

**BEFORE
THE OHIO POWER SITING BOARD**

In the Matter of the Application of Firelands Wind,)
LLC for a Certificate of Environmental Compatibility)
and Public Need to Construct a Wind-Powered) Case No: 18-1607-EL-BGN
Electric Generation Facility in Huron and Erie)
Counties, Ohio.)

DIRECT TESTIMONY OF

**Chris Leftwich
Chief Operating Officer
Copperhead Environmental Consulting, Inc.**

**on behalf of
Firelands Wind, LLC**

September 11, 2020

/s/ Christine M.T. Pirik

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1 **1. Please state your name, current title, and business address.**

2 My name is Chris Leftwich. I am the Chief Operating Officer and Principal of
3 Copperhead Environmental Consulting, Inc. ("Copperhead"). My business address is 471
4 Main Street, Paint Lick, Kentucky 40461.

6 **2. What is your educational background?**

7 In 1997, I received a Bachelor of Science degree in Environmental Policy from the
8 University of Tulsa, Tulsa, Oklahoma; and a Master of Science degree in
9 Biology/Applied Ecology from Eastern Kentucky University, Richmond, Kentucky, in
10 2003.

12 **3. What is your professional background?**

13 I have been employed by Copperhead for the past 13 years as a biologist, Sr. Biologist,
14 Project Manager and Chief Operating Officer. I am a wildlife biologist with broad
15 experience in completing wildlife and bat studies/surveys, including for proposed wind
16 projects. I have served as project manager on over 100 threatened and endangered species
17 surveys and have extensive experience working with agency personnel to develop and
18 implement field studies. I have conducted and/or managed wildlife surveys designed to
19 be used in addressing or estimating bat impacts due to wind energy and other utility
20 development in the Midwest and Southeast regions. I have extensive regulatory expertise
21 in the Endangered Species Act, National Environmental Policy Act, and United States Fish
22 & Wildlife Service ("USFWS") Land-Based Wind Energy Guidelines. I am a USFWS-
23 permitted bat biologist with extensive experience working with bat species in the Midwest
24 and eastern United States ("U.S."). I am currently permitted for these federally listed bat
25 species: Indiana bat (*Myotis sodalis*), northern long-eared bat (*Myotis septentrionalis*),
26 gray bat (*Myotis grisescens*), Virginia big-eared bat (*Corynorhinus townsendii*
27 *virginianus*), and Ozark big-eared bat (*Corynorhinus townsendii ingens*); and these
28 additional Ohio state-endangered bat species: tri-colored bat (*Perimyotis subflavus*) and
29 little brown bat (*Myotis lucifugus*). I am a past member of the Southeastern Bat Diversity
30 Network and Western Bat Working Group, and current member of The Wildlife Society,

1 the Kentucky Chapter of The Wildlife Society, and KY Bat Working Group. My resume is
2 attached at Attachment CL-1.

3
4 **4. On whose behalf are you offering testimony?**

5 I am testifying on behalf of the Applicant, Firelands Wind, LLC (“Applicant” or
6 “Firelands”).

7
8 **5. Have you been involved in other cases before the Ohio Power Siting Board (“Board”)?**

9 Yes, I have completed and supervised pre-construction bat studies for the Republic Wind
10 Project. I also provided testimony for the Republic Wind Project regarding ecological
11 information addressing the potential presence of bat species in the project area.

12
13 **6. What is the purpose of your testimony?**

14 The purpose of my testimony is to support the portions of the Application for Certificate
15 of Environmental Compatibility and Public Need (“Application”) regarding ecological
16 information addressing the potential presence of bat species in the proposed Emerson
17 Creek Wind Farm (“Project”) area. I am also sponsoring Exhibit Y to the Application,
18 which contains the various bat mist-net surveys, all of which I have reviewed and am
19 personally familiar with. My testimony, together with the other witnesses for Firelands
20 testifying in this case, confirms that the Joint Stipulation and Recommendation
21 (“Stipulation”), which was filed in this docket on September 11, 2020, and is being offered
22 in this proceeding as Joint Exhibit 1, supports a finding by the Board that the Project
23 represents the minimum adverse environmental impact, considering the state of available
24 technology, and is in the public interest.

25
26 **7. Please describe the history of your involvement with the Emerson Creek Project?**

27 I have designed, managed, and provide senior level review for three different pre-
28 construction bat presence/probable absence surveys for the Emerson Creek Project. The
29 following information outlines each study I have been directly involved with.

30

31

1 On May 30, 2017, I was asked by the Applicant to design and manage a bat mist-net survey
2 for the Project. The surveys were completed between June 19 and July 3, 2017. Data
3 collected during field work was summarized in a final report titled “2017 Emerson Creek
4 North Wind Project Bat Mist Netting Survey Report, Erie and Huron Counties, Ohio” that
5 was submitted to the Ohio Department of Natural Resources (“ODNR”), USFWS, and the
6 Applicant.

7
8 On May 30, 2017, I was asked by the Applicant to design and manage a bat mist-net survey
9 for the Project. The surveys were completed between June 19 and July 3, 2017. Data
10 collected during field work was summarized in a final report titled “2017 Emerson Creek
11 Wind Project Bat Mist Netting Survey Report, Huron County, Ohio” that was submitted to
12 the ODNR, USFWS, and the Applicant.

