ESI

ENVIRONMENTAL SOLUTIONS & INNOVATIONS, INC.

4525 Este Avenue
Cincinnati, OH 45232
Phone: (513) 451-1777; Fax: (513) 451-3321

P13057

29 May 2013

Division of Engineering and Facilities
Armory Board Section
1707 Coonskin Drive
Charleston, WV 25311-1099

RE: Fauna Survey for Indiana Bats on Camp Dawson, Kingwood, West Virginia
Solicitation No.: DEFK13017

To Whom It May Concern:

Environmental Solutions & Innovations, Inc. (ESI) is pleased for the opportunity to provide a proposal on the above-referenced project.

Our proposal follows the SPECIFICATIONS of the Solicitation RFQ **DEFK13017** (pages 18-23). We will follow all requirements in the SPECIFICATIONS, with EXEMPTIONS AND CLARIFICATIONS provided below as required in Item #11 in **GENERAL TERMS AND CONDITIONS** (page 9) of the Solicitation.

EXEMPTIONS AND CLARIFICATIONS

We propose to complete netting at locations similar to those netted during the 2006 survey, and so we anticipate that U.S. Fish and Wildlife Service (USFWS) will accept 15 sites as suitable coverage.

During the 2006 survey, 15 mist net sites were selected to cover all managed lands on Camp Dawson; sites were divided among three separate training areas: Briery Tract, Pringle Tract, and Volkstone Tract. Camp Dawson Proper possessed insufficient habitat characteristics for mist netting activities so no sites were placed directly on the base. Specific 2006 mist net sites locations were initially based upon sites netted during the 2002 survey; however, numerous sites were moved to account for changes in landscape features and some sites were also moved based on the 2002 survey data, allowing concentration on areas with greater expectation for Indiana bat activity. We anticipate that similar changes will also be required for the 2013 survey.

While we would normally anticipate that a smilar level of effort should suffice in 2013, we cannot assure that USFWS will accept this level of effort. Most notably, White Nose Syndrome (WNS) has greatly reduced the numbers of several species of bats, including the Indiana bat, in the eastern U.S. As a result, on 14 May 2013, the USFWS provided new survey guidelines. The survey effort in the two eastern regions including West Virginia was modified to increase the level of survey effort from 2 sites (8 net nights) per 246 acres of areal extent to 24 net nights per 123 acres of areal extent.

Nevertheless, this solicitation references the 15 sites used in 2006 (and 2002) and specifically states that the netting effort required at each site total 4 net-nights of effort (2 nets for 2 nights). Therefore, this level of effort is not consistent with current guidance. In West Virginia, the 2013 guidance requires a significantly higher sampling effort than was employed in 2006. Specific differences are:

1. For linear projects (i.e. sampling along streams) sampling effort has been increased from 8 to 12 net nights for each kilometer of habitat affected. This can be accomplished by adding a third net set per each site.
2. For areal based projects, the sampling effort has increased from 8 net nights per square kilometer of area to 24 net nights per half of a square kilometer.
3. Indiana bats captured during mist-netting must be radio-tagged and tracked to their roosts. The Solicitation does not address radio telemetry studies.

The 2013 survey guidance is set to determine presence or probable absence on sites where specific project impacts, typically involving habitat removal is planned. A survey that does not entail habitat losses, but is intended to provide depth to the ecological understanding of an area can sample at a lower level of effort; however, restriction on the application of the data to the Endangered Species Act (ESA) compliance for site-specific activities on the Camp may face limitations.

ESI's proposal is based on requirements of the RFQ protocol, inherently requiring an assumption that the RFQ protocol is acceptable to USFWS despite the statement "*It will be the responsibility of the contractor to get the proposed netting scenario approved by the USFWS prior to netting*" (Page 1p, last sentence paragraph 1) and ESI is only responsible for clearing the actual net sites with USFWS and the West Virginia Department of Natural Resources (WVDNR). ESI's cost and technical scoping are based on the assumption that 15 net sites will be required and those sites will consist of a minimum of 2 net stets per site operated for 2 nights yielding a total 4 net nights per site. **Total sampling is assumed to be 60 net nights of effort across 15 sites.** If USFWS requires a more extensive sampling effort, ESI's costs will increase in proportion to the increase in effort.

Regardless of the protocol employed the following assumptions apply:

- Bat detectors will not be a part of these study efforts
- The RFQ does not identify project- or location-specific access or timing restrictions. It is assumed Camp Dawson and the Contract Manager (or CO's designated agent) provide property access in a timely and efficient manner.

- This cost includes weather (cold, precipitation, wind, and lightening) delays.
- Cost includes associated reporting: As outlined in the RFQ, the draft will include one electronic and 2 hard copies produced on or before 15 August 2013, while the final will include 2 hard copies and an electronic copy by 15 September 2013.
- The RFQ does not identify project- or location-specific mandated safety equipment or training. If additional safety training or equipment is required, this will be billed as Out of Scope.
- Telemetry was not requested in the RFP and costs are not provided herein. However, ESI has the expertise to complete such studies and can add this effort to the study with minimal notice. Should a bat be captured on site, the gathering of telemetry data is strongly recommended by USFWS and WVDNR.

OVERVIEW OF SAMPLING TECHNIQUES USING 2007 NETTING PROTOCOL

As noted above, we assume **15 sites** requiring 2 nets for 2 nights will be sampled.

Study Plan

Both WVDNR and USFWS require us to notify them of our intent to conduct the survey. This effort includes generation of a study plan for approval. ESI assumes sites used during previous sampling efforts will still be acceptable, with modifications as appropriate.

Netting

Per 2007 guidelines, each site is sampled on 2 nights between 15 May and 15 August, but the RFQ restricts sampling for this project between 1 June and 30 July. At each site, there is a minimum of two individual net sets, but more than two nets may be used to sample various habitat or landscape features within sites. Mist net sites are selected based upon expectation of bat activity and an effort to provide broad coverage of the project area in habitat suitable for use by Indiana bats.

Exact net placement at each site is based upon canopy cover, presence of a flight corridor, water, and habitat conditions near the site. Nets are set to maximize coverage of flight paths along suitable corridors. Riparian corridors often provide successful mist net sites, but they may not always exist in the project area. Upland corridors (e.g., trails or logging roads) also provided suitable sites. On terrestrial corridors, road ruts or other areas of standing water are used whenever possible to facilitate capture of bats, as they (including the Indiana bat) are known to use such water sources for drinking.

Nets range in size from 6 to 18 meters (18 to 60 ft) wide, and 2 to 4 individual nets are stacked such that the set ranges in height from 6.4 to 9.1 meters (21-30 ft). Each net will be checked once every 10 minutes. Per the RFQ each net site will be staffed by a biologist permitted by WVDNR and a field assistant. We anticipate using 2-3 teams to complete this sampling effort.

The netting setup allows bats to be caught live and released unharmed near the point of capture. Bats are identified to species using a combination of morphological characteristics (e.g., ear and tragus, calcar, pelage, size/weight, length of right forearm, and overall appearance of the animal). The species, sex, reproductive condition, age, weight, length of right forearm, time, and location/net site of capture are recorded for all bats captured. Age (adult or juvenile) of bats is determined by examining ephiphyseal-diaphyseal fusion (calcification) of long bones in the wing. Weight is measured using a Pesola spring scale. Length of the right forearm is measured to the nearest 1.0 mm using a metric ruler. The reproductive condition of captured bats is classified as non-descended male, descended male, non-reproductive female, pregnant female (based on gentle abdominal palpation), lactating female, or post-lactating female.

Netting can be completed every night during the sampling window that meets minimum weather conditions (i.e. low winds, temperatures at or above 50° F, and little or no rain). If multiple days of unsuitable weather occur, ESI will remove teams from the site and return when suitable weather conditions occur.

Reporting efforts include 2 hard and one electronic copy of the draft report (including all maps), which will be produced by 15 August 2013. A final revision including 2 hard copies, an electronic file (in pdf format), and electronic copies of relevant GIS data will be submitted on or before 15 September. ESI will require 2 weeks to address comments.

Cost Proposal
The estimated cost for field studies as identified in the RFQ, reporting, weather-related delays, and to obtain site-specific authorization from USFWS and WVDNR is **$44,200.00**.

If you have questions, please contact me.

Sincerely,

Virgil Brack, Jr., Ph.D., MBA
Certified Wildlife Biologist, The Wildlife Society
Certified Senior Ecologist, Ecological Society of America

CEO and Principal Scientist
VBrack@EnvironmentalSI.com

State of West Virginia
Department of Administration
Purchasing Division
2019 Washington Street East
Post Office Box 50130
Charleston, WV 25305-0130

Solicitation

NUMBER	PAGE
DEFK13017	1

ADDRESS CORRESPONDENCE TO ATTENTION OF:
TARA LYLE
304-558-2544

VENDOR
*426112643 513-451-1777
ENVIRONMENTAL SOLUTIONS & INNO
4525 ESTE AVE

CINCINNATI OH 45232-1762

SHIP TO
DIV ENGINEERING & FACILITIES
ARMORY BOARD SECTION

1707 COONSKIN DRIVE
CHARLESTON, WV
25311-1099 304-341-6368

DATE PRINTED
05/07/2013

BID OPENING DATE: 05/30/2013 BID OPENING TIME 01:30PM

LINE	QUANTITY	UOP	CAT NO	ITEM NUMBER	UNIT PRICE	AMOUNT
0001	1	JB		968-77	$44,200.00	$44,200.00

FAUNA SURVEY FOR INDIANA BATS

THE WEST VIRGINIA PURCHASING DIVISION FOR THE AGENCY, WV NATIONAL GUARD, IS SOLICITING BIDS TO CONDUCT A CRITICAL FAUNA SURVEY FOR INDIANA BATS AT THE CAMP DAWSON ARMY TRAINING SITE LOCATED AT 240 ARMY ROAD KINGWOOD, WV 26537, PER THE ATTACHED SPECIFICATIONS.

ATTACHMENTS INCLUDE:

1. INSTRUCTIONS TO VENDORS SUBMITTING BIDS
2. GENERAL TERMS AND CONDITIONS
3. DEFK13017 SPECIFICATIONS
4. CERTIFICATION AND SIGNATURE PAGE
5. PURCHASING AFFIDAVIT
6. RESIDENT VENDOR PREFERENCE FORM

****** THIS IS THE END OF RFQ DEFK13017 ****** TOTAL: $44,200.00

SIGNATURE	TELEPHONE	DATE
	513-451-1777	5/29/2013

TITLE	FEIN	ADDRESS CHANGES TO BE NOTED ABOVE
CEO/Principal Scientist	311697213	

WHEN RESPONDING TO SOLICITATION, INSERT NAME AND ADDRESS IN SPACE ABOVE LABELED 'VENDOR'

REQUEST FOR QUOTATION
DEFK13017
Critical Fauna Survey for Indiana Bat on Camp Dawson Army Training Site
Kingwood, WV (Preston Co.)

SPECIFICATIONS

1. **PURPOSE AND SCOPE:** The West Virginia Purchasing Division is soliciting bids on behalf of West Virginia Army National Guard's Camp Dawson Army Training Site's Environmental Office to establish a contract for a critical fauna survey for Indiana bats.

   The collection of natural resource baseline information at the Camp Dawson Collective Training Area (CDCTA) is required under the Sikes Act (16 USC 670a et seq.), Army Regulation (AR) 200-3, and Department of Defense Instruction 4715.3. General faunal surveys have been completed as required through previous contracts. However, the United States Fish and Wildlife Service (USFWS) requires specialized surveys for the Indiana bat (Myotis sodalis). The specialized surveys must target this species and require accredited personnel to make the species identification determinations. A (USFWS) qualified survey team is needed to conduct surveys that will determine if this species occurs on the CDCTA and to meet USFWS requirements.

   The 3,797-acre Camp Dawson Collective Training Area is located just outside the City of Kingwood in central Preston County, West Virginia (Figure 1) and consists of four distinct tracts: Pringle Tract (1632 acres), Briery Tract (1251 acres), Camp Dawson Cantonment Area (410 acres), and Volkstone Tract (504 acres). All associated forests have been fragmented creating numerous habitat types, including upland and bottomland forests, disturbed riparian zones, open meadows (from reclaimed strip mines), successional shrubland, ephemeral and emergent wetlands, and developed areas. Forests range from regenerating to mature stands.

   The primary objective of this project is to determine if Indiana bats occur on site. The second objective is to better characterize the species of bats. The USFWS is a cooperator in the implementation of the Camp Dawson Integrated Natural Resources Management Plan (INRMP) in accordance with the Sikes Act. The USFWS, operating under Section 7 of the Endangered Species Act, concurred with the 2007 INRMP revision (USFWS Letter 12 Feb, 2007) because specialized surveys were conducted for the bat in 2006. However, the USFWS considers mist net surveys current for only three years. To garner the support of the USFWS again, these surveys must be conducted in the Spring/Summer of 2013.

   Surveys for Indiana bats will be conducted during June and July 2013 on all suitable habitat located on the 3 tracts. Surveys for this species should adhere to the guidelines outlined in the USFWS protocol. Surveys will not be conducted during rain events or when temperatures are below 50 deg F. Protocol calls for one net site per km of stream and two net sites per square km of forested habitat. Each site should consist of: 1) at least four net nights, 2) a minimum of two net locations at each site, 3) a minimum of 2 nights of netting beginning at sunset for at least 5 hours. Each net site requires a crew of 2 persons and 3

crews can work at a time. In previous surveys fifteen net sites were approved by the USFWS to cover all managed lands on CDCTA. It will be the responsibility of the contractor to get the proposed netting scenario approved by the USFWS prior to netting.

2. **DEFINITIONS:** The terms listed below shall have the meanings assigned to them below. Additional definitions can be found in section 2 of the General Terms and Conditions.

2.1 "Contract Services" means preparing methodologies and work plan for the survey, coordinating field survey with Agency personnel, conducting the survey as approved, and preparing draft and final reports for submission to Agency.

2.2 "Qualified Biologist" is an individual who holds a USFWC Recovery Permit (Federal Fish and Wildlife Permit) for federally-listed bats in the state/region in which they are surveying and/or has been authorized by the appropriate state agency to mist-net for Indiana bats. Several USFWS offices maintain lists of qualified bat surveyors, and if working in one of those states with authorizations in lieu of a Recovery Permits, the individual will either need to be on that list or submit qualifications to receive USFWS approval prior to conducting any field work.

2.3 "Pricing Page" means the pages upon which Vendor should list its proposed price for the Contract Services. The Pricing Page is either included on the last page of this RFQ or attached hereto as Exhibit A.

2.4 "RFQ" means the official request for quotation published by the Purchasing Division and identified as **DEFK13017**.

3. **QUALIFICATIONS:** Vendor shall have the following minimum qualifications:

3.1. Vendor must employ a qualified biologist who will select/approve mist net set-ups in areas that are most suitable for capturing Indiana bats. The qualified biologist must be physically present at each mist-net set-up throughout the survey period and confirm all bat species identifications. This biologist may manage more than one mist-net set-up if the net-check timing (i.e., every ten (10) minutes) can be maintained while walking between nets (which is similar to managing two (2) net set-ups at one net site in past guidance).

3.2. Vendor must provide, prior to award, a Certificate of Commercial General Liability Insurance in the amount $1,000,000.00.

4. MANDATORY REQUIREMENTS:

4.1 Mandatory Contract Services Requirements and Deliverables: Contract Services must meet or exceed the mandatory requirements listed below.

4.1.1 Contract Services Deliverable #1- Task Definition

4.1.1.1 Vendor must prepare a proposal for project defining methodologies to be employed for the surveys; how data will be collected, stored, and analyzed; how results will be reported and reports formatted; a complete breakdown of costs; and a proposed schedule for all work submission of deliverables. The curriculum vitae of the primary researchers and technicians for the various surveys shall also be submitted with this proposal.

4.1.1.2 Vendor will meet with Camp Dawson (CD) Environmental personnel to coordinate field surveys, use of CD materials, and develop an outline for the work plan. The pre-work conference will be scheduled at Camp Dawson within fifteen (15) days of the officially awarded contract but prior to the actual start of the work. The agency will coordinate this meeting date with the vendor.

4.1.1.3 Vendor will complete the work plan as prepared for the survey period. All work plans will be coordinated in association with the USFWS prior to the state of the project.

4.1.2 Contract Services Deliverable #2- Reports

4.1.2.1 Vendor must submit their start-up letter and attached approved plan of work within thirty (30) days of official contract award.

4.1.2.2 Vendor must complete Mist Net Surveys no later than July 30, 2013, and submit three (3) copies of the Draft Report and maps; two (2) in hard copy and one (1) electronically no later than August 15, 2013.

4.1.2.3 Vendor must submit three (3) copies of the Final Report and maps two (2) in hard copy and one (1) electronically, incorporating review comments, no later than September 15, 2013. All GIS SDSFIE 2.6 compliant data layers must be included in the electronic submission.

5. CONTRACT AWARD:

5.1 Contract Award: The Contract is intended to provide Agency with a purchase price for the Contract Services. The Contract shall be awarded to the Vendor that provides the Contract Services meeting the required specifications for the lowest overall total cost as shown on the Pricing Pages.

5.2 Pricing Page: Vendor should complete the Pricing Page by entering their all inclusive lump sum quote to complete the task definition and work plan, to coordinate and complete the field surveys, and prepare and submit draft and final reports as specified herein. Vendor should complete the Pricing Page in full as failure to complete the Pricing Page in its entirety may result in Vendor's bid being disqualified.

Notwithstanding the foregoing, the Purchasing Division may correct errors as it deems appropriate. Vendor should type or electronically enter the information into the Pricing Page to prevent errors in the evaluation.

6. PERFORMANCE: Vendor and Agency shall agree upon a schedule for performance of Contract Services and Contract Services Deliverables, unless such a schedule is already included herein by Agency. In the event that this Contract is designated as an open-end contract, Vendor shall perform in accordance with the release orders that may be issued against this Contract.

7. PAYMENT: Agency shall pay in accordance with the schedule noted below, for all Contract Services performed and accepted under this Contract. Vendor shall accept payment in accordance with the payment procedures of the State of West Virginia.

Vendor will request payment by submitting detailed invoices, *in quintuplicate*, to:
HQ WVARNG
ATTN: WVAR-F-EP
1703 Coonskin Drive
Charleston, WV 25311-1085

There shall be two payments allowed under this scope of work.
Payment No. 1 equals fifty percent (50%) of the contract sum, less previous payments, upon successful completion of the draft report.
Payment No. 2 equals fifty percent (50%) of the contract sum, less previous payments, plus or minus any approved change orders, upon final inspection and acceptance of all tasks as outlined in this scope of work.

DELIVERABLES	DATE	PAYMENT SCHEDULE
Project Start Date	June 2013	
Weekly Progress Reports	Provided weekly or upon request	
Completion of Mist Net Surveys	No Later Than July 30, 2013	
Completion of Draft Report	No Later Than August 15, 2013	50%
Completion of Project	No Later Than September 15, 2013	50%

Upon completion of the project, all non-expended field supplies that were purchased with funds provided by Camp Dawson Army Training Site (CDATS) will become the sole property of the CDATS.

8. **TRAVEL:** Vendor shall be responsible for all mileage and travel costs, including travel time, associated with performance of this Contract. Any anticipated mileage or travel costs must be included in the lump sum total listed on Vendor's bid. Travel costs will not be paid by the Agency separately.

9. **FACILITIES ACCESS:** Performance of Contract Services may require access cards and/or keys to gain entrance to Agency's facilities. In the event that access cards and/or keys are required:

   9.1. Vendor must identify principal service personnel which will be issued access cards and/or keys to perform service.

   9.2. Vendor will be responsible for controlling cards and keys and will pay replacement fee, if the cards or keys become lost or stolen.

   9.3. Vendor shall notify Agency immediately of any lost, stolen, or missing card or key.

   9.4. Anyone performing under this Contract will be subject to Agency's security protocol and procedures.

9.5. Vendor shall inform all staff of Agency's security protocol and procedures.

10. VENDOR DEFAULT:

10.1. The following shall be considered a vendor default under this Contract.

10.1.1. Failure to perform Contract Services in accordance with the requirements contained herein.

10.1.2. Failure to comply with other specifications and requirements contained herein.

10.1.3. Failure to comply with any laws, rules, and ordinances applicable to the Contract Services provided under this Contract.

10.1.4. Failure to remedy deficient performance upon request.

10.2. The following remedies shall be available to Agency upon default.

10.2.1. Cancellation of the Contract.
10.2.2. Cancellation of one or more release orders issued under this Contract.
10.2.3. Any other remedies available in law or equity.

11. MISCELLANEOUS:

11.1. Contract Manager: During its performance of this Contract, Vendor must designate and maintain a primary contract manager responsible for overseeing Vendor's responsibilities under this Contract. The Contract manager must be available during normal business hours to address any customer service or other issues related to this Contract. Vendor should list its Contract manager and his or her contact information below.

Contract Manager: Virgil Brack
Telephone Number: 513-451-1777
Fax Number: 513-451-3321
Email Address: vbrack@environmentalsi.com

EXHIBIT A
RFQ # DEFK13017

ALL LABOR, MATERIALS, EQUIPMENT, AND SUPPLIES NECESSARY TO CONDUCT CRITICAL FAUNA SURVEY FOR INDIANA BAT ON CAMP DAWSON ARMY TRAINING SITE AT KINGWOOD, WV

BID FORM

The undersigned, hereafter called the Bidder, being familiar with and understanding the bidding documents; and being familiar with the required qualifications and the mandatory requirements of the Project with regards to the deliverables and associated timelines, hereby proposes to furnish labor, material, equipment, supplies, and transportation to perform the work as described in the bidding documents

BIDDERS COMPANY NAME: Environmental Solutions & Innovations, Inc.

VENDOR ADDRESS: 4525 Este Avenue
Cincinnati, Ohio 45232

TELEPHONE: 513-451-1777

FAX NUMBER: 513-451-4421

E-MAIL ADDRESS: vbrack@environmentalsi.com

OVERALL TOTAL COST:

Forty-four thousand two hundred dollars and no cents

($ 44,200.00) ***(Contract bid to be written in words and numbers.)

