Dominant Subcanopy Species Avg. Subcanopy DBH range (in): 4-7
 1. MIMOSA 2. 3.

Sub-Canopy Clutter:	High (60% +)	Moderate (30 - 60%)	Low (0 - 30%)

Dominant Shrub/Understory Species
 1. HONEY SUCKLE 2. CHINESE PRIVET 3. MULTIFLORA ROSE

Shrub/Understory Clutter:	High (60% +)	Moderate (30 - 60%)	Low (0 - 30%)

STREAM CHARACTERISTICS (if relevant) N/A

Bank Height (ft): Channel Width: Stream Width:
 Riparian Width right bank: left bank: Avg. Water Depth:

Other Wildlife Observed: CAVE SALAMANDER (ON ROAD), COPE'S GRAY TREE FROG (CALLING)

Additional Comments:



Bat Capture Datasheet

Page 3 of 4Project Name/No.: 172677408Date: 5/19/2022Biologist(s): L. MEADE, M. ANGEL, A. BLAIRSite ID: RLM-13- TROUSDALECounty/State: TROUSDALE/TN Moon Phase: WANING GIBBOUS Sunset: 19:48Map Kilometer No./Quad: KM-13Latitude: 36.366841 Longitude: 86.125133 Moonrise: 24:11 Moonset: 8:40General Site Description: OLD DIRT ROAD CORRIDOR Nets Open: 19:48 Nets Closed: 00:48

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	77	1	70
21:00	75	1	70
22:00	73	1	50
23:00	74	1	30
00:00	74	2	5
01:00	74	1	5

Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	6	5.2m	31.2m ²	36.366841	86.125093	X				TRAIL CORRIDOR
B	6	5.2m	31.2m ²	36.366242	86.125945	X				TRAIL CORRIDOR

* One net at full extension ~ 2.5m high

Weather Comments: _____

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	<i>Eptesicus fuscus</i>	22:00	A	M	NR	49	17	0	A	3	—	bare spot on right neck

¹ Beaufort wind scale: 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face: leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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Bat Capture Datasheet

Page 1 of 3

Project Name/No.: Ridgeline/172677408 Date: 18 May 2022 Biologist(s): Zack Baer, Katherine Bourka, Courtnee Ramser
 Site ID: RLM-14-Trousdale County/State: Trousdale/TN Moon Phase: Waning Gibbous Sunset: 1946h
 Map Kilometer No./Quad: KM 14/ Latitude: 36.36706 Longitude: -86.11935 Moonrise: 2310h Moonset: 0735h
 General Site Description: Pipeline corridor north of Starlite Rd Nets Open: 1946h Nets Closed: 0046h

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	78	0	0
21:00	74	0	10
22:00	73	0	20
23:00	72	0	0
00:00	71	0	0
01:00	71	0	0

Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	12	5	60m ²	36.36693	-86.11948	✓				
B	12	7.5	90m ²	36.36698	-86.11996	✓				

* One net at full extension - 2.5m high

Weather Comments: _____

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	Nycticeius humeralis	2058	A	M	NR	35	9.25	0	B	6.5	—	—
2	Nycticeius humeralis	2209	A	M	NR	35	9.0	0	B	4.0	—	—
3	Lasurus borealis	2237	A	F	P	42	13.75	0	B	3.0	—	—
4	Nycticeius humeralis	2310	A	F	P	38	14.25	0	A	5.0	—	—
5	Nycticeius humeralis	0005	A	F	P	38	13.75	0	B	5.0	—	—
6	Nycticeius humeralis	0046	A	F	P	37	11.0	1	B	5.5	—	—

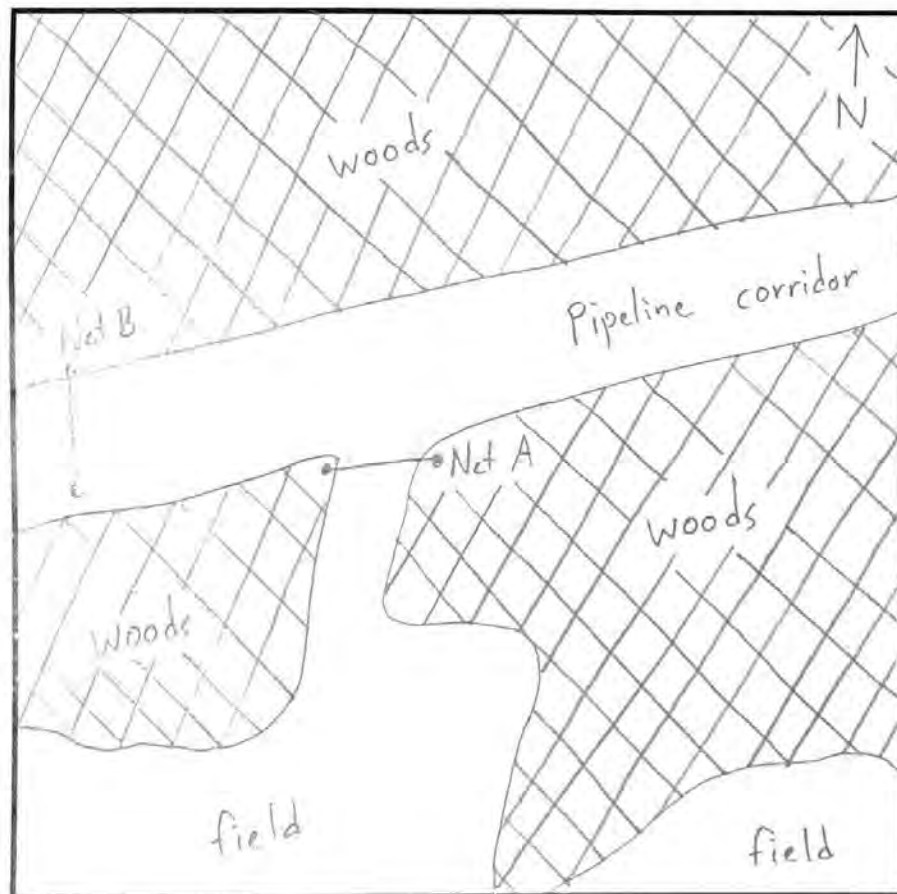
¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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1. Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Project Name/No.: Ridgeline/172677408 Date: 18 May 2022

Site ID: RLM-14-Trousdale Est. Distance to Water (ft): 600 ft

VEGETATION

Primary Habitat Type¹: Upland Forest

Potential Roost: Large Trees Snags Both Other (e.g., structure)

Roost Tree Potential: High Moderate Low

Dominant Canopy Species Avg. Canopy DBH range (in): 10

1. Juglans nigra 2. Fraxinus pennsylvanica 3. Ulmus alata

Canopy Closure: Closed (80%+) Moderate (40-80%) Open (0-40%)

Dominant Subcanopy Species Avg. Subcanopy DBH range (in): 8

1. Juniperus virginiana 2. Ulmus alata 3. Fraxinus pennsylvanica

Sub-Canopy Clutter: High (60%+) Moderate (30-60%) Low (0-30%)

Dominant Shrub/Understory Species

1. Juniperus virginiana 2. Ulmus alata 3. Maclura pomifera

Shrub/Understory Clutter: High (60%+) Moderate (30-60%) Low (0-30%)

STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): N/A Channel Width: N/A Stream Width: N/A

Riparian Width right bank: N/A left bank: N/A Avg. Water Depth: N/A

Other Wildlife Observed: _____

Additional Comments: _____



Bat Capture Datasheet

Page 3 of 3

Project Name/No.: Ridgeline 172677408

Date: 19 May 2022

Biologist(s): Zack Baer, Katherine Bouska, Courtney Ramser

Site ID: RLM-14-Trowsdale

County/State: Trousdale / TN

Moon Phase: Waning Gibbous

Sunset: 1947h

Map Kilometer No./Quad: KM-14

Latitude: 36.36766

Longitude: 86.11935

Moonrise: 0:01 h

Moonset: 0841 h

General Site Description: Pipeline corridor north of Starlite Rd

Nets Open: 1947h

Nets Closed: 0047h

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	79	0	50
21:00	77	0	50
22:00	74	0	25
23:00	75	1	0
00:00	76	2	0
01:00	76	2	0

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments:[illegible]

¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats.

Project Name/No.: Bridgeline/172677408 Date: 5/18/22 Biologist(s): Julia Wilson, Shana Kelley
Site ID: RLM-15-Trousdale County/State: Trousdale/TN Moon Phase: Waning Gibbous Sunset: 19:47
Map Kilometer No./Quad: KM-15 Latitude: 36.364829 Longitude: -86.105212 Moonrise: 23:11 Moonset: 03:10
General Site Description: Forested area around pond w/ gated corridor Nets Open: 19:47 Nets Closed: 20:24

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	76.4	0	20
21:00	72.9	0	10
22:00	71.2	0	10
23:00	69.2	0	0
00:00	68.3	0	0
01:00	68.5	0	0

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments:[illegible]

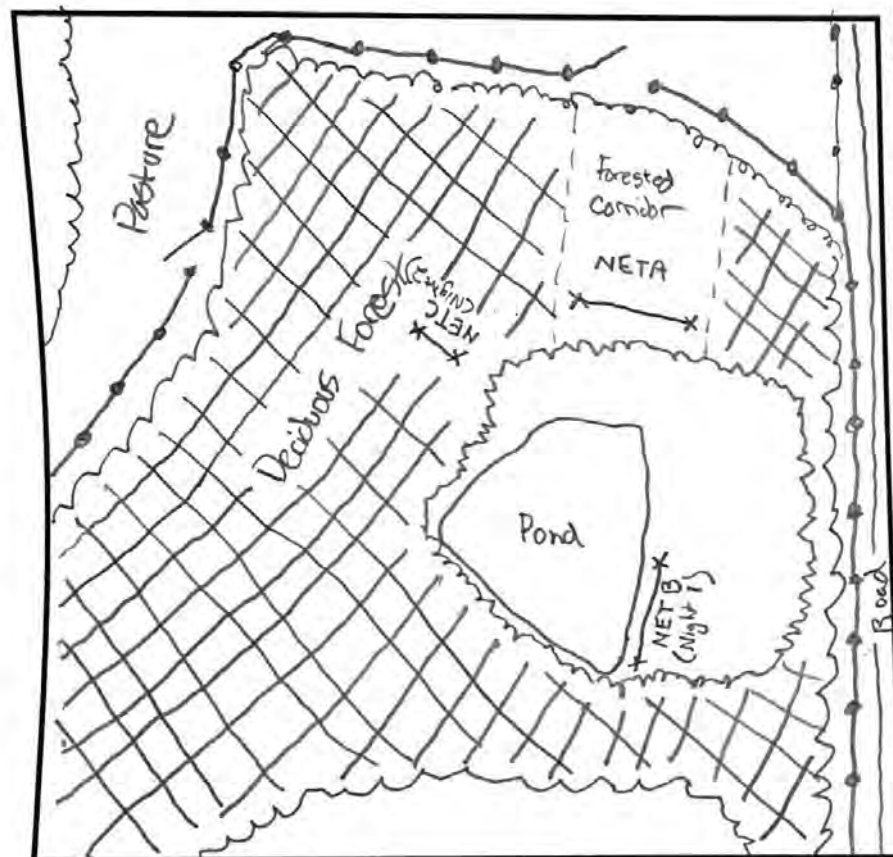
¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

* Apply band to LEFT arm for females and RIGHT arm for males.

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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Project Name/No.: Ridgeline/172677408 Date: 5/19/22
 Site ID: RLM-15-Trousdale Est. Distance to Water (ft): 750

VEGETATION

Primary Habitat Type¹: Forested periphery around Farm Pond

Potential Roost: Large Trees | Snags | Both | Other (e.g., structure)

Roost Tree Potential: High | Moderate | Low

Dominant Canopy Species Avg. Canopy DBH range (in): 12

1. Acer regundo 2. Juniperus virginiana 3. Juglans nigra

Canopy Closure: Closed (80%+) | Moderate (40-80%) | Open (0-40%)

Dominant Subcanopy Species Avg. Subcanopy DBH range (in): 5

1. Gleditsia tricanthos 2. Maclura pomifera 3. Celtis occidentalis

Sub-Canopy Clutter: High (60%+) | Moderate (30-60%) | Low (0-30%)

Dominant Shrub/Understory Species

1. Maclura pomifera 2. Rosa multiflora 3.

Shrub/Understory Clutter: High (60%+) | Moderate (30-60%) | Low (0-30%)

STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): — Channel Width: — Stream Width: —

Riparian Width right bank: — left bank: — Avg. Water Depth: —

¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Other Wildlife Observed: Bullfrog, 2-lined salamander, cows, SOSP, EATO, NOCA, EAWP, YBCU

Additional Comments:



Bat Capture Datasheet

Page 1 of 2

Project Name/No.: Ridgeline/172677408 Date: 18 May 2022 Biologist(s): James Kiser Ryan Rasmussen
 Site ID: RLM-116; Goldman Seay Gregory Lane County/State: Trousdale/TN Moon Phase: Waning Gibbous Sunset: 1948h
 Map Kilometer No./Quad: KM-16/Dixon Spring Latitude: 36.36327° Longitude: -86.10009 Moonrise: 2301h Moonset: 0733h
 General Site Description: Site is located on Goldman Seay Gregory Lane approx 100m from junction of Tennessee Central Blvd. Nets Open: 1930h Nets Closed: 0100h

Time	Temp (F)	Wind ¹	% Cloud Cover	Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
20:00	78.3	1	20	A	12m	7.5m	90m ²	36.36325	-86.09985	✓				DSC-6286-6292
21:00	72.0	1	0	B	9m	5m	45m ²	36.36302	-86.10014				limb or corneal	DSC-6293-6296
22:00	69.9	1	0											
23:00	68.4	0	0											
00:00	67.9	0	0											
01:00	68.7	1	60											

* One net at full extension ~ 2.5m high

Weather Comments: Hot and humid today with high temps in the upper 80's and very windy in afternoon

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	<i>Lasius borealis</i>	2100	A	F	NR	42.5	13.0	0	A	3	—	Hair & Guano TR-16-06
2	<i>Lasius borealis</i>	2300	A	F	P	40.5	12.8	0	A	6	—	Hair & Guano TR-16-07
3	<i>Lasius borealis</i>	2335	A	M	NR	41.0	11.5	0	A	3	—	Hair & Guano TR-16-08
4	<i>Lasius borealis</i>	2344	A	M	TD	41.0	10.0	0	A	6	—	Hair & Guano TR-16-09
5	<i>Lasius borealis</i>	0048	A	M	NR	40.0	10.2	0	A	3	—	—
6	<i>Lasius borealis</i>	0100	A	M	NR	—	—	0	A	4	—	—

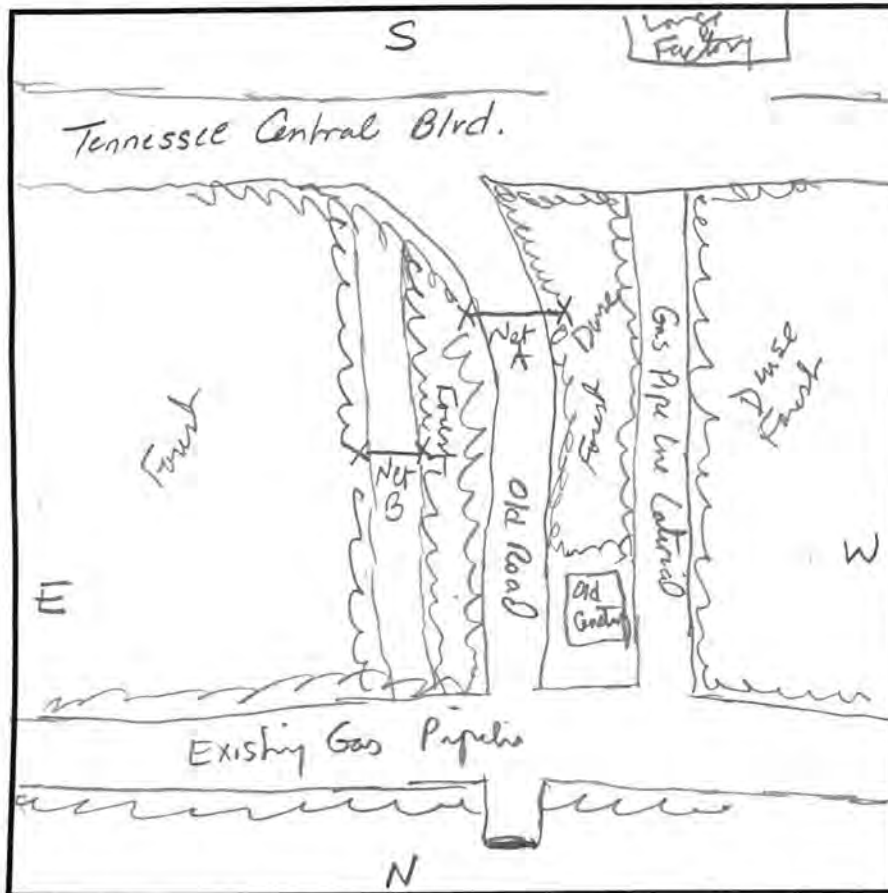
¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph). 1 = wind direction shown by smoke (1-3 mph). 2 = wind felt on face; leaves rustle (4-7 mph). 3 = leaves, twigs in constant motion (8-12 mph). 4 = dust rises; small branches move (13-18 mph). 5 = small trees in leaf begin to sway (19-24 mph)

² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for escaped bats

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1 Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Project Name/No.: Ridgeline/172677408 Date: 18 May 2022
Site ID: RLM-16; Goldman Say Gully Est. Distance to Water (ft): 7300 ft

VEGETATION

Primary Habitat Type¹: Young deciduous forest

Potential Roost:	Large Trees	Snags	<u>Both</u>	Other (e.g., structure)
Roost Tree Potential:	High	Moderate	<u>Low</u>	

Dominant Canopy Species Avg. Canopy DBH range (in): 8-14"

1. <u>Celtis occidentalis</u>	2. <u>Juglans nigra</u>	3. <u>White Ash</u>	4. <u>Osage Orange</u>
Canopy Closure:	<u>Closed</u> (80%+)	Moderate (40-80%)	Open (0-40%)

Dominant Subcanopy Species Avg. Subcanopy DBH range (in): 4-7"

1. <u>Quercus rubra</u>	2. <u>Celtis occidentalis</u>	3. <u>Juglans nigra</u>	
Sub-Canopy Clutter:	<u>High</u> (60%+)	Moderate (30-60%)	Low (0-30%)

Dominant Shrub/Understory Species

1. <u>Red Cedar</u>	2. <u>Coralberry</u>	3. <u>Privet</u>	4. <u>Spiny Dogwood</u>
Shrub/Understory Clutter:	High (60%+)	<u>Moderate</u> (30-60%)	Low (0-30%)

STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): NA Channel Width: NA Stream Width: NA
Riparian Width right bank: NA left bank: NA Avg. Water Depth: NA

Other Wildlife Observed: Wild Turkey (♀ nest w 20 eggs), N. Cardinal (Vo), N. Mockingbird (Vo), Indigo Bunting (1), E. Towhee (Vo), Hyla chrysocelis (Vo), Rana catesbeiana (Vo), Barred Owl (Vo)

Additional Comments: _____

Bat Capture Datasheet

Page / of

Project Name/No.: Ridgeline/172677408 Date: 19 May 2022 Biologist(s): James Kiser, Ryan Rasmussen
 Site ID: RLM-116, Goldman Seay Gregory Lane County/State: Frousdale/TN Moon Phase: Waning Gibbous Sunset: 1948h
 Map Kilometer No./Quad: KM-116/Dixon Springs Latitude: 36.36327 Longitude: -86.10009 Moonrise: 0511h Moonset: 1451h
 General Site Description: Site is located on Goldman Seay Gregory Lane approx. 1.0km from junction of Tennessee Central Blvd. Nets Open: 1930h Nets Closed: 0055h

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	80.9	2	50
21:00	76.8	2	30
22:00	75.3	2	40
23:00	68.6	3	20
00:00	78.2	3	0
01:00	77.2	3	0

Net ID (A, B,...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	12m	7.5m	90m ²	36.36325	-86.09265°	✓				
B	9m	5.0m	45m ²	36.36362	-86.10014°				Unusable no water	

* One net at full extension ~ 2.5m high

* One net at full extension ~ 2.5m high

Weather Comments: Hot and humid today with highs in upper 80's. Tonight warm and very windy!

[illegible]

¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

- Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats



Bat Capture Datasheet

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Project Name/No.: Ridgeline 172677408Date: 05/18/2022Biologist(s): Math Demler, Chris KnabelSite ID: RLM-17-TrousdaleCounty/State: Trousdale/TNMoon Phase: Waning Gibbous Sunset: 1947Map Kilometer No./Quad: KM-17Latitude: 36.363413Longitude: -86.078054 Moonrise: 2311 Moonset: 0734General Site Description: Small ATV Trail leading to ROW from South of TN-25E. At MP-10.5 Nets Open: 1932 Nets Closed: 0047

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	78	2	35
21:00	75	1	35
22:00	72	2	40
23:00	70	1	40
00:00	69	1	50
01:00			

Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	18	7.5	135	36.363237	-86.078282				ROW	
B	6	5.0	30	36.363918	-86.077929				ATV trail	

* One net at full extension ~ 2.5m high

Weather Comments:

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	LABO	2010	A	F	P	41	14.5	5	A	6	NA	
2	LABO	2340	A	F	P	40	12.5	0	A	4.5	NA	
3	LABO	0045	X	F	P	42	14.0	0	A	3.0	NA	Left Wing Had Several Prior Injuries; Would not close it either way.

22.0

20.0

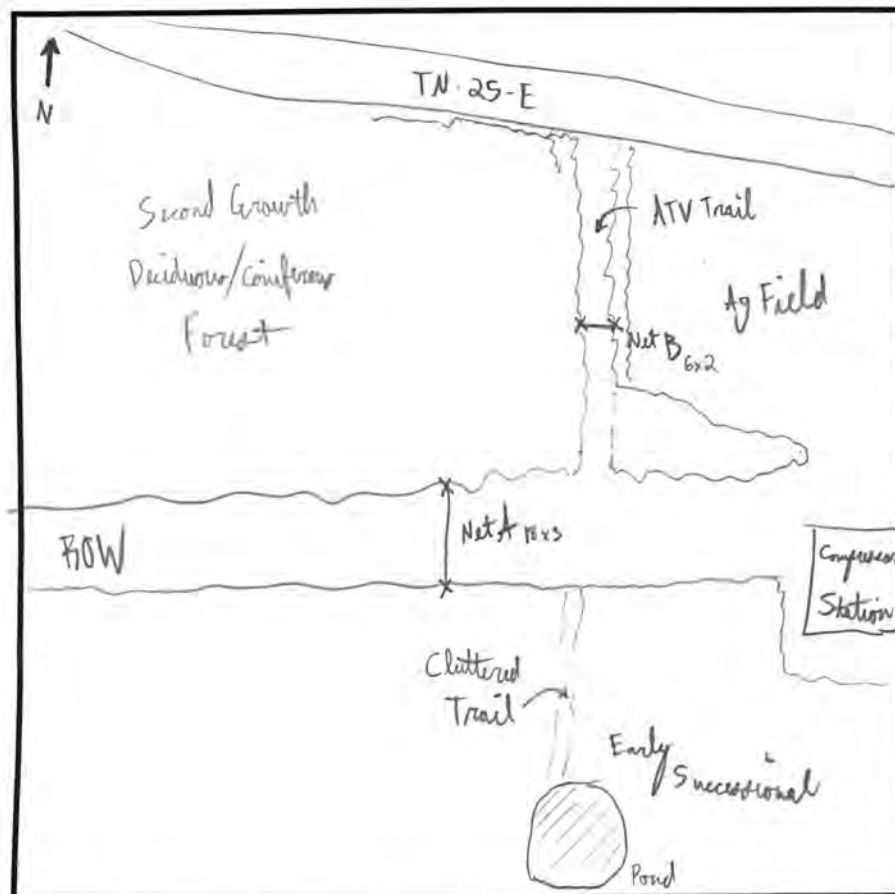
21.5

¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for escaped bats


Project Name/No.: Ridgeline/172677408 Date: 05/18/2022

Site ID: RLM-17-Trousdale Est. Distance to Water (ft): 600'

VEGETATION

Primary Habitat Type¹: MESSGDCF SECOND GROWTH DECIDUOUS/CONIFEROUS FOREST

Potential Roost: Large Trees | Snags | Both | Other (e.g., structure)

Roost Tree Potential: High | Moderate | Low

Dominant Canopy Species Avg. Canopy DBH range (in):

1. Juniperus virginiana 2. Maclura pomifera 3. Celtis laevigata

Canopy Closure: Closed (80%+) | Moderate (40-80%) | Open (0-40%)

Dominant Subcanopy Species Avg. Subcanopy DBH range (in):

1. Juniperus virginiana 2. Maclura pomifera 3. Celtis laevigata

Sub-Canopy Clutter: High (60%+) | Moderate (30-60%) | Low (0-30%)

Dominant Shrub/Understory Species

1. Ligustrum sinense 2. Symphoricarpos orbiculata 3.

Shrub/Understory Clutter: High (60%+) | Moderate (30-60%) | Low (0-30%)

STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): Channel Width: Stream Width: NA

Riparian Width right bank: left bank: Avg. Water Depth:

¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Other Wildlife Observed: NOCA, CAWR, CWWF, YBCU, REVI

Additional Comments:



Bat Capture Datasheet

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Project Name/No.: Pideline 172677408

Date: 05/19/2022

Biologist(s): Matt Denny, Chris Knobel

Site ID: FLM-17-Trousdale

County/State: Trousdale / TN

Moon Phase: Waxing Gibbous Sunset: 1949

Map Kilometer No./Quad: KM-17

Latitude: 36.363413 Longitude: 121.721111

Longitude: -76.078054 Moonrise: 0355 Moonset: 2051

General Site Description: Site No. 1. SMALL ATV TRAIL LEADING TO ROW

Nets Open: 1934 Nets Closed: 0049

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	81	3	20
21:00	75	2	20
22:00	74	1	20
23:00	71	2	0
00:00	73.5	2	0
01:00			

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments:[illegible]

¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats



Bat Capture Datasheet

Page 1 of 2

Project Name/No.: 172677408 Date: 5/20/2022 Biologist(s): L. MEADE, M. ANGEL, A. BLAIR
 Site ID: RLM-18- TROUSDALE County/State: Trousdale, TN Moon Phase: LAST QUARTER Sunset: 19:49
 Map Kilometer No./Quad: 1KM-18 Latitude: 36.366592 Longitude: 86.070678 Moonrise: 24:06 Moonset: 9:53
 General Site Description: BEDROCK/ROBBLE BOTTOM STREAM Nets Open: 19:48 Nets Closed: 00:48

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	79	0	20
21:00	71	0	20
22:00	68	0	10
23:00	66	0	10
00:00	66	0	5
01:00	66	0	5

Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	6	52M	31.2m ²	36.366548	86.070612		X			BEDROCK, ROBBLE BOTTOM
B	6	52M	31.2m ²	36.366631	86.070878		X			BEDROCK, ROBBLE BOTTOM

* One net at full extension ~ 2.5m high

Weather Comments: _____

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	Myotis grisescens	21:12	A	M	NR	42mm	11.0	0	A	0.25	TWBA-08549	RECAPTURED IN NET B
2	Lasiurus borealis	23:00	A	F	P	41	14.5	0	A	1.5	—	
3	Myotis grisescens	00:48	A	M	NR	40	9	0	A	0.5	TWBA-08548	

¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

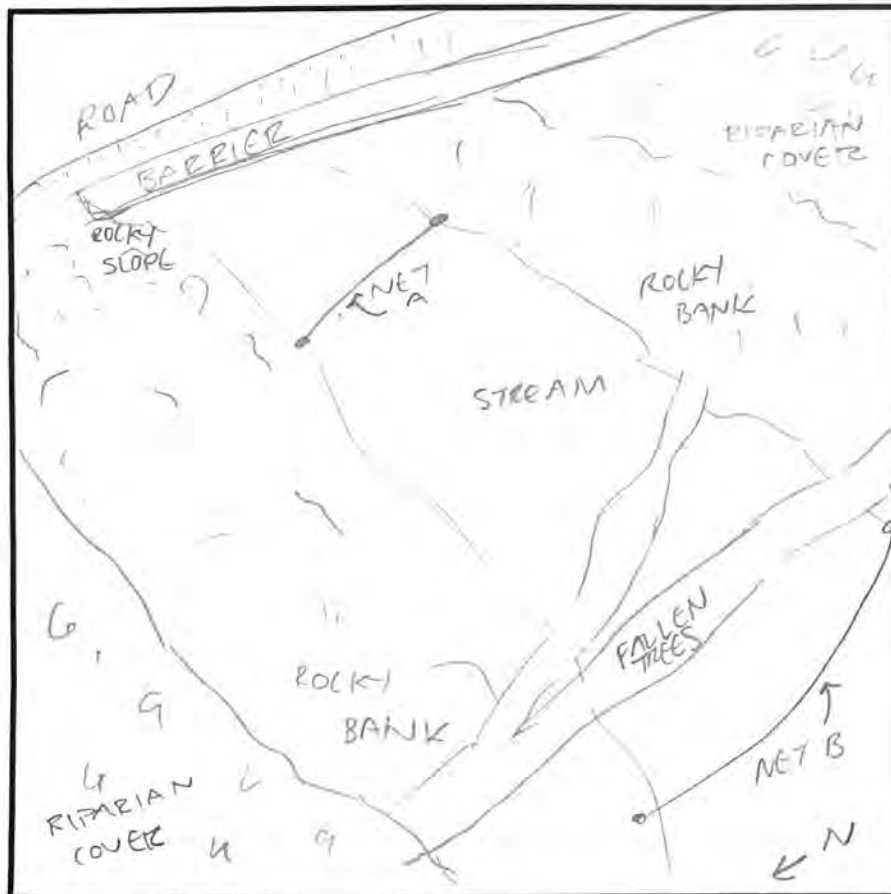
² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for escaped bats

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¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Project Name/No.: 172677408 Date: 5/20/2022
Site ID: RLM-18-TRIGSDALE Est. Distance to Water (ft): 100 W/ WATER

VEGETATION

Primary Habitat Type¹: ROCKY BOTTOM STREAM W/ CANOPY COVER

Potential Roost: Large Trees | Snags | Both | Other (e.g., structure)

Roost Tree Potential: High | Moderate | Low

Dominant Canopy Species Avg. Canopy DBH range (in):
1. HACKBERRY 2. BOXELDER 3. SUGAR MAPLE

Canopy Closure: Closed (80%+) | Moderate (40-80%) | Open (0-40%)

Dominant Subcanopy Species Avg. Subcanopy DBH range (in):
1. BOXELDER 2. HONEY LOCUST 3. YELLOW BUCKEYE

Sub-Canopy Clutter: High (60%+) | Moderate (30-60%) | Low (0-30%)

Dominant Shrub/Understory Species
1. MULTIFLORA ROSE 2. _____ 3. _____

Shrub/Understory Clutter: High (60%+) | Moderate (30-60%) | Low (0-30%)

STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): 4 Channel Width: 7m Stream Width: 1-7m

Riparian Width right bank: 2-3m left bank: 2-3m Avg. Water Depth: 2-14 in

Other Wildlife Observed: FOWLER'S TOAD, GREEN FROG, CRAYFISH, TWO-LINED SALAMANDERS, NORTHERN WATER SNAKES, DARTERS

Additional Comments: _____



Bat Capture Datasheet

Page 1 of 2

Project Name/No.: 172677408

Date: 5/22/2022

Biologist(s): L. MEADE, M. ANGEL, A. BLAIR

Site ID: RLM-18- TROUSDALE

County/State: TROUSDALE/TN Moon Phase: LAST QUARTER Sunset: 19:50

Sunset: 19:50

Map Kilometer No./Quad: 1KM 1018-11

Latitude: 31.366597 Longitude: 86.070678 Moonrise: 1:35 Moonset: 12:14

Moonset: 12:14

General Site Description: BEDROCK/COBBLE BOTTOM STREAM Nets Open: 19:49 Nets Closed: 00:50

Nets Open: 19:49

Nets Closed: 00:50

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	70	1	100
21:00	67	1	100
22:00	67	1	100
23:00	67	2	100
00:00	63	1	100
01:00	63	1	100

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments:[illegible]

¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats



Bat Capture Datasheet

Page 1 of 4

Project Name/No.: Ridgeline/172677408 Date: 5/20/22 Biologist(s): Julia Wilson, Shane Kelley
 Site ID: RLM-21-Smith County/State: Smith/TN Moon Phase: Waning Gibbous Sunset: 19:48
 Map Kilometer No./Quad: KM-21 Latitude: 36.375049 Longitude: -86.042747 Moonrise: 00:10 Moonset: 11:03
 General Site Description: Shallow creek with riffles Nets Open: 19:48 Nets Closed: 00:48

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00		0	0
21:00		0	0
22:00	69.9	0	0
23:00		0	0
00:00		0	0
01:00		0	0

Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	15	7.5	112.5	36.375702°	-86.042944		X			
B	12	7.5	90	36.375113°	-86.042764		X			

* One net at full extension ~ 2.5m high

Weather Comments: Humidity dropped, calm clear evening

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	Lasiorus borealis	20:40	A	F	NR	41.9	13.0	0	A	2	—	
2	Nycticeius humeralis	20:41	A	F	P	39.1	13.5	0	A	5	—	
3	Nycticeius humeralis	20:41	A	M	NR	35.6	10.0	0	A	4	—	
4	Nycticeius humeralis	20:42	A	F	P	36.7	13.5	0	A	4	—	
5	Nycticeius humeralis	20:42	A	M	NR	36.6	9.5	0	A	5	—	
6	Lasiorus borealis	20:42	A	F	P	42.8	12.5	0	A	0	—	
7	Lasiorus borealis	20:52	A	F	NR	40.6	13.75	0	A	10	—	
8	Lasiorus borealis	20:52	A	F	NR	42.6	15.25	0	A	4	—	
9	Nycticeius humeralis	20:52	A	F	P	36.4	13.75	0	A	3	—	
11	Nycticeius humeralis	21:04	A	F	P	36.6	14.5	0	B	5	—	
12	Nycticeius humeralis	21:10	A	F	P	38.6	12.25	0	B	3	—	
13	Nycticeius humeralis	21:10	A	F	P	37.3	14.75	0	B	10	—	

¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

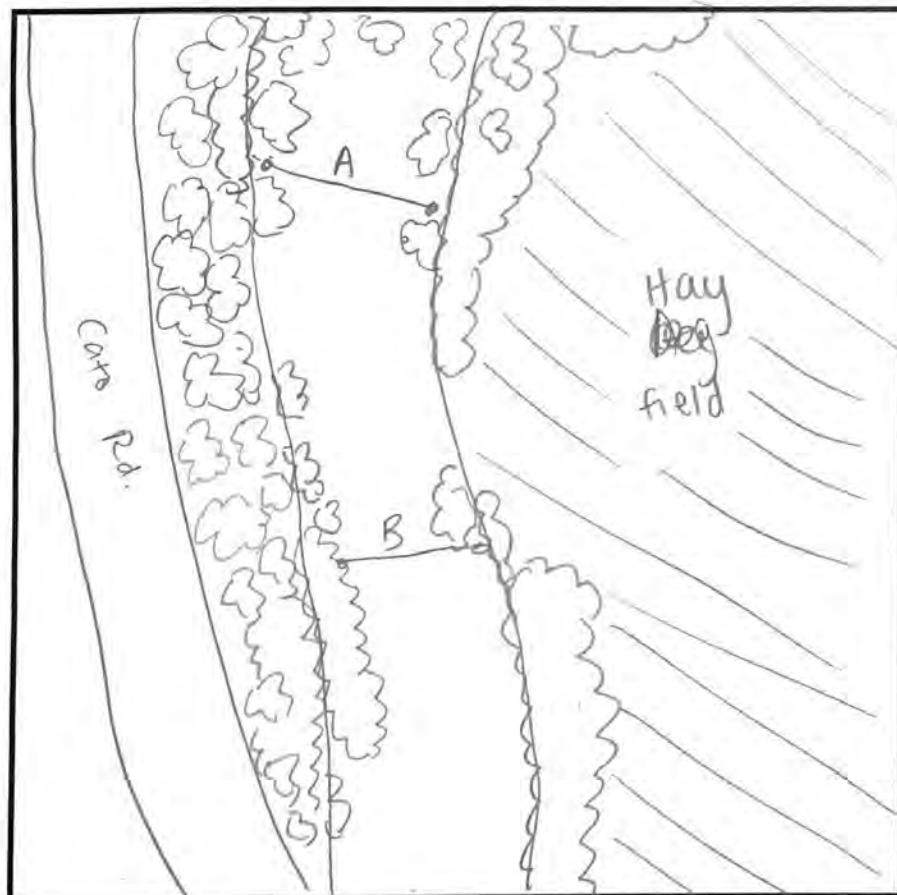
² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for escaped bats

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¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Project Name/No.: Ridgeline Date: 5/20/22
 Site ID: RLM-21-SMTH Est. Distance to Water (ft): 0

VEGETATION

Primary Habitat Type¹: Creek/Riparian
 Potential Roost: Large Trees Snags Both Other (e.g., structure)

Roost Tree Potential: High Moderate Low

Dominant Canopy Species Avg. Canopy DBH range (in): 20
 1. Platanus occidentalis 2. Populus deltoides 3. _____

Canopy Closure: Closed (80%+) Moderate (40-80%) Open (0-40%)

Dominant Subcanopy Species Avg. Subcanopy DBH range (in): 10
 1. Platanus occidentalis 2. Acer negundo 3. Celtis laevigata

Sub-Canopy Clutter: High (60%+) Moderate (30-60%) Low (0-30%)

Dominant Shrub/Understory Species
 1. Acer negundo 2. Celtis laevigata 3. Ligustrum sinense

Shrub/Understory Clutter: High (60%+) Moderate (30-60%) Low (0-30%)

STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): 4 Channel Width: 50 Stream Width: 60

Riparian Width right bank: 20 left bank: 25 Avg. Water Depth: 1.5 ft

Other Wildlife Observed: CONI, LOWA, WEVI, CLSW, BEKI, COYE, INBU, TRSW
Watersnake

Additional Comments: _____



Bat Capture Datasheet Pt. II

Page 3 of 4

Project Name/No.: Ridge line 1172677408

Date: 5/20/22

Biologist(s): Julia Wilson, Shane Kelley, OK

Site ID: RLM-21-Smith

County/State: Smith/TN

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (samples taken, transmitter #, if recap, disposition)
14	Nycticeius humeralis	21:16	A	F	P	36.2	13.75	0	B	4	—	
15	Nycticeius humeralis	21:20	A	F	P	38.9	14.5	0	A	2	—	
16	Lasiurus borealis	21:20	A	M	NR	39.4	11.5	0	A	3	—	
17	Nycticeius humeralis	21:25	A	F	P	37.1	13.5	0	A	1	—	
18	Nycticeius humeralis	21:25	A	F	P	36.2	13.25	0	AB	2	—	
19	Lasiurus borealis	21:30	BA	F	P	41.0	15.0	0	B	3	—	
20	Nycticeius humeralis	21:35	BA	F	P	37.4	12.75	0	B	3.5	—	
21	Nycticeius humeralis	21:35	BA	F	P	36.3	14.5	0	B	2.5	—	
22	Nycticeius humeralis	21:40	A	F	P	—	—	0	B	2	—	Recap
23	Nycticeius humeralis	21:45	A	F	P	—	—	0	B	2.05	—	Recap
10	Lasiurus borealis	20:40	A	F	U	U	U	U	A	3	—	Escaped bag
24	Perimyotis subflavus	22:06	A	F	P	35.95	7.75	0	B	3.5	TWPA 104074	Photos ✓ Transmitter 37 105.564
25	Myotis grisescens	22:08	A	F	NR	44.1	11.0	0	B	2.0	TWPA 10101	Bat mites
26	Lasiurus cinereus	23:10	A	F	P	50.9	34.5	0	A	1.75	—	ü
27	Myotis grisescens	23:30	A	F	P	43.8	11.25	0	B	2.0	TWPA 10102	Bat mites
28	Nycticeius humeralis	23:45	A	F	P	36.4	13.5	0	A	0.5	—	
29	Myotis grisescens	23:59	A	F	NR	43.9	11.0	0	A	2	TWPA 10103	
30	Eptesicus fuscus	00:10	A	M	NR	50.8	20.25	0	B	4	—	Penis large for species
31	Myotis grisescens	00:15	A	F	P	44.1	12.5	0	B	3	TWPA 10104	Bat mites very pregnant
32	Nycticeius humeralis	00:35	A	F	P	38.2	15.5	0	A	1.5	—	
33	Nycticeius humeralis	00:45	A	F	P	—	—	0	B	4	—	Recap
34	Myotis grisescens	00:46	A	M	NR	42.0	9.25	0	A	2.5	TWPA 10105	

² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for escaped bats

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Bat Capture Datasheet Pt. II

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Project Name/No.: Ridgevine / 172677408

Date: 5/20/22

Biologist(s): Julia Wilson, Shane Kelley

Site ID: RLM-21-Smith

County/State: Smith/TN

[illegible]

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

- * Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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Bat Capture Datasheet

Page 1 of 2

Project Name/No.: Bridgeline/17267408 Date: 5/22/20 Biologist(s): Julia Wilson, Shane Kelley
 Site ID: RLM-21-Smith County/State: Smith/TN Moon Phase: Waning Gibbous Sunset: 19:50
 Map Kilometer No./Quad: KM-21 Latitude: 36.375049 Longitude: -86.042747 Moonrise: 1:37 Moonset: 13:21
 General Site Description: Shallow creek with riffles Nets Open: 19:45 Nets Closed: 00:45

Time	Temp (F)	Wind ¹	% Cloud Cover	Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
20:00	69.8	0	100	A	15	7.5	112.5	36.3757020	-86.042944		X			
21:00	66.9	1	100	B	12	7.5	90	36.375113	-86.042704		X			
22:00	66.2	2	100											
23:00	66.5	1	100											
00:00	65.3	1	100											
01:00	64.0	1	100											

* One net at full extension - 2.5m high

Weather Comments: Very light drizzle at open, many bats seen flying. Gusty

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	<i>Perimyotis subflavus</i>	20:14	A	F	NR	34.1	7.0	0	B	1.5	A04475	Very light/minor WNS scoring
2	<i>Nycticeius humeralis</i>	20:42	A	F	P	37.5	13.75	0	A	2.0	—	
3	<i>Nycticeius humeralis</i>	20:42	A	F	P	36.9	15.75	0	A	2.5	—	Very pregnant
4	<i>Nycticeius humeralis</i>	20:45	A	F	P	36.2	13.25	0	A	3.0	—	Very large, ^{head} ^{side of tail} ^{on dorsal}
5	<i>Nycticeius humeralis</i>	21:10	A	F	P	—	—	0	B	2.0	—	RECAP bat ②
6	<i>Nycticeius humeralis</i>	21:10	A	F	P	—	—	0	B	1.5	—	RECAP bat ③
7	<i>Perimyotis subflavus</i>	21:10	A	F	P	36.1	7.25	0	B	3.0	A04476	
8	<i>Lasiurus borealis</i>	21:50	A	M	NR	41.3	11.75	0	A	0.25	—	
9	<i>Myotis grisescens</i>	21:50	A	F	P	44.3	13.0	0	B	0.75	TWRA10107	Bat mites
10	<i>Perimyotis subflavus</i>	22:10	A	F	P	34.6	7.75	1	B	1.5	A04477	
11	<i>Myotis grisescens</i>	22:40	A	M	NR	45.9	11.0	0	B	1.5	TWRA10108	Bat mites
12	<i>Nycticeius humeralis</i>	23:00	A	M	NR	36.8	8.0	0	B	2.5	—	

¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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Bat Capture Datasheet Pt. II

Page 3 of 3

Project Name/No.: Ridgeline 172677408

Date: 5/22/20

Biologist(s): Julia Wilson, Shane Keller

Site ID: RLM-21-Smith

County/State: Smith Co. / TN

[illegible]

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

- Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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Bat Capture Datasheet

Page ___ of ___

Project Name/No.: Bridgeline/172677408

Date: 05/20/2022

Biologist(s): Matt Demyler, Chris Knabel

Site ID: ALM-23-Smith

County/State: Smith/TN

Moon Phase: Waning Gibbous

Sunset: 1948

Map Kilometer No./Quad: KM-23

Latitude: 36.377151

Longitude: -86.026639

Moonrise: 0009

Moonset: 0950

General Site Description: Gravel road/driveway intersects with ROW. Mixed deciduous/coniferous second growth forest on either side.

Nets Open: 1933

Nets Closed: 0048

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	82	1	10
21:00	79	1	20
22:00	76	1	20
23:00	78	1	10
00:00	76	1	0
01:00			

Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	9.0	5.0	45.0			✓				
B	12.0	7.5	90.0						ROW	

* One net at full extension ~ 2.5m high

Weather Comments: _____

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	LABO	2010	A	F	P	43	16.5	0	A	2.5	NA	
2	LABO	2010							A	1.0		Escaped from Net
3	LABO	2100	A	M					A	3.0		Escaped from Net
4	LABO	2140	A	F	P	42	15	0	B	2.5		
5	LABO	2210	A	M	NR	38	10.9	0	A	2.5	NA	
6	LABO	2220	A	M	NR	40	10.9	0	B	3.5		
7	LABO	0020	A	M	NR	40	11.5	0	B	4		

¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

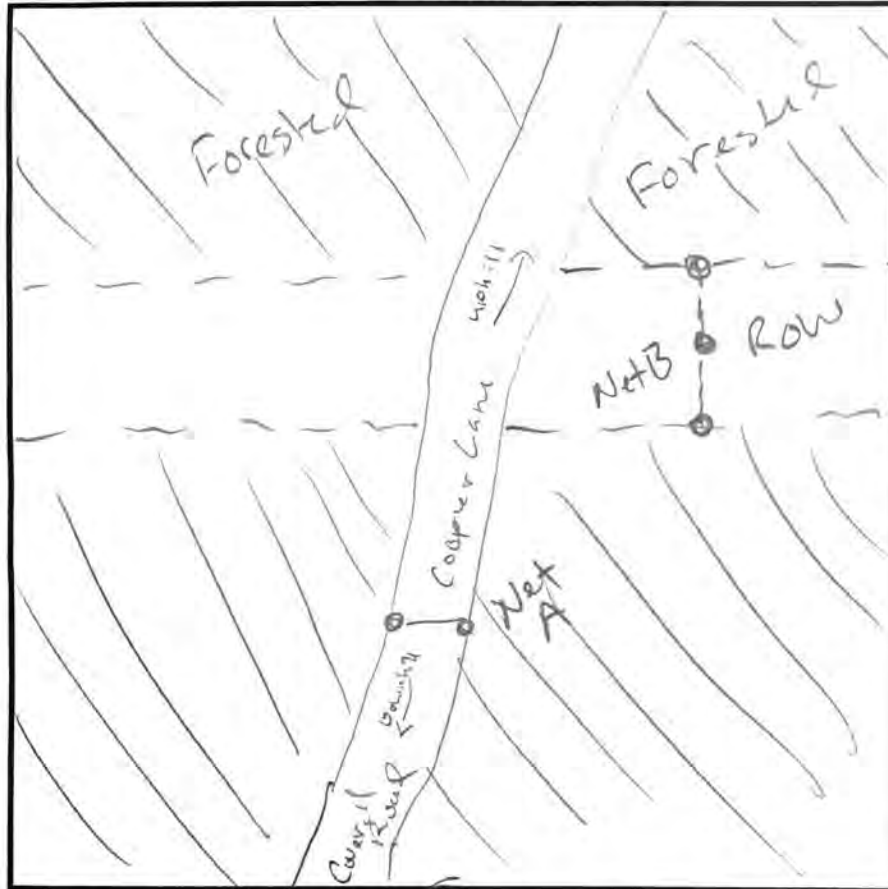
* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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Net Site Description



Project Name/No.: Piduchina 1 172673493 Date: 05/20/2022
 Site ID: PLM-23-Smith Est. Distance to Water (ft): 2,200

VEGETATION

Primary Habitat Type¹: UPLAND FOREST
 Potential Roost:

Large Trees	Snags	<u>Both</u>	Other (e.g., structure)
High	Moderate	Low	

 Roost Tree Potential:

High	Moderate	Low
------	----------	-----

Dominant Canopy Species 1. *Tupla nigra* 2. *Juniperus virginiana* 3. Avg. Canopy DBH range (in):
 Canopy Closure:

<u>Closed (80%+)</u>	Moderate (40-80%)	Open (0-40%)
----------------------	-------------------	--------------

Dominant Subcanopy Species 1. *Ailanthus altissima* 2. *Juniperus virginiana* 3. Avg. Subcanopy DBH range (in):
 Sub-Canopy Clutter:

<u>High (60%+)</u>	Moderate (30-60%)	Low (0-30%)
--------------------	-------------------	-------------

Dominant Shrub/Understory Species 1. 2. 3.
 Shrub/Understory Clutter:

High (60%+)	<u>Moderate (30-60%)</u>	Low (0-30%)
-------------	--------------------------	-------------

~~STREAM CHARACTERISTICS (if relevant)~~

~~Bank Height (ft): Channel Width: Stream Width:
 Riparian Width right bank: left bank: Avg. Water Depth:~~

¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Other Wildlife Observed: EASO, CWWI, YBCU, EATO, EWPE

Additional Comments:



Bat Capture Datasheet

Page 3 of 3

Project Name/No.: Ridgeline/172677408

Date: 22 MAY 2022

Biologist(s): Zack Baer, Katherine Bouska, Courtney Rama

Site ID: RLM-23-Smith

County/State: Smith / TN

Moon Phase: Last Quarter (49%)

Sunset: 1940 h

Map Kilometer No./Quad: KM-23/

Latitude: 36.377105

Longitude: 86.02663

Moonrise: 135 h

Moonset: 12:41

General Site Description: Gravel road/driveway. Intersects with ROW.

Nets Open: 1946 h

Nets Closed: 0049 h

Mixed deciduous/coniferous second growth forest on either side

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	69	1	100
21:00	67	1	100
22:00	67	1	100
23:00	65	1	100
00:00	64	1	100
01:00	64	1	100

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments:[illegible]

¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats



Bat Capture Datasheet

Page 1 of 1

Project Name/No.: Ridgeline/172677408

Date: 20 May 2022

Biologist(s): Zack Baer, Katherine Bouska, Courtnee Ramsa

Site ID: RLM-25 - ~~Stott~~ Smith

County/State: Smith/TN

Moon Phase: Waning Gibbous

Sunset: 1948 h

Map Kilometer No./Quad: KM 95

Latitude: 36.37562

Longitude: -86.00040

Moonrise: 0009 h

Moonset: 0951 h

General Site Description: Pipeline corridor north of Nickajack Rd.

Nets Open: 1948 h

Nets Closed: 1948 h

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	82	1	0
21:00	80	1	20
22:00	80	1	20
23:00	79	1	0
00:00	79	1	0
01:00	78	1	0

Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	6	5	30m ²	36.37553	-86.00035	✓			✓	ROW
B	9	7.5	67.5m ²	36.37599	-86.00108	✓			✓	ROW

* One net at full extension ~ 2.5m high

Weather Comments:

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	Lasiurus borealis	2046	A	F	P	42	15.25	0	B	50	—	—
2	Lasiurus borealis	0025	A	M	NR	40	10.25	0	B	35	—	—
3	Nycticeius humeralis	0048	A	M	NR	37	8.25	0	A	3	—	—
4	Lasiurus borealis	0048	A	M	NR	38	10.5	0	B	5	—	—

¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

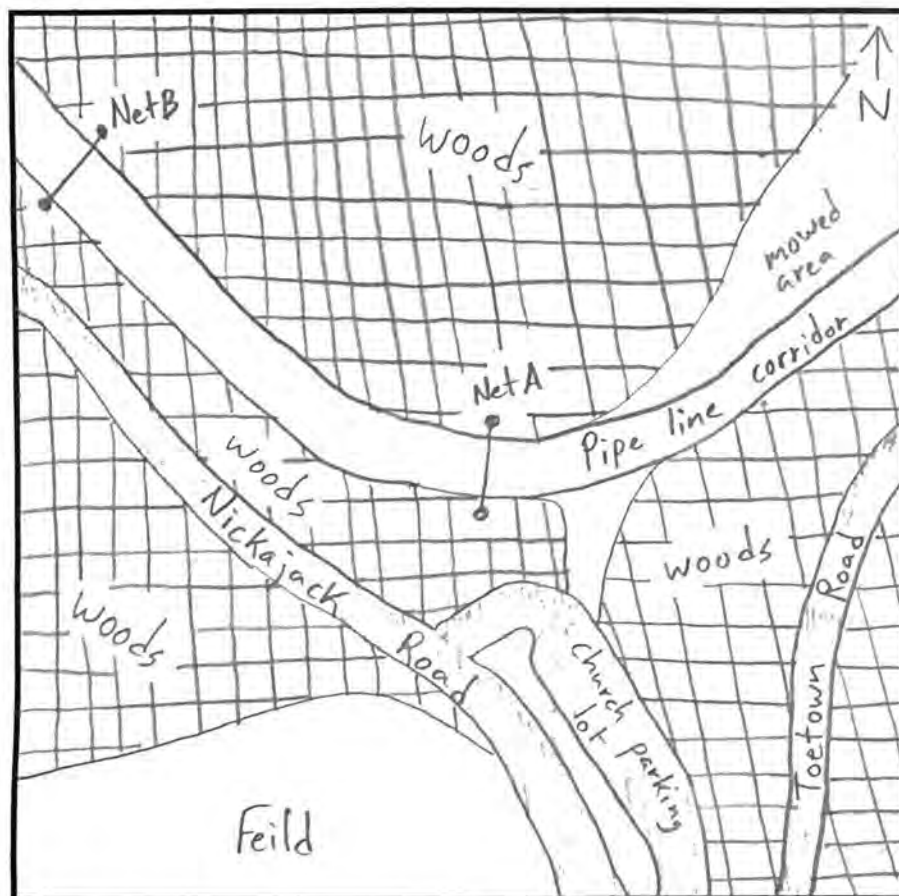
² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for escaped bats

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¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Project Name/No.: Ridgeline/1726774 Date: 20 May 2022

Site ID: RUM-25-Scott Smith Est. Distance to Water (ft): 700

VEGETATION

Primary Habitat Type¹: Upland Forest

Potential Roost:	Large Trees	Snags	Both	Other (e.g., structure)
Roost Tree Potential:	High	Moderate	<u>Low</u>	

Dominant Canopy Species	Avg. Canopy DBH range (in):
1. <u>Fraxinus pennsylvanica</u> 2. <u>Juglans nigra</u> 3. <u>Quercus montana</u>	<u>10</u>

Canopy Closure:	Closed (80% +)	Moderate (40 - 80%)	Open (0 - 40%)
	<u>Closed (80% +)</u>		

Dominant Subcanopy Species	Avg. Subcanopy DBH range (in):
1. <u>Celtis occidentalis</u> 2. <u>Juniperus virginiana</u> 3. <u>Quercus montana</u>	<u>6</u>

Sub-Canopy Clutter:	High (60% +)	Moderate (30 - 60%)	Low (0 - 30%)
	<u>High (60% +)</u>		

Dominant Shrub/Understory Species
1. <u>Cercis canadensis</u> 2. <u>Juniperus virginiana</u> 3. <u>Celtis occidentalis</u>

Shrub/Understory Clutter:	High (60% +)	Moderate (30 - 60%)	Low (0 - 30%)
	<u>High (60% +)</u>		

STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): Channel Width: Stream Width:

Riparian Width right bank: left bank: Avg. Water Depth:

Other Wildlife Observed: Barred owl, indigo bunting, American bullfrog

Additional Comments: limited roosting potential



Bat Capture Datasheet

Page 1 of 1

Project Name/No.: Ridgeline/172677408 Date: 23 May 2022 Biologist(s): Zack Bach, Katherine Bronska
 Site ID: RLM-25-Smith County/State: Smith/TN Moon Phase: Last Quarter (37%) Sunset: 1950 h
 Map Kilometer No./Quad: KM-25 Latitude: 36.37562 Longitude: -86.00041 Moonrise: 0205 h Moonset: 1318 h
 General Site Description: Pipeline corridor north of Nickajack Rd. Nets Open: 1950 h Nets Closed: 0050

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	60	1	100
21:00	60	1	100
22:00	59	1	100
23:00	59	1	100
00:00	59	1	100
01:00	59	1	100

Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	6	5	30m ²	36.37553	-86.00035				✓	RAW
B	9	9.5	84.5m ²	36.37591	-86.0008				✓	RAW

* One net at full extension ~ 2.5m high

Weather Comments: _____

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	<i>Lasiurus borealis</i>	2044	A	F	NR	41.0	12.5	0	B	4.0		
2	<i>Lasiurus borealis</i>	2044	A	F	P	42.0	15.0	0	BA	3.0		
3	<i>Lasiurus borealis</i>	2119	A	F	P	42.0	14.75	0	B	6		Recapture 20 May 2022

¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to **LEFT** arm for females and **RIGHT** arm for males

Note: U (unknown) only to be used for **escaped** bats

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Bat Capture Datasheet

Page 1 of 2

Project Name/No.: Ridgeline/172677408 Date: 5/23/22 Biologist(s): Julia Wilson, Shonn Kelley
Site ID: RLM-26-Smith County/State: Smith/TN Moon Phase: Last Quarter Sunset: 19:51
Map Kilometer No./Quad: 1KM-26 Latitude: 36.377490 Longitude: -85.807344 Moonrise: 02:07 Moonset: 13:20
General Site Description: Forested ATV trail and Pipeline Corridor Nets Open: 19:51 Nets Closed: 0051

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	68.4	0	100
21:00	66.2	0	100
22:00	57.9	0	100
23:00	58.0	1	100
00:00	58.6	0	100
01:00	58.2	0	100

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments:[illegible]

f. **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

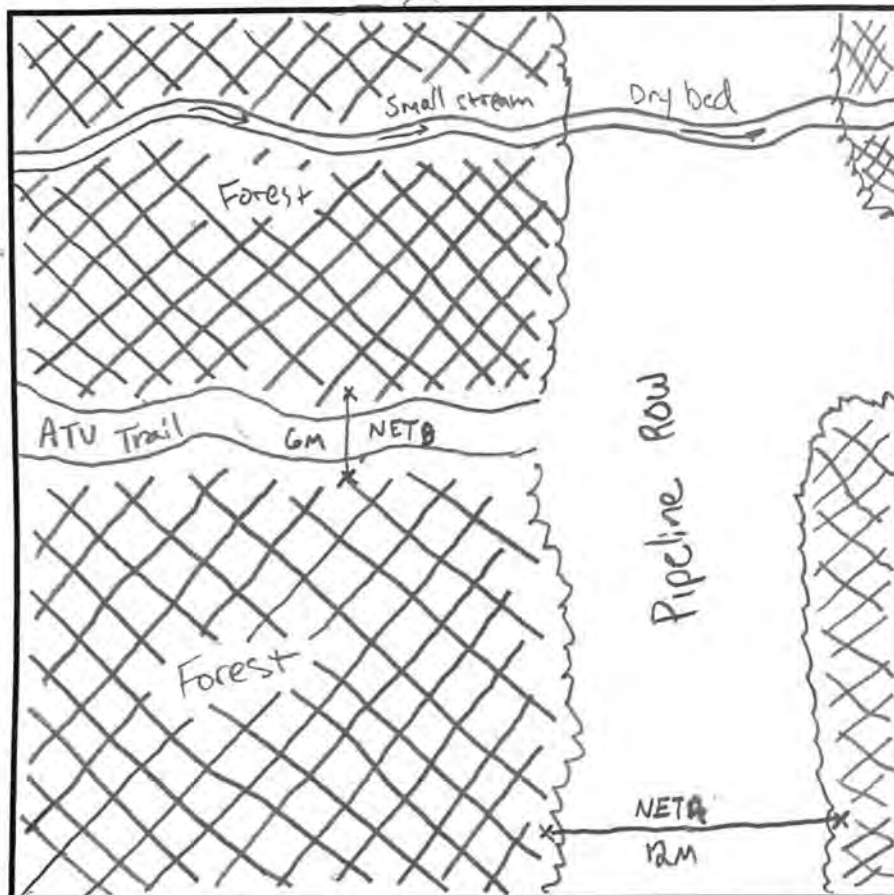
² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Project Name/No.: Bridge/172677408

Date: 5/23/22

Site ID: RLM-2B-Smith

Est. Distance to Water (ft): 50

VEGETATION

Primary Habitat Type¹: Forest & Corridors

Potential Roost: Large Trees Snags Both Other (e.g., structure)

Roost Tree Potential: High Moderate Low

Dominant Canopy Species

Avg. Canopy DBH range (in): 13

1. Ulmus americana 2. Juniperus virginiana 3. Juglans nigra

Canopy Closure:

Closed (80%+)

Moderate (40-80%)

Open (0-40%)

Dominant Subcanopy Species

Avg. Subcanopy DBH range (in): 8

1. Madia perfoliata 2. Celtis occidentalis 3. Juniperus virginiana

Sub-Canopy Clutter:

High (60%+)

Moderate (30-60%)

Low (0-30%)

Dominant Shrub/Understory Species

1. Juniperus virginiana 2. Cirsium canadense 3. Madia perfoliata

Shrub/

High (60%+)

Moderate (30-60%)

Low (0-30%)

Understory Clutter:

STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): Channel Width: Stream Width:

Riparian Width right bank: left bank: Avg. Water Depth:

Other Wildlife Observed: ESOW, INBO, WOTH, EATO, SCTA, NOFA, LOWA, YECH, PRWA, NOCA, FWPE, GOFI, BROW

Additional Comments: Large oak at crops adjacent to Net B



Bat Capture Datasheet

Page 1 of 2

Project Name/No.: Ridgeline 172677408

Date: 5/24/22

Biologist(s): Julia Wilson, Share Keller

Site ID: RLM-26-Smith

County/State: Smith / TN

Moon Phase: Last Quarter

Sunset: 19:49

Map Kilometer No./Quad: KM-26

Latitude: 36.377490

Longitude: -85.989464

Moonrise: 02:30

Moonset: 14:44

General Site Description: Forested ATV Trail and Pipeline corridor

Nets Open: 19:51

Nets Closed: 22:40

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	71.4	0	100
21:00	71.1	1	100
22:00	71.2	1	100
23:00			
00:00			
01:00			

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments:[illegible]

¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats



Bat Capture Datasheet

Page ____ of ____

Project Name/No.: 172677408/R.08elme

Date: 05/26/22

Biologist(s): Ian Burns

Site ID: RL 26 - SMITH

County/State: Smith/TN

Moon Phase: Waning Crescent

Sunset: 19.52

Map Kilometer No./Quad: 1 KM-26

Latitude: 36 37777

Longitude: -85.98943

Moonrise: 03:28

Moonset: 16.25

General Site Description: Forested Pipeline corridor & two track corridor

Nets Open: 19:52

Nets Closed: 00:52

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	66	0	0
21:00	63	0	0
22:00	59	0	0
23:00	61	0	0
00:00	61	0	100
01:00	61	0	100

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments:[illegible]

¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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Bat Capture Datasheet

Page ____ of ____

Project Name/No.: 172677408

Date: 5/23/2022

Biologist(s): L. MEADE, M. ANGEL, A. BLAIR

Site ID: RLM-27-SMITH

County/State: SMITH / TN

Moon Phase: LAST QUARTER

Sunset: 19:51

Map Kilometer No./Quad: NKMS-27 S

Latitude: 36.376157

Longitude: 85.982285

Moonrise: 2:07

Moonset: 13:20

General Site Description: PIPELINE

CORRIDOR

Nets Open: 19:51

Nets Closed: 00.51

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	61	0	90
21:00	61	0	85
22:00	59	0	85
23:00	59	0	85
00:00	59	0	85
01:00	59	0	85

[illegible]

* One net at full extension ~ 2.5m high

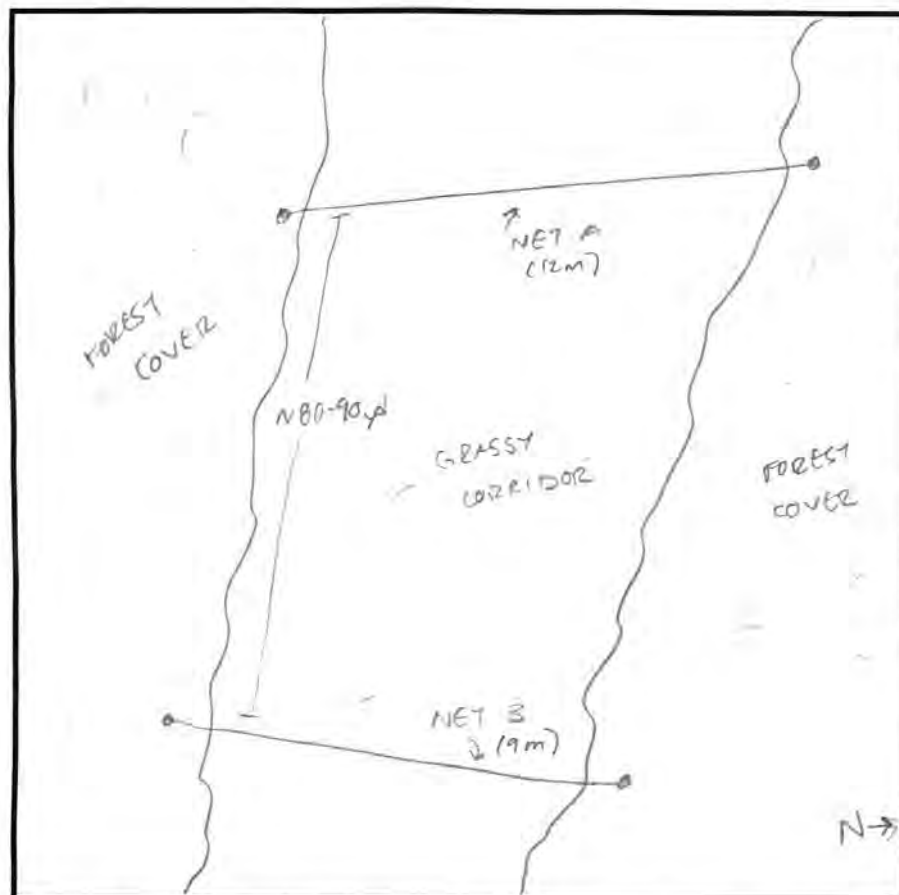
Weather Comments:[illegible]

ⁱ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats



¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Project Name/No.: 172677408 Date: 5/23/2027
Site ID: RLM-27-SMITH Est. Distance to Water (ft): 315

VEGETATION

Primary Habitat Type¹: FOREST EDGE
Potential Roost:

Large Trees	Snags	Both	Other (e.g., structure)
High	Moderate	Low	

Dominant Canopy Species Avg. Canopy DBH range (in): 12-16
1. WHITE OAK 2. MOCKERNUT HICK 3. SUGAR MAPLE

Canopy Closure:

Closed (80% +)	Moderate (40 - 80%)	Open (0 - 40%)
----------------	---------------------	----------------

Dominant Subcanopy Species Avg. Subcanopy DBH range (in): 7-10
1. SUGAR MAPLE 2. CHESTNUT OAK 3. TULIP POPLAR

Sub-Canopy Clutter:

High (60% +)	Moderate (30 - 60%)	Low (0 - 30%)
--------------	---------------------	---------------

Dominant Shrub/Understory Species
1. TULIP POPLAR 2. REDBUD 3. _____

Shrub/Understory Clutter:

High (60% +)	Moderate (30 - 60%)	Low (0 - 30%)
--------------	---------------------	---------------

STREAM CHARACTERISTICS (if relevant) N/A

Bank Height (ft): _____ Channel Width: _____ Stream Width: _____

Riparian Width right bank: _____ left bank: _____ Avg. Water Depth: _____

Other Wildlife Observed: AMERICAN TOAD, BARRED OWL

Additional Comments: _____



Bat Capture Datasheet

Page 1 of 2

Project Name/No.: 172677408 Date: 5/24/2022 Biologist(s): L. MEADE, M. ANGIEL, A. BLAIR
 Site ID: RLM-27-SMITH County/State: SMITH/TN Moon Phase: WAXING CRESCENT Sunset: 19:51
 Map Kilometer No./Quad: 0 KM-27-5 Latitude: 36.376157 Longitude: 85.982285 Moonrise: 2:36 Moonset: 14:23
 General Site Description: PIPELINE CORRIDOR Nets Open: 19:51 Nets Closed: 22:15

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	76	0	100
21:00	71	2	90
22:00	71	1	95
23:00			
00:00			
01:00			

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments:[illegible]

¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

Bat Capture Datasheet

Page 1 of 1

Project Name/No.: 172677408 Date: 26 May 2022 Biologist(s): C. Birdsall, W. Jan, E. Scheiben
 Site ID: RLM-27-SMITH County/State: SMITH/TN Moon Phase: Waning Crescent Sunset: 1951
 Map Kilometer No./Quad: N.P. KM-27 Latitude: 36.376157 Longitude: 85.982285 Moonrise: 0530 Moonset: 1625
 General Site Description: Pipeline Corridor Nets Open: 1951 Nets Closed: 0051

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	67	1	5%
21:00	62	0	0%
22:00	58	0	1%
23:00	60	0	2%
00:00	61	0	100%
01:00	62	0	95%

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments:[illegible]

¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

- Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats



Bat Capture Datasheet

Page 1 of 2

Project Name/No.: Pidolen / 172677408

Date: 23 May 2022

Biologist(s): James Kiser Chris Knabel

Site ID: RLM-28 / Top town Branch

County/State: Smith / TN

Moon Phase: Last Quarter

Sunset: 19:51

Map Kilometer No./Quad: KM-28/Carthage

Latitude: 36.37388°

Longitude: -85.96700° M

0 Moonrise: 2:07

Moonset: 13:20

General Site Description: Toxom Branch approx 200m downstream from
confluence with Richmon Branch along Store Br. Road.

Nets Open: 1940h

Nets Closed: 0040

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	59.6	1	100
21:00	60.0	1	100
22:00	59.2	0	100
23:00	56.0	1	100
00:00	59.7	1	100
01:00	59.5	1	100

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments: Today was cool (65°F) high and damp with misty ^{fair} and with hills

[illegible]

¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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Bat Capture Datasheet

Page 1 of 1

Project Name/No.: Ridgeline/172677408 Date: 24 May 2022 Biologist(s): James Kiser, Chris Knabel
 Site ID: RLM-28/Tee town Branch County/State: Smith/TN Moon Phase: Waning Crescent Sunset: 17:52
 Map Kilometer No./Quad: KM-28/Carthage Latitude: 36.37388° Longitude: -85.96700 Moonrise: 22:40 Moonset: 2:26
 General Site Description: Tee town Branch approx 200m downstream from confluence with Dickerson Branch along Stone Br. Road. Nets Open: 1930h Nets Closed: 10:45

Time	Temp (F)	Wind ¹	% Cloud Cover	Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
20:00	70.6	1	100	A	6	7.5	45m ²	36.37336	-85.96646		✓			JDK-Cell Phone @ 7:21
21:00	71.3	1	100	B	9	5.0	45m ²	36.37422	-85.96753		✓			JDK-Cell Phone @ 7:13
22:00	70.3	2	100											
23:00	RAIN	OUT	—											
00:00														
01:00														

* One net at full extension ~ 2.5m high

Weather Comments: Today's weather was Temp in mid 70's, humid, breezy with light showers around 6:00

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	<i>Lasius borealis</i>	2020	U	U	U	—	—	—	B	2	Escaped	From Net
2	<i>Nyctecicus humeralis</i>	2040	A	M	NR	34.75	9.0	0	B	1.5	—	Photos: DSC-6470-6482
3	<i>Nyctecicus humeralis</i>	↓	A	M	NR	34.75	10.0	0	B	3	—	Photos: DSC-6483-6490
4	<i>Nyctecicus humeralis</i>	2110	A	F	P	39.8	14.0	0	B	5	—	Photos: DSC-6492-6499
5	<i>Lasius borealis</i>	2120	A	F	P	—	—	0	A	3.5	—	Escaped From Net

¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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Bat Capture Datasheet

Page 1 of 1

Project Name/No.: Ridgeline/172677408

Date: 26 May 2022

Biologist(s): Josh Adams, Lucas Downs

Site ID: PLM-28/Totown Branch

County/State: Smith/TN

Moon Phase: Waning Crescent Sunset: 17:52

Map Kilometer No./Quad: KM-28/Carthage

Latitude: 36.37388° Longitude: -85.96700 Moonrise: Moonset: 16:25

General Site Description: Footwall Branch approx 200m downstream from confluence Nets Open: 1950h Nets Closed: 0052

with Dickson Branch along Stone Cr. Road.

Time	Temp (F)	Wind ¹	% Cloud Cover	Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
20:00	64.4	0	70%	A	6	7.5	45m ²	36.37336	-85.96646		✓			
21:00	64.0	0	20%	B	9	5.0	45m ²	36.37422	-85.96759		✓			
22:00	63.6	0	50%											
23:00	61.8	0	10%											
00:00	62.5	0	100%											
01:00	63.8	0	100%											

* One net at full extension ~ 2.5m high

* One net at full extension ~ 2.5m high

Weather Comments:[illegible]

¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive PG = pregnant

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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Bat Capture Datasheet

Page 1 of 3

Project Name/No.: 172677408

Date: 6/2/22

Biologist(s): Chris Krabel Mannah Staffs

Site ID: RLM-30-SMITH

County/State: Smith

Moon Phase: Waxing crescent Sunset: 1956

Map Kilometer No./Quad: 1km30

Latitude: 36.362123 Longitude: 85.952847 Moonrise: 8:36 Moonset: 2343

General Site Description: Parsons Creek with narrow riparian forest Nets Open: 750 Nets Closed: 1250

confluence of a small ephemeral creek (Net A)

Time	Temp (F)	Wind ¹	% Cloud Cover	Net ID (A, B...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
20:00	72	0	40	A	4m	1x	4	36.362003	-85.952375		X			One wgh over cluttered stream
21:00	70	0	100	B	12m	3x	36	36.362773	-85.952413		X			
22:00	68	0	100											
23:00	65	0	30											
00:00	65	0	100											
01:00														

* One net at full extension ~ 2.5m high

Weather Comments:

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	Nycticeius humeralis	2030	A	M	NR	35.5	9	0	B	1	-	Notably large penis
2	NYHU	2045	A	F	P	37	14	0	B	3	-	
3	NYHU		A	F	P	37	14	0	B	3	-	
4	NYHU		A	M	NR	35.5	10.5	0	B	3.5	-	
5	NYHU		A	F	P	37.9	14.5	0	B	4.0	-	
6	NYHU		A	F	P	35.9	12.5	0	B	4.0	-	
7	LAR		U	U	U	U	U	U	B		-	Escaped from net
8	NYHU	2100	A	F	P	37.4	15.5	0	B	2	-	
9	NYHU	2100	A	F	P	37.7	7.5	0	B	25	-	
10	LAR	2140	A	F	P	U	U	U	B	2	-	Escaped from net
11	NYHU	2150	A	M	NR	36	10	0	B	5	-	
12	NYHU	2150	A	M	NR	36	9.5	0	B	4	-	

¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph). 1 = wind direction shown by smoke (1-3 mph). 2 = wind felt on face; leaves rustle (4-7 mph). 3 = leaves, twigs in constant motion (8-12 mph). 4 = dust rises; small branches move (13-18 mph). 5 = small trees in leaf begin to sway (19-24 mph)

² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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Bat Capture Datasheet Pt. II

Page 2 of 3

Project Name/No.: 172677408

Date: 6/2/22

Biologist(s): Hannah Slaffs Christensen

Site ID: KLM-30 - SMITH

County/State: Ch. 26

[illegible]

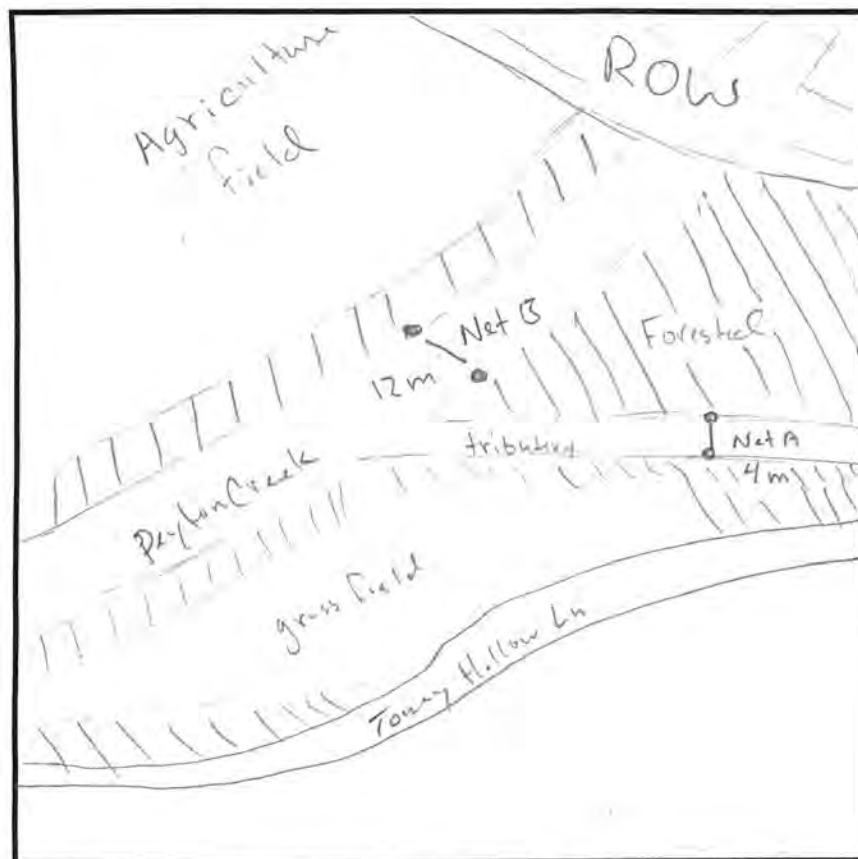
² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats.

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Project Name/No.: 172677408 Date: 6/2/2022
 Site ID: RLM-30-Smith Est. Distance to Water (ft): 0

VEGETATION

Primary Habitat Type¹: forested creek corridors w/ surrounding ag. / riparian

Potential Roost: Large Trees Snags Both Other
 (e.g., structure)

Roost Tree Potential: High Moderate Low

Dominant Canopy Species Avg. Canopy DBH range (in): 50

1. Sycamore 2. Common Hail Kberry 3. Box elder

Canopy Closure: Closed Moderate Open
 (80%+) (40-80%) (0-40%)

Dominant Subcanopy Species Avg. Subcanopy DBH range (in): 30

1. Sycamore 2. C. harkberry 3. Box elder

Sub-Canopy Clutter: High Moderate Low
 (60%+) (30-60%) (0-30%)

Dominant Shrub/Understory Species

1. Hemlock 2. Chinese Privet 3. Box elder

Shrub/Understory Clutter: High Moderate Low
 (60%+) (30-60%) (0-30%)

STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): 8 Channel Width: 14m Stream Width: 12m

Riparian Width right bank: 20ft left bank: 30ft Avg. Water Depth: 1ft

¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Other Wildlife Observed: BEKIC in net B, coles gray tree frog, blanchard's cricket frog, NOPA, INBU, GHOW, crayfish, darter, salamander, chuck-will's-widow, green frog, leopard frog, coyotes,
 Additional Comments: Greater crested flycatcher, TUII, YBLU, great horned owl, eastern bluebird, white eyed vireo, Louisiana water thrush, chuck will's widow (2), leech, skunk, flies, EATO, EAME.



Bat Capture Datasheet

Page 1 of 3

Project Name/No.: 172677408 Date: 6/3/2022 Biologist(s): Hannah Stopps Chris Kuab
 Site ID: RLM-30-Smith County/State: Smith Moon Phase: Waxing crescent Sunset: 19:54
 Map Kilometer No./Quad: KM-30 Latitude: 36.362123 Longitude: 85.952847 Moonrise: 8:34 Moonset: 23:43
 General Site Description: creek w/ riparian edge w/ surrounding ag fields Nets Open: 7:50 Nets Closed: 00:50

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00		0	5
21:00	59	0	5
22:00	57	1	0
23:00	55	0	0
00:00	54	0	10
01:00	53	0	10

Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	4m	2x	36ft ²	36.362003	85.952375		X			on field maps, removed clipper to
B	12m	3x	208ft ²	36.362073	-25.95243		X			on field maps fit additional net after 6/2/22.

* One net at full extension ~ 2.5m high

Weather Comments: Calm, little to no clouds

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	<i>Lasiorus borealis</i>	2032	A	F	L	42	9.75	0	B	5.0	—	
2	<i>Lasiorus borealis</i>	2045	A	F	NR	39	9.5	0	B	5.0	—	
3	<i>Lasiorus borealis</i>	2050	A	F	NR	41	10.5	0	B	6.0	—	
4	<i>Nycticeius humeralis</i>	2100	A	F	P	39.2	15.9	0	B	5	—	
5	<i>Nycticeius humeralis</i>	2100	A	M	TD	36.0	9.5	0	B	5	—	
6	<i>Nycticeius humeralis</i>	2115	A	F	P	38.0	15.0	0	B	7.5	—	
7	<i>Nycticeius humeralis</i>	2130	A	F	P	37.6	14.9	0	B	5.5	—	
8	<i>Lasiorus borealis</i>	2150	A	F	P	44	16.0	0	B	4	—	
9	<i>Lasiorus borealis</i>	2206	A	F	P	42.3	17.2	0	B	7.5	—	heavy - photo - very Preg
10	<i>Nycticeius humeralis</i>	2215	A	M	NR	36.6	9.0	0	B	5	—	
11	<i>Lasiorus borealis</i>	2235	A	F	P	41.7	18.0	0	B	6	—	
12	<i>Lasiorus borealis</i>	2305	A	F	P	40.5	16.0	0	B	6.5	—	

¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for escaped bats

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Bat Capture Datasheet Pt. II

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Project Name/No.: 172677408

Date: 6/3/2022

Biologist(s): Chambliss, H. Stoff

Site ID: RLM-30-Smith

County/State: Smith/TN

[illegible]

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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Bat Capture Datasheet

Page 1 of 43

Project Name/No.: A-bylive 172677408

Date: 05/29/82

Biologist(s): Joshua Adams, Lucas Downs

Site ID: RLM-31-Smith

County/State: Smith/TN

Moon Phase: Waning Crescent

Sunset: 19:54

Map Kilometer No./Quad: KM-31

Latitude: 36.362979°N

Longitude: 85.94083°W

Moonrise: 04:59

Moonset: 19:27

General Site Description: Ridge top pond + access road.

Nets Open: 19:50

Nets Closed: 00:55

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	77.0	11	15
21:00	72.6	0	10
22:00	70.3	0	0
23:00	68.8	1	0
00:00	70.1	0	0
01:00	68.5	1	0

Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	6	5		36.36304	-85.94082					
B	6	5		36.36304	-85.94082			X		
A	15	7.5		36.36335	-85.9389	X				

* One net at full extension ~ 2.5m high

Weather Comments: _____

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	P.FA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	<i>L. borealis</i>	2025	A	F	NR	41	14.25	0	B	.5		
2	<i>N. humeralis</i>	2033	A	M	NR	33	8.0	0	A	5		
3	<i>N. humeralis</i>	2105	A	M	NR	32	10.5	0	B	.5		
4	<i>L. borealis</i>	2105	A	F	PG	41	17.25	0	A	5		
5	<i>L. borealis</i> <i>N. humeralis</i>	2105	A	F	PG	35	13.5	0	A	5		
6	<i>L. borealis</i>	2120	A	F	PG	41	18.5	0	A	5		
7	<i>L. borealis</i>	2140	A	F	PG	-	-	0	B	.1		Released in net
8	<i>L. borealis</i>	2140	A	F	PG	40	17.0	0	B	.1		
9	<i>N. humeralis</i>	2140	A	F	PG	36	-	0	B	1		
10	<i>N. humeralis</i>	2140	A	F	PG	34	12.5	0	B	1		
11	<i>N. humeralis</i>	2145	A	F	PG	34	15.0	0	A	1.5		
12	<i>N. humeralis</i>	2145	A	F	PG	34	15.0	0	A	1.5		

¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

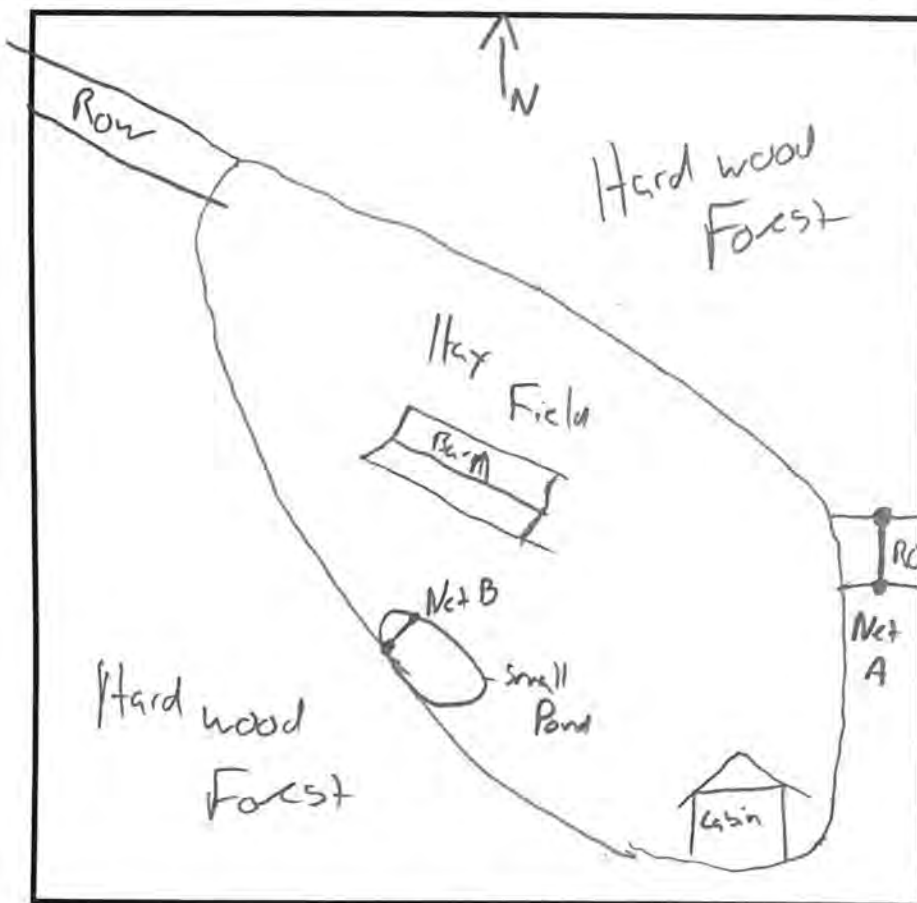
² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive PG = pregnant

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Project Name/No.: RTG 27408 Date: 30 May 22

Site ID: RM-SI-SMPT4 Est. Distance to Water (ft): 0

VEGETATION

Primary Habitat Type¹: Upland Forest

Potential Roost: Large Trees | Snags | Both | Other (e.g. structure)

Roost Tree Potential: High | Moderate | Low

Dominant Canopy Species Avg. Canopy DBH range (in): 6-14

1. J. nigra 2. P. occidentalis 3. _____

Canopy Closure: Closed (80%+) | Moderate (40-80%) | Open (0-40%)

Dominant Subcanopy Species Not Present Avg. Subcanopy DBH range (in): _____

1. _____ 2. _____ 3. _____

Sub-Canopy Clutter: High (60%+) | Moderate (30-60%) | Low (0-30%)

Dominant Shrub/Understory Species Not Present

1. _____ 2. _____ 3. _____

Shrub/Understory Clutter: High (60%+) | Moderate (30-60%) | Low (0-30%)

STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): _____ Channel Width: _____ Stream Width: _____

Riparian Width right bank: _____ left bank: _____ Avg. Water Depth: _____

Other Wildlife Observed: White tailed deer, chimney swift

Additional Comments: _____



Bat Capture Datasheet Pt. II

Page 23 of 23

Project Name/No.: Ridgepole 172677408

Date: 05/29/22

Biologist(s): Joshua Adams, Lucas Downs

Site ID: RLM-231-Smith

County/State: Smith/TN

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (samples taken, transmitter #, if recap, disposition)
13	N. humeralis	2201	A	F	PG	37	15.0	0	B	2		
14	E. fuscus	2210	A	F	PG	49	33.0	0	A	4		
15	N. humeralis	2225	A	F	PG	37	16.25	0	B	2		
16	N. humeralis	2225	A	F	PG	33	—	0	A	3		
17	N. humeralis	2225	A	F	PG	35	16.25	0	A	3		
18	N. humeralis	2225	A	F	PG	32	—	0	A	3		
19	L. borealis	2225	A	F	NR	37	15.25	0	A	3		
20	E. fuscus	2235	A	F	NR	44	24.5	0	A	3		
21	E. fuscus	2235	A	M	NR	42	16.5	0	A	3		
22	N. humeralis	2315	A	F	PG	36	13.0	0	A	3		
23	L. borealis	2315	A	M	NR	35	10.5	0	A	3		
24	N. humeralis	2315	A	F	PG	34	14.25	0	A	3		
25	N. humeralis	2325	A	F	PG	35	16.0	0	A	3		
26	N. humeralis	2325	A	F	PG	34	14.5	0	B	15		
27	N. humeralis	2325	A	F	PG	34	—	0	B	15		
28	L. borealis	2345	A	F	NR	40	15.0	0	B	15		
29	M. grisescens	2345	A	F	PG	39	14.5	0	A	5		TWRA-A04463
30	L. borealis	0030	A	M	NR	38	10.25	0	B	1		
31	N. humeralis	0045	A	F	PG	36	14.25	0	B	5		
32	L. borealis	0055	A	M	NR	37	12.25	0	A	1		
33	N. humeralis	0055	A	F	PG	35	15.25	0	B	1		

² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive PG = pregnant

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for escaped bats

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Bat Capture Datasheet

Page 1 of 2

Project Name/No.: Ridgeline 17267408 Date: 05/30/22 Biologist(s): Joshua Adams, Lucas Darrs
 Site ID: RLM-31-Smith County/State: Smith/TN Moon Phase: New Moon Sunset: 1955
 Map Kilometer No./Quad: KM-31 Latitude: 36.362979°N Longitude: -85.939683°W Moonrise: 0526 Moonset: 2026
 General Site Description: Ridgeline Pond + access road Nets Open: 1950 Nets Closed: 0055

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	79.8	1	0
21:00	77.3	1	0
22:00	74.2	1	0
23:00	73.5	1	0
00:00	73.9	1	0
01:00	74.0	2	0

Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	15	2.5		36.36335	-85.93897	X				
B	6	5		36.36304	-85.94032			X		

* One net at full extension - 2.5m high

Weather Comments: meteor shower Warm and clear most of day

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	<i>L. borealis</i>	2055	A	F	P ₃	41	16.25	0	B	1.5	—	
2	<i>N. humeralis</i>	2055	A	M	NR	34	10.5	0	B	1.5	—	
3	<i>L. borealis</i>	2055	A	F	—	—	—	—	B	.5	—	Escaped Net
4	<i>N. humeralis</i>	2105	A	F	P ₃	38	16.75	0	B	2.5	—	
5	<i>N. humeralis</i>	2105	A	F	P ₃	34	15.75	0	B	2.5	—	
6	<i>N. humeralis</i>	2100	A	M	NR	32	9.0	0	B	3.0	—	
7	<i>N. humeralis</i>	2155	A	M	NR	35	10.25	0	B	2	—	
8	<i>N. humeralis</i>	2205	A	M	NR	37	11.0	0	B	1	—	
9	<i>N. humeralis</i>	2240	A	F	P ₃	35	15.5	0	A	5	—	
10	<i>N. humeralis</i>	2255	A	RF F	P ₃	36	10.5 16.25	0	A	3	—	
11	<i>N. humeralis</i>	2255	A	M	NR	34	8.5	0	A	.5	—	
12	<i>N. humeralis</i>	2350	A	F	P ₃	36	13.75	0	B	5	—	

¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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Bat Capture Datasheet Pt. II

Page 2 of 2

Project Name/No.: Ridge/line 172677408

Date: 05/30/22

Biologist(s): Dshon Adams, Lucas Laws

Site ID: RLM-31-Smith

County/State: Smith TN

[illegible]

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

- * Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

Confidential Data. If found, please return to:

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Bat Capture Datasheet

Page 1 of 2Project Name/No.: 172677468Date: 05/29/22Biologist(s): J. Buio M. AlexanderSite ID: RLM-32-Sm. thCounty/State: Sm. th TNMoon Phase: Waning CrescentSunset: 1954Map Kilometer No./Quad: 1 KM-32Latitude: 36.36024Longitude: -85.93241Moonrise: 0451Moonset: 1927General Site Description: Rd atop P. R. Corridor / Road.Nets Open: 1954Nets Closed: 0054

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	75	0	0
21:00	72	0	0
22:00	70	0	0
23:00	68	0	0
00:00	68	0	0
01:00	68	0	0

Net ID (A, B,.)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	12	5.2	62.4	36.359322	-85.930973	✓				
B	9	5.2	46.8	36.360210	-85.932451	✓				

* One net at full extension ~ 2.5m high

Weather Comments: _____

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* # TWRA	Comments (e.g., samples taken, transmitter #, disposition)
1	LABO	2055	A	F	P	40	16.15	0	B	1.5		
2	NYHU	2105	A	M	NR	35	9.25	0	A	1		
3	NYHU	2105	A	M	NR	38	10.75	0	A	2.5		
4	LABO	2105	A	F	P	40	15.5	0	A	2.5		
5	LABO	2155	A	M	NR	40	10.25	0	A	2		
6	NYHU	2235	A	M	NR	37	9.25	0	A	2		
7	NYHU	2250	A	M	NR	38	9.25	0	B	4.5		
8	NYHU	2255	A	M	NR	36	9	0	A	4.5		
9	NYHU	2335	A	M	NR	36	7.75	0	A	4.5		
10	NYHU	0005	A	M	NR	36	8.75	0	B	2		
11	MYGR	0005	A	F	P	45	10.75	0	B	1.5	08583	mites on wings
12	NYHU	0025	A	M	NR	36	9.5	0	A	5		

¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph). 1 = wind direction shown by smoke (1-3 mph). 2 = wind felt on face; leaves rustle (4-7 mph). 3 = leaves, twigs in constant motion (8-12 mph). 4 = dust rises; small branches move (13-18 mph). 5 = small trees in leaf begin to sway (19-24 mph)

² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

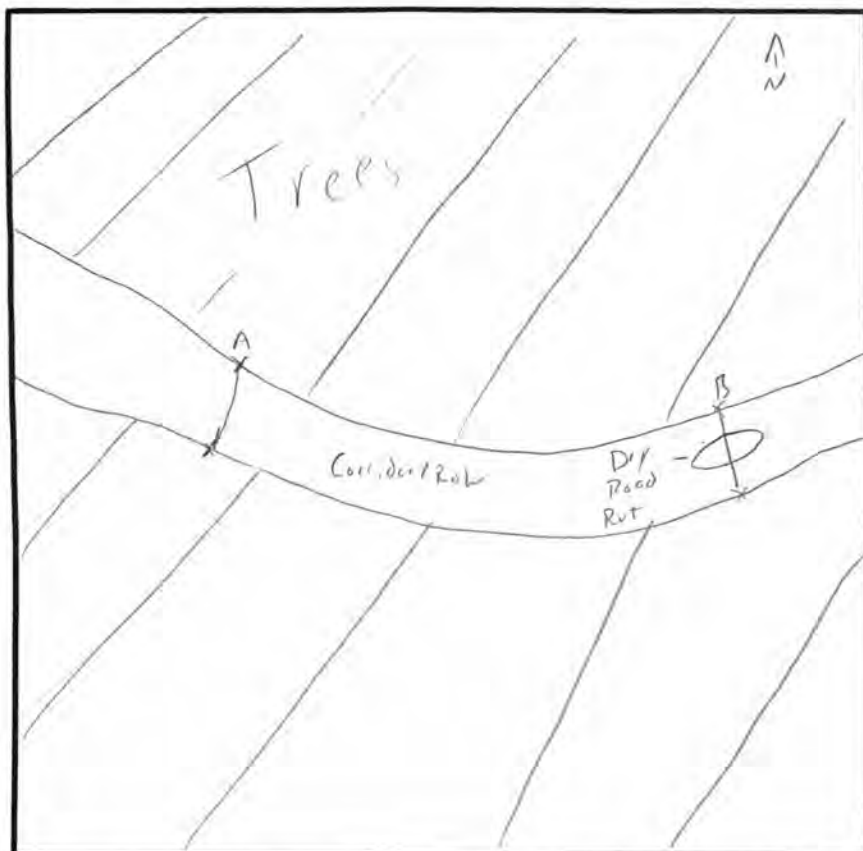
* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for escaped bats

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Net Site Description

Page ____ of ____



Project Name/No.: 172677408

Date: 05/29/22

Site ID: RLM-32-Smth

Est. Distance to Water (ft): 2000

VEGETATION

Primary Habitat Type¹: Upland Forest

Potential Roost: Large Trees | Snags | Both | Other (e.g., structure)

Roost Tree Potential: High | Moderate | Low

Dominant Canopy Species

Avg. Canopy DBH range (in):

1. Acet. rubrum 2. Quercus rubra 3. Liriodendron tulipifera

Canopy Closure: Closed (80%+) | Moderate (40-80%) | Open (0-40%)

Dominant Subcanopy Species

Avg. Subcanopy DBH range (in):

1. Acet. rubrum 2. Fagus sylvatica 3. Ailanthus altissima

Sub-Canopy Clutter: High (60%+) | Moderate (30-60%) | Low (0-30%)

Dominant Shrub/Understory Species

1. Cercis canadensis 2. Picus scabellus 3. Ailanthus altissima

Shrub/Understory Clutter: High (60%+) | Moderate (30-60%) | Low (0-30%)

STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): NA Channel Width: NA Stream Width: NA

Riparian Width right bank: NA left bank: NA Avg. Water Depth: NA
¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Other Wildlife Observed:

Additional Comments:



Bat Capture Datasheet

Page of

Project Name/No.: 172677408

Date: 05/30/22

Biologist(s): J. Burns / M. Alexander

Site ID: RLM-32-Smith

County/State: San Joaquin

Moon Phase: New moon

Sunset: 1954

Map Kilometer No./Quad: 10. KM -32

Latitude: 36 36 02 N

Longitude: -85.93241

Moonrise: 0525

Moonset: 7:26

General Site Description: Same as 05/29/22

PIPELINE CORRIDOR / ROAD

Nets Open: 1984

Nets Closed: 0054

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	79	0	0
21:00	75	0	0
22:00	75	0	0
23:00	73	0	0
00:00	73	0	0
01:00	72	0	0

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments:[illegible]

Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

* Apply band to left arm for females and right arm for males.

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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Bat Capture Datasheet

Page ____ of ____

Project Name/No.: Ridgeline 172677408

Date: 29 May 2022

Biologist(s): C. Birdsall, W. Jan, E. Scheibman

Site ID: RML-33-Smith

County/State: Smith TN

Moon Phase: Waning Crescent Sunset: 1954

Map Kilometer No./Quad: 43 20 KM-335

Latitude: 36.358815 Longitude: -85.927276 Moonrise: 0451 Moonset: 1927

General Site Description: ROW East of Friendship Hollow Rd S Nets Open: 1954 Nets Closed: 0054

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	77	0	0
21:00	75	0	0
22:00	70	0	0
23:00	68	0	0
00:00	68	0	0
01:00	68	0	0

[illegible]

* One net at full extension ~ 2.5m high

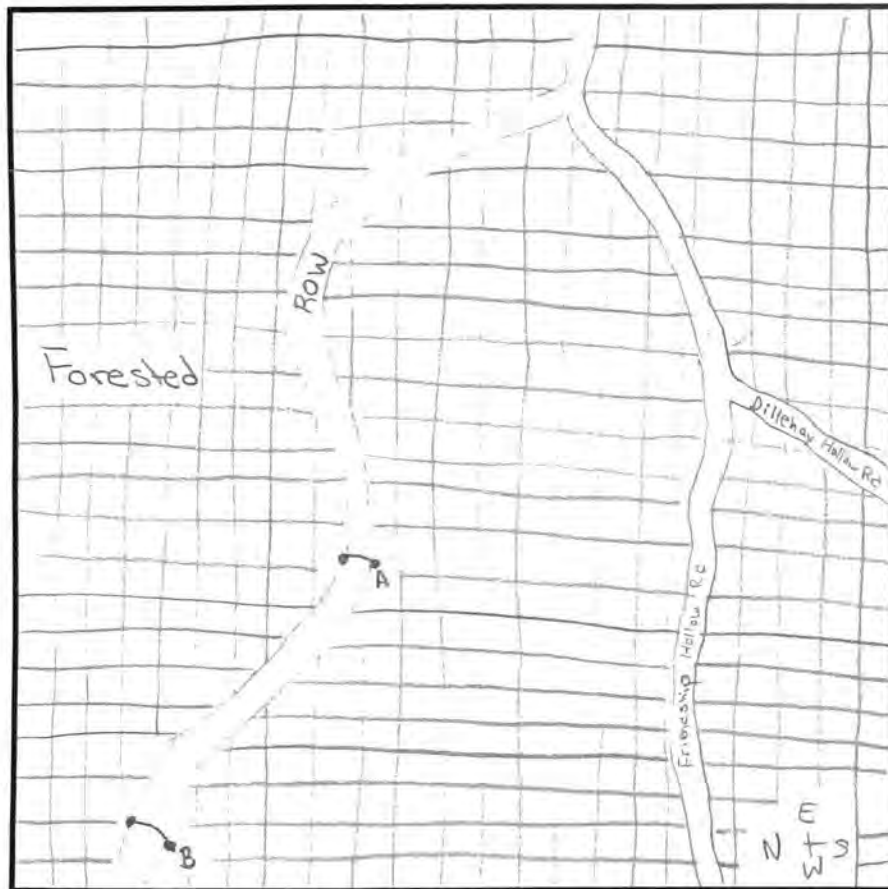
Weather Comments:[illegible]

¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats



Project Name/No.: Ridgely/122677408 Date: 29 May 2022
 Site ID: RML-33-Smith Est. Distance to Water (ft): 10560ft
 ↳ Cordell Hull Reservoir

VEGETATION

Primary Habitat Type¹: UPLAND FOREST
 Potential Roost: Large Trees | Snags | Both | Other (e.g., structure)
 Roost Tree Potential: High | Moderate | Low

Dominant Canopy Species Avg. Canopy DBH range (in):
 1. L. tulipifera 2. Acer rubrum 3. _____

Canopy Closure: Closed (80%+) | Moderate (40-80%) | Open (0-40%)

Dominant Subcanopy Species Avg. Subcanopy DBH range (in):
 1. S. albidum 2. U. americana 3. _____

Sub-Canopy Clutter: High (60%+) | Moderate (30-60%) | Low (0-30%)

Dominant Shrub/Understory Species
 1. _____ 2. _____ 3. _____

Shrub/Understory Clutter: High (60%+) | Moderate (30-60%) | Low (0-30%)

STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): _____ Channel Width: _____ Stream Width: _____
 Riparian Width right bank: _____ left bank: _____ Avg. Water Depth: _____

¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Other Wildlife Observed: _____

Additional Comments: _____

Bat Capture Datasheet

Page ____ of ____

Project Name/No.: Ridaxline/172677408

Date: 30 May 2022

Biologist(s): C. Birdsall, W. Jan, E. Scheiban

Site ID: RML-33-Smith

County/State: Smith/TN

Moon Phase: New Moon

Sunset: 1954

Map Kilometer No./Quad: KM-33

Latitude: 36.358315 Longitude: 121.851111

Longitude: -85.927276 Moonrise: 0525

Moonset: 2026

General Site Description: Row East of Friendship Hollow Rd S

Nets Open: 1954

Nets Closed: 1054

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	78	0	0
21:00	75	0	0
22:00	74	0	0
23:00	73	0	0
00:00	70	0	0
01:00	69	0	0

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments:[illegible]

¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats



Bat Capture Datasheet

Page ____ of ____

Project Name/No.: 172677488

Date: 05/31/2022

Biologist(s): I. Burns, W. Jan

Site ID: PLM-34-S₁16

County/State: Smith/Tn

Moon Phase: Waxing Crescent **Sunset:** 1955

Map Kilometer No./Quad: 1 KM-34

Latitude: 36.364282 Longitude: -85.923286 Moonrise: 0609 Moonset: 2127

Longitude: -85.923286

Moonrise: 0604

Moonset: 2123

General Site Description: Upland Forested Phelma Road Driveway Nets Open: 1955 Nets Closed: 2055

Nets Open: 1955

Nets Closed: 0055

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	81	0	0
21:00	72	0	0
22:00	70	0	0
23:00	68	0	0
00:00	68	0	0
01:00	68	0	0

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments:

[illegible]

¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph). 1 = wind direction shown by smoke (1-3 mph). 2 = wind felt on face; leaves rustle (4-7 mph). 3 = leaves, twigs in constant motion (8-12 mph). 4 = dust rises; small branches move (13-18 mph). 5 = small trees in leaf begin to sway (19-24 mph).

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: ID = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

Net Site Description

Page ___ of ___

Project Name/No.: 172677408 Date: 05/31/2022
 Site ID: RLM-34-SMITH Est. Distance to Water (ft): _____

VEGETATION

Primary Habitat Type¹: Upland Forest
 Potential Roost: Large Trees | Snags | Both | Other (e.g., structure)
 Roost Tree Potential: High | Moderate | Low

Dominant Canopy Species Avg. Canopy DBH range (in): 18
 1. Liriodendron tulipifera 2. Acer rubrum 3. Robinia pseudoacacia

Canopy Closure: Closed (80%+) | Moderate (40-80%) | Open (0-40%)

Dominant Subcanopy Species Avg. Subcanopy DBH range (in): 12
 1. Celtis occidentalis 2. Liriodendron tulipifera 3. Ailanthus altissima

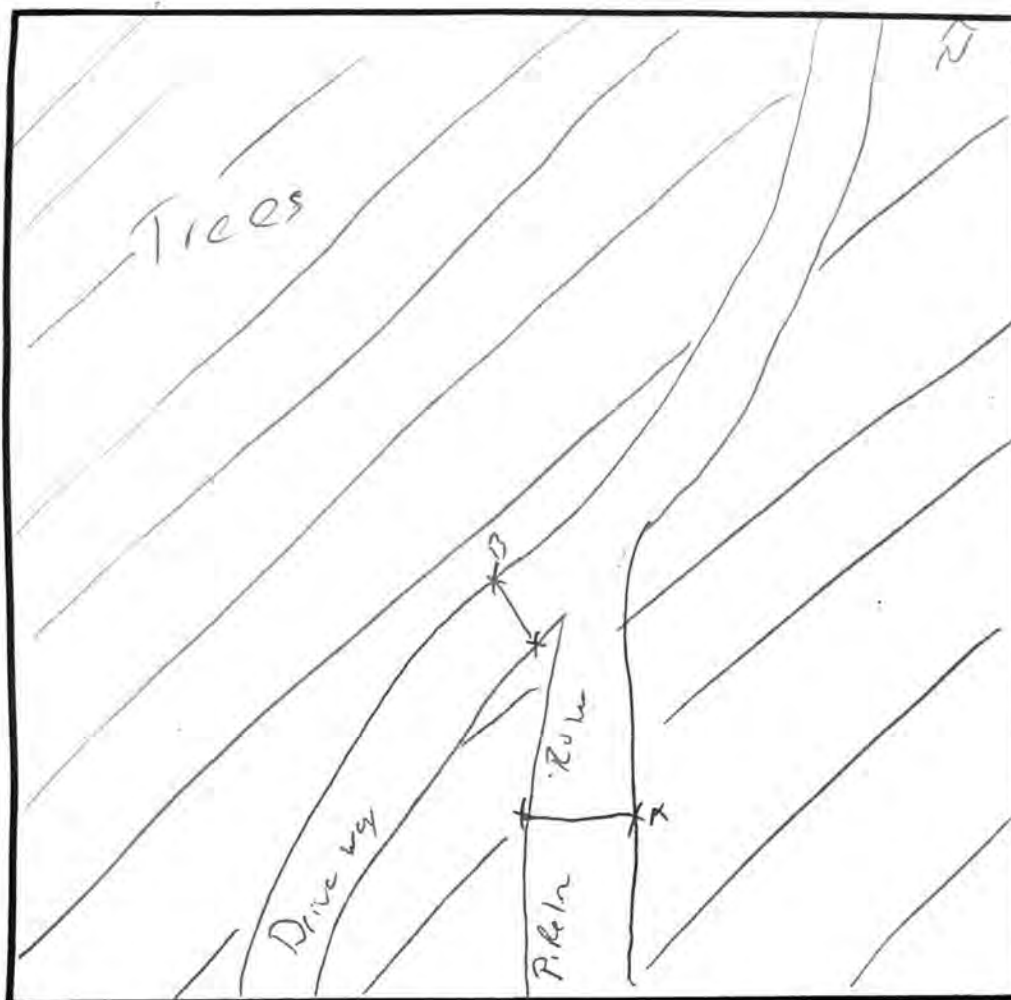
Sub-Canopy Clutter: High (60%+) | Moderate (30-60%) | Low (0-30%)

Dominant Shrub/Understory Species
 1. Ailanthus altissima 2. Cercis canadensis 3. _____

Shrub/Understory Clutter: High (60%+) | Moderate (30-60%) | Low (0-30%)

STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): N/A Channel Width: N/A Stream Width: N/A
 Riparian Width right bank: N/A left bank: N/A Avg. Water Depth: N/A



¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Other Wildlife Observed: _____

Additional Comments: _____



Bat Capture Datasheet

Page ____ of ____

Project Name/No.: 172677408 Date: 06/01/2022 Biologist(s): T. Burns, W. Jan
 Site ID: RLM-34-Smith County/State: Smith, TN Moon Phase: Waxing Crescent Sunset: 1956
 Map Kilometer No./Quad: 192 KM 434.65 Latitude: 36.364282 Longitude: -85.973286 Moonrise: 0650 Moonset: 2215
 General Site Description: Same as 05/31/2022 UPLAND FORESTED Nets Open: 1956 Nets Closed: 0056

PIPELINE ROW & DRIVEWAY

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	78	0	0
21:00	73	0	0
22:00	73	2	60
23:00	72	1	0
00:00	72	0	0
01:00	72	1	0

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments: Rain expected tomorrow 06/09/2022

[illegible]

¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats



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Bat Capture Datasheet

Page ____ of ____

Project Name/No.: Ridgevine / 172677408

Date: 31 May 2022

Biologist(s): C. Birdsall, M. Alexander, E. Scheibman

Site ID: RLM-35-Smith

County/State: Smith / TN

Moon Phase: Waxing Crescent Sunset: 1955

Map Kilometer No./Quad: 21.8 KM-35

Latitude: 36.355427 Longitude: -85.90821 Moonrise: 0604 Moonset: 2123

General Site Description: South of Dillehay hollow Rd / on Dillehay Branch Nets Open: 1955 Nets Closed: 0055

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	75	0	0
21:00	70	0	0
22:00	68	0	0
23:00	67	0	0
00:00	66	0	0
01:00	65	0	0

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments: Surface of Dike had hollow below Rd on Dike Phase Branch & Creek

[illegible]

¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats



Project Name/No.: Ridgeway/17267108 Date: 31 May 2022
 Site ID: RLM-33-Smith Est. Distance to Water (ft): 0 ft

VEGETATION

Primary Habitat Type¹: Creek/riparian

Potential Roost: Large Trees Snags Both Other (e.g., structure)

Roost Tree Potential: High Moderate Low

Dominant Canopy Species Avg. Canopy DBH range (in): 15

1. Coryna tomentosa 2. Luniperus virginiana 3. _____

Canopy Closure: Closed (80%+) Moderate (40-80%) Open (0-40%)

Dominant Subcanopy Species Avg. Subcanopy DBH range (in): 11

1. Carpinus caroliniana 3. _____

Sub-Canopy Clutter: High (60%+) Moderate (30-60%) Low (0-30%)

Dominant Shrub/Understory Species N/A

1. _____ 2. _____ 3. _____

Shrub/Understory Clutter: High (60%+) Moderate (30-60%) Low (0-30%)

STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): 1.5 Channel Width: 4 m Stream Width: 2.5 m

Riparian Width right bank: _____ left bank: _____ Avg. Water Depth: 2-3 inch

¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Other Wildlife Observed: _____

Additional Comments: _____



Bat Capture Datasheet

Page ___ of ___

Project Name/No.: Ridgeline/1721077408 Date: 01 June 2022 Biologist(s): C. Birdsell, M. Alexander, E. Scheiban
 Site ID: PLM-35-Smith County/State: Smith/TN Moon Phase: Waxing moon Sunset: 1956
 Map Kilometer No./Quad: 218KM435 Latitude: 36.355427 Longitude: -85.90821 Moonrise: 0650 Moonset: 2215
 General Site Description: South of Dillehay hollow Rd on Dillehay Branch Nets Open: 1956 Nets Closed: 0056
Creek

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	75	0	0
21:00	70	0	0
22:00	70	0	0
23:00	69	0	0
00:00	68	0	0
01:00	68	0	0

Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	6	5.2	31.2	36.355798	-85.908311				corner	
B	4	5.2	20.8	36.355208	-85.908533		✓			

* One net at full extension ~ 2.5m high

Weather Comments: _____

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	LABO	2045	A	M	nr	41	12.25	0	A	1.5		
2	LABO	2100	A	U	U	-	-	-	A	-		Escaped
3	LABO	2120	A	U	U	-	-	-	A	-		Escaped
4	LABO	2150	A	M	nr	37	10.75	0	A	4.5		

¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph). 1 = wind direction shown by smoke (1-3 mph). 2 = wind felt on face; leaves rustle (4-7 mph). 3 = leaves, twigs in constant motion (8-12 mph). 4 = dust rises; small branches move (13-18 mph). 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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Bat Capture Datasheet

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Project Name/No.: Digeline 17267408

Date: 5/31/88

Biologist(s): Joshua Adams, Lucas Owens, Chris Kunkel

Site ID: RLN-37-Smith

County/State: Smith/TN

Moon Phase: Waxing Crescent Sunset: 1955

Map Kilometer No./Quad: KM 37

Latitude: 36.353240 N Longitude: 85.892574 W Moonrise: 0605 Moonset: 2124

General Site Description: Defatted creek along pinewood LN through Row Nets Open: 1950 Nets Closed: 00:50

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	79.3	0	0
21:00	71.5	0	0
22:00	71.2	0	0
23:00	69.7	0	0
00:00	66.4	0	0
01:00	65.9	0	0

Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	9	5		36.353240	-85.892574		X			
B	9	5		36.353240	-85.892574		X			

* One net at full extension - 2.5m high

Weather Comments:

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1.	<i>L. borealis</i>	2040	A	M	NR	39	13.0	0	B	2.5		
2.	<i>L. borealis</i>	2042	A	F	PG	40	16.5	0	B	.1		
3.	<i>M. grisescens</i>	2145	A	M	NR	44	12.0	0	B	.5	TWRA-10129	
4.	<i>M. grisescens</i>	2245	A	F	PG	43	16.5	0	A	4	TWRA-10128	
5.	<i>M. grisescens</i>	2320	A	F	NR	44	12.5	0	B	1	TWRA-10127	
6.	<i>M. grisescens</i>	0033	A	F	PG	43	14.5	0	A	.5	TWRA-10125	

¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

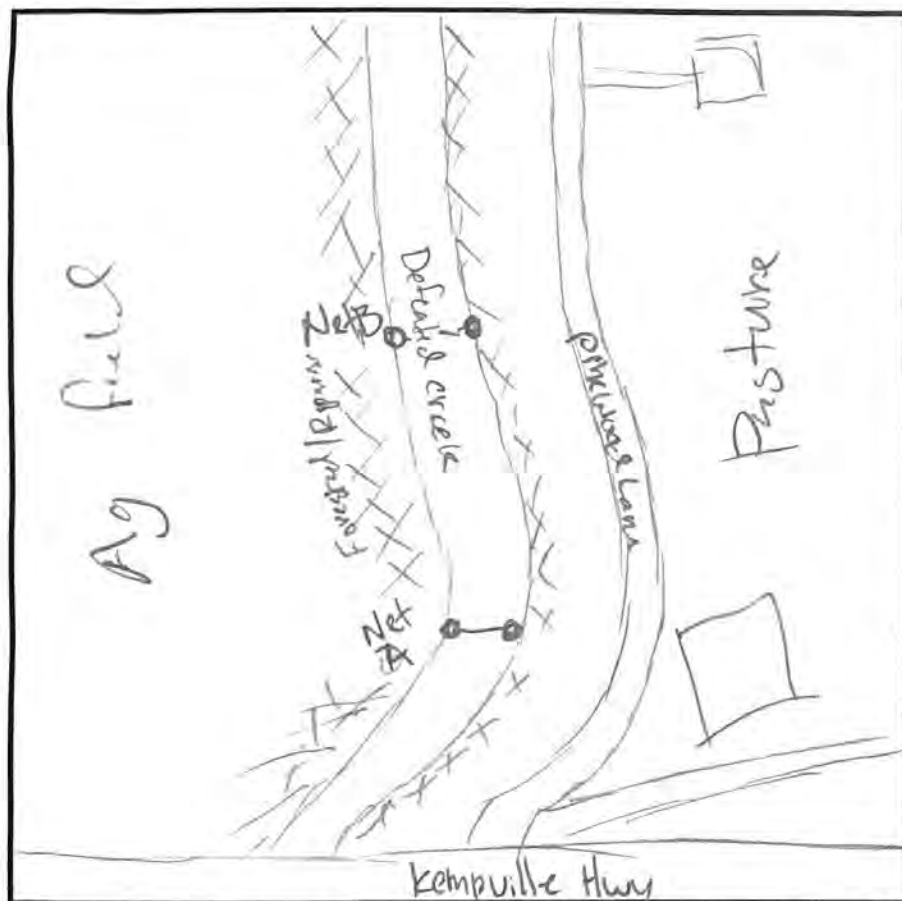
² For **females:** L = lactating, PL = post-lactating, NR = non-reproductive; for **males:** TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped bats**

PG = pregnant TWRA-10127 - lost band

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Project Name/No.: 172677408 Date: 10/1/22
 Site ID: RLM-37-smith Est. Distance to Water (ft): 0

VEGETATION

Primary Habitat Type¹: mixed deciduous
 Potential Roost:

Large Trees	Snags	Both	Other (e.g., structure)
High	Moderate	Low	

 Roost Tree Potential:

High	Moderate	Low
------	----------	-----

Dominant Canopy Species 1. Acer saccharinum 2. Robinia pseudoacacia 3. Ulmus americana A. N. y. n. d.
 Avg. Canopy DBH range (in): 40

Canopy Closure:

Closed (80% +)	Moderate (40 - 80%)	Open (0 - 40%)
----------------	---------------------	----------------

Dominant Subcanopy Species 1. Acer saccharinum 2. Black Locust 3. Acer rubrum
 Avg. Subcanopy DBH range (in): 20

Sub-Canopy Clutter:

High (60% +)	Moderate (30 - 60%)	Low (0 - 30%)
--------------	---------------------	---------------

Dominant Shrub/Understory Species 1. 2. 3.