13
14 On May 18, 2018, I was asked by the Applicant to design and manage a bat mist-net survey
15 for the Project. The surveys were completed from June 25 – 30, 2018. Data collected
16 during field work was summarized in a final report titled “2018 Bat Mist-Net Survey for the
17 Emerson North Wind Project, Erie, Huron, and Seneca Counties, Ohio” that was submitted
18 to the Ohio Department of Natural Resources (“ODNR”), USFWS, and the Applicant.

19
20 **8. Please generally describe the exhibit and studies that you are sponsoring and provide**
21 **a brief summary of the findings for each study.**

22 For the Emerson Creek Project, I am sponsoring the following studies that are included in
23 Exhibit Y of the Application:

- 24
25 a. September 27, 2018 - Bat Mist-Net Survey for Emerson North Wind Project, Erie,
26 Huron, and Seneca Counties, Ohio prepared by Copperhead: The survey goals
27 were to document bat species diversity and abundance within the project area, and
28 identify roosting habitat, foraging range, and spatial distribution of federally listed
29 Indiana bats (*Myotis sodalis*) and northern long-eared bats (*M. septentrionalis*), and
30 state-listed Rafinesque’s big-eared bats (*Corynorhinus rafinesquii*) and
31 eastern small-footed bats (*M. leibii*), if captured. Mist-net surveys were

1 implemented in accordance with guidelines outlined in the USFWS 2018 Range-
2 wide Indiana Bat Summer Survey Guidelines (“2018 USFWS Indiana Bat
3 Guidelines”), 2009 ODNR On-Shore Bird and Bat Pre- and Post-Construction
4 Monitoring Protocol for Commercial Wind Energy Facilities in Ohio (“ODNR
5 Protocols”), and the most recent 2018 ODNR Division of Wildlife (“ODNR-
6 DOW”) Guidance for Bat Permitted Biologist (“ODNR-DOW Guidelines”). The
7 study plan was submitted to USFWS on May 18, 2018, and their approval to
8 proceed was received on May 22, 2018. Additionally, ODNR was notified of the
9 study plan on May 18, 2018, in accordance with permit requirements.

10
11 Mist-net surveys were completed at 5 sites from 25-30 June 2018. A total of 16 bats
12 of two species were captured, none of which were or are federally or state
13 threatened or endangered species.

- 14
15 b. October 31, 2017 - Emerson Creek North Wind Project Bat Mist Netting Survey
16 Report Erie and Huron Counties, Ohio prepared by Copperhead: The survey goals
17 were to document bat species diversity and abundance within the Project boundary,
18 and inform understanding of roosting habitat, foraging range, and spatial
19 distribution of federally listed Indiana bats and northern long-eared bats, and state
20 listed Rafinesque’s big-eared bats and eastern small-footed bats, if captured. The
21 goal was accomplished by completing surveys in accordance with the USFWS 2017
22 Range-wide Indiana Bat Summer Survey Guidelines (“2017 USFWS Indiana Bat
23 Guidelines”), ODNR Protocols, and the ODNR-DOW Guidelines. The study plan
24 was submitted to USFWS on May 30, 2017 and their approval to proceed was
25 received on May 31, 2017. Additionally, ODNR was notified of the study plan on
26 May 30, 2017, in accordance with permit requirements.

27
28 Mist-net surveys were completed at 10 sites from June 19 through July 3, 2017. A
29 total of 58 bats of three species were captured, none of which were or are federally
30 or state threatened or endangered species.

31

- 1 c. December 4, 2017 - Emerson Creek Wind Project Bat Mist Netting Survey Report
2 Huron County, Ohio prepared by Copperhead: The goals of this survey were to
3 document bat species diversity and abundance within the Project boundary, and
4 inform understanding of roosting habitat, foraging range, and spatial distribution of
5 federally listed Indiana bats and northern long-eared bats, and state listed
6 Rafinesque's big-eared bats and eastern small-footed bats, if captured. The goals
7 were accomplished by completing surveys in accordance with the 2017 USFWS
8 Indiana Bat Guidelines"), ODNR Guidelines, and the ODNR-DOW Guidelines.
9 Mist-net surveys were implemented in accordance with state and federal guidelines
10 discussed above. The study plan was submitted to USFWS on May 30, 2017, and
11 USFWS concurrence was received on May 31, 2017. Additionally, ODNR was
12 notified of the study plan on May 30, 2017, in accordance with permit requirements.
13 Mist-net surveys were completed at 35 sites from June 19 through July 3, 2017. A
14 total of 337 bats of six species were captured, including one adult female Indiana
15 bat. The Indiana bat was tracked for eight days (June 26– July 3) to locate diurnal
16 roost trees. Three roost locations were estimated using ground triangulation or
17 aerial telemetry. All roost locations were located on private property outside the
18 Project area and therefore specific roost trees were not identified due to access.
19 Foraging data were collected over four nights (June 27-29 and July 1).
20
- 21 d. December 3, 2012 – Summer Indiana Bat Studies for the Emerson Creek Wind
22 Resource Area Seneca and Huron Counties prepared by Western EcoSystems
23 Technology, Inc. ("WEST"): The goal of the summer Indiana bat surveys were to
24 determine the presence/absence of the endangered Indiana bat, describe roosting
25 and foraging habitat of the Indiana bat (if present), and document the occurrence of
26 other bat species. The goals were accomplished by completing surveys in
27 accordance the ODNR bat survey protocols (ODNR 2009), which exceed the
28 requirements of the USFWS mist-netting guidelines, outlined in the Indiana Bat
29 Draft Recovery Plan: First Revision (April 2007). The study plan was submitted to
30 USFWS on June 22, 2012, and USFWS concurrence was received on June 28,
31 2012. Additionally, ODNR was notified of the study plan on June 22, 2012 and