The contract will be awarded to the Bidder with the lowest overall total cost meeting all of the specifications. Bidder understands that to the extent allowed by the West Virginia Code, the OWNER reserves the right to waive any informality or irregularity in any bid, or bids, and to reject any and all bids in whole or in part; to reject a bid not accompanied by the required bid security or by other data required by the bidding documents; to reject any conditions of the bid by the Bidder that is any way inconsistent with the requirements, terms, and conditions of the bidding documents; or to reject a bid that is in any way incomplete or irregular.

Failure to use this bid form may result in bid disqualification.

SIGNATURE: _____ DATE: 5/29/2013

NAME: Virgil Brack, Jr.
(Please Print)

TITLE: CEO/Principal Scientist

CERTIFICATION AND SIGNATURE PAGE

By signing below, I certify that I have reviewed this Solicitation in its entirety; understand the requirements, terms and conditions, and other information contained herein; that I am submitting this bid or proposal for review and consideration; that I am authorized by the bidder to execute this bid or any documents related thereto on bidder's behalf; that I am authorized to bind the bidder in a contractual relationship; and that to the best of my knowledge, the bidder has properly registered with any State agency that may require registration.

Environmental Solutions & Innovations, Inc.
(Company)

(Authorized Signature)

Virgil Brack, Jr., CEO/Principal Scientist
(Representative Name, Title)

513-451-1777 513-451-3321
(Phone Number) (Fax Number)

5/29/2013
(Date)

RFQ No. DEFK13017

STATE OF WEST VIRGINIA
Purchasing Division

PURCHASING AFFIDAVIT

MANDATE: Under W. Va. Code §5A-3-10a, no contract or renewal of any contract may be awarded by the state or any of its political subdivisions to any vendor or prospective vendor when the vendor or prospective vendor or a related party to the vendor or prospective vendor is a debtor and: (1) the debt owed is an amount greater than one thousand dollars in the aggregate; or (2) the debtor is in employer default.

EXCEPTION: The prohibition listed above does not apply where a vendor has contested any tax administered pursuant to chapter eleven of the W. Va. Code, workers' compensation premium, permit fee or environmental fee or assessment and the matter has not become final or where the vendor has entered into a payment plan or agreement and the vendor is not in default of any of the provisions of such plan or agreement.

DEFINITIONS:

"Debt" means any assessment, premium, penalty, fine, tax or other amount of money owed to the state or any of its political subdivisions because of a judgment, fine, permit violation, license assessment, defaulted workers' compensation premium, penalty or other assessment presently delinquent or due and required to be paid to the state or any of its political subdivisions, including any interest or additional penalties accrued thereon.

"Employer default" means having an outstanding balance or liability to the old fund or to the uninsured employers' fund or being in policy default, as defined in W. Va. Code § 23-2c-2, failure to maintain mandatory workers' compensation coverage, or failure to fully meet its obligations as a workers' compensation self-insured employer. An employer is not in employer default if it has entered into a repayment agreement with the Insurance Commissioner and remains in compliance with the obligations under the repayment agreement.

"Related party" means a party, whether an individual, corporation, partnership, association, limited liability company or any other form or business association or other entity whatsoever, related to any vendor by blood, marriage, ownership or contract through which the party has a relationship of ownership or other interest with the vendor so that the party will actually or by effect receive or control a portion of the benefit, profit or other consideration from performance of a vendor contract with the party receiving an amount that meets or exceed five percent of the total contract amount.

AFFIRMATION: By signing this form, the vendor's authorized signer affirms and acknowledges under penalty of law for false swearing (*W. Va. Code* §61-5-3) that neither vendor nor any related party owe a debt as defined above and that neither vendor nor any related party are in employer default as defined above, unless the debt or employer default is permitted under the exception above.

WITNESS THE FOLLOWING SIGNATURE:

Vendor's Name: Environmental Solutions & Innovations, Inc.

Authorized Signature: _____ Date: 29 May 2013

State of Ohio

County of Hamilton, to-wit:

Taken, subscribed, and sworn to before me this 29 day of May, 2013.

My Commission expires 11/20, 2016.

AFFIX SEAL HERE

NOTARY PUBLIC _____

LESLIE C. HILL
Notary Public, State of Ohio
My Commission Expires
November 20, 2016

Rev. 07/12

State of West Virginia

VENDOR PREFERENCE CERTIFICATE

Certification and application* is hereby made for Preference in accordance with ***West Virginia Code***, §5A-3-37. (Does not apply to construction contracts). ***West Virginia Code***, §5A-3-37, provides an opportunity for qualifying vendors to request (at the time of bid) preference for their residency status. Such preference is an evaluation method only and will be applied only to the cost bid in accordance with the ***West Virginia Code***. This certificate for application is to be used to request such preference. The Purchasing Division will make the determination of the Resident Vendor Preference, if applicable.

1. **Application is made for 2.5% resident vendor preference for the reason checked:**
____ Bidder is an individual resident vendor and has resided continuously in West Virginia for four (4) years immediately preceding the date of this certification; **or,**
____ Bidder is a partnership, association or corporation resident vendor and has maintained its headquarters or principal place of business continuously in West Virginia for four (4) years immediately preceding the date of this certification; or 80% of the ownership interest of Bidder is held by another individual, partnership, association or corporation resident vendor who has maintained its headquarters or principal place of business continuously in West Virginia for four (4) years immediately preceding the date of this certification; **or,**
____ Bidder is a nonresident vendor which has an affiliate or subsidiary which employs a minimum of one hundred state residents and which has maintained its headquarters or principal place of business within West Virginia continuously for the four (4) years immediately preceding the date of this certification; **or,**

2. **Application is made for 2.5% resident vendor preference for the reason checked:**
____ Bidder is a resident vendor who certifies that, during the life of the contract, on average at least 75% of the employees working on the project being bid are residents of West Virginia who have resided in the state continuously for the two years immediately preceding submission of this bid; **or,**

3. **Application is made for 2.5% resident vendor preference for the reason checked:**
____ Bidder is a nonresident vendor employing a minimum of one hundred state residents or is a nonresident vendor with an affiliate or subsidiary which maintains its headquarters or principal place of business within West Virginia employing a minimum of one hundred state residents who certifies that, during the life of the contract, on average at least 75% of the employees or Bidder's affiliate's or subsidiary's employees are residents of West Virginia who have resided in the state continuously for the two years immediately preceding submission of this bid; **or,**

4. **Application is made for 5% resident vendor preference for the reason checked:**
____ Bidder meets either the requirement of both subdivisions (1) and (2) or subdivision (1) and (3) as stated above; **or,**

5. **Application is made for 3.5% resident vendor preference who is a veteran for the reason checked:**
____ Bidder is an individual resident vendor who is a veteran of the United States armed forces, the reserves or the National Guard and has resided in West Virginia continuously for the four years immediately preceding the date on which the bid is submitted; **or,**

6. **Application is made for 3.5% resident vendor preference who is a veteran for the reason checked:**
____ Bidder is a resident vendor who is a veteran of the United States armed forces, the reserves or the National Guard, if, for purposes of producing or distributing the commodities or completing the project which is the subject of the vendor's bid and continuously over the entire term of the project, on average at least seventy-five percent of the vendor's employees are residents of West Virginia who have resided in the state continuously for the two immediately preceding years.

7. **Application is made for preference as a non-resident small, women- and minority-owned business, in accordance with *West Virginia Code* §5A-3-59 and *West Virginia Code of State Rules*.**
____ Bidder has been or expects to be approved prior to contract award by the Purchasing Division as a certified small, women- and minority-owned business.

Bidder understands if the Secretary of Revenue determines that a Bidder receiving preference has failed to continue to meet the requirements for such preference, the Secretary may order the Director of Purchasing to: (a) reject the bid; or (b) assess a penalty against such Bidder in an amount not to exceed 5% of the bid amount and that such penalty will be paid to the contracting agency or deducted from any unpaid balance on the contract or purchase order.

By submission of this certificate, Bidder agrees to disclose any reasonably requested information to the Purchasing Division and authorizes the Department of Revenue to disclose to the Director of Purchasing appropriate information verifying that Bidder has paid the required business taxes, provided that such information does not contain the amounts of taxes paid nor any other information deemed by the Tax Commissioner to be confidential.

Under penalty of law for false swearing (West Virginia Code, §61-5-3), Bidder hereby certifies that this certificate is true and accurate in all respects; and that if a contract is issued to Bidder and if anything contained within this certificate changes during the term of the contract, Bidder will notify the Purchasing Division in writing immediately.

Bidder: Virgil Brack, Jr. **Signed:** _____

Date: 5/29/2013 **Title:** CEO/Principal Scientist

Resumes of Qualified Biologists

ENVIRONMENTAL SOLUTIONS & INNOVATIONS, INC.

Résumé

Christopher R. Boggs

EDUCATION

B.S., Wildlife Management and Fisheries, Ohio State University, 2005

CERTIFICATIONS AND TRAINING

Independent Studies/ Apprenticeship: Tree Farm and Pond Management, Hill Top Farms, Patriot, Ohio

QUALIFICATIONS AND EXPERIENCE

Mr. Boggs has assisted with numerous wildlife research and management activities, with particular emphasis on endangered bats. Mr. Bogg's experience includes:

- Mist net set up, bat handling, and morphometric processing (species, weight, gender, and various measurements)
- Use of handheld, sub-meter accurate Trimble GPS unit

Mr. Boggs also has experience with forestry and fisheries management, watershed conservation practices, and identification of flora and fauna.

PROJECT EXPERIENCE

Biologist – EQT SMI 27 Well Pad Site: 2012. Completed summer mist netting and portal searches for Indiana and Virginia big-eared bat on a proposed 42-acre well pad site in Doddridge County, West Virginia.

Biologist – American Electric Power, Pax Branch 138 kV Extension: 2012. Completed Mist net surveys and portal searches on approximately 25 acres along the transmission line in Fayette County, West Virginia

Field Assistant – Williams Ohio Valley Midstream Pipeline: 2012. Completed summer mist-netting and diurnal roost telemetry along a 30-mile pipeline project in Washington County, Pennsylvania.

Biologist – Consol Pennsylvania Coal Company, Bailey Mine: 2011 & 2012. Completed summer mist net and radio-telemetry survey in support of ongoing monitoring for the federally endangered Indiana bat maternity colony in Greene County, Pennsylvania. Performed, diurnal roost and foraging radio-telemetry, and roost emergence studies.

Biologist – M3 Midstream 9000 Pipeline: 2012. Performed summer mist netting for the federally endangered Indiana bat along a 7-mile pipeline and associated access roads in Harrison County, West Virginia. Performed mist net site set up, bat handling, and morphometric processing.

Biologist – M3 Midstream Reliance Pipeline: 2012. Performed summer mist netting for the federally endangered Indiana bat along a 5.5-mile pipeline in Monongalia and

Marion counties, West Virginia. Performed mist net site set up, bat handling, and morphometric processing

Biologist – Paramont Coal Company, Doe Branch Surface Mine: 2012. Completed summer mist netting for endangered bats in Dickenson County, Virginia. Responsible for mist net site operation and habitat assessment, bat identification, morphometric processing and bat banding.

Field Assistant – Indiana Department of Transportation, Interstate 69, Pre- and Post-construction Surveys: 2012. Assisted with summer mist net survey and radio telemetry studies associated with a known colony of Indiana bats along Section 5 of the proposed project. Independently picked net sites and identified bats with verification from federally permitted bat biologist.

Team Leader – Confidential Client: 2011. Conducted Indiana bat summer habitat surveys on three proposed pipeline projects in Marshall and Wetzel counties, West Virginia.

Team Leader – M3 Midstream, LLC, Appalachia Pipeline: 2011. Completed mist net surveys for the federally endangered Indiana bat along a 130-mile natural gas pipeline ROW in Monongalia and Marion counties, West Virginia.

Team Leader – Consol Energy, Northern West Virginia RO Water Pipeline: 2011. Completed endangered bat survey along 31.6-mile long waterline in Monongalia, Marion, and Harrison Counties, West Virginia.

Team Leader – Public Service Electric and Gas, Roseland-Bushkill Transmission Line: 2011. Completed summer mist net survey along 45-mile transmission line corridor in Warren, Sussex, Morris, and Essex counties, New Jersey. Performed mist net site set up, bat handling and morphometric processing, and habitat assessments, and assisted with bat identification.

Field Assistant – Tennessee Gas Pipeline, Northeast Upgrade: 2011. Conducted Indiana bat mist net and along portions of a pipeline looping project in Sussex County, New Jersey and Wayne and Pike counties, Pennsylvania. Performed mist net site set up and habitat assessment and bat identification, bat handling, and morphometric processing, and also conducted radio-telemetry for eastern small-footed bats.

Field Assistant – Indiana Department of Transportation, SR25: 2011. Conducted summer mist net surveys for endangered bats in Carroll County, Indiana. Assisted with mist net site set up, habitat assessment, and morphometric processing.

Field Assistant – Indiana Department of Transportation, Interstate 69, Pre- and Post-construction Surveys: 2011. Under the direct and on-site supervision of Dr. Dale Sparks, conducted summer mist net survey for federally endangered Indiana bat along Section 3 of the interstate corridor. Responsible for mist netting, bat identification, and placing bat detectors. Captured, identified, and radio-tagged and tracked multiple Indiana bats to roosting areas.

Field Assistant – Superior Appalachian Pipeline, LLC. Karthaus Pipeline: 2010. Assisted with summer mist net survey along a 7-mile natural gas pipeline in Centre and

Clearfield counties, Pennsylvania. Assisted with mist net site set up, habitat assessment, and morphometric processing.

Field Assistant – American Electric Power. Mountaineer CSSII CO2 Injection: 2010. Assisted with summer mist net survey in Mason County, West Virginia. Assisted with mist net site set up, habitat assessment, and morphometric processing.

Field Assistant – Paramont Coal Company. Kiwanis Park Surface Mine: 2010. Assisted with summer mist net survey in Dickenson County, Virginia. Assisted with mist net site set up, habitat assessment, and morphometric processing.

Field Assistant – Clintwood Elkhorn Mining. Laurel Branch Surface Mine : 2010. Assisted with summer mist net survey in Buchanan County, Virginia. Assisted with mist net site set up, habitat assessment, and morphometric processing.

Field Assistant – Equitrans, LP, Sunrise Pipeline: 2010. Assisted with summer mist net survey on approximately 113 miles of natural gas pipeline in Greene County, Pennsylvania, and Doddridge, Marion, Harrison, Taylor and Wetzel counties, West Virginia. Assisted with mist net site set up, habitat assessment, morphometric processing and diurnal roost telemetry for one tagged Indiana bat.

Field Assistant – Columbia County Airport Obstruction Removal: 2010. Assisted with mist net surveys, radio-telemetry, and acoustic monitoring for a captured federally endangered Indiana bat on a 12-acre tract of airport property and a portion of an adjacent golf course in Columbia County, New York. Independently identified bats with verification from federally permitted bat biologist.

Field Assistant – Superior Appalachian Pipeline, LLC Snow Shoe Pipeline: 2010. Assisted with Indiana bat summer mist net survey along 14.5 miles of new natural gas pipeline in Centre County, Pennsylvania. Assisted with diurnal roost telemetry for *Myotis leibii* in Sproul State Forest.

Field Assistant – Dominion Transmission, Hub III: 2009. Completed Indiana bat mist net surveys along 9.8-mile natural gas pipeline in Greene County, Pennsylvania. Assisted with mist net site set up and habitat assessment, and morphometric processing.

Field Assistant – 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 Sussex and Passaic counties, New Jersey. Assisted with mist net site set up, habitat assessment, and morphometric processing.

Field Assistant – AES Sparrows Point LNG, LLC and Mid-Atlantic Express, LLC: 2009. Completed endangered bat surveys along the 88-mile Sparrows Point LNG Terminal and Mid-Atlantic Express Pipeline in Baltimore, Hartford, and Cecil counties, Maryland and Lancaster and Chester counties, Pennsylvania. Assisted with mist net site set up, habitat assessment, and morphometric processing.

Field Assistant – Consol Pennsylvania Coal Company, Enlow Beltline and 15l Powerline and Airshaft: 2009. Completed Indiana bat habitat and mist net surveys in

Greene and Washington counties, Pennsylvania. Assisted with mist netting, bat handling and morphometric processing.

Field Assistant – Consol Pennsylvania Coal Company, Slurry Injection Bore Holes and Slurry Line: 2009. Completed summer mist net and portal survey for federally endangered Indiana bats in Greene County, Pennsylvania. Assisted with mist net site set up and habitat assessment, and morphometric processing.

Field Assistant – Consol Pennsylvania Coal Company, Bailey Mine: 2009. Assisted with diurnal roost and nocturnal foraging radio-telemetry survey in support of ongoing monitoring for Indiana bat maternity colony in Greene County, Pennsylvania.

ENVIRONMENTAL SOLUTIONS & INNOVATIONS, INC.

Résumé

Darwin Brack

EDUCATION

B.S., Economics/Psychology, Indiana State University, 2012
B.S., Mathematics, Indiana State University, 2012

QUALIFICATIONS AND EXPERIENCE

Mr. Brack participates in field surveys for threatened and endangered species, particularly bats. He has seven years of experience working on both linear and areal projects in the eastern U.S. His experience includes mist netting, identifying, processing, and radio-tracking federally endangered Indiana bats. He assisted with hibernacula surveys in Indiana, Missouri, Kentucky, Alabama, and Tennessee caves, harp trapping and banding, including Indiana and gray bats, in both Indiana and Missouri. Mr. Brack's field experience includes proficiency with the following field techniques:

- Bat processing to determine species, weight, gender, and various measurements
- Mist netting
- Harp trapping
- Portal searches
- Radio-tracking
- Implementation of White Nose Syndrome protocols
- Emergence counts at diurnal roosts

PROJECT EXPERIENCE

Biologist – The U.S. Fish and Wildlife Service division of Alabama in collaboration with University of Tennessee: 2013. Conducted winter hibernacula surveys at Cave Springs Cave and Fern Cave. Assisted with swabbing for white nose syndrome and with counting and identifying gray bats.

Biologist – The Nature Conservancy (Tennessee) in collaboration with Tennessee Wildlife Resources Agency and University of Tennessee: 2013. Conducted winter hibernacula surveys at New Mammoth, Pearson's, and Cooper Creek caves. Assisted with swabbing for white nose syndrome and with counting and identifying Indiana and gray bats.

Biologist – U. S. Fish and Wildlife Service and Missouri Department of Conservation: 2013. Conducted winter hibernaculum survey at a new mine (confidential name and location) and new Indiana bat location. Responsible for bat identification and recording

data as the core member of one of six teams chosen to assist in counting a new pervasive mine in Missouri.

Biologist – Missouri Department of Conservation in collaboration with University of Tennessee: 2013. Conducted winter hibernaculum survey at Great Scott Cave. Assisted with swabbing for white nose syndrome and fungicidal-treatment project.

Biologist – Indiana Department of Natural Resources, Indiana Bat Hibernaculum Surveys: 2013. Conducted winter hibernacula surveys of the Indiana bat at Ray's, Clyfty, Endless, River, Grotto, Coon, Wyandotte, Batwing, Jughole, and Twin Domes caves. Responsible for identifying and photographing hibernating bats and assisting with data collection and recording.

Biologist – The Nature Conservancy (Tennessee) in collaboration with Tennessee Wildlife Resources Agency and University of Tennessee: 2013. Conducted winter hibernacula surveys at East Fork Salt River Cave. Assisted with swabbing for white nose syndrome.

Field Supervisor – American Electric Power, 765kv Transmission Line: 2012. ESI captured one of the very few Indiana bats ever documented in the state of Virginia, including the first in Tazewell County in 2004. Bat boxes and wetland-ponds were created for mitigation purposes in 2008. Completed bat box inspection and repair. Assisted with pond-monitoring including removal of invasive species and documentation of new species. Co-authored technical report.

Biologist – Kentucky Department of Fish and Wildlife Resources in collaboration with University of Tennessee and Bucknell University: 2012. Conducted winter hibernacula surveys at B&O Cave. Assisted with swabbing for white nose syndrome and fungicidal-treatment project.

Biologist – Confidential Client, Wind Resource Area: 2012. Completed acoustic surveys of bats using a combination of detectors on MET towers and ground-based detectors at a site in Huron County, Michigan. Responsible for data analysis.

Biologist – The Nature Conservancy (Tennessee) in collaboration with University of Tennessee and Southern Illinois University: 2012. Conducted visual surveys of bats at Bellamy Cave and assisted with swabbing for white nose syndrome.

Biologist – First Energy: 2012. Conducted wetlands and waterways delineation along 68 miles of electrical transmission line right-of-way in eastern Ohio.

Biologist – Missouri Department of Conservation in collaboration with University of Tennessee and U.S. Army Engineer Research and Development Center: 2012. Conducted fall mist net and harp-trap surveys at Great Scott, Powder-Mill, and Bat caves in Shannon County. Assisted with collection of biological samples including swabbing for white nose syndrome and wing punches.

Field Supervisor – Equitrans, LP, MOME-S005, MOME-S006, Big 190, FOL 39/40, CPT 11, and Big 333 Well Sites: 2012. Completed portal searches and detailed habitat evaluation for eight proposed natural gas well sites in Wetzel Country, West Virginia. Responsible for portal searches including portal assessment and evaluation for potential use by Indiana and Virginia big-eared bats.

Biologist – Confidential Client, Wind Resource Area: 2012. Participated in a mortality study on a site containing 20 turbines along a 3-mile stretch of Backbone Mountain in Garrett County, Maryland. Responsible for Data Analysis.

Assistant Project Manager – EQT NILO S002 and NILO-D001 pipelines: 2012. Assisted in managing project involving detailed habitat assessments and portal searches for suitable small-footed bat habitat for two projects in Elk and McKean counties, Pennsylvania, respectively. Responsible for field team coordination, and client coordination.