Shrub/Understory Clutter:

High (60% +)	Moderate (30 - 60%)	Low (0 - 30%)
--------------	---------------------	---------------

STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): 6 Channel Width: 9m Stream Width: 12m
 Riparian Width right bank: 6ft left bank: 12ft Avg. Water Depth: 1-2 ft

¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Other Wildlife Observed: _____

Additional Comments: _____



Bat Capture Datasheet

Page 1 of 2

Project Name/No.: 172677408

Date: 6/1/2022

Biologist(s): Chris Knobel, Hannah Stoff

Site ID: RLM-37-Smith

County/State: Smith Co.

Moon Phase: Waxing Crescent

Sunset: 1955

Map Kilometer No./Quad: LM 37

Latitude: 36353240N

Longitude: 85.892574N Moonrise: 01005

Moonset: 2124

General Site Description: on detached Creek, Along Road

Nets Open: 1950

Nets Closed: 00:56

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00			
21:00		0	5%
22:00		0	50%
23:00		0	10%
00:00		0	0%
01:00	-	-	-

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments:[illegible]

i. **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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Bat Capture Datasheet

Page 1 of 2

Project Name/No.: RidacLine/172677408 Date: 2 June 2022 Biologist(s): C. Birdsall, M. Alexander, E. Scheiban

Site ID: RLM-40-smith County/State: Smith/TN Moon Phase: Waxing Crescent Sunset: 1956

Map Kilometer No./Quad: 4KM-40 Latitude: 36.350912 Longitude: -85.859391 Moonrise: 1741 Moonset: 2302

General Site Description: On road off of Padgett Ln / forested corridor Nets Open: 1956 Nets Closed: 2056

behind pond.

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	75	0	0
21:00	71	0	0
22:00	67	0	0
23:00	65	0	0
00:00	63	0	0
01:00	63	0	0

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments:[illegible]

¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

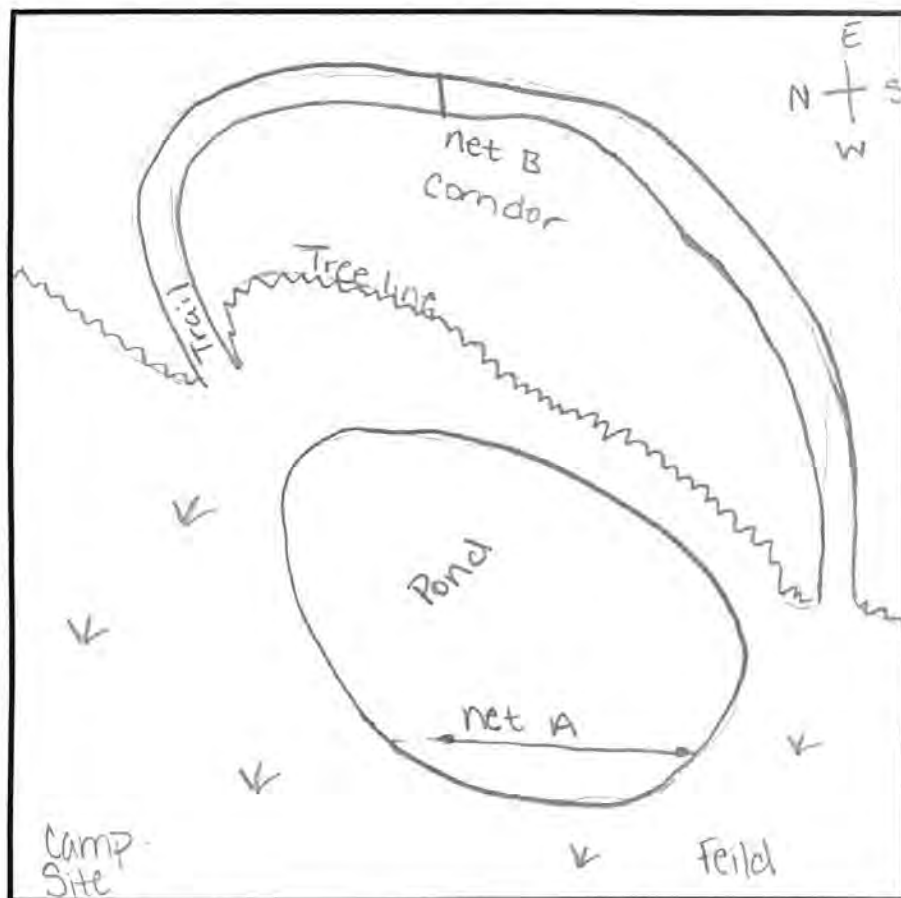
² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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Project Name/No.: RidgeLine 11726746 Date: 2 June 2022
 Site ID: RLM-40-Sm. Th Est. Distance to Water (ft): 0 ft

VEGETATION

Primary Habitat Type¹: Pond / Bottomland Forest
 Potential Roost: Large Trees Snags Both Other (e.g., structure)

Roost Tree Potential: High Moderate Low

Dominant Canopy Species Avg. Canopy DBH range (in):
 1. L. styraciflua 2. T. virginiana 3. _____

Canopy Closure: Closed (80%+) Moderate (40-80%) Open (0-40%)

Dominant Subcanopy Species Avg. Subcanopy DBH range (in):
 1. P. caroliniana 2. B. pseudoacacia 3. _____

Sub-Canopy Clutter: High (60%+) Moderate (30-60%) Low (0-30%)

Dominant Shrub/Understory Species
 1. _____ 2. _____ 3. _____

Shrub/Understory Clutter: High (60%+) Moderate (30-60%) Low (0-30%)

STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): _____ Channel Width: _____ Stream Width: _____

Riparian Width right bank: _____ left bank: _____ Avg. Water Depth: _____

¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Other Wildlife Observed: whip-poor-will caught in Net B

Additional Comments: _____



Bat Capture Datasheet

Page 1 of 2

Project Name/No.: Pipeline/172677408

Date: 3 June 2022

Biologist(s): C. Birdsell, M. Alexander, E. Scheiburn

Site ID: RLM-40-Smith

County/State: Smith / TX

Moon Phase: Waxing Crescent Sunset: 1957

Map Kilometer No./Quad: KM-40

Latitude: 36.350812

Longitude: -85.85984 / Moonrise: 837

Moonset: 2343

General Site Description: On road off of Padgett lane / forested meadow

Nets Open: 1457

Nets Closed: 0057

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	69	0	0
21:00	58	0	0
22:00	55	0	0
23:00	54	0	0
00:00	52	0	0
01:00	51	0	0

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments:[illegible]

Beaufort wind scale. 0 = smoke rises vertically (<1 mph). 1 = wind direction shown by smoke (1-3 mph). 2 = wind felt on face; leaves rustle (4-7 mph). 3 = leaves, twigs in constant motion (8-12 mph). 4 = dust rises; small branches move (13-18 mph). 5 = small trees in leaf begin to sway (19-24 mph).

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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Bat Capture Datasheet

Page 1 of 2

Project Name/No.: 172677408

Date: 06/02/2022

Biologist(s): I. Burns, W. Jan

Site ID: RLM-41-Smith

County/State: Smith, TN

Moon Phase: Waxing crescent **Sunset:** 7:56

Map Kilometer No./Quad: KM-41

Latitude: 36.34997 Longitude: 121.88997

de: 85.85272 Moonrise: 5 29 Moonset: 23 02

General Site Description: PB in 206

Nets Open: 1956 Nets Closed: 0056

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	77	0	0
21:00	72	0	0
22:00	70	0	1
23:00	69	0	1
00:00	68	0	1
01:00	65	0	1

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments:[illegible]

Beaufort wind scale. 0 = smoke rises vertically (<1 mph). 1 = wind direction shown by smoke (1-3 mph). 2 = wind felt on face; leaves rustle (4-7 mph). 3 = leaves, twigs in constant motion (8-12 mph). 4 = dust rises; small branches move (13-18 mph). 5 = small trees in leaf begin to sway (19-24 mph).

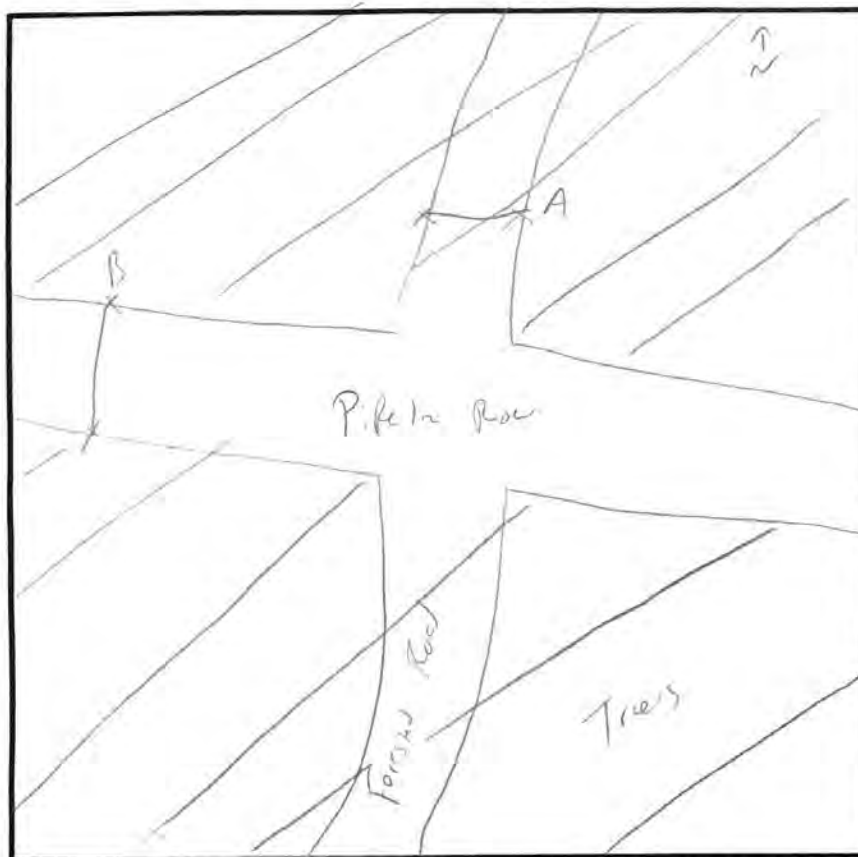
² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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Project Name/No.: 172677408 Date: 2 June 2011
 Site ID: RLM-41-Smith Est. Distance to Water (ft): 3200

VEGETATION

Primary Habitat Type¹: Upland forest
 Potential Roost: Large Trees | Snags | Both | Other (e.g., structure)

Roost Tree Potential: High | Moderate | Low

Dominant Canopy Species Avg. Canopy DBH range (in): 20

1. Quercus rubra 2. Quercus montana 3. Alnus incana

Canopy Closure: Closed (80%+) | Moderate (40-80%) | Open (0-40%)

Dominant Subcanopy Species Avg. Subcanopy DBH range (in): 12

1. Ostrya virginiana 2. Juniperus virginiana 3. Maclura pumila

Sub-Canopy Clutter: High (60%+) | Moderate (30-60%) | Low (0-30%)

Dominant Shrub/Understory Species

1. Ostrya virginiana 2. Fraxinus americana 3. Cercis canadensis

Shrub/Understory Clutter: High (60%+) | Moderate (30-60%) | Low (0-30%)

STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): NA Channel Width: NA Stream Width: NA

Riparian Width right bank: NA left bank: NA Avg. Water Depth: NA

¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Other Wildlife Observed: _____

Additional Comments: _____



Page 1 of 2

Biologist(s): I. Burns, W. Jan

Moon Phase: Waxing crescent Sunset: 1956

Longitude: -85.85272 Moonrise: 8:36 Moonset: 2343

General Site Description: Same as 06/02/2022 Nets Open: 1956 Nets Closed: 0056

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments:[illegible]

Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats



Bat Capture Datasheet

Page ____ of ____

Project Name/No.: Ridgeline 172677408

Date: 24 May 22

Biologist(s): Joshua Adams / Lucas Downer

Site ID: RLM-42-Sm.7h

County/State: TN/ Smith

Moon Phase: Waxing Crescent Sunset: 19:51

Map Kilometer No./Quad: 1KM 42

Latitude: _____ Longitude: _____ Moonrise: _____ Moonset: _____

General Site Description: Dry Creek bed adjacent to pipeline corridor Nets Open: 1950 Nets Closed: 2200

General Site Description: Dry Creek bed adjacent to pipeline corridor Nets Open: 1950 Nets Closed: 2200

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	77	0	100
21:00	72	0	100
22:00	72	1	100
23:00			
00:00			
01:00			

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments: Rain/Lightning Moved in faster than expected

[illegible]

¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

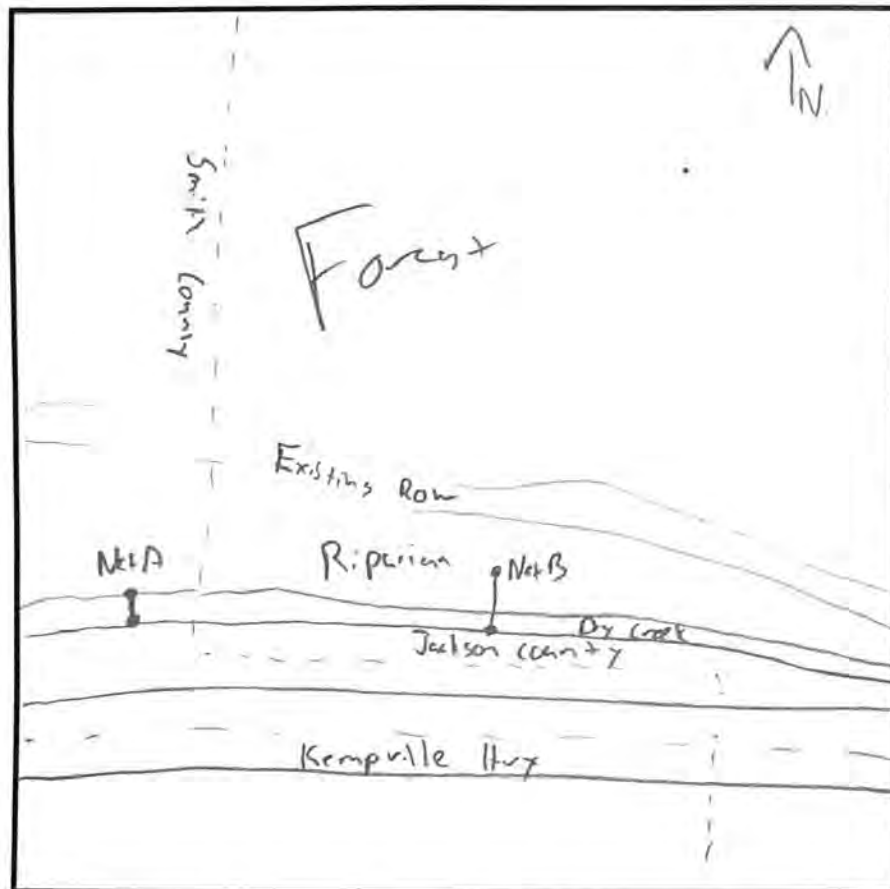
² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Project Name/No.: RLM-42-SMITH Date: 24 May 22

Site ID: RLM-42-SMITH Est. Distance to Water (ft): —

VEGETATION

Primary Habitat Type¹: Creek/Riparian

Potential Roost: Large Trees Snags Both Other (e.g., structure)

Roost Tree Potential: High Moderate Low

Dominant Canopy Species Avg. Canopy DBH range (in): 10-14

1. P. occidentalis 2. Q. palustris 3. —

Canopy Closure: Closed (80%+) Moderate (40-80%) Open (0-40%)

Dominant Subcanopy Species Avg. Subcanopy DBH range (in): 3-8

1. A. altissima 2. C. occidentalis 3. —

Sub-Canopy Clutter: High (60%+) Moderate (30-60%) Low (0-30%)

Dominant Shrub/Understory Species

1. A. saccharinum 2. C. canadensis 3. —

Shrub/Understory Clutter: High (60%+) Moderate (30-60%) Low (0-30%)

STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): 2 Channel Width: 6-10m Stream Width: 6-10m

Riparian Width right bank: 5m left bank: 15m Avg. Water Depth: —

Other Wildlife Observed: —

Additional Comments: —



Bat Capture Datasheet

Page 1 of 1

Project Name/No.: Ridgeline 172672108

Date: 27 May 2022

Biologist(s): Joshua Adams / Lucas Downs

Site ID: RLM-42-Smith

County/State: TN / Smith

Moon Phase: Waxing Crescent Sunset: ~~19:53~~ 1953

Map Kilometer No./Quad: 1KM 42

Latitude: _____ Lon _____

ude: Moonrise: 0420 Moonset: 1626

General Site Description: DRY CREEK BED ADJACENT TO

Nets Open: 1950h Nets Closed: 0055

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	61.7	0	35
21:00	59.5	1	0
22:00	57.5	0	0
23:00	57.5	1	10
00:00	57.1	0	0
01:00	58.6	0	100

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments: Over backyard stream that parallels pipeline corridor

[illegible]

¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats



Bat Capture Datasheet

Page 1 of 1

Project Name/No.: RidgeLine 172677408

Date: 28 May 2022

Biologist(s): Joshua Adams, Lucas Davis

Site ID: RLM-42 - Smith

County/State: TN/Smith

Moon Phase: Waning Crescent Sunset: 19:53

Map Kilometer No./Quad: KN 42

Latitude: _____ Long: _____

de: _____ Moonrise: 04:20h Moonset: 18:26h

General Site Description: DRY CREEK BED ADJACENT TO PIPELINE Nets Open: 19584 Nets Closed: 20354
CORRIDOR

Time	Temp (F)	Wind ¹	% Cloud Cover	Net ID (A, B,...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
20:00	64.4	0	10	A	6	6		36.34869	-85.830868		X			
21:00	60.2	0	0	B	12	9		36.34864	-85.83171		X			Extends into riparian zone
22:00	58.9	0	0											
23:00	56.9	0	0											
00:00	55.4	0	0											
01:00	56.0	0	0											

* One net at full extension ~ 2.5m high

* One net at full extension ~ 2.5m high

Weather Comments: Over dark stream that parallels pipeline corridor

[illegible]

i. **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

- Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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Stantec Consulting Services Inc.
10509 Timberwood Circle, Suite 100
Louisville, Kentucky 40223-5301

NET SITE HABITAT DESCRIPTION

Net Set Diagram:

Project Name/No.: Ridgeline/172677408

Date: 24 May 2072 Site Name: RIM-43-Jackson

Estimated Distance to Water Source: 600 ft *

Other Wildlife Observations _____

STREAM CHARACTERISTICS

Bank Height: _____ Channel Width: _____

Stream Width: _____ Riparian Width: (rt bank) _____ (lt bank) _____

Avg. Water Depth: _____ % Canopy Cover _____

% Substrate type: Bedrock____, Boulder____, Cobble____, Gravel____,

Sand _____, Fines _____.

VEGETATION

Estimated Canopy Closure: closed moderate open

[illegible]

1. _____ 2. _____ 3. _____

Roost Tree Potential consists of: Large Trees Snags Both

Roost Tree Potential for Area: **High** **Moderate** **Low**

Dominant Subcanopy Species

1. _____ 2. _____ 3. _____

Dominant Shrub Species

1. _____ 2. _____ 3. _____

Comments: * distance to pond. Site on dry stream bed.



Bat Capture Datasheet

Page of

Project Name/No.: Ridgevine/172677408

Date: 27 May 2022

Biologist(s): C. Birdsall, W. Jarr, E. Scheiben

Site ID: BML-43-Jackson

County/State: Jackson, TN

Moon Phase: Waxing Crescent

Sunset: 1952

Map Kilometer No./Quad: KM-43

Latitude: 36.349011

Longitude: -85.829346 Moonrise: 0354

Moonset: 1726

General Site Description: dry creekbed & adjacent Row N. of Kemoville Hwy Nets Open: 1952 Nets Closed: 0052

²⁰Y Nets Open: 1952

Nets Closed: 005

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	62	0	50
21:00	60	0	0
22:00	58	0	0
23:00	57	0	0
00:00	59	0	0
01:00	59	0	0

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments:[illegible]

1 **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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Bat Capture Datasheet

Page ____ of ____

Project Name/No.: Ridgevine 1172677408 Date: 28 May 2022 Biologist(s): C. Birdsall, W. Jan, E. Scheibman

Site ID: RML-43-Jackson County/State: Jackson, TN Moon Phase: Waning Crescent Sunset: 1953

Map Kilometer No./Quad: 4M-43 Latitude: 36.349011 Longitude: -85.829346 Moonrise: 0420 Moonset: 1826

General Site Description: Das creekbed & adjacent Row N. of Knoxville Hwy Nets Open: 1953 Nets Closed: 0053

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	64	0	5.0
21:00	60	0	0.0
22:00	58	0	0.0
23:00	56	0	0.0
00:00	56	0	0.0
01:00	55	0	0.0

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments:[illegible]

Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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Bat Capture Datasheet

Page ___ of ___

Project Name/No.: 172677408 Date: 05/27/22 Biologist(s): Jon Buice, Mackenzie Alexander
Site ID: RLM-45-Jackson County/State: Jackson/TN Moon Phase: Waning Crescent Sunset: 1952
Map Kilometer No./Quad: 12M-45 Latitude: 36.39989 Longitude: -85.801794 Moonrise: 0353 Moonset: 1725
General Site Description: Salt Lick Creek, East of Smith Bend Lane Nets Open: 1952 Nets Closed: 0852

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	64	0	0
21:00	59	0	0
22:00	59	0	0
23:00	57	0	0
00:00	57	0	50
01:00	59	0	100

Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	12	52	624	36.340052	-85.862210		X			Shore folder
B	12	52	624	36.340027	-85.801458		X			Shore folder

* One net at full extension - 2.5m high

Weather Comments: _____

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	LABO	20:30	A	M	NR	41	11.0	0	A	4		
2	MYHV	20:35	A	M	NR	35	8.25	0	A	4.5		wing puncture
3	MYGR	21:00	A	F	P	43	12.25	0	B	3	08578	
4	LABO	22:00	A	F	P	41	14.25	0	A	2.5		
5	MYGR	00:05	A	F	P	45	12.5	0	B	1	08579	

¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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Bat Capture Datasheet

Page ___ of ___

Project Name/No.: 172677408

Date: 05/28/22

Biologist(s): J. Burns M. Alexander

Site ID: RLM-45-Jackson

County/State: Jackson/TN

Moon Phase: Waxing Crescent

Sunset: 1952

Map Kilometer No./Quad: KM-45

Latitude: 36.339988

Longitude: 85.801794

Moonrise: 0420

Moonset: 1825

General Site Description: Sec. 05/27/22 Data Sheet

Nets Open: 1952

Nets Closed: 0052

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	64	0	0
21:00	61	0	0
22:00	57	0	0
23:00	55	0	0
00:00	57	0	0
01:00	57	0	0

Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	12	5.2	62.4	36.340052	-85.802210		✓			
B	12	5.2	62.4	36.340023	-85.801436		✓			

* One net at full extension ~ 2.5m high

Weather Comments:

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	MYGR	2045	A	F	P	44	13.25	0	A	4.5	08580	mites on wings
2	MYGR	2050	A	F	P	45	13.25	0	B	1	08581	mites on wings
3	LARDO	21:25										Escaped
4	MYGR	20:50	A	F	P	45	13.75	0	A	1	08582	
5	PESU	0035	A	F	P	34	7.5	0	A	2.5	A03851	
6	PESU	0052	A	F	P	34	6.75	0	A	4.0	A03852	

¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph). 1 = wind direction shown by smoke (1-3 mph). 2 = wind felt on face; leaves rustle (4-7 mph). 3 = leaves, twigs in constant motion (8-12 mph). 4 = dust rises; small branches move (13-18 mph). 5 = small trees in leaf begin to sway (19-24 mph)

² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for escaped bats

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Bat Capture Datasheet

Page 1 of 2

Project Name/No.: Ridgeline/172677408 Date: 31 May 2022 Biologist(s): James Kiser, Shane Kelley
Site ID: RLM-46 / Cook Hollow County/State: Jackson/TN Moon Phase: WAXING CRESCENT Sunset: 1955 h
Map Kilometer No./Quad: KM-46/Granville Latitude: N36.33659° Longitude: -85.79282 Moonrise: 0604 Moonset: 2123
General Site Description: Site is located on Cabin Lane and small stream in Cook Hollow Nets Open: 1930h Nets Closed: 0100h
in backwaters of Cordell Hull Reservoir.

Time	Temp (F)	Wind ¹	% Cloud Cover	Net ID (A, B,...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
20:00	76.2	1	25	A	9m	7.5	67.5m ²	36.35543	-85.79243	✓				JDK Work Call @ 7:18
21:00	72.1	0	0	B	6m	7.5	45m ²	36.33649	-85.79262		✓			JDK Work Call @ 7:33
22:00	69.7	1	0											
23:00	68.8	1	0											
00:00	67.6	1	0											
01:00	66.9	1	0											

* One net at full extension ~ 2.5m high

* One net at full extension ~ 2.5m high

Weather Comments: Hot & Humid with high temps in upper 80's, mostly clear and no rainfall

[illegible]

¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

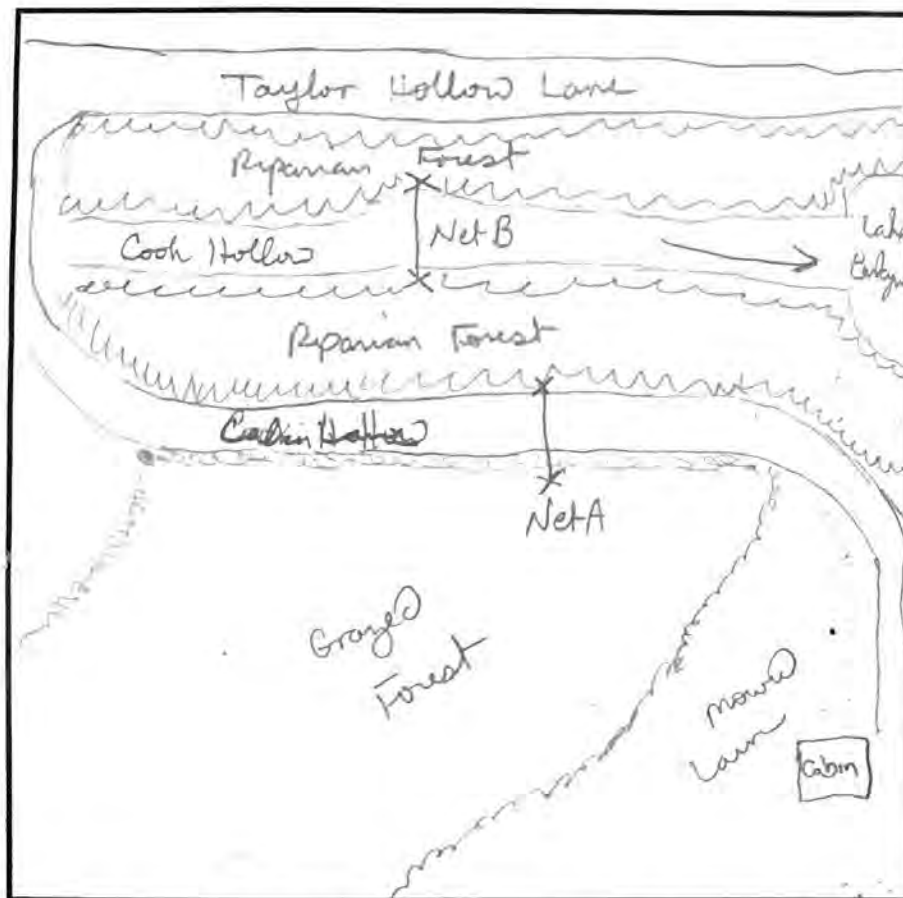
² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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Project Name/No.: Ridge Line/172677428 Date: 31 May 2022
 Site ID: RLM-46/Cook Hollow Est. Distance to Water (ft): 0

VEGETATION

Primary Habitat Type¹: Bottomland Forest/Creek Riparian

Potential Roost: Large Trees | Snags | Both | Other (e.g., structure)

Roost Tree Potential: High | Moderate | Low

Dominant Canopy Species Avg. Canopy DBH range (in): 8-12"
 1. Red Cedar 2. Box Elder 3. Sycamore 4. Tulip tree

Canopy Closure: Closed (80%+) | Moderate (40-80%) | Open (0-40%)

Dominant Subcanopy Species Avg. Subcanopy DBH range (in): 3-7"
 1. Box Elder 2. Red Cedar 3. Am. Elm

Sub-Canopy Clutter: High (60%+) | Moderate (30-60%) | Low (0-30%)

Dominant Shrub/Understory Species
 1. Autumn Olive 2. Privet 3. Sapling Box elder

Shrub/Understory Clutter: High (60%+) | Moderate (30-60%) | Low (0-30%)

STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): 3 Channel Width: 6m Stream Width: 2-3m
 Riparian Width right bank: 12m left bank: 6m Avg. Water Depth: 6"

¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Other Wildlife Observed: E. Towhee (Vo), Wood Thrush (Vo), Song Sparrow (Vo), Am. Crow (Vo), N. Mockingbird (Vo), N. Cardinal (Vo),
A. crepitans (Vo), Hyla chrysocelis (Vo), Great Blue Heron (Vo), White-eyed Vireo (Vo), Yellow-billed Cuckoo (Vo),
 Additional Comments: Belted Kingfisher (Vo), Barred Owl (Vo), Rana clamitans (Vo), Rana catesbeiana (Vo),
Alethodon glutinosus (4), Eurycea lucifuga (2), Diposaurus (1), Peromyscus leucopus (1),
Eurycea cinnigera (1)



Bat Capture Datasheet

Page 1 of 2

Project Name/No.: RidgeLine/172677408Date: 1 June 2022Biologist(s): James Kiser, Shane KelleySite ID: RLM-46/Cook HollowCounty/State: Jackson/TNMoon Phase: WAXING CRESCENT Sunset: 1956hMap Kilometer No./Quad: KM-46/GarrvilleLatitude: 36.33659Longitude: -85.79282Moonrise: 0650Moonset: 2215General Site Description: Site is located on Cabin Lane and small stream in CookNets Open: 1945hNets Closed: 0100hHollow in backwaters of Cordell Hull Reservoir.

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	76.6	1	40
21:00	72.9	0	0
22:00	71.5	1	0
23:00	71.2	1	0
00:00	70.3	0	0
01:00	70.1	0	25

Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	9m	7.5m	67.5m ²	36.33643	-85.79295	✓				
B	6m	7.5m	45m ²	36.33649	-85.79262		✓			

* One net at full extension ~ 2.5m high

Weather Comments: Extremely Hot and Humid today with high temps in low 90's. Wind calm and clear sky

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band #	Comments (e.g., samples taken, transmitter #, disposition)
1	<i>Myotis lucifugus</i>	2030h	A	M	NR	37.2	7.0	0	A	6	TWRA-10144	Frog-150.986; Photos: DSC-6516- Release Mass - 7.3g; Hair - JA-46-20
2	<i>Myotis lucifugus</i>	2240h	A	M	NR	35.5	7.25	0	A	5	TWRA-10133	Photos: DSC-6586-6589; Hair - JA-46-21
3	<i>Myotis grisescens</i>	2320	A	F	P	43.0	10.75	0	B	2	TWRA-10142	Photos: DSC-6591-6600; Hair - JA-46-22
4	<i>Myotis grisescens</i>	↓	A	F	P	43.4	11.0	0	B	2	TWRA-10141	Photos: DSC-6601-6608; Hair - JA-46-23
5	<i>Lasiurus borealis</i>	0000	A	M	Escaped from Net				A	6	---	Escaped from Net

¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for escaped bats

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Page 1 of 2

Biologist(s): H. Staffs, C. Knobel

Moon Phase: Waxing Crescent Sunset: 20:01

Latitude: 36.3230123 Longitude: 85.779758 Moonrise: 09:40 AM Moonset: —

General Site Description: Birds on around reservoir fences. Net A over pipeline Nets Open: 19:50 Nets Closed: 17:50
Corridor. Net B at opening in clutter around water body leading into a slight corridor in woods.

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments:[illegible]

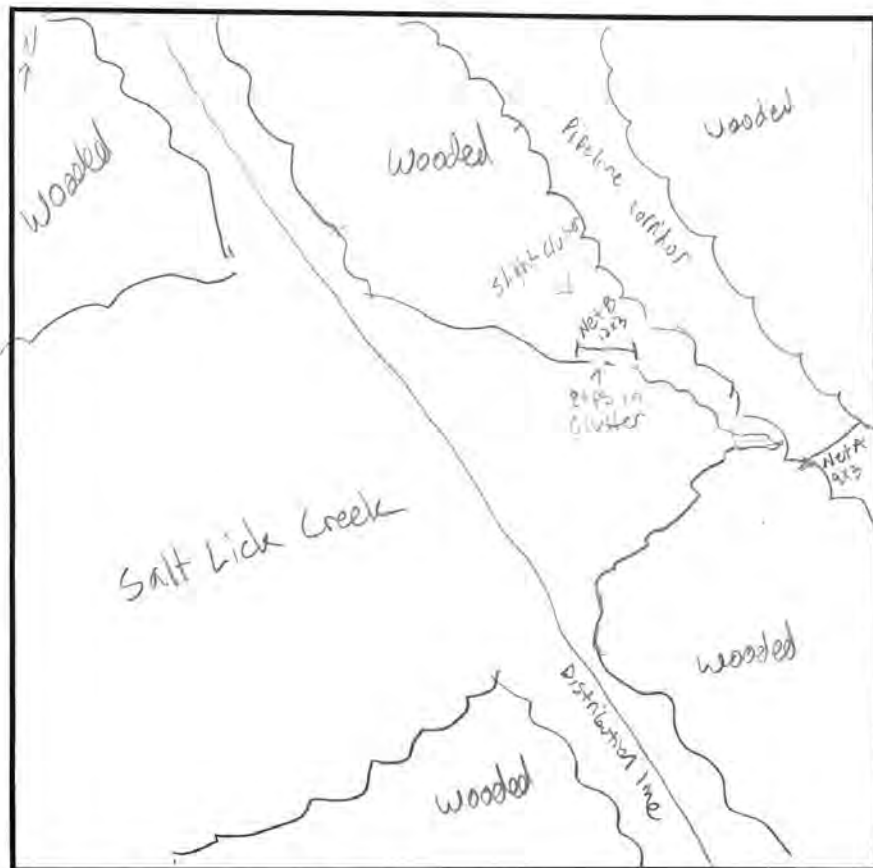
curled
staying
on wings
force his
tail
les

¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats



Project Name/No.: 172677408 Date: 6/4/22
 Site ID: RLM-49-JACKSON Est. Distance to Water (ft): 10m to Salt Lick creek

VEGETATION

Primary Habitat Type¹: Riparian ground Salt Lick creek
 Potential Roost: Large Trees | Snags | Both | Other (e.g., structure)
 Roost Tree Potential: High | Moderate | Low

Dominant Canopy Species Avg. Canopy DBH range (in):
 1. Celtis occidentalis 2. Robinia pseudoacacia 3. _____

Canopy Closure: Closed (80%+) | Moderate (40-80%) | Open (0-40%)

Dominant Subcanopy Species Avg. Subcanopy DBH range (in):
 1. Juniperus virginiana 2. Celtis occidentalis 3. woody locust

Sub-Canopy Clutter: High (60%+) | Moderate (30-60%) | Low (0-30%)

Dominant Shrub/Understory Species
 1. Juniperus virginiana 2. _____ 3. _____

Shrub/Understory Clutter: High (60%+) | Moderate (30-60%) | Low (0-30%)

STREAM CHARACTERISTICS (if relevant) not a Reservoir finger

Bank Height (ft): _____ Channel Width: _____ Stream Width: _____
 Riparian Width right bank: _____ left bank: _____ Avg. Water Depth: _____

¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Other Wildlife Observed: EATO, ACFL, DAWO, RBWO, REVI, NOCA, AMCR, CAWR, TUTI, INBU, NOPA, deer, bull frog, GHOW, coopers gray treefrog, Blunck's cricket frog, YBCW, chuck-will-widow, EAWP

Additional Comments: _____

Bat Capture Datasheet

Page 1 of 2

Project Name/No.: Enbridge Ridge Line Date: 6/5/22 Biologist(s): Hannah Stoff
Site ID: RLM-49 - JACKSON County/State: Jackson/TN Moon Phase: Waxing Crescent Sunset: 20:01
Map Kilometer No./Quad: LM49 Latitude: 36.322675 Longitude: 85.779184 Moonrise: 10:46 AM Moonset: ~~22:21 AM~~ 12:21
General Site Description: Net A in pipeline corridor Net B parallel to salt lick
wood forest gap, Net C at opening in forest and to destination gap Nets Open: 1955 Nets Closed: 0055

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	75	0	60
21:00	70	1	50
22:00	68	0	60
23:00			
00:00	66	1	10
01:00			

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments: Partly Cloudy

[illegible]

¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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Bat Capture Datasheet

Page 1 of 3Project Name/No.: 172677408Date: 4 June 2022Biologist(s): J. Burns, W. JanSite ID: RLM-SDA-JacksonCounty/State: Jackson/TNMoon Phase: Waxing CrescentSunset: 19:57Map Kilometer No./Quad: M1 KM 350Latitude: 36.316343Longitude: -85.766013Moonrise: 09:35Moonset: —General Site Description: low pasture containing small ponds & old barnNets Open: 1957Nets Closed: 0057

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	68	0	0
21:00	61	0	0
22:00	59	0	0
23:00	57	0	0
00:00	57	0	0
01:00	55	0	0

Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	12	7.8	93.6	36.316343	-85.765921			X		
B	9	5.2	46.8	36.316493	-85.766729				X	Field edge

* One net at full extension ~ 2.5m high

Weather Comments: _____

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	LAD0	2030	A	F	P	40	13.0	0	B	2.5		
2	LAD0	2104	A	M	NR	39	9.75	0	B	3.5		
3	LAD0	2104	A	M	NR	42	10.0	0	B	5.0		
4	LAD0	2120	A	F	P	43	13.75	0	B	3.0		
5	LAD0	2120	A	M	NR	42	12.50	0	B	3.0		Old wing band
6	LAD0	2345	A	F	—	39	12.4	0	A	7.0		Escaped

¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

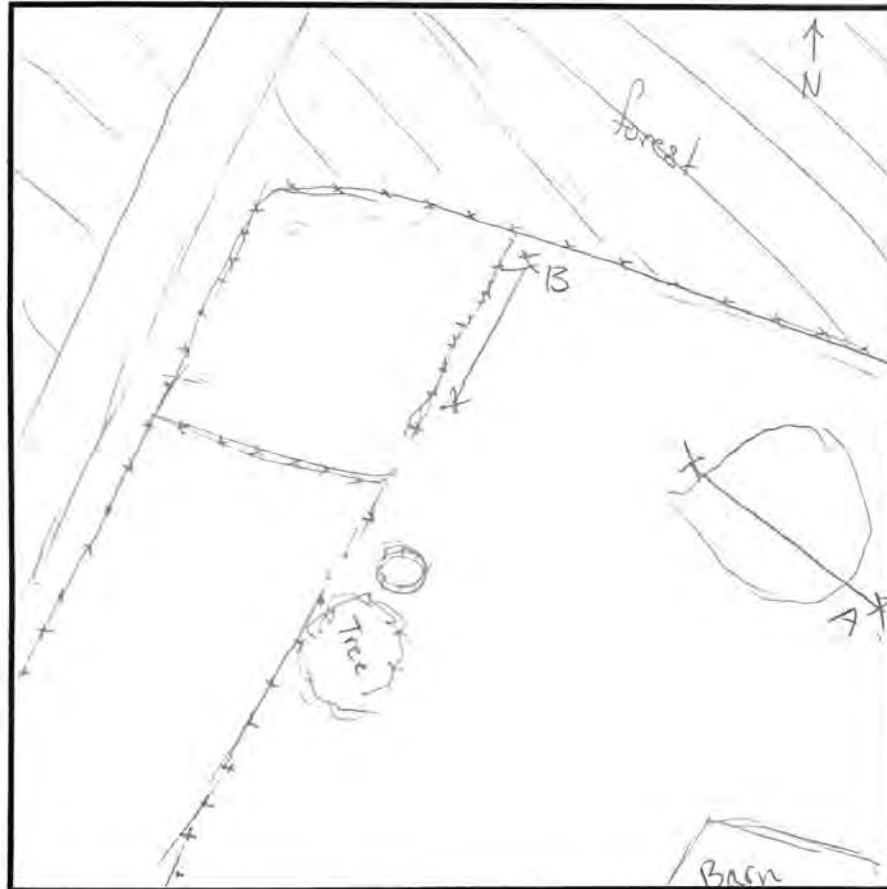
² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for escaped bats

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¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Project Name/No.: 172677408 Date: 4 June 2022
 Site ID: RUM-SDA-Jackson Est. Distance to Water (ft): 10

VEGETATION

Primary Habitat Type¹: Field Edge
 Potential Roost: Large Trees | Snags | Both | Other Both
 (e.g., structure)
 Roost Tree Potential: High | Moderate | Low

Dominant Canopy Species Avg. Canopy DBH range (in):
 1. Acer negundo 2. Carya glabra 3. Ulmus americana
 Canopy Closure: Closed | Moderate | Open
 (80%+) (40-80%) (0-40%)

Dominant Subcanopy Species Avg. Subcanopy DBH range (in):
 1. Celtis occidentalis 2. Asimina triloba 3. Ulmus americana
 Sub-Canopy Clutter: High | Moderate | Low
 (60%+) (30-60%) (0-30%)

Dominant Shrub/Understory Species
 1. Celtis occidentalis 2. Asimina triloba 3. Acer rubrum
 Shrub/Understory Clutter: High | Moderate | Low
 (60%+) (30-60%) (0-30%)

STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): _____ Channel Width: _____ Stream Width: _____
 Riparian Width right bank: _____ left bank: _____ Avg. Water Depth: _____

Other Wildlife Observed: _____

Additional Comments: _____



Bat Capture Datasheet

Page 3 of 3

Project Name/No.: 172677400

Date: 6/5/2022

Biologist(s): Zachary Baer, Ashley Harmer

Site ID: RLM-50A-Jackson

County/State: Jackson/TN

Moon Phase: Waxing Crescent

Sunset: 19:57

Map Kilometer No./Quad: MP 7KM-501

Latitude: 36.316343

Longitude: -85.766063

Moonrise: 10:41

Moonset: 12:21

General Site Description: Cow pasture (containing) small pond and old barn

Nets Open: 19:57

Nets Closed: 00:57

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	76	0	90
21:00	71	0	50
22:00	70	0	100
23:00	69	0	0
00:00	67	0	5
01:00	67	0	10

Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	12	7.8	93.6	36.316343	-85.766063			X		
B	9	5.2	46.8	36.316343	-85.766063				X	FIRE Edge

* One net at full extension ~ 2.5m high

Weather Comments:

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	Lasiurus borealis	21:15	A	F	L	50	23	0	A	5	—	
2	Lasiurus borealis	22:20	A	F	P	40	16.15	0	A	2.5	—	
3	Myotis grisescens	22:20	A	M	NR	43	10.75	0	B	2.5	100595	TURA OWIS
4	Lasiurus borealis	23:35	A	F	P	41	19.25	0	B	3	—	

¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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Bat Capture Datasheet

Page 1 of 2

Project Name/No.: Kidgeline/172677408

Date: 4 June 2022

Biologist(s): C. Birdsall, M. Alexander, E. Scheiban

Site ID: RLM-51-Jackson

County/State: Jackson TN

Moon Phase: Waxing Crescent Sunset: 1958

Map Kilometer No./Quad: 1.7 KM - 51

Latitude: 36.313835 Longitude: -85.755689 Moonrise: 9:36

Moonset: —

General Site Description: Smith Bend Lane

Nets Open: 1958 Nets Closed: 0058

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	68	0	0
21:00	68	0	0
22:00	61	0	0
23:00	58	0	0
00:00	56	0	0
01:00	56	0	0

[illegible]

- * One net at full extension ~ 2.5m high

Weather Comments:[illegible]

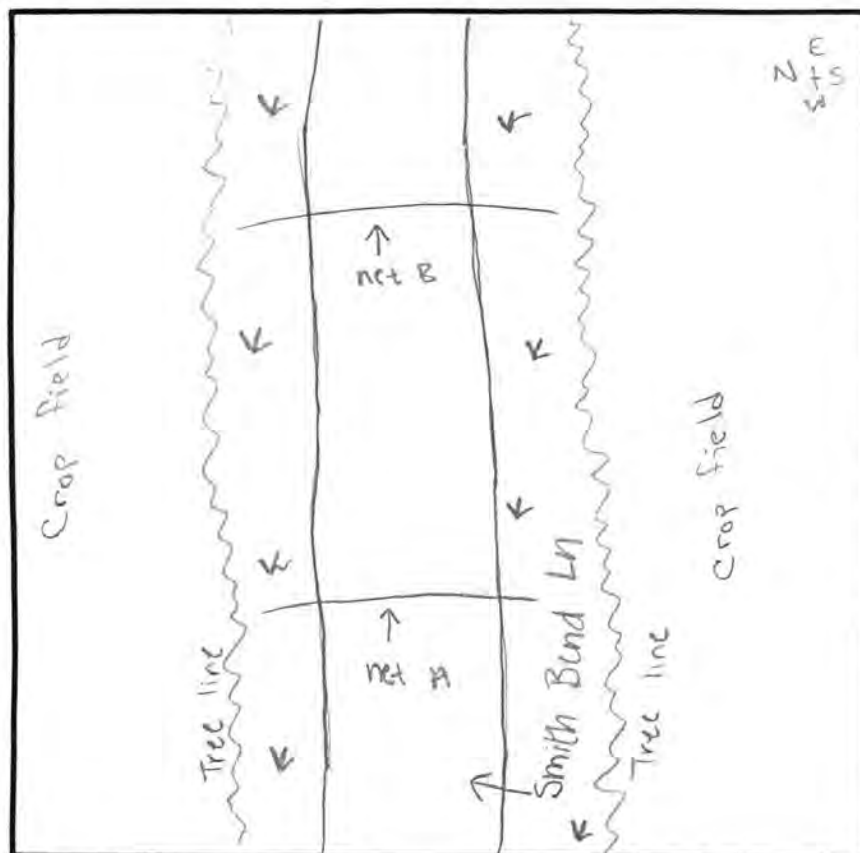
Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Project Name/No.: Bidirectional/17277908 Date: 04 June 2022
Site ID: RLM-51-Sackson Est. Distance to Water (ft): 276 ft

VEGETATION

Primary Habitat Type¹: Bottomland Swamp / Ag. land

Potential Roost:	Large Trees	Snags	Both	Other (e.g., structure)
Roost Tree Potential:	High	Moderate	Low	

Dominant Canopy Species Avg. Canopy DBH range (in): 12-30"
1. L. tulipifera 2. L. styraciflua 3. P. occidentalis

Canopy Closure:	Closed (80% +)	Moderate (40 - 80%)	Open (0 - 40%)
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Dominant Subcanopy Species Avg. Subcanopy DBH range (in): 3-14"
1. C. glabra 2. _____ 3. _____

Sub-Canopy Clutter:	High (60%+)	Moderate (30 - 60%)	Low (0 - 30%)
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Dominant Shrub/Understory Species
1. *Q. alba* 2. 3.

Shrub/ Understory Clutter:	High (60% +)	Moderate (30 - 60%)	Low (0 - 30%)
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STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): _____ Channel Width: _____ Stream Width: _____

Riparian Width right bank: _____ left bank: _____ **Avg. Water Depth:** _____

Other Wildlife Observed: Flying Squirrel in net B at 22:00

Additional Comments:

Bat Capture Datasheet

Page 1 of 1

Project Name/No.: RidgeLine / 172677408 Date: June 5, 2022 Biologist(s): M. Evans, A. Overbye, A. Blair
 Site ID: RLM-51-Jackson County/State: Jackson, TN Moon Phase: Waxing Crescent / 34% Sunset: 19:57
 Map Kilometer No./Quad: 3.14KM:51 Latitude: 36.313835 Longitude: -85.755689 Moonrise: 10:35 Moonset: 00:17
 General Site Description: Nets set across Smith Bend Lane Nets Open: 19:57 Nets Closed: 00:58

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	76	0	60%
21:00	71.5	0	60%
22:00	71.0	0	60%
23:00	68	0	20%
00:00	67	0	10%
01:00	66	0	0%

Net ID (A, B,.)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	12	5.2	62.4	36.31385	-85.75552	✓				
B	9	7.8	70.2	36.31375	-85.75502	✓				

* One net at full extension ~ 2.5m high

Weather Comments: _____

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1.	MYGR	22:12	A	M	NR	41.5	10.0	0	B	7.2	09222 FLURA	Hair sample 501
2	Unknown	23:20	U	U					B	7.0	—	Escaped while lowering net.
3	LABO	23:27	A	M	NR	40.0	10.5	0	B	7.0	—	Finger mid phal (L) 2nd finger 1 Hair Sample 502

¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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Bat Capture Datasheet

Page 1 of 2

Project Name/No.: Ridgeline/172677408 Date: 6/8/2022 Biologist(s): JT Layne
 Site ID: 52 RLM-S2-JACKSON County/State: Jackson, TN Moon Phase: WAXING GIBBOUS Sunset: 1959
 Map Kilometer No./Quad: 52 KM-52 Latitude: 36.315234 Longitude: -85.750927 Moonrise: 1452 Moonset: 0210
 General Site Description: Right of way travel, two-track, gravel access road Nets Open: 8:15 Nets Closed: 1:42

Time	Temp (F)	Wind ¹	% Cloud Cover	Net ID (A, B, ...)	Length (m)	Height* (m)	Net Area (m ²)	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
20:00	88	0	30%	A	9	7.8	7.702			✓				
21:00	87	0	30%	B	18	7.8	140.4			✓				
22:00	85	0	30%											
23:00	83	0	20%											
00:00	70	0	30%											
01:00	69	0	10%											

* One net at full extension ~ 2.5m high

Weather Comments:

Small intermittent rain at 23:00 - 23:10

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	LABO	21:20	A	F	P	39.5	18	0	A	5		38g, mass of bag 20g
2	LABO	21:50	A	M	NR	37	9.5	0	A	2		29.5g, mass of bag 20g
3	LABO	23:13	A	M	NR	39	10	0	A	2		30g, bag 20g
4	LABO	23:50	A	F	L	42	15	0	A	1.5		35g, bag 20g
5	MYGR	00:14	A	F	L	43	11.5	0	A	1.5	TWRA 08861	31.5g, bag 20g, banded right
6	LABO	00:39	A	M	NR	38.5	11.5	0	A	2.5		31.5g, bag 20g
7	MYGR	01:10	A	F	L	43.5	11.5	0	A	2	TWRA 08862	31.5g, bag 20g, banded left
8	LABO MYGR	01:42	A	F	L	44	11	0	A	2	TWRA 08863	34.5g, bag 23.5g, banded left

¹ Beaufort wind scale: 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

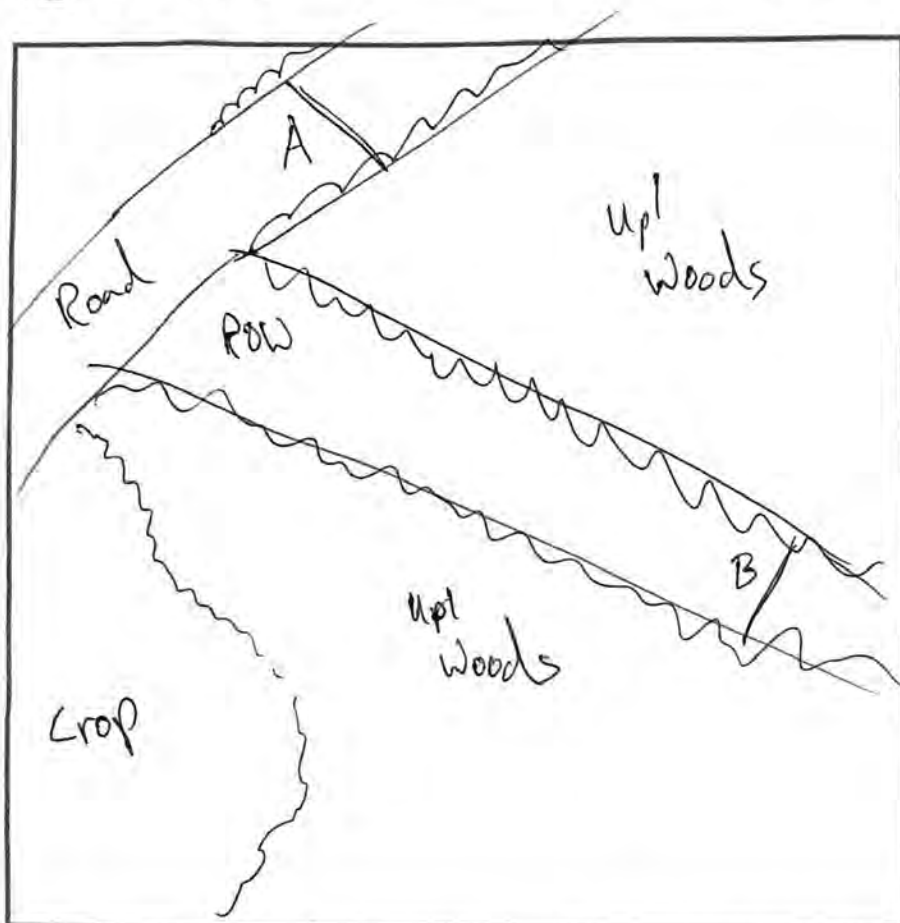
² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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1 Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Project Name/No.: Ridgeline/172677408 Date: 6/8/22
Site ID: 52 K11-52 Est. Distance to Water (ft): 400

VEGETATION

Primary Habitat Type¹: Riparian Upland
Potential Roost: Large Trees Snags Both Other (e.g., structure)

Roost Tree Potential: High Moderate Low

Dominant Canopy Species Avg. Canopy DBH range (in): 7

1. Walnut 2. Sugar Maple 3. Tree of Heaven

Canopy Closure: Closed (80%+) Moderate (40-80%) Open (0-40%)

Dominant Subcanopy Species Avg. Subcanopy DBH range (in): 3

1. Tree of Heaven 2. Sugar Maple 3. Eastern Red Cedar

Sub-Canopy Clutter: High (60%+) Moderate (30-60%) Low (0-30%)

Dominant Shrub/Understory Species

1. Scren lespedeza 2. Shrub/ 3. Understory Clutter:

High (60%+) Moderate (30-60%) Low (0-30%)

STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): X Channel Width: X Stream Width: X

Riparian Width right bank: N/A left bank: X Avg. Water Depth: X

Other Wildlife Observed: American toad, raccoon

Additional Comments: intermittent rain at 0:00.



Bat Capture Datasheet

Page ____ of ____

Project Name/No.: Ridgeline/172677408 Date: 6/9/22 Biologist(s): JT Layne
 Site ID: 52 RLM-52-JACKSON County/State: JACKSON, TN Moon Phase: WAXING GIBBOUS
 Map Kilometer No./Quad: 52 KM-52 Latitude: 36.315234 Longitude: -85.750927 Moonrise: 1600 Sunset: 1959
 General Site Description: Right of way travel, two track, gravel access road Nets Open: 8:10 Moonset: 0238
 Nets Closed: 1:15

Time	Temp (F)	Wind ¹	% Cloud Cover	Net ID (A, B,..)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
20:00	67	0	0%	A	9	8.8	76.2			✓				
21:00	63	0	0%	B	18	7.8	140.4			✓				
22:00	60	0	0%											
23:00	59	0	0%											
00:00	58	0	0%											
01:00	57	0	0%											

* One net at full extension ~ 2.5m high

* One net at full extension ~ 2.5m high

Weather Comments: Clear skies

[illegible]

¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

- Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats



Bat Capture Datasheet

Page 1 of 2

Project Name/No.: RidgeLine, 172677408 Date: 6/19/12 Biologist(s): H. Staffs, C. Knabel
 Site ID: RLM-53-JACKSON County/State: Jackson/TN Moon Phase: Waxing gibbous Sunset: 19:59
 Map Kilometer No./Quad: 59-KM-53 Latitude: 36.311630 Longitude: 85.735291 Moonrise: 12:37 14:43 Moonset: 01:17 AM 02:08
 General Site Description: Ridge top, upland deciduous forest with narrow road Nets Open: 19:59 Nets Closed: 00:59
corridors, Net A over pipeline, Net B over road corridor

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	68°F	1	10
21:00	63	1	0
22:00	65	0	0
23:00	62	0	0
00:00	57	0	0
01:00	54	1	10

* One net at full extension ~ 2.5m high

Weather Comments:

[illegible]

Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

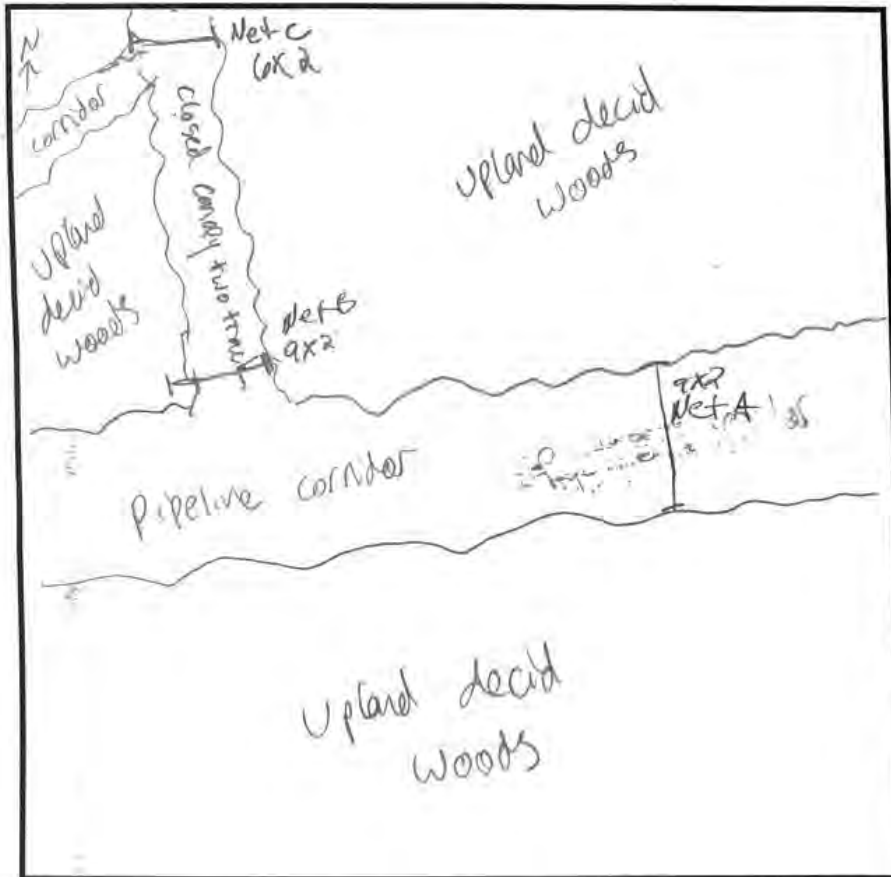
² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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Project Name/No.: Ridgeline Date: 6/19/22
 Site ID: BLM-53-JACKSON Est. Distance to Water (ft): .4 mi to
trib of Cumberland River

VEGETATION

Primary Habitat Type¹: Upland forest

Potential Roost: Large Trees | Snags | Both | Other (e.g., structure)

Roost Tree Potential: High | Moderate | Low

Dominant Canopy Species Avg. Canopy DBH range (in): 12-14

1. Juglans nigra 2. Tree of heaven 3. _____

Canopy Closure: Closed (80%+) | Moderate (40-80%) | Open (0-40%)

Dominant Subcanopy Species Avg. Subcanopy DBH range (in): 4-6

1. Juglans nigra 2. Acer saccharinum 3. _____

Sub-Canopy Clutter: High (60%+) | Moderate (30-60%) | Low (0-30%)

Dominant Shrub/Understory Species

1. Viburnum americana 2. Sweet gum 3. Acer saccharinum

Shrub/Understory Clutter: High (60%+) | Moderate (30-60%) | Low (0-30%)

STREAM CHARACTERISTICS (if relevant) NA

Bank Height (ft): _____ Channel Width: _____ Stream Width: _____

Riparian Width right bank: _____ left bank: _____ Avg. Water Depth: _____

¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Other Wildlife Observed: HOWA, WOTH, INBU, SCTA, AMRO, COYE, EATO, BAED, Luna moth, YBCW, NOCA

Additional Comments: Upland woods on ridgeline with numerous intersecting 2-track roads through out area. Net B at opening to pipeline across narrow access. Net C located approximately 75 m N of Net B where multiple corridors come together. Net A was over pipeline corridor on 6/10.



Bat Capture Datasheet

Page 1 of 2

Project Name/No.: Ridge Line 1172677408 Date: 6/10/22 Biologist(s): Hannah Stoffs, Chris Knabel

Site ID: RLM-53¹ - JACKSON County/State: Jackson TN Moon Phase: Waxing Gibbous Sunset: 20:01

Map Kilometer No./Quad: 53 KM-53 Latitude: 36.31630 Longitude: 85.73521 Moonrise: 15:50 Moonset: 12:35

General Site Description: Nets across ~~the~~ 2-track access road within upland
forest with high canopy cover percentage. Nets Open: 20:01 Nets Closed: 01:01

Time	Temp (F)	Wind ¹	% Cloud Cover	Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
20:00	76	1	20	B	9m	5.2m	46.8m	36.312300	-85.735947	X				narrow 2-track w/ no sign
21:00	62	1	0	C	6m	5.2m	31.2m	36.311865	-85.735570	X				"
22:00	62	1	0											
23:00	61	1	0											
00:00	62	1	0											
01:00														

* One net at full extension - 2.5m high

* One net at full extension ~ 2.5m high

Weather Comments:[illegible]

¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats



Bat Capture Datasheet

Page 1 of 2

Project Name/No.: Ridgeline/172677408 Date: 6/10/22 Biologist(s): JT Layne Ally Harrison
 Site ID: 54 RLM-54-JACKSON County/State: JACKSON/TN Moon Phase: half moon ^{WAXING} _{3:30 US} Sunset: 1959
 Map Kilometer No./Quad: 54 KM-54 Latitude: 36.305745 Longitude: -85.725271 Moonrise: 1600 Moonset: 0238
 General Site Description: Upland, wooded Nets Open: 8:05 Nets Closed: 1:05

Time	Temp (F)	Wind ¹	% Cloud Cover	Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
20:00	71	0	0	A	6	7.8	46.8	36.305745	-85.725271	✓				
21:00	67	0	0	B	12	7.8	93.6	36.305342	-85.725751	✓				
22:00	65	0	0											
23:00	65	3 mph	0											
00:00	64	0	0											
01:00	63	0	0											

* One net at full extension ~ 2.5m high

Weather Comments: Clear skies

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	LABO	20:05	A	F	L	43	12.5	0	B	1.5		34.5g, 22g bag
2	NYHU	20:18	A	M	NR	36.5	8	0	B	3		32.5g, 24.5g bag, photo 251-258
3	LABO	20:35	A	M	NR	40	12	0	A	1		32.5g, 20.5g bag, photo 259-262
4	LABO	20:45	A	M	NR	40	8.5	0	B	1		33g, 24.5g bag
5	EPFU	21:11	A	FM	NR	46	17	0	B	1		39g, 22g bag, photo 263-266
6	LABO	22:26	A	M	NR	39.5	13	0	A	5		35g, 22g bag
7	LABO	23:22	A	F	L	42	14.5	0	A	4		34.5g, 20g bag
8	LABO	00:12	A	F	PL ³	41	19	0	A	1		41g, 22g bag, No sign of lactation
9	LABO	00:35	A	M	NR	40.5	10.5	0	A	4		33.5g, 23g bag
10	MYGR	00:51	A	F	L	43.5	11.5	0	B	2.5	TWRA 08864	33g, 21.5g bag, photos 277-283

¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph). 1 = wind direction shown by smoke (1-3 mph). 2 = wind felt on face; leaves rustle (4-7 mph). 3 = leaves, twigs in constant motion (8-12 mph). 4 = dust rises; small branches move (13-18 mph). 5 = small trees in leaf begin to sway (19-24 mph)

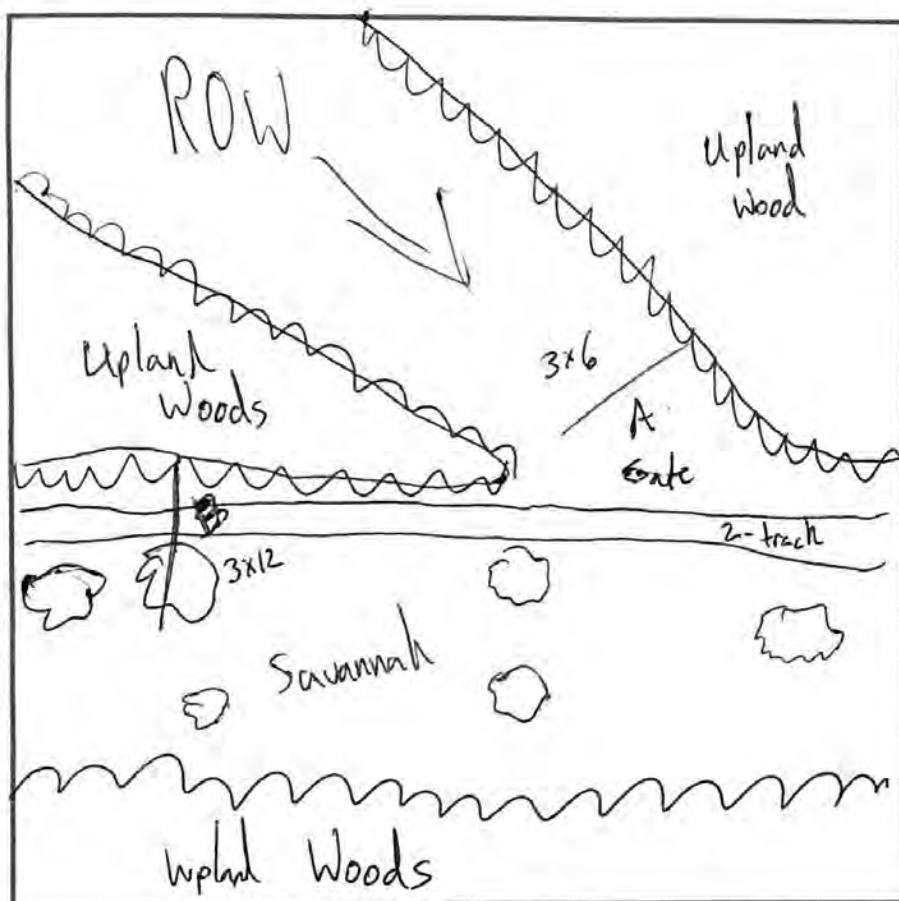
² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Other Wildlife Observed: Flying Squirrel, Luna Moth, Owl fly,

Additional Comments: 2-track ROW

Project Name/No.: Ridgeline/17267408 Date: 6/10/22

Site ID: 54 RLM-54-JACKSON Est. Distance to Water (ft):

VEGETATION

Primary Habitat Type¹: Upland Forest

Potential Roost: Large Trees Snags Both Other (e.g., structure)

Roost Tree Potential: High Moderate Low

Dominant Canopy Species Avg. Canopy DBH range (in):

1. Tree of Heaven 2. Black Walnut 3. Sugar Maple

Canopy Closure: Closed (80%+) Moderate (40-80%) Open (0-40%)

Dominant Subcanopy Species Avg. Subcanopy DBH range (in):

1. Tree of Heaven 2. American Elm 3. Sweet Gum

Sub-Canopy Clutter: High (60%+) Moderate (30-60%) Low (0-30%)

Dominant Shrub/Understory Species

1. Fescue 2. 3.

Shrub/Understory Clutter: High (60%+) Moderate (30-60%) Low (0-30%)

STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): N/A Channel Width: N/A Stream Width: N/A

Riparian Width right bank: N/A left bank: N/A Avg. Water Depth: N/A



Bat Capture Datasheet

Page 1 of 2

Project Name/No.: Ridgeline/122677408 Date: 10/11/22 Biologist(s): JT Layne Ally Harrison
 Site ID: 54 RLM-54-JACKSON County/State: JACKSON, TN Moon Phase: Waxing Gibbous Sunset: 20:00
 Map Kilometer No./Quad: 54 KM-54 Latitude: 36.305745 Longitude: -85.725271 Moonrise: 17:00 Moonset: 03:39 0339
 General Site Description: Upland, wooded Nets Open: 18:05 Nets Closed: 1:05

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	76	0	0
21:00	71	0	0
22:00	70	0	0
23:00	70	0	0
00:00	69	0	0
01:00			

Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	6	7.8	46.8	36.305745	-85.725271	✓				
B	12	7.8	93.6	36.305342	-85.725751	✓				

* One net at full extension ~ 2.5m high

Weather Comments:

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
	LABO	21:06	A	F	P	39	15.5	0	A	4		35g, 19.5g bag
	LABO	21:30	A	M	NR	39	9.5	0	A	1		29g, 19.5g bag
	MYGR	23:30	A	F	P	43	13	1	B	4	AAFBN 37	scammy due to band, buy mites 34g, 21g bag, AAFBN 37-1
	LABO	00:09	A	M	NR	38	10.5	0	A	3		31.5g, 21g bag
	LABO	00:20	A	M	NR	40	11	0	B	3		32g, 21g bag
	MYGR	00:42	A	F	L	42.5	12	0	B	1.5	TWRA 08865	32.5g, 20.5g bag 0329 - 0338
	LABO	00:55	A	F	L	42	13	0	B	2.5		21g, 8g bag

¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph). 1 = wind direction shown by smoke (1-3 mph). 2 = wind felt on face; leaves rustle (4-7 mph). 3 = leaves, twigs in constant motion (8-12 mph). 4 = dust rises; small branches move (13-18 mph). 5 = small trees in leaf begin to sway (19-24 mph)

² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for escaped bats

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Bat Capture Datasheet

Page 1 of 3

Project Name/No.: Ridgeline/172677408 Date: 6/11/22 Biologist(s): A. Spollen, Z. True
 Site ID: RLM-56-Jackson County/State: Jackson/TN Moon Phase: Waxing crescent Sunset: 20:00
 Map Kilometer No./Quad: 1KM+56 Latitude: 36.302525 Longitude: -85.709892 Moonrise: 17:05 Moonset: 03:10
 General Site Description: Mist nets are set in a very wide, mostly dry stream bed Nets Open: 19:55 Nets Closed: 01:10

Time	Temp (F)	Wind ¹	% Cloud Cover	Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
20:00	82	0	0	A	9M	5.2M		36.30328	-85.71002		X			Small patch of water
21:00	79	0	0	B	12M	7.8M		36.302525	-85.709892		X			Dry stream bed
22:00	76	0	0											
23:00	74	0	0											
00:00	72	0	0											
01:00	71	0	0											

* One net at full extension ~ 2.5m high

Weather Comments: warm a calm

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	<i>Lasiurus borealis</i>	20:25	A	M	NR	38.5	9.25	0	A	2	—	
2	<i>Myotis grisescens</i>	20:30	A	M	NR	44.1	9.20	0	B	3.5	07264	
3	<i>Lasiurus borealis</i>	20:32	—	—	—	38.5	—	—	B	3.5	—	Escaped
4	<i>Lasiurus borealis</i>	20:50	A	M	NR	38.3	10.25	0	A	2.5	—	
5	<i>Lasiurus borealis</i>	21:10	A	M	NR	37.3	11.25	0	B	4	—	
6	<i>Myotis grisescens</i>	21:12	A	F	L	44.3	11.5	0	B	4	07263	Recently gave birth
7	<i>Lasiurus borealis</i>	21:15	A	M	NR	40.0	10.5	0	B	4.5	—	
8	<i>Lasiurus borealis</i>	21:30	A	F	P	—	—	—	A	0	—	Very pregnant, escaped
9	<i>Lasiurus borealis</i>	21:35	A	M	NR	36.5	9.0	0	B	4	—	
10	<i>Lasiurus borealis</i>	22:40	—	—	—	—	—	—	A	1.5	—	Escaped
11	<i>Lasiurus borealis</i>	23:25	A	M	NR	37.0	10.0	0	A	1.5	—	
12	<i>Lasiurus borealis</i>	0:20	A	M	NR	40.2	11.75	0	B	3	—	

¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for escaped bats

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Project Name/No.: Ridgeline/F2077 Date: 6/11/22
 Site ID: RLM-Slo-Jackson Est. Distance to Water (ft): 0'

VEGETATION

Primary Habitat Type¹: Riparian strip, surrounded by hayfield

Potential Roost: Large Trees Snags Both Other (e.g., structure)

Roost Tree Potential: High Moderate Low

Dominant Canopy Species Avg. Canopy DBH range (in): 12-30"

1. Platanus occidentalis 2. Celtis occidentalis 3. Juglans nigra

Canopy Closure: Closed (80%+) Moderate (40-80%) Open (0-40%)

Dominant Subcanopy Species Avg. Subcanopy DBH range (in): 8-12"

1. Ulmus rubra 2. Fraxinus pensylv 3. Celtis occidentalis

Sub-Canopy Clutter: High (60%+) Moderate (30-60%) Low (0-30%)

Dominant Shrub/Understory Species

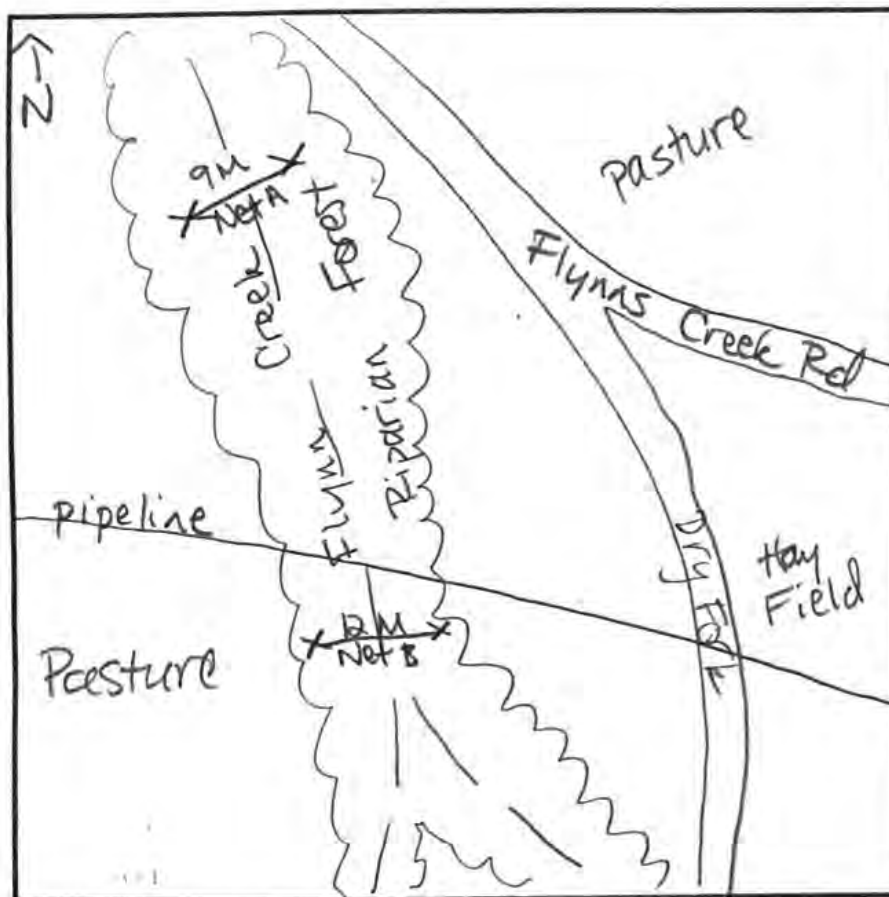
1. Chinese privet 2. 3.

Shrub/Understory Clutter: High (60%+) Moderate (30-60%) Low (0-30%)

STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): 8ft Channel Width: 28' Stream Width: 30'

Riparian Width right bank: 25' left bank: 25' Avg. Water Depth: 2"



¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Other Wildlife Observed: white-tailed deer, COYE, NOMO, SCTA, Eastern screech owls, vole, WEVI, yellow-billed cuckoo, EAME, prairie warbler, EATO, NOPA, INBU

Additional Comments: Appears to be a screech owl family group in the area, after capturing 2 individuals, the group seemed to relocate



Bat Capture Datasheet Pt. II

Page 3 of 3

Project Name/No.: Ridgeline/172677408 Date: 6/11/22

Biologist(s): A. Sjollem, Z. Tene

Site ID: RLM-SG-1 Jackson County/State: Jackson/TN

[illegible]

² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for escaped bats

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Bat Capture Datasheet

Page 1 of 2

Project Name/No. Ridgeline / 172677408

Date: 6/12/22

Biologist(s): A. Sjollem, Zoe True

Site ID: RLM-S6-Jackson

County/State: Jackson/TN

Moon Phase: Waxing gibbous

Sunset: 20:00

Map Kilometer No./Quad: MP 34KM-S6

Latitude: 36.302525

Longitude: -85.70959

Moonset: 4:21am

General Site Description: same as 9/11/22

WIDE, MOSTLY DRY

Nets Open: 19:50

Nets Closed: 1:00

STREAMBED

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	80.8	1	90%
21:00	76.0	1	90%
22:00	75.5	1	90%
23:00	75.1	0	90%
00:00	74.0	0	45%
01:00	73.9	0	25%

Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	9M	5.2M	46.8	36.30328	-85.71006		X			Small puddle of water
B	12M	7.8M	93.6	36.302525	-85.709592		X			Dry stream

* One net at full extension ~ 2.5m high

Weather Comments: Overcast early

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	<i>Lasiurus borealis</i>	20:15	A	F	L	40.7	13.0	0	B	1.5	—	
2	<i>Nycticeius humotatis</i>	20:50	A	F	L	35.3	11.0	0	A	0.5	—	
3	<i>Nycticeius humotatis</i>	20:55	A	M	NR	35.4	7.75	0	B	6.0	—	
4	<i>Lasiurus borealis</i>	21:01	A	M	NR	38.3	10.25	0	A	2.5	—	
5	<i>Nycticeius humotatis</i>	21:03	A	F	L	39.8	13.25	0	A	3.5	—	
6	<i>Lasiurus borealis</i>	21:05	A	F	P	—	—	—	A	4	—	Very pregnant
7	<i>Lasiurus borealis</i>	21:10	—	—	—	—	—	—	B	5	—	Escaped
8	<i>Lasiurus borealis</i>	21:35	A	F	L	41.0	14.25	0	B	4.5	—	
9	<i>Lasiurus borealis</i>	22:15	A	F	P	40.8	18.00	0	A	0.5	—	Very pregnant
10	<i>Myotis grisescens</i>	22:40	A	F	L	42.9	9.70	0	B	4.5	07261	
11	<i>Lasiurus borealis</i>	22:55	A	F	P	39.3	20.0	0	B	4	—	
12	<i>Lasiurus borealis</i>	23:00	—	—	—	—	—	—	A	2	—	Escaped

¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for escaped bats

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Bat Capture Datasheet Pt. II

Page 2 of 2

Project Name/No.: Ridgeline/172677408 Date: 6/12/22

Biologist(s): A. Spillema, Z. True

Site ID: RLM-56⁰-Jackson

County/State: Tackson/TN

[illegible]

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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Bat Capture Datasheet

Page 1 of 4

Project Name/No.: Ridgeline/172677408 Date: 11 June 2022 Biologist(s): Julia Wilson, Mitch Dannon
 Site ID: RLM-57-Jackson County/State: Jackson/TN Moon Phase: Waxing gibbous Sunset: 20:00
 Map Kilometer No./Quad: KM-57 Latitude: 36.29671 Longitude: 85.699905 Moonrise: 17:00 Moonset: 3:39
 General Site Description: creek adjacent to hayfield + mountains; rocky outcrops Nets Open: 20:00 Nets Closed: 1:00

along mountainside? creek disappears underground, water level decreased throughout night!

Time	Temp (F)	Wind ¹	% Cloud Cover	Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
20:00	75.7	0	0	A	9	5	45	36.296334	-85.694580		✓			
21:00	71.2	0	0	B	9	5	45	36.297082	-85.700159		✓			creek drained underground/disappeared under net at 22:10
22:00	67.2	1	0											
23:00	65.6	1	0											
00:00	64.9	1	0											
01:00	63.8	1	0											

* One net at full extension - 2.5m high

Weather Comments: low humidity

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	Nycticeius humeralis	20:20	A	F	L	37.0	10.5	0	B	3.5	—	
2	Lasiurus borealis	20:35	A	F	P	39.9	16.0	0	A	0	—	
3	Lasiurus borealis	20:35	A	F	L	38.2	12.4	0	A	0	—	
4	Nycticeius humeralis	21:00	A	F	L	38	12.8	0	B	2.0	—	
5	Lasiurus borealis	↓	A	F	E	41.1	14.9	0	B	1.0	—	
6	Lasiurus borealis	↓	A	F	P	38.9	18.4	0	B	1.5	—	
7	Lasiurus borealis	↓	A	F	NR	41	13.2	0	B	3.0	—	
8	Eptesicus fuscus	↓	Escaped			16.9		0	B	4.0	—	
9	Lasiurus borealis	↓	A	F	P	38.4	16.9	0	A	3.5	—	
10	Lasiurus borealis	↓	A	F	P	40.0	18.3	0	A	2.0	—	
11	Eptesicus fuscus	↓	A	F	L	49.0	21.8	0	A	1.5	—	
12	Lasiurus borealis	↓	A	F	L	40.0	13.4	0	A	1.0	—	

¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

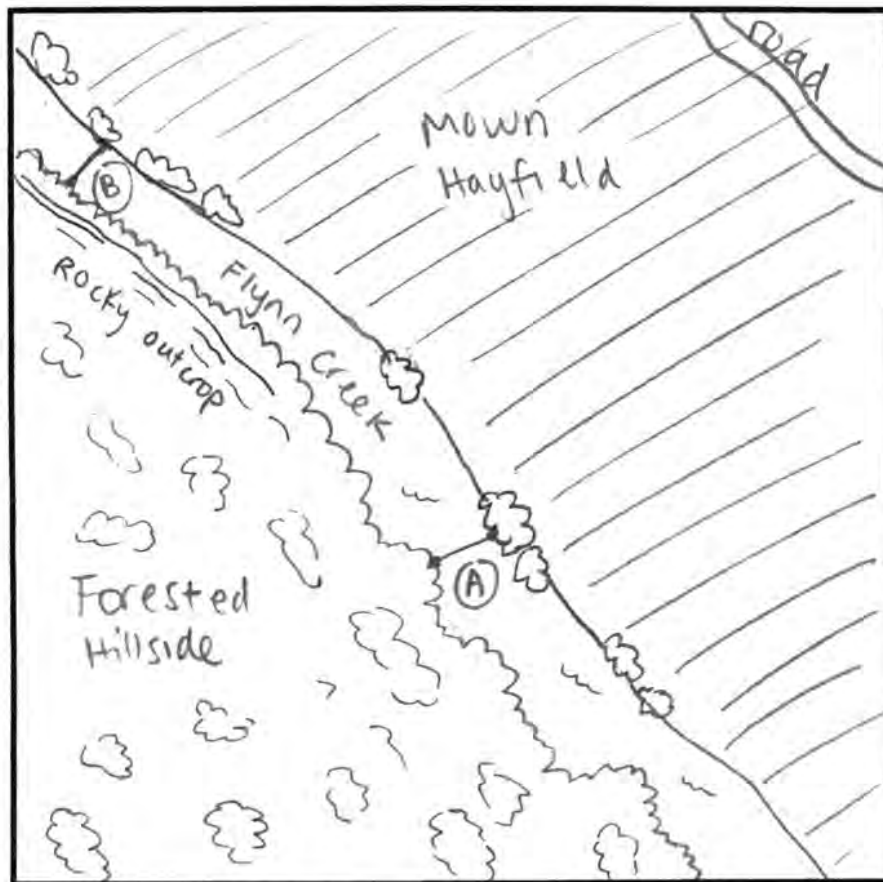
² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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Project Name/No.: 172677408
Ridgeline Date: 11 June 2022
 Site ID: RLM-57-Jackson Est. Distance to Water (ft): 0

VEGETATION

Primary Habitat Type¹: Creek/Riparian
 Potential Roost: Large Trees | Snags | Both | Other (e.g., structure)
 Roost Tree Potential: High | Moderate | Low

Dominant Canopy Species Avg. Canopy DBH range (in): 20
 1. Platanus occidentalis 2. Acer negundo 3. X

Canopy Closure: Closed (80%+) | Moderate (40-80%) | Open (0-40%)

Dominant Subcanopy Species Avg. Subcanopy DBH range (in): 5-15
 1. Betula nigra 2. P. occidentalis 3. Acer negundo

Sub-Canopy Clutter: High (60%+) | Moderate (30-60%) | Low (0-30%)

Dominant Shrub/Understory Species
 1. P. occidentalis 2. X 3. X

Shrub/Understory Clutter: High (60%+) | Moderate (30-60%) | Low (0-30%)

STREAM CHARACTERISTICS (if relevant) *

Bank Height (ft): 5 Channel Width: 10 Stream Width: 30
 Riparian Width right bank: 5 left bank: 10 Avg. Water Depth: 6in

¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Cave salamanders, cave crickets. LOWA caught in Net B
 Other Wildlife Observed: BLGR, TUVU, YTVI, EAKI, AMCR, LOWA, KEWA, BARS, CLSW, BARO
AMGO, FISP, SUTA, GCFL, ANUGA, INBA, RWBL, YBLV, WAVI, SOSP, AMPO, COYE, BHIO

Additional Comments: Little shrub/subcanopy in riparian zone
*Stream actively draining throughout survey period. At open, ~1 ft. of water beneath
Net A + B; no water under Net B at 2:10. Karsty-Rocky outcrop with crevices. MYSE habitat?



Bat Capture Datasheet Pt. II

Page 3 of 4

Project Name/No.: Ridgeline/172677408 Date: 11 June 22Biologist(s): Julia Wilson, Mitch DormanSite ID: RUM-57-JACKSONCounty/State: JACKSON/TN

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (samples taken, transmitter #, if recap, disposition)
13	EPFU	21 ¹⁰	U	U	U	U	U	U	B	2.0	—	Escaped net
14	EPFU	21 ¹⁰	U	U	U	U	U	U	B	1.0	—	Escaped net
15	NYHU	21 ¹⁰	U	U	U	U	U	U	B	4.5	—	Escaped net
16	LABO	21 ¹⁰	U	U	U	U	U	U	B	5.0	—	Escaped net
17	LABO	21 ¹⁰	A	F	P	42.0	21.25	0	B	0.5	—	very pregnant
18	NYHU	21 ¹⁰	A	M	NR	37	9.5	0	B	1.5	—	
19	EPFU	21 ¹⁰	A	M	NR	45.5	15.75	0	B	1.0	—	
20	NYHU	21 ¹⁰	A	F	L	37.5	12.25	0	B	2.5	—	
21	LABO	21 ¹⁰	A	F	P	40.0	21.25	0	B	3.0	—	
22	NYHU	21 ¹⁵	A	M	NR	36.0	8.75	0	B	1.5	—	
23	EPFU	21 ¹⁵	A	F	L	45.5	21.25	0	B	1.0	—	
24	LABO	21 ²⁰	A	F	P	38.5	16.75	0	B	0.5	—	
25	EPFU	21 ²⁰	A	U	U	U	U	0	B	2	—	Escaped back bag
26	EPFU	21 ²⁰	A	F	L	49.0	22.5	0	B	1.0	—	
27	NYHU	21 ²⁰	A	F	L	36.5	12.5	0	B	2.0	—	
28	LABO	21 ²⁵	A	F	P	—	17.0	0	B	1.5	—	Escaped hand
29	NYHU	21 ²⁵	A	F	L	32.5	12.75	0	B	3.5	—	
30	NYHU	21 ²⁵	A	F	L	37.0	13.75	0	B	4.0	—	
31	NYHU	21 ²⁵	A	F	L	39.5	12.25	0	B	2.0	—	
32	NYHU	21 ²⁵	A	F	L	37	12.5	0	A	1.5	—	
33	NYHU	21 ²⁵	A	M	NR	35.5	10.25	0	A	0.5	—	
34	NYHU	21 ²⁵	U	U	U	U	U	0	B	0	—	Escaped net

² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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Bat Capture Datasheet Pt. II

Page 4 of 4

Project Name/No.: Ridgeline 1172677408 Date: 11 June 22Biologist(s): Julia Wilson, Milton DannerSite ID: RLM-57-Jackson County/State: Jackson/TN

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (samples taken, transmitter #, if recap, disposition)
35	Eptesicus fuscus	22 ⁰⁰	A	M	NR	37.1	18.25	0	A	3.0	—	
36	Eptesicus fuscus	22 ¹⁰	A	F	L	47.5	21.0	0	B	2.0	—	
37	Myotis grisescens	22 ³⁵	A	M	NR	44.8	10.25	0	B	2.5	TWRA 07271	
38	Lasiurus borealis	22 ⁴⁵	A	F	P	39.0	15.5	0	A	0.5	—	
39	Lasiurus borealis	22 ⁴⁵	A	F	P	40.5	19.5	0	A	0.5	—	
40	Lasiurus borealis	23 ⁰⁰	A	M	NR	36.9	9.5	0	B	1.5	—	Very small, splotchy wings
41	Nycticeius humeralis	23 ⁴⁰	A	F	L	39.1	13.5	0	B	3.0	—	
42	Nycticeius humeralis	00 ⁰⁰	A	F	L	40.1	14.1	0	A	1.5	—	
43	Lasiurus borealis	00 ⁰⁰	A	F	P	43.1	18.25	0	B	3.5	—	
44	Eptesicus fuscus	00 ⁰⁰	A	M	NR	45.1	18.0	0	B	4.0	—	Almost scrotal
45	Eptesicus fuscus	00 ⁰⁰	A	F	L	46.2	22.0	0	B	3.0	—	Teeth very worn. Old?
46	Lasiurus borealis	00 ¹⁰	U	Escaped	U	U	U	U	B	2.0	—	Escaped net
47	Lasiurus borealis	00 ²⁰	A	F	L	41.1	12.1	0	B	2.5	—	
47	Myotis grisescens	00 ²⁰	A	F	NR	44.1	10.5	1	B	4.5	TWRA 07272	Light scarring
49	Lasiurus borealis	00 ³⁰	A	F	P	38.3	17.0	0	A	0	—	
50	Myotis grisescens	00 ⁴⁵	A	F	L	43.9	12.0	0	A	1.5	TWRA 08587	Foreign recap! originally banded TWRA 07272
51	Myotis grisescens	00 ⁴⁵	A	M	NR	43.1	9.5	0	A	3.0	TWRA 07272	
52	Lasiurus borealis	00 ¹⁰	A	F	P		15.75	0	A	3.5	—	Break in phalange of RFA
												!

² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for escaped bats

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Bat Capture Datasheet

Page 1 of 3

Project Name/No.: Ridgeline/172677408 Date: 12 June 22 Biologist(s): Julia Wilson, Mitch Dannon, Ally Harrison
Site ID: RLM-57-JACKSON County/State: Jackson/TN Moon Phase: Waxing gibbous Sunset: 20:01
Map Kilometer No./Quad: 5.1 KM-57 Latitude: 36.29671 Longitude: -85.699905 Moonrise: 18:16 Moonset: 0421
General Site Description: Creek/riparian-dry under net B. water level down Nets Open: 20:00 Nets Closed: 1:00

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	78.5	0	90
21:00	75.4	0	90
22:00	75.3	0	90
23:00	75.1	0	90
00:00	74.8	0	30
01:00	73.9	0	0

Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	9	5	45	36.296334	-85.699580		✓			
B	9	5	45	36.297082	-85.700158		✓			dry underneath net

* One net at full extension ~ 2.5m high

Weather Comments: More humid than last night.

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	LABO	20:20	A	F	L	43	11.5	0	B	0		
2	LABO	20:40	A	F	P	40.2	13.8	0	A	3		
3	LABO	20:50	A	F	P	41.0	19.8	0	B	3		
4	NYHU	20:52	A	F	L	37.3	14.1	0	B	1		
5	PE SU	20:52	A	F	P	34.8	8.75	0	B	2	did not band	transmitter #34 frequency 150.470 moved slightly up
6	LABO	21:10	U	U	U	U	U	U	A	15		escaped net
7	LABO	21:10	U	U	U	U	U	U	B	2		escaped net
8	LABO	21:10	U	U	U	U	U	U	B	1		escaped net
9	NYHU	21:10	A	M	NR	35	8.6	0	A	2		missing 1015 of ear. Alopecia?
10	LACT	21:10	A	F	L	52.2	32.5	0	A	1.5		
11	NYHU	21:10	A	M	NR	36.9	8.5	0	A	3		
12	LABO	21:30	A	F	P	42	19	0	B	2		small hole in wing

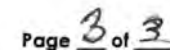
¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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Biologist(s): Julia Wilson

County/State: JACKSON / TN

Mitch Danner
Ally Harrison

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

- * Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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Bat Capture Datasheet

Page 1 of 2

Project Name/No.: Ridgeline/172677408

Date: 10/11/2022

Biologist(s): M. Evans, A. Hamner

Site ID: RLM-59-Jackson

County/State: Jackson Co TN

Moon Phase: Waxing Gibbous

Sunset: 20:00

Map Kilometer No./Quad: KM-59

Latitude: 36.289856

Longitude: -85.687797

Moonrise: 17:10

Moonsset: 03:08

General Site Description: Flynn Creek, between Flynn's Creek Rd and Ernest Mahanay rd

Nets Open: 20:05

Nets Closed: 01:05

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	72	0	0
21:00	68.2	0	0
22:00	66	0	0
23:00	65	0	0
00:00	63	0	0
01:00	63	0	0

Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	9	7.8	70.2	36.289800	-85.687675		X			
B	12	5.2	62.4	36.289732	-85.688473		X			

* One net at full extension ~ 2.5m high

Weather Comments: _____

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* # TWRA	Comments (e.g., samples taken, transmitter #, disposition)
1	<i>Lasiurus borealis</i>	20:40	A	M	NR	390	11.25	0	A	3.5	—	
2	<i>Myotis grisescens</i>	21:00	A	M	NR	420	11.25	0	B	1.0	—	Released fast due to stress
3	<i>Lasiurus borealis</i>	21:05	A	F	P	405	17.50	0	A	2.0	—	
4	<i>Myotis grisescens</i>	21:05	A	M	NR	430	9.75	0	A	1.5	08541	
5	Unknown	21:10	U	U	U	—	—	—	B	2.0	—	Escaped net

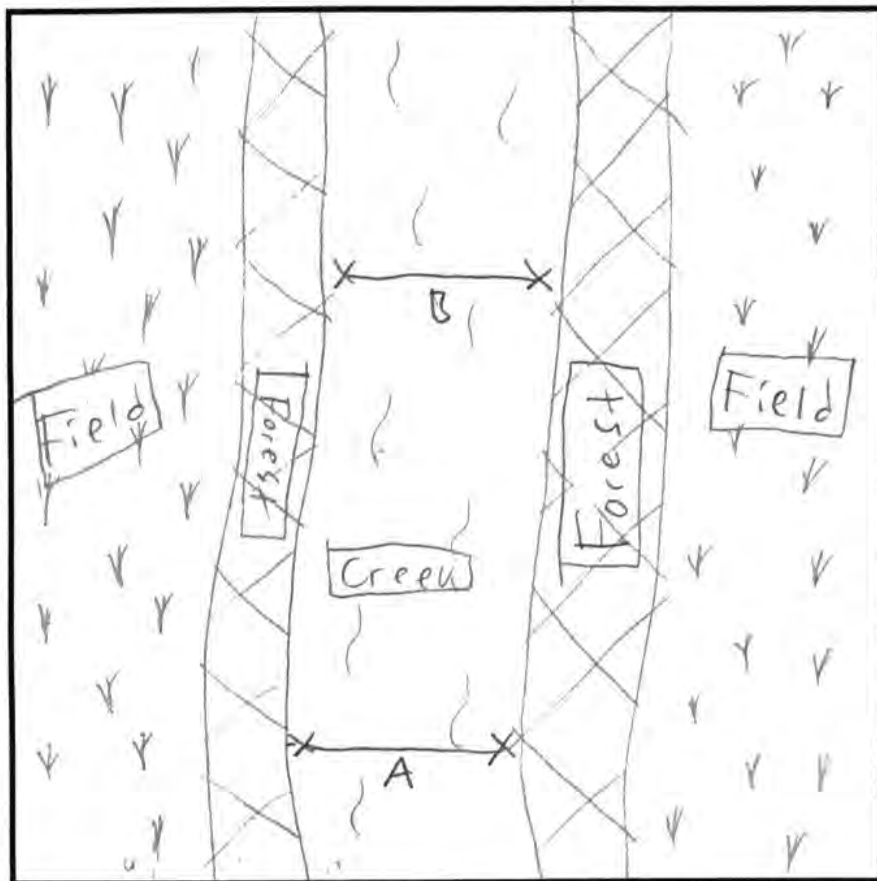
¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Project Name/No.: Ridgeline/172677408 Date: 6/11/2022

Site ID: RLM-59-Jackson Est. Distance to Water (ft): 6

VEGETATION

Primary Habitat Type¹: Creek/Riparian

Potential Roost: Large Trees Snags Both Other (e.g. structure)

Roost Tree Potential: High Moderate Low

Dominant Canopy Species Avg. Canopy DBH range (in): 8-16

1. Acer negundo 2. Juglans nigra 3. Platanus occidentalis

Canopy Closure: Closed (80%+) Moderate (40-80%) Open (0-40%)

Dominant Subcanopy Species Avg. Subcanopy DBH range (in): 4-10

1. Ailanthus altissima 2. Ulmus americana 3.

Sub-Canopy Clutter: High (60%+) Moderate (30-60%) Low (0-30%)

Dominant Shrub/Understory Species

1. Toxicodendron radicans 2. 3.

Shrub/Understory Clutter: High (60%+) Moderate (30-60%) Low (0-30%)

STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): 2-7.5' Channel Width: 45' Stream Width: 35'

Riparian Width right bank: 6-10' left bank: 25-30' Avg. Water Depth: 6"

Other Wildlife Observed: juvenile barred owls

Additional Comments:



Bat Capture Datasheet

Page 1 of 2

Project Name/No.: Ridgeline/172677408

Date: 6/12/2022

Biologist(s): M. Evans, A. Hammer

Site ID: KLM-59-Jackson

County/State: Jackson TN

Moon Phase: Waxing Gibbous

Sunset: 20:00

Map Kilometer No./Quad: KM-59

Latitude: 36.249456

Longitude: -85.687797

Moonrise: 18:23

Moonsset: 03:43

General Site Description: Algon Creek, between Flynn's Creek Rd and Ernest Mahoney Rd

Nets Open: 20:00

Nets Closed: 01:00

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	78	0	30
21:00	75	0	80
22:00	75	0	85%
23:00	75	0	40
00:00	74	0	30
01:00	72	0	5

Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	9	7.5	10.2	36.249456	-85.687797		X			
B	12	5.2	62.4	36.249732	-85.602173		X			

* One net at full extension ~ 2.5m high

Weather Comments:

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	Lasiurus borealis	20:40	A	F	L	41.5	15.5	0	A	7.5	—	bat tick on face
2	Lasiurus borealis	21:15	A	F	P	39.5	17.0	0	B	2.0	—	
3	Lasiurus borealis	21:45	A	F	P	42.0	20.0	0	B	1.5	—	
4	Lasiurus cinereus	22:40	A	F	L	52.0	29.5	0	A	6.5	—	
5	Lasiurus cinereus	23:00	—	—	—	—	—	—	A	6.75	—	Recapture

¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats



Bat-Capture Datasheet

Page 1 of 3

Project Name/No.: Ridgeline/172677408 Date: 6/13/22 Biologist(s): A. Sjollema, Z. True
 Site ID: RLM-60-Jackson County/State: Jackson, TN Moon Phase: Full Sunset: 20:01
 Map Kilometer No./Quad: 1 KM-60 Latitude: 36.27808 Longitude: -85.67474 Moonrise: 20:46 Moonset: 05:14
 General Site Description: Riparian forest along Flynn Creek w/ adjacent newfield habitat Nets Open: 20:05 Nets Closed: 01:10

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	84	0	15
21:00	82	0	15
22:00	74.5	0	15%
23:00	74.4	0	0%
00:00	74.0	0	0
01:00	72.7	0	0

Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	15M	7.8M	117	36.27857	-85.67441		X			
B	9M	7.8M	70.2	36.27808	-85.67474		X			

* One net at full extension ~ 2.5m high

Weather Comments: clear + warm, fog came in @ 00:00, but still clear in creek

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	<i>Lasiurus borealis</i>	20:10	A	M	NR	38.8	10.75	0	A	4	—	
2	<i>Perimyotis subflavus</i>	20:15	A	F	L	33.4	8.6	0	A	6	03310	
3	<i>Lasiurus borealis</i>	20:25	A	F	P	40.9	17.5	0	A	5.5	—	
4	<i>Lasiurus borealis</i>	20:30	A	F	L	41.5	11.25	0	A	3	—	
5	<i>Myotis lucifugus</i>	20:35	A	M	NR	35.7	7.30	0	A	1	07259	
6	<i>Lasiurus borealis</i>	21:00	A	M	NR	39.2	10.5	0	B	.5	—	
7	<i>Lasiurus borealis</i>	21:30	A	M	NR	37.2	10.5	0	B	2.5	—	
8	<i>Lasiurus borealis</i>	21:30	A	M	NR	38.9	11.5	0	B	3	—	
9	<i>Lasiurus borealis</i>	21:55	—	—	—	—	—	—	B	3.5	—	Escaped/bald patch on neck
10	<i>Myotis grisescens</i>	22:00	A	F	L	43.3	10.5	0	A	6.5	07258	Band on right by mistake
11	<i>Eptesicus fuscus</i>	22:20	A	M	NR	44.4	19.5	0	B	5	—	
12	<i>Nycticeius humeralis</i>	22:30	A	M	NR	35.8	9.6	0	B	4.5	—	

¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

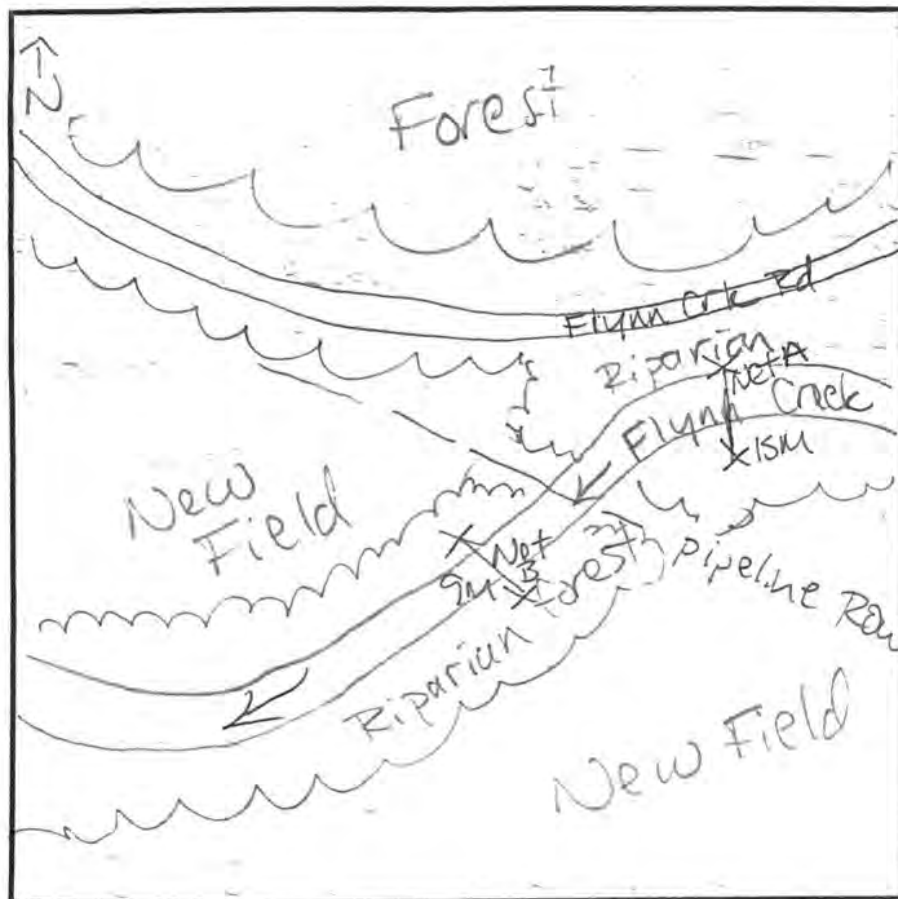
² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: ID = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for escaped bats

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1 Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Project Name/No.: Ridgeline/22077408 Date: 6/13/22
Site ID: RLM-60-Jackson Est. Distance to Water (ft): 0

VEGETATION

Primary Habitat Type¹: Riparian forest strip in newfield

Potential Roost: Large Trees Snags Both Other (e.g., structure)

Roost Tree Potential: High Moderate Low

Dominant Canopy Species Avg. Canopy DBH range (in): 20-26"
1. Juglans nigra 2. Platanus occidentalis 3.

Canopy Closure: Closed (80%+) Moderate (40-80%) Open (0-40%)

Dominant Subcanopy Species Avg. Subcanopy DBH range (in): 10-16"
1. Juglans nigra 2. Juniperus virginiana 3. Acer negundo

Sub-Canopy Clutter: High (60%+) Moderate (30-60%) Low (0-30%)

Dominant Shrub/Understory Species
1. Albizia julibriss 2. Acer negundo 3.

Shrub/Understory Clutter: High (60%+) Moderate (30-60%) Low (0-30%)

STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): 3' Channel Width: 36' Stream Width: 40'

Riparian Width right bank: 40' left bank: 40' Avg. Water Depth: 1.5'

Other Wildlife Observed: Barred owl, LWA, blue-gray gnatcatcher, WEVI, INBU, CAWP, SUTA, LEFL

Additional Comments: _____



Bat Capture Datasheet Pt. II

Page 3 of 3

Project Name/No.: Ridgeline/172677408

Date: 6/13/22

Biologist(s): A. Sjollem, Z. True

Site ID: RLM-60⁹-Jackson

County/State: Jackson, TN

[illegible]

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

- * Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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Bat Capture Datasheet

Page 1 of 1

Project Name/No.: Ridgeline / 172677408

Date: 6/14/22

Biologist(s): A. Sjolten, Z. True

Site ID: RLM-6D-Jackson

County/State: Jackson/TN

Moon Phase Waning gibbous

Sunset: 20:02

Map Kilometer No./Quad: NP-5-KM-60

Latitude: 36.27808

Longitude: 85.67474

Moonrise: 20:43

Moonset 05:14

General Site Description: Riparian forest surrounding Flynn Creek

Nets Open: 9:53

Nets Closed 01:00

with new field adjacent

Time	Temp (F)	Wind ¹	% Cloud Cover	Net ID (A, B,..)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
20:00	88.3°	1	0	A	15M	7.8M	117	36.27857	-85.67441		X			
21:00	75.9	0	0	B	9M	7.8M	702	36.27808	-85.67471		X			
22:00	74.8	0	25%											
23:00	73.5	0	35%											
00:00	73.0	0	10%											
01:00	72.4	1	5%											

* One net at full extension ~ 2.5m high

* One net at full extension ~ 2.5m high

Weather Comments: Calm, and hot transitioning to cooler throughout night. Low fog in field after 11pm, not in stream channel.