ODNR concurrence was received on July 2, 2012. Mist-net surveys were completed at 50 sites from July 2-29, 2012. A total of 1,121 bats of seven species were captured. No Indiana bats were captured.

- e. December 2011 – Indiana Bat Mist Net Survey Report prepared by Tetra Tech, Inc. (“Tetra Tech”): The goal of the summer Indiana bat surveys were to determine presence/absence of the endangered Indiana bat, and bat species composition with the Project Area. The goals were accomplished by completing surveys in accordance with the USFWS mist-netting guidelines, outlined in the Indiana Bat Draft Recovery Plan: First Revision (April 2007), and ODNR Protocols. The study plan dated July 1, 2011 was submitted to USFWS, and USFWS concurrence was received on July 8, 2011. Additionally, ODNR approved the study plan on July 10, 2011. Mist-net surveys were completed at nine sites from July 19-30, 2011. A total of 175 bats of six species were captured. No Indiana bats were captured.

9. What is the role of you and your firm in regards to the studies listed in your answer to Question 8 above?

My role for all Copperhead-prepared documents/studies was that of the Project Manager. I coordinated with the ODNR and USFWS about study plans and ensured that field staff knew the objectives of each study and how data collection should be completed. I discussed findings with field staff and reviewed deliverables prior to submission to Firelands Wind and resource agencies.

10. Please discuss the standards that were followed when these various studies and reports were prepared.

These studies and reports were performed in accordance with *ODNR On-Shore Bird and Bat Pre- and Post-Construction Monitoring Protocols for Commercial Wind Energy Facilities in Ohio*, *Ohio Division of Wildlife Guidance for Bat Permitted Biologist*, the *USFWS Land-Based Wind Energy Guidelines*, and *USFWS Indiana Bat Summer Survey Guidelines*.

11. **What degree of confidence do you have in the studies contained in Exhibit Y of the Application?**

I have a high degree of scientific certainty in the results of the five bat mist-net studies listed above. This conclusion stems from: 1) studies were completed in accordance with the USFWS and ODNR guidelines at the time of each study, 2) surveys were completed by biologists that held current USFWS and ODNR permits to handle and identify all bat species in OH, including state and federally listed bat species, 3) survey methodology was approved by USFWS and ODNR, 4) I was directly involved in the three studies completed by Copperhead, and I have reviewed in detail the methodology and results of the WEST and Tetra Tech reports. All information included in the reports is what I would expect from a mist-net survey in the portion of Ohio, where I have completed numerous mist-net surveys in the past.

12. **The Board has established rules that require applicants to analyze the potential impacts to bats from the project, and also discuss methods of mitigating these potential impacts. Please generally discuss your understanding of these rules.**

It is my understanding from reviewing the Application that the Board has rules that require the Applicant to analyze potential impacts to ecological resources located within the project area. This analysis by Firelands Wind involves various species, including bats. These rules require Firelands Wind to provide information such as:

- a. Ohio Administrative Code (“O.A.C.”) 4906-4-08(B)(1)(e) –Studies performed that address the ecological impact of the proposed facility.
- b. O.A.C. 4906-4-08(B)(3) – Evaluation of operational and maintenance impacts on ecological resources from the proposed facility.
- c. O.A.C. 4906-4-08(B)(3)(b) – Description of procedures to be utilized to mitigate both the short- and long-term impacts of operation and maintenance of the proposed facility, procedures to be utilized to avoid, minimize and/or mitigate both the short- and long-term impacts of operation and maintenance of the proposed facility, and

description any plans for post-construction monitoring of wildlife impacts.

The Application contains information that addresses Firelands Wind's analyses/reports relating to these provisions, as I understand them as a non-lawyer.

13. Please discuss the process of consulting with ODNR and USFWS when preparing the various studies and reports you are sponsoring.

Throughout the Project timeline, ODNR and USFWS have been consulted as part of bat study/survey planning. Study plans were developed in accordance with ODNR and USFWS guidelines and were discussed with ODNR and/or USFWS, as applicable. Each study plan outlined how the surveys were to be conducted in accordance with the respective agency's guidance. If updates were needed to a study plan, the appropriate update was made and submitted to the resource agencies for review and approval. Study plans were submitted to ODNR and USFWS as required, and approvals were received. After field surveys were completed, a survey report was prepared and submitted to the ODNR and USFWS, as required.

14. Have you reviewed the Stipulation that was filed in this docket on September 11, 2020?

Yes.