Field Supervisor – Sunoco Pipeline, LP Tiffin-Easton Pipeline: 2012. Completed summer mist netting surveys for bats along an 82-mile pipeline project in Seneca, Huron, Ashland, and Wayne counties, Ohio. Responsible for most aspects of project, including field work, field team management and coordination, client coordination, data analysis and reporting.

Field Supervisor – Sunoco Pipeline, LP Fostoria Connection Pipeline: 2012. Completed recon for summer mist netting surveys on a 48-acre site in Wood and Hancock counties, Ohio.

Team Leader – Chesapeake Energy: 2012. Completed summer mist netting surveys for endangered Indiana bats.

Team Leader – Indiana Department of Transportation, Interstate 69, Pre- and Post-construction Surveys: 2011-2012. Conducted summer mist net survey for federally endangered Indiana bat along final ROW for Sections 1, 2, 3, and 5. Multi-year monitoring study of a known Indiana bat maternity colony along a new interstate corridor. Led field team and performed mist netting, Indiana bat capture and radio-transmitter attachment assistance, and diurnal radio-tracking.

Team Leader – American Electric Power, Bonnyman – Soft Shell 138kV Transmission Line: 2012. Conducted portal searches along a 19.6-mile transmission line in Perry and Knott counties, Kentucky.

Team Leader – Confidential Client, Wind Resource Area: 2011. Completed mist netting, acoustic surveys, and telemetry for the federally endangered Indiana bat within a 23,468.7-acre site in Jay and Randolph counties, Indiana. Five Indiana bats were captured, three were radio-tagged and two were tracked to roost trees where emergence counts were conducted.

Team Leader – Confidential Client, Wind Resource Area: 2011. Completed mist netting and acoustic surveys for the federally endangered Indiana bat at 16 sites for a development in Whitley County, Indiana.

Team Leader – Confidential Client, Wind Resource Area: 2011. Completed telemetry studies for the federally endangered Indiana bat for a proposed 40,060-acre wind energy facility in Fayette, Rush and Henry counties, Indiana.

Team Leader – Public Service Electric and Gas, Roseland-Bushkill Transmission Line: 2011. Completed summer mist net survey along 45-mile transmission line corridor in Warren, Sussex, Morris, and Essex counties, New Jersey. Performed mist net site set up, bat handling and processing, and habitat assessments.

Team Leader – Consol Energy, Northern West Virginia RO Water Pipeline: 2011. Completed endangered bat survey along 31.6-mile long waterline in Monongalia, Marion, and Harrison Counties, West Virginia. Led field team and performed mist netting, bat handling and morphometric processing, and bat identification.

Team Leader – Appalachia Midstream Services, LLC, Greene Gathering Phase I: 2011. Completed mist net surveys for the federally endangered Indiana bat along a 9.3-mile natural gas pipeline ROW in Marshall and Wetzel counties, West Virginia. Led field team and performed mist netting, bat handling and morphometric processing, and bat identification.

Team Leader – Indiana Department of Transportation, SR25: 2011. Conducted summer mist net surveys for endangered bats in Carroll County, Indiana.

Team Leader – Duquesne Light Universal, Plum 138 kV Line: 2009. Completed Indiana bat habitat and mist net surveys along a 5.1-mile transmission line in Allegheny County, Pennsylvania. Responsibilities included mist netting, bat handling and morphometric processing, and bat identification.

Team Leader – Mid-Atlantic Express, Sparrows Point LNG Terminal and Pipeline: 2009. Completed endangered bat surveys along 88-mile pipeline in Baltimore, Hartford, and Cecil counties, Maryland and Lancaster and Chester counties, Pennsylvania. Responsible for mist net site set up and habitat assessment, bat identification, and morphometric processing.

Team Leader – Tennessee Gas Pipeline Company 300 Line: 2009. Completed Indiana bat habitat and mist net surveys along 111-mile pipeline in Potter, Tioga, Bradford, Susquehanna, Wayne, Pike, Venango, and McKean counties, Pennsylvania. Performed mist net site set up and habitat assessment, bat identification, and morphometric processing.

Volunteer Field Researcher – Indiana State University. Completed 3 bouts of spring trapping at 2 Priority 1 hibernacula for the Indiana bat, where 100's of bats were caught, including endangered Indiana and gray bats. In addition, little brown, northern, and small-footed bats, currently under status review, were caught.

Field Assistant – TW Philips, Bionol Clearfield Pipeline: 2008. Participated in mist net survey for the endangered Indiana bat associated with a proposed 8-mile pipeline in Clearfield County, Pennsylvania. Assisted with mist net site set up and habitat assessment, and morphometric processing.

Field Assistant – Pennsylvania Turnpike Commission Southern Beltway Project, Interstate 79 to Mon/Fayette Expressway and Interstate 79 to US Route 22: 2008. Participated in endangered Indiana bat mist net surveys along 25 miles of proposed roadway corridor in Allegheny and Washington counties, Pennsylvania. Assisted with mist net site set up and habitat assessment, and morphometric processing.

Field Assistant – Indiana Department of Transportation, State Route 641 Bypass (Phases III and IV): 2008: 2010. Conducted endangered bat surveys along approximately six miles of proposed new roadway in Vigo County, Indiana. Assisted with mist net site set up and habitat assessment, and morphometric processing. One

female Indiana bat (*Myotis sodalis*) was captured and diurnal radio telemetry surveys were completed. Additional studies were conducted in 2010 to resample the areas trapped during the initial survey and yielded four Indiana bats.

Field Assistant – Equitrans, Ranger Pipeline: 2008. Participated in summer mist net survey for the Indiana bat (*Myotis sodalis*) along 36-mile pipeline in Martin County, Kentucky. Assisted with mist net site set up and habitat assessment, and morphometric processing.

Field Assistant – Equitrans, Ranger Pipeline: 2008. Participated in portal searches in Wayne, Mingo and Lincoln counties, West Virginia.

Field Assistant– French Lick Airport: 2007. Participated in Indiana bat mist netting survey on 20 acres of forest edge in Orange County, Indiana. Assisted with mist net site set up, habitat assessment, and morphometric processing.

Field Assistant – Marathon: Dayton-Heath Pipeline: 2007. Conducted bat emergence counts along 110 miles of an existing petroleum pipeline running from Dayton (Montgomery County) to Heath (Licking County) Ohio.

Field Assistant – Confidential Client, Natural Gas Transmission Pipeline: 2007. Participated in portal searches along a 250-mile pipeline running through portions of Ohio, West Virginia, and Pennsylvania.

Field Assistant – American Electric Power, Maytown-Hays Branch 138 kV Transmission Line: 2007. Conducted mist net survey along 8.3-mile 138 kV electric transmission line in Floyd County, Kentucky. Assisted with mist net site set up, habitat assessment, and morphometric processing.

Field Assistant – Big Sandy Pipeline: 2007. Participated in Indiana bat mist netting survey along Equitrans' proposed 68-mile natural gas transmission line in Carter, Lawrence, Johnson, and Floyd counties, Kentucky. In spring 2008, completed roost tree identification, marking, emergence counts.

Field Assistant – USDA-Forest Service, Hoosier National Forest: 2006. Participated in Indiana bat mist netting survey and radio tracking near Celina Lake in the Tell City Ranger District in northeast Perry County, Indiana. Assisted with telemetry studies for Indiana bat.

Field Assistant – GAK Investments: 2006. Participated in Indiana bat mist netting survey on a 199-acre real estate development site in Warren County, New Jersey. Assisted with mist net site set up, habitat assessment, and morphometric processing.

Field Assistant – Ohio Department of Transportation: 2006. Participated in endangered bat surveys along 1.8 miles of existing State Route 534 in Mesopotamia Township, Trumbull County, Ohio. Assisted with mist net site set up, habitat assessment, and morphometric processing.

Field Assistant – Algonquin Ramapo Pipeline Expansion: 2006. Participated in presence/absence mist net survey for the Indiana bat, along approximately 5 miles of existing natural gas pipeline and three associated compressor stations in three counties of New York and New Jersey. Mist netting was conducted from late June to mid July,

and utilized alternative mist netting methods, including non-conductive netting poles, while surveying in proximity to high-tension powerlines.

Field Assistant – Tuxedo Reserve: 2006. Conducted presence/absence mist net survey for the Indiana bat as part of consultation for endangered species on a new housing development 417 acres in Orange and Rockland counties in southeastern New York. Assisted with mist net site set up, habitat assessment, and morphometric processing.

Field Assistant – Confidential Client: 2005. Participated in presence/absence mist net survey for the Indiana bat on an 18-acre real estate development in Hamilton County, Ohio. Assisted with mist net site set up, habitat assessment, and morphometric processing.

Field Assistant – Dominion Gas Transmission, Inc, TL 536 Line: 2005. Participated in endangered bat surveys along 9.29-mile long natural gas pipeline in Potter County, Pennsylvania. Assisted with mist net site set up, habitat assessment, and morphometric processing.

Field Assistant – Dominion Gas Transmission, Inc, TL 453 Line: 2005. Participated in summer mist net survey for endangered bats along a 12-mile natural gas pipeline in Potter County, Pennsylvania. Assisted with mist net site set up, habitat assessment, and morphometric processing.

ENVIRONMENTAL SOLUTIONS & INNOVATIONS, INC.

Résumé

Virgil Brack, Jr., Ph.D.

EDUCATION

Ph.D. Wildlife Ecology, 1983, Purdue University. Dissertation: "The Nonhibernating Ecology of Bats in Indiana with Emphasis on the Endangered Indiana Bat, *Myotis sodalis*."

M.S. Physiological Ecology, 1979, University of Missouri-Columbia. Thesis: "The Duration of the Period of Hibernation in *Eptesicus fuscus*, *Myotis lucifugus*, and *Pipistrellus subflavus* under Natural Conditions."

B.S. Wildlife Sciences, 1975, University of Missouri-Columbia

MBA 1998, Xavier University (Beta Gamma Sigma Honor Society)

PROFESSIONAL CERTIFICATIONS

Certified Wildlife Biologist: The Wildlife Society, 1999

Certified Senior Ecologist: Ecological Society of America, 2007

PROFESSIONAL TRAINING

ODOT NEPA Process Training Course (October 2012)

ODOT Categorical Exclusion Training Class (May 2011)

INDOT and FHWA: NEPA and the Transportation Decision Making Process (March 2011)

INDOT and FHWA: NEPA Categorical Exclusions (March 2011)

ODOT Section 4(f) training (November 2008)

Habitat Conservation Planning for Endangered Species (U.S. Fish and Wildlife Service 2002)

ODOT Categorical Exclusion Training Class (February 2001)

Advanced and Emerging Techniques for Improving NEPA Assessment (USEPA/Colorado State University, 1995)

Federal Projects and Historic Preservation Law: 106 Compliance (General Services Administration, 1995)

Competitive Marketing and Proposal Management (H. Silver & Ass., 1995)

The Endangered Species Act (U.S. Fish and Wildlife Service/CLE International, 1993)

Environmental Regulations (Executive Enterprises, 1993)

Habitat Evaluation Procedures (U.S. Fish and Wildlife Service, 1986)

Wetland Delineation and Functional Value Assessment (Federal Highway Administration, 1985)

QUALIFICATIONS AND EXPERIENCE

Dr. Brack has been assisting clients meet environmental compliance requirements for nearly 35 years. He has experience with many aspects of the natural environment and regulations that affect them. He has completed studies and surveys for bats, small mammals, birds, and a variety of species.

Dr. Brack has extensively studied bats and their habitat. His Master's Thesis was on aspects of winter ecology (hibernation) of bats, and his Ph.D. Dissertation was on the ecology and biology of the endangered Indiana bat. He has designed, directed, and participated in numerous surveys for bats, studies of bat biology, and assessments of summer and winter habitat. Many of these studies have been in Indiana, including work completed for Indiana DNR, U.S. Fish and Wildlife Service, Hoosier National Forest, Crane Naval Surface Warfare Center, and Camp Atterbury National Guard Training Facility.

Dr. Brack is a member of the U.S. Fish and Wildlife Service Recovery Team for the federally endangered Indiana bat. He has also worked extensively with federally endangered gray and Virginia big-eared bats. In addition, he has worked with many species of bats considered endangered or of special concern at state or regional levels. He has a continuing research effort on the ecology of bats. He directed technical development of a "Habitat Suitability Index Model" for components of the summer habitat of the Indiana bat. The habitat model, based on the USFWS Habitat Evaluation Procedures (HEP), has been used to provide baseline analysis for many Biological Assessments (BA) and Biological Opinions (BO) completed under the Endangered Species Act (ESA). For 30 years, Dr. Brack has conducted surveys of Indiana bat hibernacula in Indiana to monitoring wintering populations, and he has conducted winter cave surveys in several other states.

Dr. Brack has completed trapping for small mammals on a variety of projects using snap trap, live traps, and pit fall traps. He has completed small mammal surveys for survey work on nature preserves and to complete baseline information for assessment of project impacts.

Recent and expansive projects with endangered species include: (1) the first large-scale mitigation for loss of summer habitat for the Federally endangered Indiana bat, (2) conservation for the Federally endangered Karner blue butterfly to avoid and minimize incidental take and create/restore suitable habitat to meet long-term needs of the species, and (3) conservation of bald eagles, gray bats, and Indiana bats compatible with on-going and new missions at a major DOD facility.

Notable projects involving endangered species include:

- 90-mile powerline in Virginia and West Virginia, including endangered species surveys and field studies, and a multi-species BA: Indiana bat, Virginia big-eared bat, bald eagle, and four species of plants. Support was provided for an Environmental Impact Statement (EIS).

- Route 33 Realignment in Ohio, including endangered species surveys and field studies, and a multi-species BA for the Indiana bat, bald eagle, American burying beetle, cerulean warbler, and two species of plants. Support was provided for an EIS.
- Production of a BA and support of an EIS for the first large-scale mitigation for loss of summer habitat for the Indiana bat at the Indianapolis International airport. Numerous field studies were completed in support of the project.
- Production of BA and development of conservation measures for Indiana and gray bats on major DOD facilities. BAs were supported by field research as required
- Huron-Manistee National Forest in Michigan including a multi-species Programmatic BA for the Forest Service Management Plan. Species considered included listed, candidate, and petitioned species: Indiana bat, piping plover and its Critical Habitat, cerulean warbler, Massasauga rattlesnake, Karner blue butterfly, American burying beetle, Hungerford's water beetle, and three species of plants

Dr. Brack has completed surveys for birds in shelterbelts in support of the USFWS HEP Shelter Belt model, studied food habits of raptors, created a habitat assessment technique using birds as indicators of habitat quality, assisted in management for game species (including turkey on a game management area), completed habitat surveys for innumerable situations, completed Biological Assessments of federally listed species and Biological Evaluations for regionally sensitive species on U.S. Forest service lands (including field studies as required). He was project principal for two years of field surveys for sensitive species of birds on forest service lands associated with NEPA compliance.

PUBLICATIONS

Most of Dr. Brack's publications are on bats, many are on endangered bats and carry with them issues or management and regulatory compliance, but he also has publications on small mammals, birds, wetlands, fish, and mussels.

Francl, K. E., T. K. Canniff, R. C. Bland, D. W. Sparks, V. Brack, Jr. In Press. Quantifying wing damage of summer bats in the northeastern United States. Journal of the Pennsylvania Academy of Science.

Francl, K. E., W. M. Ford, D. W. Sparks, and V. Brack, Jr. 2012. Capture and reproductive trends of summer bat communities in West Virginia: assessing the impact of white nose syndrome. Journal of Fish and Wildlife Management 3:33-42.

Timpone, J., K. Francl, D. W. Sparks, V. Brack, Jr., and J. Beverly. 2011. Bats of the Cumberland Plateau and Ridge and Valley Provinces, Virginia. Southeastern Naturalist 10:515-528.

Sparks, D. W., K. E. Francl, and V. Brack, Jr. 2011. Indexing at different scales: a response to Reichard et al. Journal of Wildlife Diseases 47:2.

Francl, K. E., C. Bland, J. S. Lucas, and V. Brack, Jr. 2011. Comparison of survey techniques for documenting summer bat communities in Pennsylvania and New Jersey. Journal of the Pennsylvania Academy of Science 85:52-56.

Francl, K., D. W. Sparks, V. Brack, Jr, and J. Timpone. 2011. White-nose syndrome and wing damage index scores among summer bats in the northeastern United States. Journal of Wildlife Diseases 47:41-48.

Brack, V., Jr., D. W. Sparks, J. O. Whitaker, Jr., B. L. Walters, and A. Boyer. 2010. Bats of Ohio. Indiana State University, Center for North American Bat Research and Conservation. Publication Number 4.

Willis, C. K. R., R. M. R. Barclay, J. G. Boyles, R. M. Brigham, V. Brack Jr., D. L. Waldien, and J. Reichard. 2010. Bats are not birds and other problems with Sovacool's (2009) analysis of animal fatalities due to electricity generation. Energy Policy 38:2067–2069

Brack, V., Jr. In press. Food habits and foraging ecology of the Indiana bat, *Myotis sodalis*. Northeastern Naturalist.

Meretsky, V. J., V. Brack, Jr., T. C. Carter, R. Clawson, R. R. Currie, T. A. Hemberger, C. J. Herzog, A. C. Hicks, J. A. Kath, J. R. MacGregor, A. R. King, and D. H. Good. 2010. Digital photography improves consistency and accuracy of bat counts in hibernacula. Journal of Wildlife Management.

Willis, C. K. R., J. W. Jameson, P. A. Faure, J. G. Boyles, V. Brack Jr., and T. H. Cervone. 2009. Thermocron iButton and iBBat temperature dataloggers emit ultrasound. Journal of Comparative Physiology B.

Brack, V., Jr. 2009. Summer bats of Potter and McKean counties, Pennsylvania and adjacent Cattaraugus County, New York. Journal of the Pennsylvania Academy of Science 83:17-23.

Boyles, J. G., and V. Brack, Jr. 2009. Modeling survival rates of hibernating mammals with individual-based models of energy expenditure. Journal of Mammalogy 90:9-16.

Jeffcott, D., and V. Brack, Jr. 2008. Anomalous Coloring of a Big Brown Bat, *Eptesicus fuscus*. Bat Research News 40:89-91.

Boyles, J. G., J. J. Storm, and V. Brack, Jr. 2008. Thermal benefits of clustering during hibernation: a field test of competing hypotheses on *Myotis sodalis*. Functional Ecology 22:632-636.

Boyles, J. G., M. B. Dunbar, J. J. Storm, and V. Brack, Jr. 2007. Energy availability influences microclimate selection of hibernating Bats. Journal of Experimental Biology: 210:4345-4350.

Brack, V., Jr. 2007. Temperatures and locations used by hibernating bats, including the endangered Indiana bat (*Myotis sodalis*), in a limestone mine. Environmental Management 40:739-746.

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Brack, V., Jr., V. R. Holmes, T. T. Cable, and G. K. Hess. 1987. A wetland habitat assessment using birds. Proceedings of the Symposium Coastal and Ocean Management 5:1155-1169.

PUBLICATIONS IN SUBMISSION

McGuire, M. A., V. Brack, Jr., J. O. Whitaker, Jr., and D. W. Sparks. Indiana bats and roadways: size does matter. Submitted To: Biological Conservation. Significance: Demonstrates that the frequency with which Indiana bats cross roads is correlated with the size of the road.

ENVIRONMENTAL SOLUTIONS & INNOVATIONS, INC.

Résumé

Shane Justin Tyler Brodnick

EDUCATION

B.S., Wildlife and Fisheries Resources, West Virginia University, 2012
Associate, Wildlife Management, Hocking College, 2010

QUALIFICATIONS AND EXPERIENCE

Mr. Brodnick has served as a field assistant on numerous wildlife research activities. His field experience includes bat handling, implementation of White Nose Syndrome protocols and proficiency with the following equipment and techniques:

- Bat processing to determine species, weight, gender, and various measurements
- Mist netting
- Radio-telemetry, including foraging / home range, roost searches, and emergence counts
- Acoustic monitoring
- Habitat suitability assessment
- Identification and classification of plant, avian, mammal, reptile, amphibian, and aquatic species

PROJECT EXPERIENCE

Team Leader – Williams Ohio Valley Midstream Pipeline: 2012. Completed summer mist-netting along a 30-mile pipeline project in Washington County, Pennsylvania. Performed mist net site set up, bat handling, and morphometric processing.

Field Assistant – M3 Midstream 9000 Pipeline: 2012. Performed summer mist netting and completed portal surveys for the federally endangered Indiana bat along a 7-mile pipeline and associated access roads in Harrison County, West Virginia. Performed mist net site set up, bat handling, and morphometric processing.

Field Assistant – M3 Midstream Reliance Pipeline: 2012. Performed summer mist netting and completed portal surveys for the federally endangered Indiana bat along a 5.5-mile pipeline in Monongalia and Marion counties, West Virginia. Performed mist net site set up, bat handling, and morphometric processing.

Field Assistant – Aston Loop 138 kV Line: 2012. Performed summer mist netting and completed portal surveys for the federally endangered Indiana bat along a 1.3-mile transmission line and associated access roads in Marshall County, West Virginia. Performed mist net site set up, bat handling, and morphometric processing.

Biologist – Consol Pennsylvania Coal Company, Bailey Mine: 2011 and 2012. Completed summer mist net survey in support of ongoing monitoring for the federally endangered Indiana bat maternity colony in Greene County, Pennsylvania. Captured and identified Indiana bats under the direct and on-site supervision of Jason Duffey and performed radio-transmitter attachment, diurnal roost and foraging radio-telemetry, and roost emergence studies.

Field Assistant – Indiana Department of Transportation, Interstate 69 Sections 1-3 Pre- and During-construction Indiana Bat Monitoring: 2012. Participated in a multi-year monitoring study of a known Indiana bat maternity colony along a new interstate corridor. Assisted team leader and performed mist netting and under the direct and on-site supervision of Andrew Kniowski assisted with Indiana bat capture and radio-transmitter attachment assistance, diurnal radio-tracking, and roost emergence studies.

