



The following documentation is an electronically-submitted vendor response to an advertised solicitation from the *West Virginia Purchasing Bulletin* within the Vendor Self-Service portal at wvOASIS.gov. As part of the State of West Virginia's procurement process, and to maintain the transparency of the bid-opening process, this documentation submitted online is publicly posted by the West Virginia Purchasing Division at WVPurchasing.gov with any other vendor responses to this solicitation submitted to the Purchasing Division in hard copy format.

Header 3

List View

- General Information**
- Contact
- Default Values
- Discount
- Document Information
- Clarification Request

Procurement Folder: 1945307
 Procurement Type: Central Master Agreement
 Vendor ID: VS0000052523
 Legal Name: Borealis Biological
 Alias/DBA:
 Total Bid: \$22,000.00
 Response Date: 05/26/2026
 Response Time: 18:39
 Responded By User ID: borealis
 First Name: Jonathan
 Last Name: Hootman
 Email: jhootman@borealisbiologic
 Phone: 3045330999

SO Doc Code: CRFQ
 SO Dept: 0313
 SO Doc ID: DEP2600000033
 Published Date: 5/14/26
 Close Date: 5/27/26
 Close Time: 13:30
 Status: Closed
 Solicitation Description: AML - Potential Hibernacula Surveys - AML Sites Northern Reg
 Total of Header Attachments: 3
 Total of All Attachments: 3

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
1	Hibernacula Survey, based on per site, per night	20.00000	EA	1000.000000	20000.00

Comm Code	Manufacturer	Specification	Model #
77111507			

Commodity Line Comments: \$1,000.00 is for 1 night/site of effort. If a portal is netted for 6 weeks per guidelines, then this will equal out to \$6000.00/portal. Therefore if 20 portals are trapped for 6 nights, the cost will be \$120,000.00
20 sites/night multiplied by 6 weeks of surveys equals 120 nights of effort per USFWS Guidelines.
We are on the WV bat surveyors list.

Extended Description:

Hibernacula Survey, based on per site, per night. Esitmated quantities are for bid purposes only.

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
2	Acoustic Surveys, based on per site, per night	20.00000	EA	100.000000	2000.00

Comm Code	Manufacturer	Specification	Model #
77111507			

Commodity Line Comments: 20 sites/night multiplied by 6 weeks of surveys equals 120 nights of effort per USFWS Guidelines.

Extended Description:

Acoustic Surveys, based on per site, per night. Esitmated quantities are for bid purposes only.

NATIVE ENDANGERED SPECIES RECOVERY

Permit Number: ES02332D**Version Number:** 4**Effective:** 2024-12-09 **Expires:** 2029-11-30**Issuing Office:**

Department of the Interior
U.S. FISH AND WILDLIFE SERVICE
 ES Atlanta Permit Office
 1875 Century Boulevard
 Atlanta, Georgia 30345
 permitsR4ES@fws.gov

**Jennifer
Garland**

ESA section 10/Mitigation
Coordinator

Digitally signed by

Jennifer Garland
2024-12-10 04:43:43

Permittee:

MICHELLE GILLEY
 2638 GABRIEL'S CREEK RD
 MARS HILL, NC 28754
 US

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

Location where authorized activity may be conducted:

Bats: Alabama, Arkansas, Connecticut, Delaware, Georgia, Illinois, Indiana, Iowa, Kansas, Kentucky, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Nebraska, New Hampshire, New Jersey, New York, North Carolina, North Dakota, Ohio, Oklahoma, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Vermont, Virginia, West Virginia, Wisconsin, and Wyoming; and **Carolina Northern Flying Squirrel:** North Carolina, Tennessee, and Virginia.

Reporting requirements:

Annual reports are due by January 31 following each year that this permit is in effect.

Authorizations and Conditions:

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 accordance with and for the purposes described in the application submitted. Continued



NATIVE ENDANGERED SPECIES RECOVERY

Permit Number: ES02332D

Version Number: 4

Effective: 2024-12-09 Expires: 2029-11-30

1. The purpose and a description of the activities proposed.
2. Location of proposed activities, including project site (legal description and latitude and longitude), county, and state.
3. Date(s) when the project is proposed to take place.
4. You may proceed with activities only upon receipt of written concurrence from the applicable Service field supervisor. Your concurrence letter or email must be carried with this permit to authorize site-specific activities.
5. No capture activities shall occur within 20 meters of a known or potential summer or winter roost site, either natural or artificial, of a federally listed bat. If the permittee requests an exception to this prohibition, the Service field supervisor in the state(s) in which the activities are proposed to occur will confer with the Service species recovery lead (see Condition N., below) to determine whether such activities may proceed.

This permit is not valid without applicable concurrence letter(s) or email(s) for activities, and any required state permits.

F. Permittee is authorized to take (capture with mist nets or harp traps, handle, identify, band, radio-tag, and release) gray bats (*Myotis grisescens*), Indiana bats (*Myotis sodalis*), northern long-eared bat (*Myotis septentrionalis*), and Virginia big-eared bats (*Corynorhinus townsendii virginianus*) for presence/probable absence surveys; and take (capture, handle, radio tag, and release) Carolina northern flying squirrels (*Glaucomys sabrinus coloratus*) for presence/probable absence surveys and studies of home ranges, foraging behaviors, and roost tree preferences, as specified in permittee's November 07, 2023, application, and as conditioned below:

Bats



NATIVE ENDANGERED SPECIES RECOVERY

Permit Number: ES02332D**Version Number:** 4**Effective:** 2024-12-09 **Expires:** 2029-11-30

where it can recover and is removed from capture activities and predators. If a stressed bat recovers, it should be released immediately. Do not attempt to gather additional data on the bat and do not place a radio transmitter on the bat or any other attachment or marking on the bat.

5. Permittee shall carry out non-intrusive measurements on all captured bats, except as specified in Condition F.4, above. 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 form provided by the Service (e.g., Bat Reporting Spreadsheets, available at: <https://www.fws.gov/media/bat-reporting-spreadsheets-2020-2021>). Handling should be limited to the maximum extent practicable and should cease immediately at signs of undue stress (e.g., bat becoming unresponsive). 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.

6. If bands are applied, they must be lipped metal bands with a unique identifier and applied using banding pliers to the forearm of captured bats prior to release. No more than one band per bat may be used. Position the band on the forearm so that when the bat is hanging upside down, band alphanumeric information is right-side up. When banding, a single band should be placed on the right forearm of each male and the left forearm of each female bat.

7. Radio transmitters may be applied during spring, summer, and fall roosting and migration periods via nontoxic skin bond adhesive. Permittee must use one of the approved adhesives listed in Appendix D: Phase 4 Radio-tracking in the Range-wide Indiana Bat and Northern Long-eared Bat Survey Guidelines available at: <https://www.fws.gov/library/collections/range-wide-indiana-bat-and-northern-long-eared-bat-survey-guidelines>. If the adhesive you propose to use is not approved in the Guidelines, provide justification for use of a non-approved glue in the Site Study Plan to the Service's Field Office (<https://www.fws.gov/visit-us>). The total weight of the radio transmitter may not exceed 5% of the bat's body weight, and the total weight of the package (i.e., radio transmitter and adhesive) may not exceed 6% of the bat's body weight. The lightest package capable of accomplishing the required task should be used, especially with pregnant females and newly volant juveniles. Bats carrying radio transmitters must be monitored daily for at least five days, or until the radio transmitter falls off, whichever occurs first.