15. Is it your opinion that the conditions laid out in the Stipulation enable the Board to determine the probable environment impact from the facility?

Yes.

16. Is it your opinion that the conditions laid out in the Stipulation enable the Board to determine that the facility represents the minimum adverse environmental impact?

Yes.

1 **17. Are your opinions and conclusions in your testimony made with a reasonable degree**
2 **of scientific certainty?**

3 Yes.

4
5 **18. Does this conclude your testimony?**

6 Yes, it does, except that I reserve the right to update this testimony to respond to any further
7 testimony, reports, and/or evidence submitted in this case.

CERTIFICATE OF SERVICE

The Ohio Power Siting Board's e-filing system will electronically serve notice of the filing of this document on the parties referenced in the service list of the docket card who have electronically subscribed to these cases. In addition, the undersigned certifies that a copy of the foregoing document is also being served upon the persons below this 11th day of September, 2020.

/s/ Christine M.T. Pirik

Christine M.T. Pirik (0029759)

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Attachment CL-1

Resume

Regulatory Expertise

- ESA (Section 7 & 10)
- NEPA
- USFWS Land-Based Wind Energy Guidelines

Example Clients

- U.S. Fish and Wildlife Service
- U.S. Forest Service
- U.S. Department of Defense
- Department of Energy
- National Park Service
- State Natural Resource Agencies
- Wind Energy Companies
- Solar Energy Companies
- Electric Power Utilities
- Mining Companies
- State DOT's
- Academic Institutions & NGOs

Natural Resource Evaluations

- Endangered and Threatened Species
- Cave Investigations

Affiliations

- Southeastern Bat Diversity Network
- The Wildlife Society
- KY Bat Working Group

Education

M.S. Biology, 2003, Eastern Kentucky University, Richmond Kentucky

B.S. Environmental Policy, 1997, University of Tulsa, Tulsa Oklahoma

Experience

Copperhead Environmental Consulting, Inc., COO/Biologist, 2016 - Current

Copperhead Environmental Consulting, Inc., Biologist/Project Manager, March 2007 - 2015.

Environmental Solutions & Innovations, Inc., Biologist, 2004 - 2007.

Florida Division of Forestry, Biologist, 2003 - 2004.

Florida Fish & Wildlife Conservation Commission, Fisheries Assistant, 2003.

Qualifications and Background

Mr. Leftwich has been conducting bat research and surveys since 2003. His bat experience includes planning presence/absence surveys, bat handling, mist netting and harp trapping, roost tree identification, hair/tissue/guano sampling, internal and external spring, fall, and winter cave and mine (hibernacula) surveys. Other field techniques include radio telemetry (foraging and diurnal roost tree), light tagging, banding, emergence counts, Anabat (collection and analysis), and habitat assessments. Mr. Leftwich has planned, managed, and participated in over 150 bat surveys throughout the eastern U.S. He has served as project manager or principal for Indiana bat, gray bat, and northern long-eared bat habitat assessments and Endangered Species Act (ESA) compliance surveys. Over the past 16 years, he has captured and identified thousands of bats including hundreds of Indiana bats, northern long-eared bats, gray bats, and Virginia big-eared bats.

Aside from his experience with endangered species compliance surveys, Mr. Leftwich has participated in research projects with Indiana bats and is active in the bat research community. Research examples include participation in a multi-year Indiana bat spring migration project in partnership with USFWS, Tennessee Wildlife Resources Agency, and The Nature Conservancy, and assisted with artificial roost structure use by Indiana bats at Ft. Knox, Kentucky. Mr. Leftwich is a current USFWS Section 10 Recovery Permit holder (TE9489B-1) for Indiana bats, gray bats, northern long-eared bats, Virginia big-eared bats, and Ozark big-eared bats, and is also permitted by numerous state wildlife agencies throughout the eastern U.S. to capture and handle state-listed bat species.

Presentations/Posters

Leftwich, Chris; Roby, Piper; Adams, Josh and Gumbert, Mark. 2013. Monitoring, Research, and Management of an Indiana bat Maternity Colony at Ft. Knox, KY. Presentation for the KY Chapter of The Wildlife Society.

Leftwich, Chris; Roby, Piper; and Gumbert, Mark. 2014. Summary of a Multi-Year Spring Migration Study of Indiana Bats from Four Tennessee Caves, 2009-2013. Presentation for the KY Chapter of The Wildlife Society.

Leftwich, Chris and Wetzel, Theresa. Northern Long-eared Bat Foraging Ranges and Habitat Use in Ohio. 2019. Poster for the AWEA Wind Project Siting and Environmental Compliance Conference.

Project Experience

Indiana Bat and Northern Long-eared Bat Habitat Assessment for a Proposed 4,000 ac Solar Project, Franklin County, Tennessee - 2019

Project Principal in developing and managing a habitat assessment to determine extent of suitable summer and winter bat habitat present on site. Responsibilities included drafting and subsequent approval of survey methodology, directing field staff in data collection needs, coordinating with the client and TVA to determine project needs, and provided senior level review of deliverables.