Biologist – American Electric Power, Sand Hill-Wharton Hill 138kV Transmission Line: 2011. Completed bat habitat assessments and portal searches along a proposed 7-mile transmission line and associated access roads in Marshall County, West Virginia. Performed mist net site set up, bat handling, and morphometric processing.

Field Assistant – M3 Midstream Appalachia Pipeline: 2011. Completed mist net surveys for the federally endangered Indiana bat along a 130-mile natural gas pipeline ROW in Monongalia and Marion counties, West Virginia. Performed mist net site set up, bat handling, and morphometric processing.

Field Assistant – Consol Energy, Northern West Virginia RO Water Pipeline: 2011. Completed endangered bat survey along 31.6-mile long waterline in Monongalia, Marion, and Harrison Counties, West Virginia. Performed mist net site set up, bat handling, and morphometric processing.

Field Assistant – Appalachia Midstream Services, LLC, Greene Gathering Phase I: 2011. Completed mist net surveys for the federally endangered Indiana bat along a 9.3-mile natural gas pipeline ROW in Marshall and Wetzel counties, West Virginia. Performed mist net site set up, bat handling, and morphometric processing.

Field Assistant – Chief Gathering Natural Gas Pipeline: 2011. Completed summer mist net survey, portal search, and small-footed bat habitat survey along 30.1-mile pipeline in Luzerne and Wyoming counties, Pennsylvania. Performed mist net site set up, bat handling, and morphometric processing. Performed radio-telemetry of eastern small-footed bats captured while mist netting.

Field Assistant – Department of Defense, Fort Drum Army Installation: 2010. Completed Indiana bat mist net and radio-telemetry surveys in Jefferson and Lewis counties, New York. Performed mist net site set up, habitat assessments, bat handling, morphometric processing, diurnal roost radio-telemetry, and roost emergence counts.

Field Assistant – Paramont Virginia Coal Company, LLC, Kiwanis Park Surface Mine: 2010. Completed endangered bat surveys in in Dickenson County, Virginia. Assisted with mist net site set up, bat handling, and morphometric processing.

Field Assistant – Clintwood Elkhorn Mining Company, Spring Branch Surface Mine: 2010. Conducted summer mist net surveys for endangered bats on a 285-acre mine

site in Buchanan County, Virginia. Assisted with mist net site set up, bat handling, and morphometric processing.

Field Assistant – Equitrans, LP, Sunrise Pipeline: 2010. Conducted Indiana bat summer mist net survey in Greene County, Pennsylvania, and Doddridge, Marion, Harrison, and Taylor and Wetzel counties, West Virginia. Assisted with mist net site set up and morphometric processing.

Field Assistant – The Conservation Fund: 2009. Collected data for AnaBat studies in nine states across the range of the Indiana bat. Studies included examination of species distribution in potentially impacted areas and forest condition surveys. Performed AnaBat site reconnaissance, landowner interactions, habitat assessments, equipment deployment/retrieval, and data downloading and organization.

Field Assistant – Tennessee Gas Pipeline Company, 300 Line: 2009. Participated in an endangered bat presence/absence mist net survey for a 120-mile natural gas pipeline looping project in Pennsylvania and New Jersey. Assisted with mist net site set up, bat handling and identification, and morphometric processing.

ENVIRONMENTAL SOLUTIONS & INNOVATIONS, INC.

Résumé

L. Michelle Gilley

EDUCATION

Ph.D., Biology, Auburn University, In progress
M.S., Biology, University of Memphis, 2002
B.S., Wildlife Science, Auburn University, 1995

QUALIFICATIONS AND EXPERIENCE

Ms. Gilley is entering her fourteenth year of working as a wildlife biologist, with a majority of the field time spent in the study of bats. Her Master's thesis incorporated a study of bats on a military facility, and she has been involved in several collecting trips to Mexico for bats and other small mammals. Ms. Gilley has worked on private ROW corridor developments, U.S. Forest Service lands, DoD facilities, Federal Highway Administration, and state DOT projects. In addition to her experience with bats, she has completed other field studies, including surveys for endangered species and their habitat along pipeline rights-of-way, wetland delineation along ROWs, and habitat characterization aided by Global Position Systems (GPS). She is proficient in a variety of field techniques, including radio telemetry.

Ms. Gilley's Master's thesis incorporated a survey of eastern woodrats on a military facility, and she has conducted research on rodents and bats in both the United States and Mexico. Recently, she has been involved in surveying the mammals of Alabama in cooperation with Dr. Troy Best of Auburn University. Since 2003 these efforts include live-trapping for both eastern and Allegheny woodrats.

PROJECT EXPERIENCE

Field Supervisor – Global Geophysical Services Rolling Rock 3-D Seismic Survey: 2010. 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.

Field Supervisor – 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.

Field Supervisor– 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.

Field Supervisor – 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.

Field Supervisor – 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.

Field Supervisor – 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.

Field Supervisor – Department of Defense, Fort Drum Military Intallation. 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 bats, radio telemetry, and bat box monitoring at Indianapolis International Airport.

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.

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

PUBLICATIONS

Hopkins, H. L., C. Sánchez-Hernández, M. L. Romero-Almarez, 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., 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.

PROFESSIONAL AFFILIATIONS

American Society of Mammalogists (since 2003)
Southeastern Bat Diversity Network (since 2003)
Southwestern Association of Naturalists (since 1999)
The Wildlife Society

- Tennessee Chapter (since 1999)

- Alabama Chapter (1995)

Tri Beta Biological Honor Society (since 1995)

ENVIRONMENTAL SOLUTIONS & INNOVATIONS, INC.

Résumé

Amanda F. Janicki

EDUCATION

Ph.D., Ecology and Evolutionary Biology, University of Tennessee, In progress
M.S., Biology, Missouri State University, 2010. Thesis: "Effects of White-Nose Syndrome on Winter Energetics of Little Brown Bats (*Myotis lucifugus*)"
B.S., Biology, Susquehanna University, 2008.

QUALIFICATIONS AND EXPERIENCE

Ms. Janicki is a wildlife biologist involved in a variety of terrestrial ecology research projects and has extensively studied bats and their habitat for over six years. While completing her undergraduate degree at Susquehanna University, she participated in a project involving summer trapping and pit tagging of little brown bats at a barn in Selinsgrove, Pennsylvania. She also completed a project in the Nantahala National Forest, North Carolina involving trapping and radio tracking Indiana bats to learn more about the effects of different logging techniques on the species and its habitat. Ms. Janicki got involved in White-Nose Syndrome bat research for her master's degree at Missouri State University. Her research led her to compare the metabolic rates and blood samples of little brown bats from Williams Lake Hotel mine in New York, Woodward Cave in Pennsylvania, and Brooks Cave in Missouri to better understand how the disease kills affected bats. While in Missouri, she also assisted the Missouri Department of Conservation to complete bat fall swarming counts and winter hibernacula census counts at sites used by Indiana and gray bats.

Ms. Janicki is experienced in many ecological field techniques, including: species identification, habitat assessment, trapping, netting, radio-telemetry and tracking, acoustic sampling and analysis, and the collection of wing punches, blood, and fecal samples.

She is an experienced public speaker, having taught university-level courses, and presented numerous technical papers to professional organizations such as the American Society of Mammalogists, the North American Society for Bat Research, the Pennsylvania Chapter of the Wildlife Society, the Southeastern Bat Diversity Network, the National Council on Undergraduate Research, and the Northeast Bat Working Group. Much of her public speaking is on the topic of White Nose Syndrome and she is completing her PhD on the subject at the University of Tennessee. She recently assisted the Tennessee Wildlife Resources Agency to monitor Indiana and gray bat hibernacula for the spread of White-Nose Syndrome.

PROJECT EXPERIENCE

Team Leader – 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. Performed mist net site reconnaissance, site set up, habitat assessment, bat handling and identification, and morphometric processing.

Biologist – Indiana Department of Transportation, Interstate 69, Pre- and Post-construction Surveys: 2012. Conducted summer mist net survey for federally endangered Indiana bat along final ROW for Section 5 in Morgan and Monroe counties, Indiana. Performed mist net site reconnaissance, site set up, habitat assessment, bat handling and identification, and morphometric processing.

Biologist – Confidential Client: 2011. Conducted summer bat mist net pre-construction surveys for proposed wind turbine sites.

Laboratory Assistant – Smithsonian Institution: 2009. Assisted with analysis of wing damage in connection with White-Nose Syndrome research.

Research Assistant – Missouri State University: 2008-2010. Assisted with project to compare metabolic rates of little brown bats in New York, Pennsylvania, and Missouri and the relationship to White-Nose Syndrome.

Field Assistant – Missouri State University and U.S. Forest Service: 2008. Conducted summer mist netting for bats in Mark Twain National Forest in the Ava Ranger District, Missouri.

Biologist – Susquehanna University: 2007- 2008. Developed an independent research project on the effect of body mass on the emergence time of little brown bats at a maternity colony.

Field Assistant – Southeastern Bat Diversity Network: 2007-2011. Conducted summer mist netting for bats in Cherokee National Forest, Tennessee; Bankhead National Forest, Alabama; Mark Twain National Forest, Missouri; Chattahoochee National Forest, Georgia; and Pisgah National Forest, North Carolina.

Field Assistant – Clemson University and U.S. Forest Service: 2007. Conducted mist netting, radio-telemetry, and acoustic monitoring for bats in Nantahala National Forest, North Carolina.

Biologist – University of Kansas Neotropical Bat Ecology program: 2007. Assisted with project in Costa Rica to analyze emergence times in 33 neotropical bat species.

Field Assistant – Pennsylvania Trappers Association Coyote Hunt: 2007 and 2008. Collected coyote stomachs and assisted with analysis of stomach contents to determine the animals' diet.

Research Assistant – Susquehanna University: 2006-2008. Assisted with project involving trapping and surveying vertebrates in Shikellamy State Park and PP & L Montour Preserve, Pennsylvania.

TEACHING EXPERIENCE

Graduate Assistant – University of Tennessee: 2010-present. Taught several courses including Humankind in the Biotic World lab, Biodiversity lab and Human Anatomy lab.

Graduate Assistant – Missouri State University: 2008-2010. Taught three sections of Principles of Biological Science lab.

PUBLICATIONS

Janicki, A. F. 2008. Does Fatness Matter? The Effect of Body Mass on the Emergence Time of Little Brown Bats (*Myotis lucifugus*) at a Maternity Colony in Central Pennsylvania *in* Proceedings of The National Conference on Undergraduate Research 2008.

PRESENTATIONS

Janicki, A. F., J. Caddle, J. Cooper, T. Guldan, S. Haque, and P. Armsworth. Modeling a Theoretical "Cleaning" Agent for White-Nose Syndrome at 2011 White-Nose Syndrome Symposium, Little Rock, AR (May 17-19, 2011)

Janicki, A. F. and T. E. Tomasi. What Does the Body Condition of Little Brown Bats (*Myotis lucifugus*) reveal about White-Nose Syndrome? at 90th American Society of Mammalogists Annual Meeting, University of Wyoming, Laramie, WY (June 11-15, 2010)

Tomasi, T. E. and A. F. Janicki. White-Nose Syndrome and Winter Energetics of Little Brown Bats at 2010 White-Nose Syndrome Symposium, Pittsburgh, PA (May 25-27, 2010)

Janicki, A. F. Winter Energetics of Little Brown Bats (*Myotis lucifugus*) Affected by White-Nose Syndrome Thesis Defense, Missouri State University, Springfield, MO (April 19, 2010)

Janicki, A. F. and T. E. Tomasi. One Piece of the White-Nose Syndrome Puzzle: Torpid Metabolic Rates of *Myotis lucifugus* at 39th North American Society for Bat Research, Portland, OR (November 4-7, 2009)

Janicki, A. F. and T. E. Tomasi. The Effect of White-Nose Syndrome on Torpid Metabolic Rates of *Myotis lucifugus* at 89th American Society of Mammalogists Annual Meeting, University of Alaska, Fairbanks, AK (June 24-28, 2009)

Janicki, A. F. and T. E. Tomasi. Energetics of Little Brown Bats (*Myotis lucifugus*) with White-Nose Syndrome at PA Chapter of the Wildlife Society, Penn State University, State College, PA (March 28, 2009)

Janicki, A. F. Summer and Winter Energetics of Little Brown Bats (*Myotis lucifugus*) Affected by White-Nose Syndrome at a biology department senior seminar at Susquehanna University, Selinsgrove, PA (March 20, 2009)

Janicki, A. F. and T. E. Tomasi. Does White-Nose Syndrome Affect Summer Energetics of *Myotis lucifugus*? at Southeastern Bat Diversity Network Annual Meeting, Arkansas State University, Jonesboro, AR (February 12-13, 2009)

Janicki, A. F. and T. E. Tomasi. Summer Energetics of *Myotis lucifugus* in Areas Affected and Unaffected with White-Nose Syndrome at 38th North American

Symposium for Bat Research, University of Scranton, Scranton, PA (October 22-25, 2008)

Janicki, A. F. and C. A. Iudica. Emergence Time of *Myotis lucifugus*: Effect of Body Mass and Climatic Conditions at 88th American Society of Mammalogists Annual Meeting, South Dakota State University, Brookings, SD (June 22-25, 2008)

Janicki, A. F. and C. A. Iudica. Does Fatness Matter? The Effect of Body Mass on the Emergence Time of Little Brown Bats (*Myotis lucifugus*) at a Maternity Colony in Central Pennsylvania at The National Council on Undergraduate Research, Salisbury University, Salisbury, MD (April 10-12, 2008)

Janicki, A. F. and C. A. Iudica. Factors Impacting Emergence Time of Little Brown Bats (*Myotis lucifugus*) at a Maternity Colony in Central PA at Joint Meeting of Northeast Bat Working Group and Southeastern Bat Diversity Network, Virginia Tech, Blacksburg, VA (Feb 20-22, 2008)

Janicki, A. F. Really, You Are As Blind As a Bat? Too Bad Bats Are Not Blind at a weekly group meeting at the Town of Pittsford VanHuysen Senior Center, Pittsford, NY (Dec 18, 2007)

Janicki, A. F. and C. A. Iudica. Documented Color Abnormality on Pelage of the Northern Short-tailed Shrew (*Blarina brevicauda*) in Montour County, PA at Seeking Common Ground Along the Susquehanna, Bucknell University, Lewisburg, PA (Sept 29, 2007)

Janicki, A. F., S. M. Khalafalla, C. E. Veeck, and C. A. Iudica. Data From the 1st Year of a Long Term Ecological Study of Terrestrial Vertebrates from the Susquehanna River Basin at Seeking Common Ground Along the Susquehanna, Bucknell University, Lewisburg, PA (Sept 29, 2007)

Janicki, A. F. and C. A. Iudica. A Long Term Ecological Study of Mammals in Central Pennsylvania: the 1st Year Survey at 87th American Society of Mammalogists Annual Meeting, University of New Mexico, Albuquerque, NM (June 5-10, 2007)

Iudica, C. A. and A. F. Janicki. Albinistic Northern Short-Tailed Shrew (*Blarina brevicauda*) in Montour County, PA at 87th American Society of Mammalogists Annual Meeting, University of New Mexico, Albuquerque, NM (June 5-10, 2007)

Janicki, A. F. and C. A. Iudica. What Terrestrial Vertebrates Do We Have Out There? A Methodology for Monitoring Biodiversity at From the Branches of Confluence: The Upper Susquehanna River Basin and its Communities Conference, Bucknell University, Lewisburg, PA (Sept 23, 2006)

Janicki, A. F. and C. A. Iudica. A Long Term Ecological Study of Terrestrial Vertebrates in Central Pennsylvania at 86th American Society of Mammalogists Annual Meeting, University of Massachusetts, Amherst, MA (June 18-21, 2006)

HONORS AND AWARDS

University of Tennessee Graduate Assistantship (Fall 2010 – present)
Missouri State University Graduate Interdisciplinary Forum best poster (Spring 2009)
Missouri State University Graduate Assistantship (Fall 2008 – Spring 2010)

Susquehanna University Dean's List (all semesters) and National Dean's List (Spring 2006, 2007)
Susquehanna University Selected Profile Video (posted Fall 2006)
Member of ΣΑπ National Society of Leadership and Success (Fall 2007 – present)
Member of Beta Beta Beta Biology Honor Society (Fall 2005 – present)
Susquehanna University Scholarship for Distinguished Achievement in Science and Mathematics Recipient (Fall 2004 – Spring 2008)
Wildlife Highest Score in Monroe County' NY Envirothon (2002, 2003, 2004)

PROFESSIONAL AFFILIATIONS

North American Society for Bat Research – member (2008 – present) and student representative of the NASBR Board of Directors (2010 – 2011)
American Society of Mammalogists – member and participant in Membership and Resolutions Committees (2006 – present)

ENVIRONMENTAL SOLUTIONS & INNOVATIONS, INC.

Résumé

David Jeffcott

QUALIFICATIONS AND EXPERIENCE WITH BATS

Mr. Jeffcott has been a wildlife biologist with ESI and participated in field surveys for threatened and endangered species for ten years. He has worked on various development projects in the eastern U.S. and has experience in mist netting, and identifying, processing, and radio-tracking federally endangered Indiana bats. Mr. Jeffcott has served on survey teams for both small and large projects, including the Indiana DNR's Habitat Conservation Plan and the Indianapolis to Evansville I-69 expressway project. His participation in the I-69 project included bat capture, radio-tagging, tracking, and emergence counts at diurnal roosts. He also participated in winter surveys for bats in caves along the proposed I-69 ROW.

Mr. Jeffcott's field experience includes bat handling, identification and proficiency with the following equipment and techniques:

- Bat processing to determine species, weight, gender, and various measurements
- Mist netting
- Harp trapping
- Habitat suitability assessment
- Roost tree identification
- Ultrasound detectors
- Spring/autumn cave/mine (hibernacula) entrance surveying
- Summer bat surveys
- Winter Hibernacula surveys

PROJECT EXPERIENCE

Field Supervisor – Williams Ohio Valley Midstream Pipeline: 2012. Completed summer mist-netting along a 30-mile pipeline project in Washington County, Pennsylvania.

Team Leader – 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.

Biologist – First Energy, Glenwillow Transmission Line: 2012. Completed wetland and waterway delineations for a 75-mile electrical transmission line right-of-way in northeastern Ohio.

Field Supervisor – Indiana Department of Transportation, Interstate 69 Environmental Studies: 2012. Completed summer netting surveys and radio-telemetry studies of microhabitat use by the Indiana bat along the interstate corridor in Indiana.

Field Supervisor – American Electric Power, Beaver Creek-Hazard 138 kV transmission line: 2012. Completed portal searches along a 30-mile transmission line in Perry, Knott, and Floyd counties, Kentucky.

Field Supervisor – MarkWest Liberty Midstream & Resources Mobley to Sherwood Pipeline: 2012 Completed portal search along a 30-mile natural gas pipeline in Doddridge and Wetzel counties, West Virginia.

Field Supervisor – Confidential Client, Natural Gas Transmission Pipeline: 2012. Conducted summer and winter habitat assessments for the endangered Indiana bat along a 350-mile pipeline running through portions of West Virginia and Pennsylvania.

Field Supervisor – CNX Gas Company, LLC, Tygart Valley Pipeline: 2012. Completed portal searches along a 33-mile pipeline in Upshur and Barbour counties, West Virginia.

Field Supervisor – American Electric Power, Bonnyman – Soft Shell 138kV Transmission Line: 2011 and 2012. Conducted portal searches, acoustic sampling, and summer mist netting along a 19.6-mile transmission line in Perry and Knott counties, Kentucky.

Field Supervisor – Confidential Client, Wind Resource Area: 2011. Completed mist netting and acoustic surveys for the federally endangered Indiana bat in Whitley County, Indiana.

Field Supervisor – Paramont Coal Company, Black Bear #1 Surface Mine: 2011. Completed mist net surveys for the federally endangered Indiana bat in Dickenson County, Virginia.

Field Supervisor – Confidential Client, Wind Resource Area: 2011. Completed mist netting, acoustic surveys, and telemetry for the federally endangered Indiana bat within a 23,468.7-acre site in Jay and Randolph counties, Indiana.

Field Supervisor – ANR Pipeline Company- Interstate 269 Pipeline Relocation: Completed endangered bat survey along 0.7-mile pipeline ROW in Fayette and Shelby counties, Tennessee.

Field Supervisor – Forest Preserve District of Kane County: 2011. Completed summer bat mist net and acoustic surveys at four forest preserves in Kane County, Illinois.

Field Supervisor – American Electric Power, Mayo Trail Extension: 2011. Conducted Indiana bat spring portal searches, portal emergence counts, acoustic monitoring, and summer mist netting on a proposed 1.2-mile 69 kV transmission line in Johnson County, Kentucky.

Field Supervisor – Confidential Client, Wind Resource Area: 2011. Completed summer mist net surveys within a 19,926-acre site in Seneca and Crawford counties, Ohio.

Field Supervisor – Confidential Client, Wind Resource Area: 2011. Completed summer mist net surveys within an 8151-acre site in Darke County, Ohio.

Field Supervisor – American Electric Power, Sand Hill-Wharton Hill 138kV Transmission Line: 2011. Completed bat habitat assessment and portal searches along a new 7-mile transmission line and associated access roads in Marshall County, West Virginia.

Field Supervisor – Chief Gathering Natural Gas Pipeline: 2011. Completed summer mist net survey, portal search, and small-footed bat habitat survey along 30.1-mile pipeline in Luzerne and Wyoming counties, Pennsylvania.

Field Supervisor – American Electric Power, Fleming to Freemont Transmission Line Rebuild: 2010-2011. Performed portal searches, habitat assessments, and mist netting on two transmission line upgrade segments in Wise and Dickenson counties, Virginia.

Field Supervisor – Clintwood Elkhorn Mining Company, Spring Branch Surface Mine: 2010. Conducted summer mist net surveys for endangered bats on a 285-acre mine site in Buchanan County, Virginia.