8. 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 available at

NATIVE ENDANGERED SPECIES RECOVERY

Permit Number: ES02332D**Version Number:** 4**Effective:** 2024-12-09 **Expires:** 2029-11-30

7. Traps should be opened at dusk and checked the following dawn.
 8. If a squirrel is captured, close the traps for one night to avoid catching the same squirrel two nights in a row.
 9. Squirrels may also be captured via a net placed over the entrance of the nest box and placed into a soft bag (one squirrel per bag) to be weighed, measured, examined, and to apply a radio collar.
 10. Squirrels may be held for no longer than 10 minutes for accomplishment of the above-listed activities, then placed back into the nest box or released from the point of capture.
 11. Carry sugar water and hot hands into the field to treat any individuals that might go into shock. Never work up or radio collar an animal that is in poor condition. Release the individual once its condition improves.
 12. Squirrels may be outfitted with a radio collar. The total weight of the radio collar may not exceed 5% of the squirrel's body weight. The lightest weight capable of accomplishing the required task should be used. Transmitters must be removed before the battery dies.
 13. Presence/probable absence surveys, nest box surveys, and cavity den surveys may be conducted any time of the year. Trapping is prohibited during winter.
 14. Contact the Service Species Recovery Lead (Condition N.5.) at least 15 days prior to sampling to determine if any new or updated guidance has been issued or if site-specific requirements are necessary. Revised or site-specific guidance provided by the field office will supersede the permit conditions for the flying squirrel.
- G. No injury or mortality is expected to occur to federally listed species covered under this permit. In the event that any accidental injury or mortality occurs, all activities must cease, and the injury or mortality reported immediately (not to exceed 1 business day) to the appropriate Service species recovery lead (see Condition N., below) and Regional Recovery Permit Coordinator at the address and telephone number noted in Condition M.1., below. Based upon consultation between these offices, a decision will be made as

NATIVE ENDANGERED SPECIES RECOVERY

Permit Number: ES02332D**Version Number:** 4**Effective:** 2024-12-09 **Expires:** 2029-11-30

1. The name(s) and organization affiliation of all members of the survey crew.
2. The project for which the survey was conducted and the target species.
3. The date of the survey.
4. Location of the survey sites. Locations shall be noted using figures, maps, and by referencing a common coordinate system (e.g., latitude and longitude or Universal Transverse Mercator coordinate system).
5. Location and characteristics of roost trees and bat colonies.
6. Band information of all bats.
7. Results of radio tagging federally listed bats.
8. In addition to the information specified in this section, 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 form provided by the USFWS (e.g., USFWS Bat Reporting Form available at: <https://www.fws.gov/media/bat-reporting-spreadsheets-2020-2021>). The permittee may be requested to provide individual photographs after submittal of annual reporting data. The completed bat reporting spreadsheet must also be sent by email to keith_lott@fws.gov.
9. A description of any mortality, injuries, deformities, or other abnormalities observed and disposition of specimens.
10. The results of the sampling, with discussions and interpretations of the data in context to recovery of the species and project planning.
11. Copies of all published data and reports.

NATIVE ENDANGERED SPECIES RECOVERY

Permit Number: ES02332D**Version Number:** 4**Effective:** 2024-12-09 **Expires:** 2029-11-30**3. Regional Recovery Permit Coordinator**

U.S. Fish and Wildlife Service (Midwest Region)

Endangered Species Permit Office

5600 American Boulevard W, Suite 990

Bloomington, Minnesota 55437-1458

Phone: (612) 713-5343

Facsimile: (612) 713-5292

permitsR3es@fws.gov

4. Regional Recovery Permit Coordinator

U.S. Fish and Wildlife Service (Northeast Region)

Endangered Species Permit Office

300 Westgate Center Drive

Hadley, Massachusetts 01035-9589

Phone: (413) 253-8212

Facsimile: (413) 253-8482

permitsR5es@fws.gov

5. Regional Recovery Permit Coordinator & Assistant Regional Recovery Coordinator

U.S. Fish and Wildlife Service (Mountain-Prairie Region)

Endangered Species Permits Office

Denver Federal Center

P.O. Box 25486

Denver, Colorado 80225-0489

Phone: (303) 236-4256

Facsimile: (303) 236-0027

permitsR6es@fws.gov

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



NATIVE ENDANGERED SPECIES RECOVERY

Permit Number: ES02332D

Version Number: 4

Effective: 2024-12-09 **Expires:** 2029-11-30

jill_utrup@fws.gov

4. For activities involving Virginia big-eared bats:

Elizabeth Stout

U.S. Fish and Wildlife Service

West Virginia Ecological Services Field Office

694 Beverly Pike

Elkins, West Virginia 26241

Telephone: (304) 636-6586 x19

Facsimile: (304) 636-7824

elizabeth_stout@fws.gov

5. For activities involving Carolina northern flying squirrels:

Susan Cameron

Asheville Ecological Services Field Office

160 Zillicoa Street

Asheville, North Carolina 28801-1082

Telephone: 828/258-3939 x42224

susan_cameron@fws.gov

END



Résumé

Dr. L. Michelle Gilley

167 Briarwood Ln.

Mars Hill, NC 28754

(251) 769-1111 | mgilley@borealisbiological.com

EDUCATION

Ph.D: 2013. Biology. Auburn University, AL.

Dissertation: "Discovery and characterization of high frequency calls in North American flying squirrels (*Glaucomys sabrinus* and *G. volans*): Implications for ecology, behavior, and conservation"

- Research: During her Ph.D., Dr. Gilley was involved in surveying the mammals of Alabama in cooperation with Dr. Troy Best of Auburn University. Since 2003 these efforts have included live-trapping for both eastern and Allegheny woodrats and monitoring caves in northern Alabama for endangered gray and Indiana bats. The focus of Dr. Gilley's doctoral research was to study and classify the high-frequency calls of both northern and southern flying squirrels. She developed the first acoustic model of flying squirrel calls and used the model to locate four new populations of endangered northern flying squirrels in western North Carolina.

M.S. degree: 2002. Biology. The University of Memphis, Memphis, TN.

Thesis: "Ecological studies of small mammals in temperate deciduous forest: I. An assessment of microhabitat utilization by small mammals in arboreal and ground-level strata of temperate deciduous forest; II. A test of mist-net configurations in capturing bats over stream corridors"

- Research: Dr. Gilley conducted surveys of eastern bats focused on southeastern myotis and Rafinesque's big-eared bats, and other small mammals including southern bog lemming, golden mice, and eastern woodrats in western Tennessee.

B.S. degree: 1995. Wildlife Science. Auburn University, AL.

- Undergraduate Research: As an undergraduate, Dr. Gilley worked full-time during summers as a research assistant for graduate students, studying the foraging behavior of gray bats over open water and habitat with invasive Eurasian water milfoil. She assisted with Harp-trapping gray bats at caves and conducting radio telemetry studies.

QUALIFICATIONS AND EXPERIENCE

Dr. Gilley has worked with eastern species of bats since 1994, beginning as an undergraduate at Auburn University under the mentorship of Dr. Troy Best. She received her Master's degree in Biology from the University of Memphis working under Dr. Michael Kennedy. Her thesis work involved surveys for listed bats and other small mammals in western Tennessee. Dr. Gilley concluded her academic work at Auburn University, where

she obtained her PhD in Biology working on bioacoustics of northern and southern flying squirrels (*Glaucomys sabrinus* and *G. volans*). Throughout her graduate work, Dr. Gilley spent summers conducting presence/absence surveys for threatened and endangered species of bats. She has worked with bats professionally as a consultant and/or professor for **31 consecutive years**. Dr. Gilley is highly skilled in using the following techniques specific to the study and conservation of bats: mist nets, Harp traps, acoustic surveys, habitat assessments, cave surveys, transmitter attachment, radio telemetry (both ground and aerial), banding, tissue collection (wing punches, lungs, heart, kidneys, muscle), cervical dislocation, safe removal of bats from bat boxes/houses, collection of demographic data, general health assessment including for white nose syndrome (WNS).