Bat Acoustic Survey for a Proposed Wind- Energy Project, Michigan - 2019

Project Principal in developing and managing a bat acoustic survey to determine species diversity across the project area. Responsibilities included drafting and subsequent approval of survey methodology, directing field staff in data collection needs, coordinating with the client to determine project needs, and provided senior level review of deliverables.

Indiana Bat, Gray Bat, and Northern Long-eared Bat Habitat Assessment for an Oil Storage Facility Expansion, Bullitt County, Kentucky - 2019.

Project Principal in developing and managing a habitat assessment to determine extent of suitable summer and winter bat habitat present on site. Responsibilities included drafting and subsequent approval of survey methodology, directing field staff in data collection needs, coordinating with the client to determine project needs, and provided senior level review of deliverables.

Indiana Bat Mist-Net Survey for a KY American Water Stream Restoration Site, Fayette County, KY - 2018

Principal and responsible for overall coordination of endangered bat survey for a 0.5 km stream restoration project. Duties include client and USFWS coordination, project planning, scheduling field work, and report review.

Biological Assessment for a Bridge Replacement over Frozen Cr., Breathitt County, KY - 2017

Served as Project Manager for a Biological Assessment for the gray bat, Indiana bat, northern long-eared bat, and Kentucky arrow darter. Responsibilities included budget/proposal preparation, completion and submission of a USFWS approved survey plan, project design and implementation, USFWS and Kentucky Transportation Cabinet coordination, management of field crews, and report preparation.

Biological Assessment for Improvements to KY 2498 and US 460, Morgan County, Kentucky- 2017

Served as Project Manager for a Biological Assessment for the gray bat, Indiana bat, northern long-eared bat, and Kentucky arrow darter. Responsibilities included budget/proposal preparation, completion and submission of a USFWS approved survey plan, project design and implementation, USFWS and Kentucky Transportation Cabinet coordination, management of field crews, and report preparation.

Multiple Mist-Net and Acoustic Surveys for Federally Listed Bat Species for the Georgia Department of Transportation, Georgia - 2013 - Ongoing

Served as Project Manager for mist-net and acoustic surveys for eight separate road projects throughout Georgia. Responsibilities included budget/proposal preparation, completion and submission of a USFWS approved survey plan, project design and implementation, USFWS and client coordination, management of field crews, and report preparation.

Radio Telemetry Study of an Indiana Bat Maternity Colony, Fort Knox, Kentucky - 2009 - 2016

Captured and radio-tagged Indiana bats, tracked bats to diurnal roosts, conducted foraging telemetry, installed habitat enhancement features.

Hibernacula Counts of Bats, Kentucky Department of Fish and Wildlife Resources, throughout Kentucky - 2009 - Ongoing

Identify and record bat species hibernating in Kentucky caves. Tasks include data collection, identification of hibernating bats, and identification of white nose syndrome.

Multi Taxa Surveys for Cherokee National Forest, Tennessee - 2007 - 2010, 2012, 2013, 2014-2019

Responsible for overall project management and coordination of botanical, snail, salamander, and bat surveys. Duties include client and subcontractor coordination, project planning, field work, and report writing. Conducted bat and snail surveys in the northern and southern sections of the Cherokee National Forest. Snail surveys included collection of leaf litter bags in areas most likely to contain micro snails and visually searching areas for macro snails.

Mist-Net, Radio Telemetry, and Acoustic Survey for Federally Listed Bat Species for a Proposed Wind Energy Facility, Virginia - 2015

Served as Project Manager with responsibilities including budget/proposal preparation, completion and submission of a USFWS approved survey plan, project design and implementation, USFWS and client coordination, management of field crews, radio telemetry of Northern Long-Eared Bat, and report preparation.

Mist-Net Survey and Radio Telemetry of Federally Listed Bat Species for a Proposed Wind Energy Facility, Ohio - 2015

Served as Project Manager with responsibilities including budget/proposal preparation, completion and submission of a USFWS approved survey plan, project design and implementation, USFWS and client coordination, management of field crews, radio telemetry (roost tree and aerial foraging) of Northern Long-Eared Bat, and report preparation.

Federally Listed Bat Species Acoustic Survey for a Proposed Wind Energy Facility, Tennessee - 2015

Served as Project Manager with responsibilities including budget/proposal preparation, completion and submission of a USFWS approved survey plan, USFWS and client coordination, management of field crews, and report preparation.

Indiana Bat Mist-Net Surveys, Access Midstream, Minerva, Ohio - 2012 - 2013

Conducted mist-net surveys on several proposed gas lines that included over 200 survey sites throughout the shale region of northeastern Ohio.

Multiple Indiana Bat Mist-Net and Acoustic Surveys for Tennessee Department of Transportation, Tennessee - 2010 - 2013

Served as Project Manager for mist-net and acoustic surveys for 11 separate road projects throughout Tennessee. Responsibilities included budget/proposal preparation, completion and submission of a USFWS approved survey plan, project design and implementation, USFWS and client coordination, manage field crews, and report preparation.

Indiana Bat Mist-Net Survey for a Proposed Gas Line, Normandeau Associates, Ohio - 2012

Served as Project Manager for a mist-net survey of a proposed natural gas pipeline. Responsible for project design, client and agency coordination, and field work. Oversaw a field crew of 12+ biologists and completed the project with a rush deadline.