Field Supervisor– American Electric Power and U.S. Department of Energy, Mountaineer CCS II, CO_2 Pipeline and Injection Well Sites: 2010. Conducted summer mist net survey for federally endangered Indiana bat for a CO_2 transport and injection project in Mason County, West Virginia. Responsible for mist net site set up and habitat assessment, bat identification, morphometric processing and implementation of White Nose Syndrome protocols.

Field Supervisor – American Electric Power, Middle Creek 46 kV to 138 kV Upgrade: 2010. Conducted federally endangered Indiana bat surveys and portal searches along a 6.33 mile long transmission ROW in Floyd County, Kentucky. Responsible for mist net site set up and habitat assessment, bat identification, morphometric processing and implementation of White Nose Syndrome protocols.

Field Supervisor – Paramont Virginia Coal Company, LLC, Kiwanis Park Surface Mine: 2010. Completed endangered bat surveys in in Dickenson County, Virginia. Responsible for mist net site set up and habitat assessment, bat identification, morphometric processing and implementation of White Nose Syndrome protocols.

Field Supervisor – American Electric Power, Mayo Trail - West Paintsville 69 kV Line: 2010. Conducted federally endangered Indiana bat surveys and portal searches along a 1.86-mile transmission line in Johnson County, Kentucky. Responsible for mist net site set up and habitat assessment, bat identification, morphometric processing and implementation of White Nose Syndrome protocols.

Field Supervisor – Columbia Transmission LLC, Line 1278 – Line K Pipeline Replacement: 2010. Conducted endangered bat surveys along a 17-mile natural gas pipeline replacement in Pike County, Pennsylvania and Orange County, New York. Responsible for mist net site set up and habitat assessment, bat identification, morphometric processing and implementation of White Nose Syndrome protocols.

Team Leader – Equitrans, LP, Sunrise Pipeline: 2010. Conducted Indiana bat summer mist net survey in Greene County, Pennsylvania, and Doddridge, Marion, Harrison, and Taylor and Wetzel counties, West Virginia. Responsible for mist net site set up and

habitat assessment, bat identification, morphometric processing and implementation of White Nose Syndrome protocols.

Biologist– Global Geophysical Services Rolling Rock 3-D Seismic Survey: 2010. Assisted with rare plant surveys and habitat assessments in Fayette County, Pennsylvania.

Team Leader – Wells Prairie Wind Project: 2010. Conducted acoustic studies for endangered bats on a 61,256-acre, 300-megawatt wind energy generation facility in Wells, Adams, Blackford, and Jay counties, Indiana.

Field Supervisor – American Electric Power, Beaver Creek - Hazard 138 kV Relocation (Leeco): 2010. Conducted a habitat assessment and mist net survey for federally endangered Indiana bat along 1.4 miles of ROW for a power line relocation in Perry County, Kentucky. Responsible for mist net site set up and habitat assessment, bat identification, morphometric processing and implementation of White Nose Syndrome protocols.

Field Supervisor – Entergy James A. FitzPatrick Nuclear Power Plant: 2009. Completed fieldwork for Indiana bat habitat evaluation for expanding nuclear facility in Oswego County, New York.

Team Leader – Tennessee Gas Pipeline Company, 300 Line: 2009. Completed portal trapping and net site reconnaissance along a 120-mile natural gas pipeline looping project in Passaic and Sussex counties, New Jersey. Also 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.

Team Leader – Paramont Coal Company, Dry Fork and Cabin Ridge Surface Mines: 2009. Completed summer mist net surveys for endangered bats in Wise (Dry Fork) and Dickenson (Cabin Ridge) counties, Virginia. Responsible for mist net site set up and habitat assessment, bat identification, morphometric processing and implementation of White Nose Syndrome protocols.

Team Leader – Paramont Coal Company, Doe Branch Surface Mine: 2009. Completed abandoned mine portal searches and summer mist net surveys for endangered bats in Dickenson County, Virginia. Responsible for mist net site set up and habitat assessment, bat identification, morphometric processing and implementation of White Nose Syndrome protocols.

Field Supervisor – Fola Coal Company, Tomahawk Surface Mine: 2009. Completed federally endangered Indiana bat summer mist net survey in Nicholas County, West Virginia. Responsible for mist net site set up and habitat assessment, bat identification, morphometric processing and implementation of White Nose Syndrome protocols.

Field Supervisor – Consol Pennsylvania Coal Company, Bailey Mine: 2008, 2009. Environmental inspections to investigate effects of overland conveyor belt and associated facilities on the federally endangered Indiana bat in Greene County, Pennsylvania. Responsibilities included confirming project activities did not impact

known day roosts and providing oversight to spill prevention and sediment and erosion control programs.

Field Supervisor – Chief Gathering, Poor Shot Natural Gas Pipeline: 2009. Completed Indiana bat winter habitat assessment and summer mist net survey along 10-mile natural gas pipeline right-of-way in Lycoming County, Pennsylvania.

Biologist – Chestnut Flats Wind, LLC Wind Farm: 2008. Participated in endangered northeastern bulrush surveys for a project involving the construction of all aspects of a wind farm including clearing/grubbing and the subsequent construction of concrete pads, towers, access roads, buried cable lines, an overhead transmission line and an electrical substation near Altoona, Blair, and Cambria counties, Pennsylvania.

Biologist – Equitable Resources, Amity Pipeline: 2008. Assisted with plant survey for leaf-cup, gray-headed prairie coneflower, and mistflower along 12-mile pipeline corridor in Greene and Washington counties, Pennsylvania.

Biologist – Columbia Gas Line O-1821: 2008. Participated in potential roost tree marking along approximately 3.1 miles of pipeline ROW in Guernsey County, Ohio.

Biologist – Equitrans, Ranger Pipeline: 2008. Participated in summer mist net survey for the Indiana bat (*Myotis sodalis*) in Martin County, Kentucky.

Biologist – Confidential Client, Treated Effluent Line: 2008. Team leader for summer mist net survey for endangered Indiana bat for a proposed 10-mile pipeline in Stark County, Ohio. Efforts included mist netting, bat handling and morphometric processing, bat identification, and implementation of White Nose Syndrome protocols.

Biologist – Consol Pennsylvania Coal Company, Bailey Mine: 2008. Participated in field survey activities related to production of a Biological Assessment Evaluation to investigate effects of overland conveyor belt and associated facilities on the federally endangered Indiana bat in Greene County, Pennsylvania.

Biologist – Columbia Gas, Ohio Storage Expansion: 2008. Led field team to conduct a survey for Indiana bats and their potential roosting habitat in two separate natural gas storage fields in Ohio.

Field Assistant – Confidential Client, Natural Gas Transmission Pipeline: 2008. Assisted with threatened/endangered plant survey along a 250-mile pipeline running through portions of Ohio, West Virginia, and Pennsylvania. Also served as team leader for endangered bat survey. Efforts included mist netting, bat handling and morphometric processing, bat identification, and implementation of White Nose Syndrome protocols.

Biologist – Equitrans, Big Sandy Pipeline: 2007. Conducted Indiana bat habitat assessment along proposed 68-mile natural gas transmission line in Carter, Lawrence, Johnson, and Floyd counties, Kentucky.

Biologist – Department of Defense, Fort Drum Army Installation: 2007. Facility-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

conducting mist net sampling, identifying captured bats, and assessing habitat at net sites.

Biologist – Indiana Department of Transportation: 2007. Participated in study of Route 42 bridge over Cataract Lake in Owen County, and Route 62 bridge over Wabash River in Posey County, Indiana to determine use by bats.

Biologist – American Electric Power 138 kV Transmission Line: 2007. Assisted with endangered bat mist net survey, AnaBat and portal searches along an 8.3-mile electric transmission line ROW in Floyd County, Kentucky

Biologist – Columbia Gas, Eastern Market Pipeline Expansion: 2007. Participated in Indiana bat habitat assessment and abandoned mine portal search along 10 miles of natural gas pipeline and 24 well sites in Ohio and West Virginia.

Biologist – Columbia Gas Line O-1821: 2007. Participated in endangered bat survey along approximately 3.1 miles of pipeline ROW in Guernsey County, Ohio.

Biologist – Rockford Homes. 2007. Participated in mist net survey for the endangered Indiana bat on an 8.8-acre woodlot and associated fencerows associated with a proposed residential housing development.

Biologist – Summerfields at Franklin. 2007. Assisted with a mist net survey to determine the presence/absence of the endangered Indiana bat on 17.7 acres of a 176-acre proposed residential housing development site.

Biologist – American Electric Power Amos Plant: 2006. Indiana bat Habitat Assessment for a power plant expansion project in Putnam County, West Virginia: Conducted roost tree surveys to determine the presence of potential roost trees within the affected area. Trees likely to provide potential roosting habitat were observed to determine whether bats were currently using them. Also completed numerous sample plots within a 2.5-mile radius of the project site to verify habitat composition. Data were used to prepare a Biological Assessment.

Biologist – Eagle Ridge Townhouses: 2006. Conducted endangered bat radio-telemetry survey for a proposed 105-acre townhouse development associated with Fort Drum. Conducted emergence counts, and collected data on foraging areas through use of simultaneous radio-telemetry triangulation.

Team Leader – USDA – FS, Allegheny National Forest: 2006. Led a 55-site bat survey covering potentially impacted areas in Elk, Forest, McKean, and Warren counties, Pennsylvania. As a team leader, responsibilities included, conducting mist net sampling, identifying captured bats, and assessing habitat at net sites.

Team Leader – Algonquin Ramapo Pipeline Expansion: 2006. Completed presence/absence mist net survey for the Indiana bat, along approximately 5 miles of existing natural gas pipeline and three associated compressor stations in three counties of New York and New Jersey. Mist netting was conducted from late June to mid July, and utilized alternative mist netting methods, including non-conductive netting poles, while surveying in proximity to high-tension powerlines.

Team Leader – Tuxedo Reserve: 2006. Conducted presence/absence mist net survey for the Indiana bat as part of consultation for endangered species on a new housing development in southeastern New York. Completed net site reconnaissance, bat habitat assessments; mist net set-up, and bat handling and identification.

Team Leader – 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.

Team Leader – Pocono Manor Endangered Bat Survey: 2006. Conducted an Indiana bat survey for a 5000-acre commercial and residential development in Pennsylvania. As a team leader, responsibilities included, selecting sites and conducting mist net sampling, identifying captured bats, and assessing habitat at net sites.

Field Assistant – Equitrans, Big Sandy Pipeline: 2006. Participated in a field search for potential winter bat hibernacula along 68-mile natural gas pipeline in Carter, Lawrence, Johnson, and Floyd counties, Kentucky.

Field Assistant – Lewisburg Mine Hibernaculum Count: 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 and data collection.

Field Director – Northeast Storage Gas Pipeline: 2005. Summer mist net survey for endangered bats along the 21-mile Northeast Storage natural gas pipeline in Potter and McKean counties, Pennsylvania, and Cattaraugus County, New York. Responsibilities include oversight of all aspects of the bat field survey, net location, trapping, netting, net site selection, bat capture and identification, and habitat characterization.

Field Director – Dominion Transmission TL 453 Endangered Bat Surveys: 2005. Summer mist net survey for endangered bats along the 12-mile natural gas pipeline in Potter County, Pennsylvania. Responsibilities include oversight of all aspects of the field survey including net site delineation, trapping, netting, selection of survey netting sites, capture and identification of bats, and habitat characterization.

Field Director – Dominion Transmission TL 536 Endangered Bat Surveys: 2005. Summer mist net survey for endangered bats along the 9-mile natural gas line in Potter County, Pennsylvania. Responsibilities include oversight of all aspects of the field survey including net site delineation, trapping, netting, selection of survey netting sites, capture and identification of bats, and habitat characterization.

Team Leader – Indiana Department of Transportation, Interstate 69 Tier II Environmental Studies, Segments 1, 2, and 4: 2004. Completed summer netting surveys and radio-telemetry studies of microhabitat use by the Indiana bat along three sections of the proposed interstate corridor in Indiana.

Team Leader – Gohman Asphalt Highway Project: 2004. Completed summer netting surveys of the Indiana bat along a highway near Evansville, Indiana.

Team Leader – McCoy Elkhorn Coal: 2004. Completed summer netting surveys for endangered bats and completed a ground surveys to search for coal mine portals and perform suitability assessments along Long Fork, Pike County, Kentucky.

Team Leader – Frasure Creek Mining: 2004. Completed summer netting surveys for endangered bats and completed a ground surveys to search for coal mine portals and perform suitability assessments along Mud Creek, Floyd County, Kentucky.

Team Leader – Bear Fork Resources: 2004. Completed summer netting surveys for endangered bats and completed a ground surveys to search for to search for coal mine portals and perform suitability assessments along Robinson Creek, Pike County, Kentucky.

Team Leader – Elkhorn Coal: 2004. Completed summer netting surveys for endangered bats and completed a ground surveys to search for to search for coal mine portals and perform suitability assessments along Frasier Creek, Floyd County, Kentucky.

Field Assistant – Indiana Department of Natural Resources, Department of Forestry Habitat Conservation Plan: 2004. Conducted summer and autumn surveys and radiotelemetry microhabitat studies for incorporation into the Indiana DNR's Habitat Conservation Plan for the endangered Indiana Bat, Harrison-Crawford State Forest, Harrison and Crawford counties, Indiana.

Team Leader – Indiana Department of Transportation, Interstate 69 Tier II Environmental Studies: 2004–2006. Conducted autumn harp trap surveys for bats at cave openings and completed winter in-cave surveys for all species of bats in 7 caves along proposed Interstate 69 corridor in Greene, Monroe, and Lawrence counties, Indiana.

Team Leader – Ohio Department of Transportation, Millikin Road and State Route 747 Road Expansion: 2003. Conducted Indiana bat roost tree emergence count and Anabat survey. within the roadway corridor in Butler County, Ohio.

Team Leader – Department of Transportation, Portsmouth Bypass: 2003. Conducted mist net surveys and summer habitat assessments for the Indiana bat for a highway development in Scioto County, Ohio.

Field Director – Coal-Mac Stripmine Surveys: 2003. 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.

Team Leader – Phelps Stripmine Surveys: 2002. Conducted mist net surveys and summer habitat assessments for the Indiana bat for a 1459-acre coal mine development in Pike County, Kentucky.

Field Assistant – Kentucky Transportation Cabinet, Kentucky State Route 30 Reconstruction: 2002. Completed summer mist net survey and summer habitat assessment for road construction project in Jackson County, Kentucky.

Field Assistant – Ohio Department of Transportation, Route 33 Nelsonville Bypass: 2002. Bypass project in Hocking and Athens counties, Ohio. Completed (1) Spring

survey of mine portal for bats using bat traps, mist nets and Anabat, (2) Autumn harp trap and mist net sampling of mine portals along the proposed ROW, and (3) Endangered Indiana bat Summer mist net survey and summer habitat assessment.

Field Assistant – Department of Defense, Fort McClellan Army National Guard Training Center: 2002. Gray bat netting and radiotelemetry studies (roosting and foraging).

Field Assistant – K. Hovnanian Properties: 2002. Completed Indiana bat summer mist net survey and summer habitat assessment for property development in Essex County, New Jersey.

Field Assistant – USDA – FS, Allegheny National Forest: 2002. Assisted with Indiana bat Summer mist net survey and habitat assessment on the forest in Pennsylvania.

Field Assistant – Lewisburg Mine Winter Hibernaculum Survey: 2002. Assisted with winter survey of a limestone mine used as a hibernaculum by 9,600 endangered Indiana bats.

Field Assistant – Kentucky Transportation Cabinet, US Route 68/KY 80 Lake to Canton: 2002. Completed summer mist net survey and summer habitat assessment along highway expansion project at Land Between the Lakes in Trigg County, Kentucky.

Botanical Assistant – USDA – FS, Chippewa National Forest: 2002. Survey for endangered, threatened, and regional sensitive plant species in areas proposed for timber harvest on the forest in Minnesota.

Field Assistant – Red River Coal Company Backbone Ridge Mine Permit Area: 2002. Assisted with survey for the federally threatened small whorled pogonia (*Isotria medeoloides*) and its habitat in Wise County, Virginia.

Field Assistant – Virginia Department of Transportation Coalfields Expressway Corridor and Route 460 Connector: 2001. Harp Trap/mist net/bat detector survey of mine portals along proposed highway project in Wise, Dickenson, and Buchanon counties, Virginia. The project assessed potential bat use of over 100 portals and sampling was completed at 23 locations that potentially provide non-maternity habitat for the Indiana bat.

Field Assistant – Meg-Lynn Land Company Straight Fork Surface Mine Permit Area: 2001. (1) Completed spring trapping for endangered bats of a coal mine system proposed for closure as part of a mining development, (2) Completed spring mist netting to further characterize the chiropterafauna of the project area, and (3) Characterized the habitat of 2,200 acres of project lands for suitability as summer habitat for the endangered Indiana bat.

Field Assistant – White Oak Marina Development: 2001. Completed summer mist net survey and summer habitat assessment for a marina development, LaSalle County, Illinois.

Field Assistant – Red River Coal Company Backbone Ridge Mine Permit Area: 2001. Completed mist net survey and summer habitat assessment in Wise County, Virginia.

Field Assistant – Infra-Metals Industrial Barge Facility: 2001. Completed summer mist net survey and summer habitat assessment for an industrial development site in LaSalle County, Illinois.

Botanical Assistant– American Electric Power 765kv Transmission Line: 2001-2002. Survey for endangered, threatened, and regional sensitive plant species along a 90-mile powerline right-of-way corridor in Virginia and West Virginia, including a crossing of Jefferson National Forest.

ENVIRONMENTAL SOLUTIONS & INNOVATIONS, INC.

Résumé

Beth Meyer

EDUCATION

B.S., Biology, Radford University, 2009

QUALIFICATIONS AND EXPERIENCE

Ms. Meyer has assisted with numerous wildlife research and management activities. She has participated in bat, mammal, and herpetological surveys. Her experience includes field surveys and data analysis. She has specialized experience with bats and can identify most eastern bats to species (including endangered Indiana and Virginia big-eared bats), and has handled and independently identified numerous bats of both these species. Ms. Meyer's general experience includes:

- Mist net set up, bat identification, bat handling and morphometric processing (species, weight, gender, and various measurements), roost tree identification, emergence counts, and habitat assessments
- Indiana bat radio-telemetry (ground and aerial)
- Use of handheld, sub-meter accurate Trimble GPS unit
- Use of vegetation-surveying instruments (clinometer, densiometer, DBH tape, range poles)
- Identification of small mammals
- Identification of trees and herbaceous plants
- Use of Sherman live traps, snap traps, tomahawk traps and others

Ms. Meyer studied under Dr. Karen Francl of Radford University, where she gained multiple years of experience working with bats. She has dedicated time to volunteer projects such as Salvation Army Camp Redwood Glen where she developed program materials and activities, as well as implementing a program on the Wonderful World of Bats and has constructed bat houses for placement around the camp. Her volunteer work also includes participation in multiple years of bat swarming surveys conducted with regard to White Nose Syndrome effects in cooperation with the Virginia Department of Conservation and Recreation and Virginia Department of Game and Inland Fisheries. This volunteer work has provided valuable experience handling and identifying large groups of individuals of multiple cave-hibernating bat species, including the federally endangered Indiana and Virginia big-eared bats.

ESI PROJECT EXPERIENCE

Biologist – Great Swamp National Wildlife Refuge: 2012. Completed mist net surveys on the Refuge in Morris County, New Jersey to collect population data on female Indiana bats to aid in understanding White Nose Syndrome impacts to populations of all cave-dwelling bats (and including both sexes) that use the Refuge during the maternity

season. An Indiana bat was captured and radio-telemetry and emergence counts were conducted.

Biologist – Indiana Department of Transportation, Interstate 69, Pre- and Post-construction Surveys: 2012. Conducted summer mist net survey for federally endangered Indiana bat along final ROW for Section 5 in Morgan and Monroe counties, Indiana. Performed mist net site reconnaissance, site set up, habitat assessment, bat handling and identification, and morphometric processing. Also conducted radio-telemetry and emergence counts.

Team Leader – 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. Performed mist net site reconnaissance, site set up, habitat assessment, bat handling and identification, and morphometric processing.

Biologist – NiSource Big Pine Pipeline: 2012. Completed a qualitative habitat assessment, roost tree evaluation and portal search along approximately 17 miles of proposed natural gas pipeline and aputenances in Armstrong and Butler counties, Pennsylvania.

Biologist – MarkWest Liberty Midstream & Resources Mobley to Sherwood Pipeline: 2012 Completed portal search along a 30-mile natural gas pipeline in Doddridge and Wetzel counties, West Virginia.

Biologist – Confidential Client, Natural Gas Pipeline: 2012. Completed habitat assessment along a 1.71-mile long proposed pipeline in Wetzel County, West Virginia.

Biologist – EQT MOME-S002 Pipeline: 2012. Completed portal searches and habitat assessment along a 3-mile long natural gas pipeline project (Project) in Wetzel Country, West Virginia.

Biologist – CNX Gas Company, LLC, Tygart Valley Pipeline: 2012. Completed portal searches along a 33-mile pipeline in Upshur and Barbour counties, West Virginia.

Biologist – Confidential Client, Natural Gas Transmission Pipeline: 2012. Conducted portal searches and summer and winter habitat assessments for the endangered Indiana bat along a 350-mile pipeline running through portions of West Virginia and Pennsylvania.

Biologist – American Electric Power, Hernshaw 138 kV Extension and Substation: 2011. Conducted Indiana bat habitat assessment and portal searches along approximately 5 miles of new transmission line right-of-way and associated access roads in Kanawha County, West Virginia.

Biologist– CNX Gas Company, LLC, Morris to Majorsville Pipeline: 2011. Conducted Indiana bat habitat assessment in Greene County, Pennsylvania and Marshall County, West Virginia.

Field Supervisor– Roth Rock Wind Generation: 2011. Supervised and conducted a mortality study on a wind farm site containing 20 turbines along a 3-mile stretch of Backbone Mountain in Garrett County, Maryland.