Dr. Gilley is federally permitted to conduct surveys for various federal and state listed species including: *Myotis sodalis*, *M. grisescens*, *M. septentrionalis*, *Corynorhinus townsendii virginianus*, *Perimyotis subflavus*, *Glaucomys sabrinus coloratus*, *Glaucomys sabrinus fuscus*, and *Neotoma magister*, and surveys have been conducted on private right-of-way (ROW) corridor developments, U.S. Forest Service lands, DoD facilities, Federal Highway Administration, and state DOT projects. Over the course of her career, Dr. Gilley has personally handled over 5000 bats and conducted research on small mammals and bats throughout the eastern United States, Mexico, and Ecuador. She has been QIBS certified in Pennsylvania since 2014, and a federally qualified surveyor for all listed bats in Virginia. Currently, Dr. Gilley is an associate professor at Mars Hill University near Asheville, North Carolina and co-owner/principal scientist at *Borealis Biological, LLC*.

PUBLICATIONS

- Diggins, C., **L. M. Gilley**, C. A. Kelly, W. M. Ford. 2016. Comparison of survey techniques on detection of northern flying squirrels. *Wildlife Society Bulletin*, 4:654-662.
- Gilley, L. M.**, C. A. Kelly, and T. L. Best. The production of both sonic and ultrasonic vocalizations in North American flying squirrels prove to be species-specific. *Journal of Mammalogy* *In review*.
- W. M. Ford, C. A. Kelly, J. L. Rodrigue, R. H. Odom, D. Newcomb, **L. M. Gilley**, C. A. Diggins. 2014. Late winter and early spring home range and habitat use of the endangered Carolina northern flying squirrel in western North Carolina. *Endangered Species Research*, 23:73-82.
- Gilley, L. M.** 2013. Discovery and characterization of high-frequency calls in North American flying squirrels (*Glaucomys sabrinus* and *G. volans*): Implications for ecology, behavior, and conservation. Ph.D dissertation, Auburn University, Alabama, USA.
- Gilley, L. M.**, and M. L. Kennedy. 2010. A test of mist-net configurations in capturing bats over stream corridors. *Acta Chiropterologica*, 12:363-369.

Hopkins, H. L., C. Sánchez-Hernández, M. L. Romero-Alvarez, **L. M. Gilley**, G. D. Schnell, M. L. Kennedy. 2003. Flight speeds of four neotropical bats. *Southwestern Association of Naturalists*, 48:711-714.

Gilley, L. M. 2002. Ecological studies of small mammals in temperate deciduous forests. Master's thesis, The University of Memphis, Tennessee, USA.

Gilley, L. M., and M. L. Kennedy. 2001. Survey of rare mammals on the Milan Army Ammunition Plant in Carroll and Gibson counties, Tennessee. Final Report. Submitted: American Ordnance, Milan, TN. 91 pp.

PROJECT EXPERIENCE

Biologist – Borealis Biological, 2025. Subconsultant for Western Ecosystems Technology (WEST) in Virginia conducting mist-net surveys for Indiana bats, Northern long-eared bats, and tricolored bats.

Biologist – Borealis Biological, 2025. Subconsultant for Copperhead Consulting on wind energy projects in Iowa and Illinois conducting mist-net surveys for Indiana bats, Northern long-eared bats, and tricolored bats.

Biologist – Borealis Biological, 2024. Conducted extensive habitat assessments and mapping, mist net and acoustic surveys, and for Northern long-eared bats (*Myotis septentrionalis*) and Tricolored bats (*Perimyotis subflavus*), for the Tennessee Army National Guard in Milan, Tennessee.

Biologist/Project Manager – Borealis Biological, 2024. Conducted habitat assessments, mist net surveys, and winter habitat searches and surveys for endangered Indiana bats (*Myotis sodalis*), NLEB (*Myotis septentrionalis*) and Tricolored bats (*Perimyotis subflavus*) for the Tennessee Valley Authority at Chatuge Dam in Clay County, North Carolina.

Biologist – Borealis Biological, 2024. Conducted habitat assessments, mist net surveys and acoustic surveys for NLEB (*Myotis septentrionalis*) and Tricolored bat (*Perimyotis subflavus*) on a Grain Belt Express Transmission Project as a subcontractor for SWCA in multiple counties in Kansas and Missouri.

Biologist/Project Manager – Borealis Biological, 2023. Conducted habitat assessments, mist net surveys, and winter habitat searches and surveys for endangered Indiana bats (*Myotis sodalis*) and NLEB (*Myotis septentrionalis*) for a power line improvement project in Pennsylvania and Virginia.

Borealis Biological was a sub-contractor for GAI. Biologist/Project Manager – Borealis Biological, 2022. Conducted habitat assessments, mist net surveys, radio telemetry surveys, roost emergence counts, winter habitat searches and surveys for endangered Indiana bats (*Myotis sodalis*) and NLEB (*Myotis septentrionalis*) for an AEP

power line improvement project in West Virginia, Virginia, Kentucky, and Ohio. Tracking included efforts (diurnal telemetry and roost emergence counts for two NLEB). Borealis Biological was a sub-contractor for GAI.

Biologist/Project Manager – Borealis Biological, 2021. Conducted habitat assessments, mist net surveys, radio telemetry surveys, roost emergence counts, and winter habitat searches and surveys for endangered Indiana bats (*Myotis sodalis*) and NLEB (*Myotis septentrionalis*) for an AEP power line improvement project in West Virginia, Virginia, Kentucky, and Ohio. Borealis Biological was a sub-contractor for GAI.

Biologist/Project Manager – Borealis Biological, 2020. Conducted acoustic presence/absence surveys for endangered bats in Illinois, Indiana, Kansas, Missouri and Ohio. Analyzed call data with automated bat acoustic software and manually vetted calls identified as *Myotis*. Subcontracted by PARS environmental.

Biologist/Project Manager – Borealis Biological, 2019. Conducted habitat assessments, mist net surveys, radio telemetry surveys, roost emergence counts, and winter habitat searches and surveys for endangered Indiana bats (*Myotis sodalis*) and NLEB (*Myotis septentrionalis*) for an AEP power line improvement project in Ohio. Borealis Biological was a sub-contractor for GAI.

Biologist/Project Manager – Borealis Biological, 2018. Conducted habitat assessments, mist net surveys, radio telemetry surveys, roost emergence counts, and winter habitat searches and surveys for endangered Indiana bats (*Myotis sodalis*) and NLEB (*Myotis septentrionalis*) for an AEP power line improvement project in West Virginia and Kentucky. Borealis Biological was a subcontractor for GAI.

Biologist/Project Manager – Borealis Biological, 2018. Conducted mist net surveys for endangered Indiana bats (*Myotis sodalis*) and NLEB (*Myotis septentrionalis*) for a proposed Mark West natural gas pipeline in West Virginia. Borealis Biological was a subcontractor for Civil and Environmental Consultants (CEC).

Biologist/Project Manager – Borealis Biological, 2018. Conducted mist net surveys for endangered Indiana bats (*Myotis sodalis*) and NLEB (*Myotis septentrionalis*) for a proposed wind farm in Iowa. Project included capture, radio telemetry, and roost emergence counts for four NLEB. Borealis Biological was a subcontractor for HDR.