[illegible]

Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats.

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Bat Capture Datasheet Pt. II

Page 1 of 2

Project Name/No.: Ridgeline/172677408

Date: 06/09/2022

Biologist(s): M. Evans, A. Overbye, C. Ramser

Site ID: RLM-61-Jackson

County/State: Jackson Co. TN

[illegible]

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

- Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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Bat Capture Datasheet

Page 1 of 2

Project Name/No.: Ridge Line/172677408 Date: 6/10/2022 Biologist(s): M. Evans, A. Overbye, & C. Ramser
 Site ID: RLM-61-Jackson County/State: Jackson Co, TN Moon Phase: Waning Gibbous/84% Sunset: 19:59
 Map Kilometer No./Quad: 37.1-38.0 KM 61 Latitude: 36.274952 Longitude: -85.662520 Moonrise: 15:50 Moonset: 02:35
 General Site Description: Private drive off of Shady Grove Rd leading to forested ridge. Nets Open: 19:58 Nets Closed: 01:00

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	70°	0	10%
21:00	68°	0	0%
22:00	65°	0	0%
23:00	63.7°	0	0%
00:00	63.3	0	0%
01:00	61.5	0	0%

Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	6	5.2	31.2m ²	36.274786	-85.662024			✓		Upper pond; smaller.
B	12	7.8	95.6m ²	36.275084	-85.663110			✓		Lower pond

* One net at full extension ~ 2.5m high

Weather Comments: _____

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	NYHU	21:08	A	M	NR	35.5	8.50	0	B	3.0	—	—
2	NYHU	21:29	A	M	NR	35.5	9.25	0	B	0.5	—	—
3	LABO	21:55	A	F	P	40.5	17.50	0	B	0.25	—	—
4	LABO	21:55	A	F	P	41.0	17.75	0	B	0.25	—	—
5	LABO	21:55	A	F	P	41.5	15.50	0	B	0.50	—	—
6	LABO	22:15	A	F	P	37.5	17.25	0	B	0.50	—	—
7	EPFU	22:29	A	M	NR	45.5	18.75	1	B	0.25	—	—
8	LABO & LABO	23:15	U	U	U	—	—	—	A	3.0	—	Escaped
9	LABO	23:58	A	F	P	41.0	14.5	0	A	0.5	—	—

¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

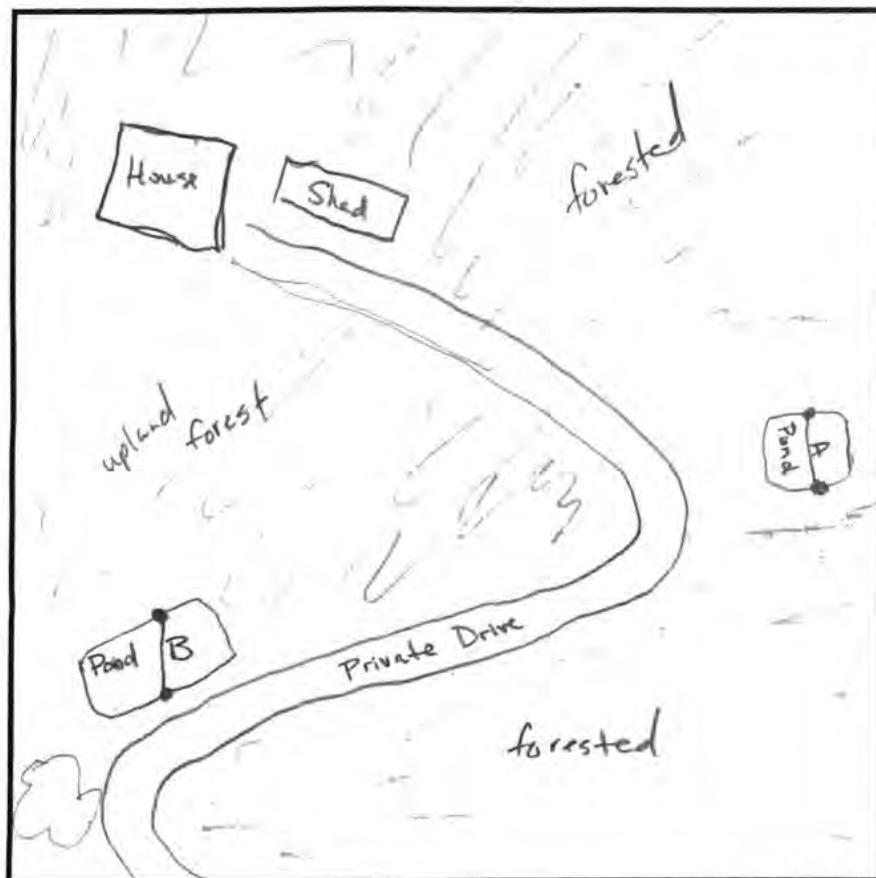
² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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Project Name/No.: Ridgeline/172177108 Date: 6/10/2022

Site ID: RLM-61-Jackson Est. Distance to Water (ft): 0'

VEGETATION

Primary Habitat Type¹: Upland forest

Potential Roost: Large Trees | Snags | Both | Other (e.g., structure)

Roost Tree Potential: High | Moderate | Low

Dominant Canopy Species Avg. Canopy DBH range (in): 12-30"

1. Q. montana 2. C. tomentosa 3. L. tulipifera

Canopy Closure: Closed (80%+) | Moderate (40-80%) | Open (0-40%)

Dominant Subcanopy Species Avg. Subcanopy DBH range (in): 2-14"

1. C. glabra 2. Cornus florida 3.

Sub-Canopy Clutter: High (60%+) | Moderate (30-60%) | Low (0-30%)

Dominant Shrub/Understory Species

1. R. multiflora 2. Toxicodendron radicans

Shrub/Understory Clutter: High (60%+) | Moderate (30-60%) | Low (0-30%)

STREAM CHARACTERISTICS (if relevant) N/A

Bank Height (ft): Channel Width: Stream Width:

Riparian Width right bank: left bank: Avg. Water Depth:

¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Other Wildlife Observed: barred owl, Fowler's toad, green frog, spring peeper, eastern whip-poor-will, scarlet tanager

Additional Comments:



Bat Capture Datasheet

Page 1 of 2

Project Name/No.: 172677408 Date: 6/11/2022 Biologist(s): Zach Baer, Amanda Overbye
Site ID: RLM-62-Jackson County/State: Jackson, TN Moon Phase: Waxing Gibbous Sunset: 20:00
Map Kilometer No./Quad: ~~62~~ KM-62 Latitude: 36.273846 Longitude: -85.654763 Moonrise: 17:01 Moonset: 03:05
General Site Description: Across creek, Flinn's, S. of Flinn's creek road Nets Open: 20:00 Nets Closed: 0100

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	70	0	0
21:00	68	0	0
22:00	66	0	0
23:00	65	0	0
00:00	64	0	0
01:00	64	0	0

Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	9	5.2	46.8	36.273560	-85.653968		X			
B	12	7.9	93.6	36.273807	-85.654617		X			

* One net at full extension ~ 2.5m high

Weather Comments: Clear

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	LABO	20:41	A	M	NR	380	10.75	0	B	3.0	---	---
2	EPFV	21:03	A	F	♀	49.0	22.75	0	A	3.0	---	---
3	NYHU	21:19	A	M	NR	350	9.75	0	A	3.0	---	---
4	MYGR	21:19	A	M	NR	44.0	10.00	0	B	2.5	TWRA 08586	---
5	MYGR	23:10	A	F	↓	44.0	12.25	0	B	2.5	TWRA 08587	---

¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

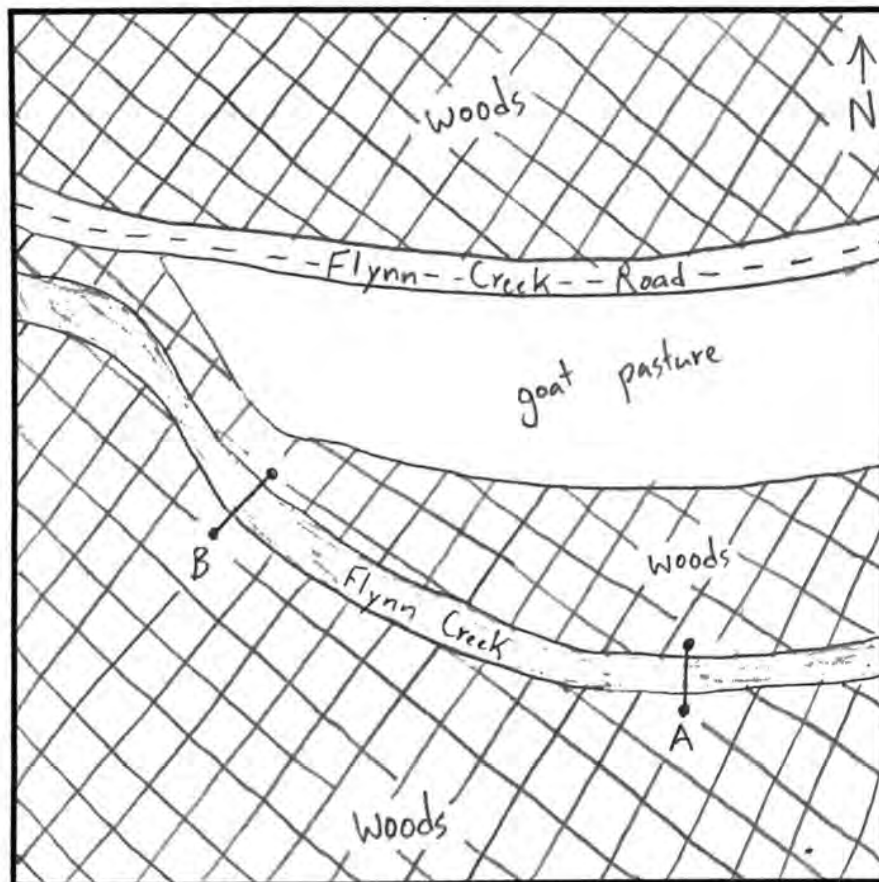
² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Project Name/No.: 172677408 Date: 6/11/2022
 Site ID: RLM-62-Jackson Est. Distance to Water (ft): 0

VEGETATION

Primary Habitat Type¹: Creek/Riparian
 Potential Roost: Large Trees | Snags | Both | Other (e.g., structure)

Roost Tree Potential: High | Moderate | Low

Dominant Canopy Species Avg. Canopy DBH range (in): 14
 1. Acer saccharum 2. Juglans nigra 3. Platanus occidentalis

Canopy Closure: Closed (80%+) | Moderate (40-80%) | Open (0-40%)

Dominant Subcanopy Species Avg. Subcanopy DBH range (in): 11
 1. Acer saccharum 2. Ulmus americana 3. Acer negundo

Sub-Canopy Clutter: High (60%+) | Moderate (30-60%) | Low (0-30%)

Dominant Shrub/Understory Species
 1. Acer negundo 2. Ulmus americana 3. Acer saccharum

Shrub/Understory Clutter: High (60%+) | Moderate (30-60%) | Low (0-30%)

STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): 1 Channel Width: 35 Stream Width: 15

Riparian Width right bank: 0 left bank: 300 Avg. Water Depth: 6in

Other Wildlife Observed: _____

Additional Comments: _____



Bat Capture Datasheet

Page 1 of 1Project Name/No.: 172677408Date: 6/12/2022Biologist(s): Zack Baer, Amanda OverbyeSite ID: RLM-62-JacksonCounty/State: Jackson, TNMoon Phase: Waxing GibbousSunset: 2000Map Kilometer No./Quad: KM-62Latitude: 36.273846Longitude: -85.654763Moonrise: 1815Moonset: 1921 dH21General Site Description: Across creek, Flynn's creek, south of Flynn's creek RdNets Open: 2000Nets Closed: 0100

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	75	0	0
21:00	73	0	0
22:00	73	0	50
23:00	73	0	100
00:00	72	0	100
01:00	71	0	0

Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	9	5.2	46.8	36.273560	-85.653968		X			
B	12	7.8	93.6	36.273807	-85.654617		X			

* One net at full extension ~ 2.5m high

Weather Comments: —

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	LABO	2143	A	F	L	41.0	14.5	0	A	3.0	—	—
2	MYGR	2303	A	M	NR	43.0	10.75	0	A	4.0	TWRA 08588	TWRA 08588
3	EPFU	2303	A	F	L	49.0	20.0	0	A	1.0	—	—

¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

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Bat Capture Datasheet

Page 1 of 2

Project Name/No.: 172677408

Date: 6/13/2022

Biologist(s): M. Evans, A. Hammer

Site ID: RLM-63-Jackson

County/State: Jackson TN

Moon Phase: Full Moon Sunset: 20:00

Map Kilometer No./Quad: KM-63

Latitude: 36.273741

Longitude: -85.646544 Moonrise: 19:37 Moonset: 04:24

General Site Description: Flynn's Creek, along Flynn's Creek Rd, near intersection of Peter Hollow Ln.

Nets Open: 20:00 Nets Closed: 01:00

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	86	0	0
21:00	72	0	0
22:00	74	0	0
23:00	73	0	0
00:00	73	0	0
01:00	72	0	0

Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	9	5.2	46.8	36.273620	-85.646605		X			Flynn Creek main stem
B	6	5.2	31.2	36.273530	-85.646683		X			

* One net at full extension - 2.5m high

Weather Comments: Very foggy, very humid

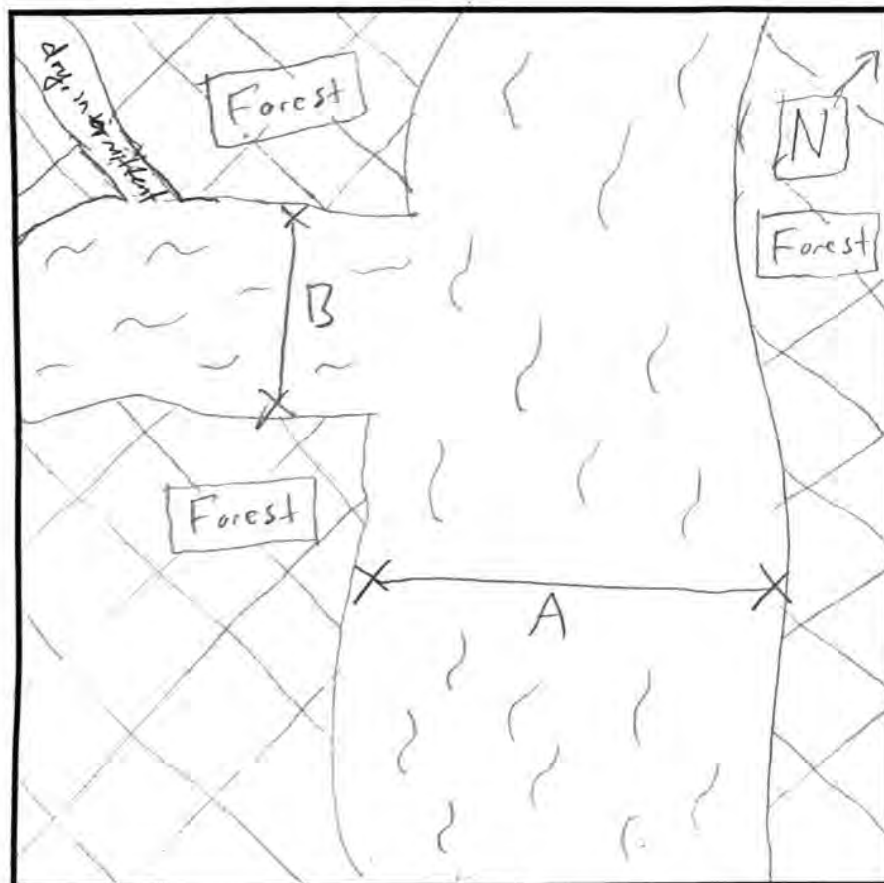
No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RF ³ (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	<i>Lasiurus borealis</i>	20:35	A	F	IP	39.5	19.25	0	B	0	—	
2	<i>Nycticeius humeralis</i>	21:10	A	M	NR	36.5	8.25	0-P	B	3.0	—	(R) right wing puncture, held on back of skull
3	<i>Nycticeius humeralis</i>	21:40	A	M	NR	34.0	8.25	0	A	1.5	—	
4	<i>Lasiurus borealis</i>	22:35	A	F	L	40.5	13.25	0	A	1.0	—	

¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats



¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Project Name/No.: 172677408 Date: 6/13/2022
Site ID: RLM-63-Jackson Est. Distance to Water (ft): 0

VEGETATION

Primary Habitat Type¹: Creek / Riparian

Potential Roost:	Large Trees	Snags	Both	Other (e.g., structure)
Roost Tree Potential:	High		Moderate	Low

Dominant Canopy Species **Avg. Canopy DBH range (in):**

1. Platanus occidentalis 2. F. pennsylvanica 3. Juglans nigra

Canopy Closure: Closed (80%+) Moderate (40-80%) Open (0-40%)

Dominant Subcanopy Species Avg. Subcanopy DBH range (in): _____
 1. Acer negundo 2. Betula nigra 3. Alnus americana

Sub-Canopy Clutter:	High (60% +)	Moderate (30 - 60%)	Low (0 - 30%)
---------------------	-----------------	------------------------	------------------

Dominant Shrub/Understory Species
 1. Alnus americana 2. L. benzoin 3. Sambucus canadensis

	High (60% +)	Moderate (30 - 60%)	Low (0 - 30%)
Shrub/Understory Clutter:			

STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): 1-3' Channel Width: 35' Stream Width: 6'
Riparian Width right bank: ~200' left bank: 20' Avg. Water Depth: 1-6"

Other Wildlife Observed: Barred owls, beaver?, hermit thrush, scarlet tanager, Fowler's toad,
green frog,

Additional Comments: _____



Stantec

Bat Capture Datasheet

Page 1 of 2

Project Name/No.: 172677408

Date: 6/14/2022

Biologist(s): M. Evans, A. Hammer

Site ID: RLM-63-Jackson

County/State: Jackson TN

Moon Phase: Full Moon

Sunset: 20:01

Map Kilometer No./Quad: KM-63

Latitude: 36.273741

Longitude: -85.646544 Moonrise: 20:47

Moonset: 05:15

General Site Description: Flynn's Creek, along Flynn's Creek Rd, near

Nets Open: 20:01

Nets Closed 01 : 00

Intersection of Peter Hollow Ln.

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	77	0	0%
21:00	75	0	0
22:00	74	0	0
23:00	73	0	30
00:00	72	0	40
01:00	71	0	0

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments: Extremely hazy from humidity

[illegible]

1 **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

- Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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Bat Capture Datasheet

Page 1 of 2

Project Name/No.: Ridgeline/172677408 Date: 6/13/22 Biologist(s): Julia Wilson, Mitch Dannon, Ally
Site ID: RLM-64-Jackson County/State: Jackson/TN Moon Phase: Full Sunset: 20:01 Harrison
Map Kilometer No./Quad: 44 KM-64 Latitude: 36.268048 Longitude: 85.638011 Moonrise: 19:37 Moonset: 04:24
General Site Description: creek and cave on hillside Nets Open: 20:00 Nets Closed: 1:00

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	84.6	0	0
21:00	75.4	0	0
22:00	74.4	0	0
23:00	74.5	0	0
00:00	73.2	0	0
01:00	72.5	0	0

Net ID (A, B, C)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	9	7	63	36.267387	85.637893		✓			
B	6	7	42	36.267856	85.638042		✓			
C	4	1	4	36.267810	85.638344				✓	cave entrance

* One net at full extension ~ 2.5m high

Weather Comments: creek and cave on hillside

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	LABO	20:20	U	U	U	U	U	U	B	4.5	—	Escaped net
2	PESU	20:40	A	M	NR	U	5.25	0	A	2	A04480	Escaped band
3	LABO	20:45	A	F	P	39.1	16	0	A	3	—	
4	PESU	22:33	A	M	NR	34.2	6.0	0	A	1	—	did not band (arm unsuitable)
5	PESU	23:01	A	M	NR	33	5.5	0	C	0.2	TWRA 04482	
6	LABO	00:04	A	M	NR	40.3	11.25	0	A	4	—	

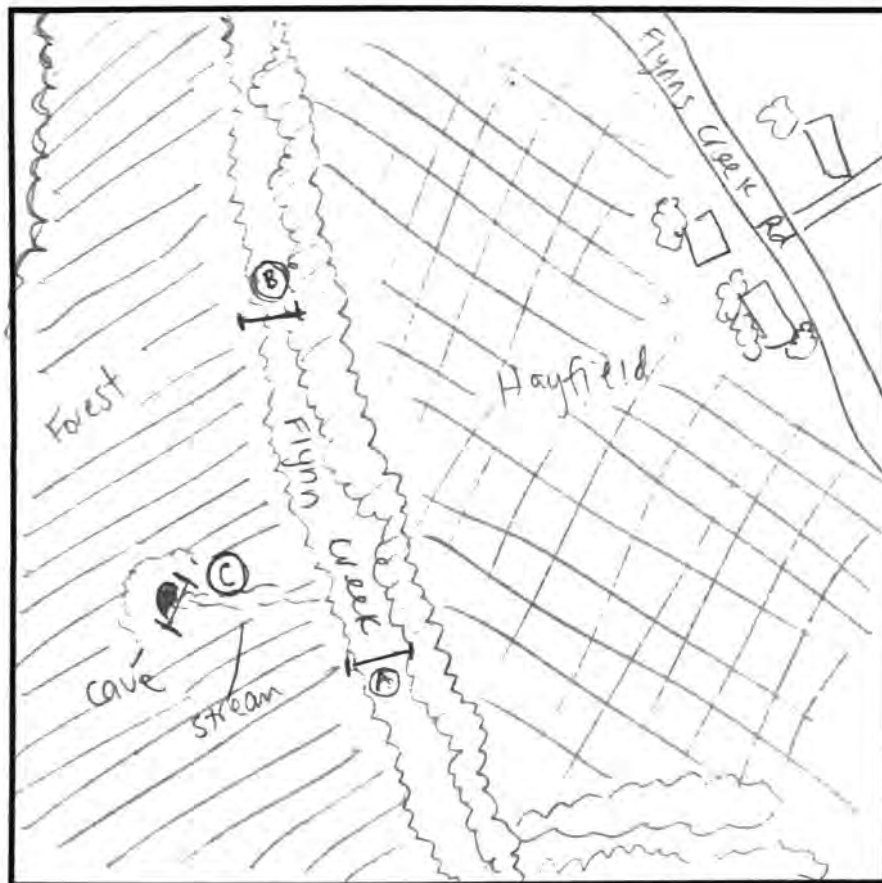
¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Project Name/No.: 172677408
Date: 13 June 22
Site ID: RLM-64-JACKSON
Est. Distance to Water (ft): 0

VEGETATION

Primary Habitat Type¹: Creek/Riparian; Cave entrance

Potential Roost: Large Trees Snags Both Other (e.g. structure)

Roost Tree Potential: High Moderate Low

Dominant Canopy Species Avg. Canopy DBH range (in): 30-50

1. Platanus occidentalis 2. Juglans nigra 3. Fagus grandifolia

Canopy Closure: Closed (80%+) Moderate (40-80%) Open (0-40%)

Dominant Subcanopy Species Avg. Subcanopy DBH range (in): 10-25

1. Acer negundo 2. Juglans nigra 3. Fagus grandifolia

Sub-Canopy Clutter: High (60%+) Moderate (30-60%) Low (0-30%)

Dominant Shrub/Understory Species

1. Viburnum acerifolium 2. Fagus grandifolia 3.

Shrub/Understory Clutter: High (60%+) Moderate (30-60%) Low (0-30%)

STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): 3 Channel Width: 10 Stream Width: 25

Riparian Width right bank: 15 left bank: 20 Avg. Water Depth: 1.0m

Other Wildlife Observed: ACFL, BARD, PUMA, KEWA, LOWA, NUPA, PRWA, WEVI

cave salamander, green frog, northern watersnake, leopard frog, Allegheny woodrat, lead-backed salamander

Additional Comments: cave has lots of air (exhaling) Passage over 20ft. deep opening

Extra net over cave entrance.



Bat Capture Datasheet

Page 1 of 2

Project Name/No.: Ridgeline/172677408 Date: 06/14/2022 Biologist(s): Julia Wilson, Anna Blair
Site ID: RLM-64-Jackson County/State: Jackson, TN Moon Phase: Waning Gibbous Sunset: 20:01
Map Kilometer No./Quad: #4 KM-64 Latitude: 36.268048 Longitude: 85.638011 Moonrise: 20:34 Moonset: 06:29
General Site Description: creek and cave on hillside Nets Open: 20:00 Nets Closed: 01:05

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	84.4	0.0	0
21:00	75.1	0.0	0
22:00	74.1	0.0	0
23:00	73.0	0.0	0
00:00	71.8	0.0	0
01:00	72.0	0.0	0

Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	9	7	63	36.267387	-85.637893		✓			
B	6	7	42	36.267856	-85.638042		✓			
C	4	1	4	36.267810	-85.638344				✓	CAVE entrance

* One net at full extension ~ 2.5m high

Weather Comments: high humidity

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	<i>Lasius borealis</i>	22:40	A	F	L	40.3	13.5	0	A	4.5	—	

¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats



Bat Capture Datasheet

Page 1 of 2

Project Name/No.: 122677408 Date: 6/13/2022 Biologist(s): Zach Baer
Site ID: RLM-65-Jackson County/State: Jackson TN Moon Phase: Waxing Gibbous Sunset: 20:00
Map Kilometer No./Quad: 65 KM-65 Latitude: 36.265373 Longitude: -85.635649 Moonrise: 19:33 Moonset: 04:21
General Site Description: Forested bottom land, Flinn's Creek pipeline corridor Nets Open: 20:00 Nets Closed: 01:00

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	80°	0	10%
21:00	77°	0	0%
22:00	76°	0	0%
23:00	75°	0	0%
00:00	74°	0	0%
01:00	73°	0	0%

Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	12	5.2	62.4	36.265463	-85.635836		X			
B	9	7.8	70.2	36.265710	-85.635654				X	Pipeline Corridor

* One net at full extension - 2.5m high

Weather Comments: Exposure to light from pipeline corridor

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	LABO	20:33	A	M	NR	40.0	11.00	0	A	2.5	—	—
2	LABO	21:08	A	M	NR	39.0	11.0	0	A	2.0	—	—
3	EP+U	21:58	A	F	L	51.0	21.50	2-P	A	2.5	—	Six holes & large tear in left wing

¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

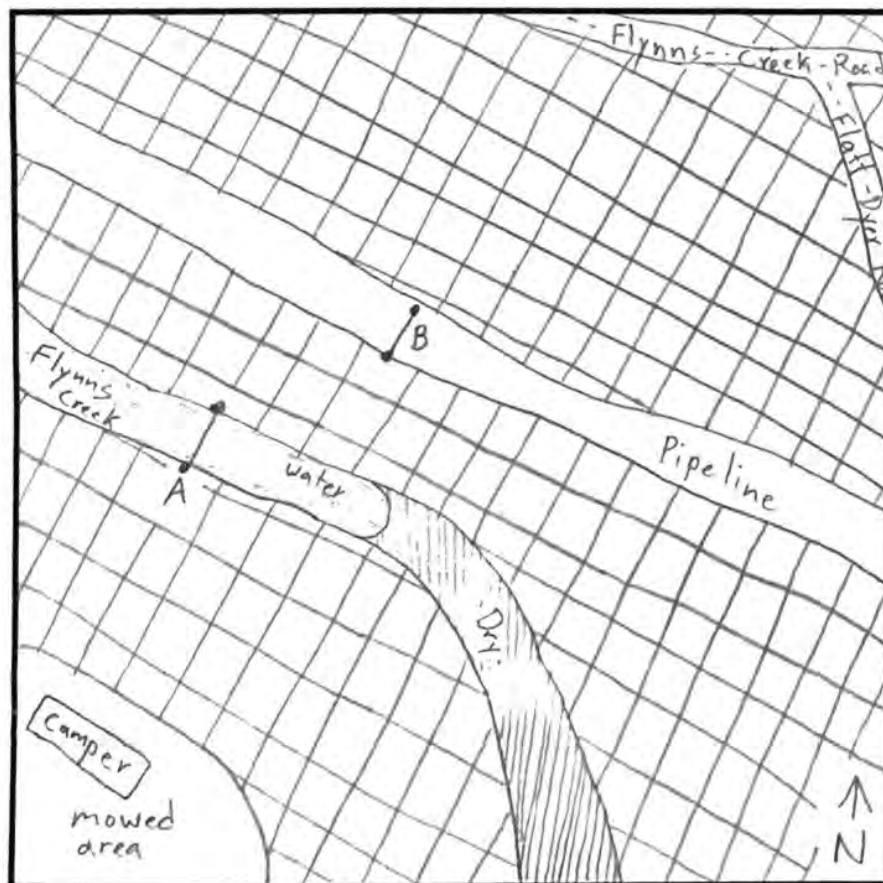
² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for escaped bats

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¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Project Name/No.: 172677408 Date: 6/13/2022
Site ID: RLM-65-Jackson Est. Distance to Water (ft): 0

VEGETATION

Primary Habitat Type¹: Creek & Riparian
Potential Roost: Large Trees | Snags | Both | Other (e.g., structure)
Roost Tree Potential: High | Moderate | Low

Dominant Canopy Species Avg. Canopy DBH range (in): 10
1. Ailanthus altissima 2. Acer negundo 3. _____

Canopy Closure: Closed (80%+) | Moderate (40-80%) | Open (0-40%)

Dominant Subcanopy Species Avg. Subcanopy DBH range (in): 8
1. Acer negundo 2. Celtis occidentalis 3. Ulmus americana

Sub-Canopy Clutter: High (60%+) | Moderate (30-60%) | Low (0-30%)

Dominant Shrub/Understory Species
1. Acer negundo 2. Lindera benzoin 3. Ulmus americana

Shrub/Understory Clutter: High (60%+) | Moderate (30-60%) | Low (0-30%)

STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): 3 Channel Width: 25 Stream Width: 15
Riparian Width right bank: 0 left bank: 300 ft Avg. Water Depth: 4 in

Other Wildlife Observed: whitetailed deer

Additional Comments: _____



Bat Capture Datasheet

Page 1 of 1

Project Name/No.: 172677408 Date: 6/14/2022 Biologist(s): Zach Baer, Amanda Overbye
Site ID: 21m-65-Jackson County/State: Jackson, TN Moon Phase: full Moon Sunset: 20:01
Map Kilometer No./Quad: 65 KM-65 Latitude: 36.265373 Longitude: -85.635649 Moonrise: 20:46 Moonset: 5:14
General Site Description: forested bottom land, flims Creek, Pipeline Corridor Nets Open: 20:01 Nets Closed: 01:01

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	78	0	0
21:00	77	0	0
22:00	76	0	30%
23:00	75	0	40%
00:00	73	0	20%
01:00	73	0	20%

Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	12	5.2	84	36.265463	-85.635836		X			
B	9	7.8	46.8	36.265710	-85.635654				X	Pipeline Corridor

* One net at full extension ~ 2.5m high

Weather Comments: _____

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	EPFU	2125	A	F	L	47	23.5	0	A	3	—	—

¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats



Bat Capture Datasheet

Page 1 of 2

Project Name/No.: Ridgepole / 172677408 Date: 6/15/2022 Biologist(s): W. Cunningham, C. Pinner
 Site ID: ~~MS66~~ RLM-66-SMITH County/State: Smith / TN Moon Phase: Waning Gibbous Sunset: 2001
 Map Kilometer No./Quad: M Km 566 Latitude: N 36-257981 Longitude: W-85-629912 Moonrise: 2152 Moonset: 0728
 General Site Description: Ridgepole pipeline corridor through dense oak-hickory. Nets Open: 1955 Nets Closed: 0100

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	82.0	0	5%
21:00	79.9	0	0%
22:00	80.8	2	0%
23:00	80.9	2	0%
00:00	79.4	0	0%
01:00	77.5	0	0%

Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	12m	4.375							X	pipeline roll-off
B	12m	7.5							X	pipeline roll-off

* One net at full extension ~ 2.5m high

* One net at full extension ~ 2.5m high

Weather Comments: Wind coming in and temp increasing around 2200. Moon breaking over tree line ~ 2315.

[illegible]

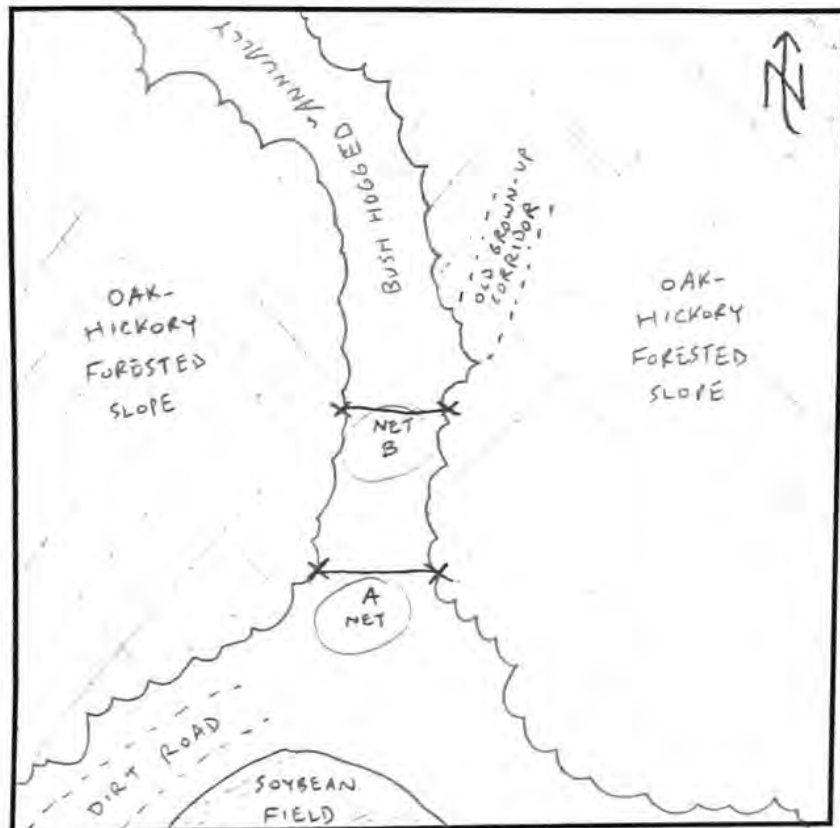
¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (16-20 mph).

* Apply band to LAET arm for females and RIGHT arm for males

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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1 Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Project Name/No.: Ridge Line/172677408 Date: 6/19/2022

Site ID: PLM-66-SMTH Est. Distance to Water (ft): _____

VEGETATION

Primary Habitat Type¹: Field Edge/Upland Forest

Potential Roost: Large Trees Snags Both Other (e.g., structure)

Roost Tree Potential: High Moderate Low

Dominant Canopy Species Avg. Canopy DBH range (in): 10-16" (24)

1. Liriodendron tulipifera 2. Carya cordiformis 3. _____

Canopy Closure: Closed (80%+) Moderate (40-80%) Open (0-40%)

Dominant Subcanopy Species Avg. Subcanopy DBH range (in): _____

1. Corylus bicolor 2. Spiraea alba 3. Acer saccharum

Sub-Canopy Clutter: High (60%+) Moderate (30-60%) Low (0-30%)

Dominant Shrub/Understory Species

1. Fraxinus americana 2. Cornus canadensis 3. Ulmus rubra

Shrub/Understory Clutter: High (60%+) Moderate (30-60%) Low (0-30%)

Moderate cluttered in some locations

STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): _____ Channel Width: _____ Stream Width: _____

Riparian Width right bank: _____ left bank: _____ Avg. Water Depth: _____

Other Wildlife Observed: BGGN, WOTH, HOWA, SUTA, SCTA, AMCR, INBU, EWPW, BDOW

Additional Comments: Quercus velutina & Q. coccinea present but not dominant in midstory & to some extent in canopy. Old grown-up corridor near Net B is small and doesn't go far, but may bats using should be funneled directly into Net B. Forest near ridge top corridor quite dense



Bat Capture Datasheet

Page 1 of 2

Project Name/No.: RidgeLine / 172677408

Date: 6/16/2022

Biologist(s): W. Cunningham, C. Pinney

Site ID: 10566 PLM-66-SM171

County/State: Smith / TN

Moon Phase: Waning Gibbous Sunset: 2001

Map Kilometer No./Quad: 11KM-66

Latitude: N 36.257981 Long: W 119.770000

ude: W-85.629912 Moonrise: 2247 Moonset: 0843

General Site Description: Kilgus pipeline through dense oak-hickory forest.

Nets Open: 1937 Nets Closed: 0105

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	82.8	2	5%
21:00	80.5	1	5%
22:00	81.6	2	60%
23:00	80.9	2	95%
00:00	80.6	2	40%
01:00	79.3	1	10%

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments:

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
NO BATS												

¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = wind moves small trees (19-24 mph), 6 = large trees in motion (25-31 mph), 7 = whole trees in motion (32-50 mph), 8 = breaks twigs (51-63 mph), 9 = uproots small trees (64-81 mph), 10 = uproots medium trees (82-100 mph), 11 = uproots large trees (101-157 mph), 12 = destroys trees (158-206 mph).

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

- Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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Bat Capture Datasheet

Page 1 of 2

Project Name/No.: Ridgeline / 172677408 Date: 6/13/2022 Biologist(s): W. Cunningham, C. Pinney
Site ID: MS-67 (Night 1) ELM-67-SMITH County/State: Smith / TN Moon Phase: Waning Gibbous Sunset: 2000
Map Kilometer No./Quad: MP 41.2 KM 67 Latitude: N 36.253346 Longitude: W-85.621846 Moonrise: 1933 Moonset: 0514
General Site Description: Upland site across pipeline corridor and adjacent tree gap Nets Open: 1945 Nets Closed: 0100

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	84.6	1	10%
21:00	81.6	1	5%
22:00	80.3	0	0%
23:00	79.8	1	0%
00:00	78.1	2	5%
01:00	77.9	1	0%

Net ID (A, B...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	12m	4.375		36.253308	-85.622042				gap	Across pipeline corridor
B	9m	4.375		36.253330	-85.621618				gap	

* One net at full extension ~ 2.5m high. 2 tier with one panel overlap (0.625m) = 4.375

Weather Comments: Very high dewpoint. Moonrise as nets being set up. Nets illuminated from 2215 until ~ 0000

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
01	<i>Lasiorus borealis</i>	2120	A	F	P	40.3	18.75	0	A	2.5	N/A	
X	<i>Glaucomys volans</i>	2300							B	3.0	N/A	
02	<i>Lasiorus borealis</i>	0040	A	F	NR	42.2	15.25	0	A	4.0	N/A	

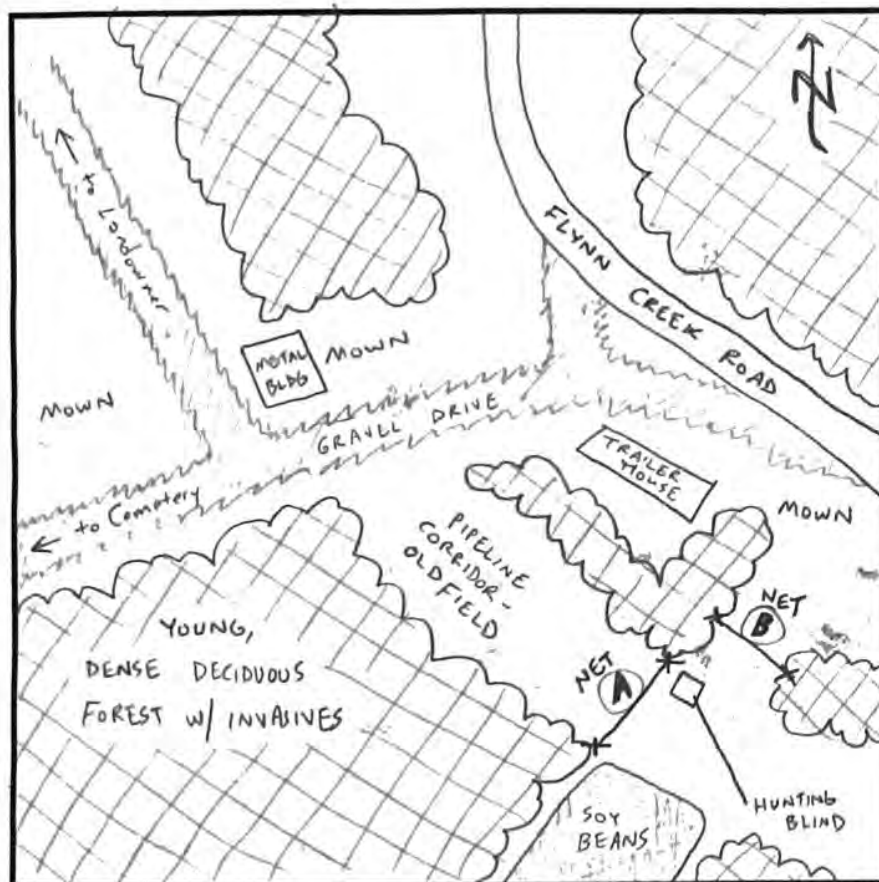
¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Project Name/No.: 172677408

Date: 6/13/2022

Site ID: ~~MS-67~~ RLM-67-SMT4 Est. Distance to Water (ft): 1000 - 1500 ft

VEGETATION

Primary Habitat Type¹: Field Edge / Upland Forest

Potential Roost:	Large Trees	Snags	Both	Other (e.g., structure)
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Roost Tree Potential:	High	Moderate	Low
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Dominant Canopy Species: *Pinus strobus* Avg. Canopy DBH range (in): 8-10"

1. Liriodendron lat. pifera 2. Carya corl. formis 3. Quercus alba

Canopy Closure:	Closed (80% +)	Moderate (40 – 80%)	Open (0 – 40%)
------------------------	--------------------------	-------------------------------	--------------------------

Dominant Subcanopy Species Avg. Subcanopy DBH range (in): 5-10

1. *Acet. rubrum* 2. *Alb. albus* 3. *R. rubra*

	High (60%+)	Moderate (30-60%)	Low (0-30%)
Sub-Canopy Clutter:			

Dominant Shrub/Understory Species

1. *Rosa multiflora* 2. *Cornus florida* 3. *Juniperus virginiana*

Shrub/ Understory Clutter:	High (60% +)	Moderate (30 - 60%)	Low (0 - 30%)
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STREAM CHARACTERISTICS (if relevant) *N/A*

~~Bank Height (ft): Channel Width: Stream Width:~~

Riparian Width right bank: _____ left bank: _____ **Avg. Water Depth:** _____

Other Wildlife Observed: _____

Additional Comments: Farm pond ~1400 feet north, ~intermittent channel ~1000 ft south.



Bat Capture Datasheet

Page 1 of 2

Project Name/No.: R. dogline / 172677408 Date: 6/14/2022 Biologist(s): W. Cunningham, C. Pinney
Site ID: ~~172677408~~ (Night 2) RLM-67-SMITH County/State: Smith / TN Moon Phase: Waning Gibbous Full Sunset: 2000
Map Kilometer No./Quad: ~~172677408~~ KM 67 Latitude: N 36.253346 Longitude: W-85.621846 Moonrise: 2047 Moonset: 0617
General Site Description: Upland site across pipeline corridor adjacent tree gap Nets Open: 1950 Nets Closed: 0100

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	80.9	1	0%
21:00	79.5	1	0%
22:00	77.5	1	5%
23:00	75.9	1	20%
00:00	75.9	1	10%
01:00	73.5	1	5%

Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	12m	4.375		36.253308	-85.622042				gap	Across pipeline corridor
B	9m	4.375		36.253330	-85.621618				gap	

* One net at full extension - 2.5m high

Weather Comments: Full moon breaking over treeline @

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
01	Eptesicus fuscus	2120	A	F	L	47.8	24.25	0	B	3.5	N/A	

¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats



Bat Capture Datasheet

Page 1 of 2

Project Name/No.: Ridgely/172677408 Date: 6/15/22 Biologist(s): A. Spillner, Z. True, A. Harrison
 Site ID: PM-68-Jackson County/State: Jackson/TN Moon Phase: Waning gibbous Sunset: 20:02
 Map Kilometer No./Quad: 422 KM 68 Latitude: 36.24812 Longitude: -85.60584 Moonrise: 21:53 Moonset: 6:16
 General Site Description: Small stream, riparian area surrounded by pasture Nets Open: 20:05 Nets Closed: 1:05

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	81.7	0	0
21:00	78.1	0	0
22:00	76.0	0	0
23:00	74.8	0	0
00:00	74.0	0	0
01:00	73.9	0	0

Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	4M	5.2M		36.24812	-85.60584		X			
B	6M	5.2M		36.24828	-85.605690		X			

* One net at full extension ~ 2.5m high

Weather Comments: Clear, warm, calm, some fog after 11 pm

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	<i>Lasiurus borealis</i>	20:20	A	F	L	41.5	14.75	0	B	0	—	
2	<i>Myotis grisescens</i>	21:48	A	F	L	43.6	12.50	0	A	0.5	07254	
3	<i>Myotis grisescens</i>	22:41	A	F	L	43.7	10.75	0	B	0.5	08542	curious, wound on tail membrane
4	<i>Myotis grisescens</i>	23:10	A	F	L	43.5	10.5	0	A	0.5	08543	Bald spot on back
5	<i>Myotis grisescens</i>	23:29	A	F	L	43.6	12	0	B	1.5	08544	
6	<i>Nycticeius humeralis</i>	0:00	A	M	NR	35.2	8.75	0	B	4	—	Wound on right wing membrane
7	<i>Myotis grisescens</i>	0:50	A	F	L	42.5	10.75	0	A	0.5	08545	

¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

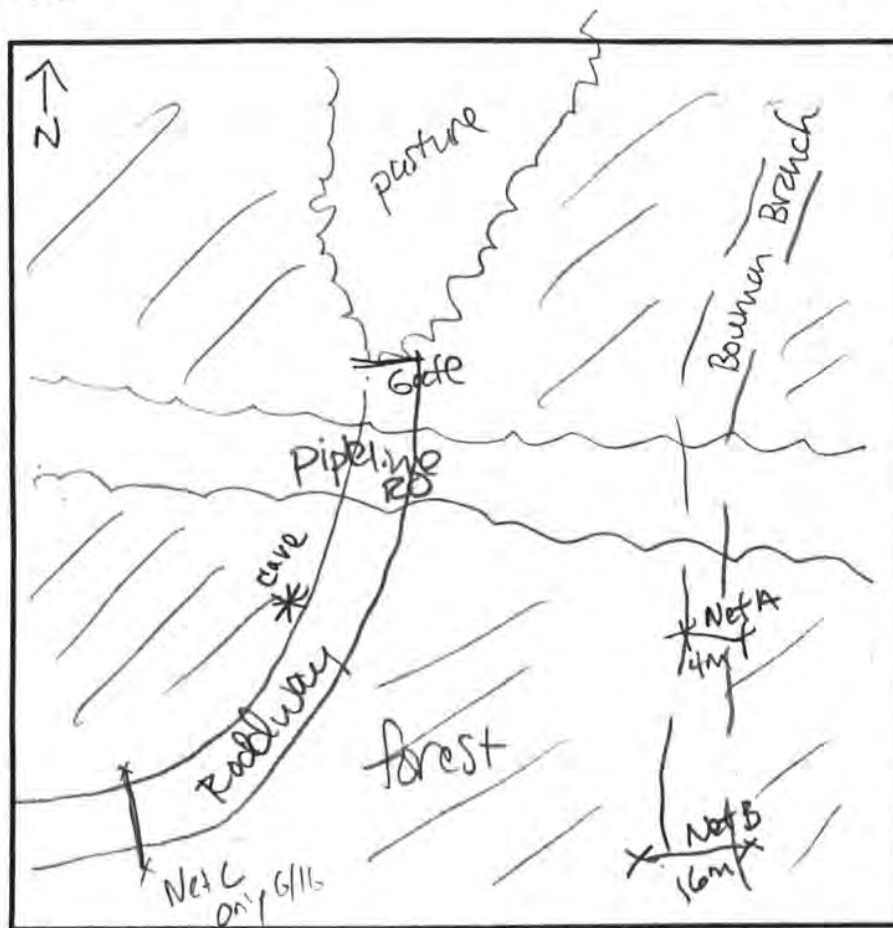
² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for escaped bats

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Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal,
 Pond, Structure, Upland Forest, Other (describe)

Project Name/No.: Ridgeline
 Date: 6/15/22
 Site ID: RLM-68-Jackson
 Est. Distance to Water (ft): 0

VEGETATION

Primary Habitat Type: Young riparian forest
 Potential Roost: Large Trees Snags Both Other (e.g., structure)
 Roost Tree Potential: High Moderate Low

Dominant Canopy Species Avg. Canopy DBH range (in): 16-26"
 1. Platanus occidentalis 2. Juglans nigra 3.

Canopy Closure: Closed (80%+) Moderate (40-80%) Open (0-40%)

Dominant Subcanopy Species Avg. Subcanopy DBH range (in): 6-12"
 1. Ostrya virginiana 2. Aesculus flava 3. Ulmus rubra

Sub-Canopy Clutter: High (60%+) Moderate (30-60%) Low (0-30%)

Dominant Shrub/Understory Species
 1. Ostrya virginiana 2. Chinese privet 3.

Shrub/Understory Clutter: High (60%+) Moderate (30-60%) Low (0-30%)

STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): 3' Channel Width: 10' Stream Width: 14'
 Riparian Width right bank: 15' left bank: 15' Avg. Water Depth: 4"

Other Wildlife Observed: white-tailed deer, WOTH, Barred Owl

Additional Comments: Cave nearby, no bats emerged



Bat_Capture Datasheet

Page 1 of 1

Project Name/No.: R. dgeline/172677408 Date: 6/16/22 Biologist(s): Josh Adams, Morgan Johnson
 Site ID: RLM-68-Jackson County/State: Jackson/TN Moon Phase: Waning gibbous Sunset: 20:08
 Map Kilometer No./Quad: APP KM 68 Latitude: 36.24812 Longitude: -85.62584 Moonrise: 22:47 Moonset: 07:27
 General Site Description: Small stream, riparian area surrounded by pasture Nets Open: 20:00 Nets Closed: 01:03

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	79.5	0	50
21:00	78.2	1	10
22:00	76.6	0	0
23:00	76.7	0	0
00:00	75.8	0	30
01:00	76.0	0	20

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments: Hot, humid, and clear - periodic clouds during setting.

[illegible]

i) **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats



Bat Capture Datasheet

Page 1 of 2

Project Name/No.: 172677408 Date: 6/9/2022 Biologist(s): Zachary Baer, Ashley Hamner
 Site ID: RLM-69-Jackson County/State: Jackson TN Moon Phase: Waxing Gibbous Sunset: 19:58
 Map Kilometer No./Quad: 11KM-69 Latitude: 36.24744 Longitude: -85.60039 Moonrise: 14:52 Moonset: 2:10
 General Site Description: Intersection of Row and gravel road Nets Open: 19:58 Nets Closed: 12:58

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	65	0	0
21:00	63	0	0
22:00	62	0	0
23:00	60	0	0
00:00	59	0	0
01:00	58	0	0

Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	9	5.2	46.8	36.247752	-85.600326	X				
B	12	7.8	93.6	36.247289	-85.600627				X	ROW

* One net at full extension ~ 2.5m high

Weather Comments: _____

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	<i>Lasiurus borealis</i>	21:10	A	F	P	41	18.75	1P	A	2.5	—	fifth digit, right ear previously banded + healed
2	<i>Lasiurus borealis</i>	21:10	A	F	P	40	19	0	A	3	—	
3	<i>Lasiurus borealis</i>	21:30	A	M	NR	41	11.25	0	A	3	—	

¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

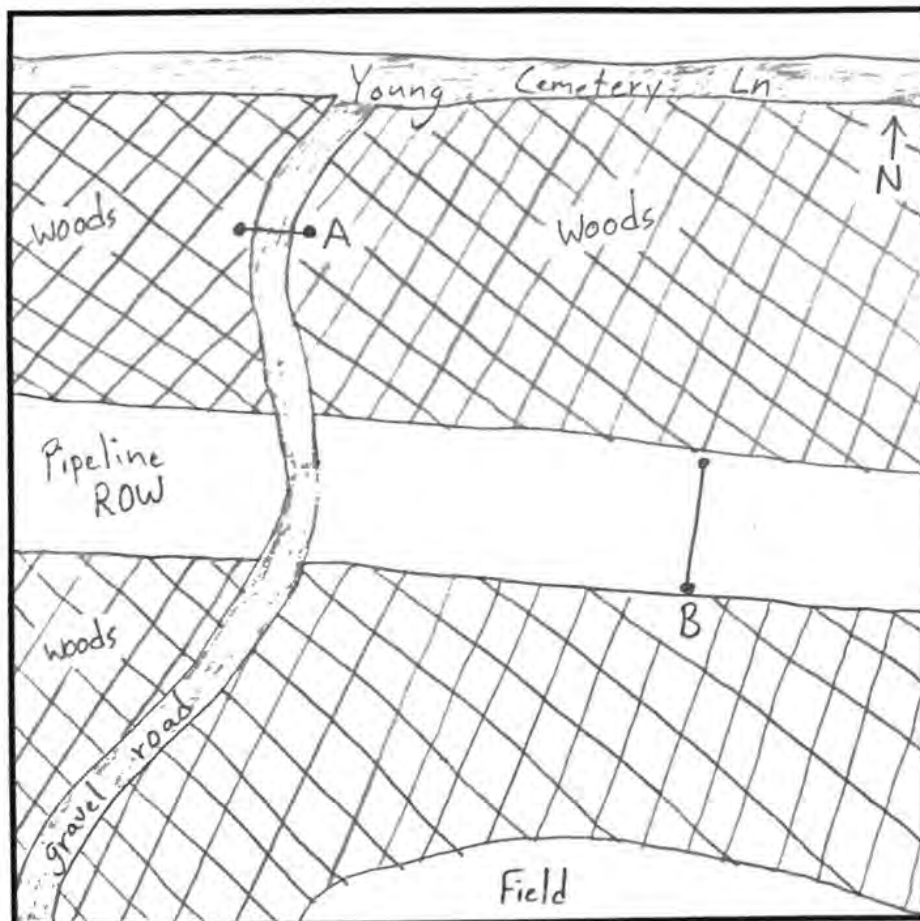
² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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Project Name/No.: 172677409

Date: 6/9/2022

Site ID: RLM-69-Jackson

Est. Distance to Water (ft): 970

VEGETATION

Primary Habitat Type¹: Upland forest

Potential Roost: Large Trees Snags Both Other (e.g., structure)

Roost Tree Potential: High Moderate Low

Dominant Canopy Species Avg. Canopy DBH range (in): 12

1. Liriodendron tulipifera 2. Juglans nigra 3. Fraxinus pennsylvanica

Canopy Closure: Closed (80%+) Moderate (40-80%) Open (0-40%)

Dominant Subcanopy Species Avg. Subcanopy DBH range (in): 8

1. Acer rubrum 2. Juniperus virginiana 3. Liriodendron tulipifera

Sub-Canopy Clutter: High (60%+) Moderate (30-60%) Low (0-30%)

Dominant Shrub/Understory Species

1. Juniperus virginiana 2. Acer rubrum 3. Cercis canadensis

Shrub/Understory Clutter: High (60%+) Moderate (30-60%) Low (0-30%)

STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): N/A Channel Width: N/A Stream Width: N/A

Riparian Width right bank: N/A left bank: N/A Avg. Water Depth: N/A

¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Other Wildlife Observed: Eastern Cottontail

Additional Comments:



Bat Capture Datasheet

Page 2 of 2

Project Name/No.: 172677408

Date: 6/10/2022

Biologist(s): Zachary Baer Ashley Hammer

Site ID: RLM-69-Jackson

County/State: Jackson TN

Moon Phase: Waxing Gibbous Sunset: 19:59

Map Kilometer No./Quad: KM-69

Latitude: 36.24744 Longitude: -95.60039 Moonrise: 16:00 Moonset: 2:39

General Site Description: Intersection of ROW and gravel road Nets Open: 19:59 Nets Closed: 00:59

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	69	1	80
21:00	65	0	0
22:00	63	0	0
23:00	62	0	0
00:00	62	0	0
01:00	61	0	0

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments:[illegible]

¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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Bat Capture Datasheet

Page ____ of ____

Project Name/No.: ~~1211~~ 172677408

Date: 06/15/2022

Biologist(s): Les Meade, M. Alexander, M. Downer

Site ID: RLM-70-Jackson

County/State: Jackson, TN

Moon Phase: Waning Gibbous

Sunset: 2001

Map Kilometer No./Quad: ~~42.9~~ 43.3 KM 70

Latitude: 36.24541

Longitude: -85.5877

Moonrise: 2152

Moonset: 0618

General Site Description: Dipline Corridor East of Lester Fox Rd.

Nets Open: 2004

Nets Closed: 0101

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	82	0	0
21:00	81	0	0
22:00	80	0	0
23:00	80	0	0
00:00	80	0	0
01:00			

[illegible]

* One net at full extension ~ 2.5m high

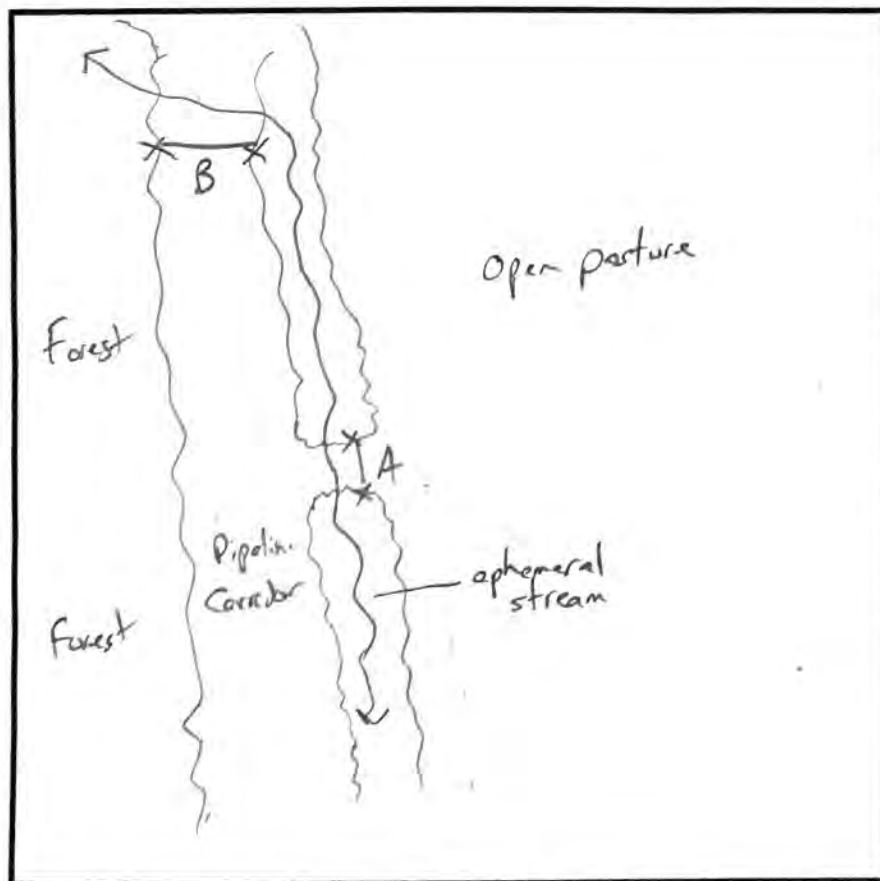
Weather Comments:[illegible]

¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats


Project Name/No.: 1241 Date: 06/15/2022

Site ID: RIM-70-Jackson Est. Distance to Water (ft): 50
(Isolated Pools)

VEGETATION

Primary Habitat Type¹: Bottomland Field / Forest Edge

Potential Roost:

Large Trees	Snags	<u>Both</u>	Other (e.g., structure)
-------------	-------	-------------	-------------------------

Roost Tree Potential:

High	<u>Moderate</u>	Low
------	-----------------	-----

Dominant Canopy Species Avg. Canopy DBH range (in): 10-14 in
1. White Oak 2. Black Walnut 3. Sweet Gum

Canopy Closure:

Closed (80% +)	Moderate (40 - 80%)	<u>Open (0 - 40%)</u>
----------------	---------------------	-----------------------

Dominant Subcanopy Species Avg. Subcanopy DBH range (in): 5-10 in
1. Tulip poplar 2. Sweet Gum 3. Sugar Maple

Sub-Canopy Clutter:

High (60% +)	<u>Moderate (30 - 60%)</u>	Low (0 - 30%)
--------------	----------------------------	---------------

Dominant Shrub/Understory Species
1. Tulip poplar 2. Sweet Gum 3. _____

Shrub/Understory Clutter:

High (60% +)	<u>Moderate (30 - 60%)</u>	Low (0 - 30%)
--------------	----------------------------	---------------

STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): 4-6 in Channel Width: 1-3 ft Stream Width: NA (dry)

Riparian Width right bank: 5-10 ft left bank: 5-10 ft Avg. Water Depth: dry (0)

¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Other Wildlife Observed: S. Leopard Frog

Additional Comments: _____



Bat Capture Datasheet

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Project Name/No.: ~~#24#~~ 172677408

Date: 06/16/2022

Biologist(s): L. Meade, M. Alexander, M. Downer

Site ID: RLM-70-TACKSON

County/State: Jackson, TN

Moon Phase: Waxing Gibbous

Sunset: 7001

Map Kilometer No./Quad: ~~12 9-43.3~~ KM 70 L

Latitude: 30.24541

Longitude: -85.58771

Moonrise: 2247

Moonset: 0727

General Site Description: pine corridor east of Lester Fox Rd

Nets Open: 2001

Nets Closed: 0101

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	82	0	0
21:00	80	0	0
22:00	79	0	0
23:00	79	0	0
00:00	78	0	0
01:00	78	0	0

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments:[illegible]

¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

- Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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Bat Capture Datasheet

Page ___ of ___

Project Name/No.: 172677408 Bat Survey Date: 15 Jun 2022 Biologist(s): T. Wetzel, E. Houston, C. Burton
 Site ID: RLM-72-Jackson County/State: Jackson/TN Moon Phase: Full Sunset: 2001
 Map Kilometer No./Quad: ————— KM-72 Latitude: 36.242587 Longitude: -85.569139 Moonrise: 2152 Moonset: 0416
 General Site Description: Confluence of East and West Blackburn Creek Nets Open: 2001 Nets Closed: 0901

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	81	0	0
21:00	79	0	0
22:00	76	0	0
23:00	76	0	0
00:00	75	0	0
01:00	74	0	0

Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	12	5	60				X			
B	18	5	90				X			

* One net at full extension ~ 2.5m high

Weather Comments:

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* # TWRA	Comments (e.g., samples taken, transmitter #, disposition)
1	PESU	2105	A	F	P	33	10.75	0	B	1.5	A03853	150.585
2	MYGR	2130	A	F	P	43	12.25	0	A	2.0	08589	
3	MYGR	2231	A	F	P	42	12.5	0	B	2.5	08590	
4	MYGR	2320	A	F	P	44	15.0	0	B	1.5	08591	

¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

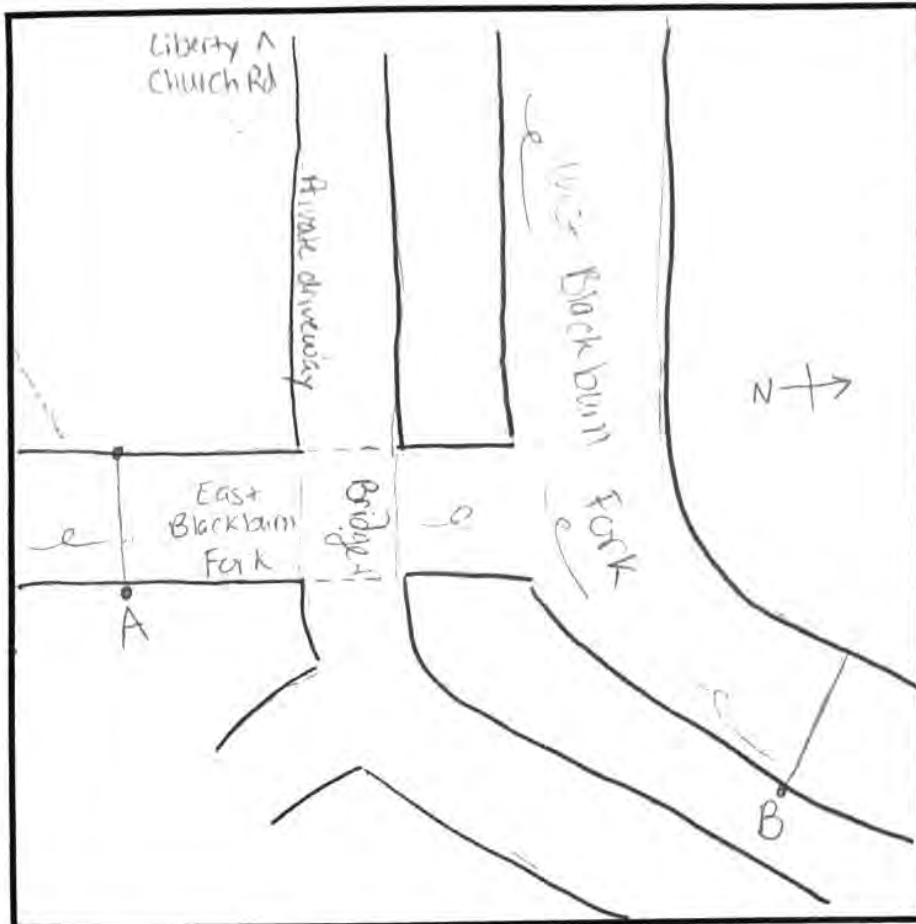
* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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Net Site Description

Page of

Project Name/No.: 172677408 ^{Ridge Line Bot Survey} Date: 15 June 2012

Site ID: RLM-72-Jackson Est. Distance to Water (ft): 0

VEGETATION

Primary Habitat Type¹: Bottomland Hardwood Forest

Potential Roost: Large Trees Snags Both Other (e.g., structure)

Roost Tree Potential: High Moderate Low

Dominant Canopy Species Avg. Canopy DBH range (in): 30

1. Acer saccharinum 2. Acer saccharum 3. Magnolia sp.

Canopy Closure: Closed (80%+) Moderate (40-80%) Open (0-40%)

Dominant Subcanopy Species Avg. Subcanopy DBH range (in): 20

1. Fagus grandifolia 2. Acer negundo 3.

Sub-Canopy Clutter: High (60%+) Moderate (30-60%) Low (0-30%)

Dominant Shrub/Understory Species

1. Japanese Honey-suckle 2. Rhus glabra 3. Rosa multiflora

Shrub/Understory Clutter: High (60%+) Moderate (30-60%) Low (0-30%)

STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): 8.0 Channel Width: 15.0 ft Stream Width: 12.0 ft

Riparian Width right bank: 3.0 ft left bank: 2.0 ft Avg. Water Depth: 1.5 ft

¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Other Wildlife Observed: Pigeon (tracks)

Additional Comments:



Bat Capture Datasheet

Page ____ of ____

Project Name/No.: 172677408 Box Survey Date: 16 June 2022 Biologist(s): J. Wetzel, E. Houston, C. Burton
 Site ID: RLM-72-Jackson County/State: Jackson, TN Moon Phase: Waning gibbous Sunset: 2001
 Map Kilometer No./Quad: ~~44.2-44.3~~ KM 72 Latitude: 36.242587 Longitude: -85.569139 Moonrise: 2147 Moonset: 0729
 General Site Description: Confluence of East + West Blackburn Creek Nets Open: 2001 Nets Closed: 0101

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	72	0	10%
21:00	79	0	0
22:00	78	0	0
23:00	76	0	0
00:00	76	1	40%
01:00	76	0	0

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments:[illegible]

¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

- * Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

12 meter A net
NLEB/Bird B net



Bat Capture Datasheet

Page 1 of 23

Project Name/No.: 172677408

Date: June 9, 2022

Biologist(s): J. Wilson, M. Dannon

Site ID: RLM-73-Jackson

County/State: Jackson, TN

Moon Phase: waxing gibbous

Sunset: 19:59

Map Kilometer No./Quad: 73 KM-73

Latitude: 36.241757

Longitude: -85.551795

Moonrise: 14:42 Moonset: 0235 (on the 10th)

General Site Description: Oak-hickory forest with gravel road adjacent to pond and pasture

Nets Open: 19:59

Nets Closed: 100

Time	Temp (F)	Wind ¹	% Cloud Cover	Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
20:00	69.7	0	0	A	12	7.5	90	36.241952	-85.551869	✓				
21:00		0	0	B	7	2.5	10	36.241814	-85.551637	✓		✓		opening on small trail leading to pond
22:00	59.9	0	0											
23:00	58.9	0	0											
00:00	57.0	0	0											
01:00	56.8	0	0											

* One net at full extension - 2.5m high

Weather Comments: very clear evening/no clouds

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	Lasiurus borealis	21:04	A	F	P	40.5	18.1	0	A	3		
2	Myotis grisescens	21:05	A	F	P	44.0	13.5	0	B	1	TWRA10111	
3	Lasiurus borealis	21:06	A	F	P	41.8	18.0	0	A	15		
4	Myotis grisescens	21:25	A	F	P	44.4	14.75	0	B	1	TWRA10112	
5	Myotis grisescens	21:50	A	F	L	43.6	11.1	0	B	1	TWRA10113	
6	Myotis grisescens	21:50	A	F	P	43.4	14.0	0	B	1	TWRA10114	
7	Myotis grisescens	21:50	A	F	L	42.5	11.1	1	B	1	—	Out of bands (2.9 mm)
8	Lasiurus borealis	21:55	A	F	P	40.3	16.75	0	A	7	—	Heavily pregnant
9	Myotis grisescens	22:20	A	F	L	43.4	10.5	0	B	1	TWRA07277	Got more bands
10	Myotis grisescens	22:22	A	F	P	43.3	14.0	0	B	1	TWRA07278	
11	Myotis grisescens	22:22	A	F	L	42.1	11.5	0	B	1	TWRA07279	*recaptured (2305) on 6/10/22
12	Myotis grisescens	22:22	—	Escaped	from hand	—	—	—	B	1	—	escaped from hand

¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

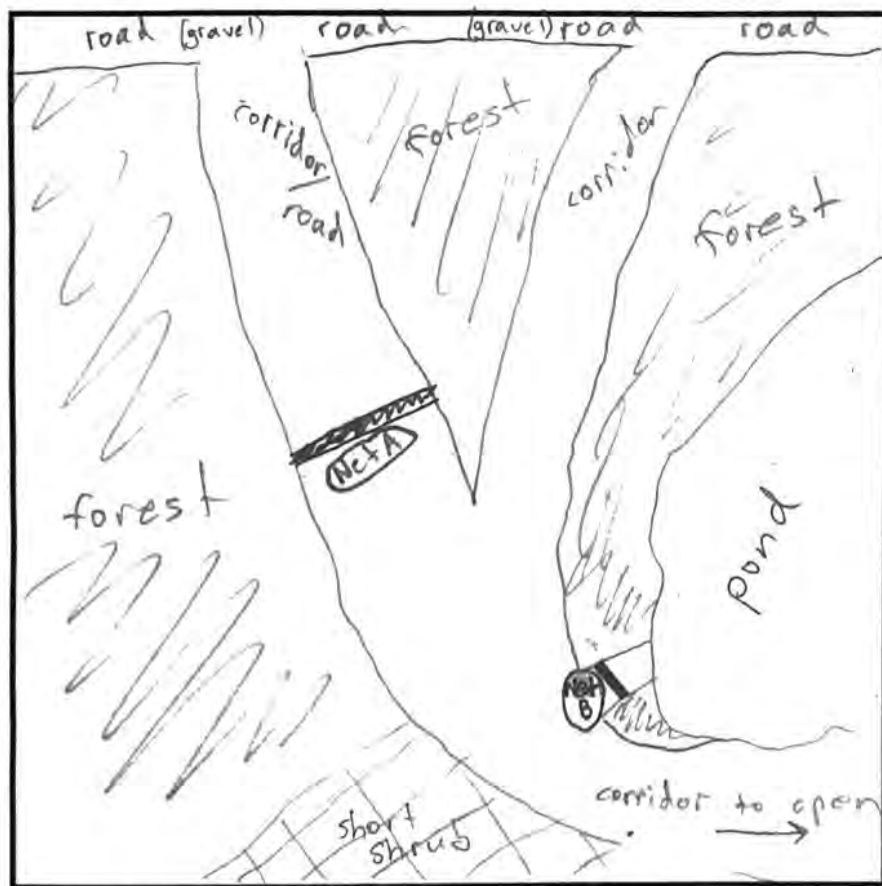
² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for escaped bats

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¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Project Name/No.: Ridgeline Date: June 9, 2022
Site ID: RLM-73-Jackson Est. Distance to Water (ft): 20m

VEGETATION

Primary Habitat Type¹: upland forest

Potential Roost: Large Trees Snags Both Other (e.g., structure)

Roost Tree Potential: High Moderate Low

Dominant Canopy Species Avg. Canopy DBH range (in): 20-50

1. Quercus alba white oak 2. Quercus rubra red 3. Pinus virginiana

Canopy Closure: Closed (80%+) Moderate (40-80%) Open (0-40%)

Dominant Subcanopy Species Avg. Subcanopy DBH range (in): 10-20

1. Acer rubrum 2. Corya tomentosa 3. Quercus alba

Sub-Canopy Clutter: High (60%+) Moderate (30-60%) Low (0-30%)

Dominant Shrub/Understory Species

1. Acer rubrum 2. Privet 3. Corya tomentosa

Shrub/Understory Clutter: High (60%+) Moderate (30-60%) Low (0-30%)

STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): Channel Width: Stream Width:

Riparian Width right bank: left bank: Avg. Water Depth:

Other Wildlife Observed: chuck will's widow, coyotes, flying squirrel in net

SCTA, GGL, WEVI, FISP, PRWA, BARO, NOAA

Additional Comments: site consists of nets placed in corridors/flyway within forest patch (~7 acres) adjacent to a large pond (~10 acres). Area surrounding immediate site consists mostly of field/pasture with fragmented forest

very diverse, heterogeneous forest stand
Oak-hickory-maple



Bat Capture Datasheet Pt. II

Page 3 of 3

Project Name/No.: Riddell/172677408

Date: 6/9/22

Biologist(s): Julia Wilson, Mitch Danner

Site ID: RLM-72-⁰Jackson

County/State: Jackson/TN

[illegible]

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

- * Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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Bat Capture Datasheet

Page 1 of 3

Project Name/No.: Ridgeline/172671408 Date: 6/10/22 Biologist(s): Julia Wilson, Mitch Dannon
 Site ID: RLM-73-Jackson County/State: Jackson/TN Moon Phase: Waxing gibbous Sunset: 20:00
 Map Kilometer No./Quad: 33 KM-73 Latitude: 36.241757 Longitude: -85.551795 Moonrise: 15:49 Moonset: 3:04(111)
 General Site Description: OAK-HICKORY FOREST W/ GRAVEL ROADS Nets Open: 20:00 Nets Closed: 1:00
ADJACENT TO POND & PASTURE

Time	Temp (F)	Wind ¹	% Cloud Cover	Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
20:00	70.1	0	10	A	12	7.5	90	36.241952	-85.551869	✓				
21:00	64.8	0	0	B	4	2.5	10	36.241814	-85.551637	✓				Pond on other side
22:00	61.8	0	0											
23:00	60.9	0	0											
00:00	60.4	0	0											
01:00	59.2	0	0											

* One net at full extension ~ 2.5m high

Weather Comments: calm, low humidity

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	<i>Myotis grisescens</i>	20:40	A	F	L	44.9	10.2	0	A	4	TWRA 07286	
2	<i>Myotis grisescens</i>	20:40	A	F	L	43.1	10.5	0	A	3	07287	
3	<i>Myotis grisescens</i>	20:45	A	F	L	43.8	10.3	0	A	2.5	07288	
4	<i>Myotis grisescens</i>	20:45	Escaped	net					A	3	—	Escaped net
5	<i>Lasiurus borealis</i>	20:45	Escaped	net					A	7	—	Escaped net
6	<i>Myotis grisescens</i>	21:15	A	F	L	42.9	10.5	0	B	1	07289	
7	<i>Myotis grisescens</i>	21:30	A	F	P	42.9	13.4	0	A	2.5	TWRA 07285	
8	<i>Nycticeius humeralis</i>	21:30	A	M	NR	35.4	9.1	0	A	3.5	—	Almost scrotal
9	<i>Nycticeius humeralis</i>	21:30	A	M	NR	—	—	—	A	4.0	—	Released from hand
10	<i>Myotis grisescens</i>	21:30	A	F	L	44.8	10.75	0	A	5.5	TWRA 07286	
11	<i>Myotis grisescens</i>	21:30	A	F	L	45.0	11.75	0	A	7.0	TWRA 07287	
12	<i>Myotis grisescens</i>	21:40	A	F	L	45.0	11.0	0	AB	1.0	07288	

¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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Bat Capture Datasheet Pt. II

Page 3 of 3

Project Name/No.: Ridgeline

Date: 6/10/12

Biologist(s): Julia Wilson, Mitch Danner

Site ID: RLM-73-Jackson

County/State: Jackson, TN

[illegible]

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

- * Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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Bat Capture Datasheet

Page 1 of 1

Project Name/No.: Ridgeline / 172677408

Date: 6/9/22

Biologist(s): A. Sollema, Zoe True

Site ID: RLM-74-Jackson

County/State: Jackson/TN

Moon Phase: Waxing gibbous

Sunset: 19:59

Map Kilometer No./Quad: 18P-74 KM-74

Latitude: 36.24033

Longitude: -85.54591 Moonrise: 14:42

Moonset: 2:08

General Site Description: Natural gas pipeline ROW ~ 45 ft wide, with mixed

Nets Open: 19:57

Nets Closed: 1:00

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	69	0	0
21:00	65	0	0
22:00	64	0	0
23:00	61	0	0
00:00	59	0	0
01:00	59	0	0

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments: Clear, cool, calm

[illegible]

¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

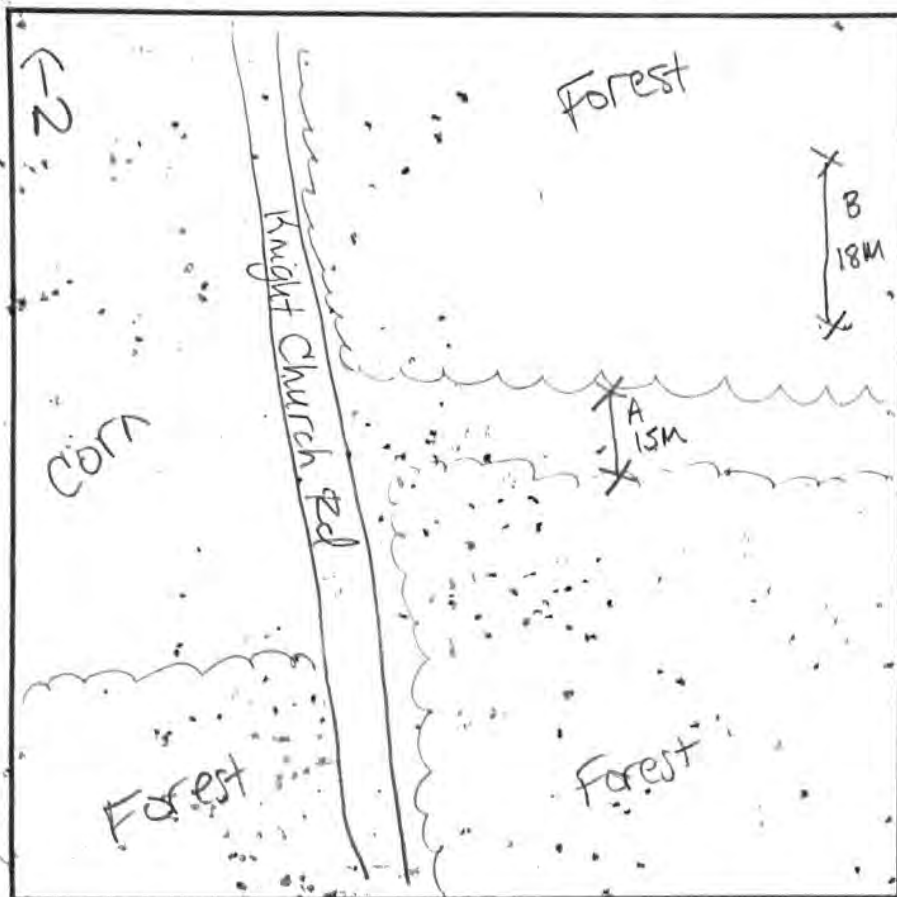
For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: (1) (unknown) only to be used for **escaped** bats

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Project Name/No.: Ridge Line 17267408 Date: 6/9/22
 Site ID: RLM-74-Jackson Est. Distance to Water (ft): ~200ft

VEGETATION

Primary Habitat Type: Mixed age deciduous forest

Potential Roost: Large Trees | Snags | Both | Other (e.g., structure)

Roost Tree Potential: High | Moderate | Low

Dominant Canopy Species: 1. Peer. rubrum 2. Quercus alba 3. Fagus grandifolia
 Avg. Canopy DBH range (in): 12-18"

Canopy Closure: Closed (80%+) | Moderate (40-80%) | Open (0-40%)

Dominant Subcanopy Species: 1. Fagus grandifolia 2. Nyssa sylvatica 3. Ulmus rubra
 Avg. Subcanopy DBH range (in): 8-12"

Sub-Canopy Clutter: High (60%+) | Moderate (30-60%) | Low (0-30%)

Dominant Shrub/Understory Species: 1. Liquidambar styraciflua 2. Fagus grandifolia 3. _____

Shrub/Understory Clutter: High (60%+) | Moderate (30-60%) | Low (0-30%)

STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): _____ Channel Width: _____ Stream Width: _____
 Riparian Width right bank: _____ left bank: _____ Avg. Water Depth: _____

Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field-Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Other Wildlife Observed: Chuck. white widow, WEVI, BLJA, FISP, BAOW

Additional Comments: _____



Bat Capture Datasheet

Page 1 of 2

Project Name/No.: Ridgeline/172677408

Date: 6/10/22

Biologist(s): A. Solema, Z True

Site ID: RLM-74-Jackson

County/State: Tucker/TN

Moon Phase: Waxing gibbous

Sunset: 20:00

Map Kilometer No./Quad: MP/KM-74

Latitude: 36,24033

Longitude: -85.54591 Moonrise: 15:50

Moonset: 2:35

General Site Description: Natural gas pipeline ROW, ~45ft wide, with mixed
age forest on either side

Nets Open: 9:50

Nets Closed: 0050

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	69	1	60%
21:00	67	0	0%
22:00	65	1	0%
23:00	63	1	0%
00:00	62	1	0%
01:00			

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments:[illegible]

Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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Bat Capture Datasheet

Page 1 of 2

Project Name/No.: R 1go/nc / 122677408

Date: 6/17/2022

Biologist(s): W. Cunningham, C. Pinney

Site ID: ~~MS-80~~ PLM-80-PUTNAM County/State: Putnam / TN

Moon Phase: Waning Gibbous

Sunset: 2001

Map Kilometer No./Quad: MP-49-3 KM 80 Latitude: N 36.22745

Longitude: W-85.48180

Moonrise: 2332

Moonset: 0956

General Site Description: Pipeline corridor through open, glazied oak-hickory forest/woodland

Nets Open: 1955

Nets Closed: 0105

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	78.0	Ø	10%
21:00	75.0	Ø	0%
22:00	73.6	Ø	0%
23:00	71.9	1	0%
00:00	71.5	Ø	Ø%
01:00	70.2	Ø	Ø%

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments:

First night with cooler temps.

[illegible]

ⁱ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

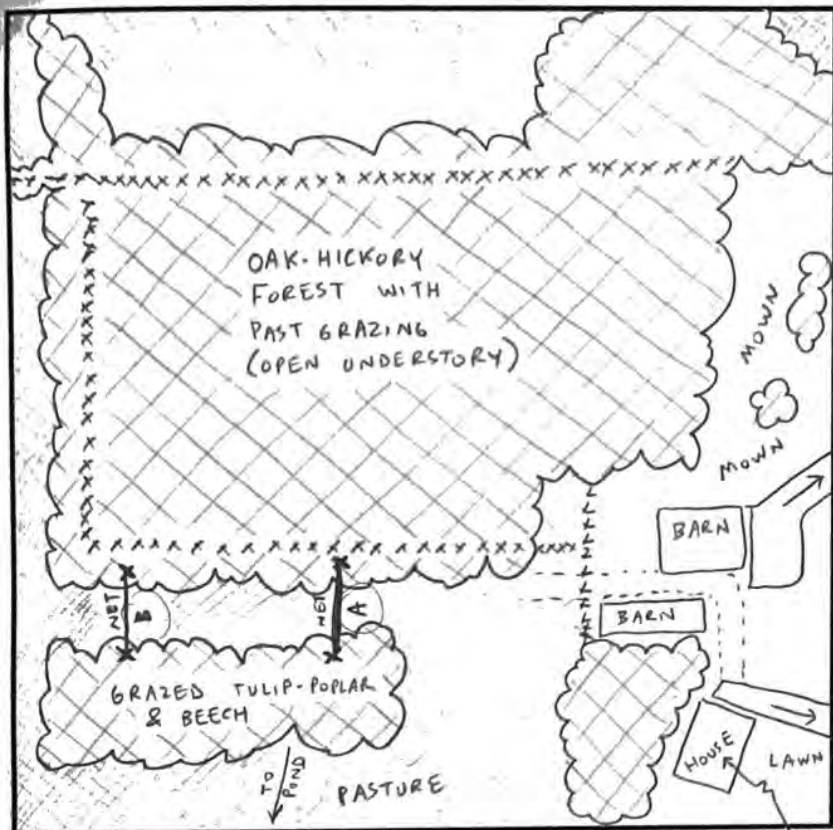
² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Project Name/No.: R. L. G. / 172677408 Date: 6/17/2022

Site ID: #588 RLM-80 - Est. Distance to Water (ft): <1000 (ponds)

PUTNAM

VEGETATION

Primary Habitat Type¹: Upland Forest / Field Edge

Potential Roost: Large Trees Snags Both Other (e.g., structure)

Roost Tree Potential: High Moderate Low

Dominant Canopy Species Avg. Canopy DBH range (in): 10-20"

1. Liriodendron tulipifera 2. Fagus grandifolia 3. Quercus texata

Canopy Closure: Closed (80%+) Moderate (40-80%) Open (0-40%)

Dominant Subcanopy Species Avg. Subcanopy DBH range (in): 5-8"

1. Acer rubrum 2. Quercus stellata 3. Corya ovata

Sub-Canopy Clutter: High (60%+) Moderate (30-60%) Low (0-30%)

Dominant Shrub/Understory Species

1. Fagus grandifolia 2. 3.

Shrub/Understory Clutter: High (60%+) Moderate (30-60%) Low (0-30%)

TO HILMAN ROAD

STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): Channel Width: Stream Width:

Riparian Width right bank: left bank: Avg. Water Depth:

Mostly snags but some white oak

Some understory/shrub due to current and historic cattle grazing

Other Wildlife Observed: Captured 1 Adult Male Indigo Bunting. Singing Chuck-Wills-Widow (CWWs)!!
Saw 1 raccoon and heard several flying squirrels (Glaucomys volans).

Additional Comments: Juniperus virginiana, Ostrya arborescens, and Nyssa sylvatica present in understory, but primarily along edges and none are dominant.

Bat Capture Datasheet

Page 1 of 2

Project Name/No.: Ridge line / 172677408

Date: 6/18/2022

Biologist(s): W. Cunningham, C. Pinney

Site ID: ~~AS-80~~ RLM-80-PUTNAM County/State: Putnam / TN

Moon Phase: Waxing Gibbous

Sunset: 2002

Map Kilometer No./Quad: ~~MP 44.3~~ KM80 Latitude: N 36.22745

Longitude: W-85.48180

Moonrise: 0008

Moonset: 1107

General Site Description: Pipeline corridor through open, grazed oak-hickory forest/woodland.

Nets Open: 1955

Nets Closed: 0055

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	69.3	1	0%
21:00	68.5	2	0%
22:00	65.9	2	0%
23:00	65.3	2	0%
00:00	63.9	1	0%
01:00	63.7	1	0%

Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	18m	7.5m		N 36.257798	W-85.629899				X	pipeline corridor
B	12m	4.375m		N 36.258307	W-85.629832				X	pipeline corridor

* One net at full extension - 2.5m high

Weather Comments:

Major temperature drop for tonight. Last night was first night in low 70s. Tonight in low 60s.

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
01	Lasurus borealis	2030	A	F	L	42.1	13.5	0	A	4m	N/A	
02	Myotis grisescens	2140	A	F	L	44.4	10.5	0*	A	4.5m	AAFB 3747	Arnold AFB Band Recovery - lots of mites
03	Lasurus borealis	2240			ESCAPED FROM NET				A	5m	N/A	pelage looked like male
04	Nycticeius humeralis	2320	A	M	NR	35.1	9.5	0	A	5m	N/A	
05	Lasurus borealis	0030	A	F	L	38.6	12.0	0	B	3.0m	N/A	

* some minor scarring, but appears to be associated with mite damage

¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for escaped bats

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Bat Capture Datasheet

Page 1 of 1

Project Name/No.: 172677408

Date: 06/17/2022

Biologist(s): L. Meade, M. Alexander

Site ID: RLM-82-Putnam

County/State: Putnam, TN

Moon Phase: Waning Gibbous

Sunset: 2001

Map Kilometer No./Quad: 10.5 KM-82

Latitude: 36.22537

Longitude: 85.4524

Moonrise: 2331

Moonset: 0841

General Site Description: on Bear Creek, Bottomland forest west of

Nets Open: 2001

Nets Closed: 0101

Mirandy. Bee Rd.

Time	Temp (F)	Wind ¹	% Cloud Cover	Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
20:00	73	0	0	A	9	5.2		36.22520	-85.45249		✓			
21:00	72	0	0	B	6	5.2		36.22435	-85.45201		✓			
22:00	72	0	0											
23:00	72	0	0											
00:00	70	0	0											
01:00	70	0	0											

* One net at full extension ~ 2.5m high

Weather Comments:

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	MYGR	8:45pm	A	M	NR	42	11	0	A	3.9	6746	
2	MYGR	1	A	F	L	44	11	0	A	1	6745	Recent given birth, just
3	MYGR	1	A	F	L	42	11	0	A	1	6744	starting to lactate
4	MYGR	1	A	F	L	43	11	0	A	1	6742	"
5	MYGR	1	A	F	L	43	10	0	A	1	6743	"
6	MYGR	1	A	F	L	43	11.25	0	A	1	6741	"
7	MYGR	1	A	F	L	43	10	0	A	1	6740	*photo of white spot/scars
8	MYGR	1	A	F	L	43	11	0	A	1	6739	"
9	MYGR	1	A	F	L	42	10.75	0	A	1	6738	Last MYGR photos reg'd.
10	MYGR	10:30pm	A	F	P	44	11.5	0	B	1.5	6737	
11	MYGR	1:00pm	A	F	P	43	13.25	0	B	1	6736	
12	MYGR	1:00pm	A	F	P	44	14.5	0	B	1	6734	

¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

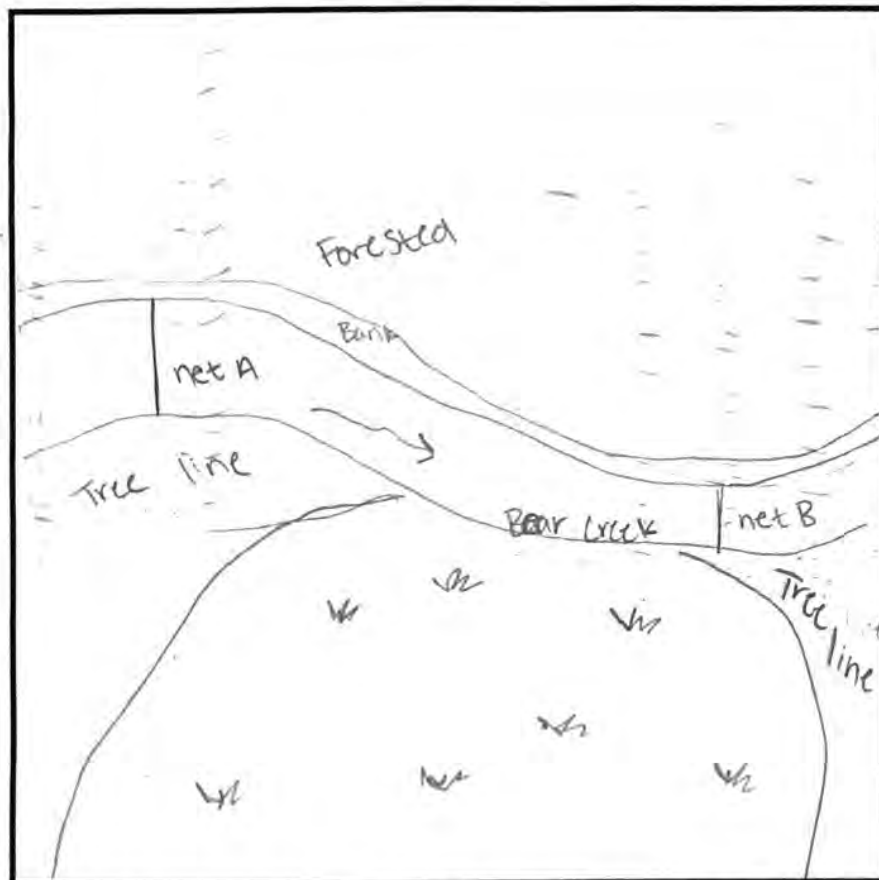
² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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Project Name/No.: 172671408

Date: 06/17/2022

Site ID: RLM-82- Putnam

Est. Distance to Water (ft): 0
VEGETATION

Primary Habitat Type¹: Bottomland forest / creek

Potential Roost:

Large Trees	Snags	<u>Both</u>	Other (e.g., structure)
-------------	-------	-------------	----------------------------

Roost Tree Potential:

High	<u>Moderate</u>	Low
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Dominant Canopy Species

Avg. Canopy DBH range (in): 14-18

1. Platanus occidentalis 2. Acer saccharum 3. Liriodendron americana

Canopy Closure:

Closed (80% +)	Moderate (40 - 80%)	Open (0 - 40%)
-------------------	------------------------	-------------------

Dominant Subcanopy Species

Avg. Subcanopy DBH range (in): 10-14

1. Acer negundo 2. Acer saccharum 3.

Sub-Canopy Clutter:

High (60% +)	Moderate (30 - 60%)	Low (0 - 30%)
-----------------	------------------------	------------------

Dominant Shrub/Understory Species

1. Carpinus caroliniana 2. Acer saccharum 3. Liriodendron tulipifera

Shrub/
Understory Clutter:

High (60% +)	Moderate (30 - 60%)	Low (0 - 30%)
-----------------	------------------------	------------------

STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): 1m Channel Width: 9m Stream Width: 5-9m

Riparian Width right bank: <100ft left bank: <100ft Avg. Water Depth: 6inch.
¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Other Wildlife Observed: Box Turtle, Green Frog, Barred owl

Additional Comments:



Bat Capture Datasheet

Page 1 of

Project Name/No.: 172677408

Date: 06/18/2022

Biologist(s): L. Meade, M. Alexander

Site ID: RLM-82-Putnam

County/State: Putnam, TN

Moon Phase: Waning Gibbous

Sunset: 2001

Map Kilometer No./Quad: 1 KM-82

Latitude: 36.22537

Longitude: -85.4524

Moonrise:

Moonset: 0955

General Site Description: on Bear Creek bottomland forest west of Miranda Rd Nets Open: 2001 Nets Closed: 0101

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	72	0	0
21:00	68	0	0
22:00	64	0	0
23:00	62	0	0
00:00	60	0	0
01:00	59	0	0

Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	9	5.2		36.22520	-85.45249		✓			
B	6	5.2		36.22455	-85.45201		✓			

* One net at full extension ~ 2.5m high

Weather Comments:

No.	Species		Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt In Net (m)	Band* # TWR	Comments (e.g., samples taken, transmitter #, disposition)
1	MYGR	2045	8:45pm	A	F	L	42	10	0	A	1.5	6733	
2	MYGR		8:45pm	A	F	L	44	10.5	0	A	1	6732	
3	MYGR		8:45pm	A	F	P	43	11	0	A	1	6731	
4	MYGR	2100	9:00pm	A	F	NR	42	10.5	1	B	1	19251	* spots on body, see photo
5	MYGR		9:00pm	A	F	L	41	11	0	B	1	19248	
6	MYGR		9:00pm	A	F	L	44	10	0	A	1.5	19249	
7	MYGR	2115	9:15pm	A	F	L	43	11.5	0	A	1.5	19247	
8	MYGR	2210	10:10pm	A	F	L	44	11	0	B	2	19246	
9	MYGR		2335	A	M	nr	44	10	0	B	1.5	19273	

¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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Bat Capture Datasheet

Page of

Project Name/No.: 172677408

Date: 17 Jun 22

Biologist(s): Josh Adams / Morgan Johnson

Site ID: RLM-83-Putnam

County/State: TN/Putnam

Moon Phase: Waning Gibbous

Sunset: 2001

Map Kilometer No./Quad: 83 KM-83

Latitude: 36 22 55

Longitude: -85.44907

Moonrise 231

Moonset: 0841

General Site Description: Logging Roads on either side of Ridge top NW

Nets Open: 145

Nets Closed: 2:10 PM

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	76.6	0	35
21:00	72.5	0	10
22:00	71.1	0	0
23:00	71.0	0	0
00:00	70.8	0	0
01:00	69.8	0	0

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments: Warm and windy most of the day, isolated storms

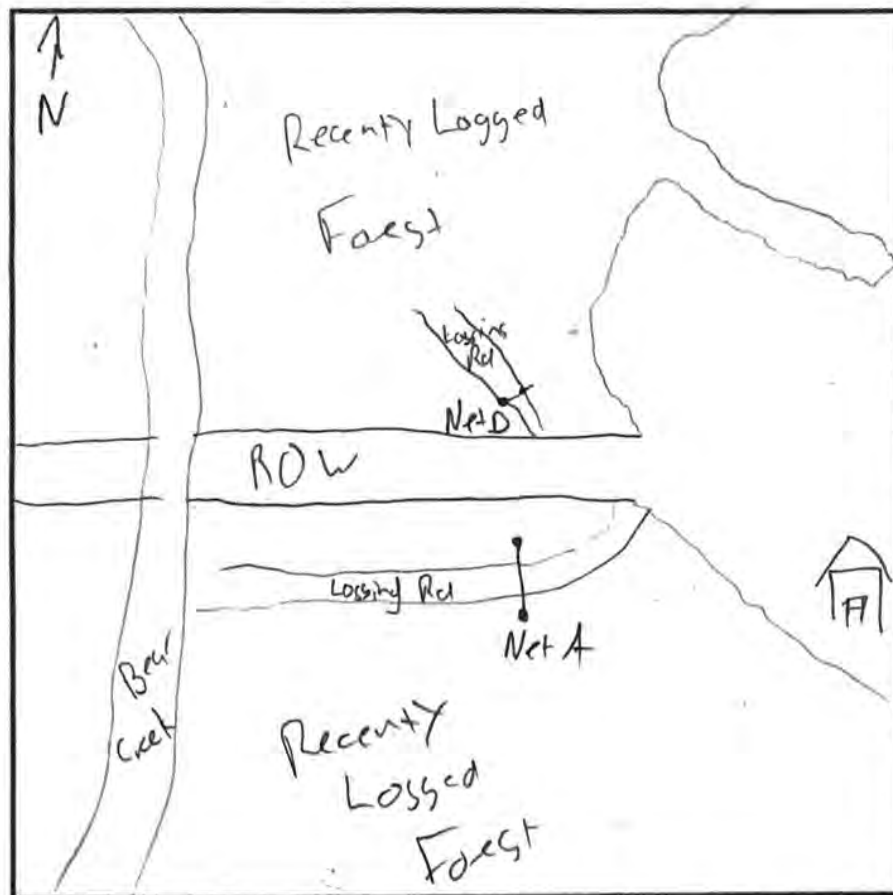
[illegible]

¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

⁷ For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats



Project Name/No.: Budgetline/172697408 Date: 06-17-22
 Site ID: RLM-83-Pulgon Est. Distance to Water (ft): 300

VEGETATION

Primary Habitat Type¹: Upland Forest
 Potential Roost:

Large Trees	Snags	<u>Both</u>	Other (e.g., structure)
-------------	-------	-------------	-------------------------

 Roost Tree Potential:

High	Moderate	Low
------	----------	-----

Dominant Canopy Species Acer saccharum Liriodendron Aspen
 Avg. Canopy DBH range (in): 8
 Canopy Closure:

Closed (80%+)	<u>Moderate (40-80%)</u>	Open (0-40%)
---------------	--------------------------	--------------

Dominant Subcanopy Species Sassafras P. Betula G
 Avg. Subcanopy DBH range (in):
 Sub-Canopy Clutter:

High (60%+)	Moderate (30-60%)	<u>Low (0-30%)</u>
-------------	-------------------	--------------------

Dominant Shrub/Understory Species Rhus sp L. tulipifera Cercis canadensis
 Shrub/Understory Clutter:

High (60%+)	<u>Moderate (30-60%)</u>	Low (0-30%)
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STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): Channel Width: Stream Width:
 Riparian Width right bank: left bank: Avg. Water Depth:

¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Other Wildlife Observed: KY Warbler, Barred Owl, Coyote

Additional Comments:



Bat Capture Datasheet

Page ____ of ____

Project Name/No.: Ridge/The 172677408

Date: 18 Jan 22

Biologist(s): J. Adams / M. Johnson

Site ID: RLM-83- Putnam

County/State: Putnam/TN

Moon Phase: Waning Gibbous Sunset: 2001

Map Kilometer No./Quad: ~~83~~ 1KM-83

Latitude: 36.2255 Longitude: -85.4467 Moonrise: — Moonset: 0955

General Site Description: Logging Roads on either side of Ridge-top Row Nets Open: 2000 Nets Closed: 0105

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	69.4	1	0
21:00	62.1	1	0
22:00	57.2	0	0
23:00	54.5	1	0
00:00	54.1	1	0
01:00	53.7	2	0

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments: Colder and windier than first week, clear skies. Highs in mid 60s

[illegible]

¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats



Bat Capture Datasheet

Page ____ of ____

Project Name/No.: 172677408 Ridgeline Survey Date: 06/17/2022 Biologist(s): T. Wetzel, E. Houston, C. Burton
Site ID: RLM-84-Putnam County/State: Putnam, TN Moon Phase: Waning gibbous Sunset: 2001
Map Kilometer No./Quad: ~~92.0-92.15~~ 92.15 KMB4 Latitude: 36.225820 Longitude: -85.433100 Moonrise: 2330 Moonset: 0841
General Site Description: North of Officer's Chapel Rd. along existing pipeline corridor Nets Open: 2001 Nets Closed: 0101

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	75	0	30%
21:00	74	0	0
22:00	73	0	0
23:00	75	0	0
00:00	72	0	1
01:00	70	0	1

[illegible]

* One net at full extension ~ 2.5m high

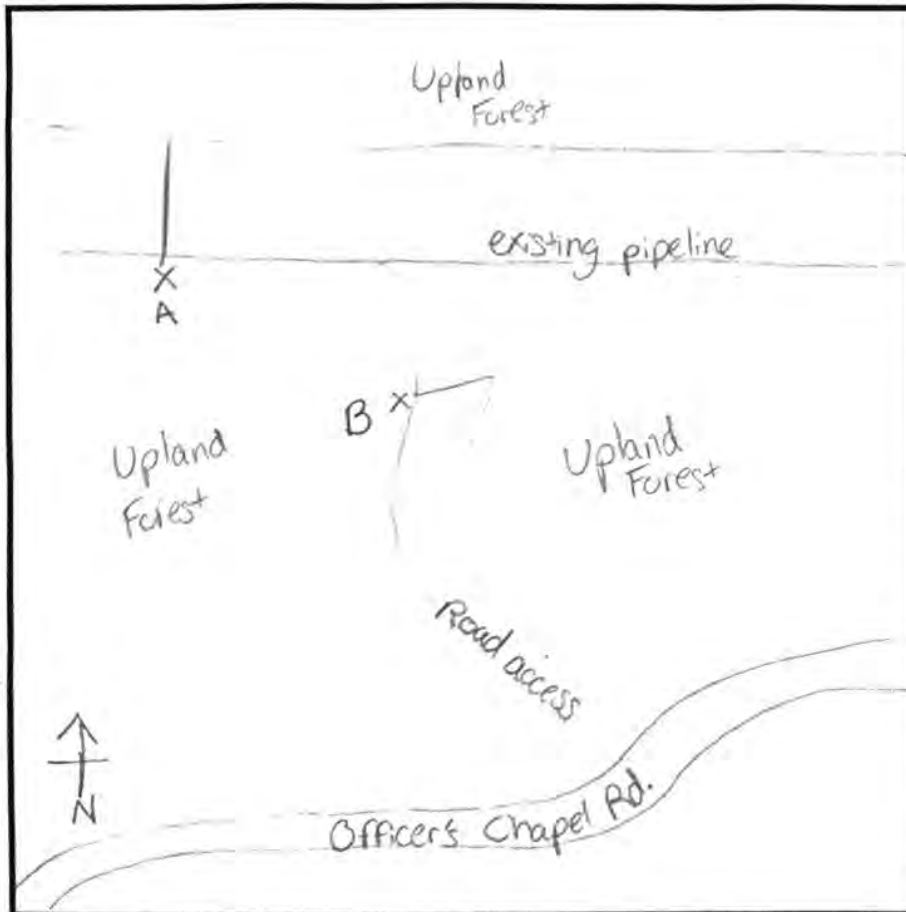
Weather Comments:[illegible]

ⁱ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

- Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats


Project Name/No.: 172677408

Date: 06/17/2022

Site ID: RLM-84-Putnam

Est. Distance to Water (ft): 050ft

VEGETATION

Primary Habitat Type¹: Upland Forest

Potential Roost:

☒ Large Trees

☐ Snags

☐ Both

☐ Other
(e.g., structure)

Roost Tree Potential:

☐ High

☒ Moderate

☐ Low

Dominant Canopy Species

Avg. Canopy DBH range (in): 20

1. Liriodendron tulipifera 2. Juglans nigra 3. _____

Canopy Closure:

☐ Closed
(80%+)

☒ Moderate
(40-80%)

☐ Open
(0-40%)

Dominant Subcanopy Species

Avg. Subcanopy DBH range (in): 10

1. Acer rubrum 2. Cercis canadensis 3. Celtis occidentalis

Sub-Canopy Clutter:

☐ High
(60%+)

☒ Moderate
(30-60%)

☐ Low
(0-30%)

Dominant Shrub/Understory Species

1. Rubus cuneifolius 2. Sassafras albidum 3. _____

Shrub/
Understory Clutter:

☐ High
(60%+)

☐ Moderate
(30-60%)

☒ Low
(0-30%)

STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): _____ Channel Width: _____ Stream Width: _____

Riparian Width right bank: _____ left bank: _____ Avg. Water Depth: _____

¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Other Wildlife Observed: _____

Additional Comments: _____



Bat Capture Datasheet Pt. II

Page 1 of 1

Project Name/No.: 175677408 ^{Ridgeline} _{Pat Survey} Date: June 18, 2022 Biologist(s): T. Witzel, E. Houston, C. Burton
Site ID: RLM-84-Putnam County/State: Putnam, TN

[illegible]

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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Bat Capture Datasheet

Page ____ of ____

Project Name/No.: Ridgeline/172677408

Date: 06-21-2022

Biologist(s): Josh Adams, M. Johnson

Site ID: RLM-85-PUTNAM

County/State: Putnam, TN

Moon Phase: waning crescent

Sunset: 20.02

Map Kilometer No./Quad: KM-85

Latitude: 36 225556

Longitude: -85.428135

Moonrise: 1:06

Moonset: 13.16

General Site Description: Highly disturbed wooded corridors leading
roadside

Nets Open: 20.20

Nets Closed: 01:05

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	73.1	0	0
21:00	70.4	0	0
22:00	67.5	0	0
23:00	66.7	0	0
00:00	66.3	0	0
01:00	56.3	0	0

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments:[illegible]

1 **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats



Bat Capture Datasheet

Page ____ of ____


Project Name/No.: Ridge line / 172677408

Date: 06-22-2022

Biologist(s): Josh Adams, Morgan Johnson

Site ID: QLM-85-PUTNAM

County/State: Perth Amherst/TN

Moon Phase: Waning Crescent  Sunset: 20:03

Map Kilometer No./Quad: KM-85

Latitude: 36 22 55G

Longitude: -85 42 80 S Moonrise: 1:50 Moonset: 2:17

General Site Description: HIGHLY DISTURBED WOODED CORRIDORS Nets Open: 20:03 Nets Closed: 21:03

LEADING HOUSE SEAT

Time	Temp (F)	Wind ¹	% Cloud Cover	Net ID (A, B,...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
20:00	77.7	0	70	A	9	5		36.225193	85.427803	✓				
21:00	76.4	0	10	B	6	5		36.22474	85.427410	✓				
22:00	75.2	0	0											
23:00	73.3	0	0											
00:00	71.8	0	0											
01:00	71.4	0	0											

* One net at full extension ~ 2.5m high

* One net at full extension ~ 2.5m high

Weather Comments:[illegible]

Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face: leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises: small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

Bat Capture Datasheet

Page of

Project Name/No.: 172677408/R:dxcl.vc

Date: 19 Jan 22

Biologist(s): Joshua Adams / Morgan Johnson

Site ID: RLM-86-Patnam

County/State: Putnam TN

Moon Phase: Last Quarter Sunset: 2001

Map Kilometer No./Quad: km-86

Latitude: 36.223134 Longitude: -85.40906 Moonrise: 0007 Moonset: 2305

General Site Description: Existing ROV and very cluttered creek with incised banks Nets Open: 2000 Nets Closed: 0105

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	70.1	0	20
21:00	58.0	0	10
22:00	58.9	0	0
23:00	56.5	1	0
00:00	56.0	0	0
01:00	52.8	0	0

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments:[illegible]

¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

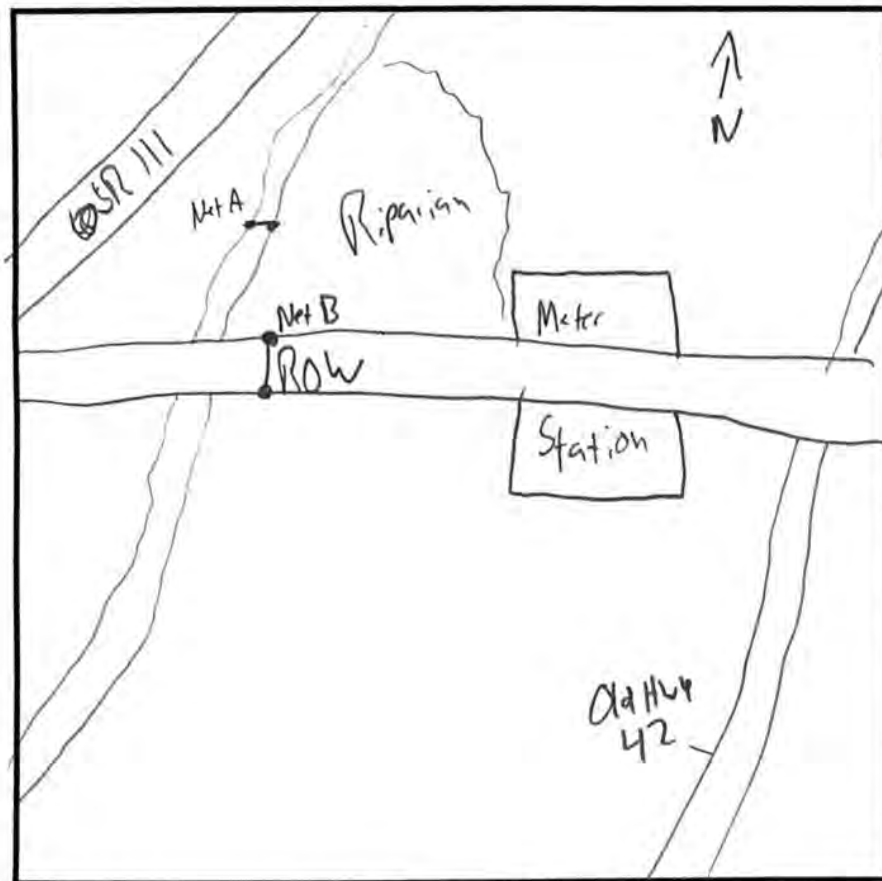
* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

Net Site Description

172677408

Page ___ of ___



Project Name/No.: ~~RLM-86 Putnam~~

Date: 20 Jun 22

Site ID: ~~172677408/Ridge~~

Est. Distance to Water (ft): 0

RLM-86-PUTNAM

VEGETATION

Primary Habitat Type¹: Bottomland forest

Potential Roost: Large Trees Snags Both Other (e.g., structure)

Roost Tree Potential: High Moderate Low

Dominant Canopy Species Avg. Canopy DBH range (in): 12

1. *J. nigra* 2. *P. occidentalis* 3. *P. deltoides*

Canopy Closure: Closed (80%+) Moderate (40-80%) Open (0-40%)

Dominant Subcanopy Species Avg. Subcanopy DBH range (in): 4

1. *F. pennsylvanica* 2. *A. negundo* 3. *Salix nigra*

Sub-Canopy Clutter: High (60%+) Moderate (30-60%) Low (0-30%)

Dominant Shrub/Understory Species

1. *Smilax* sp 2. *Salix nigra* 3.