Field Supervisor / Team Leader – Public Service Electric and Gas, Roseland-Bushkill Transmission Line: 2011. Completed summer mist net survey along a 45-mile transmission line corridor in Warren, Sussex, Morris, and Essex counties, New Jersey. Supervised up to three crews, coordinated with the client, and performed mist net site reconnaissance, site set up, habitat assessment, bat handling and identification, and morphometric processing.

Team Leader – Tennessee Gas Pipeline, Northeast Upgrade: 2011. Conducted Indiana bat mist net and portal surveys along portions of a pipeline looping project in Sussex County, New Jersey and Wayne and Pike counties, Pennsylvania. Performed mist net site set up and habitat assessment and bat identification, bat handling, and morphometric processing, also conducted radio-telemetry of eastern small-footed bats.

Field Assistant – Chief Gathering Natural Gas Pipeline: 2011. Completed summer mist net and radio-telemetry survey along 30.1-mile pipeline in Luzerne and Wyoming counties, Pennsylvania. Assisted with mist net site set up and bat identification, performed habitat assessments, bat handling, morphometric processing, and conducted radio-telemetry of eastern small-footed bats.

Field Assistant – Department of Defense, Fort Drum Army Installation: 2010. Completed Indiana bat habitat assessments, mist net surveys, and ground/aerial radio-telemetry in Jefferson and Lewis counties, New York. Assisted with mist net site set up, habitat assessment, bat handling and identification, morphometric processing, diurnal radio-telemetry, and emergence counts. Independently identified Indiana bats and tracked them to diurnal roosts.

Field Assistant – Equitrans, LP, Sunrise Pipeline: 2010. Conducted Indiana bat summer mist net survey in Greene County, Pennsylvania, and Doddridge, Marion, Harrison, and Taylor and Wetzel counties, West Virginia. Assisted with mist net site set up and habitat assessment, bat identification, morphometric processing, and radio-telemetry.

Field Assistant– Tennessee Gas Pipeline Company, 300 Line: 2009. Completed Indiana bat habitat and mist net surveys along a 120-mile natural gas pipeline in Potter, Tioga, Bradford, Susquehanna, Wayne, Pike, Venango, and McKean counties, Pennsylvania and Passaic and Sussex counties, New Jersey.

Field Assistant– Chief Gathering, Poor Shot Natural Gas Pipeline: 2009. Completed Indiana bat summer mist net survey along 10-mile natural gas pipeline right-of-way in Lycoming County, Pennsylvania. Assisted with mist net site operation and habitat assessment, bat identification, and morphometric processing.

Research Assistant – Radford University Biology Department and Smithsonian Tropical Research Institute, Gamboa, Panama: 2009. Participated in research project to evaluate effects of predator stress on Red-eyed treefrog (*Agalychnis callidryas*) growth and life history switch points, as well as predator survival and growth in aquatic pond ecosystems.

Field Technician– The Conservation Fund: 2009. Assisted with AnaBat studies across the eastern range of the Indiana bat in nine states. Studies include examination of species distribution in potentially impacted areas and forest condition surveys.

Research Technician – Radford University Biology Department: 2008-2009. Environmental internship including investigation of vegetation variations in karst sinkholes at Selu Conservancy, Montgomery County, Virginia. Responsibilities included vegetation (tree, shrub, herb) identification, utilization of multiple vegetation-surveying instruments (clinometer, densiometer, DBH tape, range poles), soil collection and analysis, and data analysis utilizing Microsoft Excel and ArcGIS.

Research Assistant – George Washington National Forest: 2007-2009. Assisted with study to determine sustainable harvest of black cohosh (*Actaea racemosa; Ranunculaceae*) in Reddish Knob, Virginia.

Field Assistant – Equitrans, Ranger Pipeline: 2008. Participated in field surveys for the endangered Indiana bat along a proposed 70-mile, natural gas pipeline in Martin and Floyd counties, Kentucky. Assisted with mist net set up and habitat assessment, AnaBat data collection and analysis, and bat identification.

Field Assistant – TW Philips, Bionol Clearfield Pipeline: 2008. Completed mist net survey for federally endangered Indiana bat along a proposed 8-mile pipeline in Clearfield County, Pennsylvania. Assisted with mist net set up and habitat assessment, bat identification, and morphometric processing.

Field Assistant – Confidential Client, 250-mile Proposed Natural Gas Pipeline: 2008. Conducted portal searches and mist net site reconnaissance in Greene County, Pennsylvania.

Research Assistant – Selu Conservancy: 2008. Assisted with salamander study to determine species use of karst sinkholes in Montgomery County, Virginia. Responsibilities included identification and tissue sample collection for genetic analysis.

Research Assistant – Selu Conservancy: 2007. Assisted with small mammal survey in Montgomery County, Virginia. Species were captured using Sherman live traps, snap traps, tomahawk traps, and mist nets.

Laboratory Technician – Environmental laboratory: 2007-2008. Processed stream samples for benthic macroinvertebrates including sorting, identification, and midge mounting.

PUBLICATIONS AND PRESENTATIONS

Francl, K., C. J. Small and B. Meyer. In progress. Quantifying long- and short-term fire effects on small mammal communities and habitat composition and structure at Caldwell Fields, Montgomery County, Virginia.

Small, C. J., Francl, K. E., Meyer, B. N. In progress. Vegetation diversity of karst sinkholes at the Selu Conservancy, southwestern Virginia.

Meyer, B., C. J. Small, and K. Francl. 2009. Biotic Diversity of Karst Sinkholes at the Selu Conservancy, Southwestern Virginia. Talk presented at winter meeting of the Virginia Chapter of The Wildlife Society, Palmyra, Virginia, as well as the Big South Undergraduate Research Symposium, Asheville, North Carolina.

Small, C. J., Mathews, D. S., and Meyer, B. N. 2008-2009. Classification of the Ecological Communities of the Selu Conservancy. Faculty-Student Collaborative Grant, Radford University.

Meyer, B. and K. Francl. 2008. "Milvus milvus" (On-line), Animal Diversity Web. http://animaldiversity.ummz.umich.edu/site/accounts/information/Milvus_milvus.html.

PROFESSIONAL AFFILIATIONS

Radford University Student Chapter of The Wildlife Society, 2008-present; Co-President, 2008-2009

ENVIRONMENTAL SOLUTIONS & INNOVATIONS, INC.

Résumé

Dale W. Sparks, Ph.D.

EDUCATION

Ph.D., Biology, Indiana State University, 2003. Dissertation: "How does urbanization impact bats?"
M.S., Biology, Fort Hays State University, 1996. Thesis: "Distribution, Natural History, Conservation Status, and Biogeography of Bats in Kansas"
B.S., Biology, Murray State University, 1993.

PROFESSIONAL CERTIFICATIONS

Certified Wildlife Biologist: The Wildlife Society, 2012
Certified Senior Ecologist: Ecological Society of America, 2012
Qualified Indiana Bat Surveyor: Commonwealth of Pennsylvania

QUALIFICATIONS AND EXPERIENCE

Dr. Sparks is a wildlife biologist involved in a variety of terrestrial ecology research positions involving herpetology, ornithology, ichthyology, and mammalogy and has extensively studied bats and their habitat. Many of Dr. Sparks' projects concern federally endangered Indiana bats (*Myotis sodalis*). He is experienced in many ecological field techniques, including: species identification, habitat assessment, trapping, netting, radio-telemetry and tracking, guano analysis, AnaBat sampling and analysis, GPS/GIS, mapping and orientation.

Dr. Sparks directed long-term studies in support of a Biological Assessment (Sec. 7 of the ESA) and a Habitat Conservation Plan (Sec. 10) associated with developments at the Indianapolis International Airport and the near-by Six-Points highway project, respectively. Studies included mist-net, AnaBat, population estimates using both emergence counts and DNA-based approaches, and radiotelemetry studies, requiring coordination with state, federal, and local agencies. These combined projects were the first large-scale mitigation for loss of summer habitat for the Indiana bat and they have produced some of the most definitive research on the interaction of the Indiana bat with human developments, with many resulting publications that bear the name of Dr. Sparks.

Dr. Sparks is an experienced public speaker, having taught university-level courses, presented educational lectures to the public, and presented technical papers to professional organizations. Dr. Sparks serves as a technical advisor to U.S. Fish and Wildlife Service for summer habitat conservation and population characteristics of the endangered Indiana bat. He is also a member of the Indiana Department of Natural Resources Mammal Technical Advisory Committee and chairs the Legislation and Regulations Committee of the American Society of Mammalogists.

Dr. Sparks has authored and co-authored numerous papers, poster and oral presentations, and book chapters and is a technical reviewer for Journal of Wildlife Management; Journal of Mammalogy; The Southwestern Naturalist; The Prairie Naturalist; Special Publications of Fort Hays State University; Sixth Chihuahuan Desert Research Symposium; USFWS Indiana Bat Recovery Plan; Biology of Cambarid Crayfishes: Conservation, Ecology, and Natural History; and the National Science Foundation.

PROJECT EXPERIENCE

Project Manager – EQT SMI 27 Well Pad Site: 2012. Completed summer mist netting and portal searches for Indiana and Virginia big-eared bat on a proposed 42-acre well pad site in Doddridge County, West Virginia.

Project Manager – EQT NILO S002 and NILO-D001 pipelines: 2012. Managed project involving detailed habitat assessments and portal searches for suitable small-footed bat habitat for two projects in Elk and Elk and McKean counties, Pennsylvania, respectively. Responsible for field team coordination, client and agency coordination, reporting and budget.

Project Manager – Cartersville Ranch: 2012. Managed project involving summer mist netting and acoustic surveys on an 1800-acre privately owned ranch in Bartow County, Georgia. Responsible for client and agency coordination, reporting, and budget.

Project Manager – Sunoco Pipeline, LP Tiffin-Easton Pipeline: 2012. Completed summer mist netting surveys for bats and Massasauga rattlesnakes along an 82-mile pipeline project in Seneca, Huron, Ashland, and Wayne counties, Ohio. Responsible for all aspects of project, including field work, client and agency coordination, reporting and budget.

Project Manager – Sunoco Pipeline, LP Fostoria Connection Pipeline: 2012. Completed summer mist netting surveys on a 48-acre site in Wood and Hancock counties, Ohio. Responsible for all aspects of project, including field work, client and agency coordination, reporting and budget.

Project Manager – Indiana Department of Transportation, Interstate 69, Pre- and Post-construction Surveys: 2010-2012. Conducted summer mist net survey for federally endangered Indiana bat along final ROW for Sections 1, 2, 3, and 5.

Project Manager – Forest Preserve District of Kane County: 2011. Managed summer bat mist net and acoustic surveys at four forest preserves in Kane County, Illinois. Coordinated with client and completed associated reporting.

Project Manager – Confidential Client, Wind Resource Area: 2011. Completed acoustic surveys of bats using a combination of detectors on MET towers and ground-based detectors at a site in Huron County, Michigan. Responsible for project management and data analysis.

Project Manager – Confidential Client, Wind Resource Area: 2011. Implemented a mortality study on a site containing 20 turbines along a 3-mile stretch of Backbone

Mountain in Garrett County, Maryland. Managed project including development of survey protocol.

Project Manager – Confidential Client, Wind Resource Area: 2011. Completed habitat assessment for potential use by endangered bats on a 45,293-acre site in Sanilac and Lapeer Counties, Michigan as part of Tier II analysis.

Project Manager – Confidential Client, Wind Resource Area: 2011. Managed mist netting, acoustic surveys, and telemetry for the federally endangered Indiana bat within a 23,468.7-acre wind resource area in Jay and Randolph counties, Indiana. Coordinated with prime consultant and completed associated reporting.

Project Manager – Confidential Client, Wind Resource Area: 2011. Managed endangered bat mist net and acoustic surveys and telemetry within a 19,926-acre wind resource area in Seneca and Crawford counties, Ohio. Coordinated with prime consultant and completed associated reporting.

Project Manager – Confidential Client, Wind Resource Area: 2011. Managed endangered bat mist net and acoustic surveys and telemetry within a 39,607-acre wind resource area in Seneca and Sandusky counties, Ohio. Coordinated with prime consultant and completed associated reporting.

Project Manager – Confidential Client, Wind Resource Area: 2011. Managed endangered bat mist net and acoustic surveys within an 8151-acre wind resource area in Darke County, Ohio. Coordinated with prime consultant and completed associated reporting.

Biologist – American Electric Power, Bonnyman-Softshell 138kV Transmission Line: 2011. Completed summer mist netting survey along a 19.6-mile transmission line in Perry and Knott counties, Kentucky. Responsible for mist net site set up and habitat assessment, bat identification, morphometric processing and implementation of White Nose Syndrome protocols.

Biologist – American Electric Power, Wyoming-Jackson's Ferry 765 kV Transmission Line: 2004-2009. Participated in mist net surveys at three wildlife mitigation ponds along a transmission line ROW in Virginia.

Project Manager – Confidential Client, Wind Resource Area: 2010. Completed bat sampling, using mist netting and ground-based acoustic detectors, on a site proposed to contain 100-130 wind turbines, in Montgomery and Boone counties, Indiana.

Project Manager – Confidential Client, Wind Resource Area: 2010. Conducted summer mist netting and associated acoustic studies for endangered bats on a 61,256-acre, 300-megawatt wind energy generation facility in Wells, Adams, Blackford, and Jay counties, Indiana. 2011, Contributing author to Habitat Conservation Plan including development of a new and comprehensive technique of estimating take.

Biologist – Equitrans, LP, Sunrise Pipeline: 2010. Conducted Indiana bat summer mist net survey in Greene County, Pennsylvania, and Doddridge, Marion, Harrison, and Taylor and Wetzel counties, West Virginia.

Project Manager – Burr Oak Wind Resource Area: 2010. Completed desk-top analysis of bat impacts for a proposed wind energy facility in Marshall and Fulton counties, Indiana.

Project Manager – Fayette Wind Resource Area: 2010. Completed desk-top analysis of bat impacts and phase II surveys for bat habitat for a proposed wind energy facility in Fayette, Rush and Henry counties, Indiana.

Biologist – Duke Energy, Lawrenceburg Road Site: 2010. Conducted summer mist net survey for the federally endangered Indiana bat on a 220-acre parcel near the confluence of the Great Miami and Ohio rivers in Hamilton County, Ohio.

Biologist – Confidential Client: 2010. Prepared Protection and Enhancement Plan for federally endangered Indiana bats in partial mitigation for construction at a mine in Greene County, Pennsylvania.

Biologist – Entergy James A. FitzPatrick Nuclear Power Plant: 2009. Completed data analysis for Indiana bat habitat evaluation for expanding nuclear facility in Oswego County, New York. Coauthored technical report.

Biologist – Indiana Department of Transportation, SR 641 Bypass (Phases III and IV): 2009. Author for Biological Assessment to investigate effects along approximately six miles of proposed new roadway in Vigo County, Indiana.

Biologist – Cincinnati Metropolitan Sewer District, Mt. Airy forest sewer replacement: 2009. Analyzed habitat quality measurements taken during surveys for federally endangered Indiana bat, cave salamander, hellbender and running buffalo clover on a 1469-acre urban forest in Hamilton County, Ohio.

Biologist – Confidential Client, Wind Farm: 2009. Completed technical report sections for endangered species studies and biological assessment at 84 windmill, 250-megawatt capacity wind farm on an island in the Great Lakes in Jefferson and Oswego counties, New York

Biologist – Consol Pennsylvania Coal Company, Bailey Mine: 2009. Author for Biological Assessment to investigate effects of coal refuse disposal on Indiana bats. Responsible for analysis of effects of coal mining related to competition of Indiana bats to both other bats and conspecifics, effects of acid mine drainage, and groundwater.

Project Manager – The Conservation Fund: 2009-2010. Managed project involving multiple field teams to complete AnaBat studies across the eastern range of the Indiana bat in nine states. Studies include examination of species distribution in potentially impacted areas and forest condition surveys. Coordinate and oversee field work (including on-site visits to ensure sampling QA/QC), interpret collected data, and coordinate with client, resource agencies, and landowners.

Field Supervisor – AES Sparrows Point LNG, LLC and Mid-Atlantic Express, LLC: 2009. Completed endangered bat surveys along the 88-mile Sparrows Point LNG Terminal and Mid-Atlantic Express Pipeline in Baltimore, Hartford, and Cecil counties, Maryland and Lancaster and Chester counties, Pennsylvania. Responsible for mist net site set up and habitat assessment, bat identification, morphometric processing and implementation of White Nose Syndrome protocols.

Research Scientist – Indianapolis International Airport: 1997-2009. Directed a mitigation project for Sec. 7 and Sec. 10 (HCP) of ESA including, conducting artificial roosts studies and directing mist-net and AnaBat surveys. These studies required extensive use of radiotelemetry, and coordination of mitigation activities with state, federal, and local agencies, directing field work, interviewing and hiring student workers, and preparing final reports. In addition provided assistance to the airport on a variety of wildlife management issues ranging from crop deprivation to animal hazards at the airfield and on local roadways.

Project Manager – Interactions with bats and roadways: 2004-Present. Used a combination of radio-telemetry data, direct field observation of bats crossing roads, and behavioral models in an effort to understand the impacts of roadways on bats.

Project Manager – Community structure and behavior of small mammals along interstate highways: 2007. Used Sherman Live Traps to capture small mammals in medians and along roadsides of Interstate 70 in Eastern Illinois. Between trapping sessions, behavioral approaches were used to compare the perceived habitat quality between roadsides and medians. In this study area, highways provided high-quality habitat for a community of small mammals comparable with that found in local nature preserves.

Project Manager – Comparison of traditional and molecular techniques to estimate summer Indiana bat colony sizes: 2006-2008. Directed field work and conducted regular emergence counts at known roost trees of Indiana bats at least twice per week in an effort to determine colony sizes. Results were used for further study and were compared with mark-recapture estimations obtained by developing and using DNA signatures of individual bats in a manner similar to traditional mark-recapture analysis.

Project Manager – Food resources of bats across an urban/rural gradient: 2005-2008. Supervised research project in which GIS was used to select points within landscape classes that were later sampled for insects. Captured insects were compared to those eaten by Indiana bats from this site and to the diets of other species in Indiana. Findings indicated urban areas provide sufficient food for bats; however, telemetry data indicated rare use of urban areas when rural habitats were available.

Project Manager – Nocturnal habitat of the Eastern Red Bat (*Lasiurus borealis*) at an urban/rural interface: 2003-2004. Supervised research project using radio-telemetry, and GIS to examine habitat selection by eastern pipistrelles near the Indianapolis Airport. This work also resulted in the only published use of radio-telemetry to track free-ranging eastern red bats during migration.

Project Manager – Diet of black and turkey vultures in a forested landscape. Directed research project involving identification of hair, scale, and bone fragments within pellets of black and turkey vultures. These data were then combined with movement data to inform Bird Avoidance Models.

Project Manager – Habitat use by a juvenile hoary bat at an urban/rural interface: 2004. Used radio-telemetry and GIS techniques to provide insight into the behavior of a rarely captured species.

Project Manager – Nocturnal habitat selection by the federally-endangered Indiana bat (*Myotis sodalis*) at an urban/rural interface: 2002. Used a combination of radio-telemetry and GIS to examine Indiana bat habitat selection near the Indianapolis Airport.

Project Manager – Comparison of habitat selection by big brown and evening bats at the Indianapolis International Airport: 2001. Supervised research project involving the use of radio-telemetry and GIS to compare habitats used by evening bats (a locally endangered species) and big brown bats (locally abundant) near the Indianapolis Airport. Published field data were the first to support the hypothesis that loss of foraging habitat is a primary cause of endangerment for bats.

Project Manager – Changes in fish community structure along an urban to rural gradient in an Indianapolis steam: 2002. Conducted fish sampling at 10 sites on multiple occasions to demonstrate changes in community structure (using Index of Biological Integrity, and species richness).

Project Manager – Amphibians and reptiles of the Indianapolis International Airport: 2001-2002. Conducted reptile and amphibian surveys at the Indianapolis Airport site using field observation techniques ranging from searching under debris to modified frog call routes to detect herps throughout an urban and rural matrix.

Research Associate – Sternberg Museum of Natural History: 1994-1996. Conducted a state-wide survey of bats of Kansas including capturing and preparing specimens, recruiting and directing volunteer field assistants, interacting with landowners, conducting public education programs, reexamining existing specimens, photographing bats, and preparing reports for publication. QMC Models 1 and 2 bat detectors were also used to detect echolocation signals.

Project Director – Indiana State University, Hardwood Ecosystem Experiment: 2006-2008. Initiated protocols for determining effects of timber harvest on bats and other species in Morgan-Monroe and Yellowwood State Forests. Conducted mist netting surveys including net site reconnaissance, bat habitat assessments; mist net set-up, bat handling and identification, and AnaBat surveys. Also directed multiple research projects involving fish, herp, and insect surveys and several studies that examined wildlife response to highways.

Wildlife Technician – Kansas Department of Wildlife and Parks: 1994-1995. Aided in efforts to understand the decline of ring-necked pheasant in Kansas. Sampled agricultural habitats for evidence of use by pheasants, song birds, and short-eared owls.

AmeriCorps Volunteer – USDA Natural Resources Conservation Service: 1995-1996. Provided assistance in Hays Kansas and surrounding area to help restore habitats damaged by historic floods in 1993.

Wildlife Technician – Kentucky Department of Fish and Wildlife Resources: 1993. Aided in efforts to reintroduce peregrine falcons in Kentucky including growth and behavior monitoring, general public and media liaison, arranging for treatment and conducting first aide for injured falcons.

Wildlife Technician – USDA Forest Service: 1992. Conducted surveys of federally-threatened northern spotted owls, and several species of local conservation concern in the Pacific Northwest including: northern goshawks, red-legged frogs, and Townsend's big-eared bats.

Coordinator – Murray State University Student Chapter of The Wildlife Society Raptor Rehabilitation Center: 1991-1993. Supervised day-to-day operation of a student-run rehabilitation center including supervising and training volunteers, administering first aid to injured birds, coordinating treatment with veterinarian, presenting public education programs, and coordinating an education program at the National Museum of the Boy Scouts of America.