Field Supervisor– MVP, Mountain Valley Pipeline: 2015-2016. Completed summer mist netting for listed bat species along portions of proposed 300-mile long natural gas pipeline in West Virginia and Virginia.

Field Supervisor – Spectra Energy, NEXUS Gas Transmission Project: 2015-2016. Completed summer mist netting for listed bat species along portions of proposed 250-mile, 36-inch diameter natural gas transmission pipeline originating in Columbia County, Ohio and extending through Ohio to Wayne County, Michigan.

Field Supervisor – Dominion Transmission, Atlantic Coast Pipeline: 2015. Completed habitat assessment for West Virginian northern flying squirrel utilizing desktop review and field surveys along portions of an approximately 564.1-mile interstate natural gas pipeline system in Virginia and North Carolina.

Field Supervisor – Dominion Transmission, Atlantic Coast Pipeline: 2015. Completed habitat assessment for state-listed southeastern myotis and eastern subspecies of Rafinesque's big-eared bat along portions of an approximately 564-mile interstate natural gas pipeline system in Virginia and North Carolina. Studies consisted of desktop analysis, field verification, and exploratory mist-net surveys at four sites.

Field Supervisor – MVP, Mountain Valley Pipeline: 2015. Completed summer mist netting for listed bat species along portions of proposed 300-mile long natural gas pipeline in West Virginia and Virginia.

Field Supervisor – Spectra Energy, NEXUS Gas Transmission Project: 2015. Completed summer mist netting for listed bat species along portions of proposed 250-mile, 36-inch diameter natural gas transmission pipeline originating in Columbia County, Ohio and extending through Ohio to Wayne County, Michigan.

Field Supervisor – American Electric Power, Bland Area Improvements 138 kV Transmission Line Rebuild Project: 2015. Completed field surveys for bats and plants along portion of 138 kV transmission line rebuild project crossing federal lands in Bland and Wythe counties, Virginia and Mercer County, West Virginia. Surveys focused on federally endangered Indiana, gray, and Virginia big-eared bat, federally threatened northern long-eared bat, and forest sensitive species eastern small-footed bat.

Field Supervisor – Transource Missouri, LLC, Sibley to Nebraska City 345kV-Transmission Line: 2014. Assisted with endangered bat mist net surveys along a 132-mile long transmission line in Holt, Nodaway, Andrew, DeKalb, Clinton, Caldwell, Ray, and Jackson counties, Missouri.

Field Supervisor – Indiana Department of Transportation, Interstate 69, Pre- and Post-construction Surveys: 2014. Conducted summer mist net survey for federally endangered Indiana bat along final ROW for Sections 1, 2, 3, and 5.

Field Supervisor – NextEra Energy Resources, Wind Resource Area, Nodaway County Missouri: 2014. Completed mist-net surveys for summer bats including the Indiana and northern long-eared bat. Nine Indiana and two northern long-eared bats were radio-tracked to roosts.

Field Supervisor – Tennessee Valley Authority, Widow's Creek Fossil Plant: 2013. Completed mist net surveys and acoustic monitoring for the federally endangered Indiana bat on a proposed 163-acre borrow area in Jackson County, Alabama.

Field Supervisor

– Crosstex Energy, Inc. Lowell North Pipeline: 2013. Completed endangered bat studies along a 33.5-mile long liquids trunk-line in Washington, Monroe, and Noble counties, Ohio.

Field Supervisor – Texas Eastern Transmission, Ohio Pipeline Energy Network Project: 2013. Completed mist net surveys for the federally endangered Indiana bat along a 73.5-mile natural gas pipeline in Columbiana, Carroll, Jefferson, Belmont, and Monroe counties, Ohio.

Field Supervisor – Enbridge Inc., Line 78 Pipeline: 2013. Completed summer mist netting surveys along a 78-mile natural gas pipeline in Livingston, Grundy, Kankakee, Will, and Cook counties, Illinois, and Lake County, Indiana.

Field Supervisor – Sunoco Pipeline, LP Tiffin-Easton Pipeline: 2012. Completed summer mist netting surveys along an 82-mile pipeline project in Seneca, Huron, Ashland, and Wayne counties, Ohio.

Field Supervisor – Global Geophysical Services Rolling Rock 3-D Seismic Survey: 2011. Project involved the monitoring and repositioning of seismic survey blasting locations to avoid disturbing potential green salamander, timber rattlesnake, and Allegheny woodrat habitat, as well as potential bat hibernacula within state-owned and private lands.

Field Supervisor – Indiana Department of Transportation, Route 641, Terre Haute Bypass: 2010. Completed Indiana bat habitat and mist net surveys supplemented with AnaBat detectors for acoustic monitoring. Selected net sites, captured and identified bats, characterized habitat, implemented white nose syndrome protocols, and supervised field crews during mist netting, radio-telemetry, and emergence counts.

Field Supervisor – Tennessee Gas Pipeline Company 300 Line: 2009. Completed Indiana bat habitat and mist net surveys in Potter, Tioga, Bradford, Susquehanna, Wayne, Pike, Venango, and McKean counties, Pennsylvania and Passaic and Sussex counties, New Jersey. Responsible for coordination of daily field crew activities, habitat assessments, and quality control of collected data.

Field Supervisor – Dominion, North Summit: 2008-2009. Project included habitat assessment surveys for Indiana bats, timber rattlesnakes, green salamanders and Allegheny woodrats, as well as rare plant surveys for an 18-square mile gas storage field seismic project in Fayette County, Pennsylvania. Responsible for coordination of daily field crew activities, habitat assessments for woodrats and bats, and quality control of collected data.

Field Supervisor – Dominion Hybrid Energy/Clinch River Transmission Line: 2008. Project included mist net and radio-telemetry surveys for three endangered bat species along a proposed 9-mile transmission line corridor in Wise and Russell counties, Virginia. Responsible for all aspects of bat field surveys. Selected net sites, captured and identified bats, characterized habitat, and supervised field crews during mist netting, radio-telemetry, and portal search efforts.

Field Supervisor – Pennsylvania Turnpike Commission Southern Beltway Project, Interstate 79 to Mon/Fayette Expressway: 2008. Participated in a mist net survey along a proposed 12-mile roadway corridor in Washington County, Pennsylvania. Responsible for mist net site selection, net set up, habitat assessment, and bat identification/processing.

Field Supervisor – Confidential Client, Natural Gas Transmission Pipeline: 2008. Conducted mist net survey for the endangered Indiana bat associated with a 250-mile pipeline running through portions of Ohio, West Virginia, and Pennsylvania.

Field Supervisor – Equitrans, Big Sandy Pipeline: 2007. Managed field crews to complete mist net surveys at 35 sites along Equitrans' 68-mile natural gas transmission pipeline through Lawrence, Johnson, and Floyd counties, Kentucky. In charge of all aspects of bat field surveys including technician supervision, survey netting site selection, and bat capture and identification, and netting site habitat characterization.

Field Supervisor – Dutchess County Airport. 2007. Managed crews conducting Indiana bat mist netting survey and emergence counts. In charge of all aspects of bat field surveys including technician supervision, survey netting site selection, and bat capture and identification, and netting site habitat characterization for a project involving runway safety/obstruction removal on a 91-acre parcel in Dutchess County, New York.

Project Manager – Essex County Airport: 2007. Managed crews conducting Indiana bat mist netting survey. In charge of all aspects of bat field surveys including technician supervision, survey netting site selection, and bat capture and identification, and netting site habitat characterization for a project involving runway safety/obstruction removal in Essex County New Jersey.