Shrub/Understory Clutter: High (60%+) Moderate (30-60%) Low (0-30%)

STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): 4.5 Channel Width: 12ft Stream Width: 12ft

Riparian Width right bank: 35 left bank: 5 Avg. Water Depth: 1

¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Other Wildlife Observed: _____

Additional Comments: _____



Bat Capture Datasheet

Page ___ of ___

Project Name/No.: RidgeLine/172677408 Date: 06-20-2022 Biologist(s): Josh Adams, Morgan Johnson
 Site ID: RLM-86-Putnam County/State: Putnam/TN Moon Phase: Last Quarter Sunset: 8:02
 Map Kilometer No./Quad: KM-86 Latitude: 36.723134 Longitude: -85.40906 Moonrise: 12:37am Moonset: 12:12pm
 General Site Description: See Jan 19th Data Sheet EXISTING FLOW & VERY CLUTTERED CREEK W/ INCISED BANKS Nets Open: 2000 Nets Closed: 0105

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	74.1	0	0
21:00	65.7	0	0
22:00	63.7	0	0
23:00	61.7	0	0
00:00	60.1	0	0
01:00			

Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
SEE 06/19 DATA Sheet										

* One net at full extension ~ 2.5m high

Weather Comments: _____

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	<i>Myotis grisescens</i>	2030	A	F	L	44	10.25	0	A	2	10550	
2	<i>Myotis grisescens</i>	2050	A	F	L	43	10.5	0	A	2	10549	
3	<i>Myotis grisescens</i>	2050	A	F	L	43	9.75	0	A	2	10522	
4	<i>Lasiurus borealis</i>	2340	A	M	NR	31	10.75	0	B	4	—	
5	<i>Lasiurus borealis</i>	0040	A	M	NR	32	10.0	0	B	35	—	

¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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Bat Capture Datasheet

Page ___ of ___

Project Name/No.: RidgeLine / 172677408 Date: 19 June 2022 Biologist(s): James Kiser, Lucas Downs
 Site ID: RLMT-87/Turkey Cr. Rd. Ridge County/State: Putnam/TN Moon Phase: Waning Gibbous Sunset: 2002
 Map Kilometer No./Quad: KM-87/Cookeville East Latitude: N36.22167° Longitude: W-85.40321° Moonrise: 0007 Moonset: 1806
 General Site Description: Site is located on ridge top upslope and east of Turkey Cr. Rd Nets Open: 1940h Nets Closed: 0205
1930 80.1 0 25 at junction of old US-42.

Time	Temp (F)	Wind ¹	% Cloud Cover	Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
20:00	76.2	0	10	A	18	7.5m		36.22189	-85.40356				corridor	
21:00	66.1	0	0	B	12	7.5m		36.22109	-85.40350	✓				
22:00	62.4	0	0											
23:00	62.5	0	0											
00:00	60.6	1	0											
01:00	61.3	1	0											

* One net at full extension ~ 2.5m high

Weather Comments: Weather today was nice with high Temps in low 80's, partly cloudy and breezy.

No.	Species	Time (24h)	Age (A, J, U)	Sex ² (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	<i>Eptesicus fuscus</i>	2020	A	M	NR	46.9	15.5	0	A	4.5	—	Gumodillon PU-87-49
2	<i>Lasiurus borealis</i>	2100	A	F	L	43.4	13.0	0	A	3	—	Hair PU-87-50
3	<i>Lasiurus borealis</i>	2120	A	F	L	42.8	13.5	0	A	4	—	Hair PU-87-51
4	<i>Myotis grisescens</i>	↓	A	F	L	44.8	10.3	0	B	1	TVRA 09303	2 photos @ 9:54+1 @ 9:55 Gumod PU-87-52
5	<i>Lasiurus borealis</i>	2140	A	F	L	40.3	12.6	0	B	3.5	—	Hair PU-87-53
6	<i>Lasiurus borealis</i>	2230	A	M	—	—	—	—	A	3	—	Escaped from net
7	<i>Lasiurus borealis</i>	2300	A	M	—	—	—	—	A	2.5	—	Escaped from net
8	<i>Lasiurus borealis</i>	2355	A	F	L	42.2	12.6	0	A	5	—	Hair PU-87-54
9	<i>Lasiurus borealis</i>	0010	A	M	NR	—	—	0	A	3.5	—	Escaped from hand
10	<i>Lasiurus borealis</i>	↓	A	F	L	41.7	12.0	0	A	7	—	Hair PU-87-55

¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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Bat Capture Datasheet

Page 1 of 2

Project Name/No.: Ridgepole/172677408

Date: 20 June 2022

Biologist(s): James Kiser, Lucas Downs

Site ID: RLM-87/Turkey Cr. Ridge

County/State: Putnam/TN

Moon Phase: Last Quarter

Sunset: 2002h

Map Kilometer No./Quad: KM-87/Cockeville East

Latitude: 36.22167°

Longitude: -85.40321

Moonrise: 0038h

Moonset: 1212h

General Site Description: Site is located on ridge top upper slope and east of Turkey Cr. Rd

Nets Open: 1940h

Nets Closed: 0205h

80.6 0 0 at junction of old US 42.

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	77.1	0	0
21:00	73.6	0	0
22:00	68.9	0	0
23:00	66.7	0	0
00:00	66.0	1	0
01:00	65.4	0	0

Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	18	7.5		36.22189	-85.40356				comedian	
B	12	7.5		36.22109	-85.40350	✓				

* One net at full extension ~ 2.5m high

Weather Comments: Weather today was warm with high temps in mid 80's, sky was clear and little to no wind.

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	<i>Lasius borealis</i>	2015	A	M	NR	40.0	9.9	0	B	4	—	Hair + Guano PU-87-56
2	<i>Lasius borealis</i>	2300	A	F	L	42.4	14.2	0	A	1.5	—	Hair + Guano PU-87-57
	<i>Glaucomys volans</i>	0050							A	2		

¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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Bat Capture Datasheet

Page 1 of 1

Project Name/No.: ~~172677408~~ 172677408

Date: 06-20-2022

Biologist(s): L. Meade, m. alexander, m. drewner

Site ID: RLM-89-Putnam

County/State: Putnam TN

Moon Phase: LAST Quarter

Sunset: 2007

Map Kilometer No./Quad: KM-89

Latitude: 36.21610410

Longitude: -85.379445 Moonrise: 2037

Moonset: 1212

General Site Description: Riparian Corridor off Spring Creek, west of Wiley Ln. Nets Open: 2002 Nets Closed: 0102

Nets Closed: 0102

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	72	0	0
21:00	68	0	0
22:00	66	0	0
23:00	64	0	0
00:00	64	0	0
01:00	62	0	0

[illegible]

* One net at full extension ~ 2.5m high

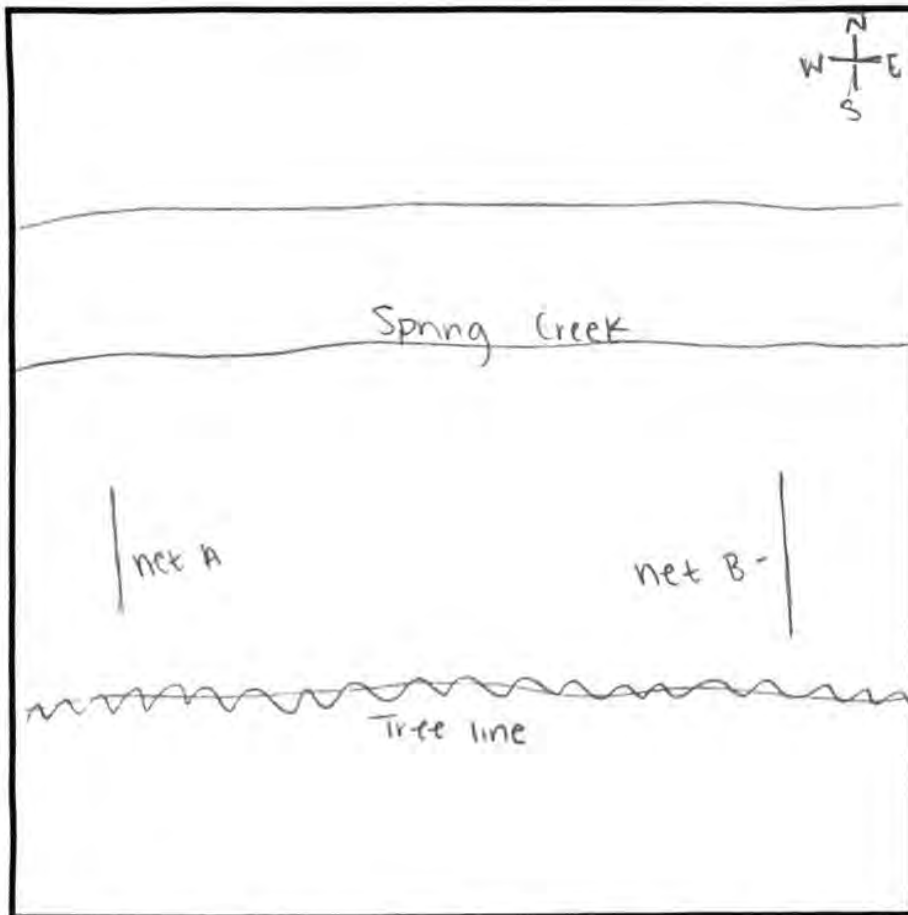
Weather Comments:[illegible]

¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

- Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats



Project Name/No.: 172677408 Date: 6-20-2022
 Site ID: RLM-89-Putnam Est. Distance to Water (ft): 30

VEGETATION

Primary Habitat Type¹: CREEK/RIPARIAN
 Potential Roost:

<u>Large Trees</u>	Snags	Both	Other (e.g., structure)
--------------------	-------	------	-------------------------

Roost Tree Potential:

High	Moderate	Low
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Dominant Canopy Species Avg. Canopy DBH range (in): 14-19
 1. Black Walnut 2. Tulip Poplar 3. Sycamore

Canopy Closure:

Closed (80%+)	Moderate (40-80%)	Open (0-40%)
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Dominant Subcanopy Species Avg. Subcanopy DBH range (in): 3-5
 1. American Elm 2. 3.

Sub-Canopy Clutter:

High (60%+)	Moderate (30-60%)	Low (0-30%)
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Dominant Shrub/Understory Species
 1. River Cane 2. Spice Bush 3.

Shrub/Understory Clutter:

High (60%+)	Moderate (30-60%)	Low (0-30%)
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STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): 8-10 Channel Width: 30ft Stream Width: 30ft
 Riparian Width right bank: 5ft left bank: 60ft Avg. Water Depth: 1-2ft

¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Other Wildlife Observed: _____

Additional Comments: _____

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Bat Capture Datasheet

Page 1 of 3

Project Name/No.: Ridgeline/172677408 Date: 21 June 2022 Biologist(s): James Kiser, Lucas Downs
 Site ID: RLM-91/Bilbrey Rd Blue Holes County/State: Putnam/TN Moon Phase: Waning Crescent Sunset: 2002h
 Map Kilometer No./Quad: Km-91/Monterey Latitude: 36.20597° Longitude: -85.36168° Moonrise: 0105h Moonset: 1316h
 General Site Description: Site is located near end Bilbrey Rd. where two Blue Nets Open: 1930h Nets Closed: 0115h
1930 79.4 1 10 Holes are located.

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	75.6	1	0
21:00	67.8	1	0
22:00	66.7	1	0
23:00	65.9	1	0
00:00	65.5	1	0
01:00	64.7	1	0

Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	18m	7.5m	135m ²	36.206136°	-85.361695°			✓		
B	9m	7.5m	67.5m ²	36.205625°	-85.361900°			✓	✓	

* One net at full extension ~ 2.5m high

Weather Comments: Weather today was hot and humid with high temps in low 90's, light wind, mostly clear skies

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	<i>Lasiorus borealis</i>	2015	A	F	L	44.1	13.5	0	B	2.5	—	Hair PU-91-58
2	<i>Lasiorus borealis</i>	↓	A	F	L	41.2	11.0	0	A	1.0	—	Hair + ^{Groom} PU-91-59
3	<i>Lasiorus borealis</i>	↓	A	F	L	42.3	12.5	0	A	1.0	—	Hair PU-91-60
4	<i>Lasiorus borealis</i>	↓	A	M	NR	40.0	11.6	0	A	7.0	—	Hair + ^{Groom} PU-91-61
5	<i>Lasiorus borealis</i>	↓	A	F	L	42.8	13.2	0	A	1.0	—	Hair PU-91-62
6	<i>Lasiorus borealis</i>	2045	A	M	NR	40.5	11.0	0	A	4.0	—	Hair PU-91-63
7	<i>Nycticeius humeralis</i>	2055	A	M	NR	37.4	10.1	0	A	6.0	—	
8	<i>Eptesicus fuscus</i>	2115	A	F	L	49.5	23.75	0	B	2.0	—	Hair + ^{Groom} PU-91-64
9	<i>Lasiorus borealis</i>	2130	U	U	U	—	—	—	A	5.0	—	Escaped from Net
10	<i>Perimyotis subflavus</i>	↓	A	M	NR	34.9	6.3	0	A	7.0	TWRA A04473	Hair PU-91-65
	<i>Glossy-winged Vole</i>	↓	—	—	—	—	—	—	A	5.0	—	
11	<i>Corynorhinus rafinesquii</i>	2150	A	M	NR	43.9	9.1	0	B	0.5	→	TWRA 10134

¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

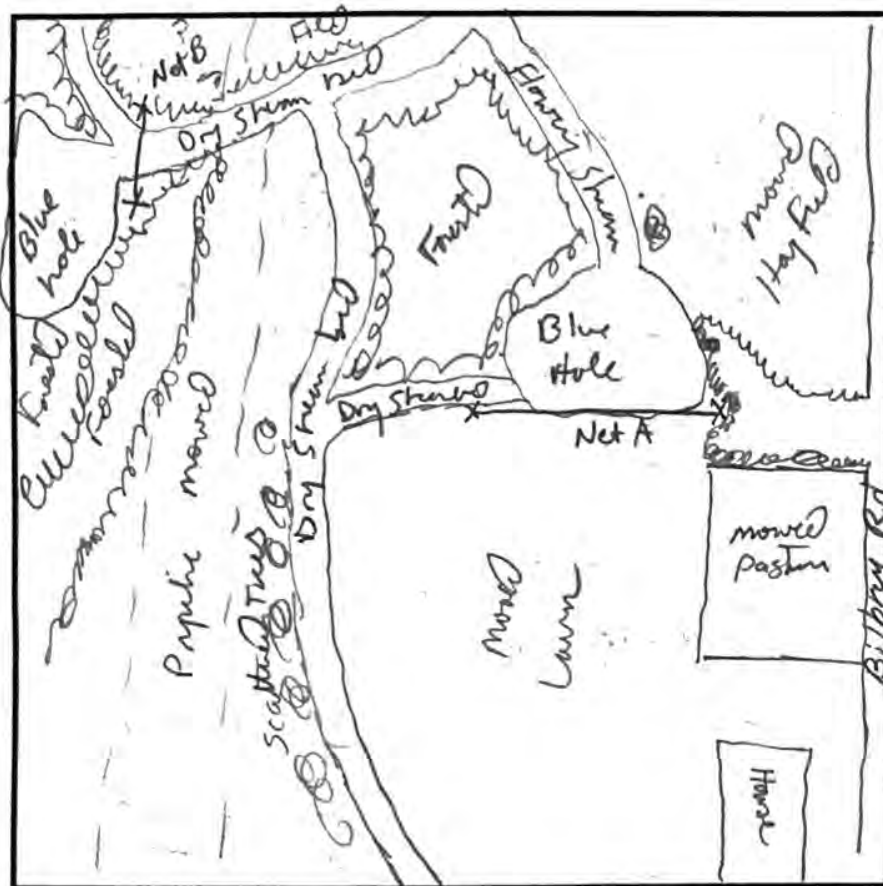
² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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Project Name/No.: Ridge/line/172677408 Date: 21 June 2022
Site ID: RLM-91/Bilberry Rd Blueholes Est. Distance to Water (ft): 0

VEGETATION

Primary Habitat Type: Pond/Creek Riparian/Field Edge

Potential Roost:	Large Trees	Snags	Both	Other (e.g., structure)
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100				

Roost Tree Potential:	High	Moderate	Low
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Dominant Canopy Species 1. Am. Elm 2. Am. Beech 3. White Oak 4. Black Maple

Canopy Closure:	Closed (80% +)	Moderate (40 – 80%)	Open (0 – 40%)
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Dominant Subcanopy Species: *Alseodaphnophloeus* Avg. Subcanopy DBH range (in): 4-8

1. Red Cedar 2. Sycamore 3. Black Walnut

Sub-Canopy Clutter:	High (60% +)	Moderate (30 – 60%)	Low (0 – 30%)
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Dominant Shrub/Understory Species
1. *Sassafras* 2. *Am. Beech* (sop) 3. *Rosa multiflora* 4. *Cornus fl.*

Shrub/ Understory Clutter:	High (60% +)	Moderate (30 - 60%)	Low (0 - 30%)
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STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): 3, Channel Width: 12-20 Stream Width: 0-8

Riparian Width right bank: <5m left bank: <5m **Avg. Water Depth:** 12"

¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Other Wildlife Observed: Eastern Towhee (Vo), Am. Robin (Vo), N. Mockingbird (Vo), Black & White Warbler (Vo), Whip-poor-will (Vo), Rana palustris (1), Peromyscus leucopus (1), Yellow-billed Cuckoo (Vo), ~~Brandenburg Owl~~ (Vo)
Additional Comments: The two blue holes provide open water for bats to drink out of the dry stream channel provides flyway.



Bat Capture Datasheet Pt. II

Page 3 of 3

Project Name/No.: Ridgefire/172677408 Date: 21 June 2022

Biologist(s): James Kiser, Lucas Downs

Site ID: RLM-91/Bilbrey Rd. Blue Holes County/State: Putnam/TN

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (samples taken, transmitter #, if recap, disposition)
12	<i>Lasurus borealis</i>	2215	U	U	U	—	—	—	A	6.0	—	Escaped from Net
13	<i>Nycticeius humeralis</i>	↓	—	—	—	—	—	—	A	4.0	—	Escaped from bag
14	<i>Eptesicus fuscus</i>	↓	A	M	NR	46.4	19.0	—	A	5.0	—	Hair + Guano PU-91-66
15	<i>Eptesicus fuscus</i>	2230	A	F	L	49.4	22.25	—	B	4.0	—	Hair + Guano PU-91-68
16	<i>Lasurus borealis</i>	↓	A	M	NR	39.5	12.75	—	B	4.5	—	Hair PU-91-67
17	<i>Lasurus borealis</i>	2245	A	M	NR	40.7	12.0	—	A	3.5	—	
18	<i>Lasurus borealis</i>	2310	U	U	U	—	—	—	A	3	—	Escaped from Net
19	<i>Myotis grisescens</i>	2320	A	F	L	44.5	—	—	A	3.5	TWRA 10135	Guano PU-91-69
20	<i>Eptesicus fuscus</i>	2340	A	F	L	51.0	20.2	—	B	3.0	—	Hair + Guano PU-91-71
21	<i>Eptesicus fuscus</i>	2350	A	F	L	48.2	19.25	—	A	5.0	—	Hair + Guano PU-91-72
22	<i>Eptesicus fuscus</i>	2330	A	F	L	50.0	20.25	—	A	3.0	—	Hair + Guano PU-91-70
23	<i>Lasurus borealis</i>	2330	A	M	NR	41.1	11.25	—	A	3.5	—	
24	<i>Lasurus borealis</i>	0010	A	M	NR	40.0	11.5	—	A	3.5	—	
25	<i>Eptesicus fuscus</i>	↓	A	F	L	49.4	17.8	—	A	2.5	—	
26	<i>Myotis grisescens</i>	↓	A	M	NR	45.5	10.5	—	A	1.5	TWRA 10136	Guano PU-91-73
27	<i>Eptesicus fuscus</i>	0030	A	F	L	47.3	21.5	—	B	2.5	—	
28	<i>Lasurus borealis</i>	0040	U	U	U	—	—	—	A	6.0	—	Escaped from Net
29	<i>Perimyotis subflavus</i>	↓	A	M	NR	33.1	6.0	—	A	6.5	TWRA 10137	Hair + Guano PU-91-74
30	<i>Myotis grisescens</i>	0050	A	F	L	43.2	11.2	—	A	3.5	TWRA 10137	
31	<i>Lasurus borealis</i>	0105	A	F	L	—	—	—	A	3	—	Escaped from Hand
32	<i>Lasurus borealis</i>	0110	A	F	L	—	—	—	B	2	—	As we were taking last net off
33	<i>Lasurus borealis</i>	0115	A	F	L	—	—	—	A	4	—	Escaped from Hand

² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for escaped bats

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Bat Capture Datasheet

Page of

Project Name/No.: RidgeLine/172677408 Date: 22 June 2022 Biologist(s): James Kiser, Lucas Downs, Chris Kralich
 Site ID: RLM-91/Bilberry Rd. Blue Holes County/State: Putnam/TN Moon Phase: Waning Crescent Sunset: 2002h
 Map Kilometer No./Quad: Km-91/Monterey Latitude: 36.20597° Longitude: -85.36168° Moonrise: 0131h Moonset: 1417h
 General Site Description: Site is located near end of Bilberry Rd. where two Blue Holes are located. Nets Open: 1940h Nets Closed: 20:05

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	74.8	0	50
21:00	74.0	0	25
22:00	71.7	0	0
23:00	70.9	0	0
00:00	70.3	0	0
01:00			

Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	18m	7.5m	135m ²	36.206136°	-85.361695°			✓		
B	9m	7.5m	67.5m ²	36.205625°	-85.361900°		✓	✓		

* One net at full extension ~ 2.5m high

Weather Comments: Hot today with high temp in mid 90's, low humidity, breezy with partly cloudy skies

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	<i>Lasius borealis</i>	2100h	A	M	NR	39.5	11.0	0	A	5	—	—
2	<i>Lasius borealis</i>	2200	A	M	NR	39.8	11.0	0	A	1	—	—
3	<i>Eplesicus fuscus</i>	↓	A	M	NR	46.7	20.75	0	B	2	—	Hair & Guano PU-91-75
	<i>Glaucomys volans</i>	2235	—	—	—	—	—	—	B	5	—	—
4	<i>Lasius borealis</i>	2300	A	A	L	42.5	EFH	0	A	6	—	Escaped from Hand
5	<i>Eplesicus fuscus</i>	2320	A	M	NR	50.3	19.0	0	A	6	—	—
6	<i>Lasius borealis</i>	0005	A	M	NR	38.0	11.25	0	A	5	—	—
7	<i>Lasius borealis</i>	0020	A	M	NR	—	—	—	A	3	—	Escaped from Net
8	<i>Lasius borealis</i>	0025	U	U	U	—	—	—	A	1.5	—	Escaped from Net
9	<i>Eplesicus fuscus</i>	0045	A	F	L	49.1	16.5	0	A	2	—	Hair & Guano PU-91-76
10	<i>Eplesicus fuscus</i>	0115	A	F	L	—	—	—	A	5.5	—	Escaped from Hand
11	<i>Eplesicus fuscus</i>	↓	A	F	L	—	—	—	A	6	—	Escaped from Hand

¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for escaped bats

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Bat Capture Datasheet

Page 1 of 2

Project Name/No.: Ridgeline/172677408 Date: 21 June 22 Biologist(s): Julia Wilson, Chris Knabel
 Site ID: RLM-92-Putnam County/State: Putnam/TN Moon Phase: Waning Crescent Sunset: 20:02
 Map Kilometer No./Quad: 92, MP 58.6 KM92 Latitude: 36.204046 Longitude: -85.355920 Moonrise: 01:05 Moonset: 18:15
 General Site Description: Field forest edge near ROW Nets Open: 20:02 Nets Closed: 1:02

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	76.2	0	10
21:00	70.4	0	0
22:00	68.6	0	0
23:00	69.1	0	0
00:00	68.3	0	0
01:00	68.0	0	0

Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	9	7.5	67.5	36.203803	-85.355778	✓			✓	Forest-field gap
B	4	5	20	36.204035	-85.355800	✓				

* One net at full extension ~ 2.5m high

Weather Comments: Very hot/humid during the day

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	<i>Myotis grisescens</i>	00:55	A	F	NR	42.8	9.0	0	A	5.5	—	Escaped without band
2	<i>Lasiurus borealis</i>	00:55	A	F	NR	40.5	12.25	0	A	6.5	—	Shedding fur in net

¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

172677408

Project Name/No.: Ridgeline Date: 21 June 22
 Site ID: RUM-92-Putnam Est. Distance to Water (ft): 600

VEGETATION

Primary Habitat Type¹: Field Edge, upland Forest

Potential Roost:	Large Trees	Snags	Both	Other (e.g., structure)
Roost Tree Potential:	High	Moderate	Low	

Dominant Canopy Species Avg. Canopy DBH range (in): 25-35
 1. Populus deltoides 2. Platanus occidentalis 3. Juglans nigra

Canopy Closure:	Closed (80%+)	Moderate (40-80%)	Open (0-40%)
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Dominant Subcanopy Species Avg. Subcanopy DBH range (in): 5-25
 1. Acer saccharum 2. Carya glabra 3. Liriodendron tulipifera

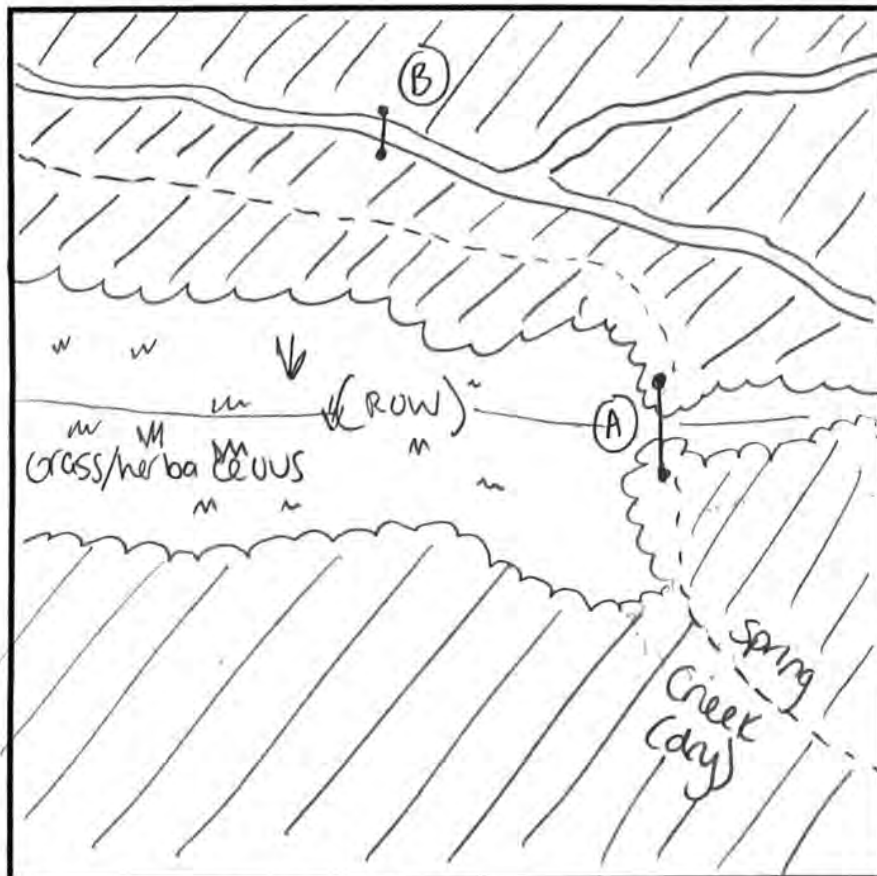
Sub-Canopy Clutter:	High (60%+)	Moderate (30-60%)	Low (0-30%)
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Dominant Shrub/Understory Species
 1. Rubus occidentalis 2. Lindera benzoin 3. Carya glabra

Shrub/Understory Clutter:	High (60%+)	Moderate (30-60%)	Low (0-30%)
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STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): 2 Channel Width: 3 Stream Width: 5
 Riparian Width right bank: 0 left bank: 0 Avg. Water Depth: 0
 (dry)



¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Other Wildlife Observed: CWW1, ACFL, GOF1, LEFL, CAWR, NOPA, KEWA, NAWA, COYE, INBU, EWPE, BARO, YBCU
American toad

Additional Comments: Dry creek bed intersects site, but is narrow and cluttered. Upland forested road is better. Tenant says there is a cave nearby.

Project Name/No.: Ridge line 1172677408 Date: 22 June 22 Biologist(s): Julia Wilson, Kate Burton
 Site ID: RLM-92-Rutnam County/State: Rutnam/TN Moon Phase: Waning crescent Sunset: 20:02
 Map Kilometer No./Quad: ~~92/MP 58.6~~ KM92 Latitude: 36.204046 Longitude: 95.355920 Moonrise: 0131 Moonset: 1417
 General Site Description: Field-forest ecotone and interior forest road Nets Open: 19:55 Nets Closed: 1:05

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	74.5	0	15
21:00	70.8	0	15
22:00	70.1	0	10
23:00	69.6	0	10
00:00	68.9	0	10
01:00	68.4	0	0

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments: Very hot during the day

[illegible]

Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

Bat Capture Datasheet

Project Name/No.: Ridgeline/172677408 Date: 06/21/2022 Biologist(s): T. Wetzel, E. Houston, C. Barton, M. Dannon

Site ID: RLM-93-Putnam County/State: Putnam/TN Moon Phase: Third quarter Sunset: 2002 0525

Map Kilometer No./Quad: 57.6-57.7 ^{km⁹³} Latitude: 36.201197 Longitude: -85.340465 Moonrise: 0105 Moonset: 1315

General Site Description: Northwest of Rt. Blaylock Mountain Rd. + Nets Open: 2002 Nets Closed: 0102

Southwest of Morgan Hwy. along Pipeline access road

Time	Temp (F)	Wind ¹	% Cloud Cover	Net ID (A, B...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
20:00	73	0	0	A	9m	7.8		36.201461	-85.340891	X				
21:00	70	0	0	B	9m	5		36.201079	-85.339978	X				
22:00	71	0	0											
23:00	73	2	0											
00:00	73	1	0											
01:00	72	1	0											

* One net at full extension ~ 2.5m high

* One net at full extension ~ 2.5m high

Weather Comments:

[illegible]

Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

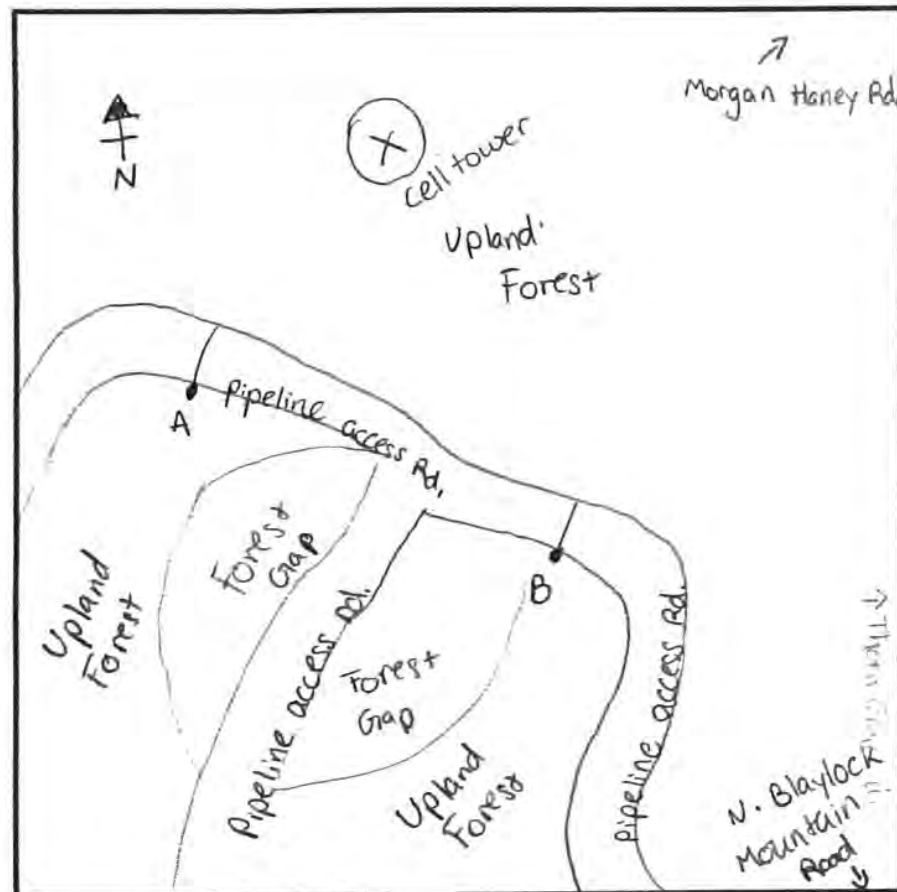
For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: ID = testes descended, NR = non-reproductive

- Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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Project Name/No.: Ridgeline/172077408 Date: 06/21/2022
 Site ID: RLM-93-Putnam Est. Distance to Water (ft): 3048

VEGETATION

Primary Habitat Type¹: Upland Forest
 Potential Roost: Large Trees Snags Both Other (e.g., structure)
 Roost Tree Potential: High Moderate Low

Dominant Canopy Species Avg. Canopy DBH range (in): 25
 1. Q. phellos 2. L. styraciflua 3. A. saccharum

Canopy Closure: Closed (80%+) Moderate (40-80%) Open (0-40%)

Dominant Subcanopy Species Avg. Subcanopy DBH range (in): 10
 1. R. pseudocacia 2. C. bignonioides 3. C. canadensis

Sub-Canopy Clutter: High (60%+) Moderate (30-60%) Low (0-30%)

Dominant Shrub/Understory Species
 1. Rubus rubus 2. P. occidentalis 3. S. albidum

Shrub/Understory Clutter: High (60%+) Moderate (30-60%) Low (0-30%)

STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): _____ Channel Width: _____ Stream Width: _____

Riparian Width right bank: _____ left bank: _____ Avg. Water Depth: _____

¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Other Wildlife Observed: Carolina wren

Additional Comments: _____



Bat Capture Datasheet

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Project Name/No.: Ridgeline/172677408 Date: 06/22/2022 Biologist(s): T. Wetzel, M. Dannon, E. Houston
Site ID: RLM-93-Putnam County/State: Putnam/TN Moon Phase: Waning Crescent Sunset: 2002 0525
Map Kilometer No./Quad: ~~57.6~~ 57.7 KM93 Latitude: 36.201197 Longitude: -85.34045 Moonrise: 0156 Moonset: 1517
General Site Description: Northwest of N. Blaylock Mountain Rd. + Southeast of Morgan Nets Open: 2002 Nets Closed: 0202
Haney Rd. along pipeline corridor

Time	Temp (F)	Wind ¹	% Cloud Cover	Net ID (A, B...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
20:00	77	0	40%	A	9	7.5		36.20146	-85.340891	X				
21:00	75	0	10%	B	9	5		36.201079	-85.339978	X				
22:00	73	0	0%											
23:00	73	0	5%											
00:00	72	1	0%											
01:00	71	0	0%											

* One net at full extension ~ 2.5m high

* One net at full extension ~ 2.5m high

Weather Comments:[illegible]

Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

Confidential Data. If found, please return to:

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Bat Capture Datasheet

Project Name/No.: Ridgeline/172677408 Date: 06/19/2022 Biologist(s): T. Wetzel, E. Houston, M. Alexander, C. Burton

Site ID: RLM-84-Putnam County/State: Putnam/TN Moon Phase: Waning gibbous Sunset: 2002 0524

Map Kilometer No./Quad: 86 57.9 KM 94 Latitude: 36.198750 Longitude: -85.33724 Moonrise: 00 07 Moonset: 11 16

General Site Description: West of Thorn Gap Rd along existing pipeline corridor Nets Open: 2002 Nets Closed: 0102

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	69	1	5%
21:00	64	0	2%
22:00	64	0	6%
23:00	63	0	0
00:00	63	0	0
01:00	63	0	0

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments:[illegible]

Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

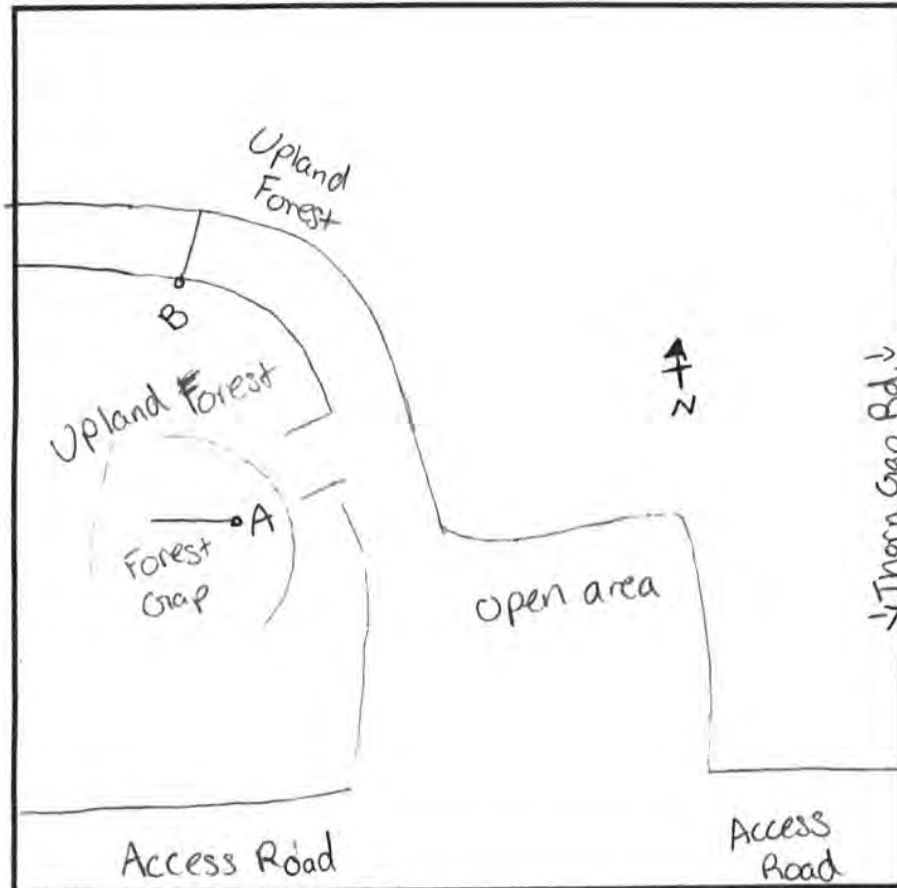
² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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Project Name/No.: RidgeLine/172677408 Date: 06/19/2022
 Site ID: RLM-94-Putnam Est. Distance to Water (ft): 1873

VEGETATION

Primary Habitat Type: Upland Forest
 Potential Roost: Large Trees Snags Both Other (e.g., structure)
 Roost Tree Potential: High Moderate Low

Dominant Canopy Species Avg. Canopy DBH range (in): 17
 1. Q. phellos 2. A. tulipifera 3. Q. falcata

Canopy Closure: Closed (80%+) Moderate (40-80%) Open (0-40%)

Dominant Subcanopy Species Avg. Subcanopy DBH range (in): 12
 1. R. pseudoacacia 2. C. canadensis 3. A. rubrum

Sub-Canopy Clutter: High (60%+) Moderate (30-60%) Low (0-30%)

Dominant Shrub/Understory Species
 1. Rubus sp. 2. Rhus glabra 3. _____

Shrub/Understory Clutter: High (60%+) Moderate (30-60%) Low (0-30%)

STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): _____ Channel Width: _____ Stream Width: _____
 Riparian Width right bank: _____ left bank: _____ Avg. Water Depth: _____

¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Other Wildlife Observed: Chuck-will's-widow (calling), G. volans (caught in net), White-tailed deer

Additional Comments: _____

Project Name/No.: Ridgeline/172677408 Date: 06/20/2002 Biologist(s): T. Wetzel, E. Houston, C. Burton
Site ID: RLM-94-Putnam County/State: Putnam/TN Moon Phase: Waning gibbous Sunset: 2002
Map Kilometer No./Quad: ~~56.0~~ 57.9 KM ⁹⁴ Latitude: 36.198750 Longitude: -88.33724 Moonrise: 0038 Moonset: 1213
General Site Description: West of Thorn Gap Rd along existing pipeline corridor Nets Open: 2002 Nets Closed: 0102

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	72	0	0
21:00	73	0	0
22:00	69	0	0
23:00	67	0	0
00:00	63	0	0
01:00	64	0	0

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments:[illegible]

Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats



Bat Capture Datasheet

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Project Name/No.: 172677408

Date: 26 June 2022

Biologist(s): K. Eshler, A. Hammer

Site ID: BLM-98-Overton

County/State: Overton, TN

Moon Phase: Waning Crescent Sunset: 20:02

Map Kilometer No./Quad: ~~100-8-60-2~~ KM 98

Latitude: 36.18843

Longitude: -85.28907 Moonrise: 03:24 Moonset: 19:16

General Site Description: Access Rd at Km 60.8-60.9 of Pipeline ROW

Nets Open: 20:02 Nets Closed: 23:00

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	70	0	70
21:00	70	0	100
22:00	69	0	25
23:00	—	—	—
00:00			
01:00			

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments: Light rain/drizzle @ 2100

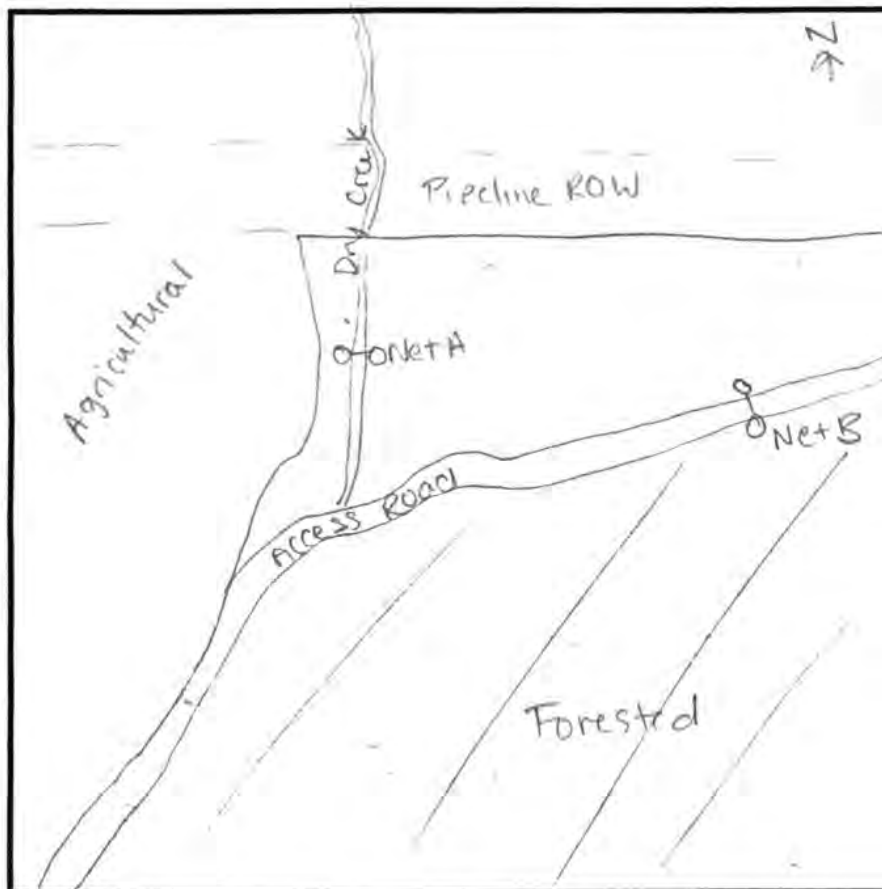
[illegible]

Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

- * Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats


Project Name/No.: 172677408 Date: 26 June 2022

Site ID: RLM-98-OVERTON Est. Distance to Water (ft): 0'
VEGETATION

Primary Habitat Type¹: Upland Forest

Potential Roost: Large Trees | Snags | Both | Other (e.g., structure)

Roost Tree Potential: High | Moderate | Low

Dominant Canopy Species Avg. Canopy DBH range (in):

1. Quercus alba 2. Liriodendron tulipifera 3. 20-40

Canopy Closure: Closed (80%+) | Moderate (40-80%) | Open (0-40%)

Dominant Subcanopy Species Avg. Subcanopy DBH range (in): 10-15

1. Prunus serotina 2. Acer rubrum 3. Carya cordiformis

Sub-Canopy Clutter: High (60%+) | Moderate (30-60%) | Low (0-30%)

Dominant Shrub/Understory Species

1. Quercus alba 2. Juniperus virginiana 3. 2-4

Shrub/Understory Clutter: High (60%+) | Moderate (30-60%) | Low (0-30%)

STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): 10" Channel Width: N/A (dry) Stream Width: 5m

Riparian Width right bank: _____ left bank: _____ Avg. Water Depth: 0'
¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Other Wildlife Observed: Deer, southern two-lined salamander

Additional Comments: _____

Bat Capture Datasheet

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Project Name/No.: 172677408

Date: 6/27/2022

Biologist(s): K. Eshler, A. Hammer

Site ID: RLM-98 - Overtown

County/State: Overton, TN

Moon Phase: Waning Crescent Sunset: 20:02

Map Kilometer No./Quad: ~~60.9~~ 60.9 KM 98

Latitude: 36.14943

Longitude: -85.28907

Moonrise: 04:05

Moonset: 19:17

General Site Description: Access Rd at Km 60.8-60.9 of pipeline ROW

Nets Open: 20:02

Nets Closed: 0102

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	72	0	0
21:00	67	0	0
22:00	64	0	0
23:00	62	0	0
00:00	60	0	0
01:00	57	0	0

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments:[illegible]

¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

Bat Capture Datasheet

Page ____ of ____

Project Name/No.: 172677408 Date: 28 June 2022 Biologist(s): Keshler, A. Hammer
 Site ID: RLM-98-Overton County/State: Overton, TN Moon Phase: New moon Sunset: 2002
 Map Kilometer No./Quad: ~~100.8-100.9~~ 100.9 Latitude: 36.18843 Longitude: -85.28907 Moonrise: 0445 Moonset: 2007
 General Site Description: Access Rd at Km 100.8-100.9 on Pipeline ROW Nets Open: 2002 Nets Closed: 0102

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	71	0	90
21:00	67	0	90
22:00	66	0	90
23:00	65	0	90
00:00	64	0	90
01:00	63	0	0

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments:[illegible]

¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

- Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats



Bat Capture Datasheet

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Project Name/No.: ~~1241~~ 172677408

Date: 06-24-2022

Biologist(s): L. Meade, M. Alexander, M. Downer

Site ID: RLM-99-Overton

County/State: Overton TN

Moon Phase: Waning Crescent

Sunset: 2002

Map Kilometer No./Quad: ~~619~~ KM 99

Latitude 36.186577

Longitude: -85.770996 Moonrise: 0222

Moonset: 1611a

General Site Description: Gravel Farm Rd North of Rock Springs Rd

Nets Open: 2002

Nets Closed: 0102

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	80	0	0
21:00	75	0	80
22:00	74	0	0
23:00	73	0	0
00:00	72	0	0
01:00	71	0	0

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments:

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
NO BATS												

Beaufort wind scale. 0 = smoke rises vertically (<1 mph). 1 = wind direction shown by smoke (1-3 mph). 2 = wind felt on face; leaves rustle (4-7 mph). 3 = leaves, twigs in constant motion (8-12 mph). 4 = dust rises; small branches move (13-18 mph). 5 = small trees in leaf begin to sway (19-24 mph).

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

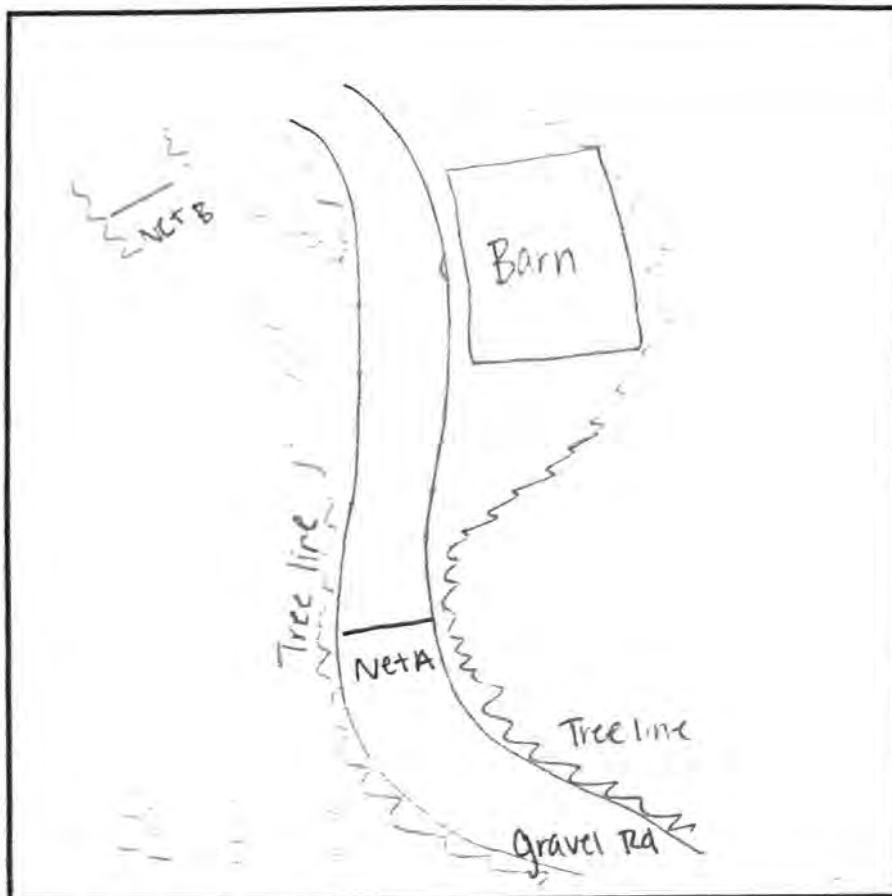
Note: U (unknown) only to be used for **escaped** bats

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Net Site Description

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¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Other Wildlife Observed: Deer, Cope's Gray Treefrogs

Additional Comments: _____

Project Name/No.: 172677408 Date: 06-24-2022
Site ID: ZLM-99-Overton Est. Distance to Water (ft): 450 ft

VEGETATION

Primary Habitat Type¹: Upland Forest
Potential Roost: Large Trees Snags Both Other (e.g., structure)
Roost Tree Potential: High Moderate Low

Dominant Canopy Species Avg. Canopy DBH range (in): 10-14
1. Black Walnut 2. 3.

Canopy Closure: Closed (80%+) Moderate (40-80%) Open (0-40%)

Dominant Subcanopy Species Avg. Subcanopy DBH range (in): 6-10
1. Tulip Poplar 2. Box Elder 3. Black Walnut

Sub-Canopy Clutter: High (60%+) Moderate (30-60%) Low (0-30%)

Dominant Shrub/Understory Species
1. Box Elder 2. Black Walnut 3. Sycamore

Shrub/Understory Clutter: High (60%+) Moderate (30-60%) Low (0-30%)

STREAM CHARACTERISTICS (if relevant) N/A

Bank Height (ft): Channel Width: Stream Width:

Riparian Width right bank: left bank: Avg. Water Depth:



Bat Capture Datasheet

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Project Name/No.: 172677408 Date: 25 June 22 Biologist(s): I. Burns, K. Bouska

Site ID: RLM-99-Oviston County/State: Oviston, TN Moon Phase: Waxing Crescent Sunset: 2002

Map Kilometer No./Quad: 619 KM 99 Latitude: 36.196577 Longitude: -85.270996 Moonrise: 0251 Moonset: 1717

General Site Description: ~~Song as 24 Jan 22~~ GRAVEL FARM RD NORTH Nets Open: 2002 Nets Closed: 2032
OF ROCK SPRINGS RD

Time	Temp (F)	Wind [†]	% Cloud Cover	Net ID (A, B,...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
20:00	—	—	—	A	6	5.2	31.2	36.186380	-85.217352				X	Corridor
21:00				B	6	6.2	31.2	36.186563	-85.21636	X				
22:00														
23:00														
00:00														
01:00														

* One net at full extension ~ 2.5m high

* One net at full extension ~ 2.5m high

Weather Comments: In/Out Lightning Out, Never Opened nets. Called it @ 2032

[illegible]

¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

- Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats



Bat Capture Datasheet

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Project Name/No.: 172677408 Date: 06-26-2022 Biologist(s): I Burns, K Bouska
Site ID: RCM-99-Overton County/State: Overton/TN Moon Phase: Waning Crescent Sunset: 2002
Map Kilometer No./Quad: ~~619~~ KM99 Latitude: 31.186577 Longitude: -85.270996 Moonrise: 0324 Moonset: 1816
General Site Description: ~~Same as 06-24-2022~~ GRAVEL FARM RD Nets Open: 2002 Nets Closed: 2200
NORTH OF ROCK SPRINGS RD

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	70	0	100
21:00	68	0	100
22:00	—	—	—
23:00			
00:00			
01:00			

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments: Light rain @ 2100, Temp down 5k at approx 2200 due to lead overcast.

[illegible]

¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

- * Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats



Bat Capture Datasheet

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Project Name/No.: 1726 77408

Date: 27 June 2022

Biologist(s): 1 Burr K. Bouska

Site ID: RLM-99-Overton

County/State: Overtown, TN

Moon Phase: Waning Crescent

Sunset: 2002

Map Kilometer No./Quad: ~~619~~ KM 99

Latitude: 36.186577

Longitude: 85.270996

Moonrise: 0401

Moonset: 1914

General Site Description:

~~Same as 24 Jan 2022~~ GRAVEL FARM RD

Nets Open: 2002

Nets Closed: 0102

NORTH OF ROCK SPRINGS RD

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	66	0	50
21:00	61	0	0
22:00	59	0	0
23:00	57	0	0
00:00	57	0	0
01:00	55	0	0

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments:[illegible]

Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

Project Name/No.: ~~124~~ 172677408 Date: 06-22-2022 Biologist(s): L. Meade, M. Alexander, M. Downer

Site ID: RLM-100 - Overton County/State: Overton TN Moon Phase: Waxing Crescent Sunset: 2001

Map Kilometer No./Quad: KM-100 Latitude: 36.185412 Longitude: -85.2214 Moonrise: 0130 Moonset: 1410

General Site Description: Dry channel, south of Rock Springs Rd Nets Open: 2001 Nets Closed: 0101

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	79	0	0
21:00	77	0	0
22:00	75	0	0
23:00	74	0	0
00:00	73	0	0
01:00	72	0	0

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments:

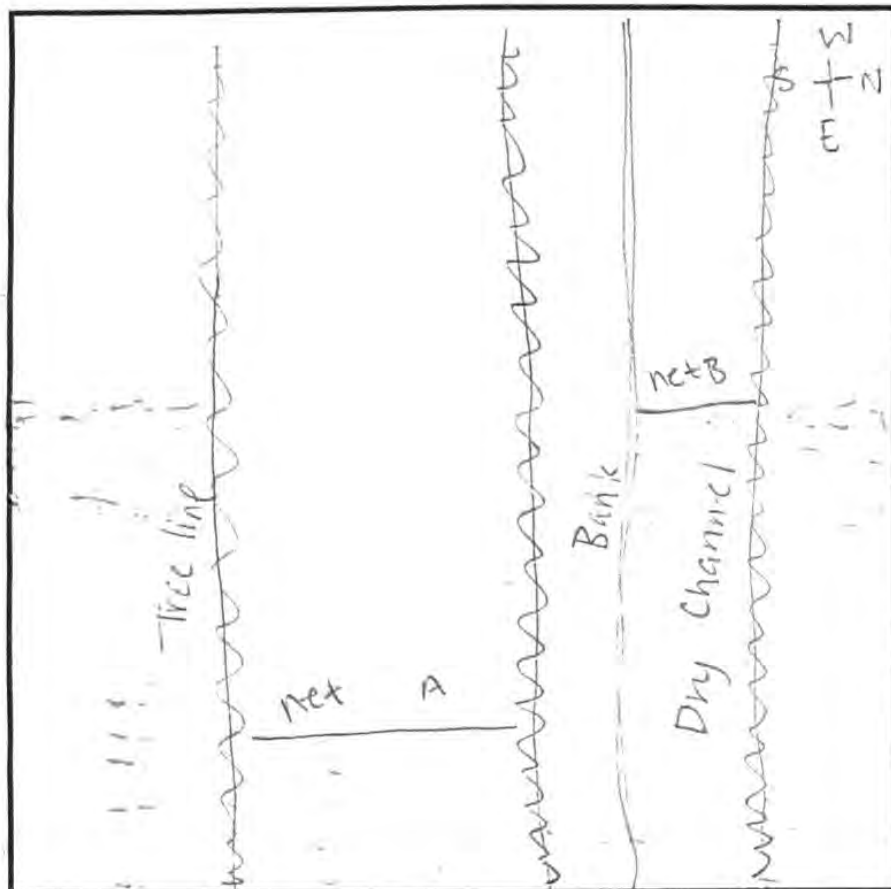
[illegible]

¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats


Project Name/No.: 172677408 Date: 06-22-2022

Site ID: RLM-8100-overton Est. Distance to Water (ft): 0

VEGETATION

Primary Habitat Type¹: Creek / Riparian

Potential Roost: Large Trees | Snags | Both | Other (e.g., structure)

Roost Tree Potential: High | Moderate | Low

Dominant Canopy Species Avg. Canopy DBH range (in): 14-18

1. Sycamore 2. Black walnut 3. Elm

Canopy Closure: Closed (80%+) | Moderate (40-80%) | Open (0-40%)

Dominant Subcanopy Species Avg. Subcanopy DBH range (in): 8-10

1. Sycamore 2. Black walnut 3. Elm

Sub-Canopy Clutter: High (60%+) | Moderate (30-60%) | Low (0-30%)

Dominant Shrub/Understory Species

1. Sycamore 2. 3.

Shrub/Understory Clutter: High (60%+) | Moderate (30-60%) | Low (0-30%)

STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): 3 Channel Width: 4-6m Stream Width: 0

Riparian Width right bank: 1-100ft left bank: 105ft Avg. Water Depth: 8in (single pool)

¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Other Wildlife Observed: Flying Squirrel, Green Frog, S. Leopard Frog, Bullfrog, Barred Owl, Two-lined Salamander, A. Toadlets + Tadpoles

Additional Comments:



Bat Capture Datasheet

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Project Name/No.: 172677408 Date: 06-23-2022 Biologist(s): L. Meade, M. Alexander, M. Downe

Site ID: BLM-100-Overton County/State: Overton, TN Moon Phase: waning crescent Sunset: 1001

Map Kilometer No./Quad: ~~51.9~~ ~~62.1~~ KM 100 Latitude: 36 18 54.12 Longitude: -85.27014 Moonrise: 0155 Moonset: 1517

General Site Description: Dry Channel South of Rock Springs Rd Nets Open: 2002 Nets Closed: 0102

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	71	0	0
21:00	68	0	0
22:00	67	0	0
23:00	67	0	0
00:00	65	0	0
01:00	65	0	0

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments:

[illegible]

¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

- * Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats



Bat Capture Datasheet

Page 1 of 2

Project Name/No.: Bidgline/172677408

Date: 23 June 2022

Biologist(s): James Kiser, Lucas Doams

Site ID: RLM-101/Sinking Cane Hollow

County/State: Overtown/TN

Moon Phase: Waxing Crescent

Sunset: 2002 h

Map Kilometer No./Quad: 10M-101/Montgomery

Latitude: 36.18154

Longitude: -85.26633

Moonrise: 0156 h

Moonset: 1517 h

General Site Description: Site is located approx. 0.3 mi. upstream (SE) from Rock Springs Creek Rd

Nets Open: 1930 h

Nets Closed: 0110 h

1930 78.6 0 20

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	74.0	0	10
21:00	65.8	1	0
22:00	63.4	1	0
23:00	62.2	1	0
00:00	61.6	1	0
01:00	60.2	1	0

Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	18	7.5	135m ²	36.18120°	-85.26586°		✓	✓	Dry	Work Cell @ 7:58 + 7:59
B	12	5.0	60m ²	36.18154°	-85.26633°	✓				Work Cell @ 7:57
C	6	7.5	45m ²	36.18165°	-85.26588°		✓	✓	Dry	Work Cell @ 7:55 + 7:56

* One net at full extension ~ 2.5m high

Weather Comments: Today it was hot with high temps in mid 90's, low humidity, breezy & partly cloudy

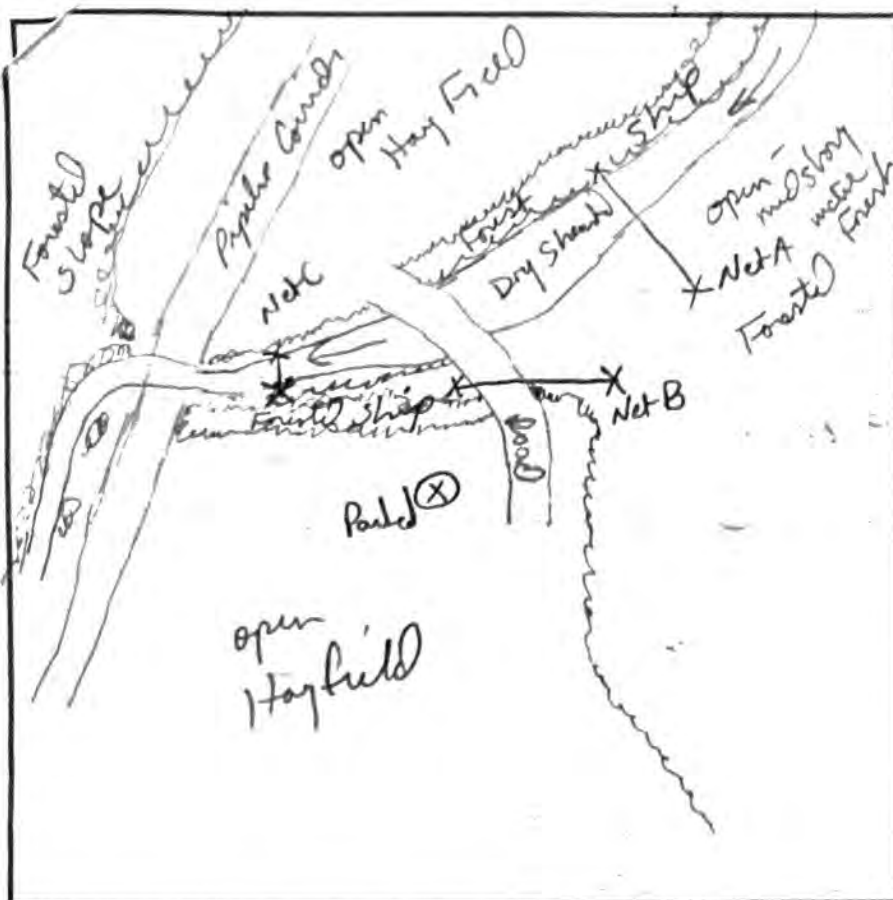
No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	<i>Lasius borealis</i>	2035	A	M	NR	38.8	10.5	0	A	2.5	—	Hair & Guano Sample # OV-101-77
2	<i>Nycticeius humeralis</i>	2045	A	M	NR	34.7	8.75	0	B	3.0	—	—
3	<i>Lasius borealis</i>	2055	A	M	NR	38.1	10.25	0	C	7.0	—	Hair & Guano Sample # OV-101-78
4	<i>Eptesicus fuscus</i>	2110	A	M	NR	50.8	16.5	0	A	1.5	—	Hair & Guano Sample # OV-101-79
5	<i>Eptesicus fuscus</i>	2250	A	F	L	50.5	18.75	0	B	2.0	—	Hair & Guano Sample # OV-101-80
6	<i>Nycticeius humeralis</i>	2330	A	M	NR	37.3	8.75	0	A	7.0	—	—
7	<i>Eptesicus fuscus</i>	0050	A	F	L	48.7	20.0	0	A	4.0	—	Hair & Guano Sample # OV-101-81

¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph). 1 = wind direction shown by smoke (1-3 mph). 2 = wind felt on face; leaves rustle (4-7 mph). 3 = leaves, twigs in constant motion (8-12 mph). 4 = dust rises; small branches move (13-18 mph). 5 = small trees in leaf begin to sway (19-24 mph).

² For females: L = lactating, FL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive.

* Apply band to LEFT arm for females and RIGHT arm for males.

Note: U (unknown) only to be used for escaped bats.



Project Name/No.: Ridge Line 172677408 Date: 23 June 2022
 Site ID: RLM-101/Sinking Cave Hollow Est. Distance to Water (ft): 0.3m Small Stream

VEGETATION

Primary Habitat Type: Creek/Riparian Forest Edge

Potential Roost:	Large Trees	Snags	<u>Both</u>	Other (e.g., structure)
Roost Tree Potential:	High	<u>Moderate</u>	Low	

Dominant Canopy Species

1. <u>Black Walnut</u>	2. <u>Sycamore</u>	3. <u>Yellow Buckeye</u>	4. <u>Basswood</u>
Avg. Canopy DBH range (in): <u>12-20"</u> <small>Tulip</small>			
Canopy Closure:		Closed (80%+)	<u>Moderate</u> (40-80%)
		Open (0-40%)	

Dominant Subcanopy Species

1. <u>Yellow Buckeye</u>	2. <u>Ashya virginiana</u>	3. <u>Basswood</u>	4. <u>Carpinus carolin</u>
Avg. Subcanopy DBH range (in): <u>4-8"</u>			
Sub-Canopy Clutter:		High (60%+)	<u>Moderate</u> (30-60%)
		Low (0-30%)	

Dominant Shrub/Understory Species

1. <u>Spice bush</u>	2. <u>Rosa multiflora</u>	3. <u>Witch Hazel</u>	4. <u>River Cane</u>
Shrub/Understory Clutter:		High (60%+)	<u>Moderate</u> (30-60%)
		Low (0-10%)	

STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): 2-3 Channel Width: 20-25 ft Stream Width: 0 ft
 Riparian Width right bank: 750m left bank: 2m Avg. Water Depth: 0 Dry

1. Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Other Wildlife Observed: Wood Thrush (Vo), Red-eyed Vireo (Vo), Acadian Flycatcher (Vo), Am. Crow (3), Wild Turkey (2), Eastern Screech Owl (Vo), Barned Owl (Vo), Yellow-billed Cuckoo (Vo), Peromyscus leucopus (1)

Additional Comments: _____



Bat Capture Datasheet

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Project Name/No.: Ridge line / 172677408 Date: 24 June 2022 Biologist(s): James Kiser, Lucas Downs
 Site ID: RLM-101 / Sinking Cane Hollow County/State: Overton / TN Moon Phase: Waxing Crescent Sunset: 2002 h
 Map Kilometer No./Quad: KM-101 / Monterey Latitude: 36.18154 Longitude: -85.26633 Moonrise: 0222h Moonset: 1627h
 General Site Description: Site is located approx. 0.3 mi upstream (SE) from Nets Open: 1930h Nets Closed: 0105h
1930 75.5 1 25% Rock Springs Church Rd.

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	73.4	1	10
21:00	72.0	1	40
22:00	70.5	1	25
23:00	69.0	1	10
00:00	68.1	1	0
01:00	67.6	1	0

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments: Today was hot (high in low 90's) and humid, partly cloudy.

[illegible]

Beaufort wind scale. 0 = smoke rises vertically (<1 mph). 1 = wind direction shown by smoke (1-3 mph). 2 = wind felt on face; leaves rustle (4-7 mph). 3 = leaves, twigs in constant motion (8-12 mph). 4 = dust rises; small branches move (13-18 mph). 5 = small trees in leaf begin to sway (19-24 mph).

For **females**: L = lactating, PL = post-lactating, NR = non-reproductive, for **males** ID = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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Bat Capture Datasheet

Page 1 of 2

Project Name/No.: Ridgeline/172077408 Date: 6/26/22 Biologist(s): A. Spillene, Z. True
Site ID: RLM-102-OVERTON County/State: Overton, TN Moon Phase: Waning crescent Sunset: 20:04
Map Kilometer No./Quad: 47655-656 ¹⁰² KM Latitude: 36.171843 Longitude: -85.249810 Moonrise: 3:25 Moonset: 18:17
General Site Description: Cleared ROW, forested on either side Nets Open: 20:05 Nets Closed: 22:15

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	69.5	2	100
21:00	69.3	2	100
22:00	69.0	2	70
23:00			
00:00			
01:00			

Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	4 M	5.2	20.8	36.171843	-85.24981				X	Gap in forest
B	15 M	7.8	117	36.172491	-85.251333				X	Pipeline ROW

* One net at full extension ~ 2.5m high

Weather Comments: overcast & rain early, clearing, light breeze

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	<i>Eptesicus fuscus</i>	20:25	A	M	NR	47.5	16.5	0	B	6	—	
2	<i>Lasiurus borealis</i>	20:35							A	1	—	Escaped net
3	<i>Lasiurus borealis</i>	21:50	A	M	NR	38.6	10.5	0	B	6	—	

¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

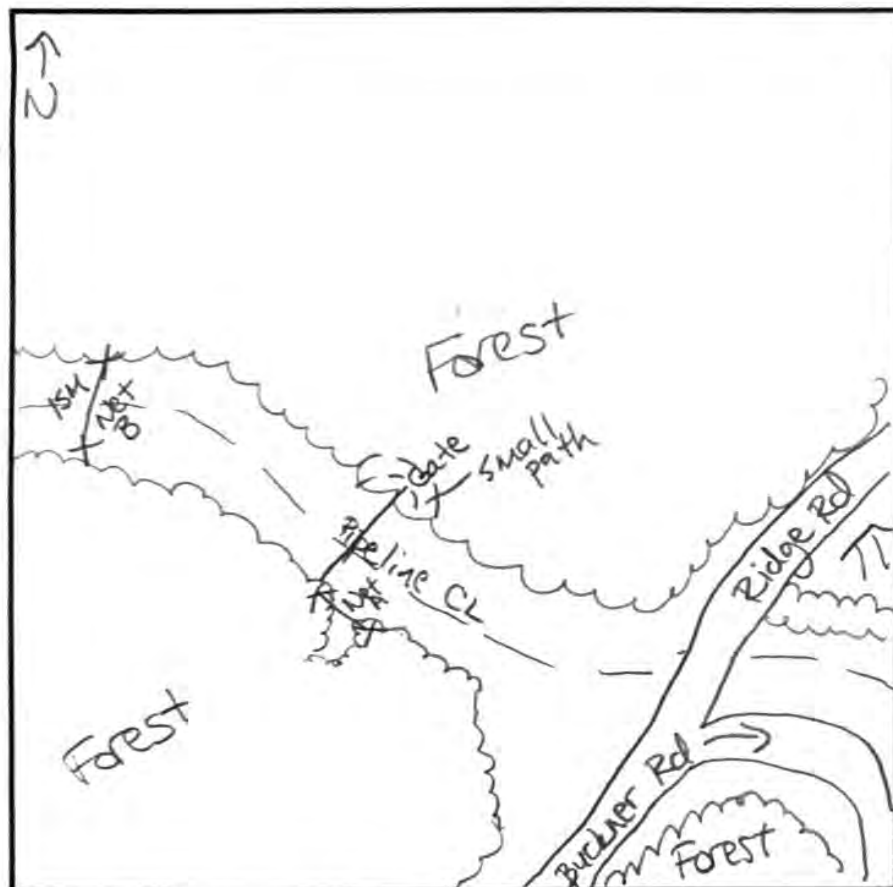
² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for escaped bats

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Project Name/No.: RidgeLine/102-77408 Date: 6/26/22
 Site ID: RUM-102-overton Est. Distance to Water (ft): ~500ft

VEGETATION

Primary Habitat Type: Mixed forest bordering pipeline ROW

Potential Roost: Large Trees Snags Both Other (e.g., structure)
 Roost Tree Potential: High Moderate Low

Dominant Canopy Species Avg. Canopy DBH range (in): 2-30"
 1. Quercus alba 2. Fraxinus pennsylvanica 3. Liriodendron tulipifera

Canopy Closure: Closed (80%+) Moderate (40-80%) Open (0-40%)

Dominant Subcanopy Species Avg. Subcanopy DBH range (in): 6-12"
 1. Fraxinus pennsylvanica 2. Liriodendron tulipifera 3. Acer saccharum

Sub-Canopy Clutter: High (60%+) Moderate (30-60%) Low (0-30%)

Dominant Shrub/Understory Species
 1. Fraxinus pennsylvanica 2. Carya ovata 3. Rodinia pseudoacacia

Shrub/Understory Clutter: High (60%+) Moderate (30-60%) Low (0-30%)

N/A **STREAM CHARACTERISTICS** (if relevant)

Bank Height (ft): _____ Channel Width: _____ Stream Width: _____

Riparian Width right bank: _____ left bank: _____ Avg. Water Depth: _____

¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Other Wildlife Observed: EATO, REVI, OVEN

Additional Comments: Forced to close due to landowner issues



Bat Capture Datasheet

Page 1 of 2

Project Name/No.: Ridgeline/172677408 Date: 6/27/22 Biologist(s): Angela Sjollena, Zoe True
 Site ID: RLM-102-Overton County/State: TN/Overton Moon Phase: Waning crescent Sunset: 20:03
 Map Kilometer No./Quad: ~~MP 635-63.6~~ ^{km 102} Latitude: 36.171843 Longitude: -85.249810 Moonrise: 4:02 Moonset: 19:14
 General Site Description: Cleared, maintained ROW w/ mixed forest on Nets Open: 19:55 Nets Closed: 1:05

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	72.9	1	40
21:00	68.1	1	10
22:00	67.5	2	0
23:00	65.6	2	0
00:00	64.5	2	0
01:00	64.6	2	0

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments: clear, unseasonably cool, light breeze growing stronger into the evening

[illegible]

Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

7 For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: ID = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped bats**

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Bat Capture Datasheet

Project Name/No.: Rideline/72677408

Date: 6/28/22

Biologist(s): A. Siollesma, Z. True

Site ID: RUM-102-Overton

County/State: TN/Overton

Moon Phase: Waning Crescent

Sunset: 20:03

Map Kilometer No./Quad: MP 63.5-63.6 KM 102
Latitude

Latitude: 36.171843

Longitude: 85.249810 Moonrise: 4:45

Moonset: 20:08

General Site Description: Cleared and maintained ROW w/ mixed forest on either side

Nets Open: 20.05

Nets Closed: 1:00

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	69.9	1	90
21:00	69.3	2	50
22:00	69.4	2	100
23:00	68.2	1	100
00:00	67.6	1	40
01:00	64.8	2	0

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments: Variable clouds, light breeze, cool, variable breeze throughout survey

[illegible]

Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats



Bat Capture Datasheet

Page 1 of 2

Project Name/No.: Ridgeline/172677408 Date: Oct 23/2022 Biologist(s): T. Wetzel, E. Houston, C. Barton
Site ID: RLM-103-Overton County/State: Overton/TN Moon Phase: Waning Crescent Sunset: 2002 0525
Map Kilometer No./Quad: ~~63.9640~~ km 103 Latitude: 36.170406 Longitude: -86.242649 Moonrise: 0130 Moonset: 1417
General Site Description: South of Harris Drive along pipeline corridor Nets Open: 2002 Nets Closed: 0102

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	70	0	0
21:00	63	0	0
22:00	62	0	0
23:00	61	0	0
00:00	58	0	0
01:00	58	0	0

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments:

[illegible]

Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

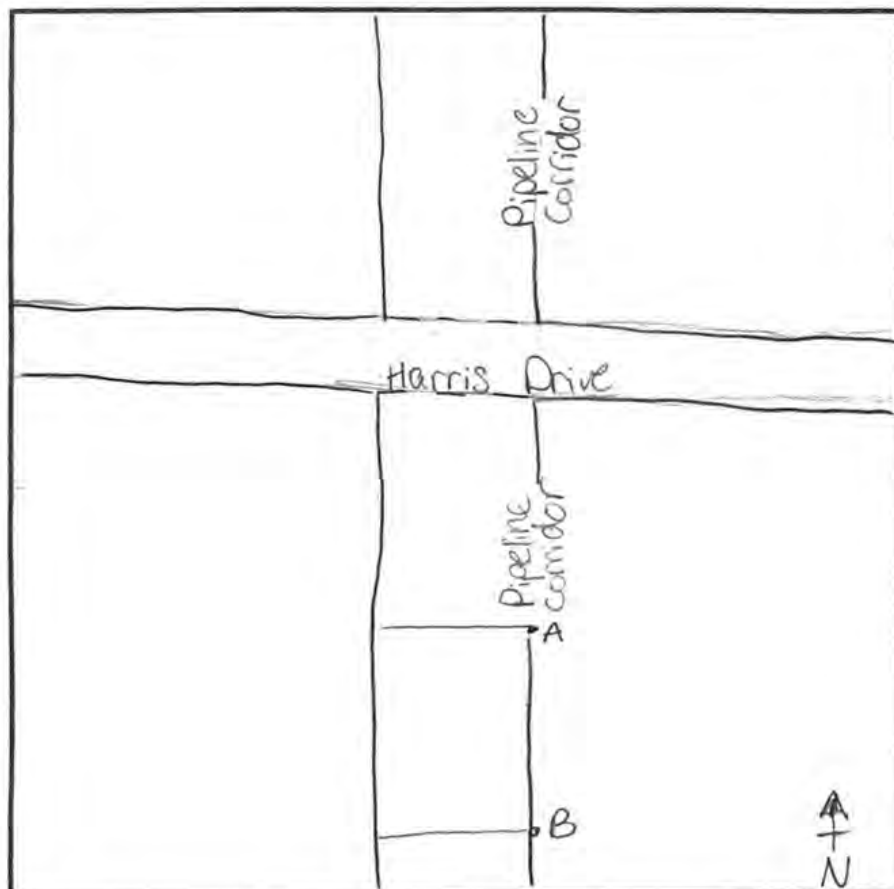
For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Other Wildlife Observed: Catbird (caught in net)

Additional Comments:

Project Name/No.: Ridgeline/172677408 Date: 06/23/2022
 Site ID: RLM-103-Overton Est. Distance to Water (ft): _____

VEGETATION

Primary Habitat Type¹: Upland Forest
 Potential Roost:

Large Trees	Snags	Both	Other (e.g., structure)
High	Moderate	Low	

 Roost Tree Potential: _____

Dominant Canopy Species Avg. Canopy DBH range (in): 30
 1. Q. alba 2. L. tulipifera 3. P. virginiana
 Canopy Closure:

Closed (80% +)	Moderate (40 - 80%)	Open (0 - 40%)
----------------	---------------------	----------------

Dominant Subcanopy Species Avg. Subcanopy DBH range (in): 15
 1. F. grandifolia 2. S. albidum 3. _____
 Sub-Canopy Clutter:

High (60% +)	Moderate (30 - 60%)	Low (0 - 30%)
--------------	---------------------	---------------

Dominant Shrub/Understory Species
 1. Rubus sp. 2. _____ 3. _____
 Shrub/Understory Clutter:

High (60% +)	Moderate (30 - 60%)	Low (0 - 30%)
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STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): _____ Channel Width: _____ Stream Width: _____
 Riparian Width right bank: _____ left bank: _____ Avg. Water Depth: _____



Bat Capture Datasheet

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Project Name/No.: Ridgeline / 172677408 Date: 06/24/2022 Biologist(s): T. Wetzel, E. Houston, C. Burton
 Site ID: RLM-103-Overton County/State: Overton/TN Moon Phase: Waning Crescent Sunset: 2003 0525
 Map Kilometer No./Quad: 63.9-64.0 ^{KM 103} Latitude: 36.170406 Longitude: -85.242649 Moonrise: 0223 Moonset: 1418
 General Site Description: South of Harris Drive along pipeline corridor Nets Open: 2003 Nets Closed: 0103

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	74	0	5%
21:00	71	0	35%
22:00	69	0	60%
23:00	67	0	0%
00:00	66	0	0
01:00	66	0	5%

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments:[illegible]

Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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Bat Capture Datasheet

Page 1 of 1

Project Name/No.: Ridgeline/172677408

Date: 23 June 22

Biologist(s): Julia Wilson, Chris Knabel, Mitch Dannon

Site ID: RLM-overton-104

County/State: Overton/TN

Moon Phase: Waning crescent

Sunset: 20:12

Map Kilometer No./Quad: ~~104~~ ~~718~~ KM 104

Latitude: 36.169677

Longitude: 85.237863

Moonrise: 01:50

Moonset: 15:17

General Site Description: ROW corridor along forest, hayfield, + pond nearby

Nets Open: 20:00

Nets Closed: 01:05

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	72.5	1	0
21:00	68.6	0	0
22:00	67.8	1	0
23:00	66.9	1	0
00:00	65.3	0	0
01:00	64.6	1	0

Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	15	7.5	112.5	36.169600	85.238216				✓	ROW cut through forest
B	12	7.5	90	36.169398	85.236429				✓	ROW, field-forest opening

* One net at full extension ~ 2.5m high

Weather Comments: Less hot and muggy during the day. Occasional light breeze

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	<i>Epptesicus fuscus</i>	20:25	A	F	L	49.5	15.5	0	A	6.0	—	
2	<i>Epptesicus fuscus</i>	20:40	A	M	NR	45.5	15.7	0	A	3.5	—	
3	<i>Lasius borealis</i>	20:50	A	F	L	40.0	13.25	0	B	6.0	—	
4	<i>Epptesicus fuscus</i>	20:55	A	F	L	49.0	19.5	0	A	2.5	—	
4	<i>Lasius borealis</i>	21:00	A	F	L	41.9	13.75	0	A	1.0	—	
5	LABO	21:00	Escaped						B	7.0	—	Escaped net
6	EPFU	21:00	A	F	PL	48.8	21.25	0	B	6.0	—	
7	<i>Epptesicus fuscus</i>	21:15	A	F	L	48.0	20.5	0	B	7.0	—	
8	<i>Epptesicus fuscus</i>	22:20	A	M	NR	45.9	18.75	0	A	3.5	—	
9	<i>Lasius borealis</i>	23:25	A	M	NR	40.0	11.0	0	A	6.0	—	

¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph). 1 = wind direction shown by smoke (1-3 mph). 2 = wind felt on face; leaves rustle (4-7 mph). 3 = leaves, twigs in constant motion (8-12 mph). 4 = dust rises; small branches move (13-18 mph). 5 = small trees in leaf begin to sway (19-24 mph)

² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for escaped bats

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Bat Capture Datasheet

Project Name/No.: 172677408 Date: 6-24-22 Biologist(s): Julia Wilson Chris Knobl Mikh O. Page 1 of 1

Site ID: RLM-104-Overton County/State: Overton Moon Phase: Waning Crescent Sunset: 20:01

Map Kilometer No./Quad: 14/04 Latitude: 36.169280 Longitude: -85.23683 Moonrise: 2:52 Moonset: 4:18

General Site Description: Pasture intersecting w/ Right of Way Nets Open: 20:01 Nets Closed: 1:01

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	78.8	0	70
21:00	78.0	1	50
22:00	73.0	1	20
23:00	68.8	1	10
00:00	67.6	1	10
01:00			

Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	15	3								
B	12	3								

* One net at full extension ~ 2.5m high

Weather Comments:

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	<i>Eptesicus fuscus</i>	2035	A	M	NR	47.9	15.5	0	D	16		
2	<i>Eptesicus fuscus</i>	2055	A	M	NR	49.5	17.75	0	D	5		
3	<i>Eptesicus fuscus</i>	2055	A	F	L	49.2	19.75	0	B	7		
4	<i>Lasiurus borealis</i>	2150	A	F	L	41.0	14.5	0	B	6		
5	<i>Lasiurus borealis</i>	22:55	U	U	U	U	U	U	B	6.5		Escaped from net
6	<i>Eptesicus fuscus</i>	00:01	A	M	NR	45	16.5	0	A	7		
7	<i>Lasiurus borealis</i>	0020	A	MA	NR	43.0	12.0	0	B	4.5		
8	<i>Lasiurus borealis</i>	0020	A	M	NR	42.0	11.5	0	B	6.5		
9	<i>Lasiurus borealis</i>	0025	A	F	L	42.0	13.0	0	B	10		

¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats



Bat Capture Datasheet

Page ___ of ___

Project Name/No.: Ridgeline 1172677408 Date: 26 June 22 Biologist(s): Julia Wilson, Chas Knobel, Mitch Dannon
 Site ID: RLM-108-Overton County/State: Overton/TN Moon Phase: waning crescent Sunset: 2002
 Map Kilometer No./Quad: KM108 46.7 Latitude: 36.166486 Longitude: 85.198217 Moonrise: 0324 Moonset: 0617
 General Site Description: Sandstone cliffs with overhangs, lots of crevices. Nets Open: 2000 Nets Closed: 2145*
*Incomplete - landowner alterations

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	71.4	2	100
21:00			
22:00			
23:00			
00:00			
01:00			

Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	18	7	126	36.166486	85.198217			✓	✓	Perpendicular to cliff face
B	4	7.5	30	36.165980*	85.198966*	✓			✓	Road forest opening adjacent to cliff

* One net at full extension ~ 2.5m high

Weather Comments:

* Insect and no photos taken due to inability to return/LO alteration

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	LABO	2030	A	F	L	40.0	12.75	0	A	0.5		
2	EPFU	2050	A	F	L	49.5	14.0	0	B	6		
3	EPFU	2050	A	F	L	49.8	18.25	0	A	2		
4	EPFU	2050	EFH	EFH	EFH	EFH	19.25	EFH	A	4		escaped from hand
5	EPFU	2105	A	M	NR	49.0	20.05	0	B	1.5		
6	EPFU	2105	A	F	P	48.0	23.0	0	B	2.0		
7	EPFU	2105	A	M	NR	44.0	20.0	0	B	4.0		
8	EPFU	2105	A	F	L	37.5	20.0	0	A			
9	EPFU	2120	EFH	EFH	EFH	39.0	EFH	0	B	5		
10	EPFU	2130	EFH	EFH	EFH	44.0	EFH	0	B	2		- released due to hostile Landowner
11	EPFU	2140	A	F	L				B	3		released due to hostile Landowner
12												

¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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Bat Capture Datasheet

Page 1 of 2

Project Name/No.: Ridgeline/172677408 Date: 6/29/22 Biologist(s): A Sjollema, Z. True
 Site ID: RLM-114-Overton County/State: Overton/TN Moon Phase: New Moon Sunset: 20:02
 Map Kilometer No./Quad: MP 70.5 KM114 Latitude: 36.16985 Longitude: -85.13480 Moonrise: 5:41 Moonset: 21:02
 General Site Description: pipeline ROW, maintained, adjacent pasture Nets Open: 20:15 Nets Closed: 1:15

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	73.2	0	50
21:00	69.2	0	50
22:00	67.3	0	50
23:00	67.1	0	25
00:00	65.6	0	0
01:00	64.8	0	35

Net ID (A, B...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	15M	7.8	117	36.16985	-85.13480				X	pipeline ROW
B	12M	7.8	93.6	36.16962	-85.135347				X	pipeline ROW

* One net at full extension ~ 2.5m high

Weather Comments: clear, calm, cool

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	Eptesicus fuscus	21:25	A	F	L	45.0	20.75	0	A	3.5	—	
2	Eptesicus fuscus	21:28	A	F	L	47.3	20.0	1	B	4	—	
3	Eptesicus fuscus	21:50	A	F	L	48.8	20.75	0	B	1	—	Mites on her wing membrane
4	Eptesicus fuscus	21:50	—	—	—	—	—	—	A	3	—	Escaped net
5	Eptesicus fuscus	22:12	A	F	L	49.2	20.25	0	A	7.5	—	
6	Eptesicus fuscus	22:45	A	F	L	46.6	19.0	0	B	4	—	
7	Lasiurus borealis	0:50	—	M	NR	—	—	—	A	7	—	Escape from hand

¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

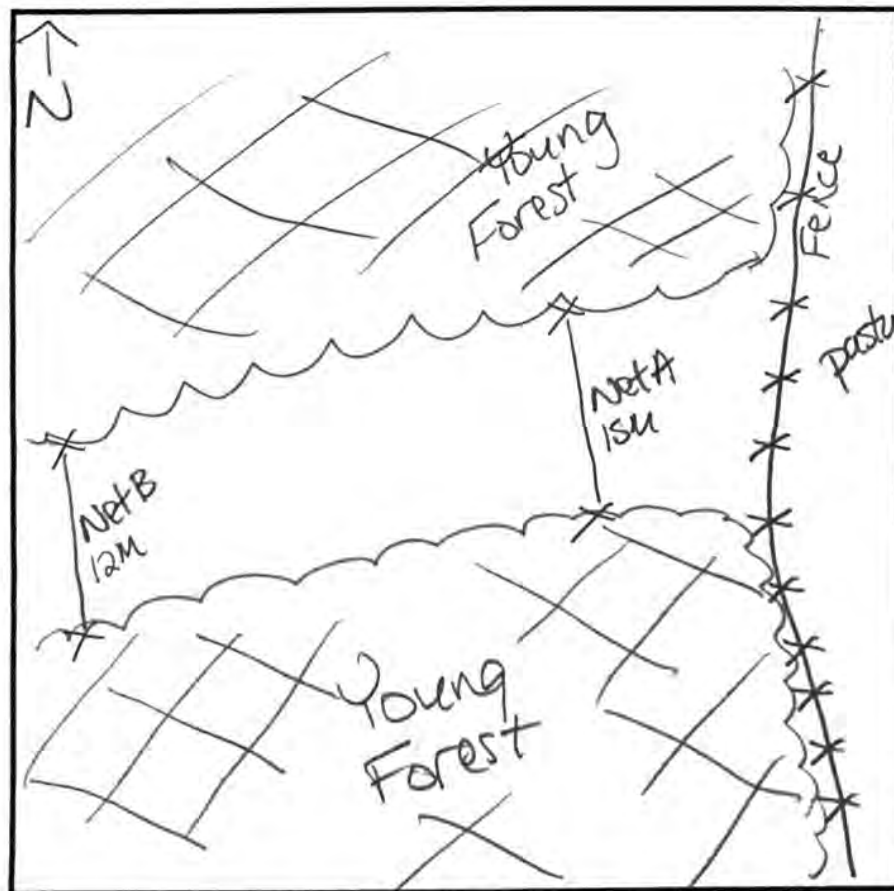
² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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Project Name/No.: Ridgeline/170677408 Date: 6/29/22
 Site ID: RUM-114-Overton Est. Distance to Water (ft): 200 ft

VEGETATION

Primary Habitat Type¹: Maintained ROW w/ young forest (Upland Forest)

Potential Roost: Large Trees Snags Both Other (e.g., structure)

Roost Tree Potential: High Moderate Low

Dominant Canopy Species Avg. Canopy DBH range (in): 14-20"

1. Pinus sylvestris 2. Liriodendron tulipifera 3. Quercus palustris

Canopy Closure: Closed (80%+) Moderate (40-80%) Open (0-40%)

Dominant Subcanopy Species Avg. Subcanopy DBH range (in): 3-10"

1. Pinus sylvestris 2. Acer rubrum 3. Oxydendrum arboreum

Sub-Canopy Clutter: High (60%+) Moderate (30-60%) Low (0-30%)

Dominant Shrub/Understory Species

1. Liriodendron tulipifera 2. Quercus palustris 3. Acer rubrum

Shrub/Understory Clutter: High (60%+) Moderate (30-60%) Low (0-30%)

N/A

STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): _____ Channel Width: _____ Stream Width: _____

Riparian Width right bank: _____ left bank: _____ Avg. Water Depth: _____

¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Other Wildlife Observed: screech owl, field sparrow, great-crested flycatcher,

Additional Comments: _____



Bat Capture Datasheet

Page 1 of 1

Project Name/No.: Ridgeline/17267408 Date: 6/30/22 Biologist(s): Angela Sollema, Chris Knabel
 Site ID: RLM-114-Overton County/State: Overton/TN Moon Phase: Waxing crescent Sunset: 20:02
 Map Kilometer No./Quad: 11P 70.5 KM 114 Latitude: 36.16985 Longitude: -85.13480 Moonrise: 6:29 Moonset: 21:39
 General Site Description: Pipeline ROW, maintained adjacent pasture Nets Open: 20:02 Nets Closed: 1:05

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	77.9	1	90
21:00	72.1	0	25
22:00	70.2	0	15
23:00	70.0	0	10
00:00	69.0	1	0
01:00	68.6	1	0

Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	15M	7.8M	117	36.16985	-85.13480				X	Pipeline ROW
B	12M	7.8M	93.6	36.169820	-85.135347				X	Pipeline ROW

* One net at full extension ~ 2.5m high

Weather Comments: Gradually decreasing clouds, calm winds

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	<i>Eptesicus fuscus</i>	2130	A	F	L	50	19.75	0	A	7	—	Mite scars on left wing
2	<i>Nycticeius humeralis</i>	2245	A	M	NR	55	9	0	A	1.5	—	
3	<i>Eptesicus fuscus</i>	2255	A	F	L	48.3	23.25	0	A	2	—	
4	<i>Eptesicus fuscus</i>	23:05	A	F	L	50.0	22.25	0	A	2.5	—	
5	<i>Nycticeius humeralis</i>	23:05	A	M	NR	35.4	8.75	0	A	5	—	
6	<i>Logiurus borealis</i>	2330	A	M	NR	39.3	14.5	0	A	3	—	

¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for escaped bats

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172677408

Project Name/No.: Ridgeline

Date: 20 June 22

Site ID: RLM-115-OVERTON

Est. Distance to Water (ft): 0

VEGETATION

Primary Habitat Type¹: Other - Sandstone cliff face, upland forest cliff line

Potential Roost: Large Trees | Snags | Both | Other (e.g., structure)

Roost Tree Potential: High | Moderate | Low

Dominant Canopy Species 1. _____ 2. _____ 3. _____ Avg. Canopy DBH range (in): _____

Canopy Closure: Closed (80%+) | Moderate (40-80%) | Open (0-40%)

Dominant Subcanopy Species 1. _____ 2. _____ 3. _____ Avg. Subcanopy DBH range (in): _____

Sub-Canopy Clutter: High (60%+) | Moderate (30-60%) | Low (0-30%)

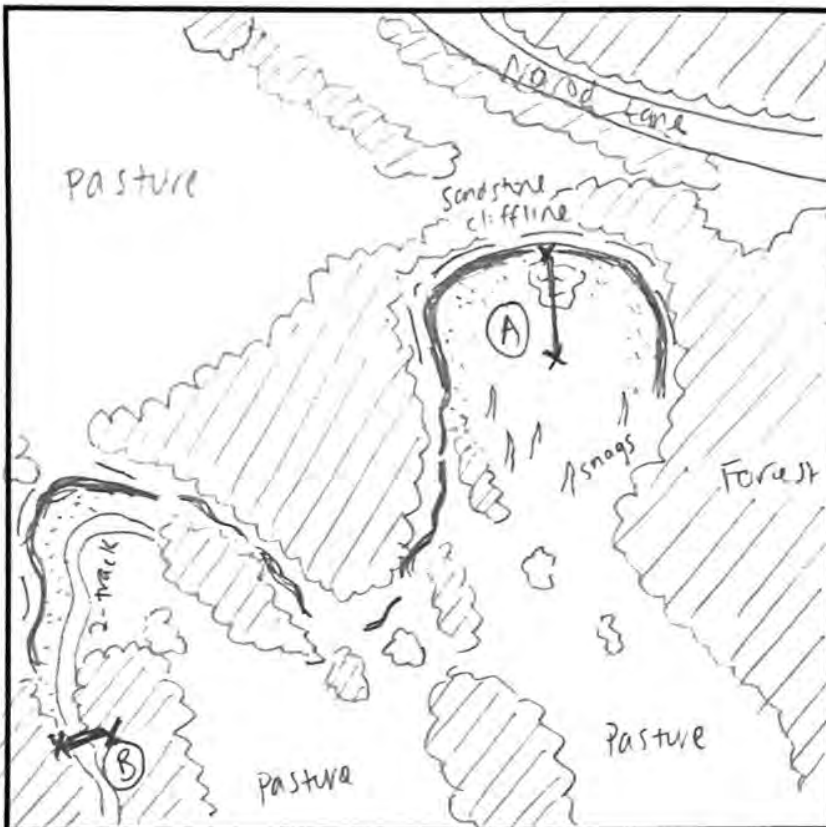
Dominant Shrub/Understory Species 1. _____ 2. _____ 3. _____

Shrub/Understory Clutter: High (60%+) | Moderate (30-60%) | Low (0-30%)

STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): _____ Channel Width: _____ Stream Width: _____

Riparian Width right bank: _____ left bank: _____ Avg. Water Depth: _____



¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Other Wildlife Observed: NRWS captured in net
bullfrog northern watersnake

Additional Comments: Incomplete - landowner altercations



Bat Capture Datasheet

Page 1 of 2

Project Name/No.: Ridgeline 1172677408

Date: 27 June 2022

Biologist(s): Julia Wilson, Chris Knebel, Mitch Danner

Site ID: RLM-115-Overton

County/State: North / TN

Moon Phase: Waning Crescent

Sunset: 20:02

Map Kilometer No./Quad: 15 111.3 KM 115 Latitude

Latitude: 30.172347

Longitude: 85.119324 Moonrise: 0401

Moonset: 1914

General Site Description: 200' corridor and road corridor through upland forest

Nets Open: 7000 ✓

Nets Closed: 0105

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	70.4	0	30
21:00	68.8	0	25
22:00	60.9	0	0
23:00	59.1	1	0
00:00	57.8	0	0
01:00	57.4	0	0

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments: Lower half d- to today.

[illegible]

Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

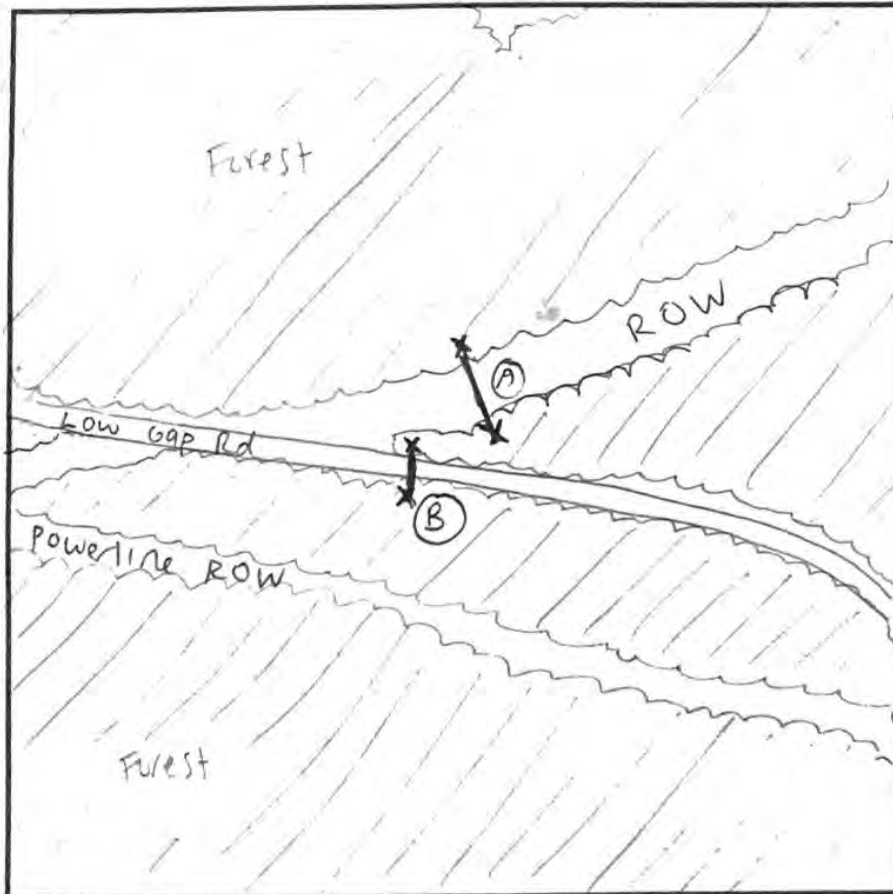
3. For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Project Name/No.: 172677408
 Site ID: Ridgeline Date: 27 June 2022
 Est. Distance to Water (ft): 900

VEGETATION

Primary Habitat Type¹: Upland Forest

Potential Roost:	Large Trees	Snags	<u>Both</u>	Other (e.g., structure)
Roost Tree Potential:	High	<u>Moderate</u>	Low	

Dominant Canopy Species Avg. Canopy DBH range (in): 30-40

1. <u>Liriodendron tulipifera</u>	2. <u>Quercus alba</u>	3. <u>Carya amara</u>	
Canopy Closure:	Closed (80%+)	<u>Moderate</u> (40-80%)	Open (0-40%)

Dominant Subcanopy Species Avg. Subcanopy DBH range (in): 10-20

1. <u>Liriodendron tulipifera</u>	2. <u>Acer rubrum</u>	3. <u>Loblolly pine</u>	
Sub-Canopy Clutter:	High (60%+)	<u>Moderate</u> (30-60%)	Low (0-30%)

Dominant Shrub/Understory Species

1. <u>Acer rubrum</u>	2. <u>Liriodendron tulipifera</u>	3. <u>Loblolly pine</u>	
Shrub/Understory Clutter:	High (60%+)	<u>Moderate</u> (30-60%)	Low (0-30%)

STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): _____ Channel Width: _____ Stream Width: _____
 Riparian Width right bank: _____ left bank: _____ Avg. Water Depth: _____

Other Wildlife Observed: CWW, WHIP, INBU (in net), SCTA, REVI, YTVI, EATO, WOTH, GCFL, ACFL
Coyote BARE
 Additional Comments: _____

Bat Capture Datasheet

Page 1 of 2

Project Name/No.: Ridgeline/172677408 Date: 28, June 22 Biologist(s): Jukka Wilson, Chris Knebel

Site ID: RUM-115-overrun County/State: Oregon/TN Moon Phase: New Moon Sunset: 20:02

Map Kilometer No./Quad: 115 / MP 111 Latitude: 36.172347 Longitude: 85.119324 Moonrise: 448 Moonset: 20 08

General Site Description: 20W corridor - road corridor through upland forest Nets Open: 19:55 Nets Closed: 20:05

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	74.6	1	40
21:00	66.2	1	55
22:00	63.7	0	100
23:00	63.1	0	100
00:00	61.5	0	100
01:00	60.1	0	100

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments:[illegible]

Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face: leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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Bat Capture Datasheet

Page ____ of ____

Project Name/No.: 172677408

Date: 28 Dec 22

Biologist(s): Ian Burns Katherine Boushon

Site ID: RLM-116-Overton

County/State: Benton / TN

Moon Phase: New Moon Sunset: 2001

Map Kilometer No./Quad: ~~777~~ 7 KM 116

Latitude: 36.172548 Longitude: -95.113577 Moonrise: 0444 Moonset: 2007

General Site Description: Pike Lake Caddis Crossings Little Hurricane Creek Nets Open: 2001 Nets Closed: 06/01

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	72	0	75
21:00	68	0	100
22:00	64	0	100
23:00	63	0	75
00:00	63	0	50
01:00	61	0	0

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments:[illegible]

¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

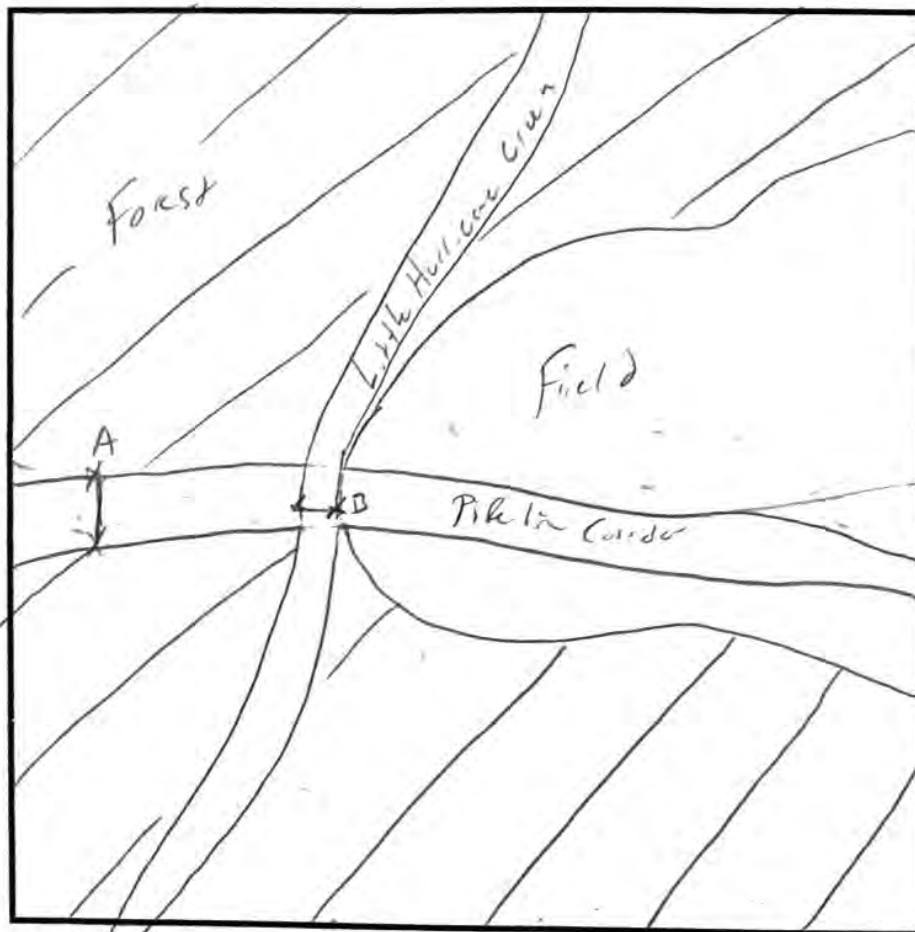
² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

- * Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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Project Name/No.: 172677408

Date: 28 June 22

Site ID: RLM-116-Overton

Est. Distance to Water (ft): 0

VEGETATION

Primary Habitat Type¹: Upland Forest / creek

Potential Roost: Large Trees Snags Both Other (e.g., structure)

Roost Tree Potential: High Moderate Low

Dominant Canopy Species Avg. Canopy DBH range (in): 20
1. Quercus alba 2. Acrospora 3. Oxydendrum arboreum

Canopy Closure: Closed (80%+) Moderate (40-80%) Open (0-40%)

Dominant Subcanopy Species Avg. Subcanopy DBH range (in): 12
1. Tsuga canadensis 2. Cornus florida 3. Acrospora

Sub-Canopy Clutter: High (60%+) Moderate (30-60%) Low (0-30%)

Dominant Shrub/Understory Species
1. Quercus alba 2. Tsuga canadensis 3. Oxydendrum arboreum

Shrub/Understory Clutter: High (60%+) Moderate (30-60%) Low (0-30%)

STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): 25 Channel Width: 20 ft Stream Width: 15 ft

Riparian Width right bank: 2 ft left bank: 3 ft Avg. Water Depth: 8 in
¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Other Wildlife Observed:

Additional Comments:



Bat Capture Datasheet

Page ____ of ____

Project Name/No.: 172677408

Date: 29 June 2022

Biologist(s): Ian Burns Katherine Bousha

Site ID: RLM-116-Overlook

County/State: Overton / TN

Moon Phase: Waxing Crescent

Sunset: 2001

Map Kilometer No./Quad: ~~A1071~~ KM 116

Latitude: 36.172548

Longitude: 85.113577

Moonrise: 0534

Moonset: 2056

General Site Description: ~~Scrub 45 22 Jan 2022~~ PIPELINE CORRIDOR

Nets Open: 2001

Nets Closed: C/161

CROSSING LITTLE HURRICANE CREEK

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	73	0	50
21:00	70	0	50
22:00	68	0	0
23:00	66	0	0
00:00	64	0	0
01:00	64	0	0

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments:[illegible]

¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

- Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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Bat Capture Datasheet

Page ___ of ___

Project Name/No.: 172677408 Date: 6/29/2022 Biologist(s): K. Eshler, A. Hammer
 Site ID: RLM-120-Fentress County/State: Fentress, TN Moon Phase: New Moon Sunset: 20:01
 Map Kilometer No./Quad: #7.9 KM 120 Latitude: 36.116887 Longitude: -85.06706 Moonrise: 05:34 Moonset: 20:58
 General Site Description: ROW NW of Clark Range Monterey Hwy Nets Open: 2001 Nets Closed: 2101

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	71	0	10
21:00	69	0	10
22:00	65	0	10
23:00	67	0	10
00:00	66	0	60
01:00	65	0	0

Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	12	5.2	62.4	36.116887	-85.06706				✓	Pipeline ROW
B	9	5.2	46.8	36.116887	-85.06706	✓				ATV trail

* One net at full extension ~ 2.5m high

Weather Comments:

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	Nycticeius humeralis	2100	A	M	N	34	9.25	0	A	3.5		
2	Edesicus fuscus	2130	A	F	PL	48	19.25	0-P	A	6		
3	E. fuscus	2130	A	F	PL	49	20.0	0	A	4		
4	E. fuscus	2150	A	F	L	47	24.0	0	A	6.5		
5	E. fuscus	22:06	J	M	NR	45	12.5	0	A	3		
6	Lasiorhinus borealis	22:32	A	M	N	39	11.5	0	A	3		
7	E. fuscus	2300	J	M	N	46	14.25	0	A	4		
8	E. fuscus	2300	A	F	L	47	23.5	0	A	5		
9	E. fuscus	2315	A	F	L	45	20.25	0	A	4		
10	N. humeralis	0000	A	M	N	34	8.25	0	B	3.5		
11	E. fuscus	0020	A	F	L	U	U	U	A	4		Escape @ net

¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

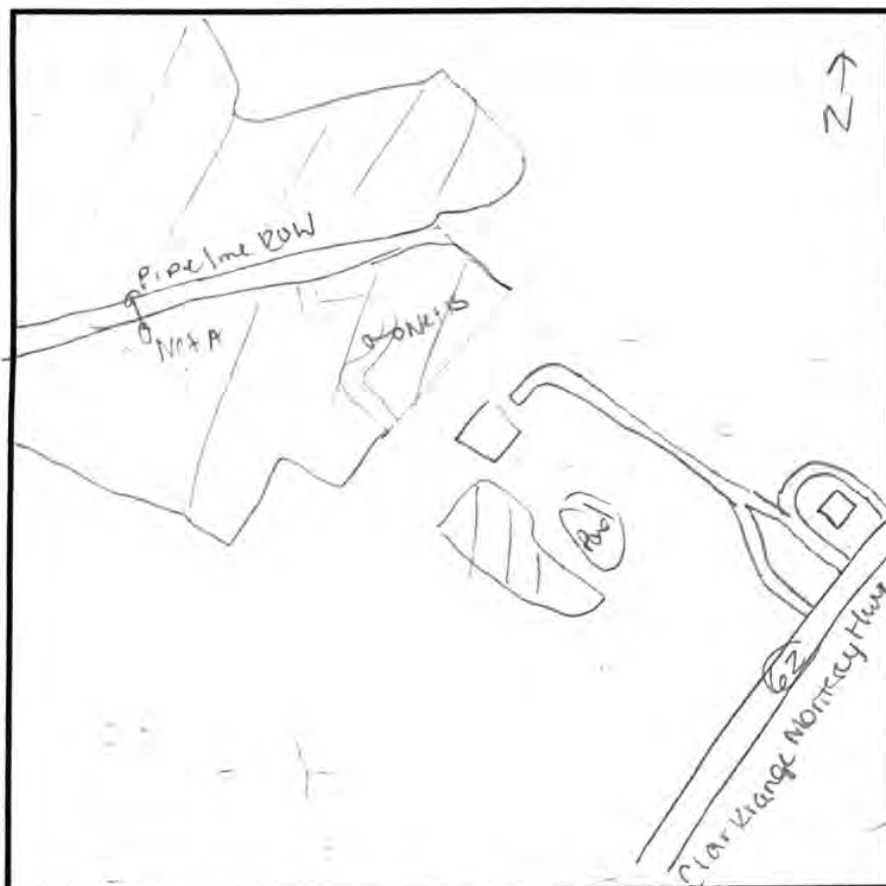
² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U [unknown] only to be used for escaped bats

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Project Name/No.: 172677408 Date: 29 June 2022
 Site ID: RLM-120-Fentress Est. Distance to Water (ft): 0

VEGETATION

Primary Habitat Type¹: Upland Forest

Potential Roost: Large Trees Snags Both Other (e.g., structure)

Roost Tree Potential: High Moderate Low

Dominant Canopy Species Avg. Canopy DBH range (in): 24-35
 1. Pinus virginiana 2. Liriodendron tulipifera 3. Quercus velutina

Canopy Closure: Closed (80%+) Moderate (40-80%) Open (0-40%)

Dominant Subcanopy Species Avg. Subcanopy DBH range (in): 10-20
 1. Quercus falcata 2. Ulmus rubra 3. Oxydendrum

Sub-Canopy Clutter: High (60%+) Moderate (30-60%) Low (0-30%)

Dominant Shrub/Understory Species
 1. Acer rubrum 2. Juniperus virginiana 3.