Indiana Bat Conservation Fund Memorandum of Agreement (MOA) Development, Agrium Advanced Technologies, Kentucky - 2012

Responsible for the development and submittal of an IBCF MOA for a grain loading facility in western Kentucky along the Ohio River. Approximately 10 acres of potential Indiana bat habitat was included in the MOA.

Indiana Bat and Migratory Bird Consultation Support for a Proposed Natural Gas Transmission Line, Tetra Tech, Illinois - 2011

Provided consultation support for a proposed gas line by addressing potential impacts to Indiana bat and migratory bird habitat. Developed mitigation options for both Indiana bat and migratory bird habitat loss.

Indiana Bat Mist-Net Survey of Three Proposed Wind Energy Facilities, Normandeau Associates, Indiana, Illinois, Tennessee - 2011

Served as Project Manager for three mist-net surveys of proposed wind energy facilities. Responsibilities included project design, proposal development, and client and agency coordination.

Habitat Assessment for a Proposed Cell Tower Site, McNairy County, Tennessee - 2011

Evaluated project area for potential foraging and roosting habitat for the Indiana bat. Results of assessment were documented in a final report and submitted to USFWS.

Yellow Bank Wildlife Management Area All Taxa Survey, Kentucky Department of Fish and Wildlife Resources, Breckinridge County, Kentucky - 2010

All taxa survey for a newly purchased parcel to be included in Yellow Bank WMA, KY. Duties include small mammal trapping, mist-netting, reptile and amphibian surveys, fish surveys, animal track and scat surveys, snail surveys.

Indiana and Gray Bat Biological Assessment for a Proposed Wind Energy Facility, SIUC University, Illinois - 2010

Managed a prepared a BA for Indiana and Gray bats for a wind energy project in southern Illinois. Project required a high level of organization, planning, and coordination with the client, USFWS, US DOE, and IDNR. This was the first BA to prepare effects analysis on Indiana bats for a known maternity colony with 1 mile of the proposed turbine site. Project was completed with an accelerated schedule.

Summer Mist-Net Survey of a Proposed Natural Gas Pipeline, AK Environmental, Lycoming County, Pennsylvania - 2010 Managed and conducted a mist-net survey for a proposed pipeline. Responsible for project design, client/agency coordination, data analysis and reporting. Potential winter habitat was also assessed. One mine portal was located and surveyed.

Indiana Bat Radio Telemetry and Habitat Characterization Study, TN TNC, Skinner Mountain Wildlife Management Area, Fentress County, Tennessee - 2010
Hand captured 10 male Indiana bats from East Salt Peter Cave near Skinner Mtn. WMA. Radio transmitters were attached to all bats. Radio telemetry was conducted for 10 days in order to locate roost trees in and around Skinner Mtn. WMA. Responsible for coordinating all field staff, data collection and analysis, and reporting.

Inventory and Monitoring of Bats, Ft. Bragg, North Carolina - 2007 - 2010

This was a multiple year contract with duties including mist-netting and radio-tracking of bats on Ft. Bragg and Camp Mackall twice a year.

Cumberland Habitat Conservation Plan Indiana Bat Spring Migration Study, Tennessee - 2009

Conducted fall swarming harp trapping at Indiana bat hibernacula. Collected hair for stable hydrogen isotope analysis. Radio tagged male Indiana bats and conducted aerial and ground telemetry to determine fall roosting areas.

Mist-Net Survey, Ohio - 2008

Developed and submitted an USFWS approved study plan for an ESA compliance Indiana bat survey for a proposed power line ROW. Conducted mist-net surveys at five sites, analyzed data, and submitted a report to USFWS.

Indiana Bat Maternity Colony Study, MODOT, Missouri - 2008

Radio tracked five female Indiana bats for 10 days in south-eastern Missouri. Located roost trees daily, recorded roost tree characteristics, and conducted emergence counts to estimate colony size.

Indiana Bat Roost Tree Survey, URS, Kentucky - 2008

Walked approximately five miles of proposed natural gas pipeline ROW identifying and marking potential Indiana bat roost trees within a 300-foot centerline buffer. Oversaw tree feeling activities to ensure compliance with USFWS regulations.

Park Lake Mountain Preserve Faunal Inventory, Kentucky - 2007 - 2008

Conducted small mammal trapping, herpetological surveys, mist-net surveys, bird surveys (including cerulean warblers), and fish surveys for a park wide inventory.

Indiana Bat Habitat Improvement, Fort Knox, Kentucky - 2007

Project goal was to create artificial roost habitat by attaching two types of artificial bark, and real bark on 18 trees in 6 different sloughs. Prior to placing artificial bark, trees were assessed for their potential to provide roosting habitat. Temperature data loggers were placed under each piece of bark, both real and artificial, to analyze thermal properties.

Indiana Bat Survey, Tennessee - 2007

Developed and conducted mist-net surveys for two coal mine permits in Tennessee. An abandoned mine portal was assessed for potential bat habitat and harp trapped in the summer and fall. Responsibilities also included USFWS coordination.