Project Manager – French Lick Airport: 2007. Managed crews conducting Indiana bat mist netting survey. In charge of all aspects of bat field surveys including technician supervision, survey netting site selection, and bat capture and identification, and netting site habitat characterization on approximately 20 acres of forest edge in Orange County, Indiana.

Biologist – Marathon: Dayton-Heath Pipeline: 2007. Conducted bat emergence counts along portions of an existing petroleum pipeline running from Dayton (Montgomery County) to Heath (Licking County) Ohio.

Biologist – Fort Drum Indiana Bat Survey and Radio-telemetry Study: 2007. Base-wide bat survey focusing on Indiana bat capture and radio-telemetry. This survey was initiated due to ESI's documentation of an Indiana bat on base property in 2006. Survey efforts included over 80 mist net sites and Indiana bat radio-tagging. Responsible for completion of surveys and coordinating field crews.

Project Manager – Equitrans. 2007. Managed field crews to complete mist net surveys at 35 sites along a 68-mile natural gas transmission pipeline through Lawrence, Johnson, and Floyd counties, Kentucky. In charge of all aspects of bat field surveys including

technician supervision, survey netting site selection, and bat capture and identification, and netting site habitat characterization.

Biologist – American Electric Power, Maytown-Hays Branch 138 kV Transmission Line: 2007. Conducted mist net survey and portal search along 8.3-mile 138 kV electric transmission line in Floyd County, Kentucky. Responsible for completion of surveys and coordinating field crews.

Field Supervisor – Dominion Transmission, South Western Virginia Expansion Project: 2006. Managed multiple field crews to complete mist net surveys at 21 sites along a 6-mile proposed natural gas ROW in Boone and Wyoming Counties. Responsible for field staff management, data accuracy and client/agency communications on field activities.

Field Supervisor – Union Pacific Railroad: 2006. Managed field crews for 5-mile railroad ROW netting surveys and diurnal and night time foraging telemetry conducted as a result of four endangered bat captures.

Field Supervisor – American Electric Power, Wyoming-Jackson's Ferry 765 kV Transmission Line: 2004 - 2006. Managed all field activities and personnel for netting on approximately 30 miles of a proposed 90-mile, 1000-foot electric transmission line ROW corridor in rugged terrain in West Virginia and Virginia during 2004. Concurrently supervised reconnaissance, netting, ground telemetry, and aerial telemetry for a crew ranging from four to thirteen individuals. Primary draft report author. Managed field wildlife research crew to determine the source of damage to insulators in 2006.

Field Supervisor – Garden Homes: 2006. Completed presence/absence surveys for the Indiana bat as part of consultation for endangered species on a 100-acre site in Essex County, New Jersey.

Field Supervisor – Dominion Transmission, Cove Point Pipeline Expansion PL-1 Extension 2: 2005. Co-managed all field activities and personnel to complete netting at 111 sites along an 80-mile existing gas line ROW in Pennsylvania. Concurrently supervised all reconnaissance, netting, land agent, client and agency interactions.

Field Supervisor – Indiana Department of Transportation, Interstate 69, Segment 2: July – August 2004. Managed all field activities and personnel completing netting and telemetry studies at 30 sites over a three-week period along a 30-mile segment of proposed roadway for the Tier 2 Environmental Studies. Concurrently supervised reconnaissance, netting, diurnal roost telemetry on nine transmittered Indiana bats, emergence counts at 8 roost trees and checks for roosting bats at 51 bridges. Field crew ranged from six to twelve individuals.

Field Supervisor – Western Greenbrier Co-Gen: July 2004. Habitat assessments and surveys for endangered mammals. Completed mist net surveys for the Indiana bat (*Myotis sodalis*), the Virginia big-eared bat (*Corynorhinus t. virginianus*), and the northern flying squirrel (*Glaucomys sabrinus*). Pedestrian surveys were also performed to document other wildlife in the area. Served as primary author for the report sections related to the northern flying squirrel survey.

Field Supervisor – Proposed Surface Mine Development: August 2003. Managed all field activities and personnel for twelve summer mist net sites in Pike County, Kentucky; including supervision of other biologists and all field assistants, survey net site selection, bat capture and identification, and net site habitat characterization.

Biologist – Ohio Department of Transportation, Portsmouth Bypass: June 2003. Conducted summer mist net surveys for the Indiana bat along a proposed ODOT highway improvement ROW.

Biologist – Southern Illinois Power Cooperative Utility Line: June 2003. Conducted summer mist net surveys for the Indiana bat between Cadle and Pittsburg in Williamson County, Illinois.

Biologist – Dominion Transmission, Greenbrier Pipeline: May 2003. Served on one of six teams conducting summer mist net surveys for the Indiana bat (*Myotis sodalis*) and the Virginia big-eared bat (*Corynorhinus t. virginianus*) in West Virginia.

Biologist – University of Memphis: 1999-2002. Conducted a survey for rare mammals on the Milan Army Ammunition Plant. Survey including trapping of eastern woodrats (*Neotoma floridana*).

Field Supervisor – Mist net survey for Indiana bats for a coal development in West Virginia. Responsible for all aspects of field survey for bats, including technician supervision, survey net site selection, bat capture and identification, and net site habitat characterization.

Field Supervisor – Completed detailed assessments for potential habitat for endangered bats on numerous impoundments for a proposed hydropower relicensing project in North Carolina; completed summer mist net surveys in areas with suitable habitat.

Field Supervisor – Mist net surveys for Indiana bats for coal mine developments in southwest Virginia. Responsible for net site selection, bat capture and identification, net site habitat characterization, and technician supervision.

Field Supervisor – Mist net survey for Indiana bats for a municipal/commercial development in West Virginia. Responsible for all aspects of field survey for bats, including net site selection, bat capture and identification, net site habitat characterization, and technician supervision.

Biologist – Department of Defense, Fort Drum Military Installation. Conducted mist net survey in New York. Responsible for all aspects of field survey for bats, including net site selection, bat capture and identification, net site habitat characterization, and technician supervision.

Field Supervisor – Mist net survey for Indiana bats for a coal development in Illinois. Responsible for all aspects of field survey for bats, including net site selection, bat capture and identification, net site habitat characterization, and technician supervision.

Field Supervisor – Mist net survey, radio telemetry (spring active, and autumn swarming), cave surveys (and mapping), and netting for bat collection for pesticide analysis involving endangered Indiana and gray bats at Ft. Leonard Wood in Missouri. Responsible for all aspects of field survey for bats, including net site selection, bat capture and identification, net site habitat characterization, and technician supervision.

Biologist – Mist net survey for Indiana and gray bats Arnold Air Force Base, Tennessee.

Biologist – Mist net survey, radio telemetry, habitat characterization, and search for caves used by endangered gray and Indiana bats at Fort McClellan, Alabama.

Biologist – Bat trap survey of mine portals in Pennsylvania to assess the probability of abandoned mines for hibernation by endangered species of bats.

Biologist – Mist net survey for endangered Indiana bats along a multi-state pipeline corridor in the Midwestern U.S.

Biologist – Mist net survey for endangered Indiana bats on Wright/Patterson Air Force Base, Ohio.

Biologist – Mist net survey for endangered Indiana bats at Camp Atterbury Army National Guard training site, Indiana.

Biologist – Mist net survey for endangered Indiana bats at Crane Navel Weapons Support Center, Indiana.

Graduate Student Research – Collected bats and other species of small mammals in Mexico; prepared museum specimens.

Bat Technician (1995 – 1998) – Mist net survey for Indiana bats, radio telemetry, and bat box monitoring at Indianapolis International Airport.