Shrub/Understory Clutter: High (60%+) Moderate (30-60%) Low (0-30%)

STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): 1 ft Channel Width: N/A Stream Width: 2m

Riparian Width right bank: 3 ft left bank: 10 feet Avg. Water Depth: N/A

¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Other Wildlife Observed: Skunk, Flying Squirrel

Additional Comments:



Bat Capture Datasheet

Page ___ of ___

Project Name/No.: 172677408 Date: 30 June 2022 Biologist(s): K. Eshler, A. Hammer
 Site ID: RUM-120-Fentress County/State: Fentress, TN Moon Phase: Waxing Crescent Sunset: 2001
 Map Kilometer No./Quad: ~~74.4~~ KM-120 Latitude: 36.16887 Longitude: -85.06706 Moonrise: 0628 Moonset: 2138
 General Site Description: ROW NW of Clarkrange Monterey Hwy Nets Open: 2001 Nets Closed: 2101

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	75	0	30
21:00	71	0	0
22:00	69	0	0
23:00	109	0	0
00:00	68	0	0
01:00	68	0	0

Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	12	5.2	62.4	36.16887	-85.06706				✓	Pipeline ROW
B	9	5.2	46.8	36.16832	-85.06628	✓				ATV trail

* One net at full extension ~ 2.5m high

Weather Comments: _____

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	<i>Eptesicus fuscus</i>	2200	J	F	N	47	15.0	0	A	3		
2	<i>Eptesicus fuscus</i>	2245	J	F	N	46	11.75	0	A	6		
3	<i>Eptesicus fuscus</i>	0040	A	F	PL	78	21.25	0	A	5		

¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for escaped bats

Confidential Data. If found, please return to:

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Bat Capture Datasheet

Page ___ of ___

Project Name/No.: 172677408 Date: 30 Jun 2022 Biologist(s): Ian Burns Katherine Buslee
 Site ID: PLM-124-Fentress County/State: Fentress/TN Moon Phase: Waxing Crescent Sunset: 2001
 Map Kilometer No./Quad: 7665-769 KM-124 Latitude: 36.181101 Longitude: -85.027344 Moonrise: 0628 Moonset: 2138
 General Site Description: Pipeline Corridor East of Taylor Rd, Clarksville TN Nets Open: 2001 Nets Closed: 0101

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	75	0	25
21:00	72	0	0
22:00	70	0	0
23:00	70	0	0
00:00	68	0	0
01:00	68	0	0

Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	12.0	5.2	62.4	36.181039	-85.026900				X	Consider
B	12.0	7.8	93.6	36.180486	-85.025912				X	Consider

* One net at full extension ~ 2.5m high

Weather Comments: _____

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* # TWRA	Comments (e.g., samples taken, transmitter #, disposition)
1	Eptesicus fuscus	2030	A	F	L	49.0	17.25	0-P	A	5.0		
2	Nycticeius humeralis	2108	A	M	NR	35.0	8.5	0-P	B	0.5		
3	Eptesicus fuscus	2124	A	F	PL	49.0	17.5	0	B	7.0		
4	Eptesicus fuscus	2124	J	M	NR	44.0	12.0	0	B	7.0		
5	Myotis grisescens	2140	A	M	NR	50.0	12.75	0-P	B	3.0	08597	

¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

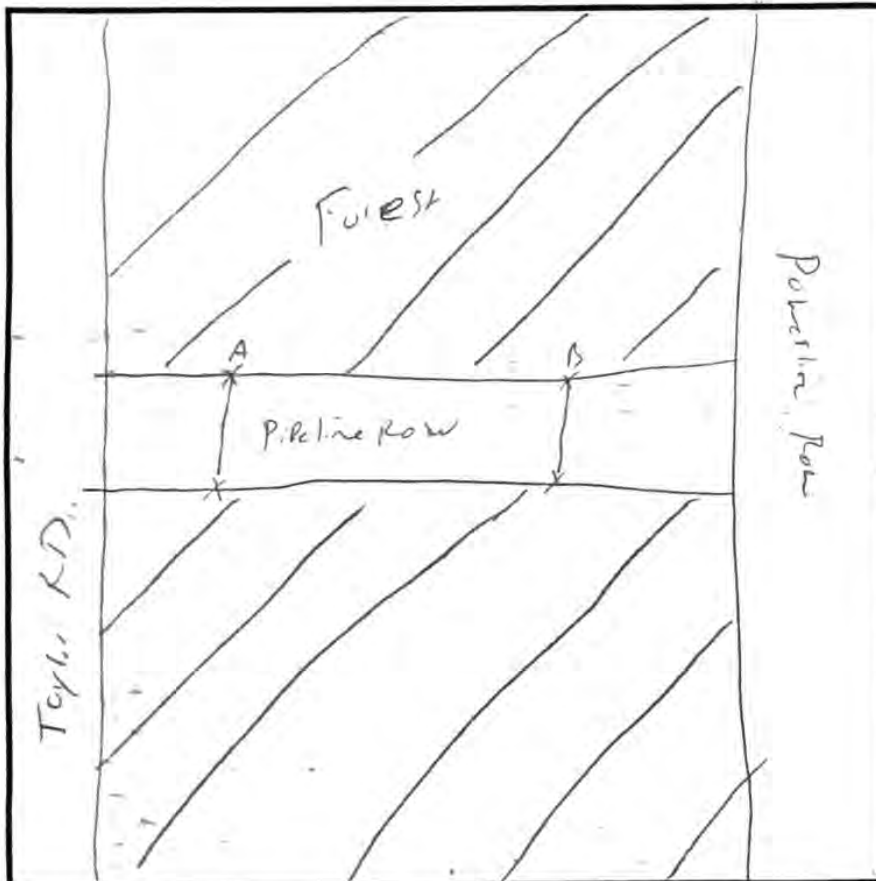
Note: U (unknown) only to be used for escaped bats

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Net Site Description

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Project Name/No.: 172677408

Date: 30 Dec 22

Site ID: RLM-129-Forest

Est. Distance to Water (ft): ~1500

VEGETATION

Primary Habitat Type¹: Upland Forest

Potential Roost: Large Trees Snags Both (e.g., structure)

Roost Tree Potential: High Moderate Low

Dominant Canopy Species

Avg. Canopy DBH range (in): 24

1. Pinus virginiana 2. Quercus alba 3. Fraxinus pennsylvanica

Canopy Closure:

Closed
(80%+)

Moderate
(40-80%)

Open
(0-40%)

Dominant Subcanopy Species

Avg. Subcanopy DBH range (in): 12

1. Fraxinus pennsylvanica 2. Quercus rubra 3. Liriodendron tulipifera

Sub-Canopy Clutter:

High
(60%+)

Moderate
(30-60%)

Low
(0-30%)

Dominant Shrub/Understory Species

1. Quercus rubra 2. Acutifolia 3. Oxycodendron arboreum

Shrub/
Understory Clutter:

High
(60%+)

Moderate
(30-60%)

Low
(0-30%)

STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): Channel Width: Stream Width:

Riparian Width right bank: left bank: Avg. Water Depth:

¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Other Wildlife Observed: Eastern screech owl

Additional Comments:



Bat Capture Datasheet

Page ___ of ___

Project Name/No.: 1726 77408

Date: 1 July 2022

Biologist(s): Len Burns, Katherine Bourke, Ashley Hammer

Site ID: PLM-124 Fentress

County/State: Fentress/TN

Moon Phase: Waxing Crescent

Sunset: 2001

Map Kilometer No./Quad: 7665-74.4 KM 124

Latitude: 36.181161

Longitude: -85.027349

Moonrise: 0726

Moonset: 2215

General Site Description:

~~Scrub 700m from 2022~~ PIPELINE CORRIDOR
EAST OF TAYLOR RD, CLARKRANGE TN

Nets Open: 2001

Nets Closed:

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	75	0	25
21:00	72	0	10
22:00	70	0	0
23:00	70	0	0
00:00	68	0	0
01:00	68	0	0

Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	12	5.2	62.4	36.181039	-85.026900				X	corridor
B	12	7.8	93.6	38.180986	-85.025912				X	corridor

* One net at full extension ~ 2.5m high

Weather Comments:

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	Lasiurus borealis	2012	A	F	PL	39.0	11.0	0	B	4.0		
2	Eptesicus fuscus	2120	A	F	PL	49.0	21.0	0	B	5.5		
3	Eptesicus fuscus	2120	J	M	NR	46.0	14.25	0	B	5.5		
4	Eptesicus fuscus	2135	A	F	PL	49.0	21.5	0	A	3.0		
5	Eptesicus fuscus	2135	A	F	PL	49.0	23.25	0	A	4.0		
6	Eptesicus fuscus	2155	J	M	NR	46.0	13.25	0	B	7.0		
7	Eptesicus fuscus	2325	A	F	PL	49.0	22.75	0	B	3.5		

¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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Bat Capture Datasheet

Project Name/No.: Ridgeline/172677408 Date: 7/1/22 Biologist(s): A. Sjollema, Z. True
Site ID: RLM-127-Fentress County/State: Fentress/TN Moon Phase: Waxing Crescent Sunset: 20.00
Map Kilometer No./Quad: ~~172677408~~ 172677408 ^{km 127} Latitude: 36.181759 Longitude: -84.98971 Moonrise: 7:29 Moonset: 22:17
General Site Description: Main tained pipeline + road ROW driveway Nets Open: 20:05 Nets Closed: 1:05
through forest

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	78.5	1	15
21:00	71.7	1	10
22:00	71.1	1	15
23:00	70.1	1	5
00:00	69.2	0	5
01:00	69.4	1	0

[illegible]

* One net at full extension ~ 2.5m high

01:00 21.4 1 0 One meter of rain extension - 2.5m high

Weather Comments: clear sky, calm wind, very humid

[illegible]

¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face: leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

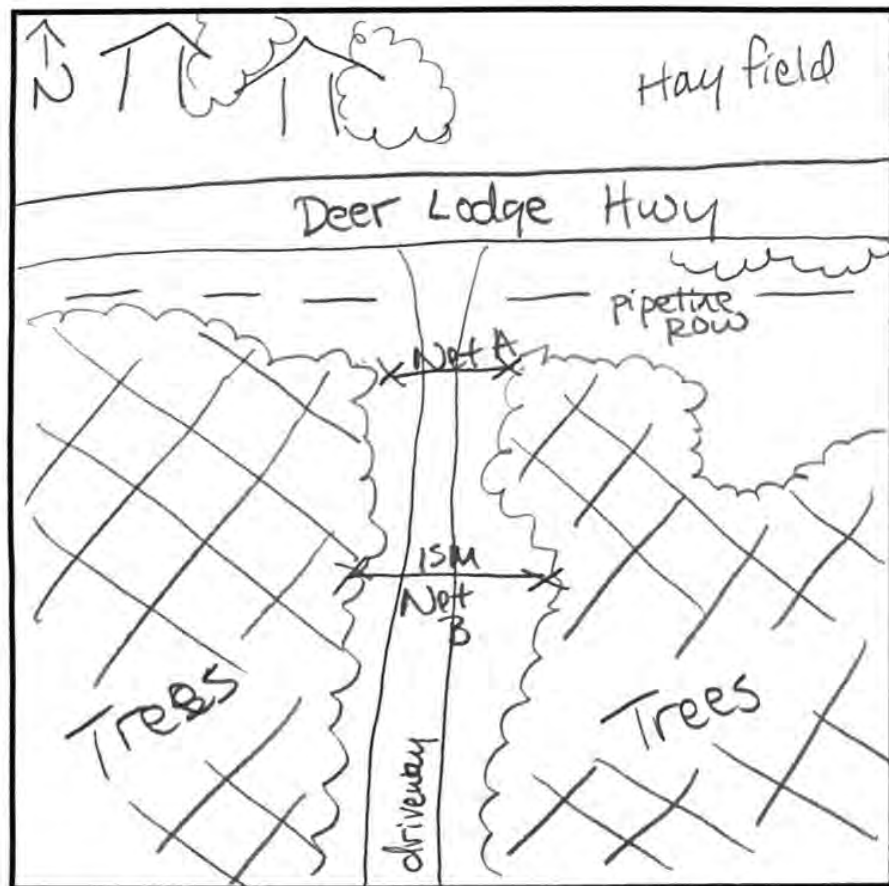
² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

Net Site Description

Page 2 of 2



1 Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Project Name/No.: 172677408 Ridge Line Date: 7/1/22
 Site ID: RUM-127- FERTRESS Est. Distance to Water (ft): 400ft

VEGETATION

Primary Habitat Type¹: Upland forest

Potential Roost: Large Trees Snags Both Other
 (e.g., structure)

Roost Tree Potential: High Moderate Low

Dominant Canopy Species Avg. Canopy DBH range (in): 16-24"
 1. Quercus alba 2. Carya glabra 3. Juglans nigra

Canopy Closure: Closed Moderate Open
 (80%+) (40-80%) (0-40%)

Dominant Subcanopy Species Avg. Subcanopy DBH range (in): 6-12"
 1. Quercus alba 2. Carya glabra 3. Pinus sylvestris

Sub-Canopy Clutter: High Moderate Low
 (60%+) (30-60%) (0-30%)

Dominant Shrub/Understory Species
 1. Pinus sylvestris 2. Cornus florida 3. Pyrus calleryana

Shrub/Understory Clutter: High Moderate Low
 (60%+) (30-60%) (0-30%)

N/A STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): _____ Channel Width: _____ Stream Width: _____

Riparian Width right bank: _____ left bank: _____ Avg. Water Depth: _____

Other Wildlife Observed: FISP, AMRO, WOTH, NOMO

Additional Comments: _____



Bat Capture Datasheet

Page 1 of 2

Project Name/No.: Ridgeline/172677408

Date: 7/2/22

Biologist(s): A. Solena, Z. True

Site ID: RUM-127-Fentress

County/State: Fentress/TN

Moon Phase: Waxing crescent Sunset: 20.02

Map Kilometer No./Quad: ~~MP 78.85-78.9~~

MP27
Latitude: 36.181759

Longitude: -84.98971 Moonrise: 8:29 Moonset: 22:47

General Site Description: Maintained pipeline ROW + Road ROW, driveway
through forested area

Nets Open: 20:00 **Nets Closed:** 1:02

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	73.6	1	75
21:00	70.3	1	80
22:00	71.7	0	50
23:00	70.2	1	20
00:00	68.7	0	5
01:00	68.2	1	25

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments: Clouds early, eventually clearing, light to no wind, cooling later

[illegible]

¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

- * Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats



Bat Capture Datasheet

Page ___ of ___

Project Name/No.: 2. dogline/172677409 Date: 07-10-2022 Biologist(s): Josh Adams / M Johnson
Site ID: RCM-129-Forest County/State: Fairfax / TN Moon Phase: Waxing Gibbous Sunset: 1959
Map Kilometer No./Quad: KM-129 Latitude: 36.183754 Longitude: -84.969064 Moonrise: 1703 Moonset: 0209
General Site Description: Driveway through young bottomland hardwood forest Nets Open: 1955 Nets Closed: 1:00

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	72.0	0	0
21:00	69.8	0	0
22:00	68.6	0	0
23:00	67.9	0	0
00:00	67.5	0	0
01:00	66.6	0	0

Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	6	5		36.183599	-84.969249	✓				Field Maps
B	4	5		36.183375	-84.969249	✓				Field Maps

* One net at full extension ~ 2.5m high

Weather Comments: Cloudy and cooler until mid afternoon, clouds broke and temps in the mid 80's

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	<i>Eptesicus fuscus</i>	20:50	A	M	NR	45	18	0	A	2.5		
2	<i>E. fuscus</i>	21:05	A	M	NR	44	16.5	0	A	2		
3	<i>E. fuscus</i>	21:10	A	M	NR	44	17.5	0	A	3		
4	<i>Lasiurus borealis</i>	21:40	A	F	L	39	14.5	0	A	1.5		

¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

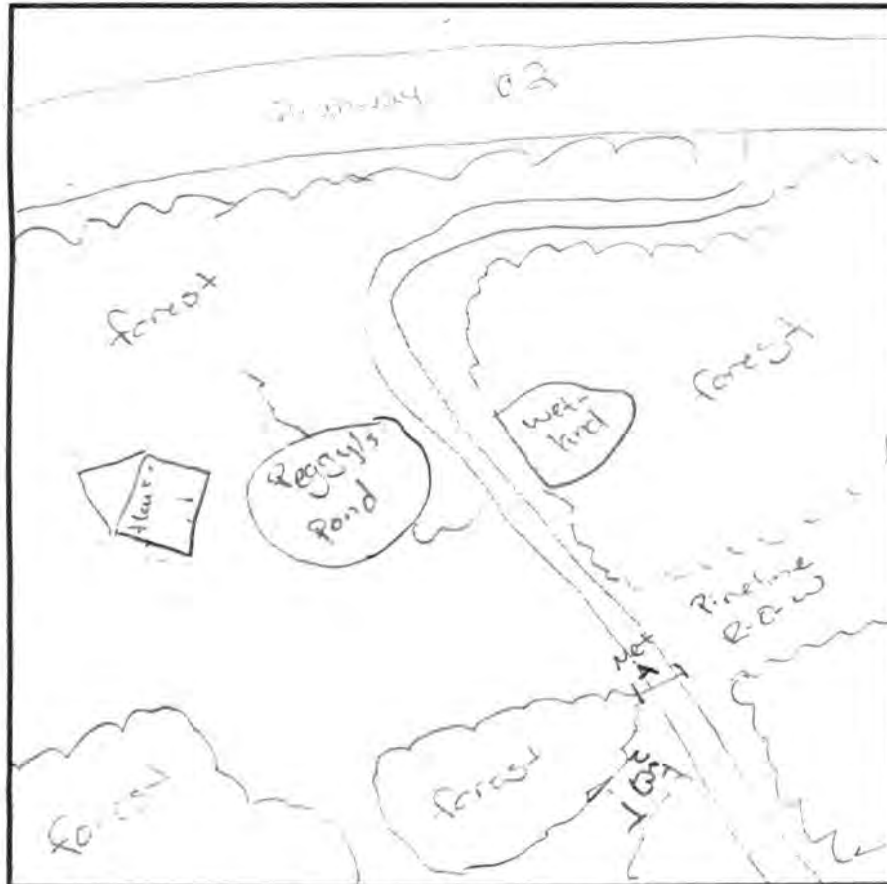
² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

Net Site Description

Page ____ of ____



Project Name/No.: Ridgepole 172677408
 Date: 07/07/2022
 Site ID: RL-129-Terraces Est. Distance to Water (ft): 20m

VEGETATION

Primary Habitat Type¹: Snags, Bottomland Forest

Potential Roost: Large Trees Snags Both Other (e.g., structure)

Roost Tree Potential: High Moderate Low

Dominant Canopy Species Avg. Canopy DBH range (in): 13-18
 1. Pinus echinata 2. Quercus alba 3. Carya cordiformis

Canopy Closure: Closed (80%+) Moderate (40-80%) Open (0-40%)

Dominant Subcanopy Species Avg. Subcanopy DBH range (in): 4-6
 1. Cornus florida 2. Carya cordiformis 3. Acer rubrum

Sub-Canopy Clutter: High (60%+) Moderate (30-60%) Low (0-30%)

Dominant Shrub/Understory Species
 1. Rosa multiflora 2. Smilax 3. _____

Shrub/Understory Clutter: High (60%+) Moderate (30-60%) Low (0-30%)

STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): _____ Channel Width: _____ Stream Width: _____

Riparian Width right bank: _____ left bank: _____ Avg. Water Depth: _____

¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Other Wildlife Observed: chickens-will-widow, bullfrog, green frog, copper gray tree frog, green-crowned

Additional Comments: _____



Stantec

172677408 ~~1241~~

Bat Capture Datasheet

Page ____ of ____

Project Name/No.: Ridge Line Pipeline BATH Survey

Date: 10 July 2022

Biologist(s): L. Meade, Tech: G. Stephens

Site ID: RLM-130-Fen+ress

County/State: Fentress TN

Moon Phase: Waxing Gibbous

Sunset: 19:59

Map Kilometer No./Quad: 80.5-80.75 KM/30 La

Latitude: 36.184963

Longitude: 84.959015

Moonrise: 17:03

Moonset: 02:09

General Site Description: Pipe line Corridor

Nets Open: 19:59

Nets Closed: 0.59

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	72	0	0
21:00	70	0	0
22:00	69	0	0
23:00	68	0	0
00:00	67	0	0
01:00	66	0	0

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments:[illegible]

¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

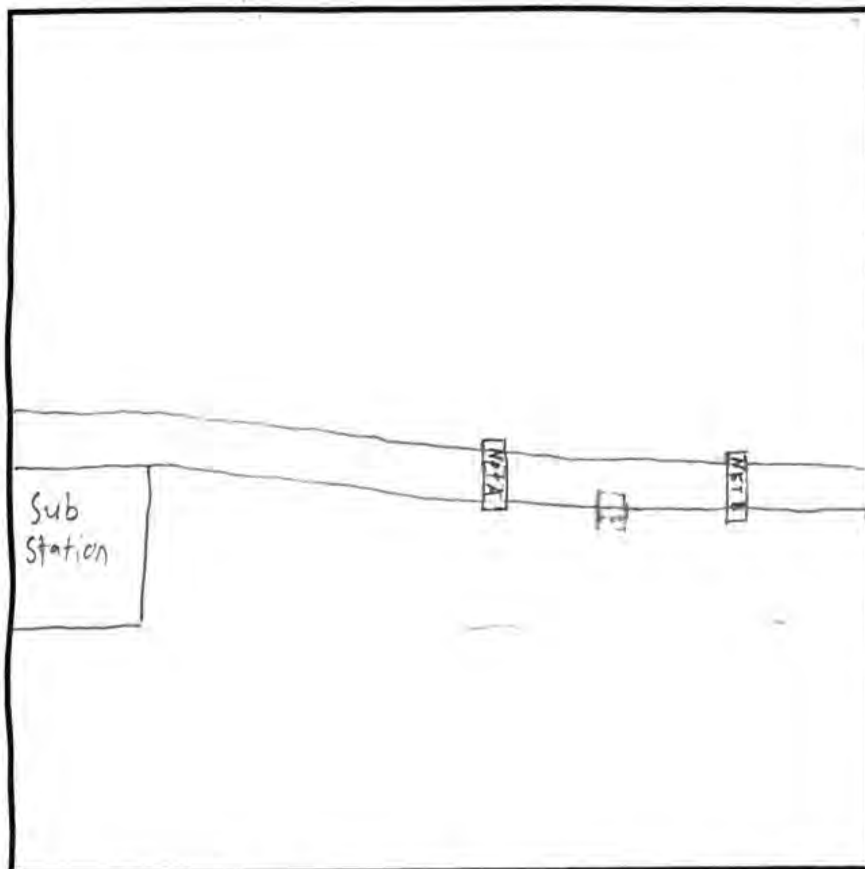
² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

Net Site Description

Page ____ of ____



¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Project Name/No.: Ridge Line Pipeline Bat Survey ¹⁷²⁶⁷⁷⁴⁰⁸ Date: 10 July 2022
Site ID: RLM-130-Fentress Est. Distance to Water (ft): 0.4 mi.

VEGETATION

Primary Habitat Type¹: Forested Slope, UPLAND FOREST

Potential Roost:

Large Trees	Snags	Both	Other (e.g., structure)
High	Moderate	Low	

Dominant Canopy Species Avg. Canopy DBH range (in): 10-12
1. Black Walnut 2. Red Maple 3. White Oak

Canopy Closure:

Closed (80% +)	Moderate (40 - 80%)	Open (0 - 40%)
----------------	---------------------	----------------

Dominant Subcanopy Species Avg. Subcanopy DBH range (in): 5-10
1. Red Maple 2. Tulip Poplar 3. Post Oak

Sub-Canopy Clutter:

High (60% +)	Moderate (30 - 60%)	Low (0 - 30%)
--------------	---------------------	---------------

Dominant Shrub/Understory Species
1. Red Maple 2. Tulip Poplar 3. -

Shrub/Understory Clutter:

High (60% +)	Moderate (30 - 60%)	Low (0 - 30%)
--------------	---------------------	---------------

STREAM CHARACTERISTICS (if relevant) N/A

Bank Height (ft): 1 Channel Width: Stream Width:

Riparian Width right bank: left bank: Avg. Water Depth:

Other Wildlife Observed: white tail Deer, Flying Squirrel

Additional Comments:



Bat Capture Datasheet

Page ___ of ___

Project Name/No.: 172677408 Ridge Line Pipeline Bat Survey Date: 11 July 2022 Biologist(s): L. Meade, G. Stephens Tech
 Site ID: RLM-130 - Fentress County/State: Fentress TN Moon Phase: Waxing Gibbous 95% Sunset: 19:59
 Map Kilometer No./Quad: 80.5 80.75 km ¹³⁰ Latitude: 36.18436 Longitude: -84.95873 Moonrise: 18:17 Moonset: 02:55
 General Site Description: Pipeline Corridor Nets Open: 19:59 Nets Closed: 00:59

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	75	0	0
21:00	73	0	20
22:00	71	0	0
23:00	70	0	0
00:00	69	0	0
01:00	69	0	0

Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	9	5.8	46.8	36.18435	-84.95848				✓	Pipeline Corridor
B	9	7.8	70.2	36.18442	-84.95911				✓	Pipeline Corridor

* One net at full extension ~ 2.5m high

Weather Comments: _____

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	<i>Lasiurus borealis</i>	20:25	J	M	NR	39	11.75	0	A	3		
2	<i>Eptesicus fuscus</i>	23:30	A	F	PL	47	20.5	0	B	3		
3	<i>Lasiurus borealis</i>	00:15	J	M	NR	38	11.25	0	B	65		

¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for escaped bats

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Bat Capture Datasheet

Project Name/No.: Ridge Line/172677408 Date: 7/10/2022 Biologist(s): M. Evans, Ellen Griffin
 Site ID: RLM-131-Fentress County/State: Fentress, TN Moon Phase: Waxing Gibbous/90% Sunset: 19:59
 Map Kilometer No./Quad: #51 KM 131 Latitude: 36.183908 Longitude: -84.953390 Moonrise: 17:03 Moonset: 02:09
 General Site Description: Herbaceous gasline ROW located to the south of Deer Lodge Nets Open: 19:59 Nets Closed: 00:59

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	77	0	15%
21:00	72	0	0%
22:00	68	0	0%
23:00	67.3	0	0%
00:00	66.8	0	0%
01:00	65	0	0%

[illegible]

* One net at full extension ~ 2.5m high

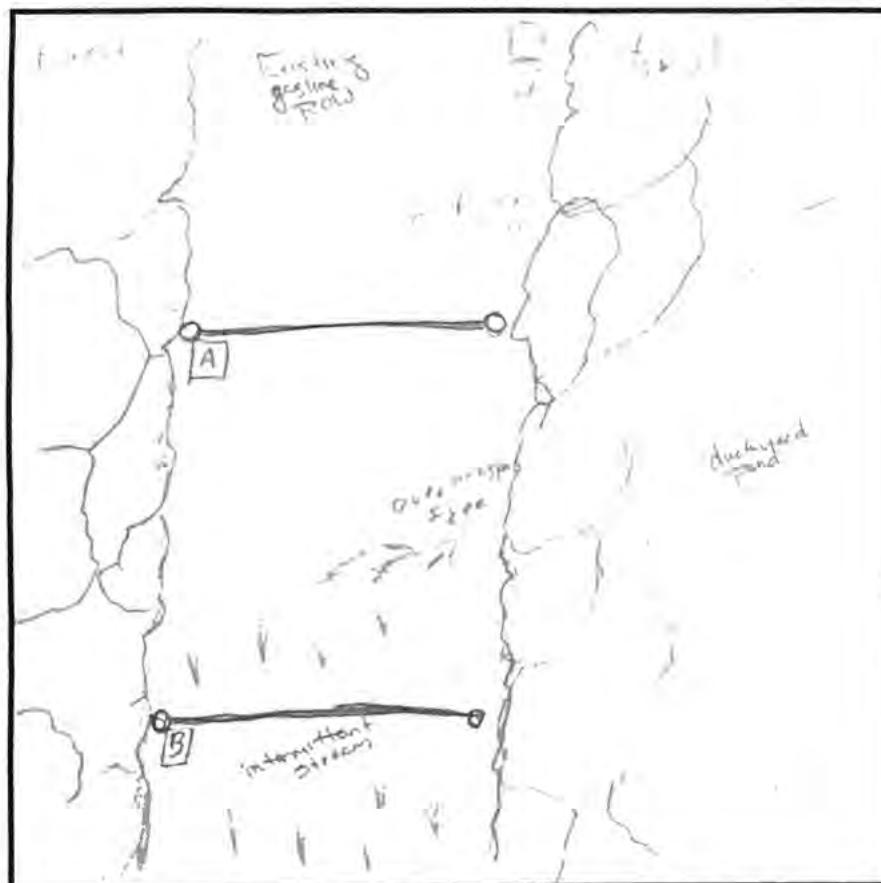
Weather Comments:[illegible]

¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

- * Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats



1 Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Project Name/No.: Ridgeline/172177408 Date: 7/10/2022
 Site ID: RLM-31-Fentress Est. Distance to Water (ft): 25'

VEGETATION

Primary Habitat Type¹: Upland Forest
 Potential Roost: Large Trees Snags Both Other (e.g., structure)
 Roost Tree Potential: High Moderate Low

Dominant Canopy Species Avg. Canopy DBH range (in): 12-24"
 1. Acer rubrum 2. L. tulipifera 3. Prunus serotina

Canopy Closure: Closed (80%+) Moderate (40-80%) Open (0-40%)

Dominant Subcanopy Species Avg. Subcanopy DBH range (in): 6"
 1. Cornus florida 2. Acer rubrum 3. Sassafras albidum

Sub-Canopy Clutter: High (60%+) Moderate (30-60%) Low (0-30%)

Dominant Shrub/Understory Species
 1. Rosa multiflora 2. common witch hazel 3. _____

Shrub/Understory Clutter: High (60%+) Moderate (30-60%) Low (0-30%)

STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): _____ Channel Width: _____ Stream Width: _____

Riparian Width right bank: _____ left bank: _____ Avg. Water Depth: _____

Other Wildlife Observed: green frog, bullfrog, Chuck-wills-widow, praying mantis,

Additional Comments: Observed 3-4 individual bats flying within gasline ROW.



Bat Capture Datasheet

Page 1 of 2

Project Name/No.: Ridgeline/172677408 Date: 7/11/2022 Biologist(s): Malachuk Evans, Ellen Griffin
 Site ID: RLM-131-Fentress County/State: Fentress, TN Moon Phase: Waxing Gibbous/10% Sunset: 19:58
 Map Kilometer No./Quad: 131 KM-131 Latitude: 36.183908 Longitude: -84.953390 Moonrise: 18:17 Moonset: 02:55
 General Site Description: Existing, herbaceous gasline ROW located to the south of Deer Lodge Hwy (62). Nets Open: 19:58 Nets Closed: 00:58

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	73.5°	0	0%
21:00	70.9°	0	0%
22:00	69.1°	0	0%
23:00	68.6	0	0%
00:00	68.3	0	0%
01:00	68.7	0	0%

Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	9m	7.8m	70.2m²	36.183890	-84.953401	X				Gasline ROW
B	12m	5.2m	62.4m²	36.183870	-84.952819	X				Gasline ROW

* One net at full extension - 2.5m high

Weather Comments:

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	EPFU	00:05	J	F	NR	480	18.5	0	A	4.5		305-507 Hair + Guano
2	LADG	00:05	A	M	TD	40.0	11.25	0	A	6.75		506 Hair

¹ Beaufort wind scale, 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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Bat Capture Datasheet

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Project Name/No.: Ridgeline/172677408

Date: 7-13-22

Biologist(s): Malachia Evans, Ellen Griffin

Site ID: RLA-132-Fentress

County/State: Fentress TN

Moon Phase: Full / 99%

Sunset: 19:58

Map Kilometer No./Quad: KM-132

Latitude: 36.191606

Longitude: -84.937583

Moonrise: 20:29

General Site Description: Herbaceous gasline Row, running Parallel to Deer Lodge Hwy (SR 62)

Nets Open: 19:58

Nets Closed: 00:58

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	73.1	0	0%
21:00	67	0	0%
22:00	64.0	0	0%
23:00	62.8	0	0%
00:00	62.0	0	0%
01:00	61.2	0	0%

Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	12	7.8	93.6	36.181722	-84.937408	X				gasline Row
B	9	5.2	46.9	36.182098	-84.937564		X			can pasture 1st year

* One net at full extension ~ 2.5m high

Weather Comments:

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	Unknown	20:45	U	U	—	—	—	—	A	7.0	—	Escaped net
2	EPFU	20:45	J	F	NR	50.0	17.25	0	A	6.5	—	
3	EPFU	20:55	J	F	NR	48.0	18.5	0	B	2.5	—	spotted wings
4	EPFU	21:10	A	F	L	50.0	19.25	0	A	2.0	—	Finger injury in net
5	EPFU	21:15	J	F	NR	46.0	16.25	0	A	6.0	—	Ruf photo, hair sample via 508
6	EPFU	21:40	J	F	NR	49.0	17.05	0	A	5.0	—	Bat Parasite
7	unknown	21:50	U	U	—	—	—	—	—	6.8	—	Escaped net
8	EPFU	22:05	J	M	NR	45.5	14.5	0	A	7	—	Bat Parasite
9	LABO	00:15	A	F	L	41.0	13.0	0	A	6.0	—	

¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

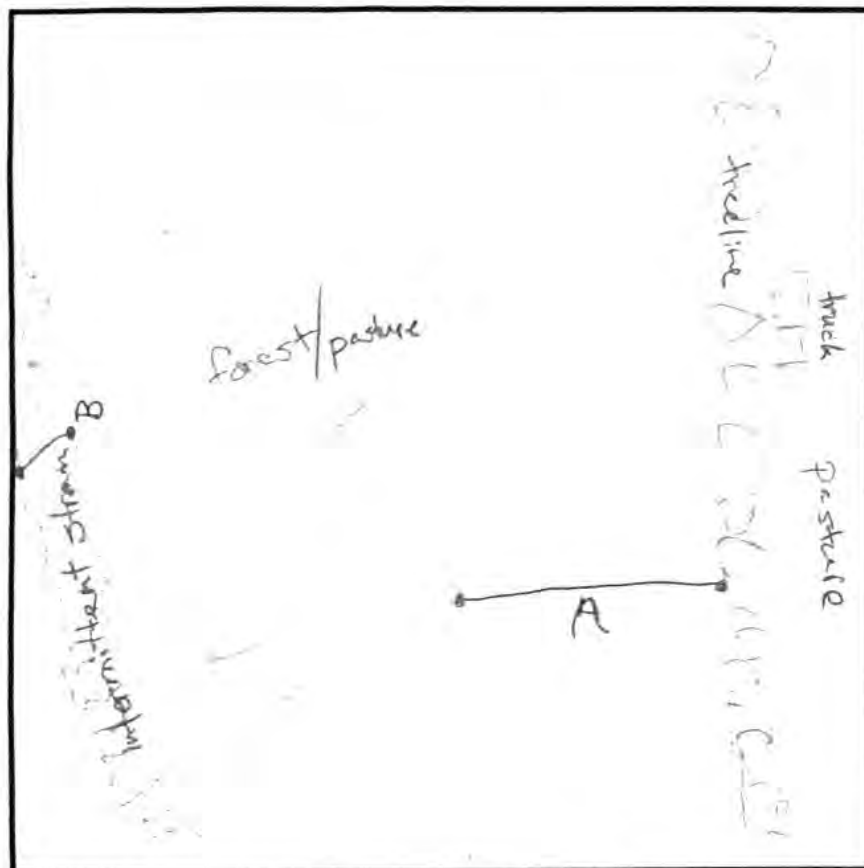
² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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Net Site Description

Page 3 of 3


¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Project Name/No.: Ridgeline 172677408 Date: 7-13-22
 Site ID: RM-132-FENTRESS Est. Distance to Water (ft): 0'

VEGETATION

Primary Habitat Type¹: Bottom land forest
 Potential Roost: Large Trees | Snags | Both | Other (e.g., structure)
 Roost Tree Potential: High | Moderate | Low

Dominant Canopy Species Avg. Canopy DBH range (in): 14-30"
 1. Quercus alba 2. Acer rubrum 3. _____

Canopy Closure: Closed (80%+) | Moderate (40-80%) | Open (0-40%)

Dominant Subcanopy Species Avg. Subcanopy DBH range (in): 3-12"
 1. Acer rubrum 2. _____ 3. _____

Sub-Canopy Clutter: High (60%+) | Moderate (30-60%) | Low (0-30%)

Dominant Shrub/Understory Species
 1. Rosa multiflora 2. _____ 3. _____

Shrub/Understory Clutter: High (60%+) | Moderate (30-60%) | Low (0-30%)

STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): 0.5' Channel Width: 2.5' Stream Width: 1.5'
 Riparian Width right bank: 10' left bank: 20' Avg. Water Depth: 1"

Other Wildlife Observed: wood frog, cottontail rabbit, bullfrog, great horned owl, chuck-wills-widow

Additional Comments: Site within active cow pastures.



Bat Capture Datasheet

Page 1 of 2

Project Name/No.: RidgeLine/172677408 Date: 7/14/2022 Biologist(s): Malachia Evans, Ellen Griffin
 Site ID: RLN-132-Fentress County/State: Fentress, TN Moon Phase: Waning Gibbous/99% Sunset: 19:57
 Map Kilometer No./Quad: 132 KM-132 Latitude: 36.181606 Longitude: -84.937583 Moonrise: 21:19 Moonset: 06:13
 General Site Description: Existing, herbaceous gasline ROW running parallel to Deer Lodge Hwy (SR162). Nets Open: 19:57 Nets Closed: 10:57

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	78.0	1	70%
21:00	70.1	1	60%
22:00	66.0	1	60%
23:00	69.2	0	60%
00:00	67.8	0	60%
01:00	69.3	0	60%

Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	12	7.8	93.6	36.181722	-84.937408	X				Gasline ROW
B	9	5.2	46.8	36.182098	-84.937564		X			Low pasture intermittent

* One net at full extension ~ 2.5m high

Weather Comments:

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	EPFV	21:05	J	M	NR	43.0	13.75	0-1	A	6.0	—	Two holes (flying)
2	EPFV	21:20	J	F	NR	45.5	16.75	0	A	6.75	—	
3	EPFU	21:50	J	M	NR	45.0	15.0	0	A	6.75	—	
4	EPFU	21:50	J	M	NR	47.5	16.0	0	A	7.0	—	
5	EPFV	22:30	A	F	PL	47.0	19.5	1	A	4.5	—	
6	EPFV	22:30	A	F	L	47.5	22.0	0	A	4.5	—	Broken tail tip
7	LABO	22:40	—	—	—	—	—	—	A	5.5	—	Escaped
8	EPFV	23:35	A	F	L	47.5	22.25	1	A	4.5	—	
9	LABO	23:40	A	M	TD	46.0	11.75	0	A	3	—	

¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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Bat Capture Datasheet

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Project Name/No.: 172077408 Date: 7-13-22 Biologist(s): Hannah Stoffs Chris Knabe
 Site ID: RLM-137-Morgan County/State: Morgan/TN Moon Phase: Full Moon Sunset: 8:01 pm
 Map Kilometer No./Quad: KM137 Latitude: 36.171025 Longitude: 84.879027 Moonrise: 5:24 pm Moonset: 4:59
 General Site Description: ROW Corridor Nets Open: 8:01 pm Nets Closed: 2:01 am

Time	Temp (F)	Wind ¹	% Cloud Cover	Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
21:00		1	0	A	9m	3x		36.170414	84.878610				X	Row
22:00	71	1	0	B	12m	3x		36.171213	84.880014				X	Row
23:00	67	1	0											
00:00	67	1	0											
01:00	68	1	0											
02:00	66	1	20											

* One net at full extension ~ 2.5m high

Weather Comments: 73-83°F Clear, higher wind at Net B (4-7 mph)

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	<i>Eptesicus fuscus</i>	9:30	J	M	NK	455	15	0	A	8		
2	<i>Eptesicus fuscus</i>	10:00	A	F	L	470	10	0	B	5		
3	<i>Eptesicus fuscus</i>	1	A	F	NR	440	17	0	B	6		
4	<i>Eptesicus fuscus</i>	1	A	F	NR	485	15	0	B	2		
5	<i>Eptesicus fuscus</i>	1	A	F	NR	475	16	0	B	4		
6	<i>Eptesicus fuscus</i>	10:10	A	F	NR	410	18	0	A	2		
7	<i>Eptesicus fuscus</i>	1	A	M	NR	46	16	0	A	2		
8	<i>Eptesicus fuscus</i>	1	A	F	NR	445	15	0	A	7		escaped from net
9	<i>Eptesicus fuscus</i>	10:20	A	F	NR	495	15	0	B	7		
10	<i>Eptesicus fuscus</i>	10:20	J	M	NR	445	14	0	B	4		
11	<i>Eptesicus fuscus</i>	10:50	S	F	NR	433	11	0	A	35		11 weight

Sealant

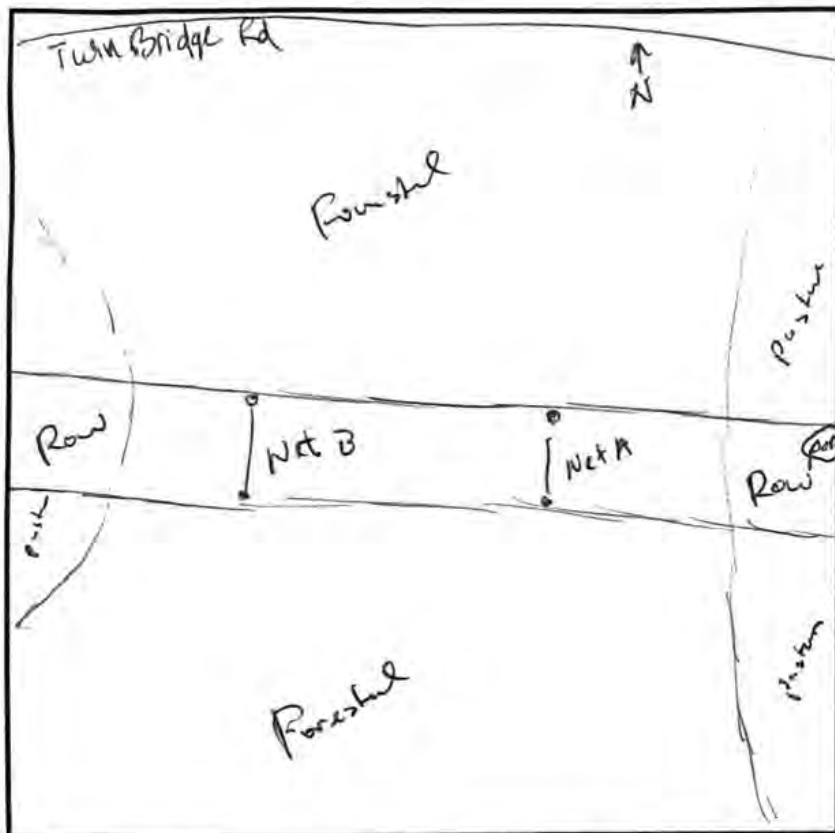
4 = dust rise

move (13-1)

10-11 to 12-13 (12-13 to 14-15)

10-11 to 12-13 (12-13 to 14-15) 10-11 to 12-13 (12-13 to 14-15) 10-11 to 12-13 (12-13 to 14-15)

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Project Name/No.: 172677408 Date: 7-13-21
 Site ID: PLM137-MORGAN Est. Distance to Water (ft): 700

VEGETATION

Primary Habitat Type¹: Upland Forest
 Potential Roost: Large Trees | Snags | Both | Other (e.g., structure)
 Roost Tree Potential: High | Moderate | Low

Dominant Canopy Species Avg. Canopy DBH range (in): 40
 1. Quercus rubra 2. Acer Rubrum 3. Liriodendron tulipifera
 Canopy Closure: Closed (80%+) | Moderate (40-80%) | Open (0-40%)

Dominant Subcanopy Species Avg. Subcanopy DBH range (in): 30
 1. Acer Rubrum 2. L. tulipifera 3. Quercus
 Sub-Canopy Clutter: High (60%+) | Moderate (30-60%) | Low (0-30%)

Dominant Shrub/Understory Species
 1. _____ 2. _____ 3. _____
 Shrub/Understory Clutter: High (60%+) | Moderate (30-60%) | Low (0-30%)

STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): _____ Channel Width: _____ Stream Width: _____
 Riparian Width right bank: _____ left bank: _____ Avg. Water Depth: _____

¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Other Wildlife Observed: Northern Cardinal, Flying Squirrel in Net A, WOTH, EATO
N2 - hooded warbler, Brown thrasher in Net B, NOBO, flying squirrel
 Additional Comments: Small wooded patch connected to woods via tree lines with parcel to corridor to east



Bat Capture Datasheet Pt. II

Page 3 of 3

Project Name/No.: 172627408

Date: 7-13-22

Biologist(s):

Page 3 of 3
Hannah Shiffs Chris Kneel

Site ID: PLM-137 - MORGAN

County/State: Maryland

[illegible]

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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Bat Capture Datasheet

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Project Name/No.: 172677408

Date: 7-14-22

Biologist(s): Hannah Stoff, Chris Knobel

Site ID: RLM-137-Morgan

County/State: Morgan Co.

Moon Phase: Waxing Gibbous

Sunset: 8:58 pm 2058

Map Kilometer No./Quad: 137 KM-137

Latitude: 36.171025 Longitude: 84.879027

Moonrise: 21:20 pm

Moonset: 01:14 am

General Site Description: Row Corridor in upland woodland south of Twin Bridge Rd

Nets Open: 8:58 pm Nets Closed: 01:58 am 2058

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	77	0	0
21:00	77	0	0
22:00	71	0	0
23:00	70	0	0
00:00	70	0	0
01:00	70	0	30

Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	9m	3x		36.170914	84.878660				X	Row
B	12m	3x		36.171213	84.880019				X	Row

* One net at full extension - 2.5m high

Weather Comments:

77-03 Clear

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	Nycticeius humeralis	2150	A	M	NR	37.5	12.5	0	A	6	—	photos on Chris' phone
2	Eptesicus fuscus	2220	A	F	L	42.8	20	0	A	6	—	
3	Lasiurus borealis	2220	J	F	NR	41.6	10.5	0	A	5.5	—	
4	Eptesicus fuscus	2230	A	F	L	—	—	—	B	4	—	released due to stress by captured
5	Eptesicus fuscus	2255	J	F	NR	14.5	51.8	0	B	6	—	
6	Lasiurus borealis	2255	U	U	U	U	U	U	B	5	—	Escaped from net
7	Lasiurus borealis	2345	A	F	L	39	13	0	B	4	—	
8	Eptesicus fuscus	2350	J	M	NR	46.5	20.5	0	B	7	—	weight 15g
9	Eptesicus fuscus	0130	J	F	NR	50	20	0	B	6	—	
10	Lasiurus borealis	0150	—	—	—	—	—	—	—	5	—	Escaped from net

¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph). 1 = wind direction shown by smoke (1-3 mph). 2 = wind felt on face; leaves rustle (4-7 mph). 3 = leaves, twigs in constant motion (8-12 mph). 4 = dust rises; small branches move (13-18 mph). 5 = small trees in leaf begin to sway (19-24 mph)

² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for escaped bats

Bat Capture Datasheet

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Project Name/No.: Budgetline/172677408

Date: 07/13/2022

Biologist(s): John Adams / M. Johnson

Site ID: RLM-138-MORGAN

County/State: Morcan TN

Moon Phase: Full moon

Sunset: 19:58

Map Kilometer No./Quad: KM-138

Latitude: -36.167779

Longitude: -84 865734 Moonrise: 20 30

Moonset: 24:50

General Site Description: Row and Forest gap to beach ridge.

Nets Open: 1053

Nets Closed: 0100

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	70.1	0	5
21:00	66.4	0	0
22:00	65.3	0	0
23:00	64.9	0	0
00:00	64.7	0	0
01:00	64.0	0	0

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments: Thunderstorms night before, dry in DMV, eightys today

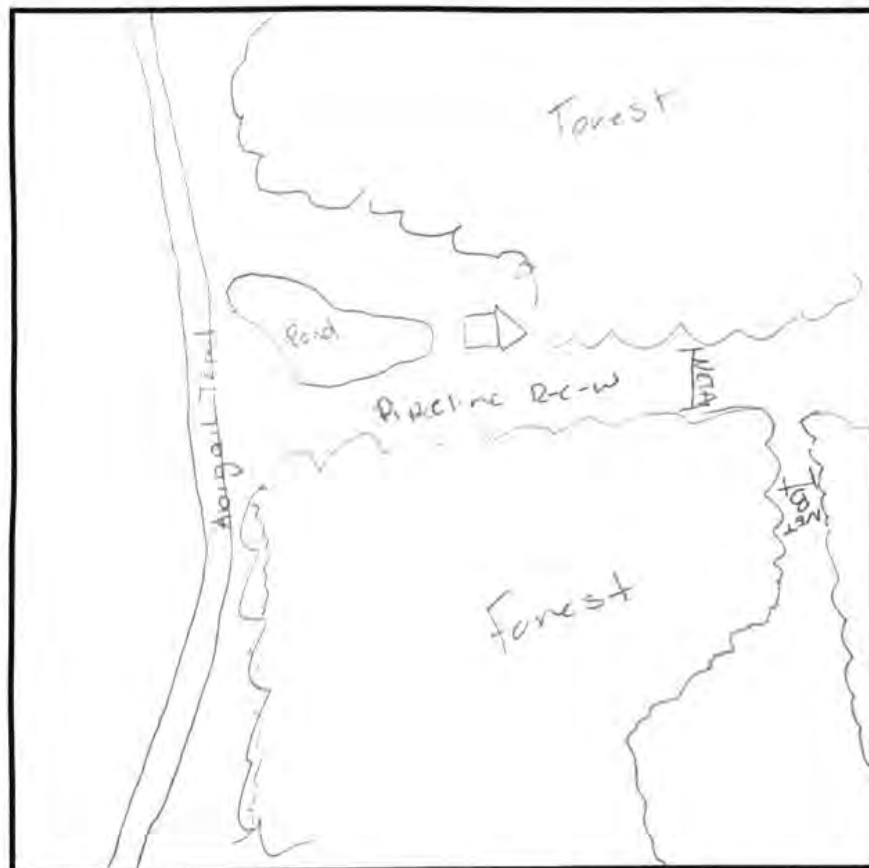
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Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

^a For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats



¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Project Name/No.: RidgeLine/172745 Date: 07/13/2023
Site ID: RLM-MOR-138 Est. Distance to Water (ft): 30

VEGETATION

Primary Habitat Type¹: UPLAND FOREST

Potential Roost:

Large Trees	Snags	Both	Other (e.g., structure)
-------------	-------	------	-------------------------

Roost Tree Potential:

High	Moderate	Low
------	----------	-----

Dominant Canopy Species Avg. Canopy DBH range (in): 8-12

1. Pinus virginiana 2. Quercus alba 3. Southern red oak

Canopy Closure:

Closed (80% +)	Moderate (40 - 80%)	Open (0 - 40%)
----------------	---------------------	----------------

Dominant Subcanopy Species Avg. Subcanopy DBH range (in): 4-8

1. Acer rubrum 2. Ostrya virginiana 3. Pinus strobus

Sub-Canopy Clutter:

High (60% +)	Moderate (30 - 60%)	Low (0 - 30%)
--------------	---------------------	---------------

Dominant Shrub/Understory Species

1. Acer rubrum 2. Smilax sp. 3. Rubus sp.

Shrub/Understory Clutter:

High (60% +)	Moderate (30 - 60%)	Low (0 - 30%)
--------------	---------------------	---------------

STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): _____ Channel Width: _____ Stream Width: _____

Riparian Width right bank: _____ left bank: _____ Avg. Water Depth: _____

Other Wildlife Observed: _____

Additional Comments: _____



Stantec

Bat Capture Datasheet

Page ____ of ____

Project Name/No.: Ridge/ve /172677408

Date: 7/15/2022

Biologist(s): J. Adams / W. Cline

Site ID: RLM-138-MORGAN

County/State: Morgan / TN

Moon Phase: Full

Sunset: 1957

Map Kilometer No./Quad: KM-138

Latitude: -36.167779 Longitude: -84.865734 Moonrise: 2119

Moonset: 0613

General Site Description: ROW & FOREST GAP TO PEACH ORCHID

Nets Open: 125

Nets Closed: 3105

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	77.9	0	90
21:00	71.2	0	40
22:00	68.2	0	40
23:00	69.1	0	60
00:00	68.0	0	66
01:00	67.1	0	40

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments: Cool and clear most of day, clouding up at sunset

[illegible]

¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats



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172677408

Bat Capture Datasheet

Page ___ of ___

Project Name/No.: Ridge Line Pipeline Bat Survey Date: 13 July 2022 Biologist(s): L. Meade, G. Stephens, Tech
 Site ID: RLM-140-Morgan County/State: Morgan TN Moon Phase: Full Super Moon 100% Sunset: 19:56
 Map Kilometer No./Quad: 957 KM-140 Latitude: 36.16446 Longitude: -84.854346 Moonrise: 20:29 Moonset: 04:58
 General Site Description: Pipeline Corridor Nets Open: 19:56 Nets Closed: 00:56

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	71	0	0
21:00	66	0	0
22:00	66	0	0
23:00	64	0	0
00:00	63	0	0
01:00	63	0	0

Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	9	7.8	70.2	36.16416	-84.85379				/	Pipeline Corridor
B	9	5.2	46.8	36.16390	-84.85308				/	Pipeline Corridor

* One net at full extension ~ 2.5m high

Weather Comments: _____

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	Eptesicus fuscus	20:45	J	M	NR	46	16	0	A	6.0		
2	Eptesicus fuscus	20:45	J	M	NR	45	19	0	A	4.0		
3	Eptesicus fuscus	20:45	A	F	NR	46	22	0	B	3.0		
4	Eptesicus fuscus	20:45	A	F	PL	48	18	0	B	4.5		
5	Lasiurus borealis	21:00	J	M	NR	40	8	0	A	7.0		
6	Eptesicus fuscus	21:00	A	F	PL	48	21.5	0	B	4.0		
7	Lasiurus borealis	21:30	J	F	NR	40	9.75	0	B	2.5		
8	Lasiurus borealis	21:30	J	F	NR	39	11.25	0	B	2.0		
9	Lasiurus borealis	21:45	J	F	NR	39	11.5	0	A	4.0		Recapture
10	Lasiurus borealis	21:45	J	M	NR	39	10.25	0	B	0.5		
11	Eptesicus fuscus	22:00	A	F	PL	48	18.5	0	A	.5		
12	Lasiurus cinereus	00:56	J	F	NR	54	23	0	A	1.0		

¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for escaped bats

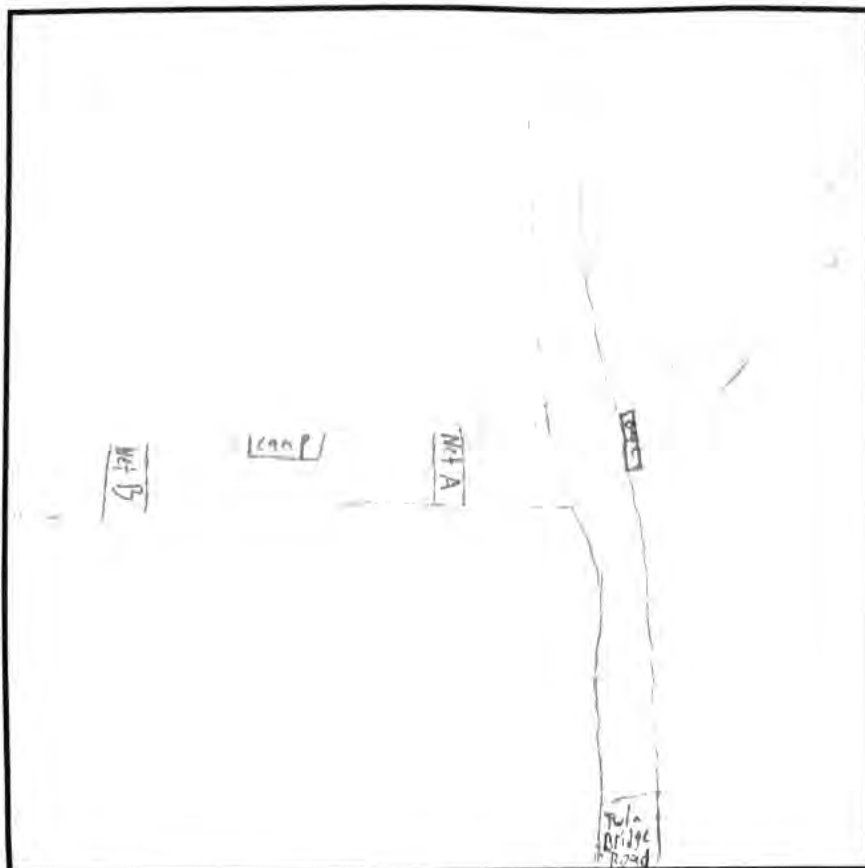
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Net Site Description

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¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Project Name/No.: 172677408-1744 Ridge Line Pipeline Bgt SurveyDate: 13 July 2022Site ID: RLM-140-MorganEst. Distance to Water (ft): .41 mi

VEGETATION

Primary Habitat Type¹: Forested SlopePotential Roost: Large Trees | Snags | Both | Other (e.g., structure)Roost Tree Potential: High | Moderate | LowDominant Canopy Species Eastern Avg. Canopy DBH range (in): 10-141. Northern Red Oak 2. White Pine 3. Tulip PoplarCanopy Closure: Closed (80%+) | Moderate (40-80%) | Open (0-40%)Dominant Subcanopy Species Avg. Subcanopy DBH range (in): 6-81. Red Maple 2. Tulip Poplar 3. Post OakSub-Canopy Clutter: High (60%+) | Moderate (30-60%) | Low (0-30%)

Dominant Shrub/Understory Species

1. Tulip Poplar 2. Sourwood 3. Red MapleShrub/Understory Clutter: High (60%+) | Moderate (30-60%) | Low (0-30%)

STREAM CHARACTERISTICS (if relevant) N/A

Bank Height (ft): _____ Channel Width: _____ Stream Width: _____

Riparian Width right bank: _____ left bank: _____ Avg. Water Depth: _____

Other Wildlife Observed: Warm Snake

Additional Comments: _____



172677408

Bat Capture Datasheet

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Project Name/No.: RidgeLine pipeline survey Date: 14 July 2022 Biologist(s): L. Meade, G. Stephens, Tech
 Site ID: RLM-140-Morgan County/State: Morgan TN Moon Phase: Full Super Moon 92% Sunset: 19:57
 Map Kilometer No./Quad: 8.67 KM-140 Latitude: 36.16446 Longitude: -84.854346 Moonrise: 21:18 Moonset: 06:13
 General Site Description: Pipeline Corridor Nets Open: 19:57 Nets Closed: 00:57

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	75	0	95
21:00	72	0	0
22:00	70	0	0
23:00	69	0	20
00:00	68	0	40
01:00	68	0	70

Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	9	7.8	70.2	36.16416	-84.85379				/	Pipeline Corridor
B	9	5.2	46.8	36.16390	-84.85308				/	Pipeline Corridor

* One net at full extension ~ 2.5m high

Weather Comments: _____

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	<i>Lasius borealis</i>	21:45	A	F	PL	40	13.5	0	B	0.5		
2	<i>Eptesicus fuscus</i>	22:00	A	F	PL	46	21.25	0	A	4.0		
3	<i>Eptesicus fuscus</i>	22:00	A	F	PL	48	21.0	0	B	3.0		
4	<i>Lasius borealis</i>	22:00	J	F	NR	40	10.25	0	B	3.0		
5	<i>Eptesicus fuscus</i>	22:13	J	F	NR	46	18.75	0	B	4.0		

¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for escaped bats

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Bat Capture Datasheet

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Project Name/No.: 172677408 RidgeLine Pipeline bat survey Date: 15 July 2022 Biologist(s): L. Meade, G. Stephens, T. Ch
 Site ID: RLM-141-Morgan County/State: Morgan TN Moon Phase: Waning Gibbous 92% Sunset: 19:56 - 0533
 Map Kilometer No./Quad: 87.6-87.7 ^{RLM-141} Latitude: 36.1609 Longitude: -84.838 Moonrise: 21:59 Moonset: 07:30
 General Site Description: Forested corridor between pond and pasture Nets Open: 19:56 Nets Closed: 00:56

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	72	0	10
21:00	68	0	0
22:00	67	0	0
23:00	66	0	90
00:00	65	0	90
01:00	65	0	100

Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	6	5.2	31.2	36.16051	-84.83801				/	Forested Corridor
B	6	5.2	31.2	36.16096	-84.83803				/	Forested Corridor

* One net at full extension ~ 2.5m high

Weather Comments:

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	<i>Lasiurus borealis</i>	21:00	J	F	NR	38	9	0	A	4.0		
2	<i>Eptesicus fuscus</i>	23:30	A	M	NR	47	18.25	0	A	3.5		

¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

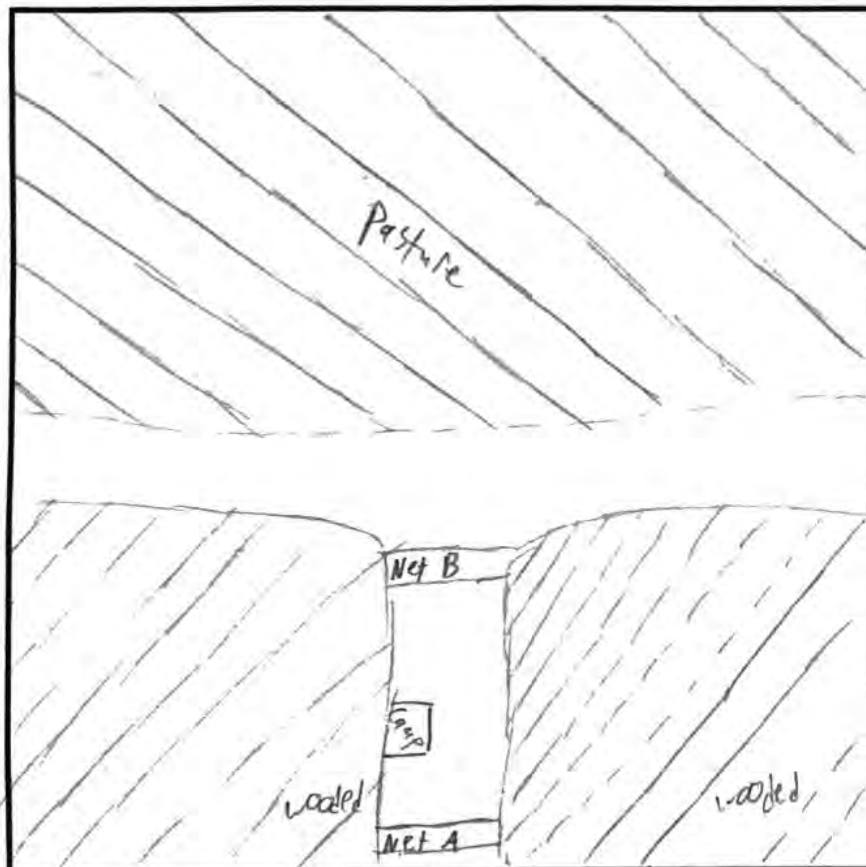
Note: U (unknown) only to be used for **escaped** bats

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Net Site Description

Page ____ of ____



¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Project Name/No.: 17267708-1244 ^{but} 8' decline pipeline survey Date: 15 July 2022
Site ID: RLM-141 - Morgan Est. Distance to Water (ft): 10 from Net B

VEGETATION

Primary Habitat Type¹: Forested Corridor
Potential Roost: Large Trees Snags Both Other (e.g., structure)
Roost Tree Potential: High Moderate Low

Dominant Canopy Species Avg. Canopy DBH range (in): 8-12
1. White Oak 2. Northern Red Oak 3. Virginia Pine

Canopy Closure: Closed (80%+) Moderate (40-80%) Open (0-40%)

Dominant Subcanopy Species Avg. Subcanopy DBH range (in): 4-8
1. Virginia Pine 2. Red Maple 3. Sourwood

Sub-Canopy Clutter: High (60%+) Moderate (30-60%) Low (0-30%)

Dominant Shrub/Understory Species
1. Virginia Pine 2. Red Maple 3.

Shrub/Understory Clutter: High (60%+) Moderate (30-60%) Low (0-30%)

STREAM CHARACTERISTICS (if relevant) N/A

Bank Height (ft): _____ Channel Width: _____ Stream Width: _____

Riparian Width right bank: _____ left bank: _____ Avg. Water Depth: _____

Other Wildlife Observed: Green Frog, Bull frog, Cope's Gray Treefrog, Long-tailed Salamander, American Toad, C. Micket Frog,

Additional Comments: _____



Bat Capture Datasheet

Page 1 of 1

Project Name/No.: 172677408

Date: 7-15-22

Biologist(s): Hannah Staffs Chris Knue

Site ID: RLM-142-Morgan

County/State: Morgan

Moon Phase: Waxing Gibbous Sunset: 7:00 2100

Map Kilometer No./Quad: KM-142

Latitude: 36.159509 Longitude: 81.929994 Moonrise: 7:20 2120 Moonset: 6:44 am

General Site Description: Row and ATV trail accessed from Twin Bridge Road to Northwest along a gravel road and south of a residence Nets Open: 7:00 2100 Nets Closed: 2:00

Time	Temp (F)	Wind ¹	% Cloud Cover	Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
20:00				A	12	7.5							X	Pipeline Row
21:00	67	0	60	B	6	7.5							X	ATV trail
22:00	63	1	20											
23:00	62	0	20											
00:00	62	0	60											
01:00	65	0	80											

* One net at full extension ~ 2.5m high

Weather Comments: Calm, Clear skies turned cloudy, temp rose at end of night

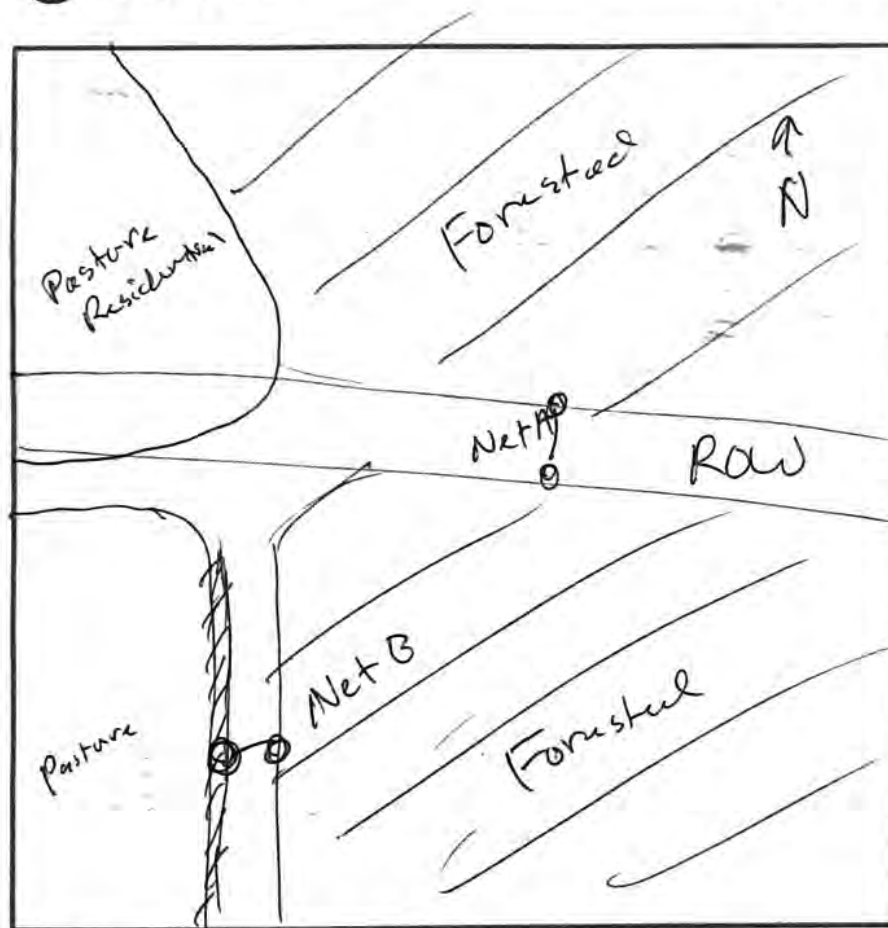
No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	Lasius borealis	21:00	J	F	NR	40.5	11	0	A	5		mass - 11g
2	Lasius borealis	21:00	A	M	TD	35.9	9	0	B	2		
3	Eptesicus fuscus	21:00	A	F	L	48.2	16	0	B	2.5		
4	Eptesicus fuscus	22:25	J	M	NR	44.9	16	0	BA	5.5		
5	Eptesicus fuscus	22:45	A	M	NR	48.2	18	0	A	2.5		
6	Eptesicus fuscus	22:45	A	FE	PL	22.0	48.0	0	A	2.0		mass + RFA reversed
7	Lasius borealis	22:45	J	F	NR	40.5	8	0	A	5.5		
8	Lasius borealis	23:05	J	FE	NR	41.0	10.5	0	A	6		
9	Lasius borealis	23:15	J	M	TD	41.2	8	0	A	6.5		
10	Lasius borealis	23:45	J	F	NR	41.6	9	0	A	5		
11	Lasius borealis											

¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for escaped bats



Project Name/No.: 172677408 Date: 7-15-22
Site ID: RLM-142-MORGAN Est. Distance to Water (ft): 400

VEGETATION

Primary Habitat Type¹: Mixed Forest

Potential Roost:	Large Trees	Snags	Both	Other (e.g., structure)
Roost Tree Potential:	High	Moderate		Low

Dominant Canopy Species Avg. Canopy DBH range (in): 30
1. E. Red Cedar 2. Q. Alba 3. Carya ovata

Canopy Closure:	Closed (80% +)	Moderate (40 - 80%)	Open (0 - 40%)
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Dominant Subcanopy Species Avg. Subcanopy DBH range (in): 15
1. E. Red Cedar 2. Q. Alba 3. Cornus florida

Sub-Canopy Clutter:	High (60% +)	Moderate (30 - 60%)	Low (0 - 30%)
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Dominant Shrub/Understory Species
1. Sassafras 2. 3.

Shrub/Understory Clutter:	High (60% +)	Moderate (30 - 60%)	Low (0 - 30%)
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STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): Channel Width: Stream Width:
Riparian Width right bank: left bank: Avg. Water Depth:

¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Other Wildlife Observed: EATO, EABL, Coyotes

Additional Comments: Varying structure landscape with native forest adjacent to grazed pasture, residence and open woodland pockets



Bat Capture Datasheet

Page 1 of 1

Project Name/No.: 172677408 Date: 7-17-2022 Biologist(s): Josh Adams, Chris Knab
 Site ID: RLM-142-Morgan County/State: Morgan Moon Phase: Waning Gibbous Sunset: ~~4:00~~ 2:00
 Map Kilometer No./Quad: 142 Latitude: 36.158509 Longitude: 84.829914 Moonrise: - Moonset: 10:56
 General Site Description: Row + ATU Trulivound fence Nets Open: ~~4:00~~ 2:00 Nets Closed: 2:00

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	70.4	0	100
21:00	74.0	0	100
22:00	72.1	0	100
23:00	73.0	0	100
00:00	73.9	0	100
01:00	73.7	0	100

Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	12	3		36.154476	-84.829914				X	Row
B	6	2		36.158733	-84.830150				X	ATU

* One net at full extension ~ 2.5m high

Weather Comments: Cloudy

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	E. fuscus	2145	J	F	NR	45	14	0	A	4		
2	L. borealis	2200	J	F	NR	42	11.5	0	B	4		
3	E. fuscus	2200	A	F	L	50	21	0	A	6		
4	E. fuscus	2200	J	F	NR	44	13.5	0	A	7		
5	E. fuscus	2250	A	-	-	-	17.5	-	B	35		Escaped from hand
6	E. fuscus	2245	J	F	NR	45	16	0	A	35		
7	E. fuscus	2300	A	F	PL	48	19	0	A	35		
8	E. fuscus	2300	A	F	L	50	20.5	0	A	6		
9	E. fuscus	2350	A	F	PL	49	17	0	A	35		
10	E. fuscus	2350	J	M	NR	45	13.5	0	A	3		
11	E. fuscus	0030	J	F	NR	47.5	15.5	0	A	7		
12	L. borealis	0130	A	F	PL	44	14.75	0	A	6		

¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for escaped bats

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Bat Capture Datasheet Pt. II

Page ____ of ____

Project Name/No.: 1726 77408

Date: 7-17-2022

Biologist(s): J. Adams, C. Kuebel

Site ID: RLM-142-Morgan

County/State: Morgan / TN

[illegible]

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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Bat Capture Datasheet

Page 1 of 2

Project Name/No.: Ridgevine / 172677408

Date: 7/15/2022

Biologist(s): Malachie Evans, Ellen Griffin

Site ID: RLM-143-Morgan

County/State: Morgan, TN

Moon Phase: Waning Gibbous/96% Sunset: 19:56

Map Kilometer No./Quad: 143 KM-143

Latitude: 36.1572

Longitude: -84.823070 Moonrise: 22:59 Moonset: 6:29

General Site Description: Perennial stream valley (Little Creek) crossed by existing gasoline ROW
north of Nashville Hwy (SR62) + south of Bernard Hall Ln.

Nets Open: 20:56 **Nets Closed:** 00:50

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	72	0	40%
21:00	65.1	0	40%
22:00	63.5	0	20%
23:00	62.8	0	60%
00:00	63.7	0	60%
01:00	63.6	0	70%

[illegible]

* One net at full extension ~ 2.5m high

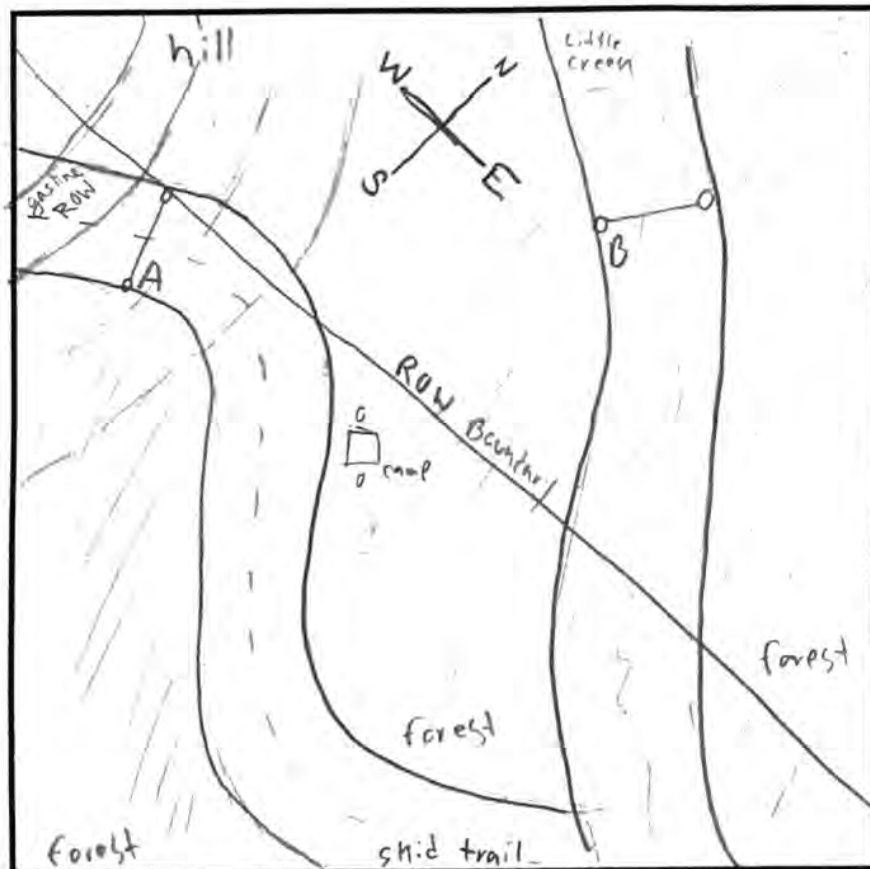
Weather Comments:[illegible]

¹ **Beaufort wind scale.** 0 = smoke rises vertically (< 1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats



¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Project Name/No.: RidgeLine/172677408 Date: 7/15/2022
 Site ID: RLM-143-Morgan Est. Distance to Water (ft): 0'

VEGETATION

Primary Habitat Type¹: Riparian/Bottomland forest
 Potential Roost: Large Trees | Snags | Both | Other (e.g., structure)
 Roost Tree Potential: High | Moderate | Low

Dominant Canopy Species Avg. Canopy DBH range (in): 10-22"
 1. Acer rubrum 2. Quercus alba 3. L. tulipifera

Canopy Closure: Closed (80%+) | Moderate (40-80%) | Open (0-40%)

Dominant Subcanopy Species Avg. Subcanopy DBH range (in): 2-8"
 1. Pinus strobus 2. Cornus florida 3. Oxydendrum arboreum

Sub-Canopy Clutter: High (60%+) | Moderate (30-60%) | Low (0-30%)

Dominant Shrub/Understory Species
 1. rhododendron 2. mountain laurel 3. Hamamelis virginiana

Shrub/Understory Clutter: High (60%+) | Moderate (30-60%) | Low (0-30%)

STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): 3' Channel Width: 18' Stream Width: 13'
 Riparian Width right bank: +200' left bank: +200' Avg. Water Depth: 2.25"

Other Wildlife Observed: barred owl, green frog, misc. fishes, wood thrush,

Additional Comments: Multiple bats observed flying high above canopy.



Bat Capture Datasheet

Page 1 of 1

Project Name/No.: Ridge line/172677408

Date: 7/16/2022

Biologist(s): Malachia Evans

Site ID: RLM-143-Morgan

County/State: Morgan Co., TN

Moon Phase: Waning Gibbous / 90%

Sunset: 19:56

Map Kilometer No./Quad: 113 KM-142

Latitude: 36.157211

Longitude: -84.823070 Moonrise: 22:34

Moonset: 08:44

General Site Description: Perennial stream valley/Little Creek crossed by existing gas line

Nets Open: 19:56

Nets Closed: 08:56

ROW north of Nashville Hwy (SR62) + south of Bernard Hall Ln.

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	75.5	0	0%
21:00	71.7	0	0%
22:00	70.1	0	0%
23:00	68.7	0	0%
00:00	68.3	0	40%
01:00	67.9	5	60%

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments:[illegible]

¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats



Bat Capture Datasheet

Page 1 of 1

Project Name/No.: RIDGELINE 1172677408 Date: 7-18-2022 Biologist(s): TODD McDANIEL
Site ID: RLM-145-MORGAN County/State: MORGAN/TN Moon Phase: WAXING GIBBOUS Sunset: 20:55
Map Kilometer No./Quad: KM-145 Latitude: 36.15502 Longitude: -84.7995 Moonrise: 21:07 Moonset: -
General Site Description: TRAIL NEXT TO PIPELINE ROW Nets Open: 20:57 Nets Closed: 1:57

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	72	0	35%
21:00	71	0	20%
22:00	71	1	0%
23:00	69	1	10%
00:00	59	1	20%
01:00	69	0	5%

Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	6m	5m		36.154924	-84.796333				✓	WOOD LOT 20m x 12m
B	6m	5m		36.154120	-84.795630	✓				

* One net at full extension ~ 2.5m high

Weather Comments: _____

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	labo	25	J	F	N	40	8	0	B	6.5	N/A	N/A

¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

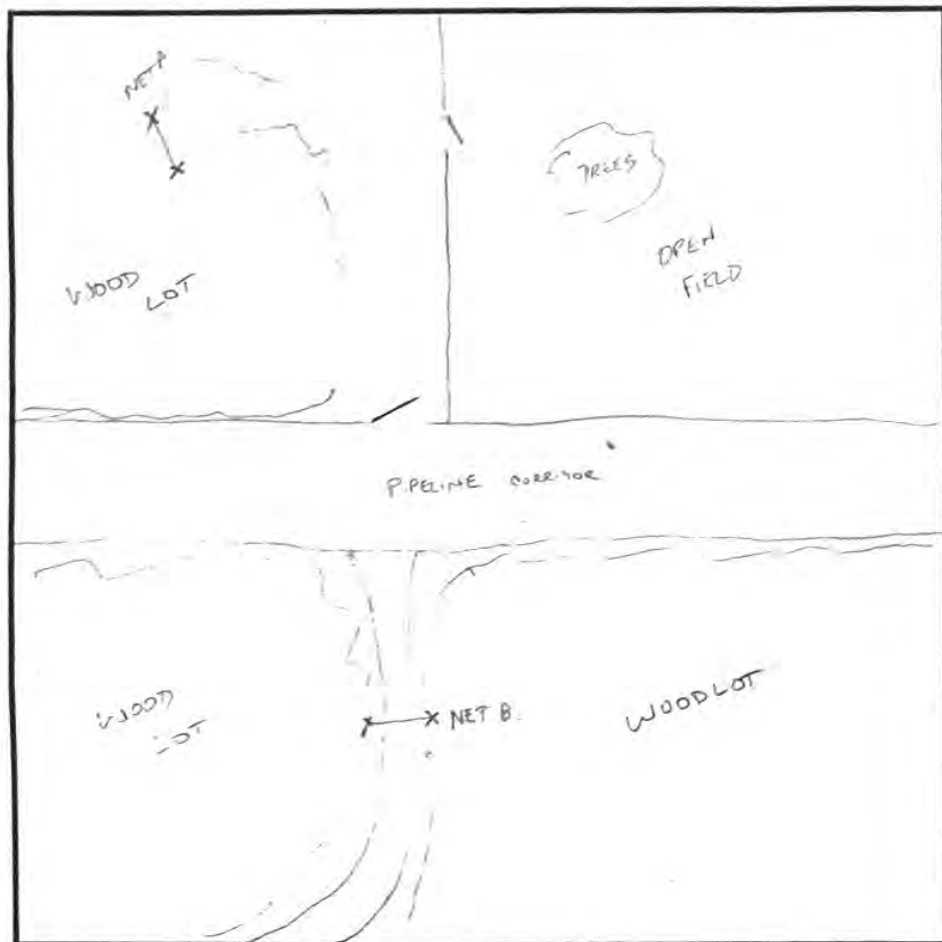
* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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Net Site Description

Page ___ of ___



Project Name/No.: 172677408 RIDGE LINE Date: 7-18-2022
 Site ID: RLM-145-MORGAN Est. Distance to Water (ft): _____

VEGETATION

Primary Habitat Type¹: UPLAND FOREST

Potential Roost:	Large Trees	Snags	Both	Other (e.g., structure)
Roost Tree Potential:	High	Moderate	Low	

Dominant Canopy Species Avg. Canopy DBH range (in): _____
 1. VIRGINIA PINE 2. POPLAR 3. MAPLE

Canopy Closure:	Closed (80% +)	Moderate (40 - 80%)	Open (0 - 40%)

Dominant Subcanopy Species Avg. Subcanopy DBH range (in): _____
 1. CEDAR 2. DOGWOOD 3. _____

Sub-Canopy Clutter:	High (60% +)	Moderate (30 - 60%)	Low (0 - 30%)

Dominant Shrub/Understory Species
 1. _____ 2. _____ 3. _____

Shrub/Understory Clutter:	High (60% +)	Moderate (30 - 60%)	Low (0 - 30%)

STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): _____ Channel Width: _____ Stream Width: _____
 Riparian Width right bank: _____ left bank: _____ Avg. Water Depth: _____

¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Other Wildlife Observed: _____

Additional Comments: _____



Bat Capture Datasheet

Page ___ of ___

Project Name/No.: RIDGELINE/1172677408 Date: 7-19-2022 Biologist(s): Tara H. Lawrence
Site ID: RLM-145-MORGAN County/State: MORGAN/TN Moon Phase: Waning Gibbous Sunset: 20:54
Map Kilometer No./Quad: 1KM-145 Latitude: 36.15502 Longitude: -84.7995 Moonrise: 0030 Moonset: 1259
General Site Description: TRAIL NEXT TO PIPELINE ROW Nets Open: 21:00 Nets Closed: 21:00

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	78	0	80%
21:00	76	0	30%
22:00	75	0	5%
23:00	71	0	0
00:00	70	0	0
01:00	68	0	0

Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
B	6	5		36.154122	-84.795631	✓				
C	9	5		36.153738	-84.795697	✓				

* One net at full extension ~ 2.5m high

Weather Comments: _____

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	Lebo	11:30	A	F	PL	44	13	1	B	1	N/A	

¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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Bat Capture Datasheet

Page 1 of 2

Project Name/No.: Ridgeline/172677408 Date: 3 Aug 2022 Biologist(s): Zachary Baer
Site ID: PLM-146-Morgan County/State: Morgan, TN Moon Phase: Waxing Crescent Sunset: 2041
Map Kilometer No./Quad: MP 90.5 KM 146 Latitude: 36.15493 Longitude: 84.7888 Moonrise: 1221 Moonset: —
General Site Description: Valley near White Creek Nets Open: 2041 Nets Closed: 2225

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	88	1	100
21:00	72	2	100
22:00	71	2	100
23:00	Survey cancelled		
00:00			
01:00			

[illegible]

* One net at full extension ~ 2.5m high

01:00

One tier of full extension - 2.5m high

Weather Comments: Survey Cancelled @ 2225 due to lightning

[illegible]

Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

- Apply band to LEFT arm for females and RIGHT arm for males

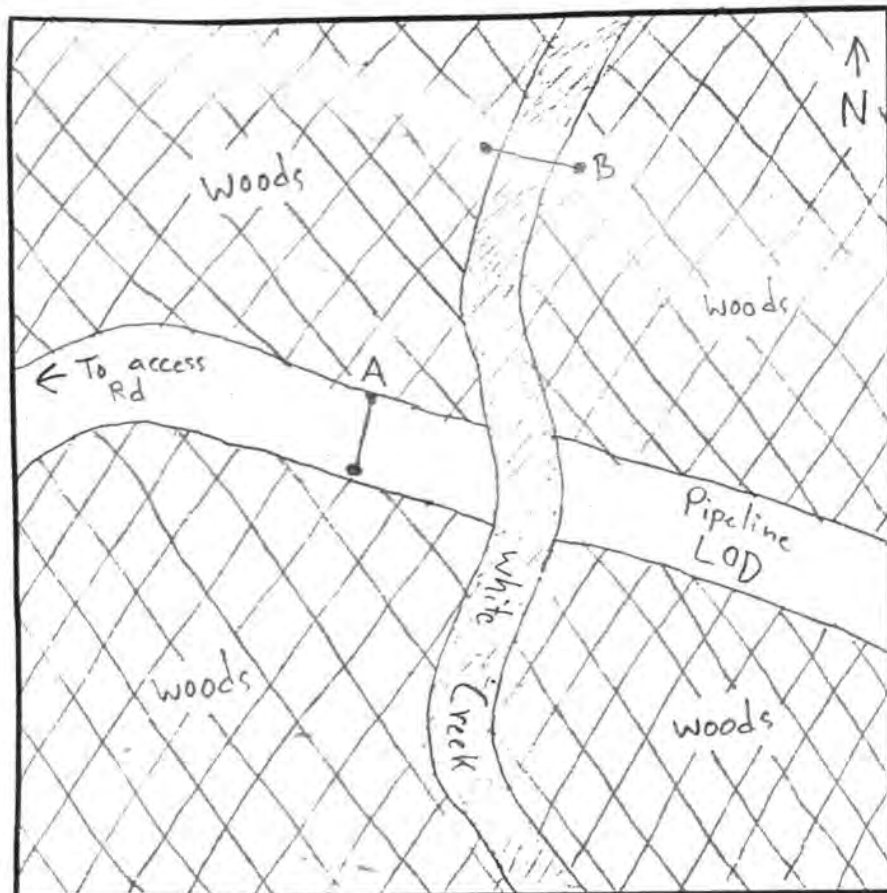
Note: U (unknown) only to be used for **escaped** bats

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Net Site Description

Page 2 of 2Project Name/No.: Ridgeline 172677408Date: 4 Aug 2022Site ID: RLM-146-MorganEst. Distance to Water (ft): 0

VEGETATION

Primary Habitat Type¹: Creek / Riparian

Potential Roost:

Large Trees	Snags	Both	Other (e.g., structure)
High	Moderate	Low	

Roost Tree Potential:

Dominant Canopy Species

Avg. Canopy DBH range (in): 201. Tsuga canadensis 2. Acer rubrum 3. Pinus strobus

Canopy Closure:

Closed (80%+)	Moderate (40-80%)	Open (0-40%)
High (60%+)	Moderate (30-60%)	Low (0-30%)

Dominant Subcanopy Species

Avg. Subcanopy DBH range (in): 121. Tsuga canadensis 2. Acer rubrum 3. Magnolia tripetala

Sub-Canopy Clutter:

Dominant Shrub/Understory Species

1. Tsuga canadensis 2. Kalmia latifolia 3. —Shrub/
Understory Clutter:

High (60%+)	Moderate (30-60%)	Low (0-30%)
High (60%+)	Moderate (30-60%)	Low (0-30%)

STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): 5 Channel Width: 30 Stream Width: 30Riparian Width right bank: — left bank: — Avg. Water Depth: 3

¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Other Wildlife Observed: _____

Additional Comments: _____



Bat Capture Datasheet

Page 1 of 2

Project Name/No.: Ridgetline / 172677408 Date: 4 Aug 2022 Biologist(s): Zachary Boer

Site ID: RLM-146-Morgan County/State: Morgan, TN Moon Phase: Waxing Crescent Sunset: 2042

Map Kilometer No./Quad: MP ~~90.5~~ KM 146 Latitude: 36.15493 Longitude: -84.7888 Moonrise: 1333 Moonset: 0302

General Site Description: Valley near White Creek Nets Open: 2042 Nets Closed: 0142

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	—	—	—
21:00	76	0	80
22:00	72	0	80
23:00	71	0	80
00:00	70	0	40
01:00	69	0	10

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments: 07:00 69 0 10%

[illegible]

Beaufort wind scale. 0 = smoke rises vertically (<1 mph). 1 = wind direction shown by smoke (1-3 mph). 2 = wind felt on face; leaves rustle (4-7 mph). 3 = leaves, twigs in constant motion (8-12 mph). 4 = dust rises; small branches move (13-18 mph). 5 = small trees in leaf begin to sway (19-24 mph)

‡ For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats:

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Project Name/No.: Ridgeline/1172677408 Date: 5 Aug 2022 Biologist(s): Zachary Baer

Site ID: RLM-146-Morgan County/State: Morgan, TN Moon Phase: Waxing Gibbous Sunset: 2039

Map Kilometer No./Quad: ~~4450~~ 5 km-146 Latitude: 36.15493 Longitude: -84.7808 Moonrise: 1443 Moonset: 0033

General Site Description: Valley near White Creek Nets Open: 2039 Nets Closed: 0139

	Time	Temp (F)	Wind ¹	% Cloud Cover
2100	20:00	72	0	80
2200	21:00	71	0	80
2300	22:00	71	0	80
0000	23:00	70	0	80
0100	00:00	70	0	80
0200	01:00	69	0	80

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments:[illegible]

¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

Bat Capture Datasheet

Page of

Project Name/No.: 172677408

Date: 7-18-22

Biologist(s): Eric Smith

Site ID: ELM-147-MORGAN

County/State: MORGAN / TN

Moon Phase: Waning Gibbous

Sunset: 20:56

Map Kilometer No./Quad: KM-147

Latitude: 36, 15 41

Longitude: -84.7794 Moonrise: 2:07

Moonset: 19:10

General Site Description: Pipeline Corridor

Nets Open: 20 07

Nets Closed: 0107

	Time	Temp (F)	Wind ¹	% Cloud Cover
21	20:00	74	1	25
22	21:00	70	1	10
23	22:00	68	1	25
00	23:00	68	0	0
01	00:00	68	0	35
02	01:00	68	1	60

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments:[illegible]

Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

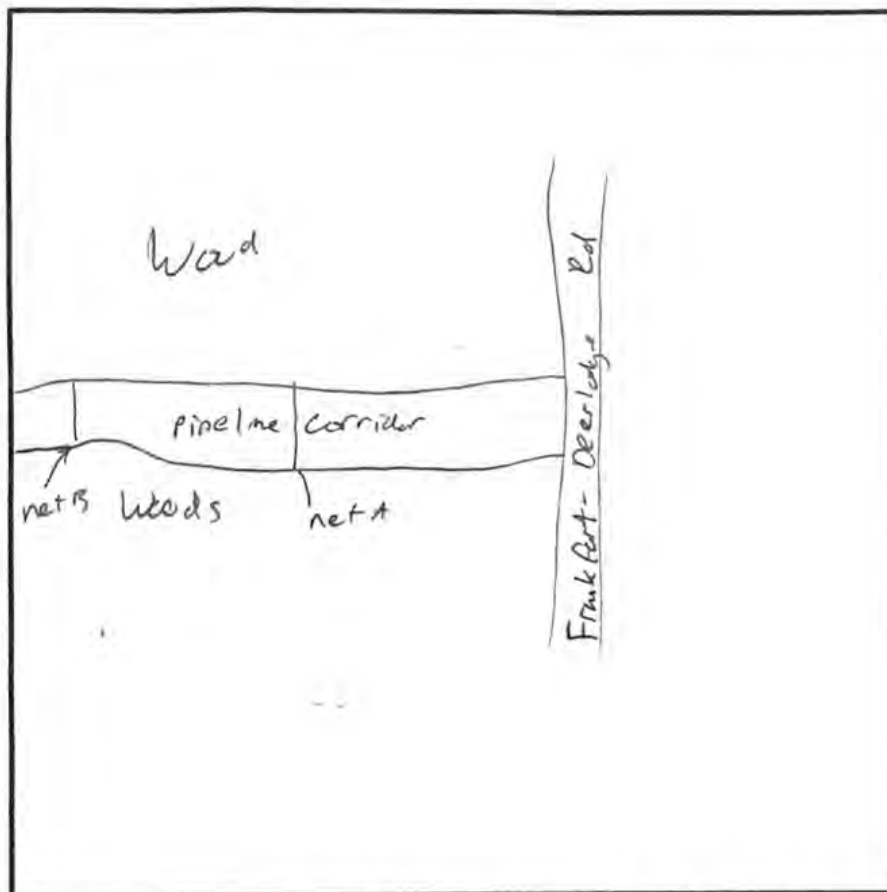
* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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Net Site Description

Page of

Project Name/No.: 172677408 Date: 7-18-22
Site ID: RLM-147-MORGAN Est. Distance to Water (ft): 100

VEGETATION

Primary Habitat Type¹: UPLAND FOREST
Potential Roost: Large Trees | Snags | Both | Other (e.g., structure)
Roost Tree Potential: High | Moderate | Low

Dominant Canopy Species Avg. Canopy DBH range (in): 14
1. Red oak 2. Red maple 3.

Canopy Closure: Closed (80%+) | Moderate (40-80%) | Open (0-40%)

Dominant Subcanopy Species Avg. Subcanopy DBH range (in): 10
1. SL. ALBIDUM 2. A. RUBRUM 3.

Sub-Canopy Clutter: High (60%+) | Moderate (30-60%) | Low (0-30%)

Dominant Shrub/Understory Species
1. Catbrier 2. Red oak 3.

Shrub/Understory Clutter: High (60%+) | Moderate (30-60%) | Low (0-30%)

STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): Channel Width: Stream Width:

Riparian Width right bank: left bank: Avg. Water Depth:

¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Other Wildlife Observed: Flying squirrel

Additional Comments:



Bat Capture Datasheet

Page ____ of ____

Project Name/No.: 172677408

Date: 7/19/22

Biologist(s): Eric Smith

Site ID: LLM-147 - MORGAN

County/State: MORGAN / TN

Moon Phase: WANING GIBBONS Sunset: 20:55

Map Kilometer No./Quad: KM-147

Latitude: 36.1541 Long: 121.7773

Longitude: -84.77° Moonrise: 0030 Moonset: 1259

General Site Description: Pipeline ROW corridor

Nets Open: 2100 Nets Closed: 0200

	Time	Temp (F)	Wind ¹	% Cloud Cover	Net ID (A, B,...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
21	20:00	77	1	20	A	9	7.5							X	LOW CORRIDOR
22	21:00	75	2	40	B	12	7.5							X	LOW CORRIDOR
23	22:00	74	1	10											
24	23:00	73	1	5											
	00:00	73	1	0											
	01:00	73	1	10											

* One net at full extension ~ 2.5m high

* One net at full extension ~ 2.5m high

Weather Comments:[illegible]

Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face: leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises: small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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Bat Capture Datasheet

Page 1 of 2

Project Name/No.: Ridgeline Bat Survey / 173677468 Date: 07/18/2022 Biologist(s): Zachary Rapp, Allen Houston, Cate Burton
Site ID: RLM-148-Morgan County/State: Morgan/TN Moon Phase: Waxing gibbous Sunset: 2053 0635
Map Kilometer No./Quad: 91.8 KM-148 Latitude: 36.152899 Longitude: -84.775935 Moonrise: 02:07 Moonset: —
General Site Description: South of Route 62 + Barnett Bridge Rd intersection Nets Open: 2053 Nets Closed: 0153
along pipeline right-of-way

Time	Temp (F)	Wind ¹	% Cloud Cover	Net ID (A, B,)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
20:00	71	0	90%	A	9	7.8	70.2	36.153644	-84.776296				X	Field edge
21:00	69	0	15%	B	12	5.2	62.4	36.153653	-84.776259				X	Field edge
22:00	68	0	20%											
23:00	67	0	10%											
00:00	68	0	20%											
01:00	67	0	20%											

* One net at full extension ~ 2.5m high

Weather Comments:

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt In Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	EPFU	2123	A	M	NR	50	17.5	0	A	4.5	—	—
2	EPFU	2100	J	M	NR	50	16.5	0	A	3.0	—	—
3	EPFU	2225	J	M	NR	48	17.25	0	A	2.5	—	—
4	EPFU	2225	J	F	NR	47	17.25	0	A	3.5	—	—
5	EPFU	2225	A	F	PL	49	19.5	0	A	4.0	—	—
6	EPFU	2225	A	M	NR	45	19.5	0	A	5.0	—	—
7	LABO	2255	J	F	NR	41	11.25	0	A	3.5	—	—
8	LABO	0031	J	M	NR	40	10.0	0	B	4.0	—	—
9	EPFU	0153	A	M	NR	47	18.0	0	A	2.5	—	—

¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for escaped bats

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Bat Capture Datasheet

Page 1 of 2

Project Name/No.: Ridgeline / 172677458 Date: 07/19/2023 Biologist(s): Zachary Baer, Ellen Houston, Kate Burton
 Site ID: RLM-148-Morgan County/State: Morgan/WV Moon Phase: Waxing gibbous Sunset: 2054
 Map Kilometer No./Quad: ~~512~~ KM 148 Latitude: 36.152856 Longitude: -84.775935 Moonrise: 0030 Moonset: 1259
 General Site Description: South of Rt. 62 + Barnett Bridge Rd. intersection Nets Open: 2054 Nets Closed: 0154
along pipeline corridor

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	79	0	90%
21:00	76	0	75%
22:00	75	0	40%
23:00	73	0	10%
00:00	72	0	0%
01:00	71	0	0%

Net ID (A, B,.)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	9	7.8	70.2	36.153044	-84.776290				X	pipeline corridor
B	12	5.2	62.4	36.153653	-84.776259				X	Field edge

* One net at full extension ~ 2.5m high

* One net at full extension ~ 2.5m high

Weather Comments:[illegible]

¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

Project Name/No.: RidgeLine/172677408 Date: 7/20/22 Biologist(s): Eric Smith

Site ID: ELM-149 - MORGAN County/State: MORGAN/TN Moon Phase: WAXING GIBBOUS Sunset: 20:54

Map Kilometer No./Quad: KM-149 Latitude: 36° 14' 03.76 Longitude: -84.758515 Moonrise: 0056 Moonset: 1401

General Site Description: FARM ROAD OFF OF ISLAND FORD RD Nets Open: 20:54 Nets Closed: 2205

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	84	2	20
21:00	82	2	30
22:00	SURVEY CANCEL		
23:00			
00:00			
01:00			

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments:[illegible]

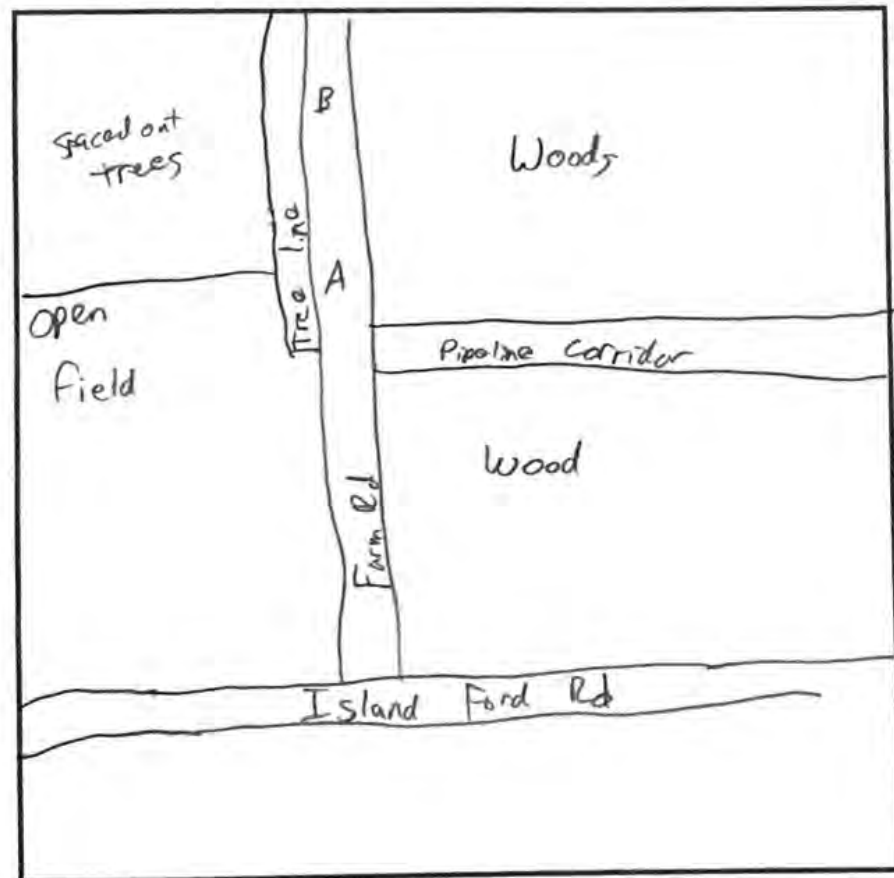
¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

Net Site Description

Page of

Project Name/No.: 172677408 Ridge Line Date: 7/20/22
Site ID: RLM-149 - MORGAN Est. Distance to Water (ft):

VEGETATION

Primary Habitat Type¹: UPLAND FOREST
Potential Roost: Large Trees | Snags | Both | Other (e.g., structure)
Roost Tree Potential: High | Moderate | Low
Dominant Canopy Species Avg. Canopy DBH range (in): 4
1. Tulip Poplar 2. Red oak 3. Red Maple
Canopy Closure: Closed (80%+) | Moderate (40-80%) | Open (0-40%)
Dominant Subcanopy Species Avg. Subcanopy DBH range (in):
1. ACER RUBRUM 2. L. TULIPIFERA 3.
Sub-Canopy Clutter: High (60%+) | Moderate (30-60%) | Low (0-30%)
Dominant Shrub/Understory Species
1. 2. 3.
Shrub/Understory Clutter: High (60%+) | Moderate (30-60%) | Low (0-30%)

STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): Channel Width: Stream Width:
Riparian Width right bank: left bank: Avg. Water Depth:
¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Other Wildlife Observed:

Additional Comments:



Bat Capture Datasheet

Page ___ of ___

Project Name/No.: 172677408 Ridge Line Date: 7/21/22 Biologist(s): Eric Smith
 Site ID: RLM-149 - MORGAN County/State: MORGAN/TN Moon Phase: WANING CRESCENT Sunset: 20:54
 Map Kilometer No./Quad: KM-149 Latitude: 36.14034 Longitude: -84.7585 Moonrise: 0124 Moonset: 1508
 General Site Description: Farm Road Nets Open: 20:54 Nets Closed: 1521

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	77	1	30
21:00	74	0	20
22:00	72	1	0
23:00	71	1	40
00:00	70	0	10
01:00	69	0	50

Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	6	7.5		36.140589	-84.758625	X				FARM RD
B	9	5		36.140910	-84.758651	X				FARM RD

* One net at full extension ~ 2.5m high

Weather Comments: _____

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	LABO	10:05	A	F	NR	40	11	0	B	2.5		
2	LABO (escape)	10:05							A	2		
3	LABO	10:35	A	F	NR	42	12	0	B	3		
4	LABO	10:45	J	M	NR	38	8	0	A	3.5		
5	EPFU	10:55	A	M	TD	47	17.5	0	B	3		
6	-LABO	10:55	A	F	NR	40	10	0	B	3		
7	LABO	10:55	A	M	TD	40	11	0	B	2.5		
8	LABO	10:55	J	M	NR	38	8.5	0	A	2.5		
9	EPFU	11:35	A	M	TD	46	19	0	A	3.5		
10	LABO	11:55	A	F	NR	40	12	0	B	2.5		
11	LABO	12:40	A	M	TD	38	12	0	A	3		

¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for escaped bats

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Bat Capture Datasheet

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Project Name/No.: RIDGELINE/171677408 Date: 7/23/2022 Biologist(s): TOON M. DENIEL
 Site ID: KLM-149 - MORGAN County/State: MORGAN/TN Moon Phase: WAXING CRESCENT 23% Sunset: 8:50
 Map Kilometer No./Quad: KM-149 Latitude: 36.14034 Longitude: -84.7585 Moonrise: 1:42 Moonset: —
 General Site Description: FARM ROAD OFF ISLAND FIELD RD Nets Open: 20:50 Nets Closed: 2:00

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00			
21:00	73	1	20
22:00	71	0	0
23:00	69	0	0
00:00	68	0	0
01:00	68	0	0

Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	6	7.5		36.140584	-84.758625	✓				FARM ROAD
B	9	5		36.140910	-84.758651	✓				FARM ROAD

* One net at full extension ~ 2.5m high

Weather Comments: 2:00 68° 0 0

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	EPFU	22:30	A	M	TD	46	16.5	0	A	5		
2	EPFU (escape)	22:30	U	U					A	4		
3	LABO (escape)	22:30	U	U					B	3		
4	EPFU	23:00	A	M	TD	47	18.5	0	B	1		WH. HORSE
5	EPFU	23:00	A	F	NR	50	22.5	0	B	5		
6	LABO	23:20	A	M	TD	39	11.5	0	A	6		
7	LABO	23:20	J	F	NR	41	11.5	0	A	2		
8	LABO	23:30	J	F	NR	40	10.5	0	A	5		
9	EPFU	00:20	A	M	TD	49	19.5	0	B	4		
10	LABO	00:50	J	F	NR	39	8.5	0	A	5		
11	EPFU	00:50	A	F	PL	49	20.5	0	A	4		
12	EPFU	02:00	A	M	TD	48	19.5	0	A	U		

¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for escaped bats

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Bat Capture Datasheet

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Project Name/No.: Ridgeline/172677408 Date: 07/20/2022 Biologist(s): Zack Baer, Eben Houston, Cate Burton
Site ID: RLM-150-Morgan County/State: Morgan/TN Moon Phase: Waning gibbous Sunset: 2054
Map Kilometer No./Quad: ~~9249~~ KM-150 Latitude: 36.138248 Longitude: -84.754506 Moonrise: 19056 Moonset: 1401
General Site Description: Northeast of Island Ford Rd along pipeline corridor Nets Open: 2054 Nets Closed: 2205

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00			
21:00	82	0	20%
22:00	Survey	Cancelled	
23:00			
00:00			
01:00			

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments:

Survey Cancelled @ 2205 due to lightning

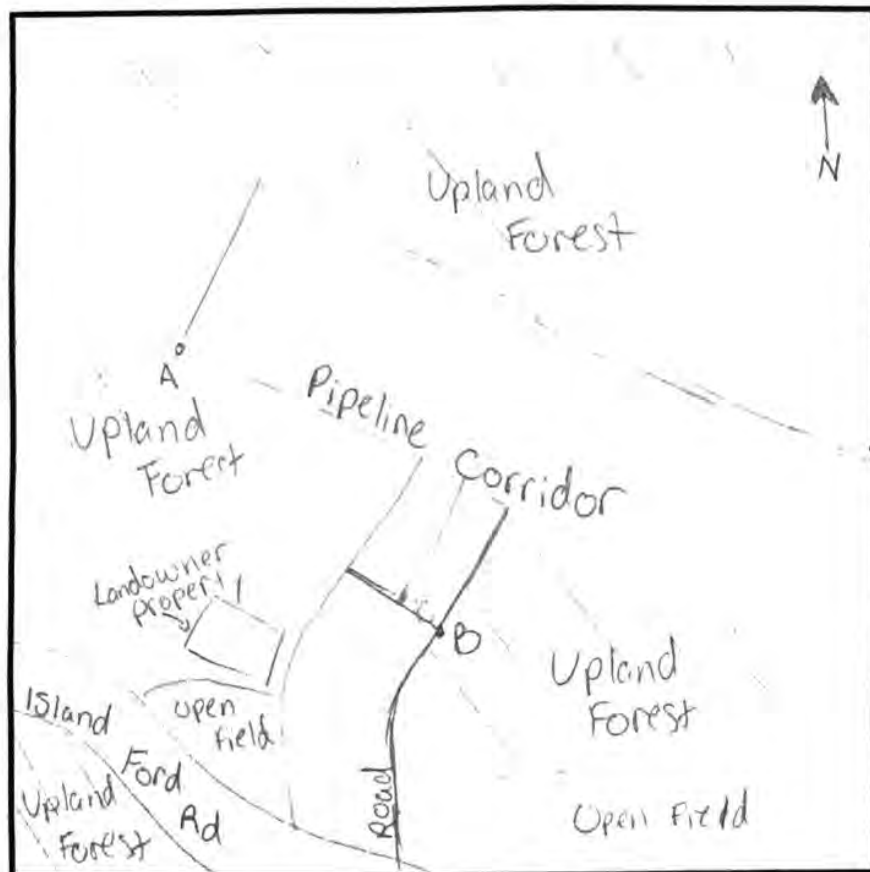
[illegible]

¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats



¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Project Name/No.: Ridgeline/172677408 Date: 07/20/2022
Site ID: RLM-150-Morgan Est. Distance to Water (ft): 350ft

VEGETATION

Primary Habitat Type¹: Upland Forest
Potential Roost: Large Trees | Snags | Both | Other (e.g., structure)
Roost Tree Potential: High | Moderate | Low

Dominant Canopy Species Avg. Canopy DBH range (in): 10.0
1. P. virginiana 2. Q. alba 3. C. tomentosa

Canopy Closure: Closed (80%+) | Moderate (40-80%) | Open (0-40%)

Dominant Subcanopy Species Avg. Subcanopy DBH range (in): 5.0
1. A. rubrum 2. N. sylvatica 3. O. arboreum

Sub-Canopy Clutter: High (60%+) | Moderate (30-60%) | Low (0-30%)

Dominant Shrub/Understory Species
1. L. opaca 2. 3.