Wildlife Technician – U.S. Forest Service, McKenzie River District: 1992. Conducted surveys for spotted owls, goshawks, Townsend's big eared bats, and red-legged frogs.

PUBLICATIONS

Bennett, V. J., D. W. Sparks, P. A. Zollner. In Press. Modeling the indirect effects of road networks on the foraging activities of bats. Landscape Ecology.

Francl, K. E., T. K. Canniff, R. C. Bland, D. W. Sparks, V. Brack, Jr. In Press. Quantifying wing damage of summer bats in the northeastern United States. Journal of the Pennsylvania Academy of Science.

Francl, K. E., W. M. Ford, D. W. Sparks, and V. Brack, Jr. 2012. Capture and reproductive trends of summer bat communities in West Virginia: assessing the impact of white nose syndrome. Journal of Fish and Wildlife Management 3:33-42.

Damm, J. P., K. R. Pearman, N. S. Gikas, D. W. Sparks, and J. O. Whitaker, Jr. 2011. Mammals of the Indianapolis International Airport conservation properties, Hendricks County, Indiana, with county records. Proceedings of the Indiana Academy of Science 120:96--103.

Gikas, N. S., D. W. Sparks, J. O. Whitaker Jr., and J. S. Johnson. 2011. New ectoparasite records for bats in West Virginia and a review of previous records. Northeasten Naturalist 18:527–533.

Sparks, D. W., K. Francl, and V. Brack, Jr. 2011. Indexing at different scales: A response to Reichard et al. Journal of Wildlife Diseases 47: 1052-1053.

Timpone, J., K. Francl, D. W. Sparks, V. Brack, Jr., and J. Beverly. 2011. Bats of the Cumberland Plateau and Ridge and Valley Provinces, Virginia. Southeastern Naturalist 10:515-528.

Francl, K., D. W. Sparks, V. Brack, Jr., and J. Timpone. 2011. White-nose syndrome and wing damage index scores among summer bats in the northeastern United States. Journal of Wildlife Diseases 47:41-48.

Zurcher, A. A., D. W. Sparks, and V. J. Bennett. 2010. Why the bat did not cross the road. Acta Chiroptologica, 12:337-340.

Judy, D. J., D. W. Sparks, J. O. Whitaker, Jr., and C. M Ritzi. 2010. Unusual migratory behavior by an Indiana bat (*Myotis sodalis*). Proceedings of the Indiana Academy of Science, 119:99-100.

Judy, D. J., D. W. Sparks, J. O. Whitaker, Jr., and S. Oyler-McCance. 2010. Bat guano is useful for more than diet studies. Proceedings of the Indiana Academy of Science, 119:95-98.

Karns, D. R., D. G. Ruch, R. D. Brodman, J. S. Castrale, J. R. Gammon, P. E. Rothrock, D. W. Sparks, and J. R. Stahl. 2010. Results of a BioBlitz at Wesselman Woods Nature Preserve, Vanderburgh, County, Indiana. Proceedings of the Indiana Academy of Science, 119:4-6.

Duchamp, J. E., D. W. Sparks, and R. K. Swihart. 2010. Exploring the nutrient hotspot hypothesis at trees used by bats. Journal of Mammalogy, 91:48-53.

Sparks, D. W., V. Brack, Jr., J. O. Whitaker, Jr., and R. Lotspeich. 2009. Reconciliation ecology and the Indiana Bat at Indianapolis International Airport, Chapter 3. *In* Airports: Performance, Risks, and Problems, (P. B. Larauge and M. E. Castille, eds.) Nova Science Publishers, Inc., Hauppauge, New York.

Sparks, D. W., 2008. Escape behavior of northern long-eared bats (*Myotis septentrionalis*) following diurnal disturbance. Proceedings of the Indiana Academy of Science, 117: 203-209.

Whitaker, J. O., Jr., and D. W. Sparks. 2008. Roosts of Indiana bats (*Myotis sodalis*) near the Indianapolis International Airport (1997-2001). Proceedings of the Indiana Academy of Science, 117:193-202.

Kelly, N. E., D. W. Sparks, T. L. DeVault, and O. E. Rhodes, Jr. 2007. Diet of black and turkey vultures in a forested landscape. Wilson Journal of Ornithology, 119:267-270.

Krochmal, A. R. and D. W. Sparks. 2007. Timing of birth and estimation of age for juvenile *Myotis septentrionalis* and *Myotis lucifugus* from west-central Indiana. Journal of Mammalogy, 88:649-656.

Walters, B. L., C. M. Ritzi, D. W. Sparks, and J. O. Whitaker, Jr. 2007. Foraging behavior of the eastern red bat (*Lasiurus borealis*) at an urban-rural interface. American Midland Naturalist, 157:365-373.

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Sparks, D. W., J. O. Whitaker, Jr, and C. M. Ritzi. 2005. Foraging ecology of the endangered Indiana bat. Pp 15-27 *In* Indiana Bats and Coal Mining, A Technical Interactive Forum (K. C. Vories and A. Harrington, eds). Office of Surface Mining, U.S. Department of the Interior, Alton, Illinois.

Sparks, D. W., C. M. Ritzi, J. E. Duchamp, and J. O. Whitaker, Jr. 2005. Foraging habitat of the Indiana bat (*Myotis sodalis*) at an urban-rural interface. Journal of Mammalogy, 86:713-718.

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Ritzi, C. M., B. C. Bartells, and D. W. Sparks. 2005. Food habits and ectoparasites of Elliot's short-tailed shrew (*Blarina hylophaga*) from Kansas. The Southwestern Naturalist, 50:88-93.

Whitaker, J. O., Jr., D. W. Sparks, and V. Brack, Jr. 2004. Bats of the Indianapolis International Airport Area, 1991-2001. Proceedings of the Indiana Academy of Science 113:151-161.

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Sparks, D. W., A. G. Burr, M. N. Bass, and G. A. Liggett. 1999. New county distribution records of amphibians and reptiles from southwestern Kansas. Herpetological Review, 30:120-121.

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EDUCATIONAL PUBLICATIONS

Sparks, D. W., C. J. Schmidt, and J. R. Choate. 2011. Bats of Kansas. Publication Number 5, Indiana State University Center for North American Bat Research and Conservation. 62 pp.

Brack, V. Jr., D. W. Sparks, J. O. Whitaker Jr., B. L. Walters, and A. Boyer. 2010. Bats of Ohio. Occasional Papers of the Center for North American Bat Research and Conservation, 4:1-92.

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POSTER AND ORAL PRESENTATIONS

Sparks, D. W.,V. Brack, Jr., K. Francl, J. Boyles. 2012. Will the evening bat (*Nycticeius humeralis*) become the dominant tree-roosting bat of the Midwest following White Nose Syndrome? Presented at the 42nd North American Symposium on Bat Research, October 24-27, San Juan, Puerto Rico.

Sparks, D. W. and V. Brack, Jr.: 2011. Conservation and Management of Habitat for Maternity Colonies of the Indiana bat: Possibilities for Transportation Projects. Presented at 2011 International Conference on Ecology and Transportation: Sustainability in Motion. August 21-25, Seattle, Washington.

Francl, K.E., J. Timpone, D. W. Sparks, and V. Brack, Jr. 2010. Tracking White-nose Syndrome in summer bat communities – spatial and temporal patterns in the eastern United States. Presented at joint meeting of the Virginia Chapters of The Wildlife Society and American Fisheries Society, Wirtz, VA.

Carter, T. C. and D. W. Sparks. The future of bats and wind, the pending storm. Presented to Midwest Bat Working Group.

Brack, V., Jr., D. W. Sparks, and J. O. Whitaker, Jr. 2009. Landscape Scale Movements of Maternity Colonies of the Indiana bat Through Time: Examples and Possibilities. Paper Presented To: National Military Fish and Wildlife Federation.

Lebsack, W. A., and D. W. Sparks. 2008. Things that go bump in the night: nocturnal activity and information transfer of an Indiana bat colony. Poster Presented To: North American Bat Research Symposium and Indiana Academy of Science.

Gonzalez-Olimon, G., J. R. St. Juliana, and D. W. Sparks. 2008. Small mammal communities along highways: species composition and behavior. Poster Presented To: American Society of Mammalogists.

Gonzalez-Olimon, G., J. R. St. Juliana, W. A. Mitchell, and D. W. Sparks. 2007. Small mammal antipredator behavior in highway triangles, medians, and road sides in selected areas in Terre Haute, IN. Poster Presented To: Indiana Academy of Science.

Farrell Sparks, J. K., D. W. Sparks, and V. Brack, Jr. 2007. Utility poles as bat roosts. Poster Presented to: American Society of Mammalogists.

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Sheets, J. J. D. W. Sparks, V. Brack, Jr., and J. O. Whitaker, Jr. 2007. Bats of Indiana State Forests. Poster Presented To: American Society of Mammalogists.

Helms, J. S., D. W. Sparks, and J. O. Whitaker, Jr. 2007 Nocturnal behavior and roosting ecology of *Perimyotis subflavus* (Eastern Pipistrelle) near Indianapolis International Airport. Poster Presented To: American Society of Mammalogists, Indiana Academy of Science (2006), and North American Bat Research Symposium (2006)

Judy, D. J., D. W. Sparks, and J. O. Whitaker. 2006. Obtaining fecal samples under Indiana bat roosts: a word of caution. Poster Presented to: American Society of Mammalogists.

Sparks, D. W., C. M. Ritzi, and B. L. Everson. 2005. Nocturnal Behavior and Roosting Ecology of a juvenile *Lasiurus cinereus* near Indianapolis, Indiana. Poster Presented to: American Society of Mammalogists.

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Sparks, D. W., and J. A. Laborda. 1999. Orientation of northern myotis (*Myotis septentrionalis*) following release in daytime. Poster presented to: North American Bat Research Symposia and American Society of Mammalogists.

Zurcher, A. A., D. W. Sparks, and V. J. Bennett. 2008. Why the bat did not cross the road. Paper Presented To: Indiana Academy of Science.

Gikas, N. S, W. A. Lebsack, and D. W. Sparks. 2008. Information sharing about roosting areas by Indiana bats (*Myotis sodalis*). Paper Presented To: Indiana Academy of Science.

Gonzalez-Olimon, G., J. R. St. Juliana, and D. W. Sparks. 2008. Small mammal communities along highways: species composition and behavior. Paper Presented To: Indiana Academy of Science.

Helms, J. S., D. W. Sparks, and J. O. Whitaker, Jr. 2008. Nocturnal behavior and roosting ecology of *Perimyotis subflavus* (Eastern Pipistrelle) near Indianapolis International Airport. Paper Presented To: American Society of Mammalogists.

McGuire, M. A., D. W. Sparks, Virgil Brack, Jr., and John O. Whitaker, Jr. 2007. Indiana bats and roadways: size does matter. Presented to: Indiana Academy of Science.

Sparks, D. W., M. A. McGuire, Virgil Brack, Jr., and John O. Whitaker, Jr. 2007. Indiana bats and roadways: size does matter. Presented to: American Society of Mammalogists.

Sparks, D. W., B. J. Foster, and J. K. F. Sparks. 2006. Roosting ecology and colony dynamics of northern myotis (*Myotis septentrionalis*) in a managed forest. Presented to: Indiana Academy of Science and American Society of Mammalogists.

Boyles, J. G., D. J. Judy, D.W. Sparks, and G. S. Bakken. 2006. Seasonal changes in thermal conductance of fur in small mammals. Presented to: American Society of Mammalogists.

Tuttle, N. M. and D. W. Sparks. 2006. Indiana bats may be avoiding urban habitats for reasons other than prey availability. Presented to: Indiana Academy of Science.

Judy, D. J., D. W. Sparks, and J. O. Whitaker, Jr. 2005. Obtaining fecal samples under Indiana bat roosts: a word of caution. Presented to: Indiana Academy of Science.

Bast, M. D., M. S. Burt, . DW. Sparks. 2005. Prey selection within a Southeastern Missouri Bat Community. Presented to: Truman State University Research Showcase.

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Sparks, D. W., C. M. Ritzi., B. L. Everson. 2003. The Indiana bat as an umbrella species for wildlife near Indianapolis. Presented to: Indiana Academy of Science.

Everson., B. L., C. M. Ritzi, Sparks, D. W., and J. O. Whitaker, Jr. 2003. Foraging behavior of eastern red bats, *Lasiurus borealis*, in central Indiana. Presented to: Indiana Academy of Science.

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Sheets, J. J., C. M. Ritzi., B. L. Everson, B. J. Foster, S. S. Nard, and D. W. Sparks. 2002. Fishes of the Indianapolis International Airport, Marion and Hendricks Counties, Indiana. Presented to: Indiana Academy of Science.

Everson, B. L., Sparks, D. W., C. M. Ritzi., and J. E. Duchamp. 2002. Foraging behavior of Indiana bats at the Indianapolis International Airport. Presented to: Indiana Academy of Science.

Nard, S. S., B. J. Foster, Sparks, D. W., and J. E. Duchamp. 2002. Urban Herpetology: Amphibians and Reptiles of the Indianapolis International Airport. Presented to: Indiana Academy of Science.

Sparks, D. W., J. E. Duchamp, and C. M. Ritzi. 2002. Comparison of the roosting ecology of *Myotis septentrionalis* and *Nycticeius humeralis*. Presented to: American Society of Mammalogists

Duchamp, J. and D. W. Sparks. 2002. Movement across a rural/suburban gradient, a comparison of foraging in *Nycticeius humeralis* and *Eptesicus fuscus*. Presented to: American Society of Mammalogists

Sparks, D. W., J. E. Duchamp, and C. M. Ritzi. 2001. Do cavity-roosting bats partition roosts? Presented to: Indiana State University Graduate/Undergraduate Research Showcase.

Sparks, D. W., A. R. Krochmal, and W. A. Mitchell. 2001. Comparison of the reproductive biology of the northern myotis (*Myotis septentrionalis*) and the little brown myotis (*Myotis lucifugus*) in Indiana. Presented to: Indiana Academy of Science.

Duchamp, J. and D. W. Sparks. 2001. Habitat preference of the evening bat, *Nycticeius humeralis*, in a developing urban area. Presented to: Indiana Academy of Science.

Farrell, J. K., B. J. Foster, and D. W. Sparks. 2001. Roosting habitat of the northern myotis *Myotis septentrionalis* at the Indianapolis International Airport. Presented to: Southwestern Association of Naturalists and Indiana State University Graduate/Undergraduate Research Showcase.

Sparks, D. W., and A. R. Krochmal. 2001. Evidence for geographic variation in birth size of *Myotis lucifugus*. Presented to: Indiana State University Graduate/Undergraduate Research Showcase.

Sparks, D. W., and A. R. Krochmal. 2000. Growth and Development of (*Myotis lucifugus*) in Poland, Indiana. Presented to: North American Bat Research Symposia.

Farrell, J. K., D. W. Sparks, and B. J. Foster. 2000. Vegetation surrounding the roost s of *Myotis septentrionalis*—a preliminary analysis. Presented to: Indiana Academy of Science.

Sparks, D. W., and A. R. Krochmal. 2000. Development of (*Myotis lucifugus*) in Poland, Indiana with comments on geographic variation. Presented to: Indiana Academy of Science.

Sparks, D. W., B. J. Foster, and J. O. Whitaker, Jr. 1999. Behavioral correlates of swarming bats. Presented to: American Society of Mammalogists

Farrell, J. K., D. W. Sparks, and J. A. Laborda. 2000. Preliminary analysis of the vegetation surrounding the roosts of *Myotis septentrionalis*. Presented to: Indiana State University Graduate/Undergraduate Research Showcase. Winner (JKF): Outstanding Undergraduate Presentation (Science).

Sparks, D. W., T. S. Crowe, and A. R. Krochmal. 2000. Patterns of growth and development of little brown myotis (*Myotis lucifugus*) at Poland, Indiana. Presented to: Indiana State University Graduate/Undergraduate Research Showcase.

Sparks, D. W., B. J. Foster, and J. O. Whitaker, Jr. 1999. Notes on bats swarming at Copperhead Cave. Presented to: Indiana Academy of Science.

Sparks, D. W., J. A. Laborda, and P. A. Zollner. 1998. Orientation of northern myotis following release in daytime. Presented to: Indiana State University Graduate/Undergraduate Research Showcase.

Sparks, D. W., J. A. Laborda, and P. A. Zollner. 1998. Orientation of northern myotis following release in daytime. Presented to: Indiana Academy of Science.

Sparks, D. W., and J. R. Choate. 1998. Impacts of settlement on three species of bats in status of bats in Kansas. Presented to: American Society of Mammalogists and Indiana State University Graduate/Undergraduate Research Showcase.

Sparks, D. W., and J. R. Choate. 1997. Impacts of settlement on the distribution and conservation status of bats in Kansas. Presented to: Indiana Academy of Sciences

Sparks, D. W., and J. R. Choate. 1995. Preliminary notes on the distribution and biogeography of bats in Kansas. Presented to: American Society of Mammalogists.

Sparks, D. W., and J. R. Choate. 1995. Preliminary notes on the distribution and biogeography of bats in Kansas. Presented to: Southwestern Association of Naturalists.

Sparks, D. W. 2008. Demography of the endangered Indiana bat. Presented to: USFWS Indiana Bat Demographic Model Rapid Prototyping and Structured Decision Making Workshop, National Conservation Training Center.

Sparks, D. W. 2007. How Biologists Use Museum Specimens. Presented to: Department of Forestry and Natural Resources, Purdue University.

Sparks, D. W. 2007. Indiana Bats and Urbanization—Lessons Learned at the Indianapolis International Airport. Presented to: Department of Forestry and Natural Resources, Purdue University and Center for Urban and Environmental Change, Indiana State University, Department of Geography, Geology, and Anthropology.

Sparks, D. W. 2006. Over-view of the Indianapolis Airport Project: What is the Benefit of Research for the Regulated? Presented to American Association of State Transportation Officials workshop on Indiana Bats.

Sparks, D. W. 2005. Landscape ecology of the endangered Indiana bat. Presented to: Indiana Bat Survival Workshop, National Conservation Training Center.

Sparks, D. W. 2005. Natural history of the endangered Indiana bat. Presented to: Indiana Bat Survival Workshop, National Conservation Training Center.

Sparks, D. W., J. O. Whitaker, Jr, and C. M. Ritzi. 2004. Foraging ecology of the endangered Indiana bat. Presented to: Indiana Bats and Coal Mining, An Interactive Technical Forum.

Sparks, D. W. 2004. Bats and Urbanization Near Indianapolis, Indiana. Presented to: Murray State University Wildlife and Fisheries Society.

Sparks, D. W. C. M. Ritzi, and J. O. Whitaker, Jr. 2004. Managing a forest bat in the suburban jungle: conserving the Indiana myotis near Indianapolis. Presented to: Second Bats and Forest Symposium (Section on Managing Indiana Bats).

Sparks, D. W. 2003. How does urbanization impact bats? Presented as: Sternberg Museum Lecture Series.

Sparks, D. W. , and T. P. Simon. 2002. Managing small collections. Presented to: Indiana Academy of Science.

Sparks, D. W. 2002. Reproductive biology of the northern myotis. Presented to: Department of Life Sciences, Indiana State University.

Sparks, D. W. 2000. Copulation, growth, development, and roosting ecology of the northern myotis, *Myotis septentrionalis*. Presented to: Ball State University Student Wildlife Society.

Sparks, D. W. 1998. Distribution, conservation status, and historical biogeography of bats in Kansas. Presented to: Department of Life Sciences, Indiana State University.

Sparks, D. W. 1998. Orientation of northern myotis, *Myotis septentrionalis*, following release in Daytime. Presented to: Department of Biology, Fort Hays State University.

PROFESSIONAL AFFILIATIONS

American Society of Mammalogists, Life member
Great Plains Natural Science Society, Life member
Southwestern Association of Naturalists, 1994
Indiana Academy of Science, 1977-Present
Society for Conservation Biology, 1996-2006
The Wildlife Society, 2000-Present

ENVIRONMENTAL SOLUTIONS & INNOVATIONS, INC.

Résumé

Jacques Pierre Veilleux, Ph.D.

EDUCATION

Ph.D., Vertebrate Ecology/Systematics, Indiana State University, 2001. Dissertation: Natural History and Roosting Ecology of the Eastern Pipistrelle, *Pipistrellus subflavus*, in Indiana.
B.S., Biology, Fitchburg State College, 1996

QUALIFICATIONS AND EXPERIENCE

Dr. Veilleux is a wildlife biologist involved in a variety of terrestrial ecology research positions and has extensively studied bats and their habitat. He is familiar with the physiology, taxonomy, and ecology of many bat species. Much of his research is focused on roosting ecology, behavior, and natural history and includes species such as eastern small-footed bat (*Myotis leibii),* hoary bat (*Lasiurus cinereus*), Indiana bat, (*Myotis sodalis),* eastern pipistrelle *(Pipistrellus subflavus),* eastern red bat *(Lasiurus borealis)* and evening bat (*Nycticeius humeralis).* He also participated in research related to hibernacula and cave habitat profiles.

Dr. Veilleux is an experienced public speaker, having taught a variety of university level courses and presented numerous papers to educational and professional organizations. He is extensively published and has served as primary author of technical reports submitted to the New Hampshire Fish and Game Department and peer-reviewed journal articles published by American Midland Naturalist, Northeastern Naturalist, Journal of Mammalogy, Proceedings of the Indiana Academy of Science, and others.

TEACHING EXPERIENCE

Associate Professor – Franklin Pierce University, Department of Biology: 2003-Present. Teach general biology, vertebrate biology, mammalogy, animal behavior, conservation biology, and mentor undergraduate students conducting supervised research projects.

Associate Professor – Sacred Heart University, Department of Biology: 2001-2003. Taught general biology, vertebrate biology, animal behavior, and senior special topics seminar, and mentored undergraduate students conducting supervised research projects.

Graduate Teaching Assistant – Indiana State University, Department of Life Science: 1997-2001. Provided undergraduate instruction in general biology, vertebrate zoology, mammalogy, herpetology, and ichthyology. Prepared lectures and exams, led field studies, and developed undergraduate research projects.