PROFESSIONAL AFFILIATIONS

Dean of Natural, Mathematical, and Health Sciences – Mars Hill University (2022 – present)

Associate Professor of Biology – Mars Hill University (2015 – present)

American Society of Mammalogists (since 2003)

Southeastern Bat Diversity Network (since 2003)

The Wildlife Society: Tennessee Chapter (since 1999); Alabama Chapter (1995)

Tri Beta Biological Honor Society (since 1995)

Appalachian Flying Squirrel Working Group (since 2016)



Résumé

Jonathan Hootman

167 Briarwood Ln.

Mars Hill, NC 28754

(304) 533-0999 | jhootman@borealisbiological.com

EDUCATION

M.A. Cultural Anthropology, California Institute of Integral Studies, 2007

B. S. Wildlife Management, Ohio State University, 2001

CERTIFICATIONS AND PERMITS

- Federal collection permit: Indiana bat (*Myotis sodalis*), northern long-eared bat (*M.septentrionalis*), tricolored bat (*Perimyotis subflavus*) and gray bat (*Myotis grisescens*)

- Qualified Indiana bat surveyor, Pennsylvania Game Commission

- State permits held in West Virginia, Wisconsin, Kentucky, Ohio, Michigan, North Carolina, Iowa, Kansas, Missouri, and Alabama (More can be added at any time).

QUALIFICATIONS AND EXPERIENCE

Acoustic Experience:

- Echo 101/ Best Practices & The Acoustic ID of Eastern Bats. Vesper 2024
- Using Kaleidoscope Pro for Bat Auto-ID. 2020
- Evaluating Acoustic Bat Surveys for ESA Compliance (5-day USFWS course). 2019
- Sonobat workshop. 2019
- Private acoustics class with Dr. Eric Britzke at ESI main office. 2004
- Mr. Hootman has been setting out acoustic detectors and analyzing calls since 2001.

Mr. Hootman has worked as a wildlife biologist with an emphasis on endangered bat surveys since 2001. He has held a federal permit since 2004 and has participated in projects involving Indiana bats, northern myotis bats, gray bats, and many state listed bat species. These surveys have occurred in a variety of places, including surveys in West Virginia, Virginia, Pennsylvania, Ohio, Michigan, Missouri, Tennessee, New York, Maryland, New Jersey, Nebraska, Wisconsin, Illinois, Indiana, Arkansas, Kentucky, and South Carolina. Mr. Hootman has concentrated on land development projects, specifically wind, mine and gas pipeline development projects. Mr Hootman has also participated in many research projects involving bat migration. He is proficient in the use of mist net surveys and Global Information Systems (GIS) to investigate the presence, distribution, and habitat use of endangered species. He is also a highly skilled radio telemetry operator and has radio tagged hundreds of bats.

Mr. Hootman has been active in outdoor activities and field biology for many years. He has worked as a field biologist on a variety of projects and has worked nine years for Environmental Solutions and Innovations and has worked five years for Apogee Environmental and Archaeological. Since then, he has started an Environmental Consulting Firm (Borealis Biological) with Michelle Gilley and has been working as the COO ever since. Mr. Hootman's field expertise includes mist net and summer habitat surveys and assessments for endangered bats, radio telemetry, rare bird surveys, habitat assessment and delineation, navigating with GPS and topographic maps, animal handling, Padi certified scuba training, fish sampling using a "backpack shocker" and general equipment operation, including operation of 4-wheel drive and all terrain vehicles.

Mr. Hootman is proficient and experienced in the application of the following equipment and techniques as they relate to the capture and handling of bats:

- Mist nets
- Artificial Roost Installation and Monitoring
- Bat harp traps
- Bat roost tree identification
- GIS
- Spring/autumn cave/mine (hibernacula) entrance surveys
- Winter bat count surveys
- Summer bat habitat suitability assessment
- Ultrasound detectors; including deployment and call analysis
- Radio Telemetry; including affixing radio tags
- Bat banding

SELECTED NEPA/ESA DOCUMENTS:

Lemen, C., J. White, P. Freeman, H. Otto, B. Andersen, and **J. Hootman**. 2017. Autumn Migration of *Myotis septentrionalis* in Nebraska: Documentation of Fall Activity, Migratory Timing, and Distance Using Radio-telemetry. Transactions of the Nebraska Academy of Sciences and Affiliated Societies 37 (2017), pp. 40–46.

Hootman, J. 2016. A winter habitat assessment and survey for the federally endangered Indiana bat (*Myotis sodalis*) and federally threatened northern long-eared bat (*Myotis septentrionalis*) at a proposed federal prison in Letcher County, Kentucky. Final report submitted to the US Fish and Wildlife Service, Frankfort, KY.

Beverly, J., **J. Hootman**, K. Cowden, and W. Webb. 2012. A summer survey and winter habitat assessment for the federally endangered Indiana bat (*Myotis sodalis*) at a proposed project area near Grassy Branch, Pike County, KY

(Application No. 898-0603 Am. 3). Final report submitted to the US Fish and Wildlife Service, Frankfort, KY.

Beverly, J., **J. Hootman**, K. Cowden, and W. Webb. 2012. A summer survey and winter habitat assessment for the federally endangered Indiana bat (*Myotis sodalis*) at a proposed project area near Panther Branch, Pike County, KY (Application No. 898-0712 Am. 1). Final report submitted to the US Fish and Wildlife Service, Frankfort, KY.

Beverly, J., **J. Hootman**, K. Cowden, and W. Webb. 2012. A summer survey and winter habitat assessment for the federally endangered Indiana bat (*Myotis sodalis*) at a proposed project area near Beetree Branch, Morgan County, KY (Application No. 877-0202 Am. 1). Final report submitted to the US Fish and Wildlife Service, Frankfort, KY.

Beverly, J., **J. Hootman**, K. Cowden, and W. Webb. 2012. A summer survey and winter habitat assessment for the federally endangered Indiana bat (*Myotis sodalis*) near known maternity colony trees, Boone County, WV (Application No. S-5012-00 & S-5023-00). Final report submitted to the US Fish and Wildlife Service, Elkins, WV.

Beverly, J., **J. Hootman**, K. Cowden, and W. Webb. 2012. A summer survey and winter habitat assessment for the federally endangered Indiana bat (*Myotis sodalis*) at a proposed Crooked Run Refuse Facility, Boone County, WV (permit pending). Final report submitted to the US Fish and Wildlife Service, Elkins, WV.

Beverly, J., **J. Hootman**, W. Webb, and K. Owens. 2012. A summer survey and winter habitat assessment for the federally endangered Indiana bat (*Myotis sodalis*) near a known colony, Kanawha & Fayette Counties, WV (permit pending). Final report submitted to the US Fish and Wildlife Service, Elkins, WV.

PROJECT EXPERIENCE

Biologist/Project Manager – Borealis Biological, 2025. Conducted habitat assessments, mist net surveys, and winter habitat searches and surveys for endangered Indiana bats (*Myotis sodalis*), NLEB (*Myotis septentrionalis*) and Tricolored bats (*Perimyotis subflavus*) for the Tennessee Valley Authority at the Paradise Fossil Plant, Muhlenberg County, Kentucky.

Biologist/Project Manager – borealis Biological, 2024-Present. Subconsultant for Copperhead Consulting providing mist net and telemetry on a tricolored bat

(*Perimyotis subflavus*) migration and winter habitat use research project in eastern North Carolina.

Biologist – Borealis Biological, 2025. Subconsultant for Western Ecosystems Technology (WEST) in Virginia conducting mist-net surveys for Indiana bats, Northern long-eared bats, and tricolored bats.