Indiana Bat Research Project, Kentucky - 2007

Conducted mist-net surveys near known maternity colonies and attached transmitter to numerous Indiana bats. Hair, guano, and blood were also collected as part of the research project. Diurnal telemetry was conducted to locate new maternity colonies. Each radio tagged bat was located daily and emergence counts were conducted nightly.

Tennessee Department of Transportation Cave Survey, Tennessee - 2007

Harp trapped a cave in the summer and fall to determine if the cave was being used by Indiana and Gray bats. Also conducted an internal survey. Responsible for data analysis, report preparation, and USFWS interactions.

Kentucky Transportation Cabinet Mist-Net Survey, Kentucky - 2007

Designed and conducted mist-net and acoustic surveys along a proposed highway in Crittenden and Caldwell counties. Assessed potential bat habitat along the project corridor, selected mist-net sites, and worked with private land owners. Anabat call files were analyzed with Analook software and Indiana bat filters after each night of netting.

Indiana Bat Foraging Study, West Virginia - 2007

Conducted a foraging telemetry study as part of an ongoing project. Responsibilities included organizing and directing field efforts, telemetry, and use of Locate 3 software both in the field and in the office.

AEP Indiana Bat Habitat Assessment, Meigs County, Ohio - 2006

Designed and conducted a habitat assessment for a proposed landfill development. Duties included determining roosting habitat suitability, oak-hickory forest delineation, mist-net survey study plan, and an on-site mitigation plan.

Indiana Bat Habitat Assessment, West Virginia - 2006

Conducted surveys to determine the presence of potential roost trees. Trees likely to provide potential roosting habitat were observed to determine whether bats were currently using them. Also completed numerous vegetative sample plots within a 2.5-mile radius of the project site to verify habitat composition. Data were used to prepare a Biological Assessment.

Pocono Manor Endangered Bat Survey, Pennsylvania - 2006

Completed an Indiana bat survey for a 5000-acre commercial and residential development in Pennsylvania. Responsibilities included survey design and scheduling, personnel management, client and agency coordination, mist netting, budget management, and reporting.

Big Sandy Pipeline Mine Portal Survey, Kentucky - 2006

Directed and completed searches for potential Indiana bat hibernaculum (abandoned coal mines) along a 68-mile natural gas pipeline ROW in eastern Kentucky. Portals discovered were assessed for their potential to provide winter habitat. Responsibilities included supervising and scheduling multiple field visits, meetings with USFWS to discuss portal assessments and surveying recommendations.

KY-163 Endangered Bat Survey, Kentucky - 2006

Directed and completed an Indiana and gray bat survey for a proposed highway improvement project in south central Kentucky. Responsibilities included survey design and scheduling, personnel (team of 6 biologists) management, client and agency coordination, and budget management. Reported capture of several gray bats during the project to USFWS.

South Western Virginia Expansion Project, Virginia - 2006

Assisted in the completion of mist-net surveys for a natural gas ROW expansion. Responsibilities included supervising one field technician, net site selection, recording bat capture and habitat data, and reporting.

Virginia Looping Endangered Bat Survey, Virginia - 2006

Completed mist-net surveys for a natural gas ROW in western Virginia. Responsibilities included supervising one field technician, net site selection, and recording bat capture and habitat data.

Lewisburg Mine Hibernaculum Count, Ohio - 2006

Conducted bat counts in the largest hibernacula in Ohio for the Ohio Division of Natural Resources. Assisted a team of 10 people identifying and counting bats in two of the nine sections within the mine complex. Responsibilities included navigation throughout the mine, bat identification and data collection.

Winter Cave Hibernacula Survey, Virginia and New Jersey - 2006

Assisted expert cavers in Virginia and New Jersey to assess the cave's potential for use by Indiana bats as hibernacula. Responsibilities included keeping detailed field notes, bat counting and identification.

Cove Point Expansion Bat Survey, Pennsylvania - 2005

Directed and conducted an endangered bat survey along 80.66 miles of a proposed natural gas transmission line in Pennsylvania. A total of 111 sites were chosen and netted two nights each, for a total of 444 net nights. Responsibilities included survey design and scheduling, personnel management (a team of 4 to 12 people), client and agency coordination, budget, statistical analysis, and reporting.

Pennsylvania Department of Environmental Protection Mine Portal Survey, Pennsylvania - 2004-2005

Completed harp trap surveys for bats at abandoned mine portals to document the presence/absence of federal and state listed bats during spring staging and autumn swarming. Completed portal assessments for habitat suitability, set up harp traps, set up and monitored Anabat for echolocation calls, and recorded morphometric data. Responsible for logistics and organization, communication with landowners and PA state agencies, data analysis and reporting.

Indiana Department of Natural Resources Habitat Conservation Plan, Indiana - 2004

Completed summer mist-net and autumn harp trap field surveys for the Indiana bat on five state forests in Indiana to improve understanding of the bat's summer foraging and roosting behavior. Assisted with net site reconnaissance, bat habitat assessments, mist-net set-up, bat identification, bat morphometric processing, radio-transmitter attachment, roost emergence counts, and day and night radio-tracking (to locate diurnal roosts and document night foraging behavior). Also participated in a light tagging study and provided ground support for aerial telemetry efforts. Work on this project provided an opportunity to observe hundreds of bats, represented predominantly by Indiana, northern, and little brown species. Contributing author for the combined Environmental Impact Statement.