PROJECT EXPERIENCE

Team Leader – 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.

Team Leader – M3 Midstream, LLC, Appalachia Pipeline: 2011. Completed mist net surveys for the federally endangered Indiana bat along a 130-mile natural gas pipeline ROW in Monongalia and Marion counties, West Virginia. Performed mist net site set up and habitat assessment, bat identification, and morphometric processing.

Team Leader – Consol Energy, Northern West Virginia RO Water Pipeline: 2011. Completed endangered bat survey along 31.6-mile long waterline in Monongalia, Marion, and Harrison Counties, West Virginia. Performed mist net site set up and habitat assessment, bat identification, and morphometric processing.

Team Leader – Appalachia Midstream Services, LLC, Greene Gathering Phase I: 2011. Completed mist net surveys for the federally endangered Indiana bat along a 9.3-mile natural gas pipeline ROW in Marshall and Wetzel counties, West Virginia. Performed mist net site set up and habitat assessment, bat identification, and morphometric processing.

Team Leader – Chief Gathering Natural Gas Pipeline: 2011. Completed summer mist net survey along 30.1-mile pipeline in Luzerne and Wyoming counties, Pennsylvania. Performed mist net site set up and habitat assessment, bat identification, and morphometric processing.

Team Leader – Equitrans, LP, Sunrise Pipeline: 2010. Conducted Indiana bat summer mist net survey in Greene County, Pennsylvania, and Doddridge, Marion, Harrison, and Taylor and Wetzel counties, West Virginia. Performed mist net site set up and habitat assessment, bat identification, and morphometric processing.

Team Leader – Tennessee Gas Pipeline, Northeast Upgrade: 2010. Conducted Indiana bat mist net survey along portions of a pipeline looping project in Sussex, Passaic, and Bergen counties, New Jersey and Bradford, Wayne and Pike counties, Pennsylvania. Performed mist net site set up, habitat assessments, bat identification, bat handling, and morphometric processing.

Team Leader – Department of Defense, Fort Drum Army Installation: 2010. Completed Indiana bat habitat and mist net surveys in Jefferson and Lewis counties, New York. Performed mist net site set up, habitat assessment, bat identification, morphometric processing, Indiana bat radio-transmitting, and diurnal roost telemetry.

Team Leader – 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. Performed mist netting activities, including site set up and bat handling. Responsible for coordination of daily field crew activities, habitat assessments, and quality control of collected data. Captured one Indiana bat in New Jersey and attached a radio-transmitter, leading to the discovery of multiple roost trees.

Assistant Curator – Indiana State University: 1998-2001. Prepared and catalogued mammal, reptile/amphibian, and fish specimens for the university's vertebrate collections. Led public group tours of the museum, provided loan specimens to outside researchers, and conducted standard maintenance activities within the collection.

Field Assistant – Department of Defense, Newport Chemical Depot: 1998. Supervised field work for a study conducted to provide a complete assessment of the diversity, distribution, and abundance of the vertebrate fauna (except birds) occurring at the facility in Vermillion County, Indiana. Prepared three manuscripts for publication in a regional peer reviewed journal.

Co-Chairperson – Wabash Valley Audubon Society, Conservation Committee: 1997-1998. Responsible for identifying current issues critical to the conservation of habitats, fauna, and flora of Indiana, as well as the nation. Drafted petition letters to state and federal legislators aimed at providing scientific data and reasoning regarding whether particular legislation should or should not be supported.

Research Aid – Harvard Museum of Comparative Zoology: 1994-1996. Participated in Nicaragua Field Expedition. Responsible for trapping and preparing museum quality skins and skeletons of the mammal fauna for Mammals of Nicaragua. Other responsibilities included identifying and cataloguing specimens and collection of ectoparasites

PUBLICATIONS

Veilleux, J.P. in preparation. The bats of the Surry Mountain Dam with an emphasis on the eastern small-footed bat (*Myotis leibii*). Northeastern Naturalist.

Veilleux, J.P. in preparation. Colonies and reproductive phenology of the eastern small-footed bat, *Myotis leibii*, in New Hampshire. American Midland Naturalist.

Veilleux, J.P. in preparation. Roosting ecology of the eastern small-footed bat, *Myotis leibii*, in New Hampshire. Journal of Mammalogy

Veilleux, J.P., P.M. Moosman, D.S. Reynolds, K.E. LaGory, and L.J. Walston, Jr. 2009. Observations of summer roosting and foraging behavior of a hoary bat (*Lasiurus cinereus*) in southern New Hampshire. Northeastern Naturalist. 16: 148-151.

Veilleux, J.P., H.H. Thomas, and P.M Moosman. 2008. Bats of Pisgah State Park, New Hampshire. Northeastern Naturalist. 15:25-34.

Veilleux, J.P. 2008. Current status of white-nose syndrome in the northeastern United States. Bat Research News. 49:15-17.

Moosman, P.M., H.H. Thomas, and J.P. Veilleux. 2007. Food Habits of Eastern Small-Footed Bats (*Myotis leibii*) in New Hampshire. American Midland Naturalist. 158:354-360.

Veilleux, J.P. 2007. A Noteworthy Hibernation Record of the Eastern Small-footed Bat (*Myotis leibii*) in Massachusetts. Northeastern Naturalist. 14:501-502.

Cryan, P.A. and J.P. Veilleux. 2007. Migration and the use of autumn, winter, and spring roosts by forest bats. Pages 153-175 *in* Bats in Forests, Conservation and

Management. (M.J. Lacki, J.P. Hayes, and A. Kurta, eds.). Johns Hopkins University Press, Baltimore, Maryland. 325pp.

Veilleux, J.P. 2006. Survey of the bat community present in select western Massachusetts hibernacula. Report to Green Berkshires, Inc. 77pp.

Veilleux, J.P. and D.S. Reynolds. 2006. Survey of known and potential hibernacula in New Hampshire. Report to the New Hampshire Fish and Game Department. 77pp.

Veilleux, J.P. and S.D. Reynolds. 2005. Cave habitat profile for New Hampshire Comprehensive Wildlife Conservation Plan. New Hampshire Fish and Game Department.

Veilleux, J.P. and S.D. Reynolds. 2005. Species habitat profiles *(Lasiurus borealis, Lasiurus cinereus, Lasionycteris noctivagans, Myotis leibii, Myotis septentrionalis, Myotis sodalis, Pipistrellus subflavus*) for New Hampshire Comprehensive Wildlife Conservation Plan. New Hampshire Fish and Game Department.

Veilleux, J.P., J.O. Whitaker, Jr., and S.L. Veilleux. 2004. Reproductive stage influences roost use by tree roosting female eastern pipistrelles, *Pipistrellus subflavus*. Ecoscience. 11:249-256.

Veilleux, J.P. and S.L. Veilleux. 2004. Intra-annual and interannual fidelity to summer roost areas by female eastern pipistrelles, *Pipistrellus subflavus*. American Midland Naturalist. 152:196-200.

Veilleux, J.P. and S.L. Veilleux. 2004. Colonies and reproductive patterns of tree-roosting female eastern pipistrelle bats in Indiana. Proceedings of the Indiana Academy of Science. 113:60-65

Veilleux, J.P., J.O. Whitaker, Jr., and S.L. Veilleux. 2003. Tree-roosting ecology of reproductive female eastern pipistrelles, *Pipistrellus subflavus*, in Indiana. Journal of Mammalogy. 84:1068-1075.

Veilleux, S.L. J.P. Veilleux, J. Duchamp, and J.O. Whitaker, Jr. 2003. Possible predation attempt at a roost tree of evening bats (*Nycticeius humeralis*). Bat Research News. 44:186-187.

Veilleux, J.P., J.O. Whitaker, Jr., and E.A. Vincent. 2001. Mammals of the Newport Chemical Depot, Vermillion County, Indiana. Proceedings of the Indiana Academy of Science. 107:91-104

Whitaker, J.O. Jr., Veilleux, J.P., and E.A. Vincent 2001. Fishes of the Newport Chemical Depot, Vermillion County, Indiana. Proceedings of the Indiana Academy of Science. 107:115-122

Vincent, E.A., J.P. Veilleux, and J.O. Whitaker, Jr. 2001. Reptiles and Amphibians of the Newport Chemical Depot, Vermillion County, Indiana. Proceedings of the Indiana Academy of Science. 107:105-113

PAPERS AND INVITED SEMINARS

Human impacts on bats: a global perspective. 2008. Invited seminar presented to the Biology Department at Rivier College, Nashua, New Hampshire.

The influence of slope aspect on the thermal characteristics of roost sites of pregnant eastern small-footed bats, *Myotis leibii*: a field experiment. 2007. 14th International Bat Research Conference, Merida, Mexico.

Diet of Eastern Small-Footed Bats (*Myotis leibii*) in New Hampshire: Evidence for Gleaning? 2006. North American Symposium on Bat Research, Wilmington, North Carolina.

Roosting Habits of *Myotis leibii* at the Surry Mountain Lake Dam in Southwestern New Hampshire. 2006. Northeastern Bat Working Group, East Stroudsburg, Pennsylvania.

Preliminary Report of the Roosting Habits of the Eastern Small-Footed Bat, *Myotis leibii,* in New Hampshire. 2005. North American Symposium on Bat Research, Sacramento, California.

Current conservation issues in bats. 2004. Invited seminar to Natural Sciences Division of Colby-Sawyer College, New London, New Hampshire.

Bat biology and conservation. 2003. Invited seminar at the Monadnock Institute of Nature, Place and Culture, Franklin Pierce College, Rindge, New Hampshire

Reproductive stage influences roost use by adult female eastern pipistrelles. 2002. North American Symposium on Bat Research, University of Vermont, Burlington, Vermont.

The influence of reproductive stage on summer roost-site selection by adult female eastern pipistrelles, *Pipistrellus subflavus*. 2002. Annual meeting of the American Society of Mammalogists, McNeese State University, Lake Charles, Louisiana.

Tree-roosting ecology of reproductive female eastern pipistrelles, *Pipistrellus subflavus*. 2001. Annual meeting of the American Society of Mammalogists, University of Montana, Missoula, Montana.

Differences roost fidelity between reproductive classes of females eastern pipistrelles, *Pipistrellus subflavus*, in southwest Indiana. 2000. North American Symposium on Bat Research, University of Florida at Coral Gables.

Differences roost fidelity between reproductive classes of females eastern pipistrelles, *Pipistrellus subflavus*, in southwest Indiana. 2000. Indiana Academy of Science Annual Meeting, Indiana University East at Richmond. .

Roosting ecology of eastern pipistrelles, *Pipistrellus subflavus*, in Indiana. 2000. Ball State University at Muncie – Invited Seminar.

Preliminary report of roosting habits of the eastern pipistrelle, *Pipistrellus subflavus*. 1999. North American Symposium on Bat Research, University of Wisconsin at Madison.

Preliminary report of roosting habits of the eastern pipistrelle. 1999. *Pipistrellus subflavus* Indiana Academy of Science Annual Meeting, University of Southern Indiana.

HONORS AND GRANTS

Named *2000 Oracle Bat Research Scholar* by the Oracle Corporation in conjunction with Bat Conservation International for research concerned with behavioral differences in roost preference between reproductive classes of eastern pipistrelles, *Pipistrellus subflavus*.

Received award for best student paper at the North American Symposium on Bat Research, University of Miami, Fall 2000. Differences in roost fidelity between reproductive classes of eastern pipistrelles, *Pipistrellus subflavus*, in southwest Indiana.

Received the 1998 I.S.U. Department of Life Sciences Teaching Scholarship awarded annually to a graduate student planning to teach biology at the university level. The grant is intended to defray costs associated with attending a professional pedagogy meeting.

Sponsored to membership of Sigma Xi, scientific research society and invitation to honorary dinner/lecture at Harvard University Faculty Club, spring1995.

New Hampshire Fish and Game Department, 2009. $7900

FPC Faculty Development Research Fund, 2008. $4000

U.S. Army Corps of Engineers, Wildlife Research Grant, 2008. $2200

FPC Faculty Development Research Fund, 2007. $3968

U.S. Army Corps of Engineers, Wildlife Research Grant, 2007. $2400

FPC Faculty Development Research Fund, 2006. $3870

U.S. Army Corps of Engineers, Wildlife Research Grant, 2006. $2000

FPC Faculty Development Research Fund, 2005. $4000
New Hampshire of Fish and Game Department, 2004. $34,800

SHU University Research and Creativity Grant, 2002. $3280

Bat Conservation International, 2002. $2330

Indiana State University Student Research Fund, 2002. $75

Indiana Academy Of Science, 2002. $1100

Indiana Academy of Science, 1999. $1200

ISU Graduate School Research Grant, 1999. $100

American Museum of Natural History/Theodore Roosevelt Fund, 1998. $840

ISU Graduate School Research Grant, 1997. $250

PROFESSIONAL AFFILIATIONS

American Society of Mammalogists
Acta Chiropterologica
Bat Conservation International
Animal Behavior Society
North American Symposium on Bat Research
Ecological Society of America

ENVIRONMENTAL SOLUTIONS & INNOVATIONS, INC.

Résumé

Justin J. Wilson

EDUCATION

B.S., Biology/Environmental Ecology, Jacksonville State University, 2001
Associates, Biology/Geography, University of North Alabama, 1997

QUALIFICATIONS AND EXPERIENCE

Mr. Wilson has assisted with numerous wildlife research and management activities. He participates in bat, mammal, bird, and herpetological surveys. He has specialized experience with bats and can identify most Eastern U.S. bats to species, including endangered *Myotis* species. He is experienced in many ecological field techniques, including:

- Mist net set up, bat handling and identification, and morphometric processing (species, weight, gender, and various measurements)
- Implementation of White Nose Syndrome protocols
- Habitat assessments
- Radio telemetry
- Use of handheld, sub-meter accurate Trimble GPS unit
- Identification of game birds and waterfowl
- Identification of trees and ferns
- Electrofishing
- Statistical analyses

Mr. Wilson's experience includes teaching biology and scientific laboratories to high school students and participating in educational outreach programs managed by U.S. Fish and Wildlife Service.

PROJECT EXPERIENCE

Team Leader – Williams Ohio Valley Midstream Pipeline: 2012. Completed summer mist-netting along a 30-mile pipeline project in Washington County, Pennsylvania.

Team Leader – PVR NEPA Gas Gathering, Marquart to Painter's Den Natural Gas Pipeline: 2012. Completed summer mist net surveys along a 15-mile natural gas pipeline in Sullivan County, Pennsylvania.

Team Leader – PVR NEPA Gas Gathering, Severcool Natural Gas Pipeline and Compressor Station: 2012. Completed summer mist net site reconnaissance along a five-mile natural gas pipeline in Wyoming County, Pennsylvania.

Biologist – Great Swamp National Wildlife Refuge: 2012. Completed mist net surveys on the Refuge in Morris County, New Jersey to collect population data on female

Indiana bats to aid in understanding White Nose Syndrome impacts to populations of all cave-dwelling bats (and including both sexes) that use the Refuge during the maternity season. An Indiana bat was captured and radio-telemetry and emergence counts were conducted.

Biologist – M3 Midstream Reliance Pipeline: 2012. Completed portal surveys for the federally endangered Indiana bat along a 5.5-mile pipeline and associated access roads in Monongalia and Marion, West Virginia.

Biologist – M3 Midstream 9000 Pipeline: 2012. Completed portal surveys for the federally endangered Indiana bat along a 7-mile pipeline and associated access roads in Harrison County, West Virginia.

Biologist – Indiana Department of Transportation, Interstate 69, Pre- and Post-construction Surveys: 2012. Conducted summer mist net survey for federally endangered Indiana bat along final ROW for Section 5 in Morgan and Monroe counties, Indiana. Performed mist net site reconnaissance, site set up, habitat assessment, bat handling and identification, and morphometric processing. Also conducted radio-telemetry and emergence counts.

Biologist – Confidential Client, Natural Gas Pipeline: 2012. Completed habitat assessment along a 1.71-mile long proposed pipeline in Wetzel County, West Virginia.

Biologist – Confidential Client: 2012. Mortality study on a site containing 20 turbines along a 3-mile stretch of Backbone Mountain in Garrett County, Maryland.

Biologist – Confidential Client, Natural Gas Transmission Pipeline: 2012. Conducted winter habitat assessments for the endangered Indiana bat along a 350-mile pipeline running through portions of West Virginia and Pennsylvania.

Team Leader – American Electric Power Bonnyman-Soft Shell 138 kV Transmission Line: 2012. Completed portal search along a 19.7-mile transmission line in Perry and Knott counties, Kentucky.

Biologist – Global Geophysical, Rolling Rock Seismic Survey: 2011. Completed habitat assessments and habitat avoidance surveys for eastern small-footed bats, timber rattlesnakes, Allegheny woodrats, and green salamanders on a seismic survey project in Fayette County, Pennsylvania.

Biologist– Roth Rock Wind Generation: 2011. Completed a bat mortality study on a site containing 20 turbines along a 3-mile stretch of Backbone Mountain in Garrett County, Maryland.

Team Leader/Field Supervisor– M3 Midstream, LLC, Appalachia Pipeline: 2011. Completed summer and autumn surveys for the federally endangered Indiana bat along a 130-mile natural gas pipeline ROW in Monongalia and Marion counties, West Virginia. During summer, performed site reconnaissance, mist net set up, bat handling and identification, and morphometric processing. During autumn, performed a portal search, assessment, and sampling (mist net, harp trap, and AnaBat monitoring).

Team Leader/Field Supervisor– Consol Energy, Northern West Virginia Ro Water Pipeline: 2011. Completed endangered bat survey along 31.6-mile long waterline in

Monongalia, Marion, and Harrison Counties, West Virginia. Performed site reconnaissance, mist net set up, bat handling and identification, and morphometric processing.

Team Leader/Field Supervisor– Appalachia Midstream Services, LLC, Greene Gathering Phase I: 2011. Completed mist net surveys for the federally endangered Indiana bat along a 9.3-mile natural gas pipeline ROW in Marshall and Wetzel counties, West Virginia. Performed site reconnaissance, mist net set up, bat handling and identification, and morphometric processing.

Biologist– American Electric Power, Sand Hill-Wharton Hill 138kV Transmission Line: 2010-2011. Completed bat habitat assessments and portal searches along a proposed 7-mile transmission line and associated access roads in Marshall County, West Virginia.

Team Leader/Field Supervisor– Equitrans, LP, Sunrise Pipeline: 2010. Conducted Indiana bat summer mist net survey in Greene County, Pennsylvania, and Doddridge, Marion, Harrison, and Taylor and Wetzel counties, West Virginia.

Team Leader – American Electric Power, Broad Run-Thorofare 138 kV Service to Columbia Gas: 2010. Conducted portal (potential hibernacula) searches along a proposed 1.5-mile transmission line in Kanawha County, West Virginia.

Team Leader – Chief Gathering Natural Gas Pipeline: 2011. Completed summer mist net survey along 30.1-mile pipeline in Luzerne and Wyoming counties, Pennsylvania. Conducted telemetry for radio-tagged eastern small-footed bats.

Field Assistant –Tennessee Gas Pipeline Company 300 Line: 2009. Completed Indiana bat habitat and mist net surveys for a 120-mile pipeline project across northern Pennsylvania and New Jersey. Performed mist net set up, bat handling and morphometric processing, diurnal radio-tracking, and roost emergence counts.

Field Assistant – The Conservation Fund: 2009. Completed AnaBat studies across the eastern range of the Indiana bat in nine states. Studies included examination of species distribution in potentially impacted areas and forest condition surveys. Performed vegetative plot surveys within forested habitat.

Field Assistant – U.S. Fish and Wildlife Service – Region 5: 2009. Participated in Indiana bat mist netting, radio-tagging, and acoustic surveying for the Wallkill River National Wildlife Refuge in Sussex County, New Jersey to identify Indiana bat diurnal roosts on the Refuge. Performed mist net site set up and bat handling. Captured, handled, and assisted with identification and radio-tracking of eight Indiana bats.

Field Assistant – USDA Forest Service, Mark Twain National Forest: 2009. Participated in summer mist net and acoustic monitoring surveys in Iron County, Missouri. Assisted with mist net set up, bat identification, handling and morphometric processing, and radio-tracking.

Field Assistant – Pocono Manor: 2006. Conducted an Indiana bat survey for a 5000-acre commercial and residential development in Pennsylvania. Assisted with mist net set up, habitat assessments, bat morphometric processing, and data transcription.

Field Assistant – Columbia Gas, Virginia Looping Pipeline: 2006. Completed mist net survey for endangered bats along 34 miles of natural gas transmission line ROW in Virginia. Assisted with mist net set up, habitat assessments, and bat morphometric processing.

Field Assistant – Department of Defense, Camp Dawson Collective Training Facility: 2006. Participated in an Indiana bat mist net survey at an Army National Guard installation in north-central West Virginia. Performed site reconnaissance and set up, habitat assessments, bat handling, and morphometric processing.

Biologist – Florida Division of Forestry: 2001-2006. Participated in various studies conducted on several state forests. Responsibilities included management of red-cockaded woodpecker recovery program, herpetofauna monitoring, vegetation sampling and monitoring, assisted with habitat restoration management plans and planned and conducted prescribed burns on state lands.

Biologist – U.S. Fish and Wildlife Service – Region 4: 2000. Conducted various surveys and research projects on multiple wildlife refuges in Louisiana. Assisted with USFWS environmental education programs developed for the public.

Field Assistant – Jacksonville State University: 1997-2001. Participated in numerous aquatic projects including fish and benthic invertebrate surveys, stream assessments, and water quality testing. Also directed studies associated with predatory behavior and feeding habits of inshore lizardfish. Completed waterfowl and shore bird identification, amphibian survey, and wetland delineation.

PROFESSIONAL AFFILIATIONS

Beta Beta Beta
Southeastern Division American Society of Ichthyologists and Herpetologists
Coastal Conservation Association
Legacy/ Alabama Nature Conservancy
Alabama Water Watch
Ducks Unlimited
Association of Southern Biologists