Shrub/Understory Clutter: High (60%+) | Moderate (30-60%) | Low (0-30%)

STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): Channel Width: Stream Width:

Riparian Width right bank: left bank: Avg. Water Depth:

Other Wildlife Observed:

Additional Comments:



Bat Capture Datasheet

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Project Name/No.: Ridgeline/172677408 Date: 07/20/2022 Biologist(s): Zack Eager, Ellen Houston, Cole Burton
 Site ID: RLM-150-Morgan County/State: Morgan/TN Moon Phase: Waning Crescent Sunset: 2053 0839
 Map Kilometer No./Quad: 92.9 KM-150 Latitude: 36.138748 Longitude: -84.754506 Moonrise: 0824 Moonset: 1908
 General Site Description: Northeast of Island Ford Rd along pipeline corridor Nets Open: 2053 Nets Closed: 0153

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00			
21:00	77	0	35%
22:00	74	0	15%
23:00	73	0	25%
00:00	72	0	120%
01:00	70	0	50%

Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	9	7.8	70.2	36.138739	-84.754849				X	pipeline corridor
B	6	5.2	31.2	36.138551	-84.754869	X				

* One net at full extension - 2.5m high

Weather Comments: 100% → 02:00 Temp: 71 Wind: 0 % Cloud Cover: 100%

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	LABO	2149	J	M	NR	40	9.5	0	A	3.5	—	—
2	EPFU	2230	A	F	L	48	19.0	0-P	A	4.5	—	healed tear in right wing
3	EPFU	2254	A	M	NR	48	17.0	0	A	3.0	—	—
4	LABO	2254	J	M	NR	41	10.0	0	A	5.5	—	—
5	LABO	2254	A	M	NR	42	12.75	0	A	6.0	—	—
6	LABO	2340	A	M	NR	39	10.75	0	A	4.0	—	—
7	EPFU	0015	A	F	PL	51	20.75	0-P	A	6.0	—	large tear right wing
8	LABO	0045	A	M	NR	40	11.0	0	A	5.0	—	—
9	LABO	0120	J	F	NR	42	11.25	0	A	5.0	—	—
10	EPFU	0120	J	F	NR	47	19.5	0	A	6.0	—	—
11	LABO	0135	J	F	NR	43	11.0	0	B	3.0	—	—

¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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Bat Capture Datasheet

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Project Name/No.: Ridgeline/172677408 Date: 07/22/2022 Biologist(s): Zack Baer, Ellen Houston, Cole Burton
 Site ID: RLM-150-Morgan County/State: Morgan/TN Moon Phase: Waning Crescent Sunset: 2053 0640
 Map Kilometer No./Quad: 92.4 KM-150 Latitude: 36.138748 Longitude: -84.75486 Moonrise: 0152 Moonset: 1606
 General Site Description: Northeast of Sand Ford Rd. along pipeline corridor Nets Open: 2053 Nets Closed: 0153

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00			
21:00	79	0	5%
22:00	75	0	0%
23:00	74	0	0%
00:00	73	0	0%
01:00	72	0	0%

Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	9	7.8	70.2	36.138739	-84.754849				X	pipeline corridor
B	6	5.2	31.2	36.138551	-84.754869	X				

* One net at full extension - 2.5m high

Weather Comments: 2.100 72° 0 wind 0% cloud cover

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	EPFU	2215	J	F	NR	48	17.5	0	A	6.0	—	—
2	EPFU	2245	A	M	NR	50	19.25	0	A	5.0	—	—
3	EPFU	2330	J	F	NR	49	18.25	0	A	4.5	—	—
4	LABO	2345	A	M	NR	40	10.5	0	A	2.5	—	—
5	LABO	0005	J	F	NR	43	11.25	0	A	2.0	—	—
6	LABO	0106	U	U	U	—	—	—	A	2.5	—	escaped from net
7	LABO	0153	J	M	NR	40	11.0	0	A	2.5	—	—

¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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Bat Capture Datasheet

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Project Name/No.: RIDGE LIFE / 1172677408

Date: 7/21/2022

Biologist(s): Todd A. Linsley

Site ID: 13ELM-151- MORGAN

County/State: MORGAN / TN

Moon Phase: waning crescent

Sunset: 2052

Map Kilometer No./Quad: EM-151

Latitude: 36.135595

Longitude: -84.742883

Moonrise: 0124

Moonset: 1508

General Site Description: Pipeline corridor with stream running through

Nets Open: 20:52

Nets Closed: 0152

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	77	0	30
21:00	74	0	20
22:00	72	0	0
23:00	71	0	40
00:00	70	0	10
01:00	69	0	50

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments:[illegible]

Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

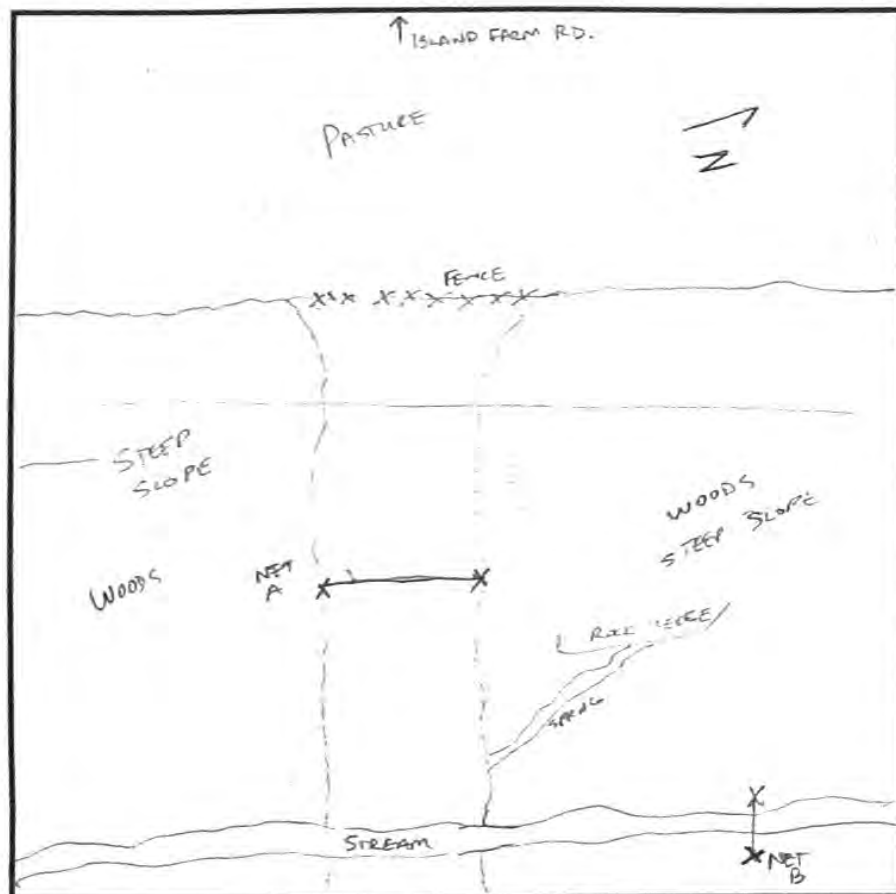
² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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Project Name/No.: 172677408 Date: 7/21/2022
 Site ID: RLM-151-MORGAN Est. Distance to Water (ft): 0

VEGETATION

Primary Habitat Type¹: Bottom Land Forest, Creek
 Potential Roost:

Large Trees	Snags	Both	Other (e.g., structure)
-------------	-------	------	-------------------------

 Roost Tree Potential:

High	Moderate	Low
------	----------	-----

 Dominant Canopy Species 1. Hemlock 2. Walnut 3. Poplar Avg. Canopy DBH range (in): _____
 Canopy Closure:

Closed (80%+)	Moderate (40-80%)	Open (0-40%)
---------------	-------------------	--------------

 Dominant Subcanopy Species 1. _____ 2. _____ 3. _____ Avg. Subcanopy DBH range (in): _____
 Sub-Canopy Clutter:

High (60%+)	Moderate (30-60%)	Low (0-30%)
-------------	-------------------	-------------

 Dominant Shrub/Understory Species 1. Spicebush 2. _____ 3. _____
 Shrub/Understory Clutter:

High (60%+)	Moderate (30-60%)	Low (0-30%)
-------------	-------------------	-------------

STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): 2 Channel Width: 10 Stream Width: 6
 Riparian Width right bank: _____ left bank: _____ Avg. Water Depth: 3 in

¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Other Wildlife Observed: _____

Additional Comments: NET A IS ONLY 2 POLES HIGH DUE TO HORNETS NET LOCATED IN THE TREE WHERE NET WAS PLACED.



Bat Capture Datasheet

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Project Name/No.: RIDGELINE/172677408

Date: 7/22/2022

Biologist(s): TODD MEDWEE

Site ID: ~~151~~ RLM-151-MORGAN

County/State: MORGAN / TN

Moon Phase: Waxing (growing)

Sunset: 72:53

Map Kilometer No./Quad: KM-151

Latitude: 36.135595

Longitude: -84.742883 Moonrise: 1:52

Moonset: 1606

General Site Description: PAPER MILL ROAD OFF ISLAND ROAD THROUGH PAPER MILL

Nets Open: 20.52

Nets Closed: 052

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00		0	0
21:00	79	1	0
22:00	75	0	0
23:00	74	0	0
00:00	73	1	0
01:00	72	0	0

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments:

[illegible]

Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats



Bat Capture Datasheet

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Project Name/No.: RIDGELINE 1172677468 Date: 7/24/2022 Biologist(s): Tom McDANIEL
Site ID: RLM-15Z-MORGAN County/State: MORGAN/TN Moon Phase: WAXING CRESCENT Sunset: 20:50
Map Kilometer No./Quad: KM152 Latitude: 36.133983 Longitude: -84.733691 Moonrise: _____ Moonset: _____
General Site Description: TRAIL NEXT TO PIPELINE CORRIDOR Nets Open: 20:51 Nets Closed: 1:51

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00			
21:00	79	0	40%
22:00	77	0	60%
23:00	74	0	60%
00:00	73	0	70%
01:00	72	0	80%

Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	6	5		36.134483	-84.734162				✓	TRAIL IN WOODS
B	6	7.5		36.134468	-84.733534				✓	TRAIL IN WOODS

* One net at full extension ~ 2.5m high

Weather Comments: 2:00 TEMP 72 WIND 0 % CLOUD COVER 50%

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	EPFU	22:00	A	F	PL	49	20.5	0	A	3		

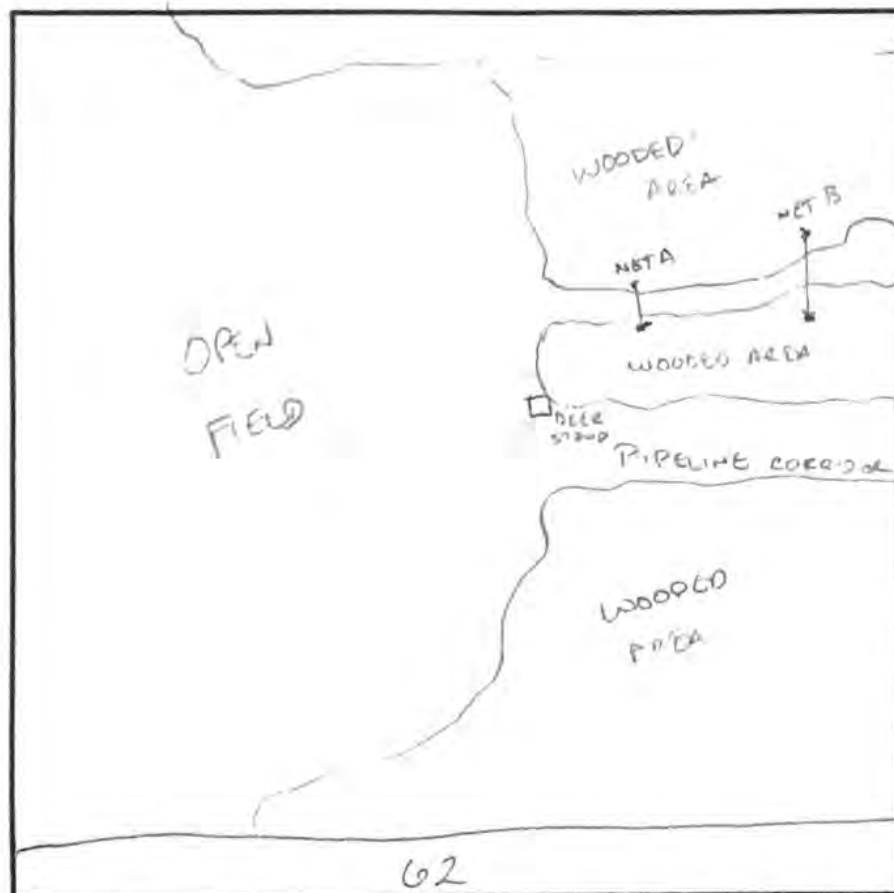
¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph). 1 = wind direction shown by smoke (1-3 mph). 2 = wind felt on face: leaves rustle (4-7 mph). 3 = leaves, twigs in constant motion (8-12 mph). 4 = dust rises; small branches move (13-18 mph). 5 = small trees in leaf begin to sway (19-24 mph)

² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for escaped bats

Net Site Description

Page of

Project Name/No.: 172677408 Date: 7/26/2022
Site ID: RLM-152-MORGAN Est. Distance to Water (ft):

VEGETATION

Primary Habitat Type¹: UPLAND FOREST

Potential Roost: Large Trees | Snags | Both | Other (e.g., structure)

Roost Tree Potential: High | Moderate | Low

Dominant Canopy Species Avg. Canopy DBH range (in):
1. RED OAK 2. WHITE OAK 3.

Canopy Closure: Closed (80%+) | Moderate (40-80%) | Open (0-40%)

Dominant Subcanopy Species Avg. Subcanopy DBH range (in):
1. MAPLE 2. WHITE PINE 3.

Sub-Canopy Clutter: High (60%+) | Moderate (30-60%) | Low (0-30%)

Dominant Shrub/Understory Species
1. HOLLY 2. DOGWOOD 3.

Shrub/Understory Clutter: High (60%+) | Moderate (30-60%) | Low (0-30%)

STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): Channel Width: Stream Width:
Riparian Width right bank: left bank: Avg. Water Depth:

¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Other Wildlife Observed:

Additional Comments:

Bat Capture Datasheet

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Project Name/No.: R. DUANE 1172677408 Date: 7/26/2022 Biologist(s): TOOD McDaniel
Site ID: BLM-152-MORGAN County/State: Morgan/TN Moon Phase: Waning Crescent Sunset: 20:48
Map Kilometer No./Quad: KM-152 Latitude: 36.13983 Longitude: -84.733691 Moonrise: 0522 Moonset: 2036
General Site Description: TRAIL NEXT TO PIPELINE CORRIDOR Nets Open: 20:48 Nets Closed: 1:43

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00			
21:00	76	0	70%
22:00	75	0	20%
23:00	74	0	30%
00:00	73	0	10%
01:00	72	1	0

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments: 2:00 71 temp 0 wind 10 3010-2

[illegible]

Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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Bat Capture Datasheet

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Project Name/No.: ROCKWELL/172677408

Date: 7/27/2022

Biologist(s): TRID M + J. DAVIS

Site ID: RLM-153-MORGAN

County/State: MORGAN/TN

Moon Phase: WANING CRESCENT Sunset: 2049

Map Kilometer No./Quad: KM-153

Latitude: 36.130729

Longitude: -84.72183 Moonrise: 0618 Moonset: 2115

General Site Description: CLEAR CREEK W/IN CROOK FOR

Nets Open: 850 Nets Closed: 1:50

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00			
21:00	78	0	0
22:00	74	0	0
23:00	74	0	0
00:00	73	0	0
01:00	73	1	10%

Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	9	5		36.131749	-84.724219		✓			
B	6	5		36.131307	-84.724041		✓			

* One net at full extension ~ 2.5m high

Weather Comments: 200 72-78 F WIND 30% CLOUD

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	PESH	22:00	A	M	TD	34	6.5	0	A	3	TWRA10588	WNS-
2	PESH	22:40	A	M	TD	34	5.5	0	A	1	TWRA10587	WNS-
3	L320	01:30	J	F	NR	44	11.5	0	B	2		

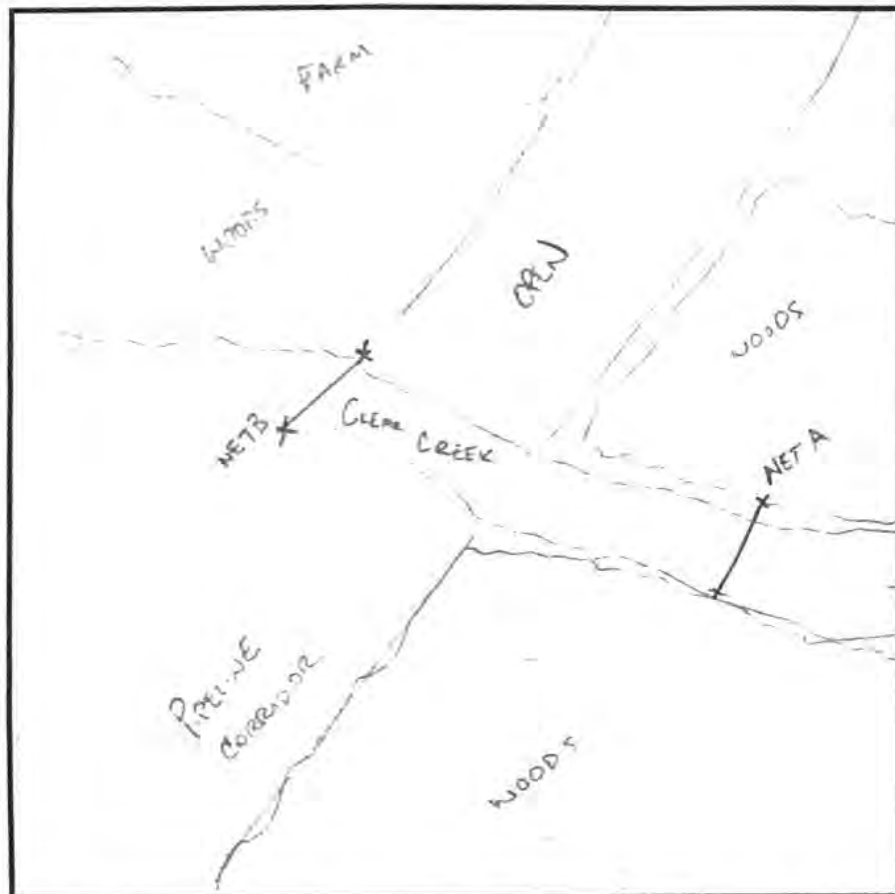
¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph). 1 = wind direction shown by smoke (1-3 mph). 2 = wind felt on face; leaves rustle (4-7 mph). 3 = leaves, twigs in constant motion (8-12 mph). 4 = dust rises; small branches move (13-18 mph). 5 = small trees in leaf begin to sway (19-24 mph)

² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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Project Name/No.: 172677408 Date: 7/27/2022
 Site ID: RLM-153 - MORGAN Est. Distance to Water (ft): 0

VEGETATION

Primary Habitat Type¹: CREEK/RIPARIAN

Potential Roost:

Large Trees	Snags	Both	Other (e.g., structure)
-------------	-------	------	-------------------------

Roost Tree Potential:

High	Moderate	Low
------	----------	-----

Dominant Canopy Species 1. Hemlock 2. Pine 3. Avg. Canopy DBH range (in):

Canopy Closure:

Closed (80%+)	Moderate (40-80%)	Open (0-40%)
---------------	-------------------	--------------

Dominant Subcanopy Species 1. Maple 2. Rhododendron 3. Holly Avg. Subcanopy DBH range (in):

Sub-Canopy Clutter:

High (60%+)	Moderate (30-60%)	Low (0-30%)
-------------	-------------------	-------------

Dominant Shrub/Understory Species 1. Rhododendron 2. H 3.

Shrub/Understory Clutter:

High (60%+)	Moderate (30-60%)	Low (0-30%)
-------------	-------------------	-------------

STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): Channel Width: Stream Width:
 Riparian Width right bank: left bank: Avg. Water Depth:

¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Other Wildlife Observed:

Additional Comments:



Bat Capture Datasheet

Page of

Project Name/No.: Ridgeline/172677408

Date: 7/29/27

Biologist(s): Eric Smith

Site ID: FLM-153 - MORGAN

County/State: Maricopa / AZ

Moon Phase: WAXING CRESCENT Sunset: 20:47

Map Kilometer No./Quad: KM-153

Latitude: X 13 0729

Longitude: -84.72183 Moonrise: 0719 Moonset: 2149

General Site Description: Clear Creek within Corridor

Nets Open: 20:47 Nets Closed: 01:45

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00			
21:00	78	1	40
22:00	72	1	10
23:00	70	1	0
00:00	69	1	0
01:00	68	1	10

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments:[illegible]

¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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Net Site Description

Page ____ of ____

112677408

Project Name/No.: Ridge Line Date: 7/26/20

Site ID: 154 RLM-154-MORGAN Est. Distance to Water (ft): ____

VEGETATION

Primary Habitat Type¹: Upland Forest Upland Forest

Potential Roost: Large Trees Snags Both Other (e.g., structure)

Roost Tree Potential: High Moderate Low

Dominant Canopy Species Avg. Canopy DBH range (in): ____

1. Tulip Poplar 2. Red oak 3. Pine

Canopy Closure: Closed (80%+) Moderate (40-80%) Open (0-40%)

Dominant Subcanopy Species Avg. Subcanopy DBH range (in): ____

1. ____ 2. ____ 3. ____

Sub-Canopy Clutter: High (60%+) Moderate (30-60%) Low (0-30%)

Dominant Shrub/Understory Species

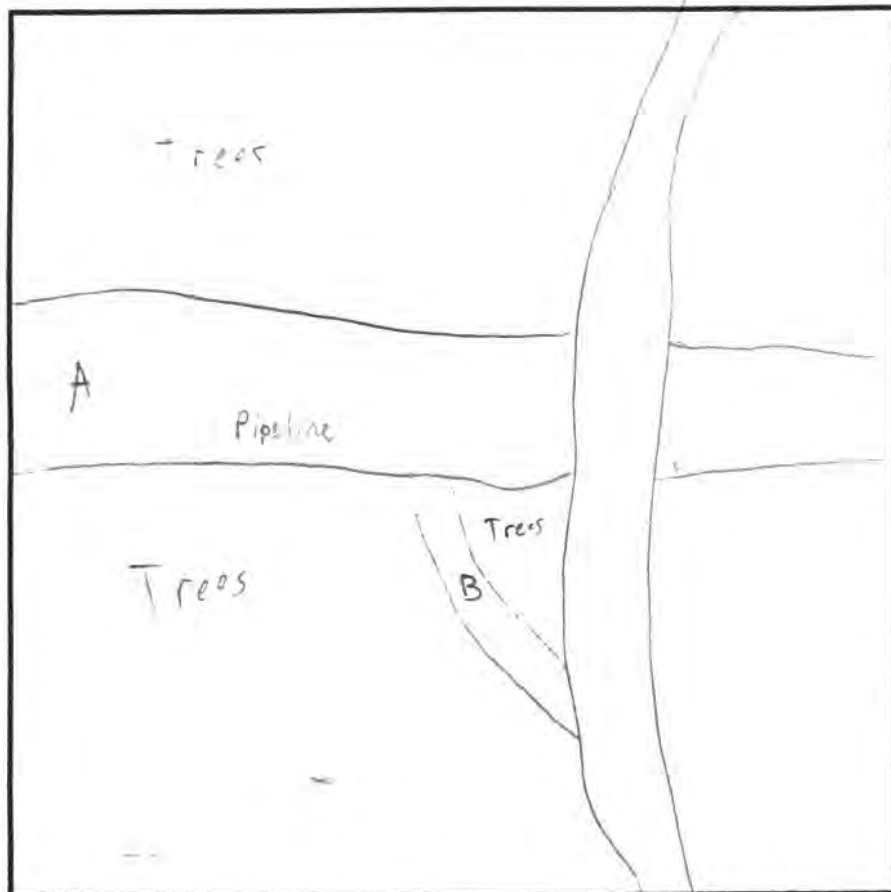
1. ____ 2. ____ 3. ____

Shrub/Understory Clutter: High (60%+) Moderate (30-60%) Low (0-30%)

STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): ____ Channel Width: ____ Stream Width: ____

Riparian Width right bank: ____ left bank: ____ Avg. Water Depth: ____


¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Other Wildlife Observed: ____

Additional Comments: ____



Bat Capture Datasheet

Page ____ of ____

Project Name/No.: Ridgeline 172677408

Date: 7/27/22

Biologist(s): Eric Smith

Site ID: RLM-154 - MORGAN

County/State: Morgan, TN

Moon Phase: WAXING CRESCENT Sunset: 20.48

Map Kilometer No./Quad: KM-154

Latitude: 36 12 44 Longitude: -84 70 587 Moonrise: 0618 Moonset: 2115

General Site Description: Pipeline Corridor and Road Rust Nets Open: 20:48 Nets Closed: 0148

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00		1	10
21:00	78	0	0
22:00	74	0	30
23:00	74	1	10
00:00	77	2	40
01:00	73	1	20

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments: _____

[illegible]

¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face: leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats



Bat Capture Datasheet

Page ___ of ___

Project Name/No.: Bridgeline/172677408 Date: 07/26/2022 Biologist(s): Math Denny, Perry Gardiner
 Site ID: 155-# 24M-155 - MORGAN County/State: Morgan/TN Moon Phase: Waning Crescent, 2.5% Sunset: 2050
 Map Kilometer No./Quad: MP 95.9 KM-155 Latitude: 36.128116 Longitude: -84.702240 Moonrise: 0521 Moonset: 2036
 General Site Description: Pipeline ROW + ATV Trail Nets Open: 2045 Nets Closed: 0150

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	74.4	1	25
21:00	77.3	1	10
22:00	76.9	1	0
23:00	75.4	0	0
00:00	73.2	1	0
01:00	73.6	0	0

Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	12m	7.5m	90m ²	36.129036	-84.702866				X	ROW
B	9m	7.5m	67.5m ²	36.128991	-84.702120				X	ATV trail

* One net at full extension ~ 2.5m high

Weather Comments: Humid

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	LABO	2250	J	F	NR	41.5	12.5	0	A	1	N/A	
2	LABO	2330	J	M	NR	38.5	10.25	0	A	4	N/A	
3	EPFU	0050	A	M	ID	45.2	16.5	0	A	3	N/A	Penia Large for Species.
4	EPFU	0120	J	F	NR	49.1	22.0	0	A	4	N/A	

25.25
11.25

¹ Beaufort wind scale, 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: ID = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for escaped bats

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Net Site Description

Page of

Project Name/No.: Bridge/172677408 Date: 07/26/2022
Site ID: 155 RLM/ISS-MORGAN Est. Distance to Water (ft): 1,000'

VEGETATION

Primary Habitat Type¹: Maintained ROW + MESSGDCV

Potential Roost: Large Trees ☐ Snags ☐ Both (e.g. structure) ☐ Other ☐

Roost Tree Potential: High ☐ Moderate ☐ Low ☐

Dominant Canopy Species
1. Red Maple 2. White Oak 3. Tulip
Avg. Canopy DBH range (in): 14

Canopy Closure: Closed (80%+) ☐ Moderate (40-80%) ☐ Open (0-40%) ☐

Dominant Subcanopy Species
1. Red Maple 2. Tulip 3. Sourwood
Avg. Subcanopy DBH range (in): 3

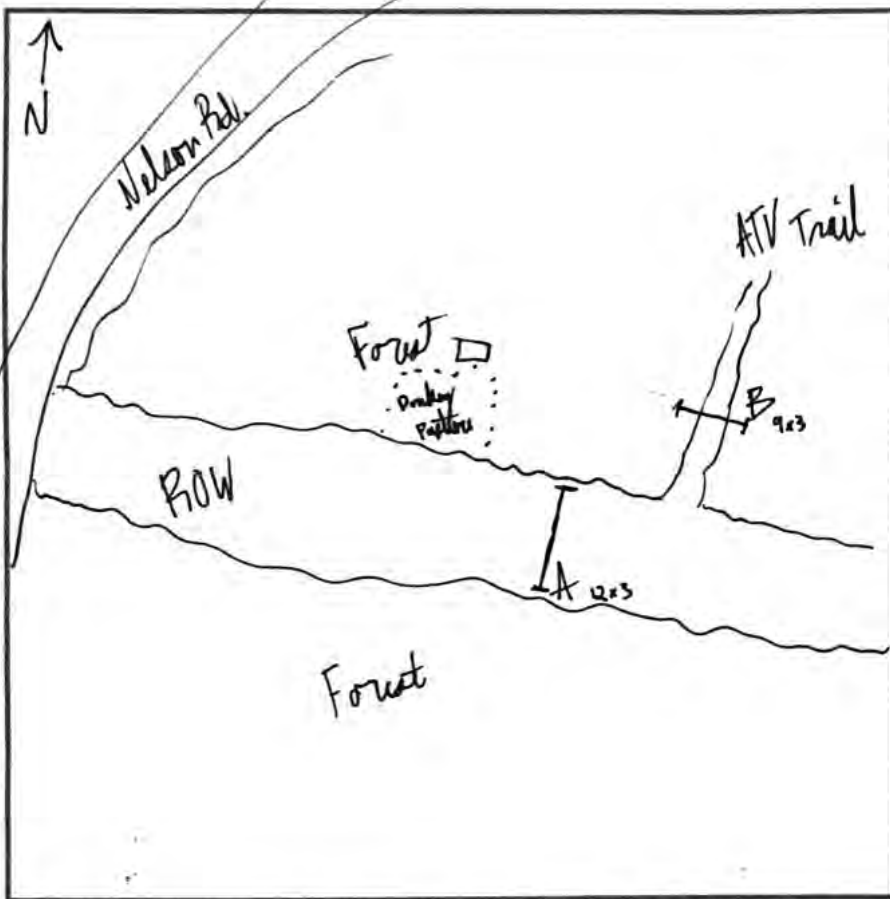
Sub-Canopy Clutter: High (60%+) ☐ Moderate (30-60%) ☐ Low (0-30%) ☐

Dominant Shrub/Understory Species
1. Sassafras 2. Southern Arrowwood 3.

Shrub/Understory Clutter: High (60%+) ☐ Moderate (30-60%) ☐ Low (0-30%) ☐

STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): Channel Width: Stream Width:
Riparian Width right bank: left bank: Avg. Water Depth:


¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Other Wildlife Observed: Imperial Moth, Pigeon Moth, BROW

Additional Comments:



Bat Capture Datasheet

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Project Name/No.: Hydroline, 112612408

Date: 07/27/2022

Biologist(s): Mathew J. Miller, Bryn Gardiner

Site ID: ~~195~~ RLM-155-MORGAN

County/State: Morgan Co. / TN

Moon Phase: Waning Crescent, 0.5%

Sunset: 2049

Map Kilometer No./Quad: KM-155

Latitude: 36.128016

Longitude: -84.702240

Moonrise: 0618

Moonset: 2115

General Site Description: Site No. 1. PIPELINE ROW & ATV TRAIL

Nets Open: 2034

Nets Closed: 0149

Time	Temp (F)	Wind ^t	% Cloud Cover
20:00			
21:00	78.4	0	20%
22:00	77.8	0	30%
23:00	75.7	0	40%
00:00	74.5	0	60%
01:00	75.2	1	40%

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments: Humid

[illegible]

Beaufort wind scale. 0 = smoke rises vertically (<1 mph). 1 = wind direction shown by smoke (1-3 mph). 2 = wind felt on face; leaves rustle (4-7 mph). 3 = leaves, twigs in constant motion (8-12 mph). 4 = dust rises; small branches move (13-18 mph). 5 = small trees in leaf begin to sway (19-24 mph).

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males



Bat Capture Datasheet

Page 1 of 2

Project Name/No.: Pipeline/172677408

Date: 7/29/22

Biologist(s): A. S. Jellena, J. Gillette

Site ID: RUM-159-Morgan

County/State: Morgan/TN

Moon Phase: Waxing Crescent

Sunset: 20:48

Map Kilometer No./Quad: MP 988 KM-159

Latitude: 36.10464

Longitude: -84.66887

Moonrise: 7:19

Moonset: 21:49

General Site Description: Pipeline ROW containing old field, bordered by 2nd growth forest

Nets Open: 20:45

Nets Closed: 1:45

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	76.8	1	90
21:00	74.0	0	70
22:00	72.5	0	50
23:00	71.6	0	30
00:00	70.0	0	30
01:00	70.9	0	30

Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	12M	7.8M	93.6	36.104662	-84.66908	X				Ruts filled w/ water
B	15M	7.8M	117	36.104581	-84.66842	X				

* One net at full extension ~ 2.5m high

Weather Comments: Humid, warm, calm, clearing sky throughout night

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	Epptesicus fuscus	21:30	A	F	NR	47.1	17.5	0	B	7.5	—	
3	Lasiurus borealis	22:00	J	M	NR	37.6	8.75	0	A	7.5	—	
2	Epptesicus fuscus	21:50	A	F	PL	46.5	18.0	0	B	7.1	—	
4	Lasiurus borealis	23:50	J	F	NR	41.0	11.5	0	B	3	—	
5	Epptesicus fuscus	23:50	J	M	NR	46.8	16.5	0	B	3.5	—	
6	Epptesicus fuscus	00:05	J	M	NR	46.2	15.25	0	B	6.0	—	
7	Lasiurus borealis	01:10	J	M	TD	36.2	8.75	0	B	4.5	—	

¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

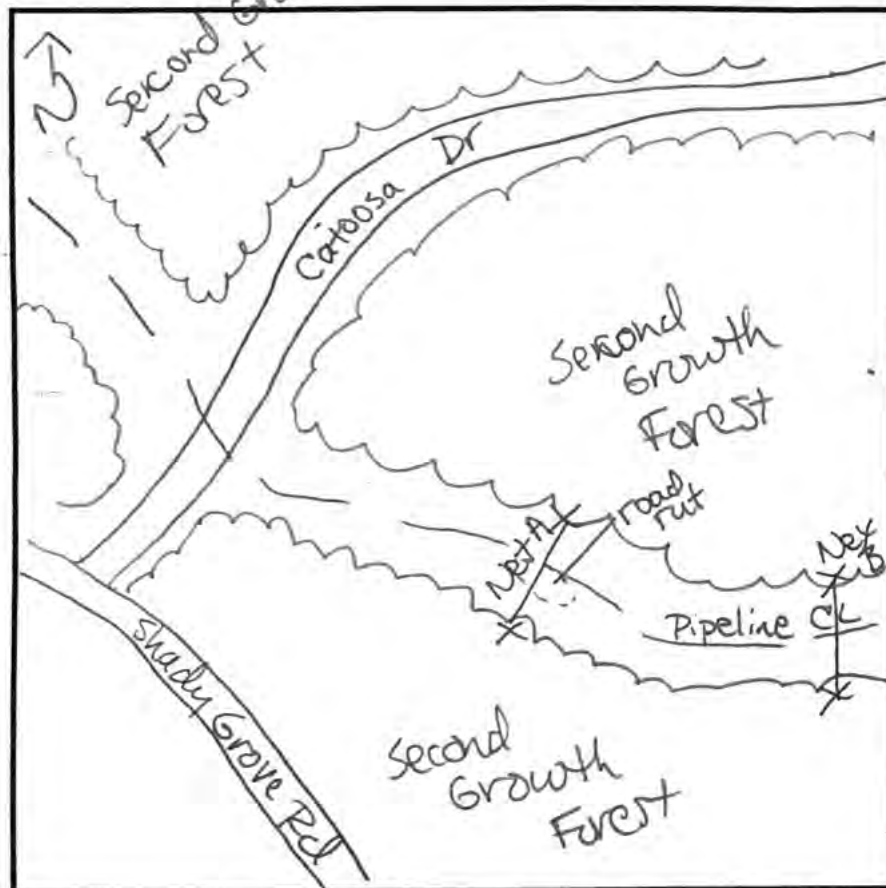
² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for escaped bats

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Project Name/No.: Ridgeline Date: 7/29/22
 Site ID: PLM-159-Morgan Est. Distance to Water (ft): ~300ft

VEGETATION

Primary Habitat Type¹: Upland Forest

Potential Roost:	Large Trees	Snags	Both	Other (e.g., structure)
Roost Tree Potential:	High	Moderate	Low	

Dominant Canopy Species Avg. Canopy DBH range (in): 8-12"
 1. Sugar Maple 2. Hickory 3. White Oak
 Canopy Closure: Closed (80%+) Moderate (40-80%) Open (0-40%)

Dominant Subcanopy Species Avg. Subcanopy DBH range (in): 3-8"
 1. Shadbark Hickory 2. Hickory 3. Sassafras
 Sub-Canopy Clutter: High (60%+) Moderate (30-60%) Low (0-30%)

Dominant Shrub/Understory Species
 1. Flora 2. Hickory 3. Green Ash
 Shrub/Understory Clutter: High (60%+) Moderate (30-60%) Low (0-30%)

STREAM CHARACTERISTICS (if relevant)

N/A

Bank Height (ft): _____ Channel Width: _____ Stream Width: _____
 Riparian Width right bank: _____ left bank: _____ Avg. Water Depth: _____

¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Other Wildlife Observed: YBCU, INBU, coyotes

Additional Comments: _____



Bat Capture Datasheet

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Project Name/No.: Ridgeline 172677408 Date: 7/30/22 Biologist(s): A. Spillema, T. Gillette
 Site ID: RUM-159-Morgan County/State: Morgan/TN Moon Phase: Waxing crescent Sunset: 20:47
 Map Kilometer No./Quad: MP 98.8 KMI 59 Latitude: 36.10464 Longitude: -84.16887 Moonrise: 8:19 Moonset: 22:18
 General Site Description: PIPELINE ROW CONTAINING OLD FIELD, BORDERED BY 2ND GROWTH FOREST Nets Open: 20:45 Nets Closed: 1:45

	Time	Temp (F)	Wind ¹	% Cloud Cover	Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
21:00	20:00	74.4	1	100	A	12M	7.8M	93.6	36.10464	-84.16887	X				Ruts filled w/ water
22:00	21:00	73.0	0	100	B	15M	2.8M	117	36.10458	-84.16882	X				
23:00	22:00	73.7	0	100											
00:00	23:00	71.7	0	100											
01:00	00:00	71.9	0	85											
02:00	01:00	72.0	1	80											

* One net at full extension ~ 2.5m high

Weather Comments: Intermittent drizzle and light fog, overcast early & clearing

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	<i>Eptesicus fuscus</i>	22:05	J	M	NR	46.6	20.5	0	A	5	—	
2	<i>Lasiurus borealis</i>	22:05	—	—	—	—	—	—	A	5.5	—	Escaped from net
3	<i>Eptesicus fuscus</i>	22:30	J	M	NR	47.6	17.5	0	A	5.5	—	
4	<i>Eptesicus fuscus</i>	22:50	J	M	NR	41.7	15.5	0	B	6.5	—	
5	<i>Eptesicus fuscus</i>	22:50	A	F	PL	48.6	23	0	B	7	—	
6	<i>Lasiurus borealis</i>	23:40	A	F	PL	43.2	16.0	0	A	6.5	—	
7	<i>Lasiurus borealis</i>	01:00	—	—	—	—	—	—	A	4.5	—	Escaped net

¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for escaped bats

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Bat Capture Datasheet

Page of

Project Name/No.: Pipeline/172677408

Date: 07/29/2022

Biologist(s): Math Demer, Kerry Gardiner

Site ID: ~~160~~ ZLM-160-MORGAN

County/State: Monroe Co. / TN

Moon Phase: Waxing Crescent, 1.8%

(Sunset: 2048)

Map Kilometer No./Quad: ~~MP 94-11-2~~ KM-160

Latitude: 36.105586

Longitude: -84.662019

Moonsrise: 0718

Moonset: 2148

General Site Description: Existing ROW + ATV trail

Nets Open: 2038

Nets Closed: 0148

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00			
21:00	75.2	1	60%
22:00	73.8	0	40%
23:00	71.1	0	50%
00:00	70.8	0	50%
01:00	70.6	0	70%

Net ID (A, B,.)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	18m	7.5m	135m²	36.105791	-84.662593				X	ROW, over tire ruts / Paddle ATV Trail
B	12m	7.5m	90m²	36.105795	-84.661217				X	
										Photos on Matt's Work Phone.

* One net at full extension ~ 2.5m high

Weather Comments: Humid.

[illegible]

¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

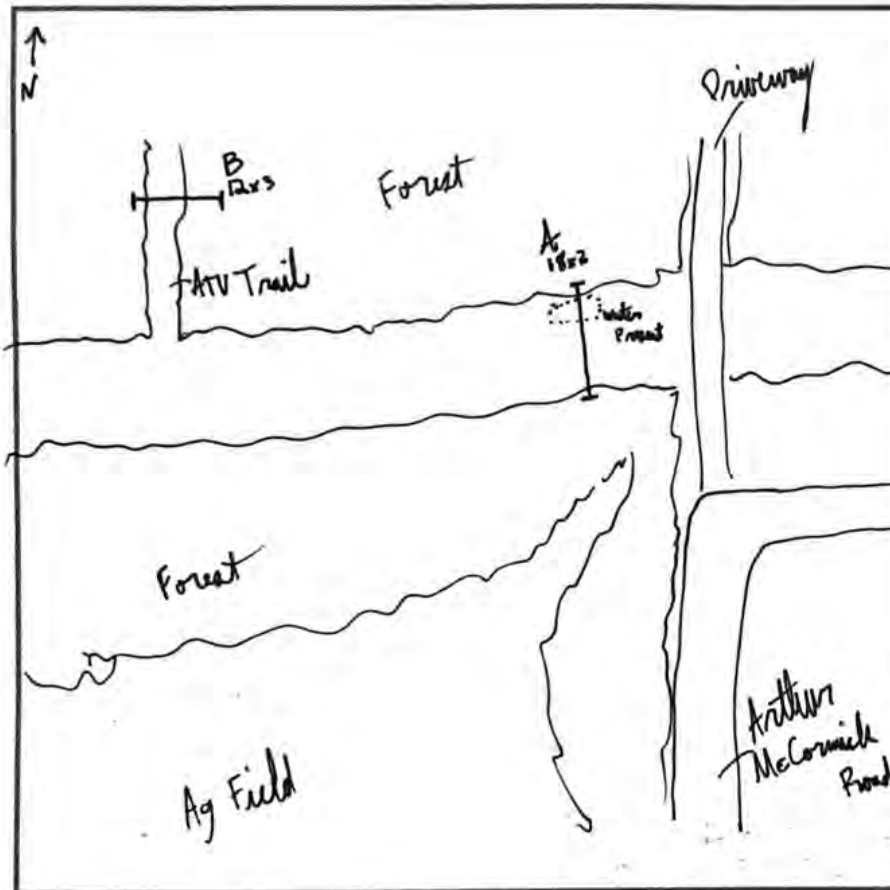
² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

Confidential Data. If found, please return to:

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Project Name/No.: Ridgeline/172677408 Date: 07/29/2022
 Site ID: EUM160 - MORGAN Est. Distance to Water (ft): 0

VEGETATION

Primary Habitat Type¹: MESGDCE
 Potential Roost: Large Trees Snags Both (e.g., structure)
 Roost Tree Potential: High Moderate Low
 Dominant Canopy Species Avg. Canopy DBH range (in): 14"
 1. Red Maple 2. White Oak 3. _____
 Canopy Closure: Closed (80%+) Moderate (40-80%) Open (0-40%)
 Dominant Subcanopy Species Avg. Subcanopy DBH range (in): 3"
 1. White Pine 2. Sour Wood 3. _____
 Sub-Canopy Clutter: High (60%+) Moderate (30-60%) Low (0-30%)
 Dominant Shrub/Understory Species
 1. Sassafras 2. Buch 3. Tulip
 Shrub/Understory Clutter: High (60%+) Moderate (30-60%) Low (0-30%)

STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): _____ Channel Width: _____ Stream Width: _____
 Riparian Width right bank: _____ left bank: _____ Avg. Water Depth: _____

¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Other Wildlife Observed: WOTH, Hercules Beetle, Dolboonfly, Leopard Frog, BDOW, YBCU
 Additional Comments: _____



Bat Capture Datasheet

Page of

Project Name/No.: Kudgelime/12677408

Date: 07/10/2022

Biologist(s): John Vennart, Larry Gardner

Site ID: PLM-160 - MORGAN

County/State: Moore Co. TN

Moon Phase: Waxing Crescent Sunset: 2045

Map Kilometer No./Quad: 11-11-19.2 KM-160

Latitude: 36.105586

Longitude: -84.662019 Moonrise: 0818 Moonset: 2217

General Site Description: Existing ROW + ATV Trail

Nets Open: 2035 Nets Closed: 0145

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00			
21:00	77.2	1	85 %
22:00	75.5	1	90 %
23:00	72.6	0	65 %
00:00	72.2	0	80 %
01:00	71.7	1	70 %

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments: Recent Precip. Very Humid. Intermittent Light Fog

[illegible]

22.0	
11.5	

¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

^d For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats



Bat Capture Datasheet

Page 1 of 2

Project Name/No.: Ridge Line / 172677408Date: 7/30/2022Biologist(s): W. Cunningham, S. ParkerSite ID: RM-161 - MORGANCounty/State: Morgan Co. / TNMoon Phase: Waxing CrescentSunset: 2045 * All times EasternMap Kilometer No./Quad: ~~MP 995~~ KM-161Latitude: N 36.106858Longitude: W 84.655730Moonrise: 0818Moonset: 2217General Site Description: Gravel road / fence gap and pond adjacent to pipelineNets Open: 2040Nets Closed: 0200

2030

Time	Temp (F)	Wind ¹	% Cloud Cover
2030	76.0	Ø	100
21:00	73.9	Ø	100
22:00	72.4	Ø	95
23:00	71.5	Ø	95
00:00	71.4	Ø	95
01:00	71.6	2	95

Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	6m	7.5m		36.105900	-84.657750	X				
B	12m	4.5m		36.106250	-84.657480			X		

* One net at full extension ~ 2.5m high

Weather Comments: Rain from 1900-2000.

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	<i>Eptesicus fuscus</i>	2144	A	F	PL	47.2	19.0	0	A	35	N/A	Photos
2	<i>Eptesicus fuscus</i>	2200	A	F	NR	49.5	21.5	0	A	3.5	N/A	
3	<i>Lasius borealis</i>	2215	A	F	NR	39.3	12.5	0	A	3	N/A	Photos

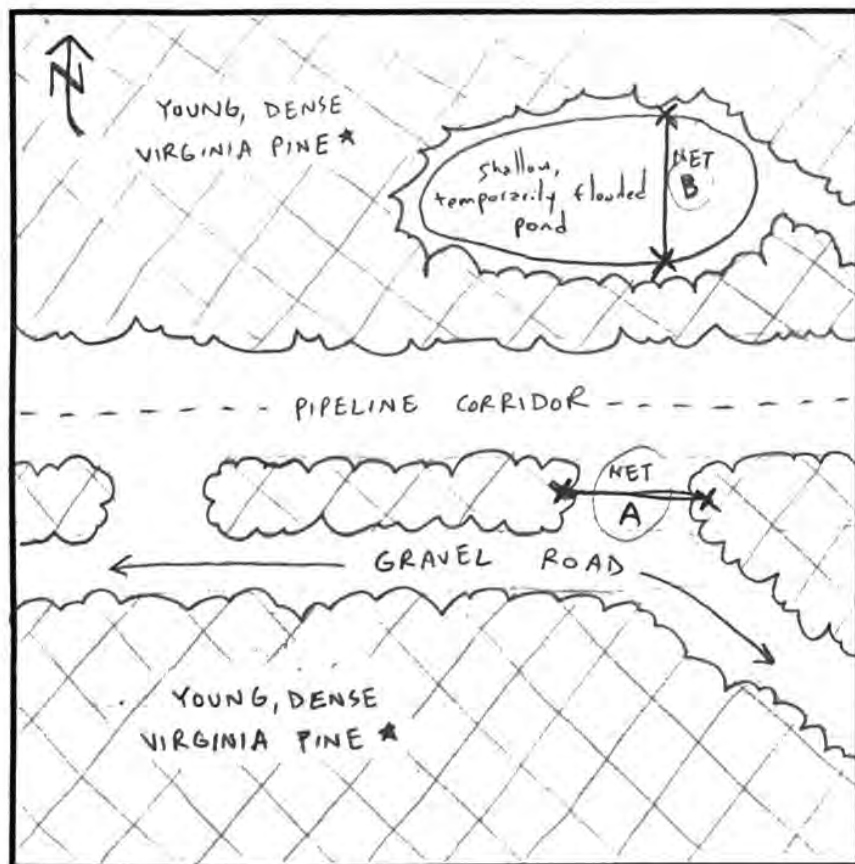
¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for escaped bats

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Project Name/No.: Ridgeview/172677408 Date: 7/30/2022
 Site ID: PAM-161-MORGAN Est. Distance to Water (ft): 0

VEGETATION

Primary Habitat Type¹: Upland Forest & Barrens
 Potential Roost: Large Trees Snags Both Other (e.g., structure)
 Roost Tree Potential: High Moderate Low

Dominant Canopy Species Avg. Canopy DBH range (in): 6-10"
 1. Quercus alba 2. Acer rubrum 3. Carya glabra
 Canopy Closure: Closed (80%+) Moderate (40-80%) Open (0-40%)

Dominant Subcanopy Species Avg. Subcanopy DBH range (in): 1-5
 1. Pinus virginiana 2. Ostrya virginiana 3. Quercus alba
 Sub-Canopy Clutter: High (60%+) Moderate (30-60%) Low (0-30%)

Dominant Shrub/Understory Species
 1. Pinus virginiana 2. Rhus copallina 3. Ostrya virginiana
 Shrub/Understory Clutter: High (60%+) Moderate (30-60%) Low (0-30%)

STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): <1' ^{opening} Channel Width: 30' Stream Width: 25'
 Riparian Width right bank: ~50' left bank: >100' Avg. Water Depth: 1.5'

¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Other Wildlife Observed: BDOW (late), Cope's gray treefrogs, narrow mouth toads, green frogs

Additional Comments: *Young, dense Virginia pine interspersed with oak, hickory, and sourwood.

DENSE WOODY VEGETATION
BUT LOTS OF FLIGHT CORRIDORS

Bat Capture Datasheet

Page 1 of 2

Project Name/No.: R.dg/wc/172677408

Date: 7/31/2022

Biologist(s): W. Cunningham, M. Johnson

Site ID: RLM 161 - MORGAN

County/State: Morgan Co. / TN

Moon Phase: Waxing Crescent

Sunset: 2044

Map Kilometer No./Quad: ~~AP 99.5~~ ELM

⁴Latitude: N 36.106858

Longitude: W-84.655730

Moonrise: 0918

Moonset: 2244

General Site Description: Gravel road / fence gap and pond adjacent to pipeline

Nets Open: 2035

Nets Closed: 2240

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	78	Ø	95
21:00	76	Ø	95
22:00	75	Ø	85
23:00			
00:00			
01:00			

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments: Rain until ~ 1900. Rain from 2156-2206. Rain + lightning in area and nets taken down @ 2240

[illegible]

¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph). 1 = wind direction shown by smoke (1-3 mph). 2 = wind felt on face; leaves rustle (4-7 mph). 3 = leaves, twigs in constant motion (8-12 mph). 4 = dust rises; small branches move (13-18 mph). 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

- * Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats



Bat Capture Datasheet

Page 1 of 2

Project Name/No.: Riderline / 172677408

Date: 8/1/2022

Biologist(s): W. Cunningham, M. Johnson

Site ID: RAMA 161 - MORGAN

County/State: Morgan Co. / TN

Moon Phase: Waxing Crescent

Sunset: 2043

Map Kilometer No./Quad: ~~MP 99.5~~ KM-16

Latitude: N 36.106858

Longitude: W-84-65573

☐ Moonrise: 1018

Moonset: 2309

General Site Description: Gravel Road/fence gap and pun adjacent to pipeline

Nets Open: 2030

Nets Closed: 0145

ALL TIMES
EASTERN

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	76	Ø	95
21:00	75	Ø 1	90
22:00	73	Ø	90
23:00	73	Ø	100
00:00	73	1	Ø
01:00	72	1	Ø

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments:[illegible]

¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

Project Name/No.: Ridge Line 1172677408 Date: 7/30/2022 Biologist(s): Eric Smith Chris Knab
 Site ID: RLM-162 - MORGAN County/State: Morgan / TN Moon Phase: Waxing Crescent Sunset: 20:45
 Map Kilometer No./Quad: KM-162 Latitude: 36.11088 Longitude: 84.936274 Moonrise: 6:45 Moonset: 22:17
 General Site Description: Road + Stream Nets Open: 20:45 Nets Closed: 1:45

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	85	5	5
21:00	80	0	90
22:00	76	1	80
23:00	73	1	20
00:00	73	1	10
01:00	72	1	50

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments:[illegible]

¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats



Bat Capture Datasheet

Page 1 of 1

Project Name/No.: Ridgeline/172677408 Date: 7/31/22 Biologist(s): A. S. Jollene, T. Gillette, C. Knabel
 Site ID: RLM-162-Morgan County/State: Morgan/TN Moon Phase: Waxing crescent Sunset: 20:43
 Map Kilometer No./Quad: 4P 100.3 km² Latitude: 36.10980 Longitude: -84.64310 Moonrise: 10:17 Moonset: 23:09
 General Site Description: ROAD & STREAM Nets Open: 20:45 Nets Closed: 22:15

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	79.0	0	100
21:00	74.3	0	100
22:00			
23:00			
00:00			
01:00			

Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
C	9M	7.8M	70.2	36.10996	-84.64259	X				Pipeline ROW
D	4M	5.2	20.8	36.10944	-84.64290		X			

* One net at full extension ~ 2.5m high

Weather Comments: Rain and storms @ 10:15pm, closed

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	<i>Plecotus subflavus</i>	21:10	A	M	NR	34.5	5.75	0	C	5	A03138	
2	<i>Eptesicus fuscus</i>	21:20	A	F	PL	47.9	20.75	0	C	6		
3	<i>Eptesicus fuscus</i>	21:40	A	F	PL	50.6	19.75	0	C	5.5		
4	<i>Eptesicus fuscus</i>	21:55	A	F	PL	49	25	0	C	4		

Rain out

¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph). 1 = wind direction shown by smoke (1-3 mph). 2 = wind felt on face: leaves rustle (4-7 mph). 3 = leaves, twigs in constant motion (8-12 mph). 4 = dust rises; small branches move (13-18 mph). 5 = small trees in leaf begin to sway (19-24 mph)

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* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for escaped bats



Bat Capture Datasheet

Page 1 of 1

Project Name/No.: Ridgepole/172077408 Date: 8/1/22 Biologist(s): A. Spillena, T. Gillette
 Site ID: RUM-162-Morgan County/State: Morgan/TN Moon Phase: Waxing crescent Sunset: 20:43
 Map Kilometer No./Quad: MP 100.3 KM 162 Latitude: 36.10980 Longitude: -84.64340 Moonrise: 10:17 Moonset: 23:09
 General Site Description: Pipeline ROW, gravel road and stream intersecting w/ stream running through Nets Open: 20:40 Nets Closed: 1:45

	Time	Temp (F)	Wind ¹	% Cloud Cover	Net ID (A, B...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
21	20:00	75.3	0	100	C	9M	7.8M	70.2	36.10996	-84.64259	X				Pipeline ROW
22	21:00	74.0	0	100	D	4M	5.2M	20.8	36.109448	-84.64290		X			
23	22:00	73.3	0	100											
00	23:00	72.6	1	50											
01	00:00	71.4	1	0											
02	01:00	71.3	1	0											

* One net at full extension - 2.5m high

Weather Comments: Overcast skies clearing, light breeze late, cooling

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	<i>Eptesicus fuscus</i>	19:30	J	F	NR	47.4	16.5	0	C	6	—	
2	<i>Nyctinomus humilis</i>	20:10	A	M	TD	36.6	11.75	0	C	6	—	
3	<i>Eptesicus fuscus</i>	22:10	J	M	NR	46.4	16.5	0	C	5	—	
4	<i>Lasiurus borealis</i>	22:30	J	M	NR	38.2	9.5	0	C	6	—	
5	<i>Eptesicus fuscus</i>	22:40	A	F	PL	49	22	0	C	9.5	—	
6	<i>Eptesicus fuscus</i>	22:50	J	M	NR	48.7	18.75	0	C	50	—	
7	<i>Eptesicus fuscus</i>	23:10	J	M	NR	46.0	19.0	0	C	4.0	—	
8	<i>Eptesicus fuscus</i>	23:40	J	F	NR	49.5	20.5	0	C	5.0	—	
9	<i>Eptesicus fuscus</i>	23:50	A	F	PL	48.3	18.5	0	C	7.0	—	

¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

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Bat Capture Datasheet

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Project Name/No.: RidgeLine/172677408Date: 8/2/2022Biologist(s): W. Cunningham, M. JohnsonSite ID: 12WAY-163 - MORGANCounty/State: Morgan Co./TNMoon Phase: Waxing CrescentSunset: 2042Map Kilometer No./Quad: ~~163-101~~ KM-1163Latitude: N 36.110186Longitude: W 84.630708Moonrise: 1118Moonset: 2334General Site Description: Mown section of pipeline corridor + ATV trail in oak woods.Nets Open: 2030Nets Closed: 0145

2030

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	80	1	10%
21:00	77	0	0%
22:00	73	0	0%
23:00	72	0	0%
00:00	69	1	0%
01:00	69	1	0%

Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	6m	4.5m		36.110440	-84.630760	X				ATV Trail
B	9m	7.5m		36.110250	-84.630210				X	Pipeline corridor near pond

* One net at full extension ~ 2.5m high

0145
68°F
W-J-1
0% Cloud

Weather Comments:

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
01	<i>Lasiurus borealis</i>	2110	A	M	R	39.0	10.25	0	B	6m	---	
02	<i>Lasiurus borealis</i>	2110	A	M	R	38.4	10.0	0	B	5.5m	---	
03	<i>Eptesicus fuscus</i>	2110	J	F	NR	48.2	20.0	0	B	4m	---	
04	<i>Eptesicus fuscus</i>	2110	J	M	NR	47.7	15.75	0	B	4.5m	---	
05	<i>Lasiurus borealis</i>	2140	A	M	NR	40.3	8.40	0	B	2.0m	---	
06	<i>Lasiurus borealis</i>	2240	J	F	NR	40.6	11.75	0	B	3.5m	---	
07	<i>Lasiurus borealis</i>	0030	J	F	NR	39.9	9.8	0	B	4.0m	---	

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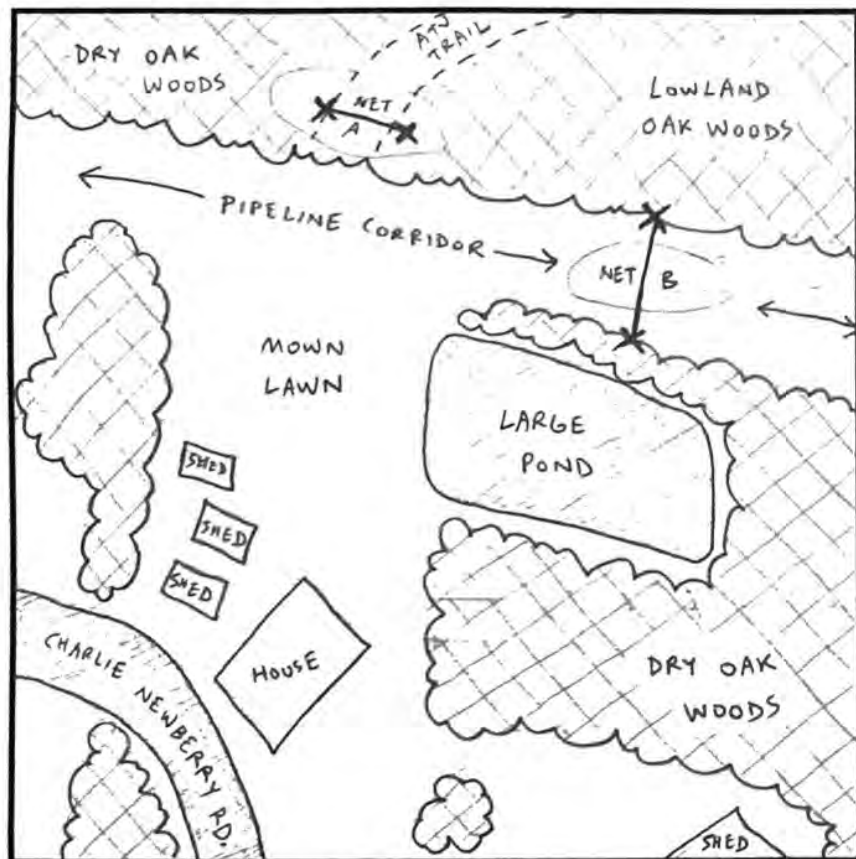
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Project Name/No.: RidgeLine / 172677408 Date: 8/2/2022
 Site ID: RLAA-163-MORGAN Est. Distance to Water (ft): 0

VEGETATION

Primary Habitat Type¹: Upland Forest / Field Edge

Potential Roost:	Large Trees	Snags	Both	Other (e.g., structure)
Roost Tree Potential:	High	Moderate	Low	

Dominant Canopy Species Avg. Canopy DBH range (in): 8-14"
 1. Quercus alba 2. Quercus falcata 3. Quercus coccinea

Canopy Closure:	Closed (80%+)	Moderate (40-80%)	Open (0-40%)
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Dominant Subcanopy Species Avg. Subcanopy DBH range (in): 3-8"
 1. Acer rubrum 2. Liriodendron tulipifera 3. Fagus grandifolia

Sub-Canopy Clutter:	High (60%+)	Moderate (30-60%)	Low (0-30%)
---------------------	-------------	-------------------	-------------

Dominant Shrub/Understory Species
 1. Acer rubrum 2. Fagus grandifolia 3. Ilex opaca

Shrub/Understory Clutter:	High (60%+)	Moderate (30-60%)	Low (0-30%)
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STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): _____ Channel Width: _____ Stream Width: _____
 Riparian Width right bank: _____ left bank: _____ Avg. Water Depth: _____

¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Other Wildlife Observed: WOTH, EAWP, YBCU, Kingsnake

Additional Comments: _____



Bat Capture Datasheet

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Project Name/No.: Ridge Line / 172677408 Date: 8/4/2022 Biologist(s): W. Cunningham, M. Johnson
 Site ID: 21MM-163-MORGAN County/State: Morgan Co. / TN Moon Phase: Waxing Crescent Sunset: 2040
 Map Kilometer No./Quad: ~~163-164~~ KM 163 Latitude: N 36.110186 Longitude: W 84.630708 Moonrise: 1324 Moonset: 0001
 General Site Description: Mown section of pipeline corridor & ATV trail in oak woods Nets Open: 2040 Nets Closed: 0140

2030

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	77	Ø	10%
21:00	77	Ø	15%
22:00	74	1	15%
23:00	74	1	40%
00:00	74	1	45%
01:00	73	1	10%

Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	6m	4.5m		36.116440	-84.630760	X				ATV trail
B	9m	7.5m		36.116250	-84.630210				X	Pipeline corridor near pond

* One net at full extension ~ 2.5m high

Weather Comments:

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
01	<i>Lasius borealis</i>	2130	J	M	NR	40.3	9.3g	Ø	B	3m	—	
02	<i>Perimyotis subflavus</i>	2350	J	M	NR	32.8	6.3g	Ø	B	2m	TWRA 07275	Transmitter # 40 (261240), Freq 150.665

¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

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Bat Capture Datasheet

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Project Name/No.: Ridgeline/172677408 Date: 8/2/22 Biologist(s): A. Sjollema, T. Gillette
 Site ID: RLM-165-Morgan County/State: Morgan/TN Moon Phase: Waxing crescent Sunset: 20:42
 Map Kilometer No./Quad: MP 102.1 KM 165 Latitude: 36.10512 Longitude: -84.61364 Moonrise: 1118 Moonset: 2334
 General Site Description: Riparian forest with cleared ROW Nets Open: 20:40 Nets Closed: 1:45

	Time	Temp (F)	Wind ¹	% Cloud Cover
21	20:00	74.1	0	0
22	21:00	69.6	0	0
23	22:00	68.7	0	0
00	23:00	67.8	0	0
01	00:00	67.3	0	0
02	01:00	67.1	0	0

Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	12M	7.8M	93.6	36.10576	-84.61374				X	Pipeline ROW
B	18M	7.8M	140.4	36.10529	-84.61364				X	↓

* One net at full extension ~ 2.5m high

Weather Comments: Clear, calm and cool

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	<i>Eptesicus fuscus</i>	22:05	A	F	PL	45.9	17.75	0	A	3	—	
2	<i>Lasiurus borealis</i>	22:20	J	F	NR	40.3	12	0	B	1.5	—	Recaptured a minute later
3	<i>Lasiurus borealis</i>	01:45	—	—	—	—	—	—	B	7	—	

¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

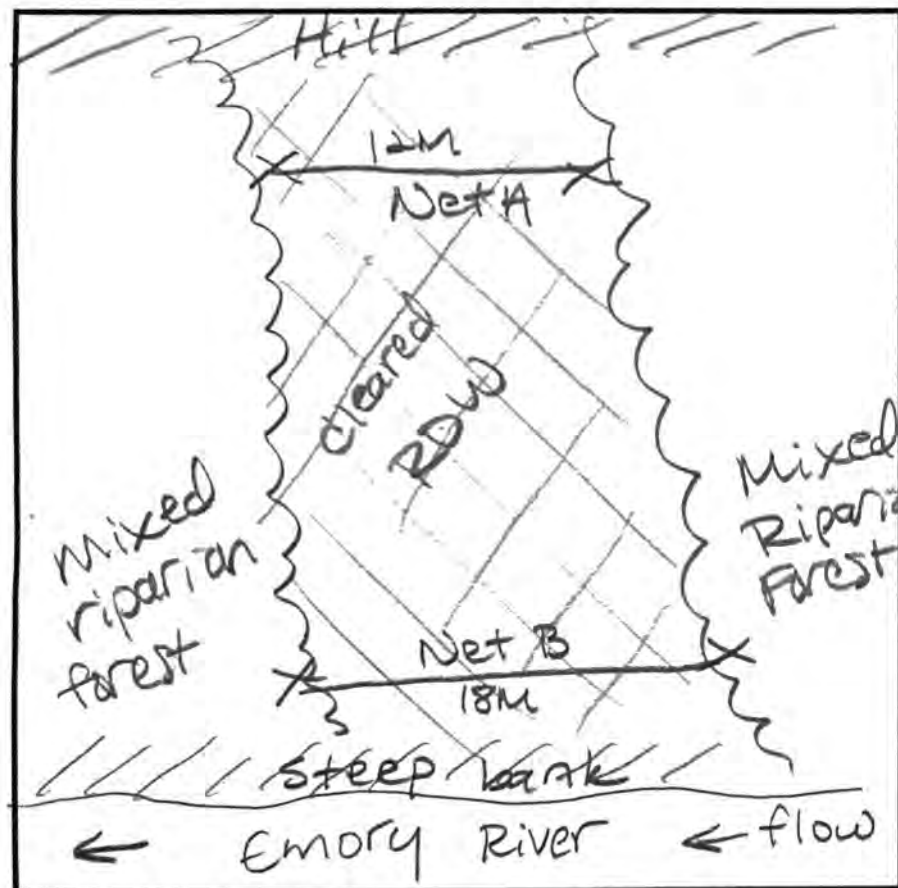
* Apply band to LEFT arm for females and RIGHT arm for males

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Net Site Description

Page 2 of 2

Project Name/No.: Ridgeline/172677408 Date: 8/3/22
Site ID: RLM-1165-Morgan Est. Distance to Water (ft): 0ft

VEGETATION

Primary Habitat Type¹: Bottomland forest
Potential Roost: Large Trees Snags Both Other (e.g., structure)
Roost Tree Potential: High Moderate Low

Dominant Canopy Species Avg. Canopy DBH range (in): 10-16"
1. Ulmus rubra 2. Liriodendron tulipifera 3.

Canopy Closure: Closed (80%+) Moderate (40-80%) Open (0-40%)

Dominant Subcanopy Species Avg. Subcanopy DBH range (in): 5-8"
1. Ostrya virginiana 2. Tsuga canadensis 3. Cornus florida

Sub-Canopy Clutter: High (60%+) Moderate (30-60%) Low (0-30%)

Dominant Shrub/Understory Species
1. Ostrya virginiana 2. Fagus grandifolia 3.

Shrub/Understory Clutter: High (60%+) Moderate (30-60%) Low (0-30%)

STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): 8' Channel Width: 80' Stream Width: 72'
Riparian Width right bank: 1000 left bank: 1000 Avg. Water Depth: 40'

¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Other Wildlife Observed: LEFL, PIWO, BEKI

Additional Comments:



Bat Capture Datasheet

Page 1 of 2

Project Name/No.: Ridgeline/172677408 Date: 8/3/22 Biologist(s): A. Spollen, T. Gillette
 Site ID: RLM-165-Morgan County/State: Morgan/TN Moon Phase: Waxing crescent Sunset: 20:43
 Map Kilometer No./Quad: ~~14P402~~ 14P402 km¹⁶⁵ Latitude: 36.10512 Longitude: -84.61364 Moonrise: 12:21 Moonset: N/A
 General Site Description: Riparian forest with cleared ROW Nets Open: 20:40 Nets Closed: 21:10

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	77.2	1	100
21:00			
22:00			
23:00			
00:00			
01:00			

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments:[illegible]

¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

- * Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats



Bat Capture Datasheet

Page 1 of 2

Project Name/No.: Ridge Line / 172677408

Date: 8/5/2022

Biologist(s): W. Cunningham, M. Johnson

Site ID: RLM
AS-165 - MORGAN

County/State: Morgan Co./TN

Moon Phase: First Quarter

Sunset: 2039

Map Kilometer No./Quad: #1-102 KM-165

Latitude: N 36.105120

Longitude: W 84.613644 Moonrise: 1432

Moonset: 0103

General Site Description: Floodplain of Emory River down the hill from Emory View Dr. Nets Open: 2030

Nets Closed: 0140

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	77	1	85
21:00	74	1	90
22:00	72	2	10
23:00	71	0	20
00:00	71	1	5
01:00	70	1	5

Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	12m	7.5m		36.096530	-84.606190				X	Pipeline corridor
B	18m	7.5m		36.096060	-84.606650				X	adjacent to Emory River

* One net at full extension ~ 2.5m high

Weather Comments: Very humid at first!

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
01	<i>Nycticeius humeralis</i>	2120	A	M	R	31.3	10.25g	1	A	3m	FWRA 07276	
02	<i>Perimyotis subflavus</i>	2120	J	F	NR	30.3	6.8g	0	A	7m	TWRA 07276	Transmitter 261233 Freq. 150.442 (443)

- ¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)
- ² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive
- * Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for escaped bats

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Bat Capture Datasheet

Page 1 of 2

Project Name/No.: Riddell/172677408 Date: 8/7/2022 Biologist(s): W. Cunningham, M. Johnson
 Site ID: RCM MS-166 - MORGAN County/State: Morgan Co./TN Moon Phase: Waning Gibbous Sunset: 2037
 Map Kilometer No./Quad: MS KM-166 Latitude: N 36.096493 Longitude: -84.606789 Moonrise: 1655 Moonset: 0234
 General Site Description: Mown lawn/pipeline corridor + pond edge Nets Open: 2030 Nets Closed: 0140

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	83	Ø	10%
21:00	76	Ø	5%
22:00	76	1	5%
23:00	73	1	15%
00:00	71	1	30%
01:00	71	2	90%

Net ID (A, B...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	18m	7.5m		36.096530	-84.606790				X	Tree gap at end of pond*
B	9m	4.5m		36.096060	-84.606630				X	Pipeline Row

* One net at full extension ~ 2.5m high

Weather Comments: Very humid.

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
01	<i>Lasius borealis</i>	2100	J	M	NR	405	11.0	Ø	A	7m		
02	<i>Nyctireus humeralis</i>	2140	A	M	NR	35	10.25	Ø	A	4m		testes partially descended
03	<i>Nyctireus humeralis</i>	2140	A	M	R	35	9.5	Ø	A	7m		
04	<i>Eptesicus fuscus</i>	2220							B	3m		ESCAPED FROM NET
05	<i>Lasius borealis</i>	2240							A	5m		ESCAPED FROM NET
06	<i>Lasius borealis</i>	2320							A	6.5m		ESCAPED FROM NET

¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

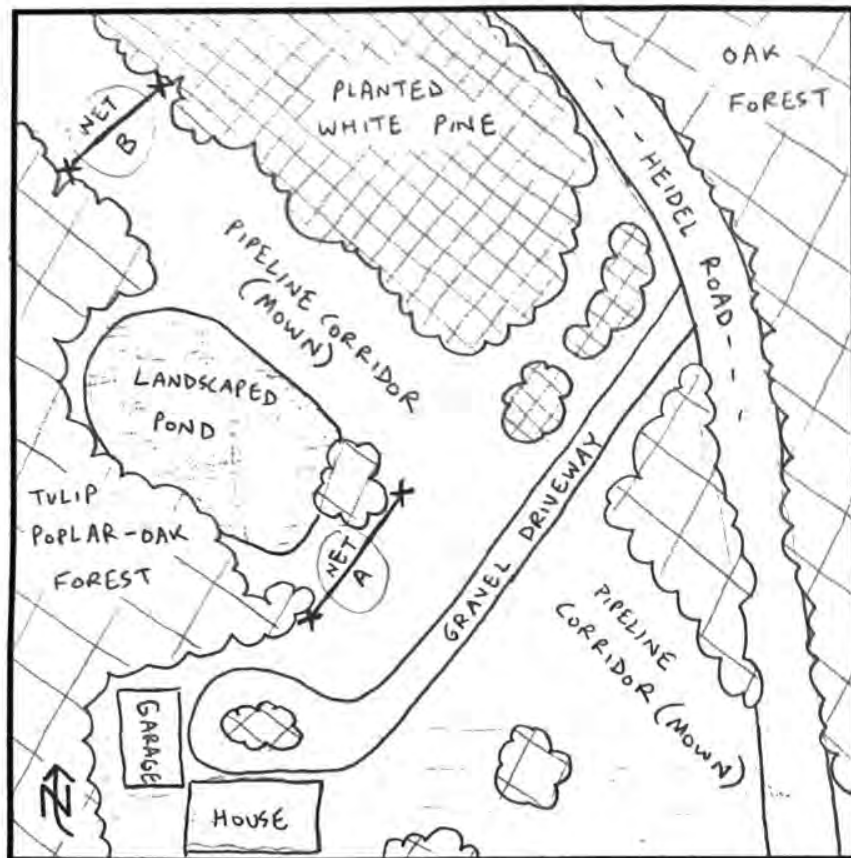
* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for escaped bats

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* Landscaped pond not netted to prevent damage to edge plants & floating plants.



¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Other Wildlife Observed: NOCA, TUTI, BEKI, BGGN, HOWA, CARW

Additional Comments: BGGN captured in Net B @ 2040.

Project Name/No.: P. dgeline/172677408 Date: 8/7/2024

Site ID: ELM MS-166 - MORGAN Est. Distance to Water (ft): 0

VEGETATION

Primary Habitat Type¹: Upland Forest / Pond Edge

Potential Roost: Large Trees Snags Both Other (e.g., structure)

Roost Tree Potential: High Moderate Low

Dominant Canopy Species Avg. Canopy DBH range (in): 10-20"

1. Liriodendron tulipifera 2. Quercus velutina 3. Quercus falcata

Canopy Closure: Closed (80%+) Moderate (40-80%) Open (0-40%)

Dominant Subcanopy Species Avg. Subcanopy DBH range (in): 3-8"

1. Acer rubrum 2. Prunus serotina 3. Liriodendron tulipifera

Sub-Canopy Clutter: High (60%+) Moderate (30-60%) Low (0-30%)

Dominant Shrub/Understory Species

1. Ligustrum sinense 2. Eleagnus umbellata 3. Liquidambar styraciflua

Shrub/Understory Clutter: High (60%+) Moderate (30-60%) Low (0-30%)

STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): Channel Width: Stream Width:

Riparian Width right bank: left bank: Avg. Water Depth:

IN FOREST ONLY



Bat Capture Datasheet

Page 1 of 2

Project Name/No.: RidgeLine/172677408 Date: 8/9/22 Biologist(s): A. Spollena, Z. True
Site ID: RLM-166-Morgan County/State: Morgan, TN Moon Phase: Waxing gibbous Sunset: 20:37
Map Kilometer No./Quad: ~~MP 103~~ KM 166 Latitude: 36.09649 Longitude: 84.60679 Moonrise: 19:11 Moonset: 3:35
General Site Description: Pipeline ROW near a pond and patches of forest Nets Open: 20:20 Nets Closed: 1:40

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	72.8	1	100
21:00	70.9	1	0
22:00	70.8	1	0
23:00	70.7	1	80
00:00	69.8	1	100
01:00	69.5	1	100

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments: Overcast and hot, clearing, light breeze, then clouding up again

[illegible]

Beaufort wind scale. 0 = smoke rises vertically (<1 mph). 1 = wind direction shown by smoke (1-3 mph). 2 = wind felt on face: leaves rustle (4-7 mph). 3 = leaves, twigs in constant motion (8-12 mph). 4 = dust rises: small branches move (13-18 mph). 5 = small trees in leaf begin to sway (19-24 mph)

For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

- * Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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172677408

Bat Capture Datasheet

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Project Name/No.: Ridgepole Bat Survey Date: August 7, 2022 Biologist(s): Z. Paer, C. Fisher
Site ID: 175697748 RLM-167-Morgan County/State: Norton, TN Moon Phase: Waxing Gibbous 79% Sunset: 2038
Map Kilometer No./Quad: 15.95 KM-167 Latitude: 36.094289 Longitude: -84.595346 Moonrise: 1709 Moonset: 0151
General Site Description: Pipeline corridor Traversing bottom land forest Nets Open: 2038 Nets Closed: 0138

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00			
21:00	73	0	10%
22:00	71	0	30%
23:00	71	0	40%
00:00	70	0	75%
01:00	70	0	90%

[illegible]

* One net at full extension ~ 2.5m high

01:00	76	0	90%	One net at full extension - 2.5m high
Weather Comments: → 02:00 Temp: 70 Wind: 0 % Cloud Cover: 30%				

[illegible]

¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

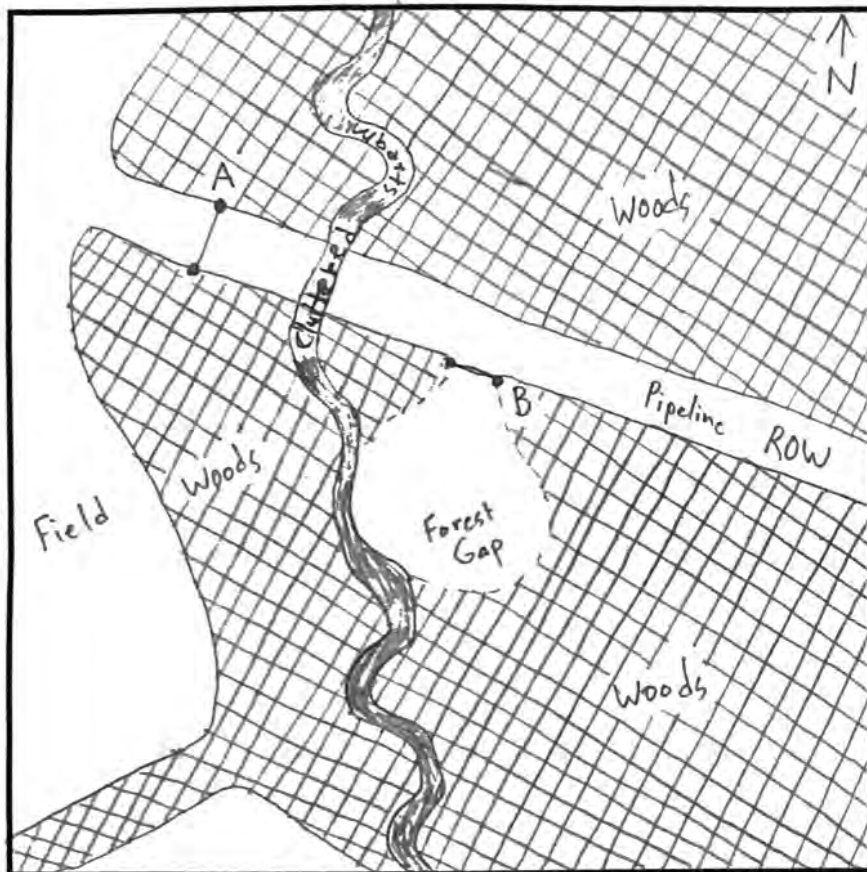
² For **females**: L = lactating, PL = post-lactating, NR = non-repro

- Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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Project Name/No.: Ridgeline Bat Survey Date: August 17, 2022
 Site ID: RLM-167-Morgan Est. Distance to Water (ft): 0

VEGETATION

Primary Habitat Type¹: Bottomland Forest

Potential Roost: Large Trees Snags Both Other
 (e.g., structure)

Roost Tree Potential: High Moderate Low

Dominant Canopy Species Avg. Canopy DBH range (in): 15"

1. Liriodendron tulipifera 2. Fagus grandifolia 3. Quercus alba

Canopy Closure: Closed Moderate Open
 (80%+) (40-80%) (0-40%)

Dominant Subcanopy Species Avg. Subcanopy DBH range (in): 12"

1. Liriodendron tulipifera 2. Acer rubrum 3. Liquidambar styraciflua

Sub-Canopy Clutter: High Moderate Low
 (60%+) (30-60%) (0-30%)

Dominant Shrub/Understory Species

1. Carpinus caroliniana 2. Hammamelis virginiana 3. Acer negundo

Shrub/Understory Clutter: High Moderate Low
 (60%+) (30-60%) (0-30%)

STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): 3' Channel Width: 6' Stream Width: 4'

Riparian Width right bank: 5' left bank: 5' Avg. Water Depth: 3"

¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Other Wildlife Observed: _____

Additional Comments: _____



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Bat Capture Datasheet

Page 1 of 2

Project Name/No.: Ridgeline 172h77408

Date: 8/9/22

Biologist(s): H. Staffs, E. Scheibers

Site ID: RLM-167-Mofar

County/State: Morgan/TN

Moon Phase: Waxing Gibbous

Sunset: 20:37

Map Kilometer No./Quad: ~~103.05~~ KM-167

Latitude: 36 09 42.44

Longitude: - 84.59481

Moonrise: 19:15

Moonset: 03:36

General Site Description: Upland woods bordering pipeline ROW adjacent to open

Nets Open: 20:35

Nets Closed: 2137

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	75	1	50
21:00	73	0	50
22:00	71	1	30
23:00	71	0	100
00:00	71	0	90
01:00	71	0	90

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments:

CrIM, Part 1, closed, n.m.d.

01:30 - 70, 1 mps $\rightarrow 2$

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
No owl captures												

¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

[†] For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

Bat Capture Datasheet

Project Name/No.: Ridge line / 172677408 Date: 8/7/22 Biologist(s): H. Staffs, E. Scheiben
 Site ID: RLM-169-Morgan County/State: Morgan / TN Moon Phase: Waxing Gibbous Sunset: 20:39
 Map Kilometer No./Quad: ~~747-105~~ KM 169 Latitude: 36.088455 Longitude: -84.575296 Moonrise: 1656 Moonset: 01:45
 General Site Description: Nets across Ridge line ROW and trib to Crooked Fork Nets Open: 20:39 Nets Closed: 01:39

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00			
21:00	77	0	30
22:00		0	30
23:00		0	30
00:00	70	0	40
01:00	71	0	80

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments: *Calm and mostly clear*

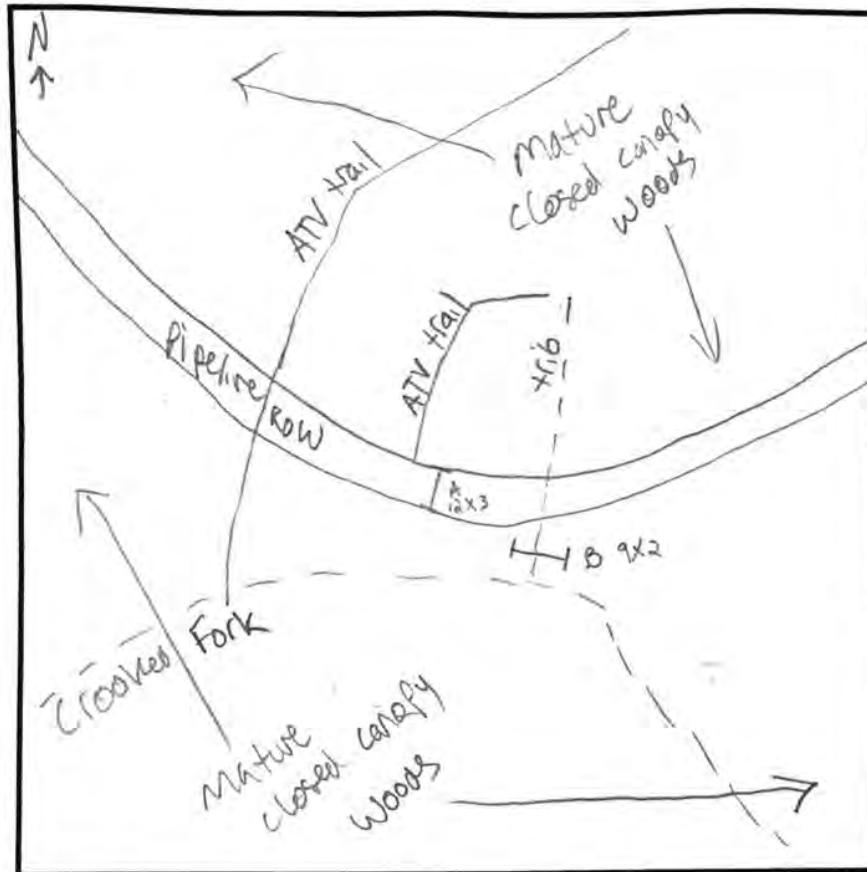
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Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

7 For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats



¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Project Name/No.: 172677408 Date: 8/7/22
Site ID: RLM-769-Morgan Est. Distance to Water (ft): 0

VEGETATION

Primary Habitat Type¹: Creek / Riparian
Potential Roost: Large Trees Snags Both Other (e.g., structure)
Roost Tree Potential: High Moderate Low

Dominant Canopy Species Avg. Canopy DBH range (in): 12-16"
1. Platanus occidentalis 2. Liquidambar styraciflua 3. Acer rubrum

Canopy Closure: Closed (80%+) Moderate (40-80%) Open (0-40%)

Dominant Subcanopy Species Avg. Subcanopy DBH range (in): 6-8"
1. Quercus alba 2. Fagus grandifolia 3.

Sub-Canopy Clutter: High (60%+) Moderate (30-60%) Low (0-30%)

Dominant Shrub/Understory Species
1. Fagus grandifolia 2. 3.

Shrub/Understory Clutter: High (60%+) Moderate (30-60%) Low (0-30%)

STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): 1.5' Channel Width: 18' Stream Width: 18'
Riparian Width right bank: 1800' left bank: 900' Avg. Water Depth: 6"

Other Wildlife Observed: _____

Additional Comments: Numerous narrow closed-canopy trails leading to pipeline and streams



Bat Capture Datasheet

Page 1 of 1

Project Name/No.: Ridgeline 172677409 Date: 8/8/22 Biologist(s): Hannah Staffs, Emily Schenker
Site ID: RLM-169-Morgan County/State: Morgan/TN Moon Phase: Waxing Gibbous Sunset: 20:13
Map Kilometer No./Quad: ~~M1155~~ KM-169 Latitude: 36.083455 Longitude: -84.572296 Moonrise: 19:11 Moonset: 03:34
General Site Description: Nets across pipeline ROW and tributary to Crooked Fork Nets Open: 20:38 Nets Closed: 01:09

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	77	0	10
21:00	76	0	0
22:00	75	0	0
23:00	75	0	0
00:00	72	0	0
01:00	75	0	100

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments: Calm, clear skies until 00:00 when it started to cloud over. Storms rolled in. No rain. Precipitation at 1.0. No precip.

[illegible]

and nets
no precip
fell
all
through
survey
period

^f **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

Bat Capture Datasheet

Project Name/No.: Ridgepole/172677408 Date: 8/10/22 Biologist(s): A. Spollen, Z. True
 Site ID: RLM-170-Morgan County/State: Morgan, TN Moon Phase: Waxing gibbous Sunset: 20:36
 Map Kilometer No./Quad: ~~MP 105.7~~ KM179 Latitude: 36.084138 Longitude: -84.561235 Moonrise: 20:05 Moonset: 4:45
 General Site Description: Bottomland forest along Corked Fork Nets Open: 20:45 Nets Closed: 1:45

	Time	Temp (F)	Wind ¹	% Cloud Cover
21	20:00	71.0	0	95
22	21:00	68.7	0	85
23	22:00	68.0	1	80
00	23:00	68.2	0	100
01	00:00	66.6	0	75
01:30	01:00	67.1	0	75

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments: Intermittent light fog, cool, humid

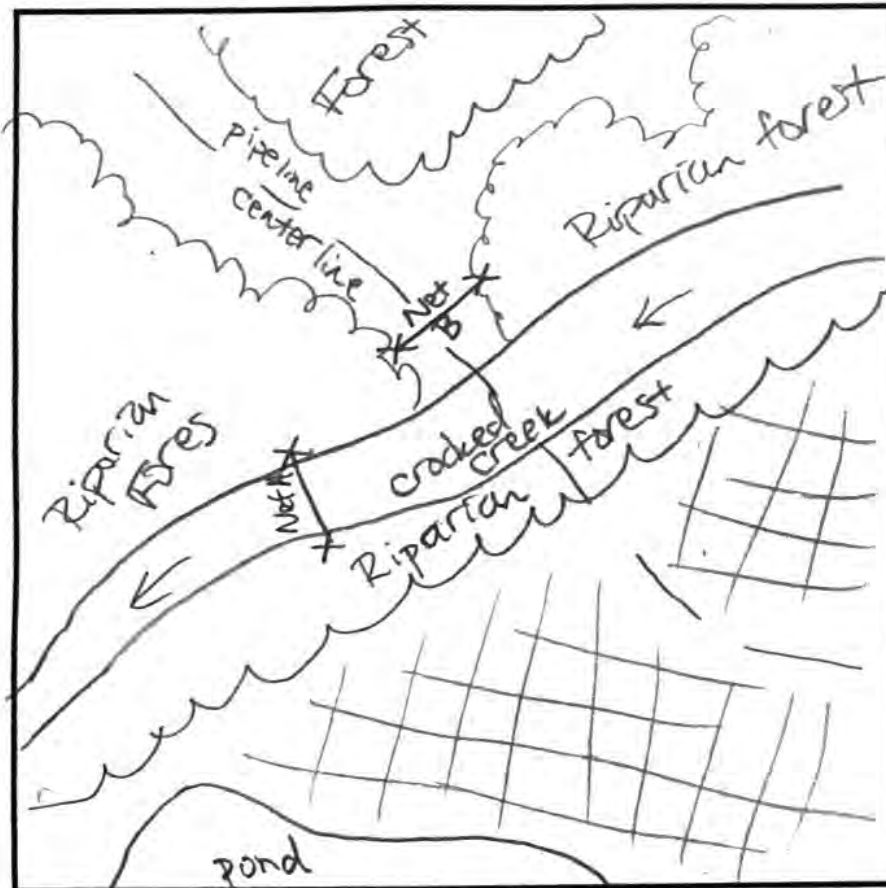
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¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats



¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Project Name/No.: Ridgeline 172677408 Date: 8/12/22
 Site ID: RM-170-Morgan Est. Distance to Water (ft): 0f

VEGETATION

Primary Habitat Type¹: Bottomland forest
 Potential Roost: Large Trees Snags Both Other (e.g., structure)
 Roost Tree Potential: High Moderate Low

Dominant Canopy Species Avg. Canopy DBH range (in): 18-28"
 1. Tsuga canadensis 2. Betula nigra 3. Quercus alba

Canopy Closure: Closed (80%+) Moderate (40-80%) Open (0-40%)

Dominant Subcanopy Species Avg. Subcanopy DBH range (in): 5-8"
 1. Tsuga canadensis 2. Betula nigra 3. Rhododendron

Sub-Canopy Clutter: High (60%+) Moderate (30-60%) Low (0-30%)

Dominant Shrub/Understory Species
 1. Tsuga canadensis 2. Betula nigra 3. _____

Shrub/Understory Clutter: High (60%+) Moderate (30-60%) Low (0-30%)

STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): 6ft Channel Width: 48ft Stream Width: 44ft
 Riparian Width right bank: 75ft left bank: 20ft Avg. Water Depth: 3ft

Other Wildlife Observed: INBU, GCFL, GBHE

Additional Comments: _____



Bat Capture Datasheet

Page 1 of 2

Project Name/No.: RidgeLine/172677408 Date: 8/12/22 Biologist(s): A. Sjollena, Zoe True
 Site ID: RLM-170-Morgan County/State: Morgan/TN Moon Phase: Waxing gibbous Sunset: 20:36
 Map Kilometer No./Quad: MP 105.7 KM 170 Latitude: 36.084138 Longitude: -84.561235 Moonrise: 20:05 Moonset: 4:45
 General Site Description: Bottomland forest along Crooked Creek Nets Open: 20:30 Nets Closed: 1:36

	Time	Temp (F)	Wind ¹	% Cloud Cover
21	20:00	62.0	0	20
22	21:00	58.4	0	30
23	22:00	57.6	0	30
00	23:00	57.5	0	50
01	00:00	57.8	1	30
01:30	01:00	56.1	0	20

Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	15M	7.8M	117	36.08401	-84.56157		X			Crooked Creek
B	18M	7.8M	140.4	36.08419	-84.56145				X	pipeline ROW

* One net at full extension ~ 2.5m high

Weather Comments: Cool, clear, calm, light fog in last half hour

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	<i>Lasiurus borealis</i>	21:25	V	V	—	—	—	—	B	5	—	Escaped from net
2	<i>Lasiurus borealis</i>	00:10	J	M	NR	38.4	9.75	0	B	6.5	—	
3	<i>Lasiurus borealis</i>	00:20	—	—	—	—	—	—	—	—	—	Escaped from net

¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph). 1 = wind direction shown by smoke (1-3 mph). 2 = wind felt on face; leaves rustle (4-7 mph). 3 = leaves, twigs in constant motion (8-12 mph). 4 = dust rises; small branches move (13-18 mph). 5 = small trees in leaf begin to sway (19-24 mph)

² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

17.75 8

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Bat Capture Datasheet

Page 1 of 2

Project Name/No.: Ridgeview / 172677400 Date: 8/10/22 Biologist(s): H. Stoffs, E. Scheiben
 Site ID: RLM-171-morgan County/State: Morgan / TN Moon Phase: Waxing Gibbous Sunset: 20:36
 Map Kilometer No./Quad: MP 105.9 km 171 Latitude: 36.082697 Longitude: -84.558080 Moonrise: 20:05 Moonset: 04:40
 General Site Description: Pipeline ROW through field woods and ATV trail near a residence with bright lamp post Nets Open: 20:36 Nets Closed: 01:36

Time	Temp (F)	Wind ¹	% Cloud Cover	Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
20:00				A	12	7.9		36.082482	-84.557823					Pipeline Row
21:00	71	0	30	B	6	7.8		36.083139	-84.558369					ATV trail
22:00	70	0	40											
23:00	69	0	40											
00:00	64	0	20											
01:00	69	0	30											

* One net at full extension ~ 2.5m high

* One net at full extension ~ 2.5m high

Weather Comments: Light fog at 2310. Visibility remains low. 01:30-09. On fire. 301 cc

[illegible]

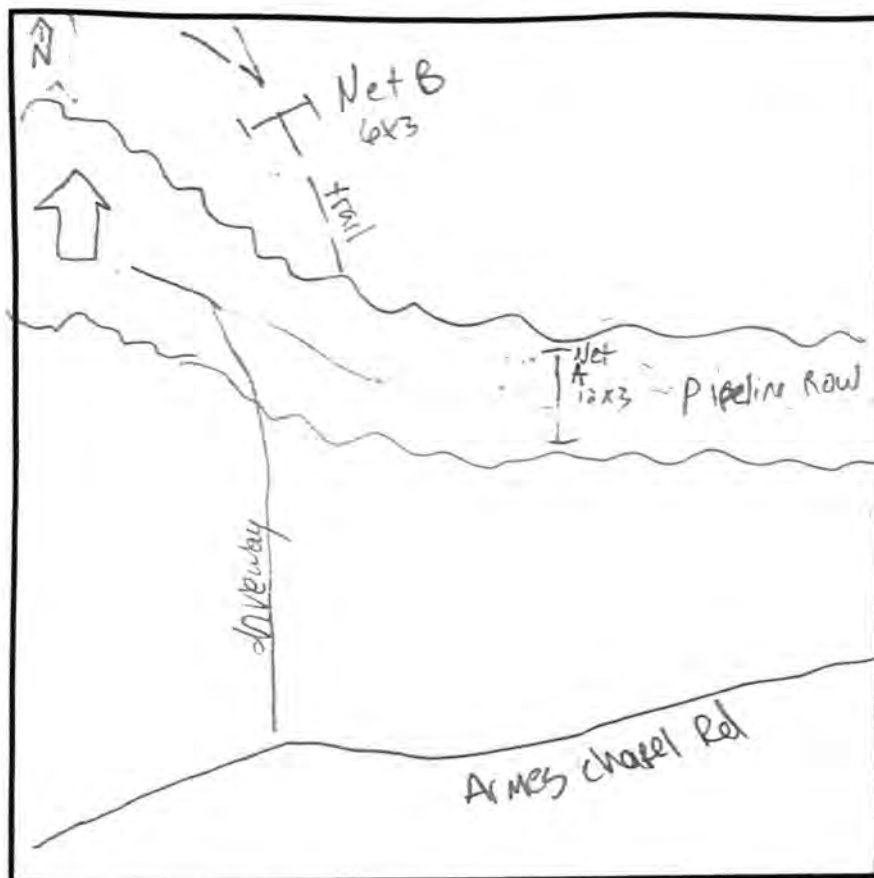
Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

Confidential Data. If found, please return to:
Slantec Consulting Services, 9200 Shelbyville Road Suite 800, Louisville Kentucky 40222 US



¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Project Name/No.: Ridgepole/171-172-173-174-175 Date: 8/10/22
 Site ID: RLM-171-Morgan Est. Distance to Water (ft): 0

VEGETATION

Primary Habitat Type¹: Upland forest

Potential Roost: Large Trees | Snags | Both | Other (e.g., structure)

Roost Tree Potential: High | Moderate | Low

Dominant Canopy Species Avg. Canopy DBH range (in): 19-22"

1. Acer rubrum 2. Carya 3. Quercus alba

Canopy Closure: Closed (80%+) | Moderate (40-80%) | Open (0-40%)

Dominant Subcanopy Species Avg. Subcanopy DBH range (in): 6-9"

1. Liquidambar 2. Acer rubrum 3. Liriodendron

Sub-Canopy Clutter: High (60%+) | Moderate (30-60%) | Low (0-30%)

Dominant Shrub/Understory Species

1. Acer rubrum 2. 3.

Shrub/Understory Clutter: High (60%+) | Moderate (30-60%) | Low (0-30%)

STREAM CHARACTERISTICS (if relevant)

N/A

Bank Height (ft): Channel Width: Stream Width:

Riparian Width right bank: left bank: Avg. Water Depth:

Other Wildlife Observed:

Additional Comments:



Bat Capture Datasheet

Page 1 of 2

Project Name/No.: Ridgeline/172677408 Date: 8/13/22 Biologist(s): A. Sjolund, Z True
 Site ID: RLM-172-Morgan County/State: Morgan/TN Moon Phase: Waning gibbous Sunset: 20:32
 Map Kilometer No./Quad: ~~14P1068~~ KM-172 Latitude: 36.074936 Longitude: -84.546103 Moonrise: 21:59 Moonset: 8:31
 General Site Description: Bottomland forest and PEM wetland maintained Nets Open: 20:32 Nets Closed: 1:32

	Time	Temp (F)	Wind ¹	% Cloud Cover
21	20:00	75.2	1	60
22	21:00	71.0	1	20
23	22:00	70.8	0	80
00	23:00	70.1	0	85
01	00:00	70.2	0	80
01:45	01:00	69.7	0	80

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments: Mostly cloudy, light breeze early then calm

[illegible]

Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

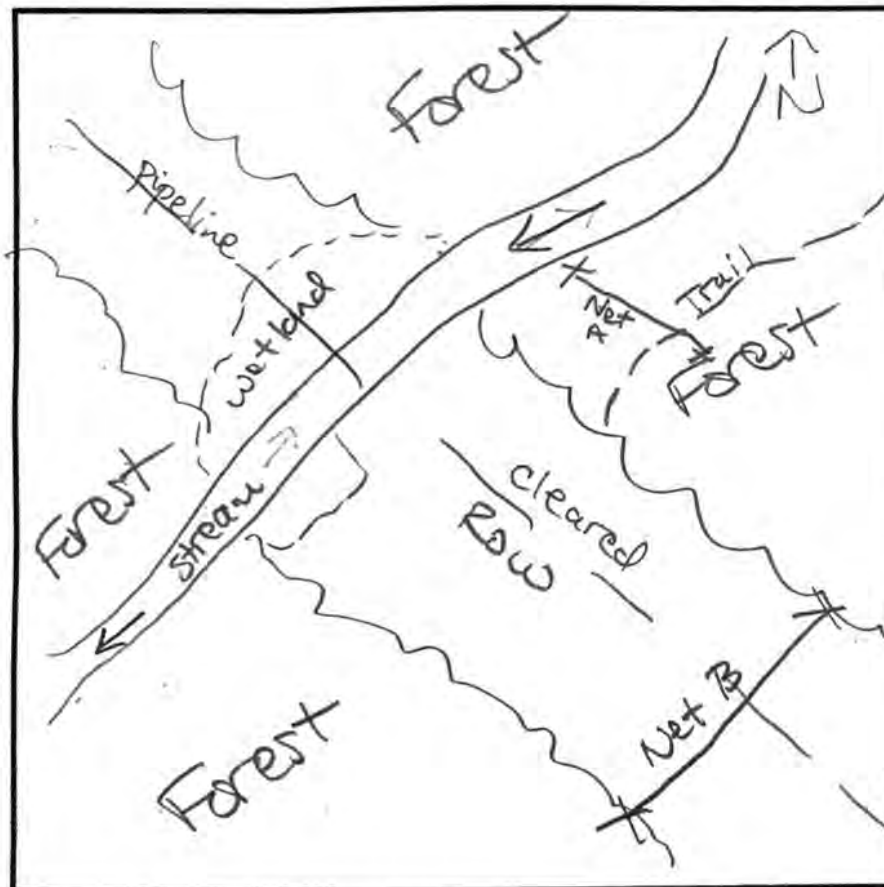
Note: U (unknown) only to be used for **escaped** bats

Confidential Data. If found, please return to:

Stantec Consulting Services, 9200 Shelbyville Road Suite 800, Louisville Kentucky 40222 US

Net Site Description

Page ___ of ___


Project Name/No.: 172677408

Date: 8/13/22

Site ID: RLM-172-Morgan

Est. Distance to Water (ft): 0 ft

VEGETATION

Primary Habitat Type¹: Bottomland Forest

Potential Roost: Large Trees Snags Both Other (e.g., structure)

Roost Tree Potential: High Moderate Low

Dominant Canopy Species Avg. Canopy DBH range (in): 10-18"

1. Liriodendron tulipifera 2. Liquidambar styraciflua 3. Acer rubrum

Canopy Closure: Closed (80%+) Moderate (40-80%) Open (0-40%)

Dominant Subcanopy Species Avg. Subcanopy DBH range (in): 4-8"

1. Liriodendron tulipifera 2. Phododendron maximum 3. Acer rubrum

Sub-Canopy Clutter: High (60%+) Moderate (30-60%) Low (0-30%)

Dominant Shrub/Understory Species

1. Ligustrum sinense 2. 3.

Shrub/Understory Clutter: High (60%+) Moderate (30-60%) Low (0-30%)

STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): 2.5 ft Channel Width: 3.5 ft Stream Width: 2.5 ft

Riparian Width right bank: 450 ft left bank: 500 ft Avg. Water Depth: 0.5 ft

¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Other Wildlife Observed: CAWR, WOTF, barred owl

Additional Comments: Stream too narrow for nets



Bat Capture Datasheet

Page 1 of 1

Project Name/No.: Ridgeline/772677408 Date: 8/14/22 Biologist(s): A. S. Iliena, Z. True

Site ID: RLM-172-Morgan County/State: Morgan/TN Moon Phase: Waning gibbous Sunset: 20:31

Map Kilometer No./Quad: 4406.8 KM-172 Latitude: 36.074936 Longitude: -84.546103 Moonrise: 22:28 Moonset: 9:42

General Site Description: Bottomland forest with small stream and PEM Nets Open: 20:22 Nets Closed: 1:35

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	74.5	1	90
21:00	73.9	0	100
22:00	73.5	0	80
23:00	73.2	1	100
00:00	71.1	1	20
01:00	70.6	1	100

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments: Fair, light breeze, mostly cloudy

[illegible]

Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)



² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive



* Apply band to LEFT arm for females and RIGHT arm for males



Note: U (unknown) only to be used for **escaped** bats

APPENDIX C

Mist Net Site and Bat Species Photologs

Client: Enbridge		Project: Ridgeline Expansion	
Site Name:		Site Location: Trousdale County, TN	
Photograph ID: 1			
Net Site: RLM-04			
Net ID: Net A			
Survey Date: 5/16/2022			
Photograph ID: 2			
Net Site: RLM-04			
Net ID: Net B			
Survey Date: 5/16/2022			



Client:	Enbridge	Project:	Ridgeline Expansion
Site Name:		Site Location:	Trousdale County, TN
Photograph ID: 3			
Net Site: RLM-05			
Net ID: Net A			
Survey Date: 5/16/2022			
Photograph ID: 4			
Net Site: RLM-05			
Net ID: Net B			
Survey Date: 5/16/2022			

Client: Enbridge		Project: Ridgeline Expansion	
Site Name:		Site Location: Trousdale County, TN	
Photograph ID: 5			
Net Site: RLM-06			
Net ID: Net A			
Survey Date: 5/16/2022			
Photograph ID: 6			
Net Site: RLM-06			
Net ID: Net B			
Survey Date: 5/16/2022			

Client:	Enbridge	Project:	Ridgeline Expansion
Site Name:		Site Location:	Trousdale County, TN
Photograph ID: 7			
Net Site: RLM-07			
Net ID: Net A			
Survey Date: 5/16/2022			
Photograph ID: 8			
Net Site: RLM-07			
Net ID: Net B			
Survey Date: 5/16/2022			

Client:	Enbridge	Project:	Ridgeline Expansion
Site Name:		Site Location:	Trousdale County, TN
Photograph ID: 9			
Net Site: RLM-08			
Net ID: Net A			
Survey Date: 5/17/2022			
Photograph ID: 10			
Net Site: RLM-08			
Net ID: Net B			
Survey Date: 5/17/2022			



Client:	Enbridge	Project:	Ridgeline Expansion
Site Name:		Site Location:	Trousdale County, TN
Photograph ID: 11			
Net Site: RLM-11			
Net ID: Net A			
Survey Date: 5/20/2022			
Photograph ID: 12			
Net Site: RLM-11			
Net ID: Net B			
Survey Date: 5/20/2022			

Client: Enbridge		Project: Ridgeline Expansion	
Site Name:		Site Location: Trousdale County, TN	
Photograph ID: 13			
Net Site: RLM-13			
Net ID: Net A			
Survey Date: 5/18/2022			
Photograph ID: 14			
Net Site: RLM-13			
Net ID: Net B			
Survey Date: 5/18/2022			

Client:	Enbridge	Project:	Ridgeline Expansion
Site Name:		Site Location:	Trousdale County, TN
Photograph ID: 15			
Net Site: RLM-14			
Net ID: Net A			
Survey Date: 5/18/2022			
Photograph ID: 16			
Net Site: RLM-14			
Net ID: Net B			
Survey Date: 5/18/2022			


05/18/2022 18:38
N 36.3662°, W 86.1260°
TN, Hartsville





Client:	Enbridge	Project:	Ridgeline Expansion
Site Name:		Site Location:	Trousdale County, TN
Photograph ID: 17			
Net Site: RLM-15			
Net ID: Net A			
Survey Date: 5/18/2022			
Photograph ID: 18			
Net Site: RLM-15			
Net ID: Net B			
Survey Date: 5/18/2022			

Client:	Enbridge	Project:	Ridgeline Expansion
Site Name:		Site Location:	Trousdale County, TN
Photograph ID: 19			
Net Site: RLM-15			
Net ID: Net C			
Survey Date: 5/19/2022			
Photograph ID: 20			
Net Site: RLM-16			
Net ID: Net A			
Survey Date: 5/18/2022			

Client: Enbridge		Project: Ridgeline Expansion	
Site Name:		Site Location: Trousdale County, TN	
Photograph ID: 21			
Net Site: RLM-16			
Net ID: Net B			
Survey Date: 5/18/2022			
Photograph ID: 22			
Net Site: RLM-17			
Net ID: Net A			
Survey Date: 5/19/2022			



Client:	Enbridge	Project:	Ridgeline Expansion
Site Name:		Site Location:	Trousdale County, TN
Photograph ID: 23			
Net Site: RLM-17			
Net ID: Net B			
Survey Date: 5/19/2022			
Photograph ID: 24			
Net Site: RLM-18			
Net ID: Net A			
Survey Date: 5/20/2022			

Client:	Enbridge	Project:	Ridgeline Expansion
Site Name:		Site Location:	Trousdale County, TN
Photograph ID: 25	 <p>05/20/2022 19:32 N 36.3666° W 86.0708° TN Hartsville</p>		
Net Site: RLM-18			
Net ID: Net B			
Survey Date: 5/20/2022			


Client: Enbridge		Project: Ridgeline Expansion	
Site Name:		Site Location: Smith County, TN	
Photograph ID: 26			
Net Site: RLM-21			
Net ID: Net A			
Survey Date: 5/22/2022			
Photograph ID: 27			
Net Site: RLM-21			
Net ID: Net B			
Survey Date: 5/22/2022			

Client: Enbridge		Project: Ridgeline Expansion	
Site Name:		Site Location: Smith County, TN	
Photograph ID: 28			
Net Site: RLM-23			
Net ID: Net A			
Survey Date: 5/20/2022			
Photograph ID: 29			
Net Site: RLM-23			
Net ID: Net B			
Survey Date: 5/20/2022			

Client:	Enbridge	Project:	Ridgeline Expansion
Site Name:		Site Location:	Smith County, TN
Photograph ID: 30			
Net Site: RLM-25			
Net ID: Net A			
Survey Date: 5/20/2022			
Photograph ID: 31			
Net Site: RLM-25			
Net ID: Net B			
Survey Date: 5/20/2022			

Client: Enbridge		Project: Ridgeline Expansion	
Site Name:		Site Location: Smith County, TN	
Photograph ID: 32			
Net Site: RLM-26			
Net ID: Net A			
Survey Date: 5/24/2022			
Photograph ID: 33			
Net Site: RLM-26			
Net ID: Net B			
Survey Date: 5/24/2022			

Client: Enbridge		Project: Ridgeline Expansion	
Site Name:		Site Location: Smith County, TN	
Photograph ID: 34			
Net Site: RLM-27			
Net ID: Net A			
Survey Date: 5/23/2022			
Photograph ID: 35			
Net Site: RLM-27			
Net ID: Net B			
Survey Date: 5/23/2022			

Client: Enbridge		Project: Ridgeline Expansion	
Site Name:		Site Location: Smith County, TN	
Photograph ID: 36			
Net Site: RLM-28			
Net ID: Net A			
Survey Date: 5/23/2022			
Photograph ID: 37	<p>NO PHOTO</p>		
Net Site: RLM-28			
Net ID: Net B			
Survey Date: 5/23/2022			



Client: Enbridge		Project: Ridgeline Expansion	
Site Name:		Site Location: Smith County, TN	
Photograph ID: 38			
Net Site: RLM-30			
Net ID: Net A			
Survey Date: 6/3/2022			
Photograph ID: 39			
Net Site: RLM-30			
Net ID: Net B			
Survey Date: 6/3/2022			

Client:	Enbridge	Project:	Ridgeline Expansion
Site Name:		Site Location:	Smith County, TN
Photograph ID: 40			
Net Site: RLM-31			
Net ID: Net A			
Survey Date: 5/29/2022			
Photograph ID: 41			
Net Site: RLM-31			
Net ID: Net B			
Survey Date: 5/29/2022			

Client: Enbridge		Project: Ridgeline Expansion	
Site Name:		Site Location: Smith County, TN	
Photograph ID: 42			
Net Site: RLM-32			
Net ID: Net A			
Survey Date: 5/29/2022			
Photograph ID: 43			
Net Site: RLM-32			
Net ID: Net B			
Survey Date: 5/29/2022			

Client: Enbridge		Project: Ridgeline Expansion	
Site Name:		Site Location: Smith County, TN	
Photograph ID: 44			
Net Site: RLM-33			
Net ID: Net A			
Survey Date: 5/29/2022			
Photograph ID: 45			
Net Site: RLM-33			
Net ID: Net B			
Survey Date: 5/29/2022			