Biologist – Borealis Biological, 2025. Subconsultant for Copperhead Consulting on wind energy projects in Iowa and Illinois conducting mist-net surveys for Indiana bats (*Myotis sodalis*), Northern long-eared bats (*Myotis septentrionalis*), and tricolored bats (*Perimyotis subflavus*).

Biologist/GIS Coordinator -- borealis Biological, 2024. Conducted extensive habitat assessments and mapping, mist net surveys, and acoustic surveys for the Tennessee Army National Guard in Milan, Tennessee. Mr. Hootman also created all the maps and GIS data for the project.

Biologist – Borealis Biological, 2024. Conducted habitat assessments, mist net surveys and acoustic surveys for NLEB (*Myotis septentrionalis*) and Tricolored bat (*Perimyotis subflavus*) on a Grain Belt Express Transmission Project as a subcontractor for SWCA in multiple counties in Kansas and Missouri.

Biologist – Borealis Biological, 2024. Conducted habitat assessments, acoustic surveys, acoustic analysis, and report for a proposed prison in Letcher County, Kentucky.

Biologist – Borealis Biological, 2024. Conducted habitat assessments and mist net surveys at a proposed wind farm in Blackford County Indiana as a subcontractor for SWCA.

Biologist/Project Manager – borealis Biological, 2023. Conducted habitat assessments, mist net surveys, and winter habitat searches and surveys for endangered Indiana bats (*Myotis sodalis*), NLEB (*Myotis septentrionalis*), and Tricolored bats (*Perimyotis subflavus*) for a First Energy power line improvement project in western Pennsylvania. Borealis Biological was a sub-contractor for GAI.

Biologist/Project Manager – borealis Biological, 2022. Conducted habitat assessments, mist net surveys, and winter habitat searches and surveys for endangered Indiana bats (*Myotis sodalis*) and NLEB (*Myotis septentrionalis*) for an AEP power line improvement project in West Virginia, Virginia, Kentucky, and Ohio. Borealis Biological was a sub-contractor for GAI.

Biologist/Project Manager – borealis Biological, 2021. Conducted habitat assessments, mist net surveys, and winter habitat searches and surveys for endangered Indiana bats (*Myotis sodalis*) and NLEB (*Myotis septentrionalis*) for an AEP power line improvement project in West Virginia, Virginia, Kentucky, and Ohio. Borealis Biological was a sub-contractor for GAI.

Biologist/Project Manager – borealis Biological, 2020. Conducted mist net surveys for endangered Indiana bats (*Myotis sodalis*) and NLEB (*Myotis septentrionalis*) for a proposed powerline ROW extension in Kentucky and Tennessee. Subcontracted by EnviroScience.

Biologist/Project Manager - borealis Biological, 2020. Conducted acoustic presence/absence surveys for endangered bats in Illinois, Indiana, Kansas, Missouri and Ohio. Analyzed call data with automated bat acoustic software and manually vetted calls identified as *Myotis*. Subcontracted by PARS environmental.

Biologist/Project Manager – borealis Biological, 2019. Conducted habitat assessments, mist net surveys, and winter habitat searches and surveys for endangered Indiana bats (*Myotis sodalis*) and NLEB (*Myotis septentrionalis*) for an AEP power line improvement project in Ohio. Borealis Biological was a sub-contractor for GAI.

Biologist/Project Manager – borealis Biological, 2018. Conducted habitat assessments, mist net surveys, and winter habitat searches and surveys for endangered Indiana bats (*Myotis sodalis*) and NLEB (*Myotis septentrionalis*) for an AEP power line improvement project in West Virginia and Kentucky. Borealis Biological was a sub-contractor for GAI.

Biologist/Project Manager – borealis Biological, 2018. Conducted mist net surveys for endangered Indiana bats (*Myotis sodalis*) and NLEB (*Myotis septentrionalis*) for a proposed MarkWest natural gas pipeline in West Virginia. Borealis Biological was a sub-contractor for Civil and Environmental Consultants (CEC).

Biologist/Project Manager – borealis Biological, 2018. Conducted point counts and nest searches for migratory birds along a proposed gas pipeline (Mountain Valley Pipeline) in Virginia and West Virginia. Borealis Biological was a sub-contractor for Environmental Solutions and Innovations (ESI).

Biologist – EnviroScience, 2016. Conducted fall portal surveys for endangered Indiana bats (*Myotis sodalis*) and NLEB (*Myotis septentrionalis*) using mist nets, harp traps, and acoustic detectors for a proposed interstate bypass in Pennsylvania.

Biologist – Jackson Group, 2016. Conducted presence/absence surveys for endangered Indiana bats (*Myotis sodalis*) and NLEB (*Myotis septentrionalis*) for a wind energy project in central Michigan.

Biologist – Department of Defense, 2016. Conducted baseline bat surveys at General Mitchell International Airport, Volk Field, and Hardwood Weapons Range in Wisconsin.

Biologist – Independent Contractor, 2016. Conducted spring cave surveys for endangered Indiana bats (*Myotis sodalis*) and NLEB (*Myotis septentrionalis*) for a private landowner affected by a proposed federal prison in Letcher County Kentucky.

Biologist – University of Nebraska, 2015. Conducted a fall migration study on NLEB (*Myotis septentrionalis*) using passive radio telemetry. Bats were captured in Fontanelle Forest and telemetry towers were placed strategically throughout eastern Nebraska.

Biologist – Kentucky Bat Working Group Volunteer, 2015. Volunteered during the annual meeting at Carter Caves State Park. We conducted harp trapping at two different known hibernacula for endangered Indiana bats (*Myotis sodalis*) and threatened NLEB (*Myotis septentrionalis*). I assisted with setup, identification, and helped conduct a test for people hoping to improve their I.D. skills.

Biologist – Copperhead Consulting, 2015. “Effectiveness of Acoustic Lures For Increasing capture success of Indiana bats (*Myotis sodalis*)” Ballard Wildlife Management Area (Ballard), La Center, Kentucky. Conducted research looking at the capture difference of using an acoustic lure versus using traditional mist netting.

Biologist – Rover Pipeline, 2015. Conducted presence/absence surveys for endangered Indiana bats (*Myotis sodalis*) and NLEB (*Myotis septentrionalis*) for a natural gas pipeline across Ohio.

Biologist – Copperhead Consulting/USFWS, 2015. Conducted a spring migration project for endangered Indiana bats (*Myotis sodalis*). Assisted with erecting the harp trap, capturing and identifying bats, and affixing radio transmitters to them. Lead biologist as part of a ground crew responsible for finding roost trees during bats' migration route.

Biologist – Sunoco, 2014. Conducted presence/absence surveys for endangered Indiana bats (*Myotis sodalis*) for a natural gas pipeline across Pennsylvania.

Field Supervisor – Civil and Environmental Consultants, 2013. Supervised multiple crews on various projects throughout Ohio, West Virginia, Kentucky, and

Pennsylvania while conducting presence/absence surveys for endangered Indiana bats (*Myotis sodalis*) for the Bluegrass natural gas pipeline project.

Project Supervisor – Alpha Natural Resources, Black Castle: 2012. Lead eight teams of two conducting mist netting, and mine portal searches for endangered Indiana bats (*Myotis sodalis*) in the mountains of West Virginia.

Project Supervisor – Alpha Natural Resources, Long Branch: 2012. Lead eight teams of two conducting mist netting, radio telemetry, and mine portal searches for endangered Indiana bats (*Myotis sodalis*) in the mountains of West Virginia.

Project Supervisor – Alpha Natural Resources, Eagle Number Two: 2012. Lead ten teams of two conducting mist netting, and mine portal searches for endangered Indiana bats (*Myotis sodalis*) in the mountains of West Virginia.