Endangered Bat Netting for Hardy Storage, LLC, West Virginia - 2005

Assisted with data analysis and report writing for an endangered bat survey in West Virginia. The report summarized the results of the bat survey and habitat assessment.

Millenium Pipeline, New York - 2005

Completed mist-net surveys and summer habitat assessments for the Indiana bat along a pipeline ROW in New York. Responsibilities included oversight of one field technician and the organization and preparation of nightly fieldwork.

West Milford Township Mist-Net Survey, New Jersey - 2005

Managed a mist-net survey crew for an Indiana bat survey. Responsibilities included pre-project planning, scheduling, personnel management (team of 2 people), client and agency coordination, budget, statistical analysis, and reporting.

Portal Trapping and Portal Search on AEP/Consol Property, West Virginia - 2005

Managed a crew of two people for an Indiana bat spring and summer survey in West Virginia. Responsibilities included pre-project planning, scheduling, personnel management, client and agency coordination, budget, statistical analysis, and reporting.

Clifty Cave Spring Harp Trap Survey, Indiana - 2005

Participated in two spring portal surveys with Dr. Virgil Brack, Jr. to determine the correlation between the numbers and species of bats captured at this hibernacula in the autumn and spring and known winter hibernating populations. A total of 99 bats of five species were caught, including the Indiana bat and two other species of *Myotis*.

Spring Portal Harp Trapping at Warwick Mine, West Virginia - 2005

Managed a crew of two people for an Indiana bat spring and summer survey in West Virginia. Responsibilities included pre-project planning, scheduling, personnel management, client and agency coordination, budget, statistical analysis, and reporting.

Tier II Environmental Surveys, I-69, Indiana - 2004

Harp trapped cave entrances to determine suitability of caves as winter hibernacula for the Indiana bat. Completed harp trap set-up, hibernacula assessment, Anabat monitoring, bat handling, identification and morphometric processing.

Proposed Surface Mine Development Bat Survey, Kentucky - 2004

Completed mist-net surveys and summer habitat assessments for the Indiana bat at three coal mine development sites in Pike and Floyd counties, Kentucky. Also performed searches for abandoned coal mine entrances and assessed their potential to provide winter habitat for hibernating bats. Other responsibilities included frequent client interaction for scheduling, planning, and production of three separate final reports. Also responsible for personnel management, client and agency coordination, budget, data analysis, and reporting.

Bat Mist-Net and Portal Searches on Two Mining Permit Areas, Kentucky - 2004

Completed summer mist-net surveys for endangered bats at four sites in Pike County, Kentucky. Completed mine portal search. New mine openings discovered were assessed for suitability as potential hibernaculum. Made recommendations for trapping at those portals determined most suitable. Also responsible for personnel management, client and agency coordination, budget, data analysis, and reporting.

Army National Guard Ravenna Training and Logistics Site, Ohio - 2004

Base-wide survey for the Indiana bat on 21,419-acres in Portage and Trumbull counties, Ohio. Participated in habitat assessments, net site selection, mist-net set up, bat handling and identification, morphometric processing, and bridge and building inspections for day and night roosts.

Rainelle Endangered Mammals Survey, West Virginia - 2004

Habitat Assessments and Surveys for Endangered Mammals for Western Greenbrier County. Completed mist-net surveys for the Indiana bat, the Virginia big-eared bat, and the Virginia northern flying squirrel. In addition, pedestrian surveys were performed to document other wildlife in the area. Worked under Ms. L. Michelle Gilley to complete habitat assessments, mist-net set-up, bat handling and identification, and morphometric processing.

Endangered Bat Surveys at Mine Portals, West Virginia - 2004

Managed personnel, client and agency coordination, budget, data analysis and reporting for a harp trap survey on two abandoned mine portals for a 30 acre site.

AEP's 765kv Transmission Line Corridor Project, West Virginia and Virginia - 2004

Participated in summer mist-netting surveys for the Federally endangered Indiana bat. Participated largely on portions of the line crossing Jefferson National Forest in Virginia and then entering West Virginia. One Indian bat was captured, radio tagged and tracked. Worked under Ms. L. Michelle Gilley to complete habitat assessments, mist-net set-up, bat handling and identification, morphometric processing, and radio tracking.

AEP's 765kv Transmission Line Corridor Project, West Virginia and Virginia - 2003

Assisted project botanist with surveys for Federally endangered and threatened plants, wetlands, and unique natural areas, such as barrens and karst, along 90 miles of a proposed 1000-foot power line corridor in Virginia and West Virginia. A portion of the corridor crossed Jefferson National Forest, requiring a survey for all plants on the Forest Service's list of regionally rare species. Data were included in a Biological Assessment (BA) for the USFWS and a Biological Evaluation (BE) for the USFS. Survey efforts in the field were conducted entirely with GPS. Field findings were recorded with GPS for inclusion into a GIS database and mapping.

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Summary: Testimony - Direct Testimony of Chris Leftwich electronically filed by Christine M.T. Pirik on behalf of Firelands Wind, LLC