Client: Enbridge		Project: Ridgeline Expansion	
Site Name:		Site Location: Smith County, TN	
Photograph ID: 46			
Net Site: RLM-34			
Net ID: Net A			
Survey Date: 5/31/2022			
Photograph ID: 47			
Net Site: RLM-34			
Net ID: Net B			
Survey Date: 5/31/2022			

Client: Enbridge		Project: Ridgeline Expansion	
Site Name:		Site Location: Smith County, TN	
Photograph ID: 48			
Net Site: RLM-35			
Net ID: Net A			
Survey Date: 6/1/2022			
Photograph ID: 49			
Net Site: RLM-35			
Net ID: Net B			
Survey Date: 6/1/2022			

Client:	Enbridge	Project:	Ridgeline Expansion
Site Name:		Site Location:	Smith County, TN
Photograph ID: 50			
Net Site: RLM-37			
Net ID: Net A			
Survey Date: 5/31/2022			
NO PHOTO			
Photograph ID: 51			
Net Site: RLM-37			
Net ID: Net B			
Survey Date: 5/31/2022			
NO PHOTO			

Client:	Enbridge	Project:	Ridgeline Expansion
Site Name:		Site Location:	Smith County, TN

Photograph ID: 52
Net Site:
RLM-40

Net ID:
Net A



Survey Date:
6/2/2022



Photograph ID: 53
Net Site:
RLM-40



Net ID:
Net B



Survey Date:
6/2/2022


Client: Enbridge		Project: Ridgeline Expansion	
Site Name:		Site Location: Smith County, TN	
Photograph ID: 54			
Net Site: RLM-41			
Net ID: Net A			
Survey Date: 6/2/2022			
Photograph ID: 55			
Net Site: RLM-41			
Net ID: Net B			
Survey Date: 6/2/2022			



Client: Enbridge		Project: Ridgeline Expansion	
Site Name:		Site Location: Smith County, TN	
Photograph ID: 56			
Net Site: RLM-42			
Net ID: Net A			
Survey Date: 5/24/2022			
Photograph ID: 57			
Net Site: RLM-42			
Net ID: Net B			
Survey Date: 5/24/2022			

Client: Enbridge		Project: Ridgeline Expansion	
Site Name:		Site Location: Jackson County, TN	
Photograph ID: 58			
Net Site: RLM-43			
Net ID: Net A			
Survey Date: 5/27/2022			
Photograph ID: 59			
Net Site: RLM-43			
Net ID: Net B			
Survey Date: 5/27/2022			



Client: Enbridge		Project: Ridgeline Expansion	
Site Name:		Site Location: Jackson County, TN	
Photograph ID: 60			
Net Site: RLM-45			
Net ID: Net A			
Survey Date: 5/27/2022			
Photograph ID: 61			
Net Site: RLM-45			
Net ID: Net B			
Survey Date: 5/27/2022			

Client:	Enbridge	Project:	Ridgeline Expansion
Site Name:		Site Location:	Jackson County, TN
Photograph ID: 62			
Net Site: RLM-46			
Net ID: Net A			
Survey Date: 6/1/2022			
Photograph ID: 63			
Net Site: RLM-46			
Net ID: Net B			
Survey Date: 6/1/2022			

Client: Enbridge		Project: Ridgeline Expansion	
Site Name:		Site Location: Jackson County, TN	
Photograph ID: 64			
Net Site: RLM-49			
Net ID: Net A			
Survey Date: 6/4/2022			
Photograph ID: 65			
Net Site: RLM-49			
Net ID: Net B			
Survey Date: 6/4/2022			

Client: Enbridge		Project: Ridgeline Expansion	
Site Name:		Site Location: Jackson County, TN	
Photograph ID: 66			
Net Site: RLM-49			
Net ID: Net C			
Survey Date: 6/5/2022			
Photograph ID: 67			
Net Site: RLM-50A			
Net ID: Net A			
Survey Date: 6/4/2022			



Client: Enbridge		Project: Ridgeline Expansion	
Site Name:		Site Location: Jackson County, TN	
Photograph ID: 68			
Net Site: RLM-50A			
Net ID: Net B			
Survey Date: 6/4/2022			
Photograph ID: 69			
Net Site: RLM-51			
Net ID: Net A			
Survey Date: 6/5/2022			



Client: Enbridge		Project: Ridgeline Expansion	
Site Name:		Site Location: Jackson County, TN	
Photograph ID: 70			
Net Site: RLM-51			
Net ID: Net B			
Survey Date: 6/5/2022			
Photograph ID: 71			
Net Site: RLM-52			
Net ID: Net A			
Survey Date: 6/8/2022			



Client: Enbridge		Project: Ridgeline Expansion	
Site Name:		Site Location: Jackson County, TN	
Photograph ID: 72			
Net Site: RLM-52			
Net ID: Net B			
Survey Date: 6/8/2022			
Photograph ID: 73			
Net Site: RLM-53			
Net ID: Net A			
Survey Date: 6/9/2022			



Client: Enbridge		Project: Ridgeline Expansion	
Site Name:		Site Location: Jackson County, TN	
Photograph ID: 74			
Net Site: RLM-53			
Net ID: Net B			
Survey Date: 6/9/2022			
Photograph ID: 75			
Net Site: RLM-53			
Net ID: Net C			
Survey Date: 6/10/2022			

Client: Enbridge		Project: Ridgeline Expansion	
Site Name:		Site Location: Jackson County, TN	
Photograph ID: 76			
Net Site: RLM-54			
Net ID: Net A			
Survey Date: 6/10/2022			
Photograph ID: 77			
Net Site: RLM-54			
Net ID: Net B			
Survey Date: 6/10/2022			



Client: Enbridge		Project: Ridgeline Expansion	
Site Name:		Site Location: Jackson County, TN	
Photograph ID: 78			
Net Site: RLM-56			
Net ID: Net A			
Survey Date: 6/11/2022			
Photograph ID: 79			
Net Site: RLM-56			
Net ID: Net B			
Survey Date: 6/11/2022			



Client: Enbridge		Project: Ridgeline Expansion	
Site Name:		Site Location: Jackson County, TN	
Photograph ID: 80			
Net Site: RLM-57			
Net ID: Net A			
Survey Date: 6/11/2022			
Photograph ID: 81			
Net Site: RLM-57			
Net ID: Net B			
Survey Date: 6/11/2022			


Client:	Enbridge	Project:	Ridgeline Expansion
Site Name:		Site Location:	Jackson County, TN
Photograph ID: 82			
Net Site: RLM-59			
Net ID: Net A			
Survey Date: 6/11/2022			
Photograph ID: 83			
Net Site: RLM-59			
Net ID: Net B			
Survey Date: 6/12/2022			

Client: Enbridge		Project: Ridgeline Expansion	
Site Name:		Site Location: Jackson County, TN	
Photograph ID: 84			
Net Site: RLM-60			
Net ID: Net A			
Survey Date: 6/14/2022			
Photograph ID: 85			
Net Site: RLM-60			
Net ID: Net B			
Survey Date: 6/14/2022			


Client:	Enbridge	Project:	Ridgeline Expansion
Site Name:		Site Location:	Jackson County, TN
Photograph ID: 86			
Net Site: RLM-61			
Net ID: Net-A			
Survey Date: 6/9/2022			
Photograph ID: 87			
Net Site: RLM-61			
Net ID: Net-B			
Survey Date: 6/9/2022			



Client:	Enbridge	Project:	Ridgeline Expansion
Site Name:		Site Location:	Jackson County, TN
Photograph ID: 88			
Net Site: RLM-62			
Net ID: Net A			
Survey Date: 6/11/2022			
Photograph ID: 89			
Net Site: RLM-62			
Net ID: Net B			
Survey Date: 6/11/2022			

Client:	Enbridge	Project:	Ridgeline Expansion
Site Name:		Site Location:	Jackson County, TN
Photograph ID: 90			
Net Site: RLM-63			
Net ID: Net A			
Survey Date: 6/14/2022			
Photograph ID: 91			
Net Site: RLM-63			
Net ID: Net B			
Survey Date: 6/14/2022			



Client: Enbridge		Project: Ridgeline Expansion	
Site Name:		Site Location: Jackson County, TN	
Photograph ID: 92			
Net Site: RLM-64			
Net ID: Net A			
Survey Date: 6/14/2022			
Photograph ID: 93	NO PHOTO		
Net Site: RLM-64			
Net ID: Net B			
Survey Date: 6/14/2022			

Client: Enbridge		Project: Ridgeline Expansion	
Site Name:		Site Location: Jackson County, TN	
Photograph ID: 94			
Net Site: RLM-64			
Net ID: Net C			
Survey Date: 6/14/2022			
Photograph ID: 95			
Net Site: RLM-65			
Net ID: Net A			
Survey Date: 6/14/2022			

Client: Enbridge		Project: Ridgeline Expansion	
Site Name:		Site Location: Jackson County, TN	
Photograph ID: 96			
Net Site: RLM-65			
Net ID: Net B			
Survey Date: 6/14/2022			
Photograph ID: 97			
Net Site: RLM-66			
Net ID: Net A			
Survey Date: 6/15/2022			



Client:	Enbridge	Project:	Ridgeline Expansion
Site Name:		Site Location:	Jackson County, TN
Photograph ID: 98			
Net Site: RLM-66			
Net ID: Net B			
Survey Date: 6/15/2022			
Photograph ID: 99			
Net Site: RLM-67			
Net ID: Net A			
Survey Date: 6/13/2022			

Client:	Enbridge	Project:	Ridgeline Expansion
Site Name:		Site Location:	Jackson County, TN
Photograph ID: 100			
Net Site: RLM-67			
Net ID: Net B			
Survey Date: 6/13/2022			
Photograph ID: 101			
Net Site: RLM-68			
Net ID: Net A			
Survey Date: 6/15/2022			

Client: Enbridge		Project: Ridgeline Expansion	
Site Name:		Site Location: Jackson County, TN	
Photograph ID: 102			
Net Site: RLM-68			
Net ID: Net B			
Survey Date: 6/15/2022			
Photograph ID: 103			
Net Site: RLM-68			
Net ID: Net C			
Survey Date: 6/15/2022			

Client: Enbridge		Project: Ridgeline Expansion
Site Name:		Site Location: Jackson County, TN
Photograph ID: 104		
Net Site: RLM-69		
Net ID: Net A		
Survey Date: 6/9/2022		
Photograph ID: 105		
Net Site: RLM-69		
Net ID: Net B		
Survey Date: 6/9/2022		



Client: Enbridge		Project: Ridgeline Expansion	
Site Name:		Site Location: Jackson County, TN	
Photograph ID: 106			
Net Site: RLM-70			
Net ID: Net A			
Survey Date: 6/15/2022			
Photograph ID: 107			
Net Site: RLM-70			
Net ID: Net B			
Survey Date: 6/15/2022			



Client: Enbridge		Project: Ridgeline Expansion	
Site Name:		Site Location: Jackson County, TN	
Photograph ID: 108			
Net Site: RLM-72			
Net ID: Net A			
Survey Date: 6/15/2022			
Photograph ID: 109			
Net Site: RLM-72			
Net ID: Net B			
Survey Date: 6/15/2022			

Client: Enbridge		Project: Ridgeline Expansion
Site Name:		Site Location: Jackson County, TN
Photograph ID: 110		
Net Site: RLM-73		
Net ID: Net A		
Survey Date: 6/10/2022		
Photograph ID: 111		
Net Site: RLM-73		
Net ID: Net B		
Survey Date: 6/10/2022		



Client:	Enbridge	Project:	Ridgeline Expansion
Site Name:		Site Location:	Jackson County, TN
Photograph ID: 112			
Net Site: RLM-74			
Net ID: Net A			
Survey Date: 6/9/2022			
Photograph ID: 113			
Net Site: RLM-74			
Net ID: Net B			
Survey Date: 6/9/2022			



Client: Enbridge		Project: Ridgeline Expansion
Site Name:		Site Location: Putnam County, TN
Photograph ID: 114		
Net Site: RLM-80		
Net ID: Net A		
Survey Date: 6/17/2022		
Photograph ID: 115		
Net Site: RLM-80		
Net ID: Net B		
Survey Date: 6/17/2022		

Client:	Enbridge	Project:	Ridgeline Expansion
Site Name:		Site Location:	Putnam County, TN
Photograph ID: 116			
Net Site: RLM-82			
Net ID: Net A			
Survey Date: 6/17/2022			
Photograph ID: 117			
Net Site: RLM-82			
Net ID: Net B			
Survey Date: 6/17/2022			



Client: Enbridge		Project: Ridgeline Expansion	
Site Name:		Site Location: Putnam County, TN	
Photograph ID: 118			
Net Site: RLM-83			
Net ID: Net A			
Survey Date: 6/17/2022			
Photograph ID: 119			
Net Site: RLM-83			
Net ID: Net B			
Survey Date: 6/17/2022			



Client:	Enbridge	Project:	Ridgeline Expansion
Site Name:		Site Location:	Putnam County, TN
Photograph ID: 120			
Net Site: RLM-84			
Net ID: Net A			
Survey Date: 6/17/2022			
Photograph ID: 121			
Net Site: RLM-84			
Net ID: Net B			
Survey Date: 6/17/2022			

Client:	Enbridge	Project:	Ridgeline Expansion
Site Name:		Site Location:	Putnam County, TN
Photograph ID: 122			
Net Site: RLM-85			
Net ID: Net A			
Survey Date: 6/22/2022			
Photograph ID: 123			
Net Site: RLM-85			
Net ID: Net B			
Survey Date: 6/22/2022			



Client: Enbridge		Project: Ridgeline Expansion	
Site Name:		Site Location: Putnam County, TN	
Photograph ID: 124			
Net Site: RLM-86			
Net ID: Net A			
Survey Date: 6/19/2022			
Photograph ID: 125			
Net Site: RLM-86			
Net ID: Net B			
Survey Date: 6/19/2022			

Client:	Enbridge	Project:	Ridgeline Expansion
Site Name:		Site Location:	Putnam County, TN
Photograph ID: 126			
Net Site: RLM-87			
Net ID: Net A			
Survey Date: 6/20/2022			
Photograph ID: 127			
Net Site: RLM-87			
Net ID: Net B			
Survey Date: 6/20/2022			

Client: Enbridge		Project: Ridgeline Expansion	
Site Name:		Site Location: Putnam County, TN	
Photograph ID: 128			
Net Site: RLM-89			
Net ID: Net A			
Survey Date: 6/20/2022			
Photograph ID: 129			
Net Site: RLM-89			
Net ID: Net B			
Survey Date: 6/20/2022			

Client:	Enbridge	Project:	Ridgeline Expansion
Site Name:		Site Location:	Putnam County, TN
Photograph ID: 130			
Net Site: RLM-91			
Net ID: Net A			
Survey Date: 6/21/2022			
Photograph ID: 131			
Net Site: RLM-91			
Net ID: Net B			
Survey Date: 6/21/2022			



Client: Enbridge		Project: Ridgeline Expansion	
Site Name:		Site Location: Putnam County, TN	
Photograph ID: 132			
Net Site: RLM-92			
Net ID: Net A			
Survey Date: 6/21/2022			
Photograph ID: 133			
Net Site: RLM-92			
Net ID: Net B			
Survey Date: 6/22/2022			

Client: Enbridge		Project: Ridgeline Expansion	
Site Name:		Site Location: Putnam County, TN	
Photograph ID: 134			
Net Site: RLM-93			
Net ID: Net A			
Survey Date: 6/21/2022			
Photograph ID: 135			
Net Site: RLM-93			
Net ID: Net B			
Survey Date: 6/21/2022			

Client: Enbridge		Project: Ridgeline Expansion	
Site Name:		Site Location: Putnam County, TN	
Photograph ID: 136			
Net Site: RLM-94			
Net ID: Net A			
Survey Date: 6/19/2022			
Photograph ID: 137			
Net Site: RLM-94			
Net ID: Net B			
Survey Date: 6/19/2022			

Client: Enbridge		Project: Ridgeline Expansion	
Site Name:		Site Location: Overton County, TN	
Photograph ID: 138			
Net Site: RLM-98			
Net Id: Net A			
Survey Date: 6/25/2022			
Photograph ID: 139			
Net Site: RLM-98			
Net Id: Net B			
Survey Date: 6/25/2022			

Client:	Enbridge	Project:	Ridgeline Expansion
Site Name:		Site Location:	Overton County, TN
Photograph ID: 140			
Net Site: RLM-99			
Net Id: Net A			
Survey Date: 6/24/2022			
Photograph ID: 141			
Net Site: RLM-99			
Net Id: Net B			
Survey Date: 6/24/2022			

Client: Enbridge		Project: Ridgeline Expansion	
Site Name:		Site Location: Overton County, TN	
Photograph ID: 142			
Net Site: RLM-100			
Net Id: Net A			
Survey Date: 6/22/2022			
Photograph ID: 143			
Net Site: RLM-100			
Net Id: Net B			
Survey Date: 6/22/2022			


Client:	Enbridge	Project:	Ridgeline Expansion
Site Name:		Site Location:	Overton County, TN
Photograph ID: 144			
Net Site: RLM-101			
Net Id: Net A			
Survey Date: 6/23/2022			
Photograph ID: 145			
Net Site: RLM-101			
Net Id: Net B			
Survey Date: 6/23/2022			

Client: Enbridge		Project: Ridgeline Expansion	
Site Name:		Site Location: Overton County, TN	
Photograph ID: 146			
Net Site: RLM-101			
Net Id: Net C			
Survey Date: 6/23/2022			
Photograph ID: 147			
Net Site: RLM-102			
Net Id: Net A			
Survey Date: 6/25/2022			

Client:	Enbridge	Project:	Ridgeline Expansion
Site Name:		Site Location:	Overton County, TN
Photograph ID: 148			
Net Site: RLM-102			
Net Id: Net B			
Survey Date: 6/26/2022			
Photograph ID: 149			
Net Site: RLM-102			
Net Id: Net C			
Survey Date: 6/27/2022			



Client: Enbridge		Project: Ridgeline Expansion	
Site Name:		Site Location: Overton County, TN	
Photograph ID: 150			
Net Site: RLM-103			
Net Id: Net A			
Survey Date: 6/23/2022			
Photograph ID: 151			
Net Site: RLM-103			
Net Id: Net B			
Survey Date: 6/23/2022			

Client: Enbridge		Project: Ridgeline Expansion	
Site Name:		Site Location: Overton County, TN	
Photograph ID: 152			
Net Site: RLM-104			
Net Id: Net A			
Survey Date: 6/23/2022			
Photograph ID: 153			
Net Site: RLM-104			
Net Id: Net B			
Survey Date: 6/23/2022			

Client: Enbridge		Project: Ridgeline Expansion	
Site Name:		Site Location: Overton County, TN	
Photograph ID: 154			
Net Site: RLM-108			
Net Id: Net A			
Survey Date: 6/25/2022 (Site unfinished)			
Photograph ID: 155	<p>NO PHOTO</p>		
Net Site: RLM-108			
Net Id: Net B			
Survey Date: 6/25/2022 (Site unfinished)			



Client: Enbridge		Project: Ridgeline Expansion	
Site Name:		Site Location: Overton County, TN	
Photograph ID: 156			
Net Site: RLM-114			
Net Id: Net A			
Survey Date: 6/30/2022			
Photograph ID: 157			
Net Site: RLM-114			
Net Id: Net B			
Survey Date: 6/30/2022			



Client:	Enbridge	Project:	Ridgeline Expansion
Site Name:		Site Location:	Overton County, TN
Photograph ID: 158			
Net Site: RLM-115			
Net Id: Net A			
Survey Date: 6/28/2022			
Photograph ID: 159			
Net Site: RLM-115			
Net Id: Net B			
Survey Date: 6/28/2022			

Client:	Enbridge	Project:	Ridgeline Expansion
Site Name:		Site Location:	Overton County, TN
Photograph ID: 160			
Net Site: RLM-116			
Net Id: Net A			
Survey Date: 6/28/2022			
Photograph ID: 161			
Net Site: RLM-116			
Net Id: Net B			
Survey Date: 6/28/2022			

Client:	Enbridge	Project:	Ridgeline Expansion
Site Name:		Site Location:	Fentress County, TN
Photograph ID: 162			
Net Site: RLM-120			
Net ID: Net A			
Survey Date: 6/29/2022			
Photograph ID: 163			
Net Site: RLM-120			
Net ID: Net B			
Survey Date: 6/29/2022			

Client: Enbridge		Project: Ridgeline Expansion	
Site Name:		Site Location: Fentress County, TN	
Photograph ID: 164			
Net Site: RLM-124			
Net ID: Net A			
Survey Date: 6/30/2022			
Photograph ID: 165			
Net Site: RLM-124			
Net ID: Net B			
Survey Date: 6/30/2022			

Client: Enbridge		Project: Ridgeline Expansion	
Site Name:		Site Location: Fentress County, TN	
Photograph ID: 166			
Net Site: RLM-127			
Net ID: Net A			
Survey Date: 7/1/2022			
Photograph ID: 167			
Net Site: RLM-127			
Net ID: Net B			
Survey Date: 7/1/2022			



Client: Enbridge		Project: Ridgeline Expansion	
Site Name:		Site Location: Fentress County, TN	
Photograph ID: 168			
Net Site: RLM-129			
Net ID: Net A			
Survey Date: 7/10/2022			
Photograph ID: 169			
Net Site: RLM-129			
Net ID: Net B			
Survey Date: 7/10/2022			



Client: Enbridge		Project: Ridgeline Expansion	
Site Name:		Site Location: Fentress County, TN	
Photograph ID: 170			
Net Site: RLM-130			
Net ID: Net A			
Survey Date: 7/9/2022			
Photograph ID: 171			
Net Site: RLM-130			
Net ID: Net B			
Survey Date: 7/10/2022			



Client: Enbridge		Project: Ridgeline Expansion	
Site Name:		Site Location: Fentress County, TN	
Photograph ID: 172			
Net Site: RLM-131			
Net ID: Net A			
Survey Date: 7/10/2022			
Photograph ID: 173			
Net Site: RLM-131			
Net ID: Net B			
Survey Date: 7/10/2022			

Client: Enbridge		Project: Ridgeline Expansion	
Site Name:		Site Location: Fentress County, TN	
Photograph ID: 174			
Net Site: RLM-132			
Net ID: Net A			
Survey Date: 7/13/2022			
Photograph ID: 175			
Net Site: RLM-132			
Net ID: Net B			
Survey Date: 7/14/2022			

Client:	Enbridge	Project:	Ridgeline Expansion
Site Name:		Site Location:	Morgan County, TN
Photograph ID: 176			
Net Site: RLM-137			
Net ID: Net A			
Survey Date: 7/14/2022			
Photograph ID: 177			
Net Site: RLM-137			
Net ID: Net B			
Survey Date: 7/14/2022			



Client:	Enbridge	Project:	Ridgeline Expansion
Site Name:		Site Location:	Morgan County, TN
Photograph ID: 178			
Net Site: RLM-138			
Net ID: Net A			
Survey Date: 7/13/2022			
Photograph ID: 179			
Net Site: RLM-138			
Net ID: Net B			
Survey Date: 7/13/2022			



Client:	Enbridge	Project:	Ridgeline Expansion
Site Name:		Site Location:	Morgan County, TN
Photograph ID: 180			
Net Site: RLM-140			
Net ID: Net A			
Survey Date: 7/13/2022			
Photograph ID: 181			
Net Site: RLM-140			
Net ID: Net B			
Survey Date: 7/13/2022			


Client:	Enbridge	Project:	Ridgeline Expansion
Site Name:		Site Location:	Morgan County, TN
Photograph ID: 182			
Net Site: RLM-141			
Net ID: Net A			
Survey Date: 7/15/2022			
Photograph ID: 183			
Net Site: RLM-141			
Net ID: Net B			
Survey Date: 7/15/2022			

Client:	Enbridge	Project:	Ridgeline Expansion
Site Name:		Site Location:	Morgan County, TN
Photograph ID: 184			
Net Site: RLM-141			
Net ID: Net C			
Survey Date: 7/18/2022			
Photograph ID: 185			
Net Site: RLM-142			
Net ID: Net A			
Survey Date: 7/17/2022			



Client:	Enbridge	Project:	Ridgeline Expansion
Site Name:		Site Location:	Morgan County, TN
Photograph ID: 186			
Net Site: RLM-142			
Net ID: Net B			
Survey Date: 7/17/2022			
Photograph ID: 187			
Net Site: RLM-143			
Net ID: Net A			
Survey Date: 7/16/2022			

Client:	Enbridge	Project:	Ridgeline Expansion
Site Name:		Site Location:	Morgan County, TN
Photograph ID: 188			
Net Site: RLM-143			
Net ID: Net B			
Survey Date: 7/16/2022			
Photograph ID: 189			
Net Site: RLM-145			
Net ID: Net A			
Survey Date: 7/18/2022			

Client:	Enbridge	Project:	Ridgeline Expansion
Site Name:		Site Location:	Morgan County, TN
Photograph ID: 190	 <p>07/18/2022 21:14 N 36.1540°, W 84.7956° TN, Deer Lodge</p>		
Net Site: RLM-145			
Net ID: Net B			
Survey Date: 7/18/2022			
Photograph ID: 191	 <p>07/19/2022 20:55 N 36.1537° W 84.7958° TN, Deer Lodge</p>		
Net Site: RLM-145			
Net ID: Net C			
Survey Date: 7/19/2022			

Client:	Enbridge	Project:	Ridgeline Expansion
Site Name:		Site Location:	Morgan County, TN
Photograph ID: 192			
Net Site: RLM-146			
Net ID: Net A			
Survey Date: 8/5/2022			
Photograph ID: 193			
Net Site: RLM-146			
Net ID: Net B			
Survey Date: 8/5/2022			

Client:	Enbridge	Project:	Ridgeline Expansion
Site Name:		Site Location:	Morgan County, TN
Photograph ID: 194	<div style="text-align: center; height: 200px;">NO PHOTO</div>		
Net Site: RLM-147			
Net ID: Net A			
Survey Date: 7/18/2022			
Photograph ID: 195	<div style="text-align: center; height: 200px;">NO PHOTO</div>		
Net Site: RLM-147			
Net ID: Net B			
Survey Date: 7/18/2022			



Client:	Enbridge	Project:	Ridgeline Expansion
Site Name:		Site Location:	Morgan County, TN
Photograph ID: 196			
Net Site: RLM-148			
Net ID: Net A			
Survey Date: 7/18/2022			
Photograph ID: 197			
Net Site: RLM-148			
Net ID: Net B			
Survey Date: 7/18/2022			


Client:	Enbridge	Project:	Ridgeline Expansion
Site Name:		Site Location:	Morgan County, TN
Photograph ID: 198			
Net Site: RLM-149			
Net ID: Net A			
Survey Date: 7/23/2022			
Photograph ID: 199			
Net Site: RLM-149			
Net ID: Net B			
Survey Date: 7/23/2022			

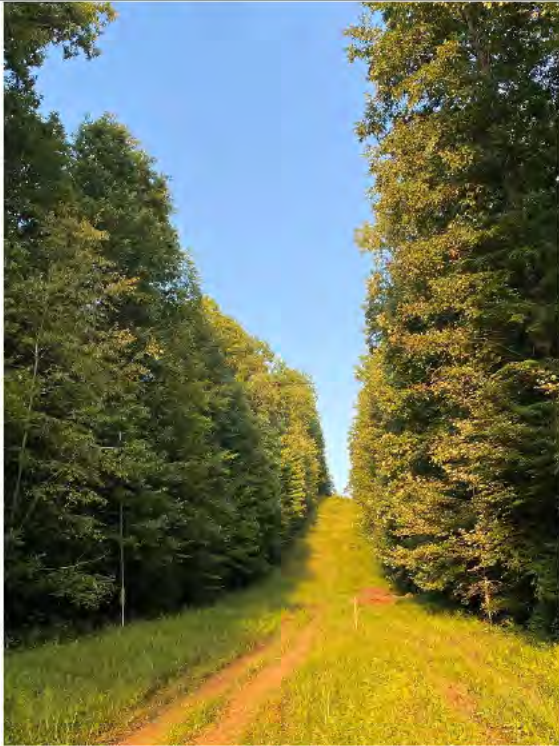

Client:	Enbridge	Project:	Ridgeline Expansion
Site Name:		Site Location:	Morgan County, TN
Photograph ID: 200			
Net Site: RLM-150			
Net ID: Net A			
Survey Date: 7/20/2022			
Photograph ID: 201			
Net Site: RLM-150			
Net ID: Net B			
Survey Date: 7/20/2022			



Client:	Enbridge	Project:	Ridgeline Expansion
Site Name:		Site Location:	Morgan County, TN
Photograph ID: 202	 <p>07/21/2022 20:54 N 36.1355°, W 84.7417°</p>		
Net Site: RLM-151			
Net ID: Net A			
Survey Date: 7/21/2022			
Photograph ID: 203	 <p>07/21/2022 21:06 N 36.1359°, W 84.7426°</p>		
Net Site: RLM-151			
Net ID: Net B			
Survey Date: 7/21/2022			



Client:	Enbridge	Project:	Ridgeline Expansion
Site Name:		Site Location:	Morgan County, TN
Photograph ID: 204			
Net Site: RLM-152			
Net ID: Net A			
Survey Date: 7/24/2022			
Photograph ID: 205			
Net Site: RLM-152			
Net ID: Net B			
Survey Date: 7/24/2022			



Client:	Enbridge	Project:	Ridgeline Expansion
Site Name:		Site Location:	Morgan County, TN
Photograph ID: 206			
Net Site: RLM-153			
Net ID: Net A			
Survey Date: 7/29/2022			
Photograph ID: 207			
Net Site: RLM-153			
Net ID: Net B			
Survey Date: 7/29/2022			



Client: Enbridge		Project: Ridgeline Expansion	
Site Name:		Site Location: Morgan County, TN	
Photograph ID: 208			
Net Site: RLM-154			
Net ID: Net A			
Survey Date: 7/26/2022			
Photograph ID: 209			
Net Site: RLM-154			
Net ID: Net B			
Survey Date: 7/26/2022			

Client: Enbridge		Project: Ridgeline Expansion	
Site Name:		Site Location: Morgan County, TN	
Photograph ID: 210			
Net Site: RLM-155			
Net ID: Net A			
Survey Date: 7/26/2022			
Photograph ID: 211			
Net Site: RLM-155			
Net ID: Net B			
Survey Date: 7/26/2022			



Client:	Enbridge	Project:	Ridgeline Expansion
Site Name:		Site Location:	Morgan County, TN
Photograph ID: 212			
Net Site: RLM-159			
Net ID: Net A			
Survey Date: 7/29/2022			
Photograph ID: 213			
Net Site: RLM-159			
Net ID: Net B			
Survey Date: 7/30/2022			



Client: Enbridge		Project: Ridgeline Expansion	
Site Name:		Site Location: Morgan County, TN	
Photograph ID: 214			
Net Site: RLM-160			
Net ID: Net A			
Survey Date: 7/29/2022			
Photograph ID: 215			
Net Site: RLM-160			
Net ID: Net B			
Survey Date: 7/29/2022			

Client:	Enbridge	Project:	Ridgeline Expansion
Site Name:		Site Location:	Morgan County, TN
Photograph ID: 216			
Net Site: RLM-161			
Net ID: Net A			
Survey Date: 7/30/2022			
Photograph ID: 217			
Net Site: RLM-161			
Net ID: Net B			
Survey Date: 7/30/2022			



Client:	Enbridge	Project:	Ridgeline Expansion
Site Name:		Site Location:	Morgan County, TN
Photograph ID: 218			
Net Site: RLM-162			
Net ID: Net A			
Survey Date: 7/30/2022			
Photograph ID: 219			
Net Site: RLM-162			
Net ID: Net B			
Survey Date: 7/30/2022			

Client:	Enbridge	Project:	Ridgeline Expansion
Site Name:		Site Location:	Morgan County, TN
Photograph ID: 220			
Net Site: RLM-162			
Net ID: Net C			
Survey Date: 7/31/2022			
Photograph ID: 221			
Net Site: RLM-162			
Net ID: Net D			
Survey Date: 7/31/2022			

Client: Enbridge		Project: Ridgeline Expansion	
Site Name:		Site Location: Morgan County, TN	
Photograph ID: 222			
Net Site: RLM-163			
Net ID: Net A			
Survey Date: 8/2/2022			
Photograph ID: 223			
Net Site: RLM-163			
Net ID: Net B			
Survey Date: 8/2/2022			

Client:	Enbridge	Project:	Ridgeline Expansion
Site Name:		Site Location:	Morgan County, TN
Photograph ID: 224			
Net Site: RLM-165			
Net ID: Net A			
Survey Date: 8/3/2022			
Photograph ID: 225			
Net Site: RLM-165			
Net ID: Net B			
Survey Date: 8/3/2022			

Client:	Enbridge	Project:	Ridgeline Expansion
Site Name:		Site Location:	Morgan County, TN
Photograph ID: 226			
Net Site: RLM-166			
Net ID: Net A			
Survey Date: 8/9/2022			
Photograph ID: 227			
Net Site: RLM-166			
Net ID: Net B			
Survey Date: 8/9/2022			



Client:	Enbridge	Project:	Ridgeline Expansion
Site Name:		Site Location:	Morgan County, TN
Photograph ID: 228			
Net Site: RLM-167			
Net ID: Net A			
Survey Date: 8/7/2022			
Photograph ID: 229			
Net Site: RLM-167			
Net ID: Net B			
Survey Date: 8/7/2022			



Client:	Enbridge	Project:	Ridgeline Expansion
Site Name:		Site Location:	Morgan County, TN
Photograph ID: 230			
Net Site: RLM-167			
Net ID: Net C			
Survey Date: 8/9/2022			
Photograph ID: 231			
Net Site: RLM-167			
Net ID: Net D			
Survey Date: 8/9/2022			



Client:	Enbridge	Project:	Ridgeline Expansion
Site Name:		Site Location:	Morgan County, TN
Photograph ID: 232			
Net Site: RLM-169			
Net ID: Net A			
Survey Date: 8/7/2022			
Photograph ID: 233			
Net Site: RLM-169			
Net ID: Net B			
Survey Date: 8/7/2022			



Client:	Enbridge	Project:	Ridgeline Expansion
Site Name:		Site Location:	Morgan County, TN
Photograph ID: 234			
Net Site: RLM-170			
Net ID: Net A			
Survey Date: 8/12/2022			
Photograph ID: 235			
Net Site: RLM-170			
Net ID: Net B			
Survey Date: 8/12/2022			

Client:	Enbridge	Project:	Ridgeline Expansion
Site Name:		Site Location:	Morgan County, TN
Photograph ID: 236			
Net Site: RLM-171			
Net ID: Net A			
Survey Date: 8/10/2022			
Photograph ID: 237			
Net Site: RLM-171			
Net ID: Net B			
Survey Date: 8/10/2022			

Client:	Enbridge	Project:	Ridgeline Expansion
Site Name:		Site Location:	Morgan County, TN
Photograph ID: 238			
Net Site: RLM-172			
Net ID: Net A			
Survey Date: 8/13/2022			
Photograph ID: 239			
Net Site: RLM-172			
Net ID: Net B			
Survey Date: 8/13/2022			



Client: Enbridge		Project: Ridgeline Expansion	
Site Name:		Site Location:	
Photograph ID: 1			
Species: Eptesicus fuscus (Big Brown Bat)			
Mist Net Site: RLM-114			
Survey Date: 6/29/2022			
Photograph ID: 2			
Species: Eptesicus fuscus (Big Brown Bat)			
Mist Net Site: RLM-124			
Survey Date: 6/30/2022			

Client: Enbridge		Project: Ridgeline Expansion	
Site Name:		Site Location:	
Photograph ID: 3			
Species: Eptesicus fuscus (Big Brown Bat)			
Mist Net Site: RLM-53			
Survey Date: 6/9/2022			
Photograph ID: 4			
Species: Eptesicus fuscus (Big Brown Bat)			
Mist Net Site: RLM-53			
Survey Date: 6/11/2022			



Client: Enbridge		Project: Ridgeline Expansion	
Site Name:		Site Location:	
Photograph ID: 1			
Species: Nycticeius humeralis (Evening Bat)			
Mist Net Site: RLM-114			
Survey Date: 6/30/2022			
Photograph ID: 2			
Species: Nycticeius humeralis (Evening Bat)			
Mist Net Site: RLM-35			
Survey Date: 6/29/2022			


Client: Enbridge		Project: Ridgeline Expansion	
Site Name:		Site Location:	
Photograph ID: 3			
Species: Nycticeius humeralis (Evening Bat)			
Mist Net Site: RLM-41			
Survey Date: 6/2/2022			
Photograph ID: 4			
Species: Nycticeius humeralis (Evening Bat)			
Mist Net Site: RLM-41			
Survey Date: 6/2/2022			



Client: Enbridge		Project: Ridgeline Expansion	
Site Name:		Site Location:	
Photograph ID: 1			
Species: Myotis grisescens (Gray Bat)			
Mist Net Site: RLM-45			
Survey Date: 5/28/2022			
Photograph ID: 2			
Species: Myotis grisescens (Gray Bat)			
Mist Net Site: RLM-45			
Survey Date: 5/28/2022			



Client: Enbridge		Project: Ridgeline Expansion	
Site Name:		Site Location:	
Photograph ID: 3			
Species: Myotis grisescens (Gray Bat)			
Mist Net Site: RLM-45			
Survey Date: 5/28/2022			
Photograph ID: 4			
Species: Myotis grisescens (Gray Bat)			
Mist Net Site: RLM-45			
Survey Date: 5/28/2022			

Client:	Enbridge	Project:	Ridgeline Expansion
Site Name:		Site Location:	
Photograph ID: 5			
Species: Myotis grisescens (Gray Bat)			
Mist Net Site: RLM-49			
Survey Date: 6/5/2022			

Client: Enbridge		Project: Ridgeline Expansion	
Site Name:		Site Location:	
Photograph ID: 1			
Species: Hoary bat (<i>Lasiurus cinereus</i>)			
Mist Net Site: RLM-04			
Survey Date: 5/17/2022			
Photograph ID: 2			
Species: Hoary bat (<i>Lasiurus cinereus</i>)			
Mist Net Site: RLM-59			
Survey Date: 6/12/2022			



Client: Enbridge		Project: Ridgeline Expansion	
Site Name:		Site Location:	
Photograph ID: 3			
Species: Hoary bat (<i>Lasiurus cinereus</i>)			
Mist Net Site: RLM-59			
Survey Date: 6/12/2022			


Client: Enbridge		Project: Ridgeline Expansion	
Site Name:		Site Location:	
Photograph ID: 1			
Species: Myotis lucifugus			
Mist Net Site:			
Survey Date:			
Photograph ID: 2			
Species: Myotis lucifugus			
Mist Net Site:			
Survey Date:			



Client:	Enbridge	Project:	Ridgeline Expansion
Site Name:		Site Location:	
Photograph ID: 3			
Species: <i>Myotis lucifugus</i>			
Mist Net Site:			
Survey Date:			
Photograph ID: 4			
Species: <i>Myotis lucifugus</i>			
Mist Net Site:			
Survey Date:			



Client:	Enbridge	Project:	Ridgeline Expansion
Site Name:		Site Location:	
Photograph ID: 5			
Species: Myotis lucifugus			
Mist Net Site:			
Survey Date:			


Client: Enbridge		Project: Ridgeline Expansion	
Site Name:		Site Location:	
Photograph ID: 1			
Species: Lasiurus borealis (Eastern red bat)			
Mist Net Site: RLM-43			
Date Captured: 6/29/2022			
Photograph ID: 2			
Species: Lasiurus borealis (Eastern red bat)			
Mist Net Site: RLM-18			
Date Captured: 6/29/2022			

Client: Enbridge		Project: Ridgeline Expansion	
Site Name:		Site Location:	
Photograph ID: 3			
Species: Lasiurus borealis (Eastern red bat)			
Mist Net Site: RLM-41			
Date Captured: 6/3/2022			
Photograph ID: 4			
Species: Lasiurus borealis (Eastern red bat)			
Mist Net Site: RLM-41			
Date Captured: 6/3/2022			

Client: Enbridge		Project: Ridgeline Expansion	
Site Name:		Site Location:	
Photograph ID: 1			
Species: Lasionycteris noctivagans (Silver-Haired Bat)			
Mist Net Site: RLM-30			
Survey Date: 6/3/2022			

Client: Enbridge		Project: Ridgeline Expansion	
Site Name:		Site Location:	
Photograph ID: 1			
Species: Perimyotis subflavus (Tricolored Bat)			
Mist Net Site: RLM-21			
Survey Date: 5/20/2022			
Photograph ID: 2			
Species: Perimyotis subflavus (Tricolored Bat)			
Mist Net Site: RLM-21			
Survey Date: 5/20/2022			

Client: Enbridge		Project: Ridgeline Expansion	
Site Name:		Site Location:	
Photograph ID: 3			
Species: Perimyotis subflavus (Tricolored Bat)			
Mist Net Site: RLM-21			
Survey Date: 5/20/2022			
Photograph ID: 4			
Species: Perimyotis subflavus (Tricolored Bat)			
Mist Net Site: RLM-21			
Survey Date: 5/29/2022			

Client:	Enbridge	Project:	Ridgeline Expansion
Site Name:		Site Location:	
Photograph ID: 5			
Species: Perimyotis subflavus (Tricolored Bat)			
Mist Net Site: RLM-21			
Survey Date: 5/29/2022			

APPENDIX D

Data Tables

Table 3.2. Vegetation Communities Affected by Construction and Operation of the Project (in acres)

Facilities	Agricultural		Bottomland Hardwood Forest		Deciduous Forest		Evergreen Forest		Mixed Forest		Grassland		Shrub-Scrub		Wetland		Total ^{a/}	
	Const	Oper	Const	Oper	Const	Oper	Const	Oper	Const	Oper	Const	Oper	Const	Oper	Const	Oper	Const	Oper
Pipeline Facilities b/	777.4	302.1	2.7	1.2	91.1	31.4	162.8	47.9	478.4	187.3	215.5	103.3	6.8	3.1	26.0	16.2	1,760.6	692.6
Staging Areas	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Access Roads	13.6	3.2	0.1	0.0	3.7	0.0	4.3	0.2	6.2	0.1	7.4	0.6	0.5	0.0	0.0	0.0	35.7	4.2
Hartsville Compressor Station	64.8	15.8	0.0	0.0	0.6	0.0	1.3	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	66.9	15.8
Columbia Gulf M&R Station	7.6	3.9	0.0	0.0	0.2	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.1	0.0	8.2	3.9
Kingston M&R Station No. TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Gainsboro Crossover	3.6	3.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.6	3.6
Clarkrange Crossover	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.8	1.8	1.8	0.1	0.1	0.0	0.0	0.0	0.0	2.7	2.7
Harriman Lateral Crossover	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Subtotal:	76.0	23.4	0.0	0.0	0.8	0.0	2.2	0.8	2.1	1.8	0.1	0.1	0.1	0.0	0.2	0.0	81.3	26.0
TOTAL:	867.0	328.6	2.8	1.2	95.5	31.4	169.2	49.0	486.7	189.2	223.0	104.0	7.3	3.1	26.2	16.2	1,877.7	722.8

Notes:

^{a/} Non-native vegetated land (industrial and residential) and open water is not included.

^{b/} Includes mainline valves and the Receiver site that will be located within the permanent ROW.

^{c/} The Texas Eastern and Midwestern Gas M&R will not impact vegetated land.

Table 3.3. Eastern Tri-Colored, Little Brown, and Rafinesque's Big-Eared Bats Captured During Mist Net Surveys for Ridgeline Expansion, Tennessee, May-August 2022

Site ID	Morphometric Information							Bands/Markers		
	Species	Age	Sex	Reproductive Status	RFA (mm)	Weight (g)	WNS Score	Band ID	Radio Frequency	Comments
RLM-05	PESU	Adult	Female	Pregnant	33.8	6.2	0	TWRA-04466	150.088	
RLM-05	PESU	Adult	Female	Non-Reproductive	34.6	5.7	0	TWRA-04465	150.514	
RLM-21	PESU	Adult	Female	Pregnant	35.95	7.75	0	TWRA-A04474	105.564	
RLM-21	PESU	Adult	Female	Non-Reproductive	34.1	7	1	TWRA-A04475	-	
RLM-21	PESU	Adult	Female	Pregnant	36.1	7.25	0	TWRA-A04476	-	
RLM-21	PESU	Adult	Female	Pregnant	34.6	7.75	1	TWRA-A04477	-	
RLM-21	PESU	Adult	Female	Pregnant	34.3	7	0	TWRA-A04478	-	
RLM-21	PESU	Adult	Female	Non-Reproductive	35.8	6.5	0	TWRA-A04479	-	
RLM-45	PESU	Adult	Female	Pregnant	34	7.5	0	TWRA-A03851	-	
RLM-45	PESU	Adult	Female	Pregnant	34	6.75	0	TWRA-A03852	-	
RLM-46	MYLU	Adult	Male	Non-Reproductive	37.2	7	0	TWRA-10144	150.986	
RLM-46	MYLU	Adult	Male	Non-Reproductive	35.5	7.25	0	TWRA-10133	-	
RLM-57	PESU	Adult	Female	Pregnant	34.8	8.75	0	-	150.470	Not Banded
RLM-60	PESU	Adult	Female	Lactating	33.4	8.6	0	TWRA-03310	-	
RLM-60	MYLU	Adult	Male	Non-Reproductive	35.7	7.3	0	TWRA-07259	-	
RLM-64	PESU	Adult	Male	Non-Reproductive	-	5.25	0	TWRA-A04480	-	Escaped Hand
RLM-64	PESU	Adult	Male	Non-Reproductive	34.2	6	0	-	-	Not Banded
RLM-64	PESU	Adult	Male	Non-Reproductive	33	5.5	0	TWRA-04482	-	
RLM-72	PESU	Adult	Female	Pregnant	33	10.75	0	TWRA-A03853	150.585	
RLM-91	PESU	Adult	Male	Non-Reproductive	34.9	6.3	0	TWRA-A04473	-	
RLM-91	CORA	Adult	Male	Non-Reproductive	43.9	9.1	0	TWRA-10134	-	
RLM-91	PESU	Adult	Male	Non-Reproductive	33.1	6	0	TWRA-10137	-	
RLM-148	MYLU	Adult	Male	Non-Reproductive	38	7.5	0	TWRA-09224	-	
RLM-153	PESU	Adult	Male	Testes-Descended	34	6.5	0	TWRA-10588	-	
RLM-153	PESU	Adult	Male	Testes-Descended	34	5.5	0	TWRA-10587	-	
RLM-153	PESU	Adult	Male	Testes-Descended	34	5	0	TWRA-10577	-	
RLM-154	PESU	Adult	Male	Testes-Descended	33	5	0	-	-	Not Banded
RLM-162	PESU	Adult	Male	Non-Reproductive	36.5	5.75	0	TWRA-A03138	-	
RLM-163	PESU	Juvenile	Male	Non-Reproductive	32.8	6.3	0	TWRA-07275	150.665	
RLM-165	PESU	Juvenile	Female	Non-Reproductive	30.3	6.8	0	TWRA-07276	150.442/443	Freq. wavered

PESU = eastern tri-colored bat (*Perimyotis subflavus*)

MYLU = little brown bat (*Myotis lucifugus*)

CORA= Rafinesque's big-eared bat (*Corynorhinus rafinesquii*)

Table 3.4. Gray Bats Captured During Mist Net Surveys for Ridgeline Expansion, Tennessee, May-August 2022

Site ID	Morphometric Information						Bands/Markers	
	Age	Sex	Reproductive Status	RFA (mm)	Weight (g)	WNS Score	Band ID	Comments
RLM-18	Adult	Male	Non-Reproductive	42	10	0	TWRA-08549	Recaptured
RLM-18	Adult	Male	Non-Reproductive	40	9	0	TWRA-08548	
RLM-21	Adult	Female	Non-Reproductive	44.1	11	0	TWRA-10101	
RLM-21	Adult	Female	Pregnant	43.8	11.25	0	TWRA-10102	
RLM-21	Adult	Female	Non-Reproductive	43.9	11	0	TWRA-10103	
RLM-21	Adult	Female	Pregnant	44.1	12.5	0	TWRA-10104	
RLM-21	Adult	Male	Non-Reproductive	42	9.25	0	TWRA-10105	
RLM-21	Adult	Male	Non-Reproductive	42.1	10.5	0	TWRA-10106	
RLM-21	Adult	Male	Non-Reproductive	45.9	11	0	TWRA-10108	
RLM-21	Adult	Male	Non-Reproductive	43.9	10	0	TWRA-10109	
RLM-21	Adult	Male	Non-Reproductive	43	10.5	1	TWRA-10110	
RLM-21	Adult	Female	Pregnant	45	10.75	0	TWRA-08575	
RLM-28	Adult	Female	Pregnant	43	12	0	TWRA-10146	
RLM-28	Adult	Male	Non-Reproductive	44.5	9.75	0	TWRA-10145	
RLM-28	Adult	Male	Non-Reproductive	41	10	0	TWRA-10143	
RLM-31	Adult	Female	Pregnant	39	14.5	0	TWRA-A04463	
RLM-31	Adult	Male	Non-Reproductive	42	9.25	0	TWRA-10130	
RLM-32	Adult	Female	Pregnant	45	10.75	0	TWRA-08583	
RLM-32	Adult	Male	Non-Reproductive	43	10.25	0	TWRA-08584	
RLM-37	Adult	Male	Non-Reproductive	44	12	0	TWRA-10129	
RLM-37	Adult	Female	Pregnant	43	16.5	0	TWRA-10128	
RLM-37	Adult	Female	Non-Reproductive	44	12.5	0	TWRA-10126	
RLM-37	Adult	Female	Pregnant	43	14.5	0	TWRA-10125	
RLM-37	Adult	Female	Pregnant	44	13.5	0	-	Escaped Hand
RLM-37	Adult	Female	Pregnant	44	13.75	0	TWRA-10124	
RLM-37	Adult	Female	Pregnant	44.7	13	0	TWRA-10122	
RLM-45	Adult	Female	Pregnant	43	12.25	0	TWRA-08578	
RLM-45	Adult	Female	Pregnant	45	12.5	0	TWRA-08579	
RLM-45	Adult	Female	Pregnant	44	13.25	0	TWRA-08580	
RLM-45	Adult	Female	Pregnant	45	13.25	0	TWRA-08581	
RLM-45	Adult	Female	Pregnant	45	13.75	0	TWRA-08582	
RLM-46	Adult	Female	Pregnant	44.7	13.75	0	TWRA-10131	
RLM-46	Adult	Female	Pregnant	44.9	14.75	0	TWRA-10132	
RLM-46	Adult	Female	Pregnant	43	10.75	0	TWRA-10142	
RLM-46	Adult	Female	Pregnant	43.4	11	0	TWRA-10141	
RLM-49	Adult	Female	Pregnant	43.7	-	-	-	Escaped Net
RLM-49	Adult	Female	Pregnant	44.4	14.2	1	TWRA-A04464	

Site ID	Morphometric Information						Bands/Markers	
	Age	Sex	Reproductive Status	RFA (mm)	Weight (g)	WNS Score	Band ID	Comments
RLM-49	Adult	Female	Lactating	43	11	0	TWRA-A04456	
RLM-50A	Adult	Male	Non-Reproductive	43	10.75	0	TWRA-08555	
RLM-51	Adult	Male	Non-Reproductive	41.5	10	0	TWRA-09222	
RLM-52	Adult	Female	Lactating	43	11.5	0	TWRA-08861	
RLM-52	Adult	Female	Lactating	43.5	10	0	TWRA-08862	
RLM-52	Adult	Female	Lactating	44	11	0	TWRA-08863	
RLM-54	Adult	Female	Lactating	43.5	11.5	0	TWRA-08864	
RLM-54	Adult	Female	Pregnant	43	13	1	AAFBTN371	Recapture
RLM-54	Adult	Female	Lactating	42.5	12	0	TWRA-08865	
RLM-56	Adult	Female	Lactating	44.3	11.5	0	TWRA-07263	
RLM-56	Adult	Male	Non-Reproductive	44.1	9.2	0	TWRA-07264	
RLM-56	Adult	Male	Non-Reproductive	44.7	9.6	0	TWRA-07262	
RLM-56	Adult	Female	Lactating	42.9	9.7	0	TWRA-07261	
RLM-56	Adult	Female	Lactating	44.1	11.75	0	TWRA-07260	
RLM-57	Adult	Male	Non-Reproductive	44.8	10.25	0	TWRA-07271	
RLM-57	Adult	Female	Non-Reproductive	44.1	10.5	1	TWRA-07272	
RLM-57	Adult	Female	Lactating	43.9	12	0	TWRA-08587	RLM-62 Recap
RLM-57	Adult	Male	Non-Reproductive	43.1	9.5	0	TWRA-07273	
RLM-57	Adult	Female	Lactating	43.9	11.5	0	TWRA-07274	
RLM-59	Adult	Male	Non-Reproductive	42	11.25	0	-	Not Banded
RLM-59	Adult	Male	Non-Reproductive	43	9.75	0	TWRA-08541	
RLM-60	Adult	Female	Lactating	43.3	10.5	0	TWRA-07258	
RLM-60	Adult	Male	Non-Reproductive	43.2	10.5	0	TWRA-07257	
RLM-60	Adult	Female	Lactating	44	12	0	TWRA-07256	
RLM-60	Adult	Male	Non-Reproductive	42.6	10	0	TWRA-07255	
RLM-62	Adult	Male	Non-Reproductive	44	10	0	TWRA-08586	
RLM-62	Adult	Female	Lactating	44	12.25	0	TWRA-08587	
RLM-62	Adult	Male	Non-Reproductive	43	10.75	0	TWRA-08588	
RLM-68	Adult	Female	Lactating	43.6	12.5	0	TWRA-07254	
RLM-68	Adult	Female	Lactating	43.7	10.75	0	TWRA-08542	
RLM-68	Adult	Female	Lactating	43.5	10.5	0	TWRA-08543	
RLM-68	Adult	Female	Lactating	43.6	12	0	TWRA-08544	
RLM-68	Adult	Female	Lactating	42.5	10.75	0	TWRA-08545	
RLM-68	Adult	Female	Lactating	43	12.5	0	TWRA-10510	
RLM-68	Adult	Female	Lactating	44	12.5	0	TWRA-10509	
RLM-68	Adult	Female	Non-Reproductive	44	11.5	0	TWRA-10508	
RLM-72	Adult	Female	Pregnant	43	12.25	0	TWRA-08589	
RLM-72	Adult	Female	Pregnant	42	12.5	0	TWRA-08590	
RLM-72	Adult	Female	Pregnant	44	15	0	TWRA-08591	

Site ID	Morphometric Information						Bands/Markers	
	Age	Sex	Reproductive Status	RFA (mm)	Weight (g)	WNS Score	Band ID	Comments
RLM-72	Adult	Female	Lactating	46	12	0	TWRA-08593	
RLM-72	Adult	Female	Lactating	43	11.5	0	TWRA-08592	
RLM-72	Adult	Female	Non-Reproductive	43	11.25	0	TWRA-08594	
RLM-72	Adult	Female	Lactating	42	11	0	TWRA-08595	
RLM-73	Adult	Female	Pregnant	44	13.5	0	TWRA-10111	
RLM-73	Adult	Female	Pregnant	44.4	14.75	0	TWRA-10112	
RLM-73	Adult	Female	Lactating	43.6	11.1	0	TWRA-10113	
RLM-73	Adult	Female	Pregnant	43.4	14	0	TWRA-10114	
RLM-73	Adult	Female	Lactating	42.5	11.1	1	-	Not Banded
RLM-73	Adult	Female	Lactating	43.4	10.5	0	TWRA-07277	
RLM-73	Adult	Female	Pregnant	43.3	14	0	TWRA-07278	
RLM-73	Adult	Female	Lactating	42.1	11.5	0	TWRA-07279	RLM-73 Recap
RLM-73	Unknown	Unknown	Unknown	-	-	-	-	Escaped Hand
RLM-73	Adult	Female	Pregnant	43.9	15	0	TWRA-07280	
RLM-73	Adult	Female	Lactating	45.3	13.75	0	TWRA-07281	
RLM-73	Adult	Female	Lactating	45	12	0	TWRA-07282	
RLM-73	Adult	Male	Non-Reproductive	43	10.5	1	TWRA-07283	
RLM-73	Adult	Female	Lactating	44.1	11.5	0	TWRA-07284	
RLM-73	Adult	Female	Pregnant	43.9	13.9	0	TWRA-07285	
RLM-73	Adult	Female	Lactating	44.9	10.2	0	TWRA-07286	
RLM-73	Adult	Female	Lactating	43.1	10.5	0	TWRA-07287	
RLM-73	Adult	Female	Lactating	43.8	10.3	0	TWRA-07288	
RLM-73	Unknown	Unknown	Unknown	-	-	-	-	Escaped Net
RLM-73	Adult	Female	Lactating	42.9	10.5	0	TWRA-07289	
RLM-73	Adult	Female	Pregnant	42.9	13.4	0	TWRA-07265	
RLM-73	Adult	Female	Lactating	44.8	10.75	0	TWRA-07266	
RLM-73	Adult	Female	Lactating	45	11.75	0	TWRA-07267	
RLM-73	Adult	Female	Lactating	45	11	0	TWRA-07268	
RLM-73	Unknown	Unknown	Unknown	-	-	-	-	Escaped Net
RLM-73	Adult	Female	Unknown	45	13.25	0	TWRA-07269	
RLM-73	Adult	Female	Lactating	44	13	0	TWRA-07270	
RLM-80	Adult	Female	Lactating	44.4	10.5	0	AAFB-3747	Arnold AFB Band
RLM-82	Adult	Male	Non-Reproductive	42	11	0	TWRA-6746	
RLM-82	Adult	Female	Lactating	44	11	0	TWRA-6745	
RLM-82	Adult	Female	Lactating	42	11	0	TWRA-6744	
RLM-82	Adult	Female	Lactating	43	11	0	TWRA-6742	
RLM-82	Adult	Female	Lactating	43	10	0	TWRA-6743	
RLM-82	Adult	Female	Lactating	43	11.25	0	TWRA-6741	
RLM-82	Adult	Female	Lactating	43	10	0	TWRA-6740	

Site ID	Morphometric Information						Bands/Markers	
	Age	Sex	Reproductive Status	RFA (mm)	Weight (g)	WNS Score	Band ID	Comments
RLM-82	Adult	Female	Lactating	43	11	0	TWRA-6739	
RLM-82	Adult	Female	Lactating	42	10.75	0	TWRA-6738	
RLM-82	Adult	Female	Pregnant	44	11.5	0	TWRA-6737	
RLM-82	Adult	Female	Pregnant	43	13.25	0	TWRA-6736	
RLM-82	Adult	Female	Pregnant	44	14.5	0	TWRA-6734	
RLM-82	Adult	Female	Lactating	42	10	0	TWRA-6733	
RLM-82	Adult	Female	Lactating	44	10.5	0	TWRA-6732	
RLM-82	Adult	Female	Pregnant	43	11	0	TWRA-6731	
RLM-82	Adult	Female	Non-Reproductive	42	10.5	1	TWRA-19251	
RLM-82	Adult	Female	Lactating	41	11	0	TWRA-19248	
RLM-82	Adult	Female	Lactating	44	10	0	TWRA-19249	
RLM-82	Adult	Female	Lactating	43	11.5	0	TWRA-19247	
RLM-82	Adult	Female	Lactating	44	11	0	TWRA-19246	
RLM-82	Adult	Male	Non-Reproductive	44	10	0	TWRA-19223	
RLM-83	Adult	Female	Lactating	44	11.25	0	-	Not Banded
RLM-83	Adult	Female	Lactating	43	12.25	0	TWRA-10121	RLM-83 Recap
RLM-86	Adult	Male	Non-Reproductive	43	9	0	TWRA-10115	
RLM-86	Adult	Female	Lactating	44	11	0	TWRA-10116	
RLM-86	Adult	Female	Lactating	43	10	0	TWRA-10117	
RLM-86	Adult	Female	Lactating	44	11	0	TWRA-10118	
RLM-86	Adult	Female	Non-Reproductive	44	9.5	0	TWRA-10119	
RLM-86	Adult	Female	Non-Reproductive	43	10	0	TWRA-10511	
RLM-86	Adult	Female	Lactating	44	10.25	0	TWRA-10550	
RLM-86	Adult	Female	Lactating	43	10.5	0	TWRA-10549	
RLM-86	Adult	Female	Lactating	43	9.75	0	TWRA-10522	
RLM-87	Adult	Female	Lactating	44.8	10.3	0	TWRA-09303	
RLM-91	Adult	Female	Lactating	44.5	-	0	TWRA-10135	Escaped Hand
RLM-91	Adult	Female	Lactating	43.2	11.2	0	TWRA-10137	
RLM-92	Adult	Female	Non-Reproductive	42.8	9	0	-	Not Banded
RLM-100	Adult	Male	Non-Reproductive	42	10.5	0	TWRA-19245	
RLM-115	Adult	Male	Non-Reproductive	42	10	0	TWRA-10601	
RLM-116	Adult	Female	Non-Reproductive	43	11.75	0	TWRA-08596	
RLM-124	Adult	Male	Non-Reproductive	50	12.75	0-P	TWRA-08597	
RLM-129	Adult	Male	Non-Reproductive	43	11	0	TWRA-106548	

Table 3.5. Weather Recordings for Ridgeline Expansion 2022 Mist Net Surveys, Tennessee.

Site	Date	Temperature °F			Wind Speed ¹			Cloud Cover %		
		2000h	2200h	0100h	2000h	2200h	0100h	2000h	2200h	0100h
RLM-04	5/16/2022	69	61	57	0	0	0	0	0	0
RLM-04	5/17/2022	69	61	58	0	0	0	0	50	50
RLM-05	5/16/2022	65.3	53.6	50.9	1	1	0	25	0	0
RLM-05	5/17/2022	60.8	57.2	55.1	1	1	0	10	0	75
RLM-06	5/16/2022	63.5	56.8	-	0.5	0	-	10	0	-
RLM-06	5/17/2022	65.1	59.3	56.7	0	0	0	0	0	20
RLM-07	5/16/2022	70	65	-	1	1	-	0	0	-
RLM-07	5/17/2022	72	67	-	1	1	-	20	30	-
RLM-08	5/16/2022	69.6	61	57	0	0	0	0	0	0
RLM-08	5/17/2022	70	65	60	0	0	0	0	0	0
RLM-11	5/20/2022	86	76.5	75.2	0	0	1	25	0	0
RLM-11	5/22/2022	67.5	65.4	62.5	2	3	2	100	100	100
RLM-13	5/18/2022	75	74	71	0	1	1	5	5	5
RLM-13	5/19/2022	77	73	74	1	1	1	70	50	5
RLM-14	5/18/2022	78	73	71	0	0	0	0	20	0
RLM-14	5/19/2022	79	74	76	0	0	2	50	25	0
RLM-15	5/18/2022	76.4	71.2	68.3	0	0	0	20	10	0
RLM-15	5/19/2022	79	72.6	75.7	0	0	1	20	10	40
RLM-16	5/18/2022	78.3	69.9	68.7	1	1	1	20	0	60
RLM-16	5/19/2022	80.9	75.3	77.2	2	2	3	50	40	0
RLM-17	5/18/2022	78	72	-	2	2	-	35	40	-
RLM-17	5/19/2022	81	74	-	3	1	-	20	20	-
RLM-18	5/20/2022	79	68	66	0	0	0	20	10	5
RLM-18	5/22/2022	70	67	63	1	1	1	100	100	100
RLM-21	5/20/2022	-	69.9	-	0	0	0	0	0	0

Site	Date	Temperature °F			Wind Speed ¹			Cloud Cover %		
		2000h	2200h	0100h	2000h	2200h	0100h	2000h	2200h	0100h
RLM-21	5/22/2022	69.8	66.2	64	0	2	1	100	100	100
RLM-23	5/20/2022	82	76	-	1	1	-	10	20	-
RLM-23	5/22/2022	69	67	64	1	1	1	100	100	100
RLM-25	5/20/2022	82	80	78	1	1	1	0	20	0
RLM-25	5/23/2022	60	59	59	1	1	1	100	100	100
RLM-26	5/23/2022	68.4	57.9	58.2	0	0	0	100	100	100
RLM-26	5/24/2022	71.6	71.2	-	0	1	-	100	100	-
RLM-26	5/26/2022	66	59	61	0	0	0	0	0	100
RLM-27	5/23/2022	61	59	59	0	0	0	90	85	85
RLM-27	5/24/2022	76	71	-	0	1	-	100	95	-
RLM-27	5/26/2022	67	58	62	1	0	0	5	1	95
RLM-28	5/23/2022	59.6	59.2	59.5	1	0	1	100	100	100
RLM-28	5/24/2022	70.6	70.3	-	1	2	-	100	100	-
RLM-28	5/26/2022	69.4	63.6	63.8	0	0	0	70	50	100
RLM-30	6/2/2022	72	68	-	0	0	-	40	100	-
RLM-30	6/3/2022	-	57	53	0	1	0	5	0	10
RLM-31	5/29/2022	77	70.3	68.5	1	0	1	15	0	0
RLM-31	5/30/2022	79.8	74.2	74	1	1	2	0	0	0
RLM-32	5/29/2022	75	70	68	0	0	0	0	0	0
RLM-32	5/30/2022	79	75	72	0	0	0	0	0	0
RLM-33	5/29/2022	77	70	68	0	0	0	0	0	0
RLM-33	5/30/2022	78	74	69	0	0	0	0	0	0
RLM-34	5/31/2022	81	70	68	0	0	0	0	0	0
RLM-34	6/1/2022	78	73	72	0	2	1	0	60	0
RLM-35	5/31/2022	75	68	65	0	0	0	0	0	0
RLM-35	6/1/2022	75	70	68	0	0	0	0	0	0
RLM-37	5/31/2022	79.3	71.2	65.9	0	0	0	0	0	0
RLM-37	6/1/2022	-	-	-	-	0	-	-	50	-

Site	Date	Temperature °F			Wind Speed ¹			Cloud Cover %		
		2000h	2200h	0100h	2000h	2200h	0100h	2000h	2200h	0100h
RLM-40	6/2/2022	75	67	63	0	0	0	0	0	0
RLM-40	6/3/2022	69	55	51	0	0	0	0	0	0
RLM-41	6/2/2022	77	70	69	0	0	0	0	1	1
RLM-41	6/3/2022	73	66	64	0	0	1	0	0	1
RLM-42	5/24/2022	77	72	-	0	1	-	100	100	-
RLM-42	5/27/2022	61.7	57.5	58.6	0	0	0	35	0	100
RLM-42	5/28/2022	64.5	58.9	56	0	0	0	10	0	0
RLM-43	5/24/2022	73	-	-	0	-	-	100	-	-
RLM-43	5/27/2022	62	58	59	0	0	0	50	0	0
RLM-43	5/28/2022	64	58	55	0	0	0	5	0	0
RLM-45	5/27/2022	64	59	59	0	0	0	0	0	100
RLM-45	5/28/2022	64	57	57	0	0	0	0	0	0
RLM-46	5/31/2022	76.2	69.7	66.9	1	1	1	25	0	0
RLM-46	6/1/2022	76.6	71.5	70.1	1	1	0	40	0	25
RLM-49	6/4/2022	69	62	-	0	0	-	0	0	-
RLM-49	6/5/2022	75	68	-	0	0	-	60	60	-
RLM-50A	6/4/2022	68	59	55	0	0	0	0	0	0
RLM-50A	6/5/2022	76	70	67	0	0	0	90	100	10
RLM-51	6/4/2022	68	61	56	0	0	0	0	0	0
RLM-51	6/5/2022	76	71	66	0	0	0	60	60	0
RLM-52	6/8/2022	88	85	69	0	0	0	30	30	10
RLM-52	6/9/2022	67	60	57	0	0	0	0	0	0
RLM-53	6/9/2022	68	65	56	1	0	1	10	0	0
RLM-53	6/10/2022	76	62	-	1	1	-	20	0	-
RLM-54	6/10/2022	71	65	63	0	0	0	0	0	0
RLM-54	6/11/2022	76	70	-	0	0	-	0	0	-
RLM-56	6/11/2022	82	76	71	0	0	0	0	0	0
RLM-56	6/12/2022	80.8	75.5	73.9	1	1	0	90	90	25

Site	Date	Temperature °F			Wind Speed ¹			Cloud Cover %		
		2000h	2200h	0100h	2000h	2200h	0100h	2000h	2200h	0100h
RLM-57	6/11/2022	75.7	67.2	63.8	0	1	1	0	0	0
RLM-57	6/12/2022	78.5	75.3	73.9	0	0	0	90	90	0
RLM-59	6/11/2022	72	66	63	0	0	0	0	0	0
RLM-59	6/12/2022	78	75	72	0	0	0	30	85	5
RLM-60	6/13/2022	84	74.5	72.7	0	0	0	15	15	0
RLM-60	6/14/2022	88.3	74.8	72.4	1	0	1	0	25	5
RLM-61	6/10/2022	70	65	61.5	0	0	0	10	0	0
RLM-62	6/11/2022	70	66	64	0	0	0	0	0	0
RLM-62	6/12/2022	75	73	71	0	0	0	0	50	0
RLM-63	6/13/2022	86	74	72	0	0	0	0	0	0
RLM-63	6/14/2022	77	74	71	0	0	0	0	0	0
RLM-64	6/13/2022	84.6	74.4	72.5	0	0	0	0	0	0
RLM-64	6/14/2022	84.4	74.1	72	0	0	0	0	0	0
RLM-65	6/13/2022	80	76	73	0	0	0	10	0	0
RLM-65	6/14/2022	78	76	73	0	0	0	0	30	20
RLM-66	6/15/2022	82	80.8	77.5	0	2	0	5	0	0
RLM-66	6/16/2022	82.8	81.6	79.3	2	2	1	5	60	10
RLM-67	6/13/2022	84.6	80.3	77.9	1	0	1	10	0	0
RLM-67	6/14/2022	80.9	77.5	73.5	1	1	1	0	5	5
RLM-68	6/15/2022	81.7	76	73.9	0	0	0	0	0	0
RLM-68	6/16/2022	79.5	76.6	76	0	0	0	50	0	20
RLM-69	6/9/2022	65	62	58	0	0	0	0	0	0
RLM-69	6/10/2022	68	63	61	1	0	0	80	0	0
RLM-70	6/15/2022	82	80	-	0	0	-	0	0	-
RLM-70	6/16/2022	82	80	78	0	0	0	0	0	0
RLM-72	6/15/2022	81	76	74	0	0	0	0	0	0
RLM-72	6/16/2022	82	78	76	0	0	0	100	0	0
RLM-73	6/9/2022	69.7	59.9	56.8	0	0	0	0	0	0

Site	Date	Temperature °F			Wind Speed ¹			Cloud Cover %		
		2000h	2200h	0100h	2000h	2200h	0100h	2000h	2200h	0100h
RLM-73	6/10/2022	70.1	61.8	59.2	0	0	0	10	0	0
RLM-74	6/9/2022	69	64	59	0	0	0	0	0	0
RLM-74	6/10/2022	69	65	-	1	1	-	60	0	-
RLM-80	6/17/2022	78	73.6	70.2	0	0	0	10	0	0
RLM-80	6/18/2022	69.3	65.9	63.7	1	2	1	0	0	0
RLM-82	6/17/2022	73	72	70	0	0	0	0	0	0
RLM-82	6/18/2022	72	64	59	0	0	0	0	0	0
RLM-83	6/17/2022	76.6	71.1	69.8	0	0	0	35	0	0
RLM-83	6/18/2022	69.4	57.2	53.2	1	0	2	0	0	0
RLM-84	6/17/2022	75	73	70	0	0	0	30	0	1
RLM-84	6/18/2022	72	65	63	0	1	2	0	0	0
RLM-85	6/21/2022	73.1	67.5	56.3	0	0	0	0	0	0
RLM-85	6/22/2022	77.7	75.2	71.4	0	0	0	70	0	0
RLM-86	6/19/2022	70.1	58.9	52.8	0	0	0	20	0	0
RLM-86	6/20/2022	74.1	63.7	-	0	0	-	0	0	-
RLM-87	6/19/2022	76.2	62.4	61.3	0	0	1	10	0	0
RLM-87	6/20/2022	77.1	68.9	65.4	0	0	0	0	0	0
RLM-89	6/20/2022	72	66	62	0	0	0	0	0	0
RLM-89	6/21/2022	77	73	70	0	0	0	0	0	0
RLM-91	6/21/2022	75.6	66.7	64.7	1	1	1	0	0	0
RLM-91	6/22/2022	74.8	71.7	-	0	0	-	50	0	-
RLM-92	6/21/2022	76.2	68.6	68	0	0	0	10	0	0
RLM-92	6/22/2022	74.5	70.1	68.4	0	0	0	15	10	0
RLM-93	6/21/2022	73	71	72	0	0	1	0	0	0
RLM-93	6/22/2022	77	73	71	0	0	0	40	0	0
RLM-94	6/19/2022	69	64	62	1	0	0	5	0	0
RLM-94	6/20/2022	72	69	64	0	0	0	0	0	0
RLM-98	6/26/2022	70	69	-	0	0	-	70	25	-

Site	Date	Temperature °F			Wind Speed ¹			Cloud Cover %		
		2000h	2200h	0100h	2000h	2200h	0100h	2000h	2200h	0100h
RLM-98	6/27/2022	72	64	57	0	0	0	0	0	0
RLM-98	6/28/2022	71	66	62	0	0	0	90	90	0
RLM-99	6/24/2022	80	74	71	0	0	0	0	0	0
RLM-99	6/26/2022	70	-	-	0	-	-	100	-	-
RLM-99	6/27/2022	66	59	55	0	0	0	50	0	0
RLM-100	6/22/2022	79	75	72	1	0	0	0	0	0
RLM-100	6/23/2022	71	67	65	0	0	0	0	0	0
RLM-101	6/23/2022	74	63.4	60.2	0	1	1	10	0	0
RLM-101	6/24/2022	73.4	70.5	67.6	1	1	1	10	25	0
RLM-102	6/26/2022	69.5	69	-	2	2	-	100	70	-
RLM-102	6/27/2022	72.9	67.5	64.6	1	2	2	40	0	0
RLM-102	6/28/2022	69.9	69.4	64.8	1	2	2	90	100	0
RLM-103	6/23/2022	70	62	58	0	0	0	0	0	0
RLM-103	6/24/2022	74	69	66	0	0	0	5	60	5
RLM-104	6/23/2022	72.5	67.8	64.6	1	1	1	0	0	0
RLM-104	6/24/2022	78.8	73	-	0	1	-	70	20	-
RLM-108	6/26/2022	71.4	-	-	2	-	-	100	-	-
RLM-114	6/29/2022	73.2	67.3	64.8	0	0	0	50	50	35
RLM-114	6/30/2022	77.9	70.2	68.6	1	0	1	90	15	0
RLM-115	6/27/2022	70.4	60.9	57.4	0	0	0	30	0	0
RLM-115	6/28/2022	74.6	63.7	60.1	1	0	0	40	100	100
RLM-116	6/28/2022	72	64	61	0	0	0	75	100	0
RLM-116	6/29/2022	73	68	64	0	0	0	50	0	0
RLM-120	6/29/2022	71	68	65	0	0	0	10	10	0
RLM-120	6/30/2022	75	69	68	0	0	0	30	0	0
RLM-124	6/30/2022	75	70	68	0	0	0	25	0	0
RLM-124	7/1/2022	75	70	68	0	0	0	25	0	0
RLM-127	7/1/2022	78.5	71.1	69.4	1	1	1	15	15	0

Site	Date	Temperature °F			Wind Speed ¹			Cloud Cover %		
		2000h	2200h	0100h	2000h	2200h	0100h	2000h	2200h	0100h
RLM-127	7/2/2022	73.6	71.7	68.2	1	0	1	75	50	25
RLM-129	7/10/2022	72	68.6	66.6	0	0	0	0	0	0
RLM-129	7/11/2022	74	71.7	69.3	0	0	0	0	0	0
RLM-130	7/10/2022	72	69	66	0	0	0	0	0	0
RLM-130	7/11/2022	75	71	69	0	0	0	0	0	0
RLM-131	7/10/2022	77	68	65	0	0	0	15	0	0
RLM-131	7/11/2022	73.5	69.1	68.7	0	0	0	0	0	0
RLM-132	7/13/2022	73.1	64	61.2	0	0	0	0	0	0
RLM-132	7/14/2022	78	66	69.3	1	1	0	70	60	60
RLM-137	7/13/2022	-	71	68	-	1	1	-	0	0
RLM-137	7/14/2022	-	71	70	-	0	0	-	0	30
RLM-138	7/13/2022	70.1	65.3	64	0	0	0	5	0	0
RLM-138	7/14/2022	77.9	68.2	67.1	0	0	0	90	40	40
RLM-140	7/13/2022	71	66	63	0	0	0	0	0	0
RLM-140	7/14/2022	75	70	68	0	0	0	95	0	70
RLM-141	7/15/2022	72	67	65	0	0	0	10	0	100
RLM-141	7/18/2022	-	77	68.2	-	0	0	-	95	20
RLM-142	7/15/2022	-	63	65	-	1	0	-	20	80
RLM-142	7/17/2022	-	74	73.9	-	0	0	-	100	100
RLM-143	7/15/2022	72	63.5	63.6	0	0	0	40	20	70
RLM-143	7/16/2022	75.5	70.1	67.9	0	0	0	0	0	60
RLM-145	7/18/2022	72	71	69	0	1	0	35	0	5
RLM-145	7/19/2022	78	75	68	0	0	0	80	5	0
RLM-146	8/3/2022	88	71	-	1	2	-	100	100	-
RLM-146	8/4/2022	-	72	69	-	0	0	-	80	10
RLM-146	8/5/2022	-	71	70	-	0	0	-	80	80
RLM-147	7/18/2022	-	70	68	-	1	0	-	10	35
RLM-147	7/19/2022	-	75	73	-	2	1	-	40	0

Site	Date	Temperature °F			Wind Speed ¹			Cloud Cover %		
		2000h	2200h	0100h	2000h	2200h	0100h	2000h	2200h	0100h
RLM-148	7/18/2022	71	68	67	0	0	0	90	20	20
RLM-148	7/19/2022	-	76	72	-	0	0	-	75	0
RLM-149	7/20/2022	84	-	-	2	-	-	20	-	-
RLM-149	7/21/2022	77	72	69	1	1	0	30	0	50
RLM-149	7/23/2022	-	71	68	-	0	0	-	0	0
RLM-150	7/21/2022	-	74	70	-	0	0	-	15	50
RLM-150	7/22/2022	-	75	72	-	0	0	-	0	0
RLM-151	7/21/2022	79	72	69	0	0	0	30	0	50
RLM-151	7/22/2022	-	75	72	0	0	0	0	0	0
RLM-152	7/24/2022	-	77	72	-	0	0	-	60	80
RLM-152	7/26/2022	-	75	72	-	0	1	-	20	0
RLM-153	7/27/2022	-	74	73	-	0	1	-	0	10
RLM-153	7/29/2022	-	72	68	-	1	1	-	10	10
RLM-154	7/27/2022	-	74	73	1	0	1	10	30	20
RLM-155	7/26/2022	79.4	76.9	73.6	1	1	0	25	0	0
RLM-155	7/27/2022	-	77.8	75.2	-	0	1	-	30	40
RLM-159	7/29/2022	76.8	72.5	70.9	1	0	0	90	50	30
RLM-159	7/30/2022	-	73	71.9	-	0	0	-	100	85
RLM-160	7/29/2022	-	73.8	70.6	-	0	0	-	40	70
RLM-160	7/30/2022	-	75.5	71.7	-	1	1	-	90	70
RLM-161	7/30/2022	76	72.4	71.6	0	0	2	100	95	95
RLM-161	7/31/2022	78	75	-	0	0	-	95	85	-
RLM-161	8/1/2022	76	73	72	0	0	1	95	90	0
RLM-162	7/30/2022	-	76	72	-	1	1	-	80	50
RLM-162	7/31/2022	-	74.3	-	-	0	-	-	100	-
RLM-162	8/1/2022	-	74	71.4	-	0	1	-	100	0
RLM-163	8/2/2022	80	73	69	1	0	1	10	0	0
RLM-163	8/3/2022	84	-	-	2	-	-	45	-	-

Site	Date	Temperature °F			Wind Speed ¹			Cloud Cover %		
		2000h	2200h	0100h	2000h	2200h	0100h	2000h	2200h	0100h
RLM-163	8/4/2022	77	74	73	0	1	1	10	15	10
RLM-165	8/2/2022	-	69.6	67.3	-	0	0	-	0	0
RLM-165	8/3/2022	77.2	-	-	1	-	-	100	-	-
RLM-165	8/5/2022	77	72	70	1	2	1	85	10	5
RLM-166	8/7/2022	83	76	71	0	1	2	10	5	90
RLM-166	8/9/2022	-	70.9	69.8	-	1	1	-	0	100
RLM-167	8/7/2022	-	71	70	-	0	0	-	30	90
RLM-167	8/9/2022	75	71	71	1	1	0	50	30	90
RLM-169	8/7/2022	-	-	71	-	0	0	-	30	80
RLM-169	8/8/2022	77	75	75	0	0	0	10	0	100
RLM-170	8/10/2022	-	68.7	66.6	-	0	0	-	85	75
RLM-170	8/12/2022	-	58.4	57.8	-	0	1	-	30	30
RLM-171	8/10/2022	-	70	69	-	0	0	-	40	30
RLM-171	8/11/2022	-	71	69	-	0	1	-	20	20
RLM-172	8/13/2022	-	71	70.2	-	1	0	-	20	80
RLM-172	8/14/2022	74.5	73.5	70.6	1	0	1	90	80	100
¹ Based on the Beaufort wind speed indicators										

Table 3.6 Telemetry Data for Ridgeline Expansion Summer Bat Surveys, Tennessee, May-August 2022.

Date	Bat ID	Frequency	Triangulation Appx/ Roost Tree Coordinates	Notes	Area Searched
5/18/2022	15-Trousdale-PESU1	150.088	No Signal	-	5-Mile buffer around capture site which was near Second Creek
5/19/2022	15-Trousdale-PESU1	150.088	No Signal	-	5-Mile buffer around capture site which was near Second Creek
5/20/2022	15-Trousdale-PESU1	150.088	No Signal	-	5-Mile buffer around capture site which was near Second Creek
5/21/2022	15-Trousdale-PESU1	150.088	No Signal	-	5-Mile buffer around capture site which was near Second Creek
5/22/2022	15-Trousdale-PESU1	150.088	36.385885, -86.204358	Triangulated	5-Mile buffer around capture site which was near Second Creek
5/23/2022	15-Trousdale-PESU1	150.088	No Signal	-	5-Mile buffer around capture site which was near Second Creek
5/24/2022	15-Trousdale-PESU1	150.088	No Signal	-	5-Mile buffer around capture site which was near Second Creek
5/18/2022	15-Trousdale-PESU2	150.514	36.385479, -86.206817	Triangulated	5-Mile buffer around capture site which was near Second Creek
5/19/2022	15-Trousdale-PESU2	150.514	36.38688, -86.20635	Triangulated	5-Mile buffer around capture site which was near Second Creek
5/20/2022	15-Trousdale-PESU2	150.514	No Signal		5-Mile buffer around capture site which was near Second Creek
5/21/2022	15-Trousdale-PESU2	150.514	No Signal		5-Mile buffer around capture site which was near Second Creek
5/22/2022	15-Trousdale-PESU2	150.514	36.385885, -86.204358	Triangulated	5-Mile buffer around capture site which was near Second Creek
5/23/2022	15-Trousdale-PESU2	150.514	36.387063, -86.222073	Triangulated	5-Mile buffer around capture site which was near Second Creek
5/24/2022	15-Trousdale-PESU2	150.514	No Signal	-	5 square miles around the capture site at accessible high spots

Date	Bat ID	Frequency	Triangulation Appx/ Roost Tree Coordinates	Notes	Area Searched
5/21/2022	21-Smith-PESU1	150.564	36.368016, -86.034436	Triangulated	3 square miles around the capture site at accessible high spots
5/22/2022	21-Smith-PESU1	150.564	No Signal	-	7 square miles around the capture site at accessible high spots
5/23/2022	21-Smith-PESU1	150.564	No Signal	-	5 square miles around the capture site at accessible high spots
5/24/2022	21-Smith-PESU1	150.564	No Signal	-	5 square miles around the capture site at accessible high spots
5/25/2022	21-Smith-PESU1	150.564	No Signal	-	7 square miles around the capture site at accessible high spots
6/2/2022	46-Jackson-MYLU1	150.986	36.345469, -85.794162	Triangulated	
6/3/2022	46-Jackson-MYLU1	150.986	36.345469, -85.794162	Triangulated	
6/4/2022	46-Jackson-MYLU1	150.986	No Signal	-	5 square miles around the capture site
6/5/2022	46-Jackson-MYLU1	150.986	No Signal	-	5 square miles around the capture site
6/6/2022	46-Jackson-MYLU1	150.986	No Signal	-	North of capture site along Gladdice Hwy/Rt 85, Smith Bend Rd. along Salt Creek, east of capture site along Fort Blount Ferry Rd and Whites Bend Rd.
6/7/2022	46-Jackson-MYLU1	150.986	No Signal	-	North and west of capture site
6/8/2022	46-Jackson-MYLU1	150.986	No Signal	-	7 square miles around capture site
6/13/2022	57-Jackson-PESU1	150.470	36.292816, -85.698633	Roost Tree 57- Jackson_PESU_R1	Area near mist net site
6/14/2022	57-Jackson-PESU1	150.470	No Signal	-	
6/15/2022	57-Jackson-PESU1	150.470	36.292300, -85.699170	Roost tree 57- Jackson-PESU1_R2	
6/16/2022	57-Jackson-PESU1	150.470	36.292300, -85.699170	Roost tree 57- Jackson-PESU1_R3	

Date	Bat ID	Frequency	Triangulation Appx/ Roost Tree Coordinates	Notes	Area Searched
6/17/2022	57-Jackson-PESU1	150.470	36.293378, -85.699430	Roost tree 57-Jackson-PESU1_R4	
6/18/2022	57-Jackson-PESU1	150.470	36.293378, -85.699430	Located back in Roost tree 57-Jackson-PESU1_R4	
6/19/2022	57-Jackson-PESU1	150.470	36.292300, -85.699170	Located back in Roost tree 57-Jackson-PESU1_R2	
6/16/2022	72-Jackson-PESU2	150.585	255 azimuth from 36.245698, -85.568667	Azimuth taken near RLM-72-Jackson	Could hear with 5-element West of West Blackburn Fork.
6/17/2022	72-Jackson-PESU2	150.585	36.245553, -85.569584	Roost Tree: 72-Jackson-PESU2-R1	
6/18/2022	72-Jackson-PESU2	150.585	36.245506, -85.569576	Roost Tree: 72-Jackson-PESU2-R2	
6/19/2022	72-Jackson-PESU2	150.585	36.245553, -85.569584	Tracked to Roost: 72-Jackson-PESU2-R2	
6/20/2022	72-Jackson-PESU2	150.585	36.245553, -85.569584	Tracked to Roost: 72-Jackson-PESU2-R2	
6/21/2022	72-Jackson-PESU2	150.585	36.245884, -85.569529	Roost Tree: 72-Jackson-PESU2-R3	
8/4/2022	163-Morgan-PESU1	150.444	No Signal	-	Searched North and South of Wartburg at every high spot in 5-mile radius of capture site
8/5/2022	163-Morgan-PESU1	150.444	No Signal	-	Searched North and South of Wartburg at every high spot in 5-mile radius of capture site
8/6/2022	163-Morgan-PESU1	150.444	No Signal	-	Searched North and South of Wartburg at every high spot in 5-mile radius of capture site
8/7/2022	163-Morgan-PESU1	150.444	No Signal	-	Searched North and South of Wartburg at every high spot in 5-mile radius of capture site
8/8/2022	163-Morgan-PESU1	150.444	No Signal	-	Searched North and South of Wartburg at every high spot in 5-mile radius of capture site

Date	Bat ID	Frequency	Triangulation Appx/ Roost Tree Coordinates	Notes	Area Searched
8/9/2022	163-Morgan-PESU1	150.444	No Signal	-	Searched North and South of Wartburg at every high spot in 5-mile radius of capture site
8/10/2022	163-Morgan-PESU1	150.444	No Signal		Searched North and South of Wartburg at every high spot in 5-mile radius of capture site
8/5/2022	165-Morgan-PESU2	150.668	No Signal	-	Searched North and South of Wartburg at every high spot in 5-mile radius of capture site
8/6/2022	165-Morgan-PESU2	150.668	No Signal	-	Searched North and South of Wartburg at every high spot in 5-mile radius of capture site
8/7/2022	165-Morgan-PESU2	150.668	No Signal	-	Searched North and South of Wartburg at every high spot in 5-mile radius of capture site
8/8/2022	165-Morgan-PESU2	150.668	No Signal	-	Searched North and South of Wartburg at every high spot in 5-mile radius of capture site
8/9/2022	165-Morgan-PESU2	150.668	No Signal	-	Searched North and South of Wartburg at every high spot in 5-mile radius of capture site
8/10/2022	165-Morgan-PESU2	150.668	No Signal	-	Searched North and South of Wartburg at every high spot in 5-mile radius of capture site
8/11/2022	165-Morgan-PESU2	150.668	No Signal	-	Searched North and South of Wartburg at every high spot in 5-mile radius of capture site

Table 3.7 Roost Tree Data for Ridgeline Expansion Summer Bat Surveys, Tennessee, May-August 2022.

Date	Tree ID	GPS	Species
6/13/2022	57-Jackson-PESU1_R1	36.292816, -85.698633	<i>Carya tomentosa</i>
6/15/2022	57-Jackson-PESU1_R2	36.292300, -85.699170	<i>Ulmus americana</i>
6/16/2022	57-Jackson-PESU1_R3	36.292300, -85.699170	<i>Carya ovata</i>
6/17/2022	57-Jackson-PESU1-R4	36.293378, -85.699430	<i>Juglans nigra</i>
6/17/2022	72-Jackson-PESU2-R1	36.245553, -85.569584	<i>Quercus alba</i>
6/18/2022	72-Jackson-PESU2-R2	36.245506, -85.569576	<i>Juglans nigra</i>
6/21/2022	72-Jackson-PESU2-R3	36.245884, -85.569529	<i>Aesculus flava</i>

Table 3.8 Emergence Count Data for Ridgeline Expansion Summer Bat Surveys, Tennessee, May-August 2022.

Date	Tree ID	Tagged Bat in tree	GPS	Bats
6/14/2022	57-Jackson-PESU1_R1	No	36.292816, -85.698633	0
6/15/2022	57-Jackson-PESU1_R2	Yes	36.292300, -85.699170	7
6/16/2022	57-Jackson-PESU1_R3	Yes	36.292300, -85.699170	4
6/18/2022	72-Jackson-PESU2-R2	Yes	36.293378, -85.699430	3
6/19/2022	72-Jackson-PESU2-R2	Yes	36.245506, -85.569576	6
6/20/2022	72-Jackson-PESU2-R2	Yes	36.293378, -85.699430	4

APPENDIX E

Acoustic Survey Memo

To: Joshua Adams

From: Caroline Byrne
Topsham, ME

Project/File: 172677408

Date: February 2, 2023

Reference: Interim Enbridge Ridgeline Project Summer Acoustics Results

SURVEY OBJECTIVES

The objective of the 2022 bat acoustics summer survey was to assess species composition of bats in the Enbridge Ridgeline Project (project area) using acoustic detectors, supplementing mist netting surveys conducted in the project area by the Stantec.

DATA COLLECTION

Biologists deployed acoustic detectors at 36 survey sites in the project corridor, completed sites were surveyed for four calendar nights. Preliminary detector locations were selected before fieldwork by federally permitted bat biologists and final detector placement was determined in the field to sample suitable bat flight corridors or foraging habitat based on criteria in the USFWS Guidelines. As USFWS Guidelines recommend, microphones were placed in areas without vegetation or with minimal vegetation within 10 meters (m) of the microphone. Microphones were placed at least 3 m away from obstructions in any direction, and detectors were spaced at least 200 m apart.

Coordinates of the final detector locations were collected using the Survey123 application. Relevant deployment and habitat information was documented on an electronic field datasheet using the digital Survey123 app, which was also used to take photographs of each site and document the surrounding habitat features of survey sites.

Acoustic surveys were conducted using full-spectrum acoustic bat detectors, Wildlife Acoustics® SM4BAT-FS and SM Mini Bat. Each detector was fitted with an omnidirectional ultrasonic microphone (Wildlife Acoustics® SMM-U1 or U2) or utilized the internal microphone. Detectors were mounted so the microphone was approximately 3 m above ground level and angled 45 degrees above horizontal to sample an optimal volume of air space, in accordance with the USFWS Guidelines. The audio and data storage settings on detectors were set according to defaults recommended by the manufacturer (e.g., detectors operated in “triggered.wav” mode using default trigger threshold settings recommended by the manufacturer). Detectors recorded from 30 minutes before sunset to 30 minutes after sunrise and were powered by alkaline batteries.

Acoustic detectors remained in the field until at least 4 nights with suitable weather conditions were sampled, as outlined in the USFWS Guidelines and below:

- Temperatures remain above 50°F during the first 5 hours of each survey night;
- Precipitation/fog persists for no more than 30 minutes during the first 5 hours of each survey night; and

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- Sustained wind speeds do not exceed 9 miles/hour for 30 minutes or more during the first 5 hours of each survey night.

Weather conditions were verified by reviewing hourly observations recorded by weather stations nearest detector sites, accessed online via Weather Underground. Following at least four nights with suitable conditions, biologists inspected the detectors in the field to confirm that each operated for a minimum of four nights (i.e., checked battery voltage, verified presence of recorded files, and viewed system status log files).

ACOUSTIC DATA ANALYSIS

Biologists processed audio files recorded by bat detectors (.wav file format) using Kaleidoscope Pro (KPro) software version 5.4.7. KPro converts standard audio (.wav files) to “zero-crossing” formats, then subjects all files to a series of filters to remove noise. Any files passing the noise filters were then classified to species (from a pre-selected list of potential species) or categorized as unknown bats (NoID) based on characteristics of the recorded sound such as minimum and maximum frequency, duration, and pulse length. KPro software used autoclassifier version 5.4.0 with a sensitivity setting of “-1” with the region set to Tennessee, as outlined in the USFWS Guidelines. During data processing, each of the 13 species that occur in Tennessee were included in the species list used by KPro software. Results of KPro identifications were compiled per detector and night, including the number of files assigned to each species, unidentified bat passes, and noise categories. Visual inspection occurred on data from sites that had a sampling night with significant maximum likelihood estimate (MLE) p-value of <0.05 for the following target species: gray (*Myotis grisescens*, MYOGRI), little brown (*M. lucifugus*, MYOLUC), northern long-eared (*M. septentrionalis*, MYOSEP), Indiana (*M. sodalis*, MYOSOD), and tri-colored bats (*Perimyotis subflavus*, PERSUB).

A biologist visually inspected files in a stepwise process as outline in the USFWS Guidelines:

1. All files identified as a target species by the auto-classifier on a sampling night as having a significant MLE for that species were inspected until the probable presence of the species was confirmed; if presence was not confirmed the process moved to step 2
2. All files identified as High Frequency (HiF) species (species with a minimum frequency of \geq 35 kHz) and files labeled NoID on the sampling night with the significant MLE for the species were visually inspected, until probable presence was confirmed, or the inspection was complete, and a determination of unlikely probable presence was made

RESULTS

Biologists deployed acoustic bat detectors at 36 sites within the project area between July 07 and August 15, 2022. Each detector site was sampled for 4 nights except sites 107 and 128, where sampling could not be completed due to equipment failure; these sites will be re-sampled in 2023.

Acoustic detectors recorded a total of 107,799 files of which 48,948 were identified as containing bats by KPro. This total can be broken down into a range of 736 to 10,645 files per site, with 356 to 48,948 files identified to contain bats by KPro software per site during the 144 nights sampling.

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All target species except MYOSEP and MYOSOD were confirmed for probable presence in the project area. Probable presence of MYOGRI and PERSUB was confirmed at 30 sites and 24 sites, respectively, out of 34 sites with complete datasets, and probable presence of MYOLUC was confirmed at 2 sites (see results table). During the visual vetting process, Stantec biologists examined 6,068 bat call files. The following results table provides for each site the number of bat passes identified to each target species by KPro autoclassifier, indicates whether the MLE score was less than 0.05 for any night, and indicates whether presence was confirmed during manual vetting of acoustic files. The results of the visual inspection (probable presence?), indicate if the probable presence of a target species as confirmed during step 1 or 2 of the stepwise inspection process. The probable presence column only represents the subset of data that was visually inspected, not all data recorded. If a target species did not have a significant MLE but was determined to have probable presence, this target species was confirmed during the vetting of HiF files for another target species (i.e., PERSUB site 2). Presence of "NA" in the probable presence column indicates that MLE values were not significant on any sampling night and visual inspection was not required. HiF vetting completed indicates if any target species had a sampling night with a significant MLE in which probable presence could not be confirmed with files labeled by autoclassification and step two in the visual inspection process was completed.

Site	MYOGRI			MYOLUC			MYOSEP			MYOSOD			PERSUB			HiF Vetting Completed?
	Site total # of files	MLE	Probable presence?	Site total # of files	MLE	Probable presence?	Site total # of files	MLE	Probable presence?	Site total # of files	MLE	Probable presence?	Site total # of files	MLE	Probable presence?	
1	65	Yes	Yes	80	Yes	No	4	No	No	4	No	No	54	No	No	Yes
2	299	Yes	Yes	159	Yes	No		No	No	1	No	No	33	No	Yes	Yes
3	125	Yes	Yes	140	No	No		No	NA	2	No	NA	134	No	NA	No
9	152	Yes	Yes	32	No	No	2	No	NA	2	No	NA	128	No	NA	No
10	40	Yes	Yes	5	No	No		No	NA		No	NA	51	No	NA	No
18	252	Yes	Yes	28	No	No	3	No	NA		No	NA	46	Yes	Yes	No
19	935	Yes	Yes	124	Yes	Yes	5	No	No	22	Yes	No	63	No	Yes	Yes
20	471	Yes	Yes	87	No	NA	5	No	NA	7	No	NA	145	Yes	Yes	No
22	284	Yes	Yes	6	No	NA		No	NA		No	NA	1364	Yes	Yes	No
42	64	Yes	Yes	23	No	NA		No	NA	1	No	NA	44	Yes	Yes	No
44	39	Yes	Yes	10	No	NA		No	NA	2	No	NA	27	No	NA	No
48	850	Yes	Yes	53	Yes	No	3	No	NA	1	No	NA	44	Yes	Yes	No
55	360	Yes	Yes	122	No	NA	8	No	NA	18	No	NA	230	Yes	Yes	No
71	535	Yes	Yes	171	Yes	No	9	No	No	2	No	No	93	Yes	Yes	Yes
75	93	Yes	Yes	84	No	NA	2	No	NA	1	No	NA	97	No	NA	No
77	41	No	NA	42	No	NA		No	NA		No	NA	159	Yes	Yes	No
78	75	Yes	Yes	83	Yes	No	4	No	No	3	No	No	29	No	No	Yes
79	135	Yes	Yes	93	Yes	No	2	No	NA	3	No	No	72	No	Yes	Yes
81	459	Yes	Yes	171	No	NA	1	No	NA	9	No	NA	209	No	NA	No
88	71	Yes	Yes	48	No	NA	2	No	NA	1	No	NA	63	No	NA	No

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Site	MYOGRI			MYOLUC			MYOSEP			MYOSOD			PERSUB			HiF Vetting Completed?
	Site total # of files	MLE	Probable presence?	Site total # of files	MLE	Probable presence?	Site total # of files	MLE	Probable presence?	Site total # of files	MLE	Probable presence?	Site total # of files	MLE	Probable presence?	
95	128	Yes	Yes	43	No	NA	3	No	NA		No	NA	477	Yes	Yes	No
96	189	Yes	Yes	52	No	Na	2	No	NA	1	No	NA	137	Yes	Yes	No
107	32	Yes	*	18	No	*		No	*		No	*	43	Yes	Yes	Yes
125	15	Yes	Yes	6	No	NA		No	NA	1	No	NA	20	No	NA	No
126	122	Yes	Yes	159	No	NA	7	No	NA	12	No	NA	106	No	NA	No
127	568	Yes	Yes	92	Yes	Yes	1	No	NA	6	No	NA	62	Yes	Yes	No
128	81	Yes	*	10	No	*		No	*	1	No	*	272	Yes	Yes	Yes
134	63	Yes	Yes	36	Yes	No	2	No	No	2	No	No	19	No	No	Yes
135	232	Yes	Yes	81	No	NA	5	No	NA	2	No	NA	260	Yes	Yes	No
144	43	Yes	No	50	No	No	3	No	No	9	No	No	61	No	Yes	Yes
157	195	Yes	Yes	37	No	No	20	Yes	No	24	Yes	No	141	Yes	Yes	Yes
175	4	No	NA	19	No	NA		No	NA	1	No	NA	191	No	NA	No
177	39	Yes	No	11	No	No	1	No	No	1	No	No	118	Yes	Yes	Yes
191	19	Yes	Yes	5	No	NA	1	No	NA		No	NA	46	Yes	Yes	No
192	540	Yes	Yes	48	No	NA	2	No	NA		No	NA	77	Yes	Yes	No
197	41	Yes	Yes	10	No	NA	2	No	NA		No	NA	53	Yes	Yes	No

Stantec Consulting Services Inc.

Caroline Byrne

Caroline M. Byrne

Wildlife Biologist
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February 2, 2023
Joshua Adams
Page 6 of 6

Reference: 172677408

APPENDIX F

Radio Telemetry Data Sheets and Photographs

Radio-Tracking Data Sheet (Triangulation)

Biologist Name: James Kiser/Shane Kelley

Date: 5/18/2022

Bat Frequency: 088

Project Name/Number: Ridgeline Pipeline Expansion

Tracking Day: 1 of 7

Capture Site: RLM-05-Trousdale

State: Tennessee

County: Trousdale

Tracking Start Time: 1200

Tracking End Time: 0420

Point	Latitude	Longitude	Bearing	Comments
				No signal found on bat this day

***If roost NOT FOUND, draw bearings to map and triangulate each day bat is tracked; If roost IS FOUND, fill out accompanying Roost Tree Data Sheet**

Roost Tree Accessible: Yes No

Roost Tree Found: Yes No

If Roost Structure Not Accessible, Reason (Private land/no permission; safety concerns; not physically able; etc.): _____

General Comments (Notes describing triangulation area; general forest/habitat comments; etc.): No signal found for bat this day. Crews searched a 5-mile radius around Second creek trying to get signals at all high spots _____

Radio-Tracking Data Sheet (Triangulation)

Biologist Name: James Kiser/Shane Kelley

Date: 5/19/2022

Bat Frequency: 088

Project Name/Number: Ridgeline Pipeline Expansion

Tracking Day: 2 of 7

Capture Site: RLM-05-Trousdale

State: Tennessee

County: Trousdale

Tracking Start Time: 1200

Tracking End Time: 0420

Point	Latitude	Longitude	Bearing	Comments
				No signal found on bat this day

*If roost NOT FOUND, draw bearings to map and triangulate each day bat is tracked; If roost IS FOUND, fill out accompanying Roost Tree Data Sheet

Roost Tree Accessible: Yes No

Roost Tree Found: Yes No

If Roost Structure Not Accessible, Reason (Private land/no permission; safety concerns; not physically able; etc.): _____

General Comments (Notes describing triangulation area; general forest/habitat comments; etc.): No signal found for bat this day. Crews searched a 5-mile radius around Second creek trying to get signals at all high spots _____

Radio-Tracking Data Sheet (Triangulation)

Biologist Name: James Kiser/Shane Kelley

Date: 5/20/2022

Bat Frequency: 088

Project Name/Number: Ridgeline Pipeline Expansion

Tracking Day: 3 of 7

Capture Site: RLM-05-Trousdale

State: Tennessee

County: Trousdale

Tracking Start Time: 1200

Tracking End Time: 0420

Point	Latitude	Longitude	Bearing	Comments
				No signal found on bat this day

*If roost NOT FOUND, draw bearings to map and triangulate each day bat is tracked; If roost IS FOUND, fill out accompanying Roost Tree Data Sheet

Roost Tree Accessible: Yes No

Roost Tree Found: Yes No

If Roost Structure Not Accessible, Reason (Private land/no permission; safety concerns; not physically able; etc.): _____

General Comments (Notes describing triangulation area; general forest/habitat comments; etc.): No signal found for bat this day. Crews searched a 5-mile radius around Second creek trying to get signals at all high spots _____

Radio-Tracking Data Sheet (Triangulation)

Biologist Name: James Kiser/Shane Kelley

Date: 5/21/2022

Bat Frequency: 088

Project Name/Number: Ridgeline Pipeline Expansion

Tracking Day: 4 of 7

Capture Site: RLM-05-Trousdale

State: Tennessee

County: Trousdale

Tracking Start Time: 1200

Tracking End Time: 0420

Point	Latitude	Longitude	Bearing	Comments
				No signal found on bat this day

*If roost NOT FOUND, draw bearings to map and triangulate each day bat is tracked; If roost IS FOUND, fill out accompanying Roost Tree Data Sheet

Roost Tree Accessible: Yes No

Roost Tree Found: Yes No

If Roost Structure Not Accessible, Reason (Private land/no permission; safety concerns; not physically able; etc.): _____

General Comments (Notes describing triangulation area; general forest/habitat comments; etc.): No signal found for bat this day. Crews searched a 5-mile radius around Second creek trying to get signals at all high spots _____

Radio-Tracking Data Sheet (Triangulation)

Biologist Name: James Kiser/Shane Kelley

Date: 5/22/2022

Bat Frequency: 088

Project Name/Number: Ridgeline Pipeline Expansion

Tracking Day: 5 of 7

Capture Site: RLM-05-Trousdale

State: Tennessee

County: Trousdale

Tracking Start Time: 1200

Tracking End Time: 0420

Point	Latitude	Longitude	Bearing	Comments
1	36.385875	-86.210238	90	
2	36.388846	-86.206552	115	
3	36.391658	-86.197807	210	Bat Triangulated to 36.385885, -86.204358

***If roost NOT FOUND, draw bearings to map and triangulate each day bat is tracked; If roost IS FOUND, fill out accompanying Roost Tree Data Sheet**

Roost Tree Accessible: Yes **No**

Roost Tree Found: Yes **No**

If Roost Structure Not Accessible, Reason (Private land/no permission; safety concerns; not physically able; etc.): Not able to access roost due to lack of land access_____

General Comments (Notes describing triangulation area; general forest/habitat comments; etc.): _____

Radio-Tracking Data Sheet (Triangulation)

Biologist Name: James Kiser/Shane Kelley

Date: 5/23/2022

Bat Frequency: 088

Project Name/Number: Ridgeline Pipeline Expansion

Tracking Day: 6 of 7

Capture Site: RLM-05-Trousdale

State: Tennessee

County: Trousdale

Tracking Start Time: 1200

Tracking End Time: 0420

Point	Latitude	Longitude	Bearing	Comments
				No signal found on bat this day

***If roost NOT FOUND, draw bearings to map and triangulate each day bat is tracked; If roost IS FOUND, fill out accompanying Roost Tree Data Sheet**

Roost Tree Accessible: Yes No

Roost Tree Found: Yes No

If Roost Structure Not Accessible, Reason (Private land/no permission; safety concerns; not physically able; etc.): _____

General Comments (Notes describing triangulation area; general forest/habitat comments; etc.): No signal found for bat this day. Crews searched a 5-mile radius around Second creek trying to get signals at all high spots _____

Radio-Tracking Data Sheet (Triangulation)

Biologist Name: James Kiser/Shane Kelley

Date: 5/24/2022

Bat Frequency: 088

Project Name/Number: Ridgeline Pipeline Expansion

Tracking Day: 7 of 7

Capture Site: RLM-05-Trousdale

State: Tennessee

County: Trousdale

Tracking Start Time: 1200

Tracking End Time: 0420

Point	Latitude	Longitude	Bearing	Comments
				No signal found on bat this day

*If roost NOT FOUND, draw bearings to map and triangulate each day bat is tracked; If roost IS FOUND, fill out accompanying Roost Tree Data Sheet

Roost Tree Accessible: Yes No

Roost Tree Found: Yes No

If Roost Structure Not Accessible, Reason (Private land/no permission; safety concerns; not physically able; etc.): _____

General Comments (Notes describing triangulation area; general forest/habitat comments; etc.): No signal found for bat this day. Crews searched a 5-mile radius around Second creek trying to get signals at all high spots _____

Radio-Tracking Data Sheet (Triangulation)

Biologist Name: James Kiser/Shane Kelley

Date: 5/18/2022

Bat Frequency: 514

Project Name/Number: Ridgeline Pipeline Expansion

Tracking Day: 2 of 7

Capture Site: RLM-05-Trousdale

State: Tennessee

County: Trousdale

Tracking Start Time: 1200

Tracking End Time: 0420

Point	Latitude	Longitude	Bearing	Comments
1	36.377395	-86.209244	15	
2	36.385816	-86.210112	50	
3	36.384837	-86.200373	275	Bat Triangulated to 36.385479, -86.206817

***If roost NOT FOUND, draw bearings to map and triangulate each day bat is tracked; If roost IS FOUND, fill out accompanying Roost Tree Data Sheet**

Roost Tree Accessible: Yes **No**

Roost Tree Found: Yes **No**

If Roost Structure Not Accessible, Reason (Private land/no permission; safety concerns; not physically able; etc.): Not able to access roost due to lack of land access_____

General Comments (Notes describing triangulation area; general forest/habitat comments; etc.): _____

Radio-Tracking Data Sheet (Triangulation)

Biologist Name: James Kiser/Shane Kelley

Date: 5/22/2022

Bat Frequency: 514

Project Name/Number: Ridgeline Pipeline Expansion

Tracking Day: 2 of 7

Capture Site: RLM-05-Trousdale

State: Tennessee

County: Trousdale

Tracking Start Time: 1200

Tracking End Time: 0420

Point	Latitude	Longitude	Bearing	Comments
1	N 36 23.16410	W 86 12.63389	60	
2	N 36 22.65171	W 86 12.56054	10	
3	N 36 22.97750	W 86.12.79821	50	Bat Triangulated to 36.38688, -86.20635

***If roost NOT FOUND, draw bearings to map and triangulate each day bat is tracked; If roost IS FOUND, fill out accompanying Roost Tree Data Sheet**

Roost Tree Accessible: Yes **No**

Roost Tree Found: Yes **No**

If Roost Structure Not Accessible, Reason (Private land/no permission; safety concerns; not physically able; etc.): Not able to access roost due to lack of land access_____

General Comments (Notes describing triangulation area; general forest/habitat comments; etc.): _____

Radio-Tracking Data Sheet (Triangulation)

Biologist Name: Chris Knabel, Lucas Downs Date: 5/20/2022 Bat Frequency: 150.514

Project Name/Number: Enbridge Ridgeline Expansion Tracking Day: 3 of 7

Capture Site: 15 State: TN County: Trousdale

Tracking Start Time: 9am Tracking End Time: 1pm

Point	Latitude	Longitude	Bearing	Comments
<u>1</u>				No Signal

*If roost NOT FOUND, draw bearings to map and triangulate each day bat is tracked; If roost IS FOUND, fill out accompanying Roost Tree Data Sheet

Roost Tree Accessible: Yes **No** Roost Tree Found: Yes **No**

If Roost Structure Not Accessible, Reason (Private land/no permission; safety concerns; not physically able; etc.): No Signal

General Comments (Notes describing triangulation area; general forest/habitat comments; etc.):

No Signal was Found looking in a 5-mile buffer of the capture site for this bat. All accessible highpoints were checked.

Radio-Tracking Data Sheet (Triangulation)

Biologist Name: Chris Knabel, Matt Denzler Date: 5/21/2022 Bat Frequency: 150.514

Project Name/Number: Enbridge Ridgeline Expansion Tracking Day: 4 of 7

Capture Site: 15 State: TN County: Trousdale

Tracking Start Time: 9am Tracking End Time: 1pm

Point	Latitude	Longitude	Bearing	Comments
<u>1</u>				No Signal

*If roost NOT FOUND, draw bearings to map and triangulate each day bat is tracked; If roost IS FOUND, fill out accompanying Roost Tree Data Sheet

Roost Tree Accessible: Yes **No** Roost Tree Found: Yes **No**

If Roost Structure Not Accessible, Reason (Private land/no permission; safety concerns; not physically able; etc.): No Signal

General Comments (Notes describing triangulation area; general forest/habitat comments; etc.):

No Signal was Found looking in a 5-mile buffer of the capture site for this bat. All accessible highpoints were checked.