Project Supervisor – REIC, Mayben: 2012. Lead four teams of two conducting mist netting, and mine portal searches for endangered Indiana bats (*Myotis sodalis*) in the mountains of West Virginia.

Project Supervisor – Civil and Environmental Consulting: 2012. Lead six teams of two conducting mist netting for endangered Indiana bats (*Myotis sodalis*) in West Virginia.

Project Supervisor – Clintwood Elkhorn: 2012. Lead one team of two conducting mist netting and mine portal searches for endangered Indiana bats (*Myotis sodalis*) in eastern Kentucky.

Project Supervisor – Roadway Unlimited: 2012. Lead two teams of two conducting mist netting and mine portal searches for endangered Indiana bats (*Myotis sodalis*) in eastern Kentucky.

Project Supervisor – Apex Panther Branch: 2012. Lead one team of two conducting mist netting and mine portal searches for endangered Indiana bats (*Myotis sodalis*) in eastern Kentucky.

Project Supervisor – Jackson Environmental: 2012. Lead two teams of two conducting mist netting and mine portal searches for endangered Indiana bats (*Myotis sodalis*) in eastern Kentucky.

Field Supervisor – Mark West Gulf Port Trunk: 2012. Lead two teams of two conducting mist netting and mine portal searches for endangered Indiana bats (*Myotis sodalis*) in eastern Ohio.

Project Supervisor – Clintwood Elkhorn: 2012. Lead two teams of two conducting mist netting and mine portal searches for endangered Indiana bats (*Myotis sodalis*) in eastern Kentucky.

Project Supervisor – Alpha Natural Resources: 2011. Lead eight teams of two conducting mist netting, radio telemetry, and mine portal searches for endangered Indiana bats (*Myotis sodalis*) in the mountains of West Virginia.

Project Supervisor – Various coal companies: 2011. Conducted mine portal surveys for endangered Indiana bats (*Myotis sodalis*) and Grey bats (*Myotis grisescens*).

Field Technician – Various coal companies: 2011. Conducted fish surveys using backpack electroshocking and seining techniques.

Project Supervisor – Massey Energy Company: 2010. Lead 6 teams of two conducting mist netting, radio telemetry, and mine portal searches for endangered Indiana bats (*Myotis sodalis*) in the mountains of West Virginia.

Biologist – Copperhead Consulting/USFWS, 2009. Conducted a spring migration project for endangered Indiana bats (*Myotis sodalis*). Assisted with erecting the harp trap, capturing and identifying bats, and affixing radio transmitters to them. Worked as part of a ground crew responsible for finding roost trees during bats' migration route.

Biologist – Copperhead Consulting 2009. Identified and took morphometric measurements on 17 PESU at a mine entrance on the Cherokee National Forest in Cocke County, TN.

Field Biologist – West Virginia: 2007-2009. Conducted a multi-year delineation of Cheat threetooth land snail habitat in the Cheat River Valley of northeastern West Virginia. This project involved the delineation and GIS mapping of critical habitat located within 1,000 acres of the Snakehill Wildlife Management and approximately 8,000 acres owned by a private timber interest.

Field Supervisor – Fort Drum, NY: 2007. Lead a crew of four, mist netting, then tracking endangered Indiana bats (*Myotis sodalis*). The bats foraging patterns were then monitored using radio-telemetry.

Field Supervisor – Union Pacific: 2006. 5-mile railroad right-of-way (ROW) netting surveys and diurnal and night time foraging telemetry conducted as a result of four endangered bat captures.

Team Leader – Allegheny National Forest Bat Survey: 2006. Conducted 55-site bat survey in Allegheny National Forest covering potentially impacted areas in Elk, Forest, McKean, and Warren counties, Pennsylvania.

Team Leader – I-66 Endangered Bat Survey: 2006. Assisted field efforts for an Indiana and gray bat survey for a proposed interstate construction project in central Kentucky. Performed reconnaissance of mist net sites and directed mist netting efforts for one research team.

Team Leader – Millenium Pipeline: 2005. Conducted mist net surveys along natural gas pipeline right-of-way.

Team Leader – Dominion Northeast Storage Project. Conducted mist net surveys along natural gas pipeline right-of-way.

Team Leader– Dominion TL-536 Line. Conducted mist net surveys along 9.5 mile natural gas pipeline right-of-way.

Team Leader – Dominion TL-453 Line. Conducted mist net surveys along 11.5 mile natural gas pipeline right-of-way.

Team Leader – Columbia Gas Line A-5 Replacement Project. Conducted mist net surveys along natural gas pipeline right-of-way.

Biologist II – Indiana Bat Surveys for Tier 2 Studies of the I-69 corridor. Conducted autumn harp trap surveys for bats at cave openings in Indiana.

Biological Technician – Newport Chemical Depot. Conducted mist net surveys and radio telemetry to locate diurnal roosts on the Newport Chemical Depot, Indiana.

Team Leader – Indiana Department of Natural Resources Habitat Conservation Plan. Conducted summer and autumn surveys and radio telemetry microhabitat studies for the endangered Indiana bat for incorporation into the IDNR's Habitat Conservation Plan in Harrison-Crawford State Forest, Harrison and Crawford counties, Indiana.

Biological Technician – ODOT Route 33 Nelsonville Bypass. Completed spring bat survey of mine portals using bat traps, mist nets and Anabat for road improvement project.

Biologist II – Chippewa National Forest, Sensitive Bird Survey. Participated in a playback survey for rare birds on nearly 7,000 acres in Minnesota.

Team Leader – Conducted mist net surveys and summer habitat assessments for endangered bats for a 220-mile natural gas transmission line development in Virginia and West Virginia.

Field Director – Conducted mist net surveys and summer habitat assessments for endangered bats for 3 sites of 296.31 acres, 838.58 acres, and 601 acres for a coal mine development in Logan County, West Virginia.

Biologist I – Ohio Department of Transportation project BUT-747.03 at Millikin Road and State Route 747. Conducted roost tree emergence count and Anabat survey for road expansion project in Butler County, Ohio.

Field Assistant – Upper Kanawha Valley Development Corporation. Conducted Indiana bat mist net surveys and summer habitat assessments on a 231-acre tract in West Virginia.

Field Assistant – Conducted Indiana bat mist net surveys and summer habitat assessments for a highway development project in Scioto County, Ohio.

Field Assistant – Completed summer mist net survey and summer habitat assessment for US Route 68/KY 80 Lake to Canton project, Trigg County, Kentucky.

Field Assistant – Completed summer mist net survey and summer habitat assessment for KY 30 London (Jackson County), Kentucky.

Field Assistant – Completed summer presence/absence mist net survey and summer habitat assessment for the Indiana bat on Camp Dawson, West Virginia.

Field Assistant – Completed Indiana bat summer mist net survey and summer habitat assessment for KY Route 70, Kentucky.

Field Assistant – Completed endangered Indiana bat summer mist netting survey at a surface coal mining site in Pike County, Kentucky.

Field Assistant – Completed endangered Indiana bat summer mist netting survey at a surface coal mining site in Logan and Mingo counties, West Virginia.

Field Assistant – Completed summer mist net survey and summer habitat assessment for endangered Indiana bats along an 11-mile pipeline corridor in central Illinois.

Field Assistant – Conducted mist net surveys and summer habitat assessments for a commercial development in Morris County, New Jersey. This development was within 5 miles of known hibernacula for the federally endangered Indiana bat.

Field Assistant – Conducted mist net surveys and summer habitat assessments for a sub-surface coal mine development in Wise County, Virginia.