Radio-Tracking Data Sheet (Triangulation)

Biologist Name: James Kiser/Shane Kelley

Date: 5/22/2022

Bat Frequency: 514

Project Name/Number: Ridgeline Pipeline Expansion

Tracking Day: 5 of 7

Capture Site: RLM-05-Trousdale

State: Tennessee

County: Trousdale

Tracking Start Time: 1200

Tracking End Time: 0420

Point	Latitude	Longitude	Bearing	Comments
1	36.385875	-86.210238	90	
2	36.388846	-86.206552	115	
3	36.391658	-86.197807	210	Bat Triangulated to 36.385885, -86.204358

***If roost NOT FOUND, draw bearings to map and triangulate each day bat is tracked; If roost IS FOUND, fill out accompanying Roost Tree Data Sheet**

Roost Tree Accessible: Yes **No**

Roost Tree Found: Yes **No**

If Roost Structure Not Accessible, Reason (Private land/no permission; safety concerns; not physically able; etc.): Not able to access roost due to lack of land access_____

General Comments (Notes describing triangulation area; general forest/habitat comments; etc.): _____

Radio-Tracking Data Sheet (Triangulation)

Biologist Name: James Kiser/Shane Kelley

Date: 5/23/2022

Bat Frequency: 514

Project Name/Number: Ridgeline Pipeline Expansion

Tracking Day: 6 of 7

Capture Site: RLM-05-Trousdale

State: Tennessee

County: Trousdale

Tracking Start Time: 1200

Tracking End Time: 0420

Point	Latitude	Longitude	Bearing	Comments
1	36.385890	-86.231578	75	
2	36.384450	-86.214823	115	Bat Triangulated to 36.387063, -86.222073

***If roost NOT FOUND, draw bearings to map and triangulate each day bat is tracked; If roost IS FOUND, fill out accompanying Roost Tree Data Sheet**

Roost Tree Accessible: Yes **No**

Roost Tree Found: Yes **No**

If Roost Structure Not Accessible, Reason (Private land/no permission; safety concerns; not physically able; etc.): Not able to access roost due to lack of land access_____

General Comments (Notes describing triangulation area; general forest/habitat comments; etc.): _____

Radio-Tracking Data Sheet (Triangulation)

Biologist Name: James Kiser/Shane Kelley

Date: 5/22/2022

Bat Frequency: 514

Project Name/Number: Ridgeline Pipeline Expansion

Tracking Day: 7 of 7

Capture Site: RLM-05-Trousdale

State: Tennessee

County: Trousdale

Tracking Start Time: 1200

Tracking End Time: 0420

Point	Latitude	Longitude	Bearing	Comments
				No signal found on bat this day

*If roost NOT FOUND, draw bearings to map and triangulate each day bat is tracked; If roost IS FOUND, fill out accompanying Roost Tree Data Sheet

Roost Tree Accessible: Yes No

Roost Tree Found: Yes No

If Roost Structure Not Accessible, Reason (Private land/no permission; safety concerns; not physically able; etc.): _____

General Comments (Notes describing triangulation area; general forest/habitat comments; etc.): No signal found for bat this day. Crews searched a 5-mile radius around Second creek trying to get signals at all high spots _____

Radio-Tracking Data Sheet (Triangulation)

Biologist Name: Chris Knabel, Matt Denezler Date: 5/21/2022 Bat Frequency: 150.564

Project Name/Number: Enbridge Ridgeline Expansion Tracking Day: 1 of 7

Capture Site: 21 State: TN County: Smith

Tracking Start Time: 9am Tracking End Time: 1pm

Point	Latitude	Longitude	Bearing	Comments
<u>1</u>	36.372767	-86.026644	<u>240</u>	Only able to get this one bearing. Bat was located in the valley between two big hills. Unable to get a beep anywhere else.
<u>2</u>	36.368016	-86.034436		Approximate location

*If roost NOT FOUND, draw bearings to map and triangulate each day bat is tracked; If roost IS FOUND, fill out accompanying Roost Tree Data Sheet

Roost Tree Accessible: Yes **No** Roost Tree Found: Yes **No**

If Roost Structure Not Accessible, Reason (Private land/no permission; safety concerns; not physically able; etc.): Roost Not Accessible, on no access property.

General Comments (Notes describing triangulation area; general forest/habitat comments; etc.): One bearing taken with location in between two big hills. Landowner information was unavailable so no tracking to roost tree was done.

Radio-Tracking Data Sheet (Triangulation)

Biologist Name: Chris Knabel, Matt Denezler Date: 5/22/2022

Bat Frequency: 150.564

Project Name/Number: Enbridge Ridgeline Expansion

Tracking Day: 2 of 7

Capture Site: 21

State: TN

County: Smith

Tracking Start Time: 9am

Tracking End Time: 1pm

Point	Latitude	Longitude	Bearing	Comments
<u>1</u>				No Signal

*If roost NOT FOUND, draw bearings to map and triangulate each day bat is tracked; If roost IS FOUND, fill out accompanying Roost Tree Data Sheet

Roost Tree Accessible: Yes **No**

Roost Tree Found: Yes **No**

If Roost Structure Not Accessible, Reason (Private land/no permission; safety concerns; not physically able; etc.): N/A

General Comments (Notes describing triangulation area; general forest/habitat comments; etc.): No Signal. Crew searched a 5 mile buffer around the capture site and all reasonable high points

Radio-Tracking Data Sheet (Triangulation)

Biologist Name: Chris Knabel, Matt Denezler Date: 5/23/2022

Bat Frequency: 150.564

Project Name/Number: Enbridge Ridgeline Expansion

Tracking Day: 3 of 7

Capture Site: 21

State: TN

County: Smith

Tracking Start Time: 9am

Tracking End Time: 1pm

Point	Latitude	Longitude	Bearing	Comments
<u>1</u>				No Signal

*If roost NOT FOUND, draw bearings to map and triangulate each day bat is tracked; If roost IS FOUND, fill out accompanying Roost Tree Data Sheet

Roost Tree Accessible: Yes **No**

Roost Tree Found: Yes **No**

If Roost Structure Not Accessible, Reason (Private land/no permission; safety concerns; not physically able; etc.): N/A

General Comments (Notes describing triangulation area; general forest/habitat comments; etc.): No Signal. Crew searched a 5 mile buffer around the capture site and all reasonable high points

Radio-Tracking Data Sheet (Triangulation)

Biologist Name: Chris Knabel, Matt Denezler Date: 5/24/2022

Bat Frequency: 150.564

Project Name/Number: Enbridge Ridgeline Expansion

Tracking Day: 4 of 7

Capture Site: 21

State: TN

County: Smith

Tracking Start Time: 9am

Tracking End Time: 1pm

Point	Latitude	Longitude	Bearing	Comments
<u>1</u>				No Signal

*If roost NOT FOUND, draw bearings to map and triangulate each day bat is tracked; If roost IS FOUND, fill out accompanying Roost Tree Data Sheet

Roost Tree Accessible: Yes **No**

Roost Tree Found: Yes **No**

If Roost Structure Not Accessible, Reason (Private land/no permission; safety concerns; not physically able; etc.): N/A

General Comments (Notes describing triangulation area; general forest/habitat comments; etc.): _____
No Signal. Crew searched a 5 mile buffer around the capture site and all reasonable high points

Radio-Tracking Data Sheet (Triangulation)

Biologist Name: Chris Knabel, Matt Denezler Date: 5/25/2022

Bat Frequency: 150.564

Project Name/Number: Enbridge Ridgeline Expansion

Tracking Day: 5 of 7

Capture Site: 21

State: TN

County: Smith

Tracking Start Time: 9am

Tracking End Time: 1pm

Point	Latitude	Longitude	Bearing	Comments
<u>1</u>				No Signal
				End Tracking

*If roost NOT FOUND, draw bearings to map and triangulate each day bat is tracked; If roost IS FOUND, fill out accompanying Roost Tree Data Sheet

Roost Tree Accessible: Yes **No**

Roost Tree Found: Yes **No**

If Roost Structure Not Accessible, Reason (Private land/no permission; safety concerns; not physically able; etc.): N/A

General Comments (Notes describing triangulation area; general forest/habitat comments; etc.): No Signal. Crew searched a 5 mile buffer around the capture site and all reasonable high points

Radio-Tracking Data Sheet (Triangulation)

Biologist Name: James Kiser, Shane Kelley Date: 6/2/2022

Bat Frequency: 150.986

Project Name/Number: Enbridge Ridgeline Expansion

Tracking Day: 1 of 7

Capture Site: 46

State: TN

County: Smith

Tracking Start Time: 9am

Tracking End Time: 1pm

Point	Latitude	Longitude	Bearing	Comments
<u>1</u>	36.343804	-85.763954	<u>315</u>	Only able to get this one bearing. Bat was in open shed behind house.
<u>2</u>	36.345469	-85.794162		Tracked to Shed on No Access Property

*If roost NOT FOUND, draw bearings to map and triangulate each day bat is tracked; If roost IS FOUND, fill out accompanying Roost Tree Data Sheet

Roost Tree Accessible: Yes **No**

Roost Tree Found: Yes **No**

If Roost Structure Not Accessible, Reason (Private land/no permission; safety concerns; not physically able; etc.): Roost Not Accessible, on no access property.

General Comments (Notes describing triangulation area; general forest/habitat comments; etc.): Tracked to shed. Location was in a hallow and unable to be picked up in other locations.

Radio-Tracking Data Sheet (Triangulation)

Biologist Name: Chris Knabel, Hannah Stoffs Date: 6/3/2022

Bat Frequency: 150.986

Project Name/Number: Enbridge Ridgeline Expansion

Tracking Day: 2 of 7

Capture Site: 46

State: TN

County: Smith

Tracking Start Time: 9am

Tracking End Time: 1pm

Point	Latitude	Longitude	Bearing	Comments
<u>1</u>	36.343804	-85.763954	<u>315</u>	Similar to first day: Only able to get this one bearing. Crew determined that bat was in open shed behind house.
<u>2</u>	36.345469	-85.794162		Tracked to Shed on No Access Property

*If roost NOT FOUND, draw bearings to map and triangulate each day bat is tracked; If roost IS FOUND, fill out accompanying Roost Tree Data Sheet

Roost Tree Accessible: Yes **No**

Roost Tree Found: Yes **No**

If Roost Structure Not Accessible, Reason (Private land/no permission; safety concerns; not physically able; etc.): Roost Not Accessible, on no access property.

General Comments (Notes describing triangulation area; general forest/habitat comments; etc.): Tracked to shed. Location was in a hallow and unable to be picked up in other locations.

Radio-Tracking Data Sheet (Triangulation)

Biologist Name: Chris Knabel, Hannah Stoffs Date: 6/4/2022

Bat Frequency: 150.986

Project Name/Number: Enbridge Ridgeline Expansion

Tracking Day: 3 of 7

Capture Site: 46

State: TN

County: Smith

Tracking Start Time: 9am

Tracking End Time: 1pm

Point	Latitude	Longitude	Bearing	Comments
				No Signal

*If roost NOT FOUND, draw bearings to map and triangulate each day bat is tracked; If roost IS FOUND, fill out accompanying Roost Tree Data Sheet

Roost Tree Accessible: Yes **No**

Roost Tree Found: Yes **No**

If Roost Structure Not Accessible, Reason (Private land/no permission; safety concerns; not physically able; etc.): N/A

General Comments (Notes describing triangulation area; general forest/habitat comments; etc.): No Signal- Searched 5-Mile Radius and All reasonable high points

Radio-Tracking Data Sheet (Triangulation)

Biologist Name: Chris Knabel Date: 6/5/2022

Bat Frequency: 150.986

Project Name/Number: Enbridge Ridgeline Expansion

Tracking Day: 4 of 7

Capture Site: 46

State: TN

County: Smith

Tracking Start Time: 9am

Tracking End Time: 1pm

Point	Latitude	Longitude	Bearing	Comments
				No Signal

*If roost NOT FOUND, draw bearings to map and triangulate each day bat is tracked; If roost IS FOUND, fill out accompanying Roost Tree Data Sheet

Roost Tree Accessible: Yes **No**

Roost Tree Found: Yes **No**

If Roost Structure Not Accessible, Reason (Private land/no permission; safety concerns; not physically able; etc.): N/A

General Comments (Notes describing triangulation area; general forest/habitat comments; etc.): No Signal- Searched 5-Mile Radius and All reasonable high points

Radio-Tracking Data Sheet (Triangulation)

Biologist Name: Chris Knabel Date: 6/6/2022

Bat Frequency: 150.986

Project Name/Number: Enbridge Ridgeline Expansion

Tracking Day: 5 of 7

Capture Site: 46

State: TN

County: Smith

Tracking Start Time: 9am

Tracking End Time: 1pm

Point	Latitude	Longitude	Bearing	Comments
				No Signal

*If roost NOT FOUND, draw bearings to map and triangulate each day bat is tracked; If roost IS FOUND, fill out accompanying Roost Tree Data Sheet

Roost Tree Accessible: Yes **No**

Roost Tree Found: Yes **No**

If Roost Structure Not Accessible, Reason (Private land/no permission; safety concerns; not physically able; etc.): N/A

General Comments (Notes describing triangulation area; general forest/habitat comments; etc.): No Signal- Searched 5-Mile Radius and All reasonable high points

Radio-Tracking Data Sheet (Triangulation)

Biologist Name: Chris Knabel Date: 6/7/2022

Bat Frequency: 150.986

Project Name/Number: Enbridge Ridgeline Expansion

Tracking Day: 6 of 7

Capture Site: 46

State: TN

County: Smith

Tracking Start Time: 9am

Tracking End Time: 1pm

Point	Latitude	Longitude	Bearing	Comments
				No Signal

*If roost NOT FOUND, draw bearings to map and triangulate each day bat is tracked; If roost IS FOUND, fill out accompanying Roost Tree Data Sheet

Roost Tree Accessible: Yes **No**

Roost Tree Found: Yes **No**

If Roost Structure Not Accessible, Reason (Private land/no permission; safety concerns; not physically able; etc.): N/A

General Comments (Notes describing triangulation area; general forest/habitat comments; etc.): No Signal- Searched 5-Mile Radius and All reasonable high points

Radio-Tracking Data Sheet (Triangulation)

Biologist Name: Chris Knabel Date: 6/8/2022 Bat Frequency: 150.986

Project Name/Number: Enbridge Ridgeline Expansion Tracking Day: 7 of 7

Capture Site: 46 State: TN County: Smith

Tracking Start Time: 9am Tracking End Time: 1pm

Point	Latitude	Longitude	Bearing	Comments
				No Signal

*If roost NOT FOUND, draw bearings to map and triangulate each day bat is tracked; If roost IS FOUND, fill out accompanying Roost Tree Data Sheet

Roost Tree Accessible: Yes **No** Roost Tree Found: Yes **No**

If Roost Structure Not Accessible, Reason (Private land/no permission; safety concerns; not physically able; etc.): N/A

General Comments (Notes describing triangulation area; general forest/habitat comments; etc.): No Signal- Searched 5-Mile Radius and All reasonable high points

Radio-Tracking Data Sheet (Triangulation)

Biologist Name: Theresa Wetzel, Morgan Johnson Date: 6/16/2022 Bat Frequency: 150.585

Project Name/Number: Enbridge Ridgeline Expansion Tracking Day: 1 of 7

Capture Site: 72 State: TN County: Jackson

Tracking Start Time: 1130am Tracking End Time: 1400

Point	Latitude	Longitude	Bearing	Comments
<u>1</u>	36.245698	-85.569584	<u>255</u>	Single bearing took. Not enough time to do a complete triangulation

*If roost NOT FOUND, draw bearings to map and triangulate each day bat is tracked; If roost IS FOUND, fill out accompanying Roost Tree Data Sheet

Roost Tree Accessible: Yes **No** Roost Tree Found: Yes **No**

If Roost Structure Not Accessible, Reason (Private land/no permission; safety concerns; not physically able; etc.): No Signal

General Comments (Notes describing triangulation area; general forest/habitat comments; etc.):
No Signal was Found looking in a 5-mile buffer of the capture site for this bat. All accessible highpoints were checked.

Radio-Tracking Data Sheet (Triangulation)

Biologist Name: Theresa Wetzell, M. Johnson Date: 06-17-22

Bat Frequency: 585

Project Name/Number: Ridgeline/172677408

Tracking Day: 2 of 7

Capture Site: RM-72-Jackson State: Tennessee

County: Jackson

Tracking Start Time: 11:30

Tracking End Time: 13:48

Point	Latitude	Longitude	Bearing	Comments

*If roost NOT FOUND, draw bearings to map and triangulate each day bat is tracked; If roost IS FOUND, fill out accompanying Roost Tree Data Sheet

Roost Tree Accessible: ☒ Yes ☐ No

Roost Tree Found: ☒ Yes ☐ No

If Roost Structure Not Accessible, Reason (Private land/no permission; safety concerns; not physically able; etc.): _____

General Comments (Notes describing triangulation area; general forest/habitat comments; etc.): _____

Radio-Tracking Data Sheet (Triangulation)

Biologist Name: Mitch Dannon Date: 06/18/2022 Bat Frequency: 150.585

Project Name/Number: Ridgeline/172677408 Tracking Day: 3 of 7

Capture Site: RLM-72-Jackson State: Tennessee County: Jackson

Tracking Start Time: 1330 Tracking End Time: 1430

Point	Latitude	Longitude	Bearing	Comments
				Tracked straight to tree
				no points/azimuth's taken

*If roost NOT FOUND, draw bearings to map and triangulate each day bat is tracked; If roost IS FOUND, fill out accompanying Roost Tree Data Sheet

Roost Tree Accessible: ☒ Yes ☐ No

Roost Tree Found: ☒ Yes ☐ No

If Roost Structure Not Accessible, Reason (Private land/no permission; safety concerns; not physically able; etc.): _____

General Comments (Notes describing triangulation area; general forest/habitat comments; etc.): _____

Bottomland forest off East Blackburn Fork; open understory
with Q. alba, A. saccharum, I. americana, F. grandifolia, + J. nigra
for canopy + subcanopy species.

Radio-Tracking Data Sheet (Triangulation)

Biologist Name: Mitch Dannon Date: 6/19/22 Bat Frequency: 150.585

Project Name/Number: Ridgeline (Enbridge) Tracking Day: 4 of 5

Capture Site: 72-Jackson State: Tennessee County: Jackson

Tracking Start Time: 1330 Tracking End Time: 1400

Point	Latitude	Longitude	Bearing	Comments
		Bat	tracked	straight
		to	72-Jackson-PESU2-R1	

*If roost NOT FOUND, draw bearings to map and triangulate each day bat is tracked; If roost IS FOUND, fill out accompanying Roost Tree Data Sheet

Roost Tree Accessible: Yes No

Roost Tree Found: Yes No

If Roost Structure Not Accessible, Reason (Private land/no permission; safety concerns; not physically able; etc.): _____

General Comments (Notes describing triangulation area; general forest/habitat comments; etc.): _____

Radio-Tracking Data Sheet (Triangulation)

Biologist Name: Mitch Dannon, Lucas Downs Date: June 20, 2022 Bat Frequency: 150.585

Project Name/Number: Ridgeline (Enbridge) Tracking Day: 5 of 7

Capture Site: 72-Jackson State: Tennessee County: Jackson

Tracking Start Time: 1330 Tracking End Time: 1400

Point	Latitude	Longitude	Bearing	Comments

*If roost NOT FOUND, draw bearings to map and triangulate each day bat is tracked; If roost IS FOUND, fill out accompanying Roost Tree Data Sheet

Roost Tree Accessible: ☒ Yes ☐ No

Roost Tree Found: ☒ Yes ☐ No

If Roost Structure Not Accessible, Reason (Private land/no permission; safety concerns; not physically able; etc.): _____

General Comments (Notes describing triangulation area; general forest/habitat comments; etc.): _____

Radio-Tracking Data Sheet (Triangulation)

Biologist Name: Mitch Dannon,
Morgan Johnson Date: June 21, 2022 Bat Frequency: 150.585
 Project Name/Number: Ridgeline (Enbridge) Tracking Day: 6 of 7
 Capture Site: ^{RIM-}72-Jackson State: Tennessee County: Jackson
 Tracking Start Time: 1330 Tracking End Time: 1400

Point	Latitude	Longitude	Bearing	Comments
				Bat tracked straight
				to new/2nd roost tree only ~100 ft
				from last roost tree (72-Jackson-PESU2-R1)

*If roost NOT FOUND, draw bearings to map and triangulate each day bat is tracked; If roost IS FOUND, fill out accompanying Roost Tree Data Sheet

Roost Tree Accessible: ☒ Yes ☐ No

Roost Tree Found: ☒ Yes ☐ No

If Roost Structure Not Accessible, Reason (Private land/no permission; safety concerns; not physically able; etc.): _____

General Comments (Notes describing triangulation area; general forest/habitat comments; etc.): _____

see roost data sheet

same woodlot/characteristics as 72-Jackson-PESU2-R1

Radio-Tracking Data Sheet (Triangulation)

Biologist Name: Chris Knabel Date: 8/4/2022 Bat Frequency: 150.444

Project Name/Number: Enbridge Ridgeline Expansion Tracking Day: 1 of 7

Capture Site: 163 State: TN County: Morgan

Tracking Start Time: 9am Tracking End Time: 1pm

Point	Latitude	Longitude	Bearing	Comments
				No Signal

*If roost NOT FOUND, draw bearings to map and triangulate each day bat is tracked; If roost IS FOUND, fill out accompanying Roost Tree Data Sheet

Roost Tree Accessible: Yes **No** Roost Tree Found: Yes **No**

If Roost Structure Not Accessible, Reason (Private land/no permission; safety concerns; not physically able; etc.): N/A

General Comments (Notes describing triangulation area; general forest/habitat comments; etc.):

No Signal on Bat

Radio-Tracking Data Sheet (Triangulation)

Biologist Name: Chris Knabel
and 150.668

Date: 8/5/2022

Bat Frequency: 150.444

Project Name/Number: Enbridge Ridgeline Expansion
1/7

Tracking Day: 2/7 and

Capture Site: 163 & 165

State: TN

County: Morgan

Tracking Start Time: 9am

Tracking End Time: 1pm

Point	Latitude	Longitude	Bearing	Comments
				No Signals

*If roost NOT FOUND, draw bearings to map and triangulate each day bat is tracked; If roost IS FOUND, fill out accompanying Roost Tree Data Sheet

Roost Tree Accessible: **No**

Roost Tree Found: **No**

If Roost Structure Not Accessible, Reason (Private land/no permission; safety concerns; not physically able; etc.): N/A

General Comments (Notes describing triangulation area; general forest/habitat comments; etc.): _____

No Signal on Bats

Radio-Tracking Data Sheet (Triangulation)

Biologist Name: Chris Knabel
and 150.668

Date: 8/6/2022

Bat Frequency: 150.444

Project Name/Number: Enbridge Ridgeline Expansion
2/7

Tracking Day: 3/7 and

Capture Site: 163 & 165

State: TN

County: Morgan

Tracking Start Time: 9am

Tracking End Time: 1pm

Point	Latitude	Longitude	Bearing	Comments
				No Signals

*If roost NOT FOUND, draw bearings to map and triangulate each day bat is tracked; If roost IS FOUND, fill out accompanying Roost Tree Data Sheet

Roost Tree Accessible: **No**

Roost Tree Found: **No**

If Roost Structure Not Accessible, Reason (Private land/no permission; safety concerns; not physically able; etc.): N/A

General Comments (Notes describing triangulation area; general forest/habitat comments; etc.): _____
No Signal on Bats

Radio-Tracking Data Sheet (Triangulation)

Biologist Name: Chris Knabel
and 150.668

Date: 8/7/2022

Bat Frequency: 150.444

Project Name/Number: Enbridge Ridgeline Expansion
3/7

Tracking Day: 4/7 and

Capture Site: 163 & 165

State: TN

County: Morgan

Tracking Start Time: 9am

Tracking End Time: 1pm

Point	Latitude	Longitude	Bearing	Comments
				No Signals

*If roost NOT FOUND, draw bearings to map and triangulate each day bat is tracked; If roost IS FOUND, fill out accompanying Roost Tree Data Sheet

Roost Tree Accessible: **No**

Roost Tree Found: **No**

If Roost Structure Not Accessible, Reason (Private land/no permission; safety concerns; not physically able; etc.): N/A

General Comments (Notes describing triangulation area; general forest/habitat comments; etc.): _____
No Signal on Bats

Radio-Tracking Data Sheet (Triangulation)

Biologist Name: Chris Knabel
and 150.668

Date: 8/8/2022

Bat Frequency: 150.444

Project Name/Number: Enbridge Ridgeline Expansion
4/7

Tracking Day: 5/7 and

Capture Site: 163 & 165

State: TN

County: Morgan

Tracking Start Time: 9am

Tracking End Time: 1pm

Point	Latitude	Longitude	Bearing	Comments
				No Signals

*If roost NOT FOUND, draw bearings to map and triangulate each day bat is tracked; If roost IS FOUND, fill out accompanying Roost Tree Data Sheet

Roost Tree Accessible: **No**

Roost Tree Found: **No**

If Roost Structure Not Accessible, Reason (Private land/no permission; safety concerns; not physically able; etc.): N/A

General Comments (Notes describing triangulation area; general forest/habitat comments; etc.): _____
No Signal on Bats

Radio-Tracking Data Sheet (Triangulation)

Biologist Name: Chris Knabel
and 150.668

Date: 8/9/2022

Bat Frequency: 150.444

Project Name/Number: Enbridge Ridgeline Expansion
5/7

Tracking Day: 6/7 and

Capture Site: 163 & 165

State: TN

County: Morgan

Tracking Start Time: 9am

Tracking End Time: 1pm

Point	Latitude	Longitude	Bearing	Comments
				No Signals

*If roost NOT FOUND, draw bearings to map and triangulate each day bat is tracked; If roost IS FOUND, fill out accompanying Roost Tree Data Sheet

Roost Tree Accessible: **No**

Roost Tree Found: **No**

If Roost Structure Not Accessible, Reason (Private land/no permission; safety concerns; not physically able; etc.): N/A

General Comments (Notes describing triangulation area; general forest/habitat comments; etc.): _____
No Signal on Bats

Radio-Tracking Data Sheet (Triangulation)

Biologist Name: Hannah Stoffs Date: 8/11/2022

Bat Frequency: 150.668

Project Name/Number: Enbridge Ridgeline Expansion

Tracking Day: 7/7

Capture Site: 165 State: TN County: Morgan

Tracking Start Time: 9am Tracking End Time: 1pm

Point	Latitude	Longitude	Bearing	Comments
				No Signal

*If roost NOT FOUND, draw bearings to map and triangulate each day bat is tracked; If roost IS FOUND, fill out accompanying Roost Tree Data Sheet

Roost Tree Accessible: **No** Roost Tree Found: **No**

If Roost Structure Not Accessible, Reason (Private land/no permission; safety concerns; not physically able; etc.): N/A

General Comments (Notes describing triangulation area; general forest/habitat comments; etc.): No Signal on Bat

USFWS INDIANA **AND/OR NORTHERN LONG-EARED BAT** ROOST DATASHEET

Biologists (Full Name): Julia Wilson Date: 6/13/22

UTM: Zone _____ Easting _____ Northing _____ OR

LAT 36.292816 LONG -85.698633

Property Owner: J. Elrod Phone# _____

State Tennessee County Jackson Site # RLM-57-Jackson

Roost # 1 Roost Name: 57-Jackson-PESU1-R1

Roost Tree Data

Species: Carya tomentosa Live ☒ Snag ☐ Other ☐

(if other, explain) _____

DBH (in or cm) _____ Total Height (ft or m) 45 ft

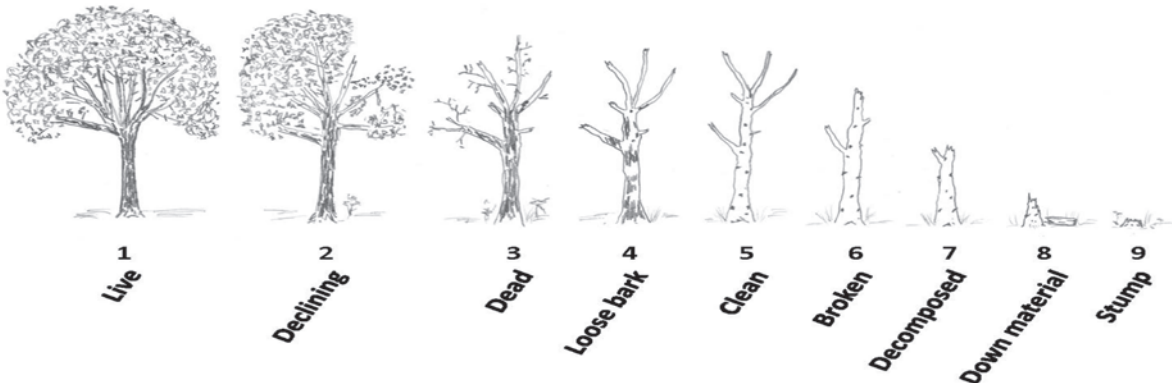
Height of roost area (if known) unknown Dist. from capture site 1600 ft

Roost position aspect (deg) n/a

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

Cavities present? No If so, describe: _____

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



APPENDIX D: PHASE 4 RADIO- TRACKING

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

Surrounding Habitat Condition

Canopy closure at roost (%) 95

Approximate woodlot size (ac or ha) 350 Distance to non-forest (ft or m) 220 ft

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

Mature, diverse oak-hickory-maple. Steep slope.

Additional Comments Pressed for time and did not get roost position aspect. Signal was strongest from foliage - likely mockernut

but possibly neighboring trees. No time to refine exact position

APPENDIX D: PHASE 4 RADIO-TRACKING

USFWS INDIANA BAT ROOST DATASHEET

Biologists (Full Name): Mitch Danner, Anna Blair Date: 6/15/2022

UTM: Zone _____ Easting _____ Northing _____ OR

LAT 36.292300 LONG -85.699170

Property Owner: John P. and Martha Schmidt Phone# _____

State Tennessee County Jackson Site # RLM-57-Jackson

Roost # 2 Roost Name: 57-Jackson-PESU1-R2

Roost Tree Data

Species: Ulmus americana Live ☒ Snag ☐ Other ☐

(if other, explain) adjacent carya ovata with canopy overhanging elm also potentially part of selected roost

DBH (in or cm) 26 in Total Height (ft or m) 55 ft

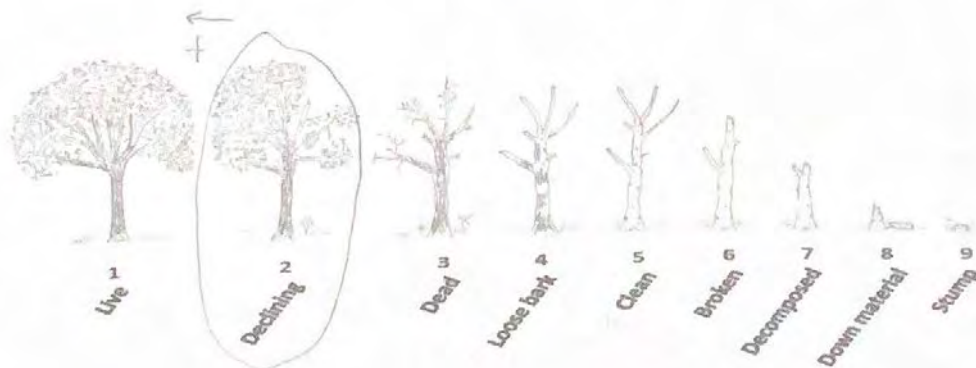
Height of roost area (if known) 52 ft. Dist. from capture site < 0.25 mi

Roost position aspect (deg) _____

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

Cavities present? No If so, describe: _____

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



Roost tree canopy position = co-dominant

canopy closure at roost(%) 40%

Approximate woodlot size (acre) 350 acre

Distance to non-forest (ft.) 400 ft.

Woodlot condition: mature, diverse mixed deciduous forest, *quercus rubra*, multiple hickory spp., *acer rubrum*, *liriodendron tulipifera*, scattered *prunus serotina*. Old, narrow, overgrown, logging trails dispersed through parts of eastern side of woodlot. Large mature trees still in these areas, possible selective cutting.

Additional comments

Downfall/snag of 3 live trees consisting of *carya ovata*, *carya cordiformis*, and *prunus serotina* immediately adjacent to roost tree. Small part of the top of *carya cordiformis* lies against roost tree (*ulmus americana*)

Pressed for time and did not get roost tree aspect

APPENDIX D: PHASE 4 RADIO- TRACKING

USFWS INDIANA AND/OR NORTHERN LONG-EARED BAT
ROOST DATASHEET

Biologists (Full Name): Mitch Dannon Date: 6/16/22

UTM: Zone _____ Easting _____ Northing _____ OR

LAT 36.292300 LONG -85.699170

Property Owner: John P. and Martha Schmidt Phone# _____

State Tennessee County Jackson Site # RLM-57-Jackson

Roost # 3 Roost Name: 57-Jackson - PESU1 - R3

Roost Tree Data

Species: carya ovata Live ☒ Snag ☐ Other ☐

(if other, explain) _____

DBH (in or cm) 28 in Total Height (ft or m) 55 ft.

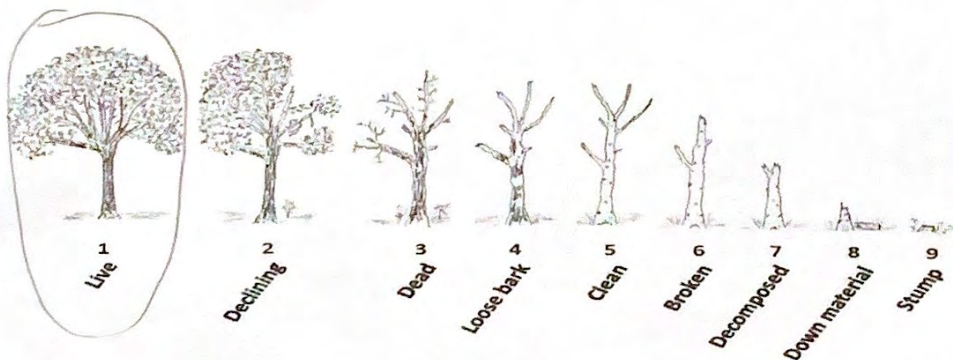
Height of roost area (if known) 53 ft. Dist. from capture site <0.25 mi

Roost position aspect (deg) n/a

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

Cavities present? No If so, describe: _____

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



APPENDIX D: PHASE 4 RADIO- TRACKING

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

Surrounding Habitat Condition

Canopy closure at roost (%) 30

Approximate woodlot size (ac or ha) 350 acre Distance to non-forest (ft or m) 400 ft.

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

mature, diverse mixed deciduous forest; quercus rubra
multiple hickory spp., acer rubrum, liriodendron tulipifera,
scattered prunus serotina, Old, narrow, overgrown
logging trails dispersed through parts of Eastern side of
woodlot. Large mature trees still in these areas possible
other use for trails or selective tree cutting.

Additional Comments This roost tree crown over-topped
the smaller/narrower crown of roost tree

57-Jackson-PESU1-R2

Roost Structure Data Sheet

Biologist Name: Theresa Wetzel Date: 6-17-22

Bat Frequency: 470

Project Name/Number: _____

Roost Number: 57-PESU1-RT4

Latitude: 36.293378 Longitude: -85.1699430

Capture site: RUM-57-Jackson

State: TN County: Jackson

Roost Located on Private Land: ☒ Yes ☐ No Roost Type: ☒ Tree ☐ Building Other: _____

Property Owner (If on private land): _____

Property Owner Contact Info.: _____

Property Address (If Applicable): _____

Roost Species: Juglans nigra

☒ Live ☒ Damaged ☐ Snag ☐ Branch

DBH (inch or cm): 38.7

Height (feet or meters): 40 ft

Canopy: ☒ Yes ☐ No

In a forest gap

Location of Roost (under bark; crack; crevice; etc.): crack/crevice

Height of Roost (If Known): N/A

Dist. From Capture Site (KM or Mile): _____

Percent Sloughing Bark: 5%

Location Sloughing Bark: ☒ Trunk ☐ Branches

Description of Roosting Structure (if structure, what type, material, etc.; if tree, are cavities present,

general information, etc.): Top broken off tree, located on

steep slope

Roost Structure Data Sheet

Biologist Name: Theresa Nethel

Date: 06-17-22

Bat Frequency: SBS

Project Name/Number: R. dgeline / 172677408

Roost Number: 72-PESU2-RT1

Latitude: 36.245664

Longitude: -85.56954

Capture site: RLM-72-Jackson

State: Tennessee

County: Jackson

Roost Located on Private Land: ☒ Yes ☐ No

Roost Type: ☒ Free ☐ Building ☐ Other: _____

Property Owner (If on private land): Virginia Simpson

Property Owner Contact Info.: _____

Property Address (If Applicable): _____

Roost Species: Quercus alba

☒ Live ☐ Snag ☐ Branch

DBH (inch or cm): 57.7

Height (feet or meters): 70-80 ft

Canopy: ☒ Yes ☐ No

Location of Roost ☒ under bark ☐ crack; crevice; etc.): under bark

Height of Roost (If Known): Unknown

Dist. From Capture Site (KM or Mile): _____

Percent Sloughing Bark: 40

Location Sloughing Bark: ☒ Trunk ☐ Branches

Description of Roosting Structure (if structure, what type, material, etc.; if tree, are cavities present, general information, etc.): live damaged tree, couple of dead

limbs

Roost Structure Data Sheet

Biologist Name: Mitch Oannon Date: 06/18/2022 Bat Frequency: 150 - 58S
 Project Name/Number: RidgeLine / 172077408 Roost Number: 72-Jackson-PES122-R2
 Latitude: 36.24553 Longitude: -86.569584 Capture site: RLM-72-Jackson
 State: Tennessee County: Jackson

Roost Located on Private Land: ☒ Yes ☐ No Roost Type: ☒ Tree ☐ Building ☐ Other: _____

Property Owner (If on private land): Virginia Simpson _____

Property Owner Contact Info.: _____

Property Address (If Applicable): _____

Roost Species: Caro glabra ☒ Live ☐ Snag ☐ Branch

DBH (inch or cm): 34 in Height (feet or meters): 20.0m Canopy: ☒ Yes ☐ No

Location of Roost (under bark; crack; crevice; etc.): Leaf clusters

Height of Roost (If Known): 18.0m Dist. From Capture Site (KM or Mile): ~ 0.10 miles

Percent Sloughing Bark: 0% Location Sloughing Bark: ☐ Trunk ☐ Branches

Description of Roosting Structure (if structure, what type, material, etc.; if tree, are cavities present,

general information, etc.): Live tree with one broken, bare limb

about 12 inches in length.

Roost Structure Data Sheet

Biologist Name: Mitch Dannon
Morgan Johnson Date: June 21, 2022 Bat Frequency: 150.585
 Project Name/Number: Ridgeline (Enbridge) Roost Number: 3
 Latitude: 36.245884 Longitude: -85.569524 Capture site: RLM-72-Jackson
 State: Tennessee County: Jackson
 Roost Located on Private Land: ☒ Yes No Roost Type: ☒ Tree Building Other:
 Property Owner (If on private land): Virginia Simpson
 Property Owner Contact Info.:
 Property Address (If Applicable):

Roost Species: Aesculus flava ☒ Live ☐ Snag ☐ Branch

DBH (inch or cm): 21 inch Height (feet or meters): 50 ft. Canopy: ☒ Yes No

Location of Roost (under bark; crack; crevice; etc.): Foliage

Height of Roost (If Known): ~45 ft. Dist. From Capture Site (KM or Mile): ~1,000 ft.

Percent Sloughing Bark: 0% Location Sloughing Bark: Trunk Branches

Description of Roosting Structure (if structure, what type, material, etc.; if tree, are cavities present,

general information, etc.): yellow buckeye growing
15 ft. up on bank of Blackburn Fork
River

APPENDIX D: PHASE 4 RADIO- TRACKING

USFWS INDIANA AND/OR NORTHERN LONG-EARED BAT
ROOST DATASHEET

Biologists (Full Name): Mitch Dannon, Morgan Johnson Date: 6/21/22

UTM: Zone _____ Easting _____ Northing _____ OR

LAT 36.245884 LONG -85.569524

Property Owner: Virginia Simpson Phone# _____

State Tennessee County Jackson Site # RLM-72-Jackson

Roost # 2 Roost Name: 72-Jackson-PESU2-R3

Roost Tree Data

Species: Aesculus flava Live ☒ Snag ☐ Other ☐ (if other, explain) _____
(^{2nd} roost tree for the tagged bat, 72-Jackson-PESU2-R2 became an identified roost tree via bats emerging from an immediately adjacent tree/canopy during emergence survey)

DBH (in or cm) 21 inch Total Height (ft or m) 50 ft.

Height of roost area (if known) _____ Dist. from capture site 1,000 ft

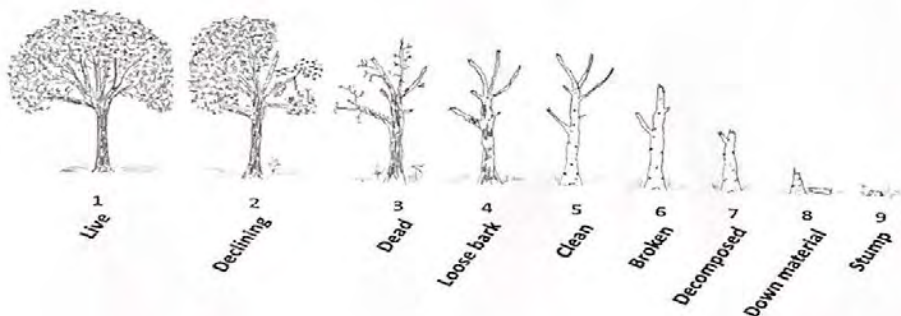
Roost position aspect (deg) _____

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

Cavities present? Yes If so, describe: tree has three trunks

immediately separating at the base. One trunk snapped

Roost Decay State: 1 2 3 4 5 6 7 8 9 Other off ~12 ft. up providing a crevice(s).



APPENDIX D: PHASE 4 RADIO- TRACKING

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

Surrounding Habitat Condition

Canopy closure at roost (%) 50%

Approximate woodlot size (ac or ha) ~23 acre Distance to non-forest (ft or m) ~175 ft.

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

thinned mixed deciduous forest that is
fenced pasture. No forage/grass grows in
undergrowth. only native vegetation and/or bare earth.
Good flyways very open understory

Additional Comments

same woodlot / characteristics
as roost tree #1 (72-Jackson-PES42-R1)

USFWS BAT EMERGENCE SURVEY DATASHEET

Survey Start Time: 1930 Time of Sunset: 2000 Survey End Time: 2100

NOTE: Emergence surveys should begin 1/2 hour before sunset and continue until at least one hour after sunset or until it is otherwise too dark to see emerging bats. The surveyor(s) should position him or herself so that emerging bats will be silhouetted against the sky as they exit the roost. Tallies of emerging bats should be recorded every few minutes or as natural breaks in bat activity allow. Ensure that surveyor(s) are close enough to the roost to observe all exiting/returning bats, but not close enough to influence emergence (i.e., do not stand directly beneath the roost and do not make unnecessary noise and/or conversation, and minimize use of lights other than a small flashlight to record data, if necessary). Do not shine a light on the roost tree crevice/cave/mine entrance itself as this may prevent or delay bats from emerging. If available, use of an infra-red, night vision, or thermal-imaging video camera or spotting scope and an ultrasonic bat detector are strongly recommended but not required.

[illegible]

APPENDIX E: PHASE 4 EMERGENCE SURVEYS

Site Name/#: RLM-57-Jackson Roost Name/#: First roost tree 57-Jackson-PESU1

Time	Number of Bats Leaving Roost*	Comments / Notes
Total Number of Bats Observed Emerging from the Roost/Feature During the Survey:	0	

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

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

no bats were observed during the survey

APPENDIX E: PHASE 4 EMERGENCE SURVEYS

57-Jackson-PESU1-R2

57-Jackson-PESU1

USFWS BAT EMERGENCE SURVEY DATASHEET

Date: June 15, 2022 Surveyor(s) Full Name: Mitch Dannon, Anna Blair

State: TN County: Jackson Project Name: Ridgeline (Enbridge)

Site Name/#: RLM-57-Jackson Roost Name/#: 2nd roost tree located Bat #: (Pregnant/Female PESU)

Lat/Long or UTM of Roost: 36.292300, -85.699170 (3rd day of tracking) captured 6/12/2022

Description of Roost/Habitat Feature Surveyed: 26 inch dbh ulmus americana immediately adjacent to two shagbark hickorys, one of which is a part of

Bat Species Known to be using this Roost/Feature (if not known, leave blank): a snag of 3 tree. The smaller tops of one of the
Perimyotis subflavus

Other Suspected Bat Species (explain): trees in the snag rests on the roost

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

85°F @ 19:30 / 0% cloud cover / 0 mph wind / no rain

Survey Start Time: 19:30 Time of Sunset: 2000 Survey End Time: 21:02

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

temp 80°F at end of survey

Time	Number of Bats Leaving Roost*	Comments / Notes
19:42	1	came from large shagbark
19:56	1	emerged from roost tree snag
20:10	1	emerged from roost tree snag
20:12	1	came from very top of (American elm) roost tree - 52 m
20:15	1	came from shagbark (very top)
20:16	1	came from shagbark (very top)
20:17	1	came from shagbark (very top)
		Shagbark: 28 dbh, 55 ft tall, 10 m higher up slope than the elm

*think this was the tagged cat

* = roost tree

O = larger shagbark hickory with canopy immediately overtop/adjacent to roost tree

□ = emerged from roost tree snag

APPENDIX E: PHASE 4 EMERGENCE SURVEYS

Site Name/#: RLM-57-Jackson Roost Name/#: Roost tree #2 57-Jackson-PESU-2

Time	Number of Bats Leaving Roost*	Comments / Notes
Total Number of Bats Observed Emerging from the Roost/Feature During the Survey:	7	most bats emerged from the solitary shagbark whose canopy hung over the shorter american elm. There is a large opening in the canopy on one side

* If any bats return to the roost during the survey, then they should be subtracted from the tally. ^{at this grouping of}
 The shagbark is the tallest tree in its vicinity & has full exposure ^{to the sun} trees.
 Describe Emergence: Did bats emerge simultaneously, fly off in the same direction, loiter, circle, disperse, etc. If a radio-tagged bat was roosting in the tree, at what time did it emerge?

2 solitary bats emerged early on spread by ~10 mins. The remaining bats all emerged from the same ^(shagbark hickory) general area. Emerging consecutively about a full minute apart. One bat definitely loitered for a 3-4 mins, foraging over the roost tree.

APPENDIX E: PHASE 4 EMERGENCE SURVEYS

USFWS BAT EMERGENCE SURVEY DATASHEET

Date: 6/16/22 Surveyor(s) Full Name: Mitch Dannon, Anna Blair
 State: IN County: Jackson Project Name: Ridgeline (Enbridge)
 Site Name/#: RLM-57-Jackson Roost Name/#: 57-Jackson-PESU1-R3 Bat #: 57-Jackson-PESU1

Lat/Long or UTM of Roost: 36.292300, -85.699170

Description of Roost/Habitat Feature Surveyed: 28 inch dbh carya ovata ~55 ft tall
which splits into Y-trunk/2 trunks of roughly equal diameter
about 15 feet up tree. Has a ton of exposure and open canopy adjacent on
one side.

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

Other Suspected Bat Species (explain):

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

20% cloud cover / 81°F @ 1930 / 0 mph / no rain / 50% cloud cover later
in survey

Survey Start Time: 1930 Time of Sunset: 2001 Survey End Time: 2103

NOTE: Emergence surveys should begin 1/2 hour before sunset and continue until at least one hour after sunset or until it is otherwise too dark to see emerging bats. The surveyor(s) should position him or herself so that emerging bats will be silhouetted against the sky as they exit the roost. Tallies of emerging bats should be recorded every few minutes or as natural breaks in bat activity allow. Ensure that surveyor(s) are close enough to the roost to observe all exiting/returning bats, but not close enough to influence emergence (i.e., do not stand directly beneath the roost and do not make unnecessary noise and/or conversation, and minimize use of lights other than a small flashlight to record data, if necessary). Do not shine a light on the roost tree crevice/cave/mine entrance itself as this may prevent or delay bats from emerging. If available, use of an infra-red, night vision, or thermal-imaging video camera or spotting scope and an ultrasonic bat detector are strongly recommended but not required.

Time	Number of Bats Leaving Roost*	Comments / Notes
* 2005	1	tagged bat (confirmed w/ telemetry) emerged from the top ~53 ft of the shagbark hickory
2012	1	came from same area as tagged bat. (near very top of shagbark)
2019	1	came from same area as PESU1 (tagged bat)
2028	1	came from very top of the shagbark hickory

50
 tagged bat came from branches overhanging elm, further from hickory trunk. Foraged in the area for 15-20 mins
 PESU not heard on telemetry after 2030

APPENDIX E: PHASE 4 EMERGENCE SURVEYS

Site Name/ #: RLM-57-Jackson Roost Name/ #: 57-Jackson-PESU1-R3

Time	Number of Bats Leaving Roost*	Comments / Notes
Total Number of Bats Observed Emerging from the Roost/Feature During the Survey:	4	second night of observation confirmed carya ovata (shagbark), which is adjacent to ulmus americana, is the primary roost tree. Not the ulmus americana.

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

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

radio-tagged bat emerged at 2005 foraging in vicinity of roost area until 2030 when signal was lost.

All but last bat emerged from same general branch area. 51 meters up in 60 meter shagbark hickory carya ovata

APPENDIX E: PHASE 4 EMERGENCE SURVEYS

USFWS BAT EMERGENCE SURVEY DATASHEET

Date: June 18, 2022 Surveyor(s) Full Name: Mitch Dannon
 State: TN County: Jackson Project Name: Ridgeline (Enbridge)
 Site Name/#: RLM-72-Jackson Roost Name/#: RLM-72-Jackson-PESU2-R1 Bat #: 72-Jackson-PESU2
 Lat/Long or UTM of Roost: 36.245553, 85.569584

Description of Roost/Habitat Feature Surveyed: _____

34 inch DBH carya glabra, 65 ft. tall. Growing on bank of stream, half the canopy overhangs stream with full exposure

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

Perimyotis subflavus

Other Suspected Bat Species (explain): _____

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

77°F @ 1935, 10 mph wind, 10% cloud cover, no rain, 69°F @ 2101

Survey Start Time: 1930 Time of Sunset: 2001 Survey End Time: 2101

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

Time	Number of Bats Leaving Roost*	Comments / Notes
1955	1	emerged from very top of canopy above tree ~ 64 ft up
2001	1 64 ft.	emerged from similar area as first bat but came down instead of above canopy
★ 2002	1	tagged 72-Jackson-PESU2 confirmed w/ telemetry, came from same area as bat #2

2020 no more signal → 2035 - 38 → 2042 50
 72-Jackson-PESU2 foraged in roost tree vicinity until 2020. Returned to vicinity from 2035 - 2038. Came back 2042 - 2050. Then picked up again at end of survey.

APPENDIX E: PHASE 4 EMERGENCE SURVEYS

Site Name/ #: RLM-72-Jackson Roost Name/ #: 72-Jackson-PESU2-R1

Time	Number of Bats Leaving Roost*	Comments / Notes
Total Number of Bats Observed Emerging from the Roost/Feature During the Survey:	3	all bats emerged from same area of tree. Generally flying up and away from canopy/roost tree. Bat #1 seemed to emerge from very top of canopy, while bats

* If any bats return to the roost during the survey, then they should be subtracted from the tally. 2 & 3 emerged from same area but coming from the side of the canopy, and then flying up and away.

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

High volume of bats foraging in this immediate stretch of stream. Like definitely a lot/more than usual?

Lower $\frac{3}{4}$ or half of tree had poor back-lighting. With the high volume of bats foraging in immediate vicinity it is possible bats emerging from tree and flying down directly to stream were not counted as emergence bats.

APPENDIX E
PHASE 4 EMERGENCE SURVEYS

USFWS BAT EMERGENCE SURVEY DATASHEET

Date: 6/19/22 Surveyor(s) Full Name: Mitch Dannon
 State: TN County: Jackson Project Name: Ridgeline (Enbridge)
 Site Name/#: RLM-72-Jackson Roost Name/#: 72-Jackson-PESU2 Bat #: 72-Jackson-PESU2
 Lat/Long or UTM of Roost: R1

Description of Roost/Habitat Feature Surveyed: 34 inch dbh, 65 ft tall carya glabra growing on left bank and overhanging Blackburn Fork River.

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

Other Suspected Bat Species (explain):

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

74°F @ 1930 / 0% cloud cover / no rain / 0 mph wind / 64°F @ 2102

Survey Start Time: 1930 Time of Sunset: 2002 Survey End Time: 2102

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

Time	Number of Bats Leaving Roost*	Comments / Notes
1957	1 ^{unknown species}	emerged from very top of black walnut tree in branches 6-8 ft from hickory branches where
1959	1 ^{unknown species}	emerged from black walnut 1-2 ft lower than last bat and only 5-6 ft from hickory branches
* 2000	1	emerged from near very top of carya glabra in branches right next to the canopy of black walnut ~63 ft.
2000	1	emerged from hickory in same spot & immediately after PESU2
2003	1	emerged from hickory in branches 1-2 ft from PESU2
2004	1	emerged from hickory in branches 1-2 ft from PESU2

bats later emerged.

* = radio-tagged bat (72-Jackson-PESU2)

Site Name/ #: RLM-72-Jackson Roost Name/ #: 72-Jackson-PESU2-R1

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

Radio-tagged bat emerged at 2000. All bats emerged upward flying over tops of trees away from the stream. Two bats came from tree/canopy (black walnut) adjacent to 72-Jackson-PESU2-R1 (carya glabra)

Roost tree 72-Jackson-PESU2-R2 created for unknown species emerging from adjacent tree/canopy.

APPENDIX E
PHASE 4 EMERGENCE SURVEYS

USFWS BAT EMERGENCE SURVEY DATASHEET

Date: June 20, 2022 Surveyor(s) Full Name: Mitch Dannon
 State: TN County: Jackson Project Name: Ridgeline (Inbridge)
 Site Name/#: 72-Jackson Roost Name/# 72-Jackson-PESU2-R1 Bat #: 72-Jackson-PESU2
 Lat/Long or UTM of Roost: 36.245553, -85.569584
 Description of Roost/Habitat Feature Surveyed: 34 inch dbh carya glabra, 65 ft. tall

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

Perimyotis subflavus

Other Suspected Bat Species (explain):

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

80°F @ 1930 / 0% cloud cover / no rain / 0 mph wind / 71°F @ 2102

Survey Start Time: 1930 Time of Sunset: 2002 Survey End Time: 2102

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

Time	Number of Bats Leaving Roost*	Comments / Notes
1956	1	juglans nigra, emerged from very top
8001	1	emerged from near center of canopy ~63ft up
★ 8001	1	this was tagged bat, emerged from same area as last bat
8004	1	emerged from same area as other bats

45

★ = 72-Jackson-PESU2 (tagged bat)

72-Jackson-PESU2 foraged in the vicinity
intermittently.

APPENDIX E
PHASE 4 EMERGENCE SURVEYS

Site Name/#: 72-Jackson Roost Name/#: 72-Jackson-PESU2-R1

Time	Number of Bats Leaving Roost*	Comments / Notes
Total Number of Bats Observed Emerging from the Roost/Feature During the Survey:	<u>3</u>	+1 from adjacent tree/canopy

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

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

all bats emerged from top of canopy
flying over forest away from stream.
72-Jackson-PESU2 (tagged bat) emerged at 2001.



Bat Capture Datasheet

Page 1 of 2

Project Name/No.: RidgeLine 172677408

Date: 9/19/22

Biologist(s): Josh Adams, Shane Kelky

Site ID: Boitel-01

County/State: Jackson / TN

Moon Phase: Waning Crescent

Sunset: 1844

Map Kilometer No./Quad:

Latitude: 36.294648

Longitude: -85.698000

Moonrise: 0103

Moonset: 1617

General Site Description: Cave portals adjacent to Flynn's Creek

Nets Open: 1800

Nets Closed:

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	84.0	0	50
20:00	78.2	0	30
21:00	73.5	1	40
22:00	73.6	1	20
23:00	72.3	1	30
00:00	72.7	1	60

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments: Calm Partly Cloudy, sprinkling rain for 5 minutes

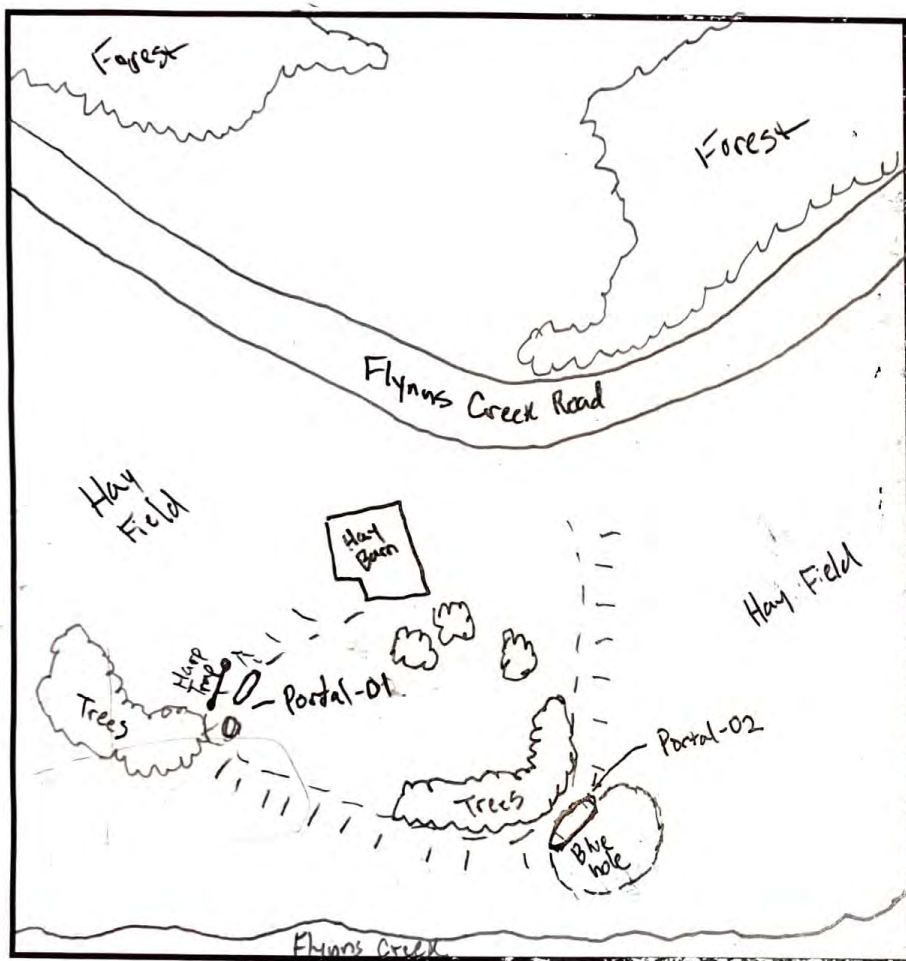
[illegible]

¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males.

*Note: U (unknown) only to be used for **escaped** bats*



¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Project Name/No.: Ridgeline / 172677400 Date: 9/19/22
 Site ID: Portal -01 Est. Distance to Water (ft): 100

VEGETATION

Primary Habitat Type¹: Cave entrance

Potential Roost: Large Trees Snags Both Other (e.g., structure)

Roost Tree Potential: High Moderate Low

Dominant Canopy Species Avg. Canopy DBH range (in):
 1. _____ 2. _____ 3. _____

Canopy Closure: Closed (80%+) Moderate (40-80%) Open (0-40%)

Dominant Subcanopy Species Avg. Subcanopy DBH range (in):
 1. _____ 2. _____ 3. _____

Sub-Canopy Clutter: High (60%+) Moderate (30-60%) Low (0-30%)

Dominant Shrub/Understory Species
 1. _____ 2. _____ 3. _____

Shrub/Understory Clutter: High (60%+) Moderate (30-60%) Low (0-30%)

STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): 4 Channel Width: 20 Stream Width: 25

Riparian Width right bank: 8.0 left bank: 100 Avg. Water Depth: _____

Other Wildlife Observed: BAOW, WEVI, BLJA, NOCA, SCOW

Additional Comments: _____



Bat Capture Datasheet

Page ____ of ____

Project Name/No.: 172677408 Ridgeline

Date: 26 Sep 22

Biologist(s): Joshua Adams, Candace Pinney

Site ID: Portal 01

County/State: Jackson / TN

Moon Phase: New **Sunset:** 1834

Map Kilometer No./Quad: _____

Latitude: _____ Longitude: _____ Moonrise: ~~200~~ 0710 Moonset: 1912

General Site Description: Rock Outcrop surrounded by Hay Pasture Nets Open: 1800 Nets Closed: 2340

	Time	Temp (F)	Wind ¹	% Cloud Cover
1800	20:00	69	1	0
1900	21:00	64.2	0	15
2000	22:00	57.1	0	0
2100	23:00	50.8	0	0
2200	00:00	45.5	0	0
2300	01:00	42.7	0	0

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments: Cool and clear

[illegible]

Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

*Note: U (unknown) only to be used for **escaped** bats*

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$$T_{\text{mp}} @ 2035 = 51.4^{\circ}$$



Bat Capture Datasheet

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Project Name/No.: Bridgeline 172677408

Date: 9/20/2022

Biologist(s): Shane Kelly + Lynda Mills

Site ID: *Patul 03*

County/State: Jackson / TN

Moon Phase: Waning Crescent

Sunset: 1942

Map Kilometer No./Quad:

Latitude: 36.2731006

Longitude: -85.645071

Moonrise: 6:02

Moonset: 1654

General Site Description: large harp trap at cave entrance

Nets Open: 1840

Nets Closed: 2342

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	84	0	0%
21:00	79.6	0	0%
22:00	76.5	0	0%
23:00	69.6	0	0%
00:00	68.0	0	0%
01:00	67.2	0	0%

[illegible]

* One net at full extension ~ 2.5m high

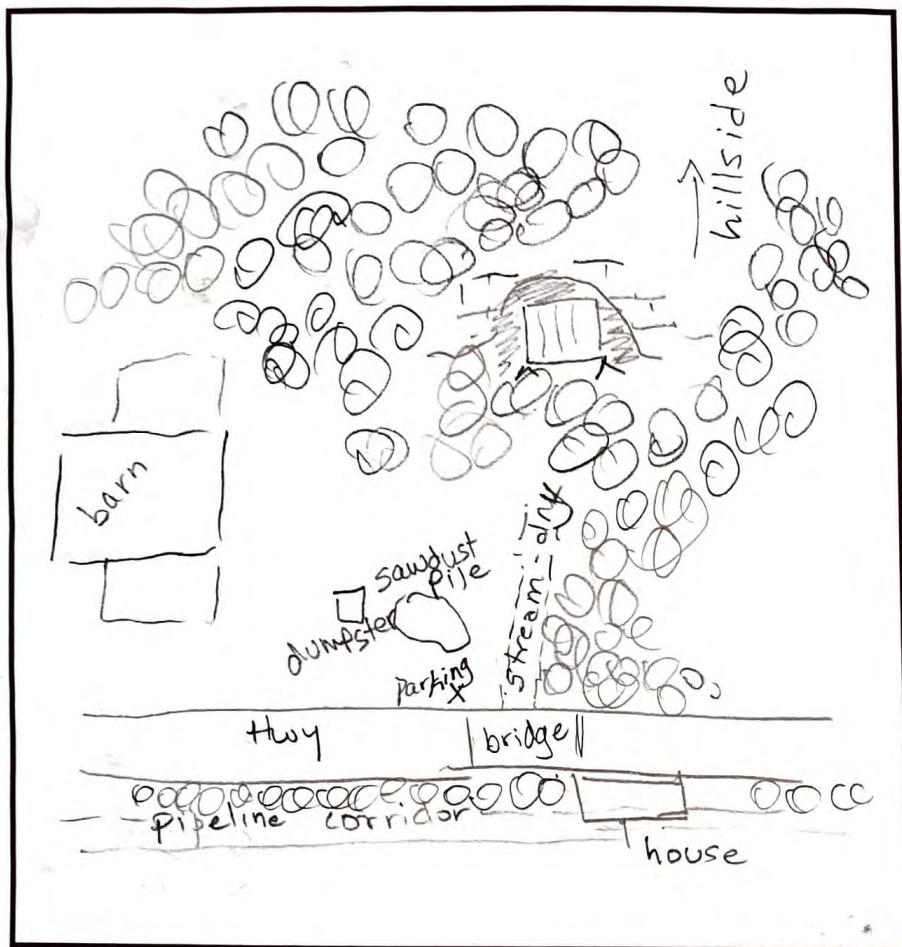
Weather Comments:[illegible]

¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats


Project Name/No.: Ridgeline Date: 9/20/2022

Site ID: Cave Portal 03 Est. Distance to Water (ft): _____

VEGETATION around cave entrance

Primary Habitat Type¹: Forest Edge along Hwy Corridor

Potential Roost:	Large Trees	Snags	<u>Both</u>	Other (e.g., structure)
Roost Tree Potential:	High	<u>Moderate</u>	Low	

Dominant Canopy Species	Avg. Canopy DBH range (in): <u>8-10"</u>	
1. <u>Sycamore</u>	2. <u>Hickory</u>	3. <u>Locust</u>

Canopy Closure:	<u>Closed</u> (80%+)	Moderate (40-80%)	Open (0-40%)
-----------------	----------------------	-------------------	--------------

Dominant Subcanopy Species	Avg. Subcanopy DBH range (in): <u>4-6"</u>	
1. <u>Maple</u>	2. <u>Sycamore</u>	3. _____

Sub-Canopy Clutter:	<u>High</u> (60%+)	Moderate (30-60%)	Low (0-30%)
---------------------	--------------------	-------------------	-------------

Dominant Shrub/Understory Species		
1. <u>Ragweed</u>	2. <u>Privet</u>	3. <u>Smilax</u>

Shrub/Understory Clutter:	High (60%+)	<u>Moderate</u> (30-60%)	Low (0-30%)
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STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): _____ Channel Width: _____ Stream Width: _____

Riparian Width right bank: _____ left bank: _____ Avg. Water Depth: _____

¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Other Wildlife Observed: Summer tanager, Eastern screech owl, s. leopard frogs, Barred Owl

Additional Comments: _____



Bat Capture Datasheet

Page ____ of ____

Project Name/No.: RidgeLine Harp Trapping / 172677408 Date: 09/29/2022 Biologist(s): Jeff Brown
 Site ID: Portal #3 County/State: Jackson / TN Moon Phase: Waxing Crescent / 8.5% ^{illumination} Sunset: 18:28h
 Map Kilometer No./Quad: 39.4 / Gainesboro Latitude: 36.273586 Longitude: -85.64505 Moonrise: 10:29h Moonset: 20:44h
 General Site Description: Cave with creek flowing out at times (dry during sample) Nets Open: 1745 Nets Closed: 2300

	Time	Temp (F)	Wind ¹	% Cloud Cover
1830	20:00	60°	0	0
1930	21:00	54.3°	0	0
2030	22:00	52.1°	0	0
2130	23:00	50.9°	0	0
2230	00:00	50.1°	0	0
2330	01:00	49.8°	0	0

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments: No clouds - warmer than first try

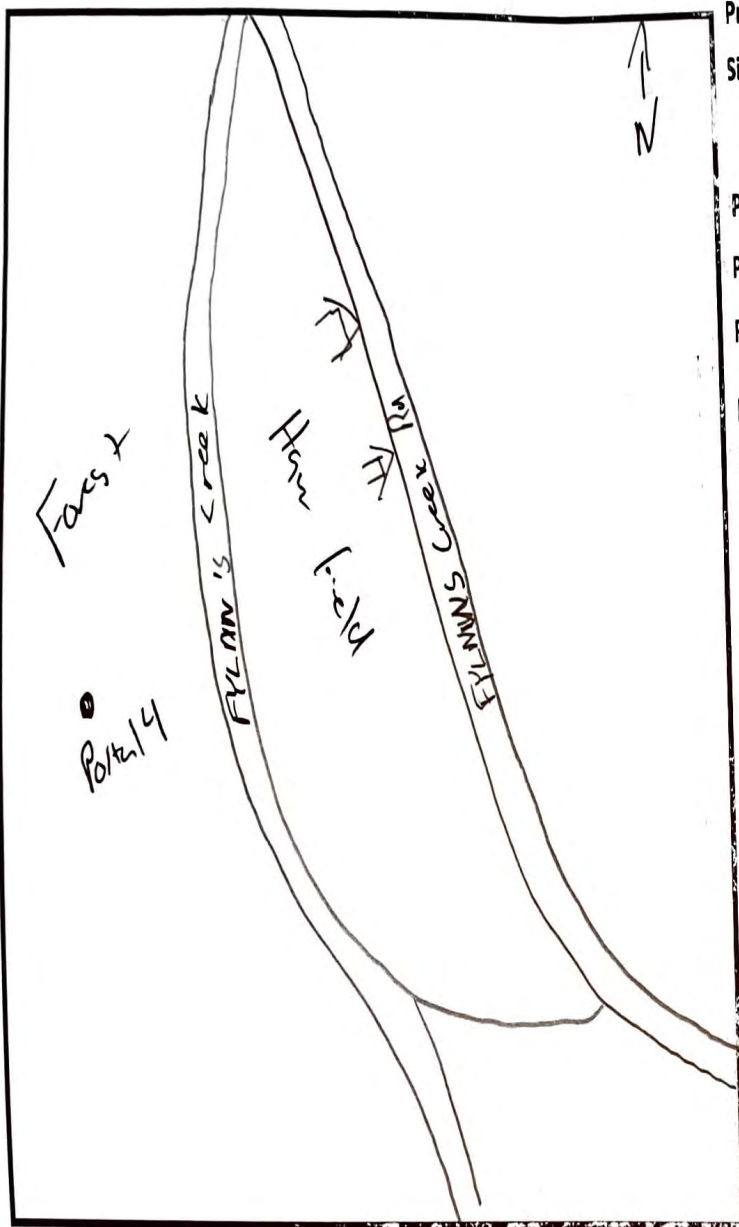
[illegible]

¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

- * Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats



Project Name/No.: Ridgeline/1726774108 Date: 20 Sep 22
 Site ID: Portal 04 Est. Distance to Water (ft): 100

VEGETATION

Primary Habitat Type¹: Cave Entrance

Potential Roost: Large Trees Snags Both Other (e.g., structure)

Roost Tree Potential: High Moderate Low

Dominant Canopy Species Avg. Canopy DBH range (in):
 1. _____ 2. _____ 3. _____

Canopy Closure: Closed (80%+) Moderate (40-80%) Open (0-40%)

Dominant Subcanopy Species Avg. Subcanopy DBH range (in):
 1. _____ 2. _____ 3. _____

Sub-Canopy Clutter: High (60%+) Moderate (30-60%) Low (0-30%)

Dominant Shrub/Understory Species
 1. _____ 2. _____ 3. _____

Shrub/Understory Clutter: High (50%+) Moderate (30-60%) Low (0-30%)

STREAM CHARACTERISTICS (if relevant) N/A

Bank Height (ft): _____ Channel Width: _____ Stream Width: _____

Riparian Width right bank: _____ left bank: _____ Avg. Water Depth: _____

¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Other Wildlife Observed: _____

Additional Comments: _____

Project Name/No.: RidgeLine Harp Tapping/132677408 Date: 09/26/2022 Biologist(s): Jeff Brown / Lucas Downs
 Site ID: Portal 4 County/State: Jackson/TN Moon Phase: Waxing Crescent 0% ^{illumination} Sunset: 18:33h
 Map Kilometer No./Quad: 39.70 / Gainesboro Twp Latitude: 36.267798 Longitude: -85.638380 Moonrise: 07:09 Moonset: 19:11h
 General Site Description: Approx 2.5 miles west of Glynn Creek intersection w/ SR56, site on west side of roadway. Across creek and uphill. Park between Berns. Nets Open: 1730h Nets Closed: _____

	Time	Temp (F)	Wind ¹	% Cloud Cover
1830	20:00	58.5	0	45%
1930	21:00	55.0	0	45%
2030	22:00	52.8	0	0%
2130	23:00	50.3	0	0%
2230	00:00	48.0	0	0%
2330	01:00	47.0	0	0%

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments:[illegible]

¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

- * Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats



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Bat Capture Datasheet

Page ____ of ____

Project Name/No.: Ridgeline Harp Topping / 172677408 Date: 10-04-2022 Biologist(s): Jeff Brown / Chris Knickel

Site ID: Porter #4 County/State: Jackson/TN Moon Phase: Waxing Gibbous - 67% ^{illuminate} Sunset: ~~00:12h~~ 18:21hr

Map Kilometer No./Quad: 39.7 / Gainesboro Latitude: 36.267798 Longitude: 85.638380 Moonrise: 15:00 Moonset: 00:12h

General Site Description: Cave is on side of hill with stream, ephemeral, coming from within Nets Open: 1730 Nets Closed: 2330
drains to Flynns Creek. Access is from Flynns Creek Rd.

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	54.8	0	0
21:00	50.2	0	0
22:00	48.7	0	0
23:00	47.5	0	0
00:00	45.2	0	0
01:00	44.1	0	0

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments: No clouds - daily high in 70s' - no air movement - cold early due to no clouds - colder in open field adjacent to cave.

[illegible]

¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

- * Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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Bat Capture Datasheet

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Project Name/No.: Ridgefire / 172677404

Date: 10 Oct 22

Biologist(s): Shane Kelley, Josh Adams

Site ID: Portal 04

County/State: Jackson / TN

Moon Phase: Full **Sunset:** 6:13

Map Kilometer No./Quad: _____

Latitude: _____ Longitude: _____

Moonrise: 1851 **Moonset:** 0726

General Site Description: Hardwood forested slope south of Flynn's Creek

Nets Open: 1800 **Nets Closed:** 2315

	Time	Temp (F)	Wind ¹	% Cloud Cover
1800	20:00	69.8	0	0
1900	21:00	63.6	0	0
2000	22:00	59.8	0	0
2100	23:00	55.0	0	0
2200	00:00	51.0	0	0
2300	01:00	48.6	0	0

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments: High in the low 70's clear and calm during the day.

[illegible]

Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

*Note: U (unknown) only to be used for **escaped** bats*

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Bat Capture Datasheet

Page 1 of 1

Project Name/No.: Ridgeline Portal #4

Date: 10/24/2022

Biologist(s): Lynda Mills / Lucas Downs

Site ID: Portal #4 Harp Trapping

County/State: Jackson Co.

Moon Phase: Waning Crescent Sunset: 17:53

Map Kilometer No./Quad: _____

Latitude: 36.26798 Long: 121.50000

Longitude: 85.63838 Moonrise: 5:59am Moonset: 2:40pm

General Site Description: Cave Portal above Stream (Flynn's Creek) Nets Open: 1750 Nets Closed: 2250

Nets Open: 1750 Nets Closed: 2250

	Time	Temp (F)	Wind ¹	% Cloud Cover
1800	20:00	65	0	6%
1900	21:00	55	0	5%
2000	22:00	54	0	25%
2100	23:00	54	0	10%
2200	00:00	54	0	10%
	01:00			

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments: Clear skies w/ scattered light clouds; calm winds

[illegible]

¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

Project Name/No.: Ridgeline Date: 10/24/22
 Site ID: Portal # 4 Est. Distance to Water (ft): 20 ft.

VEGETATION

Primary Habitat Type¹: Open hayfield + mature forest

Potential Roost:	Large Trees	Snags	<u>Both</u>	Other (e.g., structure)
Roost Tree Potential:	High	<u>Moderate</u>		Low

Dominant Canopy Species Avg. Canopy DBH range (in): 8-12"
 1. Oak 2. Hickory 3. _____

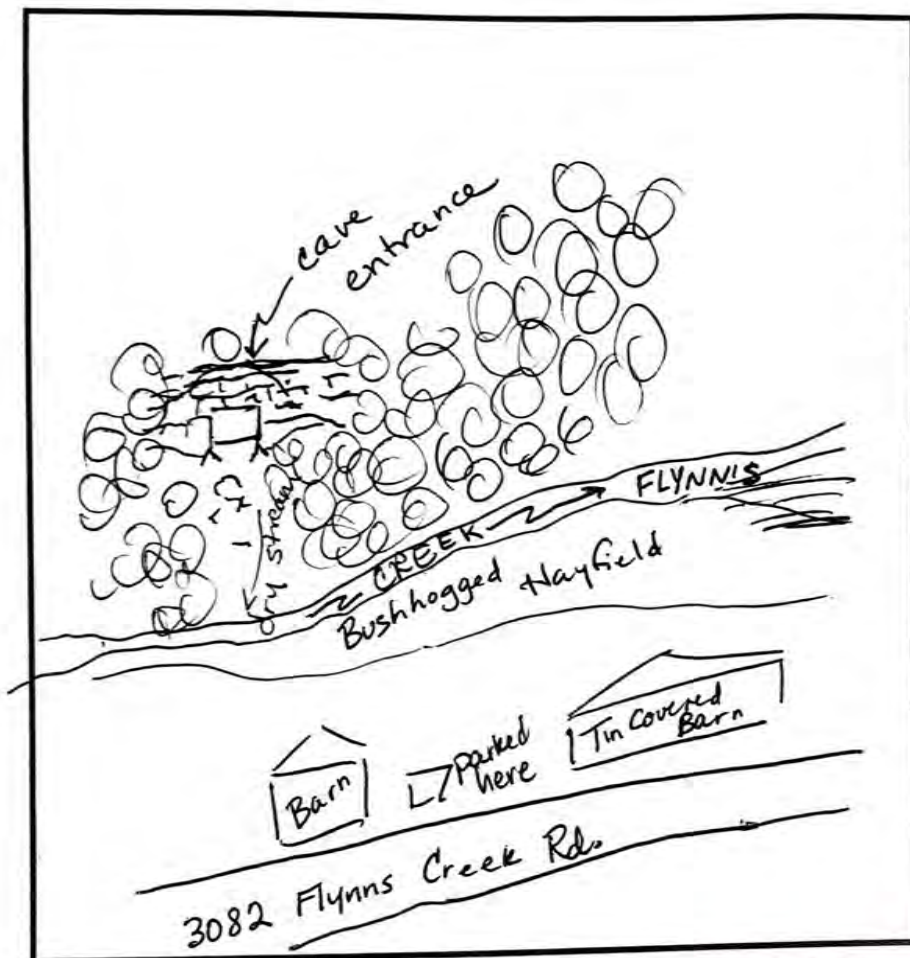
Canopy Closure:	<u>Closed</u> (80%+)	Moderate (40-80%)	Open (0-40%)
Dominant Subcanopy Species Avg. Subcanopy DBH range (in): <u>6-8"</u>			
1. <u>Birch</u> 2. _____ 3. _____			

Sub-Canopy Clutter:	<u>High</u> (60%+)	Moderate (30-60%)	Low (0-30%)
Dominant Shrub/Understory Species			
1. <u>Blackberry</u> 2. <u>Grass (field)</u> 3. _____			

Shrub/Understory Clutter:	High (60%+)	Moderate (30-60%)	<u>Low</u> (0-30%)

STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): _____ Channel Width: _____ Stream Width: _____
 Riparian Width right bank: _____ left bank: _____ Avg. Water Depth: _____



¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Other Wildlife Observed: Belted Kingfisher, Barred Owl, Northern Flicker, S. Leopard Frog (in bucket of water), Coyotes, 2-lined Salamander (photo)
 Additional Comments: 4th night of netting



Bat Capture Data Sheet

Page 1 of 2

Project Name/No.: Enbridge RL

Date: 01 November 2022

Biologist(s): James Kser, Chris Knabel

Site ID: Portal 4

Country/State: Tackson/TN

Moon Phase:

Sunset: 1745 h

Map Kilometer No./Quad: _____

Latitude: N36.26786° Longitude: W-85.63824°

Moonrise:

Moonset:

General Site Description: Cave #4

Nets Open: 1730h Nets Closed: 2330

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	62.4	1	30%
21:00	55.8	1	20%
22:00	50.8	0	20%
23:00	49.6	0	30%
00:00	48.7	0	0%
01:00	48.4	1	50%

* One net at full extension ~ 2.5m high

* One net at full extension ~ 2.5m high

Weather Comments:

50% * One net at full extension 2.5m high
Warm Day with high Temps in low 70's, Partly Cloudy and Calm with light W. D.

[illegible]

¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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Note: U (unknown) only to be used for **escaped** bats

6:30 - 51.3°F, Wind-1, Sky-30%cc, 7:30 50.2°F, Wind-0, Sky-30%cc 8:30 49.1°F, Wind-0, Sky-10%cc

Stanec Consulting Services, 9200 Shelbyville Road Suite 800, Louisville Kentucky 40222 US

Project Name/No.: _____ Date: _____

Site ID: _____ Est. Distance to Water (ft): _____

VEGETATION

Primary Habitat Type¹: _____

Potential Roost:	Large Trees	Snags	Both	Other (e.g., structure)
Roost Tree Potential:	High	Moderate	Low	

Dominant Canopy Species _____ Avg. Canopy DBH range (in): _____

1. _____ 2. _____ 3. _____

Canopy Closure:	Closed (80% +)	Moderate (40 - 80%)	Open (0 - 40%)
Dominant Subcanopy Species			

Dominant Subcanopy Species _____ Avg. Subcanopy DBH range (in): _____

1. _____ 2. _____ 3. _____

Sub-Canopy Clutter:	High (60% +)	Moderate (30 - 60%)	Low (0 - 30%)
Dominant Shrub/Understory Species			

1. _____ 2. _____ 3. _____

Shrub/ Understory Clutter:	High (60% +)	Moderate (30 - 60%)	Low (0 - 30%)
STREAM CHARACTERISTICS (if relevant)			

Bank Height (ft): _____ Channel Width: _____ Stream Width: _____

Riparian Width right bank: _____ left bank: _____ Avg. Water Depth: _____

¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Other Wildlife Observed: Woodrat (nest) fresh guano, Armadillo (1 in field), Eumeces cinerascens (1)
Eumeces lucifuga (4), Desmognathus fuscus (1)

Additional Comments: _____



Bat Capture Datasheet

Page 1 of 2

Project Name/No.: Bideline / 172677408

Date: 9/21/22

Biologist(s): Lynda Mills, Shane Kelley

Site ID: Portal-05/Hawking Impact Crater Cave County/State: Jackson/TN

Moon Phase: Waning Crescent

Sunset: 1840

Map Kilometer No./Quad:

Latitude: 36.273606

Longitude: -85.645054

Moonrise: 0303

Moonset: 1726

General Site Description: Riparian forested area along Flynn Creek

Nets Open: 1815

Nets Closed:

	Time	Temp (F)	Wind ¹	% Cloud Cover
1900	20:00	80.3	0	09%
2000	21:00	73.0	0	0%
2100	22:00	71.9	0	0%
2200	23:00	71.4	0	0%
2300	00:00	70.3	0	0%
2400	01:00			

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments: Calm, Clear Skies, 70-80°

[illegible]

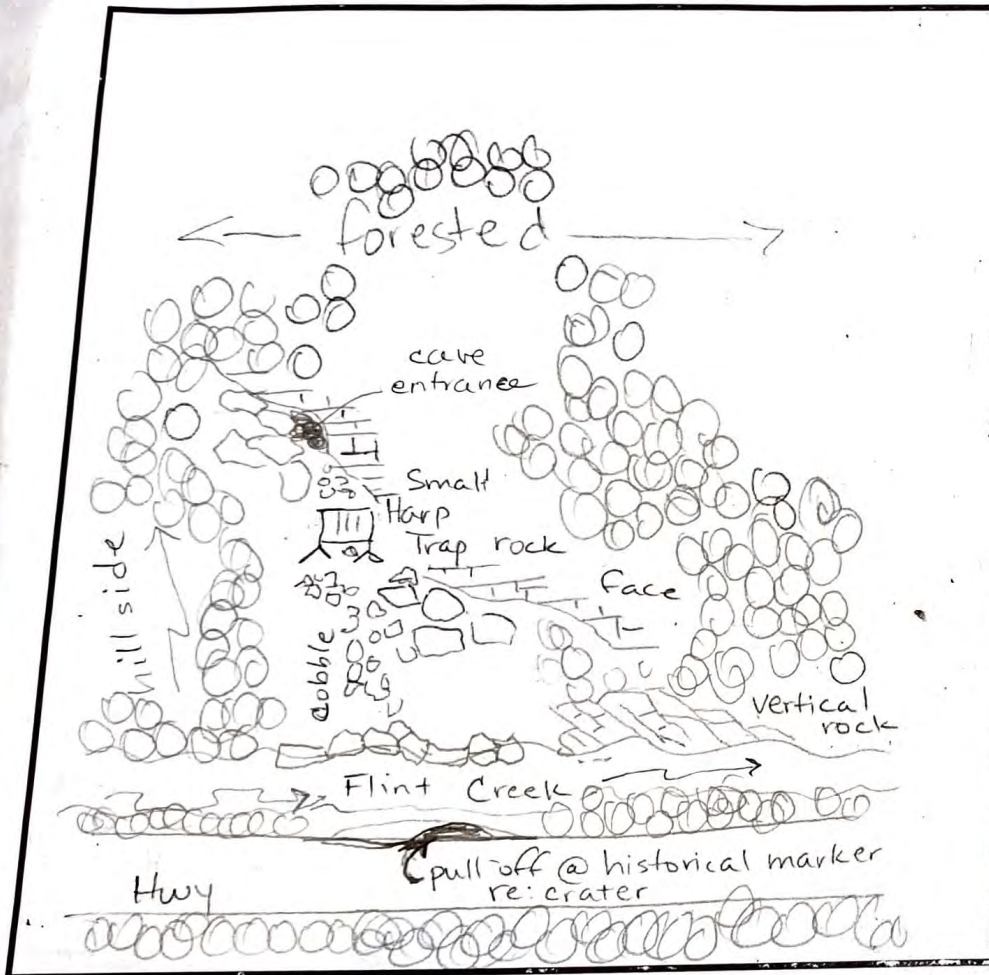
Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph).
 10 = trees break, twigs snap; reproductive; for males: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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Project Name/No.: 172677408 Date: 9/21/22
 Site ID: Portal -05/Hawkins Impact Crater Cave Est. Distance to Water (ft): 30

VEGETATION

Primary Habitat Type¹: Cave Entrance
 Potential Roost: Large Trees | Snags | Both | Other (e.g., structure)
 Roost Tree Potential: High | Moderate | Low

Dominant Canopy Species Avg. Canopy DBH range (in): 10"
 1. Sycamore 2. Am. Elm 3. _____
 Canopy Closure: Closed (80%+) | Moderate (40-80%) | Open (0-40%)

Dominant Subcanopy Species Avg. Subcanopy DBH range (in): _____
 1. Am Elm 2. Pawpaw 3. Bk Walnut
 Sub-Canopy Clutter: High (60%+) | Moderate (30-60%) | Low (0-30%)

Dominant Shrub/Understory Species
 1. _____ 2. _____ 3. _____
 Shrub/Understory Clutter: High (60%+) | Moderate (30-60%) | Low (0-30%)

STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): 3 Channel Width: 25' Stream Width: 10-12'
 Riparian Width right bank: 8' left bank: 2' Avg. Water Depth: 10-24"

¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Other Wildlife Observed: Both, Long-tailed Salamander, Lasiurus borealis flying towards M. griscesens while in hand. red salamander, wood frog, Fowler's toad (?)

Additional Comments: many bats heard flying close to harp trap and observed flying along stream



Page ____ of ____

Date: 27 Sep 22

Biologist(s): Josh Adams, Candace Pinney

County State: Jackson / TN

Moon Phase: Waxing Crescent

Sunset: 1832

Map Kilometer No./Quad:

Latitude: 36.273606

Longitude: -83.645054

Moonrise: 0814

Moonset: 1939

General Site Description: Flynn Creek impact Water Cave

Nets Open: 185

Nets Closed: 1135

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	71.2	0	0
21:00	64.2	0	0
22:00	58.5	1	0
23:00	55.2	1	0
00:00	49.6	1	0
01:00	49.2	1	0

[illegible]

* One net at full extension ~ 2.5m high

01:00 49.2 1 0 One tier of tail extension 2100 hrs
Weather Comments: Clear and cool highs in the low to mid 70's

[illegible]

Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

- Apply band to LEFT arm for females and RIGHT arm for males

Note: (I (unknown) only to be used for escaped bats

NR = non-reproductive



Bat Capture Datasheet

Page ____ of ____

Project Name/No.: Rubeline Herptopping / 172677408 Date: 10-05-2022 Biologist(s): Jeff Brown / Chris Knabel

Site ID: Portal #5 County/State: Jackson/TN Moon Phase: Waxing Gibbous/77% Sunset: 1819

Map Kilometer No./Quad: 37.5/616100 Latitude: 36.179285 Longitude: -85.666000 Moonrise: 14:46 h Moonset: 01:30 h

General Site Description: Cave is small opening ($\approx 35 \times 25$) and on side of hill opposite of The Nets Open: 1745 Nets Closed: 2300

General Site Description: Lowest small opening (~5 ft x 2 ft) above creek side - 100 ft
Parking area. Cross Shyams Creek near large rocks at parking area - Cave is to left of large gravel rock lined

Parking area. Cross Flynns Creek near large rocks at parking area - Car is to left of large exposed rock area

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	60.1	0	0
21:00	54.5	0	0
22:00	51.4	0	0
23:00	49.9	0	0
00:00	47.6	0	0
01:00	46.9	0	0

Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
1	—	—	—	36.279285	-85.666000	—	—	—	Partial	Mini Hayp Trap

* One net at full extension ~ 2.5m high

* One net at full extension ~ 2.5m high

Weather Comments: No clouds - daily high in upper 70s - no aircraft at Portal site

[illegible]

¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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Bat Capture Datasheet

Page ____ of ____

Project Name/No.: RidgeLine / 172677108

Date: 11 Oct 22

Biologist(s): Josh Adams, Shane Kelley

Site ID: Portal 05

County/State: Tackson TN

Moon Phase: Waning Gibbous **Sunset:** 1811

Map Kilometer No./Quad:_____

Latitude: _____ Longitude: _____ Moonrise: 11:20 Moonset: 0:30

General Site Description: _____ **Nets Open:** 80 **Nets Closed:** 25

	Time	Temp (F)	Wind ¹	% Cloud Cover
1810	20:00	67.2	0	10
1910	21:00	65.9	0	0
2010	22:00	63.0	0	0
2110	23:00	58.1	0	0
2210	00:00	58.7	0	70
2310	01:00	55.5	0	66

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments: Mid 70s and clear during the day

[illegible]

¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats

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Bat Capture Datasheet

Page 1 of 1

Project Name/No.: Ridgeline Portal 5 Date: 10/25/22 (rainout) Biologist(s): Lynda Mills / Trevor Walker / Lucas Downs
 Site ID: Portal 5 Impact Crater County/State: ~~Rocky Mountain~~ Jackson Moon Phase: Wax Crescent Sunset: 1750
 Map Kilometer No./Quad: _____ Latitude: 36.279285 Longitude: 85.66600 Moonrise: _____ Moonset: ~~1830~~
 General Site Description: Cave Portal above Flynn's Creek Nets Open: 1745 Nets Closed: 1830

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00			
21:00			
22:00			
23:00			
00:00			
01:00			

[illegible]

* One net at full extension ~ 2.5m high

00:00

01:00

* One net at full extension ~ 2.5m high

Weather Comments: Rain beginning @ 1645 until takedown; Safety Inspector called off trapping due to slick rocks

[illegible]

¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: ID = testes descended, NR = non-reproductive

- Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats



Bat Capture Data Sheet

Page 1 of 1

Project Name/No.: Richelieu Portal #5 Date: 10/26/22 Biologist(s): Lynda mills / Trevor Walker

Site Name/No.: Portals Impact State/County: Jackson Co Lat/Long: 36.279285 -85.66600

Quadrangle: _____ Nets Open: 1730 Nets Close: 2250 Sun ~~rise~~ / Set: 1752 Moon Rise/Set: 1848^{- rise}_{set} Moon Phase: Wax Crescent 2%

Site Information: portal to cave approx 20' above Flynn's Creek - batteries died in acoustic detector during

Time	Temp	Wind	Wind Direction	% Cloud Cover	Beaufort Wind Scale		Net	Length	Height	Road	Stream	Pond	Cave/Portal	Other
					Scale	Wind speed Indicators								
1730	57°	0	0	80%	0	Calm (0 mph)								
1830	57	0	0	75%	1	Light Wind (1-3 mph)								
2000	55	0	0	40%	2	Light Breeze (4-7 mph)								
2100	50	0	0	40%	3	Gentle Breeze (8-12 mph)								
2200	49	0	0	20%	4	Moderate Breeze (13-18 mph)								
2350	49	0	0											
						Acoustic Detector ID:								

[illegible]

*Reproduction: P – pregnant; L – lactating; PL – Post Lactating; DESC. - testes descended ; NON - testes not descended for male and not Preg, Lac, or PLac for female

rev. 6-2016



Bat Capture Datasheet

Page 1 of 2

Project Name/No.: Ridgeline / 172677408 Date: 11/1/22 Biologist(s): Shane Kelley, Morgan Johnson

Site ID: Porkal-05 County/State: Jackson / TN Moon Phase: Waxing Gibbous Sunset: 1746

Map Kilometer No./Quad: _____ Latitude: 36.279292 Longitude: -85.665581 Moonrise: 1426 Moonset: 0043

General Site Description: Cave opening along Flynns Creek Nets Open: 1746 Nets Closed: _____

	Time	Temp (F)	Wind ¹	% Cloud Cover
1800	20:00	63.3	0	10
1900	21:00	53.5	0	15
2000	22:00	52.0	0	5
2100	23:00	49.5	0	20
2200	00:00	49.2	0	60
2300	01:00	49.1	0	80

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments: Clear, Calm, Slight Breeze, 50-60°

[illegible]

¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats



Bat Capture Datasheet

Page ____ of ____

Project Name/No.: Ridgeline 172677408

Date: 21 Sep 22

Biologist(s): Joshua Adams, Lucas Down

Site ID: Portal 6

County/State: Jackson / TN

Moon Phase: Waning Crescent

Sunset: 1611

Map Kilometer No./Quad: Portal 6

Latitude: 36.275759

Longitude: -85.65664

Moonrise: 0202

Moonset: 1654

General Site Description: Cave with multiple openings North of Flynn's Creek Rd

Nets Open: 1830

Nets Closed: 2345

Trap covers the largest opening (eastern) all others excluded

Time	Temp (F)	Wind ¹	% Cloud Cover
14:00	80.1	1	0
20:00	73.0	0	5
21:00	71.9	0	0
23:00	71.9	0	0
00:00	70.3	0	0
01:00			

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments: High of 93 today hot and humid

[illegible]

Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)
For females: 1 = lactating, PL = post-lactating, 2 = pregnant

* Apply band to LEFT arm for females and RIGHT arm for males.

Note: U (unknown) only to be used for **escaped** bats

Project Name/No.: Ridgeline/172677408 Date: 21 Sep 22
 Site ID: Portal OG Est. Distance to Water (ft): 20

VEGETATION

Primary Habitat Type¹: Cave Entrance
 Potential Roost:

Large Trees	Snags	<u>Both</u>	Other (e.g., structure)
-------------	-------	-------------	-------------------------

 Roost Tree Potential:

High	Moderate	<u>Low</u>
------	----------	------------

Dominant Canopy Species 1. *C. ovata* 2. *A. velutina* 3. _____ Avg. Canopy DBH range (in): _____

Canopy Closure:

<u>Closed (80%+)</u>	Moderate (40-80%)	Open (0-40%)
----------------------	-------------------	--------------

Dominant Subcanopy Species 1. _____ 2. _____ 3. _____ Avg. Subcanopy DBH range (in): _____

Sub-Canopy Clutter:

High (60%+)	Moderate (30-60%)	Low (0-30%)
-------------	-------------------	-------------

Dominant Shrub/Understory Species 1. _____ 2. _____ 3. _____

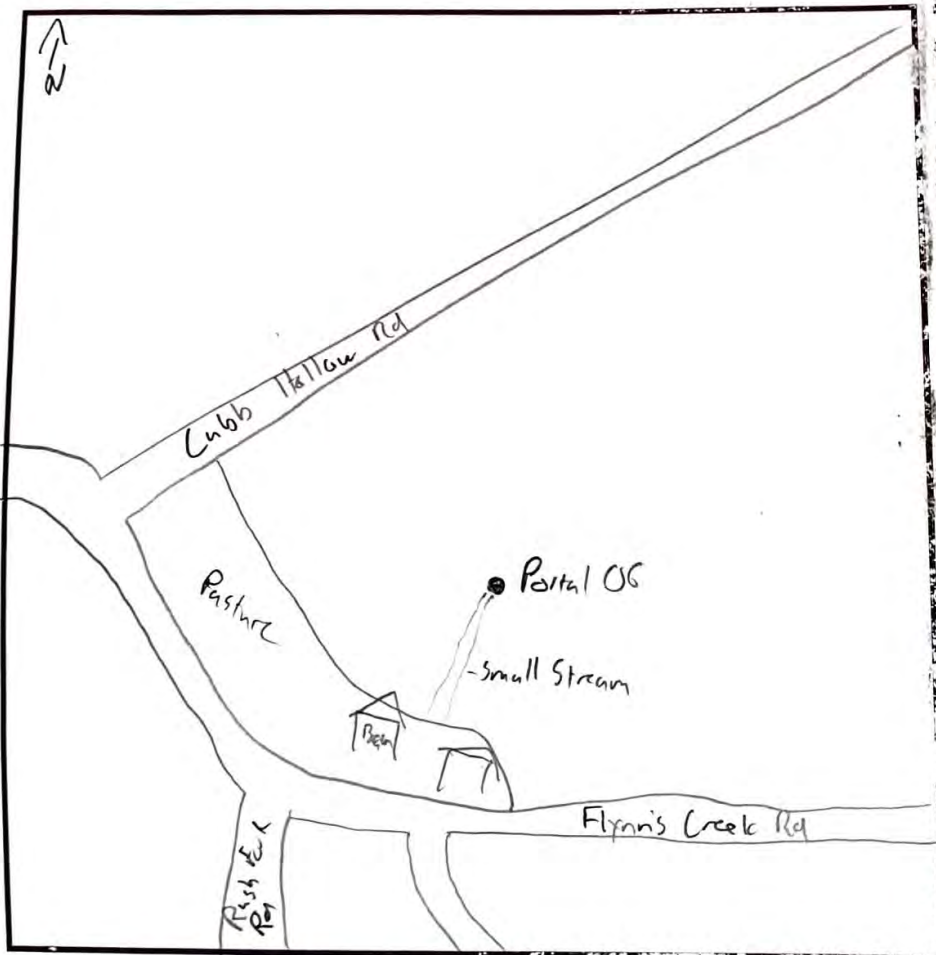
Shrub/Understory Clutter:

High (60%+)	Moderate (30-60%)	Low (0-30%)
-------------	-------------------	-------------

STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): _____ Channel Width: _____ Stream Width: _____

Riparian Width right bank: _____ left bank: _____ Avg. Water Depth: _____



¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Other Wildlife Observed: Barn Owl, Slimy Salamander

Additional Comments: _____



Bat Capture Datasheet

Page ____ of ____

Project Name/No.: Ridge Line Fall Bats/172677408

Date: 28 Sep 22

Biologist(s): Joshua Adams, Lucas Down

Site ID: Porter 06

County/State: Jackson / TN

Moon Phase: Waxing Crescent

Sunset: 1830

Map Kilometer No./Quad:

Latitude: 36.275759

Longitude: -85.6564

Moonrise: 0921

Moonset: 2009

General Site Description: see Data sheet from 21 Sep

Nets Open: 1800

Nets Closed. 2330

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	66.3	0	15
21:00	58.4	0	15
22:00	56.3	0	10
23:00	53.9	0	5
00:00	51.2	0	0
01:00	50.7	0	0

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments: High ground 70, clear and windy through the day

[illegible]

¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

2. For **females**: I = lactating, PI = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive



Bat Capture Datasheet

Page ____ of ____

Project Name/No.: Ridge Line Hump Trapping / 172677408 Date: 10-06-2022 Biologist(s): Jeff Braun / Chris Kuebel

Site ID: Portal 6 County/State: Lackson / TN Moon Phase: Waxing Gibbous / 86% ^{illuminated} Sunset: 18:18hr

Map Kilometer No./Quad: 38 / Gainesboro Latitude: 36.275759 Longitude: -85.65664 Moonrise: 15:58hr Moonset: —

General Site Description: located approximately 300ft uphillside before top and mixed forest Nets Open: 1730 Nets Closed: 2330

	Time	Temp (F)	Wind ¹	% Cloud Cover
1830	20:00	72.4	0	0
1930	21:00	59.7	0	0
2030	22:00	57.2	0	0
2130	23:00	55.6	0	50
2230	00:00	54.3	0	70
2330	01:00	53.9	0	40

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments:

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
No BATS CAPTURED												

¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats



Bat Capture Datasheet

Page ____ of ____

Project Name/No.: 172677408 / Ridge line

Date: 13 Oct 22

Biologist(s): Joshua Adams, Shane Kelley

Site ID: Portai 06

County/State: Jackson / TN

Moon Phase: Waning Gibbous **Sunset:** 1809

Map Kilometer No./Quad: _____

Latitude: _____ Longitude: _____ Moonrise: 2029 Moonset: 1058

General Site Description: _____ **Nets Open:** 1800 _____ **Nets Closed:** _____

	Time	Temp (F)	Wind ¹	% Cloud Cover
1800	20:00	60	0	0
1900	21:00	55	0	0
2000	22:00	53	0	0
2100	23:00	51	0	0
2200	00:00	50	0	0
2300	01:00	49	0	0

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments: Highs in the upper 60's and clear during the day

[illegible]

Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats



Bat Capture Datasheet

Page 1 of 2

Project Name/No.: Ridgevine/172677408

Date: 10/24/22

Biologist(s): Shane Kelley, Trevor Walker

Site ID: Porter-06

County/State: Jackson/TN

Moon Phase: New Moon

Sunset: 1755

Map Kilometer No./Quad: _____

Latitude: 36.275782

Longitude: -85.656646

Moonrise: 0559

Moonset: 1739

General Site Description: _____

Nets Open: 1755

Nets Closed: 22:50

1800
1900
2000
2100
2200
2300

Time	Temp (F)	Wind ¹	% Cloud Cover
20:00	67.1	0	0
19:00	60.4	0	40
22:00	61.4	0	50
21:00	58.5	0	40
20:00	58.6	0	40
19:00	57.8	0	30

Net ID (A, B, ...)	Length (m)	Height*	Net Area	Lat. (decimal degrees)	Long.	Road	Stream	Pond	Other (specify)	Photo ID, Notes
A	—	—	—	36.275782	-85.656646				X	Standard Harp trap

* One net at full extension ~ 2.5m high

Weather Comments: _____

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
1	<i>Eptesicus fuscus</i>	1810	A	M	TD	47.3	17.75	0	A	—	—	
2	<i>Eptesicus fuscus</i>	2000	A	F	NR	46.6	18.5	0	A	—	—	
3	<i>Eptesicus fuscus</i>	2210	A	F	NR	49.6	23.25	0	A	—	—	

¹ Beaufort wind scale. 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For females: L = lactating, PL = post-lactating, NR = non-reproductive; for males: TD = testes descended, NR = non-reproductive



Bat Capture Datasheet

Page ____ of ____

Project Name/No.: Ridge Line / 172677401

Date: 1 Nov 22

Biologist(s): Josh Adams, Lucas Downs

Site ID: Portal 06

County/State: Tackson / TN

Moon Phase: First Quarter

Sunset: 1746

Map Kilometer No./Quad:

Latitude: Longitude:

Moonrise: 1446

Moonset $\Delta 043$

General Site Description: _____

Nets Open: 1740

Nets Closed: 0045

	Time	Temp (F)	Wind ¹	% Cloud Cover
1745	20:00	66.6	0	10
1845	21:00	56.5	0	60
1945	22:00	53.3	0	50
2045	23:00	52.6	0	40
2145	00:00	51.4	0	20
2245	01:00	50.3	0	20

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments:[illegible]

¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

Note: U (unknown) only to be used for **escaped** bats



Bat Capture Datasheet

Page 1 of 2

Project Name/No.: RidgeLine/172677408 Date: 9/22/22 Biologist(s): Lynda Mills, Shane Kelley

Site ID: Portal-07 County/State: Jackson/TN Moon Phase: Waning Crescent Sunset: 1839

Map Kilometer No./Quad: _____ Latitude: 36.248455 Longitude: -85.606016 Moonrise: 0403 Moonset: 1755

General Site Description: Cave opening adjacent to creek / riparian area Nets Open: 1820 Nets Closed: 2339

	Time	Temp (F)	Wind ¹	% Cloud Cover
1900	20:00	65.3	0	0%
2000	21:00	62.6	0	0%
2100	22:00	59.2	0	0%
2200	23:00	60.4	0	0%
2300	00:00	59.6	0	0%
0000	01:00	60.3	0	0%

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments: Cool, Clear, Calm

[illegible]

¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

* Apply band to LEFT arm for females and RIGHT arm for males

*Note: U (unknown) only to be used for **escaped** bats*



Project Name/No.: Ridgeline/172677408 Date: 9/22/22
 Site ID: Portal-07 Est. Distance to Water (ft): 100

VEGETATION

Primary Habitat Type¹: Cave Entrance

Potential Roost:	Large Trees	Snags	<u>Both</u>	Other (e.g., structure)
Roost Tree Potential:	High	<u>Moderate</u>	Low	

Dominant Canopy Species
 1. Poplar 2. Oak 3. _____ Avg. Canopy DBH range (in): 12

Canopy Closure:	<u>Closed</u> (80%+)	Moderate (40-80%)	Open (0-40%)
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Dominant Subcanopy Species
 1. walnut 2. Maple 3. _____ Avg. Subcanopy DBH range (in): _____

Sub-Canopy Clutter:	High (60%+)	<u>Moderate</u> (30-60%)	Low (0-30%)
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Dominant Shrub/Understory Species
 1. Mint/leafy 2. Rugweed 3. Aspers

Shrub/Understory Clutter:	High (60%+)	<u>Moderate</u> (30-60%)	Low (0-30%)
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STREAM CHARACTERISTICS (if relevant)

Bank Height (ft): _____ Channel Width: _____ Stream Width: _____
 Riparian Width right bank: _____ left bank: _____ Avg. Water Depth: _____

¹ Bridge, Bottomland Forest, Cave Entrance, Creek/Riparian, Field Edge, Mine Portal, Pond, Structure, Upland Forest, Other (describe)

Other Wildlife Observed: Barred Owls, long-tailed salamander, Coyotes

Additional Comments: _____



Bat Capture Datasheet

Page 1 of 1

Project Name/No.: Ridgepole Hovp Trapping/172677408 Date: 09/28/2022 Biologist(s): Jeff Brown

Site ID: Port 1 # 7 County/State: Jackson TN Moon Phase: Waxing Crescent - 9.4 illuminated Sunset: 1729

Map Kilometer No./Quad: 42.1 / Cookeville West Latitude: 36.248445 Longitude: -85.6401 Moonrise: 09:50 Moonset: 21:41

General Site Description: Approx. 200' east of SR56 south of existing pipeline ROW. Nets Open: 1729 Nets Closed: 2330

	Time	Temp (F)	Wind ¹	% Cloud Cover
1830	20:00	57.8	1	<5%
1930	21:00	54.1	1	<5%
2030	22:00	50.3	1	0
2130	23:00	48.8	1	0
2230	00:00	47.5	1	0
2330	01:00	46.3	1	0

[illegible]

* One net at full extension ~ 2.5m high

Weather Comments:

No.	Species	Time (24h)	Age (A, J, U)	Sex (M, F, U)	Repro. ²	RFA (mm)	Mass (g)	WNS Score (0-3)	Net ID	Hgt in Net (m)	Band* #	Comments (e.g., samples taken, transmitter #, disposition)
NO BATS CAPTURED												

¹ **Beaufort wind scale.** 0 = smoke rises vertically (<1 mph), 1 = wind direction shown by smoke (1-3 mph), 2 = wind felt on face; leaves rustle (4-7 mph), 3 = leaves, twigs in constant motion (8-12 mph), 4 = dust rises; small branches move (13-18 mph), 5 = small trees in leaf begin to sway (19-24 mph)

² For **females**: L = lactating, PL = post-lactating, NR = non-reproductive; for **males**: TD = testes descended, NR = non-reproductive

From: [Pelren, David](#)
To: [Blount, Tom](#)
Cc: [Nicholas, Niki S](#); [Elbert, Daniel C](#); [Sikula, Nicole R](#); [Sykes, Robbie](#)
Subject: RE: [EXTERNAL] Adams, Joshua shared the folder "Ridgeline 2022 Mussel Report" with you.
Date: Wednesday, April 12, 2023 7:34:00 AM
Attachments: [image001.png](#)
[image003.png](#)
[image004.png](#)
[image005.png](#)
[image006.png](#)
[image007.png](#)

Sounds good, Tom. We'll look forward to further conversation about the Ridgeline project with you all.

-Dave Pelren

From: Blount, Tom <Tom_Blount@nps.gov>
Sent: Tuesday, April 11, 2023 3:33 PM
To: Pelren, David <david_pelren@fws.gov>
Cc: Nicholas, Niki S <Niki_Nicholas@nps.gov>
Subject: Re: [EXTERNAL] Adams, Joshua shared the folder "Ridgeline 2022 Mussel Report" with you.

I did not request access to the Ridgeline 2022 Mussel Report. It was not shared with us during the review of the draft resource reports.

This is what I was previously provided with the draft resource reports:

East Tennessee prepared a mussel survey plan in the summer of 2022, which included the federally and state listed mussel species described below. The plan was reviewed and approved by the USFWS Tennessee Field Office prior to initiating surveys. East Tennessee conducted an eDNA sampling program to identify smaller streams with mussel populations. Fall field surveys for mussels were initiated in 2022 and are expected to be finished in 2023. East Tennessee conducted field mussel surveys on all major waterbody crossing and utilized coordination with USFWS and eDNA results to determine which smaller streams to conduct field surveys. The final report will be coordinated with the USFWS upon completion. The results of the surveys and survey reports will be included in the Biological Assessment that East Tennessee will prepare and submit to USFWS in the spring or early summer of 2023. A summary of the survey results will be included in the final Resource Report 3 included in the Project Application.

Based on this information it appears that the mussel survey report has not been completed. In our review comments we expressed concern over the Emory River crossing and potential T&E impacts. I will wait for the final report but if you or the other staff see anything that we need to discuss please let me know.

Thomas E. Blount, Chief of Resource Management
Big South Fork NRR, Obed WSR and Manhattan Project NHP - Oak Ridge
[4564 Leatherwood Road, Oneida, TN 37841](#)

Office 423-569-7330

Big South Fork National River & Recreation Area: [WEBSITE](#)
Obed Wild & Scenic River: [WEBSITE](#)

Manhattan Project National Historical Park: [WEBSITE](#)

From: Pelren, David <david_pelren@fws.gov>
Sent: Tuesday, April 11, 2023 2:46 PM
To: Blount, Tom <Tom_Blount@nps.gov>
Subject: FW: [EXTERNAL] Adams, Joshua shared the folder "Ridgeline 2022 Mussel Report" with you.

Tom, here's the mussel report that I was referring to – for which Josh provided me a link to a OneDrive file. You'll need to get that link for the report directly from him (Joshua.Adams@stantec.com).

It was good to talk with you and Niki for a few minutes today. Thanks again for hollering.

David Pelren
Fish and Wildlife Biologist
Ecological Services
U.S. Fish and Wildlife Service
[446 Neal St.](#)
[Cookeville, TN 38501](#)
office phone: 931-525-4974
mobile phone: 931-261-5844

NOTE: This email correspondence and any attachments to and from this sender are subject to the Freedom of Information Act (FOIA) and may be disclosed to third parties.

From: Adams, Joshua <Joshua.Adams@stantec.com>
Sent: Tuesday, March 14, 2023 3:34 PM
To: Pelren, David <david_pelren@fws.gov>
Subject: [EXTERNAL] Adams, Joshua shared the folder "Ridgeline 2022 Mussel Report" with you.

This email has been received from outside of DOI - Use caution before clicking on links, opening attachments, or responding.



Adams, Joshua shared a folder with you

Dave,

Apologies, I had your email incorrect on the initial submittal. I have uploaded a copy of the mussel report to the onedrive linked on this email. Please let me know if you have any issues accessing the file or if you have any questions.

Thanks

 [Ridgeline 2022 Mussel Report](#)



This link only works for the direct recipients of this message.

Open

From: [Pelren, David](#)
To: [Adams, Joshua](#)
Cc: [Tennessee ES, FWS](#); [Sikula, Nicole R](#)
Subject: FWS #2022-0036436 Eagle nest records along Ridgeline gasline project alignment
Date: Wednesday, April 26, 2023 2:25:00 PM

Josh –

You had asked us during a previous conversation to provide information regarding known records of the bald eagle in proximity to the Ridgeline gasline alignment. The only record in our database that is in the proximity of the proposed alignment is located approximately 1.5 miles east-southeast of the community of Gladdice, Jackson County, Tennessee. Note that this record of a nest site is over two decades old, and it appears that eagles have abandoned this specific site. Because it is possible that a nearby tree is currently being used for nesting, we recommend vigilance during fieldwork in the general vicinity of southwestern Jackson County in order to ascertain other possible sites of occupation by the species.

Feel free to contact me with questions about this project and its potential for impact to the bald eagle.

David Pelren
Fish and Wildlife Biologist
Ecological Services
U.S. Fish and Wildlife Service
446 Neal St.
Cookeville, TN 38501
office phone: 931-525-4974
mobile phone: 931-261-5844

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